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Office

Vol. 1080 Number 1

# OFFICIAL GAZETTE

of the  
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS  
July 7, 1987

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.  
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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee: . . . . .	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed: . . . . .	520.00
—Corresponding prior U.S. national application filed: . . . . .	350.00
—Supplemental search fee, per additional invention . . . . .	140.00
European Patent Office as Searching Authority . . . . .	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority . . . . .	370.00
—Additional examination fee, per additional invention . . . . .	125.00
—Searching Authority not the USPTO . . . . .	570.00
—Additional examination fee, per additional invention . . . . .	190.00
International fees	
Basic fee: . . . . .	485.00
Basic Supplemental fee (for each page over 30): . . . . .	10.00
Designation fee for the first 10 national or regional offices: . . . . .	120.00
Designation fee for 11th and subsequent designations: . . . . .	No Charge
Handling fee . . . . .	150.00
Supplement to the handling fee . . . . .	150.00

## U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA . . . . .	170.00	340.00
USPTO was neither ISA nor IPEA . . . . .	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4) . . . . .	25.00	50.00
—For each independent claim in excess of 3 . . . . .	17.00	34.00
—For each claim in excess of 20 . . . . .	6.00	12.00
—For each application containing a multiple dependent claim . . . . .	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1 . . . . .	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1 . . . . .	26.00	26.00

June 2, 1987. DONALD J. QUIGG, Assistant Secretary and Commissioner of Patents and Trademarks.

## Implementation of Chapter II of the Patent Cooperation Treaty

This notice is intended to be a summary of various notices published to implement Chapter II of the Patent Cooperation Treaty (PCT) on July 1, 1987.

### 1. Withdrawal of reservation and implementing legislation.

A copy of the withdrawal of the reservation as to Chapter II of the PCT under PCT Article 64(6)(b) and a copy of Public Law 99-616 implementing Chapter II of the PCT were published in the *Official Gazette* of May 12, 1987 at 1078 O.G. 10-13.

The proposed rule change relating to the implementation of Chapter II of the PCT was published on Mar. 4, 1987 in the *Federal Register* at 52 F.R. 6696-6707 and on Mar. 17, 1987 in the *Official Gazette* at 1076 O.G. 29-40. The final rules were published on May 28, 1987 in the *Federal Register* 52 F.R. 20038-20052 and on June 16, 1987 in the *Official Gazette* at 1079 O.G. 32.

A listing of all current member countries of the PCT was published on Mar. 3, 1987 at 1076 O.G. 3. After July 1, 1987 only Denmark, Norway, Liechtenstein, Switzerland and the Republic of Korea (South Korea) retain reservations as to Chapter II of the PCT.

A listing of the level of PCT fees effective July 1, 1987, both because of rulemaking and a change in the exchange rate was published on June 23, 1987 in the *Official Gazette* at 1079 O.G. 50.

JULY 7, 1987

U.S. PATENT AND TRADEMARK OFFICE

1080 OG 3

A notice clarifying the requirements for entering the national stage in the United States under 35 U.S.C. 371 was published on Apr. 14, 1987 at 1077 O.G. 13.

## 2. International Preliminary Examining Authorities

The United States has informed the Director General of the World Intellectual Property Organization (WIPO) that the United States Patent and Trademark Office (USPTO) will serve as an International Preliminary Examining Authority for any international application filed in the United States Receiving Office and for any international application for which the USPTO has served as the International Searching Authority.

Applicants who have filed their international applications in the USPTO as a Receiving Office may choose to have the European Patent Office (EPO) serve as their International Preliminary Examining Authority if (1) the EPO has served as the International Searching Authority for the international application and (2) the demand filed with the EPO is one of the first 500 demands filed by applicants who have filed their international applications in the United States Receiving Office in one of the 3 years beginning July 1, 1987.

The attention of applicants desiring to use the EPO as an International Preliminary Examining Authority is also directed to the notice titled "Information for PCT applicants concerning the procedure before the EPO as an International Preliminary Examining Authority under Chapter II of the PCT" published in the *Official Journal* of the European Patent Office in volume 12/1986 at pages 441-445.

A copy of the "Memorandum of Understanding" to monitor the number of demands filed in the EPO by U.S. applicants between the USPTO and EPO appears below.

June 11, 1987. DONALD J. QUIGG, Assistant Secretary and Commissioner of Patents and Trademarks, United States Patent and Trademark Office.

## Memorandum of Understanding

Procedures for monitoring and processing demands submitted to the European Patent Office by U.S. applicants who filed their international applications with the United States Receiving Office.

### Purpose

The purpose of this memorandum is to set forth the procedures to be used to monitor the number of demands for international preliminary examination filed by U.S. applicants in the European Patent Office (EPO) in respect of international applications filed with the United States Receiving Office (hereinafter referred to as "demands filed in the EPO by U.S. applicants"). Such monitoring is important in view of the limit of 500 international preliminary examination reports which the EPO has agreed to establish during each of the first three years that PCT Chapter II is in effect as to the United States of America. The memorandum also sets forth the processing procedures for any demands filed in excess of the agreed-to amount.

### Monitoring of Number of Demands

It is essential that U.S. applicants be informed as to the number of demands which have already been filed in the EPO by U.S. applicants, especially where the number of demands filed in the EPO is approaching 500.

In order to provide such numerical information to the U.S. applicants, the EPO will provide to the USPTO, each month during the first three years by telex, the cumulative number of demands filed in the EPO by U.S. applicants during that particular year. The USPTO will then publish a notice which indicates the number of de-

mands filed in the EPO by U.S. applicants as of a particular date, in its *Official Gazette*. The number of demands filed, based upon the latest known information, will also be supplied by telephone or telex to interested persons by both the EPO and USPTO.

## Processing of Demands in Excess of 500

Since the EPO will only accept 500 demands a year from U.S. applicants, the USPTO will accept any demands beyond the 500 limit filed in the EPO by U.S. applicants.

Upon receipt by the EPO of the 501st and subsequent demands from a U.S. applicant, the EPO will promptly notify the applicant that it is not competent under PCT Rule 59.1 to receive the demand. The EPO will also immediately telex or telephone the USPTO and inform it of the international application serial number so that the USPTO may make immediate contact with the applicant.

The EPO will refund any fees paid by the applicant to the EPO and indicate that only the USPTO is competent to receive the demand and establish the international preliminary examination report, and that the demand is being forwarded to the USPTO. The EPO will indicate the date of receipt of the demand on the demand and promptly forward it to the USPTO for further processing. The EPO will be considered to be the agent of the USPTO for purposes of receiving and dating demands. The USPTO will correspond with the applicant concerning the demand and require the payment of fees to the USPTO under PCT Rules 57.4 and 58.2.

For purposes of this procedure, the contact person in the USPTO is Louis O. Maassel (telephone 703-557-3070) and the contact person in the EPO is Mr. Colin Philpott (telephone 2399-2479) for substantive and organizational matters, or Mrs. M. Houyez-Stevens (telephone 2399-2423) for numerical information.

PAUL BRAENDLI, President, European Patent Office.

DONALD J. QUIGG, Assistant Secretary and Commissioner of Patents and Trademarks, United States Patent and Trademark Office.

## Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 3, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,457,023 through 4,458,362  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and



(h), as amended effective Oct. 5, 1985, which are reproduced below:

### 37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . \$ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:  
By a small entity (§1.9(f)) . . . . . \$ 225.00  
By other than a small entity . . . . . \$ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . \$ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:  
By a small entity (§1.9(f)) . . . . . \$ 55.00  
By other than a small entity . . . . . \$ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . \$ 500.00"

### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

### PATENTS WHICH EXPIRED APRIL 19, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,380,092	06/238,223	4/19/83
4,380,096	06/283,067	4/19/83
4,380,120	06/232,503	4/19/83
4,380,121	06/249,971	4/19/83
4,380,126	06/269,726	4/19/83
4,380,131	06/216,849	4/19/83
4,380,157	06/281,366	4/19/83
4,380,159	06/255,474	4/19/83
4,380,160	06/228,067	4/19/83
4,380,165	06/266,280	4/19/83

4,380,176	06/231,511	4/19/83
4,380,177	06/223,524	4/19/83
4,380,186	06/297,629	4/19/83
4,380,190	06/234,878	4/19/83
4,380,201	06/242,288	4/19/83
4,380,206	06/247,484	4/19/83
4,380,213	06/342,802	4/19/83
4,380,215	06/284,064	4/19/83
4,380,227	06/380,081	4/19/83
4,380,231	06/229,764	4/19/83
4,380,233	06/221,469	4/19/83
4,380,236	06/301,677	4/19/83
4,380,238	06/294,915	4/19/83
4,380,242	06/267,998	4/19/83
4,380,245	06/228,629	4/19/83
4,380,246	06/245,844	4/19/83
4,380,247	06/250,203	4/19/83
4,380,255	06/294,216	4/19/83
4,380,268	06/281,718	4/19/83
4,380,269	06/319,043	4/19/83
4,380,270	06/227,754	4/19/83
4,380,271	06/255,129	4/19/83
4,380,290	06/252,384	4/19/83
4,380,293	06/216,327	4/19/83
4,380,294	06/231,661	4/19/83
4,380,302	06/254,939	4/19/83
4,380,305	06/329,258	4/19/83
4,380,326	06/301,937	4/19/83
4,380,331	06/231,160	4/19/83
4,380,339	06/292,608	4/19/83
4,380,344	06/269,996	4/19/83
4,380,374	06/254,947	4/19/83
4,380,380	06/272,506	4/19/83
4,380,382	06/274,555	4/19/83
4,380,409	06/293,165	4/19/83
4,380,410	06/243,432	4/19/83
4,380,414	06/264,284	4/19/83
4,380,421	06/317,599	4/19/83
4,380,422	06/270,973	4/19/83
4,380,425	06/234,597	4/19/83
4,380,437	06/299,335	4/19/83
4,380,439	06/299,840	4/19/83
4,380,493	06/320,121	4/19/83
4,380,500	06/322,731	4/19/83
4,380,539	06/242,583	4/19/83
4,380,545	06/245,288	4/19/83
4,380,547	06/268,416	4/19/83
4,380,560	06/331,487	4/19/83
4,380,562	06/235,681	4/19/83
4,380,565	06/338,020	4/19/83
4,380,568	06/246,411	4/19/83
4,380,571	06/369,786	4/19/83
4,380,610	06/332,416	4/19/83
4,380,613	06/279,905	4/19/83
4,380,614	06/222,924	4/19/83
4,380,624	06/288,763	4/19/83
4,380,634	06/308,014	4/19/83
4,380,640	06/224,583	4/19/83
4,380,642	06/284,398	4/19/83
4,380,645	06/329,842	4/19/83
4,380,661	06/237,196	4/19/83
4,380,678	06/226,998	4/19/83
4,380,691	06/301,224	4/19/83
4,380,700	06/278,137	4/19/83
4,380,721	06/221,085	4/19/83
4,380,727	06/247,515	4/19/83
4,380,730	06/261,259	4/19/83
4,380,778	06/260,712	4/19/83
4,380,784	06/242,923	4/19/83
4,380,787	06/303,861	4/19/83
4,380,788	06/262,656	4/19/83
4,380,791	06/267,413	4/19/83
4,380,818	06/267,664	4/19/83

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the

indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

**4,513,986**, Re. S.N. 045,052, Filed Apr. 30, 1987, Cl. 280/281R, BICYCLE FRAME, James L. Trimble, Owner of Record: *Inventor*, Attorney or Agent: John N. Williams, Ex. Gp.: 316

**4,517,172**, Re. S.N. 049,331, Filed May 13, 1987, Cl. 424/7.1, PLAQUE DISCLOSING AGENT, George L. Southard, Owner of Record: *Vipont Laboratories, Inc., Ft. Collins, Colo.*, Attorney or Agent: Eric P. Schellin, Ex. Gp.: 128

**4,517,268**, Re. S.N. 045,346, Filed May 4, 1987, Cl. 430/39, PROCESS FOR MAGNETIC IMAGE CHARACTER RECOGNITION, Robert J. Gruber, et al., Owner of Record: *Xerox Corp., Stamford, Conn.*, Attorney or Agent: Ronald Zibelli, et al., Ex. Gp.: 156

**4,566,376**, Re. S.N. 007,807, Filed Jan. 27, 1987, Cl. 99/468, SYSTEM FOR PRODUCING CRISP FRUIT CHIPS, A. Webb Wells, Owner of Record: *Inventor*, Attorney or Agent: None, Ex. Gp.: 242

**4,569,561**, Re. S.N. 049,382, Filed May 13, 1987, Cl. 305/40, ENDLESS DRIVE SYSTEM, John W. Edwards, et al., Owner of Record: *Harper, Harper, et al., Fort Meyers, Fla.*, Attorney or Agent: Roger W. Parkhurst, Ex. Gp.: 312

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**Re. 31,640**, Reexam. No. 90/001,235, Requested: May 8, 1987, Cl. 3/13, BUOYANCY INTRAOCULAR LENS DEVICE, Dr. Jerre Freeman, Owner of Record: *Inventor, Memphis, Tenn.*, Attorney or Agent: Baker & McKenzie, Ex. Gp.: 330, Requester: 3M Co., St. Paul, Minn.

**4,166,968**, Reexam. No. 90/001,246, Requested: May 26, 1987, Cl. 310/239, ELECTRICALLY ISOLATED BRUSH HOLDER, Robert L. Prittie, Owner of Record: *Lear Siegler, Inc., Santa Monica, Calif.*, Attorney or Agent: Pearne, Gordon, et al., Ex. Gp.: 210, Requester: Owner

**4,369,013**, Reexam. No. 90/001,243, Requested: May 12, 1987, Cl. 412/38, BOOKBINDING STRIPS, William Abildgaard, et al., Owner of Record: *Velo-Bind, Inc., Sunnysdale, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 320, Requester: Owner

**4,497,520**, Reexam. No. 90/001,242, Requested: May 18, 1987, Cl. 299/86, ROTATABLE CUTTER BIT, Randle W. Ojanen, Owner of Record: *GTE Products Corp., Stamford, Conn.*, Attorney or Agent: Donald R. Castle, Ex. Gp.: 250, Requester: Kennametal, Inc., Latrobe, Pa.

**4,571,331**, Reexam. No. 90/001,244, Requested: May 21, 1987, Cl. 423/345, ULTRAFINE POWDER OF SILICON CARBIDE, A METHOD FOR THE PREPARATION THEREOF AND A SINTERED BODY THEREFROM, Morinobu Endou, et al., Owner of Record: *Shin-Etsu Chemical Ltd., Tokyo, Japan.*, Attorney or Agent: Van Santen, et al., Ex. Gp.: 220, Requester: Raymond W. Green, Chicago, Ill.

**4,588,580**, Reexam. No. 90/001,245, Requested: May 26, 1987, Cl. 424/21, TRANSDERMAL ADMINISTRATION OF FENTANYL AND DEVICE THEREFORE, Robert M. Gale, et al., Owner of Record: *Alza Corp., Palo Alto, Calif.*, Attorney or Agent: Steven F. Stone, Ex. Gp.: 150, Requester: Owner

**4,592,353**, Reexam. No. 90/001,247, Requested: May 19, 1987, Cl. 128/303.100, MEDICAL AND SURGICAL LASER PROBE, Norio Daikuzono, Owner of Record: *Surgical Laser Technology Ohio, Inc., Cincinnati, Ohio*, Attorney or Agent: McDougall, Hersh, et al., Ex. Gp.: 330, Requester: W. Edward Johansen, Los Angeles, Calif.

**4,593,044**, Reexam. No. 90/001,248, Requested: May 22, 1987, Cl. 514/557, INJECTABLE SOLUTION FOR THE TREATMENT OF INFLAMMATIONS, Gunter Metz, Owner of Record: *Merckle GmbH, Blaubeuren, Germany*, Attorney or Agent: Jeffery L. Ihnen, Ex. Gp.: 150, Requester: Fernanda Fiordalisi, Garden City, N.Y.

### COMMISSIONER ORDERED REEXAMINATIONS

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

**4,666,425**, Reexam. No. 90/001,249, Ordered: June 1, 1987, Cl. 604/4, DEVICE FOR PERFUSING AN ANIMAL HEAD, Chet Fleming, Owner of Record: *The Dis Corp., St. Louis, Mo.*, Attorney or Agent: Patrick D. Kelly, Ex. Gp.: 330, Requester: The Commissioner of Patents & Trademarks, Washington, D.C.

### Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Apple Investments Inc., Beverly Hills, Calif., Reg. No. 1,181,482, for the mark "APPLE INVESTMENT INC. AND DESIGN", Canc. No. 16,016.

Biloxi Canning & Packing Co., Inc., Biloxi, Miss., Reg. No. 876,133, for the mark "BILOXI", Canc. No. 16,171.

ERMA S. BROWN,

Administrator

of the Trademark Trial

and Appeal Board.

For MARGARET M. LAURENCE,

Assistant Commissioner

for Trademarks.

### Patent and Trademark Office Board of Patent Appeals and Interferences Vacancies

The Board of Patent Appeals and Interferences will be filling a number of Examiner-in-Chief vacancies over the next several months. Positions are available in chemical, electrical, and mechanical technologies. Persons in-

interested in being considered for these vacancies are invited to submit individual applications for each of the following vacancy announcements:

PTO-87-A6-chemical technology, PTO-87-A7-electrical technology, and PTO-87-A8-mechanical technology. There is no deadline for submitting applications. However, candidates are urged to apply as soon as possible since applications will be accepted only until the positions are filled.

Excerpts from the vacancy announcements describing the duties of the position, qualification requirements, factors to be used in evaluating candidates, and necessary application materials are listed below.

**Duties:** Serves as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office. As an Examiner-in-Chief, participates in the Board's appellate and administrative responsibilities and exercises independent judgment on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner, and may be responsible for conducting interlocutory proceedings in interference and for determining questions of priority of invention and patentability between interference parties. Appeals filed in accordance with 35 USC 134 and interferences declared in accordance with 35 USC 135 involve complex legal and technical questions. The Board of Patent Appeals and Interferences has the sole power to:

- (1) hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents, for reissue of patents, and for reexamination of patents;
- (2) to declare and to conduct proceedings in interferences; and
- (3) to determine priority of invention.

Final decisions of the Board, if unfavorable to an applicant, or to a party to an interference, may be appealed to the United States Court of Appeals for the Federal Circuit or civil action may be taken in accordance with 35 USC 145, or 35 USC 146.

**Qualification requirements:** In addition to a technical degree, candidates must possess:

- (1) A minimum of five years of comprehensive patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some

other position inside or outside the Patent and Trademark Office;

- (2) A law degree and membership in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution;
- (3) A high degree of demonstrated competence in chemical, electrical, or mechanical technology;
- (4) A high degree of demonstrated competence and knowledge of interference law and practice;
- (5) Demonstrated ability to determine whether or not tests which are submitted in evidence are technically sufficient to prove the question at hand;
- (6) Demonstrated ability to write clearly, and to write logically developed opinions;
- (7) Demonstrated ability to use legal and technical background to evaluate testimony of witnesses;
- (8) Demonstrated ability to deal effectively with people within and outside the Patent and Trademark Office; and
- (9) Comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

**Factors which will be considered in evaluating qualified candidates:** Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals and questionnaire responses.

**Interested candidates should submit the following:**

- (1) Personal Qualifications Statement, SF-171;
- (2) Merit Program Interest Statement, CD-261 (PTO employees only);
- (3) Current supervisory appraisal on your agency's form or on CD-362 (letters of reference for outside candidates);
- (4) Annual narrative performance rating, or equivalent;
- (5) Examiner-in-Chief Questionnaires; and
- (6) Samples which evidence your writing ability.

Questions concerning this notice and requests for application materials should be directed to Ms. Suzanne Waddill, Office of Personnel, One Crystal Park, Suite 700, Arlington, Va., telephone (703) 557-3631.

DONALD W. PETERSON,  
Deputy Assistant Secretary  
and Deputy Commissioner of  
Patents and Trademarks.

Feb. 3, 1987.

## PATENT NOTICES

### Certificates of Correction for the Week of July 7, 1987

D. 287,408	4,616,029	4,636,451	4,646,139
D. 287,642	4,617,332	4,636,616	4,646,622
D. 289,135	4,617,752	4,636,627	4,647,293
3,974,883	4,618,518	4,636,662	4,647,529
4,474,110	4,619,960	4,636,840	4,647,568
4,499,081	4,621,076	4,637,684	4,647,579
4,507,415	4,621,241	4,637,708	4,647,604
4,511,882	4,621,299	4,637,859	4,647,625
4,527,662	4,621,512	4,637,911	4,647,687
4,529,789	4,621,643	4,638,730	4,647,777
4,531,810	4,622,686	4,639,548	4,648,193
4,544,681	4,623,272	4,640,475	4,648,271
4,547,641	4,624,533	4,640,592	4,648,414
4,548,948	4,624,649	4,640,634	4,649,127
4,554,101	4,624,895	4,640,930	4,649,205
4,555,332	4,625,429	4,641,475	4,649,451
4,560,682	4,625,699	4,641,665	4,649,563
4,568,269	4,625,992	4,641,906	4,650,362
4,570,010	4,626,433	4,642,102	4,650,500
4,571,441	4,626,544	4,642,277	4,650,685
4,572,473	4,626,581	4,642,658	4,650,869
4,573,430	4,628,703	4,642,681	4,651,380
4,574,093	4,628,902	4,642,771	4,651,535
4,577,105	4,629,171	4,642,879	4,652,005
4,577,770	4,629,183	4,643,518	4,652,497
4,583,986	4,629,264	4,643,542	4,653,117
4,591,582	4,629,532	4,643,776	4,653,216
4,594,193	4,630,738	4,643,788	4,653,446
4,595,868	4,630,922	4,643,989	4,653,662
4,600,231	4,632,131	4,644,083	4,655,064
4,600,329	4,632,900	4,644,492	4,655,077
4,601,551	4,633,075	4,644,822	4,655,246
4,602,051	4,634,227	4,645,094	4,655,696
4,605,450	4,634,948	4,645,386	4,656,017
4,606,987	4,634,973	4,645,579	4,656,156
4,611,259	4,636,312	4,645,593	4,657,446
4,611,718	4,636,359	4,645,776	4,658,281
4,612,299	4,636,409	4,645,828	

### Disclaimers

4,327,792.—*Samuel P. Landers*, Uniontown, Ohio. SPREADING NOISE GENERATED BY LOAD SUPPORTING ELEMENTS. Patent dated May 4, 1982. Disclaimer filed May 6, 1987, by the assignee, *The Goodyear Tire & Rubber Co.*

Hereby enters this disclaimer to claims 4, 6, 7, 8, 9, 11, 12, 18, 20, 26, 28, 29, 30, 31, 32, 37, 42, 44, 45, 46, 47 and 48 of said patent.

4,474,223.—*Samuel P. Landers*, Uniontown, Ohio. SPREADING NOISE GENERATED BY LOAD SUPPORTING ELEMENTS OF A TIRE TREAD. Patent dated Oct. 2, 1984. Disclaimer filed May 6, 1987, by the assignee, *The Goodyear Tire & Rubber Co.*

Hereby enters this disclaimer to claims 1 and 24 of said patent.

4,501,765.—*Peter J. Towersey*, High Wycombe, *John Longton*, Chesham and *Geoffrey N. Cockram*, Remenham Hill, England. PRODUCTION OF EDIBLE PROTEIN-CONTAINING SUBSTANCES. Patent dated Feb. 26, 1985. Disclaimer filed Mar. 20, 1986, by the assignee, *Ranks Hovis McDougall PLC*.

The term of this patent subsequent to Aug. 8, 1994 has been disclaimed.

4,522,233.—*Yousef Mojaddad*, Lenexa, Kans. MULTI-POSITION PLUG VALVE. Patent dated June 11, 1985. Disclaimer filed May 8, 1987, by the assignee, *Smith & Loveless, Inc.*

Hereby enters this disclaimer to claims 1-4 and 8 of said patent.

4,571,925.—*Jerry Adams*, Easton, Pa. INSERTION MACHINE WITH POSTAGE CATEGORIZATION. Patent dated Feb. 25, 1986. Disclaimer filed Apr. 16, 1987, by the assignee, *Bell & Howell Co.*

Hereby enters this disclaimer to claims 1-9, 12-14 and 19-35 of said patent.

4,609,662.—*Thomas A. Krenitsky*, Chapel Hill, N.C. METHOD FOR USING PURINE DERIVATIVES. Patent dated Sept. 2, 1986. Disclaimer filed Apr. 6, 1987, by the assignee, *Burroughs Wellcome Co.*

Hereby enters this disclaimer to claims 3, 4, 6, 8, 11 and 12 of said patent.



# Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
	Anchorage Municipal Libraries	(907) 264-4481
Alaska	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arizona	Little Rock: Arkansas State Library	(501) 371-2090
Arkansas	Irvine: University of California, Irvine Library	(714) 856-7234
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
	Moscow: University of Idaho Library	(208) 885-6235
Idaho	Chicago Public Library	(312) 269-2865
Illinois	Springfield: Illinois State Library	(217) 782-5430
	Indianapolis-Marion County Public Library	(317) 269-1741
Indiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Louisiana	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Maryland	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
North Carolina	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
Ohio	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
	Providence Public Library	(401) 521-8726
Rhode Island	Charleston: Medical University of South Carolina Library	(803) 792-2371
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	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
Texas	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

\*Collection organized by subject matter.

## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 23, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-06-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-06-86
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	4-15-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-08-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-07-85
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-14-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	7-22-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	1-07-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-02-86

Expiration of patents: The patents within the range of numbers indicated below expire during May 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,599,579 to 3,514,783, inclusive

Plant Patents . . . . . None



## REEXAMINATIONS

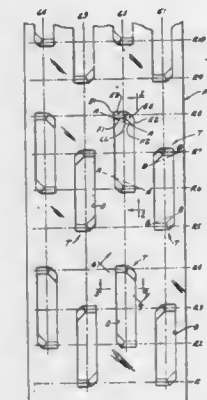
JULY 7, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

### B1 3,951,033 (713th) CONNECTOR PLATE

Walter G. Moehlenpah, St. Louis, Mo., assignor to Moehlenpah Industries, Inc., Coeur, Md.  
Reexamination Request No. 90/000,818, Jul. 8, 1985.  
Reexamination Certificate for Patent No. 3,951,033, issued Apr. 20, 1976, Ser. No. 541,606, Jan. 16, 1975.  
Int. Cl.<sup>4</sup> F16B 15/00

U.S. Cl. 411-468



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-11 are cancelled.

New claim 12 is added and determined to be patentable.

12. A connector for securing together adjacent wood members of a wood structure comprising a plate of mild commercial steel or the like having a plurality of elongate openings arranged in columns extending longitudinally of the plate, each said opening having elongate struck-out portions of the plate extending generally perpendicular to one face of the plate at each end of the opening, the struck-out portions constituting elongate teeth, said openings in each said column being spaced at substantially equal intervals relative to one another in the direction of the column and said columns being spaced transversely across the plate at substantially equal intervals, each said tooth having a shank portion and a pointed tip portion terminating at the free end of the tooth and being generally channel-shaped in cross section with the side edges of the shank portion being substantially parallel, both teeth of certain openings being so oriented relative to the longitudinal axes of their respective columns that vertical planes tangent to portions of said teeth side edges toward said certain openings are skewed in one direction at a first predetermined angle with respect to said longitudinal axes of their respective columns and both of the teeth of certain others of said openings being so oriented relative to the longitudinal axes of their respective columns that vertical planes tangent to portions of the side edges of these latter teeth are skewed at a second predetermined angle substantially equal in magnitude but opposite in direction to said first predetermined angle, each said tooth being a substantial duplicate of the tooth at the opposite end of its respective opening with both teeth in one opening being skewed at the same angle and in the same direction, said plate being a flat generally rectangular plate and the longitudinal axes of said elongate openings being generally aligned with longitudinal axes of said columns, said teeth being skewed substantially along their entire lengths with respect to the longitudinal axes of their respective openings.

### B2 3,964,405 (714th)

#### PERENNIAL WEED CONTROL BY DEEP PLACEMENT OF VOLATILE SOIL FUMIGANTS

William A. Haglund, P.O. Box 693, Mount Vernon, Wash. 98273, and Theodore P. Reiling, 500 Boright, Apt. 101, Le Sueur, Minn. 56058  
Reexamination Request No. 90/000,824, Jul. 22, 1985.  
Reexamination Certificate for Patent No. 3,964,405, issued Jun. 22, 1976, Ser. No. 121,576, Mar. 5, 1971.  
Reexamination Certificate B1 3,964,405, issued Sep. 23, 1986.  
Int. Cl.<sup>4</sup> A01C 23/02

U.S. Cl. 111-6

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 14-19 is confirmed.

Claims 1-13 were previously cancelled.

14. A method of controlling deep-rooted perennial weeds, such as field bindweed and Canada thistle, comprising: penetrating the soil to be treated to a depth of at least 14 and up to 24 inches below the soil surface at horizontal spacings ranging from 16 to 30 inches with spaced implements secured for movement through the soil; and injecting a volatile soil fumigant selected from the group consisting of 1,3 dichloropropene, methylbromide, ethylene bromide and mixtures of the foregoing through the implements into the soil at depths of at least 14 and up to 24 inches below the soil surface and at a rate of 2½ to 30 gallons per acre while moving the implement through the soil of the area to be treated.

### B2 3,995,018 (715th)

#### METHOD OF BINDING IMMUNOGLOBULIN EMPLOYING A POLYPEPTIDE FROM MICROORGANISMS

John A. Sjöquist, Uppsala, Sweden, assignor to Pharmacia Aktiebolag, Uppsala, Sweden  
Reexamination Request No. 90/001,075, Aug. 27, 1986.  
Reexamination Certificate for Patent No. 3,995,018, issued Nov. 30, 1976, Ser. No. 409,572, Oct. 25, 1973.  
Reexamination Certificate B1 3,995,018, issued Jun. 24, 1986.  
Claims priority, application Sweden, Nov. 6, 1972, 14330/72; Feb. 8, 1973, 7301779  
Int. Cl.<sup>4</sup> G01N 33/53, 33/563, 33/544, 33/545  
U.S. Cl. 435-7

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-11 is confirmed.

1. In the method of binding, in the presence of an aqueous liquid, at least one immunoglobulin or its free Fc-fragment to a polymer insoluble in said aqueous liquid with the assistance of a substance attached to the polymer by contacting said polymer with the substance attached thereto with said immunoglobulin or its free Fc-fragment in the aqueous liquid, the improvement which comprises using at least one polypeptide from Staphylococci as said substance attached to said polymer, said immunoglobulin being from the IgG-class and said polypeptide being able to bind at least one immunoglobulin from the IgG-class at the Fc-part of the said immunoglobulin.

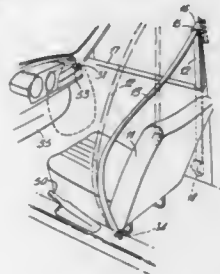
**B1 4,040,645 (716th)**  
**SEAT-BELT APPARATUS**

William McAlpin Giffin, Hailey, England; John Michael Pollitt, Gretna, Scotland, and Roy Clifford, Carlisle, England, assignors to Auto Restraint Systems Limited, London, England  
 Reexamination Request No. 90/000,600, Aug. 3, 1984.  
 Reexamination Certificate for Patent No. 4,040,645, issued Aug. 9, 1977, Ser. No. 585,426, Jun. 9, 1975.

Claims priority, application United Kingdom, Jun. 10, 1974, 25703/74

Int. Cl.<sup>4</sup> B60R 21/10

U.S. Cl. 280—803



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-5, 7 and 8 is confirmed.

Claim 6 is determined to be patentable as amended.

New claims 9-13 are added and determined to be patentable.

1. A seat-belt apparatus of the kind which is arranged to be mounted in a vehicle for automatically moving a seat-belt of the apparatus into, and away from, an operative position across a vehicle seat comprising:  
 a seat-belt retraction mechanism mounted on a vehicle door adjacent said seat,  
 means coupling said seat-belt to the retraction mechanism to permit withdrawal of the seat-belt from the retraction mechanism,  
 said retraction mechanism including acceleration responsive means operable to inhibit withdrawal of the seat-belt from the retraction mechanism when said mechanism is subjected to an acceleration in excess of a predetermined magnitude and to permit such withdrawal at all other times,  
 and means responsive to the position of said door for permitting said acceleration-responsive means to inhibit withdrawal of the seat-belt only when said door is closed and to prevent such inhibition whenever the door is open.

**B1 4,257,674 (717th)**  
**ELASTOMERIC FIBER OPTIC SPLICE**

Wendell L. Griffin, Warren, Pa.; W. John Carlsen, Natick, Mass., and John E. Benasutti, Oil City, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Reexamination Request No. 90/000,979, Apr. 3, 1986.  
 Reexamination Certificate for Patent No. 4,257,674, issued Mar. 24, 1981, Ser. No. 32,583, Apr. 23, 1979.

Int. Cl.<sup>4</sup> G02B 6/38

U.S. Cl. 350—96.21

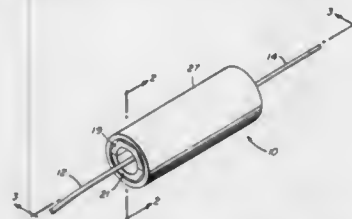
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 7 is cancelled.

Claims 1 and 8 are determined to be patentable as amended.

Claims 2-6, dependent on an amended claim, are determined to be patentable.

1. A splice for holding the ends of optical fibers in end to end relationship comprising a fiber receiving member having an external polygonal shaped surface and formed by a pair of sections, said sections having complimentary and mating planar surfaces in engagement, only one of said planar surfaces having an axially aligned groove therein and facing the other of said planar surfaces to form an opening therewith, said fiber



receiving member comprising an elastomeric material of sufficient resilience to permit said opening to expandably receive optical fibers dimensioned larger than said opening, and a cylindrically shaped sleeve mounted about said receiving member for holding said sections in assembled relationship, said sleeve having an internal surface defined as a substantially continuous curve having an internal radius of curvature smaller than the distance from the axial center of the receiving member to a corner thereof.

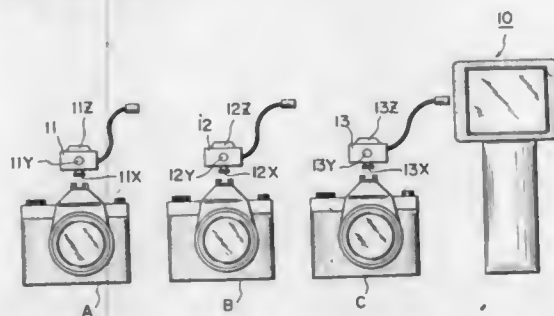
8. A splice according to claim [7] wherein said receiving member comprises a transparent material.

**B1 4,329,624 (718th)**  
**COMPUTER TYPE ELECTRONIC PHOTOFLASH**  
 Akio Kamon, Koganei; Sakyō Nagashima, Kawasaki, and Yuzo Tsuruta, Yokohama, all of Japan, assignors to Kabushiki Kaisha Sunpak, Tokyo, Japan  
 Reexamination Request No. 90/000,937, Jan. 13, 1986.  
 Reexamination Certificate for Patent No. 4,329,624, issued May 11, 1982, Ser. No. 110,126, Jan. 7, 1980.

Claims priority, application Japan, Mar. 17, 1979, 54-34759[U]; Mar. 19, 1979, 54-34399[U]

Int. Cl.<sup>4</sup> H05B 41/32; G03B 15/05

U.S. Cl. 315—151



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 2 are cancelled.

[1. An adapter for interconnecting a camera and a flash unit wherein the flash unit includes a capacitor, a flash tube, discharge means for discharging said capacitor through said flash tube, and flash-termination means for terminating the discharge of said capacitor through said flash tube, said adapter comprising a set of camera terminals for connection to said camera, a set of flash unit terminals for connection to said flash

unit, synchronizing means coupling said camera and flash unit terminals for conveying a synchronizing signal from said camera to said photoflash unit for initiating operation of said discharge means, photometric means in said adapter for responding to reflection of light developed by said flash unit, and a terminal for said adapter for connection to a terminal of said flash unit for conveying a signal from said photometric means to said flash termination means to initiate operation thereof.]

**B1 4,529,787 (719th)**  
**BULK POLYMERIZATION PROCESS FOR PREPARING HIGH SOLIDS AND UNIFORM COPOLYMERS**

Ronald E. Schmidt; Harold H. Schultz, and Dennis M. Wilson, all of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Reexamination Request No. 90/001,000, Apr. 26, 1986.  
 Reexamination Certificate for Patent No. 4,529,787, issued Jul. 16, 1985, Ser. No. 388,764, Jun. 15, 1982.

Int. Cl.<sup>4</sup> C08F 2/02

U.S. Cl. 526—209

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-18 is confirmed.

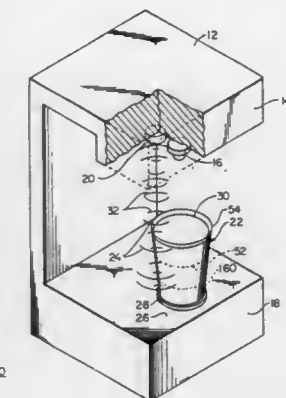
1. Bulk polymerization process for preparing enhanced yields of high solids, low molecular weight vinylic polymer product having a narrow molecular weight distribution and a low chromophore content comprising the steps of continuously:

- charging into a continuous mixed reactor zone containing a molten resin mixture;
  - a mixture of vinyl monomers comprising at least one monoalkenyl aromatic monomer and at least one acrylic monomer;
  - a polymerization initiator in amounts to provide a molar ratio of said initiator to said mixture of vinyl monomers from about 0.0005:1 to 0.04:1;
  - from about 0 to 25 percent based on the weight of vinyl monomers of a reaction solvent, wherein said molten resin mixture comprises unreacted vinylic monomers and the vinylic polymer product;
- (b) maintaining a flow rate through said reaction zone sufficient to:
- provide a residence time of said charged vinylic monomer mixture in said reaction zone of from about two minutes to one hour; and
  - maintain a predetermined level of reaction mixture in said reaction zone, and;
- (c) maintaining the molten resin mixture at a reaction temperature within the range from about 180° C. to 270° C. sufficient to provide accelerated conversion to a readily processable, uniform, concentrated polymer product having a number average molecular weight of 500 to 6000, a polydispersity ratio of less than about 2.5 and a dispersion index of less than about 4.5.

**B1 4,572,253 (720th)**  
**AUTOMATIC LEVEL SENSING SYSTEM**  
 M. Zane Farmer, and Diane B. Farmer, both of 12 Christmas Tree Dr., Ashburnham, Mass. 01430  
 Reexamination Request No. 90/001,078, Sep. 3, 1986.  
 Reexamination Certificate for Patent No. 4,572,253, issued Feb. 25, 1986, Ser. No. 632,375, Jul. 19, 1984.

Int. Cl.<sup>4</sup> B65B 3/04

U.S. Cl. 141—95



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 13, 14, 21, 22 and 24 are cancelled.

Claims 1, 6, 7, 9, 17, 18 and 25 are determined to be patentable as amended.

Claims 2-5, 8, 10-12, 15, 16, 19, 20, and 23, dependent on an amended claim, are determined to be patentable.

New claims 26-30 are added and determined to be patentable.

1. A level sensing system comprising:  
 ultrasonic sound wave [transducer] transducer means for emitting ultrasonic sound waves and for receiving ultrasonic sound waves reflected from a receptacle whose content level is to be sensed;  
 a content level detector, responsive to said reflected ultrasonic sound waves, for detecting the level of the contents of the receptacle [;] by sensing reflected ultrasonic sound waves having a signal level greater than a first reference level;  
 a rim detector, responsive to said reflected ultrasonic sound waves, for determining the location of the rim of the receptacle [; and] by sensing reflected ultrasonic sound waves having a signal level greater than a second reference level which is different from said first reference level; and  
 a level comparator, responsive to said rim detector and said content level detector, for comparing the contents level with the rim location for indicating when the contents level is within a predetermined distance of the rim.

# STATUTORY INVENTION REGISTRATIONS

PUBLISHED JULY 7, 1987

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H294

**SAW CHAIN GUIDE DEVICE FOR CHAIN SAW**  
Junichi Hiraizumi, Tokyo, and Akira Nagashima, Kawasaki, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan  
Filed Feb. 15, 1985, Ser. No. 702,243  
Claims priority, application Japan, Feb. 17, 1984, 59-21297  
Int. Cl.<sup>4</sup> B23D 57/02, 59/00; B27B 17/00  
U.S. Cl. 30—383

2 Claims



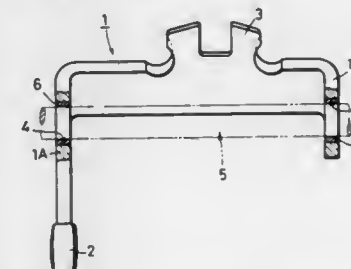
1. A saw chain guide device for a chain saw comprising a guide bar disposed adjacent to a drive sprocket for a saw chain and first and second side plates having generally planar body portions and mounted on opposite sides of the guide bar, respectively, for guiding a saw chain travelling along side edges of said guide bar, said first side plate having said drive sprocket disposed between itself and said second side plate, said first side plate defining a circular bore concentric with and having a diameter slightly greater than a tooth tip circle of said drive sprocket, said circular bore having an end edge portion about the periphery thereof, wherein an end face of each of said sides terminates adjacent to a tooth tip circle of the drive sprocket of the saw chain, and said end edge portion extending about the periphery of said circular bore terminates in close proximity to said tooth tip circle of the toothed sprocket and is integrally formed with said first side plate and each said side plate (1,2) having upper and lower edge portions (10,11 and 22,23) flanged from the general plane of said side plate body portions away from said guide bar.

H295

**SHIFT FORK SUPPORT STRUCTURE IN A MANUAL TRANSMISSION**  
Akio Numazawa, Nagoya; Hajime Arai, Aichi; Shoji Haga, and Tadashi Nozaki, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan  
Continuation of Ser. No. 453,904, Dec. 28, 1982, abandoned.  
This application Oct. 1, 1985, Ser. No. 782,172  
Claims priority, application Japan, Oct. 22, 1981, 56-158461

Int. Cl.<sup>4</sup> B60K 20/00; F16C 33/20  
U.S. Cl. 74—473 R

3 Claims



1. A shift fork for an automotive vehicle manual transmis-

sion, said shift fork being axially movable, relative to a fork shaft, said shift fork comprising:

- a pair of spaced, coaxial openings for slidably receiving said fork shaft, the axial length of the peripheries of said openings being less than the diameter of said fork shaft; and
- a bushing press-fitted in each said opening, each said bushing including a polytetrafluorethylene layer coating the inner peripheral surface thereof, said polytetrafluorethylene layer being disposed for slidable contact with said fork shaft, said bushings having axial lengths equal to said openings.

H296

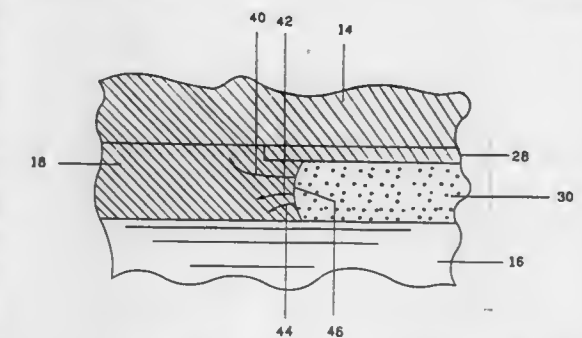
**ELASTIC PULLER SABOT FOR SMALL CALIBER FLECHETTE**

Patrick H. Zabel, Devine, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1986, Ser. No. 852,462  
Int. Cl.<sup>4</sup> F42B 13/16

U.S. Cl. 102—521

9 Claims



1. An elastic puller sabot for use in launching a flechette from a launcher having a bore, comprising:  
at least two sabot portions;  
said at-least-two sabot portions together forming said sabot, and together having an interior surface and an exterior surface;  
said interior surface having a generally identical shape to that of an exterior of said flechette;  
said exterior surface having a generally identical shape to that of an interior of said bore, said exterior surface further having a diameter no smaller than that of said interior of said bore;  
each of said at-least-two sabot portions being comprised of an elastic material.

H297

**ROBOTIC REFUELING SYSTEM FOR TACTICAL AND STRATEGIC AIRCRAFT**

Edwin R. Schultz, Wayneville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 12, 1985, Ser. No. 764,820  
Int. Cl.<sup>4</sup> B64D 37/16; B60P 3/22

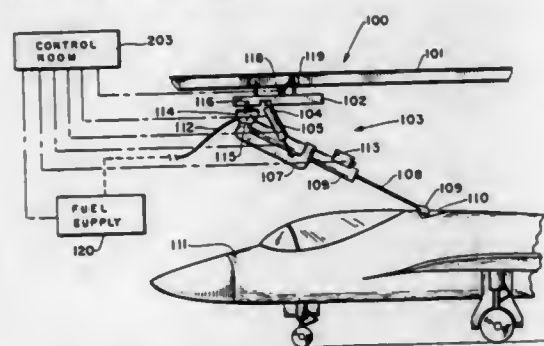
U.S. Cl. 141—232

2 Claims

1. A fixed facility aircraft refueling apparatus, comprising:  
(a) a covered structure sufficiently large whereby an aircraft may pass beneath it, the structure having a ceiling and a



- aligned entrance and exit so that an aircraft may enter and exit along a substantially straight line of travel:
- (b) an overhead track attached to the structure;
  - (c) a trolley suspended from the overhead track;
  - (d) means for moving the trolley along the overhead track;
  - (e) a telescoping boom having a first end and a second end, the boom pivotally connected at its first end to the trolley;
  - (f) a pair of telescoping piston-and-cylinder units connecting the boom and trolley controllably moving the boom in pitch and in yaw;
  - (g) an aircraft self-aligning refueling probe attached to the second end of the boom;



- (h) a fuel supply;
- (i) a fuel hose operatively interconnecting the fuel supply and the self-aligning refueling probe;
- (j) a first video camera mounted on the boom;
- (k) a lens with cross-hairs mounted to the first video camera;
- (l) a second video camera mounted to the ceiling of the structure; and,
- (m) a control room having means operatively interconnecting the control room with the trolley, the trolley moving means, the telescoping boom and the piston-and-cylinder units, the control room further having means for protecting its interior from environmental hazards.

## H298

**OXIDATION RESISTANT FILLER METALS FOR DIRECT BRAZING OF STRUCTURAL CERAMICS**  
Arthur J. Moorhead, Knoxville, Tenn., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.  
Division of Ser. No. 751,414, Jul. 3, 1985, Pat. No. 4,596,354.  
This application Mar. 11, 1986, Ser. No. 838,492  
Int. Cl.<sup>4</sup> B23K 35/22, 31/02

U.S. Cl. 228—263.19 2 Claims  
1. A brazing filler metal for joining ceramics and metals to themselves and to one another consisting essentially of 23 to 25 atomic percent aluminum and the balance nickel.

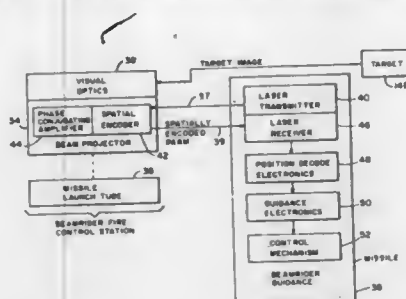
## H299

## COVERT BEAM PROJECTOR

Walter E. Miller, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed Dec. 15, 1986, Ser. No. 943,360  
Int. Cl.<sup>4</sup> F41G 7/00

U.S. Cl. 244—3.13 5 Claims  
3. A beamrider missile guidance system comprising apparatus for transmitting a laser beam along a path from a missile toward a target tracking station during trajectory of the missile toward a target; a receiver on said missile for receiving laser energy from said tracking station; laser beam projecting means

at said tracking station for receiving the transmitted laser beam, phase conjugating the received beam, encoding the



phase conjugated beam and redirecting the phase conjugated beam along said path back to the missile to said receiver.

## H300

## STRIPPING AGENT FOR CHEMICALLY RESISTANT COATINGS

Peter J. Hearst, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Filed Nov. 4, 1986, Ser. No. 928,777  
Int. Cl.<sup>4</sup> B08B 9/08; C11D 1/66, 3/26; C23G 5/02

U.S. Cl. 134—22.19 21 Claims  
1. A low viscosity stripping composition, suitable for application by spraying at elevated temperatures, for the removal of chemically resistant coatings, the mixture comprising:  
(a) 79 percent by volume of N-methylpyrrolidone;  
(b) 20 percent by volume of ethanolamine; and  
(c) 1 percent by volume of a non-ionic surface active agent for increasing penetration of the coating and without producing foam during spraying.  
5. The method for removing chemically resistant coatings from walls of bilges and tanks, comprising:  
(a) spraying the chemically resistant coatings within said bilges and tanks with a stripping composition comprised by volume of approximately 79 percent N-methylpyrrolidone, 20 percent ethanolamine, and 1 percent of a non-ionic surface active agent;  
(b) said stripping composition being applied by spraying onto said chemically resistant coatings to be removed at a temperature range of 170 to 190 degrees F.;  
(c) removing the used said stripping composition along with removed coating material for recycling of the stripping composition.

## H301

## OXIDATION RESISTANT FILLER METALS FOR DIRECT BRAZING OF STRUCTURAL CERAMICS

Arthur J. Moorhead, Knoxville, Tenn., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.  
Division of Ser. No. 751,414, Jul. 3, 1985, Pat. No. 4,596,354.  
This application Mar. 11, 1986, Ser. No. 838,489  
Int. Cl.<sup>4</sup> B32B 15/04; B22F 3/26; C03C 27/02

U.S. Cl. 428—627 2 Claims  
1. A composite body comprising at least two structural components of ceramics and metals joined to themselves or to one another with a trinickel aluminide brazing filler metal disposed thereinbetween consisting essentially of 23 to 25 atomic percent aluminum and the balance nickel.

H302  
CERAMICS CONTAINING DISPERSANTS FOR IMPROVED FRACTURE TOUGHNESS

Michael V. Nevitt; Anthony T. Aldred, both of Wheaton, and Sai-Kit Chan, Darien, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
Filed Jul. 1, 1985, Ser. No. 750,122  
Int. Cl.<sup>4</sup> C04B 35/10, 35/04, 35/18, 35/50

U.S. Cl. 501—103 10 Claims  
1. A ceramic composition consisting essentially of a ceramic matrix of Al<sub>2</sub>O<sub>3</sub>, mullite, ZrO<sub>2</sub>, MgO or mixtures thereof as a continuous phase with a hardness above about 800 and as a second component a tetragonal rare-earth niobate, tantalate or mixtures of these with each other and/or with a rare-earth vanadate, the second embodiment being present in an amount in the range of about 3–25 wt. % of the composition and dispersed in the matrix as particles sized below about 5 microns, the particles of the second component in the matrix having a transition temperature T<sub>D</sub> being below the transition temperature for the second component in bulk or T<sub>C</sub>.

## H303

## GLYCOSIDE-CONTAINING AGRICULTURAL TREATMENT COMPOSITION

Arshad H. Malik, Decatur, Ill., and Arno Cahn, Pearl River, N.Y., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.  
Division of Ser. No. 739,241, May 30, 1985, now SIR H000224.  
This application Oct. 22, 1986, Ser. No. 921,706

Int. Cl.<sup>4</sup> A01N 57/00 18 Claims  
1. A composition of matter comprising an active ingredient selected from the group consisting of insecticides and insect repellents and an effective amount of a glycoside dispersing agent selected from the group consisting of fructoside, glucoside, mannoside, galactoside, taloside, gulose, alloside, altrose, idoside, arabinoside, xyloside, lyxoside and riboside and mixtures thereof in a sufficient amount to form an emulsion or dispersion of the active ingredient, said glycoside dispersing agent corresponding to the formula:



wherein R contains from 1 to 30 carbon atoms; O is an oxygen atom; x has an average value of from 1 to about 18; and G is the glycosyl portion of said glycoside dispersing agent.

7. The composition of claim 1 wherein the glycoside dispersing agent is 2-ethylhexyl monoglucoside.

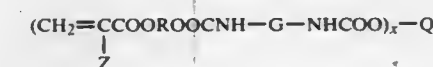
## H304

## PRINTING INK FOR USE ON FLEXIBLE FILMS

Robert J. Vorrier, Palos Hills, and Vitas Njaura, Western Springs, both of Ill., assignors to Viskase Corporation, Chicago, Ill.  
Continuation-in-part of Ser. No. 428,995, Sep. 30, 1982. This application Feb. 13, 1985, Ser. No. 701,233  
Int. Cl.<sup>4</sup> C08F 2/50, 26/00

U.S. Cl. 522—92 46 Claims  
1. An ultraviolet light curable ink composition which comprises:  
(i) a first urethane comprising a polyol urethane which is the reaction product of about one equivalent of an isocyanate containing intermediate, the isocyanate intermediate being the reaction product of about one equivalent of a monomeric diol and about two equivalents of an organic polyisocyanate, and about one equivalent of a monomeric olefinically unsaturated compound containing exactly one active hydrogen, and  
(ii) a second urethane comprising an acrylate-capped polycaprolactone which is the reaction product of a caprolac-

tone polyol, a substituted or unsubstituted isocyanate, and an acrylyl compound, and defined by the formula:



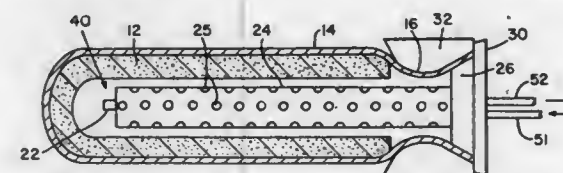
where Z is hydrogen or methyl; Q is the residue of the caprolactone polyol, R is a linear or branched divalent alkylene having from 2 to about 5 carbon atoms; G is a linear or branched alkylene having from 1 to about 10 carbon atoms, or arylene, alkylene and aralkylene having from 6 to about 12 carbon atoms, cycloalkylene having from 5 to about 10 carbon atoms, or bicycloalkylene having from 7 to about 15 carbon atoms; and x is an integer having a value from 1 to 4;  
(iii) an ultraviolet photoinitiator in an amount sufficient to cure the ink composition when exposed to ultraviolet light, and  
(iv) a pigment; wherein the first urethane and the second urethane are present in an amount such that the weight ratio of the first urethane to the second urethane is from about 2:5 to about 3:2.

## H305

## DEMILITARIZATION OF HIGH BURN RATE PROPELLANTS CONTAINING FERROCENE OR ITS DERIVATIVES

Porter H. Mitchell, Fayetteville, Tenn., and William S. Melvin, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed Nov. 6, 1986, Ser. No. 928,778  
Int. Cl.<sup>4</sup> B01D 46/00

U.S. Cl. 556—143 4 Claims



1. A method for extracting, removing, and recovering ferrocene or its derivatives from a solid propellant composition comprised of ammonium perchlorate, aluminum, crosslinked hydrocarbon binder, and said ferrocene or its derivatives, said method comprising:

- i. introducing compressed carbon dioxide gas at a predetermined pressure and temperature which results in said compressed carbon dioxide being in a near critical liquid state into a pressure vessel containing cooled solid propellant composition having ferrocene or its derivatives as a dispersed ingredient that is extractable by said near critical liquid, said pressure vessel having an inlet means for introducing said near critical liquid and said pressure vessel having an outlet means having a plurality of perforations for discharging the near critical liquid and extractibles from said pressure vessel;
- ii. providing an extraction time to achieve extraction of ferrocene or its derivatives from said propellant composition;
- iii. providing an extended extraction time to achieve maximum extraction by circulating within said pressure vessel said near critical fluid containing ferrocene or its derivatives as extractibles;
- iv. removing said near critical liquid containing said extractibles to a collection chamber;
- v. effecting pressure change and temperature change of said near critical liquid containing said extractibles to achieve a phase change and subsequent evaporation of carbon dioxide to a gas to thereby achieve a separation of said extractibles;

- vi recycling said carbon dioxide gas through a compressor for compressing to a compressed gas; and,  
vii. recovering said extractibles which include ferrocene or its derivatives.

## H306

## METHOD FOR PREPARATION OF AMINE SALT BONDING AGENTS

Marjorie E. Ducote, and James G. Carver, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 9, 1986, Ser. No. 874,312

Int. Cl.<sup>4</sup> C07C 121/42, 121/453

U.S. Cl. 558-452 2 Claims

1. A method for preparing an amine salt bonding agent comprising:

- (i) adding a predetermined stoichiometric amount of a polyamine compound selected from a cyanoethyl substituted tetraethylene pentamine and the glycidol reaction product of cyanoethyl substituted tetraethylene pentamine to a reaction container;
- (ii) slowly adding with stirring a predetermined amount of a stoichiometric amount of perchloric acid to said polyamine compound, and continue stirring to achieve a homogenous mixture;
- (iii) transferring said homogenous mixture to a vessel appropriate for stripping diluent water; and,
- (iv) stripping diluent water from said reaction mixture and recovering said amine salt bonding agent.

## H307

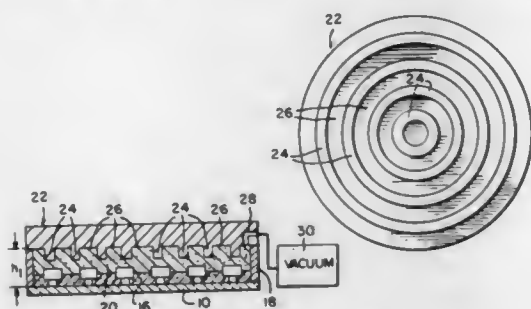
## HIGH "G" ELECTRONICS SYSTEM

Stefan T. Epure, deceased, late of San Marino (by Gertrude M. Epure, executrix); Lee K. Clark, Santa Ana, and James P. Haine, Tustin, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 23, 1986, Ser. No. 877,945

Int. Cl.<sup>4</sup> H05K 5/06; B29C 43/18; H05K 1/14

U.S. Cl. 174-52 PE 21 Claims



1. For a potted circuit board having elements connected by leads, an assembly including:
  - a first walled means for surrounding the elements and connected to the circuit board;
  - an insulating means for insulating the elements, filling the first walled means;
  - a cap means for closing the first walled means, which when placed upon the first walled means extends slightly within the first walled means;
  - a venting means via which an excess of the insulating means travels with the cap closed;
  - a second walled means shorter than and for replacing the first walled means about the insulating means, and connected to the circuit board; and
  - a pressing means for pressing the insulating means toward the circuit board until contacting the second walled means.

## H308

## FABRIC VISUAL/INFRARED/RADAR DECOYS

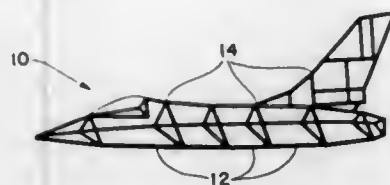
Michael B. Tatlin, Thurston, United Kingdom; Steven A. Pitman, Beavercreek, and Gregory R. Bothe, West Carrollton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 28, 1986, Ser. No. 856,567

Int. Cl.<sup>4</sup> G01S 13/00

U.S. Cl. 342-4

12 Claims



9. An aircraft decoy frame comprising tubing inserted into tubing fittings to form an assembly substantially defining the shape of an actual aircraft.

## H309

## ENERGY RECOVERABLE CHOKE FEED

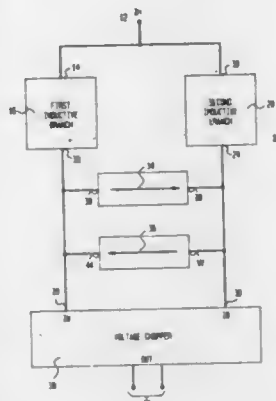
Walter E. Milberger, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 28, 1986, Ser. No. 910,113

Int. Cl.<sup>4</sup> H02M 7/00, 7/538

U.S. Cl. 363-124

6 Claims



1. An energy recoverable choke feed for a converter power supply having a voltage source and a voltage chopper circuit means for converting direct current voltage to alternating current voltage, comprising:

- an input terminal connected to said voltage source;
- first and second inductive branches, each having an input and an output, where said inputs of both of said inductive branches are connected to said input terminal;
- first directional shunt means for passing current in a fixed direction connected between said outputs of said inductive branches;
- second directional shunt means for passing current in a direction opposite to said first directional shunt means connected between said outputs of said inductive branches;
- a first output terminal connected to said output of said first inductive branch; and
- a second output terminal connected to said output of said second inductive branch, said first and second output terminals being connected to the first and second inputs, respectively, of said voltage chopper circuit means.

## H310

## ANALOG MULTIPLEXER

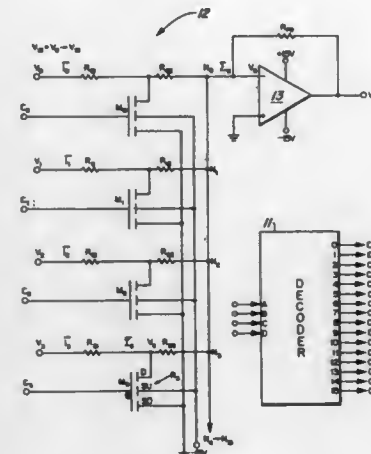
William V. Johnson, Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 13, 1986, Ser. No. 880,621

Int. Cl.<sup>4</sup> H04J 3/02

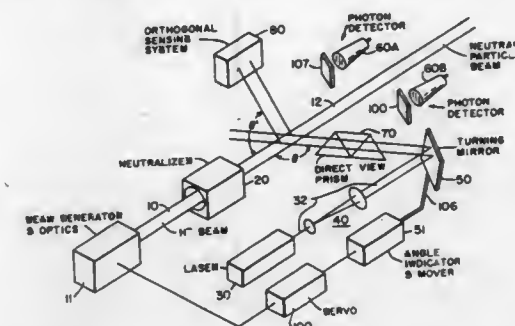
U.S. Cl. 370-114

1 Claim



1. An analog multiplexer, comprising:
  - an op amp having an inverted and noninverting input and an output and further having a summing node coupled to said inverting input and a feedback resistor coupling said output to said inverting input;
  - at least two analog inputs each having a resistance coupling to said summing nodes;
  - an equal number of MOSFETs as said analog inputs, each said MOSFET having a drain, a source, a substrate, and a gate, said drain of each said MOSFET being connected to said resistance coupling, said source of each said MOSFET being only coupled to a common signal return, and said substrate of each said MOSFET being coupled to power source;
  - decoder-driving means having a plurality of digital inputs and a plurality of driver outputs, said driver outputs being equal in number to said MOSFETs, each said driver output being coupled to said gates of each said respective MOSFET, for receiving a digital command input, and for driving one said gate of each said MOSFET low and driving said gates of all other MOSFETs high.

improvement comprising a direct view prism positioned between said first beam and the intersection of said beams for



causing a compensating change in the magnitude of said angle in accordance to a change in the frequency of said first beam.

## H312

## ROTATING ANODE X-RAY TUBE

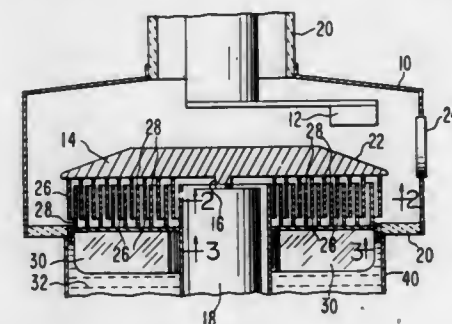
Todd S. Parker, 117 W. 1050 South, Bountiful, Utah 84010

Filed Feb. 1, 1985, Ser. No. 697,110

Int. Cl.<sup>4</sup> H01J 35/10

U.S. Cl. 378-127

29 Claims



1. An X-ray generating tube, comprising:
  - (a) a vacuum envelope;
  - (b) an anode, within said envelope, adapted for rotation about an axis and including a peripheral track and a first set of fins for radiating thermal energy;
  - (c) cathode means within said envelope, for generating a beam of electrons to strike said peripheral track with sufficient energy to generate X-rays;
  - (d) a window allowing transmission of said X-rays outside the tube; and
  - (e) a second set of fins, mounted on the inside of said vacuum envelope, and in thermal contact with the exterior of the tube, said second set of fins being interleaved with said first set of fins.

## H313

## MONOCHROMATOR FOR CONTINUOUS SPECTRUM X-RAY RADIATION

Jean-Louis Staudenmann, Ames, Iowa, and Gerald L. Liedl, West Lafayette, Ind., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 557,517, Dec. 2, 1983. This application Apr. 23, 1986, Ser. No. 854,708

Int. Cl.<sup>4</sup> G01N 23/20; G21K 1/06; G01J 1/00

U.S. Cl. 378-81

10 Claims

1. A monochromator for a continuous spectrum beam of photons comprising:
  - a first diffraction means;
  - a second diffraction means;
  - a means for positioning said first and second diffraction

H311  
COMPENSATED LASER RESONANT FLUORESCENCE BEAM SENSING DEVICE FOR NEUTRAL PARTICLE BEAMS

Robert W. Jones; George R. Edlin; Brian R. Strickland, and Thomas G. Roberts, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 18, 1986, Ser. No. 943,239

Int. Cl.<sup>4</sup> H01S 3/10, 3/13

U.S. Cl. 372-9

5 Claims

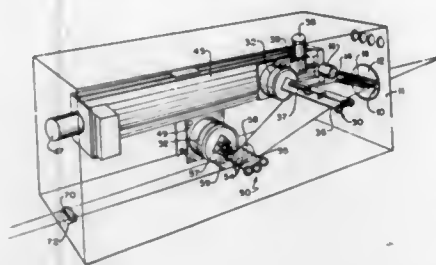
1. In a system where first and second energy beams are intersecting at an angle at an intersection so as to cause resonant fluorescence in accordance to factors including the magnitude of said angle and the frequency of said first beam, the



means with respect to an incoming continuous spectrum beam of photons and with respect to each other in a plurality of sets of positions such that in each set of positions photons of a selected energy will be firstly diffracted by said first diffraction means and secondly diffracted by said second diffraction means to form a monochromated output beam generally parallel to said incoming beam and displaced therefrom by a fixed distance; said positioning means including:

- a first means for rotating said first diffraction means about a first axis generally perpendicular to said incoming beam;
- a second means for rotating said second diffraction means about a second axis, generally parallel to said first axis, said first and second rotating means being independent of each other;
- a means for translationally moving said first diffraction

means with respect to said second diffraction means along an axis coincident with said incoming beam of photons.



said translating means being independent of said first and second rotating means.

## REISSUES

JULY 7, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,451  
WEIGHT-MONITORED AIR-CONDITIONER  
CHARGING STATION

Robert H. Proctor, Baltimore, and Arthur G. Hobbs, Jr., Hampstead, both of Md., assignors to Murray Corporation, Cockeysville, Md.

Original No. 4,513,578, dated Apr. 30, 1985, Ser. No. 497,167, May 23, 1983. Application for reissue Nov. 26, 1985, Ser. No. 802,351

Int. Cl.<sup>4</sup> F25B 45/00

U.S. Cl. 62-149

30 Claims U.S. Cl. 123-46 SC

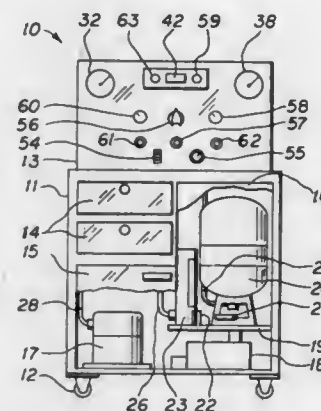
Re. 32,452  
PORTABLE GAS-POWERED TOOL WITH LINEAR  
MOTOR

Milovan Nikolich, Wilmette, Ill., assignor to Signode Corporation, Glenview, Ill.

Original No. 4,483,280, dated Nov. 20, 1984, Ser. No. 550,521, Nov. 14, 1983. Continuation of Ser. No. 227,193, Jan. 22, 1981, abandoned. Application for reissue Feb. 20, 1986, Ser. No. 831,521

Int. Cl.<sup>4</sup> F02B 71/04

21 Claims



13. In an air-conditioner charging station, the combination of:  
(a) a powered vacuum pump for evacuation of an air-conditioner;

(b) a reservoir of refrigerant under pressure,

(c) conduit means and electrically operated valve means for selectively connecting said pump and said reservoir to the air-conditioner to be serviced,

(d) weighing means for sensing the weight of said reservoir and for producing an output signal proportional to the weight of said reservoir,

(e) electronic sequencing means operatively associated with said valve means and said weighing means for receiving said output signal for monitoring weight loss from said reservoir as refrigerant is discharged therefrom and for generating signals for controlling said valve means,

(f) adjustable weight differential input means operatively connected to said sequencing means for introducing into said sequencing means a selected value representative of a preselected weight of refrigerant to be discharged from said reservoir,

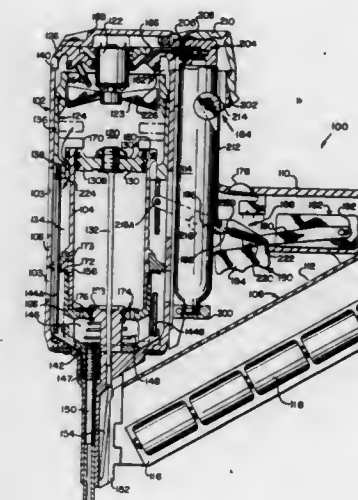
(g) means for initiating operation of said sequencing means to receive and monitor said weighing means output signal and to provide signals to said control valve means for charging a preselected weight of refrigerant from said refrigerant reservoir into the air-conditioner,

(h) a digital visual display unit for said selected weight differential means,

(i) wherein said sequencing means senses the weight loss in said reservoir during said charging cycle and said display unit continuously indicates said weight loss, and

(j) wherein said sequencing means senses both the weight loss and the rate of weight loss in said reservoir, and

(k) signal means actuated in response to a separate predetermined parameter of rate of weight loss for said reservoir.



13. A self-starting portable tool comprising  
a housing,

an elongated cylinder in said housing,

a piston having an upper face and a lower face, said piston being mounted in said cylinder to be driven between an upper position of rest and a lowermost position and forming a motor member,

a working member attached to said piston,

a combustion chamber formed within said housing and having the upper face of said piston defining a wall portion of said combustion chamber,

means for providing a fuel and air mixture in said chamber,

means for igniting and exploding said mixture in said combustion chamber to drive said piston through a driving stroke from said upper position to said lowermost position to operate said working member,

and return means for causing said piston to move upwardly from said lowermost position to said upper position of rest, said return means including outlet means in said elongated cylinder between its ends for communicating said cylinder with ambient atmosphere and being disposed below said upper position of rest and above said lowermost position of said piston, such that when said piston is driven towards said lowermost position, said piston moves past said outlet means thereby to place said combustion chamber in communication with said outlet means to exhaust a portion of combustion gases from said combustion chamber to ambient atmosphere and cause a reduction in temperature of the combustion gases remaining in the combustion chamber, and

said return means further including bumper means at the lower end of the cylinder for initially moving said piston upwardly from said lowermost position, said combustion chamber above said upper face being out of communication with ambient atmosphere during the further return of said piston to said



upper position of rest, said further return of said piston to said upper position of rest being substantially caused by through-out further such return, said return means producing an upwardly acting pressure differential on said upper and lower faces of said piston induced by the reduction in temperature of the combustion gases above the upper face to produce a sharp reduction of pressure in said combustion chamber to below ambient pressure.

Re. 32,453

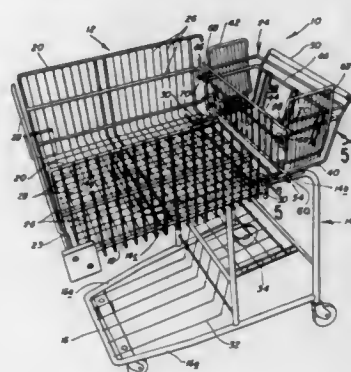
## SHOPPING CART WITH BABY SEAT

Don A. Stover, Oklahoma City; Clarence W. Upshaw, Tuttle, and Warren N. Norman, Oklahoma City, all of Okla., assignors to UNR Industries, Inc., Chicago, Ill.  
Original No. 4,423,882, dated Jan. 3, 1984, Ser. No. 376,593, May 10, 1982. Application for reissue Sep. 9, 1985, Ser. No. 773,561

Int. Cl.<sup>4</sup> B62B 3/00

U.S. Cl. 280—33.99 B

22 Claims



## 1. A shopping cart which comprises:

- a wheeled chassis;
- an elevated frame carried by said chassis;
- a basket defining a main lading-carrying space, said basket including a bottom wall secured to said elevated frame, two opposed side walls, and a gate at the front end of said cart, and having an open end at the rear thereof;
- a baby seat compartment secured to the rear portion of said elevated frame, said baby seat including a bottom wall, two opposed side walls, a front wall having an upright, closed position and an open position, the width of said baby seat front wall being less than the width of said lading-carrying basket [said hinge for said baby seat front wall being located at a level at least as high as the bottom walls of said lading-carrying basket, ] said front wall being hinged at its bottom edge portion to permit it to be swung down from its closed position in the forward direction, when desired, to rest on the bottom wall of said lading-carrying basket, said hinge for said baby seat front wall being located at a level at least as high as the bottom wall of said lading-carrying basket and a rear wall defining two openings to receive the legs of a baby seated in said baby seat; and
- latching means for providing a positive holding of said baby seat front wall to secure the same against movement in either the forward or rearward direction from its said upright, closed position while a baby is seated in the seat, said means being releasable when it is desired to swing said front wall down to rest on the bottom wall of said basket to increase the lading-carrying capacity of the shopping cart.

Re. 32,454

## PROCESS FOR DESULFURIZATION OF COAL AND ORES

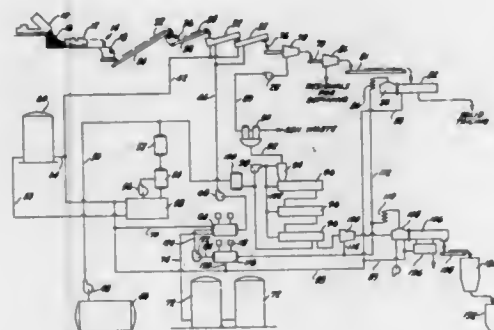
Arthur E. Starbuck, Sparks, Nev., assignor to Pure Fuel of Nevada, Inc. and Ag-Con Materials of Nevada, Inc., both of Reno, Nev.

Original No. 4,213,793, dated Jul. 22, 1980, Ser. No. 882,866, Mar. 2, 1978. Application for reissue May 26, 1981, Ser. No. 266,631

Int. Cl.<sup>4</sup> C09K 3/00; C01B 17/08

U.S. Cl. 106—286.8

26 Claims



## 1. A process for desulfurizing ores containing sulfur comprising the steps of:

- crushing ore containing sulfur to a particle consistency;
- feeding the crushed ore to a heated continuous-flow processor;
- introducing pre-heated sulfur dissolving solvent into said processor with the crushed ore;
- concurrently mixing and force conveying the crushed ore and solvent by augering in the continuous flow processor at an elevated temperature in which sulfur is dissolvable and is dissolved in a heated sulfur-solvent solution with suspended particles and a remaining ore, the processor being oriented for about horizontal augering;
- separating the sulfur-solvent solution with suspended particles from the remaining ore at an elevated temperature;
- drying the separated, remaining ore by evaporating remaining solvent from the ore;
- recovering solvent from the ore drying step by condensing the evaporated solvent;
- in the same operative process step, concurrently crystallizing sulfur dissolved in the sulfur-solvent solution and force conveying the sulfur-solvent solution and crystallizing sulfur by augering in a continuous flow chilled processor wherein the sulfur-solvent solution and crystallizing sulfur are conveyed together in a concurrent manner as a mixture in a continuous forward direction at controlled reduced temperatures as substantially the entire mixture progresses to a separate separating step, said crystallizing sulfur existing in part as a suspension and in part as a precipitate;
- separating both crystallized suspension sulfur and crystallized precipitate sulfur from the solvent solution;
- drying the separated crystallized sulfur by evaporating the solvent from the crystallized sulfur, wherein a fine crystal sulfur product is obtained;
- recovering solvent from the crystallized sulfur drying step by condensing the evaporated solvent.

Re. 32,455

## A-21978 ANTIBIOTICS AND PROCESS FOR THEIR PRODUCTION

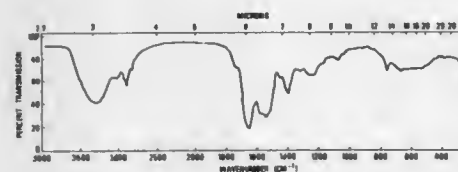
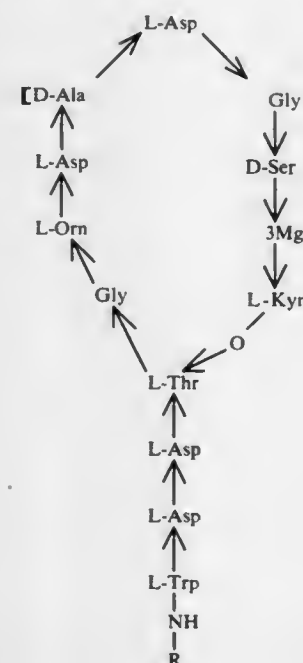
Robert L. Hamill, Greenwood, and Marvin M. Hoehn, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Original No. 4,331,594, dated May 25, 1982, Ser. No. 206,749, Nov. 14, 1980. Continuation-in-part of Ser. No. 41,274, May 21, 1979, abandoned, which is a division of Ser. No. 951,695, Oct. 16, 1978, Pat. No. 4,208,403. Application for reissue Sep. 26, 1985, Ser. No. 780,734

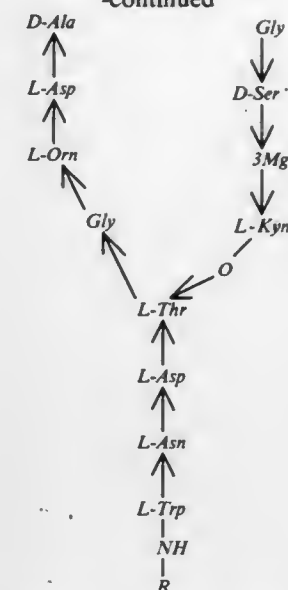
Int. Cl.<sup>4</sup> C07C 103/52

U.S. Cl. 530—317

18 Claims

1. Antibiotic A-21978C factor C<sub>0</sub>, which has the following structural formula:

-continued



wherein 3MG represents L-threo-3-methylglutamic acid, and R is a C<sub>10</sub>-alkanoyl moiety; and which has:

- a molecular formula of approximately  $[C_{72}H_{100}N_{16}O_{27}] \cdot C_{72}H_{101}N_{17}O_{26}$ ;
- a molecular weight of approximately 1622; and which, in sodium salt form, has these characteristics;
- an approximate elemental composition of 52.07% carbon, 5.95% hydrogen, 12.73% nitrogen, 25.84% oxygen and 3.4% sodium;
- an infrared absorption spectrum in KBr pellet as shown in FIG. 5 of the drawings;
- upon hydrolysis yields the following amino acids: aspartic acid, glycine, alanine, serine, threonine, tryptophan, ornithine, kynurenine, and 3-methylglutamic acid;
- is soluble in methanol, ethanol, propanol, butanol, dimethylformamide, dimethyl sulfoxide, dioxane, tetrahydrofuran, and water and in acidic and alkaline solutions, except at pH levels of below about pH 3.5; but is only slightly soluble or is insoluble in acetone, chloroform, diethyl ether, benzene, ethyl acetate, and hydrocarbon solvents;
- an R<sub>f</sub> value of approximately 0.71 on reversed-phase silica-gel TLC in water:methanol:acetonitrile (45:15:40) which contains 0.2% pyridine and 0.2% acetic acid; and
- the following specific rotation:  $[\alpha]_D^{25} + 11.9^\circ$  (c 0.7, H<sub>2</sub>O);

or a cationic or acid addition salt of A-21978 factor C<sub>0</sub>.

Re. 32,456

## BATTERY POWERED DRAWER OPENING DEVICE

Shiro Ishii, Garden Grove, Calif., assignor to M-S Corporation, Stanton, Calif.

Original No. 4,424,426, dated Jan. 3, 1984, Ser. No. 391,911, Jun. 24, 1982. Application for reissue Jan. 2, 1986, Ser. No. 815,819

Int. Cl.<sup>4</sup> H01H 3/16

U.S. Cl. 200—61.61

20 Claims

## 1. An electrically opening drawer assembly comprising:

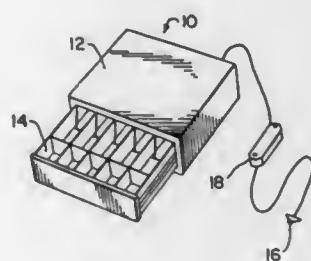
- a casing;
- a drawer tray slidable into and out of said casing;
- a first latch member fixed to said drawer tray;
- a second latch member pivotally mounted to said casing for rotation about a first mounting axis, having a hook portion engageable with said first latch member when said second latch member is in a first rotational position to hold said drawer tray inside said casing, said first latch member being spaced from said first mounting

axis in a first direction radially outwardly extended from said first mounting axis, said second latch member having a first extended portion radially extending from said first mounting axis;

[e.] a solenoid fixed in said casing, [and means, electrically capable of being coupled to said solenoid, for energizing said solenoid in response to] *energizable* by an applied [DC] voltage;

[f. switch means for coupling said energizing means to said solenoid to apply said DC voltage to said solenoid;

g.] a third latch member pivotally mounted to said casing for rotation about a second mounting axis, having a second extended portion extending generally radially outwardly from said second mounting axis and engageable at an end thereof spaced from said second mounting axis



with an end of said first extended portion spaced from said first mounting axis;

[h.] means, responsive to energization of said solenoid by said [DC] voltage, for rotating said second extended portion about said second mounting axis so as to disengage said first extended portion from said second extended portion;

[i.] first spring means, coupling said first and second extended portions, for biasing said first and second extended portions into engagement; and

[j.] second spring means for rotating said second latch member to disengage said hook portion from said first latch member and for urging said drawer tray out of said casing when said first latch member is disengaged from said hook portion.

Re. 32,457

## SCANNING CAPACITANCE MICROSCOPE

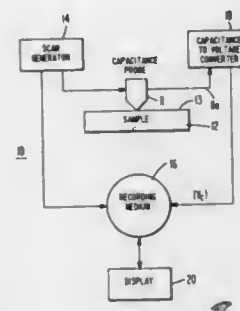
James R. Matey, West Windsor Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Original No. 4,481,616, dated Nov. 6, 1984, Ser. No. 307,021, Sep. 30, 1981. Application for reissue Dec. 19, 1985, Ser. No. 811,152

Int. Cl.<sup>4</sup> G11B 9/06

U.S. Cl. 369-58

6 Claims



10. A method for determining variations in the electrical properties of the surface layer of a body of material comprising the steps of:

- (a) scanning said surface layer with a capacitance probe to generate a first signal representing capacitance variations between said surface layer and said probe;
- (b) scanning a recording medium in synchronism with the scanning of the surface layer with said probe;
- (c) recording said first signal on the recording medium as a second signal;
- (d) generating a first image from said second signal corresponding to a predetermined surface portion of said surface layer;
- (d1) storing said first image in memory;
- (e) coating said surface layer with a conformal metallic coating having a thickness in excess of the Thomas-Fermi shielding range for electrons in the material comprising the metal of said metallic coating, said coating being thin enough to prevent significant changes in the mechanical properties of said surface layer;
- (f) after step (e) repeating steps (a) to (c) to generate a third signal representing capacitance variations and recording of said third signal as a fourth signal for generating a second image of said predetermined surface portion;
- (g) generating said first image from memory; and
- (h) comparing said first image to said second image to determine variations in electrical properties of said surface as manifested by the presence of features in the first image which are absent in the second image.

## PATENTS

GRANTED JUL. 7, 1987

## ERRATA

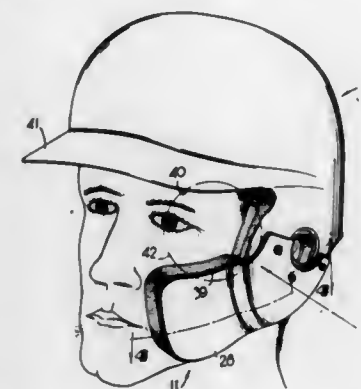
For CLASS	See PATENT NO.
072-015	4,678,042
439-610	4,678,121
439-077	4,678,249
439-083	4,678,250
439-061	4,678,251
439-062	4,678,252
439-210	4,678,253
439-139	4,678,254
439-267	4,678,255
439-347	4,678,256
439-426	4,678,257
439-571	4,678,258
439-610	4,678,259
439-607	4,678,260
439-532	4,678,261
439-857	4,678,262
356-301	4,678,277
029-407	4,678,924
439-633	4,678,932
380-015	4,679,078
315-399	4,679,211

# PATENTS

GRANTED JULY 7, 1987

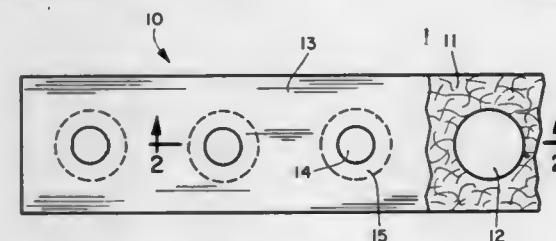
## GENERAL AND MECHANICAL

**4,677,694**  
**FACIAL PROTECTOR FOR BATTING HELMET**  
 Robert W. Crow, 4400 Harris Valley Rd., Atlanta, Ga. 30327  
 Filed Jul. 16, 1986, Ser. No. 886,532  
 Int. Cl.<sup>4</sup> A41D 13/00  
 U.S. Cl. 2—9 6 Claims



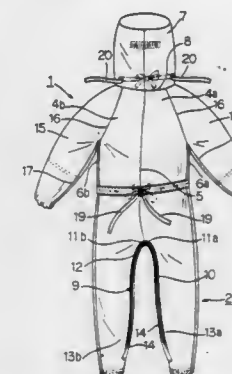
1. In a protective helmet of rigid, impact-resistant material adapted to be worn by batters and the like and having a domed shell configured to fit on the head of a player and a visor extending forwardly from said shell beyond the player's forehead, the improvement comprising a protective flap of rigid, impact-resistant material secured to and supported at one end by said shell adjacent to the ear of a wearer and cantilevered therefrom in spaced substantially parallel relation to the cheek and jaw on one side of the face of the player, said flap having a free end adjacent the chin of the player and having a lower edge approximately paralleling the lower line of the jaw of the player and an upper edge spaced below said visor to provide for unobstructed vision between said visor and said flap while cooperating with said visor to prevent a ball from penetrating between said visor and said flap.

**4,677,695**  
**WEB WITH ADJUSTABLE OPENING AND METHOD OF MAKING THE SAME**  
 Paul T. Van Gompel, Outagamie County, and Jody D. Suprise, Winnebago County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.  
 Filed Feb. 6, 1986, Ser. No. 827,297  
 Int. Cl.<sup>4</sup> A41D 1/06; B32B 3/10  
 U.S. Cl. 2—79 13 Claims



1. A composite with an adjustable, conformable opening therein, comprising a base web of less extensible, lower elastic recovery material joined to a second web, of more extensible, higher elastic recovery material, wherein said base web has a first opening therein, and said second web has a second opening therein generally concentric with the first opening and of smaller size than said first opening, so that the second opening is circumferentially peripherally bounded by an annular-shaped segment of said second web, and said annular-shaped segment of said second web in turn is circumferentially peripherally bounded by said base web.

**4,677,696**  
**DUST-FREE GARMENT FOR CLEAN ROOM**  
 Norito Tanaka, Tokyo, Japan, assignor to Toyo Lint Free Co., Ltd., Tokyo, Japan  
 Filed Nov. 17, 1986, Ser. No. 931,612  
 Claims priority, application Japan, Apr. 18, 1986, 61-57545[U]  
 Int. Cl.<sup>4</sup> A41D 10/00, 13/00  
 U.S. Cl. 2—84 6 Claims



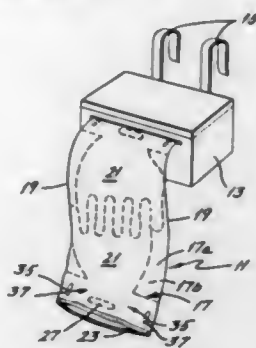
1. A dust-free garment for clean rooms, comprising: a jacket portion having sleeves, a pants portion having legs and a crotch portion, and a hood portion which are sewn together and made from synthetic woven cloth having an anti-static property, said jacket portion and said pants portion each having a front part and a back part, the front part of said jacket portion and pants portion being formed with one single continuous piece of cloth without seams or facings therein; an open-close portion provided along the insides of both legs and the crotch of the pants; fastener means coupled to said open-close portion of the garment for selectively opening and closing said open-close portion; seams between said jacket portion and said hood portion, between the front part and back parts of said jacket and pants portions, between front and back parts of said jacket portion and said sleeves, and between right and left back parts at the center of the back, being covered with piping of pieces of tape attached from the outside of the garment to keep airtightness; a first drawstring provided at the waist of the garment along the center of a back portion of the garment; and a second drawstring provided at a neck portion of the garment along the back side of said hood portion.

**4,677,697**  
**CLEAN UP GLOVE**  
 Starr R. Hayes, 1312 Bergan Rd., Orelan, Pa. 19075  
 Filed Jan. 14, 1985, Ser. No. 691,607  
 Int. Cl.<sup>4</sup> A41D 19/00; B65D 85/00, 30/10  
 U.S. Cl. 2—159 4 Claims

1. A pair of disposable clean up gloves separably attached to one another, comprising: a pair of pliable film hand-shaped enclosures with finger shapes and open wrist ends, said finger shapes of each glove interlacing with those of the other glove, each said glove having a first and second edge; means for fastening closed said open wrist ends of each said hand shaped enclosure, said fastening closed means being positioned on the normally outer side of each said hand shaped enclosure near said open wrist end; said fastening closed means including a first closure member to join said wrist ends in a straight line seal, and a second closure member to draw said wrist ends together;



said first closure member including a male interlocking strip on one side of said wrist end and a female interlocking strip on the other side of said wrist end; and said second closure member comprising a first tab extending



outwardly on the first edge of each said glove at said wrist end and a second tab extending outwardly on the second edge of each said glove at said wrist end, said first and second tabs being long enough to be tied together.

4,677,698

**HOCKEY GLOVE HAVING A FLEXIBLE CUFF**

David J. Angas, Milton, Canada, assignor to Karhu Titan Canada Limitee, Canada

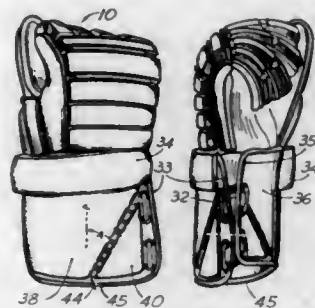
Filed Jun. 12, 1986, Ser. No. 873,412

Claims priority, application Canada, Jan. 22, 1986, 500094

Int. Cl.<sup>4</sup> A41D 13/08

U.S. Cl. 2-161 A

9 Claims



1. An improved hockey glove comprising: a hand portion including a thumb encasing portion; and a cuff portion having a lower edge and an upper edge spaced apart from each other so as to define a longitudinally extending opening distal from said thumb encasing portion of said hand portion; wherein said cuff portion comprises a triangular-shaped segment having first, second and third sides, one of said upper and lower edges defining said first side, an end of said cuff portion distal from said hand portion defining said second side, and a hinge defining said third side, said hinge extending from a first point located on the end of said cuff portion at a certain distance from one end of said one of said upper and lower edges toward a second point located on said one of said upper and lower edges.

4,677,699

**WAIST BAND ADJUSTMENT FOR GARMENT**

David J. Barabe, 2741 Lansdale La., Winston Salem, N.C. 27103

Filed Jul. 16, 1986, Ser. No. 886,569

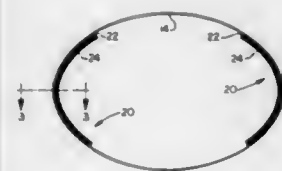
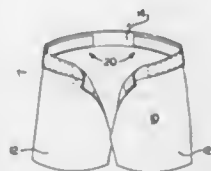
Int. Cl.<sup>4</sup> A41D 1/14

U.S. Cl. 2-221

8 Claims

1. In combination with an apparel garment of the type having a waist band at the top thereof, a waist band adjustment means

comprising at least one first flexible strip with a length of about one-half or less than the length of the garment waist band secured internally to the waist band of said garment and having fastening means on at least a portion of the outer face thereof, and at least one second flexible strip for attachment to said first flexible strip and being substantially coextensive therewith,



said second flexible strip having fastening means on at least a portion of one face thereof for releasably engaging the fastening means of said first strip, whereby said second strip may be removed and attached to said first strip according to increases and decreases, respectively, in the waist size of a person wearing the apparel garment.

4,677,700

**LAVATORY HOSPITAL BED**

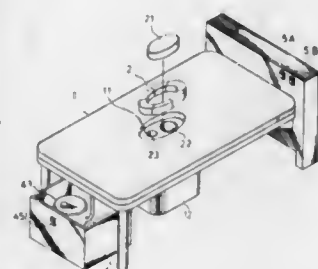
Cheng-Chung Su, No. 26, Shin Chong Road, Tainan, Taiwan

Filed Mar. 10, 1986, Ser. No. 837,787

Int. Cl.<sup>4</sup> A61G 7/02

U.S. Cl. 5-90

2 Claims



1. An improved lavatory hospital bed system comprising the combination of: a mattress with a recess and a removable cushioned insert fitting therein, diaper funnels adapted for the sex of the patient which have a fitting for a spray nozzle for cleaning the patient after usage of said diaper, fluid piping which leads to said spray nozzle, and further characterized in that: said spray nozzle is activated for either water or air by on/off switches on said lavatory hospital bed; said diaper funnels having a scoop-like shape which does not directly contact the patient but which hangs down into the recess and which funnels wastes into a disposal pipe; a disposal pipe, a urine disposal pipe, a neutralization tank containing sterilizing chemicals, an air dryer, a water pump, and piping which leads from a solenoid valve to a spray nozzle.

4,677,701

**FIRMNESS CONTROL DEVICE**

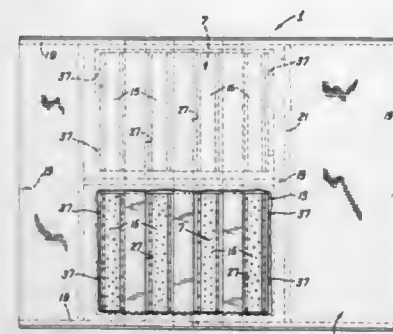
Michael H. Galumbeck, 5577 Vantage Point Rd., Columbia, Md. 21044

Filed Nov. 19, 1985, Ser. No. 799,647

Int. Cl.<sup>4</sup> A47C 23/04, 27/04

U.S. Cl. 5-447

9 Claims



1. A variable firmness control device for a foundation defined in part by an upper support surface and an internal support structure for providing resiliency to the upper support surface, which device comprises:

- (a) a platform for attachment to the underside of the foundation below the internal support structure;
- (b) a plurality of spaced resilient members carried by the platform;
- (c) means for moving the platform for simultaneously positioning the resilient members between portions of the internal support structure and at a desired distance from the upper support surface whereby the degree of deflection of the upper support surface is determined by the position of the resilient members independent of the internal support structure.

4,677,702

**WIRE INSULATION STRIPPER GUIDE**

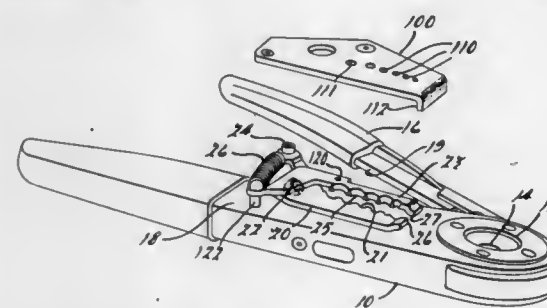
Thomas M. Cairns, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 17, 1986, Ser. No. 819,784

Int. Cl.<sup>4</sup> H02G 1/12

U.S. Cl. 7-107

2 Claims



1. In combination with a wire terminal crimping tool having a pair of separate and pivotable handles and an insulation cutter mounted at a predetermined height above one of said handles with one fixed die and one movable die pivotable with respect to said fixed die to precisely cut the insulation portion of an insulated wire inserted therein at a distance from the end of said wire that does not exceed said predetermined height distance, an improvement comprising:

plate means fixedly mounted above said fixed die of said insulation cutter and defining at least one aperture corresponding to the diameter of the insulated wire insertable for cutting by said insulation cutter and aligned in an axial direction therewith to restrict removal of said wire from said insulation cutter to said axial direction.

4,677,703

**DIES FOR FORMING DRILLING SCREWS**

Katsuhisa Yamasaki, Hatano, Japan, assignor to Topura Co., Ltd., Osaka, Japan

Continuation of Ser. No. 667,055, Oct. 31, 1984, Pat. No.

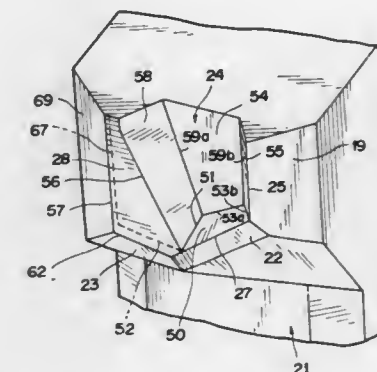
4,586,862, which is a continuation of Ser. No. 337,278, Jan. 5, 1982, abandoned. This application Mar. 7, 1986, Ser. No. 837,295

Claims priority, application Japan, Jan. 12, 1981, 56-2830

Int. Cl.<sup>4</sup> B21K 1/44; B23G 9/00

U.S. Cl. 10-9

5 Claims



1. Dies for manufacturing a drill section of a drilling screw utilizing a pair of dies, each die comprising:

- a block member having a top, a bottom and sides;
- a cavity adjacent to one side of the block and having openings in the top and said one side of said block, said cavity comprising a flat inclined tapering bottom, a first flat inclined tapering inside wall, a second flat inclined inside wall, and a third flat inclined front inner wall;
- a first top flat elongate face provided adjacent to an upper edge of the first inclined tapering inside wall;
- a first longitudinal straight side edge adjacent to said second flat inclined inside wall;
- a second longitudinal straight side edge adjacent to said first top flat elongate face and parallel to said first side edge;
- a first straight oblique inclined front edge adjacent to said third inclined front inner wall;
- a second straight oblique inclined front edge adjacent to said first top flat elongate face and said second side edge and joining with said first front oblique edge at a front point;
- two side inclined faces being respectively adjacent to said first and second parallel side edges;
- two front inclined faces respectively adjacent to said first and second front oblique edges; and
- a second top flat face adjacent to a concavity formed by said two front inclined faces and an adjacent face and lying in the same plane as said first top flat elongate face, said two longitudinal side edges and said two front oblique edges.

4,677,704

**CLEANING SYSTEM FOR STATIC CHARGED SEMICONDUCTOR WAFER SURFACE**

Richard A. Huggins, 19866 Beekman Pl., Cupertino, Calif. 95014

Filed Apr. 22, 1986, Ser. No. 854,481

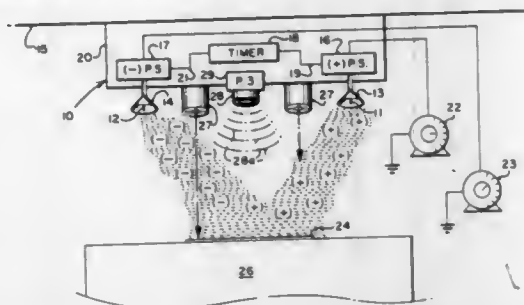
Int. Cl.<sup>4</sup> A47L 5/14

U.S. Cl. 15-1.5 R

6 Claims

1. In a system for cleaning specks of contaminants from a static charged surface comprising means directing a stream of gas against the surface to blow the specks away, portions of said stream tending to provide a laminar flow of gas passing in protective spaced relation across said specks, means generating waves of positive and negative ions to flow toward said surface to charge said surface alternately positively or negatively to provide a substantially neutral charge thereto substantially

during the transition between said positive and negative charges when said static charge acting on said specks is substantially at a minimum so as to tend to release the specks from the surface into said flow of gas, and means for disturbing said laminar flow to permit said specks to be entrained in and blown



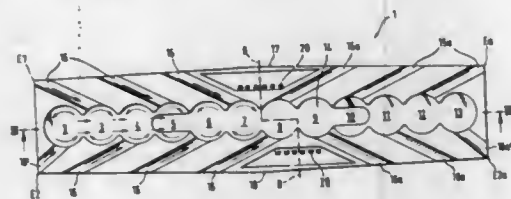
away from the surface by said stream of gas, the last-named means including means generating air-borne vibrations directed to flow toward the surface to disturb said laminar flow and specks during existence of said substantially minimum charge on said surface.

#### 4,677,705 EXHAUSTER NOZZLE

Wilhelm Schuster, Frankfurt am Main, Fed. Rep. of Germany, assignor to Allstar Verbrauchsgüter GmbH, Frankfurt am Main, Fed. Rep. of Germany  
Filed Mar. 17, 1986, Ser. No. 839,972  
Int. Cl.<sup>4</sup> A47L 9/06

U.S. Cl. 15—398

7 Claims



1. An exhauster nozzle for use in cleaning surfaces, said nozzle comprising:  
an element enclosing a suction chamber and provided with a connecting suction pipe;  
said element closed on the open side by an adapter plate;  
said adaptor plate provided with a plurality of abutting and mutually merging substantially circular chambers, said chambers opening on the outside of said adaptor plate and at least one chamber being open to said suction chamber, said chambers situated essentially along the longitudinal axis of said adaptor plate;  
air supply ducts situated on both longitudinal edges of said adaptor plate;  
at least one air supply duct obliquely oriented in the direction of said suction chamber leading tangentially into each chamber from said longitudinal edges of said adaptor plate; and  
said air supply ducts arranged on said longitudinal edges opening alternately into succeeding chambers.

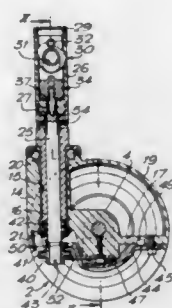
#### 4,677,706 CASTOR BRAKE

Stafford T. Screen, Stourbridge, United Kingdom, assignor to Colson Castors (Europe) Limited, United Kingdom  
Filed Jun. 19, 1985, Ser. No. 747,076  
Claims priority, application United Kingdom, Jun. 21, 1984, 8415846

U.S. Cl. 16—35 R

Int. Cl.<sup>4</sup> B60B 33/00

18 Claims



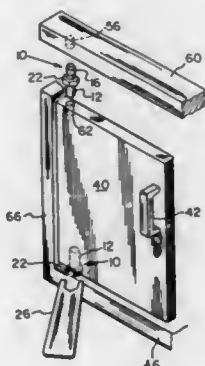
1. A castor comprising:  
a body,  
wheel means,  
means rotatably mounting said wheel means on said body, an elongate hollow mounting member,  
means mounting said body on said mounting member for rotation about a substantially vertical axis spaced from said wheel rotatable means, and  
brake means for braking said wheel means against rotation, said brake means comprising:  
a brake member slidably guided in said hollow mounting member for movement downwardly along said substantially vertical axis to release said braking, and  
brake member operating means carried by said mounting member and selectively operable to act on said brake member at the region of the upper end thereof to effect said movements of said brake member.

#### 4,677,707 ADJUSTABLE UNITARY HINGE

James M. Holler, Jamestown, N.Y., assignor to Bush Industries, Inc., Jamestown, N.Y.  
Continuation of Ser. No. 659,325, Oct. 10, 1984, abandoned.  
This application Jul. 11, 1986, Ser. No. 884,495  
Int. Cl.<sup>4</sup> E05D 5/10

U.S. Cl. 16—239

2 Claims



1. In a furniture cabinet having opposed upper and lower frame members and opposed side frame members forming a frame opening for receiving a door and the door having opposed edges within said frame opening and said opposed edges of said door being spaced from said frame members to permit

movement of said door relative to said frame members, each of two opposed frame members being formed with an elongated hole with a longitudinal central axis in substantial alignment with the longitudinal central axis of the opposed hole, two opposed edges of said door being formed with an elongated hole having a longitudinal central axis in substantial alignment with the longitudinal central axis of the hole in the opposed edge of said door, the central longitudinal axes of the holes in said frame members and the central longitudinal axes of the holes in the opposed edges of said door being in substantial alignment when said door is positioned within said frame opening, the improvement comprising a rotatable one piece hinge pivotally connecting said door to the two opposed frame members, said rotatable one piece hinge having:

- a first substantially cylindrical solid shaft having a central longitudinal axis and an uninterrupted outer surface and adapted to fit into the elongated hole in the opposed edge of said door;
- a second substantially cylindrical solid shaft having a central longitudinal axis and adapted to fit into the elongated hole in the frame member;
- a plurality of rigid circumferential ribs on the exterior surface of said second shaft to create a friction fit between said second shaft and said elongated hole in said frame member;
- a solid intermediate portion located between said first shaft and said second shaft and integral with one end of each of said shafts and the exterior edge of said intermediate portion having an exterior edge parallel to the central longitudinal axes of said shafts and said exterior edge extending at all points around its circumference outwardly beyond the exterior cylindrical surface of said first shaft and the exterior cylindrical surface of said second shaft;
- said intermediate portion being located between the frame member and the edge of said door and said exterior edge of said intermediate portion being formed with a plurality of flats for access by a wrench at all points around the periphery of said exterior edge to rotate said intermediate portion and said shafts to adjust the lateral position of said one piece hinge;
- the central longitudinal axis of said intermediate portion being aligned with the central longitudinal axis of said second shaft and the central longitudinal axis of said first shaft being laterally offset from the central longitudinal axes of said intermediate portion and said second shaft; and
- a visual locator mark on a surface of said intermediate portion to position said one piece hinge relative to said frame members and a juxtaposed edge of the door located within said frame opening formed by said frame members;
- whereby rotation of said intermediate portion of said one piece hinge by the wrench rotates said first and second shafts about their respective central longitudinal axes to laterally adjust the position of said door relative to said frame members.

#### 4,677,708 REPLACEMENT SPRING FOR A CORVETTE DOOR HINGE

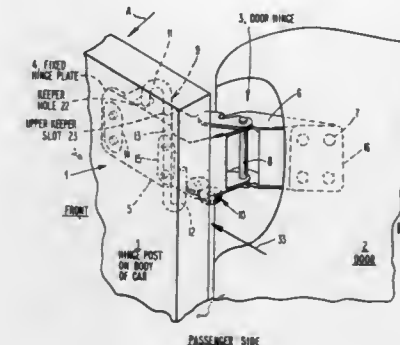
James T. Streett, Pottstown, Pa., assignor to Street Specialty Products Inc., Pottstown, Pa.  
Division of Ser. No. 490,433, May 2, 1983, Pat. No. 4,617,712.  
This application Jan. 31, 1986, Ser. No. 824,520  
Int. Cl.<sup>4</sup> E05D 11/10

U.S. Cl. 16—334

7 Claims

2. For a Corvette motor car, a cam follower spring to be mounted on the fixed hinge plate on the body of the car and engaged by cam means on the door of the car to establish a plurality of detents which control opening and closing of the door, the fixed hinge plate having a rear keeper slot and a keeper hole, the spring comprising:

a wire-form made of spring steel arranged in generally planar, S-shaped form and including:  
a straight, elongated body;  
an upper bent section on one end of the body;  
on said upper bent section, a keeper slot whose locus is normal to the plane of the wire-form for use in receiving the forward edge of said keeper hole on said fixed hinge plate; and



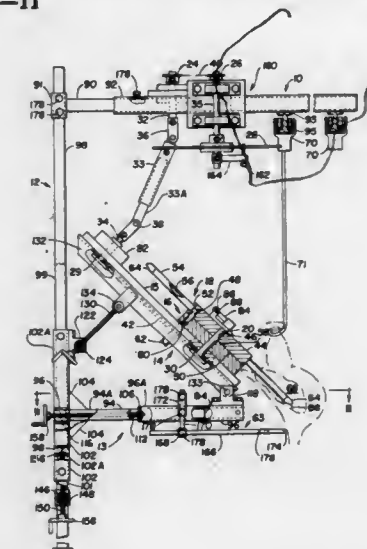
a lower bent section on the other end of the body to be engaged by said cam means whereby to create a plurality of detents for controlling opening and closing of the door and the lower bent section having a tip to extend into said rear keeper slot and be retained by one end thereof and to move toward and away from the rear keeper slot end when the lower bent section is engaged by said cam means.

#### 4,677,709 POULTRY DELUNGER APPARATUS

Fred W. Dixon, R.F.D. 5, Bluff City, Tenn. 37618  
Filed Jan. 23, 1986, Ser. No. 821,896  
Int. Cl.<sup>4</sup> A22C 21/06

U.S. Cl. 17—11

10 Claims



1. Poultry delunging apparatus comprising support means, manifold means stationarily affixed to said support means and having an upper bearing surface, a vacuum source adapted for connection to said manifold means, a delunging unit rotatably mounted on either or both of said manifold means or said support means and having a surface lying adjacent said bearing surface of said manifold means for sliding contact therewith, a plurality of vacuum probes on the periphery of said unit in prearranged spacing therearound and extending generally



radially outwardly therefrom, cooperating conduit means in said unit and said manifold means, valve means in said conduit means for rapidly opening or closing the same to apply or to interrupt the vacuum to said probes in a predetermined manner, said valve means comprising said bearing surface of said manifold means and said surface of said delunging unit, and drive means for rotating said unit at a prescribed speed.

4,677,710

# ARRANGEMENT FOR CLEANING THE PRESSING ROLLERS OF A COMBING MACHINE

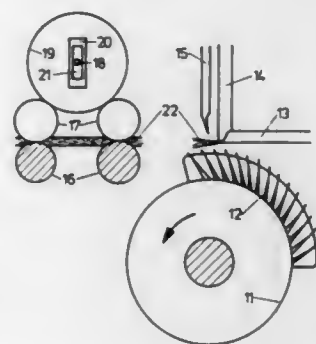
Hans Ulrich Eichenberger, Winterthur; Ludwig Lacher, Wetzikon, and Titus Schmid, Winterthur, all of Switzerland, assignors to Maschinenfabrik Rieter A.G., Winterthur, Switzerland  
Filed May 7, 1985, Ser. No. 731,482

Claims priority, application Switzerland, May 7, 1984, 2219/84

Int. Cl.<sup>4</sup> D01C 19/22

U.S. Cl. 19—218

11 Claims



1. An arrangement for use in a combing machine for cleaning a pressing roller that is pressed toward an associated detaching roller, comprising a cleaning roller; and means for mounting said cleaning roller for free rotation in engagement with the pressing roller about an axis parallel to that of the latter, the surface quality of said cleaning roller and the pressing roller being such that, during the operation of the combing machine, slippage occurs between said cleaning roller and the pressing roller, said cleaning roller having a smooth outer surface adverse to adhesion of fibers thereto, so that fibers do not adhere to said outer surface of said cleaning roller and cleaning of the latter is not necessary.

4,677,711

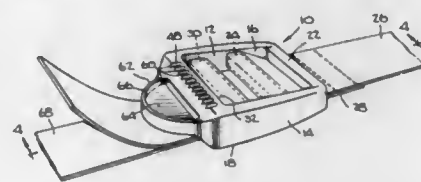
# REVERSIBLE BUCKLE

Joseph Anscher, Huntington Bay, N.Y., assignor to National Molding Corporation, Farmingdale, N.Y.  
Filed Mar. 19, 1986, Ser. No. 841,281

Int. Cl.<sup>4</sup> A44B 11/04

U.S. Cl. 24—200

20 Claims



1. A reversible fastener comprising:  
a body having two side members that define an upper face and lower face;  
means for securing the fastener to a workpiece; and  
means for adjustably securing a strap to the fastener, said adjustably securing means comprising first and second substantially parallel cross-members disposed between and connecting common surfaces of said side members,

said first and second cross-members being stationary within the body;  
said first cross-member having a substantially convex region and said second cross-member having a substantially concave region disposed substantially opposite said convex region so that said regions are capable of cooperatively engaging and adjustably securing a strap threaded there-through from said lower face or from said upper face.

4,677,712

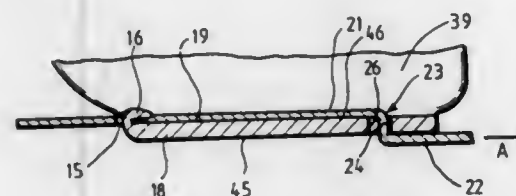
# HOSE CLAMP WITH TIGHTENER

Kurt Allert, Oberndorf am Neckar, Fed. Rep. of Germany, assignor to Kurt Allert GmbH & Co. KG, Oberndorf am Neckar, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 679,361, Dec. 7, 1984, abandoned. This application Sep. 18, 1985, Ser. No. 777,842  
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 8419624[U]

Int. Cl.<sup>4</sup> B65D 63/00

U.S. Cl. 24—274 R

16 Claims



1. A hose clamp comprising:  
a metallic tightening strap;  
a tightener means including a housing having a bottom portion to which a terminal portion of the tightening strap is fastened, and a rotatably mounted tightening worm gear means cooperable with a gear tooth system of the tightening strap for enabling an adjustment of the tightening strap;  
a bent part provided in a terminal portion of the tightening strap for enabling a fastening of the tightening strap to the bottom of the housing in a tension-proof manner;  
a transverse slit including a pair of longitudinal walls provided in a bottom portion of the housing extending substantially at a right angle to the tightening strap for accommodating the bent part, said transverse slit having a width slightly larger than a thickness of the tightening strap;  
wherein the bent part forms a cross bar adapted to be pressed onto one longitudinal wall of the transverse slit by a tension applied to the tightening strap, the bent part is formed by two approximately rectangular bends spaced from each other at a distance corresponding approximately to a height of the transverse slit; and  
wherein said longitudinal walls of the transverse slit extend substantially at a right angle to the tightening strap, said longitudinal walls having the same height and being arranged at the same level, so that said longitudinal walls are not staggered heightwise with respect to each other.

4,677,713

# ORONASAL MASK ASSEMBLIES

Warren K. Copp, Fleet, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England  
Filed Mar. 25, 1986, Ser. No. 843,605

Claims priority, application United Kingdom, Mar. 26, 1985, 8507796

Int. Cl.<sup>4</sup> A42B 7/00

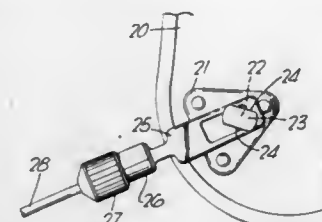
U.S. Cl. 24—590

4 Claims

1. A retaining means for an oronasal mask assembly for use

in conjunction with a protective helmet to facilitate quick release of the assembly from the helmet, the retaining means comprising:

- a first part comprising (i) a base plate adapted to be mounted on the outside of the helmet, and (ii) a pillar extending outwardly from said base plate and having an enlarged, domed elongate head having parallel long sides and rounded apexes; and
- a second part including (i) a cable length adjuster, (ii) a retaining cable for connecting said mask assembly to one end of said adjuster, and (iii) a slotted plate which is flexibly connected to the other end of said adjuster and is



adapted to pass over said domed head and to be retained by said pillar when the slot is aligned with the parallel sides of the head;

the first part being adapted to be so positioned on the helmet that when the mask assembly is retained on the helmet in its normal position, the slot makes an angle with the parallel sides of the head which is sufficient to prevent inadvertent separation of the first part and the second part of the retaining means during movement encountered in normal use but is not too great to prevent the first part and the second part of the retaining means from being separated manually.

4,677,714

# QUICK-RELEASE FASTENER

Andrew C. W. Wright, Surrey, England, assignor to Dzus Fastener Co. Inc., West Islip, N.Y.

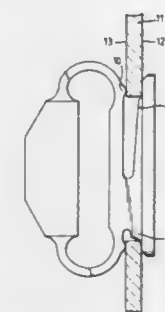
Filed Jun. 20, 1986, Ser. No. 876,718

Claims priority, application United Kingdom, Jul. 11, 1985, 8517548

Int. Cl.<sup>4</sup> F16B 21/00

U.S. Cl. 24—590

3 Claims



1. A one-piece receptacle for a quick-release fastener provided with a stud, for mounting in an aperture on a support, said receptacle having:

- a central axis;
- a base portion;
- a stud-retaining structure having a coupling socket for engagement with corresponding parts of a stud of said fastener;
- a pair of resilient webs substantially C-shaped in cross-section and connecting said stud-retaining structure to said base portion, said C-shaped resilient webs extending out-

wardly from opposite ends of said base to connect with opposite ends of said socket;  
said base portion having a pair of thin walled portions defining a cross-cut elongate slot in a plane transverse to said central axis of the receptacle; and,  
said C-shaped webs being integrally connected to said base portion in extension of the one of said thin walled portions closer to said stud-retaining structure, and said slot extending from one side of the receptacle across said central axis thereof, whereby said opposing thin walled portions of said base on opposite sides of said cross-cut slot can engage opposite surfaces of said support adjacent said aperture in which said receptacle is mounted.

4,677,715

# BUCKLE, ESPECIALLY FOR A SAFETY BELT

Gerard Escaravage, Valentigney, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

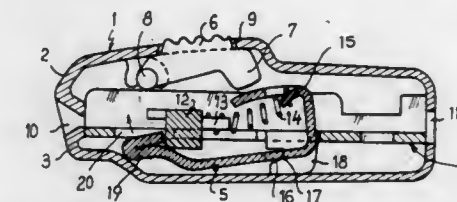
Filed Jul. 14, 1986, Ser. No. 884,947

Claims priority, application France, Jul. 17, 1985, 85-10965

Int. Cl.<sup>4</sup> A44B 11/25

U.S. Cl. 24—637

15 Claims



1. Buckle, particularly for a safety belt for an automobile vehicle, which is intended to attach in a removable manner a length of the belt to a fixed point of the vehicle body, comprising a catch assembly and a bolt (21) forming an integral part of the length to be attached, the catch assembly comprising, housed in a casing (1), a body (4) intended to be attached to a means of restraint forming an integral part of the vehicle and which defines a passage and a plane of sliding for the bolt, a member for locking (5) the bolt comprising an operating portion (19) which engages in a cavity (22) in the bolt (21) in the position in which the latter is locked, and articulated to the body (4) so as to be capable of swinging around an articulated pivot (16) which is approximately parallel to the plane of sliding and perpendicular to the direction of travel of the bolt, between a position in which the bolt is locked and a position in which it is unlocked, a sliding block (12) mounted in said body (4) so as to be capable of traveling along the direction of travel of the bolt (21) and which cooperates, on the one hand, with a front face of the bolt and, on the other hand, with resilient means for ejecting the bolt, means pushing the locking member towards its position in which the bolt is locked and means for producing unlocking (6) for moving the locking member (5) towards its position in which the bolt is unlocked, wherein the resilient means for ejecting the bolt and the means pushing the locking member towards its position in which the bolt is locked, consist of a spring (14) inserted between the sliding block (12) and the locking member (5); wherein said sliding block (12) is mounted so as to be capable of traveling in the body (4) between a forward position, in which a first bearing surface of the locking member is bearing against the sliding block (12), corresponding to the position in which the bolt is unlocked, and a rear position in which the locking member has oscillated relative to said body, so that a second bearing surface of the locking member is bearing against the sliding block, corresponding to the position in which the bolt is locked.



4,677,716

**BUCKLE IN PARTICULAR FOR A SAFETY BELT**

Jean Monsigny, Saverne, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

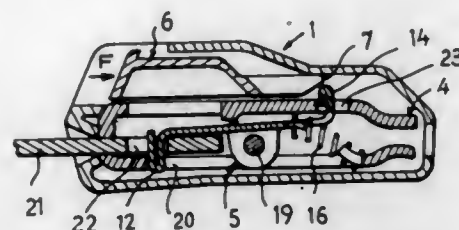
Filed Jun. 2, 1986, Ser. No. 869,787

Claims priority, application France, Jun. 10, 1985, 85 08755

Int. Cl.<sup>4</sup> A44B 11/25

U.S. Cl. 24-641

11 Claims



1. Buckle in particular for the safety belt of a motor vehicle, which buckle is intended to fix in a removable manner one end of the belt to a fixed point of the vehicle body by means of a latch (21) forming a lock integral with the end to be fixed, said buckle having a housing (1;1a) inside which there is located a body (4;4a;40) intended to be fixed to a retaining means integral with the vehicle and which defines a rectilinear passage for receiving the latch (21) and, in addition, a locking member (5;5a;30) intended to keep the latch in a locked position and a member (6) for releasing the latch, wherein the locking member (5;5a;30) is mounted inside the body (4;4a;40) so as to oscillate and be slidably displaceable, in a direction parallel to the direction of displacement of the latch in the body, between a position where the latch is locked and a position where the latter is released and wherein said locking member has at its ends means intended to cooperate with stopping surfaces of the body (4;4a;40) and of the latch (21) via the action of a destabilizing device (16), and wherein said means consist of projections (12;14;12i;14a;31;32) and wherein the locking member has, in its central part, bearing means (18;18a;35) for the end of the latch (21) so that the latter is able to displace slidably the locking member (5;5a;30) inside the body towards the locked position, against the action of an elastic destabilizing device (16), said locking member (5;5a;30) having at one end of a first projection (12;12a;31) cooperating in the locked position, via the action of the destabilizing device, with a recess (22) in the latch (21) and with a stopping edge of an aperture (20;41) provided in a first wall of the body (4;40) and at its other end a second projection (14;14a;32) cooperating with an edge (23) of a second wall of the body (4;40) opposite the first wall, the end of said second projection (14;14a;32) protruding, in the locked position, beyond the second wall and being actuatable by the lock release member (6).

4,677,717

**DEVICE FOR CONTINUOUS AND TENSION-FREE TREATMENT OF TEXTILE**

Berthold Magin, Hassloch, Fed. Rep. of Germany, assignor to MTM Obermaier GmbH &amp; Co. KG, Hassloch, Fed. Rep. of Germany

Filed Oct. 5, 1984, Ser. No. 658,224

Claims priority, application European Pat. Off., Oct. 8, 1983, 83110082.1

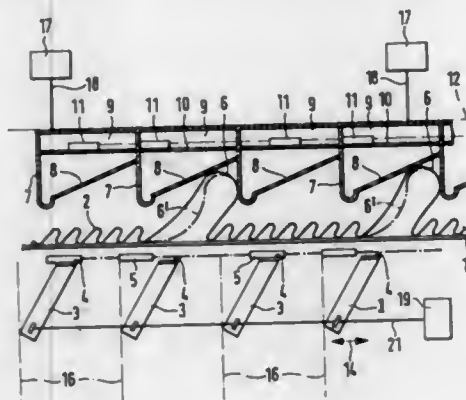
Int. Cl.<sup>4</sup> D06L 7/02

U.S. Cl. 26-18.5

9 Claims

1. Device for the continuous and tension-free treatment, such as drying, shrinking, finishing and the like, of textile fabric sheets, comprising a generally horizontally arranged transport belt having an elongated direction and a width direction extending transversely of the elongated direction for transporting an elongated fabric sheet in the transport direction corresponding to the elongated direction of said belt with the width of the fabric sheet supported on said belt in the width dimension,

said transport belt having an upper side on which the fabric sheet is supported and an opposite lower side and a pair of opposite side edges spaced apart in the width direction and extending in the elongated direction, at least one lower nozzle located below the lower side of said transport belt and extending across in the width direction of said transport belt and arranged to direct air against the transport belt so that the air passes through said belt into contact with the fabric sheet supported thereon, said at least one lower nozzle having a nozzle opening directed generally upwardly toward and extending across in the width direction of said transport belt, said at least one lower nozzle extends generally upwardly and is inclined in the transport direction relative to the vertical by a slight angle, a closing member associated with said at least one lower nozzle for selectively opening and closing said nozzle opening, generally vertically extending separating walls located above the upper side of said transport belt and extending across the width of said transport belt transversely of the transport direction, said separating walls being spaced apart in the transport direction and an adjacent pair of said separating walls defining a treatment zone extending therebetween in the elongated direction and in the width direction of said transport belt and with said at least one lower nozzle located aligned below said treatment zone, a perforated plate located above said transport belt and extending between a pair of adjacent said separating walls forming the treatment zone therebetween,



tween, said perforated plate extending in the width direction and in the elongated direction of said transport belt from adjacent the lower end of the upstream one of said pair of separating walls to the downstream one of said pair of separating walls whereby said perforated plate is inclined upwardly in the transport direction with the maximum vertical spacing between the upper side of said transport belt and said perforated plate being in the range of 5 to 15 cm, and said at least one lower nozzle has a vertical axis located between and spaced from the side edges of said transport belt and said lower nozzle is pivotable generally horizontally about the vertical axis so that said lower nozzle can be selectively oriented obliquely or perpendicularly to the transport direction whereby said lower nozzle can direct air upwardly through said transport belt for lifting the fabric upwardly toward said perforated plate from said transport belt with the fabric being lifted obliquely or perpendicularly in accordance with the selective orientation of said lower nozzle about the vertical axis, said pair of separating walls and said perforated plate form a baffle arrangement, said baffle arrangement having a generally horizontally arranged tilting axis extending in the transport direction and spaced inwardly from the side edges of said transport belt so that said baffle arrangement can be tilted about said tilting axis for varying the vertical spacing across the width of said baffle arrangement above said transport belt to compensate for any influences tending to stretch the fabric sheet.

4,677,718

**SAFETY HOOD FOR PALETTE CHANGE-OVER DEVICES OF MACHINE TOOLS**

Werner Babel, Pfronten-Mellingen, Fed. Rep. of Germany, assignor to MAHO Werkzeugmaschinenbau Babel &amp; Co., Fed. Rep. of Germany

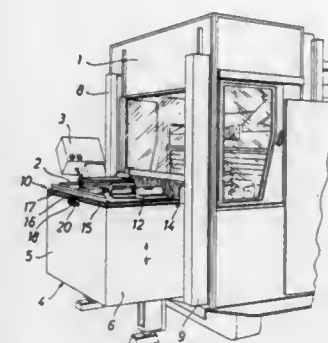
Filed Dec. 18, 1985, Ser. No. 810,430

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 8437044

Int. Cl.<sup>4</sup> F16P 3/04

U.S. Cl. 29-33 P

2 Claims



1. A safety hood for palette change-over devices of numerically controlled machine tools, comprising  
A. a U-shaped hood which, in its operating position, surrounds the palette change-over device,  
B. a driving mechanism for moving the hood,  
C. guides for the hood, which guides are mounted on a fixed part of the machine, and  
D. a probe, disposed in association with the hood, with an emergency circuit breaker which shuts down at least the driving mechanism of the safety hood as soon as the hood encounters a foreign body, said probe including a slightly protruding stirrup pivotably linked to the upper edge of the vertically moveable hood, which stirrup, on contact with the foreign body, pivots vertically against spring resistance and operates the emergency circuit breaker.

4,677,719

**TOOL HOLDING DEVICE FOR LATHES**

Helmut F. Link, Aichwald, Fed. Rep. of Germany, assignor to Index-Werke Komm.-Ges. Hahn &amp; Tessky, Fed. Rep. of Germany

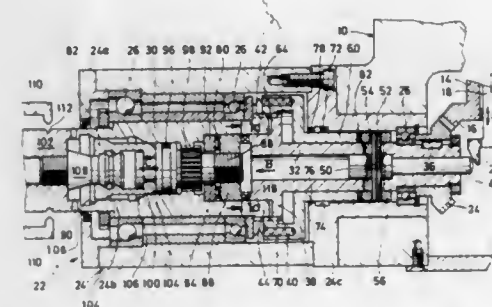
Filed Feb. 20, 1986, Ser. No. 831,354

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509635

Int. Cl.<sup>4</sup> B23B 3/22; B23C 5/26

U.S. Cl. 29-40

9 Claims



1. A tool carrier, in particular a tool turret, comprising a housing (10), a tool spindle (30) in the form of a hollow shaft, means mounting the tool spindle within said housing for rotation about a spindle axis, tool driver means carried by the tool

spindle for rotating a tool (102, 108) about the spindle axis, a first threaded element (86), arranged in said tool spindle coaxially thereto, said first threaded element being rotatable relative to said tool spindle about its axis for cooperation with a second threaded element (88) for axially tightening a tool against a seat (80) of said tool driver means, and a spindle drive element (32) also coaxial to said tool spindle for driving the same, wherein  
(a) drive connection means (116, 118) are provided for rotating said first threaded element (86) by said spindle drive element (32), and  
(b) releasable clutch means (60, 64, 40, 42) are provided for coupling said spindle drive element (32) with said tool spindle (30), said clutch means comprising a clutch element (60) shiftable along the spindle axis between a first axial position in which said spindle drive element is coupled with the tool spindle, and a second axial position in which said first threaded element (86) is rotatable by said spindle drive element without rotation of the tool spindle.

4,677,720

**METHOD FOR MAKING A DOUBLE ROW ROLLER BEARING RETAINER**

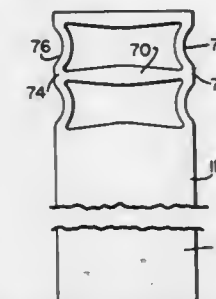
Richard L. Alling, Richard W. Shepard, both of Torrington, Conn.; Clyde L. Landrum, Granger, Ind.; Robert H. Toffield, Torrington, and Stephen T. Podhajecski, Norfolk, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 754,680, Jul. 12, 1985, Pat. No. 4,605,322, which is a continuation of Ser. No. 556,559, Nov. 11, 1983, abandoned. This application Apr. 7, 1986, Ser. No. 848,635

Int. Cl.<sup>4</sup> B21D 53/12; B21H 1/12; B21K 1/04, 1/05

U.S. Cl. 29-148.4 C

3 Claims



1. A method of making a double row roller bearing retainer from flat metal stock comprising the steps of:  
making a plurality of pockets in a flat metal strip to provide pockets in the flat metal strip separated by cross-bars, and at the same time making scallops on each edge of the flat metal strip; shaping the cross-bars for roller guidance and for roller retention; U-forming the flat metal strip to provide a strip having a U-shaped cross-section; cutting off a predetermined length of the U-formed strip to provide a U-formed strip having two ends; wrapping the predetermined length into an annular retainer; and bonding the two ends together.

4,677,721

**METHOD FOR FABRICATING AN ELASTOMERIC BEARING ASSEMBLY**

James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 782,785, Oct. 2, 1985, Pat. No. 4,585,359. This application Dec. 26, 1985, Ser. No. 813,746

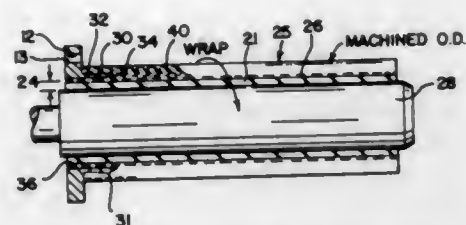
Int. Cl.<sup>4</sup> B21D 53/10; B31C 13/00; B65H 81/00; B32B 1/00

U.S. Cl. 29-149.5 S

7 Claims

1. A method of manufacturing a bearing assembly comprising the steps of preforming a generally cylindrical elastomeric sleeve, providing at least a ply of fiber reinforced elastomer onto said elastomeric cylindrical sleeve to provide a fiber

reinforced cured elastomeric bearing blank, mounting the bearing blank onto a rotatable mandrel, applying an adhesive onto one exterior end surface of the bearing blank, mounting a metallic annular flange with an inwardly extending hub onto said one exterior surface of the bearing blank into frictional



contact with said adhesive, rotating said spindle and wrapping a fiber fabric onto the outer circumferential surface of the bearing blank and hub while impregnating the fiber fabric with a plastic resin, and curing said resin to complete a fiber reinforced shell that is molded into firm engagement with said hub and said bearing blank.

4,677,722

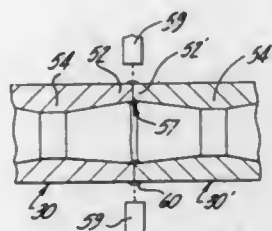
## TAPERED PISTON PIN

Eric D. Emmer, Troy, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 16, 1985, Ser. No. 808,968  
Int. Cl.<sup>4</sup> B23P 15/10; B21D 31/02, 22/00

U.S. Cl. 29—156.5 A

7 Claims



1. A method of manufacturing a tubular piston pin having a cylindrical exterior surface and a contoured interior surface in the form of a double hourglass shaped aperture extending axially therethrough and characterized by opposite thin-walled end portions and midportion and by thicker-walled portions therebetween, comprising these steps:

- supporting a metal cylinder in a cylindrical bore of a rigid housing, both having equal diameters;
- molding the metal cylinder by moving a pair of dies in opposite directions each against an opposite end face of the metal cylinder to produce a substantially tubular half pin with thin-walled end portions and a thicker-walled midportion including a radially extending wall thereacross;
- striking out the radially extending wall of the half pin to produce a continuous aperture axially through the half pin and having a substantially hourglass shape;
- axially aligning two half pins and integrally joining the abutting ends thereof to produce a piston pin of twice the length of the half pin having a double hourglass configured aperture extending axially therethrough.

4,677,723

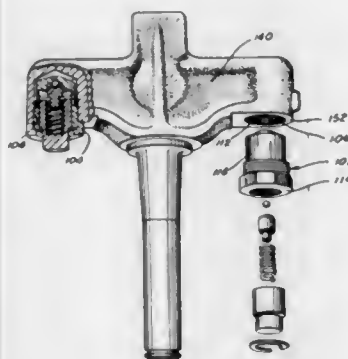
## VALVE BRIDGE CONSTRUCTION METHOD

Hilliard F. Greene, Sr., Chicago, Ill., assignor to Precision Screw Machine Company, Hillside, Ill.  
Division of Ser. No. 331,298, Dec. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 25,382, Mar. 30, 1979, abandoned, which is a continuation of Ser. No. 870,421, Jan. 18, 1978, abandoned, which is a continuation of Ser. No. 721,803, Sep. 8, 1976, abandoned. This application Apr. 9, 1984, Ser. No. 598,250

Int. Cl.<sup>4</sup> B21D 53/00

U.S. Cl. 29—157.1 R

11 Claims



1. An improved method of rebuilding a used valve bridge assembly of the type that actuates the exhaust valves in a cylinder of a diesel locomotive engine, said bridge including a cross-arm with distal ends and lash adjuster sockets adjacent to each of the distal ends, each of the lash adjuster sockets having an opening adapted to receive a lash adjuster by being press-fit therein in order to provide smooth, efficient operation of the exhaust valves, and said bridge having at least one lash adjuster socket with an inner diameter worn oversized so that a standard size lash adjuster can no longer be properly fitted therein, the improved method of:

- maintaining a stock of oversized lash adjusters which each include an outer cylindrical wall having a radially outwardly projecting rib member adapted to be in surface-to-surface contact with the inner surface of the lash adjuster sockets and having an outer diameter dimension larger in diameter than the outer diameter dimension of the corresponding rib on the standard size lash adjuster;
- disassembling the used valve bridge, including removing the used lash adjusters from each of the lash adjuster sockets;
- cleaning the valve bridge, including the lash adjuster sockets formed therein, without machining the lash adjuster sockets in the valve bridge;
- measuring the inner diameter dimension of each of the oversized lash adjuster sockets in the valve bridge;
- selecting an oversized lash adjuster from said stock of oversized lash adjusters having an outer diameter dimension comparable to the measured inner diameter dimension of each of the oversized lash adjuster sockets; and
- reassembling the valve bridge, including press-fitting the selected oversized lash adjuster into the measured lash adjuster socket so that the radially outwardly projecting rib member is in surface to surface contact with the inner surface of the measured lash adjuster socket.

4,677,724

## HEAT EXCHANGER STRUCTURE AND METHOD OF MANUFACTURING SAME

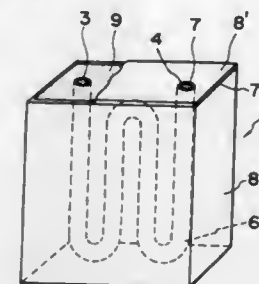
Takanori Kuroki, 2-12-1, Hinoosato, Munakata-shi, Fukuoka-ken, Japan

Filed Jun. 5, 1985, Ser. No. 741,535

Int. Cl.<sup>4</sup> B27D 53/02; B23P 15/26

U.S. Cl. 29—157.3 R

1 Claim



1. A process for making a heat exchanger comprising: inserting a pipe having end portions, into a metal box having an inner surface in such a manner that said pipe is enclosed to form a fluid passage; filling a space between said pipe and the inner surface of said metal box with at least one material selected from the group consisting of metal powder, metal particles, metal wires, and metal plates; sealing said material in the space; and diffusion-welding joint portions of said metal box to each other and peripheral surfaces of said end portions of said pipes to said metal box in an air-tight, vacuum-sealed state by hot isotropic pressure welding.

4,677,725

## MOUNTING TOOL

Stig L. Hallerback, Vastra Frolunda, Sweden, assignor to Aktiebolaget SKF, Goteborg, Sweden

Continuation-in-part of Ser. No. 574,745, Jan. 30, 1984, Pat. No. 4,587,715. This application Dec. 23, 1985, Ser. No. 812,445

Claims priority, application Sweden, Mar. 7, 1983, 8301218

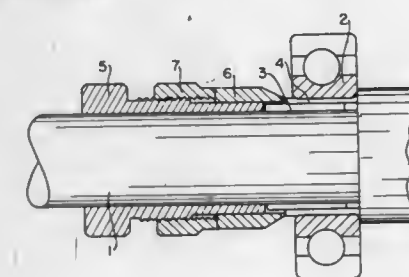
The portion of the term of this patent subsequent to May 13,

2003, has been disclaimed.

Int. Cl.<sup>4</sup> B25B 27/02

U.S. Cl. 29—280

1 Claim



1. A mounting tool for mounting a bearing assembly includ-

ing an inner ring having a tapered inner peripheral surface and an outer ring and a plurality of rolling elements in the annular space between the rings on a shaft member with a predetermined preload or play by means of a tapered sleeve confronting the tapered surface of the inner ring operable upon axial movement relative to the inner ring to exert a radial seating force on the inner ring of the bearing assembly comprising a mounting member movable axially on the shaft member and engageable with said sleeve member to actuate it axially relative to said inner ring, a spacing ring circumscribing the mounting sleeve and actuatable axially relative thereto and positioned to engage the inner ring when said mounting sleeve is moved axially to actuate the sleeve member and a stop ring having internal threads cooperating with threads on the mounting sleeve to selectively control the position of the spacing ring on the mounting sleeve and thereby control preload in the bearing assembly.

4,677,726

## MILLING MACHINE APPARATUS

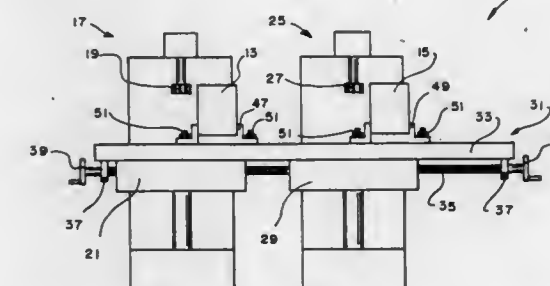
Clarence Williams, 2660 Dwight Rd., Memphis, Tenn. 38114

Filed Feb. 21, 1986, Ser. No. 831,622

Int. Cl.<sup>4</sup> B23Q 3/10

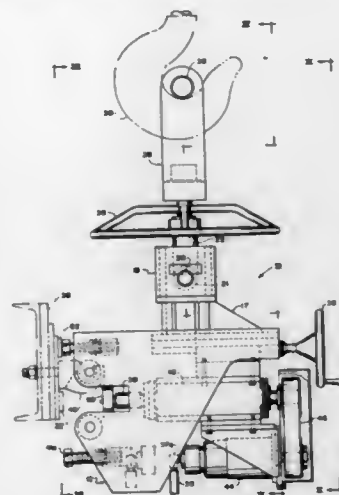
U.S. Cl. 29—401.1

3 Claims





conductor while the conductor is conducting electrical current, the method comprising providing hook means on said conductor for receiving a trunion of a portable machining apparatus, providing said apparatus with a trunion, and with an air operated motor disposed to rotate a spindle and milling cutter mounted in the spindle, insulating the portable apparatus from ground when said motor is connected to a source of pressurized air by using electrically insulating hoses connected between the motor and said source,



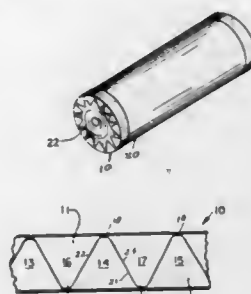
locating said milling cutter adjacent the electrical conductor by disposing the trunion in the hook means, translating the spindle towards the electrical conductor until the cutter engages the same, and rotating the cutter against a surface portion of the conductor by directing a flow of air to the motor through said hoses from the source of pressurized air to rotate the motor and thus the spindle and cutter.

4,677,728

## ROLL EDGE PROTECTOR

Albert E. Straus, 1673 W. Eighth St., Erie, Pa. 16505  
Filed Jan. 27, 1986, Ser. No. 822,598  
Int. Cl. B23P 17/00; A45C 11/34  
U.S. Cl. 29—415

5 Claims



1. A method of making a roll edge protector for rolls of sheet material comprising:  
forming thermo plastic material into continuous lengths in the form of a channel having a first leg and a second leg and a web connecting said legs,  
cutting said web along a continuous zig zag line from one end of said web to the other end, thereby forming a first continuous row of first scallops attached to said first leg

and a continuous row of second scallops attached to said second leg,  
said scallops having straight sides disposed at an acute angle to one another,  
said scallops having arcuate tips and arcuate roots curved about equal radiuses of curvature.

4,677,729

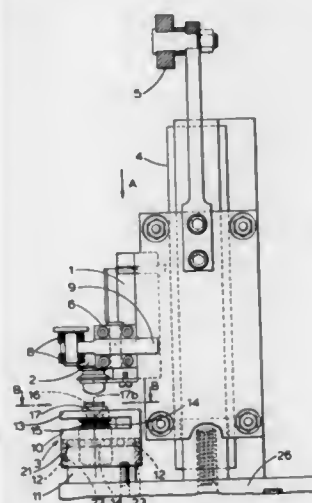
## METHOD OF MOUNTING A PARTLY FORMED LENS BLANK

Albert H. Morland, and John T. Phoenix, both of Southampton, England, assignors to Coopervision, Inc., Menlo Park, Calif.  
PCT No. PCT/GB85/00170, § 371 Date Dec. 18, 1985, § 102(e)  
Date Dec. 18, 1985, PCT Pub. No. WO85/04829, PCT Pub. Date Nov. 7, 1985  
PCT Filed Apr. 18, 1985, Ser. No. 816,120  
Claims priority, application United Kingdom, Apr. 19, 1984, 8410341

Int. Cl. B23P 19/00

U.S. Cl. 29—426.5

8 Claims



1. A method of mounting a partly formed lens blank, having a first accurately cut lens surface, on an upper block in order to be able to cut a second opposite lens surface on the blank, said method comprising bringing the upper block into contact with the first accurately cut lens surface of the blank, said blank being secured on a lower support component, while maintaining the axes of the upper block and blank secured on said lower support component in a vertical disposition and, while supporting the lower support component and blank so that it is free to move in any direction in a horizontal plane, urging the first accurately cut lens surface and upper block together with a film of liquid adhesive therebetween, whereby said adhesive acts as a lubricant between mating surfaces of the upper block and the first accurately cut lens surface and assists centralisation and alignment of the axes of the blank and upper block, and removing said lower support component from said lens blank.

4,677,730

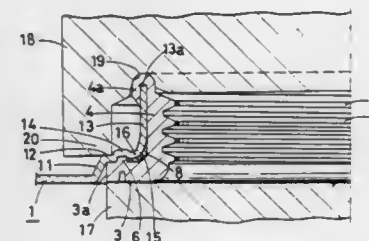
## METHOD OF ATTACHING PRESS-IN FLANGE TO DRUM OR LIKE CONTAINER

Masanari Mineo, and Kinji Mineo, both of Arakawa, Japan, assignors to Yamato Iron Works Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 609,951, May 14, 1984, abandoned.  
This application Apr. 17, 1986, Ser. No. 854,078  
Claims priority, application Japan, May 12, 1983, 58-83741  
Int. Cl. B23D 11/00; B65D 41/04; B21D 51/46  
U.S. Cl. 29—512

4 Claims

1. An improved method of attaching a press-in flange 2

comprising a tubular portion 4 having an internally threaded part 5 and a horizontal portion 3 extending outward from the lower end of the tubular portion 4 and having a polygonal edge 3a, to a drum by fitting an annular gasket 8 around the tubular portion 4 of the flange 2, forcing the flange 2 having the gasket thereon from below into a tubular mouthpiece 10 comprising a skirt portion 11 integral with the top plate 1 and polygonal in horizontal section, an annular stepped portion 12 extending horizontally inward from the upper edge of the skirt portion 11 and a tubular upstanding portion 13 made integral with the inner edge of the stepped portion 12 through a curved portion 14, and outwardly bending the upper end 4a of the tubular portion 4 of the flange 2 to hold the upper end 4a folded over the upper end 13a of the upstanding portion 13 while brining the polygonal peripheral edge 3a of the horizontal portion 3 of the flange 2 into intimate contact with the inner surface of the



skirt portion 11 of the tubular mouthpiece 10, wherein the improvement comprises:

- (a) providing an upward annular projection 6 on the horizontal portion 3 of the flange 2 substantially at the midportion of its width;
- (b) fitting said annular gasket 8 in between said annular projection 6 and the lower end of the tubular portion 4 before forcing the flange 2 into the tubular mouthpiece 10; and
- (c) bringing the annular projection 6 of the flange 2 into intimate contact with the inner surface of the curved portion 14 of the tubular portion 10 to thereby confine the gasket 8 into the space defined by the annular projection 6, the curved portion 14, the lower end of the tubular portion 4 and part of the horizontal portion 3, when the flange 2 is forced into the tubular mouthpiece 10 of the top plate 1 and fixed thereto.

4,677,731

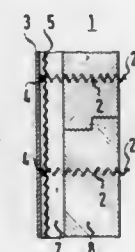
## PROCESS AND DEVICE FOR MOUNTING POROUS CERAMIC MATERIAL

Jürgen Sommerer, Rauenthal; Michael Leibold; Hartmut Kalner, both of Wiesbaden, and Hermann Stein, Taunusstein, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany  
Filed May 14, 1985, Ser. No. 733,867  
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419566

Int. Cl. F16L 59/12

U.S. Cl. 29—526 R

15 Claims



1. A process for mounting porous ceramic material to a metal surface to provide insulation for said metal surface, said process comprising the steps of:

disposing a perforated holding means in fixed relationship on said metal surface;  
choosing porous ceramic material having a porosity of about 80% to about 90% and being of such hardness that spiral paths can be cut therein by spiral springs, and choosing spiral springs such that they can, on their own, cut spiral paths in the porous ceramic material when screwed thereto;  
placing said porous ceramic material adjacent to said holding means;  
cutting helical paths in said porous ceramic material with spiral springs by screwing said spiral springs into said porous ceramic material;  
engaging said spiral springs with said perforated holding means by continually screwing said spiral springs, thereby attaching said porous ceramic material to said metal surface; and  
absorbing stresses with said spiral springs during use by deflection of said spiral springs, which stresses are at least caused by differences in thermal expansion between said porous material and said perforated holding means.

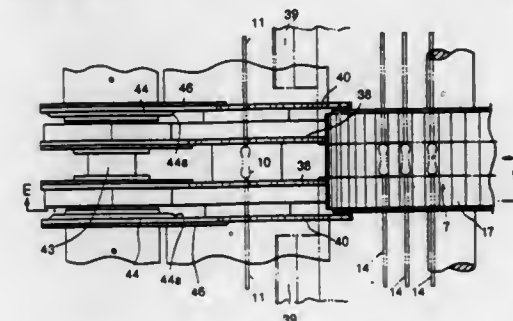
4,677,732

## APPARATUS FOR LOOSE FEEDING OF ELECTRICAL COMPONENTS

Harumi Furuya, Tokyo, Japan, assignor to Henry Mann, Inc., Huntington Valley, Pa.  
Division of Ser. No. 645,944, Aug. 30, 1984, Pat. No. 4,573,501, which is a continuation of Ser. No. 522,064, Aug. 10, 1983, abandoned. This application Jan. 22, 1986, Ser. No. 803,468  
Claims priority, application Japan, Oct. 30, 1982, 53-57191  
Int. Cl. B21F 1/02

U.S. Cl. 29—563

3 Claims



1. An apparatus for receiving a plurality of loose electrical components, each having a body and leads extending outwardly therefrom, and for providing an output flow of generally parallel components spaced a predetermined distance apart, the apparatus comprising:  
a receiver having at least one end for receiving and holding the loose components;  
conveyor means proximate the one end of the receiver for conveying the components one by one from the receiver to provide the output flow, the conveyor means including a generally continuous arcuate conveyor member having an axis extending generally parallel to the one end of the receiver, the conveyor member being rotatable about the axis and being axially separated into two axial end sections and an axial center section therebetween, the axial end sections including a plurality of generally parallel, circumferentially spaced apart grooves extending generally axially along the surface thereof, the end section grooves being in registry and being sized to receive component leads, the axial center section having a plurality of generally parallel circumferentially spaced grooves extending generally axially along the surface thereof, the center section being adjustable with respect to the two end sections to permit registry of center section grooves with the end section grooves, the center section grooves being of different sizes, with the number of center section grooves

of each size corresponding to the number of end section grooves, the center section grooves being arranged so that when one center section groove of a particular size is in registry with one pair of end section grooves, all of the remaining center section grooves of the same size are in registry with the remaining end section grooves, the center section grooves being sized to receive component bodies; and means for rotating the conveyor member about the axis at a predetermined rate to provide the output flow of components.

4,677,733

## DEVICE IN WOODWORKING MACHINES

Bengt A. Andersson, Halmstad, Sweden, assignor to Waco Jons-  
ered AB, Sweden

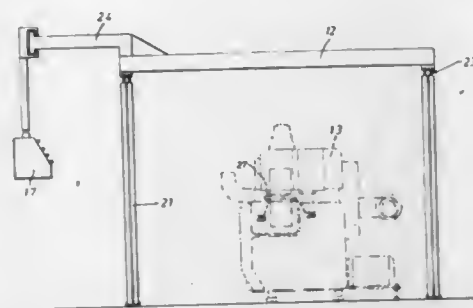
Filed May 8, 1986, Ser. No. 860,865

Claims priority, application Sweden, May 13, 1985, 8502362

Int. Cl.<sup>4</sup> B23Q 39/04

U.S. Cl. 29—563

3 Claims



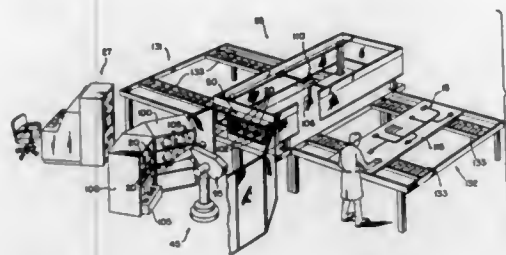
1. A device for a woodworking machine of the type having plural working stations for performing consecutive working operations on workpieces fed through the machine along a worktable defining a path of travel, said machine having sufficient working stations permitting the required working of the workpieces when at least one working station is out of operation, the working stations being doubled for each working operation, and each working station being engageable and disengageable for operation independently of the other working stations, which device comprises:

- upwardly projecting protective means disposed along the path of travel of the workpieces on the worktable;
- cover means movable into a cooperating position with the protective means for forming a tunnel portion therewith at least at the working stations;
- a soundproof casing enclosing the working stations;
- the soundproof casing including a plurality of individual compartments defined by a plurality of external walls, a plurality of partitions and a roof, each compartment being separated from an adjacent compartment by a partition, and each compartment being provided with a door for permitting access thereto;
- a working station disposed within each compartment for performing a working operation therein;
- means for preventing unintentional activation of a working station that is out of operation; and
- means for interrupting the feeding of workpieces through the machine when the cover means is removed from the cooperating position at a working station which is out of operation.

4,677,734  
**ROBOTIC WIRE HARNESS ASSEMBLY SYSTEM**  
Joseph T. Bloch, and Dan A. Cross, both of Seattle, Wash.,  
assignors to The Boeing Company, Seattle, Wash.  
Continuation-in-part of Ser. No. 539,768, Oct. 7, 1983, Pat. No.  
4,520,966. This application Jun. 4, 1985, Ser. No. 741,318  
Int. Cl.<sup>4</sup> H01R 43/00

U.S. Cl. 29—564.2

12 Claims



1. A wire harness assembly system using robots to cut wires, to automatically configure the pre-cut wires, and to assemble the pre-configured wires into the desired wire harness, comprising:

- a wire preparation subsystem for selecting a predetermined wire and for cutting that wire to a predetermined length;
- a wire reeling subsystem, including a movable table having at least one wire canister holder and a wire canister for holding the pre-cut wire from the wire preparation subsystem;
- a wire terminating subsystem for configuring the ends of the wire within the canister;
- a wire queuing subsystem for holding the canister in a bay between the wire terminating subsystem and a layup subsystem;
- a layup subsystem including a layup robot which travels over a form board to position the wire in the canister into the predetermined pattern of the wire harness;
- a transport robot to move a loaded canister from the wire reeling subsystem to the wire terminating subsystem, and then to the queuing subsystem, and to move an empty canister from the queuing subsystem to the wire reeling subsystem; and
- logic control means associated with each of the subsystems for controlling automated assembly of a wire harness into a predetermined configuration.

4,677,735

## METHOD OF PROVIDING BURIED CONTACTS FOR N AND P CHANNEL DEVICES IN AN SOI-CMOS PROCESS USING A SINGLE N+ POLYCRYSTALLINE SILICON LAYER

Satwinder D. S. Malhi, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 613,679, May 24, 1984, Pat. No. 4,621,276.

This application Jan. 9, 1986, Ser. No. 817,381

Int. Cl.<sup>4</sup> H01L 21/425

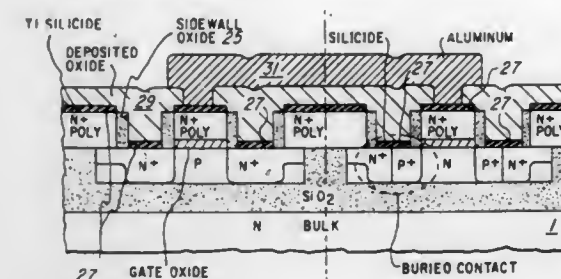
U.S. Cl. 29—571

4 Claims

1. A method of forming a silicon on insulator CMOS device using a single layer of doped polycrystalline silicon, comprising the steps of:

- providing an insulating base member having at least two electrically isolated islands of silicon semiconductor material one of each pair of islands being of opposite conducting type than the other of said pair;
- forming a gate oxide in each of said islands;
- forming an N+ polycrystalline layer over said islands and said gate oxide;
- forming N+ regions in said islands adjacent said gate oxide;

- exposing surfaces of said islands including a portion of each of said N+ regions and a portion of the region adjacent thereto under gate oxide;
- masking a portion of the exposed surface in only said N-type doped island adjacent said gate oxide;
- introducing an N+ dopant into the exposed unmasked surfaces;
- removing said mask



- doping said exposed surface with a P+ type dopant sufficient to form P+ regions in the previously masked region and to retain an N+ doping level in all prior N+ doped regions;
- forming a silicide over the surface of each said island;
- forming a conductive pattern coupled to the silicide of each of said gate oxide regions.

4,677,736

## SELF-ALIGNED INLAY TRANSISTOR WITH OR WITHOUT SOURCE AND DRAIN SELF-ALIGNED METALLIZATION EXTENSIONS

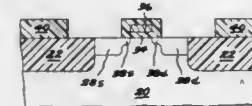
Dale M. Brown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 17, 1986, Ser. No. 853,108

Int. Cl.<sup>4</sup> H01L 21/283

U.S. Cl. 29—571

31 Claims



1. A method of fabricating field effect transistors, said method comprising the steps of:  
forming an active region in a semiconductor substrate, said active region being surrounded by insulative material;  
forming a first ion implantation mask layer in said active region, said first mask layer being disposed in substantially the pattern desired for a gate electrode for said field effect transistor;  
forming doped regions in said active region on either side of said first mask layer so as to form source and drain regions in said semiconductor substrate;  
depositing a second ion implantation mask layer over said substrate and planarizing said second mask layer at least down to the level of said first mask layer said first and second mask layers comprising distinct material;  
removing said first mask layer;  
forming oxide spacers on the sidewalls of said second mask layer in said active region;

forming a gate insulative layer on said substrate between said sidewall spacers;  
depositing conductive gate electrode material over said insulative gate material and between said sidewall spacers, whereby a gate electrode for said field effect transistor is formed;  
planarizing said gate electrode material at least to the level of said second mask layer;  
selectively removing said sidewall spacer material; and  
forming less heavily doped regions on either side of said gate electrode in said semiconductor substrate.

4,677,737

## SELF-ALIGNED ZERO OVERLAP CHARGE COUPLED DEVICE

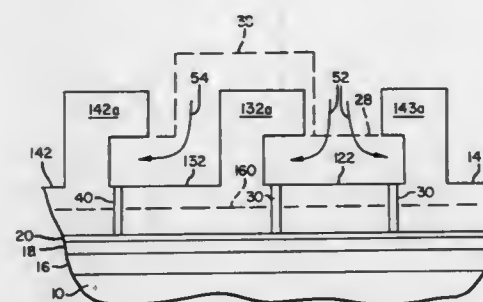
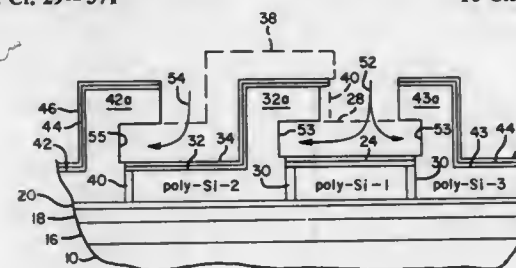
Brian L. Corrie, Gaston; Pauline Benn, Beaverton, and Michael J. McElevey, Tigard, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 23, 1986, Ser. No. 866,423

Int. Cl.<sup>4</sup> H01L 21/00, 21/58, 21/60

U.S. Cl. 29—571

16 Claims



12. A method for making multiple adjacent gate structures in a charge coupled device including a semiconductor substrate having a reference surface, the method comprising:  
providing a plasma-etch resistant layer on the reference surface to define a second reference surface;  
depositing a first layer of plasma-etchable, polysilicon material on the plasma etch-resistant layer;  
depositing a first shield layer atop an upper surface of the polysilicon layer, the shield layer being composed of a nonoxidizable, chemically-etchable material;  
patterning and etching the shield and polysilicon layers in turn to form a first polysilicon gate contact and an adjacent second gate contact opening, the first contact having an exposed sidewall intersecting the second reference surface and defining a boundary of the second gate contact opening;  
oxidizing the exposed sidewall of the first polysilicon gate contact to form thereon a dielectric sidewall layer of predetermined thickness spacing the first gate contact from the boundary of the second gate contact opening, the shield layer shielding the upper surface of the polysilicon gate contact from oxidation;  
depositing a second layer of said polysilicon material so as to cover contiguously the oxidized layer in the second gate contact opening and the dielectric sidewall layer while leaving an upper surface portion of the shield layer exposed;



selectively etching the shield layer to remove the material thereof and from a passageway exposing an undersurface portion of the second polysilicon layer extending above the first polysilicon layer; and  
selectively etching the exposed portion of the second polysilicon layer through said passageway to remove said portion.

4,677,738

## METHOD OF MAKING A PHOTOVOLTAIC PANEL

Masatsugu Izu, Birmingham; Vincent D. Cannella, Detroit, and Stanford R. Ovshinsky, Bloomfield Hills, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.  
Division of Ser. No. 750,444, Jul. 1, 1985, abandoned, which is a division of Ser. No. 653,019, Sep. 21, 1984, abandoned, which is a division of Ser. No. 402,115, Jul. 26, 1982, abandoned, which is a division of Ser. No. 151,301, May 19, 1980, Pat. No. 4,400,409.

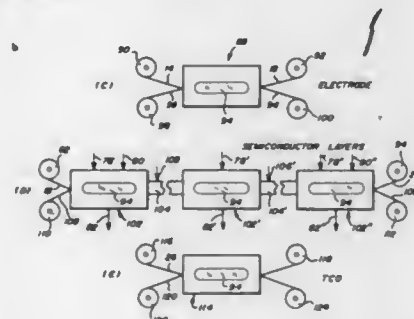
This application Mar. 3, 1986, Ser. No. 835,590

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.<sup>4</sup> H01L 31/18

U.S. Cl. 29—572

1 Claim



1. A method of making a thin film silicon alloy photovoltaic panel comprising the steps of:

- providing a substantially continuous web of flexible substrate material, said substrate material comprising a support layer having at least one substantially planar deposition surface with a layer of electrically insulating material thereupon;
- providing one or more electrode-forming regions upon the layer of insulating material;
- providing at least three discrete deposition chambers, each chamber including glow discharge means for the deposition of a discrete layer of thin film silicon alloy material; the conductivity type of the layer of silicon alloy material deposited in each chamber differing from one another;
- substantially continuously feeding said web of substrate material through each of the deposition chambers;
- introducing a plurality of reaction gases into each of the deposition chambers;
- providing means between adjacent deposition chambers for isolating the reaction gases in each chamber from one another;
- activating the glow discharge deposition means for disassociating said reaction gases and depositing a successive layer of silicon alloy material in each of the deposition chambers, said layers of silicon alloy material forming a photovoltaic region; and
- forming a thin, flexible electrode layer on said last deposited layer of silicon alloy material.

# 4,677,739 HIGH DENSITY CMOS INTEGRATED CIRCUIT MANUFACTURING PROCESS

Robert R. Doering, Plano; Michael P. Duane, and Gregory J. Armstrong, both of Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 29, 1984, Ser. No. 676,351

Int. Cl.<sup>4</sup> H01L 21/265, 29/78, 27/04

U.S. Cl. 29—576 B

9 Claims



1. A method of making a CMOS twin-well semiconductor device, comprising the steps of:

- implanting N impurity into a selected area of a face of a P type silicon body creating an N well area and growing a first oxide over said N well area;
- implanting P impurity into said face using said first oxide as a mask to create a P well area, and subjecting said body to heat treatment to drive both said N well and P well into said face;
- forming an oxidation mask over said face and opening a hole in said mask within said P well area, then etching a recess into the silicon of said face in said hole;
- oxidizing said silicon in said recess to create a field oxide isolation area extending into said face, the field oxide having a top surface about level with said face;
- applying a layer of conductive material on said face and patterning said layer to leave gates for transistors on said N well and P well areas;
- implanting N<sup>+</sup> impurity into both the N well and P well areas to create N<sup>+</sup> source/drain for an N channel transistor in the P well area, using said gates as a mask;
- implanting P<sup>+</sup> impurity into only the N well area, using the gates and a photoresist coating as a mask, to create P<sup>+</sup> source/drain regions in the N well area, at a concentration much higher than that in said N<sup>+</sup> source/drain regions, including the step of forming sidewall spacers on said gate layers prior to said steps of implanting;
- and including the step of forming direct-reacted silicide on said source/drain regions;
- said step of forming direct-reacted silicide being masked by said sidewall spacers on said gates.

4,677,740

# FORMING MONOLITHIC PLANAR OPTO-ISOLATORS BY SELECTIVE IMPLANTATION AND PROTON BOMBARDMENT

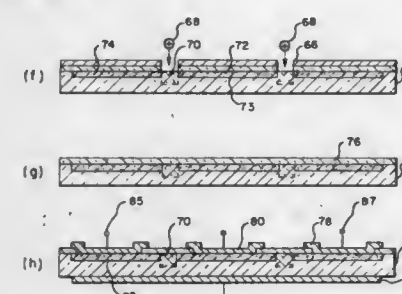
Gordon A. Shifrin, and Robert G. Hunsperger, both of Malibu, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 511,726, Jul. 8, 1983, abandoned, which is a continuation of Ser. No. 285,179, Jul. 20, 1981, abandoned, which is a continuation of Ser. No. 73,774, Sep. 10, 1979, abandoned, which is a continuation of Ser. No. 939,770, Sep. 5, 1978, abandoned, which is a continuation of Ser. No. 575,686, May 8, 1975, abandoned, which is a continuation of Ser. No. 375,227, Jun. 29, 1973, abandoned. This application Mar. 7, 1986, Ser. No. 838,409

Int. Cl.<sup>4</sup> H01L 21/265, 7/54

U.S. Cl. 29—576 B

11 Claims



1. A process for fabricating a planar monolithic electro-optical isolator comprising the steps of:

4,677,743

## WINDING METHOD

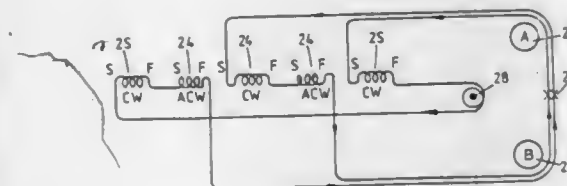
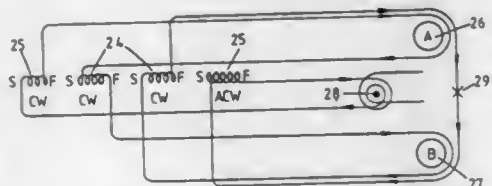
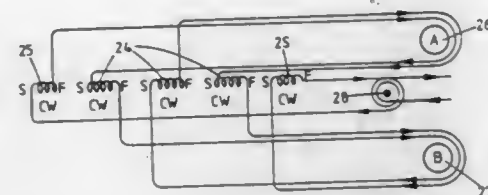
Frank M. Logie, London, England, assignor to Lucas Industries public limited company, Birmingham, England  
Filed May 29, 1986, Ser. No. 868,619

Claims priority, application United Kingdom, Jun. 18, 1985, 8515352

Int. Cl.<sup>4</sup> H02K 15/02

U.S. Cl. 29—596

2 Claims



1. A method of winding the coils of a stator structure of an electromagnetic device of the kind in which the stator structure is of cylindrical form and defines a plurality of axially spaced circumferential pole pieces, adjacent pole pieces defining a groove therebetween and grooves, the coils being located in the grooves respectively and connected to a pair of electric supply terminals at one end of the stator structure, the end coils having a reduced number of turns and being connected in series with each other, the method comprising providing a dummy connector terminal at said one end of the stator structure, connecting the wire to be used in winding the coils to said dummy connector terminal, laying the wire in a slot extending longitudinally along the stator structure, winding the end coil further from said one end of the stator structure and returning the wire to one of the supply terminals directly or by way of an intermediate coil, then winding the remaining intermediate coils starting with the one furthest from said one end of the stator structure and then winding the end coil at or nearest said nearest one end of the stator structure, one end of said end coil being connected to said dummy connector terminal.

4,677,744  
APPARATUS FOR ASSEMBLING A ROTATABLE ASSEMBLY

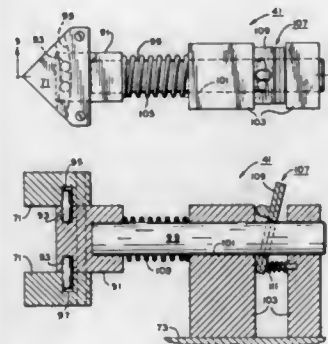
Alexander Muller, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 630,872, Jul. 13, 1984, Pat. No. 4,587,721, which is a continuation-in-part of Ser. No. 616,200, Jun. 1, 1984, Pat. No. 4,586,244, which is a continuation-in-part of Ser. No. 593,840, Mar. 27, 1984, Pat. No. 4,608,752. This application Mar. 20, 1986, Ser. No. 841,985

Int. Cl.<sup>4</sup> B23P 19/04

U.S. Cl. 29—729

7 Claims



## 7. Apparatus comprising:

a support;  
means associated with said support and operable generally for reciprocal movement in one direction and another direction opposite thereto;  
resilient means associated with said support and said reciprocal means and operable generally for opposing the movement of said reciprocal movement means in one of the one and another directions;  
wedge means associated with said reciprocal movement means for conjoint movement therewith and for pivot movement relative thereto;  
means associated with said wedge means and said reciprocal movement means for accommodating both the pivotal movement of said wedge means relative to said reciprocal movement means and the conjoint movement therewith of said wedge means; and  
means associated with said support and said reciprocal movement means and operable generally for releasably retaining said reciprocal movement means against movement in the other of the one and another direction in response to the operation of said resilient means.

4,677,745  
APPARATUS FOR AUTOMATICALLY MOUNTING SPECIAL-TYPE CHIPS ON SUBSTRATE

Keiichi Ihara, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Jun. 4, 1985, Ser. No. 741,305

Claims priority, application Japan, Jun. 7, 1984, 59-84548[U]; Jul. 17, 1984, 59-107937[U]; Jul. 26, 1984, 59-113790[U]; Jul. 26, 1984, 59-113791[U]; Sep. 4, 1984, 59-183676; Sep. 24, 1984, 59-143977[U]; Sep. 24, 1984, 59-143978[U]; Apr. 15, 1985, 60-54708[U]; May 20, 1985, 60-73513[U]

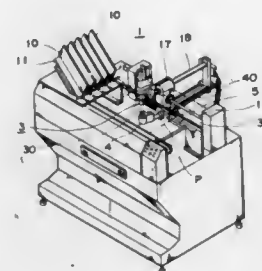
Int. Cl.<sup>4</sup> B23P 19/00

U.S. Cl. 29—741

17 Claims

1. An apparatus for automatically mounting electronic components on a substrate comprising:  
a support;  
means fixed to said support for individually and successively feeding electronic components to a mounting means and including at least one cartridge obliquely arranged, said at least one cartridge including first storage means for carry-

ing vertically stacked magazines adapted to store said electronic components therein, and second storage means laterally adjacent said first storage means for receiving empty vertically stacked magazines therein; a transfer means coupled to a lower end of said cartridge to receive an electronic component sliding out of said cartridge under the pull of gravity and being movable to transfer an electronic component to a predetermined position; and a stopper means mounted on said transfer means for stopping said electronic component being pulled down by gravity within the transfer means;  
said mounting means comprising means carried on said support for receiving said electronic component from said feeding means and placing it on said substrate;  
positioning means movably mounted on said support for



moving at least one of said transfer means and said mounting means relative to the other to bring the electronic component from the cartridge to the mounting means;  
a terminal clinching means carried on said support for cutting and bending terminal pins of said electronic component projecting from the bottom of said substrate; and  
a device carried on said support for automatically replacing a just-empty magazine from the lowest position in the vertical stack of said magazine in the first storage means including a first pusher means carried on said support for laterally transferring an empty magazine from said first storage means to the second means, and a second pusher means carried on said support for vertically moving said empty magazine upward in said second storage means, said first and second pusher means being arranged below said cartridge.

4,677,746

ASSEMBLY FOR ATTACHING A CUTTER BLADE INTO A CHAIN SAW

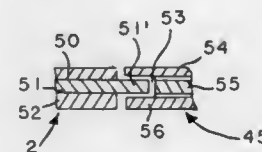
Juhani Raiski, P.O. Box 26 SipiläSF-34801 Virrat, Finland  
Filed Dec. 17, 1985, Ser. No. 810,005

Claims priority, application Finland, Dec. 21, 1984, 845087

Int. Cl.<sup>4</sup> B27B 17/00

U.S. Cl. 30—122

13 Claims



1. A chain saw assembly, comprising a main frame having a power unit and a drive member, an auxiliary frame removably connected to the main frame and having a cutter blade to carry an endless cutter chain and a power transmission unit, said power transmission unit including a driven member, connecting means for operably connecting said drive member to said driven member, said connecting means arranged to transmit rotation from said drive member to said driven member and permit relative axial movement between said members, fastening means separate from said members for releasably connecting said auxiliary frame to said main frame, and a driving

element disposed on said auxiliary frame coaxially of said driven member, said driving element being operably connected to said driven member and engaged with said chain to drive said chain, release of said fastening means enabling said auxiliary frame to be removed from said main frame without disengagement of said drive element from said chain.

4,677,747

## VEGETATION STEM CUTTING APPARATUS

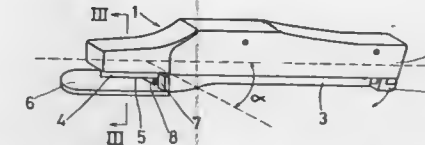
Brian A. Winer, P.O. Box 960, Sandton 2144 Transvaal, South Africa

Filed Mar. 13, 1986, Ser. No. 839,169

Int. Cl.<sup>4</sup> B26B 17/00, 13/26

U.S. Cl. 30—124

11 Claims



1. Cutting apparatus comprising a pair of elongate limbs extending in the same general direction and operatively connected to each other by connecting means which guide the limbs for movement towards and away from each other while simultaneously remaining parallel relative to each other, and whereof one limb is adapted to carry a cutting blade having a cutting edge directed towards a support surface provided on the other limb, the support surface and blade being adapted to co-operate upon relative movement of the limbs to provide a cutting action, said other limb carrying the support surface also having a split end wall for accommodating said blade passing through the split thereof, and said one limb which is adapted to carry the cutting blade having a slot therethrough for downwardly receiving the cutting blade, and including a removable retaining member for closing, in the operative position, the side of the slot remote from the cutting surface, the retaining member carried by said one limb for endwise movement thereon into and out of said position in which the closing member is located directly above the split end wall.

4,677,748

## HAND-OPERATED CABLE CUTTER

Mituharu Kobayashi, Sanjo, Japan, assignor to Kobayashi Tools Mfg. Co., Ltd., Niigata, Japan

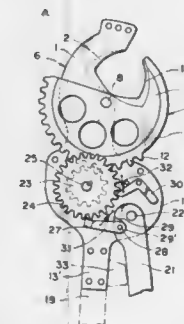
Filed Dec. 9, 1986, Ser. No. 943,939

Claims priority, application Japan, Dec. 20, 1985, 60-287564

Int. Cl.<sup>4</sup> B26B 13/00

U.S. Cl. 30—250

9 Claims



1. A hand-operated cable cutter comprising:  
a first stationary cutter blade having a first curved jaw which is formed along its one lateral side with a first cutting edge;  
a second movable cutter blade having a second curved jaw



which is formed along its one lateral side with a second cutting edge in an opposing relation with said first cutting edge, said movable cutter blade being pivotally connected to said stationary cutter blade for swinging and sliding movement relative to said stationary cutter blade;

gear teeth provided on said movable cutter blade;  
a drive mechanism including a small gear kept in engagement with said gear teeth, a large ratchet wheel mounted concentrically with and for rotation with said small gear, a knob connected to said small gear, a driving pawl held engageable with said ratchet wheel to rotate said ratchet wheel in one direction, and a detent pawl kept in engagement with said ratchet wheel to prevent rotation of said ratchet wheel in the opposite direction;  
a first stationary handle having a distal end portion to which said stationary cutter blade is secured; and  
a second swing handle having a distal end portion mounted pivotally relative to said first cutter blade and stationary handle, with said driving pawl pivotally connected thereto so that pumping strokes of said swing handle relative to said stationary handle cause said driving pawl to rotate said ratchet wheel and hence said small gear in said one direction to thereby close said second cutting edge relative to said first cutting edge for performing the cutting operation on a workpiece to be cut and, when said driving pawl and detent pawl are disengaged from said ratchet wheel, free rotation of said ratchet wheel and small gear being permitted to allow said second cutting edge to be moved either away from or toward said first cutting edge by the use of said knob.

4,677,749

## BLADE SET FOR AN ELECTRICAL KNIFE

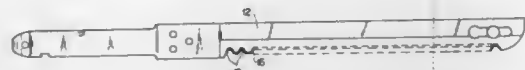
Marc P. Brison, Saint-Lô, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France

Filed Dec. 30, 1985, Ser. No. 814,737

Claims priority, application France, Jan. 30, 1985, 85 01286  
Int. Cl.<sup>4</sup> B26B 9/02

U.S. Cl. 30—355

8 Claims



1. A blade set for an electrical knife, said blade set comprising first and second elongate blades, each of said blades having an elongate inner face, an elongate outer face, and elongate top and bottom edges each joining said inner and outer faces, said first and second blades being arranged to extend in respective parallel planes with their inner faces facing towards each other and being joined together, each of said first and second blades having a plurality of indentations in its bottom edge defining a series of projecting teeth, each tooth having two side edges defining a projecting tip, a respective concave notch being formed in the projecting tip of a plurality of said teeth, each said notch being arranged to define, together with the side edges of the respective tooth, two points at the tip of said tooth, each indentation having a chamfer which extends from the inner face to the outer face of the blade and defines a cutting edge on said inner face, and each said notch being also chamfered in the direction from the inner face of the blade to the outer face of the blade, the angle between the inner face of the blade and the chamfer of the indentations being less than the angle between the inner face of the blade and the chamfer of said notches.

# 4,677,750 GUIDE ARRANGEMENT FOR A PORTABLE POWER SAW

Peter Maler, Gerokstrasse 1, D-7311 Neldingen, and Gernot Hänsel, Gerstenstrasse 31, D-7000 Stuttgart 70, both of Fed. Rep. of Germany

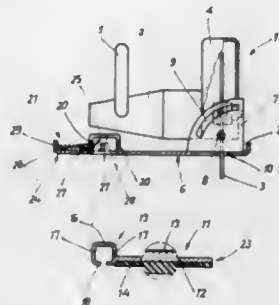
Filed Nov. 9, 1984, Ser. No. 670,336

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341003

Int. Cl.<sup>4</sup> B23D 47/02

U.S. Cl. 30—376

7 Claims



1. A guide structure for a portable power saw comprising a guide plate adapted to be laid on a piece of work to be sawed with said saw, a proud rail forming part of said guide plate and running in a feed direction of said saw, a stand plate mounted on said saw, said stand plate being adapted to fit onto said guide plate and being able to be moved along said rail in said feed direction, said stand plate having guide sections straddling said rail and engaging over opposite sides thereof, a backlash limiter acting between said stand plate and said guide plate to take up play between the rail and said guide sections while allowing motion of said saw along said rail, said backlash limiter being mounted on said stand plate and comprising an operative part adapted to act against a side face of said rail, said operative part being adapted to move in a direction normal to the direction of the rail and protruding through a gap in the said stand plate and past a face thereof turned toward said rail, and a helical compression spring for urging said operative part, that is in the form of a sliding shoe, against the rail.

4,677,751

# DEVICE AND METHOD FOR DETERMINING HOSE SIZE AND HOSE FITTING STYLE AND SIZE

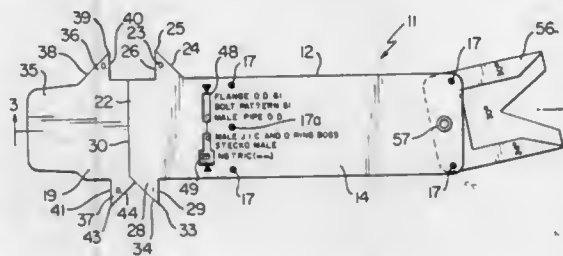
David A. Masseth, Washington Township, Montgomery County, Ohio, assignor to Dayco Products, Inc., Dayton, Ohio

Filed Oct. 1, 1984, Ser. No. 655,815

Int. Cl.<sup>4</sup> G01B 5/24

U.S. Cl. 33—143 M

16 Claims



1. In a device for measuring features of a hose or fitting, the improvement comprising a flat body which includes at least two superimposed flat sheets having viewing means and means for separating said sheets therebetween secured together by fastening means, said sheets and said separating means forming a slot between said two sheets, one end of said body having a

plurality of superimposed members, each member having a different configuration for measuring a tapered extremity to determine the type of said fitting, the other end of said body having a measuring means to measure a fitting or hose to determine the size thereof at least one portion of said measuring means being attached to one of said flat sheets, a third flat sheet slidably mounted between said two superimposed flat sheets and having at least one portion of said measuring means for cooperating with said portion on said one of said two flat sheets and having indicia correlated with the relationship between said dimensions determined by said measuring means and a plurality of standard industrial identification systems whereby said hose or fitting is identified by an indicia on said third sheet in said viewing means.

4,677,752

# MANUAL MEASURING TOOL FOR ROLLS OF MATERIAL

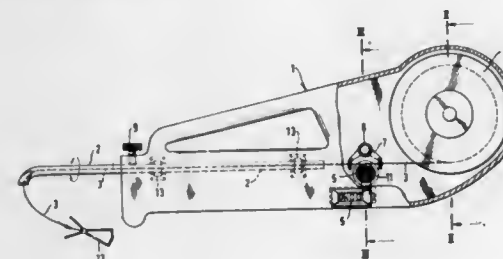
Matthias J. Auchter, Morlaüterer Strasse 11, 6750 Kaiserslautern, Fed. Rep. of Germany

Filed Apr. 17, 1986, Ser. No. 852,992

Int. Cl.<sup>4</sup> G01B 3/02

U.S. Cl. 33—128

5 Claims



1. A tool for measuring rolls of material comprising a housing and measuring thread spool rotatably mounted in said housing having a supply of measuring thread thereon, a delivery tube rotatably mounted in said housing and having one end aligned with said spool and an opposite end extending out of said housing, said measuring thread extending from said spool through said tube at one end and through said tube and out of said tube opposite end, said measuring thread having means at its outer end for engagement thereof of the material to be measured, a counter having a spool means rotatably mounted in said housing adjacent said spool means, said measuring thread having a turn extending around said spool means so that said spool means is rotated during payout of said measuring thread, said spool means having a cylindrical surface over which the thread is engaged which varies in diameter along its length and means associated with said spool means for positioning the measuring thread so as to engage around the selected portion of the circumference of said spool means.

4,677,753

# COLLISION RISK ASSESSMENT SYSTEM

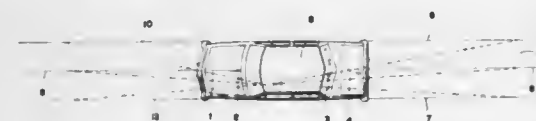
John J. Loggers, P.O. Box 62, Red Bank, N.J. 07701

Filed Feb. 18, 1986, Ser. No. 830,441

Int. Cl.<sup>4</sup> G01C 21/04

U.S. Cl. 33—264

1 Claim



1. A vehicular distance judgment device comprising a plurality of sights mounted in groups on the front and rear of a vehicle within the line of sight of the vehicle's operator, said

sights being illuminated and adjustable laterally for assisting said operator to judge the position of the vehicle relative to objects in the path of said vehicle, wherein said device includes a base having a channel formed therein, and each said plurality of sights comprising a housing illumination means mounted in said housing, and means connected between said housing and said base for adjustably mounting said housing on said base in said channel, said mounting means includes a slidably mounted locking member mounted in said channel, screw threaded means connected between said locking means and said housing, and washer means connected between said screw threaded means and said locking means for supporting and anchoring said screw threaded means, and a further plurality of sights mounted between the location of the first set of sights and the operator to establish the line of sight, and said base including means for supplying power to said illuminating means.

4,677,754

# MULTIPLEXING OF A BANDPASS FILTER CIRCUIT TO WORK WITH A FLUX-GATE SENSOR OUTPUT

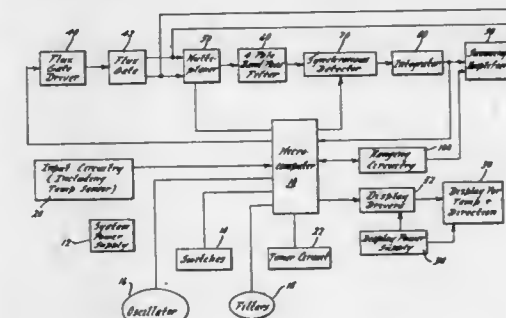
Ronald F. Hormel, Mount Clemens, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 27, 1985, Ser. No. 814,125

Int. Cl.<sup>4</sup> G01R 33/02; G01C 17/30

U.S. Cl. 33—361

1 Claim



1. A multiplexed control circuit for an electronic compass including a microcomputer, a flux-gate, a flux-gate driver, a bandpass filter, a synchronous detector, an integrator, a summing amplifier, and a ranging circuit the multiplexed control circuit comprising:

a gate switch connected at its input to the flux-gate for each magnetic component to be measured;  
a switching network, controlled by the microcomputer;  
the gate switches commonly connected at their outputs to the serial connection of the bandpass filter, synchronous detector, integrator and summing amplifier;  
the microcomputer sending signals to the switching network such that the gate switches for each magnetic component are controlled, alternately conducting, thereby alternately allowing the output of the flux-gate to pass through to the serial connection of the bandpass filter, synchronous detector, integrator and summing amplifier whereby the effects of gain and component tolerances on the control circuit is minimized.

4,677,755

## COORDINATE MEASURING INSTRUMENT

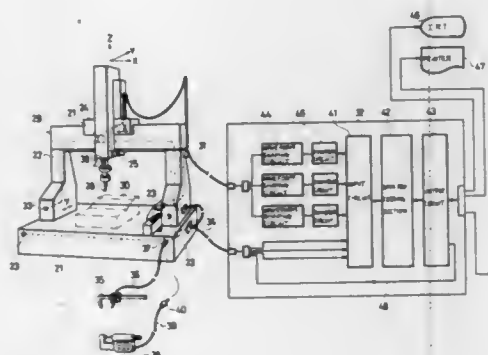
Hideo Iwano, and Kazuo Shudo, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan  
PCT No. PCT/JP85/00596, § 371 Date May 16, 1986, § 102(e)  
Date May 16, 1986, PCT Pub. No. WO86/02720, PCT Pub.  
Date May 9, 1986

PCT Filed Oct. 28, 1985, Ser. No. 871,428

Claims priority, application Japan, Oct. 29, 1984, 59-227535  
Int. Cl.<sup>4</sup> G01B 7/03

U.S. Cl. 33—503

9 Claims



1. A coordinate measuring instrument having a measuring element supported in a manner to be movable relative to a work to be measured rested on a mount tridimensionally, i.e. in the directions of X-, Y- and Z-axes, said work having a shape which is measured from a displacement value between said work and said measuring element, comprising:

X-, Y- and Z-axis displacement detector means for detecting the relative displacement values in the directions of said X-, Y- and Z-axes between said work and said measuring element;

at least one portable detecting unit including a reciprocatingly movable contact and a contact displacement detector for detecting a displacement value of said contact; each said X-, Y- and Z- axis displacement detector means and said contact displacement detector of said detecting unit being connected to an input circuit of a processing unit having a data processing section and an output circuit;

said output circuit providing output signals commensurate to displacement values from each said X-, Y- and Z- axis displacement detector means and said contact displacement detector of said detecting unit being utilized to make said processing unit able to measure the shape of said work;

means defining a plurality of jacks electrically connected to said input circuit of said processing unit, said jacks being spaced from one another around said mount; and said detecting unit being connected through a cable having a plug on an end thereof received in a one of said jacks to said input circuit in a manner to be accessible to any one object surface of measurement of said work rested on said mount.

## MEASURING INSTRUMENTS FOR MEASURING DEPTH OF CAVITIES

Lewis A. Simon, Stanmore, England, and Michael F. Scarffe, Milton Keynes, United Kingdom, assignors to VS Remek Limited, Luton and LJS Practice Management Limited, Stanmore, both of, England

Filed Mar. 20, 1986, Ser. No. 841,754

Claims priority, application United Kingdom, Mar. 21, 1985, 8507319

U.S. Cl. 33—514

Int. Cl.<sup>4</sup> A61B 5/05

18 Claims



1. An instrument for measuring the depth of a cavity comprising:

a housing member;  
a probe including a probe element and a sheath, said probe element being slidable within said sheath so as to protrude therefrom by a variable amount, one of said probe element and said sheath being mounted to said housing member;  
a slider disposed in said housing member and coupled to one of said probe element and said sheath for sliding movement therewith;  
an electrical coil winding disposed within said housing member;

a magnetic flux transmitting core disposed within said housing member and operatively coupled to said coil winding, one of said core and said coil winding being fixed relative to said housing member and the other of said core and said coil winding being operatively coupled to said slider so as to be movable therewith to vary the inductance of said coil winding upon movement of said slider;

means for producing a signal corresponding to the inductance of said coil winding so as to be indicative of the disposition of the slider relative to said housing member thereby constituting a depth signal representative of the amount of protrusion of said probe element from said sheath, said means for producing a signal including:

(a) means for applying a voltage to said coil winding;  
(b) switch means for controlling said applying means;  
(c) means for measuring current through said coil winding;

(d) means for operating said switch means so as to cut off said applying means when the measured current exceeds an upper threshold value;  
(e) means for operating said switch means to apply voltage from said applying means when the measured current is below a lower threshold value; and

(f) frequency measuring means for measuring the frequency of operation of said switch means to produce said signal representative of the inductance of said coil winding;

means for monitoring the rate of change of said depth signal; and

means for recording and/or displaying a value corresponding to said depth signal when the rate of change of said depth signal reaches a predetermined value.

4,677,757.  
OVEN

Michael Debenham, Frankston, and James D. Farfor, Cannons Creek, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed May 29, 1984, Ser. No. 614,648

Claims priority, application Australia, Jun. 2, 1983, PF9664  
Int. Cl.<sup>4</sup> F26B 3/28; B05D 7/22

U.S. Cl. 34—4

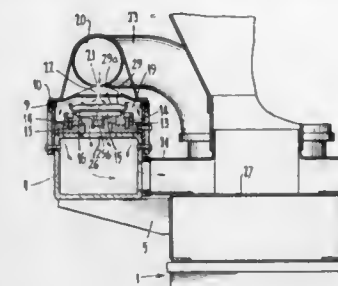
3 Claims

1. A method of heating can ends in an oven, said can ends

having an upper surface and a lower surface, said method comprising:

at least partially coating said lower surface of said can ends with a heat-curable coating;

providing an oven comprising an elongate heating chamber, a source of heat, disposed within said heating chamber, and conveying means, disposed beneath said source of heat, for conveying said can ends through said heating chamber, said conveying means including support means, engageable of said can ends, for supporting said can ends without contacting said heat-curable coating;



supporting said can ends on said support means with said lower surface directed downwardly;  
conveying said so-supported can ends through said elongate heating chamber on said conveying means beneath said source of heat;  
applying heat from said source of heat to said upper surface of said can ends to heat said upper surface of said can ends; conducting heat through said can ends from said heated upper surface to said lower surface to cure said heat-curable coating on said lower surface, whereby said heat-curable coating is cured principally by heat absorbed by said can ends.

4,677,758

## SPIN DRIER FOR SEMICONDUCTOR MATERIAL

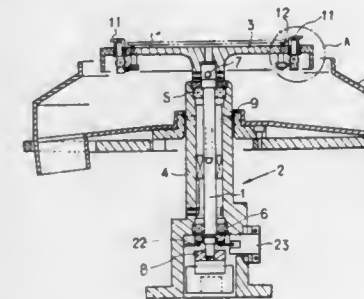
Seichiro Algo, 3-15-13, Negishi, Daito-ku, Japan

Filed Oct. 4, 1985, Ser. No. 784,569

Int. Cl.<sup>4</sup> F26B 11/18

U.S. Cl. 34—58

8 Claims



1. A spin drier for semiconductor material, which comprises: a vertical shaft rotatably mounted within a housing;  
a horizontal rotary table located on the top of the shaft; support members positioned in the table and upwardly projecting from the table surface for supporting thereon semiconductor material;

holding members to be contacted with the outer periphery of semiconductor material supported on the table;  
three or more chuck members for holding upper surface portions of the outer periphery of the support semiconductor material;

each of said chuck members comprising a pin which passes through the table, a chuck part mounted on the top of said pin which during rotation of the table passes over the top of the supported semiconductor material, thereby holding

the semiconductor material against any rise thereof, a weight eccentrically attached to said pin under the table, and a spring member for restoring said chuck part during non-rotation of the table to a determined angular position where said chuck part does not pass over the top of the semiconductor material.

## ROTARY DRIER APPARATUS FOR SEMICONDUCTOR WAFERS

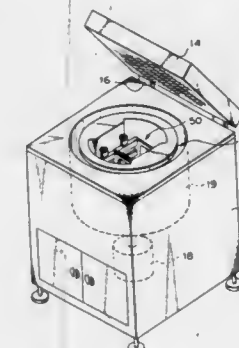
Kazuhiko Inamura, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Minato, Japan

Filed Jul. 8, 1986, Ser. No. 883,696

Claims priority, application Japan, Jul. 8, 1985, 60-148331  
Int. Cl.<sup>4</sup> F26B 17/32

U.S. Cl. 34—58

5 Claims



1. An apparatus for drying semiconductor wafers on wafer carriers by centrifugal force, said apparatus comprising: a turntable;

a pair of cradles, each mounted adjacent to each other on said turntable for rotation therewith for removably carrying a wafer carrier therein;

means, including a motor and a shaft, for driving said turntable in rotation on said shaft;

a container housing said turntable at a lower position therein, said container having side walls for receiving splatterings from semiconductor wafers on the wafer carriers carried by the cradles when said turntable is rotated by said driving means, an upper opening through which the wafer carriers are vertically removable from said turntable and said container, and a bottom plate having a hole in a middle portion thereof, said shaft extending vertically upward through said hole from said motor to a middle portion of said turntable;

a pair of supporting members fixedly mounted on a surface of said turntable, horizontally spaced apart on opposite sides of said middle portion of said turntable, said cradles being disposed between and pivotally mounted to said supporting members on opposite sides of said middle portion of said turntable for pivotal movement about respective parallel horizontal axes extending between said supporting members, said cradles having respective centers of gravity spaced from said axes so as to provide a turning moment biasing the bottom ends of said cradles toward each other, such that rotation of said turntable pivots said cradles about said axes radially outward of said turntable by centrifugal force; and

stopper means, disposed between said cradles so as to abut said cradles when said turntable is not rotating, for preventing said cradles from touching each other when said turntable is not rotating.



4,677,760

**DRIER STORABLE RACK**

Robert M. St. Louis, St. Leonard, Canada, assignor to Camco Inc., Mississauga, Canada

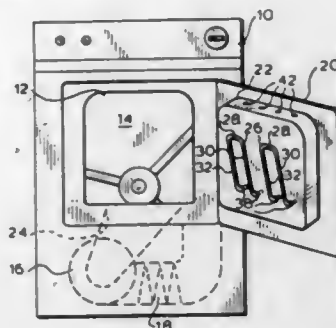
Filed Sep. 17, 1986, Ser. No. 908,169

Claims priority, application Canada, Oct. 11, 1985, 492882

Int. Cl.<sup>4</sup> F26B 20/00

U.S. Cl. 34—90

10 Claims



1. A clothes drier comprising:  
 a housing;  
 a rotatable drum mounted to rotate in said housing;  
 heater means;  
 means for circulating air heated by said heater means through said drum;  
 an access passage to said drum;  
 a door closing said access passage and having a bulkhead projecting into said passage to close off said passage;  
 rack means selectively movable between an operative position within said drum and a stored, non-operative position;  
 means for mounting said rack means on said bulkhead in said operative position, said means for mounting said rack means on said bulkhead including means forming part of said bulkhead for anchoring said rack means to said bulkhead to project inwardly in a cantilever fashion into said drier drum; and  
 means for holding said rack means in said stored non-operative position wherein said rack means is contained by said bulkhead within said access passage.

4,677,761

**SIEVE DRUM**

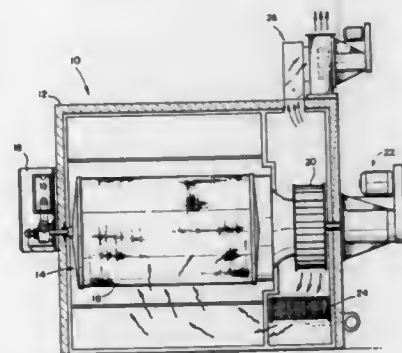
David Rattner, Box 104, Solebury, Pa. 18963

Filed Feb. 13, 1986, Ser. No. 828,890

Int. Cl.<sup>4</sup> F26B 25/20

U.S. Cl. 34—108

12 Claims



1. A sieve drum for heat treating a web material comprising:  
 a drum surface made exclusively of a close mesh screen cylindrically shaped and self-supporting for conveying the web material upon said screen under rotation, said screen comprising a plurality of longitudinal and trans-

verse wire lengths of a relatively heavy gauge interwoven in a sinusoidal fashion to form a multitude of interstitial openings each with rounded edges, the aggregate area of said openings being less than 50% of the surface of said screen; and  
 a pair of circular heads attached to either end of said screen.

4,677,762

**DRIER FELTING ARRANGEMENT**

Ralph J. Fitcher, Beaconsfield, Canada, assignor to Valmet-Dominion Inc., Lachine, Canada

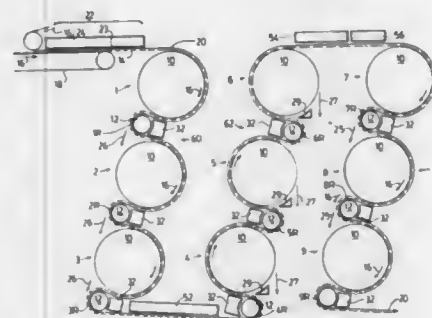
Filed Nov. 29, 1985, Ser. No. 802,728

Claims priority, application Canada, Dec. 20, 1984, 470741

Int. Cl.<sup>4</sup> F26B 13/08

U.S. Cl. 34—114

6 Claims



1. A drier felt arrangement comprising a plurality of drier drums each having an outer drying periphery around which a felt is trained, said felt passing around each of said drier drums in sequence, at least one turning roll interposed between each successive drum in said sequence, said turning rolls having smaller radii than said drier drums; one surface of said felt travelling over each of said drums in facing relation thereto, the opposite surface of said felt travelling in a face-to-face relationship around the peripheries of each of said turning rolls as said felt traverses each turning roll, means to apply a web to be dried to said one surface whereby said web is sandwiched between said felt and each said drier drum outer surface in succession as said felt passes in succession over said drier drums, a blow box located adjacent each of said turning rolls, each said blow box having a working surface adjacent said felt as the felt traverses the gap between each said drum and the oncoming side of next turning roll onto which said felt passes, each said blow box directing airflow along said working surface between said felt and said working surface to prevent contact between said felt and working surface and to prohibit drag forces associated with said working surface of said blow box from acting against said felt and directing airflow in a direction away from said next turning roll in a manner to induce further air flow and reduce the pressure on said opposite side of said felt and move air away from its adjacent of said turning rolls thereby to hold said web to said felt as said felt traverses each said turning roll.

4,677,763

**DEVICE FOR TRANSFERRING A PAPER WEB FROM THE PRESS SECTION TO THE DRYING SECTION OF A PAPER MACHINE**

Gerhard Kotitschke, Steinhelm, and Hans-Werner Hörické, Deggendorf, both of Fed. Rep. of Germany, assignors to J. M. Volth GmbH, Heldenheim, Fed. Rep. of Germany

Continuation of Ser. No. 676,789, Nov. 30, 1984, abandoned.

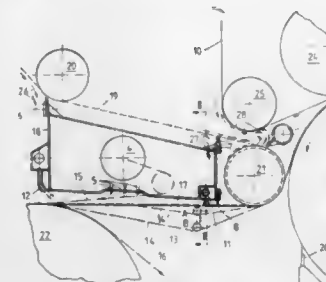
This application Sep. 23, 1986, Ser. No. 912,134

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344217

Int. Cl.<sup>4</sup> F26B 13/08

U.S. Cl. 34—116

7 Claims



1. In a device for transferring a paper web from the press section to the drying section of a paper machine with a continuous machine-wide backing belt running over a guide roll arranged in the press section and over at least a first drying cylinder of the drying section, and with a rope carrier arranged in the drying section on one side of the paper machine and outside the paper web width for threading a transfer strip through the drying section, characterized in that in the area of the transfer strip between the guide roll and the first drying cylinder there is a mechanical guide means provided for temporarily carrying the transfer strip separated from the backing belt, and the entrance point of the rope carrier is arranged before or in a paper looping zone of the first drying cylinder.

4,677,764

**APPAREL DRYING TRAY**

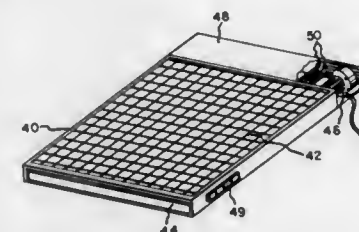
Gene L. Cerny, 3850 SW. Gamwell Rd., Topeka, Kans. 66610

Filed Feb. 11, 1985, Ser. No. 700,133

Int. Cl.<sup>4</sup> F26B 9/10

U.S. Cl. 34—195

2 Claims



1. A device for drying articles of clothing comprising:  
 a low profile rigid frame of substantially lesser height dimension than width and length dimensions and divided into a larger section having an open top and a laterally adjacent smaller section with an interface between said larger section and smaller section; a plenum positioned along said smaller section and laterally adjacent to the larger section, discharging along a majority of the interface and being adapted to direct air flow into the laterally adjacent larger section in a direction parallel to the plane of the open top of said larger section; a water permeable horizontal rigid grill covering said open top of said larger section for direct placement thereon of said articles of clothing; a drip tray horizontally positioned under and coplanar with said grill for catching water that passes through said grill; louvers opening through said frame into said plenum; a fan attached to said frame within said

plenum adapted for drawing air through said louvers and over said plurality of heating elements and discharging said air from said plenum along a plane parallel to the grill and from an edge of the grill directly adjacent said plenum.

4,677,765

**BEACHRUNNERS**

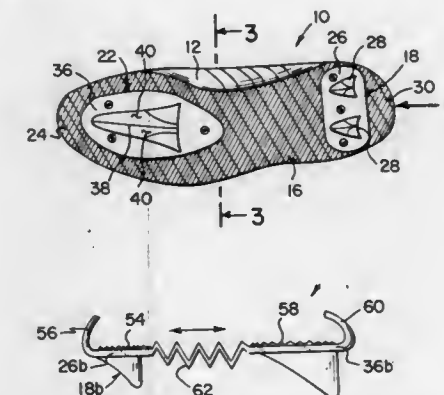
Carl Lubet, 439 Lafayette St., New York, N.Y. 10003, and George Spector, 233 Broadway Rm. 3615, New York, N.Y. 10007

Filed Feb. 28, 1986, Ser. No. 834,365

Int. Cl.<sup>4</sup> A43B 03/00, 05/00

U.S. Cl. 36—1.5

2 Claims



1. A running shoe for running along a shore line on a beach which comprises:  
 (a) a waterproof upper having a removable spat;  
 (b) a deep scored sole secured to said upper;  
 (c) a heel cleat structure attached transversely across heel portion of said sole; and  
 (d) a toe cleat structure attached in alignment to toe portion of said sole so as to give increased traction and stability to said shoe, wherein said heel cleat structure comprises:  
 (e) a flange having a pair of spaced apart downwardly extending cleats molded thereto; and  
 (f) a pair of stiffeners, each having a top lip member and a vertical member placed within one of said cleats wherein said toe cleat structure comprises:  
 (g) a flange having a downwardly extending cleat molded thereto, said cleat having a curvature to prevent sand buildup thereon; and  
 (h) a stiffener having a top lip member and a vertical member placed within said cleat, wherein said toe cleat structure further comprising:  
 (i) said flange in the toe area having a deep scored upper surface; and  
 (j) hook and loop pile fastener straps affixed to opposite sides of said flange in which said deep scored upper surface of said flange can bear against said deep scored sole with said straps secured over said upper so that said toe cleat structure can be easily secured and removed therefrom.

4,677,766

**SHOE INLAY**

Charles J. Gudas, Lockport, Ill., assignor to Scholl, Inc., Memphis, Tenn.

Filed Jul. 28, 1982, Ser. No. 402,652

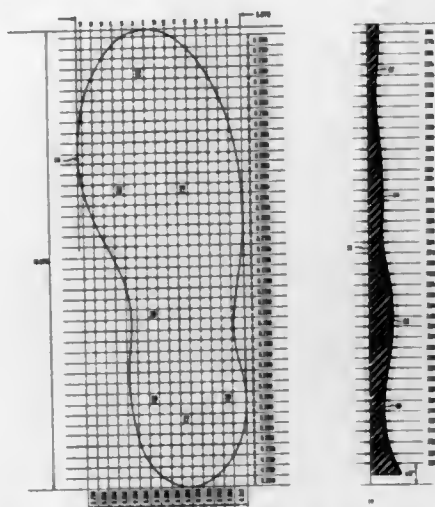
Int. Cl.<sup>4</sup> A43B 13/38

U.S. Cl. 36—43

6 Claims

1. A shaped, resilient full shoe inlay for athletic footwear comprising:  
 (a) a bottom surface,  
 (b) a contoured top surface to support a foot having:  
 (1) a depression for the first metatarsal head,  
 (2) a raised portion for the second, third, fourth and fifth metatarsal heads,

(3) a support for the medial longitudinal arch, said support being higher than said raised portion continuously curving downward from the inside of the arch toward the outside of the arch and being completely filled with resilient material from said bottom surface to the top of said support, and

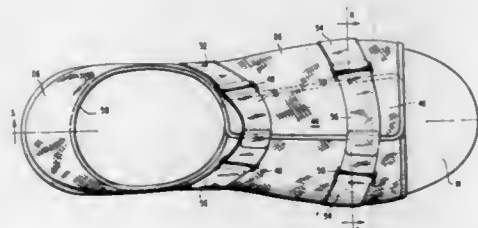
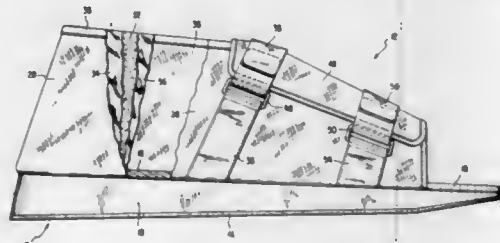


(4) a concave seat for receiving the heel, said seat being eccentric about the inlay's longitudinal axis such that said seat is built up higher on the inside of the heel than on the outside of the heel, wherein said inlay has dimensions in accordance with or proportional to those of FIGS. 1 through 16.

4,677,767

**SHOCK ABSORBING SURGICAL SHOE**

H. Darrell Darby, 1038 Sixth Ave., Huntington, W. Va. 25701  
Continuation-in-part of Ser. No. 640,392, Aug. 13, 1984,  
abandoned. This application Apr. 11, 1986, Ser. No. 850,832  
Int. Cl.<sup>4</sup> A43B 11/00, 13/18  
U.S. Cl. 36—102 5 Claims



1. A surgical shoe adapted for use on a post-operative or otherwise traumatized foot comprising:  
a sole assembly including an inner sole conforming generally to the plantar aspect of the foot, a midsole of an impact absorbing material, said midsole having its greatest thick-

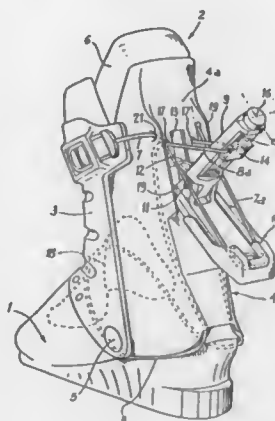
ness in the heel region and tapering downwardly toward the toe region, and an outer sole, said sole assembly having a degree of flexibility similar to that of a conventional running shoe sole assembly; and  
an upper assembly secured to said sole assembly and adapted to surround the heel, sides and dorsal portions of the foot while leaving the toe region open, the heel region of said upper assembly being angled forwardly and upwardly from the sole assembly, the forward portions of said upper assembly being divided into left and right flaps one of which is of greater length than the other, is adapted to cover the dorsal region of the foot, and underly said other of said flaps, and strap means for interconnecting the outface portions of said left and right flaps.

4,677,768

**REAR ENTRY SKI BOOT**

Louis Benoit, Frangy; Michel Mabboux, Seynod; Bernard Nerinck, La Balme De Sillingy, and Jean-Louis De Marchi, Duingt, all of France, assignors to Salomon S.A., Annecy, France

Continuation-in-part of Ser. No. 700,302, Feb. 11, 1983. This application Feb. 7, 1986, Ser. No. 827,007  
Claims priority, application France, Feb. 10, 1984, 84 02900; May 18, 1984, 84 08598; Feb. 8, 1985, 85 01844  
Int. Cl.<sup>4</sup> A43B 5/04  
U.S. Cl. 36—117 32 Claims



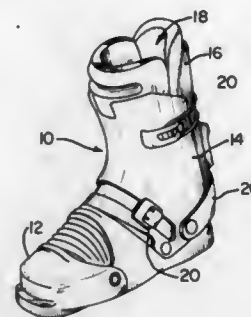
1. A ski boot for holding the lower leg and the foot of the skier therein, wherein said ski boot comprises:

- (a) means for tightening said boot on the lower leg of the skier;
- (b) means for holding the foot of the skier down in said boot;
- (c) first means for actuating said tightening means to tighten said boot on the lower leg of the skier; and
- (d) second means for actuating said holding means to hold down the foot of the skier in said boot, wherein said first and second actuating means comprise separate levers, wherein said boot further comprises a shell base, and an upper surrounding the lower leg of the skier comprising at least one posterior portion, wherein said first and second actuating means comprise two independent manipulation levers, one of which is positioned above the other, and both of which are journaled on said at least one posterior portion of said upper around an axis transverse to the longitudinal axis of said boot, wherein said tightening means is connected to one of said manipulation levers, wherein said holding means is connected to the other of said manipulation levers.

4,677,769

**FOOTWEAR WITH PIVOTAL TOE**

Eddress Ahmad, Box 1725, Avon, Colo. 81620, and Roger N. Pack, Box 841, Edward, Colo. 81632  
Filed Feb. 28, 1986, Ser. No. 835,038  
Int. Cl.<sup>4</sup> A43B 5/04  
U.S. Cl. 36—117 30 Claims



1. An article of footwear adapted to receive the human foot and operative to prevent torsional rotation of the foot while permitting bending movement about the ball of the foot, comprising:

- a toe portion having a first sole portion and a first relatively rigid upper shell, said first sole portion and said first upper shell configured to extend around and enclose a forward part of the human foot from a forward tip receiving the toes rearwardly to a location just behind the ball of the foot, said shell having a rear edge extending over the ball of the foot;
- a heel portion having a second sole portion formed independently of said first sole portion and a second relatively rigid upper shell, said second upper shell having an access opening to permit insertion and removal of the foot, said second upper shell extending around the rear of the foot and forwardly to a location proximate the ball of the foot and having a forward edge extending over the foot, said second upper shell and said second sole portion enclosing a rearward part of the foot; and
- hinge means interconnecting said toe portion and said heel portion for relative rotational motion about a fixed rotational axis in an axis plane substantially parallel to the plane of the first sole portion between a flat position wherein the respective first and second planes of said first and second sole portion are substantially parallel and a flexed position wherein said first and second planes are at an angle with respect to one another, said forward edge and said rear edge defining a wedge-shaped cut out region between said first and second upper shell when in the flat position, said hinge means pivotal about a single axis whereby said toe portion and said heel portion are fixedly interconnected in a manner substantially prohibiting torsional movement therebetween.

4,677,770

**ALPINE SKI BOOT**

Jean-Louis De Marchi, Duingt; Michel Mabboux, Seynod; Jean Paris, Sevrier, and Norbert Kopp, Chavanod, all of France, assignors to Salomon S.A., Annecy, France

Filed Dec. 20, 1985, Ser. No. 811,451  
Claims priority, application France, Dec. 20, 1984, 84 20161  
Int. Cl.<sup>4</sup> A43B 5/04  
U.S. Cl. 36—120 47 Claims

- 1. A ski boot comprising:
  - (a) shell base comprising an abutment; and
  - (b) an upper mounted on said shell base and adapted to hold the lower leg of a skier, wherein a part of said upper engages said abutment at least in response to rearward pressure from the lower leg of the skier on said upper, wherein said upper further comprises a front portion and

a rear portion, wherein said shell base further comprises a heel portion and two lateral sides, wherein said front portion of said upper comprises two lateral extensions, each extending rearwardly along a different lateral side of said shell base to said heel portion of said shell base,



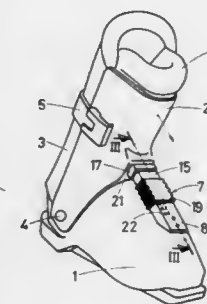
wherein said upper further comprises an element attached to said extensions, wherein at least one member of the following group engages said abutment at least in response to rearward pressure from the lower leg of the skier on said upper: said extensions and said element.

4,677,771

**SKI BOOT**

Simon Arie, Geneva, and Guy Courvoisier, Celigny, both of Switzerland, assignors to Lange International S.A., Fribourg, Switzerland

Filed Jun. 10, 1986, Ser. No. 872,707  
Claims priority, application Switzerland, Jun. 24, 1985, 2674/85; Mar. 4, 1986, 884/86  
Int. Cl.<sup>4</sup> A43B 5/04  
U.S. Cl. 36—120 12 Claims



1. A ski boot which is made of at least semi-rigid material and which consists of a shell (1; 31; 61) incorporating the sole and surrounding the foot and the heel and of an upper (2, 3; 32; 62) articulated on the shell about a transverse pivot pin (4; 64), an elastic device being arranged between the upper and the shell so as to offer elastic resistance to the forward inclination of the upper, wherein the elastic device comprises an element made of incompressible elastic material that can be deformed by expanding (15; 40; 75) and adjustable means (19; 38; 73) of limiting the length of the part of the elastic element capable of being deformed by expanding.

4,677,772

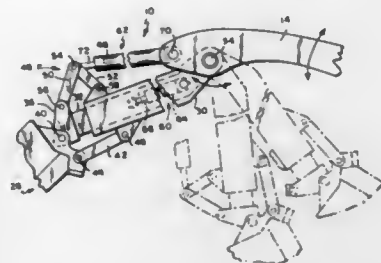
**EXCAVATOR WITH EXTENSIBLE BOOM**

Aldo Morelli, 25 Rockwood Ter., Jamaica Plain, Mass. 02130  
Filed Jan. 9, 1986, Ser. No. 798,983  
Int. Cl.<sup>4</sup> E02F 5/02  
U.S. Cl. 37—103 8 Claims

1. An excavator comprising a boom pivotally supported at its proximal end to the platform of a supporting chassis for movement of the boom about a horizontal axis, an excavator, first means supporting the excavator adjacent the distal end of the boom for rectilinear and pivotal movement thereof relative to the distal end of the boom, said first means comprising a first



rigid arm pivotally connected at one end to the distal end of the boom for pivotal movement about a horizontal axis spaced from the distal end of the boom and a rigid second arm mounted to the distal end of the first arm for rectilinear movement relative thereto, first power-operable means operable to effect rectilinear movement of the excavator relative to said



first means and second power-operable means operable to effect pivotal movement of the excavator relative to said first means and articulated links pivotally connected at their distal ends to, respectively, the distal end of the first rigid arm and the distal end of the second rigid arm and means pivotally connecting the second power-operable means to the distal end of the boom and to the articulation connecting the links.

4,677,773

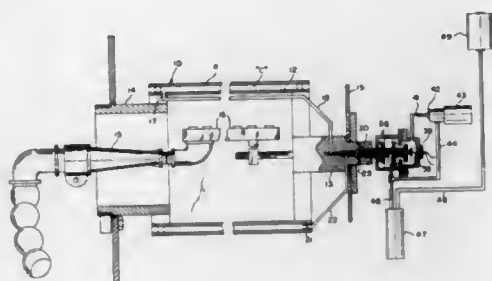
**HEATED ROTARY FLATWORK IRONER**

Eduard Kamberg, Chicago, Ill., assignor to New Super Laundry Machinery Co. Inc., Ill.

Filed Dec. 20, 1985, Ser. No. 811,356  
Int. Cl. D06F 67/02

U.S. Cl. 38-44

8 Claims



1. A heated rotary flatwork finisher comprising:
  - (a) a drum having a double wall construction providing a closed annular fluid cavity,
  - (b) means supporting said drum for rotation about its horizontal axis,
  - (c) a fluid inlet port for said cavity at the remote end of said drum and a fluid exhaust port for said cavity at the opposite end of said drum,
  - (d) a stationary ignitable heat source within said drum for heating the fluid in said cavity so as to provide an optimum heat transfer to the outer wall of the double walled drum,
  - (e) a fluid flow system including said inlet and exhaust ports and means having communication through said supporting means for recirculating the fluid into said fluid cavity through said inlet port at the remote end of said drum and out of said cavity through said exhaust port,
  - (f) means exteriorly of said drum and in a portion of said fluid flow system and in the path of the recirculating fluid for sensing the temperature of such recirculating fluid and responsive to a predetermined temperature thereof for controlling the simultaneous ignition of said heat source

and said means for recirculating the fluid through said fluid cavity, and  
(g) means for sensing the presence of fluid in said fluid flow systems.

4,677,774

**VALVE ASSEMBLY STRUCTURE FOR STEAM FLATIRONS**

Ereole Macchi, Via G. Agnesi, 5-Milano, Italy

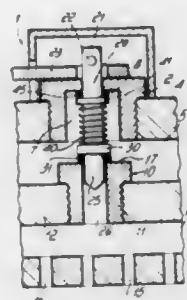
Filed Nov. 18, 1985, Ser. No. 799,533

Claims priority, application Italy, Nov. 22, 1984, 23859/84[U]

Int. Cl. F16K 1/46; D06F 75/06, 75/20

U.S. Cl. 38-77.83

10 Claims



6. A steam flatiron having an upper delimiting wall and a bottom wall connected to each other and defining therebetween a flatiron inside cavity with a main steam chamber and a steam delivery chamber, said flatiron further having an intermediate wall extending in said flatiron inside cavity between said upper delimiting wall and said bottom wall and separating therein a main steam chamber from a delivery steam chamber facing said bottom wall, said main steam chamber having steam inlet means, said bottom wall defining a plurality of steam delivery holes communicating said steam delivery chamber with the outside, said upper delimiting wall having a first threaded aperture extending therethrough providing communication between said main steam chamber and the outside, said intermediate wall having a second threaded aperture extending therethrough between said main steam chamber and said steam delivery chamber in alignment with said first threaded aperture, a valve assembly including: a first ring nut having an outwardly threaded portion in tight screw thread engagement with said first threaded aperture and a first enlarged portion abutting against said delimiting wall at the flatiron outside, said threaded portion defining an axial cavity having a cavity ceiling with a first through-hole extending in said first enlarged portion, a second ring nut having an outwardly threaded portion in tight screw thread engagement with said second threaded aperture and a second enlarged portion abutting against said intermediate wall in said main steam chamber and extending at a distance from said first ring nut, said second ring nut defining a second through-hole extending axially in said second ring nut and being axially aligned with said first through-hole, a valve stem extending through said first threaded aperture, said axial cavity and said main steam chamber and having a tip at least partially extending in said second through-hole, and a head tang protruding from said first threaded aperture toward the flatiron outside, said valve stem defining near said tip an annular flange boss and at said head tang an actuation cross-pin, a washer extending around said valve stem between said cavity ceiling and said flange boss, a first annular seal extending around said valve stem between said washer and said cavity ceiling a second annular seal extending around said valve stem between said boss flange and said second ring nut, and a spring means extending around said valve stem between said washer and said flange boss and pushing said washer and said first annular seal against said cavity ceiling and said flange boss and said second

annular seal against said second enlarged portion of said second ring nut.

4,677,775

**UNIVERSALLY ADJUSTABLE QUILTING FRAME**

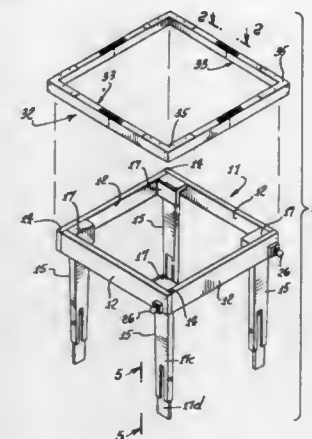
Beatrice W. Riley, 30 Woodland La., Arcadia, Calif. 91006

Filed Jun. 13, 1986, Ser. No. 873,965

Int. Cl. D06C 3/08

U.S. Cl. 38-102.2

9 Claims



1. In a quilting frame assembly, the combination comprising:
  - (a) a first rectangular frame extending generally horizontally, and legs supporting said first frame to receive a quilt thereover to drape downwardly adjacent the frame sides,
  - (b) and a second rectangular frame having four elongated members, at least two of said elongated members comprising sections which are relatively movable lengthwise of the members to vary the overall lengths of said members,
  - (c) whereby the second frame is adjustable in size to fit closely about the quilt at the level of the first frame, to firmly position the quilt on the first frame,
  - (d) pairs of said members being rigidly joined together at their ends to form four L-shaped corners of the second frame.

4,677,776

**DEVICE FOR MARKING PRESENCE, RESERVATION OR INFORMATION**

Jean-Pierre R. Lanier, Hameau de Margerie, 26230 - Colonzelle, and Georges P. Marie, Chemin du Moulin, Richerenches - 84600 - Valreas, both of France

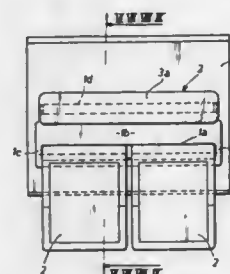
Filed Jul. 9, 1985, Ser. No. 753,274

Claims priority, application France, Jul. 13, 1984, 84 11268

Int. Cl. G09F 3/18

U.S. Cl. 40-15 R

14 Claims



1. A device for marking presence, reservation or information by means of at least one badge engaged in a case, comprising: a plurality of juxtaposed flexible blades and fixed blades presented opposite a front wall of the case, of which the

flexible blades are mounted in elastic manner in the case and cooperate with the badge to lock it on said case; a badge comprising cavities on one of its faces, which cavities are juxtaposed and correspond to said blades, certain of these cavities cooperating with free ends of said flexible blades;

at least one other flexible blade substantially parallel to said blades and mounted in elastic manner in the case and comprising at least one configuration on at least one of its side edges; and

a key engaged frontally in the case and cooperating with said flexible blades, which key comprises on its front edge a plurality of notches determining projections to abut on the flexible blades and further comprises at least one lateral notch adapted to latch on said configured flexible blade to lock the key on said blade in the absence of a badge on the case, so that the badge, in locked position, exerts a pressure on said configured blade to displace the configuration and to allow the withdrawal of the key and so that the complete engagement of the key in the case, by displacement of the flexible blades, causes the ends of the blades to leave said cavities of the badge, to allow said badge to be withdrawn.

4,677,777

**PRICE SETTING AND DISPLAY SYSTEM FOR MULTIPLE UNIT MERCHANDISING MACHINE**

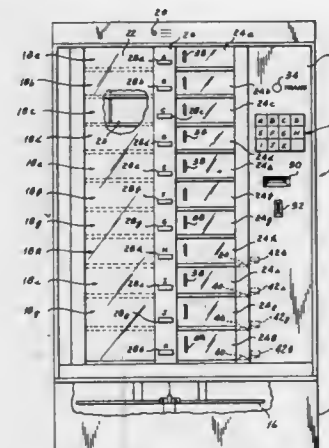
David Hoffman, Hillsdale, N.J.; Lee C. Verduin, and Ross Ouwinga, both of Grand Rapids, Mich., assignors to Rowe International, Inc., Whippany, N.J.

Filed May 8, 1985, Ser. No. 731,967

Int. Cl. G09F 19/04

U.S. Cl. 40-460

10 Claims



1. A price setting and display system for a merchandising machine adapted to sell articles of merchandise from a plurality of dispensing units at various prices, said units being disposed at spaced locations in a cabinet having a door, said cabinet with said door closed affording a view of said units while preventing access thereto, said system including a plurality of individual displays, means mounting said displays on said machine at respective positions adjacent to said locations and visible to a potential customer with the door closed, normally disabled means at a central location within said cabinet for setting prices for said units and for actuating said displays in accordance with prices at which articles are to be sold and means responsive to opening of said cabinet door for concomitantly disabling said units and enabling said normally disabled means.

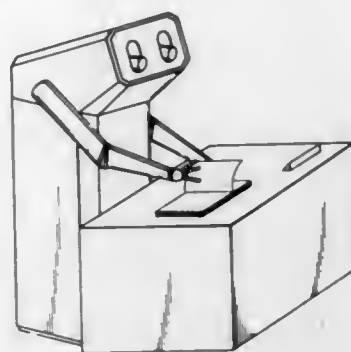
4,677,778

## SHEET MANIPULATING APPARATUS

Kanehiro Sorimachi, and Makoto Tamari, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation-in-part of Ser. No. 566,547, Dec. 29, 1983, abandoned. This application Oct. 20, 1986, Ser. No. 920,942  
Claims priority, application Japan, Jan. 7, 1983, 58-973  
Int. Cl.<sup>4</sup> G09F 11/00

U.S. Cl. 40-476

4 Claims



1. A working apparatus for manipulating a sheet comprising: arm means having a plurality of finger means disposed at an end of said arm means for contacting a sheet; a plurality of roller means provided on said finger means; sensor means provided on at least one of said finger means for detecting a condition of the sheet; and control means responsive to the output of said sensor means for controlling the force of said roller means against the sheet, said control means being adapted to provide at least one of rotational and translational movement of said roller means to pick up one sheet from a layer of sheets between said roller means,

wherein said control means (i) positions two of said roller means, apart from each other by a predetermined distance, on a portion of a top sheet on the layer, (ii) effects rotational movement, and translational movement toward one of said roller means such that the other of said two roller means is positioned at an opposite side of the top sheet from which said one roller means is positioned, (iii) causes said one and said other roller means to be rotated in opposite directions such that only the top sheet is picked up between said two roller means, and (iv) effects the translational movement of said arm means and finger means such that only the top sheet of the layer is picked up and turned without moving the remaining sheets.

4,677,779

## ELEVATOR DISPLAY SYSTEM

Anthony R. Rodriguez, 3847 Timberglen, Apt. 4212, Dallas, Tex. 75252

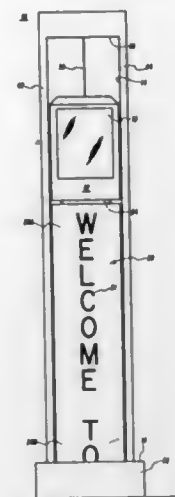
Filed Feb. 10, 1986, Ser. No. 831,003  
Int. Cl.<sup>4</sup> G09F 11/18

U.S. Cl. 40-514

14 Claims

1. A display system comprising, in combination: an elevator cab moveable between vertically spaced apart first and second positions; and means cooperating with said elevator cab for providing a

visual display between said elevator cab and at least one of said first and second positions, said display being change-



able in accordance with the movement of the elevator cab between said first and second positions.

4,677,780

## MAGNETICALLY SECURED DISPLAY APPARATUS

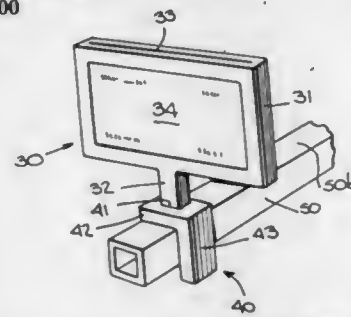
Bernard E. Shuman, Merrick, N.Y., assignor to EEE Corporation, Port Washington, N.Y.

Filed Nov. 18, 1985, Ser. No. 798,954

Int. Cl.<sup>4</sup> G09F 3/04

U.S. Cl. 40-600

11 Claims



1. A sign holder for securing a vertical planar sign on a magnetically attractable support rod of a clothing rack, or the like, comprising:

- a frame member for holding the sign; and
- clamp means for connecting said frame member to said rod, said clamp means including,
  - (i) an L-shaped tubular housing having a first leg portion and a transverse second leg portion extending from one end of said first leg portion,
  - (ii) permanent magnet means integrally connected to said first leg portion for detachably magnetically clamping said first leg portion to a vertical surface of the rod, with said second leg portion overlying and supported on an upper horizontal surface of the rod, and
  - (iii) connecting means for detachably connecting said frame member to said transverse second leg portion for supporting said frame member and the sign held therein in a substantially vertical plane when said first leg portion is magnetically attached to said vertical surface of said rod, whereby the weight of the frame member and the sign held therein passes through said second leg portion to, and is borne entirely by, the rod, said magnet means serving only to resist displacement of the sign holder.

4,677,781

## RETROFIT FIREARM

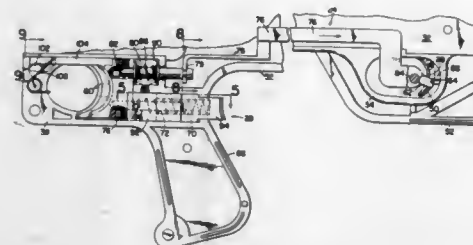
Joseph L. Lee, Woodbridge, Conn., assignor to Mossberg & Sons, Inc., North Haven, Conn.

Filed Mar. 11, 1986, Ser. No. 838,623

Int. Cl.<sup>4</sup> F41C 17/08, 7/00

U.S. Cl. 42-70.01

20 Claims



15. A retrofit firearm having a receiver, a firing mechanism contained within said receiver, a secondary trigger supported on the receiver to move between ready and firing positions for releasing said firing mechanism in said firing position to discharge said firearm, a retrofit housing containing at least a portion of said receiver, a primary trigger supported on said retrofit housing in spaced relation to said secondary trigger for movement between first and second positions corresponding respectively to said ready and firing positions, operating means for moving said secondary trigger to said firing position in response to movement of said primary trigger toward said second position, and a first safety mechanism associated with said secondary trigger including a first blocking member supported for movement between blocking and releasing positions, means for biasing said first blocking member toward said blocking position, said first blocking member in said blocking position preventing movement of said secondary trigger to said firing position, and releasing means for moving said first blocking member from said blocking position to said releasing position in response to movement of said primary trigger toward its second position.

4,677,782

## POSITION ACTUATED ILLUMINATED GUNSIGHT

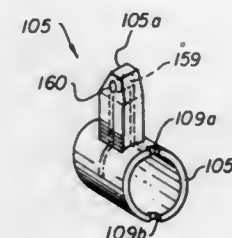
Gordon E. Kaye, Garrison, and Joseph A. Agnello, Jr., Peekskill, both of N.Y., assignors to Univention Inc., Garrison, N.Y., a part interest

Continuation-in-part of Ser. No. 451,476, Dec. 20, 1982, Pat. No. 4,524,534. This application Jun. 21, 1985, Ser. No. 747,354

Int. Cl.<sup>4</sup> F41G 1/32

U.S. Cl. 42-100

12 Claims



12. An illuminated gunsight for a firearm, having existing sighting means, comprising a base member, affixed to said sighting means by an anchoring clamp member, and an illumination member having illumination means contained therein, said illumination member having a tubular section thereof rotatably affixed to a battery fixedly anchored to said base member, said battery being contained within an insulative casing therefor, wherein said illumination means is electrically connected to an end terminal of said battery and wherein a

conductive member is affixed to said illumination means, with said conductive member being in contact with another terminal of said battery when said illumination means is in alignment with said existing sighting means thereby activating said illumination means and wherein an insulation member is positioned between said conductive member and said battery when said illumination means is out of alignment with said existing sighting means thereby deactivating said illumination means.

4,677,783

## FISHING ROD TENDER WITH AUTOMATIC FISH HOOK SETTING FEATURE

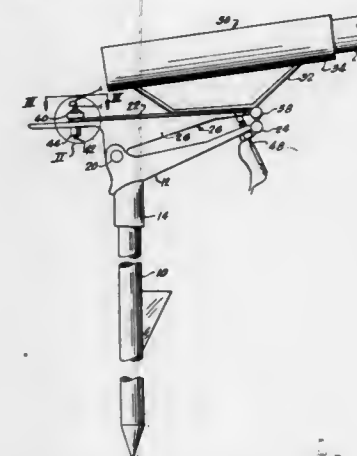
Steve N. Cratsa, 550 Foltz Dr., Verona, Pa. 15147

Filed Aug. 19, 1986, Ser. No. 898,244

Int. Cl.<sup>4</sup> A01K 97/12

U.S. Cl. 43-15

3 Claims



1. A device for automatically setting a fish hook comprising:
- (a) a vertical support element;
  - (b) a lower plate element superimposed on said vertical support element and extending outwardly therefrom to a terminal end;
  - (c) an upper plate element mounted to the lower plate element to be pivotable through a vertical arc;
  - (d) a latch element mounted on the upper plate element to be pivotable in a generally horizontal arc;
  - (e) a rod element mounted at the terminal end of the lower plate element to be pivotable in a vertical arc and to be extendable rearwardly to be engaged with the latch element;
  - (f) an expandable compression spring element positioned between the upper and lower plate elements; and
  - (g) a fishing rod holding pipe element superimposed on the upper plate member such that fishing line may be wrapped around the latch element so that tension on said line will pivot the latch element out of engagement with the rod element to relieve restraint on the spring element and allow the upper plate element to be upwardly displaced in a vertical away from the lower plate element.

4,677,784

## FISHING ROD HOLDER AND ALARM

Joseph S. Butkus, 1512 S. Indian Pl., North Brunswick, N.J. 08902

Filed Mar. 21, 1986, Ser. No. 842,273

Int. Cl.<sup>4</sup> A01K 97/12

U.S. Cl. 43-16

7 Claims

1. A fishing rod holder comprising a tubular member having a pointed lower end which can be forced into the ground, said tubular member having a plurality of holes along its length, a ring slidably mounted on said tubular member,



means associated with said ring for releasably securing said ring at selected positions along said tubular member by engaging a selected one of said holes, and



means within said ring for supporting the end of a fishing rod inside said tubular member.

4,677,785

## AERATED LIVE BAIT BUCKET

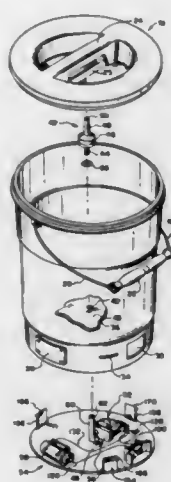
Robert G. Lambourn, 3412 W. Fairway Dr., McHenry, Ill. 60050

Filed Oct. 28, 1985, Ser. No. 792,048

Int. Cl.<sup>4</sup> A01K 97/04

U.S. Cl. 43—55

17 Claims



1. An aerated live bait bucket comprising:

- a bucket for holding water having a bottom with an aperture formed therein, and sidewalls,
- a base extension formed below said bottom and with said bottom forming a cavity,
- an air pump mounted in said cavity,
- a check valve,
- means connecting the output of said air pump through said check valve to said aperture, whereby air pumped by said air pump is introduced into the water in said bucket through said check valve and aperture, said check valve

- preventing the backflow of water from said bucket through said aperture into said air pump,
- a battery holder for holding batteries which supply energy to said pump,
- an electric switch for control of the operation of the pump, and
- a base plate is provided which substantially encloses said cavity, wherein said air pump, said battery holder and said switch are all mounted on the base plate thus facilitating construction of the aerated live bait bucket

4,677,786

## SMALL ANIMAL TRAP WITH MULTIFINGERED BAIT HOLDER

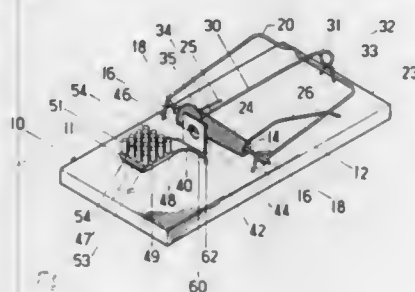
Marc Frank, 1699 Koshkonong, Stoughton, Wis. 53589

Filed Jun. 13, 1986, Ser. No. 873,796

Int. Cl.<sup>4</sup> A01M 23/30

U.S. Cl. 43—82

15 Claims



1. A small animal trap comprising:

- a base;
- biased jaw means pivotally mounted on the base for snapping from an open position to a closed position to trap the animal;
- latching means for latching the jaw means in its open position when the trap is set and releasing the jaw means to close in response to a trigger actuation movement;
- touch-sensitive trigger means for responding to small physical movement and vibrations to move the latching means so that the latching means releases the jaw means to close; and
- a bait holder mounted to the touch-sensitive trigger means, the bait holder having a flat base with a top surface and a multitude of closely spaced fingers extending upwardly from the top surface to hold bait in the interstices between the fingers, wherein the fingers are arranged in parallel rows in one direction and in parallel columns perpendicular to said one direction.

4,677,787

## APPARATUS FOR MOUNTING APPLICATION HEADS TO AN AGRICULTURAL IMPLEMENT

Ronald S. Said, 3223 E. 100 S., Hartford City, Ind. 47348

Filed Oct. 15, 1984, Ser. No. 661,108

Int. Cl.<sup>4</sup> A01G 13/00

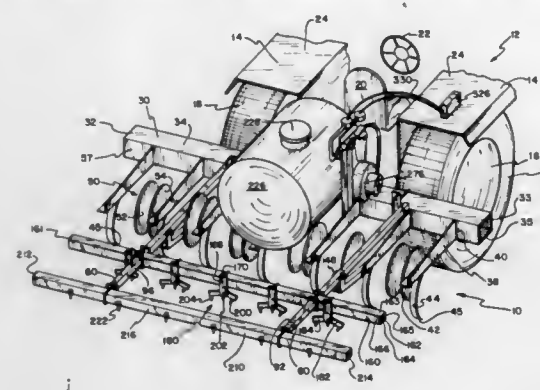
U.S. Cl. 47—1.5

9 Claims

1. An apparatus for mounting a plurality of fluid spray heads to an agricultural implement pulled by a tractor and used in row crop farming wherein the implement includes a frame having a generally transversely disposed frame support member and a plurality of row crop working devices mounted to the frame support member, the apparatus comprising:
- a mounting fixture mounted at one end thereof to the frame support member, the other end of said mounting fixture extending rearwardly of the implement so as to be positioned to the rear of the row crop working devices;
  - an elongate mount support attached to said mounting fixture adjacent the other end thereof and positioned rearwardly of the row crop working devices, said mount support disposed generally transversely to the longitudinal direc-

tion of the row crops, said mount support receivable of the fluid spray heads in a spaced-apart fashion along the length of said mount support whereby the spray heads and row crop working devices cooperate to perform a farming operation on the row crop; and

said mounting fixture further including height adjustment means for selecting the vertical position of all the spray heads relative to the row crop, said mounting fixture including a bracket directly connected to said elongate mount support, an elongate arm pivotally mounted at one end to said bracket, a pair of outer and inner telescoping members each having a distal end, said outer member pivotally mounted at said distal end thereof to said



bracket, said inner member pivotally mounted at said distal end thereof to said arm, and said outer and inner members each having a connected end at which they are telescopically connected so that the relative positioning between the inner and outer members determines the vertical distance between the spray heads and the row crops, said bracket including a plurality of spaced-apart vertically disposed apertures, and said elongate arm containing an aperture adjacent said one end thereof, said elongate arm being positionable to any one of a plurality of positions corresponding to said arm aperture being aligned with a selected one of each of said bracket apertures.

4,677,788

## SUPPORT FOR TOMATO PLANTS AND THE LIKE

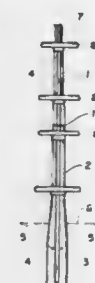
Frank Mastandrea, 300 Hamilton Rd., Pittsburgh, Pa. 15234

Filed Oct. 28, 1985, Ser. No. 792,281

Int. Cl.<sup>4</sup> A01G 17/06

U.S. Cl. 47—47

6 Claims



1. A support for tomato and other plants, comprising an elongated bottle-like plastic container having a top portion which is progressively increased in diameter in a downward direction and having an enclosed base portion of maximum diameter adapted to be inserted in the ground and which base portion has perforations at a height which determines the height of a constant reservoir of water always retained for watering and for stability, the top portion of said base portion being frusto-conical, a plurality of wheel-like elements of dif-

ferent internal diameter removably supported and slidably fitted on said top portion in vertically spaced relationship.

4,677,789

## WINDOW BAR ASSEMBLY

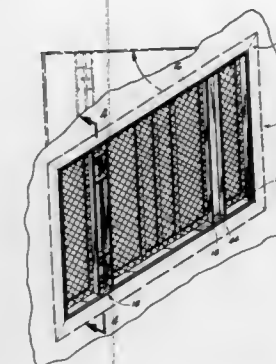
Mark A. Merry, 190 Johnson La., Tickfaw, La. 70466

Filed Feb. 3, 1986, Ser. No. 825,258

Int. Cl.<sup>4</sup> E06B 3/68

U.S. Cl. 49—56

17 Claims



1. A window guard assembly comprising:

- a first stationary rectangular frame adapted to be rigidly secured within a window opening;
- a second rectangular frame hingedly attached to said first frame and movable between a first closed position within said first frame and a second open position;
- a closure grating rigidly attached to said second frame, thereby preventing manual access therethrough; and
- means for releasably locking said second frame in said first closed position, said locking means being movable between a first locking position whereby said locking means is in engagement with said first and second frames and a second release position whereby said means is disengaged from said first and second frames, said locking means being housed in a channel member rigidly attached to said second frame and closure grating, said channel member extending vertically within said second frame between the top and bottom thereof and being open only opposite said closure grating to thereby provide access to said locking means from inside said window.

4,677,790

## DOOR EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

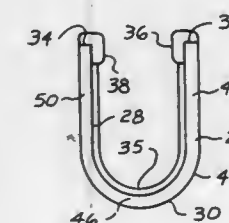
Filed Mar. 4, 1986, Ser. No. 835,917

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> E05F 7/00

U.S. Cl. 49—462

14 Claims



1. In combination with the trailing edge of a swinging closure, a self-retaining insulating metal edge guard fitted onto

said trailing edge comprises an elongate metal channel having in transverse view inner and outer legs extending from a generally semi-circular base, said inner and outer legs serving to apply self-retention forces to opposite sides of said trailing edge, said channel being formed from a metal strip of uniform thickness having side edge surfaces which become distal end edge surfaces of the legs in the channel, non-metallic insulating material disposed on the metal channel in covering relation to said legs and base including a covering relation wherein direct contact of the metal of the channel with said trailing edge is prevented by said non-metallic insulating material, said non-metallic insulating material having respective zones, one of said zones being on one leg at the location of force application by that leg to said trailing edge, another of said zones being on the other leg at the location of that other leg's force application to the trailing edge, and a further of said zones disposed on the channel between said one and said another zones wherein said one and said another zones are of harder non-metallic insulating material than said further zone of non-metallic insulating material.

4,677,791

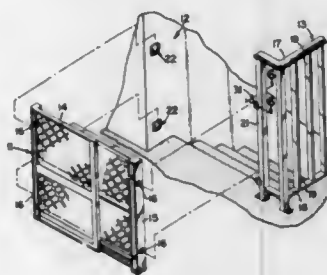
## ADJUSTABLE GATE FOR DOORWAYS

Donald A. Larson, Circle Pines, and Peter M. Runyon, St. Paul, both of Minn., assignors to North States Industries, Inc., Minneapolis, Minn.

Filed Jun. 13, 1986, Ser. No. 873,994  
Int. Cl.<sup>4</sup> E06B 3/32

U.S. Cl. 49—463

19 Claims



1. In combination:  
a portable security gate for doorways and the like, comprising relatively movable portions at least one of which has a side member with at least one projecting bumper formed from frictional material and of predetermined configuration, the security gate further comprising means for effective relative movement between said portions to vary the effective width of the gate and for urging the movable portions relatively apart to cause the frictional bumper to forceably engage a doorway defining member;  
and a mounting socket comprising a base member having front and rear faces, the rear face being constructed to conform to said doorway defining member, and including means for adhesively securing the mounting socket to a doorway defining member in a position to receive the frictional bumper, and the front face having means projecting forwardly therefrom to define a socket sized and configured to retainably receive the frictional bumper.

4,677,792

## CLAMPING OR CHUCKING SYSTEM FOR A GRINDING WHEEL OR DISK

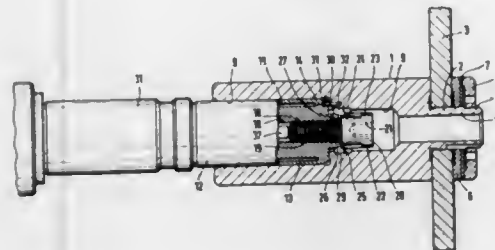
Hans Spedel, Nürtingen, Fed. Rep. of Germany, assignor to Montanwerke Walter GmbH, Tübingen, Fed. Rep. of Germany  
Filed Apr. 1, 1986, Ser. No. 846,866

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512366

Int. Cl.<sup>4</sup> B24B 41/04

U.S. Cl. 51—168

20 Claims



1. Chucking or clamping system for connecting a grinding wheel or disk (3) to a drive spindle (11) having a disk holding bushing (1) formed with an end surface for engagement with the grinding disk (3) at one end of the bushing and further formed with means coaxial with the grinding disk, for selectively releasably coupling the bushing (1) to the spindle (11), wherein said releasable coupling means comprises a coaxial cylindrical bore (8) formed in the holding bushing (1);  
a hydraulic expansion system formed on one end portion of the spindle (11, 12) and located in the bore (8) of the holding bushing (1), said hydraulic expansion system including a radially expandable thin-walled expansion sleeve (13), a hydraulic pressure chamber (15) defined within said expansion sleeve for reception of a hydraulic pressure fluid, an axially movable fluid compression piston (17) extending into the pressure chamber, and an axially movable engagement element (18) which is externally accessible and operatively coupled to the fluid piston, said expansion sleeve, upon being subjected to hydraulic pressure, expanding to clamp the spindle (11, 12) coaxially in the bore (8) of the holding bushing (1);  
and an interengaging axially latching safety locking means (25-30) coupled, respectively, to the spindle (11, 12) and the disk holding bushing (1), and movable to interengage and latch together said spindle and said bushing, said engagement element (18) being operatively coupled to said interengaging safety locking means for, simultaneously, upon axial movement of said engagement element,  
(a) interengagingly attaching the safety locking means (25-30) to latch together the spindle (11, 12) and the disk holding bushing (1); and  
(b) applying, via said compression piston (17), hydraulic pressure on the pressure fluid in said chamber (15) to thereby coaxially clamp the holding bushing (1) and the spindle (11, 12) together.

4,677,793

## METHOD AND APPARATUS FOR HIGH TOLERANCE POLISHING OF A WORKPIECE SURFACE

Itzhak Lapsker, Forest Hills, N.Y., assignor to GBI International Industries, Inc., W. Babylon, N.Y.

Continuation of Ser. No. 386,673, Jun. 8, 1982, Pat. No. 4,583,328, which is a continuation-in-part of Ser. No. 114,297, Jan. 22, 1980, Pat. No. 4,361,987, which is a continuation-in-part of Ser. No. 832,623, Sep. 12, 1977, abandoned. This application

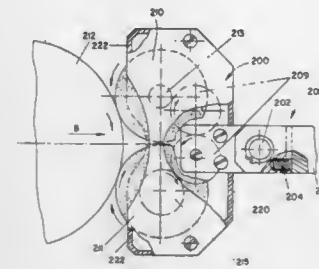
Jan. 28, 1986, Ser. No. 823,248

Claims priority, application Israel, Oct. 29, 1976, 50794

Int. Cl.<sup>4</sup> B24B 5/00

U.S. Cl. 51—251

5 Claims



1. A finishing tool for finishing the radial surface of a workpiece rotating about a longitudinal axis thereof, comprising:  
a first rotatable finishing element arranged for engagement with the moving surface of the rotating workpiece when the tool is in use, such that said first finishing element is driven by the workpiece when in engagement therewith;  
a second rotatable finishing element arranged for engagement with the moving surface of the rotating workpiece when the tool is in use;  
transmission means, connecting said first and second rotatable finishing elements, for transmitting the motion of said first finishing element, driven by the rotating surface of the workpiece, to said second finishing element such that said second finishing element turns in a direction against that in which it would otherwise be driven by the workpiece and at a surface speed which is slower than that of said first polishing element.

4,677,794

## SUPPORT ASSEMBLY FOR A SHELF OR LIKE STRUCTURE

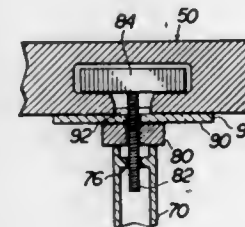
Ivan Parron, 133 W. 23rd St., Hialeah, Fla. 33010, and Michael R. Rosenthal, 6001 SW. 118 St., Miami, Fla. 33156

Continuation-in-part of Ser. No. 411,439, Aug. 25, 1982, Pat. No. 4,450,655. This application Jan. 16, 1984, Ser. No. 570,935  
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.

Int. Cl.<sup>4</sup> A47B 5/00

U.S. Cl. 52—36

14 Claims



1. A support assembly of the type primarily designed for mounting within a panel slot having a predetermined configuration and an entrance, said support assembly comprising:

- (a) a clamp assembly means for removable mounting within the panel slot and including a force distribution plate,  
(b) a support bar secured to said force distribution plate and extending outwardly therefrom away from the panel slot,  
(c) said clamp assembly means further including a first connector means movably mounted on said force distribution plate having second connector means threadably engaged therewith and a keeper bar means fixedly secured to an end of the first connector means so that said keeper bar means can be secured in clamping relation with the slot by rotating the second connector means,  
(d) said keeper bar means attached to said connector means and movably disposable within the panel slot relative to said force distribution plate, said keeper bar means disposable substantially transverse to a longitudinal axis of the panel slot and having a length substantially greater than the entrance to the panel slot so that opposing ends of said keeper bar bite into said slot, and  
(e) said connecting means selectively movable relative to said force distribution plate along with said keeper bar means and said keeper bar means cooperatively positionable with said force distribution plate into clamping relation about the entrance to the panel slot.

4,677,795

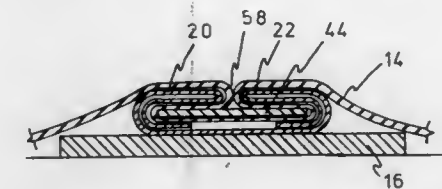
## FASTENING DEVICE AND METHOD

Linden H. Mathews, 3366 E. Fair Pl., Littleton, Colo. 80121, and Douglas R. Crabb, 5642 W. Lakeridge Rd., Lakewood, Colo. 80227

Continuation-in-part of Ser. No. 532,675, Sep. 16, 1983, abandoned. This application Feb. 28, 1985, Ser. No. 706,722  
Int. Cl.<sup>4</sup> E04B 7/14, 1/12, 1/347

U.S. Cl. 52—63

12 Claims



1. A roof structure for a building having an exterior surface to be covered, comprising in combination:  
at least one membrane composed of a flexible, water-repellant sheet, said sheet defining a roof covering applied over said exterior surface; and  
a plurality of fastening devices interposed at spaced intervals between said membrane and said exterior surface of said roof structure, each said fastening device including an elongated base member attached to said exterior surface and a pair of elongated, bendable arms extending upwardly from opposite sides of said base member, said arms being bendable about said base member between a first position defining a channel therebetween and a second position in which said arms extend inwardly with portions of said membrane covering free ends of said arms, and said arms extending parallel to said base member with said portions of said membrane touching one another a portion of said membrane disposed in each said channel to extend along inner facing surfaces of said arms and said base member when said arms are disposed in said first position, and said membrane portion fixed between said arms and said base member when said arms are bent into said second position.



# 4,677,796 SHELTER STRUCTURE

John A. Mellott, Indian Hills, P.O. Box 34B, Mountain Center, Calif. 92361

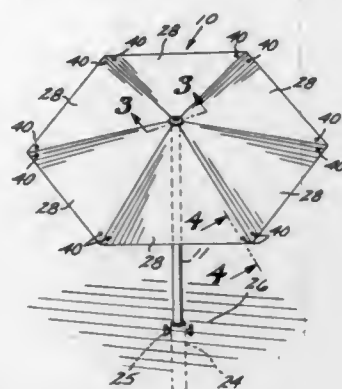
Continuation of Ser. No. 864,423, May 19, 1986, abandoned.

This application Oct. 16, 1986, Ser. No. 919,508

Int. Cl.<sup>4</sup> E04B 1/34, 7/00; A45F 1/00

U.S. Cl. 52—73

17 Claims



1. A shelter structure comprising: a member extending in the vertical direction; means associated with one end of said vertically extending member having a plurality of openings therein for receiving corresponding ends of a first set of a plurality of elongated members;
- a plurality of fitting members, each of said fitting members having at least three portions associated therewith, the other ends of said first set of elongated members each being coupled to one portion in a corresponding fitting member;
- a second set of plurality of elongated members, one end of each elongated member being coupled to another portion of one of said fitting members, the other end of said elongated member being coupled to another portion of an adjacent fitting member, the coupling of said second set of elongated members resulting in a connected, multi-edged side member; said side member and the connected first set of elongated members forming a series of inclined open sections; and
- means for substantially enclosing each of said inclined open sections.

# 4,677,797 KNOCKDOWN HOUSING STRUCTURE

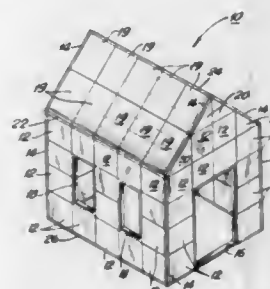
Herman Roth, 233 Keap St., Brooklyn, N.Y. 11211

Filed May 21, 1986, Ser. No. 865,414

Int. Cl.<sup>4</sup> E04B 7/02; E04C 1/10, 1/30

U.S. Cl. 52—94

18 Claims



1. A knockdown housing structure comprising: a plurality of wall panels; coupling means for interconnecting said wall panels; said coupling means including projecting members and elongated receiving slots;

said projecting members and slots being slidably engaged into a locking relationship; said slots being provided along opposing outer edges of said panels; said projecting members including projecting pins with enlarged heads; and elongated connecting strips for interconnecting adjacent panels, said pins projecting from opposing sides of said strips and engaging said slots.

# 4,677,798 STEEL SHELL MODULES FOR PRISONER DETENTION FACILITIES

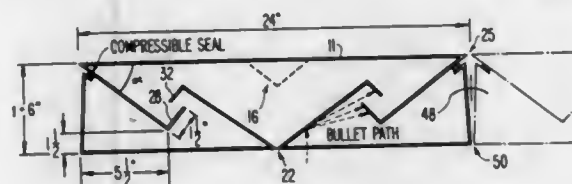
Edward H. Phillips, P.O. Box 979, Fort Collins, Colo. 80522

Filed Apr. 14, 1986, Ser. No. 852,021

Int. Cl.<sup>4</sup> E04H 3/08

U.S. Cl. 52—106

26 Claims



1. Building modules adapted to fit together for construction of fire, sound and impact resistant security barriers and rooms for use in securing records and persons, comprising in combination, an outer shell of substantially parallelepiped shaped with two outer steel plate panel sections of greater surface area serving as inner and outer walls for a structure when a plurality of the modules are fitted together, sealant means spacing the two panel sections from steel to steel contact with each other by a thermal-acoustical barrier material, and further means disposed inside the shell for increasing its load bearing capacity comprising internal steel baffles extending inwardly from the steel shell walls.

# 4,677,799 MULTI-SECTIONAL RACEWAY

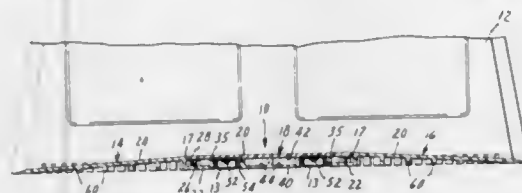
Peter J. Zarembo, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 3, 1985, Ser. No. 804,041

Int. Cl.<sup>4</sup> E04B 5/48

U.S. Cl. 52—220

14 Claims

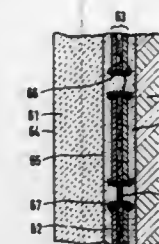


1. A multi-sectional raceway for use in combination with a pair of detection system panels, interconnected by at least one support beam, to protect electrical wires and the like passing between the panels and to permit travel between the panels without materially affecting the operation of the system, comprising: a generally rectangular central platform section having an upper surface, a lower surface, and a first end and a second end opposite said first end; a first ramp section and a second ramp section, each of said ramp sections having an upper surface, a lower surface, and a raised end adapted to abut with one of said first or second ends; interlocking means associated with said raised abutting ends of said ramp sections, and with said first end and said

second end of said central platform section for lockingly interconnecting said ramp sections and said central platform section to form a continuous upper surface; and girder structure means running the width of said central platform section lower surface and having a substantially flat base for distributing loads applied thereto, and a plurality of arms extending from the base adapted to bear against and support a said platform section, at least one passageway being formed between said arms for permitting and protecting electrical wiring which may be positioned along said passageway to electrically connect the panels,

wherein said support beams interconnecting said detection panels have a predetermined cross-sectional configuration, and wherein said platform section, ramp sections and girder means are further dimensioned relative to said predetermined configurations to form in combination when assembled together at least one channel running along the lower surface of the platform section and between the outer edge of the girder means and the raised end of the ramp sections, within which may be accommodated in a non-engaging relationship at least one said support beam thereby isolating load forces associated with said travel upon said raceway between said panels from said panels to prevent wobbling of said panels.

having inner and outer jackets of polyester and an electrical resistance member sandwiched between said jackets, means for connecting said resistance member to a source of electrical energy, at spaced intervals said resistance member having voids, a first layer of adhesive for bonding said inner jacket to said substratum; a layer of ceramic tiles forming the exterior



surface of said means, a second layer of adhesive between said tiles and an outer jacket of said heating element and bonded to both said outer jacket and the inner face of said tiles, at each of said voids in said resistance member a connection being formed between said first and second layers of adhesive capable transmitting from the tile to the substratum all of stress required to support said tile.

# 4,677,800 LIGHTWEIGHT ROOFING SYSTEM

David L. Roodvoets, Westerville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 10, 1984, Ser. No. 639,751

Int. Cl.<sup>4</sup> B32B 7/10; E04B 1/80, 7/00

U.S. Cl. 52—309.12

5 Claims



1. A roofing system comprising a roof deck, a waterproof membrane on said roof deck, a plurality of panels of foam plastic insulation on said waterproof membrane, said foam plastic insulation panels having a plurality of ribs having substantially flat tops lying in a common plane and spaced apart by grooves on the upper surface thereof, and a plurality of concrete panels overlying said raised areas, and means securing said concrete panels to said foam plastic insulation panels comprising adhesive on the flat tops of said ribs, each of said concrete panels having a plurality of holes therethrough disposed among the raised areas for ventilation of said foam plastic insulation panels, said holes being arranged in a plurality of rows within each concrete panel aligned with and overlying and communicating with said grooves, wherein said holes permit passage of water and air through each concrete panel into and out of the grooves of said insulating panels to provide ventilation by allowing moisture to escape from the panels and to provide wind resistance.

# 4,677,801 WALL, CEILING AND/OR FLOOR FORMATION AND A METHOD FOR PRODUCING IT

Martin Bard, Seminargasse 26, D-8450 Amberg, Fed. Rep. of Germany

Filed Sep. 11, 1985, Ser. No. 774,919

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433702

Int. Cl.<sup>4</sup> E04B 2/02; H05B 3/36

U.S. Cl. 52—389

6 Claims

1. Means for heating a room having at least one surface forming a rigid substratum, a flat blanket-like heating element

# 4,677,802 SUSPENDED CEILING SYSTEM AND RUNNER

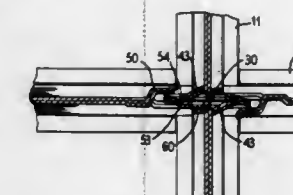
Ronald W. Vukmanic, Naperville, Ill., assignor to Chicago Metallic Corporation, Chicago, Ill.

Filed Mar. 7, 1986, Ser. No. 837,370

Int. Cl.<sup>4</sup> E04B 5/52

U.S. Cl. 52—488

11 Claims



1. A suspended ceiling system comprising main runners extending parallel to each other and cross-runners extending between the main runners at spaced intervals, each of said runners being composed of a first member and a cap member, said first member having an inverted T configuration with a pair of flange elements being connected by webs to an integral bead, each of the flange elements having a first flange portion being connected by an offset portion to a second flange portion extending substantially parallel to the first flange portion, said pair of flange elements defining a longitudinally extending groove opening away from the bead, said cap member having a center portion connected to flange portions by offset portions to provide a configuration matching the configuration of the pair of flange elements, said cap member being secured to the outer edges of the second flange portions with the center portion and offset portions being received in the groove to form a flange arrangement with continuous edges for the runners with a longitudinal channel, each of the cross-runners having ends with a notch formed through the second flange portions and a part of the offset portions to provide offset surfaces for the end surfaces of the second flange portions which offset surfaces are offset from the end surfaces of the first flange portions, remaining parts of the offset portions and the webs, said webs having a tongue extending beyond the end surfaces of the bead and flange portions, each of the webs of the main runners having an elongated slot for receiving the tongues of the cross-runner with the notch receiving the continuous second flange portion of the main runner and the remaining parts of the offset portions and the first flange portions being spaced from the offset portion of the main runner, each

of the tongues having first means cooperating with the elongated slot to lock the tongue in the slot with the offset surface loosely engaging the continuous edges of the second flange portions of the main runner and second means cooperating with the second means of another tongue to interconnect the two tongues together to form an end-to-end joint between cross-runners extending into the elongated slot from opposite directions, said first means being a tab bent from the tongue to form a catch surface facing away from the end of the tongue.

4,677,803

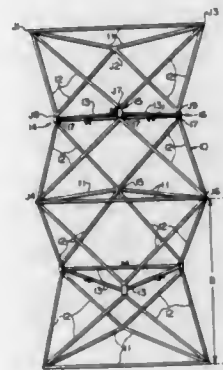
## DEPLOYABLE GEODESIC TRUSS STRUCTURE

Martin M. Mikulas, Jr., Poquoson; Marvin D. Rhodes, and J. Wayne Simonton, both of Yorktown, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 20, 1986, Ser. No. 831,371  
Int. Cl.<sup>4</sup> E04H 12/18

U.S. Cl. 52—646

11 Claims



1. A deployable geodesic truss structure for movement between a collapsed stowed state and an elongated erected state comprising:

- a first equilateral triangle formed by three battens connected at their ends by first, second, and third joint means;
- a second equilateral triangle formed by three battens connected at their ends by fourth, fifth and sixth joint means; said first and second equilateral triangles being spaced from one another;
- six longitudinal cross members connected between said first, second and third joint means and said fourth, fifth and sixth joint means, said cross members being connected so that a first cross member extends from said first joint to said sixth joint, a second cross member extends from said third joint to said fourth joint, a third cross member extends from said first joint to said fifth joint, a fourth cross member extends from said second joint to said fourth joint, a fifth cross member extends from said second to said sixth joint and a sixth cross member extends from said third joint to said fifth joint;
- the first and second cross members being connected by a seventh joint means intermediate their lengths, the third and fourth cross members being connected by an eighth joint member intermediate their lengths and said fifth and sixth cross members being connected by ninth joint means intermediate their lengths;
- three actuator means connected to their ends by said seventh, eighth, and ninth joint means, said actuator means each having an elongated member and means to vary the length of said member whereby the position in space of said seventh, eighth, and ninth joint means can be varied from a compact stowed position wherein all nine of the joints of said structure are spaced into a position where all said joints are substantially adjacent to the same plane with joint pairs one and four; two and five; and three and six

each substantially adjacent to three points on said plane to an erected position wherein the first through third, fourth through sixth and seventh through ninth joints of the structure are substantially spaced from one another.

4,677,804

## DEMOUNTABLE FRAMES

Richard E. Holt, 23 Beauchamp Avenue, Leamington Spa, England

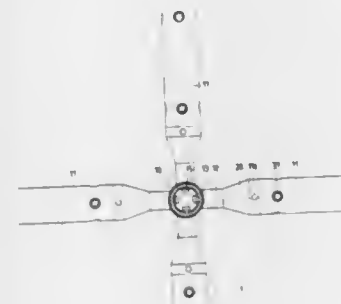
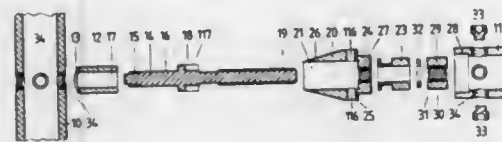
Filed Aug. 27, 1984, Ser. No. 644,396

Claims priority, application United Kingdom, Aug. 26, 1983, 8323093

Int. Cl.<sup>4</sup> F16B 7/00

U.S. Cl. 52—648

17 Claims



1. A demountable frame including two spaced structural members each provided with a screw-threaded aperture, said spaced member arranged with each of said apertures aligned with and facing the other of said apertures at a predetermined distance apart and a transverse structural member extending between said spaced members, each end of said transverse member having a projection extending therefrom, each said projection comprising a pin having a screw-threaded portion at each end thereof and a shoulder intermediate said screw-threaded portions, the screw-threaded portion at the outer end of said pin engageable in a respective one of the apertures to locate said transverse member to the respective one of said spaced member, the pin of each of said projections being temporarily partially axially retractable into the respective end of said transverse member, thereby to reduce the overall length of said transverse member and said projections to less than said distance to permit said transverse member to be fitted between and removed from said two spaced members without moving them apart beyond said distance; a tubular spacer on said pin between the outer end thereof and said shoulder, said spacer having a length such that said spacer is gripped between the outer surface of the adjacent one of said spaced members and said shoulder when the screw-threaded portion at the outer end of said pin has been screwed tightly into the screw-threaded aperture of said one spaced member, the end of the spacer which abuts against the outer surface of said one spaced member having a shape complementary to the shape of said outer surface, said projection also including a locking thimble movable into screw-threaded engagement with the screw-threaded inner end of said pin, said thimble being movable on said screw-threaded inner end to a locking position in which

said thimble engages against the respective end of said transverse member, said shoulder being accessible through an aperture in said thimble, whereby said pin is rotatable in one direction to effect disengagement from said aperture in said one spaced member and corresponding axial movement of said pin relatively to said transverse member to effect said temporary retraction and in the other direction to engage said pin in said aperture in said one spaced member.

4,677,805

## STRUCTURAL CONNECTOR

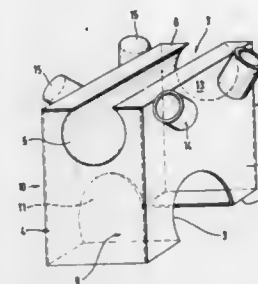
Uriel Schleisner, 68-70 Bar-Kochba Street, Petach Tiqva, Israel  
Filed Sep. 12, 1985, Ser. No. 775,491

Claims priority, application Israel, Nov. 1, 1984, 73390; Mar. 1, 1985, 74479

Int. Cl.<sup>4</sup> F16L 39/00

U.S. Cl. 52—648

12 Claims



1. A structural element connecting joint comprising a hollow multi-sided part with at least two pairs of opposite sides with the sides in each said pair arranged in spaced parallel relation and with said sides in each said pair extending transversely of the sides of the other said pair, each of said sides having an elongated opening, each of said pair of sides having axially aligned openings through each side of said pair with the axis of the openings in one said pair of sides extending transversely of the axis of the other said pair of sides and said axes being spaced apart in the elongated direction of said sides, said aligned openings arranged to receive elongated structural elements extending therethrough with the structural elements disposed transversely of one another, and a number of axially extending spigot-like sleeves secured to and projecting outwardly from at least one of said sides of said part with the axes of each of said sleeves extending obliquely outwardly from the side to which said sleeve is secured, the point of securement of each of said sleeves to said sides being spaced from said openings and the axes of said sleeves extending angularly relative to the axes of said openings.

4,677,806

## WOODEN BUILDING SYSTEM WITH FLANGE

INTERLOCK AND BEAMS FOR USE IN THE SYSTEM  
Roger L. Tuomi, Madison, Wis., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 4, 1986, Ser. No. 848,175

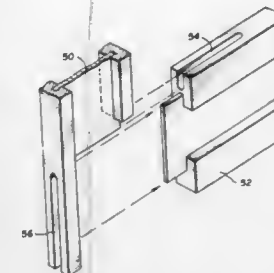
Int. Cl.<sup>4</sup> E04C 3/11

U.S. Cl. 52—656

17 Claims

1. A vertical rectilinear frame for a building comprising a floor beam, right and left wall beams, and a roof beam, said floor, wall and roof beams forming a joint at each of the four junctions of said floor, wall and roof beams, wherein said beams are interlocked at each joint to form a unitized frame having structural continuity among all its beams, whereby said vertical frame functionally comprises a single high strength structural component of said building, each of said beams comprising a web and a plurality of flanges, wherein each of said wall beams at the interlock joint with said roof beam includes a web segment which longitudinally extends beyond its flanges to define an extended web segment, wherein said

extended web segment is connected to said roof beams flanges in slots therein, wherein said extended web segment is coplanar and at least nearly butting with said roof beam's web, wherein one beam of each pair of the interlocking beams at the floor-wall joints includes a web segment which longitudinally extends beyond at least one flange of said one



beam to define an extended web segment on said one beam, wherein said extended web segment on said one beam is connected to at least one flange of the other beam of said pair, wherein said connection is at points across said segment's substantially entire width, wherein said extended web segment on said one beam is coplanar and at least nearly butting with said other beam's web.

4,677,807

## SYSTEM FOR AUTOMATICALLY ENVELOPING A LARGE ROUND BALE WITH A WRAPPING

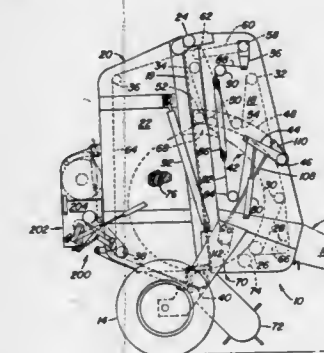
Michael J. Verhulst, and Henry D. Anstey, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 8, 1986, Ser. No. 883,791

Int. Cl.<sup>4</sup> B65B 11/04

U.S. Cl. 53—118

7 Claims



1. In a large round baler including a first device for wrapping a bale located in a bale-forming chamber with twine, said first device having a control circuit including:

- (a) a sump;
- (b) a pump;
- (c) a double acting twine arm cylinder for moving a twine arm between first and second laterally spaced locations adjacent the bale-forming chamber;
- (d) a twine arm cylinder control means coupled to the pump, sump and cylinder for selectively cycling the cylinder for moving the twine arm from its first to its second location and then back to the first location when a bale of a desired size is located in the bale-forming chamber, the improvements comprising: a second device for alternatively wrapping a bale with a wrap material having a width substantially commensurate with said chamber, the second device including:
  - (i) a pair of selectively drivable wrap material drive rolls



for feeding wrap material toward said chamber when driven;

- (ii) normally disengaged drive means coupled to one of said pair of drive rolls;
- (iii) a double-acting hydraulic wrapper feed control cylinder coupled to said drive means for establishing engagement thereof only during movement of the wrapper control cylinder in a first direction; and said wrapper control cylinder being coupled to the twine arm cylinder control means in parallel with said twine arm cylinder for moving in said first direction when the twine arm cylinder is operated to move the twine arm from its first to its second location.

4,677,808

#### ASSEMBLY FOR ASSORTED PACKINGS WITH DIFFERENT PRODUCTS

Alexis Chenevard, Morges, Switzerland, assignor to Sapal, Societe Anonyme des Plieuses Automatiques, Ecublens, Switzerland

Continuation of Ser. No. 708,972, Mar. 7, 1985, abandoned.

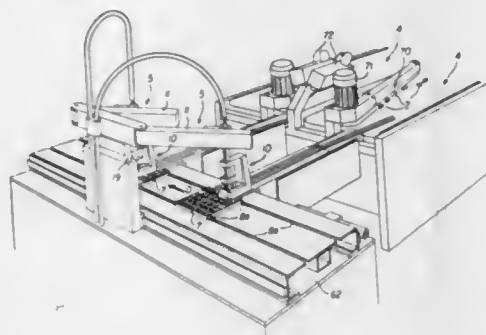
Filed Oct. 22, 1986, Ser. No. 922,831

Claims priority, application Switzerland, Mar. 15, 1984, 1294/84

Int. Cl.<sup>4</sup> B65B 5/00

U.S. Cl. 53—238

9 Claims



1. An assembly for filling preformed containers of assorted packings with different kinds of products, comprising several rigidly fixed transport bands for respectively advancing products of a same kind disposed in a row to corresponding distributing means, at least one belt conveyor associated with each distributing means for advancing the products of a same kind to a filling station for filling the containers with this kind of products, and transport means for intermittently advancing the containers to said filling station, and filling station comprising depositing means for gripping and removing the products from the belt conveyor and depositing the products in said containers wherein the belt conveyor associated with each said distributing means is extensibly and pivotally mounted at a first end adjacent said distributing means on a fixed pivot, and wherein a second end of said belt conveyor remote from said distributing means carries said depositing means, whereby said second end and said associated depositing means are movable together in two directions essentially perpendicular to each other to reach any point of an area covering at least the surface of a preformed container which has been previously positioned in the filling station.

#### 4,677,809 METHOD OF MAKING PACKING MATERIAL WITH ANTI-STATIC COATING

Stuart G. Long, South Laguna, and Michael J. Maciocia, Ontario, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

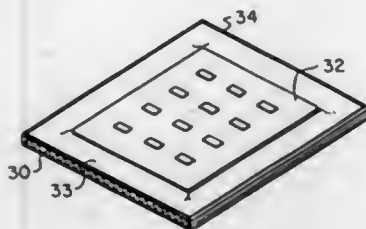
Continuation of Ser. No. 733,221, May 10, 1985, abandoned, which is a division of Ser. No. 597,974, Apr. 9, 1984, abandoned.

This application Jun. 3, 1986, Ser. No. 870,039

Int. Cl.<sup>4</sup> B65B 11/52

U.S. Cl. 53—427

2 Claims



1. A method of making a sealed, anti-static container, comprising the step of employing a skinpackaging procedure to heat seal a sealing sheet of flexible, thermoplastic, electrostatic-free material to a flat, uniplanar sheet of backing material wherein said sheet of backing material comprises a first layer of substantially rigid substrate material and a second layer including an organic plastic heat-sealable material formed on said first layer according to a predetermined manufacturing method separate from said skin-packaging method, said predetermined manufacturing method including the step of adding a tertiary animal fatty amine to said sealing sheet and

4,677,810

#### METHOD AND APPARATUS FOR PLACING FLEXIBLE WEB PIECES INTO CONCAVE SHAPED SHELLS

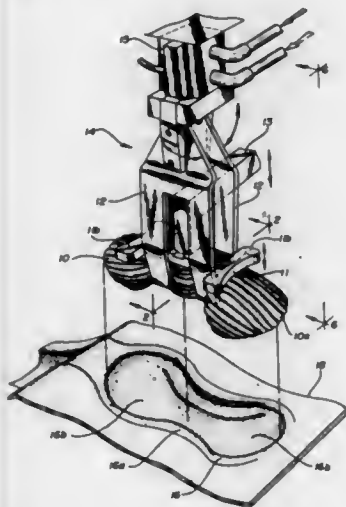
John D. Spano, Bordentown Twsp., Burlington County, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Aug. 15, 1986, Ser. No. 897,224

Int. Cl.<sup>4</sup> B65B 1/24

U.S. Cl. 53—428

16 Claims



10. A method for placing multiple elongated pieces of flat fibrous web each into corresponding concave formed shells, said method comprising:

- (a) providing a plurality of corrugated flat flexible web pieces disposed in parallel relation to each other on rails of a shuttle conveyor;

- (b) moving the parallel web pieces laterally apart from each other while disposed on the shuttle conveyor;
- (c) picking up each said web piece while simultaneously longitudinally crimping the piece to have a convex-shaped upper surface;
- (d) transferring laterally each said crimped web piece and moving the adjacent parallel web pieces longitudinally while simultaneously transferring the web pieces to the formed shells; and
- (e) placing each said crimped web piece into a concave formed shell which is shaped to retain the crimped web piece in the formed shell, including additionally bending upwardly the opposite ends of each said web piece while inserting the piece into the concave shell.

4,677,811

#### METHOD OF AND INSTALLATION FOR PUTTING STACKS OF COINS INTO CARTRIDGES

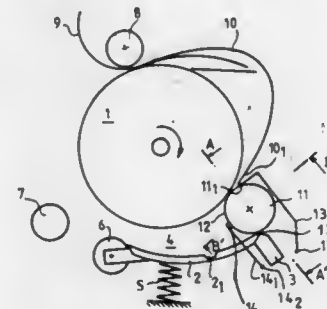
Marcel Brisebarre, Saint Genis Pouilly, France, assignor to Monex S.A., France

Filed Apr. 24, 1986, Ser. No. 856,044

Int. Cl.<sup>4</sup> B65B 11/04

U.S. Cl. 53—456

24 Claims



1. A method of putting stacks of coins into tubes, comprising the steps of:

- partially rolling up a sheet of paper to form at least one complete circumference of a tube of which the circular cross-section is slightly greater than the diameter of the coins to be packaged,
- placing a stack of coins inside the tube,
- moving the stack of coins and the tube towards one of the ends of a corridor, said corridor being defined by two surfaces having parallel generatrices, one of said surfaces being adapted for movement in the direction of displacement of the stack and of the tube so that it displaces the tube and the stack of coins along the corridor by rolling on the non-moving surface, and
- continuing to roll up the sheet of paper around the stack of coins.

4,677,812

#### METHOD FOR SEALING TAMPER-EVIDENT CAPSULES

Amad Tayebi, Westford, Mass., assignor to Capsule Technology International, Ltd., Windsor, Canada

Continuation of Ser. No. 614,746, May 29, 1984, which is a continuation-in-part of Ser. No. 529,162, Sep. 2, 1983, abandoned. This application Aug. 18, 1986, Ser. No. 897,381

Int. Cl.<sup>4</sup> B65B 51/10

U.S. Cl. 53—477

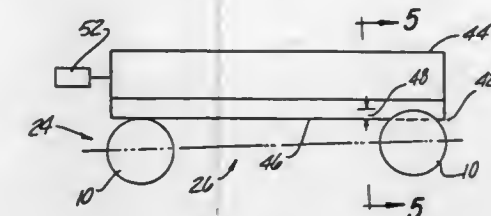
10 Claims

1. A method for sealing a capsule of the type commonly used to contain medication and having an elongated cylindrical body and cylindrical cap that is assembled by slidably inserting said body into said cap so that a portion of the cap overlies a portion of the body, so that an attempt to separate an assembled, sealed capsule will result in the destruction of the capsule to thereby indicate tampering with same, said method for sealing comprising the steps of:

- moving an assembled capsule cap and body and a thin,

elongated bar relative to each other such that said assembled capsule starts its relative movement with its axis spaced a first distance from an edge of one end of said bar and ends its relative movement with its axis spaced a second distance from the edge of the other end of said bar, where said first distance is greater than said second distance, and said capsule rotated during said relative movement, and

heating said elongated bar such that it is hottest at a first point somewhere between the ends of said bar and coolest



at the ends of said bar, the temperature of the edge of said bar at a second point closest to its said one end and at which the edge of said heated bar comes into contact with said capsule being sufficient to heat plasticize the material from which said capsule cap and body are made so that they will deform to thereby form an indentation circumferentially around said assembled capsule at a point where said cap and said body overlies each other, the indentation being deep enough that an attempt to separate said cap from said body will result in them being fractured and thereby indicate tampering with the sealed capsule.

4,677,813

#### CANE HARVESTER

Rodney A. Stiff, Malcolm J. Baker, and Leslie J. Lester, all of Bundaberg, Australia, assignors to Austoft Industries Limited, Canada

Division of Ser. No. 423,262, Sep. 24, 1982, Pat. No. 4,555,896.

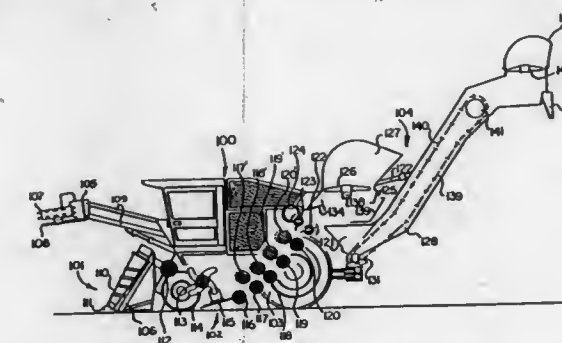
This application Jul. 18, 1985, Ser. No. 756,277

Claims priority, application Australia, Nov. 20, 1981, PF1633

Int. Cl.<sup>4</sup> A01D 34/03

U.S. Cl. 56—13.9

5 Claims



1. A sugar cane harvester comprising chopping means to chop the cane crop into billets, a cleaning chamber to separate the chaff in aid crop from said billets after said crop passes through said chopping means, an energy absorbing plate mounted in said cleaning chamber to contact said billets after said billets leave said chopping means, said plate being adjustably mounted to contact a greater or lesser amount of crop after said crop passes through said chopping means into said cleaning chamber.

4,677,814

**QUICK ATTACH APPARATUS FOR CROP HARVEST HEADER AND THE LIKE**

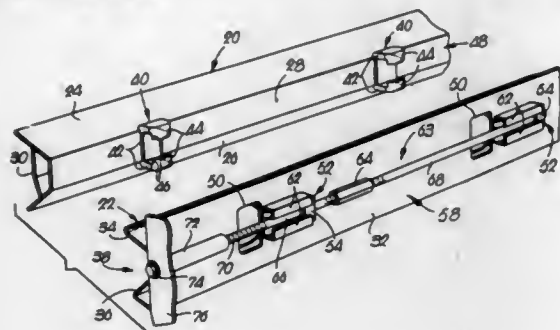
J. Dale Anderson; Kenneth R. McMillen, both of Canton, and Arnold E. Goertz, Buhler, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Jun. 8, 1984, Ser. No. 618,821

Int. Cl.<sup>4</sup> A01D 41/06, 47/00; A01B 51/00

U.S. Cl. 56—15.6

10 Claims



1. In a farm implement having an elongated header-supporting member, and a crop-handling header having an elongated frame member, a mechanism for releasably clamping the members together comprising:

a plurality of keepers spaced longitudinally of the frame member and rigidly secured thereto, the supporting member having an opening for each keeper respectively through which the keepers extend, and a latch for each keeper respectively shiftably mounted on the supporting member, each keeper having a passage for slidably receiving its latch; and

a latch shifter for wedging the latches into their passages between the supporting member and the keepers to draw the members into progressively tighter interengagement, the header and its frame member being disposed forwardly of the supporting member with the members having their longitudinal axes disposed transversely of the normal path of travel of the implement, the supporting member having an upright, flat rearwardly facing surface, and the keepers extending rearwardly from the frame member beyond said surface, the latches being reciprocable longitudinally of said surface in sliding contact therewith as the latches are shifted into their passages, each keeper having a tapered edge spaced rearwardly of said surface, each latch having a rear edge sloped to mate with its corresponding tapered edge, said tapered edges being disposed to slidably receive said rear edges during shifting of the latches along said surface.

4,677,815

**FRICTION ROLLER FOR OPEN-END FRICTION SPINNING**

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Mar. 6, 1986, Ser. No. 836,748

Claims priority, application Fed. Rep. of Germany, May 28, 1985, 3519102

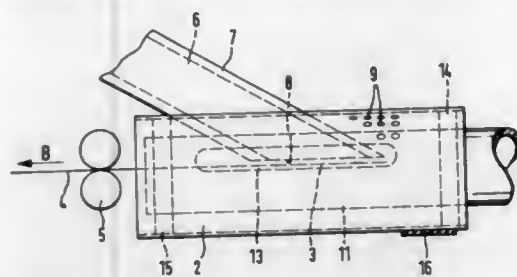
Int. Cl.<sup>4</sup> D01H 1/135; D02G 1/08

U.S. Cl. 57—401

17 Claims

1. Friction roller construction for open-end friction spinning device of the type having a roller yarn forming cover surface portion that imparts friction to fibers and forming yarn in a

yarn formation zone, said yarn forming surface portion exhibiting an outer surface texture which includes a plurality of mi-



crochannels extending essentially in the longitudinal direction of the roller over a substantial length of the roller.

4,677,816

**STRANDING MACHINE**

Stanley Woxholt, Vereeniging, South Africa, assignor to Sharon Wire Mill Corporation (Proprietary) Limited, Transvaal Province, South Africa

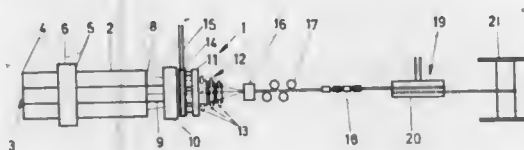
Filed Dec. 16, 1985, Ser. No. 809,330

Claims priority, application South Africa, Dec. 18, 1984, 84/9847

Int. Cl.<sup>4</sup> D07B 3/00

U.S. Cl. 57—59

2 Claims



1. A stranding machine for making multi-stranded cables and the like, filament feeding means comprising elongated tubular filament coil support devices including a central support device for supporting a coil of a core filament and a plurality of winding filament support devices for supporting coils of winding filaments to be wound around said core filament, means external and intermediate the ends of said support devices for mounting the winding filament support devices symmetrically about and with the axes thereof parallel to the axis of said central support device and providing for rotation of said support devices about the axis of said central support device, said support devices having filament feed orifices at the forward ends thereof and being open at the opposite ends for loading coils of filaments therein.

4,677,817

**TRAVELLERS FOR SPINNING MACHINERY**

Hiroyuki Kanai, Ashiya, Japan, assignor to Kanai Juyo Kogyo Kabushiki Kaisha, Itami, Japan

Filed Dec. 19, 1985, Ser. No. 810,711

Int. Cl.<sup>4</sup> D01H 7/60

U.S. Cl. 57—125

5 Claims

1. A traveller for spinning made of a hard steel wire or an alloy steel wire body, having a surface coated with a ceramic

nitride layer selected from the group consisting of TiN, TiCN, ZrN, Si<sub>3</sub>N<sub>4</sub>, TaN, AlN, GaN, BN and InV, said coating being



at least at the surface of a part which makes contact with a ring.

4,677,818

COMPOSITE ROPE AND MANUFACTURE THEREOF  
Kenji Honda, deceased, late of Aichi, Japan (by Reiko Honda, executor), and Tadaaki Sawafuji, Aichi, Japan, assignors to Toho Beslon Co., Ltd. and Tokyo Rope Manufacturing Co., Ltd., both of Japan

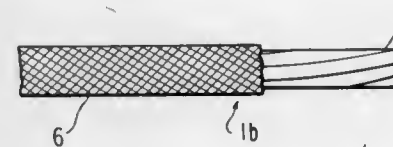
Filed Jul. 11, 1985, Ser. No. 753,838

Claims priority, application Japan, Jul. 11, 1984, 59-143995

Int. Cl.<sup>4</sup> D02G 3/36, 3/38, 3/40

U.S. Cl. 57—224

22 Claims



1. A composite rope obtained by a process comprising  
(1) impregnating a fiber core of a reinforcing fiber bundle with a thermosetting resin,  
(2) coating the outer periphery of the resin-impregnated fiber core with fibers to prevent leakage of said resin from said fiber core, and  
(3) curing the thermosetting resin with heat.

4,677,819

**METHOD AND APPARATUS FOR OPERATING AN OPEN-END FRICTION SPINNING MACHINE**

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

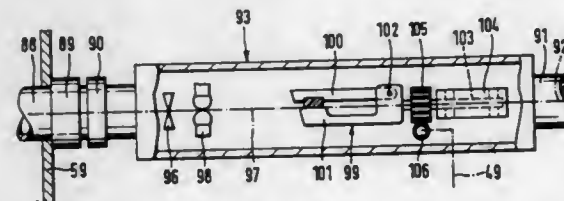
Filed Mar. 20, 1986, Ser. No. 841,936

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510512

Int. Cl.<sup>4</sup> D01H 13/22, 13/32

U.S. Cl. 57—264

26 Claims



1. A method for operating an open-end friction spinning machine of the type having a plurality of spinning units with: drivable friction surface means defining a yarn formation zone; and feeding means for feeding fibers to the yarn formation zone,

said fibers passing through the yarn formation zone along a predetermined path, said process comprising:  
monitoring yarn twist of yarn formed at a spinning unit;  
comparing the monitored yarn twist with a predetermined desired yarn twist value; and  
adjusting at least one parameter of spinning conditions in response to deviations from the predetermined desired yarn twist without changing the predetermined path along which the fibers pass through the yarn formation zone.

4,677,820

**SUCTION CONTROL ARRANGEMENT FOR OPEN-END FRICTION SPINNING**

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

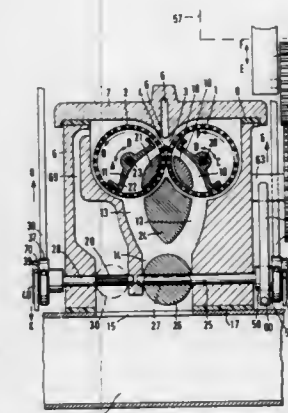
Filed Apr. 3, 1986, Ser. No. 847,475

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514905

Int. Cl.<sup>4</sup> D01H 15/02, 1/135, 7/898

U.S. Cl. 57—401

18 Claims



1. Apparatus for open-end friction spinning comprising: movable friction surface means defining a yarn forming region, suction device means acting on said yarn forming region, valve means for interrupting operation of the suction device means when spinning operations are interrupted and for controlling the magnitude of suction applied during spinning operations, suction device interruption adjusting means for adjusting the movement of the valve means to a position for accommodating interruption of the spinning operations, and suction device control adjusting means for adjusting the control of the valve means to control the magnitude of suction applied during spinning operations, said suction device control adjusting means operating independently of said suction device interruption adjusting means.

4,677,821

**PROCESS START-UP**

Anthony P. Smith, Wilton, England, assignor to Imperial Chemical Industries PLC, London, England  
Continuation of Ser. No. 26,799, Apr. 3, 1979, abandoned. This application Feb. 8, 1982, Ser. No. 347,027

Claims priority, application United Kingdom, Apr. 13, 1978, 14564/78; Feb. 12, 1979, 7904905; Mar. 8, 1979, 7908246

Int. Cl.<sup>4</sup> F02C 7/27

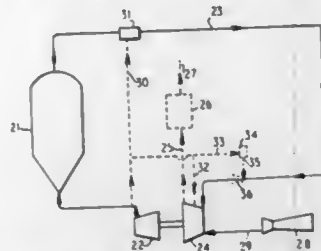
U.S. Cl. 60—39.02

3 Claims

1. A start-up process for a chemical processing plant including at least one compressor, and heat recovery turbine, the start-up process comprising the steps:



providing ducting means for receiving exhaust from a gas turbine engine and directing same into the heat recovery turbine;  
physically and operatively engaging the gas turbine engine through the ducting means to the heat recovery turbine; operating the gas turbine engine so that exhaust therefrom provides start-up energy to the heat recovery engine;



physically and operatively disengaging the gas turbine engine from the heat recovery turbine once said chemical processing plant becomes self-sustaining; and  
utilizing a burner supplied with air from the compressor, said process further comprising the step of selectively introducing additional heated air from the burner into the heat recovery turbine so that the additional heated air supplements said exhaust from said gas turbine engine to provide sufficient start-up energy.

4,677,822

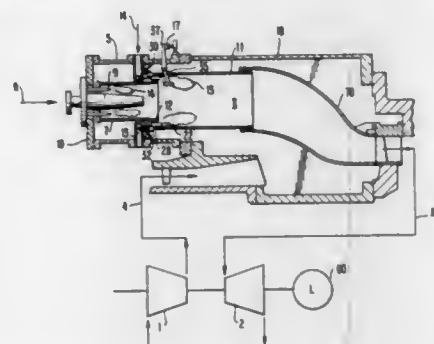
## GAS TURBINE COMBUSTOR

Nobuyuki Iizuka; Katsukuni Hisano; Katsuo Wada; Masashi Kunihiko; Fumiyuki Hirose; Yoji Ishibashi; Isao Sato; Osamu Arai; Hiroshi Inoue, all of Hitachi, and Osamu Sakuda, Jyuh, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Feb. 24, 1986, Ser. No. 831,855

Claims priority, application Japan, Feb. 22, 1985, 60-32703  
Int. Cl. F02C 3/14

U.S. Cl. 60-39.23

8 Claims



1. A gas turbine combustor including air flow rate control means, the combustor comprising:

an inner cylinder means for forming a combustion chamber means therein with an air supply port in a circumferential wall thereof; fuel nozzle means for supplying a fuel into the combustion chamber means; outer cylinder means provided along an exterior of the inner cylinder means for forming a space for air passage between an outer surface of the inner cylinder means and an inner surface of the outer cylinder means; control means provided on an outer side of the inner cylinder means and adapted to be movable substantially in an axial direction of the inner cylinder means for regulating the opening of the air supply port, said control means is cylindrically shaped and surrounds the air supply port in the combustion chamber means; flexible means for supporting the control means in order to maintain the gap between the control means and an

exterior of the air supply port on the inner cylinder means and for allowing movement of the control means substantially in the axial direction of the inner cylinder means, said flexible means is circularly-shaped and has a larger diameter than a diameter of the control means and drive means for moving the control means substantially in the axial direction of the inner cylinder means; and wherein the flexible means is connected with the drive means through a second flexible means spaced in an axial direction of the inner cylinder means with respect to the first flexible means.

4,677,823

## DIESEL ENGINE PARTICULATE TRAP REGENERATION SYSTEM

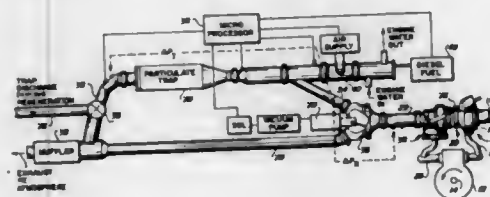
James A. Hardy, Playa Del Rey, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 1, 1985, Ser. No. 794,346

Int. Cl. F01N 3/02

U.S. Cl. 60-274

14 Claims



1. A particulate trap system comprising:  
a particulate trap for filtering exhaust gas entrained particles;  
a bypass conduit in parallel with said particulate trap, said particulate trap and by-pass conduit connected to carry engine exhaust gas by suitable piping;  
valve means for directing exhaust gas to said trap or said bypass conduit;  
burner means upstream of said trap for burning the filtered particles, said burner means including a fuel and air supply systems, said fuel supply system further including a fuel source, a fuel pump, and means for varying the pressure of the fuel; and  
means for controlling the position of said valve means and the operation of said burner means.

4,677,824

## OUTPUT CONTROL APPARATUS FOR STIRLING ENGINES

Masahiko Hasegawa, Anjo; Yoshihiro Naito, Nagoya; Masaru Tsunekawa, Aichi, and Yutaka Momose, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Sep. 26, 1986, Ser. No. 911,871

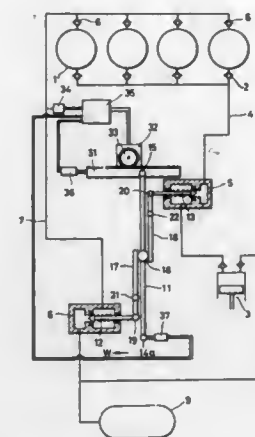
Claims priority, application Japan, Sep. 26, 1985, 60-214065  
Int. Cl. F02C 1/04

U.S. Cl. 60-521

2 Claims

1. A Stirling engine control apparatus comprising:  
a working gas compressor;  
a working gas storage tank;  
a maximum cycle pressure line connecting a working space to said working gas compressor and said working gas tank via a first check valve;  
a pressure reducing valve provided in said maximum cycle pressure line;  
a minimum cycle pressure line connecting said working space to said working gas storage tank via a second check valve;

a pressure boost valve provided in said minimum cycle pressure line;  
an operating lever pivotable about a movable fulcrum for controlling opening and closing of said pressure reducing valve and said pressure boost valve;



a movable member on which the movable fulcrum of said operating lever is provided; and  
control means for positionally shifting said movable member upon comparing a target pressure corresponding to displacement of said operating lever and pressure within said minimum cycle pressure line.

4,677,825

## THERMOMOTOR

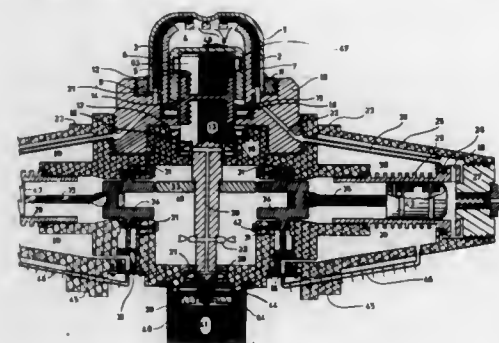
Oscar L. Fellows, P.O. Box 201207, Austin, Tex. 78720

Filed Jun. 12, 1986, Ser. No. 873,686

Int. Cl. F02G 1/04

U.S. Cl. 60-525

1 Claim



1. A Stirling cycle machine of unique mechanical arrangement, comprising a rotatable engine body having a heater head at one end, with a lining of open-cell, foamed metal bonded to its inner surface; a displacer which reciprocates within the heater head; a rotor housing at the opposite end from the heater head, composed of a material which is permeable to electric and magnetic fields, so that said fields pass through said housing unaffected in order to induce currents into the rotor housed within said housing; a plurality of cylinders disposed radially about the circumference of said engine body; a plurality of pistons disposed respectively in said cylinders, said pistons connected respectively to a plurality of rotatable crankshafts disposed within the engine body and positioned with respect to the axes of the reciprocating pistons, said crankshafts connected by gears or other connecting means to a rotatable central shaft so that the rotation of said central shaft is related to and dependent upon the reciprocating movements of said pistons; a plurality of rollers affixed to the sides of said central shaft at one end, which connect the central shaft to the

displacer by means of a camming groove machined into the displacer in which said rollers ride; an electromagnetic induction rotor affixed to the opposite end of said central shaft which rotates in conjunction with the central shaft; a plurality of centrifugal pumps connected by means of coupled shafts to the aforesaid crankshafts, said pumps housed within the engine body and connected by means of coolant passages within the engine body, to heat exchangers affixed externally to the engine body and disposed adjacent and parallel to the exterior plane of the engine body; an electromagnetic stator comprised of field windings formed of electrical conductors, said stator mounted externally to, and unconnected mechanically to, the engine body; an engine mounting frame which supports the engine body and attaches the entire machine to the device or load to be driven, or to an engine support of some sort, said frame also supporting the stator and peripheral equipment; a connecting means affixed to the body of the engine for the purpose of transmitting the motion of the engine body to an output shaft mounted in the engine frame; a plurality of engine support bearings which support the engine body within said frame; filler and drain plugs located in the exterior surface of the engine body for the purpose of adding or removing coolant or lubricant; a seal mounted on, and disposed annularly about, the upper end of the ceramic coupling which joins the displacer shaft and displacer shaft head, said seal composed of titanium or other high temperature material; a hollow washer and ring seal located beneath the heater head liner, and disposed annularly about the displacer shaft coupling, said seal composed of titanium or other high temperature material; a seal located in the upper displacer shaft bearing support plate, and disposed annularly about the displacer shaft; a seal located in the lower displacer shaft bearing boss, and disposed annularly about the rotor end of the displacer shaft; an oil circulating pump or means attached to, and disposed annularly about, the displacer shaft, said means promoting lubricant to the displacer shaft bearings and other engine parts requiring lubrication; a plurality of bearings within the engine body, which support the displacer shaft and piston crankshafts in their respective positions; a one-way valve located atop the displacer, said valve provided for the purpose of allowing automatic escape of working gas entrapped beneath the displacer; a plurality of roller bearings affixed to the sides of the displacer, which guide the displacer within a heater head liner which fits inside the heater head in close contact with the metal foam lining, said rollers riding in guide slots made into the inside surface, parallel to the axis of said heater head liner; a plurality of quick-connect valves located in the respective cylinder sleeve retaining fittings which seal the cylinder cavities, at the surface of the engine body, said valves allowing the addition or removal of the working gas, a ceramic thermal break which fits between the heater head assembly and the engine body, to reduce conduction between the heater head and engine body; a plurality of passages made through the ceramic thermal break, which conduct the working gas between the heater head and the gas cooler tubes to the cylinders, said gas cooler tubes disposed from the ceramic break to the respective cylinders through the coolant jacket of the engine body; a plurality of porous metal disks, said discs disposed within the aforesaid passages in the ceramic break, said discs acting as regenerative devices which remove and restore thermal energy from and to the working gas as it passes through said discs.

4,677,826

**OUTBOARD MOTOR WITH TURBO-CHARGER**

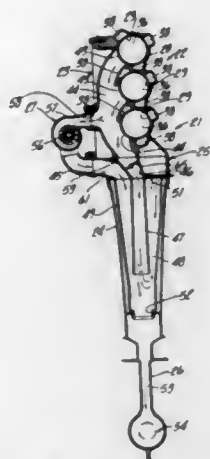
Tomio Iwai, Hamamatsu, and Yukio Matsushita, Iwata, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 614,439, May 25, 1984, Pat. No. 4,630,446. This application May 30, 1986, Ser. No. 868,754. Claims priority, application Japan, May 27, 1983, 58-92340; May 27, 1983, 58-92341; May 27, 1983, 58-92342

Int. Cl.<sup>4</sup> F02B 37/00

U.S. Cl. 60—602

6 Claims



1. In a turbo-charger arrangement for a two cycle, crankcase compression, multiple cylinder internal combustion engine comprising an exhaust chamber for receiving exhaust gases from the cylinders, an exhaust system including an exhaust pipe extending from said exhaust chamber, an expansion chamber, said exhaust pipe discharging into said expansion chamber for receipt of said exhaust gases from said exhaust chamber and a turbo-charger having a turbine stage inlet and exhaust, the improvement comprising said turbine stage inlet being in direct communication with said exhaust chamber for driving the turbine from the exhaust gases in said exhaust chamber.

4,677,827

**NATURAL GAS DEPRESSURIZATION POWER RECOVERY AND REHEAT**

Thirahalli A. Shenoy, Whitehall, and John C. Tao, Perkiomenville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 22, 1985, Ser. No. 704,679  
Int. Cl.<sup>4</sup> F01K 23/04, 25/06

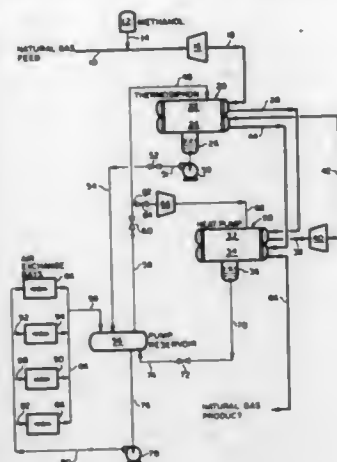
U.S. Cl. 60—648

13 Claims

1. A process for reduction in pressure of natural gas with the recovery of net power and the control of the temperature of the low pressure natural gas product by heat exchange with ambient atmosphere comprising the step of:

- introducing high pressure natural gas at a pressure in the range of 100 to 2000 psia into an expansion turbine;
- expanding the natural gas to a low pressure in the range of 40 to 100 psia and a resulting low temperature in the expansion turbine and recovering power from said turbine;
- rewarming the low pressure, low temperature natural gas in at least two stages by heat exchange with an ambient atmosphere comprising:
  - indirect heat exchange of said natural gas with a refrigerant in a thermosiphon cycle which indirectly heat exchanges with said ambient atmosphere;
  - indirect heat exchange of the natural gas of substep (1)

with a refrigerant in a heat pump cycle which indirectly heat exchanges with said ambient atmosphere;



(d) recovering the natural gas at a low pressure and at a relatively warm temperature of at least 35° F.

4,677,828

**CIRCUMFERENTIALLY AREA RULED DUCT**

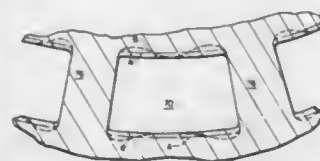
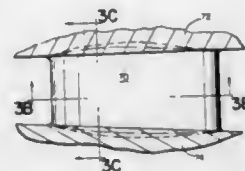
John A. Matthews, Melrose; Edmund E. Striebel, South Windsor; Domingo Sepulveda, Vernon, and Francis C. Pane, Jr., South Windsor, all of, assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 504,996, Jun. 16, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 671,385

Int. Cl.<sup>4</sup> F02C 1/00

U.S. Cl. 60—751

2 Claims



1. In combination, a gas turbine engine having a burner for receiving a working medium, an annular diffuser having an inner conically shaped wall and an outer conically shaped wall diverging relative to each other for diffusing said working medium prior to entering said burner, at least eight, but less than 20, equally spaced struts between said inner wall and outer wall supporting said walls in spaced relationship, said struts defining with said inner and outer walls open-ended passageways within said diffuser and being an obstruction to the flow passing therethrough, means for compensating for said obstruction to obtain a relatively uniform velocity profile in the circumferential direction, said means including a circumferential increase in cross sectional flow area of each of the diffuser passageways formed by each of said inner and outer walls on either side of each of said struts, and said inner and outer walls having a displaced portion of concave shape merging with an adjacent strut and further including convex wall

portions disposed between each pair of adjacent concave portions.

4,677,829

**METHOD FOR INCREASING THE EFFICIENCY OF GAS TURBINE GENERATOR SYSTEMS USING LOW BTU GASEOUS FUELS**

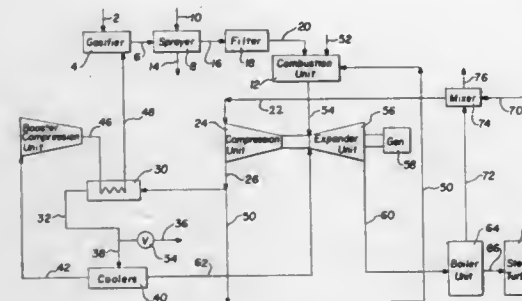
David H. Archer, Ross Township, Allegheny County, and M. Mushtaq Ahmed, Turtle Creek, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1986, Ser. No. 827,036

Int. Cl.<sup>4</sup> F02C 3/28

U.S. Cl. 60—39.02

14 Claims



1. In a process for operating a gas turbine system containing a compression unit, a combustion unit and an expansion unit to operate a generator, and wherein a portion of the air from said compression unit is bled from the system so as to prevent surges in said compression unit by limiting the flow of combustion gases to said expansion unit, the improvement comprising using a gaseous fuel having a low BTU value in said combustion unit with the discharge of hot combustion exhaust gases therefrom, heating the air charged to said compression unit and reducing the volume of air from said compression unit that is bled from the system and thereby increasing the efficiency of the gas turbine system.

4,677,830

**AIR CONDITIONING SYSTEM FOR AUTOMOTIVE VEHICLES**

Seiji Sumikawa, and Ichiro Noguchi, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

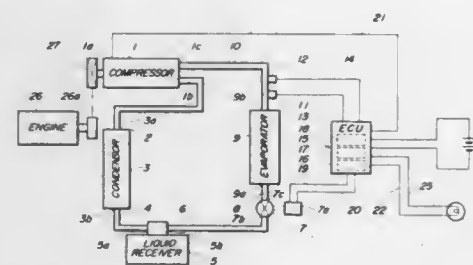
Filed Sep. 11, 1985, Ser. No. 774,760

Claims priority, application Japan, Sep. 17, 1984, 59-192607

Int. Cl.<sup>4</sup> F25B 41/04

U.S. Cl. 62—126

1 Claim



1. In an air conditioning system for an automotive vehicle having a passenger compartment, including a compressor having a driving shaft driven by an automotive engine having an output shaft to compress refrigerant circulating in said system, an electromagnetic clutch interposed between said driving shaft of said compressor and said output shaft of said engine, a condenser for cooling the refrigerant compressed by said compressor to liquefy same, an expansion valve for con-

trolling the flow rate of the liquefied refrigerant to proper values corresponding to thermal load on said air conditioning system, an evaporator for evaporating the liquefied refrigerant to cool air to be blown into said passenger compartment through heat exchange thereof with the refrigerant, a temperature sensor and a pressure sensor for detecting, respectively, the temperature and pressure of the refrigerant at an outlet of said evaporator, and an expansion valve control means for controlling the opening of said expansion valve in response to output signals from said temperature sensor and said pressure sensor,

the improvement comprising:

electronic control means in which said expansion valve control means is provided, said electronic control means including conversion means for electrically converting the pressure of refrigerant detected by said pressure sensor to a corresponding saturation temperature of the refrigerant, and determining means for electronically determining whether or not the quantity of the refrigerant in said air conditioning system is smaller than a required value through comparison of the difference between the temperature of the refrigerant detected by said temperature sensor and the corresponding saturation temperature of the refrigerant obtained by the conversion by said conversion means with a predetermined reference value, said determining means including means for determining whether or not the quantity of the refrigerant is smaller than said required quantity immediately after the start of said compressor; and

indicator means controlled by said electronic control means for indicating the existence of an abnormality when said determining means determines that the quantity of the refrigerant is smaller than said required value; said expansion valve control means also being operable to interrupt power transmission from said engine to said compressor by disengaging the electromagnetic clutch when said determining means determines that the quantity of the refrigerant is smaller than said required value.

4,677,831

**APPARATUS FOR LAYING TRANSVERSE WEFT THREADS FOR A WARP KNITTING MACHINE**

Roland Wunner, Schwarzenbach/Wald, Fed. Rep. of Germany, assignor to Liba Maschinenfabrik GmbH, Naila, Fed. Rep. of Germany

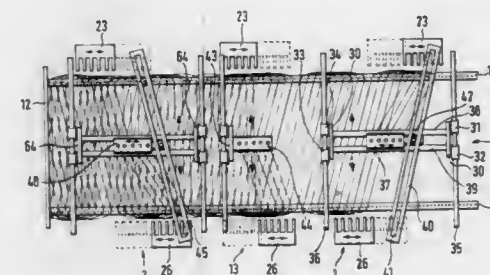
Continuation of Ser. No. 674,648, Nov. 26, 1984. This application May 5, 1986, Ser. No. 860,699

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3343048

Int. Cl.<sup>4</sup> D04B 23/06

U.S. Cl. 66—84 A

14 Claims



1. A weft thread laying apparatus for warp knitting machines having a needle bed and two spaced apart longitudinal conveyors for continuously weft threads in a given direction to the needle bed, the apparatus comprising: first and second carriage reciprocally movable between said two longitudinal conveyors in a substantially transverse direction to the movement of said conveyors, with said second carriage spaced from said first carriage and



located intermediate said needle bed and said first carriage;  
 first and second thread laying guides carried on said first and second carriages, respectively, and adapted for movement in a direction relative to the direction of movement of said conveyors to lay a first and a second plurality of parallel weft threads between said conveyors;  
 first and second runway rails cooperating with said first and second thread laying guides, respectively, to guide the same in a given reciprocal path between said opposed conveyors;  
 first and second guide rails being movable relative to the direction of movement of said conveyors to cause said thread laying guides lay said plurality of first and second weft threads at an angle of 20° or greater as viewed transversely to the direction of travel of said conveyors;  
 a pair of displacement combs for each of said first and second thread laying guides, with each comb of said pair located outwardly adjacent each of the opposed conveyors and adapted to pick the plurality of weft threads from said thread laying guide substantially at the location where said thread guide carried by said thread carriage passes over one conveyor, reverses direction, and moves in that angular reciprocal path determined by said rail toward said other conveyor;  
 each comb of said pair movable in a reciprocable path parallel to said conveyors that distance necessary for said thread guide to lay successive equal widths of a given plurality of weft threads in parallel onto its respective conveyor;  
 whereby each of said combs can receive a given plurality of parallel weft threads from said thread guide, locate the same on the respective adjacent conveyor and then move in a direction opposite to that of the conveyor that distance necessary for said thread guide to place a successive equal width of the given plurality of parallel weft threads onto the conveyor so that all the weft threads of each of said first and second thread guides extend in parallel between said opposed conveyors, said plurality of weft threads from said first and second thread guides retained in position thereon until knitted together at the needle bed.

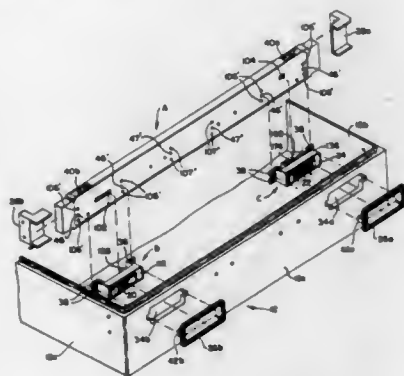
4,677,832

## LUGGAGE LATCHING SYSTEM

Richard C. Remington, Pompton Plains, N.J., assignor to Kidde, Inc. (Presto Lock Company Division), Garfield, N.J.  
 Continuation of Ser. No. 524,691, Aug. 19, 1983, abandoned, which is a continuation of Ser. No. 240,848, Mar. 5, 1987, abandoned. This application Apr. 7, 1986, Ser. No. 850,073  
 Int. Cl.<sup>4</sup> E05B 65/52

U.S. Cl. 70—67

38 Claims



1. A luggage article latching system including an elongate latch console comprising spaced hasp-engageable and disengageable latches, drive means for operating said latches in unison and means permitting an actuator assembly for operat-

ing said drive means to be mounted on said console selectively in alternative locations.

4,677,833

## BAG LOCK

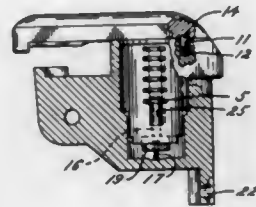
Frank J. Scherblag, deceased, late of Cook, and by F. J. Scherblag, Jr., executor, Peoria, both of Ill., assignors to Warrior Corporation, Bensenville, Ill.

Filed May 12, 1986, Ser. No. 861,929

Int. Cl.<sup>4</sup> E05B 67/38

U.S. Cl. 70—68

6 Claims



1. In a bag zipper locking device having a lock housing and anvil with a tubular bore therein,  
 a rotatable keeper arm carrying a lock cylinder assembly containing resiliently biased lock tumblers,  
 and said keeper arm moveable between an open position transverse to the lock housing anvil and a closed position axially aligned with the lock housing anvil,  
 said resiliently biased lock tumblers included within the key-receiving lock cylinder assembly in said keeper arm being retractable upon insertion of the proper key into the axial keyway, the improvement comprising, in combination,  
 a cammed surface, upper spring-loaded detent pin in said housing which is upwardly biased against said keeper arm and, when aligned in the lock-closed position, said pin is upwardly biased into a cooperating notch in said keeper arm precluding inadvertent rotation, and  
 a lower detent pin contained at the bottom of the tubular bore in said lock housing which is resiliently biased into the axial keyway to block at least one of said resiliently biased lock tumblers until depressed by insertion of the proper key to permit the tumblers to be actuated for opening the lock.

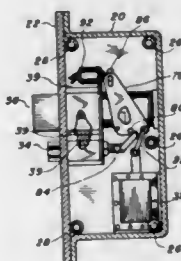
4,677,834

## ELECTRO-MECHANICAL SECURITY LOCK

Cecil B. Hicks, 13200 Bombay St., Sylmar, Calif. 91342  
 Continuation-in-part of Ser. No. 763,424, Aug. 7, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 909,279  
 Int. Cl.<sup>4</sup> E05B 47/00

U.S. Cl. 70—279

6 Claims



1. A security lock for architectural security systems comprising:  
 (a) a housing, having a faceplate on one narrow end and a

cover on one wide side, formed into a rectangular shape defining a box-like structure;  
 (b) a key release cylinder, having a rotatable pawl, installed through said housing cover providing a key actuated mechanism for manual operation of said lock;  
 (c) an electromagnetic solenoid mounted inside said housing having a linear moving plunger providing mechanical movement when electrically energized therewith;  
 (d) a spring loaded latchbolt having an integral roller penetrates through said faceplate in a retractable manner providing a secondary latch for said lock;  
 (e) a door latch assembly having a conical nosed dead lock follower within a latch barrel restrained by a plurality of round solid balls penetrates said faceplate in a retractable manner providing a latch for said lock; and,  
 (f) connecting linkage means unites said solenoid, latchbolt, door latch and cylinder together in such a manner as to retract said latchbolt and door latch simultaneously when said solenoid is electrically energized, and also when said cylinder is rotated by said key providing a dual electrical and mechanical operation.

4,677,835

## PLASTIC CARD/KEY COMBINATION AND HINGE STRUCTURE

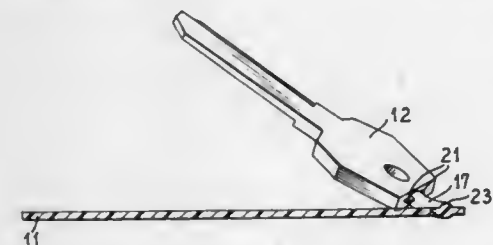
Robert Almblad, Phoenix, Ariz., assignor to Donald Almblad, Morton Grove, Ill.

Filed Apr. 10, 1986, Ser. No. 850,155

Int. Cl.<sup>4</sup> A47G 29/10

U.S. Cl. 70—456 R

20 Claims



1. A key and card combination formed from molded plastic material and presenting a one-piece unitary molding, comprising:  
 a key carrying card with a key-shaped recess socket in the plane of the card;  
 a key separably located in the recess socket and formed in one piece with the card, and as an integral part of said molding;  
 and integral multidirectional hinge means comprising a unitary part of said molding and formed from the same material as the key and card and integrally connecting an edge of a head end of the key to an edge of the card in said socket and adapting the key to be swung out from and swung back into the plane of the card; and  
 said hinge means comprising a generally rod-shaped elongated element permitting the key to be not only swung as aforesaid, but enabling twisting of the key relative to the card on and about said hinge.

4,677,836

## APPARATUS FOR FLANGING AND SPLINING A THIN-WALLED POWER TRANSMISSION MEMBER

Carl E. Anderson, Mt. Clemens, and James T. Killop, Warren, both of Mich., assignors to Anderson-Cook, Inc., Fraser, Mich.

Continuation-in-part of Ser. No. 626,286, Jun. 29, 1984, abandoned. This application Jun. 12, 1985, Ser. No. 747,971

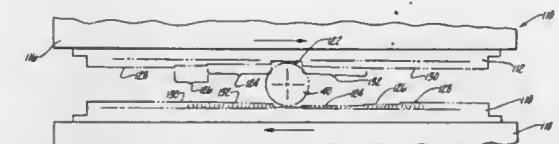
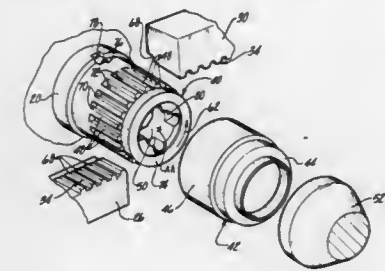
Int. Cl.<sup>4</sup> B21H 3/06

U.S. Cl. 72—88

19 Claims

1. Apparatus (110,210) for flanging and splining a thin-walled blank to make a splined power transmission member

(42) comprising: a plurality of die members (26,30; 112,114; 138,140) having opposed toothed work surfaces (34); a toothed mandrel (40) positioned between the opposed work surfaces (34) of the dies for receiving a blank (42) to be splined; means for moving said die members relative to each other to cause their respective work surfaces (34) to move in opposite directions to perform a spline forming operation in cooperation with said mandrel; characterized by cooperating chamfering means (68,70) on said dies and mandrel operable during a spline forming operation for forming an outwardly projecting chamfered flange (66) on the blank; a loading notch (122) formed intermediately in each of the work surfaces (34), said notches (122)



located in opposed relationship to one another in a loading position of the die members (112,114; 138,140) for receiving the mandrel (40) with a blank (42) mounted thereon prior to a spline forming operation, each of said work surfaces (34) having rough forming teeth (124,126,128) and finish forming teeth (130,132) located on opposite sides of said loading notch (122) the die members (112,114; 138,140) being sequentially movable in opposed directions from the loading position to cause the rough forming teeth (24,126,128) to perform a rough forming operation on the blank (42) and then in a reverse direction to cause the finish forming teeth (130,132) to perform a finish forming operation on the blank (42).

4,677,837

## FLAT DIE THREAD ROLLER

Warren M. Jackson, Rockford, Ill., assignor to Warren M. Jackson, Inc., Rockford, Ill.

Division of Ser. No. 551,476, Nov. 14, 1983, Pat. No. 4,583,385. This application Jan. 27, 1986, Ser. No. 822,476

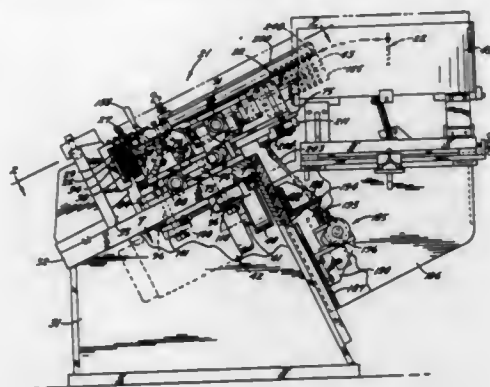
Int. Cl.<sup>4</sup> B21H 3/06

U.S. Cl. 72—88

6 Claims

1. A flat die thread rolling machine comprising a support, stationary and movable dies on said support, means for reciprocating said movable die back and forth relative to said stationary die to form a thread on a fastener blank located between the dies, mechanism for feeding successive fastener blanks between said dies, a hopper for storing a supply of fastener blanks, and a pair of elongated and laterally spaced parallel rails extending between said hopper and said feeding mechanism for delivering fastener blanks forwardly from said hopper to said feeding mechanism, the improvement in said machine comprising, means mounting said hopper on said support for up and down adjustment, means mounting said rails on said support for up and down adjustment, a reversible poweroperated drive mechanism operably connected to said hopper and said rails and operable when actuated to simultaneously adjust said hopper and said rails upwardly or downwardly on said support, means for adjusting one of said rails toward and away

from the other of said rails to enable the lateral spacing between the rails to be changed, said drive mechanism having drive train means for permitting adjustment of said one rail



toward and away from said other rail while maintaining an operative drive to said rails for adjusting said rails upwardly and downwardly in unison.

4,677,838

### INSTALLATION FOR PREPARING METAL BILLETS FOR EXTRUSION

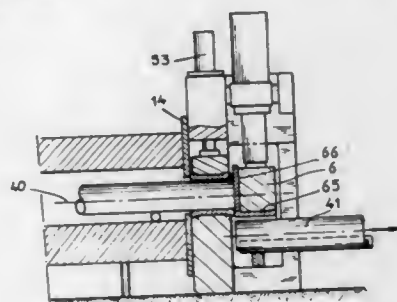
Gay Bessey, Anvers sur Oise, and Claude Bimbert, Neuilly-Plaisance, both of France, assignors to CLECIM, Courbevoie, France

Filed Dec. 10, 1985, Ser. No. 807,084

Claims priority, application France, Dec. 10, 1984, 84 18811  
Int. Cl.<sup>4</sup> B21C 29/00

U.S. Cl. 72-254

4 Claims



1. An installation for preparing metal billets to be extruded, comprising a furnace heating a metal bloom and a shear cutting the bloom into billets of a length suitable for extrusion,

- said furnace comprising a heating enclosure defining an elongate receptacle of a length at least equal to that of said bloom and means for pushing said bloom out of said receptacle along a longitudinal axis of movement, passing through an outlet orifice located at one end of the latter;
- said shear comprising connected jaws, each defining an orifice of a cross-section substantially equal to that of said bloom and centered on the axis of movement of the latter;
- said jaws including a pair of rear jaws mounted in a fixed frame adjacent to said furnace and at least one front jaw mounted for transverse sliding movement relative to the axis of movement of said bloom along said rear jaws on the opposite side to said furnace and associated with means for controlling the shearing of a specific length of said bloom as a result of sliding;
- said rear jaws being placed directly against an outlet end of said furnace in an extension of said receptacle, so as to form together with said receptacle a substantially continuous enclosure;
- said front jaw being maintained in alignment with said receptacle after transverse sliding, said front jaw forming

in this position a door closing said furnace between two shearing operations;

- a rear face part of said front jaw arranged in alignment with said receptacle after sliding being provided with a plate made of refractory material for shutting off said orifice limited by said rear jaws.

4,677,839

### APPARATUS FOR SHAPING A SPIRAL CATALYST SUPPORT

William B. Retallick, West Chester, Pa., assignor to Camet, Inc., Hiram, Ohio

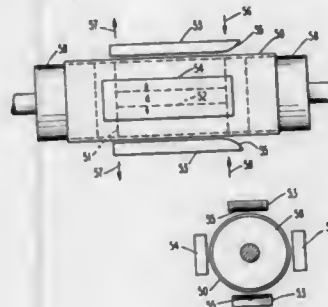
Division of Ser. No. 763,975, Aug. 9, 1985, Pat. No. 4,598,063.

This application Mar. 27, 1986, Ser. No. 844,607

Int. Cl.<sup>4</sup> B21J 13/00; B21D 53/84

U.S. Cl. 72-402

7 Claims



6. Apparatus for shaping a honeycomb catalyst support, the support being contained in a tube, the support including at least one strip of metal which is spirally wound on a generally cylindrical core to form a cylindrical catalyst support, the tube and the support having two ends of generally circular shape, the apparatus comprising two pairs of plates, the plates of both pairs being disposed at diametrically opposite sides of the tube, and between the ends of the tube, the plates being movable towards each other at one end of the tube and away from each other at the other end of the tube, such that movement of the plates towards the tube compresses the tube and the catalyst support contained therein, and means for moving the plates towards and away from the tube, wherein the moving means is configured such that the plates of the first pair move towards each other at the first end of the tube, while the plates of the second pair move away from each other at the first end of the tube, and wherein the plates of the second pair move towards each other at the second end of the tube, while the plates of the first pair move away from each other at the second end of the tube.

4,677,840

### AUTOMOTIVE BODY TOOL

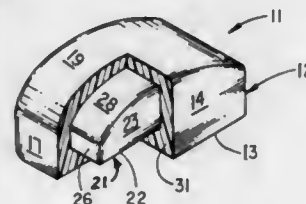
Joseph A. Kellogg, Suisun City, and James E. Prather, Fairfield, both of Calif., assignors to Non Mar, Inc., Fairfield, Calif.

Filed Jan. 14, 1986, Ser. No. 818,585

Int. Cl.<sup>4</sup> B21B 25/00

U.S. Cl. 72-465

6 Claims



1. An automotive body tool comprising:

- a core of iron or similar heavy material having a planar bottom, a pair of longitudinal side walls, a pair of transverse end walls and an arcuate top; and,
- a core covering of elastomeric material having a first predetermined thickness over all surfaces of said core except the bottom, and a second predetermined thickness over the bottom, said second predetermined thickness being approximately twice said first predetermined thickness, said covering having an arcuate top, transverse end walls, longitudinal side walls and a planar bottom for face to face engagement with a planar sheet of automotive door panel material as said sheet is installed on a door framework.

4,677,841

### METHOD AND APPARATUS FOR MEASURING THE RELATIVE DENSITY OF GASES

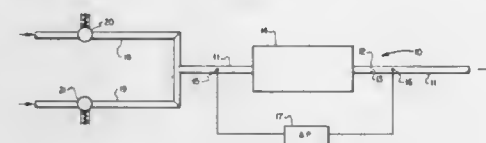
Lyn R. Kennedy, Dallas, Tex., assignor to Precision Measurement, Inc., Duncanville, Tex.

Continuation of Ser. No. 597,176, Apr. 5, 1984, abandoned. This application Mar. 6, 1986, Ser. No. 836,860

Int. Cl.<sup>4</sup> G01N 9/26, 9/32

U.S. Cl. 73-30

16 Claims



1. A method for measuring the relative density of a gas comprising:  
flowing said gas under an applied pressure through an orifice or pore in a line;  
measuring the pressure drop in said gas; and calculating the flow rate of said gas from said measured pressure drop; said orifice or pore being very small relative to said line and sized with respect to the applied pressure so that deviations from ideal behavior of said flowing gas are substantially balanced by other flow effects, thus rendering an orifice discharge coefficient unnecessary in calculating flow rate from said measured pressure drop, the square of said flow rate being inversely proportional to said relative density.

4,677,842

### ULTRASONIC DENSITY MEASUREMENT

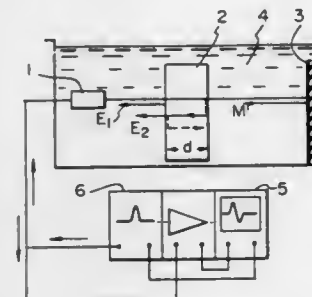
Luc Piché, Montreal, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 713,341, Mar. 18, 1985, abandoned. This application Jul. 3, 1986, Ser. No. 881,972

Int. Cl.<sup>4</sup> G01N 9/00

U.S. Cl. 73-32 A

6 Claims



1. An apparatus for determining the density of a polyethylene sample comprising:  
transducer means for transmitting and detecting an ultrasonic pulse having a frequency of greater than 1 MHz, an

ultrasonic reflector, and means providing for immersion of the transducer means, reflector and the sample in a liquid; means for measuring the time delays of a transmitted pulse reflected from each of the reflector, the front surface of the sample, and the rear surface of the sample; and means for computing the velocity of ultrasound through the sample in accordance with the equation  $v=c(\Delta t/2\tau+1)$  wherein  $c$  is the velocity of ultrasound in the liquid,  $\Delta t$  is the difference in the time delay taken with and without the sample in the liquid,  $2\tau$  is the time delay of the reflected pulse returning from the rear surface of the sample after the front surface, wherein the density is determined from a predetermined relationship of density to ultrasonic velocity.

4,677,843

### ROLLER OVEN FOR TESTING FLUIDS

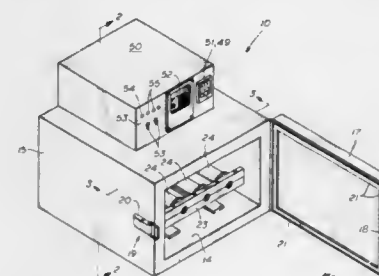
Royce E. Schroeder, Spring, Tex., assignor to OFI Testing Equipment Inc., Houston, Tex.

Filed Jan. 23, 1985, Ser. No. 694,024

Int. Cl.<sup>4</sup> G01N 11/00, 25/00; F27B 17/02; F27D 21/02

U.S. Cl. 73-54

13 Claims



1. An apparatus for testing fluid samples to determine the effect of temperature and various chemical additives on rheological, filtration and chemical properties under simulated circulating conditions comprising, in combination;  
an enclosable environmental chamber capable of maintaining its interior at a predetermined temperature and having a sealable door member,  
a cylindrical container having an end opening with a removable cover sealed for receiving a fluid material for testing and removably positioned in said chamber,  
supporting means for rotatably supporting said fluid container,  
means for turning said supporting means to rotate said chamber,  
heating means positioned at the bottom of said chamber underlying said supporting means for heating the interior of said chamber and said fluid,  
temperature measuring means for measuring the temperature within said chamber,  
temperature indicating means supported outside said chamber on the top thereof,  
thermostat means positioned outside said chamber on the top thereof and cooperative with said heating means for establishing and maintaining a predetermined temperature within said chamber, and  
a housing exterior to said chamber on the top thereof enclosing said temperature indicating means and said thermostat means for easy access and visibility.

12. A method of testing fluid samples to determine the effects of temperature and chemical additives on rheological, filtration and chemical properties under simulated circulating conditions comprising the steps of;  
measuring the rheological, filtration and chemical properties of said fluid sample and placing said sample into a sealed enclosure,



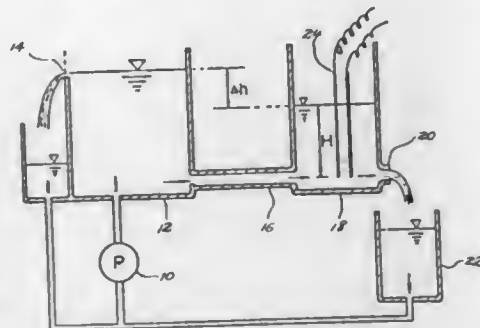
preheating an environmental chamber as defined in claim 1 to a predetermined temperature, placing said sealed enclosure into said preheated environmental chamber on rotatable rollers, rotating said rollers and said enclosure for a predetermined length of time at a predetermined temperature, removing said enclosure from said chamber, and measuring the change in rheological, filtration and chemical properties of said fluid sample due to the effect of the temperature and time to which said sample was subjected.

4,677,844

**APPARENT VISCOSITY MEASURING APPARATUS**  
Noboru Sonoda, Ichihara, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan  
Filed Sep. 26, 1985, Ser. No. 780,471  
Claims priority, application Japan, Oct. 17, 1984, 59-219270  
Int. Cl.<sup>4</sup> G01N 11/04

U.S. Cl. 73-55

5 Claims



1. An apparent viscosity measuring apparatus wherein grease is pushed out under pressure through at least one capillary tube and the pressure applied to the grease during push-out is measured to thereby seek an apparent viscosity, comprising:

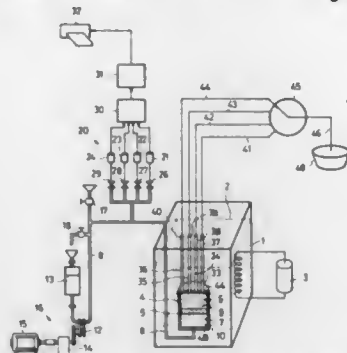
- a cylinder, in which a piston is inserted, and lid members are provided at opposite ends thereof, respectively, whereby there are defined a first chamber for containing a test sample and a second chamber for containing hydraulic oil to push said piston;
- means for feeding the hydraulic oil to said second chamber so as to push said piston toward said first chamber;
- a plurality of capillary tubes each constructed such that one end thereof is secured to a first of said lid members to simultaneously provide communication between said first chamber and each of said capillary tubes, said capillary tubes each having a different inner diameter;
- switching means for selectively opening a selected one of the other ends of said capillary tubes to atmosphere one after another; and
- means for measuring the pressure applied to the hydraulic oil when the grease is pushed out of said capillary tube, said pressure measuring devices, each having a different measuring range to thereby facilitate the selection of an appropriate pressure measuring device corresponding to the selected capillary tube to be used for measurement.

4,677,845

**DEVICE FOR DETECTING VISCOSITY OF LIQUID**  
Kouji Izumi, Yokohama; Masanori Horike, Tokyo; Tatsuya Furukawa, Yokohama; Hiromichi Komai, Yokohama; Osamu Naruse, Hatano, and Yutaka Ebi, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan  
Filed Dec. 5, 1985, Ser. No. 804,612  
Claims priority, application Japan, Dec. 7, 1984, 59-259612  
Int. Cl.<sup>4</sup> G01N 11/04

U.S. Cl. 73-56

5 Claims



1. A device for detecting the viscosity of a liquid which circulated through a liquid supply system comprising: a first tank for holding said liquid; a supply means for supplying said liquid to said first tank; a height regulator means coupled to said supply means for maintaining at a predetermined height said held liquid; a second tank; a conduit coupling said first and second tanks below the level of said held liquid for transferring said liquid from said first tank to said second tank; an orifice in said second tank for providing an outflow of said liquid; sensor means placed in said second tank and in direct contact with said liquid contained therein for sensing the height of said liquid in said second tank; viscosity detecting means coupled to said sensor for calculating the viscosity of said liquid in response to the output of said sensor.

4,677,846

**METHOD OF MEASURING AND REGULATING THE CONCENTRATION OF A FIBRE SUSPENSION AND A DEVICE FOR CARRYING OUT THE METHOD**  
Peter Lundberg, Åmål, Sweden, assignor to Eur-Control Kalle AB, Sweden

PCT No. PCT/SE85/00166, § 371 Date Nov. 27, 1985, § 102(e) Date Nov. 27, 1985, PCT Pub. No. WO85/04716, PCT Pub. Date Oct. 24, 1985

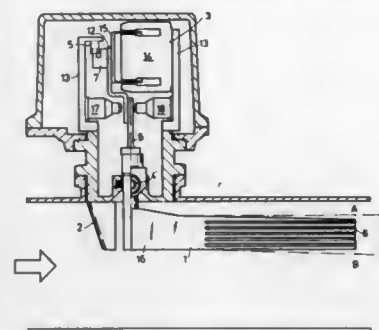
PCT Filed Apr. 9, 1985, Ser. No. 829,123  
Claims priority, application Sweden, Apr. 6, 1984, 8401950  
Int. Cl.<sup>4</sup> G01N 11/00

U.S. Cl. 73-63

9 Claims

1. A method of measuring and regulating the concentration of a fibre suspension, with aid of a blade (1) pivotally suspended in the suspension, said blade being caused to pivot such that its free of trailing edge (8) moves between two end positions (A-B) in the suspension to provide a predetermined angular stroke ( $\alpha$ ), wherein the blade (1) pivots intermittently and with a constant force, at least in the measuring direction in the suspension, between both end positions (A and B) with a stroke exceeding 1 mm at the trailing edge (8) of the blade (1), time measurement being carried out when the trailing edge (8) moves through a 50-80% portion of the angular stroke ( $\alpha$ ), said portion being situated at an equal distance from the upper end position (A) and lower end position (B) of the stroke ( $\alpha$ ), said time having a value which is a parabolic function of the

concentration and varying in response to the shear force resistance in the fibre suspension of the blade (1) during its angular



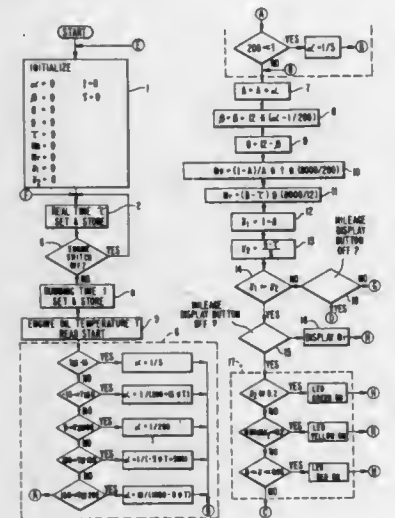
stroke, and thus in response to the concentration of solid substances in the suspension.

4,677,847

**AUTOMOTIVE ENGINE OIL MONITORING SYSTEM**  
Takeo Sawatari, Birmingham; Mitsutaka Nakamura, Farmington Hills, and Toshihiro Sugiura, Birmingham, all of Mich., assignors to Aisin Seiki Kabushiki Kaisha, Asahi, Japan  
Filed Sep. 30, 1985, Ser. No. 781,501  
Int. Cl.<sup>4</sup> G01N 33/28

U.S. Cl. 73-64

8 Claims



7. A system for continuously monitoring and indicating engine oil deterioration during the period of the oil's useful life in an internal combustion engine comprising: temperature signal generating means for generating a signal representative of engine oil temperature; deterioration rate measuring means coupled to said temperature signal generating means for determining the rate of deterioration of said oil as a function of oil temperature; engine running time measuring means for generating a signal representative of elapsed engine running time; time measuring means for generating a signal representative of actual elapsed time since the oil was changed; a first remaining useful life determining means coupled to said deterioration rate determining means and said engine running time measuring means for determining the first remaining useful life ( $M_R$ ) in accordance with the following expression:

$$M_R = \frac{1-A}{\alpha} \times t \times M,$$

where

$$A = \int_0^t \alpha(T) dt;$$

t=elapsed engine running time

T=oil temperature

 $\alpha$ =oil deterioration rate

M=a constant representative of average mileage of an automobile in miles/hour,

and producing a continuous output signal representative of said first remaining useful life;

a second remaining useful life determining means coupled to said deterioration rate determining means and said time measuring means for determining the second remaining useful life of said oil as a function of said deterioration rate and said actual elapsed time and producing a continuous output signal representative of said second remaining useful life;

signal selecting means for selecting either the output signal from the first remaining useful life determining means or the output signal from the second remaining useful life determining means; and

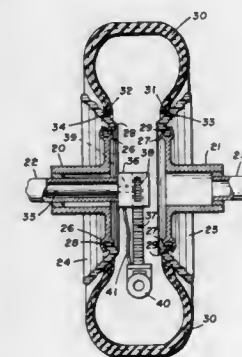
indicating means coupled to said remaining useful life determining means for indicating the remaining useful life as a function of the selected output signal.

4,677,848

**MULTI-SIZE TIRE CHUCK**  
Thomas A. Flory, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.  
Filed Dec. 2, 1985, Ser. No. 803,755  
Int. Cl.<sup>4</sup> G01M 17/02

U.S. Cl. 73-146

5 Claims



1. A device for holding a pneumatic tire under internal inflation pressure comprising two opposing frusto-conical members

(A) made from a deformable, semi-rigid material relatively transparent to, and not easily degraded by, x-rays, and (B) having a plurality of stepped ridges shaped to fit the axially outer portion of a tire bead and sized to accommodate a plurality of standard bead diameters, said device also including means holding the members in a spaced, opposing position relative to each other, said means mounted for rotation about the central axes of the members.

4,677,849

**HYDROCARBON WELL TEST METHOD**

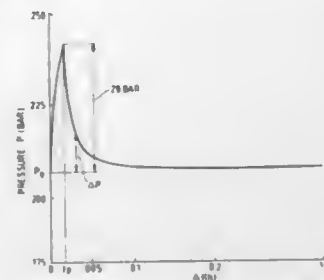
Joseph Ayoub, Lafayette, La., and Dominique Bourdet, Vaux-le-Pénil, France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Aug. 19, 1985, Ser. No. 767,216

Claims priority, application France, Aug. 29, 1984, 84 13359  
Int. Cl.<sup>4</sup> E21B 49/00

U.S. Cl. 73—155

3 Claims



1. A well test method for determining the physical characteristics of a system consisting of a well and of a subsurface formation containing a fluid such as a hydrocarbon and communicating with said well, wherein the formation is homogeneous or heterogeneous and exhibits the skin effect and/or the wellbore storage effect, comprising changing the flow rate of said fluid and measuring a characteristic parameter of the pressure  $P$  of the fluid at successive time intervals  $\Delta t$ , the change of flow rate being carried out in a short period so as to obtain a flow pulse resembling a Dirac pulse, with the amplitude of said flow pulse being sufficiently high to allow the measurement of said characteristic parameter of the pressure  $P$  of the fluid at said successive time intervals  $\Delta t$ , and being characterized in that one also measures the variations in the pressure  $P$  of the fluid during said short period, then during the subsequent period of return to the initial state of the well-formation system, and one compares the experimental pressure curve thus obtained with the curves of a double network of type curves representing, as a function of a common parameter, the pressure  $P$  and its derivative  $P'$  with respect to time, by matching the branch of the experimental curve corresponding to the short period with a curve  $P$  and the branch of this curve corresponding to the subsequent period with the curve  $P'$  of the same parameter.

4,677,850

**SEMICONDUCTOR-TYPE FLOW RATE DETECTING APPARATUS**

Kazuhiko Miura, Kaichi; Tadashi Hattori; Yukio Iwasaki, both of Okazaki; Tokio Kohama, Nishio, and Kenji Kanehara, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 579,075, Feb. 10, 1984, abandoned.

This application Mar. 21, 1986, Ser. No. 843,922

Claims priority, application Japan, Feb. 11, 1983, 58-20842; May 10, 1983, 58-82418; Jun. 20, 1983, 58-110398; Jun. 23, 1983, 58-113977

Int. Cl.<sup>4</sup> G01F 1/68

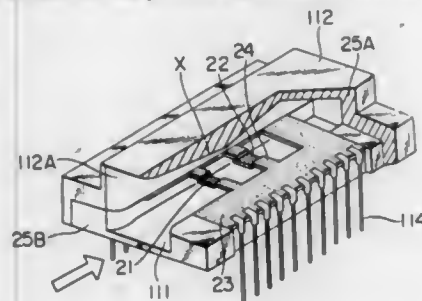
U.S. Cl. 73—204

15 Claims

1. A semiconductor-type apparatus for detecting a fluid flow rate comprising:  
a casing having a communicated portion arranged in a flow path of the fluid;  
at least one insulating base provided in said casing and having a cut-out portion formed at the communicated portion of said casing;  
a first rectangular thin plate semiconductor chip having its long sides sufficiently longer than its short sides and arranged in said cut-out portion supported by said insulating base at both short sides so that the long sides are perpen-

dicular to a direction of fluid flow and both surfaces of said first semiconductor chip are substantially in parallel with the direction of fluid flow and having a first temperature detecting element formed on the surface of said first semiconductor chip having a maximum area so that the surface having said first temperature detecting element is parallel with the direction of fluid flow, and both surfaces of said first semiconductor chip are exposed to the fluid flow; and

a second rectangular thin plate semiconductor chip having its long sides sufficiently longer than its short sides, positioned in proximity to said first semiconductor chip and arranged in said cut-out portion supported by said insulat-



ing base at both short sides of said second semiconductor chip so that the long sides thereof are perpendicular to the direction of fluid flow and both surfaces of said second semiconductor chip are substantially parallel with the direction of fluid flow and having a heater element and a second temperature detecting element formed on the surface of said second semiconductor chip having a maximum area so that said heater element is formed at substantially the center with respect to the long sides of said second semiconductor chip and so that the surface on which said heater element and said second temperature detecting element are formed is also parallel with the direction of fluid flow, and both surfaces of said second semiconductor chip are exposed to the fluid flow.

4,677,851

**METHOD AND APPARATUS FOR MONITORING THE DENSITY OF A LIQUID**

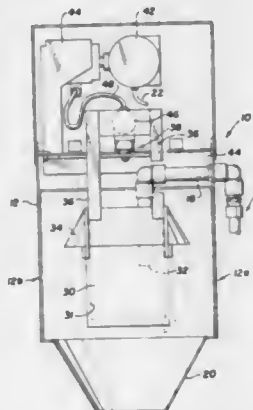
James A. McAuley, 8111 LBJ Freeway 190 1055, Dallas, Tex. 75251

Filed Feb. 10, 1986, Ser. No. 827,511

Int. Cl.<sup>4</sup> G01N 9/04

U.S. Cl. 73—434

21 Claims



1. A method of continually monitoring the density of a liquid, comprising the steps of:  
(a) continually obtaining samples of the liquid;

- (b) flowing the samples into a container having a closed bottom and sides;
- (c) overflowing the container so as to maintain a fixed predetermined volume of the liquid samples within the container;
- (d) supporting the container and liquid samples on at least one bed of pressurized fluid; and
- (e) varying the pressure of the fluid as a function of the weight of the container and liquid to produce a signal representative of the density of the liquid.

4,677,852

**METHOD OF AND APPARATUS FOR INSPECTING AND/OR POSITIONING OBJECTS WITH WAVE ENERGY USING WAVE GUIDES**

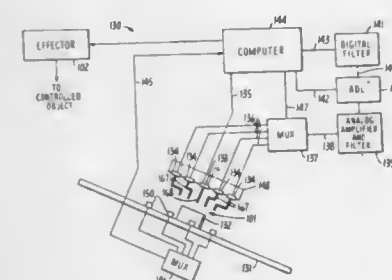
James A. Pinyan, Sunnyvale, and B. Shawn Buckley, San Jose, both of Calif., assignors to Cochlea Corporation, San Jose, Calif.

Filed Sep. 27, 1985, Ser. No. 781,259

Int. Cl.<sup>4</sup> G01N 29/00

U.S. Cl. 73—628

28 Claims



1. Apparatus for achieving at least one of inspecting and positioning of an object, that comprises:

an array adapted to generate continuous wave energy of a single frequency, to transmit the wave energy to an interaction region where it interacts with the object, said array including a plurality of waveguides to transmit the energy in both directions to and from the objects and further including sensor means comprising a multiplicity of spaced-apart sensors disposed to receive said wave energy at a multiplicity of places after interaction with the object, said sensor means being adapted to produce electric signals representative of the received wave energy, said array comprising a transducer to generate said continuous wave energy which is transmitted by a waveguide of the plurality of waveguides to the interaction region, said array comprising a coupling volume to achieve enhanced coupling between the waveguides and the transducer and the sensor means;  
means for processing the electric signals into at least one of amplitude and phase information for each sensor of the sensor means; and  
means for analyzing said at least one of amplitude and phase information from each sensor of the multiplicity of sensors into at least one of a geometric characteristic and an electromagnetic characteristic of the object.

4,677,853

**ULTRASONIC PROBE**

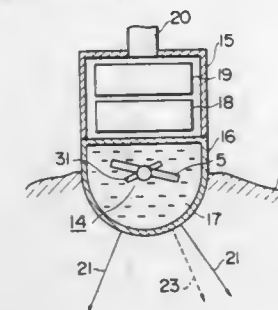
Masami Kawabuchi, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 23, 1986, Ser. No. 854,784

Claims priority, application Japan, Apr. 26, 1985, 60-90021  
Int. Cl.<sup>4</sup> G01N 29/00

U.S. Cl. 73—644

19 Claims



1. An ultrasonic probe comprising:  
a first rotatable composite oscillator which includes first and second oscillators having inherent center frequencies different from each other, said first and second oscillators being disposed back-to-back; and  
a second rotatable, frame-shaped composite oscillator which is disposed around said first composite oscillator and includes third and fourth oscillators having inherent center frequencies different from each other, said third and fourth oscillators being disposed back-to-back.

4,677,854

**TEST DEVICE FOR PRODUCING A BIAXIAL STATE OF TENSION**

Antonio Gabelli, IJsselstein, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Netherlands

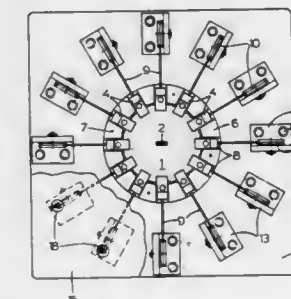
Filed Jan. 6, 1986, Ser. No. 816,429

Claims priority, application Netherlands, Jan. 22, 1985, 8500151

Int. Cl.<sup>4</sup> G01N 3/00

U.S. Cl. 73—794

4 Claims



1. Apparatus for producing a biaxial state of tension in a flat body (1) in the form of a thin test specimen made of an elastic material comprising a plurality of clamping members (4) adapted to be detachably secured to the periphery of the test body, a drawplate (15), means connecting the clamping members to the drawplate including force transmitters in the form of cables, each cable connected at one end to a clamping member (4) and at its opposite end by adjustable and removable means to the drawplate, rerouting wheels (10) directing the cables (9) from the drawplate to the clamps to thereby distribute a uniaxial force on the drawplate uniformly to the clamping members via the rerouting wheels and a plurality of aligning members (6) for removably receiving the clamping members to



provide means for accurately positioning the clamping members on the periphery of the test body.

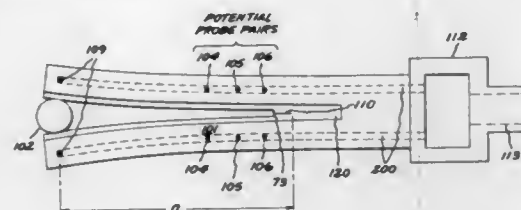
# 4,677,855 METHOD FOR MEASURING DAMAGE TO STRUCTURAL COMPONENTS

Louis F. Coffin, Jr., and Thomas A. Prater, both of Schenectady, N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 19, 1985, Ser. No. 810,628  
Int. Cl.<sup>4</sup> G01N 19/00

U.S. Cl. 73-799

14 Claims



1. A method for measuring crack growth within a solid having a preformed crack and a crack mouth which comprises the steps of applying a current to the solid to produce a potential field within said solid, measuring the voltage across the crack by at least two pairs of probes positioned at up to 99% of the preformed crack depth measured from the mouth of the crack, the two probes from each pair of probes being positioned on opposite sides of the crack at an equivalent distance from the mouth of the crack; approximating a straight line with average values for the measured voltage across each pair of probes versus the average distance of said pair of probes from the mouth of the crack, calculating the distance intercept of said straight line at the axis where voltage=0, and monitoring the changes in value for the intercept over time to determine the change in crack depth.

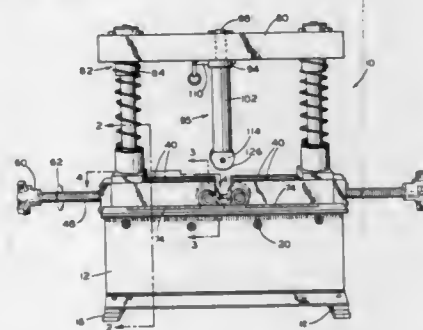
# 4,677,856 GUIDED-BEND TEST APPARATUS

Glenn N. Fischer, c/o Fischer Engineering Company 7595 E. Singer Rd., Dayton, Ohio 45424

Filed Apr. 14, 1986, Ser. No. 851,199  
Int. Cl.<sup>4</sup> G01N 3/20

U.S. Cl. 73-850

11 Claims



1. Apparatus for testing the ductility of a weld located within an elongated specimen, said apparatus for use with a device having a ram supported for raising and lowering over a bed, said apparatus comprising:  
a base defining an upper surface having a central opening;  
a pair of rollers, each of said rollers having a pair of ends and a width sufficient for supporting the specimen, each of said rollers further being supported at said ends by said base to extend over said opening;

a beam;  
at least two upright supports mounted to said base to extend upwardly therefrom;  
said beam being fitted onto said upright supports to be freely vertically slidable thereon;  
stop means for preventing vertical upward movement of said beam on said upright supports beyond a predetermined height above said base;  
spring means connected between said base and said beam for biasing said beam upwardly against said stop means; and  
a downwardly extending mandrel connected to said beam, said mandrel defining at its lower end a working surface;  
said mandrel having a length and being located, when said beam is biased upwardly against said stop means, with said working surface above but between said rollers;  
whereby said base may be placed on the bed, the specimen may be positioned upon said rollers with the weld disposed equidistant between said rollers, said mandrel may be contacted by the ram for applying downward force by the ram, and whereby said mandrel may be forced downwardly by the ram to cause said mandrel to contact the specimen along said working surface to bend the specimen into said opening; and  
whereby upon subsequent upward movement of the ram, said spring means forces said beam upwardly against said stop means.

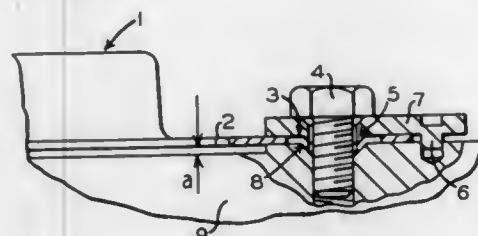
# 4,677,857 FASTENER ARRANGEMENT FOR DEFORMATION SENSOR

Joachim Feldmann, Neustadt, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 28, 1985, Ser. No. 791,674  
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1984, 3441127; Jun. 28, 1985, 3523168

Int. Cl.<sup>4</sup> G01L 1/26; F16B 29/00  
U.S. Cl. 73-855

24 Claims

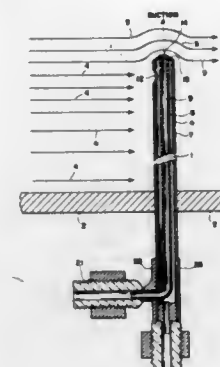


13. A fastener arrangement for fastening a first member to a second member by at least one screw which is screw-threaded into said second member comprising:

- (a) said first member being deformable in at least one contact area thereof with said second member;
- (b) screw support means interposed between said screw and said first member so as to be nonrotatable for isolating from said first member the turning moments imparted by said at least one screw during tightening thereof;
- (c) said second member and said screw support means having die and counter-die formations in their portions adjacent said at least one contact area; and
- (d) said at least one contact area of said first member being pressed into a shape conforming to said die and counter-die formations during said tightening of said at least one screw, to provide in said at least one contact area a form-fit connection by which said first member is fastened to said second member.

4,677,858  
DOUBLE-ACTING PITOT TUBE  
Buford U. Ohnhaus, 9925 Lorelei Lane NE., Albuquerque, N. Mex. 87111  
Filed Mar. 13, 1986, Ser. No. 839,424  
Int. Cl.<sup>4</sup> G01F 1/46  
U.S. Cl. 73-861.65

18 Claims



1. Double-acting differential fluid pressure measuring device for measuring fluid flow, comprising:

a dual-channel elongate duct equipped for mounting in a position transverse to the direction of flow of a fluid medium into which a portion of said duct, including a first end thereof, projects when mounted in said position, said mounted position defining an upstream side of said portion of said duct, said duct having a first channel, having straight end portion, for measuring a pressure lower than the static pressure of said medium when there is a flow of said medium in said direction and a second channel for measuring a pressure higher than the static pressure of said medium when there is a flow of said medium in said direction;

a first orifice at said first end of said duct providing an open end for said straight end portion of said first channel facing perpendicularly to said direction of flow and terminating in a plane perpendicular to said straight end portion of said first channel, for passage of said fluid medium into and out of said first channel, said first orifice being provided with a fluid-deflecting rim surrounding said first orifice having a surface inclined to said plane perpendicular to said straight end portion of said first channel, said inclined surface having a central profile, in said direction of flow, inclined at an angle to said plane, averaged along said profile leading away from said plane to the outer periphery of said surface which is in the range from 15° to 45°;

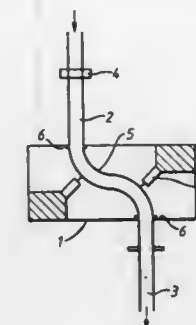
a second orifice on said upstream side of said duct near said first end thereof for permitting passage of said fluid medium into and out of said second channel;

means at and near a second end of said duct, oppositely located relative to said first end, for connecting said first channel of said duct to the low-pressure sensing connection of a differential manometer having high and low pressure sensing connections and for connecting said second channel of said duct to the high pressure sensing connection of said differential manometer;

whereby said manometer, by virtue of the position of said first orifice and the configuration and extent of said rim, measures a pressure difference representative of the rate of said flow which difference is at least 25% greater than the difference between the pressure at said high pressure sensing connection of said manometer and the static pressure of said medium in the region of the measure flow.

4,677,859  
FLOW METER  
David Chinery, Hayes, England, assignor to The British Petroleum Company, p.l.c., London, England  
Filed Jul. 22, 1985, Ser. No. 757,469  
Claims priority, application United Kingdom, Aug. 4, 1984, 8420882  
Int. Cl.<sup>4</sup> G01F 1/78  
U.S. Cl. 73-861.72

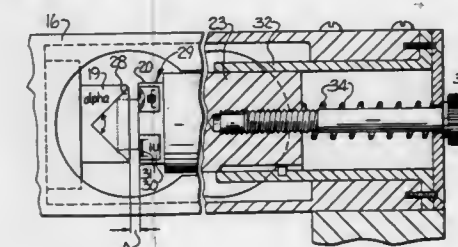
8 Claims



1. Flow meter comprising a housing having an inlet and an outlet for a fluid, a flow tube located within the housing and allowing fluid from the inlet to the outlet, the flow tube having an S bend geometry comprising a pair of symmetrical bends, one in a first direction and another in an opposite direction, each of said bends having a midpoint, the ends of the flow tube being slightly spaced apart from the respective housing inlet and outlet to enable fluidic communication between the flow tube and the housing, the flow tube being rigidly mounted on means for measuring the reaction forces generated by fluid flow through the flow tube, and said means being disposed normal to the midpoints in the bends of the flow tube.

4,677,860  
YARN TENSION SENSOR  
Bernd Wessolowski, Remscheid, and Wilfried Mink, Wuppertal-Ronsdorf, both of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany  
Filed Feb. 26, 1986, Ser. No. 833,906  
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506897; Jun. 21, 1985, 3522239  
Int. Cl.<sup>4</sup> G01L 5/10, 25/00  
U.S. Cl. 73-862.48

27 Claims



1. A yarn tension sensor adapted for use with a textile yarn processing machine and comprising  
an elongate spring arm having one end adapted to be fixedly mounted to a textile yarn processing machine and an opposite free end which is deflectable in a predetermined deflecting direction with respect to said machine,  
guide surface means mounted to the free end of said arm for engaging a running yarn, and such that the tension in the running yarn acts to deflect the free end of said spring arm in said deflecting direction, and  
means for damping the deflecting movement of said free end of said spring arm, said damping means including a recep-

tacle supporting a magnetic fluid, and with said spring arm having a portion thereof immersed in said magnetic fluid.

4,677,861

**FORCE RECORDING SEAT BELT ASSEMBLY**

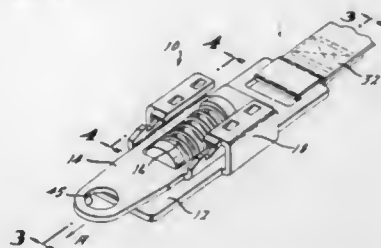
Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Sep. 16, 1985, Ser. No. 776,643

Int. Cl.<sup>4</sup> G01D 1/12, 21/02; G04E 7/00

U.S. Cl. 73—862.54

24 Claims



1. A safety belt assembly for measuring the force exerted on the assembly, the assembly comprising:
  - a first and second member;
  - means associated with said first and second members for providing incremental movement of said members with respect to one another the amount of incremental movement enabling a measurement of said force;
  - a resilient biasing means in communication with said members for maintaining said members in a first relaxed position when no force is exerted, said biasing means resiliently restraining said incremental movement of said members when said force is exerted;
  - means on at least one of said members for securing said assembly into a buckle; and
  - means on at least one of said members for securing said assembly onto a belt.

4,677,862

**EXTRUDED LOAD CELL**

Seymour H. Raskin, P.O. Box 913, Rockwall, Tex. 75087

Continuation of Ser. No. 543,247, Oct. 19, 1983, abandoned.

Continuation-in-part of Ser. No. 202,460, Oct. 31, 1980, Pat. No.

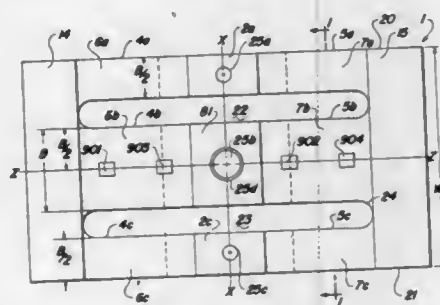
4,420,985, which is a division of Ser. No. 37,133, May 8, 1979,

abandoned. This application Sep. 24, 1986, Ser. No. 912,156

Int. Cl.<sup>4</sup> G01L 1/22

U.S. Cl. 73—862.65

20 Claims



1. In a force sensitive structural element, a pair of parallel side faces spaced apart by a desired width such that said width includes the width of one middle portion, the width of two side portions and the width of two slots, whereby the width of each of said side portions is equal to one-half the width of said middle portion; a pair of mounting holes in said side portions and a load securing hole in said middle portion; a center post stem extending through said load securing hole, said center post stem having threads at its lower end; a center post cap on said stem; a center post nut secured to the said threads; and

welds disposed within the internally threaded portion of said nut at an elevation coincidental with the lower end surface of the said stem, so that any shrinkage of said weld tends to pull said stem deeper into said nut.

4,677,863

**SUB-MICRON PARTICLE SAMPLER APPARATUS**

Don D. Gay, Aiken, and William G. McMillan, Ulmers, both of S.C., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 599,292, Apr. 12, 1984, Pat. No. 4,530,250.

This application Mar. 25, 1985, Ser. No. 715,319

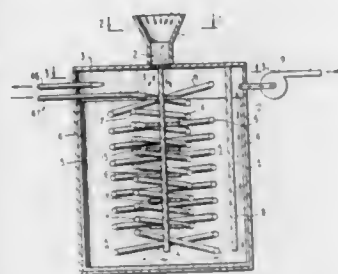
The portion of the term of this patent subsequent to Jul. 23,

2002, has been disclaimed.

Int. Cl.<sup>4</sup> B01D 50/00, 47/05

U.S. Cl. 73—863.12

11 Claims



1. An apparatus for sampling sub-micron sized particles contained in a carrier gas sample, comprising:
  - a collection chamber defining a volume and having sample gas inlet and outlet means;
  - means for filtering a sample gas prior to said sample gas entering said collection chamber, said filtering means removing from said sample gas large particles having a diameter of at least about 0.3 microns;
  - means in said collection chamber for removing small particles from said sample gas, said small particles having a diameter of less than about 0.3 microns, said removing means including means for cooling said sample gas to a temperature at which moisture in said sample gas is frozen, said small particles being trapped in said frozen moisture;
  - means for removing said small particles from said collection chamber; and
  - means for concentrating and collecting said small particles from said frozen moisture to provide a sample for subsequent analysis.

4,677,864

**SYSTEM FOR AUTOMATIC SAMPLING AND SAMPLE CONVEYANCE FOR ANALYSIS**

Nikolai N. Gluschenko; Vladislav V. Golikov, and Viktor A. Emelyanov, all of Sverdlovsk, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatel'skiy I Konstruktorskiy Institut Tsvetmetavtomatika, Sverdlovsk, U.S.S.R.

Filed Oct. 17, 1985, Ser. No. 788,469

Claims priority, application U.S.S.R., Apr. 6, 1981, 3272538

Int. Cl.<sup>4</sup> G01N 1/20, 1/14

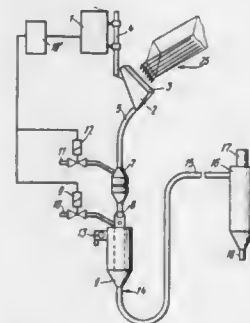
U.S. Cl. 73—863.51

1 Claim

1. A system for automatic sampling and sample conveyance for analysis, comprising:

- a sampler having a slurry sampling member;
- a flexible hose having two ends and designed for draining slurry from said slurry sampling member;
- a metering receptacle having a sample inlet, a compressed air inlet, and an outlet;
- said flexible hose having one said end thereof connected to

- said slurry sampling member and said other end connected to said slurry inlet of said metering receptacle;
- a water supply line connected to another inlet of said metering receptacle;
- a chamber for accumulation and dispatch of samples having an inlet for the admission of slurry and compressed air, a first outlet for dispatching slurry, and a second outlet for draining an excess of water;
- a first check valve mounted at said inlet of said chamber for accumulation and dispatch of samples;
- a second check valve mounted at said second outlet of said chamber for accumulation and dispatch of samples;
- said metering receptacle being connected to said first inlet of said chamber for accumulation and dispatch of samples through said first check valve;
- a compressed air supply line connected to said inlet of said chamber for accumulation and dispatch of samples through a first controlled valve;



- an additional controlled valve mounted between said water inlet of said metering receptacle and said water supply line;
- a conveying line for conveying samples, having two ends, a sample receiver having an inlet for receiving slurry;
- said conveying line having one said end thereof connected to said first outlet of the chamber for accumulation and dispatch of samples and the other said end thereof connected to said inlet sample receiver;
- a command device having two outputs;
- one said output of the command device being electrically connected to said sampler;
- said other output of the command device being connected to said controlled valves;
- said controlled valves being connected in parallel with each other;
- capacities of said metering receptacle and said chamber for accumulation and dispatch of samples being about equal to each other.

4,677,865

**PIPE PIG WITH RUNNING GEAR**

Peter Lehmann, Hilden, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 24, 1985, Ser. No. 726,778

Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419683

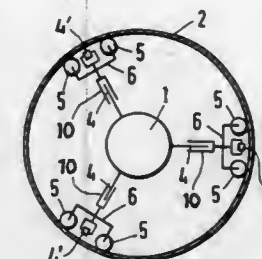
Int. Cl.<sup>4</sup> G01M 19/00

U.S. Cl. 73—866.5

13 Claims

1. A pipe pig for axial movement in a pipe line comprising:
  - a main body having a longitudinal axis;
  - at least two runners extending outwardly from said main body for supporting said main body on an inside surface of a pipe line, said at least two runners being disposed at different locations around the longitudinal axis of said main body, said at least two runners comprising means for contacting the inner surface of the pipe line for axial movement therein and for driving said runners in rotation

about said longitudinal axis of said main body to any angular position about said longitudinal axis with respect to the pipe line, said at least two runners supporting said main body at all said angular positions, wherein said runners extend outwardly from said main body in directions



substantially radial with respect to said longitudinal axis, and wherein at least one of said runners can rotate about an axis thereof normal to said longitudinal axis and oriented in said substantially radial direction; and means on said pipe pig for detecting the axial and angular positions of the pipe pig within the pipe line.

4,677,866

**COUPLING SYSTEM AND DOUBLE SHAFT TRANSMISSION STRUCTURE FOR AN AGRICULTURAL TRACTOR**

Masatsugu Tone, Hashimoto, Japan, assignor to Kubota Ltd., Osaka, Japan

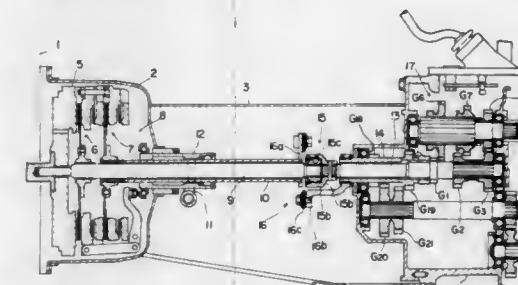
Filed Oct. 21, 1985, Ser. No. 789,767

Claims priority, application Japan, Mar. 1, 1985, 60-30096[U]; Mar. 18, 1985, 60-39596[U]; Mar. 20, 1985, 60-40001[U]

Int. Cl.<sup>4</sup> F16H 37/00

U.S. Cl. 74—15.86

5 Claims



1. A transmission structure for an agricultural tractor having an engine and a double clutch mechanism including a propelling system clutch and a power takeoff system clutch operable in sequence, an inner and outer double shaft construction extending from the double clutch mechanism and including a propelling system drive shaft and a power takeoff system drive shaft surrounding said propelling system drive shaft, a gear transmission case, a propelling system gear transmission housed in said gear transmission case for receiving the output of the propelling system drive shaft, and a power takeoff system gear transmission housed in the gear transmission case for receiving the output of the power takeoff system drive shaft, said transmission structure comprising:
  - a clutch housing adapted to be directly connected to the engine and containing,
  - a transmission housing formed of sheet metal and interconnecting the clutch housing and the gear transmission case, a propelling system input shaft supported by the gear transmission case,
  - a power take off system input shaft supported by the gear transmission case and surrounding said propelling system



input shaft so as to provide an inner and outer double shaft construction,  
 a ball coupling interconnecting the propelling system drive shaft and the propelling system input shaft which are inner shafts of the double shaft construction in the transmission housing, and  
 a flange type elastic coupling interconnecting the power takeoff system drive shaft and the power takeoff system input shaft which are outer shafts of the double shaft construction in the transmission housing.

4,677,867

# POWER CHANGE-OVER MECHANISM OF A VEHICLE FOR INDUSTRIAL MACHINERY

Noritaka Sumi, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Mar. 22, 1985, Ser. No. 714,749

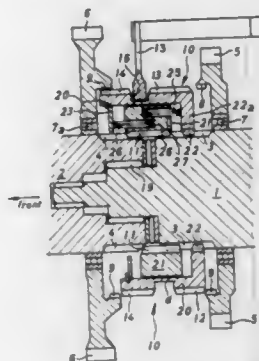
Claims priority, application Japan, Mar. 23, 1984, 59-42622[U]

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> F16H 3/08

3 Claims

U.S. Cl. 74-332



1. A power changeover mechanism of a vehicle for industrial machinery comprising:

- a first driving shaft and a high-speed gear mounted for rotation thereon;
- a second driving shaft disposed in coaxial arrangement with said first driving shaft and having a low speed gear mounted for rotation thereon;
- splines formed in both said shafts and both said gears;
- a power change-over annular spool disposed between said gears freely slidably operable in an axial direction from a two-wheel drive position to a four-wheel drive position;
- said spool being divided into two members; an outer peripheral member having a cylindrical portion with exterior splines for freely meshing with said gears and a radially inwardly extending flange at one end of said cylindrical portion with an interior sub-spline constantly meshing with the spline of the first driving shaft and adapted for axial movement between said two-wheel drive position and said four-wheel drive position;
- said outer peripheral member being disposed around an internal peripheral side member with an annular clearance between said members;
- said outer peripheral member also having an annular washer on its inner peripheral surface held against axial movement to prevent said washer from moving in a direction away from said flange portion;
- said inner and outer peripheral member being movably connected to each other in the axial direction through a damper means.

4,677,868

# TRANSMISSION VIBRATION VISCOUS DAMPER

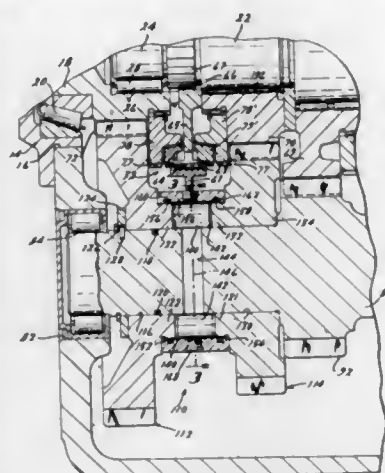
Timothy J. Filkins, Elbridge, N.Y., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 10, 1986, Ser. No. 850,184

Int. Cl.<sup>4</sup> F16H 3/08, 55/14; F16D 3/80

U.S. Cl. 74-359

9 Claims



1. A manual transmission comprising an input shaft adapted to be clutched to the crankshaft of an internal combustion engine, said input shaft having an input gear integral therewith; said input gear formed with peripheral teeth and having a concentric axial bore formed as an integral part of said input shaft; a transmission output shaft supported at its forward end by journal means located in said axial bore, said output shaft having a speed gear formed with peripheral teeth journaled thereon, a countershaft having an axis of rotation parallel with the axis of rotation of said output shaft, the improvement wherein said countershaft having a viscous fluid damper coupling supported thereon, said coupling comprising a first driven gear journaled on said countershaft, said first driven gear having peripheral teeth in constant meshed engagement with said input gear peripheral teeth, a second driven gear fixed on said countershaft for rotation therewith, said second driven gear having peripheral teeth in constant meshed engagement with said speed gear peripheral teeth, a diametrical through bore extending through said countershaft intermediate said first and second driven gears, each said first and second driven gears formed with a set of longitudinally extending mirror image axial teeth arranged concentrically about said axis of rotation, said sets of axial teeth being sized to mesh in a loose fitting manner defining predetermined interconnected clearance spaces between said sets of axial teeth, said spaces being in communication with said through-bore and providing limited freedom of rotary movement of said first driven gear relative to said countershaft and said second driven gear, a hollow sleeve concentrically surrounding said sets of axial teeth, means sealing said sleeve to associated portions of said first and second driven gears while allowing relative rotary movement between said sleeve and said first driven gear, means sealing said first driven gear to said countershaft whereby said sleeve and said first and second driven gears providing a sealed viscous fluid chamber comprising said through-bore and said interconnected spaces between said loosely mating axial teeth, clutch means for selectively connecting said speed gear in driving engagement with said output shaft, wherein upon said clutch means connecting said speed gear in driving engagement with said output shaft, the viscous fluid in said chamber providing a dampening medium substantially obviating the transfer of torsional vibrations from said input shaft to said countershaft and thus to said output shaft speed gear.

4,677,869

# LINEAR ACTUATOR

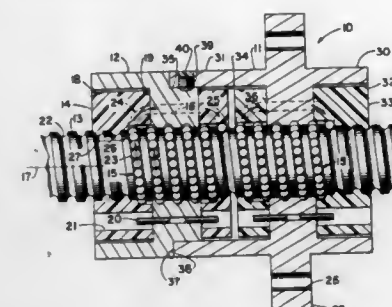
Ralph W. Mayfield, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 25, 1985, Ser. No. 801,667

Int. Cl.<sup>4</sup> F16H 1/18

U.S. Cl. 74-424.8 R

3 Claims



1. In a linear actuator having: a ball screw with a helical ball screw groove; a ball nut with a corresponding helical ball nut groove; a plurality of balls arrayed in an endless ball circuit extending along said ball nut groove, out of the opposite ends of said ball nut, and through a ball nut hole extending between said opposite ends of said ball nut; an improved nut closure device located proximate to at least one of said ball nut ends, wherein the improvement comprises:

- a closure body;
- a ball guide portion in said closure body extending for approximately one revolution of said endless ball circuit around said ball screw;
- a non-linear closure ball passage formed in said closure body, said non-linear closure ball passage having:
  - a first portion communicating with said ball guide portion and oriented substantially tangent to said ball screw groove; and
  - a second portion parallel to the longitudinal axis of said ball screw and blending into said first portion; and
- means for preventing relative rotation between said closure body and said ball nut in assembly while said closure ball passage and said ball nut hole are in alignment.

4,677,870

# FORGED SPUR GEAR WITH WEB CONNECTED TEETH

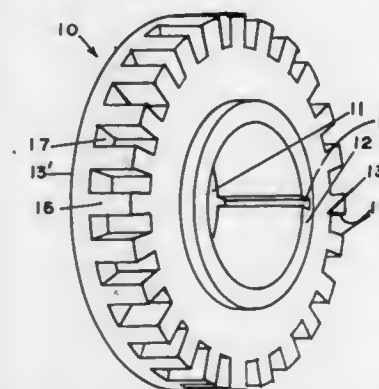
Ebrahem Alshareedah, P.O. Box 16155, Qudessiah, Kuwait

Filed Sep. 30, 1985, Ser. No. 781,484

Int. Cl.<sup>4</sup> F16H 55/06

U.S. Cl. 74-431

2 Claims



1. A forged steel spur gear having constant pitch diameter radial teeth disposed parallel to the gear axis and configured with a lateral face extremity portion extending as a continuous

web integral with gear teeth from the root of said teeth to substantially the addendum circle at one lateral face only of said gear, enabling said gear to be removed from forging dies in conventional manner, the forged metal of said gear being densified and refined throughout and of greater strength and resilience than as-cast metal.

4,677,871

# LUBRICATION MECHANISM IN FINAL DRIVE AND DIFFERENTIAL UNIT

Kiyoshi Taniyama, and Hiroshi Hori, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

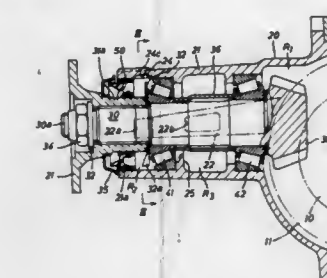
Filed Jul. 1, 1985, Ser. No. 750,309

Claims priority, application Japan, Jul. 6, 1984, 59-102634[U]

Int. Cl.<sup>4</sup> F16H 57/04; F01M 1/00

U.S. Cl. 74-467

5 Claims



1. In a final drive and differential unit for a motor vehicle comprising a differential carrier integrally formed with a cylindrical support structure and arranged to store an amount of lubricating oil therein, a differential gear unit rotatably mounted within said carrier, a ring gear contained within said carrier and mounted on said differential gear unit for rotation therewith, and a drive pinion shaft supported by a pair of axially spaced outside and inside bearings mounted within said cylindrical support structure, said drive pinion shaft extending outwardly through an annular oil seal member mounted within an outer end portion of said cylindrical support structure and having an inner end integral with a drive pinion in mesh with said ring gear, wherein said cylindrical support structure has first and second side walls located at respective sides of said pinion shaft, said first side wall being formed therein with an oil supply passage having one end in open communication with the interior of said carrier for receiving lubricating oil picked up by said ring gear and another end in open communication with an annular space around said drive pinion shaft between said oil seal member and said outside bearing, and said second side wall being formed therein with an oil return passage having one end in open communication with the interior of said carrier and another end in open communication with the annular space around said drive pinion shaft,

the improvement wherein said cylindrical support structure is formed at an inner wall thereof with a recessed portion which is located above the annular space around said drive pinion shaft and includes a guide surface inclined with respect to said drive pinion shaft and directed toward an upper portion of said oil seal member, and wherein an impeller member is mounted on said drive pinion shaft for rotation therewith and arranged to pick up lubricating oil stored in the annular space around said drive pinion shaft and carry it toward the recessed portion in said cylindrical support structure.

4,677,872

# METHOD OF FITTING GRIP OVER HANDLEBAR AND GRIP USED IN CARRYING THE METHOD INTO PRACTICE

Hiroshi Nishida, Miki, and Takemi Inoue, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

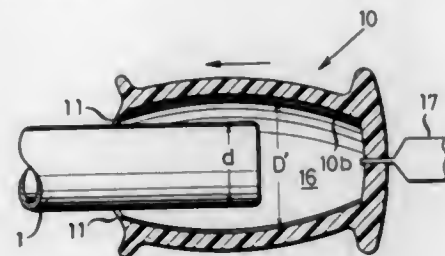
Filed Jul. 31, 1985, Ser. No. 760,763

Claims priority, application Japan, Jul. 31, 1984, 59-117686[U]

Int. Cl.<sup>4</sup> B62K 21/26

U.S. Cl. 74—551.9

3 Claims



1. A method of fitting a grip over a handle portion of a handlebar, comprising the steps of:
  - providing the grip with a lip formed integrally with the main body of the grip, said lip being directed radially inwardly and located along an entire front edge at an open end of the grip;
  - forming the grip and integral lip of elastic material;
  - bringing the grip into contact with a forward end portion of the handle portion of the handlebar in such a manner that a sealed chamber is defined between an inner surface of the grip and outer surface of the handle portion;
  - injecting air into the sealed chamber by an air injector, to expand the grip;
  - moving the grip over the handle portion of the handlebar until a predetermined position is reached; and
  - withdrawing the air from the sealed chamber to allow the grip to be brought into intimate contact at its inner surface with the handle portion at its outer surface, to enable the grip to be adhesively secured to the handle portion of the handlebar.

4,677,873

# TRANSFER CASE WITH INTER-AXLE DUAL-PLANETARY DIFFERENTIAL

Richard E. Eastman, Central Square, and Randolph C. Williams, Weedsport, both of N.Y., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 23, 1985, Ser. No. 812,661

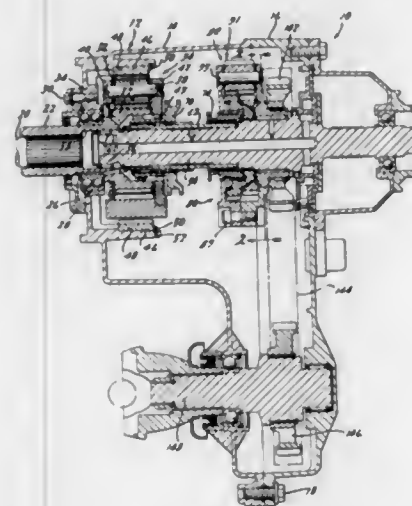
Int. Cl.<sup>4</sup> F16H 37/08

U.S. Cl. 74—665 GE

8 Claims

1. In a transfer case apparatus adapted for driving a four wheel drive motor vehicle having front and rear ground engaging wheels, said apparatus including a housing, an input shaft adapted for connection to a transmission of the motor vehicle, a pair of first and second output shafts supported for rotation in said housing, said first output shaft adapted for driving connection to the rear ground engaging wheels and said second output shaft adapted for driving connection to the front ground engaging wheels, and a dual helical planetary differential gear assembly arranged in a compact manner for proportioning torque between said first and second output shafts, said dual planetary differential helical gear assembly comprising a dual planetary carrier including first and second longitudinally spaced carrier rings rotatable about the central axis of said first output shaft, said first carrier ring having a central opening formed with internal splines concentrically disposed about said first output shaft, first and second juxtaposed toothed helical gear concentrically disposed about said first output shaft, said first sun gear fixed to said first

output shaft and having its teeth at a first uniform radius, said second sun gear journaled on said first output shaft and having its teeth at a second uniform radius a predetermined distance less than said first sun gear teeth radius, means interconnecting said second sun gear with said second output shaft, first and second sets of spur-type toothed pinion gears having identical uniform diameters rotatably supported on first and second, respective, sets of pins disposed parallel to said central axis, said first and second sets of pins journaled between said carrier rings at first and second radial distances, respectively, outward from said central axis, wherein said first radial distance is a predetermined distance greater than said second radial distance, the teeth of each said first set pinion gear extending a first predetermined axial distance substantially equal to the axial extent of both said first and second sun gear teeth, the teeth of each said first set pinion gear positioned in meshing engagement with said first sun gear teeth while forming a predetermined clearance with said second sun gear teeth, the teeth of each said second set pinion gear extending a second longitudinal distance about one-half the axial extent of each



said first set pinion gear teeth so as to be substantially equal to the axial extent of said second sun gear teeth and in meshing engagement with said second sun gear teeth, said first and second sets of pinion gears disposed in paired relation such that each said first set pinion gear teeth in meshing engagement with a corresponding second set pinion gear teeth, said first sun gear having a predetermined number of gear teeth greater than the number of gear teeth on said second sun gear, a mode clutch collar having external spline thereon being axially movable relative to said dual planetary differential to a position wherein its external splines slidably engage said first carrier ring internal splines, and clutch means operative when engaged to drivingly interconnect said mode clutch collar with said input shaft, such that with said mode clutch collar external splines being in engagement with said first carrier ring internal splines and said clutch means being engaged differentiation is provided by said dual planetary differential between said first and second output shafts, and wherein the drive torque supplied to said input shaft is divided between said first and second output shafts in a ratio proportional to the number teeth on said respective first and second sun gears.

4,677,874

# TRANSMISSION, PARTICULARLY FOR CROSS-COUNTRY MOTOR VEHICLES

Karl Friedrich, Leibnitz, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

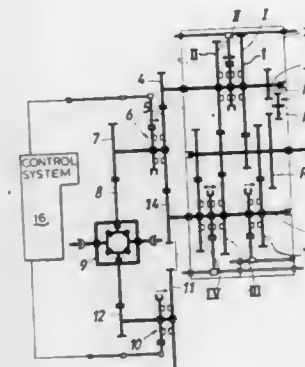
Filed Mar. 18, 1986, Ser. No. 840,885

Claims priority, application Austria, Mar. 28, 1985, A 917/85

Int. Cl.<sup>4</sup> F16H 37/08, 3/08

U.S. Cl. 74—665 GC

3 Claims



## 1. In a transmission comprising

- a change gear set comprising input shaft means, gear set output shaft means, a plurality of fixed spur gears non-rotatably connected to one of said shaft means, and a plurality of loose spur gears, each of which is rotatably mounted on and adapted to be selectively coupled to the other of said shaft means and permanently in mesh with one of said fixed spur gears, said loose spur gears comprising first and second groups of loose spur gears for relatively low and relatively high speeds, respectively, and
  - a second gear set adapted to be selectively driven by said output shaft means,
- the improvement residing in that said input shaft means consist of an input shaft,
- said gear set output shaft means consist of first and second gear set output shafts,
- said fixed spur gears are non-rotatably mounted on said input shaft,
- said loose spur gears of said first and second groups are rotatably mounted and adapted to be coupled to said first and second gear set output shafts, respectively,
- first and second additional spur gears are non-rotatably connected to said first and second gear set output shafts, respectively,
- a common idler gear is provided, which is in mesh with both said first and second additional spur gears,
- a pinion is provided,
- a first clutch is provided for selectively coupling said pinion to said common idler gear,
- a final output gear is provided, which is permanently in mesh with said pinion,
- said second gear set comprises a large spur gear, which is permanently in mesh with said second additional spur gear, a small spur gear, which is permanently in mesh with said final output gear, and a second clutch for selectively coupling said large and small spur gears to each other, and
- clutch control means are provided, which are selectively operable in one mode to engage said first clutch and disengage said second clutch and in another mode to disengage said first clutch and to engage said second clutch.

4,677,875

# TRANSFER CASE FOR MULTIPLE DRIVE AXLE VEHICLE

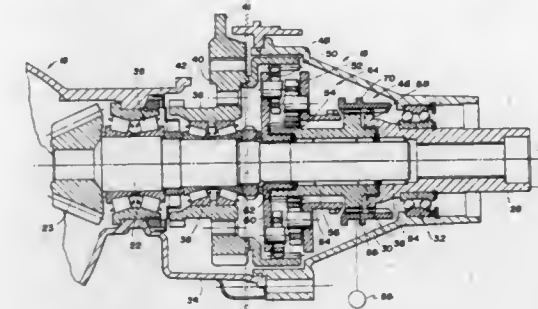
Robert B. Batchelor, Birmingham, Mich., assignor to American Motors Corporation, Southfield, Mich.

Filed Dec. 9, 1985, Ser. No. 806,696

Int. Cl.<sup>4</sup> F16H 37/08, 1/42

U.S. Cl. 74—695

18 Claims



## 1. A transfer case for a vehicle drive train having a transmission comprising:

- a housing;
  - input means for receiving the torque output from the vehicle transmission;
  - a first output shaft and first means for rotatably supporting said first output shaft in said housing;
  - a second output shaft and second means for rotatably supporting said second output shaft in said housing; and
  - means for selectively driving said first and second output shafts in response to actuation of said input means, said means for selectively driving comprising a planetary gear set having an annulus, a first set of first planet gears engaged with said annulus, a second set of second planet gears, each second planet gear being engaged with one of said first planet gears, a sun gear engaged with said second planet gears, third means for rotatably mounting said sun gear in said housing and a planet carrier having means for rotatably supporting said first and second planet gears and co-axially secured to said first output shaft for rotation therewith, and further comprising clutch means for selectively engaging said sun gear with said planet carrier and said second output shaft,
- wherein said input means comprises means for rotatably driving said annulus.

4,677,876

# TORQUE-PROPORTIONING DIFFERENTIAL WITH CYLINDRICAL SPACER

Walter L. Dissett, Southfield, Mich., assignor to Tractech, Inc., Warren, Mich.

Filed Feb. 13, 1984, Ser. No. 579,712

Int. Cl.<sup>4</sup> F16H 1/38

U.S. Cl. 74—715

2 Claims

## 1. Gear differential apparatus for supplying driving torque from a drive shaft to a pair of aligned axially spaced output shafts, comprising

- (a) a sectional differential carrier housing adapted to be rotatably driven by the drive shaft, said housing including a center body section, and a pair of end cover sections connected on opposite ends of said center body section, said center body section containing a central transverse bore (52) of circular cross-sectional configuration, one end of said transverse bore being enlarged to define a recess (54) on one side of said center body section;
- (b) a pair of annular helical side gears journaled in corresponding aligned bores contained in opposite ends of said center body section, respectively, said side gears having splined inner circumferences for non-rotatable connection with the output shafts when the adjacent ends of the shafts





- matic transmission when the engine torque is less than the predetermined torque value;
- (7) shifting the automatic transmission to the optimum gear position; and
  - (8) engaging the clutch.

4,677,881

## CHAIN SAW SHARPENER

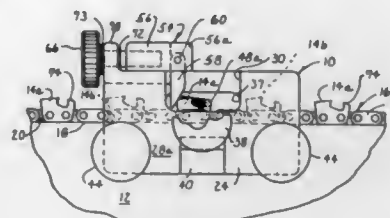
James E. Jorde, 217 E. Center St., Basalt, Id. 83218

Filed May 2, 1986, Ser. No. 859,040

Int. Cl.<sup>4</sup> B23D 63/16

U.S. Cl. 76—25 A

7 Claims



1. A device for sharpening the cutting teeth of a chain saw while the chain is in place on the guide bar of the chain saw, the device comprising a generally U-shaped frame defined by an upper web and first and second parallel side walls for overlying the chain and guide bar of the chain saw; an open area adjacent the center of the upper web defining a sharpening area; clamp means associated with the first side wall to secure the frame to the guide bar; second clamp means associated with the side wall for lightly engaging the chain saw tooth to be sharpened in order to fix its position with respect to the sharpening area; a tooth stop pawl for adjusting the position of the tooth within the sharpening area, the tooth stop pawl being mounted in a sliding block received in a keyway in the upper web of the frame, the keyway being aligned with the guide bar of the chain saw and permitting only a single degree of freedom in the direction of the guide bar; a pawl member pivotally attached to the sliding block extending into the open sharpening area; an adjustment bolt associated with the tooth stop pawl and rotatably captured with respect to the frame for adjusting the position of the sliding block along the length of the keyway; and guide means having diagonally disposed bores associated with the second side wall and a rotary burr insertable into either of the guide bar bores for sharpening the teeth of the chain saw.

4,677,882

## FEEDING MEANS FOR INTERMITTENTLY ROTATING A CIRCULAR SAW BLADE OF GREAT PITCH

Ernst Beck, Maselheim; Peter Lenard, Biberach an der Riss, and Hans Hatzel, Ummendorf, all of Fed. Rep. of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Biberach Riss, Fed. Rep. of Germany

Filed Oct. 28, 1985, Ser. No. 792,145

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1984, 3440500

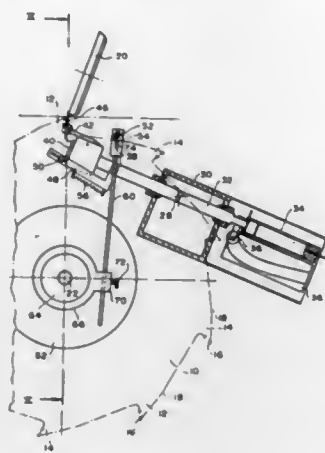
Int. Cl.<sup>4</sup> B23D 63/14

U.S. Cl. 76—77

10 Claims

1. A feeding means for intermittently rotating a circular saw blade of great pitch, comprising a slip-on arbor for the saw blade, a principal pawl designed for strokewise reciprocating motion such as to push the tooth face of a tooth of the saw blade upon every other forward stroke into a working position, a secondary pawl disposed behind the principal pawl and designed to reciprocate together with the principal pawl such as to engage behind the tooth face of the next tooth upon each return stroke following the positioning of a tooth and to move said tooth face during the next succes-

sive forward stroke into an intermediate position at which the principal pawl may engage behind this tooth face during the subsequent return stroke, and a stop which limits the movement of the secondary pawl,



characterized in that the stop is formed at a drag lever which is pivotable about a pivot bearing, at least approximately coaxial with the slip-on arbor, and connected to the secondary pawl by a guide means extending at least approximately in the direction of the movement of the secondary pawl.

4,677,883

## CORK SCREW

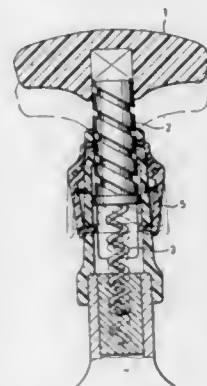
Wen-Hsin Lee, 4th Fl., No. 61, Lul-Ho I Road, Kaohsiung City, Taiwan

Filed Jun. 9, 1986, Ser. No. 872,121

Int. Cl.<sup>4</sup> B67B 7/04

U.S. Cl. 81—3.37

3 Claims



1. A cork screw comprising: a rotary handle; a stem connected to said handle and having a helical groove extending on the periphery of said stem; a penetrating screw fixed to the bottom of said stem; a hollow pedestal provided around said stem and said penetrating screw, the wall of said pedestal having an upper portion sleeved slideably on said stem, first openings in said upper portion, a bottom portion adapted to be seated against a spout of a bottle, and an engaging means provided in a portion between said upper portion and said bottom portion; two dog members funcrured at two opposite outer sides of said pedestal and each having a first engaging end capable of extending through one of said first openings to engage

with said helical groove, and a second engaging end opposite to said first engaging end capable of engaging releasably said engaging means so as to temporarily maintain said first engaging end in a released position from said helical groove; and springs members attached to the outer side of said pedestal and normally biasing said first engaging ends to engage with said helical groove of said stem.

4,677,884

## PORTABLE END PREP LATHE

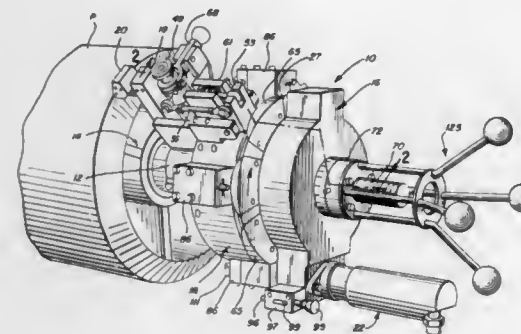
Horst Kwech, Lake Bluff, and Peter K. Olson, Buffalo Grove, both of Ill., assignors to The E. H. Wachs Company, Wheeling, Ill.

Filed Apr. 5, 1985, Ser. No. 720,170

Int. Cl.<sup>4</sup> B23B 5/16

U.S. Cl. 82—4 C

4 Claims



1. A portable end prep lathe having a frame, means attachable to a pipe and movably mounting said frame, a rotatable tool head on said frame, means coaxing between the frame and the tool head for rotating the tool head on said frame, a tool slide mounted on said tool head for movement radially of a pipe, means on the tool head for moving the tool slide on said tool head, and means mounting the tool head and frame for movement axially of the pipe, means responsive to the rotation of the tool head for moving the tool head and frame axially of the pipe, a star wheel in a fixed position relative to tool head rotation, a plurality of actuator pins circumferentially spaced about the tool head for successive engagement with the star wheel, said actuator pins being movable and having an inoperative position and a pre-operative position, means urging the actuator pins to an operative position, a retainer pin for each actuator pin for holding an actuator pin against the action of the urging means, said retainer pin being movable into a slot to free the actuator pin in response to the rotation of an actuator pin, each actuator pin having a cross pin, and manually operable means on the frame for engaging a cross pin to rotate an actuator pin and cause an actuator pin to move from pre-operative position to operative position as an actuator pin moves past said manually operable means.

4,677,885

## FACE DRIVER FOR CENTERING AND DRIVING WORKPIECES CHUCKED IN A LATHE

Herbert Schmid, Renningen, and Karl Hiestand, Pfullendorf, both of Fed. Rep. of Germany, assignors to Sandvik Kosta GmbH and SMW Schneider &amp; Weisshaupt GmbH, of DEX

Filed May 15, 1986, Ser. No. 863,611

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517633

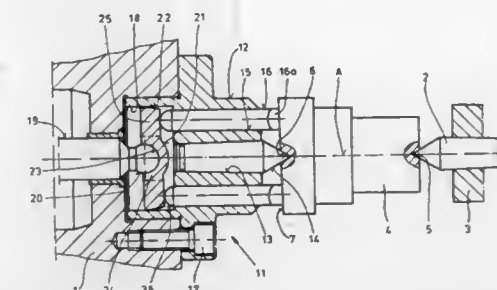
Int. Cl.<sup>4</sup> B23B 33/00

U.S. Cl. 82—40 R

15 Claims

1. A face driver for centering and driving a workpiece to be chucked in a lathe, comprising a support having one end with a dead center adapted to engage against the workpiece and having at least four axially circumferentially spaced recesses around the dead center, a driving pin movable in each of the

recesses and having first ends adapted to press against the workpiece and opposite second ends, said support having an opposite end with a cylindrical recess, a pressure plate floatably retained within the recess and having one side with engagement portions in engagement with respective second ends of said pins, recess means for each engagement portion of said



pressure plate which renders each engagement portion independently elastically deformable, said pressure plate having an opposite side, and a compression member engaged against the opposite side of said pressure plate urging said plate and said driving pins toward the workpiece, so that each independently elastically deformable engagement portion independently and elastically urges its driving pin toward the workpiece.

4,677,886

## HONEYCOMB CUTTER AND CHIP BREAKER/CHAF REMOVER

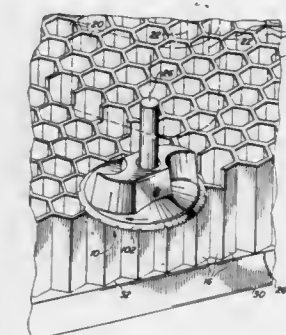
Horst W. Neu, Torrance, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Dec. 12, 1985, Ser. No. 808,317

Int. Cl.<sup>4</sup> B23P 15/28; B26D 1/14

U.S. Cl. 82—53

9 Claims

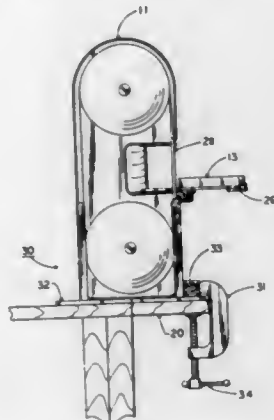


1. A tool for machining a workpiece of honeycombed material or the like comprising, in combination: a honeycomb cutter member, said honeycomb cutter member having a cutting knife and an axial shaft, said cutting knife being disc-shaped and rotatable about its center, said cutting knife having a sharp, peripheral edge extending radially outwardly to slice or cut a workpiece when rotated, said shaft having an inboard end adapted to be received by a rotational motion imparting mechanism, said shaft having an outboard end secured to said cutting knife for rotation therewith, with the axis of rotation of said shaft passing through the center of said cutting knife; and a chip breaker/chaf remover device having a central, axial bore mountable over said shaft with the outboard face of said chip breaker/chaf remover device located in association with the inboard face of said cutting knife for rotation therewith, said chip breaker/chaf remover device having at least one sharp, essentially circumferentially directed,



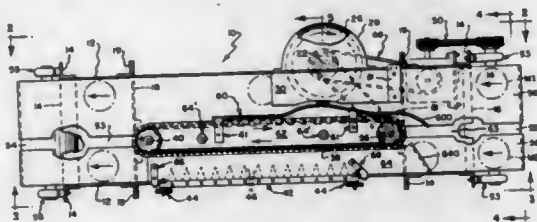
radially outward breaker edge located radially inwardly of the radially outward edge of said cutting knife for breaking previously cut portions of the workpiece, said breaker edge being skewed toward the axis of rotation of said shaft as the edge recedes from the cutting knife, and said breaker edge also being slanted circumferentially backward from the cutting edge to provide progressive relief both inwardly and backwardly from the cutting edge.

**4,677,887**  
**BAND SAW STAND**  
Leonard G. Martin, Box 217, Yanceville, N.C. 27379  
Filed Nov. 4, 1985, Ser. No. 794,479  
Int. Cl.<sup>4</sup> B27B 13/00  
U.S. Cl. 83—788



1. A stand for a portable band saw, comprising: a rectangularly shaped planar base, said base having a top and a bottom surface, a pair of channel shaped vertical supports, said vertical supports oppositely, diagonally attached to said base, said vertical supports for receiving the band saw to hold it upright on the base clamping means, said clamping means pivotally affixed to said top surface of said base, said clamping means pivotable about an axis parallel to said base for securing a support structure to the bottom surface of said base.

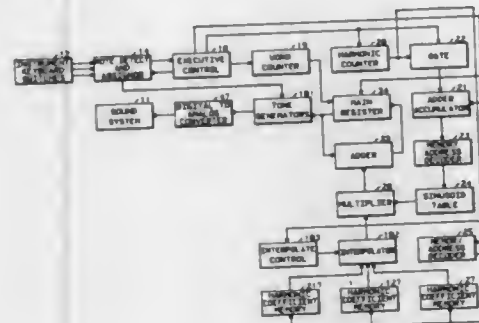
**4,677,888**  
**SELF-CONTAINED MACHINE FOR SIMULTANEOUSLY SLICING AND PERFORATING MUFFINS PRIOR TO PACKAGING**  
John Terragnoli, 103 Wallace Ave., Buffalo, N.Y. 14214  
Filed Jun. 23, 1986, Ser. No. 877,375  
Int. Cl.<sup>4</sup> A21C 15/04; B26D 3/08, 3/30; B26F 3/02  
U.S. Cl. 83—862



1. A self-contained machine for slicing and perforating baked goods, such as muffins, said machine including frame means, motor means, baked goods conveying means, slicing means and perforating means mounted on said frame means, and drive means operatively connecting said motor means with said conveying means, slicing means and perforating means, wherein the improvement comprises: said slicing and perforating means including guide means cooperating with said con-

veying means, slicing means and perforating means, for simultaneously slicing and perforating said baked goods, said motor means comprising but a single motor operatively connected to said conveying means, slicing means and perforating means by said drive means.

**4,677,889**  
**HARMONIC INTERPOLATION FOR PRODUCING TIME VARIANT TONES IN AN ELECTRONIC MUSICAL INSTRUMENT**  
Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan  
Filed Oct. 25, 1985, Ser. No. 791,631  
Int. Cl.<sup>4</sup> G10H 1/06, 7/00  
U.S. Cl. 84—1.01

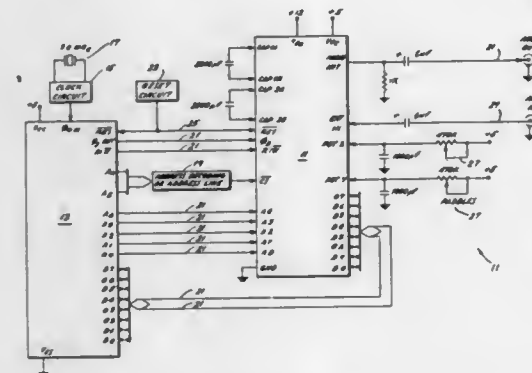


13. In combination with a musical instrument in which a plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed from a preselected set of harmonic coefficients at regular time intervals and converted into musical tones, apparatus for producing musical tones having a time variant spectra comprising: a plurality of harmonic coefficient memory means each storing a preselected set of harmonic coefficients, harmonic addressing means for simultaneously reading out a sequence of corresponding harmonic coefficients from each of said plurality of harmonic coefficient memory means, a harmonic coefficient select means whereby a subset of said harmonic coefficients read out from said plurality of harmonic coefficient memory means are selected, an interpolation means whereby an interpolated harmonic coefficient value is generated in response to said selected subset of harmonic coefficients, a means for computing responsive to each said interpolated harmonic coefficient value whereby said amplitudes of points defining the waveform of said musical tone are computed, and a means for producing a musical tone from said amplitudes of points.

**4,677,890**  
**SOUND INTERFACE CIRCUIT**  
Robert J. Yannes, Media, Pa., assignor to Commodore Business Machines Inc., West Chester, Pa.  
Filed Feb. 27, 1983, Ser. No. 455,974  
Int. Cl.<sup>4</sup> G10G 1/12, 1/46  
U.S. Cl. 84—1.19

1. A sound interface circuit for selectively generating a plurality of voices, for use in a home video game circuit, said name circuit having a programmable microprocessor holding digital instruction signals, analog game player inputs and providing a first and second non-overlapping clock pulses, comprising: a data buffer circuit means for receiving said microprocessor instruction signals for providing control instructions; a data bus connected to said buffer means for carrying said

control instructions connected from said data buffer means;  
a means connected to said analog game play inputs for analog to digital transformation of each said analog player input to digital player instructions, said player instructions being fed to said data bus;  
a first, second and third tone oscillator circuit means, each individually operated and independently structured, for each providing a separate tone frequency according to a digital instruction signals from said data bus;  
a first, second and third envelope generator circuit means each individually operated and independently structured for each providing a frequency envelope format according to a digital instruction signals from said data bus;  
a first, second and third amplitude modulator circuit means, each independently structured for each providing an amplitude modulated signal, said first modulator circuit

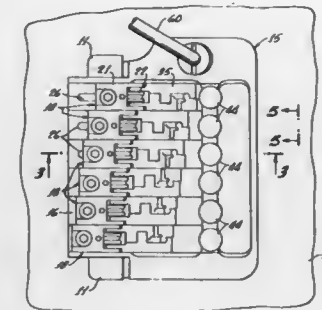


means being connected to said first tone oscillator circuit means and said first envelope generator circuit means, said second modulator circuit means being connected to said second tone oscillator circuit means and said second envelope generator circuit means, said third modulator circuit means being connected to said third tone oscillator circuit means and said third envelope generator circuit means;  
a digital filter circuit means for shaping a signal, said digital filter circuit means operating according to digital instruction signals from said data bus and being connected thereto;  
a volume controller connected on said digital filter signals circuit means output and operative according to a digital instruction from said data bus; and being connected thereto; and  
switch circuit means for selectively interconnecting any of said first, second and third amplitude modulator circuit means outputs with said digital filter means.

**4,677,891**  
**TREMOLO BRIDGE FOR GUITARS**  
Charles A. Gressett, Jr., Brea; John F. Page, La Mirada; Daniel J. Smith, Placentia, and John Carruthers, Venice, all of Calif., assignors to Fender Musical Instruments Corporation, Brea, Calif.  
Filed Jan. 31, 1985, Ser. No. 697,221  
Int. Cl.<sup>4</sup> G10D 3/04  
U.S. Cl. 84—313

1. In combination with an electric guitar having a body, neck, and strings extending over said body and neck, a tremolo apparatus characterized by the substantial absence of cross talk between the strings even when at least one string is bent, said apparatus comprising:  
(a) a tremolo plate;  
said tremolo plate having a crank arm extended downwardly therefrom and fixedly connected to such plate,  
(b) a plurality of bridge saddles mounted on said plate,

there being one bridge saddle for each string,  
(c) means to adjust each individual one of said bridge saddles toward or away from said guitar neck, in order to achieve proper intonation,  
(d) a tremolo arm connected to said plate to actuate the same,  
(e) spring means connected to said crank arm to bias said tremolo plate toward a predetermined position, and  
(f) pivot means to pivotally associate said plate with said guitar body,  
said pivot means having a pivot axis located at such dis-

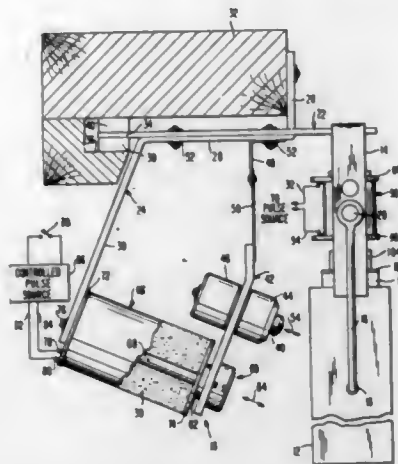


tance from said guitar neck, and said adjustment means (c) being so constructed that, the intonation points on said saddles may be adjusted between positions closer to said neck than is said axis, and positions farther from said neck than is said axis, the moment between the axis of said pivot means (f) and the region where said spring means connects to said crank arm being, when said plate is floating and not actuated, at least nine times the moment arm between the axis of said pivot means and the intonation points on said bridge saddles (b), said latter moment arm being very small when said plate is in normal unactuated condition.

**4,677,892**  
**ELECTRICAL ACTUATOR FOR PERCUSSION INSTRUMENTS**  
Justin Kramer, 1028 W. 8th Pl., Los Angeles, Calif. 90017, and Richard H. Peterson, 11601 S. Mayfield Ave., Worth, Ill. 60482  
Filed Oct. 1, 1985, Ser. No. 782,324  
Int. Cl.<sup>4</sup> G10D 13/08  
U.S. Cl. 84—405

1. A highly damped actuator for striking a sound-producing surface in a percussion musical instrument, comprising: armature means; clapper means mounted on said armature; means for mounting said armature for motion of said clapper between a rest position spaced from a sound-producing surface and an impact position at said sound-producing surface; a permanent magnet-solenoid set for holding said clapper at said rest position; and means for applying an electrical current pulse to said solenoid, said pulse being of sufficient amplitude to produce a repelling magnetic field between the permanent magnet and the solenoid of said set which drives said armature from its rest position toward said impact position and which causes said clapper to strike said sound-producing

surface, and for terminating said pulse to collapse said magnetic field between the permanent magnet and the



solenoid of said set to facilitate return of said armature to its rest position for retention by said permanent magnet.

4,677,893

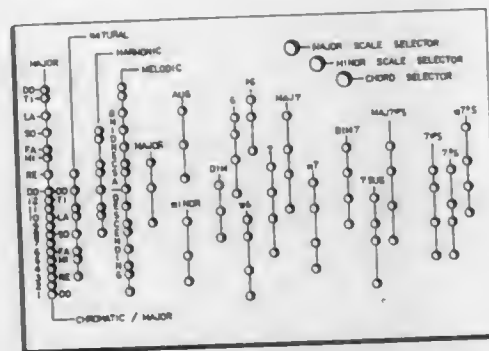
## QUICK MUSIC NOTES SLIDE RULE

E. Carl Fahnestock, 1270 Main St., Glastonbury, Conn. 06033  
Filed Jul. 11, 1985, Ser. No. 748,172

Int. Cl.<sup>4</sup> G09B 15/02

U.S. Cl. 84-473

11 Claims



1. In a Music Note Letter and Symbol Display Device comprising a data storage member on which are displayed multiple columnar segments of music note letter and symbol combinations where within each said columnar segment are contained three (3) columnar displays which are each uniquely identified by their relative positions within each said columnar segment as left positioned, center positioned and right positioned respectively and where the physical spacing between the said left positioned columnar display and the said center positioned columnar display is equal to the physical spacing between the said center positioned columnar display and the said right positioned columnar display, and where,

the physical spacing between the said columnar displays of said columnar segment is equal to the physical spacing between the columnar displays which are contained within any other columnar segment, and where, the physical spacing between any two (2) physically adjacent columnar segments is equal to the physical spacing between any other two (2) physically adjacent columnar segments, and where, the physical spacing between any two (2) physically adjacent rows which are contained within any columnar display of any columnar segment is equal to the physical spacing between any two (2) other physically adjacent

rows which are contained within any other columnar display which is contained within any other columnar segment, and where,

the music note letter and symbol combinations which are either overtly displayed or covertly implied for all rows within any columnar display are ordered by a musically chromatic relationship wherein the unique music note letter and symbol combination which is either overtly displayed or covertly implied within any unique row which is contained within any unique columnar display has a musical value which is one (1) musically chromatic pitch value higher than either the overtly displayed or covertly implied value defined for a first adjacent row which is contained within the said unique columnar display and which said first adjacent row is relatively positioned below the said unique row, and wherein,

the said unique music note letter and symbol combination which is either overtly displayed or covertly implied for said unique row has a musical value which is one (1) musically chromatic pitch lower than either the overtly displayed or covertly implied value defined for a second adjacent row which is contained within the said unique columnar display and which said second adjacent row is positioned relatively above said unique row, and where, the musical value which is either overtly displayed or covertly implied for said unique row which is contained within said unique columnar display is identical in musical value to either the overtly displayed or covertly implied musical value or its enharmonic equivalent which is displayed in the same relative row within each of the other two (2) columnar displays which are both contained within the said unique columnar segment which contains said unique columnar display, and where,

either the overtly displayed or covertly implied musical values or their enharmonic equivalents which are defined for said unique row which is contained within all columnar displays within said unique columnar segment are seven (7) chromatic pitch values lower than either the overtly displayed or covertly implied musical values or their enharmonic equivalents which are defined for the same relative row which is contained within the physically adjacent columnar segment which said physically adjacent columnar segment is positioned relatively to the right of said unique columnar segment, and whereby,

the means for the retrieval of music note letter and symbol combination data is provided by positioning over the said data storage member a data retrieval member which is slidably mounted and which contains readout apertures through which music note letter and symbol combinations can be viewed, and where,

within the said data retrieval member are positioned three (3) key apertures which are used to position the said data retrieval member for the retrieval of music note letter and symbol data through the other said readout apertures, and where,

the said data retrieval member is in a position for retrieval of music note letter and symbol combination data through the other said readout apertures when music note letter and symbol combination data is simultaneously displayed through all three (3) said key apertures, and where,

the musical scale readout apertures which are used in the retrieval of music note letter and symbol combinations which define Major and Minor Scales are positioned to function in cooperation with the three (3) key apertures such that the music note letter and symbol combinations which are viewed through the said musical scale readout apertures are retrieved from only the said relative left positioned columnar display of each participating columnar segment, and where,

the unique music note letter and symbol combination displayed through a unique readout aperture for a unique positioning of the three (3) said key apertures defines a unique musical note which is a part of the musical expres-

sion of either a musical scale or a musical chord, and where,

the said unique music note letter and symbol combination which is displayed on the data storage member in a unique relative columnar display positioning and viewed through said unique readout aperture is used to express a musical note which is a part of another musical expression of either a musical scale or musical chord by display through a second readout aperture which is positioned in the same relative row position and the same relative columnar display positioning as said unique readout aperture and which said second readout aperture is positioned on the said data retrieval member relatively to the left of said unique readout aperture, and where,

each music note letter and symbol combination which is displayed on the said data storage member is uniquely located in a relative left positioned or center positioned or right positioned columnar display and defined row positioning within a unique columnar segment whereby each said music note letter and symbol combination is defined for cooperative use only through apertures which have been uniquely defined for functioning within the same relatively positioned columnar display and defined row positioning on the said data retrieval member, and where, the musical note letter and symbol combination which is displayed through a readout aperture is the proper musically correct notation which will define a musical note value used in the musical expression of either scale or chord information for Major or Minor musical keys.

4,677,894

## DEVICE FOR THE CENTERING RETENTION OF AMMUNITION IN AN AMMUNITION RECEIVER

Leonhard Pongratz, Karlsfeld; Ferenc Kotai, and Markus Spötl, both of Munich, all of Fed. Rep. of Germany, assignors to Krauss-Maffei A.G., Fed. Rep. of Germany

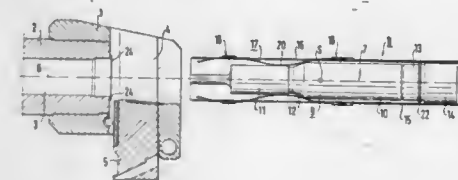
Filed Oct. 15, 1986, Ser. No. 919,014

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536672

Int. Cl.<sup>4</sup> F42B 33/00

U.S. Cl. 86-45

15 Claims



1. A device for centering retention of ammunition comprising:

- means for receiving ammunition;
- means for gripping an ammunition cartridge rim associated with said means for receiving;
- means for retaining ammunition in axially centered alignment within said means for receiving wherein said means for retaining comprises;
- a plurality of circumferentially distributed, radially inwardly acting leaf springs arranged on said means for receiving;
- means for fastening a rearward end of each leaf spring to said means for receiving at a first radial plane;
- means for fastening a forward position of each leaf spring to said means for receiving at a second radial plane;
- a plurality of recesses in said means for receiving between said first radial plane and said second radial plane, wherein a radially inwardly contoured portion of said leaf springs extends through said recesses;
- a radially inward directed forward extension of said leaf springs wherein said forward extension extends past said second radial plane and away from said first radial plane.

184-021 O.G.-87-4

4,677,895

## MULTIPLE RAIL ELECTROMAGNETIC LAUNCHERS WITH ACCELERATION ENHANCING RAIL CONFIGURATIONS

Richard J. Carlson, Santa Clara, Calif., and George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

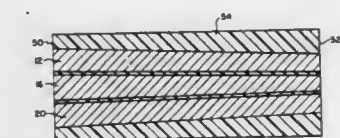
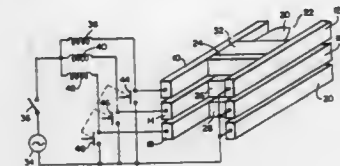
Filed Mar. 29, 1985, Ser. No. 717,993

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> F41F 1/02

U.S. Cl. 89-8

9 Claims



1. An electromagnetic projectile launcher comprising: four generally parallel conductive rails lining a bore; first and second sources of electric current; means for conducting current between a first pair of said rails and between a second pair of said rails, and for propelling a projectile along said rails;
- means for substantially simultaneously connecting said first current source to a first end of said first pair of rails and for connecting said second current source to a first end of said second pair of rails; and
- wherein the total stacked height of said rails adjacent to said bore decreases from said first ends of said rails to a second end of said rails, thereby for a given current, increasing acceleration force on said projectile, caused by current flowing through said rails and through said means for conducting current, as said means for conducting current travels from said first ends to said second ends of said rails.

4,677,896

## RESCUE VEHICLE

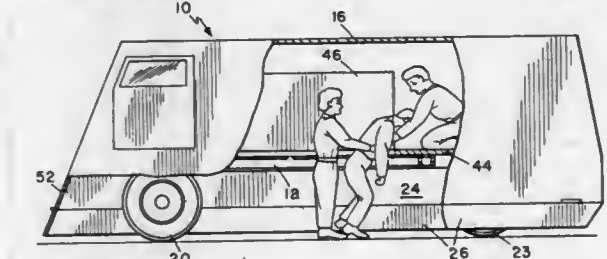
Jerome S. Litvinoff, 6536 Crystalline Dr., San Diego, Calif. 92120

Filed Dec. 17, 1984, Ser. No. 682,078

Int. Cl.<sup>4</sup> F41H 5/12

U.S. Cl. 89-36.08

3 Claims



1. A rescue vehicle comprising: a vehicle body having a front and rear end, sides, roof and floor defining at least one internal vehicle compartment; vehicle wheels rotatably mounted on the vehicle body;

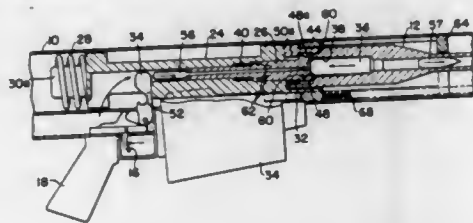


drive means within the vehicle body for driving the wheels to propel the vehicle;  
 the vehicle body having an armor construction exterior shell;  
 the shell having armored front, rear and side skirt sections which extend downwardly around the periphery of the body from the floor level to a level close to the ground level and enclose said vehicle wheels to from a shielded space beneath the vehicle;  
 the front, rear and side skirt sections each terminating in retractable flaps which are moveable between a lowered position in which they extend downwardly close to the ground level and a raised position in which they are raised above the ground;  
 the front flap covering a front entry opening when lowered, the front entry opening being of dimensions sufficient for driving the vehicle forwardly over a prone, injured person in front of the vehicle with some clearance;  
 control means within the vehicle body for selectively raising and lowering the front flap;  
 at least one trap door in said floor for providing access from the ground beneath said floor to the internal compartment;  
 the vehicle floor at the front end of the vehicle having no downward projections and being raised above ground level by a sufficient distance to enable the vehicle to be driven forwardly with some clearance over a prone, injured person until the person is positioned beneath the trap door; and  
 at least one window opening in the floor at the forward end of the vehicle adjacent a driver's position for allowing the driver to view the ground beneath the vehicle and position the vehicle over an injured person.

#### 4,677,897 ANTI-ARMOR GUN

Ronnie G. Barrett, 745 E. Vine St., Murfreesboro, Tenn. 37130  
 Filed Dec. 19, 1983, Ser. No. 563,234  
 Int. Cl.<sup>4</sup> F41D 3/06

U.S. Cl. 89—166



1. A shoulder-firable gun comprising:
  - (a) an elongated housing having a front portion, a rear portion, an upper portion, and a lower portion, said rear portion comprising a shoulder stock,
  - (b) trigger mechanism in the lower portion of said housing,
  - (c) an elongated bolt carrier received within said housing for longitudinal, reciprocable movement, said bolt carrier having a coaxial forward-opening bolt cavity,
  - (d) an elongated bolt slidably received within and projecting forward from said bolt cavity, the front portion of said bolt comprising radially projecting bolt locking lugs and an elongated reciprocable coaxial firing pin,
  - (e) said bolt cavity having a rear seat for engaging a rear portion of said bolt when said bolt is fully retracted within said cavity,
  - (f) bolt spring means in said bolt carrier normally biasing said bolt forward,
  - (g) cam and slot means interconnecting said bolt and bolt carrier to provide limited rotary movement of said bolt relative to said bolt carrier during longitudinal movement of said bolt relative to said bolt carrier,
  - (h) an elongated recoil spring within said rear portion of said

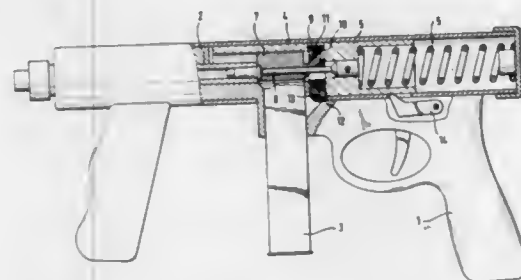
- housing and in coaxial alignment with and behind said bolt carrier,
- (i) an elongated barrel comprising a rear barrel portion having a barrel chamber and terminating in an enlarged bolt locking collar,
  - (j) said bolt locking collar having radially inward directed collar locking lugs for engaging and disengaging said bolt locking lugs in a battery position,
  - (k) a front bushing fixed in the front end portion of said housing for slidably receiving said barrel for longitudinal reciprocable movement,
  - (l) a rear bushing fixed in said housing substantially behind and in coaxial alignment with said front bushing and in front of said bolt locking collar,
  - (m) a barrel travel stop member fixed within said housing between said rear bushing and said front bushing and encompassing at least a portion of said barrel,
  - (n) an abutment member fixed on and substantially encompassing said barrel between said stop member and said front bushing to engage said stop member to limit the rearward movement of said barrel,
  - (o) barrel spring means connecting said barrel to said housing to bias said barrel forward to a battery position,
  - (p) said bolt locking lugs counter-rotating and disengaging said collar locking lug after said abutment member engages said stop member during the rearward travel of said barrel, whereby said bolt carrier continues its rearward movement against the action of said recoil spring while said bolt rotates forward relative to said bolt carrier, and said barrel is biased forward to its battery position by said barrel spring.

#### 4,677,898 HAND FIREARM

Satish K. Malhotra, Steyr, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria  
 Filed Feb. 19, 1986, Ser. No. 831,154  
 Claims priority, application Austria, Feb. 20, 1985, 504/85  
 Int. Cl.<sup>4</sup> F41D 3/00

U.S. Cl. 89—187.01

3 Claims



1. A hand firearm having a forward and a rear end defined by the direction of fire, comprising
  - a stock,
  - a barrel attached to said stock, said barrel defining a longitudinal axis of said firearm along said direction of fire,
  - a return spring located at the rear end of said firearm and being aligned with said longitudinal axis,
  - a breech block carrier located forward of said drum spring and along said longitudinal axis, said breech block carrier being displaceable against the biasing force of said return spring,
  - a breech block received within said breech block carrier, said breech block being operable between open and closed positions, said breech block being displaceable along said longitudinal axis relative to said breech block carrier,
  - an ignition pin traversing said breech block,
  - a latch means disposed on said breech block carrier, said latch means located to the rear of said breech block along said longitudinal axis and in a plane of symmetry of said breech

block, said latch means being displaceable along said longitudinal axis and in a direction transverse to said longitudinal axis, said latch means having a rearward oblique face,  
 said stock of said firearm including a forward oblique counterface adapted to be in registry with said face, said face and said counterface having the same degree of obliquity, said face and said counterface opposing each other with a small amount of play when said breech block is in the closed position,  
 said latch means moving in said transverse direction when ignition of said firearm is effected and said face and counterface come into contact with each other,  
 said breech block, said breech block carrier, and said latch means carrying out a joint recoil movement when ignition of said firearm is effected.

#### 4,677,899

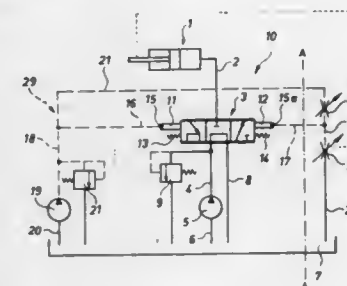
#### APPARATUS FOR CONTROLLING AN ADJUSTABLE MEMBER

Heinz Schulte, Marktheidenfeld, and Norbert Mucheyer, Rechtenbach, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany  
 Division of Ser. No. 188,453, Sep. 18, 1980, abandoned. This application Feb. 25, 1986, Ser. No. 832,634  
 Claims priority, application Fed. Rep. of Germany, Oct. 5, 1979, 2940403

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.  
 Int. Cl.<sup>4</sup> F15B 11/08

U.S. Cl. 91—403

5 Claims



1. An apparatus for positioning an adjustable member as a function of a command signal and a controlled condition, especially for the positioning of a hoisting means on a tractor or the like, the apparatus comprising:
  - an operating circuit having a bidirectional positionable valve with a valve slide and with first and second control devices for regulating flow of pressure medium from a supply tank to the adjustable member;
  - a control circuit connecting a control pressure medium source to said control devices for said positionable valve, said control circuit having first and second adjustable throttles, said first adjustable throttle being connected between the supply tank and a junction of said control circuit and said first control device, said second adjustable throttle being connected between said control pressure medium source and said junction and in series with said first adjustable throttle;
  - said junction being between said first and second throttles and being connected to said first control device through a fifth adjustable throttle; and
  - sixth and seventh adjustable throttles being connected in series between said control pressure medium source and the supply tank, and an eighth adjustable throttle being connected between said first control device and a junction between said sixth and seventh throttles, said fifth and eighth throttles being mechanically coupled for inverse operation.

#### 4,677,900

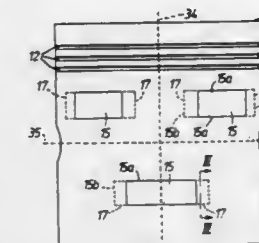
PISTONS FOR INTERNAL COMBUSTION ENGINES  
 Jonathan D. Philby, Rugby, England, assignor to AE PLC, Warwickshire, England

Filed Jul. 26, 1985, Ser. No. 759,650  
 Claims priority, application United Kingdom, Aug. 4, 1984, 8419928

Int. Cl.<sup>4</sup> F16J 1/04

U.S. Cl. 92—212

18 Claims



1. A piston for reciprocation in a lubricated cylinder of an internal combustion engine having a central piston axis and comprising:
  - a crown,
  - a gudgeon pin bore defining a gudgeon pin bore axis,
  - a skirt having two opposed portions,
  - at least one strip of plastics material carried on at least one of said skirt portions,
  - at least one strip of plastics material carried on the other of said skirt portions,
  - each said at least one strip of plastics material projecting beyond the associated skirt portion to prevent the formation of a film of lubricant between the skirt and said cylinder,
  - each said at least one strip of plastics material being rectangular and having a width and length substantially greater than the thickness thereof to allow each said one strip of plastics material to tilt relative to the associated skirt portion, to permit the formation between each strip and an associated lubricated cylinder of a hydrodynamic film of lubricant on reciprocation of the piston in said associated cylinder.

#### 4,677,901

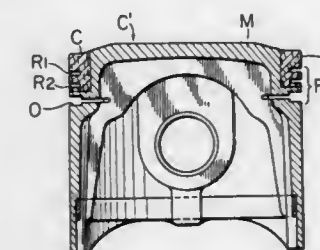
#### FIBER-REINFORCED PISTON FOR INTERNAL COMBUSTION ENGINES AND ASSOCIATED METHOD OF CONSTRUCTION

Keisuke Ban, Fujimi, and Akimasa Daimaru, Oomiya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 388,666, Jun. 15, 1982, Pat. No. 4,498,219. This application Nov. 21, 1984, Ser. No. 673,664  
 Claims priority, application Japan, Jun. 18, 1981, 56-94461  
 Int. Cl.<sup>4</sup> F16J 1/04

U.S. Cl. 92—213

14 Claims



1. A fiber reinforced piston for an internal combustion engine comprising a top land and a ring region provided with an uppermost ring groove, said top land and said ring region being defined by a reinforced part of the piston formed by a matrix metal reinforced with inorganic fibers, said reinforced

part of the piston being circularly symmetrical around an axis of the piston and forming an annulus around a top portion of the piston, said reinforced part having a cross-section, in a plane containing the axis of the piston, of substantially rectangular shape except for the uppermost ring groove, said piston having an upper crown surface, said reinforced part being formed as a cylindrical shell having an upper radial surface which is continuously formed in said upper crown surface, a lower radial surface, an inner cylindrical surface joining said upper and lower radial surfaces and an outer cylindrical surface having a radius equal to that of the outer cylindrical surface of the piston, said uppermost ring groove having an upper annular side wall surface, a lower annular side wall surface and an annular bottom surface connecting said upper and lower annular side wall surfaces, said inner cylindrical surface of the reinforced part having a smaller radius than that of the annular bottom surface of the uppermost ring groove, said reinforced part extending in the axial direction of the piston from the upper crown surface to a position below said lower annular side surface of the uppermost ring groove, whereby said uppermost ring groove is totally defined within said reinforced part.

4,677,902

# DEODORIZING DEVICE OF AN AIR CONDITIONING SYSTEM FOR AUTOMOTIVE VEHICLES

Masami Takemasa, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

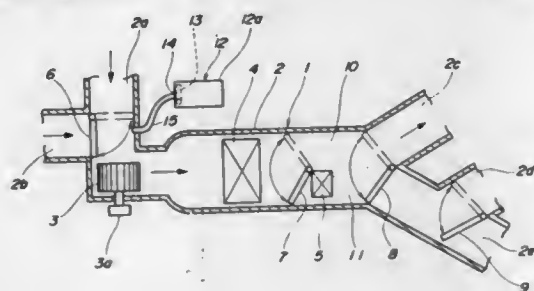
Filed Dec. 16, 1985, Ser. No. 809,526

Claims priority, application Japan, Dec. 18, 1984, 59-190849(U); Dec. 18, 1984, 59-190850(U); Dec. 18, 1984, 59-190851(U)

Int. Cl.<sup>4</sup> B60H 3/00

U.S. Cl. 98-2.11

6 Claims



1. A deodorizing device of an air conditioning system for use in an automotive vehicle, said air conditioning system including a housing having an air passage defined therein and at least one air outlet at a downstream end portion of said air passage for discharge of air into a passenger compartment of said automotive vehicle, an evaporator arranged in said air passage of said housing, a blower arranged in said air passage of said housing at a location upstream of said evaporator, and a power switch for selectively activating and deactivating said blower, said deodorizing device comprising:  
a casing;  
communication passage means communicating the interior of said casing with said air passage in said housing at a location upstream of said evaporator;  
a volatile deodorant accommodated in said casing;  
door means adapted to selectively open and close said communication passage means; and  
driving means responsive to turning on and turning off of said power switch and a second switch, for driving said door means to selectively open and close, said driving means being adapted to open said door means when both said power switch and said second switch are turned on.

4,677,903

# CONSTRUCTION UTILIZING A PASSIVE AIR SYSTEM FOR THE HEATING AND COOLING OF A BUILDING STRUCTURE

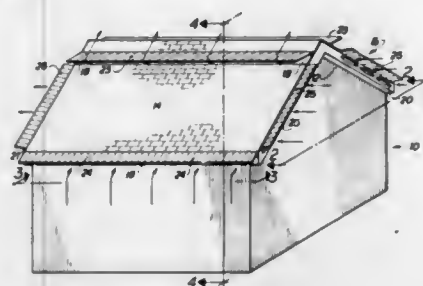
J. F. Mathews, III, P.O. Box 190647, Miami Beach, Fla. 33119

Filed Jul. 26, 1985, Ser. No. 759,205

Int. Cl.<sup>4</sup> F24F 7/00

U.S. Cl. 98-31

11 Claims



1. A passive air system of the type primarily designed to heat and cool a building structure utilizing natural occurring phenomenon, said system comprising:

- a. an external covering structure mounted on and disposed in spaced relation to a roof of a building structure and dimensioned to cover an exterior surface of the roof;
- b. an air space defined between said external covering structure and said roof and extending substantially over the exterior surface of the roof;
- c. interconnecting means comprising a plurality of studs disposed in spaced, substantially parallel relation to one another and extending between open, opposite longitudinal ends of said air space, said plurality of studs disposed between adjacent ones of said air passages for interconnecting said external covering structure and the exterior surface of the roof;
- d. a plurality of air passages disposed within said air space and extending in communicating relation between said open, opposite longitudinal ends of said air space, said air passages structured to conduct air between said opposite ends of said air space and the exterior of said covering structure;
- e. said plurality of air passages and said studs extending upwardly at an incline from a lower one of said opposite longitudinal ends to an upper one of said opposite longitudinal ends; said plurality of air passages disposed to conduct air current by convection within said air space and over the exterior surface of said roof;
- f. covering means movable secured to said covering structure for closing each of said opposite longitudinal ends of said air space, said covering means selectively movable between an open and a closed position;
- g. said closed position defined by covering relation to said opposite longitudinal ends and separating relation to the interior of said air space relative to the exterior thereof, said open position defined by non-covering relation of two said opposite longitudinal ends and fluid communication between the interior and exterior of said air space;
- h. said closed position of said covering means further defining air trapped within said air space, and said open position of said covering means further defining an air flow throughout said air space between said opposite longitudinal ends; and
- i. a plurality of air channels formed on the interior of said air space and extending in transverse relation to said plurality of air passages and extending between and communicating relation with open transverse ends of said air space, said plurality of air channels disposed and structured to conduct air therethrough between said transverse ends of said exterior of said air space, said covering means being further movably connected at each of said opposite transverse ends of said air space and movable between a closed

position and an open position, said open position defined by communicating relation of each of said transverse ends with the exterior of said air space, said closed position defined by covering relation to said transverse ends and trapped relation of air within said air space relative to the exterior thereof.

4,677,904

# FLUID FLOW CONTROL ASSEMBLY

Takeshi Natsumeda; Motoyuki Nawa, both of Nara, and Norio Sugawara, Shiki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

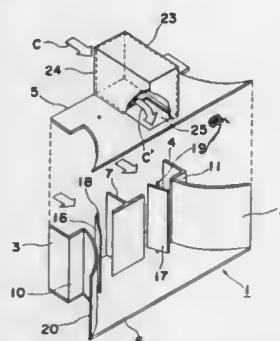
Filed May 19, 1986, Ser. No. 864,464

Claims priority, application Japan, May 20, 1985, 60-107325; Jun. 28, 1985, 60-142882

Int. Cl.<sup>4</sup> F24F 7/00

U.S. Cl. 98-38.1

14 Claims



1. A fluid flow control assembly which comprises:

- a fluid inlet structure having a fluid inlet region defined therein for the passage of fluid therethrough in one direction;
  - a fluid outlet defining structure fluid-connected with and positioned downstream of the inlet defining structure, said outlet defining structure including first and second guide walls extending outwardly from each other in a direction away from the inlet defining structure;
  - a partitioning member arranged in the inlet region for dividing the fluid flowing in the inlet region into first and second fluid streams as it passes through the inlet defining structure;
  - first and second deflector members disposed in respective paths of flow of the first and second fluid streams, each of said first and second deflector members being supported for angular movement about a respective axis between first and second positions for controlling the direction of flow of the respective fluid stream; and
  - a passage means for introducing a third fluid stream in between the first and second fluid streams generally at right angles to the direction of flow of any one of the first and second fluid streams;
- said first and second deflector members being so positioned as to control a wall attachment of the first and second fluid streams relative to the first and second guide walls wherefore a draft of fluid emerging outwardly from the outlet defining structure can be directed outwardly, be biased in one lateral direction or be centered on a limited region.

4,677,905

# FOOD STEAMING APPARATUS

Robert A. Johnson, 317 Origen St., Burlington, Wis. 53105

Filed Dec. 23, 1985, Ser. No. 812,815

Int. Cl.<sup>4</sup> A47J 27/04

U.S. Cl. 99-413

11 Claims

1. A food heating apparatus placeable over the open top of a container of boiling water, said apparatus comprising a plate including a generally planar upper surface, a lower surface generally parallel to said upper surface, a central portion hav-

ing a first width and a first thickness between said upper and lower surfaces, and an adjacent outer portion having a second width greater than said first width and a second thickness



between said upper and lower surfaces substantially less than said first thickness, said plate having therethrough a plurality of steam passages extending between said lower surface and said upper surface.

4,677,906

# PAN INSERT

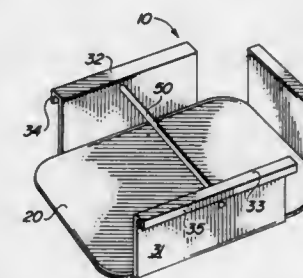
Virginia L. Lowe, 500 E. Silver Star Rd., Ocoee, Fla. 32761

Filed Feb. 6, 1986, Ser. No. 826,605

Int. Cl.<sup>4</sup> A47J 37/00, 43/18

U.S. Cl. 99-450

2 Claims



1. A pan insert for use in a roasting pan for enabling removal of roast meat from the pan, said insert comprising:

- (a) a substantially planar tray dimensioned for resting on an inner bottom surface of the roasting pan and having two opposing sides and two opposing ends transverse to said sides;
- (b) first and second integral meat retaining side panels positioned on said two opposing sides of said tray and extending upwardly with respect to the bottom surface of the pan when the tray is seated on the bottom inner surface of the pan, top edges of the side panels being formed with outwardly extending portions forming handles, said first and second panels being sufficient to retain the meat and for enabling lifting of said tray, said top edges being disassociated from the pan;
- (c) a third integral meat retaining panel extending upwardly from one end of said tray and spaced from the side panels along the periphery of the pan insert to define open liquid draining spaces along said tray between said third panel and each of said first and second panels such that the tray can be lifted slightly and tilted toward said third panel to drain the meat of any drippings while the third panel will retain the meat on the pan insert; and
- (d) the other opposing end of said tray between said first and second side panels being free of panels and thus open sufficient for allowing the meat to be slid from said tray by tilting of said tray toward said other end.



4,677,907

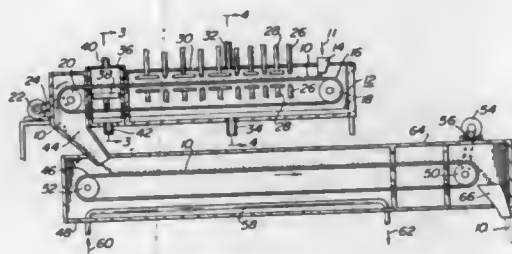
## APPARATUS FOR PREPARING QUICK COOKING RICE AND VEGETABLES

Bjarne Weibye, Oslo, Norway, assignor to Apothekernes Laboratorium A.S., Oslo, Norway  
Continuation of Ser. No. 550,273, Nov. 9, 1983, abandoned, which is a division of Ser. No. 414,140, Sep. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 298,676, Sep. 2, 1981, Pat. No. 4,385,074. This application Jun. 20, 1986, Ser. No. 878,400

Int. Cl.<sup>4</sup> A23L 1/00, 3/00

U.S. Cl. 99—483

3 Claims



1. An apparatus for continuously preparing completely gelatinized rice or vegetable pieces comprising:
  - a selectively closable chamber;
  - a porous conveyor belt disposed for movement through said chamber for supporting the rice or vegetable pieces;
  - at least two sets of nozzles, each said set of nozzles including a water spray adjacent to a steam spray, said sets of nozzles positioned in an opposing relationship on opposite sides of said belt such that said belt passes between a water spray prior to passing between a steam spray during movement thereof and means for controlling the moisture added by said sets of nozzles to the rice or vegetables pieces.

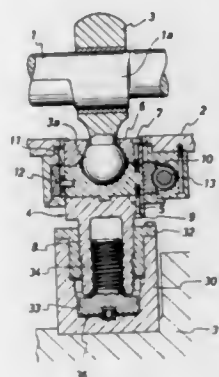
4,677,908

SLIDE-ADJUSTING DEVICE FOR A PRESS  
Shozo Imanishi, and Mitsuo Sato, both of Sagami-hara, Japan, assignors to Aida Engineering, Ltd., Kanagawa, Japan  
Filed Dec. 3, 1985, Ser. No. 804,251

Int. Cl.<sup>4</sup> B30B 1/26; F16H 1/16

U.S. Cl. 100—53

4 Claims



1. A press having a slide adjusting device and which comprises:
  - a press crown;
  - a crank shaft mounted on said crown and having an eccentric portion;
  - a connecting rod mounted on said eccentric portion;
  - a slide adjusting screw means connected to said connecting rod;
  - a worm wheel mounted on the outer periphery of said slide

adjusting screw means for rotating said slide adjusting screw means with said worm wheel and for relative axial sliding movement of said slide adjusting screw means and said worm wheel;

means engaging said worm wheel for holding the worm wheel fixed against movement in the vertical direction relative to said press crown, whereby the slide adjusting screw means is moved in the rotational direction by rotation of said worm wheel and is slidable in the vertical direction in said worm wheel;

a worm shaft engaged with said worm wheel for rotating said worm wheel;

a motor mounted on said press crown and connected to said worm shaft for driving said worm shaft;

a press slide means threadedly engaged by the outer periphery of said slide adjusting screw means at the lower end thereof;

a piston vertically movably mounted on said press slide means with the upper portion thereof threaded to the lower end of said slide adjusting screw means;

said piston and said slide means defining an oil pressure chamber therebetween; and

pressure means for supplying oil under pressure to said oil pressure chamber and a control valve for controlling the level of said oil pressure.

4,677,909

## WASTE TRANSFER PACKERS

Brian G. Beesley; Clive Hurley; Ramon H. J. Brend; Thomas P. Edwards; Robert W. D. Sherrell, and Andrew J. Vickery, all of Devon, England, assignors to Devon County Council, Exeter, England

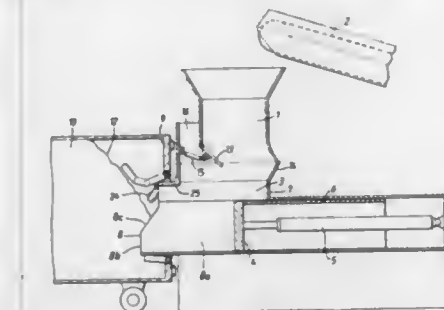
Filed May 8, 1985, Ser. No. 731,898

Claims priority, application United Kingdom, May 10, 1984, 8411933

Int. Cl.<sup>4</sup> B30B 15/06

U.S. Cl. 100—229

10 Claims



1. A waste transfer packer and transfer container combination, said waste transfer packer comprising
  - a feed hopper,
  - a hollow spigot extending substantially horizontally from said feed hopper and adapted to penetrate through an aperture in a wall of the transfer container, and
  - a reciprocable ram operable substantially within said spigot to insert charges of waste material from said free hopper into said transfer container and to compress said charges therein, the maximum penetration of said ram within said transfer container being substantially coextensive with the penetration of said spigot and being of a distance in the order of half the ram height,
- said spigot having a lower margin and coextensive therewith a pair of side walls, forward edges of said side walls extend upwards initially from a lower margin of said side walls about one quarter of the ram height whereafter said forward edges slope rearwards to about a level of a top of the ram.

4,677,910

## PROCESS FOR PROCESSING SECURITY PAPER WEBS OR SECURITY PAPER SHEETS TO FORM BUNDLES OF SECURITY PAPERS

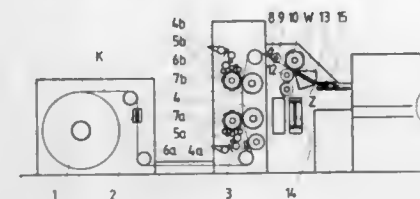
Runwilt Kuhfuss, Metzingen, Fed. Rep. of Germany, assignor to De La Rue Glori S.A., Lausanne, Switzerland  
Filed Jun. 19, 1985, Ser. No. 746,555

Claims priority, application Switzerland, Jul. 5, 1984, 3251/84

Int. Cl.<sup>4</sup> B41J 1/00; B07C 5/00

U.S. Cl. 101—93,01

9 Claims



1. Process for processing print carriers, printed with security paper prints, in the form of security paper webs or security paper sheets, the security paper prints of which are arranged in the manner of matrices in transverse rows and longitudinal rows, comprising the steps of
  - a. marking spoilt prints detected on said print carriers;
  - b. scanning the positions of all spoilt prints on the printed carriers and storing these positions before the print carriers are numbered;
  - c. feeding said print carriers in a numbering machine, where only the satisfactory security paper prints are serially numbered on the print carriers, while said serial numbering is interrupted when a spoilt print appears, and continued when the next satisfactory security paper print appears, the numbering mechanism of said numbering machine being controlled individually as a function of said stored positions;
  - d. applying cancellation prints to said spoilt prints, said operation being controlled as a function of said stored positions and being effected before cutting up said print carriers;
  - e. cutting up said print carriers to individual security papers cut to size;
  - f. eliminating the individual security papers having spoilt prints;
  - g. assembling the remaining serially numbered individual security papers to form bundles with complete numerical sequence in each case.

4,677,911

## CONVERSION OF LETTERPRESS TO OFFSET PRINTING

Carl J. Hermach, Gulfport, Fla., assignor to Publishers Equipment Corporation, Carrollton, Tex.

Continuation of Ser. No. 473,967, Mar. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 209,222, Nov. 24, 1980, abandoned, which is a continuation-in-part of Ser. No.

175,126, Aug. 4, 1980, abandoned, which is a

continuation-in-part of Ser. No. 122,908, Feb. 20, 1980, abandoned. This application Jun. 21, 1985, Ser. No. 747,383

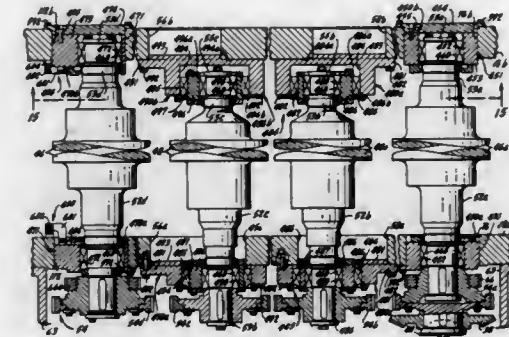
Int. Cl.<sup>4</sup> B41F 5/06, 5/22

U.S. Cl. 101—218

14 Claims

1. In an offset press unit having a main frame defining a pair of spaced apart walls including pairs of aligned bores adapted to receive and rotatably support a pair of plate cylinders, and two additional pairs of aligned bores spaced generally intermediate said pairs adapted to receive said plate cylinders, at least one of said pairs of aligned bores including bearing housings disposed therein and including cylinder support bearings therein, a pair of plate cylinders disposed inside said frame rotatably supported thereon in spaced apart relation, at least one of said plate cylinders being rotatably supported upon said cylinder support bearings of said bearing housings disposed in

said at least one pair of aligned bores, and a pair of blanket cylinders disposed inside said frame, each rotatably supported for rolling contact with the other and with one of said plate cylinders at least a first non-rotatable internal support bracket secured inside the main frame to one of said walls and defining a bore eccentrically disposed with respect to each one of said pairs of aligned bores, at least a first a nonrotatable external support bracket secured outside the main frame to the other of said walls and defining a bore coaxially aligned with the bore



defined by said internal support bracket, cylinder supporting bearings disposed in said bores of said internal and external support brackets, and one of said printing cylinders rotatably supported upon said cylinder supporting bearings, wherein said internal support bracket overlies one of said bores of one of said aligned pairs and includes a pilot disposed within said bore, said external support bracket overlying the other one of said same pair of aligned bores and including a pilot disposed within said bore, said internal and external support brackets rotatably supporting a blanket cylinder.

4,677,912

## INK FOUNTAIN PREPARATION STATION AND INTERCHANGEABLE INK FOUNTAIN SYSTEM

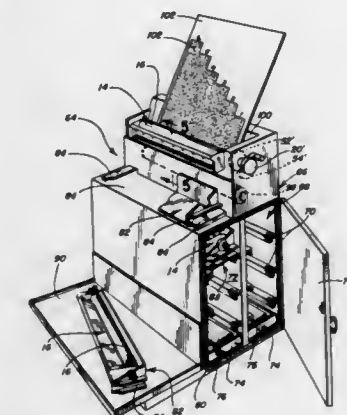
Eber L. Goodwin, Arlington Heights, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Apr. 16, 1985, Ser. No. 723,794

Int. Cl.<sup>4</sup> B41F 31/06, 31/30

U.S. Cl. 101—365

26 Claims



1. A preparation station for ink fountains used in duplication machines, such as rotary offset lithographic machines, the ink fountain including a fountain trough defined by an elongated blade, an ink fountain roller and means for adjusting the ink flow-through gap between the blade and roller, comprising:
  - a housing independent of the duplicating machine;
  - support means for removably mounting an entire ink foun-





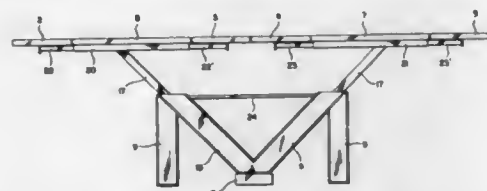
car interior in a horizontal plane and mounted to the car floor and extending upwardly therefrom;  
the guide track having a front run lateral to the car and a side run along each car side wall;  
guide means carried by the bottom of the door assemblies engaging the guide track to guide the door assemblies along the track when they are moved to open and close the car end;  
the guide track front run having two spaced apart retractable track sections movable up and down from an up position wherein the track sections project above the floor level to a down position wherein the track sections are at a height not above the floor level;  
bridge plate support means mounted on the car adjoining each retractable track section;  
means maintaining a track section in said down position when a bridge plate is engaged with the adjoining bridge plate support means; and  
each of the retractable track sections in said down position being positioned to be rolled over by the wheels on one side of four-wheel vehicles transported by the railroad car.

4,677,919

**TRANSFORMABLE LOW DRAWING-ROOM TABLE**  
Giuseppe Baggiani, Via Provinciale Castiglione, 58043 Castiglione della Pescaia GR, Italy  
Filed Feb. 4, 1986, Ser. No. 825,931  
Claims priority, application Italy, Feb. 13, 1985, 47674 A/85  
Int. Cl.<sup>4</sup> A47B 57/00

U.S. Cl. 108—63

10 Claims

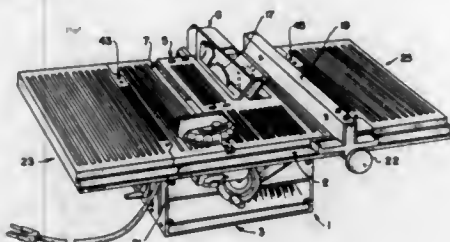


1. A transformable low drawing-room table comprising four upper flat rectangular, side by side arranged, elements which are equal to one another in length and width, two lower flat rectangular, side by side arranged elements which are equal to each other in length and width and have the same length as the upper flat elements while being each twice the width of one of said four upper flat elements, said four upper flat elements overlap said two lower flat elements, outer elements of said upper flat elements being hinged to said lower flat elements along outer sides, inner elements of said upper flat elements being hinged to said lower flat elements along inner sides, and a pair of independently height adjustable supporting means each supporting two of said four upper elements and one of said two lower elements and each including two central slanting braces forming a "V", each slanting brace includes a groove defining an inner guide, a sliding arm guided within said inner guide, an upper end of said sliding arm being integral with a horizontal bracket supporting one of said two said lower elements, locking means for locking each sliding arm in a raised position, and the length of said sliding arm being such that the movement of said sliding arm in an inclined direction causes said sliding arm to be locked and a sideward and outward shift of said lower flat element supported by said arm is allowed to extend to an extent corresponding to the width of an upper flat element.

4,677,920  
**ADJUSTABLE SIDE EXTENSIONS FOR WORK TABLE**  
Curtis J. Eccardt, St. Charles County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.  
Filed Jun. 3, 1985, Ser. No. 740,759  
Int. Cl.<sup>4</sup> A47B 1/04

U.S. Cl. 108—69

7 Claims

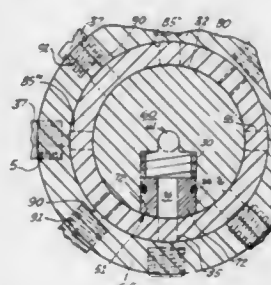


1. An adjustable side extension for a work table, the latter having an upper surface and at least one side and one end, and the side extension having an upper surface and at least one side and one end, with the side of the work table and the side of the side extension being generally in side-to-side relation, and means for permitting adjustment of the side extension with respect to the work table and for securing the side extension relative to the work table such that the upper surfaces of the work table and the side extension are substantially coplanar and such that the end of the work table and the end of the side extension are generally in line with one another, said means comprising an upper flange and a lower flange carried by said side extension, each of said flanges having an aperture therein, each said aperture having an aperture side generally parallel to the side of said side extension, said work table having a threaded opening therein in register with each of said apertures in said side extension when said side extension is in generally side-to-side relation with said work table, a threaded fastener received in each of said apertures and being threadably received in a respective said threaded opening in said work table, said aperture side being inclined with respect to the vertical, said aperture side of said upper flange aperture and said aperture side of said lower flange aperture facing in opposite directions with respect to one another such that said side extension can be moved both in vertical and horizontal direction with respect to said work table to a desired position, and such that upon tightening of said fasteners, said fasteners engage their respective said aperture sides of their respective apertures thereby to positively secure said side extension to said work table in its desired vertical and horizontal adjusted position with respect to said work table.

4,677,921  
**AGRICULTURAL CHEMICAL APPLICATOR**  
Max A. Brown, 316 Framington Dr., Plantation, Fla. 33317  
Filed Feb. 10, 1986, Ser. No. 828,222  
Int. Cl.<sup>4</sup> A01C 23/02

U.S. Cl. 111—6

5 Claims



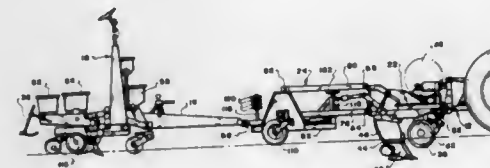
1. A soil treating apparatus comprising:

a first means adapted to be advanced on the ground in rolling contact therewith;  
a plurality of hollow spike means connected and mounted on said first means and projecting outwardly therefrom and so constructed and arranged to sequentially penetrate the ground and to withdraw therefrom;  
a fluid means connected to said hollow means for providing a source of fluid that flows through said hollow means into the ground;  
mounting means connected to said first means for positioning said first means for rolling contact with the ground;  
said mounting means including valve means for permitting flow of fluid from said fluid means through mounting means, said valve means and said hollow means to restrict the flow of fluid out through said hollow means;  
said valve means including  
a relatively fixed member including a passageway, said fixed member connected to said mounting means;  
a relatively movable member mounted in intimate, slidable engagement with said relatively fixed member, said relatively movable member connected to and rotatable with said first means and including a plurality of spaced passages in a circular band shaped face adapted to selectively and singularly communicate with said passageway, the areas between said passages being imperforate each of said plurality of spaced passages operably connected to one of said hollow means;  
said relatively fixed member including a recess extending only partially through the thickness thereof and coextensive with said passageway;  
a plug-like element of substantially the same shape and size of said recess freely movable within said recess, said plug-like element including a passage therethrough communicating with said passageway and adapted to communicate with a selected one of said spaced passages of said relatively fixed member, said plug-like element having a sealing face of a relatively small surface area; and  
biasing means in said recess operable to continuously urge said sealing face of said plug-like element into engagement with said band shaped face of said relatively fixed element.

4,677,922  
**SINGLE PASS FRACTURE PLANTING SYSTEM**  
Dale Shrull, Rte. 5, Box 31A, and Joe W. Hendricks, Rte. 5, Box 179, both of Russellville, Ky. 42276  
Filed Mar. 5, 1985, Ser. No. 708,212  
Int. Cl.<sup>4</sup> A01C 5/00

U.S. Cl. 111—52

7 Claims



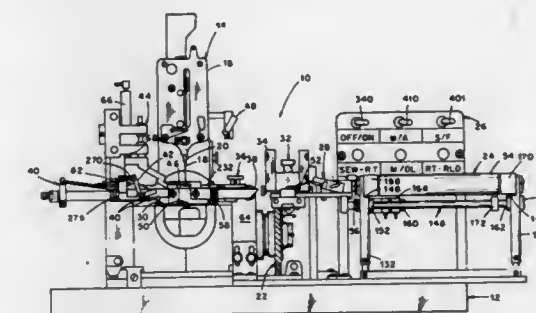
1. A single pass planting system;  
a tractor;  
sub-soil plow means;  
lift connecting means connecting said plow means to said tractor;  
planter means having planter bins for delivering seed, insecticide and fertilizer;  
hitch means connecting said planter means to said sub-soil plow means for trailing simultaneously with said sub-soil plow means;  
said hitch means having drawbar means connected to said planter means, said drawbar means mounted for pivotal movement at one end, the other end being connected to said planter means;

a curved track on said hitch means beneath the end of said drawbar connected to said planter means;  
roller means mounted on said drawbar means;  
said roller means resting on said curved track supporting and guiding said drawbar when it is allowed to swing from side to side;  
hydraulic centering means connected to said drawbar for automatically centering said drawbar after a turn is made and during a planting pass;  
said hydraulic centering means comprising a pair of hydraulic cylinder means on either side of said drawbar abutting and holding said drawbar in a centered position and releasing said drawbar for swinging movement when retracted;  
multi-point pivot connecting means connecting said hitch means to said sub-soil plow means whereby said hitch means remains level whenever said sub-soil plow is lifted to make turns.

4,677,923  
**CARD FEEDING APPARATUS**  
William A. Tice, 7005 Monarch Ct., Knoxville, Tenn. 37918  
Filed Jul. 22, 1986, Ser. No. 888,783  
Int. Cl.<sup>4</sup> D05B 3/12

U.S. Cl. 112—104

26 Claims



1. An apparatus for feeding cards from a supply of cards to a work surface of a machine having working mechanisms that operate in a work cycle, comprising:  
means for removing a card from the card supply;  
means for delivering the card removed from the card supply to a predetermined delivery location adjacent the work surface;  
means for holding at least a portion of the card in a spaced relationship above the work surface separately of said delivery means when said delivery means delivers the card to the delivery location;  
said delivery means being operable to release the card and retract from the work surface after delivering the card to the holding means; and  
means for mounting said holding means in a position proximate to the work surface, said mounting means being operable to position the holding means separately of the working mechanisms of the machine so that the card is held in a desired position relative to the work surface and other working mechanisms.  
14. An apparatus for feeding a card from a supply of cards to a sewing station of a sewing machine having a sewing surface and sewing mechanisms that operate in a sew cycle, comprising:  
means for removing a card from the card supply;  
means for delivering the card removed from the card supply to a predetermined delivery location adjacent the sewing surface;  
means for gripping and holding at least a portion of the card a predetermined distance above the sewing surface independently of said delivery means; and  
said gripping and holding means being positionable separate from the sewing surface and the sewing mechanisms to

hold the card at a desired position independently from the sewing mechanisms.

26. An apparatus for feeding a card from a card supply to a sewing station having a sewing surface and for sewing the card to a material segment, comprising:

- means for removing a card from the card supply;
- means for delivering the card removed by said removing means to a delivery location adjacent the sewing station;
- means for gripping and holding at least a portion of the card in a spaced relationship above the sewing surface when said delivery means delivers the card to said delivery location, the delivery means being operable to retract when said gripping and holding means grips the card;
- means for folding the card as said delivery means delivers the card to the delivery location;
- selectively actuatable sewing means for sewing the card to the material segment in a predetermined sewing program at the sewing station;
- means for actuating said sewing means in response to placement of the material segment in a predetermined position adjacent the card when the card is being gripped and held by said gripping and holding means, said last mentioned means being operable to release the card in response to actuation of said sewing means; and
- means for detecting the removal of the material segment from the sewing station after said sewing means has completed the sewing program, said delivery means being operable to deliver a next card to said delivery location in response to said detection means detecting removal of the material segment and its attached card.

4,677,924

**SEWING MACHINE HOUSING CONSTRUCTION**  
Horst Diener, Ulm; Ernst Albrecht, Hochspeyer, and Erich Willenbacher, Kaiserslautern, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

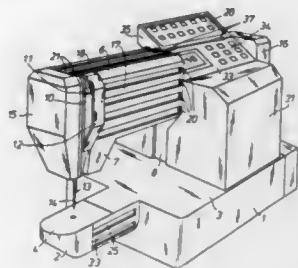
Filed May 8, 1986, Ser. No. 861,055

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 8513828

Int. Cl.<sup>4</sup> D05B 73/00, 73/06

U.S. Cl. 112-258

9 Claims



1. A housing for a sewing machine, comprising a base with a material support arm, and upright standard extending upwards from the base, and a horizontal arm extending outwards from the standard and overlying said base, said support arm and said horizontal arm both having opposite flat vertical outer side surfaces, said horizontal arm having a flat horizontal outer top surface, said horizontal side surfaces being at right angles to said horizontal top surface, said side surfaces all having a plurality of substantially parallel indentations therein for in fixing attachment units to said housing.

#### 4,677,925 METHOD OF INITIALLY SETTING A STEPPING MOTOR IN A SEWING MACHINE

Eiji Murakami; Yasuro Sano, both of Tokyo, and Tohru Hyodo, Kokubunji, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

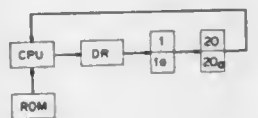
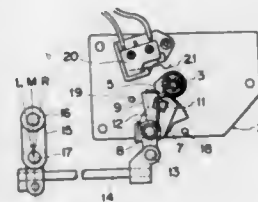
Filed Jul. 31, 1985, Ser. No. 761,105

Claims priority, application Japan, Jul. 31, 1984, 59-158582

Int. Cl.<sup>4</sup> D05B 3/02

U.S. Cl. 112-266.1

4 Claims



1. A method for setting a stepping motor to an initial set position at a time that a power supply is applied to an electronic sewing machine incorporating the stepping motor which is used to control under the control of stitch control signals, at least one of a pair of stitch forming elements including a swingable needle and a fabric feeding dog of the sewing machine within a predetermined stitch control range (A) required for producing desired stitches, said stitch control being located within a maximum control range (B) to be rotationally traversed by the stepping motor, said method comprising the steps of: dividing said maximum control range into a predetermined number of steps each corresponding to a rotational step of said stepping motor; providing a plurality of check points (P<sub>1</sub>-P<sub>0</sub>) among said predetermined number of steps with a predetermined number of steps provided therebetween, to which said stepping motor is rotationally positioned with predetermined energizing phases applied thereto, some of said check points being located within said stitch control range (A) and the others being located outside of said stitch control range; providing a detector (20) between two of said check points located outside of said stitch control range, said detector being responsive to the rotation of said stepping motor to produce an electric signal; steppingly rotating said stepping motor at the time the power supply is applied to the sewing machine in one direction to progressively stop said stepping motor at said check points until said electric signal produced by said detector is checked for and confirmed at one of said two check points; further steppingly rotating said stepping motor with a predetermined number of steps from said one check point towards the opposite extreme check point until the stepping motor rotationally moves through all of said stitch control range in one way and returns to said one check point again; and then steppingly rotating said stepping motor with a predetermined number of steps upon generation of said electric signal of said detector until said stepping motor rotationally comes to one of said check points located within said stitch control range.

#### 4,677,926 POSITIONING DEVICE FOR SEWING MACHINE MAIN SHAFT

Albert Dusch, and Erich Willenbacher, both of Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industrie Maschinen GmbH, Fed. Rep. of Germany

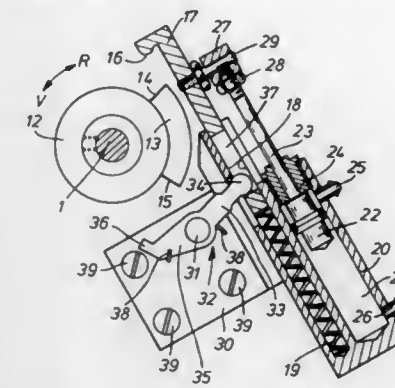
Filed Jan. 10, 1986, Ser. No. 818,119

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1985, 8500520

Int. Cl.<sup>4</sup> D05B 69/22, 69/08

U.S. Cl. 112-274

5 Claims



1. A drive device for positioning a sewing machine main shaft driven by its own positioning motor into a first predetermined position when the main shaft is stopped in a second position, comprising a movable drive lever having a driver cam, a cam secured to the main shaft for rotation thereby having a cam shoulder motion disposed in the path of movement of said driver cam and a stop portion of said cam spaced circumferentially away from said shoulder portion, drive means associated with said drive lever to move said drive lever to engage said driver cam with said shoulder portion and to rotate said cam and the main shaft, and stop means engageable with said stop portion of said cam with the main shaft in a second predetermined position, said cam including a raised cam portion having a shoulder at one end forming said shoulder portion engageable with the driver cam of said drive lever and an opposite radially extending end defining said stop portion and including a two armed lever pivotally mounted alongside said drive lever and rotated thereby when said drive lever is moved to position a stop in the path of said portion of said cam.

4,677,927

#### ELECTRONIC FANCY SEWING MACHINE HAVING MEANS FOR ADJUSTING THE DRIVING MEANS OF A CLOTH FEEDER DURING A FEEDING PHASE

Bengt A. Bergvall, Huskvarna, Sweden, assignor to Huskvarna Aktiebolag, Huskvarna, Sweden

Filed Apr. 4, 1986, Ser. No. 848,390

Claims priority, application Sweden, Apr. 9, 1985, 8501733

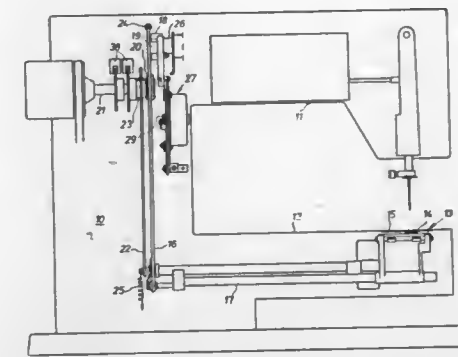
Int. Cl.<sup>4</sup> D05B 3/02

U.S. Cl. 112-455

8 Claims

1. In an electronic fancy sewing machine with a stepping motor arrangement, including a stepping motor, for adjustment of the driving means of a cloth feeder wherein the stepping motor arrangement includes an angularly adjustable member, the length of feed of the cloth feeder for each step of the stepping motor being a function of the angular position of the adjustable member; the improvement comprising means for

adjusting the adjustable member during a feeding phase to have a first angular position when the cloth feeder engages



cloth being sewn and another angular position when the cloth feeder disengages the cloth.

4,677,928

#### CIRCULAR LINKED ROTATING FOIL ASSEMBLY FOR VESSELS

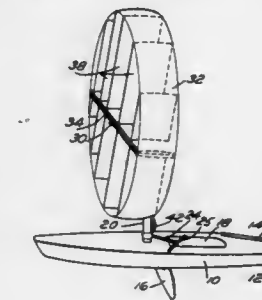
John G. Hoyt, One Harborview Dr., Newport, R.I. 02840

Filed Mar. 28, 1986, Ser. No. 845,837

Int. Cl.<sup>4</sup> B63H 9/06

U.S. Cl. 114-39

4 Claims



1. A sailing craft having an upright support received for rotation in said craft, a circular structure having an inner surface, a diametrical support extending across the structure and between the inner surface of the circular structure, means connecting the diametrical support to said support for rotative movement, a plurality of parallel foils fixedly mounted within said structure between the diametrical support and the inner surface of said circular structure, said circular structure providing end plate effect for said foils, control means for controlling the rotative movement of the diametrical support and for controlling the rotative position of the upright support.

4,677,929

#### DESICCANT CARTRIDGE FOR FUEL TANK VENT LINE

William B. Harris, 3222 Orangewood Ave., Los Alamitos, Calif. 90720

Filed Feb. 28, 1986, Ser. No. 834,405

Int. Cl.<sup>4</sup> B63J 2/00

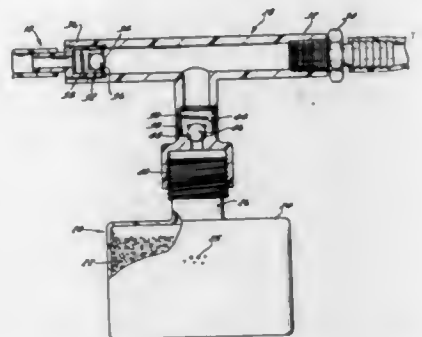
U.S. Cl. 114-211

7 Claims

1. Apparatus for use in a boat having a fuel tank and a vent line connected to the fuel tank for permitting air to enter the fuel tank as fuel is removed from the tank and for permitting air to be exhausted from the fuel tank when the air pressure in the fuel tank exceeds the air pressure of the surrounding atmosphere, the apparatus comprising:  
a first check valve providing for air flow from the fuel tank through the vent line to atmosphere and preventing air flow into the fuel tank through the vent line,



means for selectively providing for air flow through the vent line into the fuel tank when the pressure of the atmosphere is greater than the pressure in the fuel tank, the means for selectively providing for air flow through the vent line into the fuel tank including a second check valve, and means for removing moisture from the air drawn through the second check valve into the vent line and into the fuel tank, the means for removing moisture including a container connected to the second check valve and a desiccant housed in the container for removing moisture from air drawn through the container and through the second check valve to the fuel tank and



means for removably connecting said container to said vent line, said means for removably connecting including a connector having a first portion adapted to be connected to a portion of said vent line communicating with said fuel tank, a second portion adapted to be connected to said container, said second portion housing said second check valve, and a third portion adapted to be connected to a portion of said vent line communicating with the atmosphere, said third portion of said connector housing said first check valve.

4,677,930

# APPARATUS FOR QUICK-RELEASE OF A STORAGE VESSEL FROM A RISER

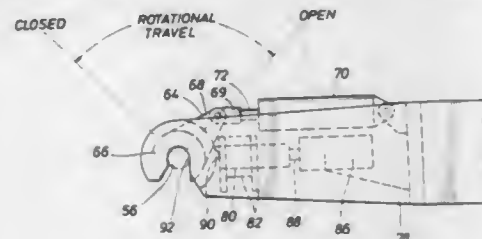
John E. Ortloff, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Continuation of Ser. No. 760,783, Jul. 31, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 937,450

Int. Cl.<sup>4</sup> B63B 21/00

U.S. Cl. 114-230

14 Claims



1. A quick-release connector for securing two offshore mooring sections comprising:

- a pin member attached to one end of one mooring section;
- a latch member having a hook at one end with an open region therein adapted to engage said pin member and to rotate concentrically about said pin member on a fixed axis substantially corresponding to that of said pin member when in engagement, said latch member being attached to one end of said other mooring section;
- a plunger adapted for axial movement between a first position, wherein said plunger is displaced from said open region of said hook, permitting the rotational movement of said latch, and a second position, wherein said plunger

advances within said open region of said hook, prohibiting said rotational movement;

means for rotating said latch member about said pin member; and

means for longitudinally displacing said plunger between said first and second positions.

4,677,931

# VARIABLE BUOYANCY APPARATUS

Brian L. Buckle, 16 Sunningdale Grove, Colwyn Bay, Clwyd, United Kingdom

PCT No. PCT/GB85/00013, § 371 Date Sep. 5, 1985, § 102(e) Date Sep. 5, 1985, PCT Pub. No. WO85/03049, PCT Pub. Date Jul. 18, 1985

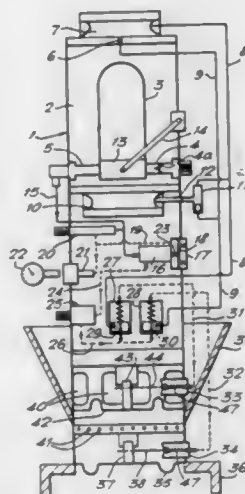
PCT Filed Jan. 10, 1985, Ser. No. 774,589

Claims priority, application United Kingdom, Jan. 12, 1984, 8400810

Int. Cl.<sup>4</sup> B63G 8/14

U.S. Cl. 114-331

11 Claims



10. Buoyancy apparatus for carrying a payload to and maintaining the payload within a desired depth range, which apparatus comprises variable buoyancy means, depth sensing means, means for detecting upward motion, means for automatically decreasing the buoyancy of the variable buoyancy means when upward motion is detected, means for automatically increasing the buoyancy to produce upward motion when no upward motion is detected and means for preventing activation of said means for increasing and decreasing the buoyancy until the depth sensing means senses that the payload is at a predetermined depth, wherein the variable buoyancy means comprises a source of pressurized gas and a buoyancy vessel having an inlet provided with an inlet valve and an outlet for said gas provided with an outlet valve.

4,677,932

# HANDICAP TURN SIGNAL BAR FOR AN AUTOMOBILE

Joseph Ewing, 8245 Peach Orchard Rd., Baltimore, Md. 21222

Filed Mar. 26, 1986, Ser. No. 844,185

Int. Cl.<sup>4</sup> H01H 3/16, 9/00

U.S. Cl. 116-35 R

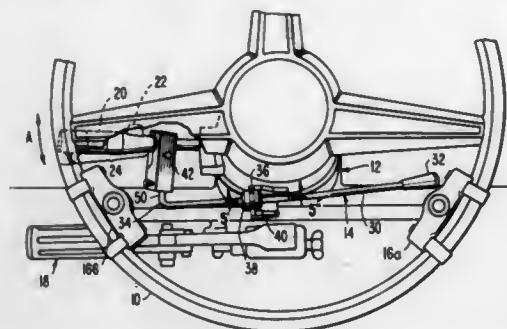
4 Claims

1. A handicap turn signal bar adapted to be mounted on an automobile's steering column, said steering column terminating in a steering wheel and having a vertically actuated turn signal lever substantially horizontally positioned and extending generally radially from said steering column comprising:

- an elongated lever member substantially parallelly disposed with respect to said turn signal lever and pivotally mounted on said steering column, one longitudinal end of said member adapted to be proximate a portion of said

steering wheel and the other longitudinal end of said member disposed in the vertical plane of movement of said turn signal lever;

a split clamp attached to said other longitudinal end of said member and having first and second mating parts that define a varied dimensional through-hole adapted to loosely encircle said turn signal lever, said first mating



part being removably attached to said second mating part such that said split clamp is adapted to be detachable from said turn signal lever; and,

wherein said vertical dimensional through-hole has a cross-sectional area larger than the area of the adjacent portion of said turn signal lever to permit multiple movements of said turn signal lever therein.

4,677,933

# STOCK PRICE TRACKING APPARATUS

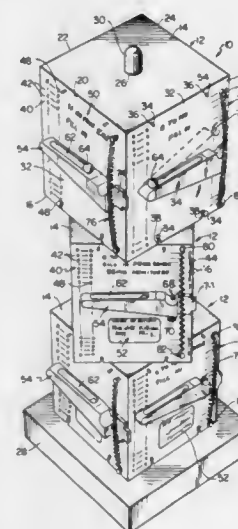
Thomas B. Rotella, 22 E. 7th St., Clifton, N.J. 07011

Filed Nov. 22, 1985, Ser. No. 801,064

Int. Cl.<sup>4</sup> G09B 19/18; G09F 9/00

U.S. Cl. 116-313

22 Claims



7. Stock price tracking apparatus, comprising:

a base having a cube configuration with four sides;

a first scale on each side of said base;

a second scale on each side of said base;

lever means mounted on each side of said base and releaseably retainable in a selected position for monitoring prices of a selected stock to determine one of: (a) when to buy or retain and (b) when to sell or retain said selected stock, each said lever means removably and pivotally mounted on a side of said base along said first scale at a selected position corresponding to a selected price for said stock, each said lever means including pointer means for pointing to an actual price for said stock on said second scale,

said lever means being pivoted by an external force about said selected position in accordance with changes in said actual price for said stock, and a channel extending along said lever means; and

ball means associated with each lever means and movable in the respective channel between a first position and a second position in correspondence with the pivoted position of said lever means for indicating one of: (a) when to buy or retain and (b) when to sell or retain said stock in dependence upon the position of said ball means and upon the relationship between said selected price for said stock on said first scale corresponding to said selected position of said lever means and said actual price for said stock on said second scale pointed to by said pointer means.

4,677,934

# COATING DEVICE FOR COLD BOTTLES OR LIKE CONTAINERS

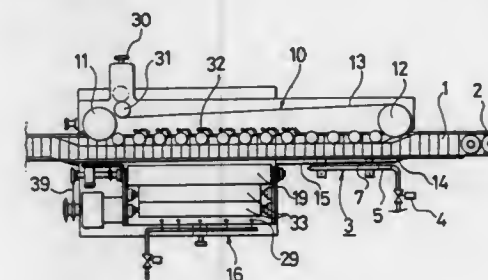
Hironobu Maeda; Seizaburo Kitahara; Haruo Yosimura; Takao Torawaki; Takasi Yaegashi, and Isao Yamaoka, all of Sapporo, Japan, assignors to Sapporo Breweries, Ltd., Japan

Filed Jul. 21, 1986, Ser. No. 888,782

Int. Cl.<sup>4</sup> B05C 1/02, 11/00

U.S. Cl. 118-58

5 Claims



1. A coating device for cold bottles or like containers, characterized in that a conveyor is provided for transporting cold bottles or like containers, a bottle rotating means is provided on one side of line of cold bottles or like containers which are transported by the conveyor, said rotating means comprising a bottle drive belt which moves in parallel to the direction of transportation of the conveyor and in contact with the cold bottles or like containers, an air spraying station and a coating fluid application station are sequentially disposed on other side of the line of containers, compressed air jet nozzles are disposed on at least two levels at the air spraying station, said jet nozzles being directed to predetermined portions to be coated on the containers, coating fluid application rolls are disposed on at least one level at the coating fluid application station, said application rolls rotating about axes parallel to the direction of transportation of the containers and in contact with the containers, said application rolls being supplied with coating fluid transferred from spray nozzles through sponge rolls which rotate in contact with the application rolls.

4,677,935

# PAINT SPREADER APPARATUS FOR THE MAINTENANCE OF INSTALLED POLES, WITH PAINT EJECTOR AND SPREADING ROLLERS

Gaetano Fusi, and Silvio Meniconi, both of Poggibonsi, Italy, assignors to Sivep di Meniconi Giorgio & C.S.a.s., Siena, Italy

Filed Jun. 26, 1985, Ser. No. 749,288

Claims priority, application Italy, Jun. 27, 1984, 9448 A/84

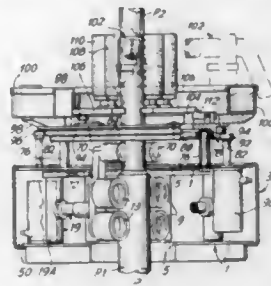
Int. Cl.<sup>4</sup> B05C 11/02; B05B 1/28, 3/02

U.S. Cl. 118-108

5 Claims

1. An apparatus for painting pole structures comprising in combination a carriage constructed to be movable along the axis of a pole, a carousel rotatably secured to said carriage mounted to revolve around said pole as said carriage moves upwardly and downwardly there along, a paint sprayer located

on said carousel for spraying paint on the circumference of said pole as said carousel revolves, two roller means located symmetrically with respect to the paint sprayer and biased to engage said pole about its circumference as said carousel rotates.



4,677,936

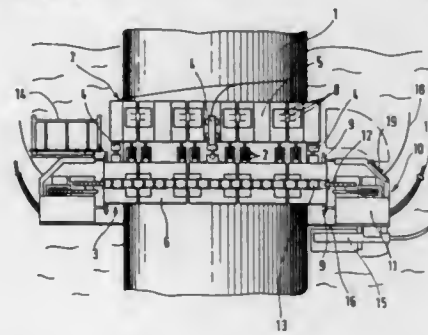
**PROGRESSIVELY MOVABLE HOLDING DEVICE**  
Wolfgang Dahlem, Meersburg, Fed. Rep. of Germany, assignor to ZF-Herion-Systemtechnik GmbH, Friedrichshafen, Fed. Rep. of Germany  
PCT No. PCT/EP85/00445, § 371 Date May 8, 1986, § 102(e)  
Date May 8, 1986, PCT Pub. No. WO86/01791, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 4, 1985, Ser. No. 865,558

Claims priority, application Luxembourg, Sep. 12, 1984, 84/00278

Int. Cl.<sup>4</sup> B05B 15/00

U.S. Cl. 118—307



16 Claims

1. A progressively movable holding device (2, 3) especially utilizable as tool or implement carrier (10) for treatment and/or inspection processes or workpieces (1) of larger or extended surfaces or of difficult access such as cast-iron pipes, having a number, adjustable to a predetermined processing length, of variably movable individual elements supported against the surface or contour of said workpiece (1), upon which elements both said holding device (2, 3) itself and said tool or implement carrier (10) are separately transportable by remote control to alternating working positions; wherein tightening elements (4, 12) actuable by auxiliary energy provide for progressive movement from one working position to the next, and said tool carrier (10) is conveyable along said individual elements, characterized in that said individual elements consist of link plates (5, 6) retained together in releasable hinges and joined together to form two link chains (2, 3) at variable distance, said link plates (5, 6) are each separately held at a constant distance in respect to said workpiece, being themselves directly designed as double rails (26) for

said tool or implement carrier (10) movable therealong and there being provided for progressive movement a partly transitory loosening and retightening of at least a few link plates (5, 6) by means of peripheral tightening elements (4, 32) actuable by remote control.

4,677,937

# **APPARATUS FOR HOLDING ELECTRICAL OR ELECTRONIC COMPONENTS DURING THE APPLICATION OF SOLDER**

Sim Ah Tee, Singapore, Singapore, assignor to Sun Industrial Coatings Private Ltd., Singapore

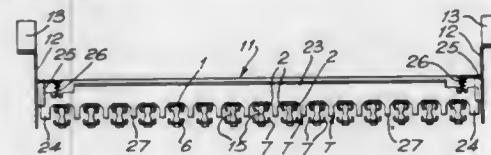
Filed Jul. 30, 1985, Ser. No. 760,585

Claims priority, application United Kingdom, Jul. 30, 1984, 8419420

Int. Cl.<sup>4</sup> B05D 5/12

U.S. Cl. 118—500

8 Claims



1. A carrier for a plurality of electrical or electronic components comprising a frame in which is provided a plurality of parallel tracks for receiving the components, wherein the tracks are formed by a plurality of parallel, laterally spaced, axially extending upper support members each of which define a pair of parallel, axially extending upper rails having downwardly facing portions and a plurality of parallel, laterally spaced, axially extending lower support members aligned with and vertically spaced from the upper support members each of the lower support members defining a pair of parallel, axially extending lower rails having upwardly facing portions, whereby each track is defined by four rails and is situated between two adjacent upper support members and their aligned lower support members.

4,677,938

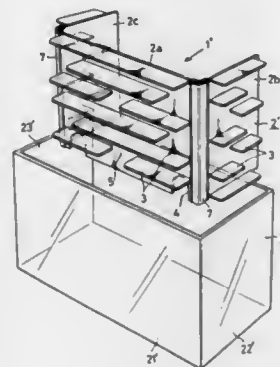
**GYMNASTIC DEVICE FOR SMALL PET ANIMALS**  
Kazutoshi Tominaga, Higashi Osakashi, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kogyosho, Higashi Osakashi, Japan

Filed Nov. 1, 1985, Ser. No. 793,962

Int. Cl.<sup>4</sup> A01K 15/02

U.S. Cl. 119—29

4 Claims



1. A gymnastic device for use in combination with a breeding box having side walls for keeping small pet animals, the device comprising:

a first, a second, and a third plate associated with respective side walls of the breeding box, at least one plate having at least one opening therein along an edge, said second and third plates being arranged perpendicular to said first plate so that each of said plates is arranged to face the respective breeding box side wall; and  
a plurality of plate members associated with each of said first, second and third plates and arranged substantially horizontally thereon facing the respective breeding box side wall, each of said plate members being shorter in length than the associated breeding box side wall and arranged on each of said first, second and third plates with spaces interposed between adjacent plate members, wherein each space is large enough to allow the animals to pass therethrough.

4,677,939

# **HEAT EXCHANGER AND APPLICATION TO A FLUID HEATING APPARATUS, PARTICULARLY A DOMESTIC HOT WATER ACCUMULATOR**

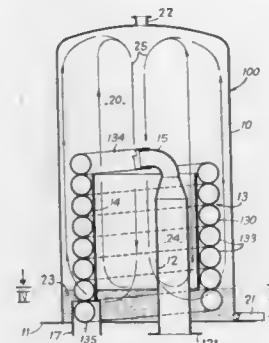
Jean-Paul Henault, Bourseville; Albert Drapier, Saint Maur; Guy Grochowski, Deuil la Barre, and Alain Meslief, Luzarches, all of France, assignors to Gaz de France and Societe Industrielle Auer S.A., both of, France

Filed Jan. 21, 1986, Ser. No. 820,988

Claims priority, application France, Jan. 21, 1985, 85 00803  
Int. Cl.<sup>4</sup> F22B 5/00

U.S. Cl. 122—17

11 Claims



1. In an apparatus for heating a fluid, particularly a domestic hot water accumulator, comprising a heating enclosure supplied in its lower part with fluid to be heated, a combustion chamber comprising a burner at one of its ends and extending on the side opposite the burner inside the enclosure, a heat exchanger tube disposed inside the enclosure to constitute a contra-flow heat exchanger, which tube is hermetically connected to the outlet of the combustion chamber and opens out in a fume evacuation device located in the lower part of the enclosure in order to evacuate the fumes to outside the heating apparatus, and means for taking heated fluid in the upper part of the enclosure, the improvement wherein  
the heat exchanger tube comprises an originally flexible, tight, ringed metal tube;  
the ringed tube is disposed spirally substantially in the lower third of the enclosure,  
adjacent turns of the ringed tube are tangentially in contact with one another in order to form a compact exchanger; and  
the flexible ringed tube is wound around a rigid support which comprises a cylindrical surface surrounding that part of the combustion chamber located inside the enclosure.

4,677,940

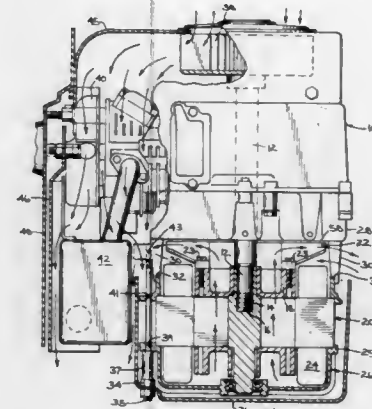
**COOLING SYSTEM FOR A COMPACT GENERATOR**  
Jeffrey L. Bracht, Sheboygan; Martin W. Heinrich, Cedar Grove; Richard D. van Maaren, Sheboygan, and Richard L. Sleder, Howards Grove, all of Wis., assignors to Kohler Co., Kohler, Wis.

Filed Aug. 9, 1985, Ser. No. 764,869

Int. Cl.<sup>4</sup> F02B 63/04

U.S. Cl. 123—2

4 Claims



1. A compact generator unit, comprising:  
A. an internal combustion engine, including an engine housing and a vertical shaft; and  
B. a generator which lies below said engine and is driven by said vertical shaft, said generator including a generator fan which is a radial fan located on the top of said generator; and a generator housing; wherein said engine housing and said generator housing are coupled together at points outside of the perimeter of said generator fan such that said engine is directly above said generator fan and such that said generator fan draws air up through said generator and across the bottom of said engine, thereby cooling both said generator and said engine.

4,677,941

**ELECTRICAL COOLING FAN**  
Erich Kurz, Wiernsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

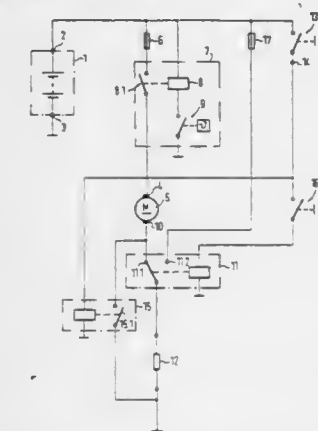
Filed Aug. 7, 1985, Ser. No. 763,265

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429052

Int. Cl.<sup>4</sup> F01P 5/02

U.S. Cl. 123—41.12

15 Claims



1. An electric cooling fan arrangement having an electric



motor for engines such as for internal combustion engines of motor vehicles, wherein said electric motor is independently controllable by a thermostatic switch means which activates upon the engine temperature reaching a first specified threshold temperature, said arrangement comprising:

an electric resistance means detachably connected in series to said electric motor for reducing the speed of said electric motor during decreased cooling air requirements of said engine, wherein said resistance means includes a rear window heating unit.

4,677,942

### COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

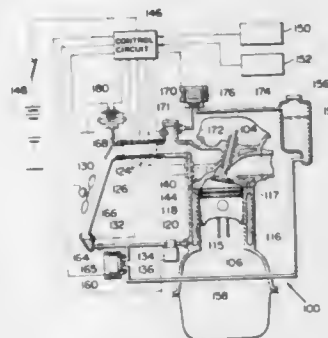
Filed Aug. 6, 1984, Ser. No. 687,780

Claims priority, application Japan, Aug. 9, 1983, 58-145469; Aug. 9, 1983, 58-145468

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.  
Int. Cl.<sup>4</sup> F01P 3/22

U.S. Cl. 123—41.21

19 Claims



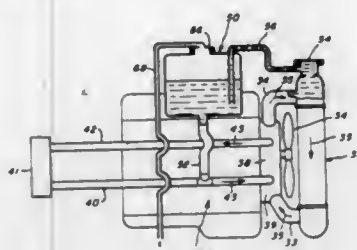
1. In a method of cooling a device, the steps of:  
boiling a liquid coolant in a coolant jacket to produce a vapor;  
condensing the vapor produced in said boiling step, in a radiator;  
increasing the boiling point of said liquid coolant by reducing the heat exchange capacity of said radiator in the event that the rate of condensation exceeds a predetermined maximum value and the boiling point of said liquid coolant falls below a predetermined minimum value, wherein said coolant jacket and said radiator form part of a cooling system, and including the step of selectively sealing the cooling system to selectively permit pressure in said system to vary above or below atmospheric.

14. In a method of cooling a device, the steps of:  
boiling a liquid coolant in a coolant jacket to produce a vapor;  
condensing the vapor produced in said boiling step, in a radiator;  
sensing the level of coolant in said coolant jacket;  
pumping liquid coolant from said radiator to said coolant jacket in response to said level sensing step;  
sensing a difference in pressure between pressure in said radiator and atmospheric pressure; and  
reducing the heat exchange capacity of said radiator in the event that the sensed difference in pressure indicates that the rate of condensation exceeds a predetermined maximum value.

4,677,943  
AUTOMOTIVE NON-PRESSURE COOLING SYSTEM  
Alan A. Sklaner, 19 Hillcrest Ave., Brockton, Mass. 02401  
Filed Mar. 3, 1986, Ser. No. 835,638  
Int. Cl.<sup>4</sup> F01P 11/02

U.S. Cl. 123—41.27

12 Claims



1. A non-pressure automotive engine cooling system comprising: a radiator containing a liquid coolant, coupling hoses that intercouple the radiator to the engine, pump means associated with the engine for circulating coolant through the engine and radiator, said pump means having a suction side, a radiator cap sealed on the radiator, an expansion tank disposed in the engine compartment, vent means on the tank for venting the tank to atmosphere, a coupling tube disposed between the radiator below the radiator cap and the expansion tank to enable free flow of the coolant under expansion from the radiator to the expansion tank, said radiator cap sealing to the radiator but providing a substantially non-pressure and unimpeded fluid path from the radiator to the coupling tube, a return line coupled from the expansion tank to the suction side of the pump means, said radiator having a gooseneck with the radiator cap sealably engaged with the gooseneck, an outlet port from the top of the radiator to which the coupling tube is connected, said outlet port being continuously open and unblocked by said radiator cap to provide free fluid flow from the radiator to the expansion tank over the entire operating temperature range, said radiator cap sealing only at the top of the gooseneck, and means for supporting said expansion tank at a position at a height corresponding to the top of the radiator whereby under normal temperature range operating conditions the liquid level line is substantially the same in both the radiator and the expansion tank.

4,677,944

### FUEL SUPPLYING DEVICE FOR INTERNAL COMBUSTION ENGINE

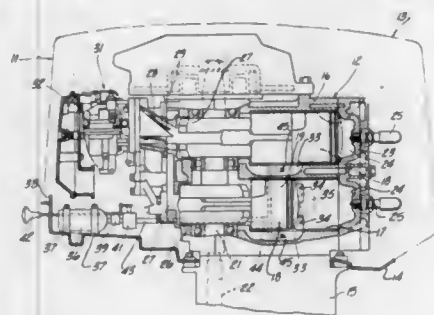
Seiichi Nishimura, and Hidekazu Takayasu, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 650,364, Sep. 13, 1984, abandoned.  
Filed Jun. 9, 1986, Ser. No. 873,105

Claims priority, application Japan, Sep. 17, 1983, 58-170615  
Int. Cl.<sup>4</sup> F02B 43/00

U.S. Cl. 123—73 B

8 Claims



1. In a fuel feeding system for an outboard motor having an internal combustion engine having a combustion chamber and

of the type operated on a liquid fuel and having a charge forming device and associated induction system for running of said engine, and a protective cowling encircling said outboard motor, the improvement comprising a source of pressurized gaseous fuel contained within said protective cowling and means for selectively supplying said gaseous fuel to said engine to an area that communicates with said combustion chamber only during a portion of the cycle of engine operation.

4,677,945

### MECHANICAL VALVE LIFTER CONSTRUCTION ADAPTED FOR MECHANICAL/HYDRAULIC VALVE LIFTER INTERCHANGABILITY

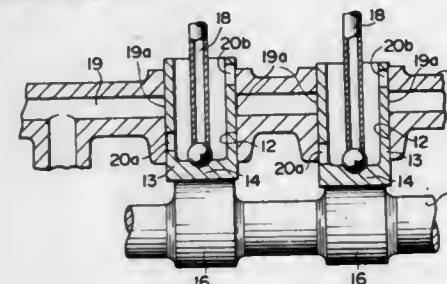
Kazumasa Futamura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 26, 1985, Ser. No. 780,431

Claims priority, application Japan, Jan. 18, 1985, 60-007065  
Int. Cl.<sup>4</sup> F01L 1/14

U.S. Cl. 123—90.48

3 Claims



1. A mechanical valve lifter construction, for an engine formed with a valve lifter bore with a lubricant supply opening, positioned at an axially intermediate point therealong, to which is communicated a passageway to which lubricating oil is supplied under pressure, said engine comprising means for reciprocating a valve lifter in said valve lifter bore along a determinate stroke, comprising:

a generally cup shaped valve lifter, with an outer cylindrical surface slidably inserted in said valve lifter bore and with an internal hollow, formed with a generally radially extending lubricant escape hole through its side from its said internal hollow to its said outer cylindrical surface; said lubricant escape hole opening to said outer cylindrical surface of said valve lifter at such a position that, when said valve lifter is slidably inserted in said valve lifter bore and is reciprocated therein by said reciprocating means, said lubricant escape hole does not come into register with said lubricant supply opening at any time during the movement of said valve lifter along its said determinate stroke.

4,677,946

### APPARATUS FOR POSITIONING TWO SENSOR DEVICES

Henry J. Tamagne, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 739,344, May 30, 1985, Pat. No. 4,635,353.  
This application Jun. 16, 1986, Ser. No. 874,723

Int. Cl.<sup>4</sup> F02P 1/00

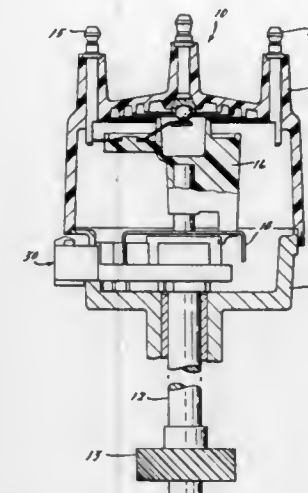
U.S. Cl. 123—146.5 A

5 Claims

1. A mount for two Hall sensors for mounting on a distributor at a predetermined desired rotational position, said mount including:

a primary carrier for supporting a first Hall sensor and having a first alignment means for rotationally positioning the first Hall sensor with respect to a distributor and establishing the firing point of the first Hall sensor;  
a secondary carrier for supporting a second Hall sensor, said secondary carrier including a second alignment means for indicating the firing point of the second Hall sensor;  
said primary carrier including a third alignment means for

establishing the rotational position of the secondary carrier, and thus, in turn, the second Hall sensor with respect to the primary carrier;



said second and third alignment means being coupled to another so as to mount said secondary carrier to said primary carrier and fix the relative rotational positions between the firing points of said first and second Hall sensors

4,677,947

### CLAMPED, READILY-REMOVABLE OIL PAN WITHOUT DRAIN HOLE

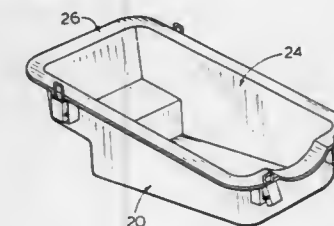
Beaumont Bousquet, 20 Lesgay Crescent, Willowdale, Canada M2J 2H8

Filed Jun. 30, 1986, Ser. No. 880,183

Int. Cl.<sup>4</sup> F02F 7/00

U.S. Cl. 123—195 C

6 Claims



1. In combination in an internal combustion engine: an oil pan adapted for readily-removable connection to an underside of the engine; and a plurality of readily-releasable clamping means; wherein: the oil pan is adapted to contain a lubricating fluid; the oil pan has an upper opening having an oil pan periphery; the oil pan has no outlet for removing lubricating fluid such that the oil pan must be removed from the underside of the engine in order to replace lubricating fluid in the oil pan; the underside of the engine has a lower opening having an underside periphery; the underside periphery is substantially the same size, shape and configuration as the size, shape and configuration of the oil pan periphery, such that when in combination the oil pan periphery is in contact with substantially all portions of the underside periphery; each clamping means applies a clamping force in a direction substantially perpendicular to a line defined as being the points where the oil pan periphery contacts the underside

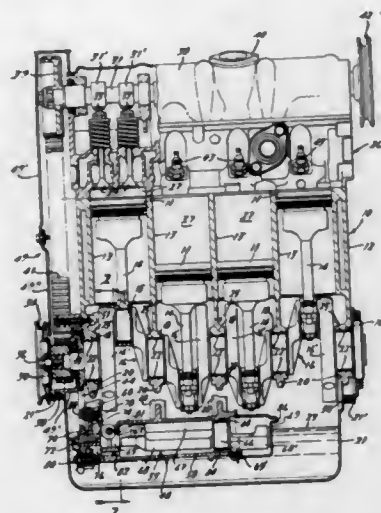
periphery in the region proximate to the clamping means; and the clamping force of each clamping means is obtained by means other than bolts or screws.

#### 4,677,948 LUBRICATING SYSTEM FOR AN ENGINE BALANCING DEVICE

Cornell Candea, Clawson, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.  
Filed May 29, 1986, Ser. No. 868,904  
Int. Cl. F02B 75/06

U.S. Cl. 123—192 B

2 Claims



1. For an internal combustion engine having an engine block with cylinder bores therein, pistons, connecting rods and a crankshaft with the pistons and associated connecting rods movable in the parallel cylinder bores of the engine block when the crankshaft rotates thereby generating a periodic unbalance force with each half-rotation of the crankshaft, an improved balancing device to generate an opposing force to effectively cancel the unbalance forces of the pistons and connecting rods, comprising: the balancing device including a housing enclosure located beneath the crankshaft and block, the housing having a hollow interior and a pair of apertures at either end thereof; a pair of elongated balance shafts extending in parallelism through the hollow interior with adjacent end portions projecting through the apertures thereby supporting the balance shafts for rotation in the housing; the housing being supported by the block and beneath the crankshaft and with the balance shafts in parallelism with the crankshaft axis; means attached to the housing forming an enclosure having an interior enclosing adjacent end portions of the balance shafts which project from an end of the housing; means for oil lubricating the shaft mounting apertures and means for discharging oil from the interiors of the housing and the enclosure means; a vacuum breaking air bleed means in an upper portion of the enclosure means for facilitating the discharge of oil from the enclosure interior.

#### 4,677,949 SCROLL TYPE FLUID DISPLACEMENT APPARATUS

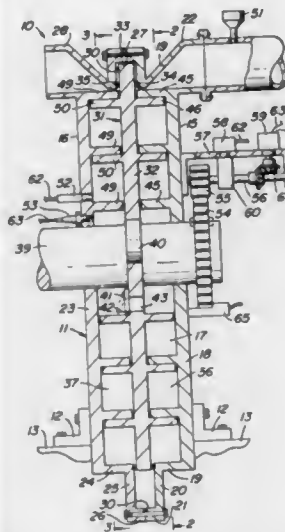
Robert K. Youtie, 200 Uxbridge Ave., Cherry Hill, N.J. 08034  
Filed Aug. 19, 1985, Ser. No. 767,114  
Int. Cl. F02B 53/00

U.S. Cl. 123—235

5 Claims

1. A scroll type apparatus comprising a casing having a gas inlet chamber and a gas exhaust chamber in side by side relation, a fixed compression spiral wrap in said inlet chamber facing toward said exhaust chamber, a fixed expansion spiral wrap in said exhaust chamber facing toward said inlet chamber,

ber, orbital carrier means interposed between and having opposite sides facing toward respective fixed spiral wraps, carrier means mounting means mounting said carrier means for orbital movement relative to said fixed spiral wraps, a moveable compression spiral wrap on one side of said carrier means interfitting with and orbitally moveable relative to said fixed compression spiral wrap, a moveable expansion spiral wrap on the other side of said carrier means interfitting with and orbitally moveable relative to said fixed expansion spiral wrap, said compression spiral wraps being oriented in one angular direction to compress gas in said inlet chamber and



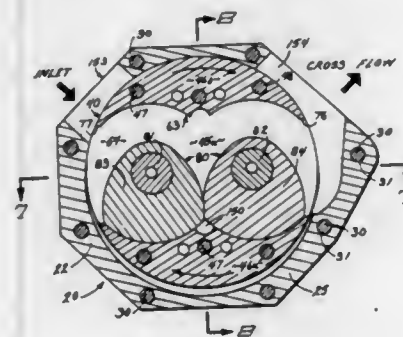
displace compressed gas inwardly upon said orbital carrier means movement, and said expansion spiral wraps being oriented in the other angular direction to expand gas and displace it radially outwardly into said exhaust chamber upon orbital carrier means movement, port means centrally of said carrier means communicating between said inlet and exhaust chambers for passing compressed gas from said compression spiral wrap to said expansion spiral wraps, and combustion charge means communicating with said expansion spiral wraps for ignition to expand gas in said expansion spiral wraps and drive said carrier and mounting means.

#### 4,677,950 ROTARY CAM FLUID WORKING APPARATUS

Norm Buske, HCR 11 - Box 17, Davenport, Wash. 99122  
Filed Jan. 10, 1986, Ser. No. 818,595  
Int. Cl. F02B 53/00; F04C 2/00

U.S. Cl. 123—241

25 Claims



18. An internal combustion engine comprising: a housing having housing walls which substantially enclose a housing interior; said housing further including at least one intake passageway and at least one exhaust passage-

way through which at least one working fluid passes to and from said housing interior;

a rotor mounted within the housing interior for rotation about a rotor axis of rotation which extends longitudinally within said housing; said rotor having exterior surfaces which are substantially cylindrical about said rotor axis of rotation; said rotor further including interior surfaces having cylindrically concave interior surface portions extending longitudinally within said rotor to define a rotor interior; said rotor further having at least one rotor port communicating the rotor interior with the housing passageways to allow passage of a working fluid into and from said rotor interior;

a plurality of cam structures mounted substantially within the rotor for rotation with respect thereto; said cam structures including cam surfaces which are convex; exterior surfaces of said cam structures each including a major curvature surface which is at least partially defined by an associated major radius of curvature centered upon the associated axis of rotation of the cam structure; each major radius of curvature being greater than one-half of a separation distance existing between the associated axis of rotation of the cam structure and adjacent axes of rotation of adjacent cam structures; and

cam synchronizing means for maintaining said cam structures in approximately parallel relative angular orientations with respect to said housing as the rotor rotates and the cam structures revolve about each other.

#### 4,677,951 FUEL INJECTION PUMP

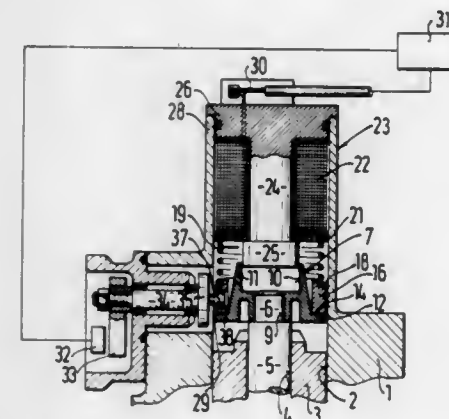
Werner Pape, Magstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Dec. 3, 1985, Ser. No. 804,195

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501379

Int. Cl. F02D 41/40

U.S. Cl. 123—357

11 Claims



1. A fuel injection pump having a housing comprising, a rotary distributor for determining injection duration and for injection timing, said rotary distributor positioned in a bore in said housing, an associated electromagnetic final control element and a control unit therefor, said electromagnetic final control element arranged to adjust said distributor counter to a restoring force, a transducer for detecting the axial position of said distributor, said transducer being connected to said electric control unit, means firmly joined to one end of said distributor, said means having an outer circumference including a collar, an intermediate ring supported on said collar, spring means urging said intermediate ring against said collar and means carried by said intermediate ring, said last named means adapted to transmit signals to said transducer.

#### 4,677,952 UNIT FOR COUPLING A DISPLACEABLE OPERATING MEMBER, IN PARTICULAR WITH AN ADJUSTING ROD OF A FUEL INJECTION AGGREGATE IN AN INTERNAL COMBUSTION ENGINE

Tomas Visek, Gottfried Czaby, and Georg Nowotny, all of Steyr, Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria

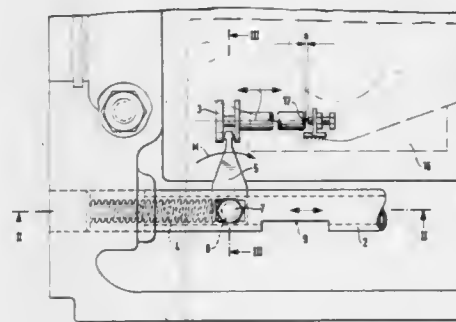
Filed Nov. 26, 1985, Ser. No. 801,738

Claims priority, application Austria, Nov. 27, 1984, 3750/84; Dec. 11, 1984, 3918/84

Int. Cl. F02M 59/28

U.S. Cl. 123—372

9 Claims



1. A unit for coupling a displaceable operating member with at least one regulating member of a fuel injection aggregate of an internal combustion engine, comprising

a unit casing of a fuel injection aggregate, said unit casing having at least one bore, a displaceable operating member having first and second transverse bores, said first transverse bore being associated with said bore of said unit casing, a regulating member, a positioning pin being insertable into said bore of said unit casing and said first transverse bore of said operating member for securing said operating member against displacement relative to said unit casing, said positioning pin being set during an initial step of assembling said regulating member with said operating member, a cam engaging said regulating member, abutting means for limiting the movement of said regulating member in one direction,

screw means for firmly clamping said cam on said operating member and into engagement with said regulating member, said screw means extending through said second transverse bore in said operating member, said cam projecting transversely from said operating member, said screw means having an external threading, and nut means located on said cam, said nut means having an internal threading for engaging said external threading of said screw means, said internal threading of said nut means being self-locking and thereby causing an increased screwing-down momentum, the direction of force exerted on said cam by said screwing-down momentum of said screw means corresponding to the direction of movement of said regulating member toward said abutting means.



4,677,953

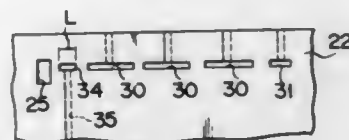
FUEL INJECTION SYSTEM FOR  
INTERNAL-COMBUSTION ENGINESHorofumi Kizawa, Oyama, Japan, assignor to Kabushiki Kaisha  
Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,719

Claims priority, application Japan, Oct. 26, 1983, 58-  
164623(U); Oct. 31, 1983, 58-167627(U)Int. Cl.<sup>4</sup> F02M 41/06

U.S. Cl. 123-450

6 Claims



1. A fuel injection system for internal combustion engines, comprising a rotary valve device which is driven in synchronism with a crankshaft of the engine to distribute high pressure fuel to unit injectors of the engine and has a rotary spool rotating in a housing having fuel supply port means and fuel metering groove means in said housing and disposed in a plane perpendicular to the axis of said spool for metering the amount of fuel injection each formed on the circumference thereof, characterized in that said fuel metering groove means includes a plurality of independent divisions, one for each unit injector.

4,677,954

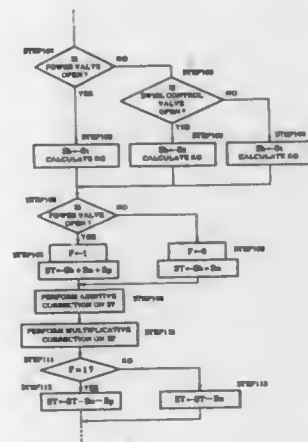
METHOD AND SYSTEM INCORPORATING  
ZERO-CORRECTION FOR FUEL SUPPLY CONTROL  
FOR INTERNAL COMBUSTION ENGINEToshimitsu Ito, and Akio Okamoto, both of Toyota, Japan,  
assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 7, 1986, Ser. No. 837,403

Claims priority, application Japan, Mar. 11, 1985, 60-047868  
Int. Cl.<sup>4</sup> F02D 41/00

U.S. Cl. 123-478

30 Claims



1. A method for controlling an internal combustion engine fuel supply system comprising:

- an intake passage;
- a main fuel conduit which supplies fuel into said intake passage to be mixed with air flowing therethrough to provide air-fuel mixture for said internal combustion engine;
- means for regulating fuel flow through said main fuel conduit through a range of values according to the value of a main fuel conduit control signal, the fuel flow provided through said main fuel conduit when said main fuel

conduit control signal is substantially zero being a determinate basic value substantially greater than zero;

- a power fuel conduit which selectively supplies fuel into said intake passage to be mixed with said air flowing therethrough; and
- a means for regulating said power fuel conduit to be either open or closed, according to the value of a power fuel conduit control signal; comprising the steps of:

- when said power fuel conduit is closed:
  - determining a basic value  $S_b$  for said main fuel conduit control signal according to engine operational parameters;
  - adding a value  $S_n$  to said basic value  $S_b$ ;
  - applying a multiplicative correction to the result of step f2; and
  - determining the value for said main fuel conduit control signal by subtracting said value  $S_n$  from the result of step f3; and

when said power fuel conduit is open:

- determining a basic value  $S_b$  for said main fuel conduit control signal according to engine operational parameters;
- adding said value  $S_n$  and a value  $S_p$  to said basic value  $S_b$ ;
- applying a multiplicative correction to the result of step g2; and
- determining the value for said main fuel conduit control signal by subtracting said value  $S_n$  and said value  $S_p$  from the result of step g3;

(h) where said value  $S_n$  represents the value of said main fuel conduit control signal which would be required, in a virtual sense, for providing said determinate basic main fuel conduit flow value from a zero flow value, and said value  $S_p$  represents the incremental value of said main fuel conduit control signal which would be required to increase the fuel flow amount through said main fuel conduit by an amount corresponding to the fuel flow through said power fuel conduit when it is open.

4,677,955

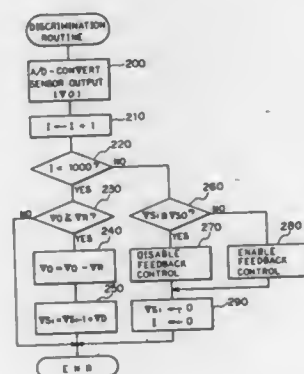
METHOD AND APPARATUS FOR DISCRIMINATING  
OPERATIVENESS/INOPERATIVENESS OF AN  
AIR-FUEL RATIO SENSORMitsunori Takao, Kariya, Japan, assignor to Nippondenso Co.,  
Ltd., Kariya, Japan

Filed Oct. 30, 1985, Ser. No. 792,929

Claims priority, application Japan, Nov. 30, 1984, 59-254431  
Int. Cl.<sup>4</sup> F02D 41/22

U.S. Cl. 123-489

9 Claims



1. An apparatus for discriminating operativeness/inoperativeness of an air-fuel ratio sensor which produces an output signal indicative of air-fuel ratio, provided in an exhaust passage of an internal combustion engine so that an air-fuel ratio of mixture to said engine is feedback-controlled in response to an

output signal of said air-fuel ratio sensor, said apparatus comprising:

- means for comparing the output signal of said air-fuel ratio sensor with a predetermined reference level;
- means for calculating a difference between the output signal of said air-fuel ratio sensor and said predetermined reference level;
- means for integrating, for a predetermined interval of time, the difference calculated by said calculating means to produce an integration value;
- means for comparing the integration value produced by said integrating means with a predetermined discrimination reference, so that operativeness/inoperativeness of said air-fuel ratio sensor is discriminated in response to a comparison output of said comparing means; and
- means for enabling said difference calculating means to calculate said difference in response to an output of said output signal comparing means indicative of an attainment of the output signal of said air-fuel ratio sensor at the predetermined reference level.

4,677,956

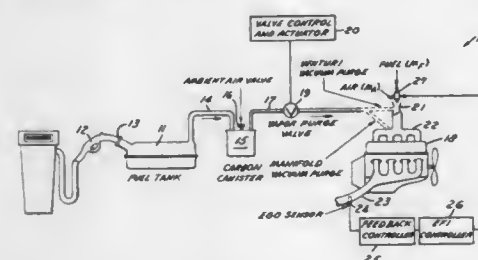
SOLENOID DUTY CYCLE MODULATION FOR  
DYNAMIC CONTROL OF REFUELING VAPOR PURGE  
TRANSIENT FLOWDouglas R. Hamburg, Birmingham, Mich., assignor to Ford  
Motor Company, Dearborn, Mich.

Filed Jul. 19, 1985, Ser. No. 756,611

Int. Cl.<sup>4</sup> F02M 25/08

U.S. Cl. 123-520

2 Claims



1. A method of controlling purging of fuel vapors from a vapor canister storing fuel vapors from the fuel tank of an internal combustion engine to the intake of an internal combustion engine, including the steps of:

- inducting a mixture of fuel and inlet air into the internal combustion engine;
- providing a purge command signal during the time desired to purge the canister of vapors;
- inducting purge air through the canister to induct a mixture of purge air and fuel vapor from the canister into the internal combustion engine in response to said purge command signal;
- sensing an output parameter in the exhaust of said internal combustion engine indicative of the air/fuel ratio of the internal combustion engine;
- regulating said mixture of fuel and inlet air in response to said output sensing to provide an air/fuel ratio of inlet air and purge air to fuel vapor and fuel within a predetermined range; and
- modulating the purge flow mixture of purge air and fuel vapor in response to initiation of said purge command signal, said modulating enabling gradual increase of purge flow from no purge flow during a predetermined transient time at the beginning of said purge command signal so that said regulating step is able to prevent the air/fuel ratio from exceeding said predetermined range during said predetermined transient time, and said predetermined transient time being approximately equal to the propagation time of a mixture of air and fuel through the same engine.

4,677,957

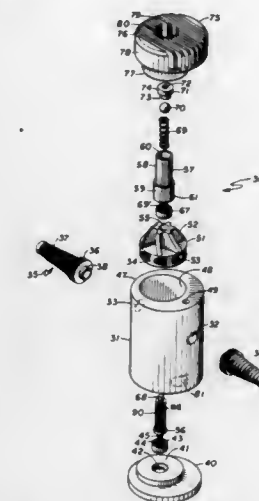
CONTROL SYSTEM FOR INTERNAL COMBUSTION  
ENGINESAlvaro G. Valencia, Armenia, Colombia, assignor to Turbo's  
Investigacion Energetica, Colombia

Filed Feb. 4, 1986, Ser. No. 825,906

Int. Cl.<sup>4</sup> F02M 25/06

U.S. Cl. 123-572

10 Claims



1. In a control system for use in internal combustion engines, having a crankcase and having an intake manifold, comprising:

- a main body having a throughbore therein offset from the central axis thereof;
- an inlet leading into the interior of said throughbore, said inlet being connected to the crankcase;
- an outlet in fluid communication with the interior of said throughbore, said outlet being connected to the intake manifold;
- a shaft mounted for rotation in said bore;
- a turbine having a plurality of blades thereon keyed to said shaft for rotation therewith, said turbine having turbine rotating means disposed in a position wherein fluids entering said throughbore from said inlet impel on said turbine rotating means thereby rotating said turbine; and
- spring biased ambient air valve means mounted at the top of said main body having an inlet communicating with the interior of said throughbore with a spring biased ball mounted in said inlet adapted, in a first position, to admit ambient air into the interior of said throughbore and, in a second position, prevent any fluids in said throughbore from exiting out of said inlet.

4,677,958

FUEL DELIVERY TO INTERNAL COMBUSTION  
ENGINESRobert J. Gayler, Mersham, England, assignor to Piper FM  
Limited, Ashford, EnglandDivision of Ser. No. 486,288, filed PCT GB82/00199, Jul. 7,  
1982, published as WO83/00191, Jan. 20, 1983, Pat. No.

4,617,898. This application Feb. 18, 1986, Ser. No. 831,037

Claims priority, application United Kingdom, Jul. 7, 1981,

8120988; Sep. 8, 1981, 8127132; Oct. 29, 1981, 8132624; PCT

Int'l Appl., Jul. 7, 1982, PCT/GB82/00199

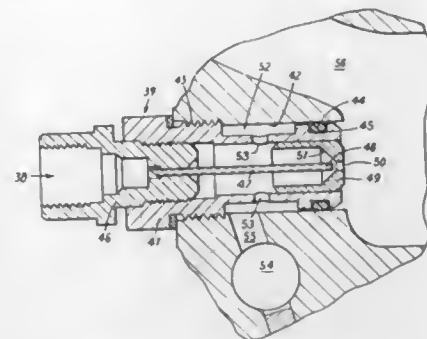
Int. Cl.<sup>4</sup> F02M 69/08

U.S. Cl. 123-585

11 Claims

5. Apparatus for delivering successive charges of fuel to a working chamber of an internal combustion engine from a liquid fuel supply line having a flow rate therethrough which is controlled in accordance with operating conditions of the engine, comprising a nozzle mounted in a side wall of an inlet duct leading to a combustion chamber and having an engine throttle associated therewith, the inlet duct communicating with the combustion chamber through an openable inlet valve,

the nozzle comprising a small bore fuel delivery tube connected to the supply line and mounted in an air passage connected to receive air from a supply bypassing the engine throttle, the air passage being convergent to an outlet for delivering fuel and air into the inlet duct, characterized in that the delivery tube is continuously connected to the supply line and in



that the pressure maintained in the supply line in relation to the dimensions of the delivery tube is insufficient to discharge a charge of fuel from the delivery tube in the absence of air movement in the air passage so that a charge of fuel is delivered by the delivery tube only during induction of a charge of air into the combustion chamber.

4,677,959

#### AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Norio Suzuki, Tokyo; Akira Watabe, Fujimi, and Kazunari Yamashita, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

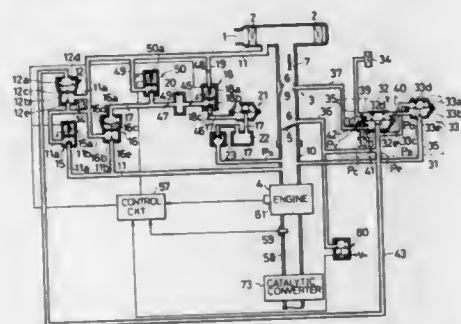
Filed May 21, 1986, Ser. No. 865,394

Claims priority, application Japan, May 21, 1985, 60-109034

Int. Cl.<sup>4</sup> F02M 23/08

U.S. Cl. 123—587

5 Claims



1. An air intake side secondary air supply system for an internal combustion engine having an intake air passage with a carburetor and a throttle valve, comprising:

- a first secondary air supply passage leading to the intake air passage downstream of the throttle valve;
- a second secondary air supply passage leading to the intake air passage downstream of the throttle valve;
- air/fuel ratio detection means for detecting an air/fuel ratio of a mixture supplied to the engine from a composition of an exhaust gas of the engine;
- an open/close valve disposed in said first secondary air supply passage which is operated to open only when said detection means detect a rich air/fuel ratio;
- an air control valve having a pressure chamber and disposed in said second secondary air supply passage, for varying a sectional area of a flow through said second secondary air supply passage in response to a magnitude of a pressure applied in said pressure chamber;

a first control pressure source for generating a first control pressure for opening said air control valve;

a second control pressure source for generating a second control pressure for closing said air control valve;

engine operation detection means for detecting at least a state of engine operation in which a supply of said air intake side secondary air in response to a result of a detection operation of said air/fuel ratio detection means is to be stopped, and for generating an engine operation detection signal upon detection of said state of engine operation; and

pressure control means for gradually supplying said first control pressure to said pressure chamber so as to gradually increase said sectional area when said air/fuel ratio detection means detect the rich air/fuel ratio, and supplying gradually said second control pressure to said pressure chamber so as to gradually decrease said sectional area when said air/fuel ratio detection means detect a lean air/fuel ratio and said engine operation detection signal is not produced, and rapidly supplying said second control pressure to said pressure chamber so as to rapidly close said air control valve when said engine operation detection signal is produced by said engine operation detection means.

4,677,960

#### HIGH EFFICIENCY VOLTAGE DOUBLING IGNITION COIL FOR CD SYSTEM PRODUCING PULSED PLASMA TYPE IGNITION

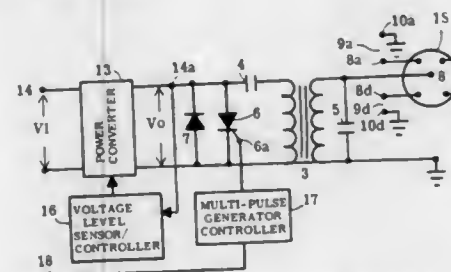
Michael A. V. Ward, Lexington, Mass., assignor to Combustion Electromagnetics, Inc., Arlington, Mass.

Filed Dec. 31, 1984, Ser. No. 688,030

Int. Cl.<sup>4</sup> F02P 3/08, 15/08; H01F 27/30

U.S. Cl. 123—598

34 Claims



1. In an electrical ignition system including a transformer with primary and secondary windings wound about a magnetic core material and an input capacitor of capacitance C1 connected to the primary winding for storing and discharging electrical energy, and secondary winding connected to a spark gap providing a total secondary output capacitance C2, the improvement comprising:

the transformer winding turns ratio N being constructed between 25 and 55 to provide a peak secondary output voltage V2 for an input voltage V1 to which capacitor C1 is charged, where V2 is given by  $V2 = k1 \cdot N \cdot V1 \cdot VP$ , where k1 is the coil coupling coefficient and VP is the voltage doubling parameter defined according to  $VP = 2 / [1 + (N^2 \cdot C2 / C1)]$ , and the system is constructed and arranged so that the voltage doubling parameter VP is greater than 1.6.

4,677,961

#### CLAY PIGEON LAUNCHER

James A. Allison, 3701 N. Mio Rd., Rose City, Mich. 48654

Filed Nov. 12, 1985, Ser. No. 797,037

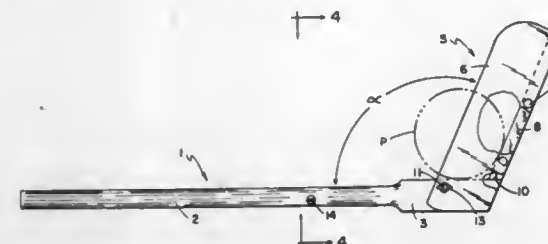
Int. Cl.<sup>4</sup> F41J 9/18

U.S. Cl. 424—5

6 Claims

1. A launcher for a projectile such as a clay pigeon comprising a carrier having a base flanked by a pair of spaced, parallel walls forming a trough open along one side at both ends, said

walls projecting beyond said base at one end of said body; an elongate handle straddled by the projecting walls of said carrier; and means connecting said projecting walls to said handle



with said base abutting said handle, said base and said handle having therebetween an included angle of between about 110° and 120°.

4,677,962

#### GEARLIKE TOOL FOR DRESSING ABRASIVE, GEARLIKE, PRECISION MACHINING TOOLS

Herbert Loos, Dorfen-Stadt, and Manfred Erhardt, Puchheim, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

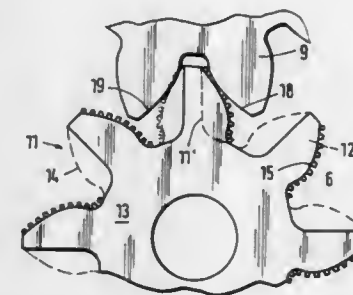
Continuation of Ser. No. 664,811, Oct. 25, 1984. This application Apr. 17, 1986, Ser. No. 853,088

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346189

Int. Cl.<sup>4</sup> B24B 53/06

U.S. Cl. 125—11 CD

8 Claims



1. In a dressing tool for dressing of abrasive gearlike precision tools, comprising a metallic, gearlike constructed base member, the tooth flanks of which are coated with extremely hard grinding grains and in which the gap between two successive teeth is wider than in a comparable gear with otherwise the same tooth system data, the improvement comprising wherein on the metallic base member from at least each second tooth, from a defined location on said metallic base member, is removed at least one of the normal left and right tooth flanks.

4,677,963

#### ANNULAR CUTTING DISC

Hrant K. Ajamian, 30087 Cartier Dr., Rancho Palos Verdes, Calif. 90274

Filed Nov. 14, 1984, Ser. No. 671,175

Int. Cl.<sup>4</sup> B28D 1/04

U.S. Cl. 125—15

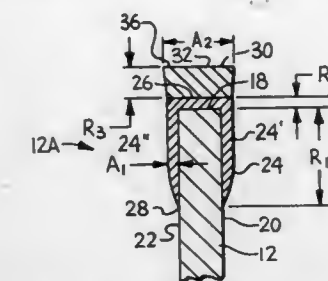
11 Claims

1. An improved annular cutting disc comprising, in combination:

- a metallic annular core member having:
  - (A) a central axis;
  - (B) an outer wall defining a predetermined outer perimeter;
  - (C) an inner wall defining a predetermined inner perimeter;
  - (D) a pair of opposed surfaces extending between said core member in regions adjacent said cutting portion thereof, and extending radially outwardly from said

inner wall a first preselected distance toward said outer wall, and having an inner first coating edge spaced from said central axis, and said first coating having a first preselected axial thickness on each of said pair of opposed surfaces of said core member to define outer surfaces of said first coating;

a second coating on said inner first coating edge and extending radially inwardly toward said central axis a third preselected distance to define a cutting edge, and said second coating having a second preselected axial thick-



ness and having a pair of opposed radially extending surfaces between said inner first coating edge and said cutting edge, said second preselected axial thickness of said second coating is greater at said cutting edge than at said inner first coating edge;

said first coating is, substantially free of diamond particles; said second coating is a slurry of diamond particles in a matrix; and

said pair of opposed radially extending surfaces of said second coating are substantially free of loosely held diamond particles.

4,677,964

#### PORTABLE GAS GRILL

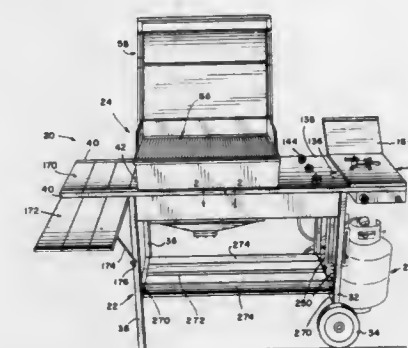
Charles W. Lohmeyer, Barrington; Erich J. Schlosser, Lindenhurst; James E. Tucker, Batavia; James C. Stephen, Arlington Heights; Andrzej Leja, Palatine, and John Beecher, III, Carpentersville, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed Jul. 26, 1985, Ser. No. 759,531

Int. Cl.<sup>4</sup> F24C 3/04

U.S. Cl. 126—41 R

30 Claims



1. A gas grill comprising a rectangular housing having upper and lower edges and a pair of corner support members at opposed corners with abutments on upper surfaces between said upper and lower edges and openings in an opposed end wall aligned with said corner support members, at least two elongated burner units of substantially identical construction, each burner unit consisting of an elongated tube having at least one row of apertures along a peripheral edge and a flattened portion on one end located in a common plane with said row of apertures, said flattened portion having a slot extending from a free edge with said slot being offset from the center axis



of said elongated tube and receiving an abutment so that said tubes can be inserted axially through said openings and be supported on said corner support members and said opposed wall end with said apertures directed towards the center of said housing.

4,677,965

## WOOD OR COAL BURNING HEATER

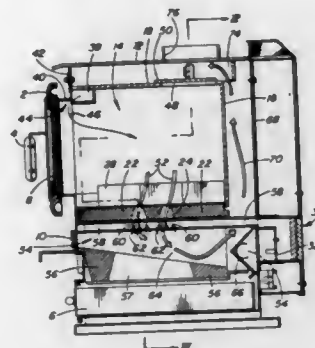
Johann G. Duerichen, P.O. Box 3637, Smithers British Columbia, Canada V0J 2N0

Filed Jul. 28, 1986, Ser. No. 889,912

Int. Cl.<sup>4</sup> F24B 5/00

U.S. Cl. 126—76

8 Claims



1. A wood and coal burning heater comprising a housing having a front surface, a rear surface, a bottom surface and a side surface and a top surface having a chimney opening, and a normally closed primary combustion chamber for the combustion of wood and coal within the housing, the combustion chamber having a top wall and a rear wall spaced inwardly from the top and rear surfaces of the housing forming therebetween horizontal and vertical smoke passages respectively, and a door opening in the front surface for access to the primary combustion chamber and a door for tightly closing the door opening, and a secondary combustion chamber positioned below the primary combustion chamber for the burning of combustible smoke, gas and ash passing downwardly from the primary combustion chamber, the secondary combustion chamber being lined along its bottom and sides with insulating refractory material and having a narrow opening in the bottom for the downward discharge of ashes into an air-tight ash drawer, the primary and secondary combustion chambers being separated by a grate of high-temperature ceramic refractory material which is provided with two narrow spaced slots which are aligned in front of rear direction, and an elongate air supply tube positioned immediately below and in parallel alignment with the slots in the grate with the air supply tube having air supply orifices positioned beneath the slots for the discharge of air for secondary combustion, and means for independently introducing air for combustion into the primary and secondary combustion chambers, the air for combustion in the primary combustion chamber being introduced upwardly in the primary combustion chamber and the air for combustion in the secondary combustion chamber being introduced through the air supply tube, whereby smoke and gas produced by combustion in the primary combustion chamber pass downwardly through the slots in the grate into the lined secondary combustion chamber and then rearwardly therein and then upwardly in the vertical smoke passage to the horizontal smoke passage for discharge through the chimney opening.

4,677,966

## SOLAR HEAT COLLECTOR ASSEMBLY

Nobushige Aral, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

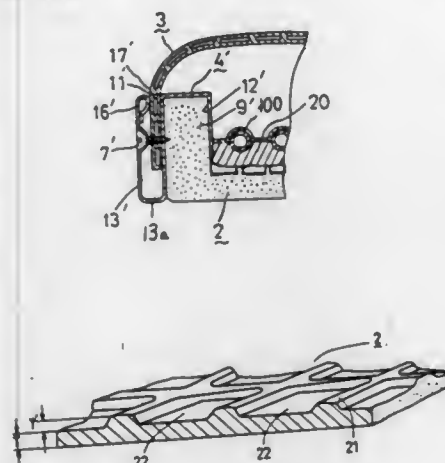
Continuation of Ser. No. 687,270, Dec. 28, 1984, abandoned, which is a division of Ser. No. 637,690, Aug. 6, 1984, Pat. No. 4,526,162, which is a continuation of Ser. No. 485,286, Apr. 15, 1983, abandoned. This application Mar. 5, 1986, Ser. No. 837,653

Claims priority, application Japan, Oct. 29, 1982, 57-164793[U]

Int. Cl.<sup>4</sup> F24J 3/00

U.S. Cl. 126—450

1 Claim



1. A solar heat collector assembly comprising: a heat collector means, a top cover means for the heat collector means containing a plurality of air cavities for increasing the heat insulating efficiency of said assembly, and a base means for accommodating said heat collector means made of a foamed resinous heat insulating material, said top cover means joining with said base means to house said heat collector means, said base means including a latticed rib configuration portion extending therefrom comprising a multiplicity of ribs defining a plurality of rectangularly shaped concavities therebetween, said ribs having a trapezoidal configuration which enhance the stability of said heat collector assembly.

4,677,967

## INTRAVAGINAL ANCHOR

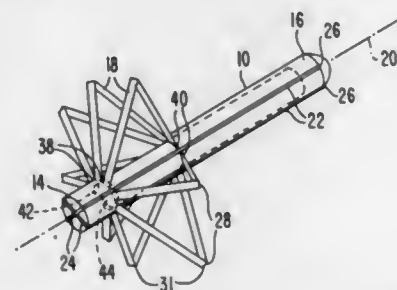
David L. Zartman, Worthington, Ohio, assignor to New Mexico State University Foundation, Las Cruces, N. Mex.

Filed Nov. 1, 1984, Ser. No. 667,370

Int. Cl.<sup>4</sup> A61B 19/00

U.S. Cl. 128—1 R

23 Claims



1. An intravaginal anchoring device for a mammalian female comprising (a) an elongated tubular body provided with a plurality of slots disposed substantially parallel to each other and to the length of said body such that, in an expanded position,

the ends of said body are moved towards each other and flange portions of said body between adjacent pairs of said slots are distended away from an axis of said body and, in a collapsed position, the ends of said body are moved away from each other and flange portions are retracted towards said axis and

- (b) a biasing means for urging said body into said expanded position, wherein, in said expanded position, the greatest distance between distal vertices of opposing flange portions is less than an expanded internal diameter of an anterior portion of said female's vagina but greater than a contracted internal diameter of a posterior portion of said vagina prior to the onset of fetal delivery so that the device is free and mobile therein.

4,677,968

## METHODS OF TESTING THE REACTION OF VARIOUS SUBSTANCES ON LIVING HUMAN SKIN

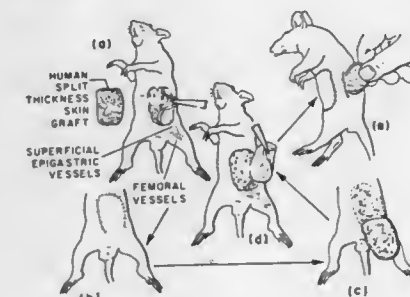
Gerald G. Krueger, Salt Lake City, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah

Filed Jan. 14, 1986, Ser. No. 818,871

Int. Cl.<sup>4</sup> A61B 19/00

U.S. Cl. 128—1 R

36 Claims



1. A method for testing the effects of substances on human skin comprising the steps of:

- (a) providing an isolated skin flap having a layer of living human skin and a layer of living animal skin, said flap being served by an isolated vasculature attached to a test animal and sandwiched between the layers of skin such that substantially all blood leaving the flap flows through the isolated vasculature;
- (b) placing a quantity of the substance to be tested in contact with the human skin portion of the skin flap;
- (c) removing at least one sample of blood from the isolated vasculature as the blood leaves the skin flap;
- (d) analyzing the contents of the blood removed.

4,677,969

## CERVICAL COLLAR PERMITTING TRACHEOTOMY

Anthony Calabrese, Philadelphia, Pa., assignor to Charles Griener and Company, Inc., Westville, N.J.

Continuation of Ser. No. 656,123, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 520,083, Aug. 4, 1983, Pat. No. 4,515,153. This application Nov. 1, 1985, Ser. No. 794,258

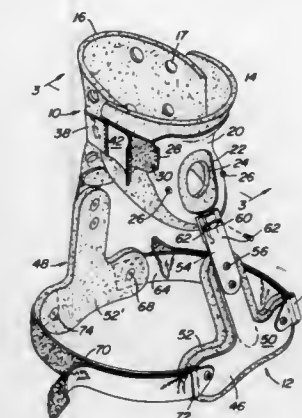
Int. Cl.<sup>4</sup> A61H 1/02

U.S. Cl. 128—75

6 Claims

1. A cervical collar suitable for use with a stabilizer having a connecting member with a tongue resiliently connected thereto and a hole for receipt of a rivet, said collar comprising: first and second discrete collar halves, one of said collar halves being a front half and the other being a rear half, each collar half being U-shaped and having a bight portion and side portions and being formed of a soft flexible light-weight polymeric plastic material;

a first rigid support means secured to and located adjacent a bight portion of the front collar half; a second rigid support means secured to and located adjacent the bight portion of the rear collar half; means for removably interconnecting the free ends of the collar halves in overlapping relation; and each of said first and second rigid support means including a lower portion adapted to releasably secure the stabilizer thereto, each lower portion includes an alignment means



and a fastening means, said alignment means includes a tab which is an extension of said lower portion, said tab having a width less than said lower portion, said tab having a slot extending into said tab, said slot adapted to receive the tongue on said stabilizer, and said fastening means includes an opening through said tab and spaced from said slot and adapted to receive the rivet whereby when the tongue engages said slot, the opening and hole are coaxially aligned.

4,677,970

## ORTHOPEDIC HEAT TRANSFER SYSTEM FOR ORTHOPEDIC CASTS

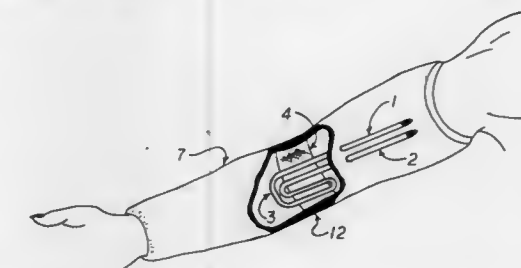
Carlos J. Green, Rte. 5, Box 161B, Covington, La. 70433; John L. Hirsius, 4620 Richland, and Marshall K. Book, 3939 Houma Blvd., both of Metairie, La. 70002

Filed Aug. 9, 1985, Ser. No. 764,833

Int. Cl.<sup>4</sup> A61M 1/00

U.S. Cl. 128—82.1

14 Claims



1. An orthopedic cast system using a liquid for the transfer of heat to or from a trauma location existing on an individual, comprising:

- continuous, closed, tubular pathway means for circulation of a liquid medium into and out of a cast without fluid loss; restraining means associated with said tubular means for holding said tubular means in a fixed configuration at a fixed location;
- an inlet port allowing the liquid medium into said tubular means;
- an outlet port allowing the removal of the liquid from said tubular means; and

cast means surrounding and integrally incorporating said pathway means and said restraining means into the cast.

4,677,971

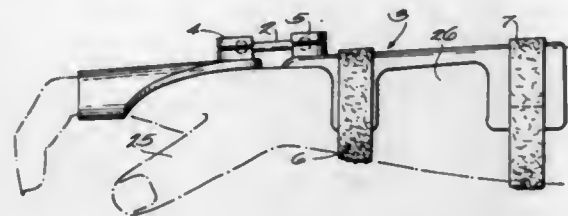
## ADJUSTABLE WRIST SPLINT

Peer Lindemann, West Bend, Wis., assignor to Rolyan Manufacturing Co., Inc., Menomonee Falls, Wis.

Filed Dec. 26, 1985, Ser. No. 813,539

Int. Cl.<sup>4</sup> A61F 5/04

U.S. Cl. 128—87 R



1. An adjustable wrist splint including a selectively positioned and supported handpiece in a selected one of a plurality of positions on a forearm piece comprising:  
a cushioned forearm piece;  
a cushioned handpiece;  
a single link pivotally connected to said forearm piece and to said handpiece and supporting said handpiece to selectively allow universal pivotal movement between said pieces;  
said handpiece including means for embracing a hand;  
said forearm piece including means for embracing a forearm;  
said link including at least one universal pivotal movement joint to selectively allow universal pivotal movement between said forearm piece and said handpiece; and  
readily adjustable tightening means in said universal pivotal joint to selectively lock said joint and prevent pivotal movement of said joint and fixedly support said handpiece on said forearm piece.

4,677,972

## COUPLING ASSEMBLY FOR JOINING AN IMPLANT TOOL TO A BONE IMPLANT

Alain Tornier, Le Brocey, 38130 Crolles, France

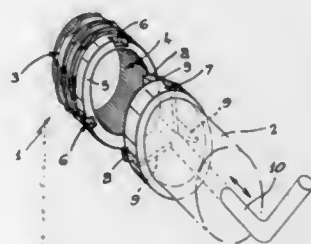
Filed Feb. 5, 1986, Ser. No. 826,450

Claims priority, application France, Feb. 7, 1985, 85 01915

Int. Cl.<sup>4</sup> A61F 5/04

U.S. Cl. 128—92 V

3 Claims



1. A coupling assembly for securing a bone implant such as an artificial acetabulum to a tool for use in implanting the implant comprising the bone implant having an annular flange mounted thereto, said annular flange having a front face, a plurality of notches formed in spaced relationship with respect to one another in said front face of said annular flange, each of said notches having at least one undercut wall portion, the tool having a forward annular end portion having a plurality of wedge shaped teeth extending outwardly therefrom in generally parallel relationship to the axis of the tool, each of said wedge shaped teeth of the tool being of a size to be cooperatively received within said notches in said annular flange so as

to create a space adjacent thereto in each notch, a plurality of shim means slideably carried by the tool adjacent each of said wedge shaped teeth so as to be axially movable with respect thereto, and means for simultaneously moving said shim means so as to enter said spaces within said notches to thereby bind each of said wedge shaped teeth within said notches and thereby lock the tool to the bone implant.

4,677,973

## PROXIMAL, TIBIAL OSTEOTOMY FOR LEVELING A TIBIAL PLATEAU

Barclay Slocum, 241 Sly Glass Dr., Eugene, Oreg. 97401

Filed May 28, 1985, Ser. No. 737,737

Int. Cl.<sup>4</sup> A61F 5/04

U.S. Cl. 128—92 VW

2 Claims



1. A method of performing a proximal tibial osteotomy comprising:  
producing a curvilinear cut adjacent the proximal metaphysis of the tibia, the lower part of which cut is concave as viewed from such metaphysis, such cut being made generally perpendicular to the sagittal plane, to free a caudal, tibial portion within the metaphyseal region of the tibia for movement relative to the remaining portion of the tibia that includes the diaphysis of the tibia and the tibial crest, rotating the two thus-cut-separated tibial portions to produce a new angular relationship therebetween in such plane without effecting translation of the thus-cut-separated tibial portions relative to one another, and fixing the two thus-rotated portions to anchor them in such new angular relationship.

4,677,974

## METHOD AND APPARATUS FOR IMMOBILIZING AN EYELID

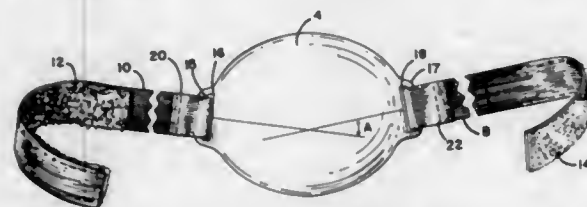
David Leonardi, 2320 Plaza del Grande, Las Vegas, Nev. 89102

Filed Sep. 30, 1985, Ser. No. 781,457

Int. Cl.<sup>4</sup> A61F 13/12

U.S. Cl. 128—163

8 Claims



1. An eyelid splint adapted to immobilize an eyelid of only

one eye of a patient consisting essentially of a flexible, resilient pad member adapted to press against the exterior of a patient's eyelid, said pad having a thickness of at least 14 mm, a backing member for mounting a pad thereon, and means for maintaining a pressure of 23–40 mm Hg on the eyelid, said means consisting essentially of an elastic strap means attached to the backing member for encircling the head of a patient, the strap means comprising first and second elastic strap members each having an end portion, and first and second interengaging fastening members comprising a plurality of mating hooks and loops mounted on the end portions of said straps for fastening said straps at adjustable lengths.

4,677,976

## EMERGENCY MASK

Katsumi Fujinuma, 2-105; 1100-4, Ohaza-Iwatsuki, Iwatsuki City, Saitama Pref.; Tsuneyoshi Takase, and Yoriyuki Hayaishi, both of Shimonoseki, all of Japan, assignors to Toyo Cei Kabushiki Kaisha, Tokyo and Katsumi Fujinuma, Iwatsuki, both of Japan

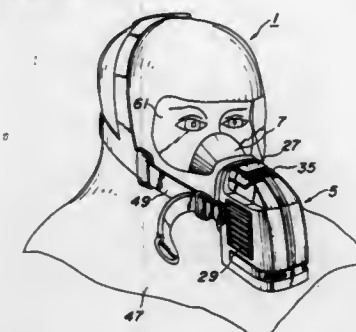
Filed Mar. 27, 1984, Ser. No. 594,973

Claims priority, application Japan, Apr. 1, 1983, 58-46746[U]

Int. Cl.<sup>4</sup> A62B 7/00

U.S. Cl. 128—201.25

10 Claims



4,677,975

## METHOD OF DISPENSING AND/OR A DISPENSER

Brian W. Edgar, and Robert B. Elliott, both of Auckland, New Zealand (4), assignors to The University of Auckland, Auckland, New Zealand

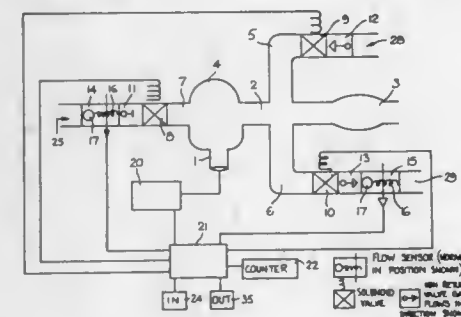
Filed Oct. 16, 1985, Ser. No. 788,030

Claims priority, application New Zealand, Oct. 16, 1984, 209900

Int. Cl.<sup>4</sup> A61M 16/00

U.S. Cl. 128—200.14

16 Claims



1. A dispenser, comprising:  
a supply means to supply inhalable material in inhalable form;  
a mouthpiece;  
said supply means being in communication with the atmosphere and said mouth piece;  
a flow control means to selectively allow or substantially prevent flow between said supply means and said mouth piece and between said supply means and the atmosphere;  
a signalling means to indicate to the user when to inhale and subsequently when to exhale;  
a first detection means to detect the commencement of inhalation and to cause a first timer to time a predetermined inhalation period, said first detection means also causing said flow control means to permit said inhalable material to move from said supply means to said mouth piece during a predetermined part of said period of inhalation, and to substantially prevent further inhalation at the end of said inhalation period; and  
a second detection means to detect the commencement of exhalation subsequent to the end of the period of inhalation and to cause a second timer to time a predetermined exhalation period.

1. An emergency mask comprising: a hood covering at least the face of a user and having an air passage hole; a face piece attached to the inside of the hood so as to engage the nose and mouth of the user and having a tubular coupling end; a canister containing air-purifying antidote therein and having two opposed ends, with an intake hole being disposed at one end and a discharge hole being disposed at the other end, an inlet check valve; and an outlet check valve; characterized in that the mask further comprises: a substantially cylindrical sealing member made of soft non-flammable flexible material and having one end thereof airtightly secured to the periphery of the air passage hole of said hood; a canister-holder having a tubular coupling end thereof airtightly coupled with said tubular coupling end of the face piece, with said sealing member being interposed between said tubular coupling end of said canister-holder and said tubular coupling end of said face piece so as to create an airtight seal between said hood, said face piece and said canister-holder; said canister-holder having an inside chamber defined therein which chamber communicates with said face piece through said coupling end thereof and has an inlet opening and an outlet opening; and a connecting means for airtightly connecting said canister to said canister-holder in a detachable manner with the discharge hole of the canister facing the inlet opening of the canister-holder, the connecting means having a loop rib projecting toward said canister around the inlet opening of the canister-holder, and a clamp means pivotally secured to said canister-holder so as to selectively engage and urge the canister toward said loop rib for causing airtight coupling between the other end of the canister and the canister-holder around said inlet opening; the inlet check valve being interposed between the intake hole of the canister and the inside chamber of the canister-holder for permitting air flow through the inlet opening of the inside chamber only in the direction from the canister toward the inside chamber; and the outlet check valve being mounted on said outlet opening of said canister-holder so as to allow air outflow through said outlet opening only away from the inside chamber and exclusively to the atmosphere.

4,677,977

## MASK FOR PRESSURE BREATHING

Orland W. Wilcox, Pasadena, Calif., assignor to Gentex Corporation, Carbondale, Pa.

Filed Aug. 3, 1984, Ser. No. 637,398

Int. Cl.<sup>4</sup> A62B 7/00

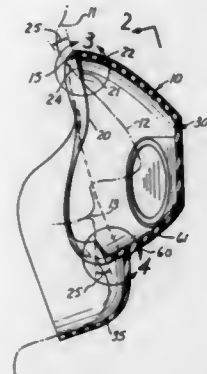
U.S. Cl. 128—206.24

9 Claims

1. A face mask for pressure breathing comprising: a body



having a sealing boundary shaped to fit over the bridge of the wearer's nose, downward past both sides of his nose and mouth, and across his mental protuberance, so as to make a fluid sealing contact along said boundary, said sealing boundary including a reflective primary seal, a secondary seal substantially non-deflectible with respect to said primary seal, and a canopy extending from said boundary to overlay the region included by said boundary, said canopy including means adapted to be connected to a breathing hose, said primary seal extending entirely around said sealing boundary and comprising a readily flexible flange having a base edge and a free edge, and between them and facing away from the canopy, a sealing



surface, said sealing surface being so shaped and arranged as to form an acute angle with the face around substantially all of its length, before substantial deflection, and to lay against the wearer's face when the mask is pressed sufficiently against the wearer's face, said secondary seal extending entirely around said sealing boundary and being more rigid than said primary seal, said secondary seal extending along said boundary on the other side of said sealing boundary from said free edge and so disposed and arranged as to not substantially indent the skin when the primary seal first touches the face, but to be drawn against and indented into the skin when pressed sufficiently tightly against the face by force exerted toward the face mask in alignment with said secondary seal;

4,677,978

# EMERGENCY CRICOTHYROTOMY SYSTEM AND CRICOTHYROTOMY KIT

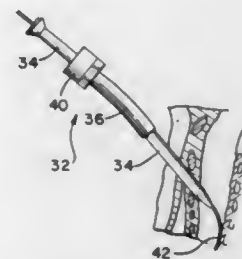
Richard J. Melker, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 414,680, Sep. 3, 1982, abandoned. This application Sep. 27, 1984, Ser. No. 655,317

Int. Cl.<sup>4</sup> A61M 16/00

U.S. Cl. 128—207.14

1 Claim



1. A method for performing emergency cricothyrotomy ventilation permitting spontaneous inspiration and complete exhalation between inspirations comprising the steps: palpating the cricothyroid membrane between the thyroid and cricoid cartilages; making an incision in the membrane between the thyroid and cricoid cartilages;

placing an over-the-needle catheter over a hollow needle; inserting an over-the-needle catheter and needle into the airway between the thyroid and cricoid cartilages through the incision with an attached syringe remaining outside of the airway; determining that the needle is in the airway by applying gentle back pressure on the syringe; removing the needle and syringe; feeding a guide-wire through the over-the-needle catheter into the airway; removing the over-the-needle catheter; dilating the cricothyroid membrane to receive an air passage catheter having an internal diameter of about 5.5 mm thereby permitting spontaneous inspiration and complete exhalation between inspirations; introducing an air passage catheter having an internal diameter of about 5.5 mm along the guide-wire into the airway; removing the guide-wire and securing the air passage catheter in the airway.

4,677,979  
LANCET

James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

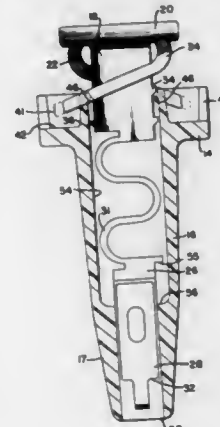
Filed Jun. 11, 1985, Ser. No. 743,231

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> A61B 17/34

U.S. Cl. 128—314

10 Claims



1. A lancet assembly comprising,
  - (a) an elongated housing;
  - (b) a passage extending through said housing with a lance opening at one end thereof;
  - (c) an elongated lancet body reciprocable in said passage;
  - (d) a lance blade positioned in said lancet body at one end thereof;
  - (e) handle means on said lancet body at the end thereof opposite said lance blade; the improvement characterized by
  - (f) a plurality of spaced apart first integral abutment means on said housing and extending into said passage;
  - (g) a plurality of spaced apart second integral abutment means on said lancet body for cooperating with said first abutment means;
  - (h) first integral resilient means on said handle means and extending between said handle means and said housing;
  - (i) second resilient means in said lancet body;
  - (j) whereby pushing said handle means causes said body to move through said passage in a first direction making one of said second abutment means to move past one of said first abutment means causing a snap-action in a puncture direction and in turn causing said lance blade to move through said lance opening;

4,677,981

# DEVICE FOR THE EXAMINATION OF OBJECTS BY ULTRASONIC ECHOGRAPHY WITH ANGULAR FOCUSING

Roger H. Conrart, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1985, Ser. No. 778,634

Claims priority, application France, Sep. 25, 1984, 84 14682 Int. Cl.<sup>4</sup> A61B 10/00

U.S. Cl. 128—660

1 Claim

# 4,677,980 ANGIOGRAPHIC INJECTOR AND ANGIOGRAPHIC SYRINGE FOR USE THEREWITH

David M. Reilly, Glenshaw, and Arthur E. Uber, III, Pittsburgh, Pa., both of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

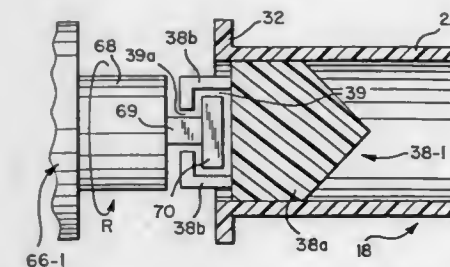
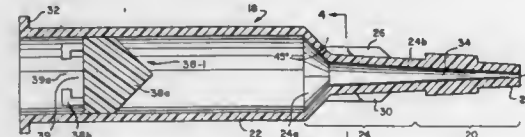
Continuation-in-part of Ser. No. 617,807, Jun. 6, 1984,

abandoned. This application Oct. 1, 1985, Ser. No. 782,586

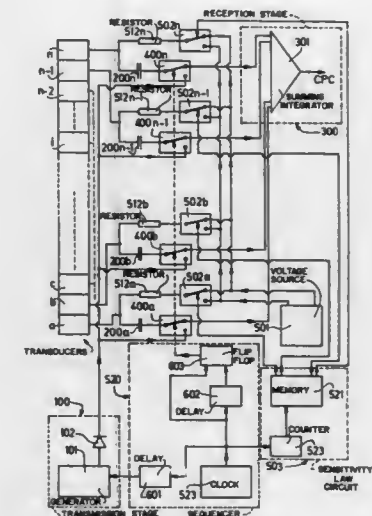
Int. Cl.<sup>4</sup> A61M 5/20; A61B 6/00

U.S. Cl. 128—655

65 Claims



1. An angiographic injector for injecting a contrast media from an angiographic syringe which includes a movable plunger for forcing contrast media from said syringe into the vascular system of an animal, said injector comprising: mounting means for supporting at least one syringe for an injection operation; actuating means adjacent said mounting means for controlling the movement of said plunger in said syringe; drive means disposed at one end of said actuating means for causing retraction of said plunger in said syringe and advancement of said plunger in said syringe to force the contrast media from said syringe in the injection operation; and quick release means forming respective mating parts of said plunger and said drive means for selectively placing said plunger in a driven state by said drive means such that said drive means can retract said plunger in said syringe, and in an undriven state by said drive means such that said drive means can be retracted relative to said plunger without retraction of said plunger, the mating parts of said quick release means cooperating so that said plunger can be placed in its driven state or in its undriven state at any time during the injection operation and at any position of the plunger, without substantial force being applied therebetween.



1. A device for the examination of objects by ultrasonic echography comprising a focusing network of  $n$  ultrasonic transducers associated with a transmission stage for the repeated transmission of ultrasonic waves across the region to be explored and with a reception stage for the processing of the return echoes received, wherein:

said ultrasonic transducers are made of an electrostrictive material with non-remnant polarisation and further comprising

- (1) a source of  $p$  polarisation direct voltages,
- (2) demultiplexing and branching circuit means which include  $n$  demultiplexers each of which receives the  $p$  polarisation direct voltages selects one of the said voltages and supplies, via a series polarisation resistor the selected voltage to one of said ultrasonic transducers;
- (3) a circuit means which determines a law of sensitivity corresponding to two phase states and to  $p/2$  or  $(p+1)/2$  amplitude states when  $p$  is even or odd, respectively, said circuit means comprising a counter having a number of states which correspond at least to the number of different directions in which it is desired to perform an examination by focusing the ultrasonic waves, and a memory which supplies to the  $n$  demultiplexers, in response to any particular state of the counter,  $n$  respective digital combinations corresponding to the said state thereby indicating to each demultiplexer one of the direct voltages which it has to select for the polarisation of the transducer associated with it;
- (4) sequencer means comprising a clock circuit which fixes the duration of the transmission and reception periods and the rate of change of state of the counter.

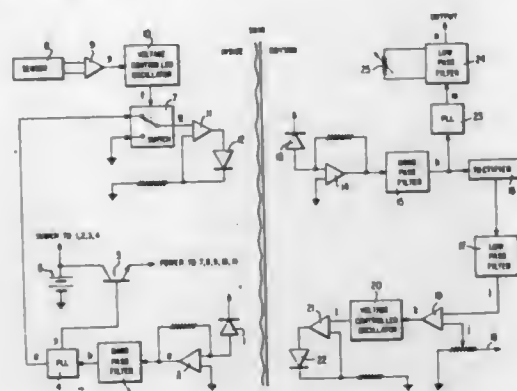
# 4,677,982 INFRARED TRANSCUTANEOUS COMMUNICATOR AND METHOD OF USING SAME

Llinas, Rodolfo R.; Matsuyuki Sugimori, and Ronald K. Crank, all of New York, N.Y., assignors to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 336,337, Dec. 31, 1981, abandoned. This application Mar. 29, 1984, Ser. No. 594,990 Int. Cl.<sup>4</sup> A61B 5/00

U.S. Cl. 128—664

7 Claims



1. A method for bidirectionally transmitting information between an infrared transmitter implanted in the interior of a living organism, and an external apparatus controlled by an operator, comprising:

- transmitting an infrared light signal at a desired adjustable frequency within a given frequency range from said external apparatus to an infrared light detector implanted in the interior of said organism;
- detecting the frequency of the infrared signal received by the implanted infrared light detector;
- in response to detection of a frequency of the received said infrared signal which is within said given frequency range, converting the detected received frequency within said given frequency range to a voltage signal whose amplitude is proportional to the received frequency;
- measuring a physiological variable of the organism, by means of a sensor implanted in the interior of said organism, and providing a signal whose frequency is proportional to the measured physiological variable;
- frequency modulating said voltage signal with said signal whose frequency is proportional to the measured physiological variable;
- feeding said frequency modulated signal to said transmitter to cause same to transmit a frequency modulated infrared signal to said external apparatus;
- receiving said frequency modulated infrared signal in said external apparatus; and
- detecting the frequency of the received frequency modulated signal as a measure of the physiological variable measured by the sensor.

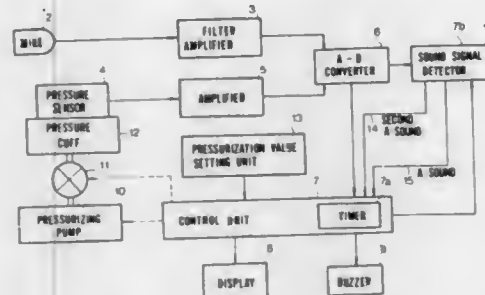
4,677,983  
**METHOD AND APPARATUS FOR MEASURING CIRCULATORY FUNCTION**  
 Keiji Yamaguchi, Shimizu, and Hideo Ishizaka, Hatano, both of Japan, assignors to Terumo Corporation, Tokyo, Japan  
 Filed Mar. 11, 1986, Ser. No. 838,604  
 Claims priority, application Japan, Mar. 11, 1985, 60-46379 Int. Cl.<sup>4</sup> A61B 5/02

U.S. Cl. 128—680

24 Claims

1. A circulatory function measurement apparatus comprising:
- pressure control means for controlling pressure applied to a blood vessel of a living body;
  - sound detecting means for detecting a sound from the blood

vessel produced due to a change in a value of the pressure applied to the blood vessel by said pressure control means; first recognition means for recognizing whether the sound from the blood vessel detected by said sound detecting means agrees with a first specific condition and for generating first recognition information indicating agreement with the first specific condition; second recognition means for recognizing whether a sound from the blood vessel detected by said sound detecting means agrees with a second specific condition less stringent than the first specific condition and for generating second recognition information indicating agreement with the second specific condition; and measuring means for measuring first and second parameters of circulatory function based on the first and second recognition information from said first and second recognition



tion means, said measuring means selectively measuring the first parameter of circulatory function based upon the first recognition information from said first recognition means when there is a reduction in the pressure applied to the blood vessel by said pressure control means, said measuring means selectively measuring the second parameter of circulatory function based upon the second recognition information from said second recognition means when said first recognition means recognizes that the sound from the blood vessel agrees with the first specific condition, this latter measurement being made for a predetermined period of time after such recognition, and said measuring means again selectively measuring the first parameter of circulatory function based upon the first recognition information from said first recognition means after the predetermined period of time.

4,677,984  
**CALIBRATED ARTERIAL PRESSURE MEASUREMENT DEVICE**  
 Bohumir Sramek, Irvine, Calif., assignor to Bomed Medical Manufacturing, Ltd., Irvine, Calif.

Filed Sep. 24, 1984, Ser. No. 653,460

Int. Cl.<sup>4</sup> A61B 5/02

U.S. Cl. 128—681

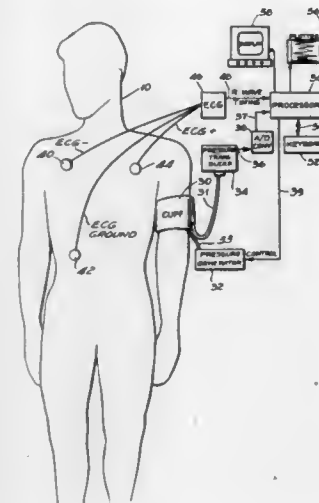
21 Claims

1. An apparatus for measuring arterial blood pressure and recreating the arterial blood pressure waveform throughout the cardiac cycle of a patient, comprising:

- an inflatable cuff;
- a source of selectively variable pneumatic pressure connected to said cuff to inflate and deflate said cuff;
- a pressure transducer connected such that it detects the magnitude of the pneumatic pressure applied to said cuff and provides a transducer output signal including transitions corresponding to increases in the detected pressure magnitude at the beginning of arterial blood flow beneath said inflatable cuff during a cardiac cycle and transitions corresponding to decreases in the detected pressure at the end of arterial blood flow beneath said inflatable cuff during a cardiac cycle;

an electrocardiographic means for sensing the electrical signals of the patient's heart and for providing an R-wave output signal responsive to the R-wave in said electrical signals; and

- a control means electrically connected to receive said transducer output signal and said R-wave output signal, which control means processes said output signals to calculate the elapsed times from the occurrence of the R-wave in a cardiac cycle to said transitions in said transducer output



signal and to accumulate data corresponding to said calculated elapsed times and the magnitude of said pneumatic pressure for each cardiac cycle, and to provide output information corresponding to the magnitude of the blood pressure of the patient with respect to time within the cardiac cycle, said control means further providing control signals to said source of variable pneumatic pressure to control the rates of increase and decrease of said pneumatic pressure.

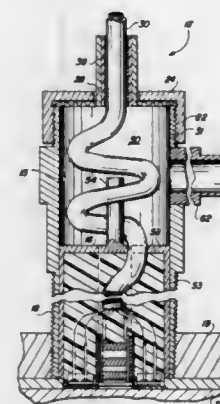
4,677,985  
**APPARATUS AND METHOD FOR DETERMINING INTRACRANIAL PRESSURE AND LOCAL CEREBRAL BLOOD FLOW**  
 William J. Bro, 3735 W. Cavalier Dr., Phoenix, Ariz. 85019, and L. Philip Carter, 2910 N. 3rd Ave., Phoenix, Ariz. 85013

Filed Aug. 12, 1985, Ser. No. 764,496

Int. Cl.<sup>4</sup> A61B 5/02

U.S. Cl. 128—691

11 Claims



1. An intracranial probe for measuring local cerebral blood flow and intracranial pressure comprising:
- (a) a casing defining a generally cylindrical bore, said casing

184-021 O.G.-87-5

having an exterior portion for securement to the skull of a body and further including a pressure port communicating with said bore and adapted to communicate pressure to a remote pressure monitor;

- (b) a piston reciprocal in said bore;
- (c) a first platinum-containing contact plate forming at least a portion of said piston;
- (d) a second platinum-containing contact plate forming at least a portion of said piston;
- (e) first signal means coupled to said first contact plate for outputting a signal proportional to the temperature of the first plate;
- (f) second signal means coupled to said second contact plate for outputting a signal proportional to the temperature of said second plate, said first and second means adapted to be connected to comparative means;
- (g) first conductor means connected to said first plate;
- (h) second conductor means connected to said second plate, said first and second conductor means adapted to be connected to polygraph means to monitor current generated by said plates; and
- (i) means for polarizing said contact plates whereby said probe is securable in said skull with the said portions of the piston adapted to be in contact with the dura for measuring local cerebral blood flow by both thermal and hydrogen clearance techniques and means associated with said piston communicating a pressure signal indicative of intracranial pressure whereby the internal pressure is communicated across said piston to said bore to said pressure port.

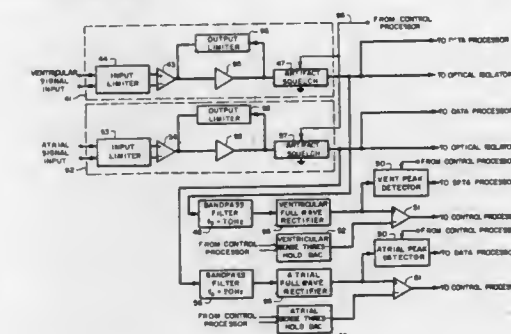
4,677,986  
**UNSATURABLE SENSE AMPLIFIER FOR PACER SYSTEM ANALYZER**  
 Robert DeCote, Jr., Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed May 28, 1985, Ser. No. 738,608

Int. Cl.<sup>4</sup> A61B 5/04

U.S. Cl. 128—697

10 Claims



1. An unsaturable sense amplifier for use in a pacer system analyzer to sense and amplify intracardiac signals induced in response to pacing pulses being applied to the heart of a patient, comprising:

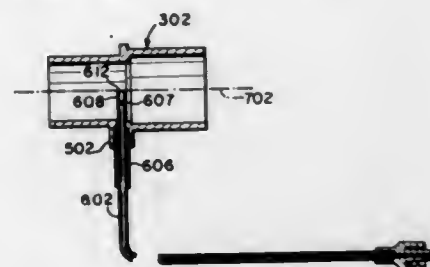
- first amplifier means for amplifying an applied voltage and being subject to saturation by said applied voltage exceeding a first predetermined saturating level;
- second amplifier means coupled to the output of said first amplifier means and being subject to saturation by said output exceeding a second predetermined saturating level;
- input limiting means coupled to the input of said first amplifier means for limiting said applied voltage to less than said first predetermined saturating level;
- output limiting means connected between the input and output of said second amplifier means for limiting said input of said second amplifier means to less than said second predetermined saturating level; and



artifact squelch means coupled to said output of said second amplifier means for squelching said output when said output exceeds a predetermined squelch level.

**4,677,987**  
**GAS SAMPLING APPARATUS FOR CAPNOGRAPHY**  
 Pradip V. Choksi, Northridge, Calif., assignor to SpaceLabs Inc., Redmond, Wash.  
 Filed Apr. 16, 1986, Ser. No. 852,859  
 Int. Cl.<sup>4</sup> A61B 5/08  
 U.S. Cl. 128—719

3 Claims



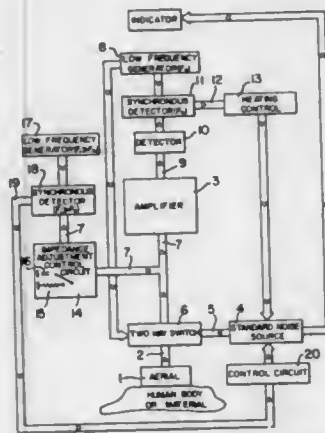
1. An apparatus for obtaining a sample gas flow from a patient's exhaled gas stream present in an air tube coupled to said patient comprising:

- a connector adapted for insertion in said air tube, said connector providing a pathway for said gas flow, said connector including:
- an elongated main tubular portion along whose axis said gas flow pathway is generally parallel; and
- a hollow cylinder coupled to a side wall of said main tubular portion and protruding outwardly therefrom, the interior of said cylinder communicating with the ambient atmosphere through a distal open end and with the interior of said main tubular portion through an aperture in the wall of said main tubular portion, said hollow cylinder having an internal diameter substantially larger than the diameter of the aperture in said tubular portion wall;
- a hollow sampling line detachably coupled to said connector comprising:
- a sampling end portion with a first open end and at least one hole spaced apart from said open end through the wall of said sampling end portion; and
- a reinforced portion for reinforcing said sampling line, said reinforced portion spaced apart from said sampling line open end and said at least one hole, said reinforced portion having an outer diameter substantially larger than the diameter of said sampling end portion, said sampling end portion comprising the length of said sampling line from the first open end to the start of said reinforced portion, said reinforced portion adapted to frictionally engage the interior of said hollow cylinder when said sampling line is coupled to said connector, the length of said sampling end portion being long enough such that said first open end and said at least one hole extend through said aperture in the wall of said main tubular portion into the patient's exhaled gas stream.

**4,677,988**  
**METHOD AND APPARATUS FOR MEASURING MICROWAVE NOISE**  
 Eugène Constant; Yves Leroy, both of Villeneuve d'Ascq, and Jean-Claude Van De Velde, Mons-en-Baroeul, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France  
 Filed Mar. 21, 1985, Ser. No. 714,700  
 Claims priority, application France, Mar. 21, 1984, 84 04792  
 Int. Cl.<sup>4</sup> A61B 5/05; A61N 5/02  
 U.S. Cl. 128—736  
 10 Claims

1. A device for measuring thermal microwave radiation of an object for measuring the internal physical temperature of

the object including a human or animal body comprising, an antenna to pickup thermal microwave electromagnetic radiation of the object and convert it into a received signal proportional to the temperature of the object, an integrated circuit comprising a temperature reference source of known temperature made as a planar resistor for developing a temperature reference signal proportional to the temperature of the temperature reference source, an amplifier in said integrated circuit and switch means for alternatively applying said received signal and said temperature reference signal to said amplifier to develop an output therefrom corresponding to an error signal representative of a difference between the temperature of said object and the temperature of said temperature reference source, detector means receiving outputs of the amplifier for detecting said error signal, a low frequency generator in the

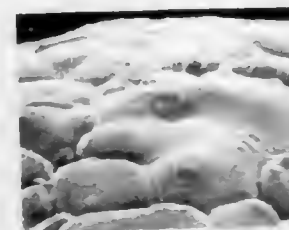


integrated circuit for applying a low frequency signal to said switch means for alternately connecting to said amplifier the antenna and said temperature reference source to continuously apply the signal outputs therefrom to said amplifier to compare the physical temperatures of said body and said temperature reference source, heat control means in said integrated circuit comprising heatable resistors for controlling the application of heat to said planar resistor of said temperature reference source for varying the physical temperature thereof, synchronizing means receptive of the error signal from the detector means for synchronizing application of the error signal from the detector to said heat control means and which is directly proportional to the temperature difference between said body and the temperature reference source thereby to obtain a nil error signal so that the temperature of the temperature reference source will thereby correspond to the temperature of said object.

**4,677,989**  
**IRIDIUM OXIDE COATED ELECTRODES FOR NEURAL STIMULATION**  
 Lois S. Robblee, Randolph, Mass., assignor to EIC Laboratories, Inc., Norwood, Mass.  
 Filed Feb. 6, 1986, Ser. No. 829,693  
 Int. Cl.<sup>4</sup> A61N 1/05  
 U.S. Cl. 128—784  
 6 Claims

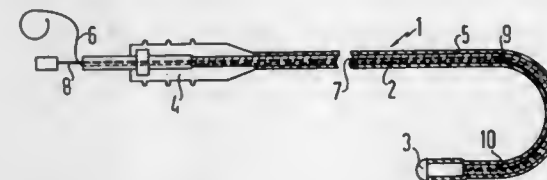
- 1. A metallic electrode for injecting charge into biological tissue with controlled electrical pulses comprising, a metallic electrode that is made of a metal that is predominantly different from iridium having a metallic surface, said metallic surface being coated with an iridium oxide coating sufficiently thick to significantly reduce corrosion

and significantly increase charge capacity while being sufficiently thin to allow charge to flow between said



metallic surface and biological tissue separated from said metallic surface by said iridium oxide coating.

**4,677,990**  
**ENDOCARDIAL ELECTRODE CONTROLLABLE TO FORM SELECTED CONTOURS**  
 Heinz Neubauer, Jaerfaella, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany  
 Filed Feb. 25, 1986, Ser. No. 832,677  
 Claims priority, application Fed. Rep. of Germany, Feb. 28, 1985, 3507119  
 Int. Cl.<sup>4</sup> A61N 1/05  
 U.S. Cl. 128—786  
 8 Claims



- 1. An endocardial electrode controllable to form selected contours comprising:
- a flexible electrical conductor having an internal axial channel and covered with an insulating sheath, said conductor having a distal end and a proximal end;
- at least one electrode head attached at said distal end of said conductor for contact with heart tissue; and
- at least one traction element extending through and freely movable in said channel and attached to said conductor at a selected location and having at least one portion thereof eccentrically guided outside and parallel to said conductor within said insulating sheath for a predetermined distance, said traction element projecting from said channel at said proximal end thereof;
- whereby tension exerted on said traction element at said proximal end deforms said conductor in a region substantially co-extensive with said portion of said traction element to a selected contour dependent upon the amount of tension.

**4,677,991**  
**GRAIN DEFLECTOR FOR COMBINES**  
 James R. Harris, and Leland H. Harris, both of R.R. 1, Miami, Mo. 65344  
 Filed Jan. 31, 1986, Ser. No. 824,435  
 Int. Cl.<sup>4</sup> A01F 12/44  
 U.S. Cl. 130—27 AE  
 39 Claims

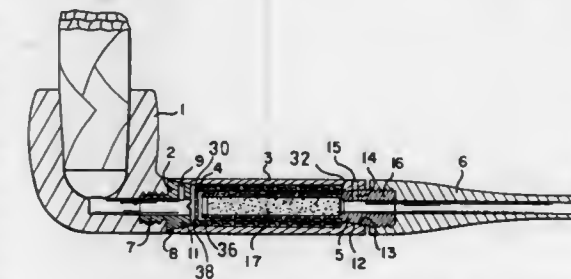
- 24. An attachment for the foraminous, reciprocable grain cleaning platform of a crop harvesting machine for increasing the cleaning efficiency of the platform during operation of the machine on side hill slopes, said platform having a pair of upstanding sidewalls extending along opposite side margins of the platform in the direction of reciprocation thereof, said attachment comprising:
- a pair of separate, elongated deflector members each having a longitudinally extending base adapted for disposition

alongside of one of said sidewalls inboard of the latter when the attachment is secured to the platform, each of said members further having an inclined baffle surface extending along the length thereof and projecting from said base at an oblique angle relative to the plane of the latter; and means for securing said members to opposite sidewalls of the



platform in such a manner that said baffle surfaces of the members project angularly inwardly and upwardly toward one another above lateral side margins of the platform in order to redirect air and crop materials back toward the central portion of the platform when the machine is harvesting on a side hill slope, said securing means serving to fix said baffle surfaces relative to said platform.

**4,677,992**  
**SMOKING APPARATUS HAVING CONVOLUTED FILTERING/HEAT-REDUCTION PASSAGEWAY**  
 Bedrich V. Bliznak, 362 Rindge Ave., Apt. 3B, Cambridge, Mass. 02140  
 Filed Feb. 10, 1986, Ser. No. 828,028  
 Int. Cl.<sup>4</sup> A24D 3/04  
 U.S. Cl. 131—209  
 13 Claims

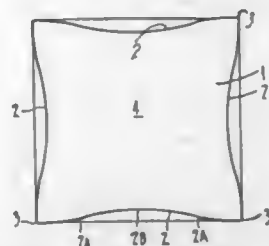


- 1. A smoking apparatus having a long convoluted passageway through which smoke must travel for filtering and heat reduction, wherein the smoking apparatus comprises:
- an elongated separable tubular casing;
- removably attached to one end of the tubular casing, a means for receiving and holding a burning tobacco product;
- removably attached at an opposite end of the casing, a mouthpiece for drawing smoke from the burning tobacco product into a user's mouth;
- intermediate of the two ends a convoluted passageway through which smoke from the burning tobacco product passes en route to the user's mouth, wherein the passageway comprises at least one elongated member having a series of disconformities along its surface, which disconformities create a passageway through which the smoke passes in a substantially spiraling pattern;
- wherein the convoluted passage comprises within the casing a first cylinder slightly smaller in diameter than the casing, wherein the cylinder along its length on an exterior surface comprises a spiral ridge protruding from the outer cylinder into contact with the casing to form a spiral passageway therebetween;
- wherein the first cylinder is hollow and sealed on the end

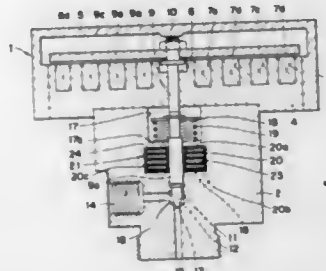




bell shaped configuration which is concave in a center portion and convex in areas adjoining said corners, relative to said edge, wherein said means for tensioning is an inelastic tendon fastened to said panel member.



**4,678,000**  
**HIGH SPEED ELECTROMAGNETIC VALVE**  
Takeo Kishida, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan  
Filed Jan. 2, 1986, Ser. No. 815,998  
Claims priority, application Japan, Jan. 18, 1985, 60-7191  
Int. Cl.<sup>4</sup> F16K 31/06  
U.S. Cl. 137—1



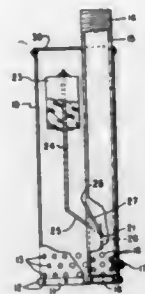
1. A method of driving a high speed electromagnetic valve having a housing, a stator fixed to said housing comprising excitation coil means, an armature slidably mounted to said housing for moving toward and away from said stator and subject to an excitation force exerted by said stator when current is supplied to said excitation coil means, a valve rod fixed to said armature and slidable therewith, a spring means connected between said housing and said armature for exerting a displacement force on said armature acting in a first direction opposite to a second direction in which said excitation force acts and a piezoelectric means mounted to said housing around said valve rod, said method comprising:

initially applying voltage to said piezoelectric means mounted to said housing around said valve rod thereby causing said piezoelectric means to contract to exert pressure on said valve rod such that said valve rod and said armature fixed thereto are held by said piezoelectric means and cannot slide relative to said housing and said stator;

while applying said voltage to said piezoelectric means, exciting said excitation coils thereby exerting said excitation force on said armature held by said piezoelectric means; and

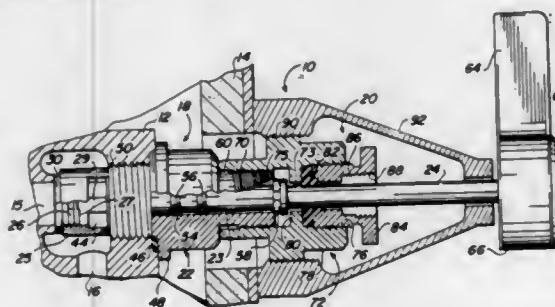
after exciting said excitation coils, interrupting said application of voltage to said piezoelectric means thereby causing said contracted piezoelectric means to expand to release said valve rod whereby said armature and said valve rod slide in said first direction under the influence of said excitation force exerted on said armature by said stator against said displacement force exerted on said armature by said spring.

**4,678,001**  
**PUMP PRIME MAINTAINER**  
James J. Lacey, c/o Ed Lacey, P.O. Box 829, Trent, S. Dak. 57065  
Continuation-in-part of Ser. No. 711,747, Mar. 14, 1985, abandoned. This application Feb. 10, 1986, Ser. No. 828,136  
Int. Cl.<sup>4</sup> F16K 31/18  
U.S. Cl. 137—194



1. A device to control the flow of liquid being exhausted from a sump or the like comprising a substantially circular cylindrical casing formed to provide openings through which said liquid can enter said casing, a pipe extending into said casing, a butterfly valve in said pipe, said valve having a pivoting plate loosely fitting in said pipe, said valve having an open position and a closed position and being movably adjustable between the two positions, float means operably connected to said valve and adapted to move said valve between said open and closed positions, said float means including a float vertically slidable within said casing.

**4,678,002**  
**FAUCET VALVE WITH ADJUSTABLE STEM TIGHTENER**  
Harold J. Valley, 23462 Coso, Mission Viejo, Calif. 92692  
Filed May 10, 1985, Ser. No. 732,611  
Int. Cl.<sup>4</sup> F16K 43/00, 5/08, 41/00  
U.S. Cl. 137—315



1. A ceramic disc faucet valve with stem tightening means which allows said faucet valve to be mounted in a horizontal attitude with a control lever having a laterally extending handle portion mounted thereon, said faucet valve with stem tightening means comprising in combination:

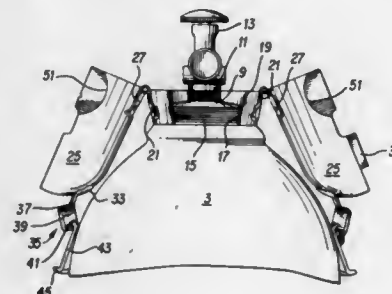
(a) a faucet valve including,

- I. a valve body for mounting on a vertical surface and defining a water flow path therethrough,
- II. a valve stem mounted in said valve body and having an elongated portion of uninterrupted cylindrical configuration extending axially therefrom, said valve stem being rotatable about a horizontal axis,
- III. a matching pair of ceramic discs mounted in contiguous engagement with each other within the flow path of said valve body, a first one of said pair of discs being held against rotation in said valve body and a second

one of said pair of discs being coupled for rotation with said valve stem about the horizontal axis, each of said pair of discs having at least one aperture formed therethrough so that reciprocal rotation of said second one of said discs through approximately 90 degrees will align and misalign the apertures of said pair of discs for opening and closing of the flow path through said valve body;

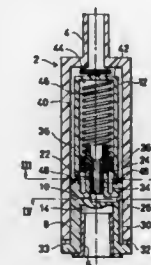
- (b) a valve stem tightening means on said valve body and extending axially therefrom in circumscribing relationship with said valve stem, said valve stem tightening means being in frictional engagement with the periphery of the cylindrical extending portion of said valve stem to prevent unwanted rotational movement thereof; said valve stem tightening means includes means surrounding at least a portion of said valve stem which is adjustable for varying the amount of friction applied radially and inwardly thereby on said valve stem, a cover means surrounding said tightening means and said adjustable means to prevent any tampering thereto; and
- (c) a control lever mounted on the extending end of said valve stem for manual manipulation thereof, said control lever including a lever body which is mounted on the extending end of said valve stem and an elongated handle portion extending laterally from said lever body.

**4,678,003**  
**SAFETY CAP FOR VALVE ON HIGH-PRESSURE CYLINDER**  
Beacher C. Griffin, Rte. 1, Box 292, Pamlico, S.C. 29583  
Filed Oct. 10, 1986, Ser. No. 917,548  
Int. Cl.<sup>4</sup> F16K 27/12  
U.S. Cl. 137—382



1. A safety cap for use with a high-pressure gas cylinder having a shut-off valve, said shut-off valve having radial and longitudinal axes, said safety cap having a closed position to protect said shut-off valve against damage and tampering, said safety cap having an open position to provide unrestricted access to said valve; said safety cap comprising a base bracket, hinge means, shield halves, clamping means; said gas cylinder and base bracket having cooperating means mounting said base bracket in removable fixed relationship on said cylinder and without interfering with said shut-off valve, said base bracket carrying said hinge means, said shield halves having lateral axes, said hinge means pivotally mounting said shield halves to turn about their said lateral axes, said shield halves being pivotable in one direction toward each other for abutting relationship of said shield halves and defining the closed position of said safety cap with said shield halves protecting said valve against damage and tampering, said shield halves being pivotable in the opposite direction away from each other and defining the open position of said safety cap providing such unrestricted access radially and longitudinally to said valve, and said shield halves carrying said clamping means for clamping together said shield halves and maintaining said shield halves in their abutting relationship in the closed position of said safety cap.

**4,678,004**  
**QUICK-ACTION ON/OFF VALVE**  
Peretz Rosenberg, Moshav Belt Shearim, Israel  
Filed Jun. 20, 1985, Ser. No. 746,863  
Claims priority, application Israel, Jul. 6, 1984, 72316  
Int. Cl.<sup>4</sup> F16K 17/30  
U.S. Cl. 137—469



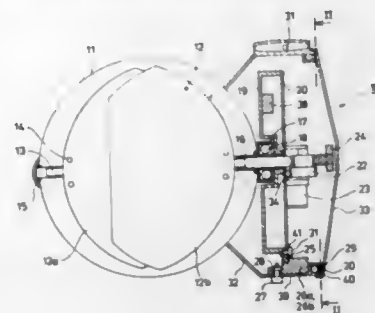
1. An on/off valve for controlling the flow of a fluid between an inlet line and an outlet line to which said valve is to be connected, comprising:

- a housing including a partition dividing its interior into a first chamber, a second chamber, and an interconnecting passageway;
- a first port connectable to one of said lines and communicating with said first chamber;
- a second port connectable to the other of said lines and communicating with said second chamber;
- a piston fixed in said first chamber;
- a cylinder disposed in said first chamber and movable with respect to said piston fixed in said first chamber;
- said cylinder including a closed end facing said first port and of substantially larger cross-sectional area than said first port;
- the space between said piston and cylinder being vented to the atmosphere;
- a resilient disc interposed between said first port and said closed end of the cylinder;
- the opposite end of the cylinder being opened and facing said partition;
- spacing means cooperable with said partition and said open end of the cylinder for continuously maintaining communication between said first chamber and said interconnecting passageway;
- and a spring interposed between said fixed piston and said movable cylinder urging the cylinder in the direction tending to close said first port.

**4,678,005**  
**FLOW REGULATOR**  
Erkki Aalto, and Veikko Ylä-Hemmilä, both of Kausala, Finland, assignors to Halton Oy, Finland  
Filed Jan. 7, 1985, Ser. No. 695,363  
Claims priority, application Finland, May 20, 1983, 831799  
Int. Cl.<sup>4</sup> F16K 31/12, 17/00  
U.S. Cl. 137—499

1. A flow regulator for gaseous substance, particularly for air in air-conditioning and ventilation installations, for maintaining the volumetric flow rate of the gaseous substance at desired magnitude with sufficient accuracy when differential pressure acting across the flow regulator varies within given limits, said flow regulator comprising an envelope and a regulating member turnably disposed in a flow passage confined by the envelope, said member disposed to turn with increasing differential pressure progressively crosswise with reference to the direction of flow and assume an equilibrium position in response to a torque produced by the gaseous substance on the flow regulating member and a counter-torque dependent on the position of the regulating member, such that the requisite

pressure drop for maintaining the volumetric flow at pre-selected magnitude is achieved, characterized in that there is at least one position in the operating range of turning



of the flow regulator, wherein at least a part of a flow surface of the regulating member is left in a shadow of the flow surface thereof as viewed in the direction of flow of the gaseous substance.

4,678,006

### ELECTRICALLY OPERATED AUTOMATIC TRANSMISSION CONTROLLER ASSEMBLY

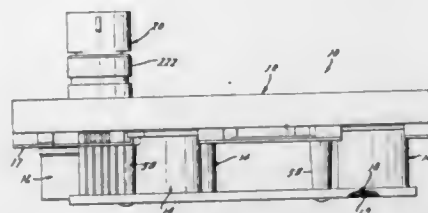
Bradley L. Northman, Southfield; Michael Slavin, Troy, and Donald J. West, Warren, all of Mich., assignors to Lectron Products, Inc., Rochester Hills, Mich.

Filed Mar. 24, 1986, Ser. No. 843,164

Int. Cl. F15B 13/06

U.S. Cl. 137-596.17

37 Claims



1. A transmission controller assembly adapted for use with a transmission having a portion thereof formed with a mounting surface and fluid ducts of predetermined configuration opening through said mounting surface, said assembly comprising:

- a manifold having fluid flow ports and adapted to be detachable fastened to said transmission with a first side thereof on said mounting surface;
- solenoid operated valve means having inlet and outlet ports at one end and electrical terminals at the other end thereof said solenoid operated valve means adapted to control the flow of fluid in said fluid ducts in response to electrical signals applied to said electrical terminals;
- mounting means supporting said solenoid operated valve means on said manifold and positioning said valve means with said inlet and outlet ports exposed to said fluid flow ports of said manifold and in communication with said fluid ducts;
- holding means fastening said solenoid operated valve means to said manifold; and
- a circuit board surmounting said manifold, said circuit board having a first surface facing away from said manifold and soldering pads on said first surface, said solenoid electrical terminals extending through said board and positioned adjacent said soldering pads.

4,678,007

### PRESSURE OPERATED VALVE

Keith C. Ransom, Benfleet, and Henry G. Howitt, Malmesbury, both of United Kingdom, assignors to Ford Motor Company, Dearborn, Mich.; Mycalex (Motors) Ltd., Gloucestershire, England

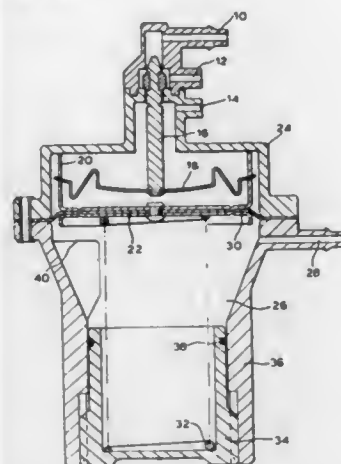
Filed Dec. 5, 1985, Ser. No. 805,493

Claims priority, application United Kingdom, Dec. 5, 1984, 8430681

Int. Cl. F16K 31/126

U.S. Cl. 137-625.66

8 Claims



1. A two position, three port control valve assembly, comprising, a valve housing having a central port and an end port axially spaced therefrom on each side of the central port, a valve reciprocally mounted in the housing movable between two end positions alternately connecting the central port to one or the other of the end ports, an annular flexible diaphragm movable independent of the valve and dividing the housing into a valve chamber side and a pressure chamber side, a control pressure port opening into the housing and operatively connected to the pressure chamber and connected to a source of pressure for moving the diaphragm, and overcenter snap action type spring means operatively connecting the diaphragm to the valve for a limited movement therebetween for control movement of the valve between its end positions upon actuation of the diaphragm and for providing a snap action overcenter movement of the valve during diaphragm movement to rapidly move the valve between its end positions, the connecting means including a spacer axially spacing the spring means from the diaphragm which interconnects the two, the spacer being a cup-shaped element with a base and an upstanding annular wall portion, and the spring means being of the plate type edge mounted to the wall portion.

4,678,008

### WEDGE TYPE GATE VALVES

Leslie L. Gyongyossy, 245 N. Point St., Apt. 306, San Francisco, Calif. 94133

Filed Sep. 8, 1986, Ser. No. 904,365

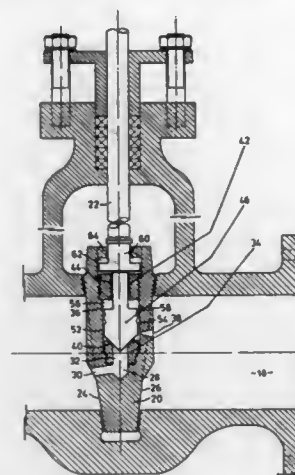
Int. Cl. F16K 3/12

U.S. Cl. 137-630.12

4 Claims

1. In a gate valve having a valve stem mounted in a wedge-shaped valve member for limited relative movement between an extended position and a contracted position, said wedge-shaped valve member having a pressure equalizing passage opening therethrough which communicates between the upstream and downstream sides thereof, a pressure equalizing valve located in a chamber formed in said valve member which is arranged to communicate with said through passage, said pressure equalizing valve being movable toward and away from a valve seat located in said pressure equalizing passage to close and open the pressure equalizing passage, said chamber being proportioned to provide an expansion compartment on

the side of the pressure equalizing valve remote from the valve seat to accommodate movement of the pressure equalizing valve from the closed position to the opened position, said pressure equalizing valve being freely movable within said chamber when said valve stem is in said extended position relative to said valve member, the improvement of;



a vent passage opening from said expansion compartment of said chamber through the downstream side of the valve member such that any pressure buildup in the expansion compartment resulting from the opening of the pressure equalizing valve may be vented to the downstream side of the valve member and will not cause the pressure equalizing valve to move to its closed position.

4,678,009

### FLUIDIC COMPLEMENTARY GAIN CHANGING CIRCUIT

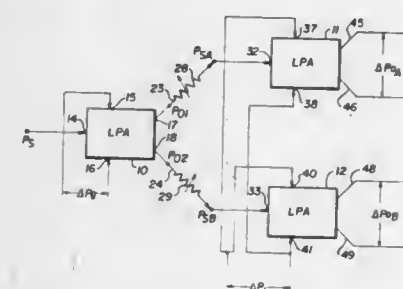
George Mon, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1986, Ser. No. 917,446

Int. Cl. F15C 1/12, 1/08

U.S. Cl. 137-818

5 Claims



1. A laminar flow fluidic complementary gain changing circuit comprising:

- A first laminar proportional amplifier having a supply stream input port connected to a fluid pressure supply, a first control stream input port, a second control stream input port, a first output port and a second output port;
- bias means connected to the first and second control stream input ports of said first laminar proportional amplifier for supplying a differential pressure signal therebetween;
- a second laminar proportional amplifier having a supply stream input port, a first control stream input port, a second control stream input port, a first output port and a second output port;
- first channel means for connecting the first output port of

said first laminar proportional amplifier to the supply stream input of said second laminar proportional amplifier;

- a third laminar proportional amplifier having a supply stream input port, a first control stream input port, a second control stream input port, a first output port and a second output port;
- second channel means for connecting the second output port of said first laminar proportional amplifier to the supply stream input of said third laminar proportional amplifier;
- third channel means for connecting the first control stream input port of said second laminar proportional amplifier with said first control stream input port of said third laminar proportional amplifier;
- fourth channel means for connecting the second control stream input port of said second laminar proportional amplifier with said second control stream input port of said third laminar proportional amplifier, whereby said third and fourth channel means receive differential input pressure signals therebetween so that a first differential output signal is produced between the first and second output ports of said second laminar proportional amplifier and a second differential output signal is produced between the first and second output ports of said third laminar proportional amplifier, the magnitude of the first and second differential output signals being complementary to one another with pressure gains a function of the differential pressure signal supplied to the first and second control stream input ports of said first laminar proportional amplifier.

4,678,010

### ACCUMULATOR FOR AIRLESS SPRAYING APPARATUS

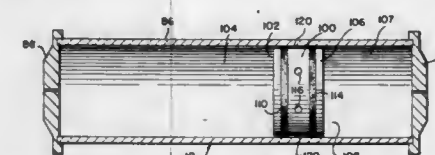
Gene Purvis, 7704 Grensted, Lawton, Okla. 73505; Russell Phelps, 106 N. 6th St.; Tim Dupler, 2100 S. 4th St., both of Lawton, Okla. 73501; Patrick Landoll, Elgin, and Leonard Landoll, Lawton, both of Okla., assignors to Gene Purvis; Russell Phelps and Tim Dupler, all of Lawton, Okla.

Filed Feb. 22, 1985, Ser. No. 704,521

Int. Cl. F16L 55/04

U.S. Cl. 138-31

4 Claims



1. An accumulator for an airless spraying apparatus, the accumulator comprising:

- (a) a pressure vessel,
- (b) a single piston slideably disposed in said pressure vessel,
- (c) an expandable chamber partially defined by one side of said piston, which expandable chamber is for receiving, storing and discharging pressurized liquid,
- (d) an energy storing section on the other side of said piston for storing energy from the expansion of the expandable chamber due to the introduction of a pressurized liquid into the expandable chamber and for releasing that energy when liquid is discharged from the expandable chamber and the chamber contracts,
- (e) said piston including a first seal adjacent said one side of said piston and a second seal adjacent said other side of said piston, said first and second seals defining a lubricating space therebetween, said one side and said other side of said piston being rigidly and integrally joined to one another for movement together as a unit,
- (f) said piston including a plurality of inwardly extending passages therein, said passages opening into said lubricating space,



- (g) said passages containing a supply of lubricant therein, which lubricant is permitted to flow into said lubricating space to lubricate said first and second seals, whereby said lubricating passages provide for a long term self-contained supply of lubricant;
- (h) said lubricating space being sealed and isolated from said expandable chamber and from said energy storing section so that there is no communication between said lubricating space, on the one hand, and said expandable chamber and energy storing section on the other hand, whereby said expandable chamber and said energy storing section are kept substantially free of lubricant;
- (i) said inwardly extending passages being elongated and extending radially inwardly to provide a spoke-like pattern of lubricating passages in said piston;
- (j) each said inwardly extending passage being in the form of a blind hole which ends in the interior of said piston such that, except where each said inwardly extending passage opens into said lubricating space, which lubricating space surrounds said piston, each said inwardly extending passage is isolated from every other inwardly extending passage within said piston, whereby each said inwardly extending passage provides a separate reservoir of lubricant.

4,678,011

## END CAP FOR A TUBULAR MEMBER

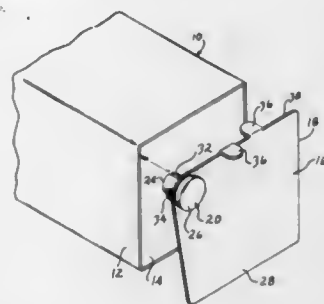
Charles A. Weber, Goshen, Ind., assignor to Bock Products, Elkhart, Ind.

Filed Jan. 7, 1985, Ser. No. 816,885

Int. Cl. B65D 59/00

U.S. Cl. 138—96 R

8 Claims



1. In combination, a tubular member having a side wall defining an open end, an end cap carried by said tubular member and removably overlying said tubular member open end, said cap comprising a plate part and an attachment part pivotally carried by said plate part, said attachment part secured to said tubular member side wall and constituting means for permitting said plate part to be pivoted relative to the attachment part between a closed position overlying said tubular member open end and an open position exposing said tubular member open end, said attachment part including a shank and a head, said plate part having an opening, said attachment part shank extending through said plate part opening with said attachment part head abutting said plate part, said attachment part shank including a terminal end face and having a slot formed therein extending longitudinally from said end face towards said attachment part head, said attachment part shank fitted at said slot about said tubular member side wall at its said open end, a securement device carried by said attachment part shank and contacting said tubular member side wall to connect the attachment part shank to said tubular member side wall.

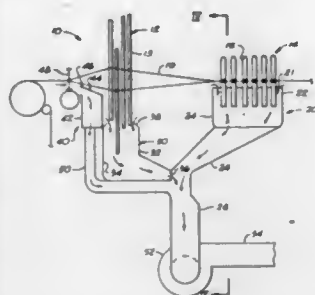
4,678,012  
CLEANING AND YARN CONDITIONING SYSTEM FOR WEAVING MACHINES  
Walker O. Graham, 105 Sycamore Dr., Mauldin, S.C. 29662, and William T. Pearson, Lakewood Dr., Prosperity, S.C. 29127

Filed Aug. 4, 1986, Ser. No. 892,936

Int. Cl. D03J 1/02

U.S. Cl. 139—1 C

16 Claims



1. In a weaving machine having a warp supply, a warp stop motion having drop wires, a harness motion for selectively raising and lowering warp ends passing through the drop wires and harness heddles, a reed mounted on a sley for beating up weft yarn, and a cloth take-up roll, means for conditioning the warp yarns and for cleaning lint, size and fly from selected surfaces of said weaving machine, comprising:

- (a) a first vacuum chamber disposed beneath and having walls which partially surround the warp stop motion, having an open top, through which the drop wires extend;
- (b) a second vacuum chamber disposed adjacent to the harnesses in a position to receive air passing over the heddles and the warp yarn from the ambient atmosphere of the weave room; and
- (c) means for creating a partial low pressure vacuum within said vacuum chambers whereby the ambient atmosphere of the weave room is drawn into said vacuum chambers, across the warp yarn, the drop wires, the heddles, and adjacent surfaces of the weaving machine, to condition the warp yarns and to clean the drop wires, the heddles, and adjacent weaving machine surfaces to remove lint, size and fly developed when the warp yarn passes through said drop wires and said heddles.

4,678,013

## WOVEN SLIDE FASTENER

Masaatsu Ofusa, Toyama, and Toshio Isbihama, Osaka, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,774

Claims priority, application Japan, Oct. 12, 1983, 58-157484[U]; Oct. 12, 1983, 58-157485[U]; Oct. 12, 1983, 58-157486[U]

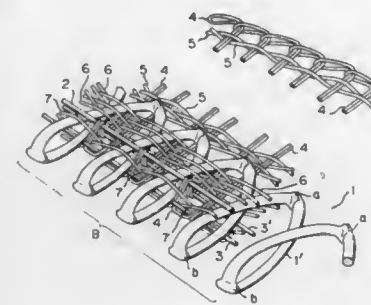
Int. Cl. D03D 1/00; A44B 19/34

U.S. Cl. 139—384 B

6 Claims

1. A woven slide fastener which comprises:
- a fastener element row in the form of a flat coil composed of a continuous monofilament having a number of turns, each turn of the flat coil constituting a separate fastener element having a single coupling head, an upper leg and a lower leg, each fastener element including a heel formed by bending the continuous monofilament near a boundary of a neighboring fastener element substantially in a plane containing an axis of the flat coil, the coupling head being formed by bending the continuous monofilament having a single coupling head, an upper leg and a lower leg, each fastener element including a heel formed by bending the continuous monofilament near a boundary of a neighboring fastener element substantially in a plane containing an axis of the flat coil, the coupling head being formed by

- bending the continuous monofilament in a plane substantially orthogonal to the axis of the flat coil;
- a slide fastener tape including a tape body having a first longitudinal tape edge into which the fastener elements are woven and a second longitudinal tape edge opposite said first longitudinal tape edge;
- first warp threads woven into the tape body;
- second warp threads woven along said first longitudinal tape edge and extending alternatively about the upper side of the upper legs and the lower side of the lower legs of said elements;



- an upper binding warp thread positioned outside of the upper legs and nearer to the coupling heads than said second warp threads and extending along an upper side of an upper leg of said fastener element;
- a lower binding warp thread positioned outside of the lower legs and nearer to the coupling heads than said second warp thread and extending along a lower side of a lower leg of said fastener element; and
- a weft thread woven into said first and second warp threads so as to cross and interlace with said upper and lower binding warp threads.

4,678,014

## INFLATOR/DEFLATOR WITH MOLDED HOUSING

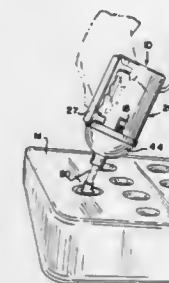
Charles B. Owen, Long Grove; Charles C. Owen, Chicago, both of Ill., and Steve Lin, Taipei, Taiwan, assignors to Siesta Corporation, Northbrook, Ill.

Continuation-in-part of Ser. No. 668,518, Nov. 5, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 845,483

Int. Cl. B65B 3/14

U.S. Cl. 141—67

4 Claims



1. A hand-holdable device for inflating and deflating inflatable articles, comprising:
- an electric motor;
- impeller means, for propelling air, secured to and rotatably driven by said electric motor;
- a generally rectangular mounting frame secured to said electric motor for effecting mounting thereof, said mounting frame including opposite end frame portions respectively secured to said motor, and a pair of opposed side frame portions extending in parallel relationship to each other between said end frame portions, said mounting frame defining a pair of stop openings respectively posi-

tioned at an end of each said side frame portions generally at the junction thereof with one of said end frame portions;

a generally cylindrical, one-piece injection molded plastic housing having an integral, perforate end wall defining a plurality of air inlets, and an open end opposite said perforate end wall, said electric motor, said impeller means, and said mounting frame being positionable within said molded housing so that operation of said electric motor rotates said impeller means to create air flow axially through said housing for effecting inflation of an associated inflatable article, said mounting frame facilitating positioning of said mounting frame, said electric motor, and said impeller means in said molded housing, as an integrated pre-assembled unit, by insertion into said housing through said open end thereof;

said molded housing including integrally formed channel means for receiving said mounting frame comprising a pair of opposed channels arranged in parallel relationship to each other on the interior of said molded housing, each said channel being defined by a respective pair of spaced apart, parallel channel projections, said channels being configured to respectively receive said parallel side frame portions of said mounting frame to facilitate mounting of said electric motor and said impeller means within said housing;

said molded housing further including integrally formed stop means on the interior thereof comprising a pair of stop projections respectively positioned at an end of each of said opposed channels, said stop projections being positioned generally adjacent said perforate end wall of said housing, said stop projections respectively engaging said side frame portion of said mounting frame by respective disposition within said stop openings when said mounting frame is inserted through said open end of said housing and received by said channel means for effecting the desired relative axial positioning of said motor and said impeller means within said housing;

locking means positioned within said housing in operative engagement with said mounting frame for locking said mounting frame in position within said opposed channel to maintain said relative axial positioning of said electric motor and said impeller means within said housing;

a perforate end plate secured to said molded housing at said open end thereof, said perforate end plate defining a plurality of air outlets for accommodating said airflow axially through said housing; and

nozzle means adapted to be secured to said housing so that air flowing through said housing flows through said nozzle means, said nozzle means being adapted for detachable connection to said associated inflatable article, said housing including integrally molded thread means for removably securing said nozzle means on either opposite end of said housing, whereby said nozzle means can be secured to one end of said housing for effecting inflation of said associated inflatable article, and can be secured to the other end of said housing for effecting deflation of said associated inflatable article.

4,678,015

## PRODUCT APPORTIONING SYSTEM

Glen F. Raque, and Edward A. Robinson, both of Louisville, Ky., assignors to Raque Food Systems, Inc., Louisville, Ky.

Filed Apr. 3, 1986, Ser. No. 847,487

Int. Cl. B65B 3/04

U.S. Cl. 141—131

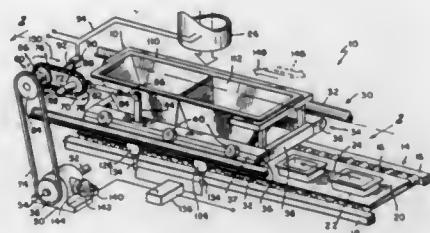
7 Claims

6. An apportioning apparatus for depositing a selected amount of a particulate material onto a moving receptacle, the apparatus comprising:
- a frame;
- a carriage located above the moving receptacles;
- means for mounting the carriage to the frame to allow reciprocating horizontal movement;

at least one bucket mounted in the carriage having an inlet for receiving the particulate material and an outlet for depositing selectively the received particulate material onto the moving receptacles;

two blades attached to said bucket in opposed relation, said blades being movable between a confronting position where said blades cooperate to seal said bucket outlet and a spaced-apart position where said blades cooperate to open said bucket outlet;

a fluid cylinder attached to each blade for moving each blade between the confronting position and the spaced-apart position;



means for reciprocally driving the carriage between a first position where the bucket receives the particulate material and a second position where the bucket deposits the received particulate material onto the moving receptacle; first means for controlling the speed of movement of the reciprocating carriage such that the speed and direction of the carriage substantially matches the speed and direction of the moving receptacle near the second position; and second means for controlling the air cylinders to open the blades for a specified period of time when the carriage is in the second position to deposit the particulate material onto the receptacle.

4,678,016

MACHINE AND APPARATUS FOR MAKING BASKETS

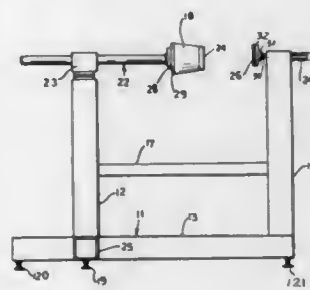
Timothy L. Hall, R.D. #10, Box 176, Meadville, Pa. 16335

Filed Sep. 2, 1986, Ser. No. 902,788

Int. Cl.<sup>4</sup> B23J 1/00

U.S. Cl. 147-48

5 Claims



1. A machine for use in making a basket comprising a basket mold and a frame, a basket mold on said frame, a support shaft on said frame supporting said basket mold, said basket mold having an end, clamping means comprising a hydraulic cylinder having a piston and a piston rod, said piston rod being supported on said frame, a first flange bearing supported on said piston rod, a second flange bearing supporting said piston rod, a pad support on said piston rod, a foam rubber pad on said pad support, hydraulic means for moving said piston rod toward said basket mold for urging into position and securing a basket bottom to said basket mold end whereby said basket bot-

tom is supported between said foam rubber pad and said mold.

4,678,017

WHEEL END VALVE FOR CENTRAL TIRE INFLATION SYSTEM

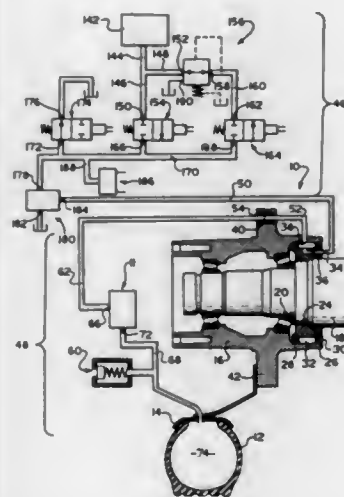
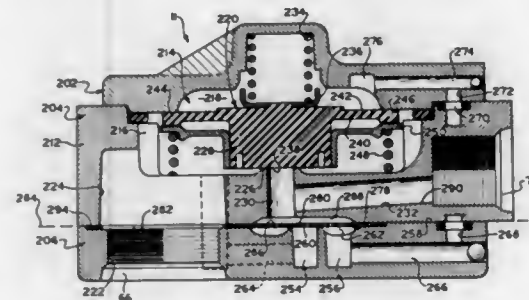
Gary R. Schultz, Portage, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 617,646, Jun. 4, 1984, This application Jul. 1, 1985, Ser. No. 750,363

Int. Cl.<sup>4</sup> B60C 29/00

U.S. Cl. 152-416

3 Claims



1. A modular wheel end valve assembly for a central tire inflation system comprising a valve body having only a first and a second fluid connection from the exterior to the interior thereof, said first fluid connection defined by a first port for connection to a selectively pressurized and exhausted conduit, said second fluid connection defined by a second port for connection to the interior pressurized chamber of an inflatable tire, said valve assembly comprising first valve means responsive to pressurization of said selectively pressurized and exhausted conduit to assume a first position for establishing fluid communication between said first and second ports and responsive to exhausting to atmosphere of said selectively pressurized and exhausted conduit to assume a second position for blocking fluid communication between said first and second ports thereof, said first valve means comprising a first diaphragm having a first surface exposed to fluid pressure at said first port and an opposed second larger surface, said valve assembly comprising second valve means constantly in fluid communication with said second port and responsive to a sensed pressurization of said interior chamber of said tire being less than a predetermined minimum reference pressure to auto-

matically maintain said first valve means in said second position thereof, said assembly characterized by:

said second valve means comprising a second diaphragm having a third surface constantly exposed to fluid pressure at said first port and an opposed fourth surface substantially greater surface constantly exposed to fluid pressure at said second port, said second diaphragm normally biased by fluid pressure in said second port exceeding said minimum reference pressure to block fluid communication between said first port and said second surface and responsive to fluid pressure at said second port not exceeding said minimum reference value to establish fluid communication between said first port and said second surface.

4,678,018

SCREEN ARRANGEMENT

Peter Grundstedt, Sundbyberg, and Bill Taube, Spånga, both of Sweden, assignors to Hennix i Stockholm AB, Sundbyberg, Sweden

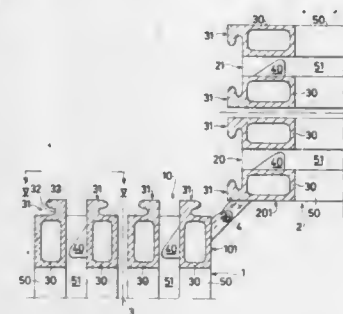
Filed Feb. 6, 1986, Ser. No. 826,599

Claims priority, application Sweden, Feb. 15, 1985, 8500730

Int. Cl.<sup>4</sup> A47G 5/00

U.S. Cl. 160-135

15 Claims



14. A foldable screen arrangement, comprising:

first and second, generally planar frames adapted to receive screen panels within said frames, said first and second frames each comprising a plurality of frame members; means for pivotally connecting said first and second frames so that in an unfolded condition of the screen arrangement, a first frame member of said first frame is generally parallel to and opposes a second frame member of said second frame;

each of said first and second frame members comprising spaced longitudinal section elements which are independently flexible in a direction normal to the plane of the frame, said first and second frame members provided with projections disposed along said longitudinal section elements, in said unfolded condition said projections on said first frame member at least partially overlapping in said normal direction said projections on said second frame member, said projections having a profile such that as said first and second frames are pivoted into the unfolded condition of the screen arrangement, the longitudinal sections are deflected in said normal direction and said projections of the first and second frame members are releasably interconnected;

each first and second frame member provided with means for retaining a panel within the frame during the interconnection and release of said projections.

4,678,019

GUIDE ELEMENT ESPECIALLY SUITABLE FOR SOLAR GREENHOUSES AND THE LIKE AND PARTICULARLY UTILIZABLE FOR CONTROLLED SHADING

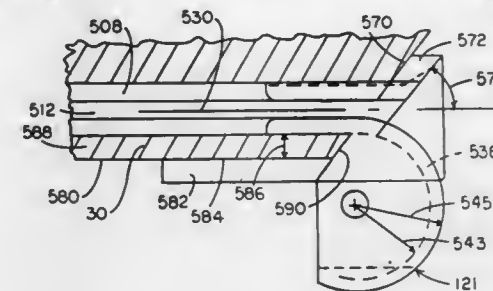
Chris Esposito, W. Baysboro, N.Y., assignor to Four Season Solar Products Corporation, Holbrook, N.Y.

Division of Ser. No. 591,959, Mar. 21, 1984, Pat. No. 4,598,752, which is a continuation-in-part of Ser. No. 455,475, Jan. 4, 1983, Pat. No. 4,596,093. This application Dec. 2, 1985, Ser. No. 803,550

Int. Cl.<sup>4</sup> A47H 3/00

U.S. Cl. 160-272

7 Claims



1. A guide comprising a body having lateral edges and defining two funnel shaped and generally arcuate guide tracks having generally parallel axes, said tracks being spaced from said edges and in the shape of open troughs, and two parallel tubular extensions on said body defining bores aligned in continuation of said guide tracks, said bores being generally tangentially related to said guide tracks, said tubular extensions being each provided with a lateral slot extending longitudinally therealong, said body being provided with slots extending from said lateral edges and corresponding with the slots in said tubular extensions.

4,678,020

CURING FOUNDRY MOULDS AND CORES

Peter R. Hayes, Redditch, England, assignor to BCIRA, Birmingham, England

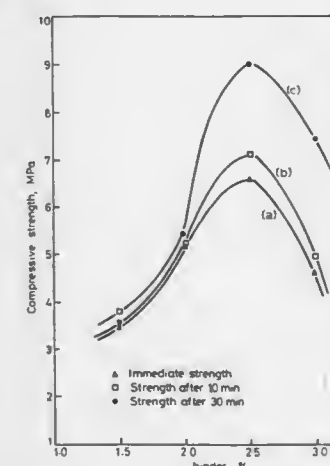
Filed Dec. 16, 1985, Ser. No. 809,258

Claims priority, application United Kingdom, Dec. 22, 1984, 8432571

Int. Cl.<sup>4</sup> B22C 9/12

U.S. Cl. 164-16

12 Claims



1. A method of making foundry moulds and cores, said method comprising mixing a granular refractory material with a binder comprising ammonium polyacrylate together with a metal compound which produces a complex ammonium metal polyacrylate to produce a refractory mixture, forming a mould or core from said mixture in a warm box, and passing warm air



through said mixture to convert said ammonium metal polyacrylate into a waterinsoluble metal polyacrylate with the evolution of ammonia, said binder being present to the extent of up to 5 percent by weight of the weight of said refractory material.

4,678,021

# METHOD AND AN APPARATUS FOR REPLACING PATTERN PLATES IN A MOULDING SYSTEM

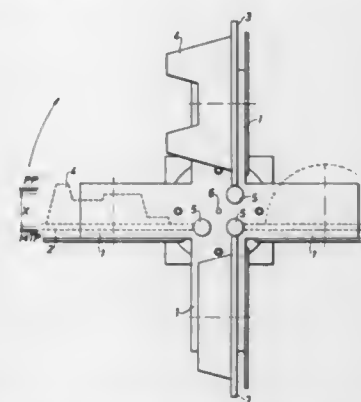
Vagn Mogensen, Gentofte, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed Sep. 10, 1985, Ser. No. 774,410

Claims priority, application Denmark, Sep. 10, 1984, 4315/84

Int. Cl.<sup>4</sup> B22C 15/02, 17/00, 19/00

U.S. Cl. 164—40



1. A method of changing pattern plates in moulding apparatus, said moulding apparatus comprising:

a moulding chamber;

pattern fixtures in said moulding chamber for moulding an article between opposed front faces of said pattern fixtures;

means for releasably securing a pattern plate to respective opposed front faces of said pattern fixtures;

means for conveying pattern plates to said pattern fixtures by a transverse sliding movement between a first position outside said moulding chamber in which first position the rear of the pattern plate is essentially flush with the front of respective pattern fixture and a second position in said moulding chamber in which second position the rear surface of a pattern plate is adjacent the front face of a respective pattern fixture;

said method comprising

providing a rotatable member comprising means for holding said pattern plates on said rotatable member such that the rear surface thereof extends in a plane substantially parallel to a plane which includes the axis of rotation of said rotatable member and which is spaced a distance from said plane; and

rotating said rotatable member to bring each respective pattern plate into said first position.

2. Moulding apparatus comprising:

a moulding chamber;

pattern fixtures in said moulding chamber for moulding an article between opposed front faces of said pattern fixtures;

means for releasably securing a pattern plate to respective opposed front faces of said pattern fixtures;

means for conveying pattern plates to said pattern fixtures;

fixtures by a transverse sliding movement between a first position outside said moulding chamber in which first position the rear of a pattern plate is essentially flush with the front of a respective pattern fixture and a second position in said moulding chamber in which second position

tion the rear surface of a pattern plate is adjacent the front face of a respective pattern fixture; and means for changing pattern plates in said moulding apparatus comprising:

a rotatable member;

means for holding said pattern plates on said rotatable member such that the rear surface thereof extends in a plane substantially parallel to a plane which includes the axis of rotation of said rotatable member and which is spaced a distance from said plane; and

means for rotating said rotatable member to bring each respective pattern plate into said first position.

4,678,022

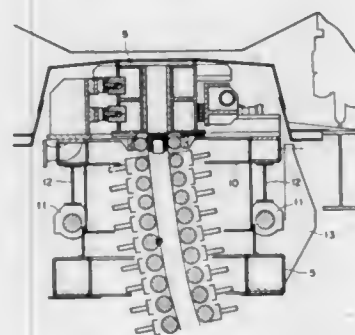
# MOLD-OSCILLATING APPARATUS IN A CONTINUOUS CASTING ASSEMBLY

Herbert Lemper, McMurray, Pa., assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 3, 1986, Ser. No. 835,802

Int. Cl.<sup>4</sup> B22D 11/04

U.S. Cl. 164—416



1. A mold-oscillating apparatus in a continuous casting assembly, comprising:

a mold table;

a base frame;

first and second driven eccentric shafts;

drive means connected to each of said first and second shafts;

first and second stationary bearing housings connected to said base frame and within which said first and second shafts are respectively mounted;

first and second moving bearing housings connected to said mold table and within which said first and second shafts are respectively mounted; and

a connecting beam interconnecting said mold table with said first and second moving bearing housings wherein said mold table is oscillated via said connecting beam upon rotation of said first and second shafts by said drive means.

4,678,023

# CLOSED LOOP DELIVERY GAUGE CONTROL IN ROLL CASTING

David J. Knapp, Monroeville, and Marion D. Waltz, Tarentum, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 24, 1985, Ser. No. 812,996

Int. Cl.<sup>4</sup> B22D 11/16

U.S. Cl. 164—452

9 Claims

1. An integrated process for automatically controlling the position of solidification of molten metal in the bite of rotating rolls of roll casting apparatus, and compensating for roll eccentricity, without coupling of the two efforts, the process comprising the steps of:

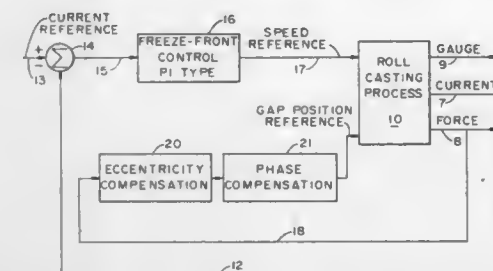
rotating the rolls,

supplying molten metal to the bite of the rolls,

solidifying the metal in said bite and directing the same through a gap provided between the rolls, measuring a casting parameter and providing therefrom a time based value representing the actual position of metal solidification in the roll bite,

providing a reference value of said parameter,

obtaining a value representative of any difference occurring between the reference and solidification position values, and utilizing the same to properly position solidification,



estimating from a time based casting parameter the frequency of the eccentricity of the rolls, and developing therefrom a frequency based eccentricity value, and utilizing the frequency based eccentricity value to cyclically change the size of gap between the rolls to offset the effects of eccentricity on the gauge of solid metal exiting the rolls without influencing the ability to control the position of solidification in the roll bite.

4,678,024

# HORIZONTAL ELECTROMAGNETIC CASTING OF THIN METAL SHEETS

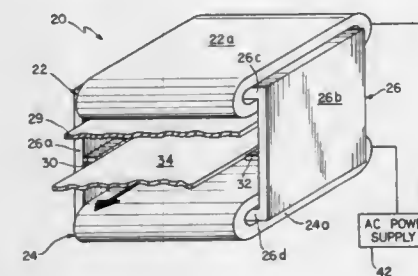
John R. Hull, Hinsdale; Robert J. Lari, Aurora; Walter F. Praeg, Palos Park, and Larry R. Turner, Naperville, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 10, 1986, Ser. No. 872,725

Int. Cl.<sup>4</sup> B22D 27/02

U.S. Cl. 164—503

33 Claims



1. Apparatus for the horizontal casting of thin metal sheets comprising:

vessel means containing a molten metal and including an aperture for discharging said molten metal in the form of a thin, horizontal sheet;

electromagnetic conducting means positioned adjacent to the aperture in said vessel means and in spaced relation from said molten metal sheet for directing a horizontal magnetic field across and about said molten metal sheet; and

conductive shield means positioned within said magnetic field and electrically coupled to said molten metal sheet for defining a horizontally oriented equilibrium position of the molten metal sheet within said magnetic field wherein the strength of said magnetic field increases with increasing displacement of said molten metal sheet below said equilibrium position and decreases with increasing displacement above said equilibrium position.

placement of said molten metal sheet above said equilibrium position such that said magnetic field exerts a constant, uniform levitation force on said molten metal sheet.

4,678,025

# HEATING/COOLING/VENTILATION UNIT

George H. Oberlander, P.O. Box 1505, Watertown, S. Dak. 57201, and Keith E. Stormo, 32483 Oakville, Space 74, Albany, Oreg. 97321

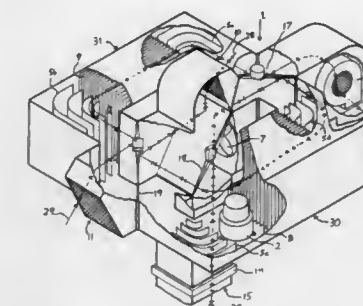
Continuation of Ser. No. 526,641, Aug. 26, 1983, abandoned.

This application Jan. 10, 1986, Ser. No. 817,810

Int. Cl.<sup>4</sup> F25B 29/00

U.S. Cl. 165—12

5 Claims



1. Heating/cooling/ventilation unit comprising:

a. a casing having a condenser plenum and an evaporator plenum, said condenser plenum having a first and second end and said evaporator plenum having a first and second end, said casing having two outside air ports, an inside air outlet, and an inside air inlet connected to said plenums;

b. a compressor connected to an evaporator with evaporator fins and connected to a condenser with condenser fins housed within said condenser plenum and said evaporator plenum;

c. turning vanes housed within said plenums;

d. an outside damper pivotably connected to said casing and positioned between the first end of the evaporator plenum and the first end of the condenser plenum, a cycling damper pivotably connected within said inside air outlet and positioned between the second end of the evaporator plenum and the second end of the condenser plenum, and a return damper between the outside damper, said cycling damper, said inside air inlet and one of the outside air ports;

e. means for controlling said cycling damper; and

f. a supply fan located between an inside air inlet and an outside air inlet both of which are interconnected to said plenums and a return fan within an inside air outlet interconnected to said plenums and an outside air outlet interconnected to said plenums.

4,678,026

# COOLER FOR A WATER COOLED INTERNAL COMBUSTION ENGINE

Werner Lenz, Mühlacker, and Manfred Möst, Tamm, both of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik Julius Fr Behr GmbH & Co., Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,286

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428857

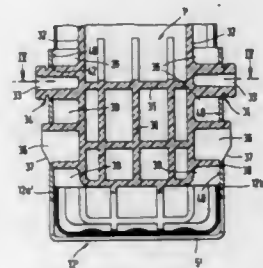
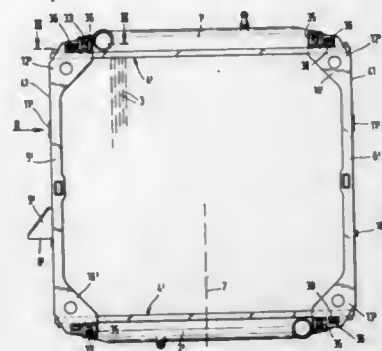
Int. Cl.<sup>4</sup> F28F 9/00; F28D 1/00

U.S. Cl. 165—67

15 Claims

1. A radiator assembly for a water cooled internal combustion engine having upper and lower water tanks, cooling block means for communicating fluid flow between said upper and lower water tanks and lateral part means for connecting said upper and lower water tanks, each said upper and lower tank

having longitudinal sides, two end sides and a surface connecting said longitudinal sides and the two end sides, said lateral part means comprising a pair of parallel fastening bracket means for engagement with both said longitudinal sides of said water tanks, said fastening bracket means being elastically deformable in directions away from said longitudinal sides,



said water tanks having connection pin means extending from said longitudinal sides, said pin means exhibiting a slanted surface for elastically deforming said fastening bracket means during slideable engagement of said fastening bracket means with said pin means, said fastening bracket means having openings for engagement of said connection pin means extending through said openings.

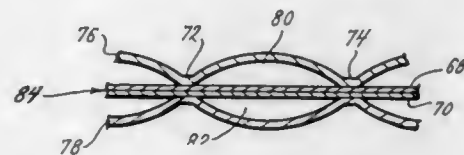
#### 4,678,027 DUAL-WALLED COILED PLATE HEAT EXCHANGER WITH VENTED INTERFACE

Phillip G. Shirey, Nixa; David W. Rowe, Springfield, and William R. Waynick, Walnut Grove, all of, assignors to Paul Mueller Company, Springfield, Mo.

Filed Dec. 14, 1984, Ser. No. 681,873  
Int. Cl.<sup>4</sup> F28F 11/00

U.S. Cl. 165—70

13 Claims



11. A coiled plate-type heat exchanger, said heat exchanger being comprised of two pairs of plates, means sealing the first pair of plates to each other substantially adjacent their periphery, means sealing the second two plates together substantially adjacent their periphery, means sealing said pairs together along at least a portion, but less than all, of their periphery, at

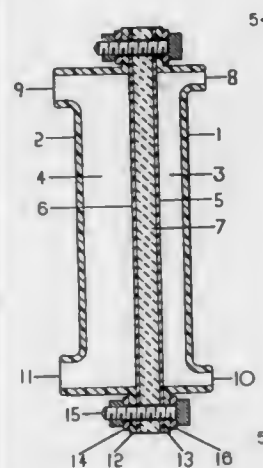
least one plate of each pair being at least partially expanded away from its associated plate to thereby form a passageway therebetween for the circulation of a fluid, one of said pairs being adapted to circulate refrigerant therethrough, the other of said pairs being adapted to circulate potable water therethrough, and means joining the pairs together in close thermal contact, said joining means comprising a plurality of spaced spot welds, at least some of the welds extending through both pairs of plates, said sealing means thereby forming a vented interface between the interior of said pairs, said heat exchanger being coiled into an annular configuration and means to fix said heat exchanger in said annular configuration.

#### 4,678,028 PLASTIC LABORATORY CONDENSER

Louis A. Conant; Wilbur M. Bolton, both of Rochester, and James E. Wilson, Livonia, all of N.Y., assignors to Intertec Associates Inc., Rochester, N.Y.  
Continuation-in-part of Ser. No. 703,344, Feb. 20, 1985, abandoned. This application Jan. 21, 1986, Ser. No. 820,125  
Int. Cl.<sup>4</sup> F28B 1/02

U.S. Cl. 165—72

36 Claims



1. An impact resistant compact condenser comprising a plastic shell having two side walls enclosing at least one heat transfer disc having generally smooth side surfaces, said at least one heat transfer disc being disposed between said side walls dividing said shell into at least one cooling cell and at least one unobstructed vapor cell, means for retaining said disc in sealed abutment against said end walls of said side walls, each of said cells having an inlet port and an outlet port, said outlet port of said vapor cell being positioned so as to allow gravity flow of condensate therefrom.

#### 4,678,029 EVAPORATING HEAT TRANSFER WALL

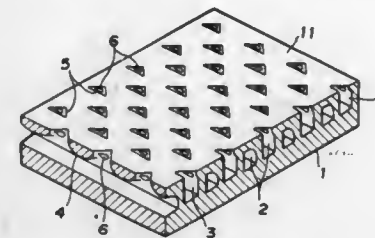
Toshi Sasaki, Hitachiota; Hiromichi Yoshida; Shigeo Fukuda, both of Hitachi; Kiyoshi Oizumi, Tsuchiura; Kimito Kakizaki, Hitachi; Wataru Nakayama, Kashiwa; Takahiro Daikoku, Utsunomiya; Tadakatsu Nakajima, Shimo-Ogino, and Yoshihiko Nakayama, Sakura, all of Japan, assignors to Hitachi Cable, Ltd. and Hitachi, Ltd., both of Tokyo, Japan  
Filed Sep. 19, 1984, Ser. No. 652,294  
Claims priority, application Japan, Sep. 19, 1983, 58-172810  
Int. Cl.<sup>4</sup> F28F 13/18, 19/02

U.S. Cl. 165—133

19 Claims

13. An evaporating heat transfer wall having a number of fine and elongate tunnels adjacent to each other and positioned a minute distance under the wall surface, a number of discrete small closely spaced openings for communicating said tunnels to the outside of said wall by extending from the ceilings of said tunnels to the wall surface, a plurality of tongue-like pro-

jections protruding convexly when viewed perpendicularly to said heat transfer wall surface, and each projection associated with and extending from an edge wall of a respective opening or a vicinity of such opening to extend across said opening leaving a continuous gap having at least one first gap portion and at least one second gap portion which second gap portion is dimensionally narrower than said first gap portion and



which has relatively higher resistance to fluid flow than said first gap portion such that vapor bubbles formed in the tunnel preferentially pass through said first gap portion and liquid can simultaneously enter said tunnel by capillary action through said second gap portion, the upper and lower surfaces of each tongue-like projection being inclined in the same general direction relative to the surface of said heat transfer wall within a range of from 5 to 80 degrees.

#### 4,678,030 PLATE HEAT EXCHANGER

Christer Almqvist, Täby, Sweden, assignor to Reheat AB, Täby, Sweden  
Filed Nov. 29, 1985, Ser. No. 802,823  
Claims priority, application Sweden, Jun. 6, 1985, 8502802  
Int. Cl.<sup>4</sup> F28F 3/04

U.S. Cl. 165—166

4 Claims



1. A plate heat exchanger comprising: a plurality of heat exchanger plates placed close to and sealed against each other and having respective pressed-out ridges to form a heating surface of each respective plate including two different flow passages forming a heat exchanger body wherein said heat exchanger plates are generally alike, a packing groove having a bottom disposed in a central plane of each said plate, said heating surface being divided into at least two area portions, ones of said ridges in one area portion having a first angle relative to symmetry axes X and Y, respectively of said plate lying in a plane of said plate which is different from a second angle formed by ones of said ridges in the other said area portion with symmetry axes thereof and one or more of the other ones of said plates included in said heat exchanger body being disposed at an angle of approximately 180 degrees about one of said symmetry axes (x,y) starting from the orientation of one plate in said heat exchanger body; and wherein said symmetry axes of said plate included in said heat exchanger body defines four area portions.

#### 4,678,031 ROTATABLE RECIPROCATING COLLAR FOR BOREHOLE CASING

David M. Blandford, 160 Sage Rd., Juniper Heights, Durango, Colo. 81301, and John H. Easter, 2418 Greenbriar, Abilene, Tex. 79605

Filed Jan. 27, 1986, Ser. No. 823,183  
Int. Cl.<sup>4</sup> F16L 35/00; E21B 17/14

U.S. Cl. 166—242

9 Claims



1. A rotatable reciprocating collar for series connection into a borehole casing string between an upper segment and a lower segment of the casing string to assist in a multistage cementing operation, means being provided for passing cement from the interior of the casing string to the annulus between the casing string and borehole proximate the collar, comprising:

- an open cylindrical barrel having a first barrel end, a second barrel end, and an inner surface;
- a plurality of barrel splines projecting radially inward from said inner surface at said first barrel end;
- an open cylindrical mandrel having a first mandrel end, a second mandrel end, and an outer surface;
- a plurality of mandrel splines projecting radially outward from said outer surface at said first mandrel end;
- said mandrel slidably disposed within said barrel such that said second mandrel end is telescopically extendable from said first barrel end;
- wherein said mandrel splines engage said barrel splines when said second mandrel end is telescopically extended from said first barrel end and said mandrel splines disengage said barrel splines when said mandrel is telescopically retracted into said barrel; and
- said second barrel end being connected to one of said segments of the casing string and the second mandrel end being connected to the other of said segments to permit rotation and reciprocation of the upper segment relative to the lower segment during a multistage cementing operation, the collar remaining permanently within the borehole after cementing to form a portion of the casing.

#### 4,678,032 POLYMER AND METHOD FOR PERMEABILITY PROFILE CONTROL UNDER SEVERE RESERVOIR CONDITIONS

Paul Shu, Princeton Junction, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 23, 1986, Ser. No. 866,634  
Int. Cl.<sup>4</sup> E21B 33/138

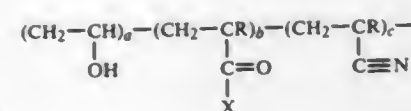
U.S. Cl. 166—295

8 Claims

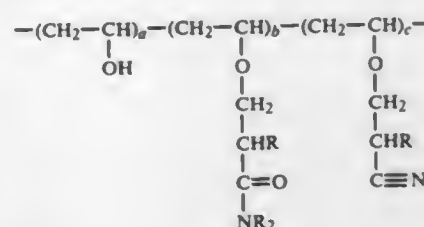
1. Method for treating a subterranean formation by reducing formation permeability, said formation penetrated by at least one well bore, comprising:

- a. injecting into the formation through said well bore a first polymer solution which includes a polymer





poly(vinylalcohol-co-vinylether),



wherein:

- R is H, alkyl, alkyl sulfonate or aryl groups having not more than 10 carbon atoms;  
X is NR<sub>2</sub>, OH, OR, O<sup>-</sup>, alkylammonium, or alkylsulfonate; and  
a, b, and c are mole fractions of each co-monomer unit such that a+b+c=1, a>0, b>0, and  
b. injecting a solution containing a complexing ion selected from the group consisting of multivalent transition metals of the Group IIIa-VIa, VIII, and Ib-Vb of the Periodic table.

4,678,033

## HYDROCARBON RECOVERY PROCESS

John E. Killough, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 8, 1986, Ser. No. 904,532

Int. Cl.<sup>4</sup> E21B 43/22

U.S. Cl. 166—246

23 Claims

1. A process for recovering hydrocarbons from a subterranean, hydrocarbon-bearing formation comprising:  
(a) introducing microbes into said formation, said microbes being capable of acting to render at least a portion of said hydrocarbons in said formation more easily recoverable;  
(b) passing electrical energy through at least a portion of said formation without substantially raising the temperature of the formation; and  
(c) recovering hydrocarbons from said formation.

4,678,034

## WELL HEATER

Bernard J. Eastlund, Spring; Kenneth J. Schmitt, The Woodlands, and Ronald M. Bass, Houston, all of Tex., assignors to Formation Damage Removal Corporation, Spring, Tex.

Continuation of Ser. No. 762,697, Aug. 5, 1985, abandoned. This application May 23, 1986, Ser. No. 867,338

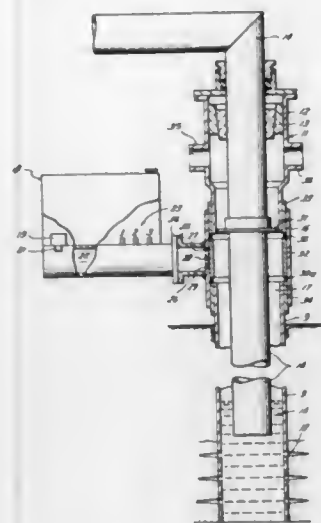
Int. Cl.<sup>4</sup> E21B 36/00

U.S. Cl. 166—248

20 Claims

1. A system for heating a well tubing comprising, a petroleum well having a metal casing and a metal wellhead at the upper end of the casing,  
a metal tubing suspended from said wellhead within said casing and providing with said casing an annular area adjacent to said wellhead, and  
means for generating in said annular area microwaves in at

least one mode which naturally occurs in and is transmitted axially along said annulus including a source of micro-



waves at 2450 MHz and a wave guide exterior of the well communicating such source with said annular area.

4,678,035

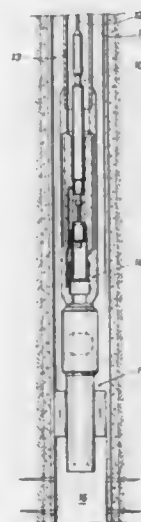
## METHODS AND APPARATUS FOR SUBSURFACE TESTING OF WELL BORE FLUIDS

Pierre Goldschild, Vulaines-sur-Seine, France, assignor to Schlumberger Technology Corporation, Houston, Tex.  
Continuation of Ser. No. 630,033, Jul. 12, 1984, abandoned. This application Dec. 27, 1985, Ser. No. 813,792

Claims priority, application France, Jul. 12, 1983, 83 11629  
Int. Cl.<sup>4</sup> E21B 34/14, 43/12, 47/06

U.S. Cl. 166—250

17 Claims



1. A method for testing a production well having a production string therein including a packer isolating a lower well bore interval, a pipe string coupled to said packer and extending to the surface, means including a valve having an actuator operable in response to its upward and downward movement for controlling the flow of connate fluids from said isolated well bore interval into said pipe string, and means defining a measuring station above said valve having passage means in

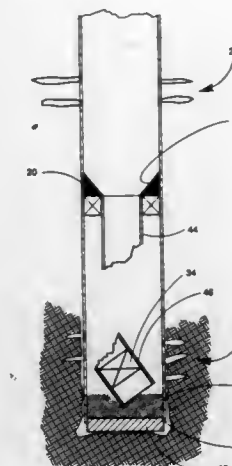
communication with said isolated well bore interval, and comprising the steps of:

connecting a suspension cable to a testing tool carrying fluid-measuring means adapted to measure a characteristic of connate fluids and including anchoring means adapted to be engaged with said measuring station and subsequently released therefrom only after a predetermined number of successive upward and downward movements of said suspension cable so that a corresponding number of said multiple measurements can be obtained before said anchoring means are released, and coupling means adapted to be releasably coupled to said actuator when said anchoring means are engaged with said measuring station;

lowering said testing tool into said production string until said anchoring means are engaged with said measuring station for communicating said fluid-measuring means with said passage means and coupling said coupling means to said actuator; and

successively moving said suspension cable upwardly and downwardly for repetitively opening and closing said valve to obtain multiple measurements of said fluid characteristic before said anchoring means are released from said measuring station.

ing of the upper zone without establishing fluid communication with the lower zone;  
perforating the upper zone;



fracturing the upper zone; and  
explosively releasing the seal between said upper and lower zones without fracturing the formation in either zone.

4,678,036

## MISCIBLE OIL RECOVERY PROCESS

Kathy J. Hartman, Arlington, and Winston R. Shu, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.  
Filed Feb. 22, 1985, Ser. No. 704,232

Int. Cl.<sup>4</sup> E21B 43/22

U.S. Cl. 166—273

30 Claims

1. A method for the recovery of oil from a subterranean, oil-bearing reservoir penetrated by an injection well and a production well extending from the surface of the earth into the reservoir, which method comprises:

- (i) injecting into the reservoir through the injection well, a mixture of a multiple contact miscible solvent for the oil and a solubility improving additive in an amount sufficient to lower the minimum miscibility pressure to a value no higher than the reservoir pressure thereby attaining multiple contact miscibility as said solvent begins to penetrate said reservoir;  
(ii) producing fluids including oil from the production well; and  
(iii) continuing to inject the mixture of solvent and solubility additive into the reservoir with a reduced proportion of the additive in the mixture relative to the initially injected mixture.

4,678,037

## METHOD AND APPARATUS FOR COMPLETING A PLURALITY OF ZONES IN A WELLBORE

Michael B. Smith, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Dec. 6, 1985, Ser. No. 806,254

Int. Cl.<sup>4</sup> E21B 29/02

U.S. Cl. 166—299

22 Claims

1. A method for permitting fluid flow from a plurality of subterranean zones into a wellbore, there being at least an upper and lower perforated zone, comprising the steps of:

- perforating the lower zone;  
creating a seal in the wellbore between the upper and lower zones prior to perforating the upper zone to allow fractur-

1. In a well logging system in which conductor cable extends outside of a string of drill pipe into a sidewall passage of a side entry sub and through the drill pipe to a logging instrument located at the lower end of the drill pipe, an improved apparatus for releasing the side entry sub from the drill pipe if the drill pipe becomes stuck, comprising:

- a release sub adapted to be connected to the drill pipe below the side entry sub;  
a tubular mandrel adapted to be carried in the side entry sub and to extend into the release sub, the mandrel having aperture means for receiving the cable passing through the sidewall passage of the side entry sub, the mandrel being



moveable relative to the side entry sub under sufficient fluid pressure from an upper position to a lower position; latch means for latching the side entry sub to the release sub, and when engaged by the mandrel in its lower position, for releasing the side entry sub from the release sub to enable the side entry sub to be pulled upward; and blockage means adapted to be lowered into the drill pipe from the surface into contact with the upper end of the mandrel for blocking flow through the mandrel, enabling fluid pressure to be applied through the drill pipe from the surface to the mandrel to move the mandrel to the lower position.

4,678,039

# METHOD AND APPARATUS FOR SECONDARY AND TERTIARY RECOVERY OF HYDROCARBONS

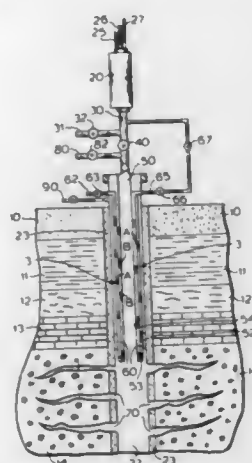
Nelson Rivas, Hempstead, N.Y., and Rudi Beichel, Sacramento, Calif., assignors to WorldTech Atlantis Inc., New York, N.Y.

Filed Jan. 30, 1986, Ser. No. 824,171

Int. Cl.<sup>4</sup> E21B 36/02, 43/24

U.S. Cl. 166—303

5 Claims



1. Apparatus for secondary and tertiary recovery of hydrocarbons from oil fields comprising:
  - a. a bipropellant generator capable of producing exhaust gases at supercritical pressures and temperatures;
  - b. transport means for carrying said exhaust gases into a well bore, at least a portion of said well bore extending into a hydrocarbon bearing formation from which hydrocarbons are to be recovered;
  - c. means for introducing water into said transport means; and
  - d. a water cooling jacket extending into at least the upper portion of said well bore, the center of said cooling jacket receiving said exhaust gases from said transport means, means being provided for the introduction of chemical additives through a portion of said cooling jacket.
2. A process for secondary and tertiary recovery of hydrocarbons from geological formations comprising:
  - a. providing a well bore extending at least into the strata of said geologic formation containing said hydrocarbons to be recovered;
  - b. providing at least the upper portion of said well bore with a cooling jacket, said cooling jacket being provided with a central, open portion;
  - c. generating gases at supercritical temperatures and pressures;
  - d. introducing water into said supercritical gases to form steam;
  - e. forcing said mixture of supercritical combustion gases and steam through the central open portion of said cooling jacket and said well bore into said hydrocarbon strata; and

- f. adding chemical additives to said mixture of combustion gases and steam below said cooling jacket.

4,678,040

# METHODS AND APPARATUS FOR RECOVERY OF HYDROCARBONS AND OTHER LIQUIDS FROM UNDERGROUND

Wayne C. McLaughlin, St. Charles; William J. Recker, Bloomington; Phillip C. Modesitt, Chicago, and Paul K. Francescon, Coal Valley, all of Ill., assignors to Pump Engineer Associates, Inc., Addison, Ill.

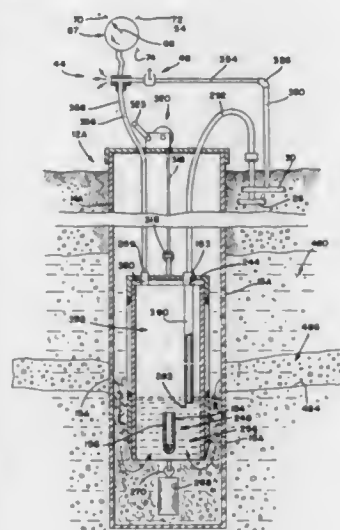
Continuation-in-part of Ser. No. 691,166, Jan. 14, 1985, Pat. No. 4,625,801, which is a continuation-in-part of Ser. No. 513,264, Jul. 13, 1983, Pat. No. 4,527,633. This application Dec. 3, 1985, Ser. No. 804,265

Claims priority, application Canada, Jul. 4, 1984, 458105 The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> E21B 43/12, 44/16; F04F 1/08

U.S. Cl. 166—370

9 Claims



9. An ejector pump comprising:
  - a rigid, elongated, tubular body defining a pump chamber; said tubular body having an upper end and a lower end, liquid outflow conduit means positioned in an opening in said upper end of said body for conveying liquid from said chamber and comprising check valve means for preventing flow of liquid into said chamber through said conduit means; the input end of said outflow conduit means being positioned in said chamber near said lower end of said body and the output end of said outflow conduit means extending outside said body;
  - liquid inflow conduit means positioned in a second opening in said upper end of said body for conveying liquid into said chamber and comprising check valve means for preventing flow of liquid out of said chamber through said inflow conduit means; and
  - other conduit means positioned in a third opening in said upper end of said body for conveying gases from and to said chamber for selectively venting and pressurizing said chamber.

4,678,041

# FIRE FIGHTING SERVICE VEHICLE

Hermann Staudinger, Neuhofen, Austria, assignor to Konrad Rosenbauer KG., Leonding, Austria

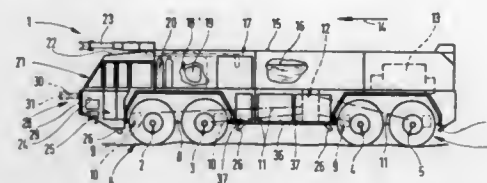
Filed Mar. 14, 1985, Ser. No. 711,617

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409807

Int. Cl.<sup>4</sup> B60P 3/00; B62D 63/02; A62C 27/20

U.S. Cl. 169—24

22 Claims



1. A service vehicle for use as a fire-fighting tanker vehicle comprising an uninterrupted chassis frame carrying a driver's cab and supported by four driving axles driven independently of each other by a driving engine, the four driving axles being carried on the chassis frame via pressure fluid springs at opposite sides of the vehicle and the pressure fluid springs associated with wheels at one side being connected via a pressure fluid supply system and a load compensator system to the pressure fluid springs associated with wheels situated at the other side of the vehicle, an automatic transmission situated between front and rear undercarriages each comprising two of said driving axles, the driving axles of each undercarriage being separately coupled to the automatic transmission which is coupled to the driving engine situated on the chassis from above the rear undercarriage, and quenching agent tanks and a quenching agent pump arranged on the chassis.

4,678,042

# METHOD AND APPARATUS FOR CUTTING AN ATHLETIC FIELD LINE

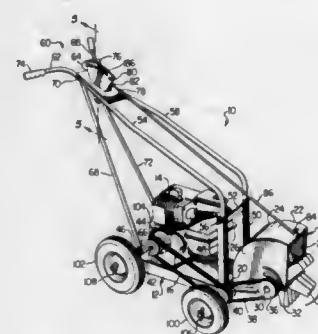
James W. Barton, and Hubert D. Allen, both of Rockwall, Tex., assignors to Tamer Corporation, Rockwall, Tex.

Filed Sep. 27, 1985, Ser. No. 780,982

Int. Cl.<sup>4</sup> A01B 45/04

U.S. Cl. 172—15

14 Claims



1. Apparatus for cutting an athletic field line, comprising:
  - a chassis including a front end and a rear end;
  - a plurality of wheels including a pair of laterally spaced rear wheels for supporting said chassis in a fixed attitude relative to the ground and for locomotion across the ground in a predetermined line of travel;
  - drive means mounted on said chassis;
  - a cutter head mounted on the front end of said chassis by means of a hinge substantially parallel to the ground and substantially perpendicular to said predetermined line;
  - an axle rotatably mounted on said cutter head and spaced forward of and disposed substantially parallel to said hinge;
  - a plurality of cutter blades mounted on said axle to skim the earth for removing a continuous strip of grass and the like from a band of earth between said rear wheels, said strip being substantially narrower than the space between said rear wheels straddling said predetermined line to form an

athletic field boundary line, said blades rotating so as to throw cut grass and the like forward of the apparatus; said drive means coupled to said rotating axle for supplying power to said axle and cutter blades; an operator station at said rear end at which an operator directs the apparatus over the ground on said predetermined line, said cutter head and said operator station substantially centered on and colinear with said predetermined line; and means at said operator station and coupled to said cutter head for adjusting the level of said cutter head relative to the ground.

4,678,043

# HAND TOOL FOR LOOSENING SOIL

Hans vom Braucke, Vlotho; Manfred vom Braucke, and Dieter Westerwelle, both of Bielefeld, all of Fed. Rep. of Germany, assignors to Bielefelder Kuchenmaschinen-und Transportgeratefabrik vom Braucke GmbH, Bielefeld, Fed. Rep. of Germany

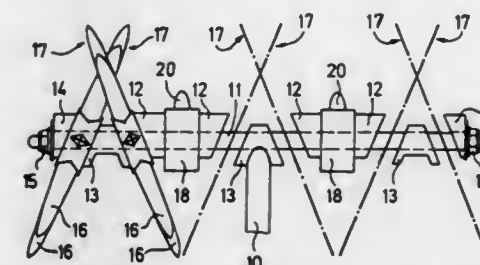
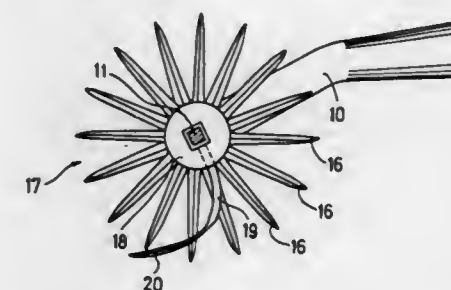
Filed Jan. 11, 1985, Ser. No. 690,765

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 3401000; Sep. 28, 1984, 3435601

Int. Cl.<sup>4</sup> A01B 1/06, 1/20

U.S. Cl. 172—349

15 Claims



1. A hand tool for loosening, cutting and crumbling garden soil or the like, including axle means, connecting means connected to said axle means for permitting displacement of said tool, at least two pronged wheels each of said wheels having radially extending prongs and being freely rotatably mounted on bearing sleeves non-rotatably mounted on said axle means, said pronged wheels having vertical central planes extending in the direction of the radially extending prongs and at least some of the adjacent pronged wheels intersecting each other at an acute angle and wherein at least one spade-type prong is supported on said axle means and terminates in enlarged end means and is disposed along said axle means between every other adjacent pair of said pronged wheels, each said spade-type prong being formed with with said end means protruding outwardly from said axle means beyond the radially extending prongs of the pronged wheels, said bearing sleeves on which said intersecting pronged wheels are mounted facing one another at an acute angle to form V-like arrangements, and intermediate guide bearings are disposed between said bearing sleeves and are mounted together with the bearing sleeves on said axle means so as to be non-rotatable and displaceable in the longitudinal direction of the axle means, each said spade-type prong being rigidly secured to a coaxial bearing sleeve which is non-rotatably mounted on said axle means.



4,678,044

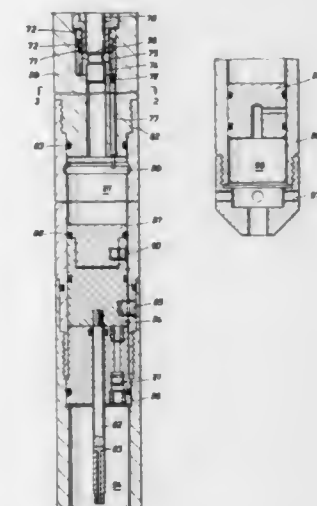
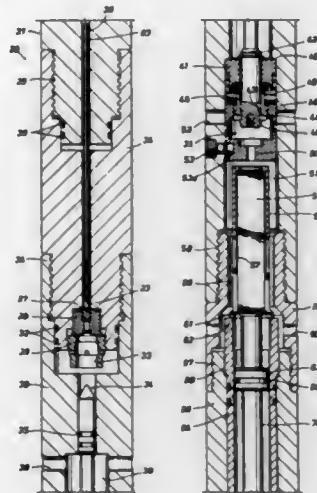
**TUBING PRESSURE OPERATED INITIATOR FOR PERFORATING IN A WELL BOREHOLE**

Robert R. Luke, Houston; James M. Barker, Katy, both of Tex.; Michael L. Smith, Sand Springs, Okla.; Larry L. Grigar, East Bernard, and Carl B. Miller, Houston, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 31, 1986, Ser. No. 846,405  
Int. Cl.<sup>4</sup> E21B 43/1185

U.S. Cl. 175-4.52

22 Claims



1. A method of perforating a well below a packer comprising the steps of:

- positioning a perforating gun assembly on a tubing string at a specified depth in a well below a packer;
- selecting a pressure in excess of bottom hole pressure at which a perforating gun detonator means is operated;
- increasing the pressure below the packer by pumping a fluid through the tubing into the volume below said packer at least to that pressure required for perforating gun detonator means operation;
- firing the perforating gun detonator means by arming the perforating gun detonator means by exceeding the pressure required to move a piston in a cylinder within said perforating gun detonator means to an armed position; and
- locking the piston in the cylinder after movement to the armed position.

4,678,045

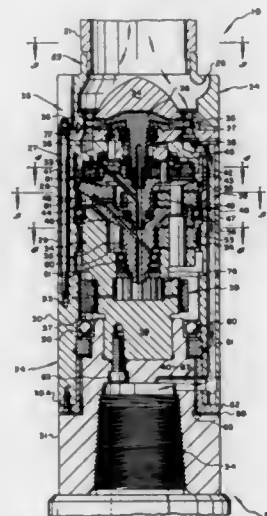
**TURBINE TOOL**

William C. Lyons, P.O. Box 2457, Santa Fe, N. Mex. 87504-2457

Continuation-in-part of Ser. No. 514,865, Jul. 18, 1983, abandoned. This application Oct. 8, 1985, Ser. No. 785,492  
Int. Cl.<sup>4</sup> E21B 4/02, 7/04

U.S. Cl. 175-61

3 Claims



1. In a borehole forming operation wherein a rotary drill bit forms a borehole which extends along a relatively straight line and then makes a turn of a very small radius of curvature and then extends along another relatively straight line as the borehole penetrates a payzone, the method of drilling said borehole comprising the steps of:

- flowing power fluid down a flexible drill pipe string; said flexible drill pipe string has the capability of negotiating said turn of very small radius while concurrently conducting said power fluid therethrough;
- attaching a turbine motor having an output shaft to the end of said drill pipe string, and using the power fluid for driving the output shaft of the turbine;
- series connecting a plurality of planetary reduction gear assemblies together and to the output shaft of the turbine; said gear assemblies having input and output shafts; and

arranging the input and output shafts of the reduction gear assemblies along a common axial centerline;

- enclosing the planetary reduction gear assemblies within a housing which includes an oil chamber, circulating oil from said oil chamber, to said planetary reduction gear assemblies, and back to said oil chamber to thereby provide a closed lubrication system for said planetary reduction gear assemblies;
- carrying out step (4) by placing an oil pick-up ring about an oil pump; forming a plurality of radial passageways from the pump outwardly into communication with the oil pick-up ring; making one side of the oil pick-up ring heavier relative to another side of the ring so that the heavy side of the ring gravitates into the oil located within the oil chamber, thereby providing the suction side of the oil pump with an oil supply, regardless of the orientation of the housing;
- turning a rotary drill bit with the output shaft of the last of the series connected reduction gear assemblies;
- using the spent power fluid from the turbine for drilling fluid by conducting the spent power fluid from the turbine, through a passageway formed externally of the reduction gear assemblies and to the bit; and,
- overcoming the torque of the bit while forcing the bit towards the formation by directing a flow of power fluid through a reaction port which is arranged in opposition to the direction of penetration of the drill bit, and at an angle to provide a force which is in opposition to the drill bit torque.

4,678,046

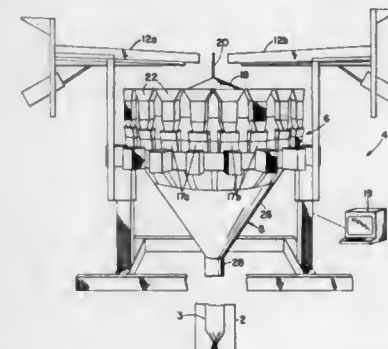
**COMBINATION WEIGHING APPARATUS FOR TWO COMBINED PRODUCTS**

Oren A. Mosher, Hayward, Calif., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed Jan. 31, 1986, Ser. No. 824,842  
Int. Cl.<sup>4</sup> G01G 19/22

U.S. Cl. 177-1

32 Claims



1. A combination weighing system for weighing out quantities of at least two of different types of products to contribute to a package, said system comprising:

- a first plurality of weighing scales for weighing out quantities of a first product,
- a second plurality of weighing scales for weighing out quantities of a second product, said first product being a different type than said second product,
- combination search means for selecting from said first plurality of weighing scales a combination which contains a combined quantity of said first product near in weight to a predetermined fractional target weight, and for selecting from said second plurality of weighing scales a combination which contains a combined quantity of said second product near in weight to the difference between a combined target weight for said first and said second types of products within said package and the weight of said first

product within the selected combination of said first plurality of scales.

4,678,047

**ARTICLE SUPPLY FOR A COMBINATORIAL WEIGHING MACHINE**

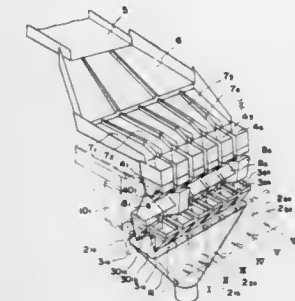
Koichi Kataoka, Shiga, and Takashi Kabumoto, Mukou, both of Japan, assignors to Kabushiki Saisha Ishida Koki Seisakusho, Kyoto, Japan

Continuation of Ser. No. 572,315, Jan. 20, 1984, abandoned. This application Apr. 2, 1986, Ser. No. 847,092

Claims priority, application Japan, Jan. 20, 1983, 58-008320  
Int. Cl.<sup>4</sup> G01G 19/22, 21/28

U.S. Cl. 177-1

10 Claims



1. A method of supplying articles to be weighed in an automatic weighing system having plural weighing hopper sets each of which includes a pair of weighing hoppers attached to respective ones of plural weighing machines, a pool hopper and a director chute provided for the pair of weighing hoppers in each weighing hopper set, a drive apparatus provided for each weighing hopper set for operating the corresponding pool hopper and the corresponding director chute to selectively supply articles from the pool hopper and the director chute to the pair of weighing hoppers in the weighing hopper set, and a control apparatus for controlling the drive apparatus, said method comprising the steps of:

- computing combinations by means of the control apparatus on the basis of weight values from the plurality of weighing machines;
- discharging articles from selected weighing hoppers in response to a first command sent from the control apparatus to the drive apparatus for each weighing hopper set which includes one of the selected weighing hoppers forming a part of an optimum combination from the optimum combinations computed in said step (a), by causing the drive apparatus to open the selected weighing hoppers which correspond to the optimum combination;
- selectively sending a tilt command from the control apparatus to the drive apparatus for each weighing hopper set which includes one of the selected weighing hoppers to cause the drive apparatus to tilt only the director chutes corresponding to the weighing hopper sets from which articles have been discharged, toward the corresponding selected weighing hoppers; and
- supplying articles from the pool hoppers to the corresponding selected weighing hoppers which have discharged their articles, in response to a second command sent from the control apparatus to the drive apparatus, the second command causing the drive apparatus for the weighing hopper sets which include one of the selected weighing hoppers to open only the pool hoppers corresponding to the weighing hopper sets from which articles have been discharged.

4,678,048

**APPARATUS FOR THE CONTACTLESS COUPLING OF A SUSPENDED PART TO FORCE MEASURING DEVICE**  
Hans-Wilhelm Löscher, Emscherstrasse 8, 4630 Bochum 1; Rainer Kleinrahm, Röntgenring 2, 4030 Ratingen; Norbert Pieperbeck, Barlachweg 42, 4630 Bochum 1, and Wolfgang Wagner, Virchowstrasse 7, 4630 Bochum 1, all of Fed. Rep. of Germany

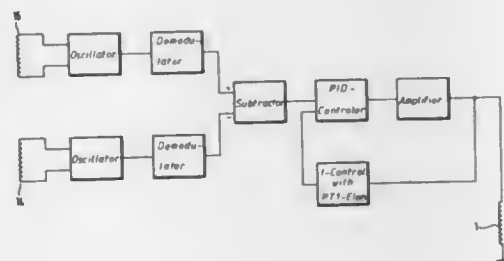
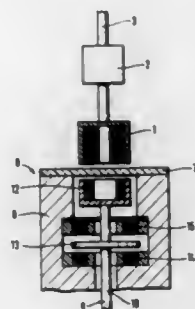
Filed Jul. 30, 1985, Ser. No. 760,657

Claims priority, application European Pat. Off., Aug. 2, 1984, 84109178.8

Int. Cl.<sup>4</sup> G01G 7/00, 3/14

U.S. Cl. 177—212

12 Claims



1. Apparatus for the contactless coupling of a suspended part to a force measuring device, comprising a stationary housing for enclosing the suspended part with the force measuring device being above the housing, an electromagnet at the end of the measuring device facing said housing, a permanent magnet at the top of the suspended part adjacent the electromagnet, a second measuring device for measuring movements of the suspended part and thus of the permanent magnet, and a control loop electrically connected to said second measuring device and said electromagnet for receiving an input signal from said second measuring device and giving an output signal to said electromagnet to keep the suspended part in suspension, the improvement comprising said second measuring device being stationarily attached to said housing, for measuring the position of the suspended part relative to said housing in absolute terms against the stationary location of said housing and said control loop being connected to receive a value for the measured position, for comparing this value with a predetermined value of a preselected position and for controlling the electromagnet to keep the suspended part in its preselected position.

4,678,049

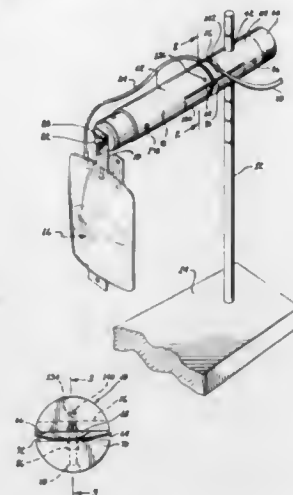
**BLOOD COLLECTION BAG WEIGHT MONITOR**  
John B. Gummere, and Stephen C. Minney, both of Tucson, Ariz., assignors to Engineering & Research Associates, Tucson, Ariz.

Filed Oct. 17, 1985, Ser. No. 788,423

Int. Cl.<sup>4</sup> G01G 3/08, 19/00; B65D 81/00

U.S. Cl. 177—229

22 Claims



1. A weight monitor for monitoring the fill of a blood collection bag, said weight monitor comprising in combination:

- (a) a fixed end;
- (b) a movable end;
- (c) means for suspending the blood collection bag from said movable end; and
- (d) spring means for interconnecting said fixed end with said movable end and for repositioning said movable end from a first state to a second state on application upon said movable end of a predetermined force presented by the weight of a filled blood collection bag, said spring means having the characteristic of a buckling beam to abruptly reposition said movable end with a snap action upon application of the predetermined force and to essentially resist repositioning of said movable end in response to any applied force of a lesser magnitude than the predetermined force.

4,678,050

**MASS AND FORCE METER**

Johannes Wirth, and Mario Gallo, both of Zurich, Switzerland, assignors to K-Tron Patent AG, Zurich, Switzerland  
Filed Jan. 13, 1986, Ser. No. 818,138

Claims priority, application European Pat. Off., Jan. 22, 1985, 85810017.5

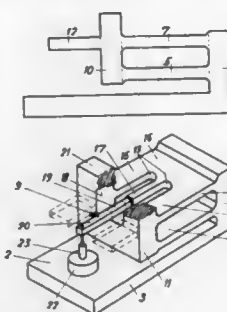
Int. Cl.<sup>4</sup> G01G 3/08

U.S. Cl. 177—229

10 Claims

1. In a mass and force meter with a single extruded profiled block and a motionless measuring system, said block presenting in cross-section several components which form a frame, a load support, a means for guiding said load support parallelly and vertically, and a resilient transmission member that transmits a part of the load to the measuring system, said means consisting of at least two flat springs mounted one above the other, said flat springs being fitted in said frame and in said load support, said transmission member consisting of parts from

three different components of said block, one of said components comprising three strips forming parts of one of said flat



springs and one strip forming a part of said transmission member.

4,678,051

**RECTILINEARLY TRAVELING VEHICLE**

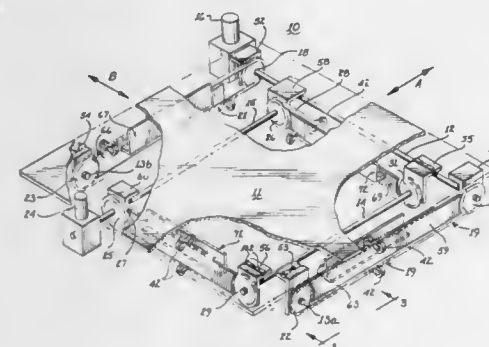
Thomas E. Dugle, 5000 Miami Rd., Cincinnati, Ohio 45243

Filed Apr. 23, 1986, Ser. No. 854,794

Int. Cl.<sup>4</sup> B62D 11/00, 57/00

U.S. Cl. 180—9.1

5 Claims



1. A vehicle, or the like, capable of moving in mutually perpendicular directions comprising, a supporting framework, a first pair of continuous link moving elements supported by said framework and oriented in one direction, said support by said framework of said first pair of continuous link moving elements including a first pair of plate means attached to said framework and each one extending substantially the full length of the respective one of said first pair of continuous link moving elements and each one having a lower guiding edge for supporting same continuously along substantially along said full length, a second pair of continuous link moving elements supported by said framework and oriented in a second direction perpendicular to said one direction, said support by said framework of said second pair of continuous link moving elements including a second pair of plate means attached to said framework and each one extending substantially the full length of the respective one of said second pair of continuous link moving elements and each one having a lower guiding edge for supporting same continuously along substantially along said full length, the links in said first pair of moving elements comprising first roller means whose axes are parallel to said one direction, and the links in said second pair of moving elements comprising second roller means whose axes are parallel to said second direction.

4,678,052

**POWER STEERING APPARATUS**

Yoshio Suzuki, and Seiji Yamaguchi, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

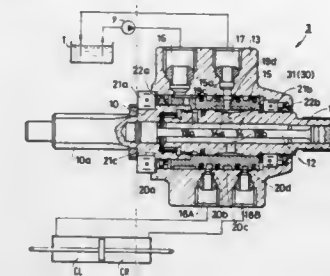
Filed Mar. 13, 1985, Ser. No. 711,438

Claims priority, application Japan, Mar. 13, 1984, 59-34893[U]

Int. Cl.<sup>4</sup> B62D 5/08

U.S. Cl. 180—143

8 Claims



1. In a power steering apparatus comprising an oil pump adapted to supply pressurized oil from an oil tank to a flow control valve, said flow control valve being operable to selectively supply said oil to either a left or a right cylinder chamber of a power cylinder, and being adapted to return part of the pressurized oil discharged from said oil pump to said oil tank, the improvement wherein at least one orifice having a small opening is provided communicating a pressurized oil feed line directed to one of said chambers in said power cylinder with a return line directed to said oil tank from the other one of said chambers in said power cylinder at a downstream side of said flow control valve.

4,678,053

**TILTABLE TRICYCLE**

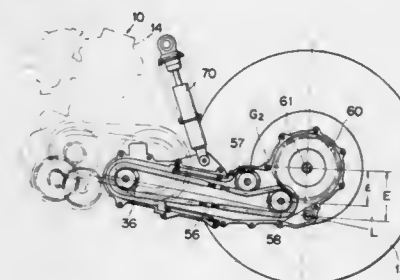
Masaki Watanabe; Hitoshi Yamamoto; Yoshinori Matsuoka, all of Saitama, and Kunihiko Tanaka, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 569,256, Jan. 9, 1984, abandoned. This application Oct. 14, 1986, Ser. No. 918,635

Claims priority, application Japan, Jan. 8, 1983, 58-1549

Int. Cl.<sup>4</sup> B62D 61/06

U.S. Cl. 180—210

7 Claims



1. A tiltable tricycle comprising:

- (a) a body frame;
- (b) a single front wheel steerably supported on a front portion of said body frame;
- (c) a power unit mounted on a rear portion of said body frame and including at least an engine having a crankshaft;
- (d) a joint case connected to said power unit for vertical angular movement and including a first speed reducer shaft rotatably supported therein and operatively connected to said crankshaft;
- (e) a rear axle support case connected to said joint case for



lateral rolling movement and including a second speed reducer shaft rotatably supported therein;  
 (f) a secondary speed reducer mechanism incorporated in said rear axle support case;  
 (g) a rear axle assembly rotatably supported on said rear axle support case;  
 (h) a pair of rear wheels coupled to said rear axle assembly, respectively; and  
 (i) a shock absorber disposed between said body frame and said joint case;  
 said second speed reducer shaft being offset downwardly of said rear axle assembly.

4,678,054

## BODY FRAMES

Kazuo Honda, Yokohama; Yoshiaki Horii, Niiza; Kinuo Hiramatsu, Wako; Shuhei Nakamoto, Yono, and Takashi Kudo, Shiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

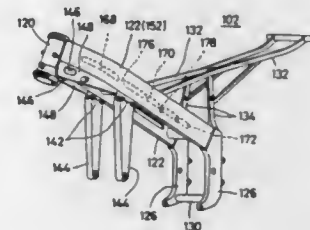
Filed Dec. 24, 1985, Ser. No. 813,281

Claims priority, application Japan, Dec. 26, 1984, 59-196041[U]; Mar. 6, 1985, 60-31964[U]; Mar. 19, 1985, 60-55098; Mar. 19, 1985, 60-55100

Int. Cl.<sup>4</sup> B62K 11/08, 19/30

U.S. Cl. 180—225

12 Claims



1. A body frame structure for a saddle type motor vehicle comprising a head pipe and  
 a pair of main frame pipe members extending rearwardly from and attached at their front end to said head pipe, at least one of said main frame pipe members having therein a longitudinally extending partition wall dividing said frame pipe member into a plurality of passages, each such passage forming a hollow section,  
 said plurality of passages including at least one passage closed at its opposite ends and having an inlet and an outlet, and at least one passage for wiring cables, including control cables, and a wire harness,  
 said wiring passage being closed at its opposite ends and having openings along one wall, said cables being clamped to said partition wall adjacent said openings by a fastener means.

4,678,055

## FOUR-WHEEL VEHICLE DRIVE SYSTEM

Toshio Yoshinaka, Nagoya, and Syuji Nagano, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 22, 1986, Ser. No. 909,695

Claims priority, application Japan, Oct. 16, 1985, 60-158140[U]

Int. Cl.<sup>4</sup> B60K 41/26; F16H 3/38

U.S. Cl. 180—247

35 Claims

1. A four-wheel drive system for use in a vehicle including first and second pairs of road wheels, an engine including an output shaft, and a transmission including input and output shafts, the input shaft of the transmission being selectively connected to the output shaft of the engine, the output shaft of the transmission selectively being in driving engagement with the input shaft of the transmission, the four-wheel drive system comprising:

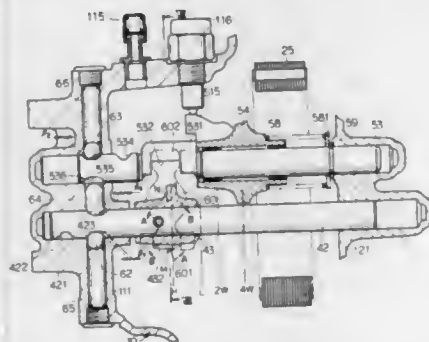
a first spline member being rotatable about a first rotational

axis, said first spline member being driven by the output shaft of the transmission, said first spline member having a first engagement means and a first part of a disengagement preventing means;

a second spline member being rotatable about the first rotational axis of said first spline member, said second spline member being located next to said first spline member, said second spline member having a second engagement means;

an engagement sleeve member being slidably mounted on said second spline member, said engagement sleeve member having a third engagement means and a second part of the disengagement preventing means, the third engagement means of said engagement sleeve member engaging with the second engagement means of said second spline member, the third engagement means of said engagement sleeve member selectively engaging with the first engagement means of said first spline member, the second part of the disengagement preventing means of said engagement sleeve member selectively engaging with the first part of the disengagement preventing means of said first spline member, said engagement sleeve member being selectively positioned at one of a first spline engagement position and a first spline disengagement position;

a shaft member being located parallel to the first rotational axis of said first spline member, said shaft member being selectively positioned at one of a first position and a second position, the first position of said shaft member corre-



sponding to the first spline engagement position of said engagement sleeve member, the second position of said shaft member corresponding to the first spline disengagement position of said engagement sleeve member, said shaft member having a first notch and a second notch, a width of the first notch being larger than a width of the second notch;

a locking member being biased toward said shaft member, said locking member being selectively inserted in one of the first and second notches of said shaft member, so that when the shaft member is positioned at the first position the locking member is inserted in the first notch of said shaft member and a space is defined in the longitudinal direction of said shaft member between a side of the locking member and a corresponding side of the first notch, and when the shaft member is positioned at the second position the locking member is inserted in the second notch of said shaft member and two sides of the locking member are in contact with corresponding sides of the second notch; and

a fork member being secured to said shaft member, said fork member having an engagement finger, the engagement finger engaging with said engagement sleeve member, the fork member being selectively positioned according to one of the first and second positions of said shaft member, whereby when the shaft member is positioned at the first position the locking member is inserted in the first notch of said shaft member with the space, the engagement sleeve member is positioned at the first spline engagement

position and the first part of the disengagement preventing means of the first spline member engages with the second part of the disengagement preventing means of the engagement sleeve member, so that even when a torque is applied to the first spline member and a thrust force is exerted on the engagement sleeve member, the engagement sleeve member, the fork member and the shaft member are displaced within the space defined between the locking member and the first notch of the shaft member without a large amount of friction and without disengagement of the engagement sleeve member.

4,678,056

## PART TIME FOUR WHEEL DRIVE VEHICLE WITH ROAD SURFACE CONDITION SENSOR

Yuji Kobari, Yokosuka, and Keiichi Miyamoto, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

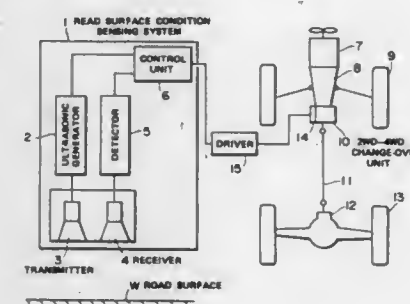
Filed Oct. 3, 1985, Ser. No. 783,562

Claims priority, application Japan, Oct. 9, 1984, 59-151700[U]

Int. Cl.<sup>4</sup> B62D 1/24; B60F 17/34

U.S. Cl. 180—247

6 Claims



1. A vehicle comprising:

an engine,

first and second pairs of wheels

a four wheel drive system for transmitting power from said engine to said first and second pairs of wheels, said drive system comprising change-over means for selectively changing said drive system from a four wheel drive mode in which power is transmitted to all of said first and second pairs of wheels to a two wheel drive mode in which power is transmitted only to said first pair of wheels, and vice versa,

road surface condition sensing means for transmitting ultrasonic waves toward a road surface, receiving ultrasonic waves reflected back from the road surface and delivering an output signal when an intensity of the reflected ultrasonic waves is equal to or lower than a predetermined value, and

an actuator means for actuating said change-over means to change said drive system from the two wheel drive mode to the four wheel drive mode when the output signal is produced by said road surface condition sensing means independent of the slip of the wheels of the first pair.

4,678,057

## BREATH ALCOHOL ANALYZER

Brian P. Elfman, Alameda, and Patricia L. Zajac, Richmond, both of Calif., assignors to Autosense Corporation, Hayward, Calif.

Filed Jan. 16, 1986, Ser. No. 819,514

Int. Cl.<sup>4</sup> B60R 1/00; G08B 23/00

U.S. Cl. 180—272

53 Claims

1. An apparatus for analyzing a breath sample, comprising:

(a) a first means for sensing the pressure, the temperature and the humidity of the breath sample and in response generating a breath signature signal;

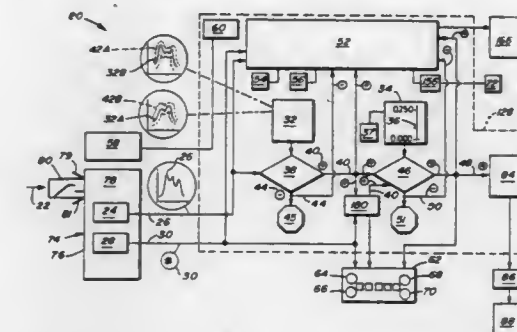
(b) a second means for sensing the alcohol content if any of

the breath sample and in response generating an alcohol signal;

(c) a third means for providing a breath reference;

(d) a fourth means for providing an alcohol reference which includes an alcohol threshold level;

(e) a fifth means for comparing the breath signature signal with the breath reference and in response generating one of (i) a valid signal if the breath signature signal substan-



tially matches within a pre-selected range the breath reference and (ii) an invalid signal if the breath signature signal does not substantially match the breath reference within the pre-selected range; and

(f) a sixth means for comparing the alcohol signal with the alcohol reference and in response generating one of (i) a passing signal if the alcohol signal is less than the threshold level and (ii) a failing signal if the alcohol signal equals or exceeds the threshold level.

4,678,058

## VEHICLE SEAT SWITCH

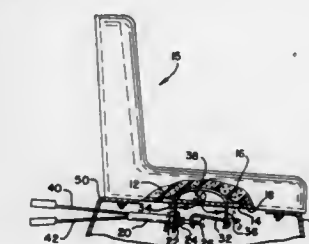
Eldon W. Wooters, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 7, 1986, Ser. No. 849,128

Int. Cl.<sup>4</sup> B60K 28/00

U.S. Cl. 180—273

5 Claims



1. An apparatus for selectively interrupting the ignition circuit of an ignition system for a vehicle motor in response to a load being applied to a vehicle operator seat assembly mounted to the vehicle, the seat assembly having a support plate and a cushion means supported by said support plate, said apparatus comprising a switch means, a plunger mounted in said switch means for reciprocal movement along a generally longitudinal axis and adapted to electrically actuate the switch means, a spring means having a first end portion, a second end portion and an arcuate central portion, said first end portion being connected to said second end portion by said arcuate central portion, said arcuate central portion being vertically moveable responsive to the vertical movement of said cushion means, said support plate having a first opening for the passage of said first end portion and a second opening for the passage of said second end portion, the portion of said support plate between said first and second openings being adapted to contact the bottom end portions of said arcuate central portion of spring means and facilitate the flattening of the same in

response to vertical movement of the cushion means, said first end portion of said spring means being secured to said switch means, said plunger being connected to said second end portion of said spring means, said second end portion and said plunger being movable in a generally horizontal direction in response to vertical movement of said central portion thereby actuating said switch means between electrically open and closed positions upon the selective application and removal of a load to said seat assembly.

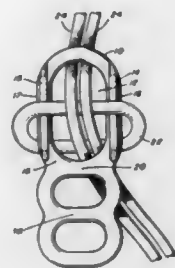
4,678,059

## ROPE DESCENDING DEVICE

Thomas K. Bowker, R.F.D. 1, Pine Acres, Rumney, N.H. 03266  
Filed May 27, 1986, Ser. No. 867,049  
Int. Cl.<sup>4</sup> A63B 29/00

U.S. Cl. 182-5

9 Claims



1. A rope descending device, comprising: an oval ring defining an inner aperture, said ring having a first surface and a second surface, said surfaces lying in substantially parallel planes, a rail attached to the first surface a clasp means for attachment across the width of said ring, and means for connecting the ring to the user of the rope descending device.

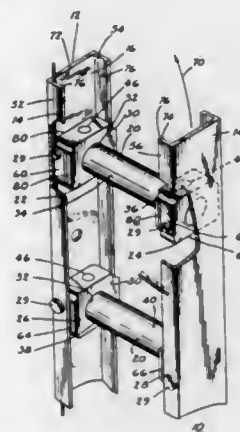
4,678,060

## COLLAPSIBLE LADDER DEVICE

Joseph A. Pugliese, 94 Elm Ave., Fairview, N.J. 07022  
Filed Aug. 25, 1986, Ser. No. 899,637  
Int. Cl.<sup>4</sup> E06C 1/383

U.S. Cl. 182-160

7 Claims



1. A collapsible ladder device, comprising:
  - (a) first and second railing members disposed opposite each other in substantially parallel relationship with each other;
  - (b) a plurality of rung elements disposed between said railing members in spaced apart relationship, said rung elements having respective first ends disposed adjacent to said first railing member and respective second ends disposed adjacent to said second railing member;
  - (c) a first set of bracket members disposed at respective ones

of said rung element first ends and a second set of bracket members disposed at respective ones of said rung element second ends, said bracket members of said first set being pivotally connected to said first railing member and said bracket members of said second set being pivotally connected to said second railing member; and

- (d) pin means for connecting said bracket members to their respective railing members, said pin means being disposed so as to be removed from the central axes of their respective bracket members, whereby said bracket members can act to limit the travel of said railing members when said ladder device is opened for use wherein said side railing members comprise protruberances disposed at their distal edge regions and said bracket members comprise respective detents at their side faces, whereby said protruberances can engage said bracket members at their respective detents when said ladder is open, thereby serving to provide greater rigidity to said ladder device.

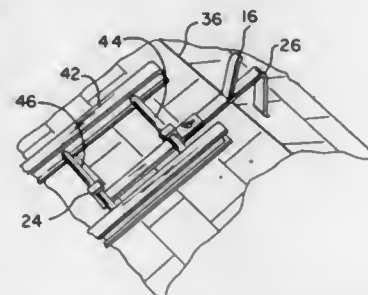
4,678,061

## LADDER ROOF BRACE

Mark T. Jordan, 368 Shaw St., Braintree, Mass. 02184, and  
Mark Ferragamo, 18 Oakwood Dr., Randolph, Mass. 02368  
Filed Feb. 6, 1986, Ser. No. 826,687  
Int. Cl.<sup>4</sup> E06C 5/36, 7/42, 7/48

U.S. Cl. 182-206

1 Claim



1. A ladder hook comprising a base portion, a roof bearing portion and an adjustable, hook element, the base portion comprising a center portion having a first terminal end, a second terminal end and a longitudinal slot, the first terminal end being formed into a first hook portion and the second terminal end being formed into a support portion, the longitudinal slot positioned between the first terminal end and the second terminal end, the hook element formed into a second hook portion and having means of movably engaging the longitudinal slot, the roof bearing portion attached to the second terminal end and extending in a direction opposite to that of the first hook portion, the roof bearing portion and the second terminal end providing a V shaped configuration adapted to engage the roof ridge of a building or the like, said ladder hook further comprising a gutter hook, the gutter hook extending from the center portion of the base portion in angular relation thereto toward the same plane as that toward which the first hook portion extends and positioned between the second terminal end and the longitudinal slot.

4,678,062

## ELEVATOR CAR

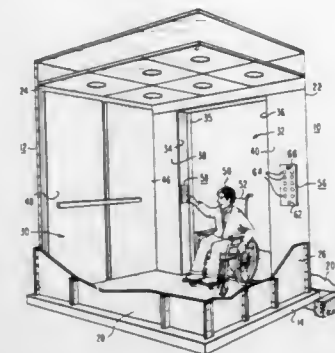
Elmer H. Sumka, Edison, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Apr. 8, 1986, Ser. No. 849,250  
Int. Cl.<sup>4</sup> B66B 9/00

U.S. Cl. 187-1 R

9 Claims

1. An elevator car, comprising:
  - a cab having side, rear and front walls which define an enclosure,
  - the front wall of said cab defining an opening to said enclosure which includes first and second door jambs,
  - the front wall of said cab further defining at least one inner

wall portion inside said enclosure which is immediately adjacent to a predetermined one of said first and second door jambs,  
door means mounted for sliding motion to open and close the opening to the enclosure,  
a first car call panel mounted at a location on said at least one inner wall portion of the front wall selected for convenient use by a passenger on foot,



and a second car call panel mounted at a predetermined location selected for convenient use by a passenger on a wheelchair, notwithstanding a crowded enclosure, said predetermined location of the second car call panel being on a selected one of the first and second door jambs, such that an elevator call may be registered by a passenger on a wheelchair while still in the opening to the cab enclosure, before the door means closes the enclosure opening, and before the wheelchair passenger is fully within said enclosure.

4,678,063

## APPARATUS FOR CONTROLLING AN ELEVATOR

Takashi Kitaoka, and Eiki Watanabe, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

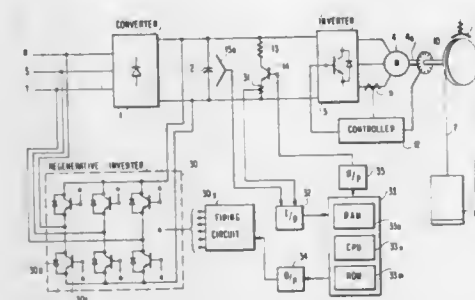
Filed Sep. 20, 1985, Ser. No. 778,042

Claims priority, application Japan, Oct. 5, 1984, 59-209406

Int. Cl.<sup>4</sup> B66B 1/30

U.S. Cl. 187-119

5 Claims



1. In an elevator controlling apparatus in which an alternating current supplied from a power source is converted into a direct current by a converter, and said direct current is further converted into a variable-voltage and variable-frequency alternating current for controlling a hoist motor, the improvement comprising:

regenerated power detecting means for producing a first signal when said hoist motor is regenerating electric power;  
resistor means, connected to the direct current side of the converter, for consuming the regenerated power in response to said first signal;  
consumed power detecting means, coupled to said resistor

means, for detecting the amount of the regenerated power being consumed by said resistor means and for producing a second signal when said amount is in excess of a predetermined value; and

regenerative inverter means, actuated in response to said second signal, for returning the excess regenerated power to said power source.

4,678,064

## SEALING BOOT FOR USE IN DISC BRAKE ASSEMBLY

Yoshiharu Adachi, Gamagori; Fumio Fujimori, Anjo; Toshio Kondo; Hiroshi Uemura, both of Okazaki, and Juichi Shibatan, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

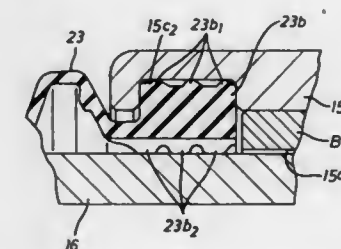
Filed May 24, 1985, Ser. No. 737,484

Claims priority, application Japan, May 25, 1984, 59-077559[U]

Int. Cl.<sup>4</sup> F16D 65/14; B61F 15/22

U.S. Cl. 188-73.45

11 Claims



1. A sealing boot of elastomeric material for use in a disc brake assembly of the pin slide type which includes a stationary support member, a caliper member slidably mounted on said stationary support member, and at least one support pin fixed to one of said stationary support member and said caliper member and being slidably inserted into an axial bore formed in the other of said members for slidable support of said caliper member, said sealing boot being arranged in surrounding relationship with said support pin and including a bellows portion which is integrally formed at opposite ends thereof with an outside cylindrical sealing portion coupled over said support pin and an inside cylindrical sealing portion coupled within an annular groove formed in said other member, the inside cylindrical sealing portion being retainingly disposed between opposed end walls of said annular groove, being formed at its outer circumference with a first annular projection in contact with the bottom surface of said annular groove, and being formed at its inner circumference with a second annular projection in sliding contact with the outer circumference of said support pin to permit sliding movement of the inside cylindrical sealing portion on said support pin,

wherein the second annular projection of said inside cylindrical sealing portion is slightly displaced relative to the first annular projection toward an open end of said axial bore in said other member, wherein the first annular projection of said inside cylindrical sealing portion is formed at one side thereof with a steep annular surface directed toward the open end of said axial bore and at the other side thereof with a gentle slope annular surface and has a rounded annular head in contact with the bottom surface of said annular groove, and wherein said first annular projection is disposed in spaced relation with respect to both of said opposed end walls of said annular groove and in position to be radially expanded by a fluid pressure acting on the steep annular surface thereof.

5. A sealing boot of elastomeric material for use in a disc brake assembly of the pin slide type which includes a stationary support member having at least one support pin fixed thereto, and a caliper member having a boss portion axially slidably supported on said support pin, said sealing boot being arranged



in surrounding relationship with said support pin and including a bellows portion which is integrally formed at opposite ends thereof with an outside cylindrical sealing portion coupled over said support pin and an inside cylindrical sealing portion coupled within an annular groove in the boss portion of said caliper member, the inside cylindrical sealing portion being retainingly disposed between opposed end walls of said annular groove, being formed at its outer circumference with a first annular projection in contact with the bottom surface of said annular groove, and being formed at its inner circumference with a second annular projection in sliding contact with the outer circumference of said support pin to permit sliding movement of the inside cylindrical sealing portion on said support pin,

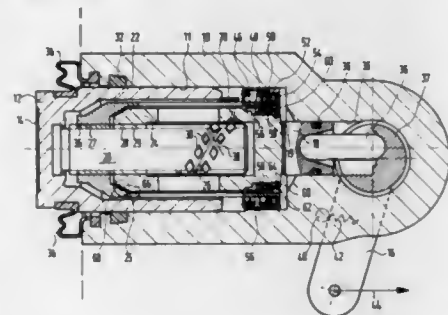
wherein the second annular projection of said inside cylindrical sealing portion is slightly displaced relative to the first annular projection toward the exterior, wherein the first annular projection of said inside cylindrical sealing portion is formed at one side thereof with a steep annular surface directed outwardly and at the other side thereof with a gentle slope annular surface and has a rounded annular head in contact with the bottom surface of said annular groove, and wherein said first annular projection is disposed in spaced relation with respect to both of said opposed end walls of said annular groove and in position to be radially expanded by a fluid pressure acting on the steep annular surface thereof.

#### 4,678,065 BRAKE ACTUATOR

Ralf Erben, Koblenz, and Michael F. M. Walden, Andernach-Elch, both of Fed. Rep. of Germany, assignors to Lucas Industries Public Limited Company, Birmingham, England  
Filed Nov. 19, 1985, Ser. No. 799,576  
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1984, 8434025[U]

Int. Cl.<sup>4</sup> F16D 55/16; B60T 7/00  
U.S. Cl. 188—196 D

7 Claims



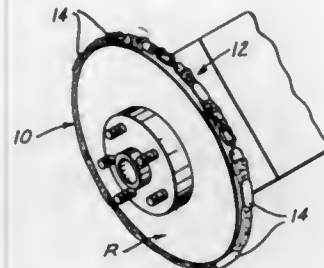
1. A brake actuator, comprising a cylinder casing (10) in which an hydraulically operable piston (12) and a mechanically operable tappet (18) are guided between which there is arranged an adjustment device for transmitting a mechanical actuating force and including a spindle (20) and two different screw thread pairs (26, 27; 28, 29) each being of non-self-locking type, and a coupling (25) being engaged upon actuation of the tappet to prevent relative rotation of the screw threads of each pair characterized in that two threads (26, 28) are formed on said spindle, said threads (26, 28) intersecting over a co-extensive part of the length of the spindle (20), in that both an adjusting nut (24) and a collet (22) are threaded on said intersecting threads (26, 28), and in that the coupling (25) is formed by a friction surface between said adjusting nut (24) and said collet (22).

#### 4,678,066 VIBRATION DAMPENER

Robert J. Heintz, Box 891, Royal Oak, Mich. 48068  
Filed Aug. 29, 1985, Ser. No. 770,765  
Int. Cl.<sup>4</sup> F16F 15/12

U.S. Cl. 188—218 A

3 Claims



1. A vibration dampener for dampening vibration in a brake rotor during resurfacing, comprising a first elongated flexible and stretchable member, a second elongated flexible and stretchable member which is shorter than the first, weights carried by said members, and means for connecting said members together end-to-end in a closed loop capable of being stretched over the periphery of a relatively large diameter brake rotor, said connecting means being releasable so that said second member may be removed and the ends of said first member connected together in a closed loop capable of being stretched over the periphery of a smaller diameter brake rotor, said members being tubular and said connecting means comprising a connector assembly for each end portion of each member, each connector assembly comprising a cap sleeved on an end portion, and an eye-bolt having an eye outside said end portion and a shank extending into said end portion beyond said cap to a point where it has an enlargement of sufficient diameter to radially stretch said end portion, said cap having an inside diameter smaller than said enlargement and cooperating with said enlargement to prevent said eye-bolt from pulling out of said end portion.

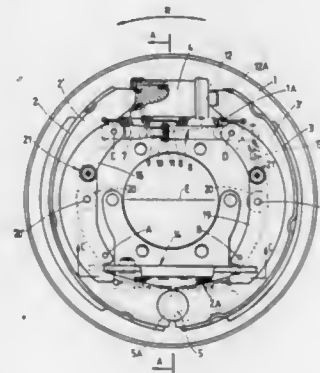
#### 4,678,067 INTERNAL SHOE-DRUM BRAKE

Richard E. Thompson, Gwent, United Kingdom, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jul. 29, 1985, Ser. No. 759,904  
Claims priority, application United Kingdom, Aug. 9, 1984, 8420228

Int. Cl.<sup>4</sup> F16D 51/48, 65/14  
U.S. Cl. 188—328

19 Claims



1. An internal shoe drum brake comprising:  
a pair of arcuate brake shoes mounted on a backplate;  
a first actuator disposed between one pair of adjacent shoe

end portions and operable to expand the shoes into braking engagement with a brake drum for service operation; a strut having one end and extending between the shoes at a location adjacent said one pair of adjacent shoe end portions;  
an abutment device disposed between and normally engaged by the other pair of adjacent shoe end portions;  
a mechanical second actuator disposed adjacent to said abutment device;  
a lever arm having one end adjacent one of said brake shoes and engaged adjacent said one end of said lever arm with said one end of said strut, and an opposite end adjacent said abutment device, said lever arm being operatively associated with said mechanical second actuator; and  
force transmission means supported on said lever arm in a position to engage said one brake shoe at an intermediate location between said one end of said lever arm and the end of said one brake shoe adjacent said abutment device; so that operation of said mechanical second actuator causes said lever arm to pivot about the engagement thereof with said strut and more outwardly with respect to the brake axis and thereby apply an actuating force to said one brake shoe by said force transmission means at said intermediate location for initiating duo-servo operation of the brake via said strut upon contact of said one brake shoe with the drum.

#### 4,678,068

##### AUTOMOBILE BRAKE LOCKING SYSTEM

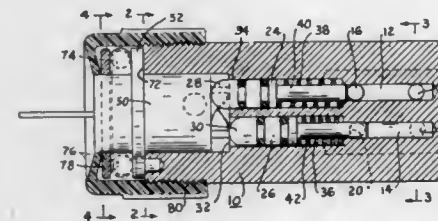
Thomas A. Matthews, 4824 Atlantic Ct., Apartment 6, Cape Coral, Fla. 33904; Walter Fischer, P.O. Box 782713, Sandton, Johannesburg, South Africa 2146, and Lucas Petzwinkler, P.O. Box 34248, Erasmus 0023, South Africa

Filed Aug. 19, 1985, Ser. No. 766,489

Int. Cl.<sup>4</sup> B60R 25/08; B60T 17/16

U.S. Cl. 188—353

1 Claim



1. In a vehicle having front and rear wheels, hydraulically operated brake cylinders at said front and rear wheels, a foot-operated pedal to apply said front and rear brake cylinders by a tandem master cylinder situated between the foot-operated pedal and the brake cylinders, the master cylinder including separate outlet ports, a key-operated control mechanism including a key, the mechanism being separate from said master cylinder, the mechanism further being interposed between the master cylinder and said front and rear brake cylinders, said mechanism including a cylindrical barrel with two parallel compound diametered cylinders each having smaller and larger longitudinally extending bores, longitudinally spaced front and rear apertures or ports in each of said smaller bores, compound plunger assemblies with each assembly including a rounded end, an intermediate plunger and a plunger projection of smaller diameter than the respective plunger, the assemblies slidably mounted in said two diametered cylinders, an hydraulic fluid conduit interconnecting one of said front ports with said front brake cylinders and an hydraulic conduit interconnecting the other front port with said rear brake cylinders, separate hydraulic fluid conduits interconnecting the rear ports separately with said master cylinder outlet ports, each of said smaller-diametered plunger projections each being operable in one position by operation of the key-operated control mechanism to cause longitudinal movement of the plungers and associated projections to overlie and close the front ports and

operable in the key-operated mechanism's inoperative position to open the front ports, a separate coil spring surrounding each of the smaller diametered plunger projections and operable to urge the plunger projections to move to uncover the front ports in the smaller diametered bores in said inoperative position to provide open fluid communication between the front and rear ports, the rounded ends of each plunger assembly being integral with the said intermediate plungers with the rounded ends projecting beyond the larger diametered bores toward key operated cam members of said mechanism to engage the rounded ends of the larger diametered plungers to longitudinally move the smaller diametered plunger projections to close the front ports of the smaller diametered bores to trap fluid in the front and rear brake cylinders to lock the vehicle wheels against rotation, the locking mechanism being of the double-acting cam type, rotation of the key inducing cam surfaces of the double-acting cam to rotate relative to the rounded ends of said plungers to cause the shifting of said plunger assemblies by direct engagement between the cam surfaces and rounded ends of the respective plunger assembly.

#### 4,678,069

##### CLUTCH CONTROL SYSTEM WITH VARIABLE CLUTCH CONNECTION POSITION

Hiroshi Yoshimura, Yokohama, and Toshihiro Hattori, Ayase, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

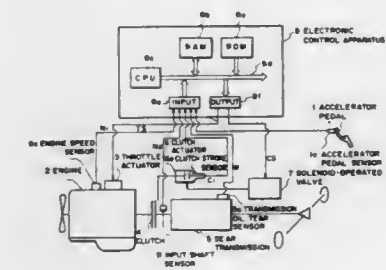
Filed Feb. 28, 1986, Ser. No. 834,370

Claims priority, application Japan, Feb. 28, 1985, 60-39375

Int. Cl.<sup>4</sup> F16D 66/00

U.S. Cl. 192—0.033

16 Claims



1. A clutch control system for controlling a clutch to transmit and cut off rotation from an automobile engine to wheels of the automobile, said clutch control system comprising:  
a gear transmission, having lubricating oil, for changing the speed of the transmitted rotation from the automobile engine;  
a clutch, coupled between the automobile engine and said gear transmission, for transmitting rotation from the automobile engine to said gear transmission;  
a clutch actuator, coupled to said clutch, for operating said clutch between a connected position and a disconnected position with respect to the automobile engine;  
means for learning and storing a learned value corresponding to a position at which to start connecting said clutch;  
means, coupled to said gear transmission, for detecting the temperature of the lubricating oil of said gear transmission;  
means for storing a corrective clutch control value corresponding to the detected temperature of the lubricating oil; and  
means, coupled to said learning means and said storing means, for correcting the learned value by the corrective clutch control value derived from the detected temperature of the lubricating oil to provide a new learned value.

# 4,678,070 FLUID COUPLING DEVICE HAVING IMPROVED HEAT DISSIPATION

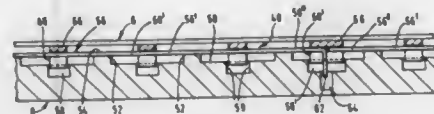
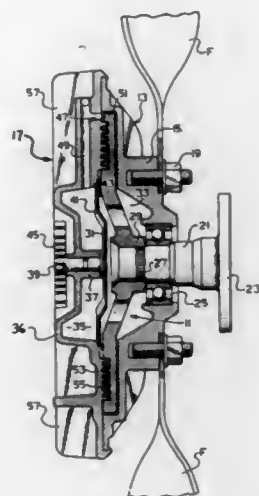
Gerard M. Light, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 725,683, Apr. 22, 1985, abandoned. This application May 5, 1986, Ser. No. 861,651

Int. Cl.<sup>4</sup> F16D 27/02, 13/72

U.S. Cl. 192—58 B

22 Claims



pressure plate, a first annular fulcrum arrangement to one side of the diaphragm spring and provided on the pressure plate, a second annular fulcrum arrangement to the opposite side of said diaphragm spring and provided on the cover, and the diaphragm spring acting between the fulcrum arrangements, at least one of the fulcrum arrangements comprising cushioning means comprising a resilient fulcrum ring, an annular array of spaced supporting means supporting the ring about the axis of the diaphragm springs, portions of the ring each spanning a

# 4,678,072 BILL VALIDATING AND ACCUMULATING DEVICE

Osamu Kobayashi, Masaki Akagawa, and Hiroshi Hayashi, all of Saitama, Japan, assignors to Nippon Colnco Kabushiki Kaisha, Tokyo, Japan

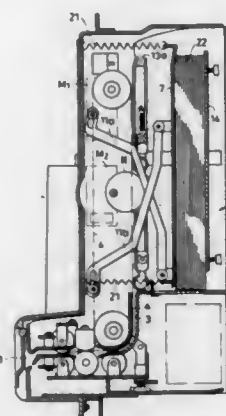
Filed Oct. 1, 1984, Ser. No. 656,585

Claims priority, application Japan, Oct. 3, 1983, 58-184848

Int. Cl.<sup>4</sup> G07F 7/04

U.S. Cl. 194—206

7 Claims



1. A rotary coupling device of the type including a first rotatable coupling assembly comprising a housing member and a cover member cooperating to define a coupling chamber therebetween, a second rotatable coupling member disposed in said coupling chamber and being rotatable relative to said first rotatable coupling assembly, the forward surface of said second coupling member and an adjacent surface of said cover member cooperating to define a torque-transmitting region therebetween, control means operable to control the amount of torque transmission between said first rotatable coupling assembly and said second rotatable coupling member in response to variations in a predetermined condition, said rotary coupling device being of the type in which the torque-transmitting capability of said coupling device is limited at least in part by the ability of said coupling device to dissipate heat generated as a result of said torque transmission, said cover member including a plurality of cooling fins disposed on the forward surface of said cover member and being operable to dissipate heat transmitted from said torque-transmitting region by said cover member; characterized by:

- (a) said plurality of cooling fins being arranged in a plurality of groups of cooling fins; and
- (b) each of said groups of said cooling fins comprising one cooling fin oriented generally radially, the remainder of said cooling fins in each group being oriented substantially parallel to said one radially-oriented cooling fin, over at least a major portion of the length thereof, thereby to increase substantially the total possible fin length within a given finned area, and the resulting heat dissipation.

# 4,678,071 DIAPHRAGM SPRING CLUTCH COVER ASSEMBLY

Robert J. Ball, Bishops Itchington, and Ian C. Maycock, Leamington Spa, both of England, assignors to Automotive Products plc, Leamington Spa, England

Filed Jun. 23, 1986, Ser. No. 877,354

Claims priority, application United Kingdom, Jul. 10, 1985, 8517470; Feb. 27, 1986, 8604874

Int. Cl.<sup>4</sup> F16D 13/50

U.S. Cl. 192—70.27

19 Claims

1. A diaphragm spring clutch cover assembly comprising a pressure plate, a cover, a diaphragm spring for loading the

2. A bill validator, comprising:  
a vertically elongated casing,  
a bill insertion slot on the lower front of said casing,  
validation sensors, means within said casing for conveying an inserted bill rearwardly and upwardly past said validation sensors,  
an accumulation box forming part of the mid and upper rear of said casing, said accumulation box including a rear channel shaped portion, said channel spaced portion being rotatable backward to permit removal therefrom of an accumulated stack of bills, and  
push plate means within said casing for translating a true validated bill, after upward conveyance, rearwardly into said accumulator box.

# 4,678,073 APPARATUS AND METHODS FOR HANDLING BULK ARRAYS OF ARTICLES

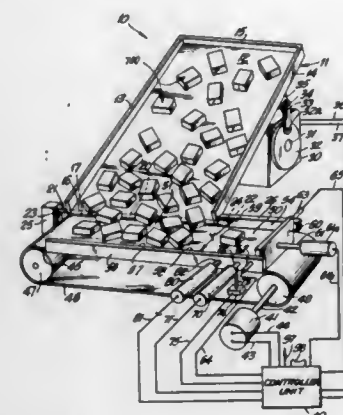
Carl R. Anderson, Arvada, and Gary G. Seaman, Broomfield, both of Colo., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Murray Hill, N.J.

Filed Apr. 4, 1985, Ser. No. 719,934

Int. Cl.<sup>4</sup> B65G 47/19, 47/20

U.S. Cl. 198—396

3 Claims



1. Apparatus for handling bulk array of articles comprising: an upwardly facing hopper tray for receiving said array, said tray having at its front a discharge opening the bottom of which is defined by an edge of said tray, an elongated horizontal conveyor disposed outward of, and tangential to its inner side with, said edge and extending alongside said opening and beyond it to a zone spaced from said opening, motor means for moving said conveyor forward past said opening into said zone, an abutment opposite said edge at the outer side of said conveyor for retaining articles thereon, tray tilting means for displacing said tray's rear up and down relative to its front so as to move said tray between down and up angular positions at which articles on said tray will, respectively, remain on it and slide off it onto said conveyor for transport thereby of said articles to said zone, the tilting of said tray down being adapted to relieve pressure on articles forced on such conveyor against said abutment by articles still on said tray, article sensing means disposed along said conveyor between said opening and the end away from said opening of said zone and adapted to produce signals in response to passage by said sensing means of articles carried by said conveyor from said opening to said zone, jamming of articles on said conveyor resulting in said articles not passing by said sensing means, and a control unit coupled to receive said signals and operable after nonproduction of said signals for a period of time to reversely energize said motor means so as to impart a temporary reverse movement of said conveyor tending to relieve said jamming.

# 4,678,074 APPARATUS FOR SEPARATING OBJECTS (PACKAGES) FROM A CONTINUOUS ROW OF OBJECTS

Heinz Focke, Verden, and Hugo Mutschall, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke and Co., Fed. Rep. of Germany

Continuation of Ser. No. 515,420, Jul. 20, 1983, abandoned. This application Jan. 15, 1986, Ser. No. 818,917

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, 3230533

Int. Cl.<sup>4</sup> B65G 47/26

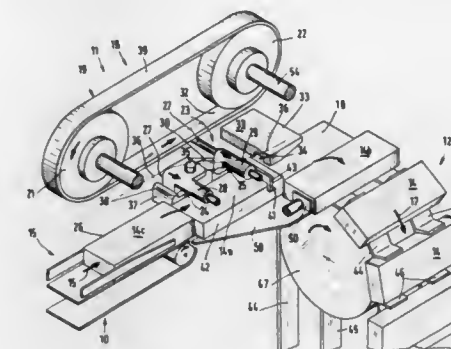
U.S. Cl. 198—457

18 Claims

1. In an apparatus for separating front objects one at a time from a row of objects fed in a densely packed row of end-to-end abutting objects, particularly packages such as cigarette cartons, by transversely pushing away at least the front object of said row, one at a time, said apparatus comprising: a feed

conveyor bearing said row of objects, a transverse pusher conveyor moving generally parallel to said feed conveyor bearing said row of objects, transverse pushers provided on said transverse pusher conveyor which grasp an object laterally and, as the conveying continues, push it away, transverse to the feed conveying direction of said objects, the improvement comprising:

means for moving said transverse pushers (23, 56) relative to said feed conveyor (10) at a speed lower than the speed of movement of said feed conveyor (10) and means for moving said transverse pushers (23, 56) lengthwise along an



essentially linear conveying path transverse to the feed conveying direction (16) at least during the pusher motion.

a discharge conveyor (12) mounted laterally to one side of the feed conveyor (10) on the discharge side of the transverse pushers (23, 56) and in the path of movement of the objects leaving the feed conveyor (10), and  
a stop (49) provided on the discharge conveyor (12) to the side remote from said feed conveyor and said transverse pushers for limiting the movement of objects (14) in their longitudinal direction of movement onto said discharge conveyor.

# 4,678,075 OVERHEAD CONVEYOR CLEANING APPARATUS

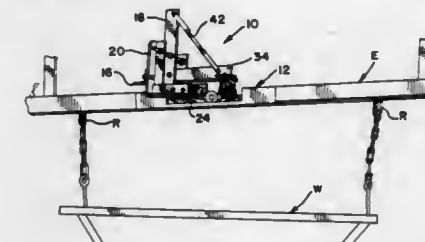
John H. Bowman, Jr., 9723 S. Meade, Oak Lawn, Ill. 60453

Filed Jan. 16, 1986, Ser. No. 819,793

Int. Cl.<sup>4</sup> B65G 45/00

U.S. Cl. 198—496

14 Claims



1. An apparatus for cleaning an overhead conveyor system including a suspended guide rail and a conveyor movable along said rail, said apparatus comprising:

a main support structure configured for fixed mounting on an upper surface of said guide rail;  
at least one generally elongated support arm pivotally mounted on said main support structure by fulcrum means and including a free end portion;  
wire brush means mounted on each said support arm at the free end portion thereof, said brush means comprising a plurality of juxtaposed wire elements engageable with said conveyor as said conveyor moves relative to said guide rail and said brush means; and



threaded adjustment means connected to and extending between said main support structure and each said support arm, said threaded adjustment means being selectively adjustable to move said support arm about said fulcrum means to vary the pressure exerted on said conveyor by said wire brush means, whereby said brush means effects continuous cleaning of debris from said conveyor.

4,678,076

## TRANSFER ASSEMBLY OF BELT CONVEYOR

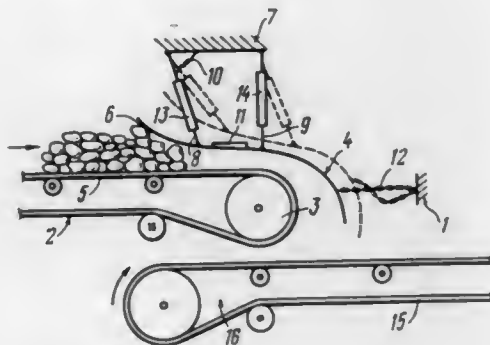
Sergei S. Nenakhov; Robert S. Tilles, both of Moscow; Vitaly V. Savinykh, Moskovskoi; Vladimir A. Dyakov, and Vladimir V. Nikitin, both of Moscow, all of U.S.S.R., assignors to Vsesojuzny Institut Po Proektirovaniyu Organizatsii Energeticheskogo Stroitelstva, Moscow, U.S.S.R.

Filed Oct. 15, 1985, Ser. No. 787,430

Claims priority, application U.S.S.R., Oct. 24, 1984, 3806901  
Int. Cl.<sup>4</sup> B65G 47/19

U.S. Cl. 198—525

4 Claims



1. A transfer assembly of a conveyor belt extending in a longitudinal direction, comprising:

- a rigid frame means;
- a discharge end of the conveyor;
- a discharge drum of the conveyor, said discharge drum being rigidly secured to said frame means at said discharge end of the conveyor;
- a deflector shield means hinged to said frame means on said discharge end of the conveyor, said deflector shield means having a curvilinear portion whose concavity faces said discharge drum and is located after said discharge drum along the conveyor belt travel;
- said deflector shield means having an entry portion located before said discharge drum upstream along the conveyor belt;
- a support means rigidly secured to said frame means at said discharge end of the conveyor;
- at least two rods spaced from each other in said longitudinal direction and downstream with respect to the conveyor belt, and each hinged at one end to said deflector shield means and at an opposite end to said support means in order to ensure hinged suspension of said shield means from said frame means; and
- said rods being connected to said support means and said deflector shield means so that said entry portion of said deflector shield means rises faster than said curvilinear portion in response to the transporting of large pieces of transported material on said conveyor.

4,678,077

## SYSTEM FOR CONTROLLING THE JAWS OF A SELF-CENTERING PLATFORM (PALLET) WHICH CAN BE MOVED BETWEEN FITTINGS (PALLET SUPPORTS) CARRIED BY THE LOADING AND UNLOADING STATION AND THE WORKING STATION OF A MACHINE TOOL

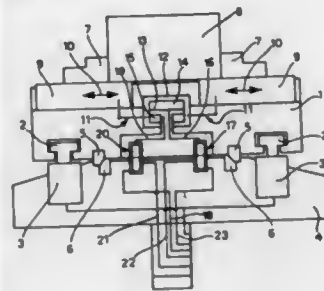
Mario Bertorello, Turin, Italy, assignor to Rotomors S.p.A., Turin, Italy

Filed Feb. 19, 1985, Ser. No. 702,468

Claims priority, application Italy, Dec. 7, 1984, 54134 8/84  
Int. Cl.<sup>4</sup> B23Q 3/00

U.S. Cl. 198—803.01

6 Claims



1. In a machine tool of the type having a loading and unloading station, a working station, respective pallet supports at said stations, and a self-centering pallet provided with jaws and movable between said pallet supports, a system for controlling the jaws of said pallet including a double-acting hydraulic cylinder incorporated in the pallet to control the movements of said jaws, a pair of supply and discharge ducts connected to said cylinder, and a hydraulic control circuit outside the pallet having a pair of ducts communicating with said supply and discharge ducts,

wherein the improvements consist in said ducts of the external hydraulic control circuit being formed in the pallet support of one of said stations, and each of said ducts communicating with one of the supply and discharge ducts through a respective connecting device including: interengageable connectors mounted in correspondence with the mutually-facing surfaces of said pallet and said pallet support, the connector projecting from the pallet support being movable axially;

- a pallet support valve which is connected to the connector on said pallet support and is held open against a resilient force when said connector on said pallet support is engaged in the connector projecting from said pallet during the superpositioning of said pallet on said pallet support;
- a non-return valve recessed in the connector projecting from said pallet;
- a rod passing through the connector projecting from said pallet support and able to advance and open the non-return valve independently of the pallet support valve; and
- a piston connected to said rod to effect the advance of the rod upon the application of a pilot pressure to the piston.

4,678,078

## SLAT CONVEYOR BELT FOR SLAT CONVEYOR

Hugo S. Hastem-Müller, Oettinger Strasse 9, D-8860 Nördlingen, Fed. Rep. of Germany

Filed Dec. 4, 1985, Ser. No. 804,811

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1984, 3445125

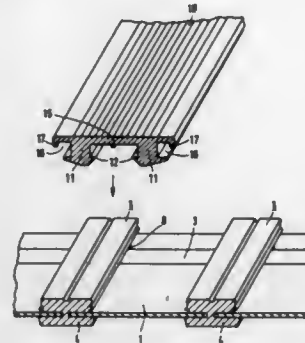
Int. Cl.<sup>4</sup> B65G 47/84

U.S. Cl. 198—803.2

12 Claims

1. In a flat conveyor belt for slat conveyors having a plurality of endless belts operationally arranged in parallel spaced relationship, transverse equally spaced transport ribs secured

to the inner surface of said belts, said ribs being operationally engageable by complementary grooves in at least one driven transport roller, and transverse rest elements integral with said transport ribs and projecting through holes in said belts to the outer surface of said belts, slat positioning means on said rest elements comprising rest ribs having side rest grooves extending over the entire transverse length thereof and providing outer rest lugs, elongated slats cooperable with said positioning



means comprising a pair of spaced longitudinal crosspieces depending from the bottom surface thereof, a longitudinal projection, on each of said crosspieces to provide a pair of opposed projections, said crosspieces and projections being arranged and dimensioned so that the slats are fittable over the rest lugs from above said rest grooves, and a plurality of sharp raised parts integral on said slats or said rest ribs which when operationally press-fitted engage the associated opposed part to secure the slat against longitudinal movement.

4,678,079

## CONTAINER FOR HANGER-SUPPORTED GARMENTS

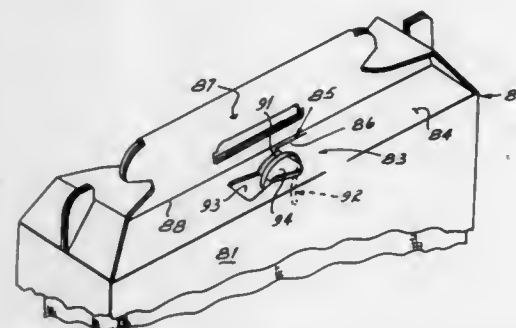
John C. Henning, Fairfield, Ohio, assignor to Product Investment Incorporated, Cincinnati, Ohio

Filed May 15, 1986, Ser. No. 863,462

Int. Cl.<sup>4</sup> B65D 85/18

U.S. Cl. 206—279

16 Claims



1. In a paper-board container for transporting articles supported from a hanger, said container comprising a top wall and handle means associated with the top wall, the improvement comprising a hanger-support structure found in said top wall and comprising a slot having an elongated leg and a transverse leg extending at an angle to said elongated leg, a flap in the top wall adjacent said slot, and an opening in said top wall disposed on the side of said flap remote from said slot, the slot being adapted to receive the hook of said hanger, the flap being foldable under said hook and the opening being adapted to receive the end of said hook.

4,678,080

## VIDEOCASSETTE SLEEVE AND COVER

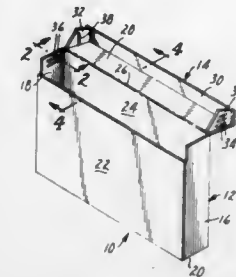
Norman E. Nelson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 3, 1985, Ser. No. 804,060

Int. Cl.<sup>4</sup> B65D 85/672, 43/14

U.S. Cl. 206—387

1 Claim



1. A closed, molded box for storing a videocassette or like object, comprising:  
an open sleeve adapted to accept a said videocassette, said sleeve having rectangularly disposed first and second end walls, a first edge wall and two opposed side walls;  
a cover movable to a closed position wherein said cover defines a second edge wall of said sleeve;  
a living hinge connecting one of said sidewalls of said sleeve and said cover, said hinge, said sleeve and said cover being molded simultaneously and integrally;  
locking walls extending perpendicular to said cover and disposed within, adjacent and parallel to each of said sleeve end walls when said cover is in said closed position; mating projections including at least one raised ridge on at least one of said locking walls projecting toward said locking wall's adjacent end wall and at least one raised detent projecting from at least one of said end walls toward said end wall's adjacent locking wall, said raised ridge and said raised detent being disposed so that said raised ridge must be forced past said raised detent when said cover is moved to said closed position; and  
a videocassette-positioning protrusion projecting toward the other of said locking walls and adapted to contact a said videocassette within said sleeve when said cover is in said closed position, so that said videocassette will force said locking wall raised ridge and said end wall raised detent into engagement.

4,678,081

## MAGAZINE FOR RECORDING TAPE CASSETTES

Herbert Richter, Pforzheim-Bue, Fed. Rep. of Germany, assignor to Herbert Richter, Metallwaren-Apparatebau GmbH & Co., Pforzheim-Bue, Fed. Rep. of Germany

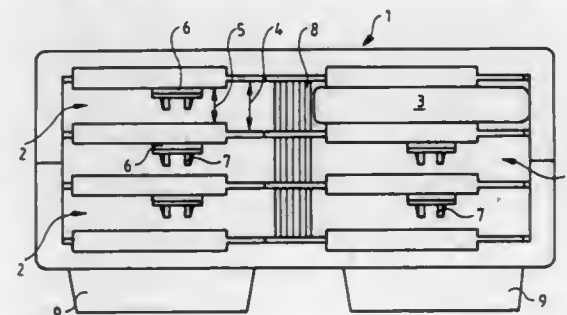
Filed Dec. 13, 1985, Ser. No. 808,603

Claims priority, application European Pat. Off., Sep. 11, 1985, 85111504.8

Int. Cl.<sup>4</sup> B65D 85/67

U.S. Cl. 206—387

11 Claims



1. A magazine for recording tape cassettes especially for use in vehicles, comprising a housing having a number of cham-

bers, each for the reception of one cassette, each said chamber having an opening of a cross-section corresponding to the smaller cross-section of a tape cassette and adapted to receive such cassette lengthwise; said chambers being arranged horizontally and formed by drawer-like building elements stacked on top of one another and compressed within said cassette housing, one being disposed on top of each chamber, each of said building elements having at least one spring leaf cantilevered from each building element so as to extend essentially in the direction of movement of a cassette into, and out of, said chamber, said spring leaf having a free end movable relative to said chamber; a locking member supported at the free end of each spring leaf so as to project downwardly into said chamber for engagement with the hub opening of at least one of a tape cassette's reel hub openings, said locking member including a cam-like rib projection oriented also in the direction of movement of a cassette into, and out of, said chamber, said cam-like rib having cam-like edges adapted to cause the locking member to resiliently back up when a cassette portion is moved past them, each of said building elements having downwardly projecting side walls at opposite sides of said chambers with resilient guide straps disposed at one side thereof and projecting into said chamber and engaging herein any cassette inserted into said chamber so as to force said cassette into engagement also with the opposite wall of said chamber.

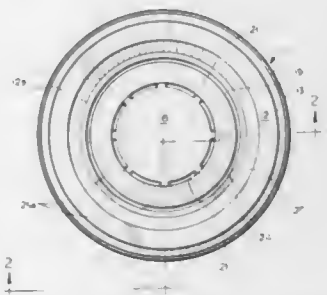
4,678,082

**VACUUM INDICATING THERMOPLASTIC CLOSURE**  
William E. Fillmore, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 10, 1986, Ser. No. 884,244  
Int. Cl.<sup>4</sup> B65D 41/04

U.S. Cl. 206—459

16 Claims



1. In combination with a container containing a vacuum-packed product therein and having a finish portion for receiving a closure to close and seal said container, a closure sealingly engaging the finish portion of said container, said closure comprising, in combination: a top portion spanning the finish of the container; and an annular skirt extending downwardly from the top portion over the upper portion of the finish and securely engaging said finish, said top portion being formed from a thermoplastic material and comprising a generally planar circular inner portion, said top portion further having an inside which faces toward said vacuum-packed product and an outside which faces away from said vacuum-packed product, a first annular portion surrounding said circular inner portion, said closure top portion being thinned on said outside along a first interrupted generally circular line between said circular inner portion and said first annular portion to form a first plurality of narrow, spaced apart bridges along said first interrupted generally circular line, and a second annular portion surrounding said first annular portion, said closure top portion, further, being thinned on the inside along a second interrupted generally circular line between said first annular portion and said second annular portion to form a second plurality of narrow, spaced apart bridges along said second interrupted generally circular line, said circular inner portion, said first annular portion and said second annular portion being integrally formed in one piece with said circular inner portion

being hinged to said first annular portion along said first interrupted generally circular line and said first annular portion being hinged to said second annular portion along said second interrupted generally circular line, the plane of said circular inner portion being movable with respect to the plane of said second annular portion from a first position when there is a vacuum in said container to a second position when there has been a loss of the desired vacuum in said container, with the second position being higher in elevation than the first position when the container is in its normal upright position, said first plurality of narrow, spaced apart bridges and said second plurality of narrow spaced apart bridges being in compression when said circular inner portion is in said first position to assist in moving said circular inner portion to said second position upon said loss of the desired vacuum in said container.

4,678,083

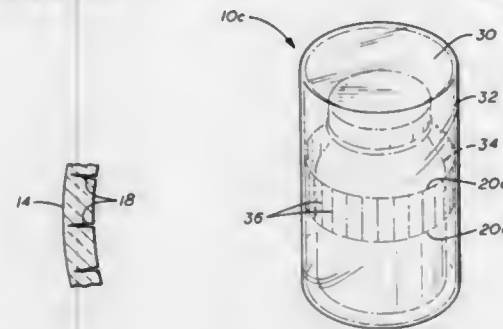
**INTRUSION INDICATING SHIELD FOR CONSUMER PRODUCTS**

David H. Anderson, 13002 Breezeaway, Houston, Tex. 77037  
Filed Jul. 29, 1986, Ser. No. 891,454

Int. Cl.<sup>4</sup> B65D 41/32

U.S. Cl. 206—459

9 Claims



1. An intrusion indicating shield for consumer products in a container having an opening comprising, a body enclosing the opening to the container, said body having at least one elongate perforation on the inside of the body extending outwardly from the interior of the body towards but spaced from the exterior of the body, gripping means on the exterior of the body for manually breaking the body along the perforations for providing access to the container, said body being of a semi-rigid plastic material which discolors when damaged for providing a visual indication of tampering.

4,678,084

**SHIPPING CONTAINER FOR PACKAGING ENDLESS BELTS FOR TRANSPORTATION OR STORAGE**

Lewis W. Maker, Charlotte, N.C., and Horace Nicholson, Mullins, S.C., assignors to United States Supply Company, Charlotte, N.C.

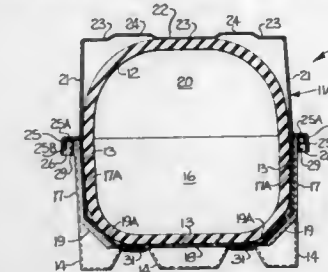
Filed Dec. 17, 1985, Ser. No. 810,055  
Int. Cl.<sup>4</sup> B65D 19/00

U.S. Cl. 206—597

31 Claims

1. A generally rectangularly shaped container for facilitating the shipment, storage and removal of heavy, bulky and deformable endless belts of a generally cylindrical configuration and of a type used in the textile industry for shrinking fabrics, said container comprising top and bottom members cooperatively engaging each other to form a hollow closed chamber, said top and bottom members each being integrally molded of relatively thick plastic material, said top member comprising opposing pairs of side and end walls and a top wall, said bottom member comprising opposing pairs of side and end walls, a bottom wall, and interposed wall portions extending at an

angle between said bottom and side walls and interconnecting the same, said interposed wall portions being adapted to serve for preventing deformation of a belt by providing stabilizing underlying support for the belt portions resting thereon and belt portions extending upwardly therefrom for maintaining the generally cylindrical configuration of the belt so as to prevent the formation of creases in the belt, and a plurality of



spaced apart projecting members extending downwardly from said bottom wall, said interposed wall portions and said adjacent side walls, said projecting members defining supporting feet for the container, and wherein said projecting members are arranged so as to define forklift channels therebetween adapted to receive the forks of a forklift truck for facilitating the lifting and transporting of the container.

4,678,085

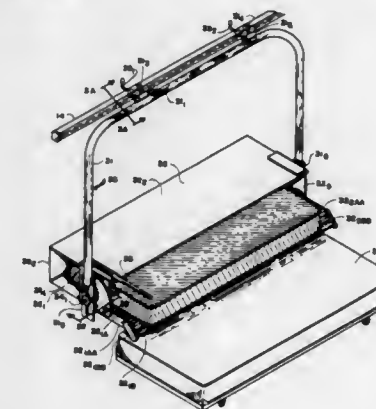
**APPARATUS FOR THE DISPLAY AND STORAGE OF MATTRESSES**

Daniel D. Sando, 11888 Longridge Dr., Baton Rouge, La. 70816  
Filed Sep. 5, 1986, Ser. No. 903,706

Int. Cl.<sup>4</sup> A47F 7/00

U.S. Cl. 211—28

20 Claims



1. Apparatus for the display and storage of mattresses which, in combination, comprises  
a housing, inclusive of floor frame, supports and ceiling frame, providing mattress display and storage areas,  
a plurality of overhead tracks mounted upon and supported by the ceiling frame of said housing, each track being independently mounted and parallel one track with respect to another,  
a plurality of mattress display and storage carriages corresponding in number to the number of tracks, each being suspended from and independently mounted on a track such that mattresses contained within said mattress display and storage carriages can be stored in tandem within said storage area, and independently transported upon the track from which it is suspended and mounted to said display area, and  
a box spring located within the display area, the box spring being movable about the floor of the display area for receipt of mattresses from the mattress display and storage carriages.

4,678,086

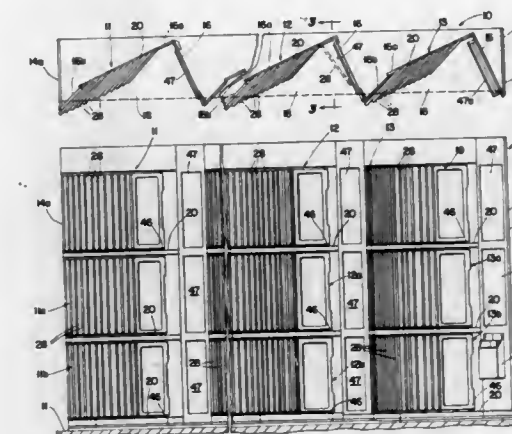
**PAGE TYPE DISPLAY FIXTURE WITH SELF RETURN FEATURE**

Charles H. Nervig, Berea, and Vance E. Dimmick, Strongsville, both of Ohio, assignors to American Greeting Corporation, Cleveland, Ohio

Filed Oct. 1, 1984, Ser. No. 656,354  
Int. Cl.<sup>4</sup> A47F 7/16

U.S. Cl. 211—47

19 Claims



1. A display fixture comprising a base frame, a series of generally side-by-side swingable page members, each having means thereon for supporting an article for display purposes, each of said page members being pivotally mounted for swinging movement on said base frame in a generally horizontal plane and with respect to respective generally vertically spaced pivots on said base frame, the lower one of each pair of said pivots having self return means for causing each said page member to automatically move by gravity into a predetermined reposed position with respect to said base frame and with respect to the adjacent page members, said reposed position being one wherein the respective page member is disposed at a predetermined acute angle with respect to a generally vertical plane passing through said lower pivots of said series of page members, and wherein said self return means comprises a generally horizontal base section and a pair of inclined, generally helical upwardly extending camming surfaces coacting with each said lower pivot in generally surrounding relation with the respective lower pivot, and the respective of said page members includes a rider section spaced from the pivotal axis of the page member and which is adapted for camming engagement with one of the respective said pair of camming surfaces whereby said respective page member is urged into aid predetermined reposed position with respect to said base frame and with respect to the other page members of said series, said surfaces at their lower ends commencing at said base section in generally equal laterally spaced relation to said vertical plane and curving smoothly upwardly from said base section and in the general direction of said vertical plane, whereby when each of said page members are automatically urged to said reposed position, said rider section of the respective page member is disposed at said lower end of the respective said one surface, said self return means being utilizable for either right hand or left hand orientation of a respective series of said page members.

4,678,087

**MODULAR SKI RACK**

Randall A. York, 16791 Summer Cloud La., Huntington Beach, Calif. 92646

Filed Feb. 21, 1985, Ser. No. 704,770  
Int. Cl.<sup>4</sup> A47F 7/00

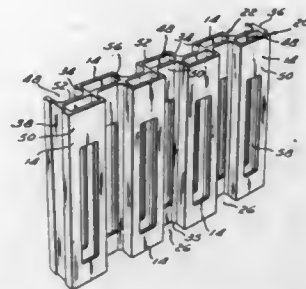
U.S. Cl. 211—70.5

19 Claims

1. A ski rack comprising a plurality of vertically elongated



pockets in which the tail end of a pair of skis can be supported, said pockets having an open top through which the skis are introduced and removed, said pockets being aligned to form a substantially linear rack with a front row and rear row of pockets which are substantially parallel, the pockets forming the front row of the rack being spaced from each other and the



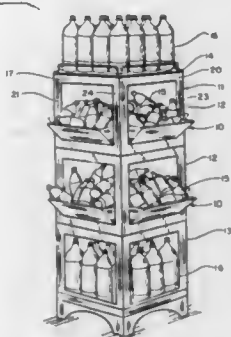
pockets forming the rear row of the rack also being spaced, but staggered relative to the front pockets so that where there is a space between front pockets, there is a rear pocket, and vice versa, the width of the spaces between adjacent pockets in a row being less than the width of one of said adjacent pockets, enabling close, edge to edge packing of skis within a short linear space, without entanglement of the ski bindings.

**4,678,088**  
**COLLAPSIBLE DISPLAY AND STORAGE CONTAINER**  
Paul Flum, Ladue, Mo., assignor to Paul Flum Ideas, Inc., St. Louis, Mo.

Filed Apr. 28, 1986, Ser. No. 856,284  
Int. Cl.<sup>4</sup> A47B 47/06

U.S. Cl. 211-73

30 Claims



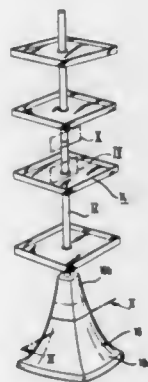
1. A collapsible display container comprising a sheet of material having top and bottom surfaces and a plurality of side edges, said sheet including means for weakening said sheet along a portion thereof, said weakening means being positioned at an intermediate location spaced from said plurality of side edges and defining a central panel portion within said sheet, portions of said sheet located between said weakening means and said plurality of side edges defining a plurality of side panels, each of said side panels being movable about said weakening means in at least one direction relative to said central panel portion, and a plurality of connecting panels each positioned respectively between and joining adjacent side panels, each of said connecting panels having at least a portion thereof movable to a position out of the planes of said side panels and in a direction towards said central panel portion.

**4,678,089**  
**DISPLAY STAND**  
Franz J. Lang, Kelkheim, Fed. Rep. of Germany, assignor to Display-Design GmbH für moderne Verkaufsförderungsmittel und Raumausstattung, Kelkheim, Fed. Rep. of Germany  
Filed Jun. 27, 1985, Ser. No. 749,309  
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428554

Int. Cl.<sup>4</sup> A47F 3/14

U.S. Cl. 211-133

10 Claims



1. A display stand comprising a pedestal (10), a carrier column (12) supported by the pedestal (10) and at least one goods carrier (14) secured on the carrier column (12), said pedestal (10) comprising a lower part (10a) and an upper part (10b), said lower part (10a) having a base portion (10h) and an upwardly tapered sleeve portion (10i) above said base portion (10h), said tapered sleeve portion (10i) being provided with an upper transversal wall having a central opening (10k), said upper transversal wall (10k) being provided in a central part thereof with a downwardly tapered reception pit (10c), said reception pit (10c) being provided with an upper ledge and a bottom wall (10l) at the lower end thereof, said bottom wall (10l) being provided with an upwardly directed projection (10d), a detachable centering washer (10e) covering the upper end of said column reception pit (10c), said centering washer (10e) having lateral peripheral extensions which pass downwardly through corresponding slots in the edge of the transversal wall central opening, wherein upon rotation of said washer, said extensions are misaligned from said slots thereby locking said washer between the transversal wall and said upper ledge; to the upper end of said carrier column reception pit (10c) on about the level of said upper transversal wall (10k) by bayonet catch means, said centering washer (10e) having a central opening (10m), said carrier column being a hollow tube having an inner cross-sectional area receiving said fixing projection (10d) and an outer cross-sectional area received by said central opening (10m) of said centering washer (10e), said upper part (10b) having a sleeve portion (10n) and an upper terminal wall (10o), said sleeve portion (10n) of said upper part (10b) being a smooth upwardly tapered continuation of said sleeve portion (10i) of said lower part (10a), an inwardly recessed fixation step (10p) being provided adjacent the upper end of said tapered sleeve portion (10i) of said lower part (10a), said tapered sleeve portion (10n) of said upper part (10b) having a lower edge portion (10q), said lower edge portion (10q) being received by said inwardly recessed fixation step (10p).

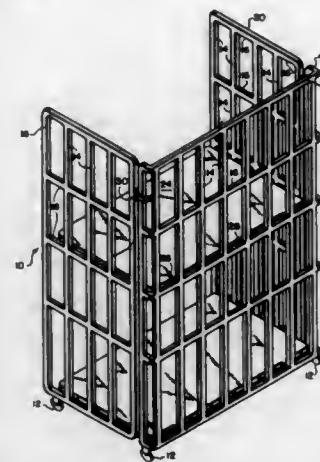
**4,678,090**  
**LATCH**

Sherwood B. Ross, Miami, Fla., assignor to Ross Bicycles Inc., Rockaway Beach, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,756

Int. Cl.<sup>4</sup> A47F 5/00

U.S. Cl. 211-150



1. An improved latch for selectively securing and releasing a shelf in a storage unit having side and rear panels and hinge means connecting said side panels to said rear panel, comprising:

a pivot leg rotatable about a bolt means of said hinge means;  
a first connecting leg extending at an approximate angle of 90° from said pivot leg and said first connecting leg extending along a respective side panel and outside said storage unit;  
a second connecting leg extending at approximately an angle of 45° from said first connecting leg; and  
a support leg extending at an approximate angle of 45° from said second connecting leg and extending within said storage unit to selectively secure said shelf in a storage position.

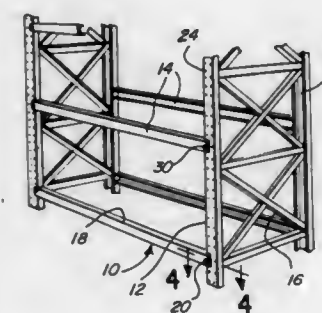
**4,678,091**  
**BEAM TO COLUMN CONNECTION**  
Anthony N. Konstant, Winnetka, and John J. Welder, Arlington Heights, both of Ill., assignors to Konstant Products, Inc., Skokie, Ill.

Filed Aug. 7, 1986, Ser. No. 894,363

Int. Cl.<sup>4</sup> A47F 5/00

U.S. Cl. 211-191

9 Claims



1. In a structure which comprises at least one column connected to at least one beam positioned in transverse relation to said column, said column defining a first aperture and said beam defining a second aperture, the improvement comprising, in combination:

means for retaining said beam and column in tight contact in which said first and second apertures overlap each other in offset relation, said means including bolt means extending through said overlapping apertures, said first and second apertures being each of larger diameter than said bolt means, the distance of overlap between said first and

second apertures in said positions of registry being less than the diameter of said bolt means.

**4,678,092**  
**DISPOSABLE BABY BOTTLE**

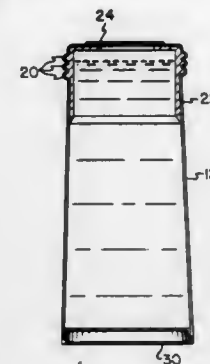
Melody A. Rane, 501 Ryan Ct., Eureka, Calif. 95501

Continuation of Ser. No. 677,291, Dec. 3, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 874,900

Int. Cl.<sup>4</sup> A61J 9/00

U.S. Cl. 215-11 E

1 Claim



1. A disposable cartridge feeding bottle for cooperative engagement to a baby bottle nipple and baby bottle retaining ring, said baby bottle retaining ring including an aperture through which said nipple is pushed and maintained and having downwardly depending female threads for engagement to male threads on the outside of said feeding bottle;

said disposable cartridge feeding bottle comprising:  
a pouch, constructed from a substantially cylindrical, lightweight, flexible, liquid impermeable plastic, said pouch configured as a frustum having an enlarged, enclosed, lower end and an upper end extending upwardly to and toward a nipple receiving end of said bottle;

a substantially rigid ring member, circumferentially coupled to the inside of said pouch proximate the upper end thereof, said substantially rigid ring member having a frustum shape complementary to the frustum shape of the upper end of said pouch;

said substantially rigid ring member further defining on the exterior surface thereof a plurality of male spiral threads disposed about the circumferential surface thereof and adapted to cooperate with the female threads of said baby bottle retaining ring;

the upper end of said frustum shaped pouch conformed to and over the exterior surface of said frustum shaped substantially rigid ring member and over the exterior surface of said male defined threads and onto and over an inwardly extending annulus defined at the upper end of said threads whereby said lightweight, flexible, liquid impermeable plastic covers said ring member;

a sealing cover disposed to overlay the open of said pouch at said ring member over said annulus whereby said annulus forms a rigid contact surface for adhering said sealing cover over the top of said pouch, said sealing cover including an outwardly extending pull tab integrally formed at one edge of said sealing cover and adapted to cooperate with the sealing cover so that said bottle may be grasped by pulling upwardly on the tab when it is desired to obtain access to food product contained within said sealed pouch;

said substantially rigid ring member and pouch defining at the portion of said pouch overlying the threads on said ring member the threads for said baby bottle retaining ring whereby said nipple and baby bottle retaining ring can be threaded onto said ring members; and

a self-supporting rim comprising a crimped, reinforced circular rim provided at the lower end of said pouch.

4,678,093

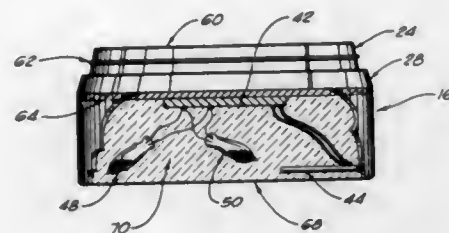
## MUSICAL BABY BOTTLE

Sammy G. Allen, Magnolia, Tex., assignor to Ronny Sewalt, Magnolia, Tex.

Filed Dec. 19, 1985, Ser. No. 811,102  
Int. Cl.<sup>4</sup> A61J 9/00; G10H 5/04

U.S. Cl. 215-11 R

3 Claims



## 1. A musical baby bottle comprising:

- a nipple;
- a liquid container connected to said nipple such that a liquid passes from said liquid container to said nipple, said liquid container having an opening at the end opposite said nipple;
- a base section fastened to said opening of said liquid container, said base section having a generally round exterior configuration, said base section having a beveled upper surface which engages the inner surface of said liquid container, said beveled upper surface slidably engaging said inner surface of said liquid container, said base section having a lip extending from said beveled upper surface, said lip engaging said inner surface of said liquid container, said base section having a flat surface across the top of said beveled upper surface, said flat surface sealing the interior of said base section from the interior of said liquid container, said base section having a shoulder area formed at the bottom of said beveled upper surface, said shoulder abutting the end of said liquid container;
- a microchip having musical information encoded therein, said microchip fastened to the interior portion of said base section, said microchip fastened to the side of said flat surface opposite the interior of said liquid container;
- an insulating layer fastened to the side of said flat surface opposite the interior of said liquid container, said microchip fastened to the opposite side of said insulating layer from said flat surface;
- a speaker electrically connected to said microchip, said speaker fastened within the interior of said base section, said speaker being a generally flat speaker, said speaker positioned adjacent an outer surface of said base section;
- a battery electrically connected to said microchip, said battery fastened within the interior of said base section; and
- switch means electrically connected to said microchip, said switch means for selectively activating said microchip, said switch means responsive to external stimulus acting on said baby bottle, said switch means comprising:
  - a first mercury switch fixedly positioned within said base section, said first mercury switch tilted such that the off-position of said switch is tilted toward the bottom of said base section, the on-position of said first mercury switch being farther from the bottom of said base section than said off-position;
  - a second mercury switch fixedly positioned within said base section, said second mercury switch being angularly offset by 90 degrees from said first mercury switch; and
  - a third mercury switch fixedly positioned within said base section, said third mercury switch angularly offset by 90 degrees from both said first mercury switch and said second mercury switch, said second and third mercury switches having an off-position closer to the bottom of said base section than the on-position, said first, second and third mercury switches responsive to an angular

movement of said baby bottle, said first, second and third mercury switches connected to said microchip such that when any of said mercury switches are in the on-position, the microchip is activated to release the encoded musical information.

4,678,094

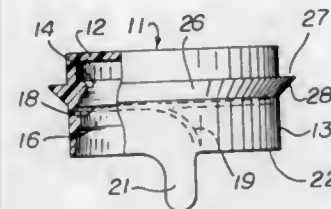
## TAMPER-RESISTANT CONTAINER CAP

Joseph J. Bullock, Atherton, Calif., assignor to Bankers Trust Co., New York, N.Y.

Filed Apr. 29, 1986, Ser. No. 857,197  
Int. Cl.<sup>4</sup> B65D 41/48

U.S. Cl. 215-256

17 Claims



1. A tamper-resistant tearable cap for a container comprising a top disk, a skirt depending from the periphery of said top disk, bead means on the interior of said skirt cooperable with cooperating means on a container neck to secure said cap on said neck while said skirt is intact, score means on said skirt, a tear tab on said skirt adjacent said score means whereby upon pulling said tear tab said skirt may be torn to disengage said bead means from said cooperating means, and a peripheral flange on the exterior of said skirt located substantially below said disk, said score means comprising a horizontal circumferential score line and said flange being located immediately above said circumferential score line, said flange preventing tearing of said skirt above the level of said flange.

4,678,095

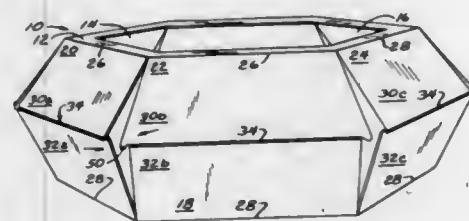
## COLLAPSIBLE CONTAINER

Earl D. Barnett, Glenview, and Robert W. Mundstock, Schaumburg, both of Ill., assignors to Chicago Show Printing Co., Morton Grove, Ill.

Filed May 2, 1986, Ser. No. 858,685  
Int. Cl.<sup>4</sup> B05D 5/36

U.S. Cl. 220-4 F

5 Claims



1. A one piece collapsible container comprising:
- (a) a bottom panel of polygonal shape having at least three sides;
  - (b) a top panel of polygonal shape having the same number of sides as the bottom panel;
  - (c) a plurality of side panels hingedly secured to said top and bottom panels, respectively, the top side panels also being hingedly connected to the bottom side panels to permit movement between deployed and collapsed positions, said top and bottom side panels folding outwardly to a substantially flat, juxtaposed position when the container is collapsed;
  - (d) interlocking means carried by said top and bottom side

panels for securing top side panels to the bottom side panels in the deployed position.

4,678,096

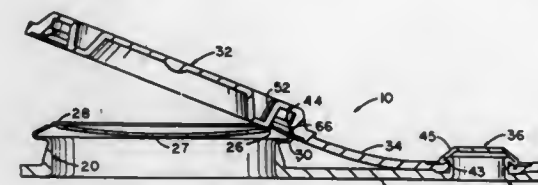
## INTEGRAL RIVET

Robert L. LaBarge, Ben Avon Borough, and Frank E. Maier, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 738,975, May 29, 1985, Pat. No. 4,580,692. This application Apr. 3, 1986, Ser. No. 847,772  
Int. Cl.<sup>4</sup> B65D 17/46

U.S. Cl. 220-273

5 Claims



1. A rivet integral with a sheet metal panel for fastening an object to the panel, comprising:
- a hollow cylindrical shank projecting upwardly from the panel;
  - an end wall across the shank end away from the panel; and
  - a flange extending outwardly from the shank and downwardly from the periphery of the end wall.

4,678,097

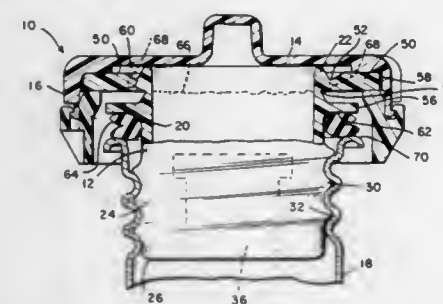
## BREAKAWAY GAS GAP

Billy G. Crute, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Filed Jul. 9, 1986, Ser. No. 883,563  
Int. Cl.<sup>4</sup> B65D 41/04, 41/32

U.S. Cl. 220-288

10 Claims



1. A cap for closing an automobile fuel fill neck comprising:
- an axially extending housing adapted to engage and seal said neck;
  - said housing having a radially outwardly extending first flange on the axially upper portion of said housing, said first flange including a frangible portion;
  - an outer cover attached to said first flange;
  - said housing also having a radially outwardly extending second flange spaced axially downwardly from said first flange, said second flange configured to engage a gasket in said fill neck to seal said neck, whereby an impact on said outer cover will fracture said frangible portion of said first flange leaving said housing and said second flange intact to seal said neck.

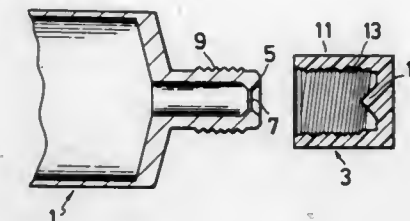
4,678,098  
FASTENING STRUCTURE OF TUBE AND CAP ASSEMBLY

Yasuo Oka, 23-24 Yohsai, Momoyama-cho, Fushimi-ku, Kyoto-shi, Kyoto-fu, Japan

Filed Mar. 24, 1986, Ser. No. 843,234  
Int. Cl.<sup>4</sup> B65D 41/04

U.S. Cl. 220-289

9 Claims



1. A fastening structure of a tube and cap assembly, comprising:
- a mouth member projecting outwardly from said tube;
  - a first threaded portion formed on the periphery of said mouth member;
  - a cap with a second threaded portion formed on the inner surface thereof, said second threaded portion being screwed on said first threaded portion of said mouth member to constitute a tube and cap assembly and being selectively unscrewable therefrom;
  - one of said threaded portions made of material having a certain predetermined degree of hardness;
  - an unthreaded stopper portion formed on the other of said threaded portions, said unthreaded stopper portion made of plastic material softer than the hardness of said one threaded portion such that the screwing motion of said cap on said mouth member toward said tube is stopped by the stopper portion when said cap is screwed with torque not exceeding a limit value; and
  - when said cap is screwed with torque exceeding the limit value, said screwing motion of said cap plastically deforms said unthreaded stopper portion to overcome the resistance of the unthreaded stopper portion and is continued until a leading end inner surface of said cap abuts against a part of said mouth member.

4,678,099

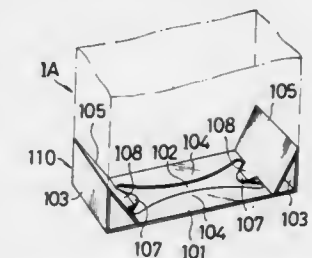
## CONTAINER FOR STORING STACK OF THIN AND SOFT SHEET MATERIALS

Sumio Matsui, 5-7, Kitami 9-chome, Setagaya-ku, Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 783,342  
Claims priority, application Japan, Feb. 19, 1985, 60-29390; Aug. 29, 1985, 60-188504

U.S. Cl. 221-48

4 Claims



1. A container having a discharge port on the underside of said container for containing therein a stack of thin and soft sheets of material having edges overlapping folded portions of adjacent sheets so that after dispensing of one sheet a leading end of a next sheet protrudes through said discharge port to be



ready for a subsequent dispensing operation by a user, said discharge port being defined by a least one pair of opposing flexible lugs and being enlarged by said one sheet when the sheet is drawn out of the container while contacting and pushing down initially one of said flexible lugs and then contacting and pushing down the other one of said flexible lugs, at least one pair of opposing upper bolster members being disposed above said flexible lug pair for bearing the weight of said stack of thin and soft sheets of material and for guiding said thin and soft sheets of material to said discharge port, each tip end of said pair of opposing upper bolster members protruding beyond the marginal edge of said discharge port downwards beyond the underside of said flexible lugs.

3. A container having a discharge port on the underside of said container for containing therein a stack of thin and soft sheets of material having edges overlapping folded portions of adjacent sheets so that after dispensing of one sheet a leading end of a next sheet protrudes through said discharge port to be ready for a subsequent dispensing operation by a user, said discharge port being defined by at least one pair of opposing flexible lugs and being enlarged by said one sheet when the sheet is drawn out of the container while contacting and pushing down initially one of said flexible lugs and then contacting and pushing down the other one of said flexible lugs, at least one pair of opposing upper bolster members being disposed above said flexible lug pair for bearing the weight of said stack of thin and soft sheets of material and for guiding said thin and soft sheets of material to said discharge port, each tip end of said pair of opposing upper bolster members abutting against the underside of each of the flexible lugs so that each of said pair of flexible lugs is bent downwards to guide the thin and soft sheet materials to be drawn out of said container.

4,678,100

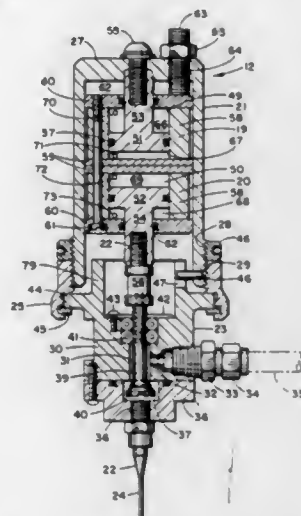
# VARIABLE FLOW RATE DISPENSING VALVE ASSEMBLY

William A. Gelinas, Hadley, Mass., and Robert N. McDermott, Wethersfield, Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Jun. 17, 1985, Ser. No. 745,655  
Int. Cl.<sup>4</sup> B05C 11/00

U.S. Cl. 222—52

9 Claims



1. A material dispensing valve comprising: back to back, first and second cylinders comprising closed bodies defining respective internal first and second chambers, first and second pistons in sliding arrangement within said respective first and second internal chambers, said pistons dividing each such chamber into a first section adjacent one side of each respective piston and a second section adjacent the other side of each respective piston, first and second piston rods connected to said respective first and second pistons, said piston rods extending in

opposing directions and outwardly of said bodies, said sections being arranged such that the second section of each chamber are arranged adjacent one another;

a first port in said first body arranged to communicate with said first section of said first chamber;

a second port in said first body arranged to communicate with said second section of said first chamber;

a third port in said second body arranged to communicate with said second section of said second chamber;

a fourth port in said second body arranged to communicate with said first section of said second chamber;

said ports being adapted for alternatively pressurizing or exhausting chamber sections;

a housing for supporting said bodies for movement relative thereto, said first piston rod being secured to said housing;

means connected to said housing for rapidly and precisely dispensing said material without excess on a workpiece,

said dispensing means including a valve for controlling the dispensing rate of said material and actuating means for selectively positioning said valve in at least three positions

providing at least a high dispense rate for a first position, a low dispense rate for a second position and no dispense rate for a third position, said actuating means comprising

said first and second cylinders wherein said valve is connected to said second piston rod; and

control means for selectively controlling said actuating means for pressurizing or exhausting said respective sections of said cylinders through said ports to adjust said valve to a desired valve dispensing position wherein said

first valve position is obtained by said first port being exhausted, said second port being pressurized, said third port being pressurized and said fourth port being exhausted,

said second valve position is obtained by said first port being pressurized, said second port being exhausted, said third port being pressurized and said fourth port being exhausted,

said third valve position is obtained by said first port being pressurized, said second port being exhausted, said third port being pressurized and said fourth port being exhausted,

said third port being pressurized and said fourth port being exhausted, said third valve position is obtained by said first port being pressurized, said second port being exhausted, said third port being pressurized and said fourth port being pressurized whereby said valve is operationally

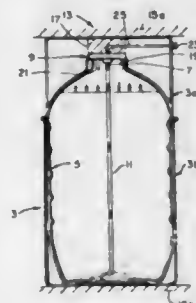
responsive to the movement of said second piston rod to provide said at least three valve positions.

4,678,101  
DISPENSING CONTAINER CLOSURE

Harold L. Nitchman, 1230 Parody, St. Charles, Mo. 63301, and William B. Cunningham, Jr., 916 Woodshire, Creve Coeur, Mo. 63141  
Continuation-in-part of Ser. No. 487,561, Apr. 22, 1983, Pat. No. 4,531,656, which is a continuation-in-part of Ser. No. 439,115, Nov. 4, 1982, which is a continuation-in-part of Ser. No. 363,511, Apr. 2, 1982, Pat. No. 4,491,247, which is a continuation-in-part of Ser. No. 285,611, Jul. 21, 1981, Pat. No. 4,440,319. This application Jul. 25, 1985, Ser. No. 759,073  
Int. Cl.<sup>4</sup> B67B 7/24

U.S. Cl. 222—82

4 Claims



1. In a pressurized liquid dispensing system comprising a container having a mouth, said container being of a suitable

synthetic resin and being incapable of withstanding internal pressurization forces necessary for pressure dispensing of said liquid, means receiving said container for withstanding axial and circumferential pressure forces exerted on said container upon internal pressurization thereof, said pressure withstanding means comprising a shroud body receiving at least a portion of said container, a shroud top telescopically received by said shroud body, and means for securing said shroud body and shroud top together so that said shroud body and shroud top withstands circumferential pressure forces and said securing means withstands axial pressure forces, said shroud top having a first puncturing tube disposed along the axial centerline of said shroud top through which liquid from within said container may be dispensed, and a second puncturing tube located radially outwardly from said first puncturing tube which may be selectively connected to a source of compressed gas, wherein the improvement comprises: a closure for closing said mouth of said container, means for sealably securing said closure to said mouth, a dip tube operatively associated with said closure, said dip tube being located generally at the center of said closure, said closure having a first puncturable area at the center of said closure in register with said dip tube for closing said dip tube and a second puncturable area located radially outwardly from said dip tube and extending circumferentially around said first puncturable area such that with said container received within said shroud body and with said shroud top telescopically applied to said shroud body, said first puncturing tube is in axial register with said first puncturable area and said second puncturing tube is in register with said puncturable area without the necessity of rotatably aligning said container and said shroud top relative to one another such that upon inward axial movement of said shroud top with respect to said shroud body said first puncturing tube punctures said first puncturable area thereby to open communication with said dip tube and said first puncturing tube and said second puncturing tube punctures said second puncturable area at any circumferential position therearound in register with said second puncturing tube thereby to admit said compressed gas into said container for the pressurized dispensing of said liquid via said dip tube.

4,678,102

# CONTAINER HAVING A HOOKED-SHAPED MEMBER SLIDABLY ATTACHED THERETO

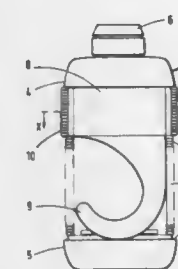
Geoffrey A. Ryder, Welwyn Garden City, England, assignor to Beecham Group p.l.c., England

Filed Oct. 1, 1985, Ser. No. 782,507  
Claims priority, application United Kingdom, Oct. 3, 1984, 8424958

Int. Cl.<sup>4</sup> B67D 5/06

U.S. Cl. 222—181

5 Claims



1. A container for dispensing viscous liquids, comprising a hollow resiliently deformable body having top and bottom ends connected by a body wall, a valve cap mounted at the top end of the body, and a hook-shaped member attached to the body for slidable movement along the body wall in a direction between the top and bottom ends, the hook shaped member comprising an arcuate portion arranged to encircle at least partially the deformable body, and a hook depending from the arcuate portion and extending in a direction parallel to the body wall and being shaped and contoured to follow the body

cross-section, the body and the hook-shaped member having mutual stop means to limit slidable movement of said hook-shaped member between a retracted position which causes said hook to lie along said body wall and not project beyond the bottom end of the body and an extended position which causes said hook to project beyond said bottom end, whereby the member may be extended to suspend the container in an inverted position and retracted when the container is not in use.

4,678,103

# PLURAL-CHAMBERED DISPENSING DEVICE EXHIBITING CONSTANT PROPORTIONAL

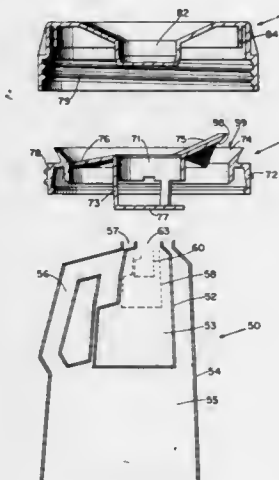
CO-DISPENSING AND METHOD FOR MAKING SAME  
Robert S. Dirksing, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 27, 1986, Ser. No. 844,919

Int. Cl.<sup>4</sup> B67D 5/56

U.S. Cl. 222—130

15 Claims



1. A device for simultaneously dispensing at least two flowable products by the force of gravity alone, said device comprising:

(a) an outer container defining an outer chamber and having an upper portion, said outer chamber adapted to contain a first flowable product, said upper portion having a first discharge opening;

(b) an inner container defining an inner chamber adapted to contain a second flowable product and being fixedly disposed within said outer container, said inner container having a second discharge opening; and

(c) a third empty container disposed within said inner chamber, said third empty container being so shaped and fixedly positioned relative to said inner and outer containers that incremental dispensing of said first and second flowable products is maintained at a substantially constant, predetermined ratio.

4. A device for simultaneously dispensing at least two flowable products by the force of gravity alone, said device comprising:

(a) an outer container defining an outer chamber and having an upper portion, said outer chamber being adapted to contain a first flowable product, said upper portion having a first discharge opening therein; and

(b) an inner container defining an inner chamber adapted to contain a second flowable product and being fixedly disposed within said outer container, said inner container having a second discharge opening, said inner container being so shaped and fixedly positioned relative to said outer container that the impact of said inner container on the pouring characteristics of said first flowable product in said outer container is simulated on the pouring charac-

teristics of said second flowable product in said inner container, whereby incremental dispensing of said first and second flowable products is maintained at a substantially constant, predetermined ratio without either said first or said second discharge openings becoming inundated by said first or said second flowable products, respectively.

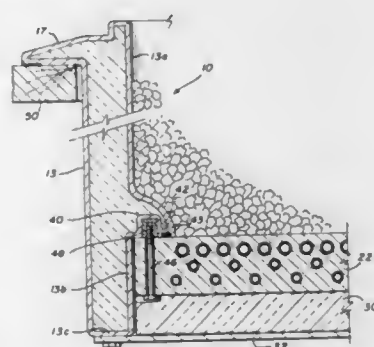
4,678,104

**COLD PLATE FOR BEVERAGE DISPENSING**  
James D. Pritchett, Plano, Tex., assignor to Booth, Inc., Dallas, Tex.

Filed Nov. 13, 1984, Ser. No. 670,618  
Int. Cl.<sup>4</sup> B67D 5/62

U.S. Cl. 222—146.6

6 Claims



1. A cooling system for dispensing beverages comprising:
- a tubular tub member, adapted for disassembly with a cooperating cooling-plate, open at the top and bottom and defining an inner wall, said tub member having a ledge portion extending from the inner wall of the tub member into the interior thereof about the entire periphery of the inner wall at a given distance from the bottom of the tub member, said ledge having a planar downwardly facing rabbet and a channel;
  - a flat cast metal cooling plate, adapted for disassembly from the tub member, having syrup and water cooling coils cast in said plate, said metal plate having a plurality of bolt receiving holes passing therethrough distributed about the periphery of the metal plate near the exterior edges of the metal plate;
  - a resilient gasket for positioning between the downwardly facing rabbet of said tub and the top of the plate to form a watertight seal between the plate and the tub;
  - said channel adapted to receive a plurality of threaded inserts, said inserts opening through the rabbet;
  - a plurality of bolts, each bolt inserted through a hole in said metal plate from the bottom of the plate to threadedly engage a threaded insert to compress the resilient gasket between the top surface of the metal plate and the rabbet to form a water tight seal therebetween, said bolts thereby adapted for disassembly of the plate from the tub member, whereby said tub member may be readily repeatedly filled with ice for maintaining said plate at a low uniform temperature while cooling cold beverages which pass through said coils and which may readily disassemble for ease of repair and cleaning.

4,678,105

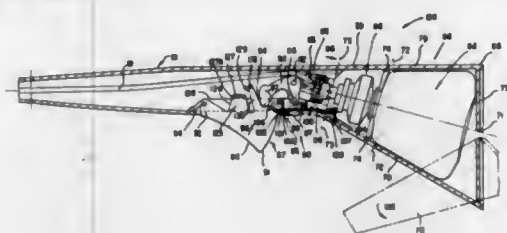
**SAFETY LOCK MECHANISM FOR CLEANING WAND**  
Samuel C. Heck, San Antonio, Tex., assignor to Sani-Fresh International, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 592,945, Mar. 23, 1984, which is a continuation-in-part of Ser. No. 478,516, Mar. 24, 1983, Pat. No. 4,534,669. This application Sep. 20, 1984, Ser. No. 652,864

Int. Cl.<sup>4</sup> B67D 5/32

6 Claims

U.S. Cl. 222—153



1. A cleaning wand having a safety lock mechanism, comprising:
- a handle;
  - a cleaning head on one end of said handle;
  - a trigger pivotally mounted within a slot in said handle;
  - a pivotal door on an end of said handle opposite said cleaning head; and
  - a button having an elongate engagement member connected thereto in operative engagement therewith, said button connected to said engagement member in approximately the center of said engagement member, said engagement member having a first end toward said cleaning head and a second end toward said door, said button received within a button slot within said handle, said button alternately slidable within said button slot to a first position toward said cleaning head, a second position in approximately the center of said button slot, and a third position toward said door, said trigger being adapted for alternate engagement with or disengagement from said first end of said engagement member, said door having a stop member for alternate engagement with or disengagement from said second end of said engagement member, said first end of said engagement member engaging said trigger and said second end of said engagement member being disengaged from said stop member when said button is in said first position, to impede pivoting of said trigger and permit opening of said door, said first end of said engagement member engaging said trigger and said second end of said engagement member engaging said stop member when said button is in said second position, to impede pivoting of said trigger and impede opening of said door, and said first end of said engagement member being disengaged from said trigger and said second end of said engagement member being engaged with said stop member when said button is in said third position, to permit pivoting of said trigger and impede opening of said door.

4,678,106

**DISPENSING DEVICE**

Robert E. Newell, Pinner; Paul K. Rand, Hitchin, and Carole A. Osterweil, London, all of England, assignors to Glaxo Group Limited, London, England

Filed Jul. 30, 1985, Ser. No. 760,596

Claims priority, application United Kingdom, Jul. 31, 1984, 8419437

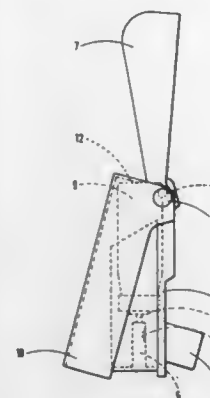
Int. Cl.<sup>4</sup> B67D 5/64

U.S. Cl. 222—162

7 Claims

1. A device for dispensing a mixture of propellant and product from a pressurized aerosol container having an outlet valve, comprising a housing receiving, or adapted to receive, a pressurized aerosol container, the housing having an outlet spout near one end thereof; a cover; cooperating pivot means

on the cover and on the housing near the other end thereof, which provide for pivotal movement between the cover and the housing about a first axis, the cover being pivotal from a closed position in which it encloses the outlet spout to an open position in which the outlet spout is exposed; an actuator lever having a portion disposed to be engagable with the container to exert an axial force thereon; cooperating pivot means on the cover and the lever which provide for pivotal movement between the cover and the lever, the lever being pivotally closable onto a portion of the housing not covered by the



cover, pivotal movement between the cover and lever being about a second axis which is parallel to said first axis and is spaced therefrom, whereby movement of the cover from its closed position to its open position shifts the position of said first axis with respect to said second axis, said shift being such as to bring said container-engaging portion of said lever into engagement with said cover so that when the lever is closed on the housing it exerts a force on the container to displace the valve of the container to dispense said mixture from the container through the outlet spout.

4,678,107

**DRIPLESS DISPENSER FOR LIQUIDS AND VISCOUS FLUIDS**

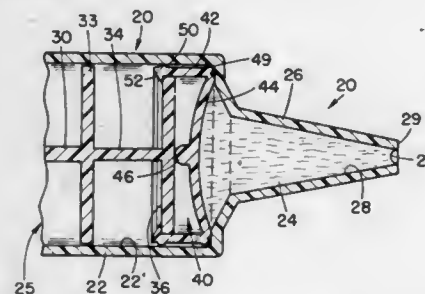
James F. Ennis, III, Preston, Conn., assignor to Mark L. Anderson, Elmwood, Wis.

Filed Aug. 2, 1985, Ser. No. 762,305

Int. Cl.<sup>4</sup> B67D 5/00

U.S. Cl. 222—386.5

7 Claims



1. A fluid dispensing device, comprising:
- a cylindrical barrel for containing a fluid to be dispensed;
  - a nozzle at a forward end of said barrel for discharging fluid from barrel, said barrel having an open rear end;
  - an elongated plunger having one end insertable axially into said barrel through said open rear end thereof; and
  - a cup-shaped cylindrical cap fitted to said one end of said plunger in said barrel, said cap having an axially extending sidewall with external circumferential beading providing fluid tight sealing between said cap and said barrel and having a flexible, elastic externally concave end wall for applying pressure to fluid in said barrel to force the same

out of said nozzle when said plunger is axially advanced in said barrel, said one end of said plunger being disposed adjacent to and confronting an internal side of said end wall, the internal side of said end wall being formed convexly, said end wall of said cap being sufficiently flexible and elastic to assume an axially stressed, flattened out configuration when a forwardly directed force is applied to the internal side of said end wall by said one end of said plunger upon advancement of said plunger in said barrel, and to reassume said external concave configuration when said force and stress are released, thereby creating a suction in said barrel ahead of said end wall to draw back fluid in said nozzle and prevent dripping of fluid from said nozzle;

said end wall of said cap having formed on the external surface thereof, where the end wall is joined to the side-wall, a circumferentially extending, peripheral groove providing a reduced thickness region to relieve radial and circumferential pressure on said end wall when said end wall is flattened out under axial stress; and

a knob centrally located on said internal convex side of said end wall for contact by said one end of said plunger, such that said end wall will assume a flat position when a forwardly directed force is exerted thereon by said one end of said plunger.

4,678,108

**GOLF BALL CARRIER**

Charles S. Inman, 1506 - Fifth St., New Brighton, Pa. 15066  
Filed Jun. 18, 1986, Ser. No. 875,472

Int. Cl.<sup>4</sup> A47F 1/08

U.S. Cl. 224—274

10 Claims



1. A device for carrying golf balls, comprising: a normally vertical rigid plastic elongated tubular section with an elongated sight opening extending for the major part of the length of the said tubular section, with said sight opening width at inside wall of said tubular section being less than 1.62 inches, having affixed top and bottom rigid plastic reducing coupling end pieces, with said bottom reducing coupling having its bottom opening less than 1.62 inches, with said top reducing coupling having its top opening greater than 1.68 inches, with said top reducing coupling positioned on said tubular section to loosely retain a flexible annular ring between upper rim of said tubular section and inside of said top reducing coupling, with inside of said top reducing coupling contoured to allow upward flexing of said flexible annular ring, with said tubular section having a wall thickness to retain and yet to allow downward flexing of said flexible annular ring, with said flexible annular ring sized to allow entry and exit of said golf balls from said carrier device using finger pressure to cause flexing



of the said annular ring by the said golf ball, with said flexible annular ring in relaxed condition preventing exit of said golf balls, with said flexible annular ring being removable and replaceable, thereby allowing use of said carrier device for storage of said golf balls of U.S.G.A diameter dimension or for storage of said golf balls of British diameter dimension by insertion of said flexible annular ring in said carrier device with said flexible annular ring having an inside diameter slightly smaller than the outside diameter of said golf balls being stored in said carrier device, and with said carrier device having holes and/or other attaching means for mounting said carrier device on a support.

4,678,109

**TRACTOR MECHANISM FOR PRINTERS**

Bengt-Ake Henriksson, Svangsta, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden  
PCT No. PCT/SE85/00079, § 371 Date Oct. 10, 1985, § 102(e) Date Oct. 10, 1985, PCT Pub. No. WO85/03671, PCT Pub. Date Aug. 29, 1985

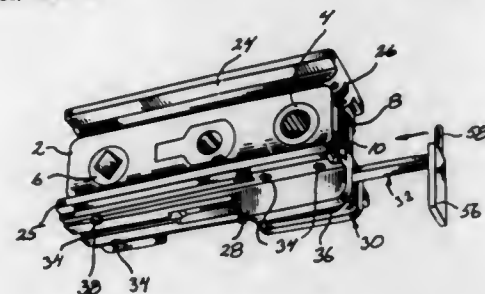
PCT Filed Feb. 15, 1985, Ser. No. 795,343

Claims priority, application Sweden, Feb. 17, 1984, 8400857

Int. Cl. B41J 11/26; B65H 20/20

U.S. Cl. 226—74

10 Claims



1. Device in tractor mechanisms for paper traction feed printers and typewriters, such a mechanism including an endless belt (8) in a holder (2), the belt being mounted for movement in its endless direction, as well as a drive connection for the belt, which belt has external teeth (10) intended for driving a printing medium such as a paper web or the like through the printer on movement of the belt, by engagement with a row of holes along an edge of the medium, the holed edge and the toothed belt running in a gap (14) defined by two wall portions (18, 22) of the holder, the height of the gap being less than the height of the teeth (10) plus the thickness of the belt, the wall portion facing towards the teeth having a groove (26) for the teeth, characterized in that the holder (2) carries a printing medium insertion means with a feeder (32) movable independent of the two wall portions, said feeder movable from an extended printing medium engagement position, in which a hole arrangement means (58) carried by the feeder is brought into engagement with a part of the row of holes in the printing medium intended for insertion in the gap (14), is movable together with the printing medium to a drawn-in position in which a plurality of holes in the row of holes are brought into engagement with teeth (10) in the gap (14), there being moving means (36, 54) carried by the holder and disposed in association with the drawn-in position to move the hole engagement means (58) out of engagement with the row of holes.

4,678,110

**VEHICLE BODY ASSEMBLY SYSTEM**

Tatuhiko Handa, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed May 24, 1985, Ser. No. 737,425

Claims priority, application Japan, May 26, 1984, 59-106721

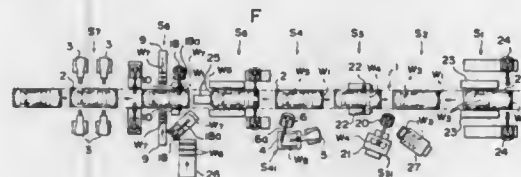
Int. Cl. B23K 37/00

U.S. Cl. 228—4.1

3 Claims

1. A vehicle body assembly system for feeding various body components to respective body members conveyed in succes-

sion along a vehicle body assembly line and assembling the body member and the body components together, comprising: at least one first component feeding station means disposed along the vehicle body assembly line for feeding a body component of a first type which can be placed by itself on the body member which is being conveyed along the vehicle body assembly line, onto the body member; at least one second component feeding station means disposed along the vehicle body assembly line for feeding a body component of a type which cannot be placed by itself on the body member which is being conveyed along the vehicle body assembly line, onto the body member; at least one first robot associated with and provided adjacent to the at least one first component feeding station means for welding the first type of component at a sub-assembly table which is disposed near the first component feeding station means and for placing the welded first type of component onto the body member;



a locating device associated with and disposed adjacent to the second component feeding station means for feeding and positioning the second type of component with respect to the body member at the second component feeding station means; and at least one second robot associated with and provided adjacent to the second feeding component feeding station means for feeding the second type of component to the locating device and welding the at least one second type of component, which is positioned with respect to the body member, onto the body member, wherein the at least one first robot and the at least one second robot each comprise a single robot arm having a detachable end for feeding the components which can be replaced with an arm end for performing a welding operation.

4,678,111

**VAPOR PHASE SOLDERING MACHINE**

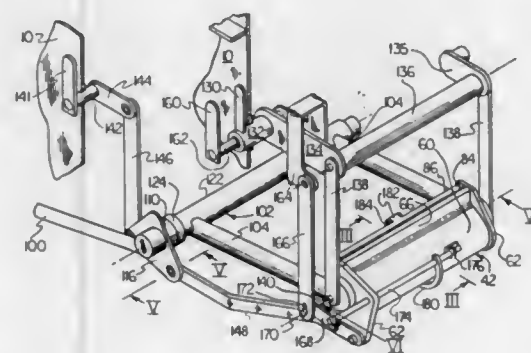
Gerard G. Derrico, Maynard, Mass., assignor to Dynapert-HTC Corporation, Concord, Mass.

Filed Jul. 30, 1986, Ser. No. 891,934

Int. Cl. B23K 1/06

U.S. Cl. 228—37

1 Claim



1. A machine for soldering a work product comprising a tank for containing an electronic liquid,

heater means for heating contained electronic liquid to generate a zone of saturated vapor, means for conveying work product through the zone of saturated vapor, applicator means within the zone of saturated vapor for directing an extended stream of molten solder against the work product, means for draining the molten solder from said applicator means including means for pivotally supporting said applicator means for rotation about a horizontal axis, and means for rotating said applicator about the horizontal axis to a drain orientation, said applicator means including an end plate having an axially extending hole communicating with the lowermost portion of the solder within said applicator means when said applicator means has the drain orientation, said supporting means including an end plate having a hole extending axially therethrough at a location in alignment with said applicator means end plate hole when said applicator means end plate has the drain orientation, and means for sealing said applicator means end plate hole when said holes are not in alignment.

4,678,112

**METHOD FOR PRODUCING A HEAT EXCHANGER HAVING A FLAT TUBE AND HEADER PIPES**

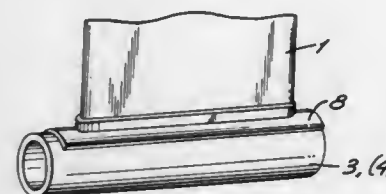
Mikio Koisuka, and Hisao Aoki, both of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Dec. 5, 1984, Ser. No. 678,399

Int. Cl. B23K 31/02

U.S. Cl. 228—138

5 Claims



1. A method for producing a heat exchanger comprising a flat metal tube of an aluminum alloy for conveying fluid, and two header pipes joined respectively onto opposite ends of said flat tube, which comprises the steps of preparing said flat tube and said header pipes of an aluminum alloy other than a brazing filler metal, and preparing two brazing filler members of an aluminum alloy brazing filler metal, each of said header pipes having an axial slot in a side wall for receiving an end of said flat tube therethrough, each brazing filler member comprising an elongated plate portion arcuately curved transversely with a lengthwise elongated opening therein, and with a flat sleeve portion projecting from an outer surface of said elongated opening overlying said elongated opening in registration therewith, said sleeve portion having an inner surface congruent with the perimeter of said elongated opening, said sleeve portion inner surface and said elongated opening having an inner contour slightly larger than the outer contour of said flat tube; inserting each of opposite ends of said flat tube through both said sleeve portion and said elongated opening of a respective brazing filler member, and thereafter inserting each of said flat tube ends into a respective one of said header pipes through said axial slot therein while bringing said arcuately curved plate portions in contact with the outer surface of the corresponding header pipe, and then heating said brazing filler members together with said header pipes and end portions of said flat tube to melt said brazing filler members, so that said header pipes are joined and brazed to the corresponding ends of said flat tube.

4,678,113

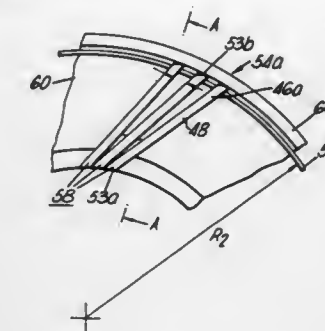
**BRUSH SEALS**

Stuart A. Bridges, and John Goddard, both of Bristol, England, assignors to Rolls-Royce plc, London, England  
Filed Feb. 10, 1986, Ser. No. 827,397  
Claims priority, application United Kingdom, Feb. 20, 1985, 8504331

Int. Cl. B23K 31/02

U.S. Cl. 228—160

17 Claims



1. A method of manufacturing a brush seal comprising the steps of: forming a tape which comprises one or more layers of parallel contiguous lengths of filaments adhesively bonded together over substantially the entire length of said filaments to form a self supporting body; cutting the tape into discrete portions and forming a plurality of tufts of bonded filaments therefrom; assembling a plurality of tufts closely adjacent to each other in a support member with a part of each tuft projecting from the support member; securing each tuft in the support member; and removing the adhesive from at least that part of each tuft which projects from the support member.

4,678,114

**METHOD OF WIRE BONDING WITH APPLIED INSULATIVE COATING**

Hideharu Egawa, Tokyo, and Katsuya Okumura, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 423,283, Sep. 24, 1982, Pat. No. 4,488,674. This application Oct. 24, 1984, Ser. No. 664,373

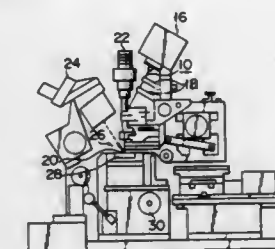
Claims priority, application Japan, Oct. 12, 1981, 56-162197

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl. H01L 21/60

U.S. Cl. 228—176

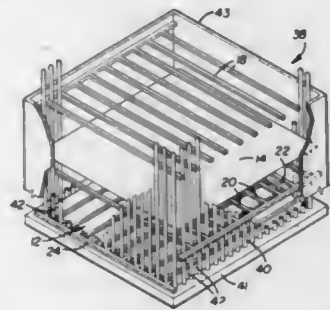
7 Claims



1. A method for connecting a bonding pad to a lead frame of a semiconductor device through a bonding wire, comprising the steps of: providing a bonding wire which has a core wire made of a metal and an insulating film which surrounds said core wire, said insulating film being made of a flexible resin which is thermally stable at temperatures below 200° C.,

and which thermally decomposes and scatters at a temperature of 200° to 300° C.; thermally decomposing and scattering one end portion of said insulating film of said bonding wire and thereafter bonding the one end portion of said core wire which is exposed to said bonding pad by a nail head bonding method; and bonding the other end portion of said core wire to said lead frame.

**4,678,115**  
**METHOD FOR MAKING LAYERED FOIL STRUCTURE**  
Edward D. Welsert, San Carlos, Calif., assignor to Ontario Technologies Corporation, Menlo Park, Calif.  
Filed Apr. 15, 1985, Ser. No. 723,629  
Int. Cl.<sup>4</sup> B23K 31/02  
U.S. Cl. 228—183 3 Claims



1. A method of forming an expanded unitary structure having a plurality of deformed foils each having an undulating cross-section, said foils having first and second sides and being stacked one upon another with said first sides facing in one direction and said second sides facing in an opposing direction, adjacent of said foils having their undulations at a non-zero angle to one another, comprising:

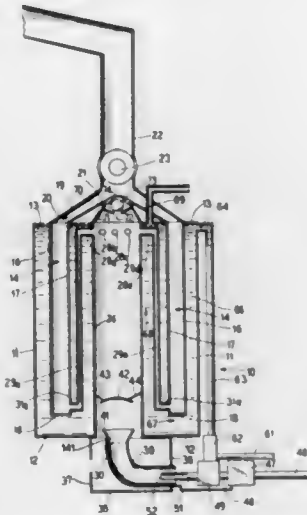
- (A) positioning a first plurality of parallel rods against first side of a respective one of said foils;
- (B) positioning a second plurality of parallel rods against second side of said respective one of said foils with the rods of said second plurality of rods between and parallel to the rods of said first plurality of rods;
- (C) thereafter repeating steps (A) and (B) with each next adjacent foil with the rods positioned against said each next adjacent foil at a non-zero angle to the rods positioned against each preceding one of said foils with the rods of every other of each of said first pluralities of rods parallel to one another and with the rods of every other of each of said second pluralities of rods parallel to one another, to define a plurality of aligned cross-over positions, until a desired number of foils and rods have been positioned, said rods serving to establish and being of a size sufficient to substantially fully define said undulating cross-sections of said foils;

- (D) bonding each of said foils to each next adjacent of said foils at their points of contact to form said expanded unitary structure by applying force to compress said foils together at said cross-over positions and subjecting the compressed foils to bonding conditions to bond said foils together at said cross-over positions; and
- (E) removing each of said pluralities of rods longitudinally from said expanded unitary structure;

further including, following step (C) and preceding step (D): positioning a non-undulating foil next to a lastmost of said undulating foils; and using a modified rod as the last of said first plurality of parallel rods, said modified rod having a plurality of nubs contacting said lastmost of said undulating foils,

said nubs being positioned substantially in alignment with said cross-over positions.

**4,678,116**  
**WATER HEATER**  
C. K. Krishnakumar, Lombard, and Clyde K. Schafer, Glendale Heights, both of Ill., assignors to Chamberlain Manufacturing Corporation, Elmhurst, Ill.  
Filed Apr. 29, 1986, Ser. No. 857,189  
Int. Cl.<sup>4</sup> F22B 35/00  
U.S. Cl. 236—25 A 6 Claims



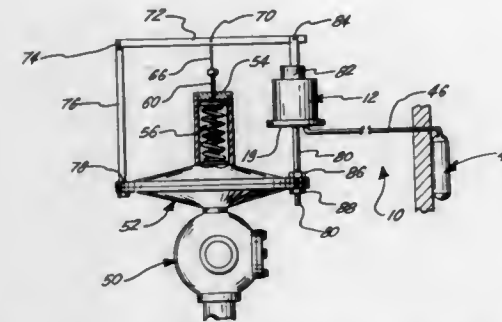
1. A compact continuous flow, high efficiency water heater, comprising a generally cylindrical tank, a central flue mounted in said tank, a gas fired burner mounted to supply burning gases to said flue, a plurality of tubes connected to the top of said flue and extending downwardly through a water chamber formed in said tank to heat water therein, an annular-shaped exhaust chamber formed in said tank and said plurality of tubes connected to the lower end thereof, and with said water chamber surrounding said annular-shaped exhaust chamber, an exhaust pipe; connected to the upper end of said annular-shaped exhaust chamber to vent the burned gasses and inlet and outlet water pipes connected to said tanks, wherein said generally cylindrical outer tank is formed of material having low heat conductivity, wherein said central flue, said plurality of tubes and said annular-shaped exhaust chamber are formed of material having high heat conductivity, and comprising a gas modulator valve connected between said fired burner and a gas supply pipe and controlling the gas supply as a function of the water flow rate.

**4,678,117**  
**TEMPERATURE RESPONSIVE GAS CONTROLLER APPARATUS**  
Wesley J. Trahan, 1818 Julia St., and Albert B. Montandon, 706 Compton St., both of New Iberia, La. 70560  
Continuation of Ser. No. 664,532, Oct. 25, 1984, abandoned.  
This application May 5, 1986, Ser. No. 859,389  
Int. Cl.<sup>4</sup> G05D 27/00  
U.S. Cl. 236—92 A 7 Claims

1. An apparatus responsive to a change in ambient temperature, for regulating the pressure of gas within a gas pressure regulator of the type having a gas supply means, including a gas inlet and a gas outlet, said gas supply means further including a flexible diaphragm member housed in the gas supply means movable between a first position for achieving maximum pressure within the system, and a second position for achieving the

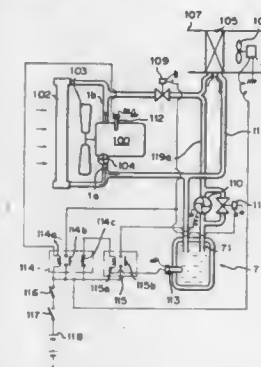
minimum pressure within the system, the apparatus comprising:

- a spring means including a base associated with the diaphragm member for normally maintaining the diaphragm member in the first position achieving the maximum pressure within the system;
- means for contracting the spring to move the diaphragm member toward a position to decrease the pressure within the system, said means further comprising:
  - sensing means, including a fluid expandable through an increase in ambient temperature;
  - a piston member receiving a fluid from said sensing means and movable upward in response to the expanse of said gas;



- iii. a lever member, connectable on a first end to said piston member and movable in conjunction with said piston member; and
- iv. means extending between an arm member and the base of the spring member, so that upon movement of the arm member to the up position in response to the upward movement of the piston member, the base of the spring is pulled in the up direction, imparting movement of the diaphragm toward the second position decreasing the pressure in the system, and upon the arm member returning to the down position, the spring member returns to its normal first position for achieving the maximum pressure within the system.

**4,678,118**  
**DUAL-FUNCTION CAR SPOILER**  
Akira Fukami, Okazaki; Takao Oshiro, Toyoake, and Hideaki Sasaya, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan  
Filed Aug. 15, 1984, Ser. No. 640,986  
Claims priority, application Japan, Oct. 14, 1983, 58-192690; Oct. 27, 1983, 58-202453  
Int. Cl.<sup>4</sup> B60H 1/02  
U.S. Cl. 237—12.3 B 5 Claims

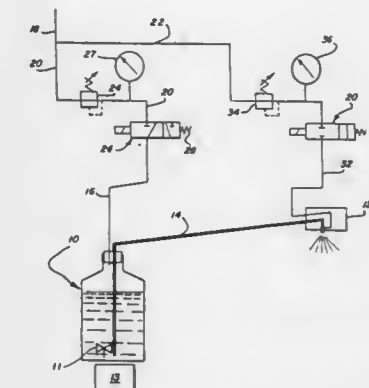


1. A hot-water type passenger compartment heating system

for an automobile having an engine with a cooling system and having a dual-function car spoiler secured to the vehicle body for aerodynamically controlling the airflow around the vehicle body, said heating system comprising:

- a car heater unit disposed in a heat exchange relationship with the air in the passenger compartment;
- first conduit means for circulating a coolant in said cooling system through said car heater unit;
- a hot coolant reservoir provided in said car spoiler in a heat insulating manner from the ambient air;
- second conduit means for connecting said first conduit means to said hot coolant reservoir; and
- valve means responsive to the coolant temperature for interrupting the flow of coolant from the engine to said car heater unit and circulating the coolant stored in said hot coolant reservoir through said car heater unit when the coolant temperature at the engine is below a predetermined value and for supplying the hot coolant from the engine to said hot coolant reservoir when the engine is warmed up.

**4,678,119**  
**ABRASIVE SLURRY SUPPLY SYSTEM FOR USE IN METALLOGRAPHIC SAMPLE PREPARATION**  
Ralph R. Doyle, Des Plaines, Ill., assignor to Buehler Ltd., Lake Bluff, Ill.  
Continuation of Ser. No. 433,834, Oct. 12, 1982, abandoned.  
This application Aug. 12, 1985, Ser. No. 765,049  
Int. Cl.<sup>4</sup> B05B 7/24; B24C 7/00  
U.S. Cl. 239—9 9 Claims



1. A method of supplying abrasive slurry to a lapping, polishing or grinding machine for preparing the surface of a metallographic specimen, the method comprising, in combination, providing a container of abrasive slurry and connecting said container by an upwardly inclined conduit to a nozzle, supplying air under pressure through a first air passage to said container to force abrasive slurry through said upwardly inclined conduit to said nozzle, supplying air under pressure through a second air passage to said nozzle to mix air under pressure with said abrasive slurry at said nozzle to create an abrasive slurry mist, intermittently disconnecting said first air passage from said container and, with each disconnecting step, simultaneously venting said container to atmosphere to permit abrasive slurry in said inclined conduit to drain back to said container, and substantially continuously mixing the abrasive slurry in said container.



4,678,120

## REFRACTORY FLAME-GUNNING APPARATUS

Masataka Matsuo, Kitakyushu, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 673,173, Nov. 19, 1984, abandoned.

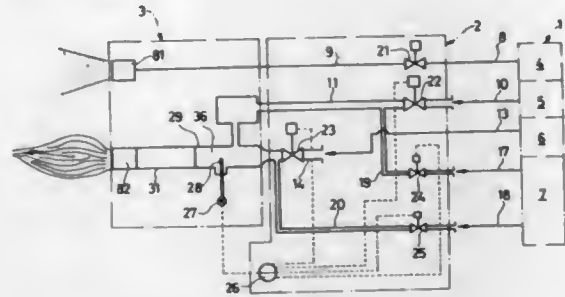
This application Sep. 22, 1986, Ser. No. 912,176

Claims priority, application Japan, Nov. 22, 1983, 58-220411

Int. Cl.<sup>4</sup> B05B 12/10

U.S. Cl. 239—75

5 Claims



1. A refractory flame-gunning apparatus which comprises:
  - a feeder comprising a refractory powder feeding section, an inflammable gas feeding section, a combustion-assisting gas feeding section, and an inert gas feeding section;
  - a controller for controlling the supply of refractory powder and the supply of inflammable gas, combustion-assisting gas and inert gas, said controller having an inflammable gas pipe means extending from said inflammable gas feeding section, a combustion-assisting gas pipe means extending from said combustion-assisting gas feeding section, a first inert gas pipe means extending from said inert gas feeding section and connected to said inflammable gas pipe means, a second inert gas pipe means extending from said inert gas feeding section and connected to said combustion-assisting gas pipe means, an inflammable gas valve in said inflammable gas pipe means between the point where said inflammable gas and first inert gas pipe means meet and said inflammable gas feeding section,
  - a combustion-assisting gas valve in said combustion-assisting gas pipe means between the point where said combustion-assisting gas and second inert gas pipe means meet and said combustion-assisting gas feeding section, a first inert gas valve in said first inert gas pipe means, a second inert gas valve in said second inert gas pipe means; and a control unit including a temperature sensor for detecting a temperature due to backfiring, the control unit including means for outputting opening and closing signals to said inflammable gas valve, said combustion-assisting gas valve and said first and second inert gas valves on the basis of signals emitted by said temperature sensor; and
  - a flame-gunning burner having a plurality of refractory powder and flame ejecting nozzles disposed at the tip thereof, a gas mixer having an inflammable gas passage to which said inflammable pipe means is connected, a combustion-assisting gas passage to which said combustion-assisting gas pipe means is connected, said burner having a gas mixing chamber therein to which said inflammable and combustion-assisting gas passages are connected, and a mixed gas passage extending out of said gas mixing chamber to said flame ejecting nozzles, and a combustion-assisting gas cutoff valve in said combustion-assisting gas passage normally urged toward the closed position and held out of said closed position and having means exposed to said mixed gas passage for releasing the holding of said cutoff valve to quickly close said combustion-assisting gas passage in response to a build-up of pressure in said mixed gas passage due to backfiring, said temperature sensor being positioned in said mixed gas passage, and said outputting means in said control unit outputting signals for closing said combustion-assisting gas valve and opening said second inert gas valve when a temperature indicating

backfiring is sensed, and for subsequently closing said inflammable gas valve and opening said first inert gas valve.

4,678,121

## MULTIPLANE CONNECTOR SYSTEM

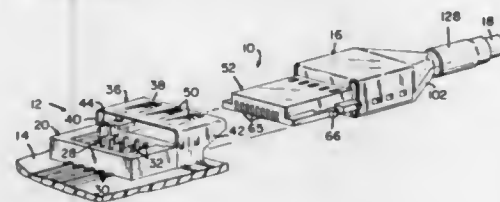
George H. Dooty, Mifflintown, and John M. Landis, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa. Continuation-in-part of Ser. No. 505,151, Jun. 17, 1983, Pat. No. 4,506,940. This application Jan. 25, 1984, Ser. No. 624,151

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.<sup>4</sup> H01R 13/46

U.S. Cl. 439—610

5 Claims



1. A connector system comprising:
  - a header member having a mating face in a connector receiving cavity profiled to receive a mating connector in a direction parallel to said mating face and a plurality of contacts each with one end extending from the mating face,
  - a connector member comprising a housing having a front mating end profiled for reception in said cavity, a rear terminating end, and a plurality of terminal passages extending therebetween, said mating end having a mating surface for reception against said mating face, said passages opening at said mating end as a plurality of parallel slots on said mating surface and at said terminating end as a plurality of parallel channels on opposite sides thereof, adjacent slots extending to channels on opposite sides thereof, alternate slots extending to channels on the same side, said connector member further comprising a plurality of terminals in respective passages, each terminal having a conductor engaging portion in a respective channel and a contact engaging portion in a respective slot, said slots being spaced to receive respective contacts.

4,678,122

## HAND OPERATED LIQUID ATOMIZER

Antonio Riglietti, Bassano Del Grappa, Italy, assignor to ALTA S.p.A., Vicenza, Italy

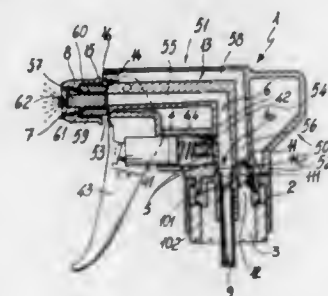
Filed Apr. 11, 1986, Ser. No. 850,971

Claims priority, application Italy, Apr. 18, 1985, 30681/85[U]

Int. Cl.<sup>4</sup> B05B 9/04; B65D 83/14

U.S. Cl. 239—333

3 Claims



1. A hand-operated liquid atomizer comprising a main body of substantially L-like form defining first and second body

portions extending at substantially right angle to each other, said first body portion defining a connection end for connection to a liquid container and said second body portion defining an atomizing end; a fluid passage conduit in said main body, said fluid passage conduit defining a first fluid passage conduit part extending in said first body portion and ending at said connection end and a second fluid passage conduit part extending in said second body portion substantially at right angle to said first fluid passage conduit part and ending at said atomizing end; an auxiliary venting conduit in said main body, said venting conduit defining a first venting conduit part extending in said first body portion substantially parallel to said first fluid passage conduit part and ending at said connection end and a second venting conduit part extending in said second body portion substantially parallel to said second fluid passage conduit part and ending at said atomizing end; a venting stopper engaging with and closing said venting conduit at said atomizing end; a small venting hole in said stopper; an atomizer nozzle at said atomizing end, said nozzle having a cylindrical member defining a through passage aligned with said second fluid passage conduit part and a cylindrical shutter in said through passage having peripherally protruding portions for engaging with said cylindrical member and closing said through passage; an atomizer nozzle adjusting ring nut encircling said atomizer nozzle and having a supply hole substantially aligned with said through passage, said ring nut having a peripheral outwardly protruding flange formation facing said atomizing end and said small venting hole, said ring nut being adjustably screw thread engaged with said atomizer nozzle, thereby in a non-use fully screwed down condition of said ring nut said flange formation abutting against said venting stopper and closing said small venting hole; an atomizer pump including a pump chamber extending in said first body portion in a middle position thereof and at right angle thereto, said pump chamber being in communication with said first fluid passage conduit part, a reciprocating pump plunger movable in said pump chamber, elastic bias means in said pump chamber acting against said pump plunger for urging it in a position at least partially extracted from said pump chamber, an actuation lever hingedly attached to said main body and, urging said pump plunger towards said pump chamber; first valve means including a first valve seat in said first passage fluid conduit part substantially at said connection end and a first valve closing member in said first valve seat, second valve means including a second valve seat in said first venting conduit part substantially at said connection end and a second valve closing member in said second valve seat.

4,678,123

## SPRAY NOZZLE FOR A LIQUID ATOMIZER

Karlheinz Klaeger, Portnerstrasse 84, 9802 Neusässen, Fed. Rep. of Germany

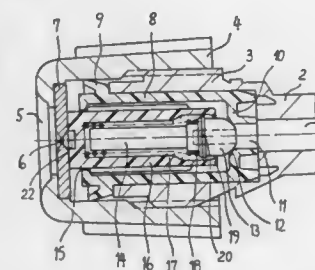
Filed Nov. 21, 1985, Ser. No. 800,489

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443640

Int. Cl.<sup>4</sup> B05B 1/34; F16K 43/00, 25/00

U.S. Cl. 239—464

15 Claims



1. A manually operated liquid atomizer, comprising:
  - a threaded housing portion having therein an opening and a

pressure duct which communicates with and can carry a pressurized fluid to said opening;

- a union nut which is adapted to be screwed onto said threaded housing portion and which has nozzle means thereon;
- a socket adapted to be axially inserted into said opening in said threaded housing portion and having therein an axially extending cavity which receives check valve means for normally closing said pressure duct, said check valve means including a valve pin axially displaceably supported in a cavity of a cup-shaped twist member disposed coaxially in said cavity in said socket, said twist member having thereon an axially facing surface which co-operates with a surface of said nozzle means;
- a resetting spring disposed within said cavity of said twist member and cooperable with a bottom wall of said twist member and said valve pin so as to bias a head portion of said valve pin against a valve seat of said check valve means; and
- an annular stop flange which is provided on said valve pin and has a larger diameter than said head portion thereof, said stop flange being biased by the urging of said resetting spring toward a radially inwardly projecting holding lip which is provided at an end of said cavity in said twist member.

4,678,124

## ELECTROMAGNETICALLY ACTUATABLE VALVE IN PARTICULAR A FUEL INJECTION VALVE

Udo Hafner, Lorch; Waldemar Hans; Wilhelm Kind, both of Bamberg; Rudolf Krauss, Stuttgart, and Rudolf Sauer, Benningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

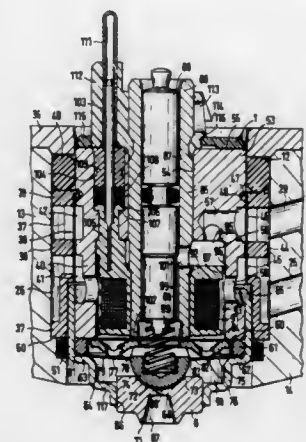
Continuation of Ser. No. 674,729, Nov. 27, 1984, abandoned, which is a continuation of Ser. No. 415,116, Sep. 7, 1982, abandoned. This application Apr. 11, 1986, Ser. No. 851,906

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143848

Int. Cl.<sup>4</sup> B05B 1/30; F02M 51/00

U.S. Cl. 239—585

4 Claims



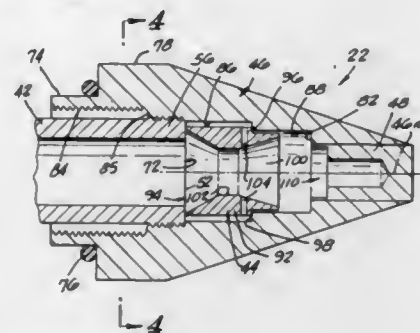
1. An electromagnetically actuable fuel injection valve for a fuel injection system of an internal combustion engine comprising a holder body (13), including a valve chamber, a shell (53) having an upper base (55) and a bottom face (60) disposed in said holder body valve chamber, whereby said upper base is arranged at one end of said shell and said bottom face is arranged at the opposite end of said shell, an axial aperture (54) in said base of said shell which leads from an outer face (55) on said base of said shell to an inner face of said base, an axial interior bore (56) of substantially uniform diameter in said shell that extends from said base to said bottom face and having a greater diameter than said axial aperture, a nozzle carrier

coaxial with said shell and shell holder body (valve chamber) with an axially directed extension that extends into said holder body and surround a portion of said shell and said bottom face of said shell, a spacer ring secured between said bottom face of said shell within said nozzle carrier extension and a shoulder on said nozzle carrier juxtaposed said bottom face of said shell, a guiding membrane secured between said shoulder on said nozzle carrier and said spacer ring and pressed against said spacer ring and said shoulder of said nozzle carrier, a tubular shaped core made of ferro-magnetic material that is inserted in said aperture in said shell and extends through the interior bore (56) in a direction to said bottom face of said shell, a magnetic coil wound about said core of ferro-magnetic material and disposed within said valve chamber, a substantially flat armature arranged in coaxial alignment with said magnetic coil juxtaposed an end of said core, a valve component secured to said armature coaxial therewith and movable thereby, a nozzle coaxially supported by said nozzle carrier, a dished valve seat formed on said nozzle in coaxial alignment with said valve component for reception thereof, said substantially flat armature includes a circumferential extremity which overlaps a portion of a bottom face of said shell, said substantially flat armature assumes a normal first position spaced away from said portion of said bottom face of said shell whereby a first air gap is provided in said first position when said valve is closed, and a second position in which said circumferential extremity of said armature is in abutment with said overlapped portion of said bottom face of said shell upon actuation of said magnetic coil to open said valve.

4,678,125  
NOZZLE

Thomas P. Elston, Randburg, South Africa, assignor to G S I Holdings (Proprietary) Limited, Transvaal, South Africa  
Filed Aug. 12, 1985, Ser. No. 764,938  
Claims priority, application South Africa, Aug. 13, 1984, 84/6260

Int. Cl.<sup>4</sup> B05B 3/14, 7/04, 1/14, 1/00  
U.S. Cl. 239—589.1 11 Claims



8. A nozzle unit comprising  
(a) a frusto-conical nozzle having  
(i) a transverse flat end face;  
(ii) an outlet passage formed in the flat end face;  
(iii) an inner conduit member which in use is connected to a source of pneumatic pressure;  
(iv) a water conduit which in use is connected to a source of water under pressure; and  
(v) a mixing chamber having  
(1) a venturi passage therethrough having a low pressure section including a venturi throat which venturi passage is connected to the said inner conduit member, and  
(2) inlet bores extending from the exterior of the chamber to the low pressure section of the passage, the inlet bores being connected to the water conduit;  
(b) a concave cylindrical cap having  
(i) an open mouth facing the outlet passage, the mouth being spaced from the end face by no more than one-half of the diameter of the throat of the venturi; and

- (ii) an outer diameter which is less than the diameter of the outlet passage; and  
(c) carrier means integral with the nozzle and the cap and carrying the cap on the nozzle.

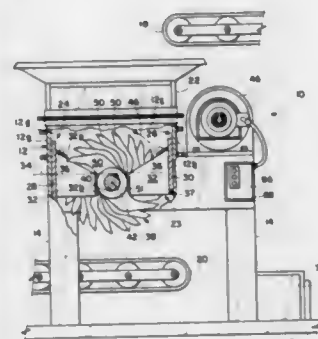
4,678,126  
SHREDDER

Charles E. Prentice, and Nadine P. Prentice, both of Rte. 3, Box 655, Beaverton, Oreg. 97007

Filed Nov. 4, 1985, Ser. No. 794,739  
Int. Cl.<sup>4</sup> B02C 18/16

U.S. Cl. 241—34

16 Claims



1. A shredder comprising:  
a housing for receiving material to be shred;  
power means;  
arbor means rotatably mounted in said housing and driven by said power means;  
anvil means mounted in said housing; said anvil means including grating members, each grating member having a top surface which inclines downwardly toward said arbor means progressing inward from a side of the housing; and plural teeth fixed on said arbor means extending radially outwards therefrom, said teeth being laterally adjacent, angularly displaced with respect to each other to provide a helical tooth pattern extending the length of said arbor means, said teeth being interspersed with said grating members, each tooth having a distal shearing portion having a tip and a substantially flat stretch leading into a concave cutting surface immediately adjacent said arbor means;  
said teeth and said grating member being constructed and arranged such that the tip moves past a grating member top surface before portions of the shearing portion located inward from the tip, thus to produce a shearing action forcing matter inward to the arbor means.

4,678,127

#### PUMPED FLOW ATTRITION DISK ZONE

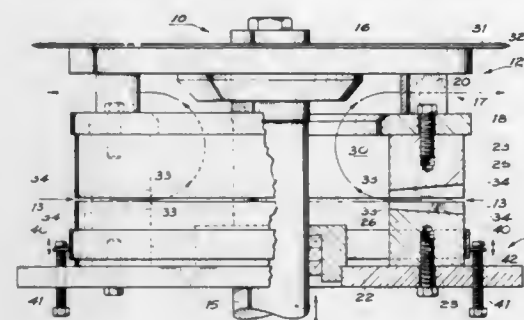
Edward H. Cumpston, 6 Stonehedge Dr., Bennington, Vt. 05201  
Continuation-in-part of Ser. No. 461,025, Jan. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 303,997, Sep. 21, 1981, abandoned. This application Oct. 10, 1984, Ser. No. 659,408

Int. Cl.<sup>4</sup> B02C 7/12

U.S. Cl. 241—46.04 29 Claims

1. In an attrition device having an attrition zone formed between a stator and rotor having annularly arrayed confronting bars contiguously separated by grooves, said attrition device being arranged within a tank of wetted and unpumpable fiber material that may contain contaminants, an improvement making said attrition zone self-cleaning while said attrition zone defibers said unpumpable material, said improvement comprising:  
a. said rotor having a hollow interior that is enclosed between an inner periphery of said attrition zone and an annular discharge region;  
b. impeller vanes arranged within said annular discharge

region to pump slurry from said hollow rotor interior radially outward through said discharge region and thereby to pull fiber clumps of said material into an outer periphery of said attrition zone, flow said fiber clumps radially inward through said attrition zone against the outward pumping force of said confronting bars, and draw said slurry from said inner periphery of said attrition zone through said hollow rotor to said discharge region;



- c. radially outer ends of said bars on said rotor and stator at said outer periphery of said attrition zone lying in a cylindrical locus and presenting an interrupted cylindrical barrier to entry of said contaminants into said attrition zone; and  
d. leading surfaces of said bars at said outer periphery being sloped to prevent fibers from wrapping around outer ends of said bars.

4,678,128

#### FIBER-BALE PLUCKER

Hubert A. Hergeth, Kockerellstrasse 3, D-5100 Aachen, Fed. Rep. of Germany

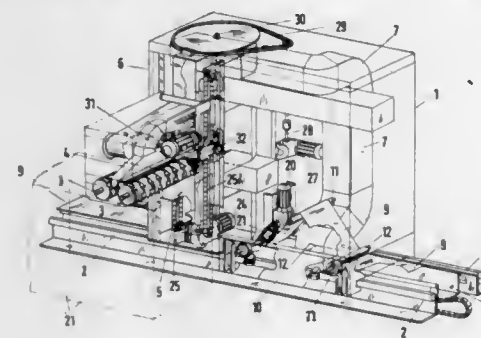
Filed Jan. 24, 1986, Ser. No. 821,994

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3503523

Int. Cl.<sup>4</sup> D01G 7/06

U.S. Cl. 241—101 A

8 Claims



1. In a fiber-bale mill comprising a cutting device which is movable along a row of fiber bales, means defining an upwardly open collector passage over which said cutting device travels back and forth and positioned parallel to said row of bales, fibers being drawn to said collector passage through an air passage in said cutting device, and a cover strip at least partially covering said collector passage, the improvement wherein an upper and a lower guide means for said cover strip are provided on said cutting device which lift said cover strip from said collector passage at a location at which said air passage opens into said collector passage, and guide said cover strip over a part of said air passage opening into said collector passage.

4,678,129

#### PADDLE WHEEL ASSEMBLY FOR FORAGE HARVESTERS

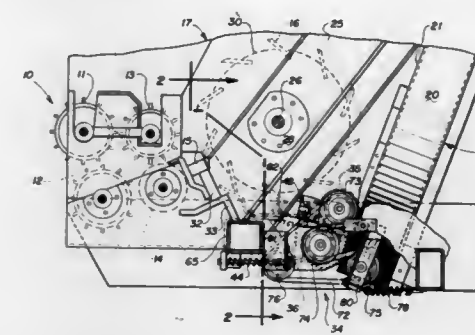
James F. Dallinger, Narvon, Pa., assignor to New Holland Inc., New Holland, Pa.

Filed Apr. 9, 1986, Ser. No. 849,669

Int. Cl.<sup>4</sup> B02C 21/02

U.S. Cl. 241—101.7

9 Claims



1. In a forage harvester crop processor having means for cutting and chopping crop material, a compressor roll assembly for further conditioning crop material that has been previously cut and chopped by said cutting and chopping means, said compressor roll assembly including upper and lower compressor rolls arranged to condition crop material therebetween, one of said compressor rolls being removably mounted on support means which is movable to facilitate removal of said compressor roll from the forage harvester crop processor, and means for discharging crop material that has been further conditioned by said compressor roll assembly, the improvement comprising:

- a paddle wheel assembly removably mountable on said support means for replacing said one compressor roll, said paddle wheel assembly including paddles for conveying cut and chopped crop material from said cutting and chopping means to said discharging means while causing only minimal further conditioning of the cut and chopped material.

4,678,130

#### QUICK ADJUST SHEAR BAR MECHANISM

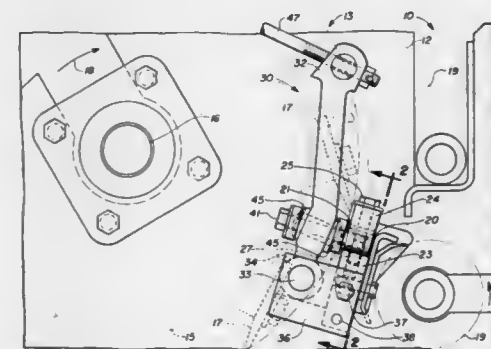
Wayne B. Martenas, Brugge, Belgium, assignor to New Holland Inc., New Holland, Pa.

Filed Oct. 4, 1985, Ser. No. 784,391

Int. Cl.<sup>4</sup> B02C 18/16

U.S. Cl. 241—222

14 Claims



1. In an adjustable shearbar apparatus for a forage harvester having spaced opposing side sheets; an elongated shearbar having opposing sides and an elongated axis extending between opposing ends; lower support means for supporting the



shearbar, said lower support means being an elongated support member extending between and connected to said side sheets; upper clamping means associated with said lower support means for urging said shearbar against said lower support means adjacent opposite ends of said shearbar; a pair of levers pivotally movable relative to said elongated support member; connection means detachably affixing said shearbar to each of said levers; and means for pivoting said levers to move said shearbar linearly relative to said lower support means, said means for pivoting including an adjustment linkage coupled directly to said levers, the improvement comprising:

said connection means including a threaded fastener received through an opening extending through each said lever and threadably engaged with said shearbar, the pivotal connection between said levers and said elongated support member being located in an offset relationship relative to said shearbar axis; and said upper clamping means being detachably connected to said lower support means by threaded members positioned in line with said shearbar axis, said shearbar being clamped between said upper clamping means and lower support means.

4,678,131

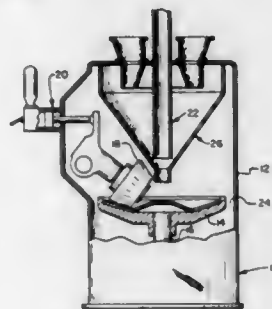
**HIGHLY ABRASIVE RESISTANT MATERIAL**

Arthur L. Rankin, III, Signal Mtn., Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.  
Division of Ser. No. 703,160, Feb. 19, 1985, Pat. No. 4,604,781.  
This application Jan. 24, 1986, Ser. No. 822,095

Int. Cl. B02C 4/30

U.S. Cl. 241—293

3 Claims



1. In a pulverizer roll for a bowl mill including a body portion formed of a relatively soft, easily machinable material, the improvement comprising a highly abrasive surface formed on said body portion of an alloy having a composition, by weight percentages, of 4.0–6.0% Carbon; 3.0–14.0% Manganese; 1.0–2.5% Silicon; 15.0–30.0% Chromium; 4.0–6.0% Molybdenum; and 0.5–2.0% Boron, the balance being essentially iron.

4,678,132

**TRACTION DEVICE FOR LINE HANDLING EQUIPMENT**

George A. Fowler, Dartmouth; James M. Hamilton, Halifax, and William J. Whiteway, Windsor Junction, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 13, 1986, Ser. No. 930,244

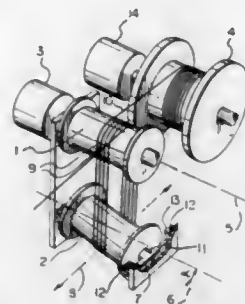
Int. Cl. B65H 51/26

U.S. Cl. 242—47.09

3 Claims

1. A traction device for line handling equipment comprising: a first driven roller mounted with an axis of rotation parallel to the axis of rotation of a storage reel; a second roller with an axis of rotation oriented at an angle to that of the first roller and within a second plane parallel to a first plane defined by the axis of rotation of the first roller; said first and second rollers being operative to receive a plurality of wraps of a line and wherein said angle is

selected to provide the desired wrap spacing on the rollers; and slidable support means for the second roller allowing free displacement of the second roller axis within the second



plane and in a direction generally normal to axis of rotation of the rollers, and operative to be displaced by the action of the line wraps seeking to maintain constant total wrap length while traversing back and forth across the rollers.

4,678,133

**AUTOMATIC CUTTING AND WINDING APPARATUS FOR A WEB-LIKE MATERIAL SUCH AS A FILM**

Tsutomu Suzuki, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

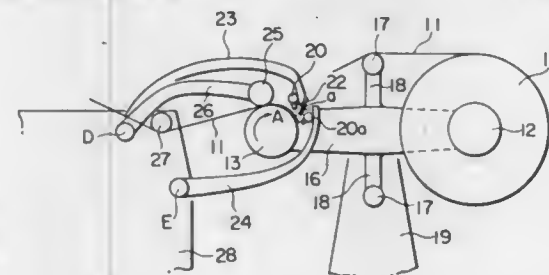
Filed Nov. 19, 1985, Ser. No. 799,736

Claims priority, application Japan, Nov. 30, 1984, 59-253090

Int. Cl. B65H 19/20

U.S. Cl. 242—56 A

4 Claims



1. A turret type automatic cutting and winding apparatus for automatically cutting a continuous web as the web is maintained in pressing engagement against a rotating winding core by a press roller, and for wrapping the web around the rotating winding core, said apparatus comprising:

a frame; a cutter for cutting the web across the entire width thereof, said cutter being movable to a position adjacent the winding core downstream from the press roller for cutting the web thereat to form a leading free end of the web; electrostatic charging means movable to a position adjacent the winding core downstream from the press roller for applying an electrostatic charge to the leading free end of the web such that the leading free end of the web is attracted to adhere against the winding core; and swingable arm means pivotally mounted to said frame and on which said cutter and said electrostatic charging means are mounted, said swingable arm means pivoting between first and second positions to move said cutter and said electrostatic charging means to said positions adjacent the winding core respectively.

4,678,134

**ARRANGEMENT FOR SAFETY BELT**

Hanafi Ameer, Studenstaden 4, S-75233 Uppsala, Sweden  
PCT No. PCT/SE84/00289, § 371 Date May 13, 1985, § 102(e)  
Date May 13, 1985, PCT Pub. No. WO85/01217, PCT Pub. Date Mar. 28, 1985

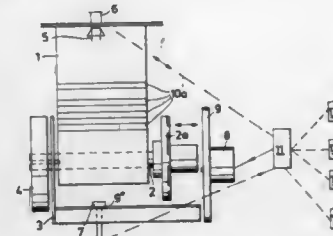
PCT Filed Sep. 5, 1984, Ser. No. 734,269

Claims priority, application Sweden, Sep. 12, 1983, 8304319

Int. Cl. B60R 22/38, 22/40

U.S. Cl. 242—107.4 A

10 Claims



1. A safety belt arrangement for protecting passengers in motor driven vehicles, comprising:

at least one strap roller having a spindle mounted for rotation in a housing attached to the vehicle body;  
at least one belt strap, one free end of which is attached to said spindle and which can be wound onto and unwound from said spindle;  
biasing means urging said spindle to rotate so as to keep said belt strap wound onto said spindle;  
locking means actuable for locking said spindle so as to prevent further unwinding of said belt strap;  
at least one reference surface provided on said rotating spindle;  
a detector which on unwinding of said belt strap senses said at least one reference surface at least once per revolution of said spindle and passes a signal to a memory means each time a reference surface is detected; and, memory means arranged to register the time interval between the signals received from the detector and to determine the unwinding velocity of said belt strap, said memory means activating said locking means when a preselected value of the unwinding velocity is exceeded, thereby preventing further unwinding of said belt strap from said spindle.

4,678,135

**CONTROL OF LINE WRAPPING ON REEL, BY REEL GROOVE DESIGN**

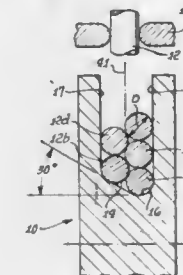
Ralph W. Jones, 1025 Avondale Rd., San Marino, Calif. 91108

Filed Aug. 22, 1985, Ser. No. 768,204

Int. Cl. B65H 75/14, 75/18

U.S. Cl. 242—117

7 Claims



1. An apparatus for wrapping a line, the line having an average cross section dimension D, and including a reel having an axis of rotation, a hub outer surface extending about said axis, and two axially spaced flange surfaces which face one another, outwardly of the reel surface, and across a groove

defined between said flange surfaces and outwardly of the hub surface, the improvement comprising:

(a) said groove having a width W, where  $W=1.87 D$ ,  
(b) said hub surface inclined relative to said axis to urge the line initial wrapping on the hub surface to a predetermined position,  
(c) and including said line and a line guide aligning the line with and guiding the line toward the center of the groove as the line winds into said groove, the line guide defining an opening passing the line, said opening having width in the direction of W, and which is less than W and close to D.

4,678,136

**SUSPENDED CREEL**

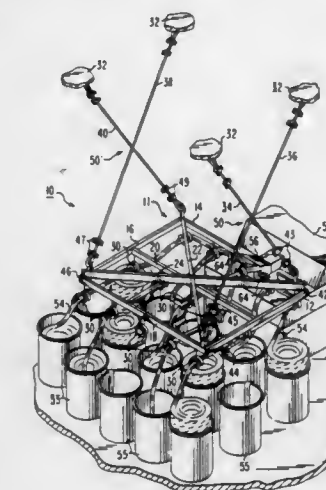
Donald A. Cook, Gainesville, Ga., assignor to Coronet Industries, Inc., Atlanta, Ga.

Filed Jan. 16, 1986, Ser. No. 874,470

Int. Cl. B65H 49/14, 57/06, 57/16

U.S. Cl. 242—131

9 Claims



1. A suspended creel comprising:

a frame having a given weight;  
a plurality of yarn guide elements secured to the frame; and a plurality of wires of a given stiffness attached at one end thereof to the frame in spaced relation and adapted to be attached at the other end to an overhead support in spaced relation in crisscross fashion to suspend the frame from the support via the force of gravity, said wires each being secured to the frame structure at an angle of less than about 75° to the horizontal, the angle, wire stiffness and weight of the frame being such that the frame tends to resist swaying in response to an applied horizontal force caused by the friction engagement of yarns with the guide elements through which the yarns pass.

4,678,137

**TAPE TRANSPORT APPARATUS**

David W. Kincheloe, 417 North St., Graham, N.C. 27253

Filed Mar. 30, 1984, Ser. No. 595,405

Int. Cl. G11B 15/32

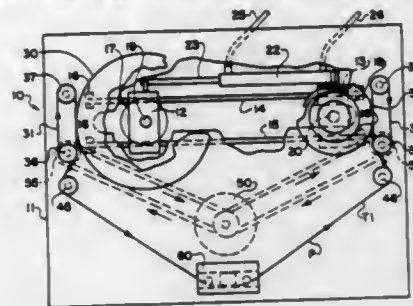
U.S. Cl. 242—192

9 Claims

1. A tape transport apparatus for delivering a tape at high speed and under a constant tension within a precise plane of tape travel, comprising:

(a) a rotatably mounted tape supply means;  
(b) a rotatably mounted tape take-up means;  
(c) a first moving rim drive belt cooperating with said take-up means and including a guide for placing the moving tape onto said rim drive belt, said rim drive belt positioned

- to carry the moving tape to the tape take-up means and apply it to the tape take-up means;
- (d) drive means for rotating said tape take-up means;
- (e) said guide comprising a roller having a crowned drive surface for centering the rim drive belt and the tape thereon during rotation thereof in the tape winding plane



- of the tape take-up means for applying the tape precisely within the desired plane; and
- (f) tape tensioning means for maintaining constant, predetermined tension on the tape, said tape tensioning means rotating said tape take-up means at a pre-determined, slightly faster surface speed than the speed at which the tape is being supplied thereto from said tape supply means.

#### 4,678,138 MAGNETIC TAPE CASSETTE WITH REEL BRAKE MECHANISM

Tsuneo Nemoto, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

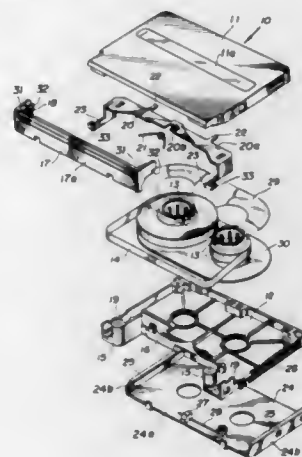
Filed Oct. 31, 1985, Ser. No. 793,549

Claims priority, application Japan, Nov. 2, 1984, 59-167213[U]

Int. Cl.<sup>4</sup> G11B 15/22, 23/04

U.S. Cl. 242-198

11 Claims



1. A magnetic tape cassette comprising:
  - a cassette casing housing a tape reel onto which a magnetic tape is wound;
  - a movable tape-protecting lid for selectably covering and exposing a front mouth of said casing, said tape-protecting lid having a side plate extending substantially parallel to side walls of said casing and pivoted thereon;
  - a reel brake disposed within said casing and movable between a reel brake state and a brake-release state, said reel brake being biased toward said reel brake state, in which it restricts rotation of said tape reels;
  - a first strip section integral with said side plate of said tape-protecting lid and movable between a first position corresponding to a closed position of said tape-protecting lid

and a second position corresponding to an open position of said tape-protecting lid;

a second strip section integral with said reel brake and actuated in a first direction by said first strip to said reel brake state corresponding to said first position of said first strip and to said brake release state corresponding to said second position of said first strip; and

means for establishing interengagement between said first and second strips, said interengagement means comprising a recessed section on one of said first and second strips for retaining a complementary section of the other of said first and second strips for preventing relative displacement of the strips transverse to said first direction during interengagement of the strips.

#### 4,678,139 RIBBON CASSETTES AND APPARATUS FOR RECEIVING SAME

Alan Harry, Royston, England, assignor to PA Consulting Services Limited, London, England

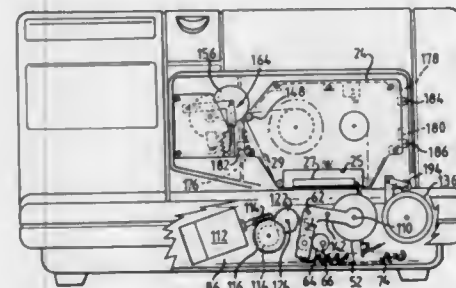
Filed Jan. 14, 1986, Ser. No. 818,667

Claims priority, application United Kingdom, Jan. 19, 1985, 8501406

Int. Cl.<sup>4</sup> G11B 23/087; B41J 35/28

U.S. Cl. 242-199

6 Claims



1. A cassette and compartment for securably receiving said cassette, guide means for guiding the cassette during insertion into the compartment and retaining means for securing the inserted cassette, wherein spring means is located at the rear of the compartment having two mutually diverging resiliently displaceable arms one of which is engageable by the rearwardly advancing face of the cassette and the other of which is simultaneously engageable with a side wall of the cassette as said cassette is inserted into the compartment, and arranged whereby a force is applied by the said other arm of the spring means in a direction generally perpendicular to the direction in which the cassette is guided during insertion into the compartment, thereby on completion of said guided insertion to move the cassette in the said perpendicular direction into engagement with the said retaining means for securing the inserted cassette

#### 4,678,140 TAPE CASSETTE HAVING A MOUNTING FOR A LEG SPRING FOR A REEL BRAKE SPRING

Klaus Schoettle, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 25, 1985, Ser. No. 758,969

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 8422103[U]

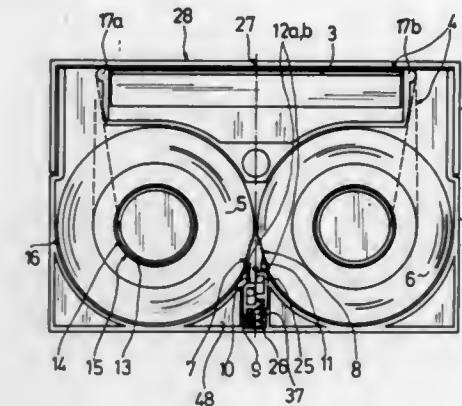
Int. Cl.<sup>4</sup> G03B 1/04

U.S. Cl. 242-199

15 Claims

1. A tape cassette, in particular a video tape cassette, having a housing with a mounting for a torsion spring, in particular for a reel brake system, including a brake element, in the tape cassette, said torsion spring including a generally cylindrical center section, forming an aperture therein, and two spring

arms extending from the two ends respectively of said center section, the center section of the torsion spring being attached to said brake element and the spring arms being supported on housing parts, which comprises a holding element has a cross-



sectional dimension which is at least slightly larger than the largest dimension of the aperture of the center section of the torsion spring, so that, after it has been mounted on the holding element, the spring is held, so that it cannot be lost, by radial tension acting on the center section.

#### 4,678,141 AIRCRAFT LAUNCHER AND RETRIEVER

August C. Sarrantonio, Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

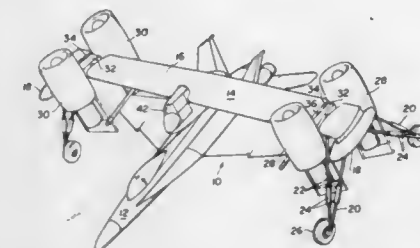
Continuation of Ser. No. 243,767, Mar. 16, 1981, abandoned.

This application Aug. 4, 1986, Ser. No. 892,452

Int. Cl.<sup>4</sup> B64C 37/02; B64D 5/00

U.S. Cl. 244-2

20 Claims



1. A composite VTOL vehicle comprising:
  - a single aerodynamically shaped wing beam;
  - a left pair and a right pair of engines mounted respectively near the left and right outboard edges of the wing beam to straddle said wing beam, said engines including pivoting means by which the engines may be pivoted between a first position in which the engines provide substantially vertical thrust to each side of the wing beam and a second position in which the engines provide substantially horizontal thrust above and below said wing beam;
  - a centerline mounted cabin attached directly to the underside of the wing beam and positioned so that at least a portion thereof protrudes below said wing beam;
  - an attaching means for releasably attaching an aircraft to the underside of the cabin, said attaching means being adapted to attach the aircraft to be held thereby between the engine pairs; and
  - a landing gear means arranged in supportive deployment with respect to the vehicle.

#### 4,678,142 PRECISION GUIDED ANTIAIRCRAFT MUNITION

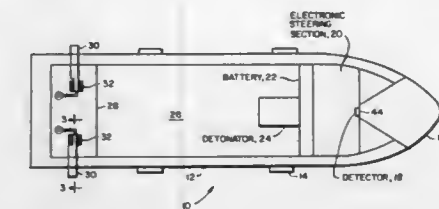
Tomas B. Hirschfeld, Livermore, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 25, 1985, Ser. No. 758,927

Int. Cl.<sup>4</sup> F42B 15/027

U.S. Cl. 244-3.16

1 Claim



1. A guided projectile for use in an antiaircraft gun, a target aircraft being illuminated by a pulsing laser designator for said guided projectile to home upon, said guided projectile comprising:

- a casing, said casing being aerodynamically shaped;
- means for derotating and steering said guided projectile, said means attached to a rear section of said casing, said means including a plurality of steerable deployable vanes, said vanes being positioned in said rear section of said casing, said vanes causing said projectile to change from spin stabilized to drag stabilized;
- optical means for focusing reflected laser radiation from said aircraft onto a designated area, a position of a spot, being the focused reflected laser radiation, on said designated area corresponding to a position of said aircraft in a field of view, said optical means being positioned at a front of said casing;
- an electronic steering section, said electronic steering section outputting signals for controlling said vanes for derotating and steering said guided projectile, said signals being a function of said position of said spot on said designated area, said electronic section outputting signals to null said signals, said electronic steering section including a bridge cell having four detector quadrants forming said designated area, said bridge cell coupled to said optical means;
- a vane control section, said vane control section receiving said signals from said electronic steering section, said vanes being driven by piezoelectric actuators that receive said signals;
- a high energy explosive, said explosive positioned within said casing;
- a detonator, said detonator causing said explosive to ignite upon predetermined conditions; and
- a battery, said battery being activated upon the firing of said guided projectile, said battery providing power to said electronic steering section and said vane control section.

#### 4,678,143 LAUNCHER FOR REMOTELY PILOTED AIRCRAFT

Denais Griffin, Guildford, England, assignor to Frazer-Nash Ltd., England

Continuation of Ser. No. 539,983, Oct. 7, 1983, abandoned. This application Jun. 28, 1985, Ser. No. 749,822

Claims priority, application United Kingdom, Dec. 17, 1982, 8235670

Int. Cl.<sup>4</sup> B64F 1/06

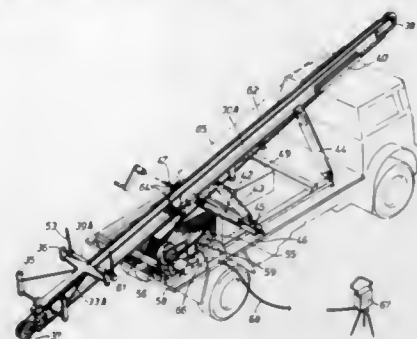
U.S. Cl. 244-63

15 Claims

1. A launcher for launching a remotely piloted aircraft, comprising a transporter vehicle; a launch ramp mounted on said transporter vehicle and providing an inclined track; a carriage mounted on said launch ramp to travel along said inclined track; actuating means for accelerating said carriage with an aircraft to be launched thereon up said inclined track,



said actuating means including a flywheel disengageable driving connection between said flywheel and said carriage, and motor drive means for accelerating said flywheel up to an operational speed of rotation with said driving connections disengaged; a frictional holdback mechanism at the lower end of the launch ramp track to engage the carriage and restrain it



over a predetermined range of movement by a frictional holdback force at the commencement of launch and over the entire range of restraint as a decreasing function of distance traveled by said carriage whereby a predetermined force is developed to impel the carriage along the track; and frictional holdback force adjusting means to adjust the frictional force exerted by said holdback mechanism.

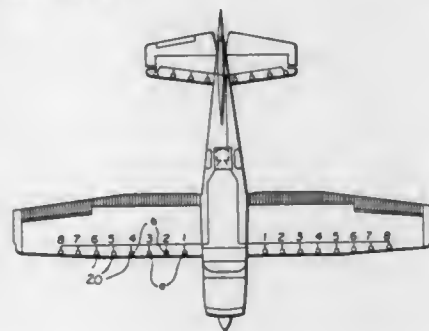
#### 4,678,144 ELECTRO-IMPULSE DE-ICING SYSTEM FOR AIRCRAFT

Robert D. Goehner, Norwich; Norman I. Glover, Guilford, and Donald G. Hensley, Norwich, all of N.Y., assignors to Simmonds Precision, Tarrytown, N.Y.

Filed Oct. 26, 1984, Ser. No. 665,056  
Int. Cl. B64D 15/16

U.S. Cl. 244-134 R

7 Claims



1. A method for de-icing an airfoil of an aircraft by means of a de-icing system having an energy storage means connected via a triggering means for energizing a plurality of electromagnetic coil sets arranged in a linear array under the leading edge of said airfoil for a given span thereof, comprising the steps of sequentially selecting interlocking groups of said coil sets for being energized, each of said groups occupying a portion of said span of said airfoil, whereby said interlocking groups are progressively energized along said span of said airfoil, simultaneously energizing said coil sets in each of said groups when sequentially selected, including triggering each of said coil sets twice from 3 to 5 seconds apart during said energizing step.

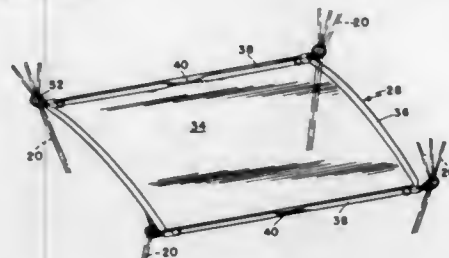
#### 4,678,145 REMOVABLE SLIDER FOR PARACHUTE DEPLOYMENT

Robert J. Buchrer, Whittier, and William L. B. Gargano, Davis, both of Calif., assignors to FXC Corporation, San Diego, Calif.

Filed Jul. 26, 1985, Ser. No. 759,609  
Int. Cl. B64D 17/62

U.S. Cl. 244-152

13 Claims



5. In combination, a parachute having a canopy and a plurality of longitudinally extending suspension lines; and manually releasable means for restraining the suspension lines to control the rate of inflation of the canopy during the deployment thereof, including a panel, a plurality of rings each surrounding and slidable longitudinally over a corresponding set of the suspension lines, and a plurality of tear away connectors for coupling the panel to corresponding ones of the rings.

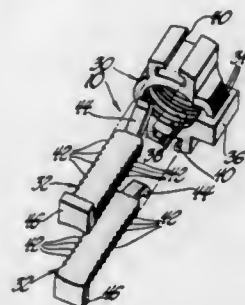
#### 4,678,146 UNIVERSAL GROMMET RETAINER

Robert G. Plyler, Vienna, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 5, 1985, Ser. No. 804,619  
Int. Cl. F16L 5/00

U.S. Cl. 248-56

3 Claims



1. A grommet assembly attachable to a panel having opposed surfaces to pass a wire bundle through an aperture in said panel, said grommet assembly comprising, a grommet body adapted to hold said wire bundle fast as it extends through said grommet body, and also including a stop portion engageable with one surface of said panel when said grommet body has been placed in an attachment position with said wire bundle passing through said aperture, a universal retainer, said retainer including a gripper member structurally separate from said grommet body and adapted to be clamped around said wire bundle at a location spaced from the other surface of said panel, said retainer further including at least one biasing member slideably movable relative to said gripper member when said gripper member is clamped to said wire bundle, said biasing member having a contact portion engageable with said panel other surface as said biasing member moves relative to said clamped gripper member toward said panel other surface, and

latch means operative between said biasing member and said gripper member to prevent said contact portion from moving away from said panel other surface when said contact member has engaged said panel other surface, whereby, when said biasing member is moved relative to said clamped gripper member toward said panel other surface, said biasing member contact portion engages said panel other surface, thereby biasing said clamped gripper member away from said panel other surface and pulling on said wire bundle to draw said grommet body stop portion into tighter engagement with said panel one surface, said grommet body stop portion and said biasing member contact portion being maintained in engagement with their respective panel surfaces by said latch means, said structurally independent universal retainer thereby cooperating with said grommet body to attach said grommet assembly to said panel.

#### 4,678,147 CLAMPS FOR ATTACHING PIPELINES TOGETHER IN PARALLEL RELATIONSHIP

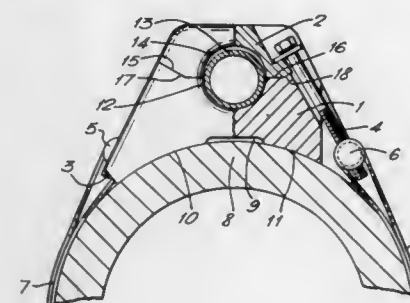
John R. Barnes, Surbiton; John E. Diamond, London, and Graham J. Griffin, Binfield, all of United Kingdom, assignors to Conoco Inc., Ponca City, Okla.

Filed Aug. 15, 1985, Ser. No. 766,602  
Claims priority, application United Kingdom, Aug. 17, 1984, 8421027

U.S. Cl. 248-74.1

Int. Cl. F16L 3/08

12 Claims



1. A clamp for use in mounting a line of smaller diameter on a line of larger diameter which comprises a saddle for positioning on the line of larger diameter, a channel formed in an outer face of the saddle for receiving the line of smaller diameter, a closure member mountable on the saddle to close the channel around the line of smaller diameter, a strap for passing around the line of larger diameter, connectable to opposite sides of the closure member and at least two tensioning devices connectable between the respective ends of the strap and the opposite side of the closure member and tensionable around the line of larger diameter whereby in use the saddle is pressed against the line of larger diameter and the closure member is pressed against the saddle as the tensioning devices are tensioned, wherein the tensioning devices are bolts which are provided at their ends with tee-bars for attachment to the strap and which in use pass through bolt holes or slots on either side of the closure member.

#### 4,678,148 SUPPORT ARRANGEMENT FOR FACILITATING A FASTENING OF WALLS, PARTITION ELEMENTS AND SHOW CASES

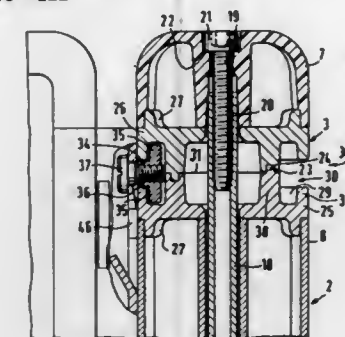
Klaus Winn, Giessen, and Erich Otto, Burbach, both of Fed. Rep. of Germany, assignors to Weyel KG, Haiger, Fed. Rep. of Germany

Filed Oct. 21, 1985, Ser. No. 789,475  
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438343

U.S. Cl. 248-122

Int. Cl. F16L 3/00

11 Claims



1. In a support arrangement, in particular for fastening of walls, adjustable walls, partition wall elements, boards, which are built of individual pipe sections, the improvement comprising wherein between two of said pipe sections there is inserted an intermediate piece, wherein said intermediate piece is provided with an annular recess for receiving of fastening elements therein, wherein all said pipe sections and said intermediate piece are guyed against one another by a pull rod which extends through all thereof, said intermediate piece being provided with annular shoulders on each side which cooperate with an inner wall of said pipe sections, and wherein recesses are provided in said annular shoulders, into which recesses are received webs provided on the inside of said pipe sections.

#### 4,678,149 SUPPORT

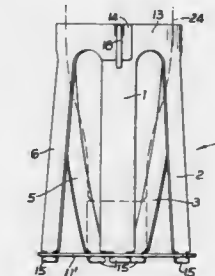
Geoffrey S. Chase, 17 High Street, Criccieth, Gwynedd LL52 OBS, England

Filed Sep. 10, 1985, Ser. No. 774,536  
Claims priority, application United Kingdom, Sep. 21, 1984, 8423951

U.S. Cl. 248-150

Int. Cl. A47G 23/02

9 Claims



1. A support comprising a slotted base portion and an originally flat, open-topped wall portion, the wall portion comprising a web and a plurality of tongues, each tongue having a root and a free end, the tongues being commonly joined at their roots by said web, the web being bendable to make a cage-like enclosure of the tongues, means to connect together opposite ends of the web when the web is bent into an annular configuration to make said enclosure, the base slots being arranged to

receive respective free end portions of at least some of the tongues so that the cage-like enclosure is upstanding from the base and each said at least some tongues having a formation spaced from the free end thereof to engage the associated slot whereby said free end portions provide feet for the support beneath the base.

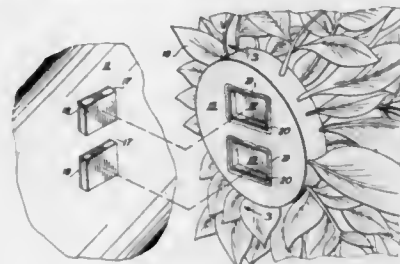
4,678,150

**DETACHABLE FOAM-BORNE MOUNTING METHOD**  
Lola Newman, and Joseph Zelasko, both of 1613 W. Carol Ave.,  
Mesa, Ariz. 85202

Filed Oct. 6, 1986, Ser. No. 915,978  
Int. Cl.<sup>4</sup> A47H 1/10

U.S. Cl. 248—205.3

20 Claims



1. A detachable foam-borne mounting method comprising the steps of:

- providing a penetrable rigid foam base, said penetrable rigid foam base having a display surface, said penetrable rigid foam base having a rear surface thereupon obverse said display surface, said rear surface having at least one shield-engagement cavity;
- injecting into each said shield-engagement cavity a first adhesive, said penetrable rigid foam base insoluble in said first adhesive;
- providing shield means, said shield means having indexing means, said shield means insoluble in said first adhesive;
- inserting into each said shield-engagement cavity said shield means, said first adhesive intermediately adhering said shield means to said penetrable rigid foam base within said shield-engagement cavity, said shield means conformal said shield-engagement cavity, said shield means having at least one mount-engagement cavity therein obverse said shield-engagement cavity;
- injecting into each said mount-engagement cavity a second adhesive, said shield means insoluble in said second adhesive;
- providing first mount means corresponding to each said shield means, said first mount means insoluble in said second adhesive;
- inserting into each said mount-engagement cavity the corresponding said first mount means, said second adhesive intermediately adhering said first mount means to said shield means within said mount-engagement cavity, said first mount means conformal said mount-engagement cavity;
- providing one of second mount means corresponding to each said first mount means, said second mount means detachably mateable to the corresponding said first mount means, said second mount means non-rotatingly indexable to one of the corresponding said shield means and the corresponding said first mount means;
- providing a display surface;
- penetratingly affixing display matter to said penetrable rigid foam base;
- releasably matingly indexingly joining each said first mount means to each corresponding said second mount means;
- applying onto at least one of said display surface and said second mount means a third adhesive means, said display

surface insoluble in said third adhesive, said second mount means insoluble in said third adhesive means;  
(m) emplacing said second mount means at a desired location upon said display surface, said third adhesive affixingly intermediate said second mount means and said display surface.

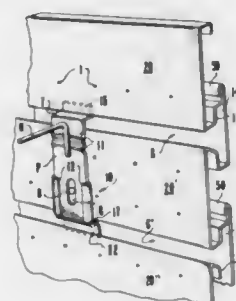
4,678,151

**MERCHANDISE HANGER FOR SLOTTED WALL DISPLAY PANEL**

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.  
Continuation-in-part of Ser. No. 626,532, Jun. 29, 1984, Pat. No. 4,607,753. This application Apr. 9, 1986, Ser. No. 849,848  
Int. Cl.<sup>4</sup> A47F 5/00

U.S. Cl. 248—220.2

6 Claims



1. A hanger support for displaying small articles of merchandise on a generally planar slotted wall merchandise display panel having horizontal grooves between opposed edges of adjacent slats forming the wall, comprising

- an assembly of a length approximately the height of the slats adapted to be detachably connected to a first slat at any point along the length thereof and having a cantilever hanger projecting forwardly therefrom for supporting and displaying the small articles of merchandise;
- said assembly comprising a main plate having said hanger affixed to the front face of said plate and a first offset retaining flange bent rearwardly from one end thereof and adapted for insertion into a first groove adjacent to said slat for ultimate disposition in a plane substantially parallel to said slat and in engagement with the rear portion of a second slat adjacent to said first slat;
- an auxiliary plate spanning the entire width of the rear face of said main plate and mounted for slideable movement thereon adjacent to the end thereof remote from said first flange;
- cooperating means on said plates for limiting the extent of the sliding movement therebetween, and
- secondary retaining means on the free end of said auxiliary plate adapted for insertion into a second groove adjacent to the opposite edge of said first slat for engagement with the rear portion of a third slat adjacent to and beyond said second groove.

4,678,152

**APPARATUS FOR SUPPORTING OR ERECTING STRUCTURES**

Eric K. Cheng, London, United Kingdom, assignor to Reyloc Limited, London, United Kingdom

Filed Sep. 21, 1984, Ser. No. 652,975

Claims priority, application United Kingdom, Oct. 6, 1983, 8326708; Jun. 28, 1984, 8416500

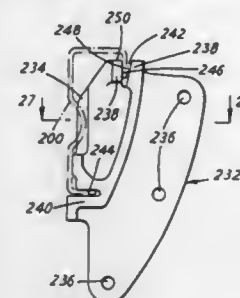
Int. Cl.<sup>4</sup> E04F 19/06

U.S. Cl. 248—225.1

6 Claims

4. An apparatus for supporting or erecting structures comprising a bracket which engages an elongated linear support,

said elongated linear support member having a vertical support member web and a horizontal support member web, said horizontal support member web having a vertical, downwardly extending flange and said vertical support member web having a horizontal extending flange, said bracket having a first blade portion and a main body portion, said main body portion having first and second body webs extending laterally of said first blade portion, said first and second body webs each having walls defining respective first and second notches,



said first body web presenting a substantially flat surface in an upward direction and said first notch being defined by a vertical wall and an inclined wall, such that said vertical, downwardly extending flange extends into said first notch when said bracket engages said elongated linear support,

said second body web presenting a substantially flat surface in an outward direction and said second notch being defined by a pair of walls of which at least one is substantially horizontal, such that said horizontally extending flange extends into said second notch when said bracket engages said elongated linear support.

4,678,153

**TROUBLE LAMP AND RETAINER**

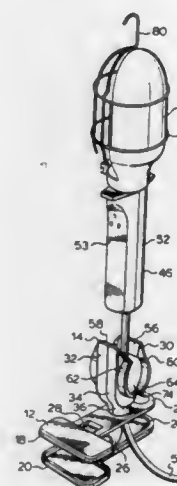
William H. Maddock, Markham, and Bert Bobrovniczky, Don Mills, both of Canada, assignors to Noma Inc., Scarborough, Canada

Filed Nov. 4, 1985, Ser. No. 795,008

Int. Cl.<sup>4</sup> A47B 96/06

U.S. Cl. 248—229

14 Claims



1. A retainer for a trouble lamp having an elongated handle comprising:

- a holder including a pair of spaced apart elongated jaws extending about a first central axis and connected at one axial end thereof by a bight portion, said jaws defining a first pair of opposed axially aligned substantially concave

bearing surfaces and a second pair of transversely aligned opposed substantially concave bearing surfaces located about a second central axis extending transverse to and intersecting said first central axis intermediate the axial ends thereof for receiving and retaining the handle of said trouble lamp therebetween in either an axially aligned or a transversely aligned position, and;

a clamp member;

one of said clamp member and the bight portion of said holder being provided with a journal and the other a bearing for said journal to thereby connect said clamp member and said holder for relative axial rotation.

4,678,154

**HOLDER FOR BEVERAGE CONTAINERS AND THE LIKE**

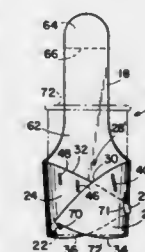
Joseph R. McFarland, 507 Palo Alto Dr., Vancouver, Wash. 98661

Filed Apr. 25, 1986, Ser. No. 856,593

Int. Cl.<sup>4</sup> A47K 1/08

U.S. Cl. 248—311.2

15 Claims



1. A holder for beverage containers and the like, of flexible sheet material having a generally three-armed shape when flat, comprising:

- a first arm having a distal portion and a proximal portion;
- a second arm extending laterally with respect to said first arm and being connected with said proximal portion of said first arm, said second arm having a hook portion;
- a third arm extending generally oppositely away from said second arm and being connected with said proximal portion of said first arm, said third arm including a tapered tongue portion extending away from said second arm;
- first slot means defined in said second arm for adjustably receiving said tapered tongue portion therein; and
- second slot means defined in said third arm for selectively receiving and holding said hook portion of said second arm with said second and third arms configured to encircle a beverage container as a generally frusto-conical receptacle in a selected one of a plurality of sizes.

4,678,155

**MECHANISM ON A VEHICLE SEAT FOR ADJUSTING STIFFNESS OF RIDE**

John W. Carter, Moline, Ill., assignor to The Wise Company, Inc., Memphis, Tenn.

Filed Dec. 12, 1986, Ser. No. 941,201

Int. Cl.<sup>4</sup> F16M 13/00

U.S. Cl. 248—564

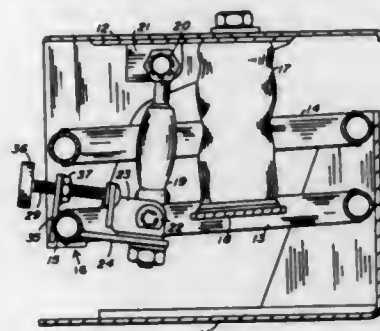
2 Claims

1. A suspension for a vehicle seat, said suspension having first and second supporting members spaced apart, said first supporting member being a support for said seat, said second supporting member being a base to be attached to a vehicle, each of said supporting members having a pair of pivots, first and second links connected between said supporting members, the ends of said links being connected to respective ones of said pivots to provide parallel linkage, a resilient member connected to said parallel linkage to support said first supporting member at a desired height, a shock absorber positioned apart from said resilient member and connected between any one of said supporting members and any one of said links, one end of



said shock absorber being connected to said any one supporting member and the other end of said shock absorber being connected to said any one link at a position approximate a respective one of said pivots connected to said any one link, the improvement comprising:

- an adjustable assembly connecting said other end of said shock absorber to said any one link, said adjustable assembly comprising:
- a plate connected to said any one link, the position of said plate being approximate said respective pivot connecting said any one link to said any one supporting member, a surface of said plate facing said any one supporting member and being substantially normal to a line directed to



said one end of said shock absorber, said surface extending a moderate desired distance along the length of said any one link,

a slide positioned on said surface of said plate and restricted to move a moderate desired distance over said surface along a line directed from said respective pivot thereof in a plane substantially parallel to said any one link, means pivotally connecting said other end of said shock absorber to said slide, and

adjusting means for setting said slide along said line within said moderate desired distance to control quality of ride without changing said desired height of said first supporting member for said seat.

4,678,156

#### REUSABLE CONCRETE FORMS WITH SPACER/TIER RODS

Joseph Scalomandre, Freeport, and John J. Vigilante, Glendale, both of N.Y., assignors to Fred Scalomandre, Freeport and Michael L. Vigilante, Massapequa Park, both of N.Y., a part interest

Filed Dec. 31, 1984, Ser. No. 687,834  
Int. Cl. E04G 17/12

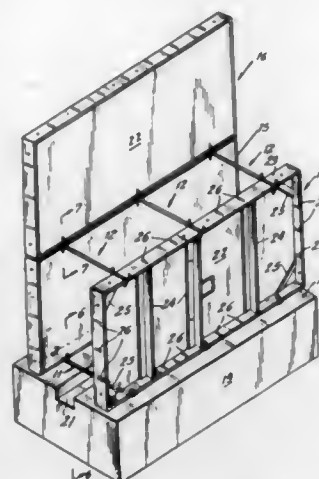
U.S. Cl. 249-34

21 Claims

1. A reusable form, for in situ construction of poured concrete, the form comprising a plurality of sections each having a sheet-like structure stiffened by a peripheral frame and spacer/tie means holding opposing form sections in a spaced relationship, the spacer/tie means comprising:

- an elongated main portion;
- first and second indexing formations on said main portion at opposite ends thereof, and third and fourth indexing formations on said main portion at fixed locations along the length thereof with said locations being a predetermined distance inboard of the respective first and second indexing formations;
- said predetermined distance being substantially equal to the thickness of a section of the frame and the distance between the third and fourth indexing formations being equal essentially to the thickness of a wall to be poured;
- said first and second indexing formations being tool bendable with respect to said main portion;
- said first and second formations extending from said main

portion inwardly toward one another and over the frames of a first pair of opposing form sections, firmly holding



said first pair of form sections against vertical movement with respect to said main portion.

4,678,157

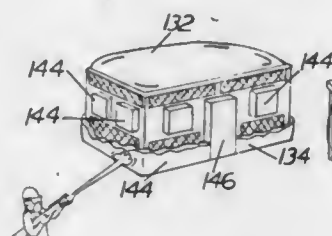
#### APPARATUS FOR THE CONSTRUCTION OF A LOW COST STRUCTURE

Robert Foodiller, 200 W. 58th St., New York, N.Y. 10019

Filed Aug. 30, 1984, Ser. No. 645,802

Int. Cl. B28B 7/32; B29C 41/08; E04B 1/34; E04G 11/02  
U.S. Cl. 249-65

9 Claims



1. An apparatus for the rapid construction of structures comprising an inflatable member having a plurality of integrally formed outwardly projecting protuberances with said protuberances inflatable along with said inflatable member, means for inflating said inflatable member, hardenable material, and means for applying said hardenable material to said inflatable member in areas between said protuberances thereby forming a shell structure with said protuberances forming apertures in said shell structure.

4,678,158

#### INJECTION MOLD INCLUDING MOLD SIDEWALL LOCKING BARS

Robert E. Brock, Mukwonago, Wis., assignor to Triangle Tool Corporation, Brookfield, Wis.

Filed Nov. 21, 1985, Ser. No. 802,353

Int. Cl. B29C 45/33, 39/34

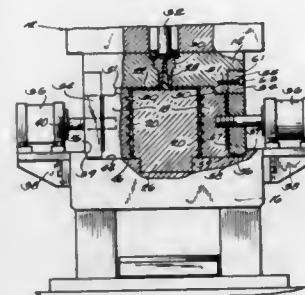
U.S. Cl. 249-161

13 Claims

1. A mold assembly comprising a first mold plate, a second mold plate, means for supporting said first and second mold plates for movement toward and away from each other between a mold open position and a mold closed position, a plurality of mold sidewalls positioned between said first

mold plate and said second mold plate, said sidewalls being moveable in a direction generally transverse to the direction of movement of said first and second mold plates with respect to each other and between a mold open position and a mold closed position wherein said sidewalls define a mold cavity, said sidewalls each including a first portion adjacent said first mold plate and a second portion adjacent said second mold plate, and

means for locking said mold sidewalls in said mold closed position, said means for locking including a locking bar



having opposite ends, one of said ends being fixed to said first mold plate and the other of said opposite ends of said locking bar extending toward said second mold plate and being wedged between said second portion of one of said sidewalls and a portion of said second mold plate when said first and second mold plates are in said mold closed position and when said sidewalls are in said mold closed position and to prevent outward movement of said second portion of said one of said sidewalls with respect to said second mold plate.

4,678,159

#### MANUALLY ACTUATED FLUID FLOW CONTROL VALVE AND METHOD OF MAKING SAME

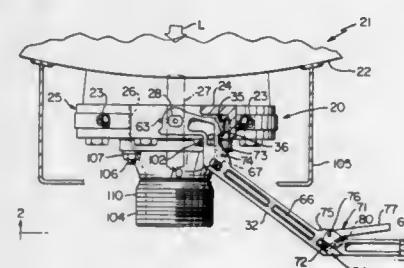
John F. Gardner, Loveland, and Gerald H. Morton, Cincinnati, both of Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

Filed May 14, 1985, Ser. No. 733,964

Int. Cl. F16K 35/02

U.S. Cl. 251-107

18 Claims



1. In a manually actuated fluid flow control valve assembly which has an associated support structure, said valve assembly comprising, a valve body having a flow passage therethrough, a closure device carried by said valve body for controlling fluid flow through said passage, a manually operated handle operatively connected to said closure device, said handle being manually movable between an open and a closed position thereof which also define an open and a closed position of said closure device and hence said valve assembly, and manually releasable means for holding said handle in said closed position, said manually releasable means comprising automatic lock means carried by one of said structure and said handle for engaging the other of said structure and said handle for providing automatic locking of said handle once said handle and said

closure device are in said closed position, said automatic lock means comprising spring lock means, the improvement in which said spring lock means is in the form of a yieldable spring clip having a substantially U-shaped configuration defined by a bight having a pair of legs diverging therefrom, one of said legs being fastened to said one of said structure and said handle and the other of said legs having a projection which extends away from both of said legs, and said projection being adapted to yieldingly engage said other of said structure and said handle and provide said automatic locking of said handle.

4,678,160

#### SOLENOID VALVE

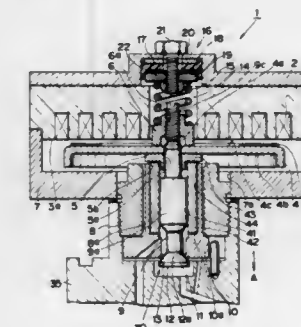
Keiichi Yamada, and Tatsuhiro Abe, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1986, Ser. No. 885,145

Claims priority, application Japan, Jul. 18, 1985, 60-157049  
Int. Cl. F16K 31/06

U.S. Cl. 251-129.02

8 Claims



1. A solenoid valve which has a valve member made of an electrically conductive material and an electrically conductive body having a valve seat associated with said valve member, thereby constituting a switch for electrically connecting said electrically conductive body with said valve member when said valve member is seated on said valve seat, said solenoid valve comprising:

- a solenoid actuator which has a stator with an exciting coil and an armature fixed to said valve member and provides an electromagnetic force to seat said valve member on said valve seat;
- a spring means for biasing said valve member to separate from said valve seat at the time said solenoid actuator is in the de-energized state;
- a stopper connected to said valve member for determining the maximum stroke of said valve member for the opening state of said solenoid valve; and
- an insulating guide member having a guide hole for supporting and guiding said valve member while maintaining an electrically insulating state between said body and a sliding surface of said valve member, said insulating guide member being mounted on the body in such a way that said stopper comes in contact with only one of the end portions of said insulating guide member when said solenoid actuator is in the de-energized state and this end portion is acting as an electrically insulating stopping member for said stopper.

4,678,161

## BALL VALVE

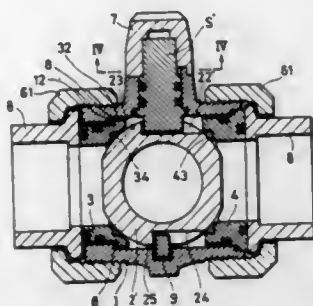
Yoshiaki Bando; Teruyoshi Asano; Shigenobu Kato, all of Saitama, and Katsuhiko Tanioaka, Shiga, all of Japan, assignors to Selkisul Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 660,182, Oct. 12, 1984, abandoned. This application Aug. 7, 1986, Ser. No. 893,448

Int. Cl.<sup>4</sup> F16K 25/00, 5/06

U.S. Cl. 251-171

5 Claims



1. In a ball valve in which a ball is arranged in a valve body in such a manner as to selectively open and close a fluid passage in said body, and annular seals abut against said ball from both sides in said fluid passage, said annular seals being pushed towards said ball by a first and a second seal carrier, the improvement wherein:

said first seal carrier having a continuous flange formed on the periphery of one end adjacent said ball, said flange being locked to a step which is formed on an inner surface of one end of said valve body and a flat inner surface at the other end, said second carrier having a flat surface at its end adjacent said ball confronting said flat surface on said valve body on an inner surface of one end of said valve body, wherein a reaction biasing force is generated when said ball is forced against said first seal carrier, and wherein said reaction force maintains the seal between both of said seal carriers and said ball.

4,678,162

## JACK HAVING THE PNEUMATIC AIR PUMP FUNCTIONS AND USING A COMMON DRIVE MOTOR

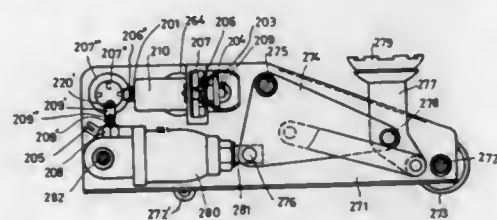
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Oct. 25, 1985, Ser. No. 791,503

Int. Cl.<sup>4</sup> B60P 1/48; B66F 3/24

U.S. Cl. 259-8 B

1 Claim



1. In a hydraulic floor jack adapted for the tasks of lifting a vehicle and pumping up a tire, respectively, the combination of a housing, a common drive motor in the housing, the motor including an elongated double-ended shaft having respective end portions projecting from the motor, an air pump on the housing and including a piston connected to one of the end portions of the motor shaft, reduction gearing driven by the other end portion of the motor shaft, an oil pump including a crank driven by the reduction gearing, an oil pressure tank driven by the oil pump and including a drive rod, a lifting mechanism including a pivoted arm set driven by the drive rod, a pivoted upper arm coupled to the arm set and including a supporting block for lifting a vehicle, and drain control means for the air pump and oil pump, respectively.

4,678,163

## TIRE HANDLING APPARATUS

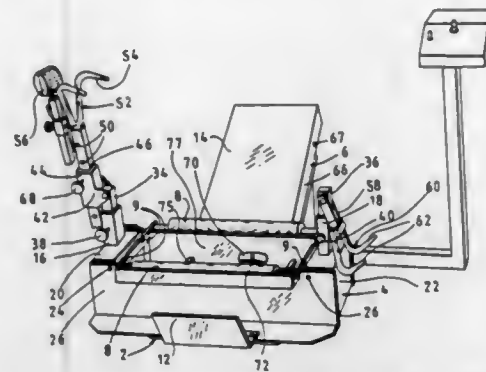
Arne Hjorth-Hansen, Virringvej 2, DK-8660 Skanderborg, Denmark

Continuation of Ser. No. 707,031, Mar. 1, 1985, abandoned. This application Sep. 18, 1986, Ser. No. 908,781

Int. Cl.<sup>4</sup> B60C 25/14

U.S. Cl. 254-50.2

10 Claims



1. A tire handling apparatus of a tire spreader type, the apparatus comprising a support member for receiving and supporting a tire in an upright position thereof, said support member including tire spreading claw means operable to be brought into engagement with an inside of opposed tire bead areas and to draw such opposed bead areas away from each other for facilitating access to an interior of the tire with the latter located in a convenient working height upon elevation of the tire from a floor supporting the apparatus; wherein the support member is a unit of a height dimension substantially smaller than said convenient working height; wherein the support member is associated with an underlying, floor supported lower apparatus part through a lift system operable to automatically raise and lower the support member between a lower tire receiving position and an elevated working position upon an actuation of the lift system; and wherein the spreading claw means are operated during a raising movement of the lower apparatus part by said lift system so as to support the tire in an upright position.

4,678,164

## JACK HAVING THE PNEUMATIC AIR PUMP FUNCTIONS AND USING A COMMON DRIVE MOTOR

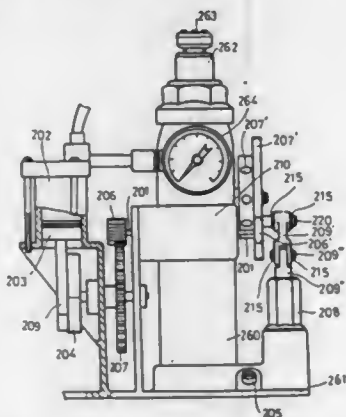
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Continuation-in-part of Ser. No. 791,503, Oct. 25, 1985, abandoned. This application Jan. 8, 1986, Ser. No. 817,245

Int. Cl.<sup>4</sup> B66F 3/24; B60P 1/48

U.S. Cl. 254-93 H

1 Claim



1. In a hydraulic jack including an air pumping feature, the combination of a base, a main body on the base, a common drive motor in the body transversely thereof, the motor includ-

ing an elongated double-ended shaft having respective end portions projecting from the motor, an air pump in the body and including a piston, first reduction gearing connected between the piston and one of the end portions of the motor shaft, second reduction gearing driven by the other end portion of the motor shaft, an oil pump driven by the second reduction gear, a lifting mechanism including a stand shaft driven by the oil pump, a top block driven by the stand shaft for lifting a base, and drain control means for the air pump and oil pump, respectively.

4,678,165

## MODE OF CONSTRUCTION OF LIFTING MECHANISMS FOR A JACK-UP PLATFORM AND LIFTING MECHANISM FOR A JACK-UP PLATFORM

Jarmo Eloranta, Parkano, Finland, assignor to Rauma-Repola Oy, Parkano, Finland

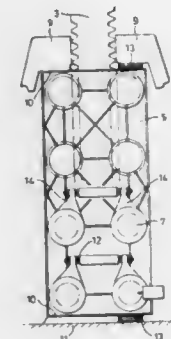
Filed May 6, 1986, Ser. No. 860,242

Claims priority, application Finland, May 27, 1985, 852112; Mar. 26, 1986, 861311

Int. Cl.<sup>4</sup> B66F 7/12

U.S. Cl. 254-97

10 Claims



1. A lifting mechanism for a jack-up platform comprising a platform, a platform support frame for supporting said platform and at least one leg for supporting said platform support frame, said leg having a toothed rack extending therealong, said platform support frame being movable relative to said at least one leg, said lifting mechanism comprising:

a lifting frame, adjacent said at least one leg and movable relative thereto, connected to said platform support frame; and

lifting means, connected to said lifting frame and engaging said toothed rack, for moving said lifting frame relative to said leg;

wherein said lifting means comprises: two cog wheels engaging said toothed rack, said cog wheels being rotatable so as to move along said toothed rack;

first gear box means for one of said cog wheels, having a first torque arm to transmit torques produced by said one of said cog wheels moving along said rack, for rotating said one of said cog wheels in response to a first rotational force;

first motor means, operably associated with said first gear box means, for providing said first rotational force;

second gear box means for the other of said two cog wheels, having a second torque arm to transmit torques produced by said other of said cog wheels moving along said rack, for rotating said other of said cog wheels in response to a second rotational force;

second motor means, operably associated with said second gear box means, for providing said second rotational force;

wherein said first and second torque arms are interconnected so that the torques produced by the cog wheels compensate for each other.

184-021 O.G.-87-7

4,678,166

## ECCENTRIC LOADER GUARDRAIL TERMINAL

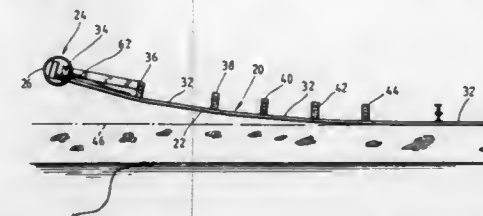
Maurice E. Bronstad, San Antonio, Tex.; James H. Hatton, Jr., Washington, D.C., and Leonard C. Meczowski, Herndon, Va., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 24, 1986, Ser. No. 855,852

Int. Cl.<sup>4</sup> E01F 15/00

U.S. Cl. 256-13.1

6 Claims



1. An eccentric loader guardrail terminal for use at the upstream end of a guardrail comprising, a plurality of joined together horizontally extending W-beam guardrails, a plurality of vertical supports for vertically supporting said W-beam guardrails, said vertical supports are breakaway posts, said plurality of rails flaring away from the traffic side of the guardrail in an upstream direction, and an eccentric lever means connected to the upstream end of the plurality of rails whereby an impacting vehicle at the upstream end will facilitate buckling of the rails allowing the vehicle to pass behind the terminal.

4,678,167

## TUNDISH CAR IN A CONTINUOUS CASTING ASSEMBLY

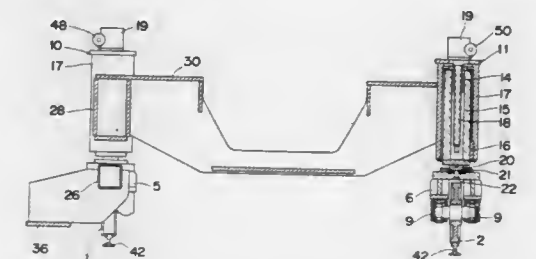
Herbert Lemper, McMurray, Pa., assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 26, 1986, Ser. No. 833,112

Int. Cl.<sup>4</sup> C21B 3/10

U.S. Cl. 266-165

8 Claims



1. A tundish car in a continuous casting assembly, comprising:

a lifting main frame for supporting a tundish; first and second wheel support frames for supporting a pair of front wheels and a pair of rear wheels; a plurality of lift mechanisms respectively mounted above said wheel support frames and connected to said lifting main frame;

means for rigidly interconnecting a first and second lift mechanism of said plurality of lift mechanisms; and

a spherical plate fixed to a bottom portion of at least one of said plurality of lift mechanisms and a spherical seat provided on at least one of said wheel support frames wherein said at least one of said plurality of lift mechanisms is supported on said spherical seat by engagement of said spherical seat with said spherical plate.



4,678,168

**TILTING CHANNEL ARRANGEMENT FOR GUIDING A MOLTEN MATERIAL**

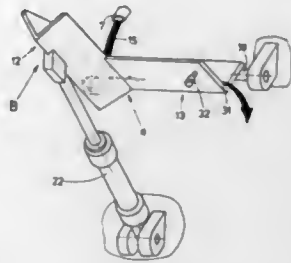
Bernhard Enkner; Leopold Amon, both of Linz; Alfred Kübelböck, Zwettl/Rodl; Wolfgang Trimmel, Leoben; Paul Nalepka, Niklasdorf; Leopold Schropp, Linz; Helmut Schwaighofer, Neumarkt; Reinhard Pum, Linz; Manfred Traxler, Hart, and Franz Tasch, Bad Mitterndorf, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 13, 1985, Ser. No. 775,536

Claims priority, application Austria, Sep. 18, 1984, 2965/84  
Int. Cl.<sup>4</sup> F27D 3/15

U.S. Cl. 266—196

12 Claims



1. A tilting channel arrangement for guiding a stream of molten material as it is being discharged from a tap hole in the side of a metallurgical vessel, said tilting channel arrangement having two branches extending divergently at an angle of less than 180° from a common origin to respective outlet ends, each branch consisting of a linear channel, one of said branch channels having a bottom which, when said branch channel is positioned for conveying said material away from said origin to its outlet end, is located at a lower level than the bottom of said other branch channel, said tilting channel arrangement being provided with a tiltable mount for securing the tilting channel arrangement in a first position beneath said tap hole with said one branch channel having its longitudinal axis aligned with the plane of the trajectory of said material when issuing from said tap hole and with said origin located beneath said tap hole for receiving issuing material at a point of impact in the vicinity of said origin, said tiltable mount being constructed to provide a tilting axis about which said tilting channel arrangement can be rotated selectively from said first position to a second position where said outlet end of said one branch channel is elevated sufficiently to cause any material that issues from said tap hole to accumulate in the vicinity of said point of impact and enter said other branch channel which has moved into position for conveying said material toward its said outlet end.

4,678,169

**PRINTED CIRCUIT BOARD HOLDER**

Herbert Fishman, Newton Center, and Alvin J. Rogers, Brockton, Mass., assignors to Systems Engineering & Manufacturing Corp., Stoughton, Mass.

Continuation of Ser. No. 565,860, Dec. 27, 1983, abandoned, which is a continuation-in-part of Ser. No. 455,956, Jan. 6, 1983, Pat. No. 4,454,003. This application Jul. 7, 1986, Ser. No. 882,182

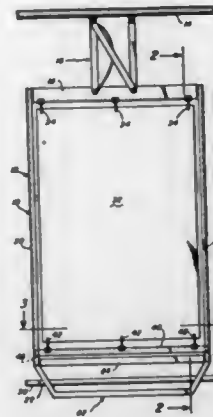
Int. Cl.<sup>4</sup> B23Q 1/00

U.S. Cl. 269—46

14 Claims

1. In a frame for use in conveying at least one substantially planar printed circuit board component in a vertical plane along a path for treatment of sides of said board, said frame defining a rigid frame support and means for mounting said frame for movement along said path, the improvement comprising:

means for mounting an edge of said board at a first position on said frame,  
a moveable weight bar means for mounting a second edge of said board at a second position on said frame below said first position with said weight bar acting to provide a gravitational force on said board component for aiding in maintaining said component substantially planar during processing of said component mounted in said frame.



said weight bar being mounted for reciprocal movement toward and away from the pull of gravity with the weight of the weight bar providing a gravitational force to restrain said board component,  
said weight bar having ends slidably inter-engageable with side pieces of said frame to further restrain said board component,  
said weight bar being supported relative to said frame so that substantially the full weight of the weight bar imposes a gravitational force on said board component.

4,678,170

**LOG HOLDER DEVICE**

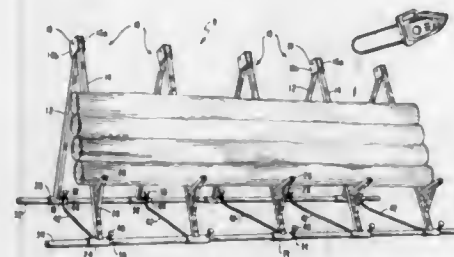
Robert L. Sampson, 901 W. 3rd, Anaconda, Mont. 59711  
Continuation of Ser. No. 643,773, Aug. 24, 1984, abandoned.

This application Apr. 16, 1986, Ser. No. 852,620

Int. Cl.<sup>4</sup> B23Q 3/00

U.S. Cl. 269—296

2 Claims



1. An improved device for holding logs and for facilitating the cutting of logs into pieces when the device is positioned on a base surface comprising:

- (a) upright means including at least two upright members extending upwardly from the base surface, for holding multiple logs stacked one on top of the other, such logs being arranged with their longitudinal axes in a generally parallel and horizontal direction;
- (b) a log support member being mounted to each upright member such that the log support member extends outwardly from the upright member at an angle of 90° or less with respect to the upright member, the log support mem-

- ber being located in spaced apart relation with the base surface;
- (c) means for holding the upright members in a spaced apart parallel relation, said means being located below the log support member;
- (d) the upright members being constructed so that when the upright members are positioned for holding logs, the log support members extend in an upwardly direction with respect to the horizontal direction and the space above the log support members and the top of the upright members and between the upright members is free from any obstructions.

4,678,171

**POSITIONING LIFT FOR SURGICAL TABLE**

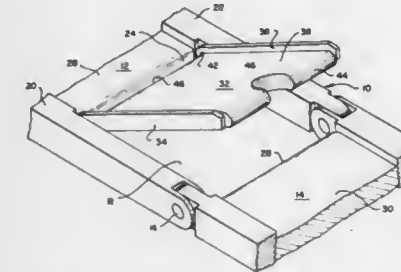
Ward L. Sanders, and David W. Robinson, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Jun. 19, 1985, Ser. No. 746,411

Int. Cl.<sup>4</sup> A61G 13/00

U.S. Cl. 269—325

14 Claims



1. In a surgical table having a multisectioned patient support surface including a back section for supporting the patient's back and at least one adjacent section, each of the sections being so pivotally movable relative to the adjacent sections that the table surface can assume a range of positions for anatomically posturing portions of the patient's body for different surgical procedures, the improvement comprising:
- the back section defining an opening therein, said opening having a perimeter;
  - a movable member mounted in said opening and being so pivotally connected to a portion of said perimeter that said movable member can assume a range of articulated positions relative to the back section for lifting portions of the patient's body, the assumption of said positions within said range of articulated positions being selectively independent of the assumption of positions by the table surface; and
  - means for locking said movable member into selective positions within said range of articulated positions.

4,678,172

**HIGH SPEED ON-LINE RESHINGLING OF PRINTED PRODUCTS**

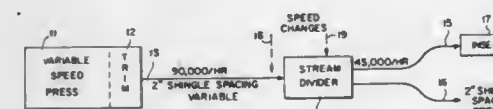
Hans G. Faltin, York, Pa., assignor to Custom-Bilt Machinery, Inc., York, Pa.

Filed Dec. 27, 1985, Ser. No. 813,878

Int. Cl.<sup>4</sup> B41F 13/64

U.S. Cl. 270—18

13 Claims



1. A printing system for downstream processing of shingled products conveyed from a variable speed printing press, com-

prising in combination, a variable speed printing press for providing a plurality of printed products, on-line conveyor delivery means downstream of said printing press for receiving printed products and for presenting printed products in shingled relationship in a press output stream at a predetermined product rate, reshingling means for processing the on-line product stream to divide the stream into two continuous streams of output shingled products conveyed at a product rate substantially less than said predetermined rate.

4,678,173

**APPARATUS FOR AUTOMATICALLY AND CONTINUOUSLY FEEDING AND FOLDING TEXTILE ARTICLES**

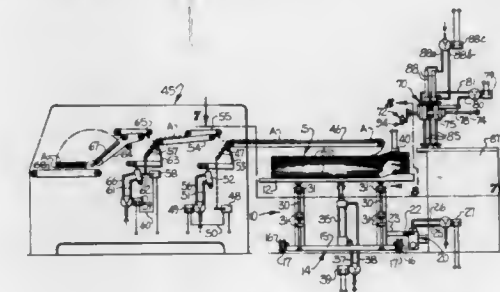
David M. Basinger, Kannapolis; Gary L. Hatley, Stanley; Billy J. Kiser, Concord, and James N. Moser, Kannapolis, all of N.C., assignors to Fieldcrest Cannon, Inc., Eden, N.C.

Filed Dec. 11, 1985, Ser. No. 807,869

Int. Cl.<sup>4</sup> B42C 1/00

U.S. Cl. 270—45

15 Claims



1. Apparatus for automatically and continuously feeding and folding successive textile articles, such as towels and the like, from a supply stack of such textile articles; said apparatus comprising:

supply means including first and second table means for respectively receiving first and second supply stacks of the textile articles thereon, movable carriage means carrying said two table means for movement between a first position in which said first table means is in a feeding position for feeding of the textile articles from the stack thereon and said second table means is in a non-feeding position so that a stack of textile articles may be placed thereon and a second position in which said second table means is in the feeding position for feeding of the articles from the stack thereon and said first table means is in the non-feeding position so that a stack of textile articles may be placed thereon, means connected to said carriage means for selective movement of said carriage means between the first and second positions, means independently mounting said respective table means on said carriage means for vertical up and down movement, and means connected to said table mounting means for moving said table means in the vertical direction to maintain the stack of textile articles on said table means in the feeding position at a desired height as the textile articles are fed therefrom;

folding means for successively receiving the textile articles and for folding the textile articles into a desired folded condition; and

robot feeding means positioned adjacent said supply means and the supply stack of textile articles in the feeding position for successively picking-up the textile articles from the top of the stack in the feeding position and transporting them therefrom to said folding means and releasing the textile articles.

4,678,174

# APPARATUS FOR PICKING-UP AND FURTHER TRANSPORTING, FOLDED PRINTED PRODUCTS, ESPECIALLY SIGNATURES OR SHEETS, FROM A CONVEYING DEVICE

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

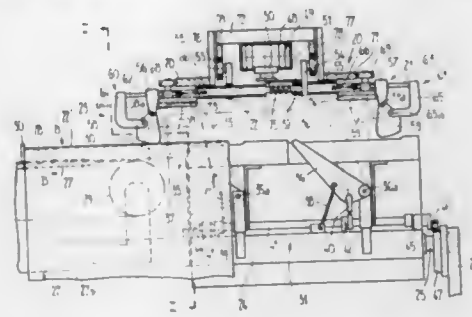
Filed Aug. 18, 1986, Ser. No. 897,419

Claims priority, application Switzerland, Aug. 29, 1985, 03708/85

Int. Cl.<sup>4</sup> B65H 39/02

U.S. Cl. 270—54

18 Claims



1. An apparatus for picking-up and further transporting folded printed products, especially signatures or sheets, from a conveying device upon which the folded printed products straddlingly rest with folded edges thereof substantially aligned in the direction of conveyance of the conveying device, comprising:

elevating means for elevating the folded printed products; transport means for further transporting the folded printed products away from the conveying device; said transport means comprising a product withdrawal device for picking-up the folded printed products from said elevating means by entering between respective product portions of each folded printed product; and said product withdrawal device comprising a circulatingly driven traction member and a plurality of controllable holding means mounted on said circulatingly driven traction member for laterally entering between said respective printed products at folded edges thereof.

4,678,175

# SHEET MONEY FEEDING MACHINE WITH IMPROVED SEPARATION MEANS

Brian D. Arltd, Austin, Tex.; Jonathon T. Loeb, Concord; Joseph C. Miller, Huntersville, both of N.C.; Hossein B. Parsapour, Darnestown, Md.; Fred H. Rascoe, III, and Don W. Woodward, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 798,777, Nov. 18, 1985, abandoned.

This application Aug. 8, 1986, Ser. No. 894,707

Int. Cl.<sup>4</sup> B65H 3/04

U.S. Cl. 271—34

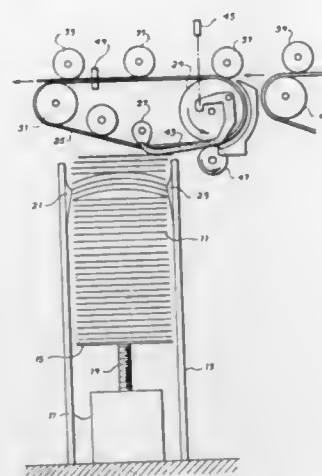
5 Claims

1. A sheet money feeding machine comprising: a friction feed means disposed above a cassette, said friction feed means having an actuator for selectively feeding a top sheet of money from a stack of money in said cassette;

said cassette having a pair of sidewalls and a moveable bottom, said bottom being connected to a motor for raising said bottom as sheets of money are fed from the top of said stack of money in said cassette, so as to maintain said top of said stack of money substantially at the top of said cassette;

an inwardly projecting ramp extending from each of said sidewalls for squeezing each sheet inwardly and causing it to bow upwardly and be separated from the immediately underlying sheet, as said stack of money is raised in said

cassette, said ramp means being spaced from said top of said cassette for permitting those sheets of money which



have passed said ramp means to again lie substantially flat in preparation for feeding by said friction feed means.

4,678,176

# FRONT AIR KNIFE TOP VACUUM CORRUGATION FEEDER

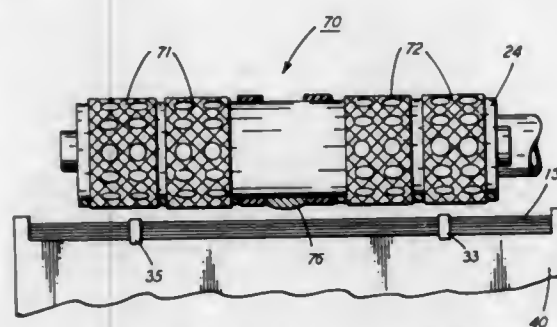
George J. Roller, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 6, 1985, Ser. No. 795,678

Int. Cl.<sup>4</sup> B65H 3/12

U.S. Cl. 271—94

7 Claims



1. A top sheet feeding apparatus comprising a sheet stack support tray for supporting a stack of sheets within the tray, air knife means positioned immediately adjacent the front of said stack of sheets for applying a positive pressure to the sheet stack in order to separate the uppermost sheet in the stack from the rest of the stack, and feedhead means including a vacuum plenum chamber positioned over the front of the sheet stack having a negative pressure applied thereto during feeding, said vacuum plenum chamber having a sheet corrugation member located in the center of its bottom surface and perforated feed belt means associated with said vacuum plenum chamber to transport the sheets acquired by said vacuum plenum chamber in a forward direction out of the stack support tray, and wherein said perforated feed belt means includes a multiple shaft tipped knurled elastomer surface that is configured such that frictional contact is enhanced between said perforated feed belt means and each sheet in said stack of sheets and a more uniform vacuum force is applied over the entire sheet area once a negative pressure is applied to the top sheet in the sheet stack by said vacuum plenum.

4,678,177

# REGISTERING METHOD

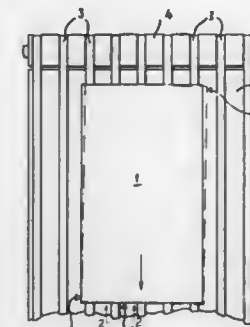
Ben Zion Landa, Edmonton, Canada, assignor to Savin Corporation, Stamford, Conn.

Continuation of Ser. No. 39,270, May 16, 1979, abandoned, which is a continuation of Ser. No. 794,096, May 5, 1977, abandoned. This application Apr. 21, 1981, Ser. No. 256,132

Int. Cl.<sup>4</sup> B65H 9/04

U.S. Cl. 271—238

2 Claims



1. Apparatus for stationarily positioning a sheet of thin flexible paper-like material at a given location in a process station including in combination, means for gravitationally supporting and frictionally conveying a sheet of material along a path having a certain direction from a remote location to said given location with the leading edge of said sheet normally generally perpendicular to said direction, said conveying and supporting means permitting sliding movement of the sheet relative thereto in response to an obstacle encountered by an edge of said sheet, first stop means at said station for engaging the leading edge of a normally conveyed sheet at one side of the centerline thereof with reference to said direction while leaving the leading edge at the other side of said centerline free for initiating a turning movement of said sheet relative to said conveying means and to said path direction as it enters said given location, a second stop at said station positioned to engage one side edge of said sheet adjacent to a leading corner thereof and a third stop at said station positioned at a location along said path spaced rearwardly of the second stop to engage the other side edge of said sheet adjacent to a trailing corner thereof, said second and third stops positively arresting said turning movement after a predetermined movement while inhibiting sliding movement of said sheet relative to said first stop means generally in the direction of said turning movement accurately to hold said sheet at said station in a skewed position relative to said path direction to permit an operation to be performed on said sheet.

4,678,178

# SHEET MATERIAL CONVEYING DEVICE

Kazunori Aklyama, Takatsuki; Aribiro Tsunoda, Sakai, and Satoshi Tanaka, Yao, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 26, 1985, Ser. No. 705,804

Claims priority, application Japan, Feb. 29, 1984, 59-29973[U]; Oct. 30, 1984, 59-164871[U]

Int. Cl.<sup>4</sup> B65H 9/14

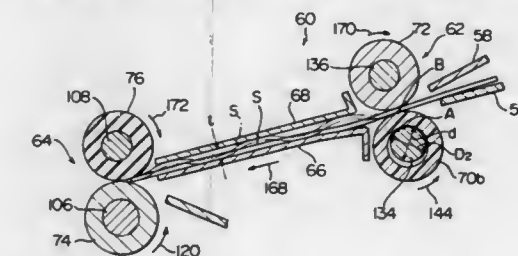
U.S. Cl. 271—242

10 Claims

1. In a paper sheet material conveying device for feeding paper sheets in an electrostatic copying machine, said conveying device being of the type comprising a feed roller assembly for feeding the paper sheets in a feed direction and temporary hampering means, located downstream of said feed roller assembly with respect to said feed direction, for temporarily stopping forward movement of a paper sheet being fed by said feed roller assembly, said feed roller assembly comprising a driven shaft extending substantially horizontally, means for continuously rotating said driven shaft, a follower shaft ex-

tending substantially horizontally at a position above said driven shaft, and at least one follower roller mounted on said follower shaft, said driven rollers and said follower roller rotating and nipping therebetween a paper sheet during feeding thereof by said feed roller assembly, and the paper-sheet, upon being stopped temporarily by said hampering means, preventing rotation of said follower roller, the improvement comprising means for, upon the paper sheet being stopped by said hampering means, reducing soiling of the paper sheet without interruption of the continuous rotation of said driven shaft, said reducing means comprising:

said plurality of driven roller comprising at least one first driven roller having a non-slip rotary connection with said driven shaft and at least one second driven roller having an inside diameter larger than the outside diameter of said driven shaft and mounted on said driven shaft with a rotary slip connection therebetween, said non-slip rotary



connection comprising means for displacing said first driven roller upwardly and downwardly with respect to said driven shaft during each revolution thereof between an upper position, whereat the uppermost surface of said first driven roller is at substantially the same level as the uppermost surface of said second driven roller, and a lower position below said level; and said first and second driven rollers contacting the paper sheet and cooperating with said follower roller to nip therebetween the paper sheet during feeding thereof; whereby when feeding of the paper sheet is stopped temporarily by said hampering means, rotating of said at least one second driven roller is interrupted during continued rotation of said driven shaft due to said rotary slip connection therebetween, while rotating of said at least one first driven roller is continued during continued rotation of said driven shaft due to said non-slip rotary connection therebetween.

4,678,179

# COPYING MACHINE WITH A ROTARY SORTER HAVING SHEET GRIPPING DEVICES

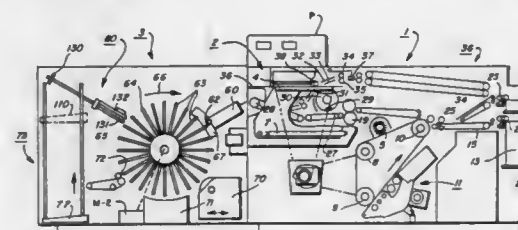
William B. Edwards, and Thomas J. Hamlin, both of Macedon, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1984, Ser. No. 684,772

Int. Cl.<sup>4</sup> B65H 39/10

U.S. Cl. 271—295

12 Claims



1. A sorting apparatus for collating sheets entering the same as a stream of sheets comprising: a frame; a sorter mounted for rotation on said frame having radially extending bins arranged in the path of the stream of sheets



to receive the stream of sheets at a loading station and to collate the same into booklets,  
means for imparting indexing rotation to said sorter relative to said loading station whereat a sheet is received for each indexing motion,  
means for registering the sheets within said bins,  
each of said bins having a sheet retaining means for engaging the received sheets and to hold the same in registered condition therein during rotation of the sorter, and  
means for releasing each of said retaining means when each bin is indexed to said loading station to permit the entry of a sheet therein.

4,678,180

## SELECTIVE SHEET FEEDER

Kaoru Tamura; Kawal Yasubiro, and Isao Utsumi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

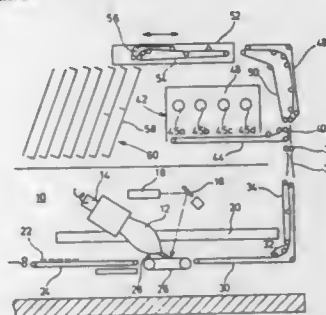
Filed Oct. 21, 1985, Ser. No. 789,812

Claims priority, application Japan, Oct. 20, 1984, 59-220677; Oct. 20, 1984, 59-220678; Apr. 18, 1985, 60-84030

Int. Cl.<sup>4</sup> B65H 39/115

U.S. Cl. 271-296

17 Claims



1. A selective sheet feeder comprising: a plurality of trays (58) having openings directed upwardly and inclined at a prescribed angle; and a sheet feed unit (52) movable along a travel path over said trays, said sheet feed unit including a casing (62), belt conveyor means (54,56) disposed in said casing, a first rotational drive source (63) for driving said belt conveyor means, and a second rotational drive source (61) for moving said sheet feed unit along said travel path, said sheet feed unit being movable, while a sheet (22) is held on said belt conveyor means, toward and stoppable in a position over a prescribed one of said trays, and said belt conveyor means being drivable by said first rotational drive source for discharging said sheet into said prescribed tray.

4,678,181

## HAND DEVELOPMENT SYSTEM

John R. Ditsch, Tinley Park; Theodore G. Williams, Lyons, and Luis H. Berrios, Chicago, all of Ill., assignors to HDS, Inc., Tinley Park, Ill.

Continuation-in-part of Ser. No. 755,708, Jul. 16, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 904,851

Int. Cl.<sup>4</sup> A63B 11/08

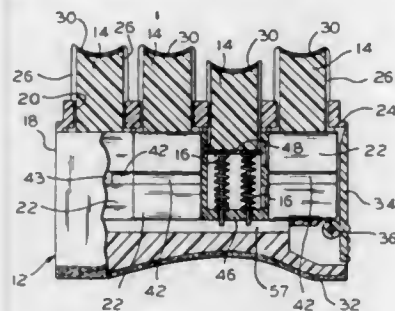
U.S. Cl. 272-68

31 Claims

1. A hand development system, comprising:  
a body adapted to be gripped by the hand of a user, said body including a single interior compartment and a plurality of openings in communication with said single interior compartment, said openings being provided along a top edge of said body;  
means for exercising the fingers of the user, said exercising means being operatively associated with said body and including a plurality of individually moveable members each adapted to be moved by one of the fingers of the user, said exercising means also including means for resisting movement of said individually moveable members;

said individually moveable members each comprising a key adapted to be depressed from a normal position by one of the fingers of the user, one of said keys being disposed in each of said openings and normally extending outwardly therefrom, said body being generally rectangular in shape and said openings being disposed in longitudinally aligned relationship, said keys each being adapted for sliding movement relative to the corresponding one of said openings;

means for access to said single interior compartment of said body, said access means being independent of said openings for said keys and spaced therefrom, said access means



normally maintaining said single interior compartment of said body substantially entirely enclosed;  
said movement resisting means including a set of spring-loaded cartridges disposed in said single interior compartment, said cartridges each including at least one spring having a selected resistance to depression of said keys, said cartridges being removable from said single interior compartment through said access means;  
said interior compartment of said body being generally rectangular in shape, said cartridges also being generally rectangular in shape, said cartridges being sized for sliding insertion into said interior compartment; and  
means for accurately positioning each of said cartridges within said single interior compartment for resisting movement of one of said keys.

4,678,182

## BICYCLE ERGOMETER AND EDDY CURRENT BRAKE THEREFOR

Shinroku Nakao, Kanagawa; Masao Itoh, Tokyo; Akira Itoh, Tokyo, and Hiroshi Takano, Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

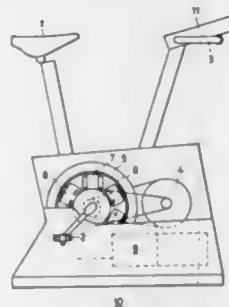
Filed Mar. 13, 1984, Ser. No. 588,933

Claims priority, application Japan, Jul. 8, 1983, 58-123172; Jul. 8, 1983, 58-123173

Int. Cl.<sup>4</sup> A63B 69/16

U.S. Cl. 272-73

3 Claims



1. An ergometer for obtaining an optimum athletic load value for a user of an exercise device in which the legs of the user are bent and stretched to rotate a rotary unit having a

variable load applied thereto during continuous exercise by the user, the athletic load value being increased step-wise in accordance with a linear load versus pulse rate correlation graph, the ergometer comprising:

means for sequentially setting the load to first, second, and third levels;

means for determining a first data corresponding to the pulse rate of the user at rest, a second data corresponding to the pulse rate of the user after exercise with the rotary unit having said first load level applied thereto, a third data corresponding to the pulse rate of the user after exercise with the rotary unit having said second load level applied thereto, and a fourth data corresponding to the pulse rate of the user after exercise with a rotary unit having said third load level applied thereto;

means for providing a reference graph comprising the pulse rate versus load level correlation graph as computed by a minimum square law average;

means responsive to said first, second, and third data for determining from said reference graph said first, second, and third levels according to said first, second, and third data, respectively, and for controlling said setting means to sequentially set said load to said first, second and third levels; and

optimum load determining means for determining an optimum load level for the user from said second to fourth data if said fourth data is less than an athletic safety pulse rate or from said first to third data if the pulse rate of the user reaches the athletic safety pulse rate before said determining means determines said fourth data.

4,678,183

## DEVICE FOR SKI TRAINING

Joseph Skovajsa, 19, Avenue Vanquelin, 93470 Courbron, France

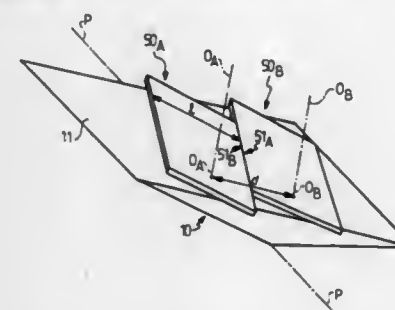
Filed Oct. 4, 1985, Ser. No. 784,848

Claims priority, application France, Oct. 10, 1984, 84 15543

Int. Cl.<sup>4</sup> A63B 69/18

U.S. Cl. 272-97

18 Claims



1. A ski training device comprising:

a support plate, oscillating about a longitudinal principal axis of symmetry, said support plate formed of a body having a flat upper surface and a lower surface composed of two relatively inclined planes delimiting a principal longitudinal pivot bearing about said longitudinal principal axis at the vicinity of their junction, and

two sole plates for the feet of the user, said sole plates being pivotally carried on said support plate, respectively on one side and the other of a plane of symmetry passing through the principal pivot axis of said support plate, about respective auxiliary axes, generally parallel to each other and perpendicular to the upper surface of said support plate, so that alternating pivoting of said sole plates about their respective auxiliary axes, brought about by the user, is accompanied by an alternating rocking of said support plate about the associated principal axis.

4,678,184

## CONSTANT FORCE EXERCISE DEVICE

Henri J. C. Neiger, Melesse; Claude M. Genot, Mordelles; Gérard C. Prud'Hon, Boulogne, and Michel Schoens, Villiers le Bel, all of France, assignors to Merobel - Societe Anonyme Fracaise, Paris, France

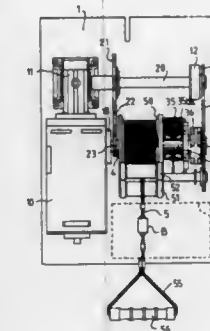
Filed Jan. 17, 1985, Ser. No. 692,658

Claims priority, application France, Jan. 20, 1984, 84 00925

Int. Cl.<sup>4</sup> A63B 21/24

U.S. Cl. 272-129

13 Claims



1. An apparatus for training, investigating and reeducating neuro-muscular functions in a subject, the apparatus comprising:

a frame fixed on a support;  
a work member, supported by said frame, for interfacing with a subject to be exercised;  
a non-drivable motor means rotatable in a motor direction;  
first and second mechanical transmission means arranged in parallel between the motor means and the work member;  
said first mechanical transmission means being provided for driving said work member in a first direction of motion, depending upon the motor direction, and comprising a controllable force coupler;  
said second mechanical transmission means being provided to drive said work member in a second direction of motion opposed to said first direction of motion, and comprising a unidirectional drive means for rendering said second mechanical transmission means operative when an absolute value of the ratio between the work member speed and the motor means speed exceeds a preselected threshold; and  
means for controlling said motor means and said controllable force coupler as a function of predetermined parameters.

4,678,185

## EXERCISE APPARATUS

Parker E. Mahnke, Studio City, Calif., assignor to Marcy Gymnasium Equipment Co., Alhambra, Calif.

Filed Jan. 17, 1986, Ser. No. 820,538

Int. Cl.<sup>4</sup> A63B 21/00

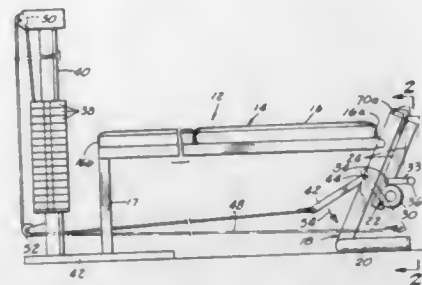
U.S. Cl. 272-134

15 Claims

1. An exercise apparatus for use by a trainee in the performance of various exercises, including arm and leg exercises, said apparatus comprising:

(a) support means for supporting the trainee in various exercising positions;  
(b) first body engaging means disposed proximate said support means for engagement by the trainee in the performance of a first exercise to impart pivotal movement thereto about a pivot axis spaced a first distance from said support means, said body engaging means being movable relative to said support means from a first position to a second spaced position wherein said body engaging means is engageable by the trainee in the performance of a second exercise to impart pivotal movement thereto about a pivot axis spaced a second distance from said support means;

- (c) resistance means operably associated with said body engaging means for providing a constant resistive force to resist pivotal movement of said body engaging means when said latter means is in either said first or second position; and
- (d) linkage means for operably interconnecting said resistance means with said body engaging means, said linkage means comprising:
- (i) a first linkage adapted for pivotal movement about a fixed axis located a fixed distance from said support



means, said first linkage being operably interconnected with said resistance means; and

(ii) a second automatically adjustable linkage for operably interconnecting said body engaging means with said first linkage when said body engaging means is in either said first or second position, whereby pivotal movement of said body engaging means by the trainee will cause pivotal movement of said first linkage about said fixed axis, which pivotal movement will be uniformly resisted by said resistance means.

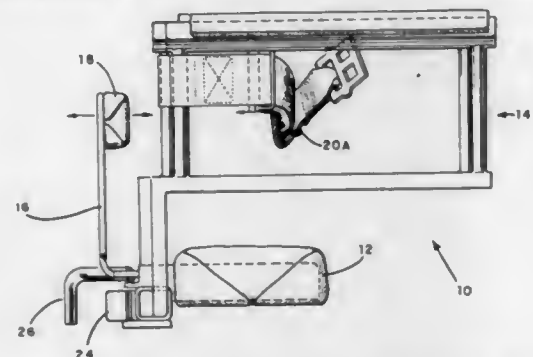
4,678,186

**PELVIC RESTRAINT FOR EXERCISE APPARATUS**  
Donald R. McIntyre, Chapel Hill, and James E. Miles, Graham, both of N.C., assignors to Isotechnologies, Inc., Hillsborough, N.C.

Filed Jan. 17, 1986, Ser. No. 820,719  
Int. Cl.<sup>4</sup> A63B 21/00

U.S. Cl. 272-134

12 Claims



8. In combination with a back exercise machine particularly adapted for providing resistance to movement by the user, a pelvic restraint comprising:
- seat means for accommodating at least a portion of the buttocks of the upstanding user;
- a pair of laterally spaced-apart hip restraint means adjustably engaging said seat means for restraining hip movement, said pair of restraint means extending generally upwardly from said seat means and in converging relationship to each other so as to engage the hips of the user;
- strap restraint means secured to said pair of hip restraint means and extending therebetween for restraining forward movement of the pelvis of the user;
- back restraint means adjustably engaging said seat means for

engaging the low back of the user to restrain rearward movement of the pelvis; and

means for coupling said pelvis restraint device to a back exercise machine.

4,678,187

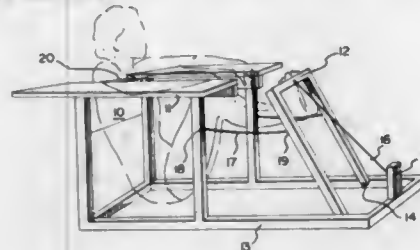
**EXERCISE DEVICE TO SUPPORT USER'S BODY**  
Jan Prsala, P.O. Box 91, Site 12, R.R. #3, Armdale, Nova Scotia, Canada B3L 4J3

Filed Feb. 4, 1985, Ser. No. 697,975

Claims priority, application Canada, Feb. 2, 1984, 446659  
Int. Cl.<sup>4</sup> A63B 23/04

U.S. Cl. 272-144

12 Claims



1. An exercise device comprising:
- (a) a frame having a front and rear end;
- (b) an upper trunk support comprising a unit including a pair of arm supports and a back support, said upper trunk support connected to said frame near said rear end by an upright suspension means;
- (c) a footrest connected to said frame near said front end, wherein one of the upper trunk support or the footrest is movable in relation to the other and the other is fixed;
- (d) a resilient means operatively connected to the movable one of the upper trunk support or the footrest for resisting movement thereof; and
- whereby the device entirely supports a person by the upper trunk and feet of the person so that the person's body, at least from the lower back to the knees, is freely suspended.

4,678,188

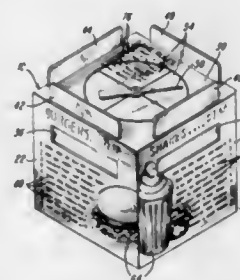
**QUESTION AND ANSWER GAME STRUCTURE PARTICULARLY FOR USE IN A RESTAURANT OR THE LIKE**

David W. Johnson, 5860 Hanley Rd., Jamestown, Ohio 45335  
Filed Sep. 16, 1985, Ser. No. 776,514

Int. Cl.<sup>4</sup> A63F 9/18

U.S. Cl. 273-1 R

11 Claims



1. A question and answer game structure comprising a body which is substantially in the form of a cube and provided with a plurality of indicia-carrying side surfaces, each indicia-carrying side surface being provided with indicia in the form of questions, a plurality of answer-carrying member, there being one answer-carrying member movably positioned within the body and adjacent each of the indicia-carrying side surfaces, and selector means movably carried by the body for identifying

ing one of the indicia-carrying side surfaces for consideration of the questions carried thereby.

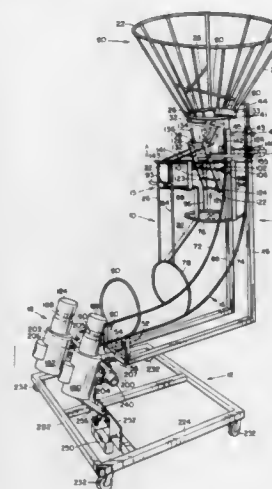
4,678,189

**BASKETBALL RETURN DEVICE**  
Richard E. Koss, 3530 E. 8th Ave., Denver, Colo. 80206  
Filed Aug. 1, 1985, Ser. No. 761,320

Int. Cl.<sup>4</sup> A63B 69/00

U.S. Cl. 273-1.5 A

1 Claim



1. A basketball return mechanism, comprising:
- a lower support frame;
- an upper support frame pivotally mounted on said lower frame and rotatable in a horizontal plane with respect to said lower frame, said upper support frame comprising a vertical portion and a horizontal portion;
- a basket-mounting frame releasably secured to said vertical portion of said upper frame, said mounting frame securable in a multiplicity of extended vertical positions with respect to said upper frame;
- a ball-receiving basket attached to said basket mounting frame, said basket having first and second ends and being adapted to receive a ball through said first end and to pass said ball through said second end;
- two rotatable heads carried on said horizontal portion of said upper frame, said head separated by a distance sufficient to allow a ball to pass therethrough, with said ball being engaged by opposing faces of said heads;
- first motor means for rotating said heads in opposite directions such that a ball engaged by said opposing faces of said rotating heads is propelled toward a player;
- a ball delivery track adapted to transport a ball from said ball-receiving basket to a position between said rotatable heads;
- ball retaining means having a first position and a second position, said retaining means operable to restrict passage of a ball from said ball-receiving basket to said delivery track with said ball in said first position and operable to permit passage of said ball with said retaining means in said second position;
- means for biasing said retaining means toward said first position;
- actuator means for moving said retaining means to said second position;
- timer means for activating said actuator means at timed intervals to allow a ball to pass from said ball-receiving basket to said delivery track; and
- second motor means for rotating said upper frame in a horizontal plane with respect to said lower support frame.

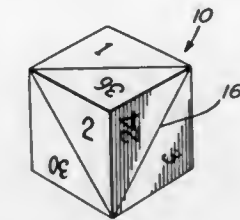
4,678,190

**SET OF DICES FOR LOTTERY**  
Yves Dery, 4500 Samson Boulevard - unit 4, Chomedey, Laval, Quebec, Canada H7W 2H1  
Filed Mar. 18, 1986, Ser. No. 840,682

Int. Cl.<sup>4</sup> A63F 9/04

U.S. Cl. 273-146

5 Claims



1. A set of dices to be thrown on a surface for aiding a lottery player in the selection of winning integers in a lottery of the type in which one must select a pre-determined number of integers in a given series of such integers, the number of dices in the set being equal to the number of integers to be selected in the specific lottery type, at least some of the six faces of each dice bearing at least two distinct integers forming two series of lottery integers, the dice integers being distributed on the various dice faces such that each integer will appear on two dices and such that all the integers on any given dice will not appear on any other single dice but will be distributed amongst the remaining dices of the set.

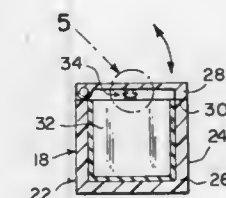
4,678,191

**MULTIPLE DICE GAME**  
Sean R. Mills, and George Spector, both of 233 Broadway Rm 3615, New York, N.Y. 10007  
Filed Oct. 4, 1985, Ser. No. 784,584

Int. Cl.<sup>4</sup> A63F 9/04

U.S. Cl. 273-146

3 Claims



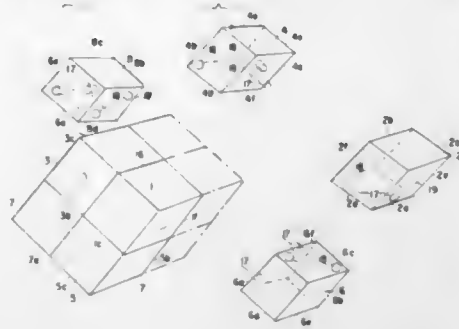
1. A multi-player game of chance comprising:
- (a) a set of five chips for each said player of said game;
- (b) a pot for holding various amounts of said chips during the course of said game; and
- (c) five identification devices bearing identifying indicia, each said device capable of being manipulated to indicate random placement of each said chip of each said player within said pot and to other said players until one said player is left with at least one said chip to win all of said chips within said pot, wherein each said identification device is a cube, each face of said cube bearing different identifying indicia, and each said cube comprises:
- (a) a hollow shell having a hinged lid on one side with various combinations of said identifying indicia provided on said faces of said shell; and
- (b) a removable insert placed within said hollow shell so that proper weight can be added to said shell when said device is manipulated by tossing and rolling of said cube.



4,678,192

**MANUALLY ASSEMBLED PUZZLE APPARATUS**  
 Bruce E. Campbell, P.O. Box 118, Smithfield, Va. 23430  
 Filed Jan. 2, 1986, Ser. No. 815,541  
 Int. Cl.<sup>4</sup> A63F 9/12; A63H 33/08  
 U.S. Cl. 273—157 R

33 Claims



15. A parallelepipedic puzzle formed from at least eight smaller parallelepipedic blocks, said puzzle comprising at least first, second, third, fourth, fifth, sixth, seventh, and eighth blocks, each block having first, second, third, fourth, fifth, and sixth faces wherein said first and fifth blocks, fifth and sixth blocks, seventh and third blocks, fourth and second blocks, second and sixth blocks, sixth and eighth blocks, third and fourth blocks, and seventh and eighth blocks, respectively, have faces which are directly connected to each other, all of the remaining faces being physically unattached to each other, each of said blocks including three exposed faces located on the exterior surface of said puzzle, wherein the three exposed faces of each of said fourth and said sixth blocks are flat and have no apertures, holes or pegs thereon.

4,678,193

**GOLF SWING TRAINING DEVICE**  
 Håkan Kronogård, Skarpskyttevägen 26 d, 222 42 Lund, and Roberto Selberg, Killian Zollsgatan 28 a, 217 56 Malmö, both of Sweden  
 Filed Mar. 11, 1985, Ser. No. 711,802  
 Int. Cl.<sup>4</sup> A63B 69/36  
 U.S. Cl. 273—186 C

10 Claims

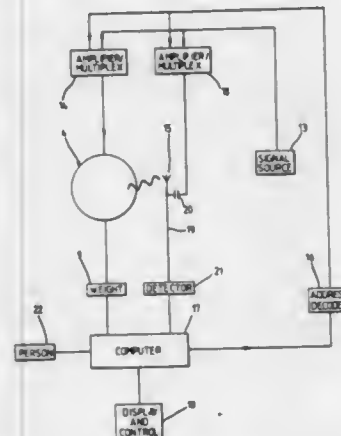


1. A golf swing training device comprising:  
 a curved rod extending from an imaginary golf ball position and along a portion of a circle;  
 an adjustment means for adjusting the position of said curved rod;  
 a means for maintaining the curved rod in said adjusted position;  
 an indicator means for indicating when said curved rod has been adjusted to extend along a circle which corresponds to a desired swing circle in which a tangent of the curved rod at the imaginary golf ball position extends along a desired target line and the centrum of the swing circle is positioned substantially close to the shoulder portion of a golfer, and the curved rod extends from the imaginary golf ball position and in a direction away from the target.

4,678,194

**TARGET APPARATUS INCLUDING TRANSMITTING/RECEIVING DART**  
 William H. Bowyer, Farnham; Robert L. Crocker, Farnham Royal; Christopher M. Hansford, Beaconsfield; Leslie K. Parker, High Wycombe, and Nigel Gray, Winchester, all of England, assignors to Viragat Limited, London, England  
 PCT No. PCT/GB83/00264, § 371 Date Jan. 18, 1984, § 102(e) Date Jan. 18, 1984, PCT Pub. No. WO84/01618, PCT Pub. Date Apr. 26, 1984  
 PCT Filed Oct. 18, 1983, Ser. No. 624,665  
 Claims priority, application United Kingdom, Oct. 18, 1982, 8229686  
 Int. Cl.<sup>4</sup> A63B 63/00  
 U.S. Cl. 273—373

16 Claims



1. A target in which projectiles may be embedded, said target including a target face, the target face being divided into a plurality of beds, the beds being formed from substantially parallel fibres that are, or have been treated to be, conductive at least on the outer surfaces of said fibres adjacent the face of said target, said fibres in each bed extending substantially normally to the target face and being insulated from the fibres in adjacent beds, further including a backing means for mounting said fibres substantially normal to said backing member, each of said fibres having a free end, where the free ends of said fibres define said target face wherein conductive means are provided connected to each of said beds to enable a separate signal to be applied to each bed, and wherein aerial means are provided to respond to a signal radiated from a dart protruding from any bed.

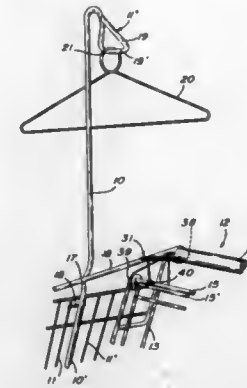
4,678,195

**SHOPPING CART APPAREL HANGER**  
 Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Cari All Inc., Quebec, Canada  
 Filed Dec. 26, 1985, Ser. No. 813,424  
 Int. Cl.<sup>4</sup> B62D 39/00  
 U.S. Cl. 280—33.99 A

5 Claims

1. In a shopping cart having a frame supported on casters, said frame defining a basket having side walls, a front and rear wall, a bottom wall and an open top end, a handle bar secured to said frame rearwardly of said rear wall to displace said shopping cart on said casters, the improvement comprising an elongated support rod telescopically secured to one of said side walls and extending substantially vertically from one of said side walls above said open top end, and support means formed in a top end of said support rod for supporting articles of clothing outside said basket and above a floor surface, said support rod having a straight securement section received in a pipe coupling secured to said one of said side walls of said basket, said pipe coupling extending substantially vertically and having an elongated straight guide slot therein, a locking cavity formed integral with said guide slot in a top end thereof,

said straight securement section having a transverse guide finger projecting through said slot and configured to enter said locking cavity whereby to support said support rod in an

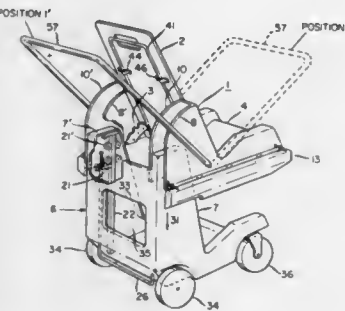


extended position above said basket open top end, said support rod also having an engaging bottom end configured to overlap a rod of a bottom section of said frame to support said support rod in a retracted position.

4,678,196

**CHILD CAR SEAT CONVERTIBLE INTO A STROLLER**  
 Kip Van Steenburg, 4 Marlboro Rd., Sudbury, Mass. 01776  
 Filed Feb. 5, 1986, Ser. No. 826,408  
 Int. Cl.<sup>4</sup> B62B 7/10  
 U.S. Cl. 280—47.41

8 Claims

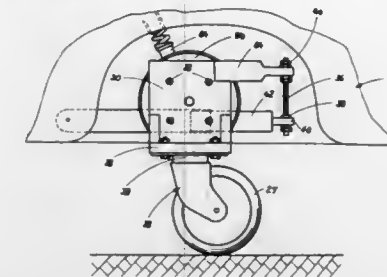


1. A child transporter comprising:  
 child support means having a support surface for supporting said child;  
 base means having roller means at lower portions thereof;  
 user activated positioning means for selectively causing said child support means to be maintained in a first extended position separated from said roller means, by a sufficient distance to enable said transporter to be readily utilized as a stroller, or to be maintained in a second collapsed position wherein said child support means is adjacent said roller means, enabling said transporter to be utilized as a car seat and readily positioned within a vehicle and upon a seat thereof; and  
 said roller means including wheels rotatably mounted to first and second lower portions of said base member and further including wheel cover means, wheel cover support means for mechanically supporting and biasing said wheel cover means against side portions of said base member for causing said wheel cover means to clear said wheels during transition of said superstructure from said first position to said second position, and to thereafter inwardly rotate in a first direction to automatically cover lower rim portions of said wheels.

4,678,197

**ARRANGEMENT FOR INFLUENCING THE KEEPING OF A DRIVING DIRECTION BY A MOTOR VEHICLE**  
 Willy Stein, Kindelbergweg 1, 7253 Renningen, Fed. Rep. of Germany, assignor to Willy Stein, Renningen, Fed. Rep. of Germany  
 Filed Jul. 21, 1986, Ser. No. 887,263  
 Int. Cl.<sup>4</sup> B62D 63/00  
 U.S. Cl. 280—80 R

9 Claims

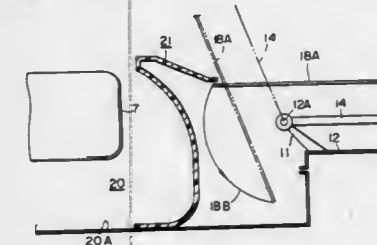


1. An arrangement for influencing the keeping of a driving direction by a motor vehicle having at least one non-driven wheel support body which is mounted on a wheel suspension for rotation about an axis, comprising  
 a holding component rigidly connected to the wheel support body;  
 a caster including a wheel centered on a rotational axis, and means for mounting said wheel on said holding component for rotation about said rotational axis thereof and also for turning about an additional axis which is substantially normal to the axis of the wheel support body and to said rotational axis of said wheel; and  
 means for preventing the rotation of the wheel support body about the axis thereof, said preventing means being connected to a non-rotatable part of the wheel suspension.

4,678,198

**CONSTRUCTION OF MUDGUARD OF MOVABLE FENDER PORTION IN MOTOR VEHICLE**  
 Kazuhiro Nomura, Anjo, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan  
 Filed May 17, 1984, Ser. No. 611,339  
 Claims priority, application Japan, May 19, 1983, 58-74912  
 Int. Cl.<sup>4</sup> B62B 9/14  
 U.S. Cl. 280—153 A

8 Claims



8. A tire mudguard for a vehicle having a movable fender comprising:  
 a vehicle frame including a wheel section, a fender section and a door section, said fender section being positioned substantially between said wheel section and said door section, said wheel section having an arcuate inner wall radially spaced from the tire to extend across the tire and around a predetermined amount of the circumference of the tire, said inner wall having a bowed outer edge extending radially inward, said wheel section also having a side wall extending radially outward from said outer edge, said side wall having a distal portion proximate said fender section, said fender section having a movable member and

a fixed member, said movable member having a leading edge proximate said distal portion;  
support means adapted to be mounted on said vehicle frame for supporting said movable member and said door section; and  
means for pivotally connecting said movable member and said door section to said support means, said movable member extending between said support means and said door section, wherein opening of said door section pivots said movable member about said support means producing an arcuate path of movement for said leading edge, while preventing engagement between said movable member and said wheel section, said arcuate path of movement extending substantially between said support means and said wheel section.

4,678,199

## VEHICLE TRAILER HITCH

Thomas Dickmann, Erich-Heckel-Strasse 63, 7500 Karlsruhe 41, Fed. Rep. of Germany

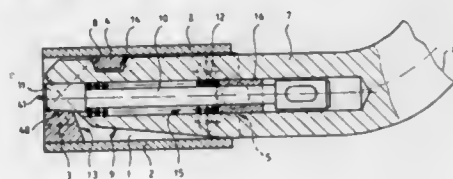
Filed Nov. 17, 1986, Ser. No. 931,270

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1985, 3541520; Jun. 4, 1986, 3618809

Int. Cl.<sup>4</sup> B60D 1/06

U.S. Cl. 280—491 E

19 Claims



1. A trailer hitch for a vehicle, especially a motor vehicle, said trailer hitch comprising: a support tube structure adapted to be mounted to a vehicle body, a ball carrying bar removably supported in said tube structure, said tube structure having a projecting end with engagement surfaces and said ball bar having engagement bolts projecting therefrom in opposite directions and being arranged so as to be received and abut said engagement surfaces, a locking member disposed at the inner end of said tube structure and having a wedging wall face, a support block also disposed at the inner end of said tube structure opposite said locking member and having an inclined ramp area, and a safety bolt axially movably disposed within a passage in said ball bar and having a head adapted to project, under the force of a spring, out of said ball bar, said head having an inclined wedging surface corresponding to the ramp area of said support block so as to force said ball bar into firm engagement with said locking member's wedging wall face under the force of said spring, and means for locking said safety bolt in its outwardly projecting ball bar locking position.

4,678,200

## PLATFORM FOR ATTACHING TO A SKI TO PROVIDE A MONOSKI

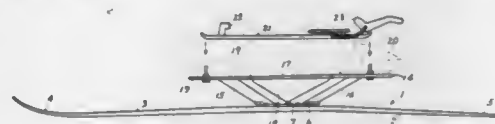
William Powell, R.D. 3, Box 95, Andover, N.J. 07821

Filed Dec. 20, 1985, Ser. No. 811,290

Int. Cl.<sup>4</sup> A63C 5/00

U.S. Cl. 280—607

20 Claims



1. An improved platform for attaching to a ski having an

upturned tip portion on one end thereof and a tail portion on the other end thereof to provide a monoski comprising:

a single base member;

means to secure said base member at a predetermined location on an upper surface of said ski between said tip portion and said tail portion;

a first plate disposed substantially parallel to and spaced a first predetermined distance above said base member, said first plate being capable of supporting the toe portion of both feet of the skier;

a second plate disposed substantially parallel to and spaced a second predetermined distance above said base member in a predetermined longitudinal spaced relationship with said first plate, said second plate being capable of supporting the heel portion of both feet of said skier;

a first bar-like column extending toward said tip portion at a first predetermined acute angle from said base member to said first plate to support said first plate above said base member;

a second bar-like column extending toward said tail portion at a second predetermined acute angle from said base member to said second plate to support said second plate above said base member; and

a rigid bar-like member secured to and extending between said first and second plates.

4,678,201

## SKI BINDING

Gregory Williams, 20 May Road, Mt. Roskill, Auckland, New Zealand

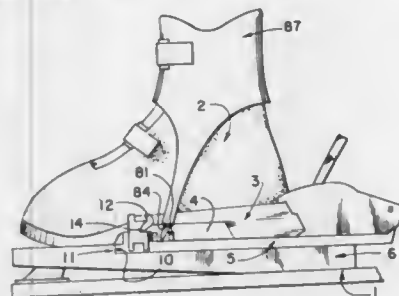
Filed Jul. 27, 1984, Ser. No. 635,278

Claims priority, application New Zealand, Aug. 3, 1983, 205133; Feb. 24, 1984, 207265

Int. Cl.<sup>4</sup> A63C 9/08

U.S. Cl. 280—620

41 Claims



1. A ski stressing means comprising a ski-boot, at least one lever mounted on said ski-boot and tensioning means between said at least one lever and said ski, said tensioning means comprising a tensioning member, a connection means between said ski and said tensioning member, said connection means comprising a slide member having a slot therein, a pin movable in said slot and attached to said ski, said slot being disposed relative to said ski so that movement of said pin in said slot can cause selectively an increase and decrease in distance between said ski and said slide member.

4,678,202

## FOLDING WHEELCHAIR

Tom M. Jensen, Everett; Frederick T. Yoshimura, Seattle, and Deborah P. Jensen, Everett, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 811,068, Dec. 19, 1985, Pat. No. 4,640,525. This application Oct. 23, 1986, Ser. No. 922,217

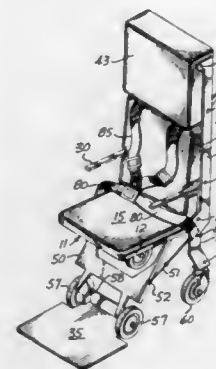
Int. Cl.<sup>4</sup> B62B 7/08

U.S. Cl. 280—642

6 Claims

1. A wheelchair assembly, comprising: a back frame having a pair of vertically parallel side frame members and transverse frame members secured between said side frame members for integrally forming a rigid back frame; a seat pan frame extending horizontally forward from said back frame when in posi-

tion for occupancy and being pivotally supported at its aft end to said back frame for limited articulation between a forward extended, horizontal position for occupancy and a rearward retracted, vertical position for stowage; said seat pan frame having side frame members with a lengthwise orientated slot including a locking detent located at the forward end of the slot; rear legs formed by the lower portion of said back frame; a front leg assembly having an upper extent with means cooperating within the slots in said seat side frame members for rearward retraction or forward extension movement in said slot, relative to the rear legs when said seat pan frame is articu-



lated from its stowed position to its seating position respectively; said front leg assembly having upper extent locked in a forward extended position by the detent in said slot when an occupancy load is applied to said seat pan frame; a front leg brace comprising a folding linkage having a forward extent connected to the midportion of said front leg assembly and having a rearward extent connected to said back frame for forming a diagonal brace for maintaining the lower extent of said front leg assembly in a forward extended position; and wheels mounted to the lower end of the front leg assembly and the rear legs for rolling movement of the wheelchair assembly.

4,678,203

## AIR SPRING

Gerhard Röhner, Mannheim; Willi Schweikert, Heidelberg, and Gerd-Heinz Ticks, Wald-Michelbach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

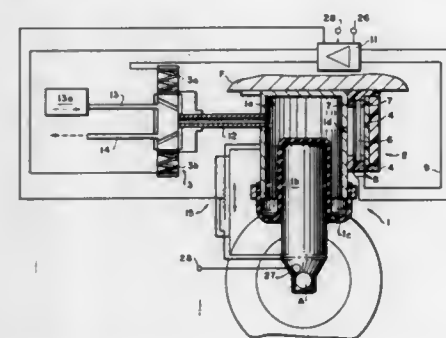
Filed Sep. 6, 1985, Ser. No. 773,415

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434660

Int. Cl.<sup>4</sup> B60G 11/26

U.S. Cl. 280—707

20 Claims



1. An air spring for use between relatively-moving bodies comprising, in combination:

(a) means providing a variable interior space filled with a gas at a mean pressure for spring action between the bodies;

(b) a compressed - gas source;  
(c) a supply line having an intake valve connecting said source to said interior space;  
(d) an outlet line having an outlet valve connecting said interior space to a low pressure gas sink;  
(e) a control device having an electric sensor for detecting the pressure in said interior space; and  
(f) means responsive to said control device for actuating said intake and outlet valves;  
wherein said control device opens said outlet valve when the pressure in said interior space exceeds said mean pressure and opens said intake valve when the pressure in said interior space falls below said mean pressure.

4,678,204

## AUXILIARY SHOCK ABSORBER ASSEMBLY

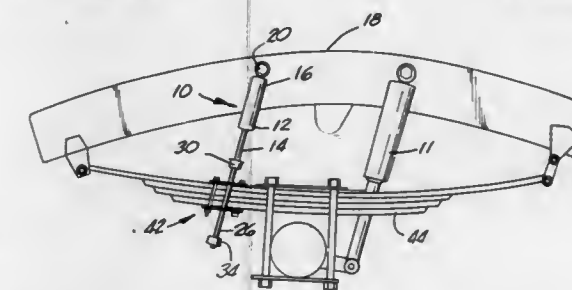
Todd G. Hetherington, 1968 Church St., Costa Mesa, Calif. 92627

Filed Jul. 14, 1986, Ser. No. 885,272

Int. Cl.<sup>4</sup> B66G 11/26

U.S. Cl. 280—710

6 Claims



1. An auxiliary shock absorber assembly adapted to be secured to the frame of a vehicle and to the vehicle suspension system for providing additional shock absorption in the event of the vehicle impacting an irregularity in the roadway, said assembly comprising a shock absorber having a piston rod extending from one end thereof and including means disposed therein for biasing said piston rod outwardly therefrom; means carried by said shock absorber for securing said shock absorber to the frame of the vehicle such that said piston rod extends downwardly therefrom, a first stop member carried by to said piston rod adjacent the end thereof, a second stop member carried by said piston rod and spaced from said first stop member; and a bracket assembly defining means for securing said bracket assembly to the vehicle suspension system and means for slidably receiving the portion of said piston rod disposed between said stop members thereon such that upon securing said shock absorber to the frame of the vehicle and said bracket to the vehicle suspension system with said piston rod being slideably through said bracket assembly between said stop members, sufficient upward movement of the vehicle suspension system in response to the vehicle impacting an irregularity in the roadway causes said bracket assembly to abut said second stop member and urge said piston rod into said shock absorber thereby providing additional shock absorption for the vehicle.

4,678,205

## METHOD AND APPARATUS FOR USE WITH A SAFETY HARNESS

Jay S. Wold, 2202 S. Emerson, Gillette, Wyo. 82716

Filed Jan. 3, 1985, Ser. No. 740,480

Int. Cl.<sup>4</sup> B60R 22/00

U.S. Cl. 280—808

2 Claims

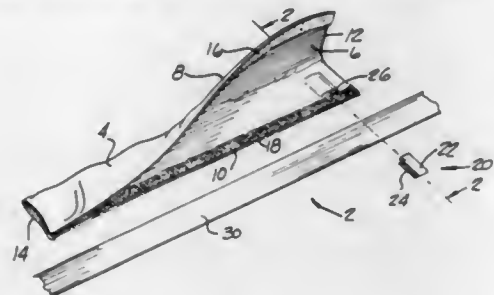
1. Apparatus for enhancing the use of safety harness in a vehicle comprising:  
means for covering a portion of the safety harness with a comfortable material;  
means for joining said covering means to said safety harness



so that said covering means may be readily moved to a desired location when said safety harness is applied by said user, will move relative to said safety harness but remain stationary relative to said user when said user moves and automatically move to a storage position when said safety harness is released by said user;

said means for joining said covering means to said safety harness comprising:

a spring means;  
about one-half of said spring means being embedded in said covering means; said covering means comprising:  
two rectangularly shaped pieces of comfortable material having two relatively long sides and two relatively short sides;  
means securing said two rectangularly shaped pieces of



material in superposed relationship; means for surrounding said safety harness with said covering means comprising:

a "Velcro" fastener;  
one-half of said "Velcro" fastener secured to said covering means adjacent to one of said relatively long sides; the other half of said "Velcro" fastener secured to said covering means adjacent to the other of said relatively long sides; said spring means comprising:  
a spring clip having a length greater than its width; the lower half of said spring clip being located and secured between said two rectangularly shaped pieces of comfortable material with said length extending in a direction parallel to said relatively short sides; and the opening of said spring clip facing the centerline between said long sides.

4,678,206

## PEN AND NOTE PAD

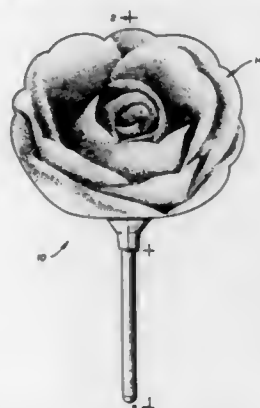
Daniel P. Leahan, 1420 S. Bayside Dr. Apt. 402, Miami, Fla. 33131

Filed Aug. 21, 1986, Ser. No. 898,901

Int. Cl.<sup>4</sup> B42D 5/00; G09F 1/00; B65D 27/00

U.S. Cl. 281-15 B

9 Claims



1. A combination note pad and writing implement holder comprising a base member having a planar portion provided with shaped top, side and bottom peripheral portions, a portion of the bottom periphery being provided with a substantially

straight area, implement receptacle means being integrally formed with said base member and extending outwardly from said bottom peripheral portion, a note pad comprised of a plurality of sheets of paper, said note pad having an outer peripheral shape substantially identical to the peripheral shape of said base member, means for adhering said note pad to said base and an implement received within said receptacle means so that said implement extends outwardly away from said base member.

4,678,207

## CONNECTOR ASSEMBLY FOR A WATER-DISPENSING FIXTURE

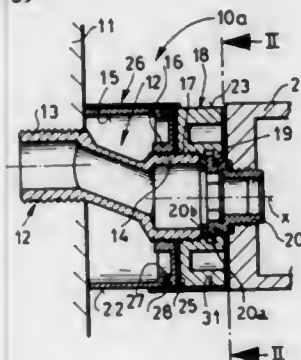
Helmut Dornbracht, and Klaus-Peter Grasse, both of Iserlohn, Fed. Rep. of Germany, assignors to Aloys F. Dornbracht GmbH & Co., Iserlohn, Fed. Rep. of Germany  
Filed Dec. 27, 1985, Ser. No. 814,108

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1984, 3447802

Int. Cl.<sup>4</sup> F16L 55/00

U.S. Cl. 285-39

10 Claims



1. A connector assembly for a water-dispensing fixture wherein at least one connecting fitting is to be joined to an inlet fitting of said fixture, said assembly comprising:  
a collar threaded onto an end of said connecting fitting and adapted to bear upon a wall around said connecting fitting;  
a nut threaded onto said end of said connecting fitting for joining said inlet fitting thereto, said nut having flats enabling the engagement thereof by a wrench, said nut and said collar having axially aligned cylindrical surfaces of the same diameter;  
an apron axially shiftable on said nut and said collar and having a surface close fitting to said cylindrical surfaces and of an axial length greater than that of said nut and less than the total length of said nut and said collar, whereby said apron can be shifted axially in one direction on said cylindrical surfaces to expose said flats and in the opposite axial direction to completely cover said nut; and  
means for retaining said apron relative to said nut at least in a position of said apron in which said nut is covered by said apron.

4,678,208

## GASKET FOR SEGMENTED PIPE COUPLINGS

Peter G. De Raymond, Nazareth, Pa., assignor to Victaulic Company of America, Easton, Pa.

Filed Oct. 7, 1986, Ser. No. 916,277

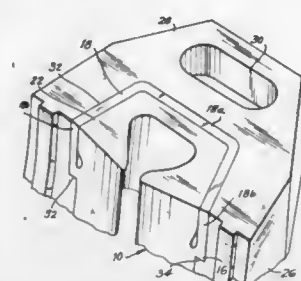
Int. Cl.<sup>4</sup> F16L 21/06

U.S. Cl. 285-112

8 Claims

1. A symmetrical elastomeric gasket segment for a segmented pipe coupling, comprising:  
a said gasket segment formed from an elastomeric material and having a circumferential length greater than that of the coupling segment with which it is to be employed;  
a flange providing a reaction member adjacent each end of said gasket segment and extending outwardly therefrom for engagement with a corresponding shoulder of a said coupling segment;

a skirt portion integral with said flange and extending spaced from the adjacent end of said gasket segment to define an open channel;  
the ends of said gasket segment being retractable and displaceable into the associated said skirt portions under



compressive loading of the associated end face of said gasket segment against the reaction provided by said flange;  
the extent of compressive loading at said end faces being determined by the spring forces stored in said end portions upon the retraction and displacement thereof.

4,678,209

## CASING HANGER

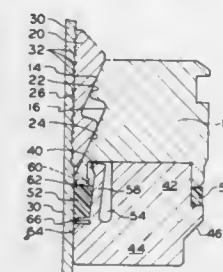
Walter L. Guice, Houston, Tex., assignor to Vetco Offshore, Inc., Ventura, Calif.

Filed Oct. 21, 1985, Ser. No. 789,681

Int. Cl.<sup>4</sup> F16L 21/00

U.S. Cl. 285-144

12 Claims



1. An improved casing hanger for suspending an inner pipe string or the like from an interior seat of a casing head comprising:

a slip bowl forming an exterior seat for engaging the interior seat of a casing head and forming an inner wedging surface defining a central opening therein;  
slip means disposed in circumferentially spaced relation about said opening and forming a central bore for wedging movement downwardly and inwardly with respect to said wedging surface into engagement with the exterior of a pipe string disposed in said bore to support the pipe string therein, said slip means comprising a plurality of slip members having an inner surface with a series of teeth engageable into a pipe string disposed in said bore and having an opposing outer surface with a second series of teeth engageable with the slip bowl wedging surface, said second series of teeth having a tapered tooth profile wherein said teeth protrude at an increasing radial distance from said outer surface in accordance with the distance from a central outer surface portion of said slip member.

4,678,210

## LOADING AND LOCKING MECHANISM

Peter J. Balsells, 17592 Sherbrook Dr., Tustin, Calif. 92680, assignor to Peter J. Balsells and Joan C. Balsells, both of Tustin, Calif.

Filed Aug. 15, 1986, Ser. No. 896,722

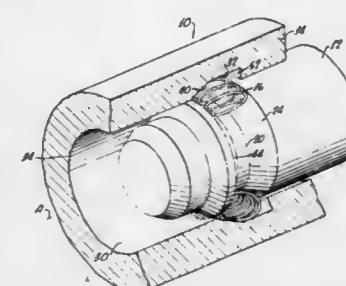
Int. Cl.<sup>4</sup> F16L 39/00

U.S. Cl. 285-318

14 Claims

1. Loading and locking mechanism comprising:

a first cylindrical member including means defining a circumferential groove therein, said circumferential groove including a first surface of revolution disposed at an angle with the axis of said first cylindrical member;  
a second cylindrical member including means defining an axial opening sized to accommodate said first cylindrical member, said second cylindrical member including means defining a groove in an inside surface of said second cylindrical member, the inside surface groove including a second surface of revolution disposed at an angle with the axis of said second cylindrical member;  
spring means disposed in both the first and second cylindrical member grooves for forcing said first and second



surfaces of revolution away from one another to cause an axial loading between the first and second cylindrical member; and,

locking means for preventing separation of the first and second cylindrical member by movement of the first and second surfaces of revolution away from one another, said locking means comprising a first locking surface in said circumferential groove disposed in a plane approximately perpendicular to the axis of the first cylindrical member and a second locking surface in the inside surface groove disposed in a plane approximately perpendicular to the axis of the second cylindrical member.

4,678,211

## JOINTS FORMED WITH WELDED FLANGE PIPES

Terence Bateman, Chesterfield, and William W. Stevens, Ilkerton, both of England, assignors to Stanton and Staveley Limited, United Kingdom

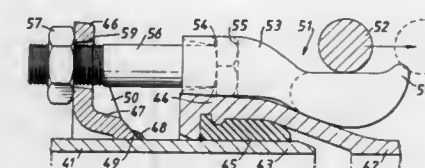
Filed Jul. 30, 1985, Ser. No. 760,472

Claims priority, application United Kingdom, Aug. 10, 1984, 8420328; Feb. 27, 1985, 8505030

Int. Cl.<sup>4</sup> F16L 21/02

U.S. Cl. 285-368

6 Claims



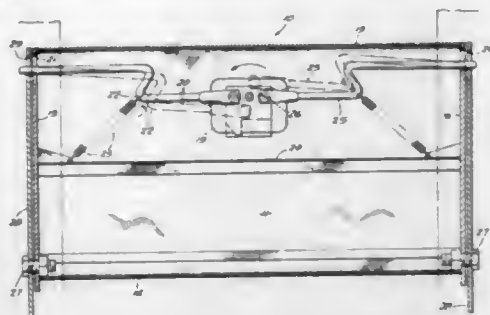
1. A joint formed with a welded flange pipe wherein a spigot of one pipe, provided with a spigot flange welded thereto, is disposed in a socket of another pipe having a socket flange assembly located thereabout, the spigot flange and the socket flange assembly being connected by holding members linked therebetween, the socket flange assembly being in the form of a continuous ring of larger diameter than the socket together with a plurality of shoes, each connectable with the spigot flange, spaced around the ring and located between the ring and the socket such as to bear, when connected to the spigot flange, against the socket.

# 4,678,212 TAILGATE LATCH MECHANISM

Richard Rubio, 3708 Missouri Ave., W. Covina, Calif. 91792  
Filed Mar. 3, 1986, Ser. No. 835,649  
Int. Cl.<sup>4</sup> E05C 5/02

U.S. Cl. 292-7

4 Claims



1. A latch mechanism for releasably securing a tailgate in closed condition to a truck bed, comprising:
  - a tailgate pivotally mounted to swing from a closed position to an open position, said tailgate having a top edge, bottom edge and two opposite sides;
  - a handle rotatably mounted on the tailgate and having parts unitarily rotatable with the handle;
  - a swivel plate affixed to the handle parts for rotation therewith;
  - first and second rods pivotally connected to the swivel plate at opposite sides of the handle parts and having end portions respectively resting on first and second support means at the respective tailgate opposite sides such that an end portion of each rod extends outwardly of said tailgate opposite sides;
  - spring means for resiliently biasing the rods toward the tailgate bottom edge and toward the respective adjacent side; and
  - first and second locking plate means fixedly located respectively adjacent the tailgate sides, said locking plate means each including an opening that receives the end portions of the rods therein when the tailgate is in closed condition and each said locking plate means opening has an open access including an upwardly slanted ramp which swings the outer end portions of the rods up the ramp on the tailgate being moved from open to closed.

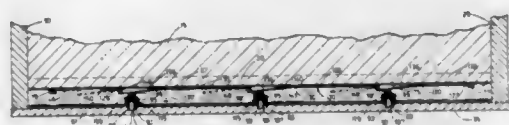
4,678,213

# LOCKING APPARATUS

Larry R. Brasuell, 1798 E. Nees, Fresno, Calif. 93710, and  
Clayton E. Olson, 2666 W. San Jose, Fresno, Calif. 93711  
Filed Feb. 11, 1985, Ser. No. 700,028  
Int. Cl.<sup>4</sup> E05C 9/02

U.S. Cl. 292-37

4 Claims



1. A locking apparatus comprising,
  - A. a housing having upper and lower portions, said upper portion defining an elongated channel dimensioned to be received about the lower edge portion of the door and said lower portion of the housing having a base mounting upright portions defining a channel therebetween and said base having a plurality of circular apertures extending therethrough;
  - B. a guide cylinder assembly including a guide cylinder mounted in axially upright attitude on the base within the

- channel between said upright portions in alignment with each of said apertures and a helical compression spring loosely fitted about each of said guide cylinders;
- C. a locking element received for slidable movement within each guide cylinder, each of said locking elements having a body dimensioned for substantially close fitting slidable movement axially within its respective guide cylinder and a bolt secured on the body and extending through and securing an annular flange on the body for compressibly engaging the helical compression spring extending about the guide cylinder; and
- D. an actuating assembly for reciprocal slidable movement in the channel, defined by said upright portions of the lower portion of the housing, between a first position and a second position, the actuating assembly including a plurality of serial interconnected actuating members each having an oblique portion extending obliquely downwardly for engagement with an individual locking element, said actuating assembly, upon movement of the first position, causing each oblique portion to engage the bolt of each locking element to urge the body thereof to extend externally of the lower portion of the housing to a locked attitude and, upon movement to the second position, moving each oblique portion to permit each helical compression spring to urge the body of each locking element to a retracted position substantially completely internally of its respective guide cylinder in an unlocked attitude.

4,678,214

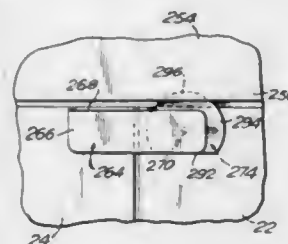
# SURGICAL CASE CART

Robert J. Cohn, Dallas, Pa.; Frank C. Olsson, East Lyme, Conn.; James W. Holzman, New Tripoli, and Paul Santarelli, Hudson, both of Pa., assignors to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Division of Ser. No. 354,762, Mar. 4, 1982, Pat. No. 4,550,956.  
This application Jul. 5, 1985, Ser. No. 752,099  
Int. Cl.<sup>4</sup> E05C 3/10

U.S. Cl. 292-213

4 Claims



1. A cart comprising:
  - an enclosed container having a pair of adjacent first and second front door panels with an overlying top wall, said top wall having a depending lip;
  - latching means having two distinguishably different closed positions including a first closed position for locking at least said first front door panel and a second closed position for locking both of said front door panels;
  - said latching means having an open position for permitting opening of both of said front door panels;
  - said latching means including a plate member rotatably coupled to said first front door panel;
  - said plate member having a cut off section and at least first and second laterally extending engagement portions for engaging said top wall lip to prevent opening of said first front door panel;
  - handle means secured to said plate member for selectively rotating said plate member into one of said closed and open positions;
  - said handle means extending outwardly from said plate member in a direction parallel to a free edge of said cut off section of said plate member;

- said open position being provided when said free edge of said cut off section of said plate member and a longitudinal edge of said handle means extend along said first front door panel and are disposed horizontally adjacent to a top edge of said first front door panel;
- said first closed position being provided when said handle means is rotated 90 degrees from said open position so that said first engagement portion of said plate member engages behind said top wall lip; and
- said second closed position being provided when said handle means is rotated 180 degrees from said open position so that said second engagement portion of said plate member engages behind said top wall lip and said handle means extends in front of said second front door panel to prevent opening of said second front door panel.

4,678,215

# SAFETY LATCHING ASSEMBLY FOR ELECTRONICS EQUIPMENT WITH EXTERNAL BATTERY PACK

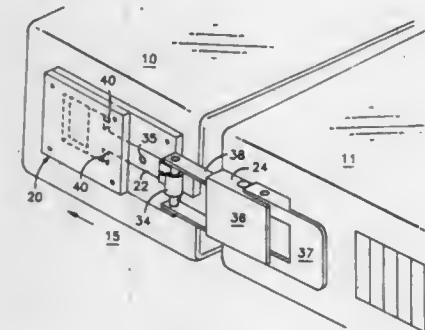
Clayton J. Rehbein, Chandler, and Leland B. Battin, Jr., Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 19, 1986, Ser. No. 864,241

Int. Cl.<sup>4</sup> E05C 5/02

U.S. Cl. 292-247

8 Claims



1. In conjunction with portable and/or remote electronics equipment having an external battery pack sealably attached thereto, a safety latching assembly comprising:
  - a guide frame fixedly attached to a side of one of the battery pack and the electronics equipment, said guide frame defining a central opening with a predetermined width and side portions defining an exit with a reduced width, the exit being directed generally toward the other of the battery pack and the electronics equipment;
  - a strike plate having a elongated body with a width smaller than the reduced width of the exit and with an enlarged portion having a width larger than the exit and smaller than the central opening adjacent one end thereof and a clasp portion adjacent an opposite end thereof, the elongated body being slideably engaged in the exit of the central opening of said guide frame with the enlarged portion being positioned in the central opening and the clasp portion being positioned outside the exit of the central opening, said strike plate being slideable between a first position in which the enlarged portion of the elongated body is spaced into the central opening from the side portions of the guide frame and a second position in which the enlarged portion of the elongated body is in abutting engagement with the side portions of the guide frame;
  - a shear pin extending transversely through said strike plate and holding said strike plate in the first position; and
  - a catch mounted on the other of the battery pack and the electronics equipment so as to be engaged with the clasp portion of the elongated body of said strike plate, said catch including a cam acting lock having open and locked positions, said catch being mounted to draw said strike

- plate toward said catch in the locked position and thereby seal the battery pack and electronics equipment together.

4,678,216

# THERMOPLASTIC CLAMPING RING

Dieter Gregory, Attendorf, Fed. Rep. of Germany, assignor to Theodor Schemm, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,795

Int. Cl.<sup>4</sup> E05C 17/54

U.S. Cl. 292-256,69

4 Claims



1. A clamping ring for clamping covers on barrels and having a U-shaped cross-sectional configuration and two ends, and provided with a clamping lever with spaced flanges pivotally connected to one end of the clamping ring, and a clamping link with spaced flanges which is both pivotally connected to the other end of the clamping ring and pivotally connected to the flanges of the clamping lever, which clamping ring comprises:
  - (a) a plurality of reinforcing ribs circumferentially spaced around the exterior of the clamping ring and disposed in parallel with the central axis of the clamping ring;
  - (b) the clamping ring including a pair of inner peripheral edges, with each edge terminating in an outwardly directed ring bead;
  - (c) the reinforcing ribs extending around the exterior of the clamping ring to the ring beads;
  - (d) a hook-shaped pivot eye carried on each end of the clamping ring;
  - (e) a pivot bolt disposed through each pivot eye;
  - (f) the clamping lever being pivotally connected to one pivot eye by a corresponding pivot bolt and the clamping link being pivotally connected to the other pivot eye by a corresponding pivot bolt; and
  - (g) one pivot eye being disposed between a corresponding pair of spaced flanges of the clamping lever and the other pivot eye being disposed between a corresponding pair of spaced flanges of the clamping link.

4,678,217

# CARRIER TOOL

Frank J. Viola, Uniondale, and Henry H. Hubner, Jr., Levittown, both of N.Y., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 625,889, Jun. 29, 1984, abandoned.

This application May 6, 1986, Ser. No. 861,116

Int. Cl.<sup>4</sup> B65G 7/12; B66C 1/44

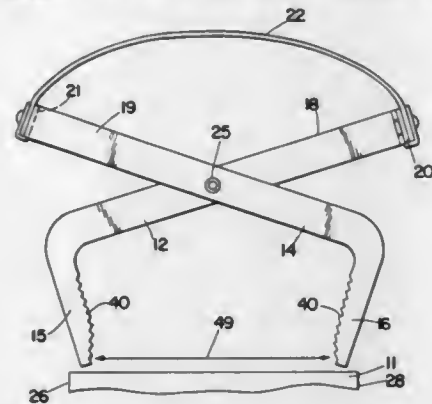
U.S. Cl. 294-16

6 Claims

1. A tool for carrying an automotive battery and the like, comprising:
  - a pair of levers, each of said levers having a gripping jaw at one end and a handle at the other end, each of said levers being formed of a rigid plate wherein each said jaw lies



substantially in a common plane with said respective lever;  
means connecting said pair of levers at a single pivot location between said jaw and handle in side by side disposition for pivotal movement of said jaws toward and away from one another, said jaws extending at substantially a right angle relative to said respective levers, and having respective confronting inner faces formed of the edge of said respective jaw transverse to the plane of and adjacent said lever, said levers being connected with said handle of each said lever adjacent said jaw of the other said lever so that said levers may be moved to a substantially parallel, side by side disposition with said jaws extending substantially parallel to one another in a fully spaced disposition adapted for placement adjacent the sides of said automotive battery;  
gripper means in a convex curvature extending along a



portion of said inner face of each of said jaw, each said gripper means being curved substantially in the plane formed by said respective jaw and lever, each said gripper means comprising a plurality of teeth distributed along said respective inner face, whereby as said jaws are pivotally moved toward and away from one another, different teeth of said gripper means will become operatively opposed, at different spacings from one another, for gripping purposes, said gripper means extending transversely substantially no further than the thickness of said plate to provide the sole means for gripping engagement of said automotive battery; and

means biasing said jaws toward one another for gripping the sides of an automotive battery therebetween, said biasing means comprising a semi-rigid strap fixedly attached to said handles of said levers in a manner to urge said jaws to a partially closed position and serving as a handle for said tool.

4,678,218

## SALT BLOCK CARRIER

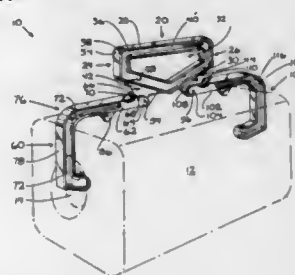
Lowell C. Babcock, 22014 Anthony Rd., Marengo, Ill. 60152

Filed Jun. 6, 1986, Ser. No. 871,375

Int. Cl. B65G 7/12

U.S. Cl. 294-16

18 Claims



1. A salt block carrier for holding a salt block including a

handle, and a first movable arm secured to said handle and a second movable arm secured to said handle, wherein:

- said first movable arm includes a first securing end for movably securing said first movable arm to said handle;
- said first movable arm includes a first knobbed end for contacting said salt block oppositely disposed from said first securing end;
- said second movable arm includes a second securing end for movably securing said second movable arm to said handle;
- said second movable arm includes a second knobbed end for contacting said salt block oppositely disposed from said second securing end;
- a first release means for releasing said first movable arm from said salt block;
- a second release means for releasing said second movable arm from said salt block;
- said handle includes a grip area, said grip area being generally the portion of said handle in contact with a hand of a person using said salt block carrier;
- a first handle side is at one end of said grip area;
- a second handle side is oppositely disposed from said first handle side at an opposing end of said grip area;
- said grip area extends into said first handle side and said second handle side;
- said first handle side extends into a first handle base;
- said second handle side extends into a second handle base;
- said first handle base and said second handle base meet to complete said handle in cooperation with said first handle side, said second handle side, and said grip area;
- said handle has a handle exterior and a handle interior oppositely disposed from said handle exterior;
- said first handle base includes a first base arm mount on said handle exterior; and
- said second handle base includes a second base arm mount on said handle exterior.

4,678,219

## HELICOPTER CARGO HOOK

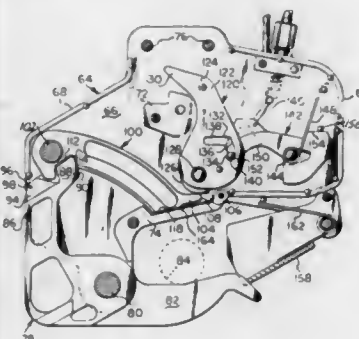
Donald E. Smith, Delphos, and Greg A. Hauhorst, VanWert, both of Ohio, assignors to Aeroquip Corporation, Jackson, Mich.

Filed May 14, 1986, Ser. No. 863,059

Int. Cl. B66C 1/34

U.S. Cl. 294-82.33

4 Claims



1. In a cargo hook including a support, a load arm pivotally mounted on the support pivotal about an axis between a closed load supporting position and an open load releasing position, a first abutment surface defined on the load arm radially spaced from the arm pivot axis, a latch arm pivotally mounted on one end on the support on an axis parallel to the load arm axis and having a free end, a second abutment surface defined on the latch arm adjacent the pivotally mounted end thereof, said latch and load arms having a coincident plane of operative movement, the latch arm being pivoted between a first position

whereby the first abutment engages the second abutment preventing pivoting of the load arm from the closed load supporting position to the open load releasing position, and a second position disengaging the first and second abutments permitting the load arm to pivot to the open position, a latch pivotally mounted on the support on an axis substantially parallel to the load arm axis engageable with the latch arm free end at a first latch position maintaining the latch arm in the first position thereof and releasing the latch arm at a second latch position for permitting movement of the latch arm to its second position, a cam slot defined in the latch having an end, a lock arm lever pivotally mounted upon the support pivotal about an axis substantially parallel to the latch pivot axis, a cam slot follower mounted upon the lock arm lever received within the latch cam slot, pivotal movement of the lock arm lever in a first direction pivoting the latch toward its first position and pivotal movement of the lock arm lever in a second direction pivoting the latch toward its second position, and operating means connected to the lock arm lever for pivoting the lock arm lever about its pivot axis to translate the cam follower within the cam slot and pivot the latch between its first and second positions, the improvement comprising, stop means mounted on the support engaging the lock arm lever when pivoting in its first direction to locate the cam follower in spaced relationship to the cam slot end when the latch is in its first position.

4,678,220

## SHOVEL-LIKE COUPLING DEVICES WITH AUTOMATIC MATERIAL HANDLING FEATURES

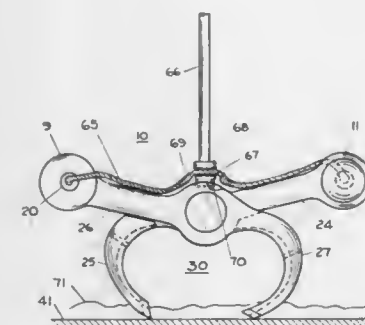
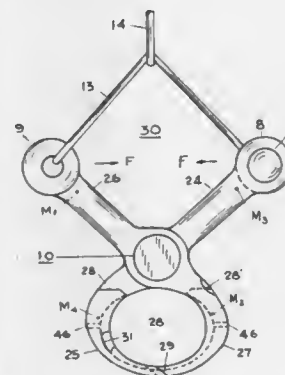
Edwin Z. Gabriel, 91 Mt. Tabor Way, Ocean Grove, N.J. 07756

Filed Feb. 14, 1986, Ser. No. 830,211

Int. Cl. B66C 1/38, 3/10

U.S. Cl. 294-118

4 Claims



1. An automatic, tongs-like materials' scooping and unloading device, comprising a tong-like structure having two elongated members and having upper and lower portions, pivoted near their midsections with a pivot pin, for use with hoist cables being adapted for attachment to said upper portions of said structure, and a load cable, said upper portions having

additional weights attached, said lower portions being sharply curved toward each other and having ends that are forced into contact with each other as a result of the tension on said hoist cables, to scoop up a load cable attached to a load to transport said load, said ends being sharp-edged and overlapping to facilitate the picking up of said cable; said ends having arcuate mating surfaces, one being concave and the other convex, said concave and convex surfaces being adapted to mate with each other, said surfaces having the same radius of curvature, so that said stresses being imposed on said pivot pin, said stresses being caused by the lateral swinging motions of said scooping device under load-suspended, wind-gust conditions, whereby said lower portions will separate automatically when said tension in said hoist cables is significantly reduced, thus enabling said load to be discharged; said tension on said hoist cables being caused by said additional weights placed on the upper portions of said elongated members.

4,678,221

## CARRYING HANDLE FOR TWO BOTTLES HAVING BUILT IN CARRYING LIPS

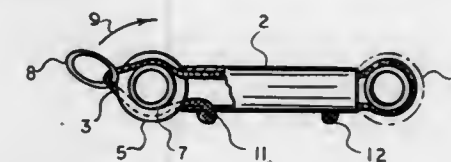
Frederick G. Josenhans, 14020 Netherfield Dr., Midlothian, Va. 23113

Filed Dec. 4, 1985, Ser. No. 804,525

Int. Cl. B65D 23/10, 71/00

U.S. Cl. 294-170

2 Claims



2. A device for removably securing and carrying two beverage bottles having identical annular carrying flanges which extend outwardly from a narrow neck, said device comprising:

- a substantially rigid tube handle having two opposed extremities, and two apertures in the wall of said tube handle, and
- a substantially non-elongatable cord positioned within and extending the entire length of said tube handle and protruding from each extremity as a loop whose size is self-adjusting by virtue of movement of the cord axially within said tube handle between said extremities to cause equal but opposite size change in the opposite loop, the length of said cord relative to the length of said tube handle being such that when one of said loops is in tight-fitting contact with the neck of one bottle below its flange, the size of the opposite loop is adequate to make tight-fitting passage over the carrying flange of the other bottle, said cord having two ends, each end passing from the interior of said tube handle to the exterior thereof through one of said apertures and being anchored upon the exterior of said tube handle.

4,678,222

## FRONT COVER FOR BABY CARRIAGES

Kenzo Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Jun. 2, 1986, Ser. No. 869,577

Claims priority, application Japan, Jul. 19, 1985, 60-111292[U]

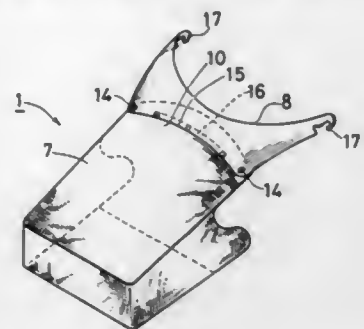
Int. Cl. B60J 9/00

U.S. Cl. 296-78 A

6 Claims

1. A front cover for a baby carriage having a seat with a seating surface on which to place a baby and a back rest extending approximately upwardly from said seating surface, said front cover serving to cover the lower half of a baby's body placed on the seat, said front cover comprising a front

cover body defining a space between itself and said seating surface for receiving the lower half of a baby's body, said front cover body having a first end edge region facing toward said back rest and a second end edge facing away from said back rest, a shape retaining member made of a material of relatively high stiffness, and means securing said shape retaining member to an upper surface of said first end edge region of said front



cover body along an arc normally bulging toward said second end edge away from said back rest, whereby said shape retaining member is normally in a resting position flat on said front cover body, said securing means permitting said shape retaining member to be turned out of said resting position into an operative position in which said shape retaining member causes said front cover body to form an upward bulge at least of said first end edge region to open said front cover for easy access.

4,678,223

**COWLING DEVICE FOR RIDING TYPE VEHICLES**  
Toshiaki Kishi, and Mitsuyoshi Kobama, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

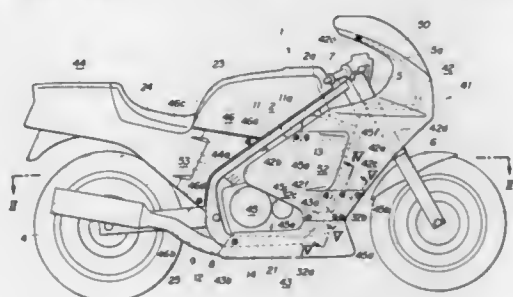
Filed Dec. 23, 1985, Ser. No. 812,655

Claims priority, application Japan, Dec. 26, 1984, 59-199547[U]

Int. Cl.<sup>4</sup> B62J 17/02; B60K 11/08

U.S. Cl. 296—78.1

6 Claims



1. A cowl device for a riding type vehicle having a vehicle frame, said cowl device covering said frame and comprising:

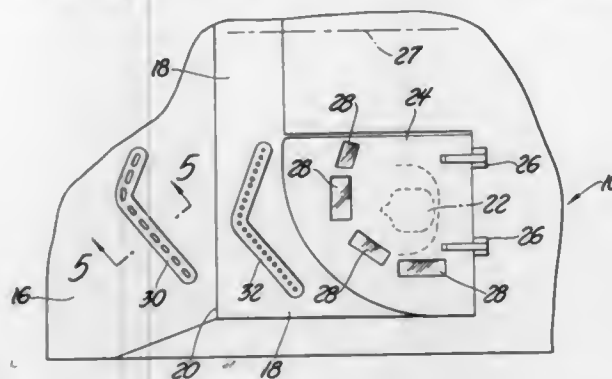
- a forward cowl unit defining a first air intake opening and trailing lateral cut-out portions;
- a pair of cowl panels disposed rearwardly of the forward cowl unit and attached thereto, said attached panels at forward edges thereof defining a second air intake opening smaller than said first opening;
- said second opening spaced transversely inwardly of the respective cut-out portions; and
- each forward edge of the cowl panel and a respective trailing cut-out portion defining an air exit opening therebetween.

# 4,678,224 **PREVENTION OF PARTICULATE ACCUMULATIONS ON OBSERVATION WINDOWS IN MILITARY VEHICLES**

Erwin F. Geppert, 27563 Meadowbrook, Novi, Mich. 48050  
Filed May 6, 1985, Ser. No. 730,413  
Int. Cl.<sup>4</sup> B60J 1/20

U.S. Cl. 296—91

1 Claim



1. In a military tracked vehicle comprising a hull having a longitudinal axis; said hull including an upper wall having a hatch opening therein enabling a human driver to enter or leave the vehicle, a movable cover for the hatch opening, and a number of vision blocks mounted in the cover for enabling the human driver to view the terrain in the forward path of the vehicle; said hatch opening and associated cover being offset laterally from the vehicle's longitudinal axis, so that when the vehicle is moving in a forward direction airborne particulates generated by one of the vehicle tracks tend to be concentrated in zones in the path taken by the hatch cover; at least some of the vision blocks having external surfaces thereof facing in a forward direction, whereby there is a danger that airborne particulates in the path of the vehicle will impinge on external surfaces of the vision blocks: the improvement comprising means for preventing airborne particulates from impinging on the vision block surfaces while the vehicle is moving in the forward direction; said prevention means comprising a tube-like manifold secured to the hull upper wall in an area thereof directly forward from the hatch cover; said manifold having a V-shaped configuration when looking downwardly onto the hull surface; a gas pressure source within the vehicle, conduit means extending between the gas pressure source and the tube-like manifold for supplying pressurized gas to the manifold; a series of gas discharge nozzle openings extending along the manifold for discharging pressurized gas upwardly away from the hull surface; said nozzle openings being sufficiently close together that the discharged gas forms a substantially continuous pressurized gas curtain in the space forwardly of the aforementioned vision blocks; said gas curtain being operable to apply upwardly-acting forces on particulates encountered by the curtain; said V-shaped manifold having a length, measured normal to the hull longitudinal axis, that is approximately the same as the lateral dimension of the hatch cover, whereby the pressurized gas curtain has sufficient length to substantially completely shield the vision blocks from airborne particulates; said tube-like manifold being physically engaged by an upper exposed face of the hull such that it is not likely to be deformed or broken should a soldier step thereon when entering or leaving the vehicle through the hatch opening; said manifold being spaced forwardly from the hatch cover by a distance that is greater than one foot and less than three feet, whereby there is sufficient space between the gas curtain and vision block surfaces so that deflected particulates have enough time to escape from the path taken by the vision blocks; the V-shaped configuration of the manifold being such that the gas curtain exerts lateral force components on the encountered particulates.

4,678,225

# **COVERED GOODS TRUCK, IN PARTICULAR SILO TRUCK**

Antal Ritzl, Zurich, and Jürg Zehnder, Uitikon, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis

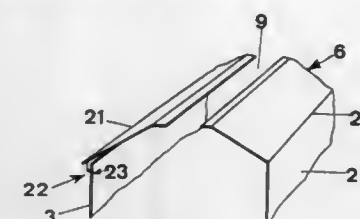
Filed May 8, 1986, Ser. No. 861,091

Claims priority, application Switzerland, May 15, 1985, 2086/85

Int. Cl.<sup>4</sup> B62D 33/00

U.S. Cl. 296—181

19 Claims



1. Covered goods truck which comprises a silo truck superstructure made up of interconnected longitudinal walls, end walls and floor designed as a self-supporting body that twists relatively easily, a roof covering said superstructure including at least one longitudinal part which is attached to one of said longitudinal walls and, with respect to the end walls and the other of said longitudinal wall, exhibits freedom of movement in the longitudinal direction which accommodates the twisting action while the truck is in motion.

4,678,226

# **CONSTRUCTION OF VEHICLE BODY**

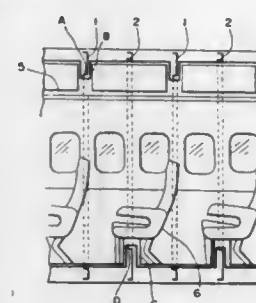
Masashi Ishizuka, and Makoto Ogawara, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 657,539, Oct. 4, 1984, abandoned. This application Nov. 20, 1986, Ser. No. 933,274

Int. Cl.<sup>4</sup> B62D 31/02; B60N 1/04; B61D 17/00

U.S. Cl. 296—203

2 Claims



1. An elongated vehicle body of substantially square cross-sectional shape comprising: a plurality of transverse frames; a plurality of longitudinal structural members located at right angles to said frames to connect said transverse frames together; and a shell attached and secured to outer surfaces of said frames and of said longitudinal structural members, said plurality of frames comprising a plurality of substantially square first and second frames, each first frame having relatively large radius inwardly projecting portions for reinforcing each first frame at two upper corners thereof and a relatively small radius at each of two lower corners thereof, each second frame positioned between adjoining first frames and having relatively large radius inwardly projecting portions for reinforcing each second frame at two lower corners thereof and a relatively small radius at each of two upper corners thereof, said upper corner small radii being such located respectively vertically above a passenger seat, and said lower corner small

radii being each located respectively between adjoining passenger seats to provide increased space for the accommodation of passengers.

4,678,227

# **WEATHER STRIP FOR A MOTOR-VEHICLE**

Aldo Castagno, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

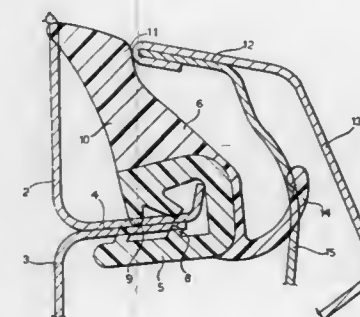
Division of Ser. No. 761,722, Aug. 2, 1985, abandoned. This application Sep. 11, 1986, Ser. No. 906,687

Claims priority, application Italy, Aug. 2, 1984, 67768 A/84

Int. Cl.<sup>4</sup> B60J 5/04

U.S. Cl. 296—213

2 Claims



1. A motor vehicle having a body portion with at least one door opening in each side thereof, a roof having a top portion, a downwardly extending side portion on each side thereof and an outwardly extending flange along each side portion which defines a drip channel above each door opening, a door hinged to said body in each opening with an inwardly extending upper edge portion overlying said flange in the closed position of the door in substantially flush relation with said top portion and a sealing member for the top edge of each door comprising a first channel-shaped portion of semi-rigid material having an upper surface, an end surface and a lower surface mounted on said outwardly extending flange and a second soft, solid rubber portion secured to said upper and end surfaces of said first portion and having a first projection with an upwardly tapered substantially trapezoidal cross section extending upwardly and inwardly from said upper surface of said channel-shaped portion wherein the uppermost end portion of said first projection is formed with a protruberance adapted to be engaged between the top edge of said door and said side portion of said roof adjacent said top portion to provide an upper surface which is substantially flush with said top portion of said roof and said upper edge portion of said door and having a second projection extending laterally outwardly and upwardly from said end surface of said channel-shaped portion for engagement by the inner surface of said door in the closed position.

4,678,228

# **SLIDING ROOF FOR A VEHICLE**

Robert T. Boots, Haarlem, Netherlands, assignor to Vermeulen-Hollandia Octrooien II B.V., Netherlands

Filed Nov. 20, 1985, Ser. No. 800,051

Claims priority, application Netherlands, Dec. 6, 1984, 8403710

Int. Cl.<sup>4</sup> B60J 7/047, 7/185

U.S. Cl. 296—216

10 Claims

1. A sliding roof for a vehicle having a fixed roof with a roof opening therein which opening has front and rear edges and spaced lateral sides, comprising:

- a panel having a first forward closed position closing the roof opening and a second rearward, upwardly and rearwardly inclined position, in which the panel partially overlaps the fixed roof, the panel being movable between said first and second positions;
- means defining first and second slots on the lower side of the



panel, said slots having surfaces that are generally parallel to the panel and extend in direction from front to rear;

a latch pin mounted on the means defining and protruding into the second slot adjacent a rearward end of the second slot;

a front support mounted to be movable backwardly and forwardly in the longitudinal direction of the vehicle and having means for pivotally mounting the panel thereon; and

a lever disposed rearwardly of the front support, the lever having upper and lower ends and being pivotally supported at its lower end about a transverse pivot axes, the lever having at least first, second and third guide elements formed at the upper end thereof, said first guide element comprising a transverse pin pivotally and slidably en-



gaged in the first slot, and the second guide element being a protrusion formed on an opposite side of the lever from the transverse pin, the protrusion permanently engaging in the second slot as the panel moves between its first and second positions, said second slot extending rearwardly at least as far as the first slot, the protrusion comprising a part circular wall of complementary shape to the latch pin, said part circular wall fitting around said latch pin to prevent rearward movement of the panel relative to the upper end of the lever with the lever in a first lever position when the panel is adjacent its first position, said protrusion moving to a position to release the latch pin for rearward movement of the panel toward its second position when the lever has been pivoted to a second lever position.

4,678,229

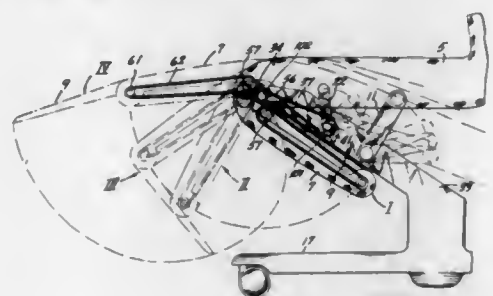
## RECLINING CHAIR

James M. Ryan, New York, N.Y.; Sanford S. Golden, Palm Springs, Calif., and Larry Sliker, Newton, N.J., assignors to Henry Dreyfuss Associates, New York, N.Y. and Golden Associates, Palm Springs, Calif.

Filed Mar. 25, 1986, Ser. No. 843,575  
Int. Cl.<sup>4</sup> A46C 1/02

U.S. Cl. 297—68

4 Claims



1. A reclining chair, comprising:  
a seat shell having a seating portion and a back portion;  
seat support means for supporting said seat shell at an elevation, said seat support means having a diagonal component extending upwards beneath said seat shell towards a forward edge of said seat shell and forming an acute angle therewith;  
first crank means, secured at an upper end about a first point on the seating portion of said seat shell and pivotally

secured at a lower end to a first pivot point located on said diagonal component;  
said seat shell being disposable in degrees of recline between an upright orientation and a full recline orientation relative to said seat support means, said crank means pivoting about said first pivot point in degrees relative to the degree of recline of said seat shell;

a leg support portion rotatably extendable in degrees about the forward edge of said seat shell, wherein said leg support portion includes a legrest and a footrest, said footrest being rotatably extendable in degrees about a forward edge of said legrest, a second pivot point being provided substantially about a rearward edge of said leg support portion and in proximity to the forward edge of said seat shell, said leg support portion pivoting about said second pivot point;

first belt drive means including a first endless belt revolving about said lower end of said first crank means and said second pivot point, drivingly pivoting said leg support portion in degrees about said second pivot point in response to the pivoting of said crank means and relative to the degree of pivot of said crank means and thereby rotatably extending said leg support portion about the forward edge of said seat shell, said first crank means driving said first endless belt;

second belt drive means including a second endless belt revolving between a point located substantially about the rearward edge of said legrest and a third pivot point provided substantially about a rearward edge of said footrest for drivingly pivoting said footrest in degrees about said third pivot point and thereby rotatably extending said footrest about said forward edge of said legrest; and  
belt drive engagement means cooperating with said first and second belt drive means for engaging said second endless belt relative to the degree of pivot of said first crank means and the resultant revolving of said first endless belt.

4,678,230

## BACK SUPPORT MEANS

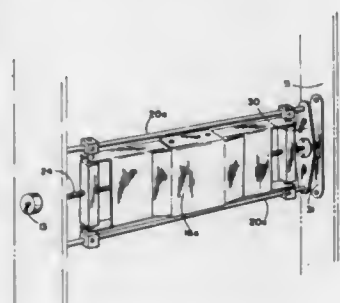
Graeme J. Winkle, 395 Brisbane Corso, Yeronga, 4104, Brisbane, Queensland, Australia  
PCT No. PCT/AU84/00197, § 371 Date Jun. 28, 1985, § 102(e)  
Date Jun. 28, 1985, PCT Pub. No. WO85/01644, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 10, 1984, Ser. No. 760,746

Claims priority, application Australia, Oct. 14, 1983, PG1842  
Int. Cl.<sup>4</sup> A47C 3/00

U.S. Cl. 297—284

8 Claims



1. A back support mechanism for a backrest of a chair mountable between two spaced side rails of a chair, said mechanism including:  
adjustable support means including laterally disposed link members, each said link member having an upper and a lower arm, said support means further including two guide posts, said arms of each said link member engaging with a respective said guide post at spaced locations therealong, said arms being formed on an end portion of each said link member, each said link member having meshing

projections formed thereon and spaced from said arms such that said meshing projections of said link members engage during operation of the mechanism;

a bearing pad means pivotally secured to said link members adjacent said meshing projections and bridging between said link members;

a pair of spaced guide rails extending between the side rails of the chair, said guide posts being mounted for movement along the guide rails; and,  
control means including a screw threaded shaft engaging said guide posts such that rotation of said shaft in one direction causes said guide posts to move towards one another and thereby cause the meshing projections to mesh and move the bearing pad means to an extended position and rotation of said shaft in a direction opposite to said one direction causes said meshing projections to mesh and said bearing pad means to move to a retracted position.

4,678,231

## ADJUSTABLE CHAIR

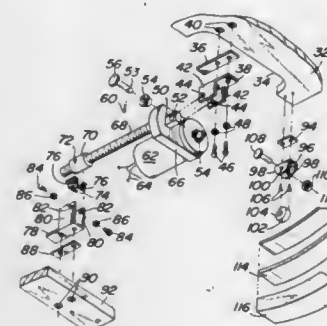
Michael Chizek, Kenosha, Wis., assignor to Contour Chair-Lounge Co., Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 775,853, Sep. 13, 1985, abandoned. This application Mar. 17, 1986, Ser. No. 841,039

Int. Cl.<sup>4</sup> A47C 1/02

U.S. Cl. 297—329

13 Claims



1. An adjustable chair comprising:  
a seat portion having a convex undersurface, said seat portion including laterally disposed convex side members joined together by a plurality of cross members;  
roller means fixed in a spaced apart relation along said convex side members;  
a base portion having a concave upper surface, said base portion including laterally disposed concave side members joined together by a plurality of cross members and a plurality of legs affixed to said concave side member;  
track means fixed in spaced apart relation along said concave side members; said roller means adapted for rolling engagement along said track means;  
power transmission means, a first end of said power means pivotally connected to a cross member of said seat portion, a second end of said power means pivotally connected to a cross member of said base portion, said power means being adapted to move said seat portion along an arcuate path defined by said concave upper surface of said base portion; and  
a noise dampening preload means associated with said second end of said power means.

4,678,232

## HEADREST ASSEMBLY FOR VEHICLES

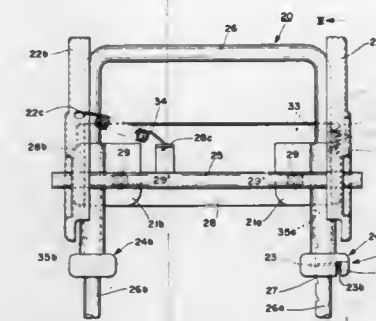
Keiichi Ishida, and Takami Terada, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan  
Filed Apr. 11, 1985, Ser. No. 721,912

Claims priority, application Japan, Apr. 13, 1984, 59-55226[U]

Int. Cl.<sup>4</sup> A47C 1/10

U.S. Cl. 297—408

5 Claims



1. A headrest assembly for vehicles having a seat backrest, comprising:  
a headrest;  
a stay fixedly secured to the seat backrest and having a pair of leg portions;  
guide shoe means slidably mounted on each of said leg portions for slidably supporting said headrest relative to said stay, said guide shoe means including a pair of guide shoes;  
a fixed bracket extending between said leg portions and secured to said guide shoe means for sliding relative to said stay with said guide shoes;  
a rod rotatably mounted on said fixed bracket;  
movable bracket means mounted at opposite ends of said rod for pivotally supporting said headrest;  
first locking means connecting said movable bracket means and said fixed bracket for adjusting the position of said movable bracket means relative to said fixed bracket, thereby preventing pivotal movement of said headrest when locked, said first locking means including:  
engagement means fixedly secured to said movable bracket means and including a latch having a first series of teeth centered on said rod;  
a pawl means rotatably mounted on said fixed bracket for engagement with said latch; and  
reversal spring means connecting said pawl means and said fixed bracket means for biasing said pawl means into engagement with or disengagement with said latch; and  
second locking means adapted to be mounted on at least one of said guide shoes to engage a corresponding one of said leg portions for regulating the position of said guide shoes relative to said leg portions when raising and lowering said headrest.

4,678,233

## ARMCHAIR, PARTICULARLY FOR HANDICAPPED PERSONS, EQUIPPED WITH A DEVICE FOR RAPIDLY LOCKING THE FOOT REST

Jean-Jacques Chabrol, Gironde, and Jean-Pierre Lambert, Indre et Loire, both of France, assignors to Composites Aquitaine S. A. and Etablissements Poirier S.A., both of France  
Filed May 6, 1986, Ser. No. 860,365

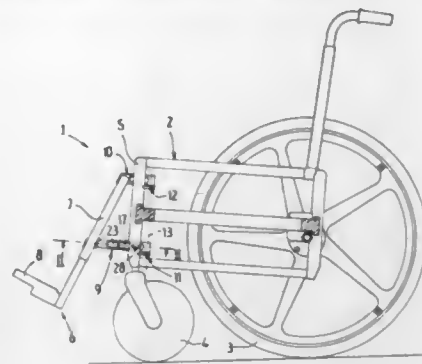
Claims priority, application France, May 7, 1985, 85 06913  
Int. Cl.<sup>4</sup> A47C 7/50

U.S. Cl. 297—429

5 Claims

1. In an armchair comprising a frame on which is retractably fixed at least one foot rest which may pivot with respect to said frame about a pin mounted substantially perpendicular to the

bearing plane of said armchair over the ground, said foot rest comprises a locking device cooperating in the service position of the foot rest with one of the uprights of the frame disposed in the path of the foot rest to lock the foot rest against rotation, said locking device comprising a cam mounted for rotation



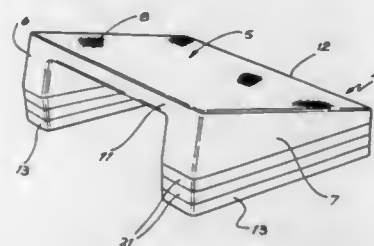
about said pin and parallel to the axis of said upright said cam having a lateral surface for cooperation with the surface of said upright and means for locking said cam in position cooperating with said one of the uprights of said frame, said means for locking including a locking finger mounted on said foot rest for abutting said cam.

#### 4,678,234 FOOTREST

Ian G. Wilson, 17/201 Waterloo Road, Marsfield, New South Wales 2122, Australia  
Filed Mar. 17, 1986, Ser. No. 840,520  
Claims priority, application Australia, Mar. 20, 1985, PG9821  
Int. Cl.<sup>4</sup> A47C 9/12

U.S. Cl. 297-439

9 Claims



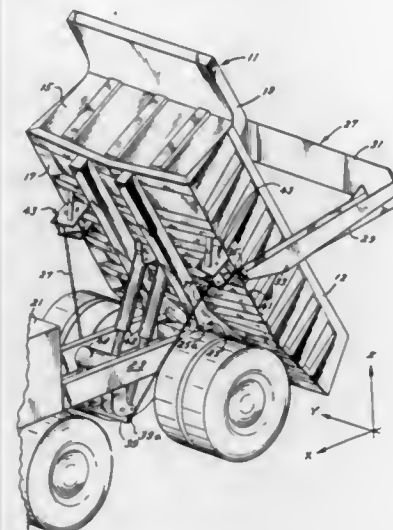
1. A footrest comprising a foot member, a body portion composed of moulded thermoplastic material and having a platform integrally formed with a pair of legs depending at opposite sides from said platform and each having a chamfered outer end to support the platform from a floor surface at a downward inclination from a rearward edge to a forward edge thereof, a plurality of spacing pieces having moulded thermoplastic bodies of identical form and having a two-part thread connecting means and a hole, said connecting means and hole equally offset from, and at opposite sides of, a center point of said body, thereby allowing stacking of a selected number of said spacing pieces with one part of said connecting means of one spacing piece passing through said hole of an adjacent spacing piece and receiving the second part of said connecting means for fastening of said spacing pieces together, a projecting stud at the outer end of each of said legs for insertion through the hole in a selected one of said spacing pieces for fastening thereto by a nut, and said foot member detachably connected beneath each of said legs and any selected number of spacing pieces, said spacing pieces detachably connected between each of said foot members and its respective leg.

#### 4,678,235 APPARATUS FOR ROTATION OF TAILGATE ASSEMBLY

LeRoy G. Hagenbuch, 4602 N. Rosemead, Peoria, Ill. 61604  
Filed Jul. 25, 1983, Ser. No. 759,401  
Int. Cl.<sup>4</sup> B60P 1/26

U.S. Cl. 298-23 DF

8 Claims



4. A mechanism for rotating a tailgate assembly mounted for rotation on a dump body of a vehicle in response to pivoting of the body about the frame of the vehicle wherein said dump body includes a bottom sheet, two opposing side sheets and a front sheet with said side sheets meeting said bottom sheet at a junction defining side edges of said body, said mechanism comprising:

a pair of roller assemblies, each mounted on the bottom sheet of said dump body adjacent the side edge;  
linkage means joining said tailgate assembly to said frame whereby said linkage means is biased away from said side edges by said roller assemblies in a manner so as to create angles in said linkage means that lie approximately in a first plane that is substantially transverse to a second plane which is substantially parallel with said side sheets;  
means for pivoting said dump body on said frame;  
said linkage means responding to the pivoting of said dump body to generate a torque on said tailgate assembly, thereby causing rotation of said tailgate assembly about said side sheets; and  
each of said roller assemblies including means (1) for angling said linkage means in said second plane in addition to said first plane as said body pivots and said tailgate assembly rotates so that said linkage means is biased along the length of said side edge by said means (1) to limit repositioning of the linkage means along the length of the side edge as the body pivots and the tailgate assembly rotates.

#### 4,678,236 APPARATUS FOR WORKING DEPOSITS BY THE OPEN-CAST WORKING PROCESS

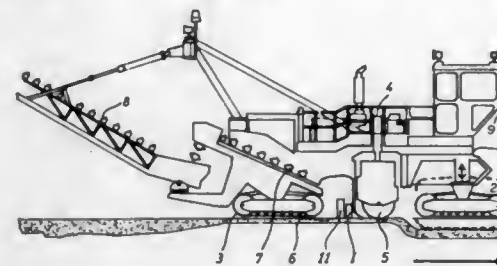
Reinhard Wirtgen, Hohner Strasse 2, D-5461 Windhagen, Fed. Rep. of Germany  
Filed Jan. 30, 1986, Ser. No. 824,251  
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1985, 3504610; Feb. 11, 1985, 3504611  
Int. Cl.<sup>4</sup> E21C 47/02

U.S. Cl. 299-1

20 Claims

1. Apparatus for working deposits by the opencast working process, with a self-propelled chasis, with a cutting implement mounted with vertical adjustability thereon for cutting away the deposit to a specific depth, and with a loading apparatus for

the material cut away, wherein one or more photosensors, which are provided at the height of the deposit cut away, react



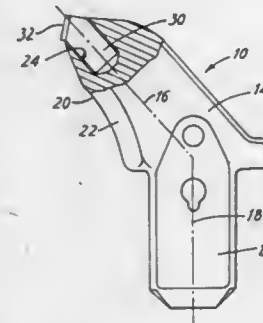
to the light reflected by the deposit and control the vertical setting of the cutting implement.

#### 4,678,237 CUTTER INSERTS FOR PICKS

William D. Collin, Sandton, South Africa, assignor to Huddy Diamond Crown Setting Company (Proprietary) Limited, Johannesburg, South Africa  
Filed Aug. 5, 1983, Ser. No. 520,594  
Claims priority, application South Africa, Aug. 6, 1982, 82/5690

Int. Cl.<sup>4</sup> E21C 35/18; E21B 10/46  
U.S. Cl. 299-79

15 Claims



1. A stud for use in a mining pick comprising  
(a) a tip consisting of a polycrystalline diamond composite and having a cutting face and  
(b) a body having two ends between which extends an axis, the body comprising a lower portion extending from one end of the body and a carrying surface at the other end of the body on which carrying surface the tip is mounted in which the carrying surface is inclined to the axis of the body by an angle of between 45° and 65°.

#### 4,678,238 COOLANT SLEEVE FOR MINING TOOLS

Kenneth C. Emmerich, Lexington, Ky., assignor to Fansteel Inc., North Chicago, Ill.  
Filed Mar. 17, 1986, Ser. No. 840,155  
Int. Cl.<sup>4</sup> E21C 35/22; E21F 5/02

U.S. Cl. 299-81

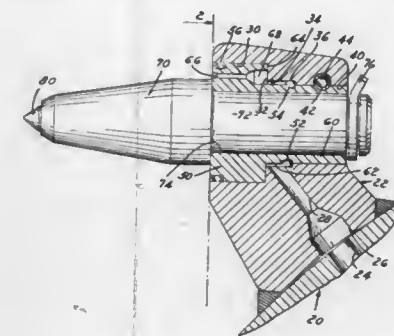
2 Claims

1. A mining bit mount for standard mining bits for use on a power-driven mining machine with a source of liquid coolant which comprises:

(a) a one-piece, integral, valve-less mounting block to be secured to a moving element of a mining machine, said block having a stepped bore with an outer end to be adjacent the working end of a mining bit and an inner end spaced axially from said outer end, said bore being disposed on a first axis coincident with an axis on which a mining bit is to be mounted, said bore being a stepped passage having the larger end at the outer end, the smaller end at the inner end to provide an annular axial support

shoulder between the larger end and the smaller end of the said bore, said block having a coolant passage opening to said stepped bore,

(b) a one-piece, integral, valve-less two-step sleeve fitted within said stepped bore having an axial bore to receive a mounting shank of a cutting bit, and a large end to interfit with said larger end of said stepped bore with a radial shoulder to seat on said annular support shoulder in said block and a smaller end to interfit with said smaller end of said stepped bore, and means between the wall of said



stepped bore of said mounting block and the said sleeve to form an annular unrestricted passage open to said coolant passage in said block,

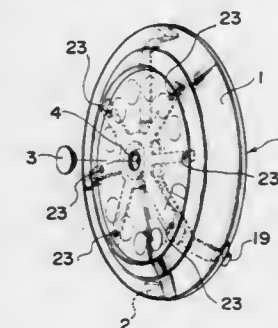
(c) an axially extending unrestricted passage formed in said sleeve in constant communication with said annular passage having a spray outlet directed axially along the mining bit, and  
(d) a retainer means to interfit with a notch in said sleeve to lock said sleeve axially and rotationally in said stepped bore of said mounting block.

#### 4,678,239 FREE WHEEL CAP

Yutaka Matsushita, 8850-2 Nishi Haruchika, Ina City, Nagano Prefecture, Japan  
Filed Sep. 23, 1985, Ser. No. 779,267  
Claims priority, application Japan, Sep. 27, 1984, 59-202498  
Int. Cl.<sup>4</sup> B60B 7/04, 7/06

U.S. Cl. 301-37 N

6 Claims



1. A hub cap assembly for a vehicular wheel having a curved peripheral rim, comprising a wheel cover having on its front surface advertising material or other indicia and on its back surface a weight, an outer bracket comprising a central annulus from which radially extends a plurality of spokes to the free ends of which the wheel cover is attached, an inner bracket comprising a central boss from which radially extends a plurality of stays and a ball bearing assembly located within the central annulus of said outer bracket and having one race fixedly connected thereto and its other race fixedly connected to the central boss of said inner bracket, each of stays of said inner bracket having at their free ends a V-shaped clip having



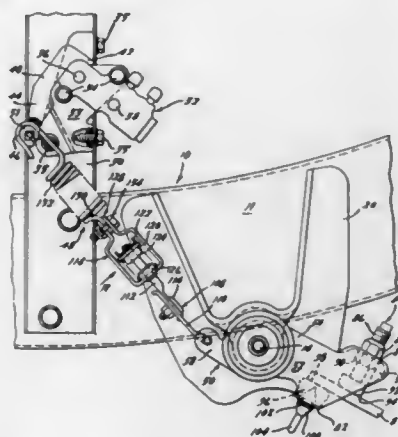
a rounded tip adapted to be inserted within the rim of the vehicular wheel to resiliently secure said inner bracket to said wheel for conjoint rotation therewith and independently of said outer bracket and weighted wheel cover.

4,678,240

**REAR SPRING ACTUATED BRAKE PROPORTIONER**  
James L. Schenten, Sterling Heights, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.  
Filed Mar. 27, 1986, Ser. No. 844,659  
Int. Cl.<sup>4</sup> B60T 13/04, 8/22

U.S. Cl. 303-6 C

3 Claims



1. In a vehicle, a brake and suspension system including a leaf-type rear spring between sprung and unsprung portions of the vehicle with at least one end portion attached to the sprung portion of the vehicle for pivotal movements thereabout, a master brake fluid pressure control means for selectively generating desired levels of brake fluid pressure for transmission to brake components associated with each wheel, a proportioning valve means fluidly connected between the master brake control and the rear wheel brake components to regulate the pressure level of brake fluid transmitted to rear brake components and having a force input thereto responsive to loading of the vehicle for controlling the proportioning valve and including an improved vehicle load responsive sensing means, comprising:

- an elongated follower lever having first and second end portions and a mid-portion with an aperture therethrough; means for pivotally mounting both the one end portion of the spring and the mid-portion of the lever in coaxial relation to one another;
- spring contact means supported by the first end portion of the lever follower with a contact surface thereof engaging one face of the spring's end portion;
- a deformable elastomeric bumper supported by the first end portion of the follower lever and contacting the opposite face of the spring's end portion;
- the spring contact means and the deformable elastomeric bumper being spaced with respect to one another and contacting the two faces of the spring end portion respectively so that the contact surface is firmly held against the face of the spring's end portion even as the spring end pivots about the mounting means;
- the pivotal mounting means for the mid-portion of the follower lever including a generally tubular sleeve member adapted to be securely mounted within the aperture of the follower lever;
- a low-friction bearing means having outer and inner housing portions rotatable with respect to one another and supporting rollable elements therebetween;
- the outer housing portion being secured to the tubular sleeve and the inner housing portion being supported by the spring end fastening means so that the housing portions are coaxial with the support of the spring end portion

whereby relatively rapid pivotal movements of the spring end portion caused by road bumps are nearly effortlessly transmitted to the follower lever through the spring contact means and elastomeric bumper;

an elongated and yieldable connecting means between the second end portion of the lever and the input of the proportioning valve to generate and transmit a force input to the proportioning valve in response to angular movements of the spring's end portion and the lever.

4,678,241

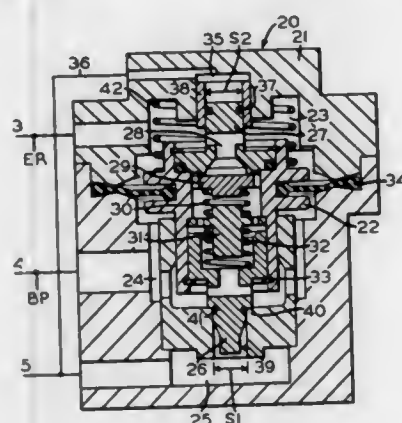
**EQUALIZER DISCHARGE VALVE FOR A RAILROAD CAR AIR BRAKE SYSTEM**  
Hideo Tamamori, Kobe, and Mitsubishi Ikeda, Amagasaki, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Mar. 10, 1986, Ser. No. 838,214  
Claims priority, application Japan, Mar. 11, 1985, 60-49062; Mar. 11, 1985, 60-49063

Int. Cl.<sup>4</sup> B60T 11/34

U.S. Cl. 303-33

9 Claims



1. An equalizer discharge valve for use on a railroad air brake system having an equalizer reservoir, a brake valve, and a brake pipe extending through each railroad car of the train, said equalizer discharge valve comprising:

- (a) a valve housing;
- (b) a piston movable within a chamber formed in said valve housing;
- (c) a diaphragm connected to said piston on the inner circumference and connected to said valve housing on the outer circumference;
- (d) said piston and said diaphragm dividing said chamber into an equalizer chamber on one side of said piston and a brake pipe chamber on the opposite side of said piston;
- (e) a connecting passageway formed through said piston;
- (f) a check valve partially formed on a portion of said piston adjacent said connecting passageway, said check valve being effective such that fluid pressure can flow only from said equalizer chamber to said brake pipe chamber when said check valve is open;
- (g) an exhaust chamber disposed in said valve housing below said brake pipe chamber; and
- (h) an exhaust valve formed between said brake pipe chamber and said exhaust chamber, said exhaust valve being effective such that, upon a preselected reduction in fluid pressure in said equalizer chamber, said piston rises and opens said exhaust valve to exhaust an amount of fluid pressure from said brake pipe chamber substantially equivalent to such preselected reduction of fluid pressure from said equalizer chamber.

4,678,242

**HYDRAULIC VEHICLE BRAKE SYSTEM WITH ANTI-LOCKING**

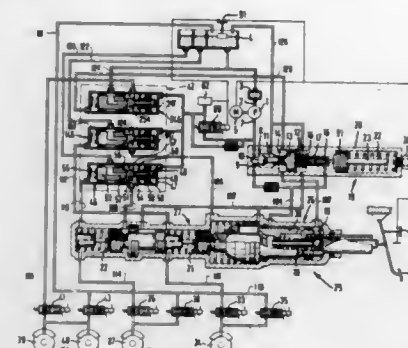
Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany  
Filed Oct. 4, 1985, Ser. No. 784,675

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437575

Int. Cl.<sup>4</sup> B60T 13/68

U.S. Cl. 303-92

5 Claims



1. A hydraulic vehicle brake system with anti-locking, wherein a braking pressure generator (25) comprising a hydraulic power booster (26) and a master cylinder (27) connected downstream thereof is employed for the pressure supply of the brake circuits, wherein wheel brakes (34, 37) are connected to the pressurizable working chambers (31, 32) of the braking pressure generator by way of first valves (33, 36), and wherein the respective working chambers (31, 32) are connectible with an auxiliary pressure source (1) by way of second valves (147, 47), a third valve (60) being interposed, between the auxiliary pressure source and the second valves, which can be switched to assume an open position in response to a pedal contact and a predetermined minimum pressure of the auxiliary pressure source, wherein the second valves (147, 47) are provided as double seat valves of the same kind, and include a piston (153, 53) which is displaceable by the pressure in the respective brake circuit and by which a hydraulic connection is provided in the brake pedal's release position between the respective working chamber (31, 32) and an unpressurized supply reservoir (4).

4,678,243

**METHOD AND APPARATUS FOR CONTROLLING BRAKE PRESSURE IN VEHICLE BRAKE SYSTEMS**  
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Nov. 21, 1985, Ser. No. 800,570

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444827

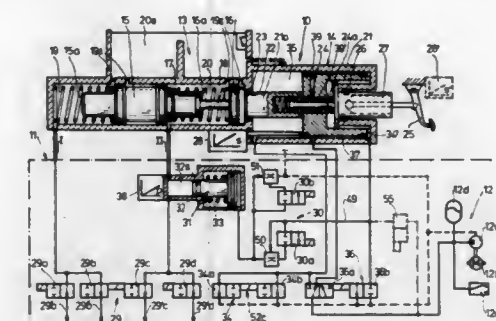
Int. Cl.<sup>4</sup> B60T 8/02

U.S. Cl. 303-114

28 Claims

13. An apparatus for controlling and adapting brake pressure in a vehicle brake system, comprising a hydraulic brake booster provided with an associated pedal-actuated brake valve for feeding a pressure medium from a pressure medium supply means to at least one wheel brake cylinder in at least one closed brake circuit between said brake booster and said at least one wheel brake cylinder, at least one supplementary pump piston being provided in said at least one closed brake circuit between said brake booster and said at least one wheel brake cylinder, said supplementary pump piston being provided with pressure supply and pressure withdrawal lines for regulating its supply of brake pressure and said supplementary pump piston has a pressure supply line for pressurizing said pressure chamber to a booster chamber of the hydraulic brake booster and said supplementary pump piston further has a

return line connected via a second magnetic valve to the pressure medium supply means for depressurizing said pressure



chamber, and said pressure supply and return lines include throttle means therein.

4,678,244

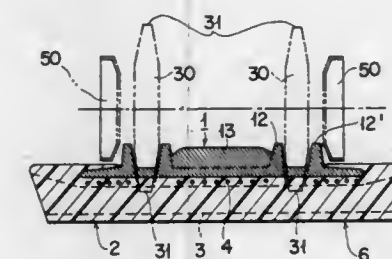
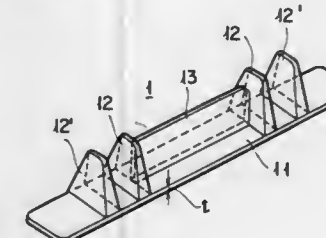
**CORE OF RUBBER CRAWLER**

Mitsuo Furuta, Hiratsuka, and Shinji Uchida, Kanawaga, both of Japan, assignors to Bridgestone Co., Ltd., Tokyo, Japan  
Filed Jul. 2, 1985, Ser. No. 751,767

Claims priority, application Japan, Jul. 5, 1984, 59-139315  
Int. Cl.<sup>4</sup> B62D 55/18

U.S. Cl. 305-57

1 Claim



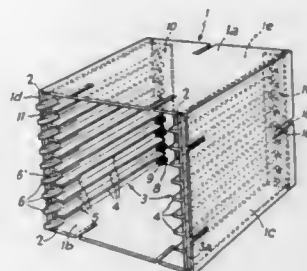
1. A rubber crawler core, comprising:  
a rectangular core body having longitudinal ends;  
at least one pair of protrusions integrally formed with the core body, said protrusions being situated adjacent to the longitudinal ends of the core body and extending upwardly therefrom;  
at least one rib integrally formed with the core body, said rib extending upwardly from the core body between the protrusions in an orientation perpendicular to the protrusions, each rib having a height exceeding a middle or center portion of the protrusion; and  
an additional protrusion formed adjacent each respective protrusion of said pair of protrusions, each additional protrusion being spaced from the respective adjacent protrusion of said pair of protrusions outwardly toward the longitudinal end of the core body to permit a drive tumbler to pass between the protrusion and the additional protrusion.

4,678,245

MODULAR DEVICE FOR STORING COMPACT DISCS  
OR THE LIKEJean-Pierre Fouassier, 10, rue de Strasbourg, 94230 Cachan,  
FranceContinuation-in-part of Ser. No. 740,048, May 22, 1985,  
abandoned. This application Apr. 11, 1986, Ser. No. 850,615Int. Cl.<sup>4</sup> A47B 81/06

U.S. Cl. 312-15

8 Claims



1. A modular device for storing a plurality of objects such as compact disc cartridges, audio tape cassettes, video tape cassettes or the like comprising:

- (a) a frame comprising:
  - (i) a generally horizontal bottom wall;
  - (ii) two generally vertical outer side walls and a generally vertical rear wall extending upwardly from the bottom wall; and,
  - (iii) a generally horizontal top wall attached to the outer side and rear walls to define a frame having an open front;
- (b) first and second inner side walls each having a plurality of generally horizontal fixed protrusions extending from one side thereof, each inner side wall having an edge portion and defining a slot having an end;
- (c) guide means defined by the bottom and top walls for removably locating an inner side wall adjacent to an outer side wall such that the inner side walls extend generally parallel to the adjacent outer side wall;
- (d) releasable locking means interposed between an inner side wall and an adjacent outer side wall to positively latch the inner side wall to the adjacent outer side wall;
- (e) a resilient tongue formed on at least one of the inner side walls so as to be located near the open front of the frame, the tongue having a distal end;
- (f) a retaining hook member formed on the distal end of the resilient tongue; and,
- (g) at least one removable protrusion removably attached to each inner side wall, the removable protrusion comprising:
  - (i) a generally planar, horizontally extending portion;
  - (ii) a fixing portion attached to the planar portion;
  - (iii) a first catch means defined by the fixing portion and the planar portion adapted to removably engage the edge portion of the inner side wall; and
  - (iv) a second catch means defined by the fixing portion and the planar portion adapted to removably engage the end of the slot defined by the inner wall.

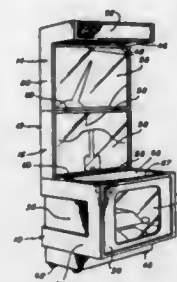
4,678,246

## DISPLAY DEVICE

Willy Ytter, Stockholm, Sweden, assignor to Extraversion, Inc.,  
New York, N.Y.Continuation of Ser. No. 397,514, Jul. 12, 1982, Pat. No.  
4,601,524. This application May 3, 1985, Ser. No. 730,083The portion of the term of this patent subsequent to Jul. 22,  
2003, has been disclaimed.Int. Cl.<sup>4</sup> A47F 3/00

U.S. Cl. 312-114

20 Claims



1. A display apparatus comprising:  
a base housing having a front wall including a first display means,  
an upper housing overlying the base housing and including a second display means,  
means hingedly securing the upper housing to a rear end of a top surface of the base housing along a base hinge line, said upper housing having a display position in which said second display means is directed forwardly and in which the upper housing is in an upright position, and a storage position in which at least part of the upper housing is disposed to extend over the top surface of the base housing,  
said upper housing having top and bottom housing sections wherein the top section is disposed over the bottom section in the display position, and in the storage position the bottom section is disposed over the top surface of the base housing while the top section extends to cover the first display means,  
means for hingedly securing the upper housing top housing section to the upper housing bottom housing section, said bottom and at least part of said top housing sections, in said display position, adapted to be disposed in substantially co-planar vertical position,  
said the top section of the upper housing being hinged from the bottom sections with the hinge line disposed, in the storage position, adjacent the edge formed between the top surface and front surface of the base housing.

4,678,247

REFRIGERATOR SHELF FOR DISPENSING CANS OR  
THAWING FOOD

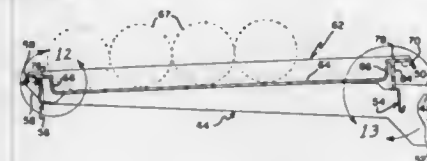
John J. Plink, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Dec. 20, 1985, Ser. No. 811,224

Int. Cl.<sup>4</sup> A47F 3/04

U.S. Cl. 312-116

10 Claims



1. Food thawing and can dispensing apparatus for a refrigerator, comprising:  
a tray having a bottom and raised sides;

means for supporting said tray in a refrigerator; and  
said tray comprising a downwardly extending lateral leg at one end thereof, said leg being seatable on said supporting means in a first position of said tray with respect to said supporting means for holding said bottom horizontally, said leg further being seatable on said supporting means in a second position of said tray with respect to said supporting means for holding said bottom at an incline wherein, in said second position, said tray is adapted for storing cans rollably disposed towards the front of said refrigerator.

4,678,248

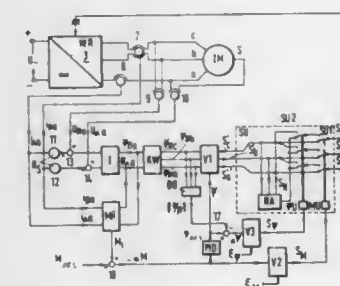
DIRECT SELF-CONTROL OF THE FLUX AND ROTARY  
MOMENT OF A ROTARY-FIELD MACHINEManfred Depenbrock, Bochum-Stiepel, Fed. Rep. of Germany,  
assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of  
Germany

Filed Oct. 18, 1985, Ser. No. 788,816

Claims priority, application Fed. Rep. of Germany, Oct. 20,  
1984, 3438504Int. Cl.<sup>4</sup> H02P 7/36

U.S. Cl. 318-805

15 Claims



1. Apparatus for controlling a rotating-field machine, comprising: an inverter having an output voltage system being connected to the rotating-field machine and being variable with respect to amplitude, phase and frequency; an integrator connected to said inverter and a component converter connected to said integrator for forming amplitudes of stator flux components from measured stator current components and stator voltage components as actual values of a flux control loop; means for supplying a predetermined stator flux reference value; and a flux control in the form of a comparator having inputs connected to said component converter for receiving the amplitudes of the flux components and to said supplying means for receiving said stator flux reference value, and said flux control having an output connected to said inverter for delivering switching state variables for driving said inverter, said flux control changing the phase and frequency of the inverter output voltage system as a function of said stator flux reference value.

4,678,249

ELECTRICAL SWITCH HAVING FLEXIBLE PRINTED  
CIRCUIT CONNECTOR CABLE

Charles E. Black, III, Mount Prospect, and Raymond T. Halstead, Wheeling, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Filed Dec. 27, 1985, Ser. No. 813,771

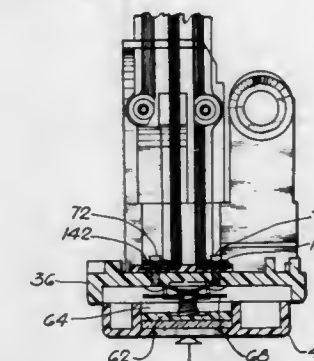
Int. Cl.<sup>4</sup> H01R 4/48

U.S. Cl. 439-77

3 Claims

1. An electrical switch or the like, comprising  
an electrically insulating terminal supporting member having first and second opposite sides,  
said member having a substantial rigidity and being made of a resinous plastic material,  
said member having an opening therein extending between said opposite sides,

an electrically conductive terminal rivet having a head portion on said first side of said terminal supporting member, said rivet having a shank portion connected to said head portion and extending through said opening in said member,  
a flexible laminated printed circuit having an aperture therein for receiving said shank portion of said rivet, said flexible printed circuit having an electrically insulating base lamina and an electrical conductor lamina securely laminated to said base lamina,  
said base lamina being made of a thin flexible resilient electrically insulating resinous plastic material,  
said electrical conductor lamina being made of thin flexible metal,  
said base lamina engaging said second side of said insulating terminal supporting member,



and a compressible annular spring washer mounted on said shank portion of said rivet and engaging said electrical conductor lamina,  
said rivet having an upset end portion on said shank portion for securely engaging and retaining while also compressing said compressible spring washer,  
said washer being made of thin flexible resilient metal and being formed with a central annular dished portion,  
a reversely dished peripheral annular portion,  
and a smoothly rounded annular bulging portion therebetween for engaging said conductor lamina without any tendency to cut into said conductor lamina,  
said washer being resiliently compressible to obviate any looseness of said terminal rivet despite any minor dimensional variations and despite any shrinkage of said flexible printed circuit and said terminal supporting member due to such factors as aging and temperature variations.

4,678,250

## MULTI-PIN ELECTRICAL HEADER

Edward L. Romine, Hoffman Estates, and Roger W. Byczek, Westchester, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Jan. 8, 1985, Ser. No. 689,668

Int. Cl.<sup>4</sup> H05K 1/00

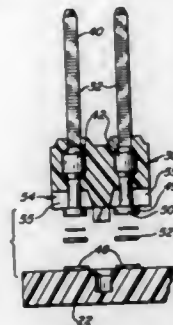
U.S. Cl. 439-83

9 Claims

1. A multiple male pin electrical header for connection to the surface of a printed circuit board, the header comprising, in combination, an integral, electrically insulating body member, and a plurality of solid, generally cylindrical male pin connectors extending at least partly through the body member, at least one pin having a tail portion adapted to electrically contact the surface of a printed circuit board and being provided with a pad tip recess opening in the direction of the axis of the cylindrical male pin and adapted to temporarily receive in a recess a reflow solder pellet oriented parallel to the surface of the underlying printed circuit board, the pin further having a head portion adapted for connection with another electrical connector, the insulating header body portion being formed to define a plurality of pin cavities, each cavity being shaped to expose



a single individual solid male pin connector side for contact by a test probe, yet discourage simultaneous test probe shorting



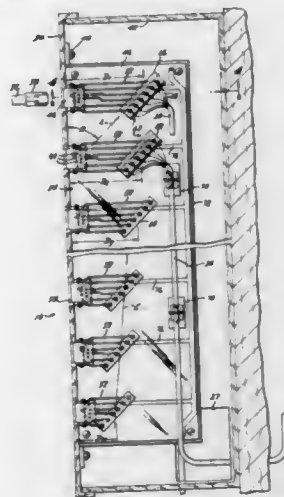
contact with a plurality of connector pins or a plurality of single connector pin surfaces.

#### 4,678,251 MODULAR INSTALLATION SYSTEM FOR DATA CABLE INTERFACING

Stephen J. Willard, Granada Hills, Calif., assignor to Installation Technology, Inc., Birmingham, Mich.  
Filed Feb. 10, 1986, Ser. No. 827,945  
Int. Cl.<sup>4</sup> H01R 29/00

U.S. Cl. 439—61

17 Claims



1. An installation system for interfacing a plurality of entrance cables comprising:
  - a circuit board having a first plurality of traces and a second plurality of traces and having a first edge;
  - a first jack secured to said circuit board adjacent said first edge and electrically coupled to said first plurality of traces;
  - a second jack secured to said circuit board adjacent said first edge and electrically coupled to said second plurality of traces;
  - first connector means secured to said circuit board and electrically coupled to said first plurality of traces for coupling a first one of said entrance cables thereto;
  - second connector means secured to said circuit board and electrically coupled to said second plurality of traces for coupling to a second one of said entrance cables;
  - a panel having first and second apertures for registration respectively with said first and second jacks;
  - a bracket for securing said circuit board to said panel with said first edge most adjacent said panel;
  - said bracket having a shield plate means extending in spaced relation to said first and second plurality of traces; and
  - jumper cable means having plug connectors at the ends

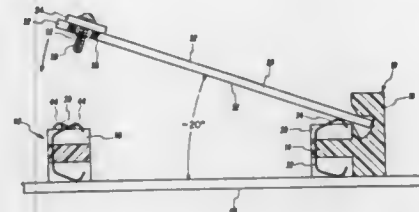
thereof for removably engaging said jacks and for establishing electrical communication between said first and second connectors.

#### 4,678,252 ELECTRICAL CONNECTOR FOR CIRCUIT BOARDS

Larry V. Moore, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.  
Filed May 27, 1986, Ser. No. 866,650  
Int. Cl.<sup>4</sup> H01R 9/09

U.S. Cl. 439—62

10 Claims



1. Electrical connector apparatus for use with a printed circuit board of a given width and a predetermined thickness and having electrical contacts on one surface near an edge to be inserted into the electrical connector apparatus comprising, in combination:

- (a) angled insulator means having first and second legs and a predetermined length at right angles to the legs;
- (b) a pie-shaped cavity in said insulator means at the meeting point of said two legs with the cavity extending for a distance necessary to receive the printed circuit board, the pie-shaped cavity being such that the edge of a printed circuit board inserted into said cavity can be moved through an arc of at least 15 degrees terminating with a position parallel to said first leg;
- (c) flexible electrical contact means forming a portion of said first leg and extending above the surface thereof, the dimensions of said cavity and the electrical contact means being such that a printed circuit board being inserted into said cavity must be inserted at an angle of approximately at least 15 degrees with respect to said first leg and then moved through an arc to be parallel with said first leg whereby good electrical contact is made between electrical contacts on the one surface of the printed and said flexible electrical contact means of said electrical connector apparatus.

#### 4,678,253 BUS DUCT HAVING IMPROVED BUS BAR CLAMPING STRUCTURE

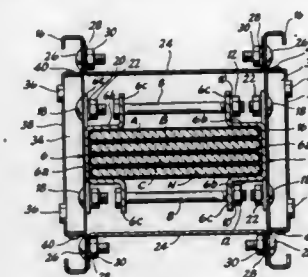
Loy A. Hicks, Jr., Nazareth; Edward P. Sherwood, Allentown, and Thomas J. Saks, Bethlehem, all of Pa., assignors to Eaton Corporation, Cleveland, Ohio  
Continuation-in-part of Ser. No. 665,480, Oct. 29, 1984. This application Apr. 22, 1985, Ser. No. 724,954  
Int. Cl.<sup>4</sup> H02G 5/08

U.S. Cl. 439—210

37 Claims

1. A bus duct comprising, in combination:
  - a plurality of wide flat bus bars arranged in stacked relation with flat surfaces of each bus bar in face-to-face engagement with contiguous flat surfaces of adjacent bus bars;
  - U-shaped reinforcement members disposed over opposite edges of said stacked bus bars with bight portions of said members abutting respective edges of said stacked bus bars and legs of each member extending along outermost flat surfaces of said stacked bus bars toward corresponding legs of a respective opposed member, free ends of said legs being disposed outwardly from said outer flat surfaces; and
  - clamping means engaging said outwardly disposed free ends

of opposed ones of said reinforcement members for urging said members together against said edges of said stacked bus bars and for applying a bending moment to said legs



about respective junctures thereof with said bight portions for urging said legs inwardly against said flat surfaces of said stacked bus bars for compressing said bus bars together in face-to-face relation.

#### 4,678,254 HIGH INTENSITY POWER PLUG

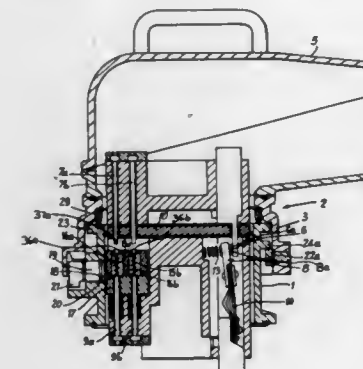
Yves Le Magourou, Ermont, France, assignor to Societe d'Exploitation des Procédes Marechal (SEPM), Paris, France  
Filed Dec. 20, 1985, Ser. No. 811,475

Claims priority, application European Pat. Off., Dec. 27, 1984, 84 402722.7

Int. Cl.<sup>4</sup> H01R 13/44

U.S. Cl. 439—139

46 Claims



1. An electric power connection comprising:
  - (a) a socket comprising first power contacts;
  - (b) a plug comprising second power contacts adapted to be connected to said first power contacts;
  - (c) a pilot circuit comprising first pilot contacts provided in said socket and second pilot contacts provided in said plug, said pilot circuit controlling the de-energization and energization of said first power contacts when said circuit is opened and closed, respectively; and
  - (d) manipulation means for preventing certain movements of said plug and said socket when said pilot circuit is in a closed position and for allowing said certain movements when said pilot circuit is in an open position.

#### 4,678,255 CHIP CONNECTOR

Clyde T. Carter, Shermans Dale, Pa., assignor to Wells Electronics, Inc., South Bend, Ind.  
Filed Apr. 3, 1986, Ser. No. 847,932

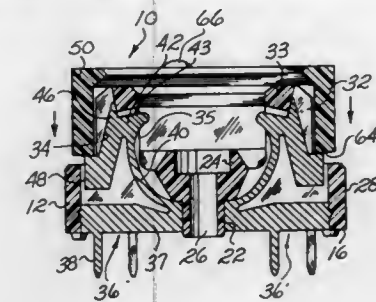
Int. Cl.<sup>4</sup> H01R 13/62

U.S. Cl. 439—267

4 Claims

1. A connector for a chip carrier, said connector including a base member having a central opening therein, a plurality of conductive contacts for engaging said carrier, each contact

anchored in said base member and including an upwardly extending part, said contacts positioned on at least one side edge of said base member opening and constituting clamp means for engaging said carrier within said, connector, the improvement wherein each contact includes an upward projection extending from its upwardly extending part, and a cantilevered part projecting outwardly from the upwardly extending part outwardly of said base member opening, said



base member including integral positioning means contacting each contact upward projection for biasing said contacts in a clamping position within said base member opening, and a movable top overlying said base member, said top including an abutment means in contact with each said contact cantilevered part for moving and flexing said contacts into an unclamped position outwardly of said base member opening upon movement of the top in a substantially straight line downward direction.

#### 4,678,256 CONNECTOR

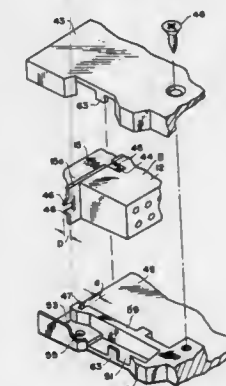
Yoshimitsu Nishino; Wataru Tsuruda; Kihachiro Koike, and Kensaku Matsuoka, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry Limited; NEC Corporation and Hirose Denki Kabushiki Kaisha, all of Tokyo, Japan  
Filed Dec. 4, 1985, Ser. No. 804,424

Claims priority, application Japan, Dec. 10, 1984, 59-186923[U]; Dec. 10, 1984, 59-186924[U]

Int. Cl.<sup>4</sup> H01R 13/629

U.S. Cl. 439—347

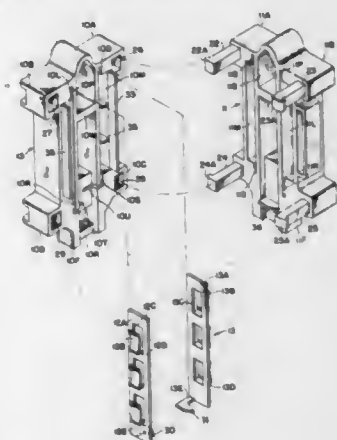
13 Claims



1. A connector comprising:
  - a plug connector having a plurality of plug contact pins projecting out forwardly of a body of an insulating material and a metallic shell mounted on the front of the body in a manner to surround projecting portions of the contact pins arranged in a predetermined pattern;
  - a cover in which the plug connector is entirely housed with the front end face of its shell positioned near a front opening of the cover, recesses being made in both side walls of the cover and first slots being made in the cover to extend from the recesses to the front opening of the cover; and
  - locking members respectively housed in the recesses of the

cover, each locking member being made of a strip of resilient metal and having at its intermediate portion a shaft through which it is pivotally mounted on the cover, a portion of each locking member extending forwardly of the shaft being bent inwardly to form a locking portion which extends forwardly through the first slot in the cover, a gap being defined between the locking member and either side face of the shell of the cover for receiving a locking piece of a receptacle connector, a portion of each locking member extending rearwardly of the shaft having a release lever which projects out of the recess of the cover, the rear end portion of the release lever being bent and the bent end portion being urged against a partition wall made in the cover.

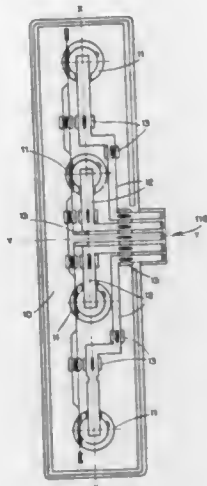
**4,678,257**  
**MULTIPLE-SOCKET END CONNECTOR FOR EXTENSION CORDS**  
 Joseph M. Ahroni, 2701 W. Manor Pl., #204, Seattle, Wash. 98199  
 Continuation-in-part of Ser. No. 755,230, Jul. 17, 1985. This application May 27, 1986, Ser. No. 865,795  
 Int. Cl.<sup>4</sup> H01R 19/28  
 U.S. Cl. 439-426 15 Claims



1. A housing for a multiple-socket end connector, comprising:

- two interfitting housing shells each having a set of openings extending through the exterior surface of the shell, each set being adapted to receive two blades of an electrical plug, said shells having spaced elongated pockets arranged to provide two internal elongated cavities communicating with said sets and adapted to receive two parallel conductor members for engagement by the blades of plugs occupying said sets, and said shells having central elongated recesses arranged to jointly provide an externally opening wireway extending between said elongated cavities for receiving an electrical cord;
- two pairs of flexible legs projecting integrally from one of said shells near opposite ends thereof, each leg having a laterally extending locking foot at its free end, said legs being arranged to extend through open-ended bores formed in the other shell and having their locking feet engaging retaining shoulders at the outer ends of the bores to prevent withdrawal of the legs from the bores;
- each of said bores having a widened mouth portion at its inner end aligned with the respective retaining shoulder for introduction of the locking foot of the respective leg at the start of assembly of the housing, and then tapering inwardly from said mouth portion such as to spring the leg inwardly during assembly until its locking foot reaches the outer end of the bore and springs back outwardly to fit over the respective retaining shoulder.

**4,678,258**  
**CONNECTORS FOR THE CONNECTION OF LIGHTS ON MOTOR VEHICLES**  
 Giuliano Cossetti, Tolmezzo, Italy, assignor to Selma Italiana S.p.A., Tolmezzo, Italy  
 Continuation of Ser. No. 505,441, Jun. 17, 1983, abandoned.  
 This application Feb. 14, 1985, Ser. No. 701,455  
 Claims priority, application Italy, Aug. 27, 1982, 83437 A/82  
 Int. Cl.<sup>4</sup> B60Q 1/26; H01R 13/60  
 U.S. Cl. 439-571 5 Claims

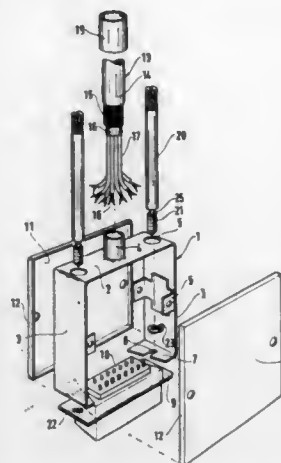


1. A panel for lights on motor vehicles, which comprises applied conductor-element strips and an insulating support, said support defining at least two walls for each conductor-element strip permitting a conductor-element strip to slide reciprocally, such walls cooperating with the conductor-element strip by interference, said two walls being opposite each other, between which fits the conductor-element strip, said support defining a central wall between said two walls, said conductor-element strip having a slot therein which fits over said central wall and which is longer than the central wall, said central wall having an undercut, the placement of the conductor-element strip over the central wall taking place by elastic deformation of the central wall.

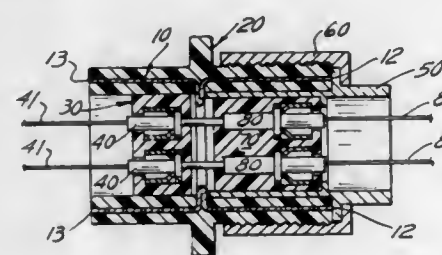
**4,678,259**  
**METAL JUNCTION BOX FOR PLUG-IN MULTICONTACT CONNECTOR**  
 André Petit, Longpont sur Orge, France, assignor to Alcatel, Paris, France  
 Filed Jan. 21, 1986, Ser. No. 820,291  
 Claims priority, application France, Jan. 23, 1985, 85 00928  
 Int. Cl.<sup>4</sup> H01R 13/648 2 Claims

1. In a metal box for connection of a cable (13) having a grounding shield (15) surrounding insulated electrical conductors (17) which extend out from the end of the said shield, the ends (48) of the conductors (17) being connected to a multi-pin connector plug (10), said box being equipped with a sleeve (4) over which the grounding shield (15) is fitted, the said end being held in place around the sleeve by a ferrule (19), the improvement wherein the said box includes a bracket (1) consisting of a central arm (2) and two, right angle, parallel side arms (3), two lateral covers (11) terminating in flanges (12) orthogonal to the planes of the said covers (11), said sleeve (4) is fixed to the central arm (2) of the bracket (1) and directed along the axis of the bracket, and wherein said bracket (1) includes on its two side arms (3) double mounting lugs (6), respectively, said two covers (11) being screwed to said double mounting lugs from opposite sides of the box, said side arms terminating at ends remote from said central arm and in respect

tive tabs (7) directed toward the inside against said connector plug (10) said plug including a metal plate (9) pressed against said tabs, the said plate (9) having ends abutting said tabs (7) and wherein said flanges (12) of said covers (11), overlie respective edges of the bracket (1) and aligned edges of the said



**4,678,260**  
**EMI SHIELDED ELECTRICAL CONNECTOR**  
 David O. Gallusser, Oneonta; Robert W. Brush, Sr., Unadilla, and David W. MacAvoy, Bainbridge, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.  
 Filed May 14, 1984, Ser. No. 610,069  
 Int. Cl.<sup>4</sup> H01R 4/66 9 Claims

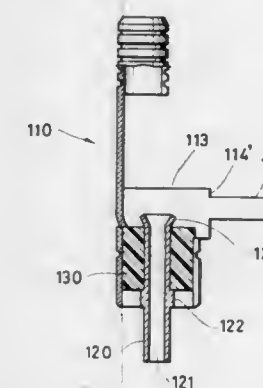


7. In combination with an EMI shielded connector assembly of the type having a tubular plastic outer housing; a dielectric insert having a plurality of axial passages therein, said insert mounted in said plastic outer housing; and a plurality of electrically conductive contacts mounted in respective passages in said dielectric insert, the improvement wherein said plastic outer housing is characterized by:

- an electrically conductive foraminous sleeve embedded in the plastic outer housing, the inside surface and outside surface of said sleeve completely covered by the material of said plastic housing, said foraminous sleeve being comprised of an electrically conductive wire mesh having a plurality of holes substantially evenly distributed throughout said sleeve, and with said plastic housing molded in a manner such that substantially all of said holes are filled with plastic material of said housing whereby the mechanical strength of the connector housing is strengthened; and
- an electrically conductive annular shoulder extending radially inward from said tubular plastic housing, said conductive annular shoulder electrically connected to said elec-

trically conductive foraminous sleeve and being an integral part thereof, and the ends of said sleeve and said inwardly extending shoulder being exposed for electrical connection in direct contact with another electrically conductive member extending within the interior of said plastic housing.

**4,678,261**  
**L-TYPE COAXIAL PLUG CONNECTOR**  
 Ikujirou Mitani; Norihide Kawanami, and Fumio Kobayashi, all of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan  
 Filed Apr. 23, 1986, Ser. No. 855,183  
 Int. Cl.<sup>4</sup> H01R 17/18 5 Claims



1. An L-type coaxial plug connector comprising:

- a central terminal adapted to be connected to the core conductor of a coaxial cable so as to constitute a part of the core conductor of the coaxial line to be formed;
- an outer shell adapted to be connected to the outer conductor of said coaxial cable so as to constitute a part of the outer conductor of the coaxial line to be formed;
- and
- a crimp sleeve on an outer sheath of said coaxial cable and adapted to be collapsed so as to fix said coaxial cable to said plug connector;

wherein said outer shell has a cylindrical portion holding a dielectric member in which said central terminal is fixed, a cylindrical outer conductor fitting portion adapted to be inserted into the boundary between the inner dielectric layer and the outer conductor of said coaxial cable, and an intermediate portion which extends axially from a portion of an upper circumferential edge of said cylindrical portion so as to connect said portion of said cylindrical portion to the corresponding portion of the lower circumferential edge of said outer conductor fitting portion such that the axes of said cylindrical portion and said outer conductor fitting portion extend in parallel with each other,

said intermediate portion having a U-shaped arm portion which extends from said intermediate portion in the direction perpendicular to said axis of said cylindrical portion, and a cover portion which is adapted to cover an adjacent open end of said cylindrical portion when said intermediate portion is flexed substantially orthogonally towards said U-shaped arm portion.



# 4,678,262 CONTACT ELEMENT

Manfred Reichardt, Weinsberg, and Rolf D. Loss, Heilbronn, both of Fed. Rep. of Germany, assignors to Allied Corporation, Morris Township, Morris County, N.J.  
Continuation of Ser. No. 730,216, May 3, 1985, abandoned. This application Oct. 14, 1986, Ser. No. 918,191  
Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416968

Int. Cl.<sup>4</sup> H01R 13/41, 13/11  
U.S. Cl. 439—857

7 Claims



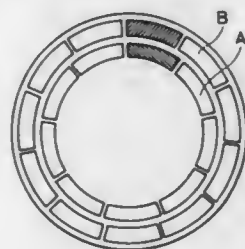
1. A single piece contact element comprising a termination portion at one end, a female contact portion at the other end, a press fit region between said termination portion and said female contact portion, said press fit region being adapted to form a contacting region when said contact element is pressed into a contact opening of a circuit board, an opening in said contact element in an area above the press fit region, a receiving surface formed at said opening, and a connecting portion arranged between the press fit region and the female contact portion, the connecting portion being bent such that the longitudinal axis of the female contact portion is aligned with the longitudinal axis of the termination portion, said opening being formed in said bent connecting portion, said receiving surface being aligned with the longitudinal axis of the termination portion of the contact and said receiving surface being adapted to receive a press-in tool pin introduced through said female contact portion and said opening along the longitudinal axis of said female contact portion, to allow said contact element to be press-fitted into a contact opening of a circuit board.

# 4,678,263 PHOTO SCANNER DEVICE

Hiroyoshi Funato, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan  
Continuation of Ser. No. 565,817, Dec. 27, 1983, abandoned.  
This application Oct. 21, 1985, Ser. No. 788,528  
Claims priority, application Japan, Dec. 24, 1982, 57-225815  
Int. Cl.<sup>4</sup> G02B 26/10, 26/08

U.S. Cl. 350—3.71

2 Claims



1. A photo scanner device comprising:  
a rotary disk having a plurality of holograms thereon and

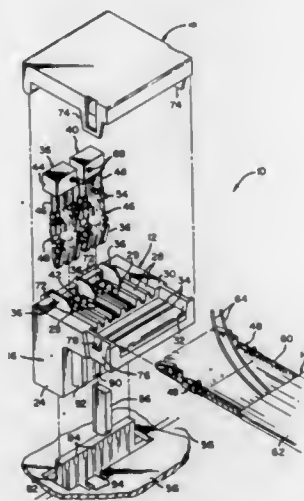
arranged in at least two concentric circles with respect to the axis of rotation of said disk;  
a light source which generates a beam of light which is incident on the disk at a selected radial distance which may be varied so as to illuminate the holograms arranged on a selected concentric circle;  
the holograms on the same concentric circle each subtending the same angle from said axis;  
the holograms on different concentric circles subtending different angles from said axis, thereby permitting the angle of scan to be switched by selection of the radial distance at which said beam of light is incident;  
the holograms at the same radial distance from the axis of rotation each having substantially the same grid direction; and  
the holograms at different radial directions having different grid directions so that a scanning start point is the same irrespective of the difference in scanning angle caused by the holograms at different radial distances subtending different angles from the axis.

# 4,678,264 ELECTRICAL AND FIBER OPTIC CONNECTOR ASSEMBLY

Terry P. Bowen, Etters; Douglas W. Glover, Harrisburg; Charles D. Hoover, Harrisburg; John H. Huber, Harrisburg, and Ronald R. Schaffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.  
Continuation of Ser. No. 480,569, Mar. 30, 1983, abandoned.  
This application Oct. 4, 1985, Ser. No. 784,275

Int. Cl.<sup>4</sup> G02B 6/36  
U.S. Cl. 350—96.20

17 Claims



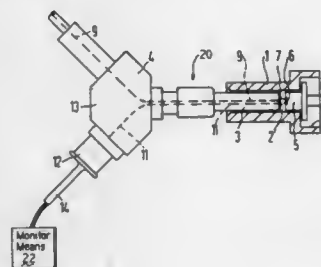
1. An electrical and fiber optic connector assembly for terminating a cable having electrical conductors and fiber optic transmission members, for electrical connection of the electrical conductors to conductive members of an electrical article and optical connection of the fiber optic transmission members to photoelectric devices and then electrically connecting the photoelectric devices with other conductive members of the electrical article, comprising:

a dielectric housing having a termination section including a cable-receiving channel and including conductor-receiving passageways and fiber-receiving passageways extending forwardly from said channel, device-receiving cavities at forward ends of said fiber-receiving passageways, and terminal-receiving passageways extending inwardly from a mating face and in communication with said conductor-receiving passageways and said device-receiving cavities, said conductor-receiving passageways adapted to receive said conductors having first terminals terminated thereon

and said fiber-receiving passageways adapted to receive and selectively locate end portions of said fiber optic transmission members;  
photoelectric devices associated with respective said fiber optic transmission members and having fiber-connecting means for optical connection with said fiber optic transmission members, said photoelectric devices having electrical leads extending therefrom with second terminals terminated thereon, said photoelectric devices being located in said device-receiving cavities such that said fiber-connecting means are located at forward ends of said fiber-receiving passageways and said second terminals on said electrical leads are located in respective said terminal-receiving passageways proximate said mating face; and  
a cover member securable to said housing at said termination section after said cable is received therealong and is adapted to secure and strain relieve said cable in said housing and to secure said conductors and said fiber optic transmission members in respective said conductor-receiving and fiber-receiving passageways and to secure said photoelectric devices in said housing, whereby said end portions are receivable along said fiber-receiving passageways and are optically connectable to said photoelectric devices at and by said fiber-connecting means thereof, and said terminated conductors are receivable along said conductor-receiving passageways such that said first terminals are located in respective said terminal-receiving passageways proximate said mating face, after which said cover member secures said cable to said housing and said conductors and said fiber optic transmission members therewithin for connection to respective conductive members of an electrical article at said mating face.

4,678,265  
OPTICAL FIBER PLUG DEVICE INCLUDING FIBER FOR MONITORING A LIGHT SOURCE  
Ludwig Fink, Pullach, and Hans-Norbert Toussaint, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany  
Filed May 24, 1984, Ser. No. 613,265  
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 8317054[U]  
Int. Cl.<sup>4</sup> G02B 6/36; H01J 5/16  
U.S. Cl. 350—96.20

6 Claims



1. In a light waveguide plug device having two halves, one of said two halves being a body with a pin-like section, said section having an end face and a concentric bore receiving an optical fiber as a light waveguide with an end of the waveguide being plane-parallel to the end face of said section of said body and the other half of said two halves having a guide sleeve and a light exit surface of a light transmitter, the plane-parallel end of the waveguide being adjustable relative to the other half by said section being adjustably received in the guide sleeve so that said plane-parallel end of the waveguide receives light from the light exit surface and is adjustably positioned relative to the light exit surface by moving the section in the guide sleeve, the improvements comprising the pin-like section having an additional bore extending along the length of the pin-like section and being both offset and spatially separated from

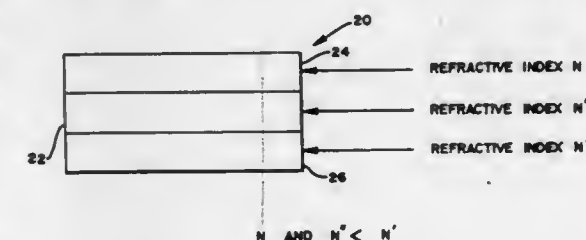
the concentric bore, said additional bore having an end being offset from and situated as closed as possible to an end of the concentric bore at the end face of the pin-like section, and an additional elongated light waveguide having an end surface being disposed in said additional bore with the end surface at the end face of the pin-like section so that with the pin-like section in a desired position relative to the light exit surface, light of the light exit surface is also beamed into the end surface of the additional elongated waveguide.

# 4,678,266 USE OF Pnictide FILMS FOR WAVE-GUIDING IN OPTO-ELECTRONIC DEVICES

Diego J. Olego, Croton-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.  
Continuation-in-part of Ser. No. 509,210, Jun. 29, 1983, Pat. No. 4,567,503, which is a continuation-in-part of Ser. No. 581,115, Feb. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 581,140, Feb. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 581,171, Feb. 17, 1984, abandoned. This application Jan. 28, 1985, Ser. No. 695,255  
The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.  
Int. Cl.<sup>4</sup> G02B 6/10

U.S. Cl. 350—96.12

25 Claims

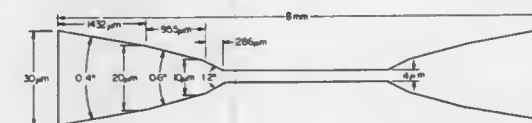


1. An electro-optical device comprising:  
(A) a semiconductor body; and  
(B) at least one pnictide layer for guiding light waves in said body wherein said pnictide layer comprises a material chosen from the group consisting of MP<sub>x</sub> and elemental pnictide in non-compound form, where M is an alkali metal, P is a pnictide, and x ranges from 15 to infinity.

# 4,678,267 PARABOLIC OPTICAL WAVEGUIDE HORNS AND DESIGN THEREOF

William K. Burns, Alexandria, Va., and A. Fenner Milton, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Continuation of Ser. No. 852,646, Nov. 18, 1977, abandoned.  
This application Jun. 30, 1981, Ser. No. 279,105  
Int. Cl.<sup>4</sup> G02B 6/26  
U.S. Cl. 350—96.15

2 Claims



1. Means for coupling between a narrow and a wide-channel optical waveguide for bidirectionally propagating rays of single-mode optical power and preserving the power in the first-order mode comprising:  
a coupling section of optical dielectric waveguide having a constant refractive index, and having a shape varying in width from a narrow opening, for fitting the width of the

narrow-channel optical waveguide, to a wider opening for fitting the width of the wide-channel optical waveguide, so that said coupling section forms a continuous waveguide from said narrow-channel waveguide to said wide-channel waveguide, said shape being defined from the equation

$$\theta_h = \alpha \theta_p = \frac{\alpha \lambda_0}{2n_b W} \frac{\tan^{-1}[b/(1-b)]}{\pi/2} = \frac{1}{2} \frac{dW}{dz}$$

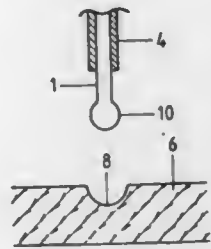
where  $\theta_h$  is the local angle formed by the wall of the coupling section and the waveguide axis,  $\theta_p$  is the projection of the ray angle of the lowest-order mode in the plane of the coupling section,  $\lambda_0$  is the free-space wavelength of the lowest-order normal mode of the narrow-channel waveguide,  $n_b$  is the bulk index of refraction of the material which bounds the waveguide,  $z$  is the distance coordinate along the axis of the coupling section,  $W$  is the width of the coupling section at any specific value of  $z$  along the axis of the section,  $\alpha$  is a constant less than or equal to unity, and  $b'$  is the normalized mode effective index of refraction,  $b'$  being defined as

$$b' = (n_{eff}^2 - n_b^2) / (n_{eff}^2 - n_b^2)$$

wherein  $n_{eff}$  is the effective index of refraction of the first-order mode for finite  $W$ , and  $n_{eff}$  is the effective index of refraction of the first-order mode for  $W = \infty$ .

4,678,268

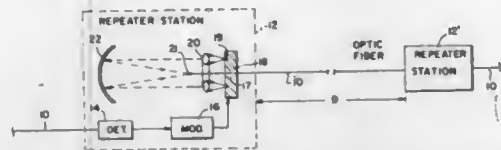
**METHOD AND APPARATUS FOR CONSTRUCTING MICROLENS ENDS FOR OPTICAL FIBERS**  
Vera Russo; Stefano Sottini; Giancarlo Righini, and Silvana Trigari, all of Florence, Italy, assignors to Consiglio Nazionale Delle Ricerche Roma, Rome, Italy  
Filed Oct. 22, 1984, Ser. No. 663,547  
Claims priority, application Italy, Oct. 25, 1983, 9545 A/83  
Int. Cl. G02B 6/32  
U.S. Cl. 350-96.18 12 Claims



1. A method for constructing an integral microlens at an end of an optical fiber made of a material transparent to electromagnetic radiation of at least one frequency, but absorptive of other frequencies, comprising steps of introducing primary radiation to which said material is transparent into said fiber and along the length thereof toward and through said end, converting said primary radiation emitted from said fiber end to secondary radiation whose spectrum is at least partially absorbable by a said fiber material, and causing said secondary radiation to strike said fiber end to heat the same for a time sufficient to cause localized fusion of said end and the rounding thereof by surface tension of the material.

# 4,678,269 CONCENTRIC LIGHT SOURCE TO FIBER COUPLING SYSTEM

Nevlin C. Pace, P.O. Box 41, Bailey, Miss. 39320  
Filed Dec. 10, 1985, Ser. No. 807,329  
Int. Cl. G02B 6/42  
U.S. Cl. 350-96.18 3 Claims

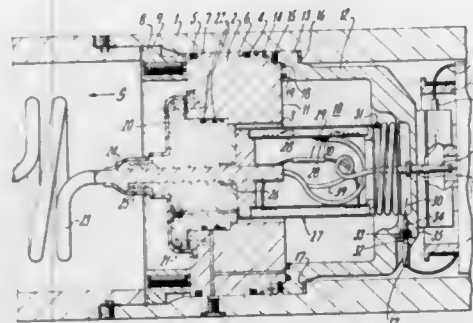


1. A fiber optic light transmission system comprising in combination, a fiber for transmitting light in said system having a fiber joint adapted to receive modulated light thereinto for transmission axially along the fiber, a source of modulated light for transmission through the fiber presenting in a ring shaped light emission pattern concentrically configured about the axis of said fiber and directing the light concentrically toward the fiber joint, said source of modulated light having an edge emitting PN junction diode, an optical system for receiving the concentrically directed light comprising a toroidal collimating lens concentrically located about the fiber in a position near an end of said fiber receiving the concentrically configured light from said source, and a parabolic reflector positioned to inject the modulated light into the end of said fiber in a ring shaped pattern at the end of said fiber.

4,678,270

# SUBMERSIBLE OPTICAL REPEATERS AND OPTICAL FIBRE GLANDS

Duncan A. Gunn, Saffron Walden; John C. Crownshaw, Sawbirdgeworth; Arthur A. Davis, Harrold Wood, and Gilbert W. P. Colegate, Orpington, all of England, assignors to Standard Telephones and Cables Public Limited Co., London, England  
Filed Jan. 10, 1985, Ser. No. 690,206  
Claims priority, application United Kingdom, Jan. 19, 1984, 8401447  
Int. Cl. G02B 6/36  
U.S. Cl. 350-96.20 4 Claims



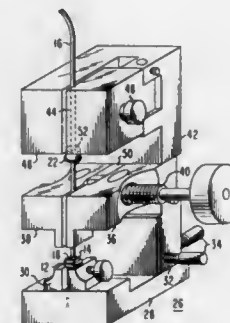
1. An optical repeater comprising a tubular casing having a longitudinal axis and a removable bulkhead assembly secured to and closing an end of the casing such as to resist seabed pressures, a regenerator circuit within the casing, said assembly defining a chamber having walls, there being an optical fibre cable sealed through one wall of the chamber, there being an electrical conductor for carrying electrical power from the cable and sealed in an electrically insulating gland through another wall of the chamber, and a coated optical fibre for carrying optical signals between the cable and the regenerator circuit and sealed through a fibre gland separate from the insulating gland and removably secured in an aperture in a wall of the chamber, said fibre gland comprising a tubular gland

body having an inner bore and a mounting flange, and a rigid primary tube secured to the fibre with adhesive and secured inside the tubular gland body with adhesive, said rigid primary tube fitting closely in the inner bore of the gland body and fitting closely around said coated optical fibre.

4,678,271

# APPARATUS FOR ALIGNING A FIBER AND A DEVICE

Andre R. Beaulieu, Plncourt, Canada, assignor to RCA Corporation, Princeton, N.J.  
Filed Mar. 26, 1986, Ser. No. 844,137  
Int. Cl. G02B 6/42  
U.S. Cl. 350-96.20 6 Claims



1. An apparatus for providing and maintaining the alignment between a device and a fiber during the bonding of the fiber to the device and assembly of a housing thereover, comprising

- a base, including means for supporting said device;
- a first support connected to said base including means for adjusting the relative position between said base and said first support;
- a lower fiber holding means mounted on said first support such that said lower holding means is vertically spaced from, and extends over said device support means;
- a second support extending vertically from said lower fiber holding means;
- an upper fiber holding means mounted on said second support such that said upper holding means is vertically spaced from, and extends over said lower holding means; and
- an alignment element to maintain alignment between said lower and upper fiber holding means; and
- releasable means for securing said housing above the lower holding means.

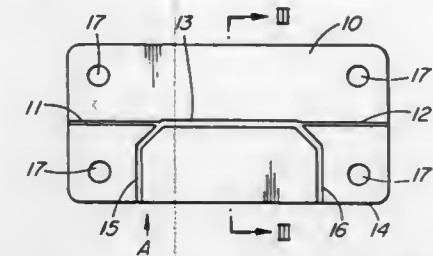
4,678,272

# OPTICAL FIBER SPLICE

Roger C. Finn, Nepean, and Morley S. MacKenzie, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada  
Filed Feb. 8, 1982, Ser. No. 347,013  
Int. Cl. G02B 6/38  
U.S. Cl. 350-96.21 22 Claims

1. An optical fiber splice joining two optical fibers, each fiber having a plastic coating layer, in an end-to-end relationship, comprising:  
two optical fibers fused end-to-end, the coating layer re-

moved from the end of each fiber for a predetermined distance prior to fusion, and

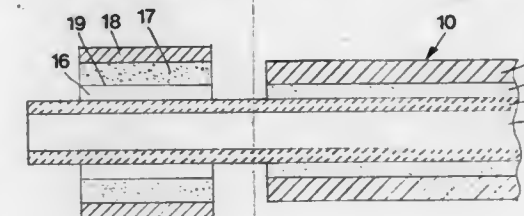


a radiation cured synthetic resin extending in a continuous unbroken layer over the uncoated ends of the fibers and over a predetermined length of the coating of each fiber.

4,678,273

# HIGH POWER OPTICAL FIBER WITH IMPROVED COVERING

Kennet Vilhelmsson, Gothenburg, Sweden, assignor to Radians AB, Gothenburg, Sweden  
Filed Dec. 24, 1984, Ser. No. 685,783  
Claims priority, application Sweden, Dec. 23, 1983, 8307140  
Int. Cl. G02B 6/02  
U.S. Cl. 350-96.30 8 Claims



1. In an optical fiber for transmitting high optical power having a central core portion adapted to conduct radiation, a cladding layer surrounding the core portion, and at least one covering surrounding the cladding layer and adapted to provide an improved mechanical stability to the fiber and to damp scattered radiation, the improvement for preventing the radiation level in any volume part of the covering from exceeding the limit at which the material of the covering is damaged comprising:

- a radiation resistant transmitting material arranged outside of and in contact with the cladding at least at an entrance side over a portion of the length of the fiber and having a real refractive index greater than or close to the refractive index of the cladding; and
- at least one additional material layer outside of said radiation resistant transmitting material, at least the outermost layer comprising a heat-conducting means in which the radiation is absorbed.

4,678,274

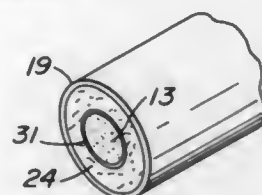
# LOW LOSS CLADDED OPTICAL FIBERS FROM HALIDES AND PROCESS FOR MAKING SAME

Terry A. Fuller, West Bloomfield, Mich., assignor to Fuller Research Corporation, West Bloomfield, Mich.  
Filed Dec. 27, 1983, Ser. No. 565,569  
Int. Cl. G02B 6/16  
U.S. Cl. 350-96.34 53 Claims

39. A clad optical fiber for transmission of electromagnetic energy in the infrared region of the spectrum comprising:  
a cylindrical core formed from a first halide compound having a first index of refraction;  
a coaxial cladding layer disposed around said core formed from a second halide compound having a second index of refraction less than the first index of refraction;



a first polymer film means coaxially disposed intermediate the cylindrical core and the coaxial cladding layer, said first film means having a radial thickness less than the thickness which causes appreciable energy absorption at infrared frequencies.



40. A cladded optical fiber according to claim 39 having a second non-hygroscopic polymer film means providing a continuous intimate covering around said cladding layer.

4,678,275

# OPTICAL FIBER FOR INFRARED TRANSMISSION CONSISTING ESSENTIALLY OF HIGH PURITY MIXED CRYSTAL OF THALLIUM BROMIDE AND THALLIUM IODIDE

Masaru Ikeda, Ikoma; Masafumi Watari, Osaka; Yoshiaki Hayashi, Osaka; Osamu Yamamoto, Osaka, and Hiroshi Tsutsui, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

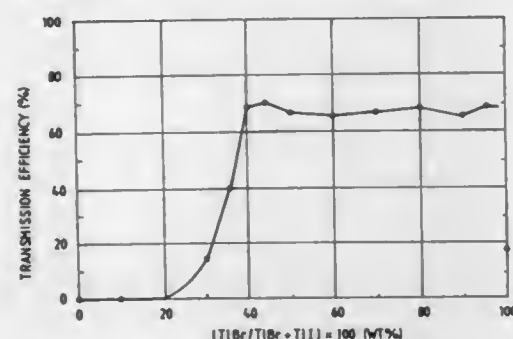
Filed Mar. 26, 1985, Ser. No. 716,156

Claims priority, application Japan, Aug. 2, 1984, 59-163103

Int. Cl.<sup>4</sup> G02B 6/16

U.S. Cl. 350—96.34

7 Claims



1. An optical fiber which is able to transmit infrared energy of high power and is flexible and long in life, said fiber consisting essentially of a mixed crystal of 40 to 45 wt% of thallium bromide and the balance of thallium iodide, each having a purity not less than 99.9%, said fiber being free of any particles having a size not smaller than 1  $\mu$ m.

4,678,276

# OBJECTIVE LENS DRIVE/SUPPORT MECHANISM IN AN OPTICAL DISC PLAYER

Yoshihiro Sekimoto; Shigeo Terashima, both of Teori; Kiyoshi Kumata, Tsuzuki, and Toshiyuki Tanaka, Kadoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 14, 1984, Ser. No. 681,818

Claims priority, application Japan, Dec. 26, 1983, 58-250747

Int. Cl.<sup>4</sup> G02B 7/02; F16F 7/12, 15/04

U.S. Cl. 350—247

5 Claims

1. An objective lens drive/support mechanism comprising: shaft means; an objective lens support member slidably and rotatably secured to said shaft means; an objective lens disposed in said objective lens support member at a position which is extended from said shaft means by a predetermined distance; drive means for slidably shifting said objective lens support

member along said shaft means, and for rotating said objective lens support member around said shaft means; a symmetrical, elastic damping member secured to said shaft means at its center portion thereof; and



securing means tightly connecting opposing ends of said symmetrical, elastic damping member to said objective lens support member.

4,678,277

# METHOD OF DISCRIMINATION IN SPECTROMETRY

Michel Delhaye, 80, rue Thiers; André Deffontaine, 39, rue Degas; André Chapput, 78, rue Faidherbe, all of 59650 Villeneuve d'Ascq; Michel Bridoux, 1, rue Jean Mermoz, 59890 Quesnoy sur Deule, and Edouard Da Silva, Place de l'Eglise, 60390 Auneuil, all of France

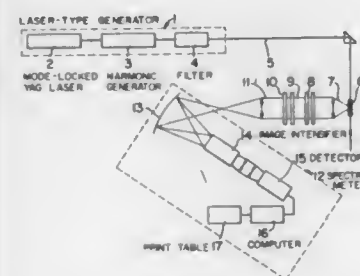
Filed Sep. 26, 1984, Ser. No. 655,024

Claims priority, application France, Sep. 30, 1983, 83 15939

Int. Cl.<sup>4</sup> G01J 3/44; G01N 21/65

U.S. Cl. 356—301

10 Claims



1. A method of analysis of a sample by Raman spectrometry and discriminating fluorescence and elimination thereof in the analysis comprising, exciting the sample with a pulsed laser incident light wave for causing the sample to emit light, introducing the emitted light from the sample into a two-beam or a multiple-beam interferometer in which the round trip of the multiply reflected light is significantly longer than the duration of the incident light wave and shorter in duration than fluorescence from the sample, collecting the emitted light at the outlet of the interferometer, and spectrometrically analyzing the collected emitted light.

4,678,278

# SIGHT TUBE FOR MONITORING OF FLUIDS

Albert D. Friesen, and Walter F. Grassler, both of Winnipeg, Canada, assignors to The Winnipeg Rb Institute Inc., Winnipeg, Canada

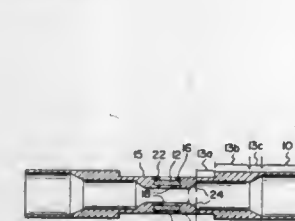
Filed Dec. 4, 1984, Ser. No. 677,860

Claims priority, application Canada, Aug. 16, 1984, 461169

Int. Cl.<sup>4</sup> G02B 5/00

U.S. Cl. 350—319

3 Claims



1. A sight tube of the kind having windows at opposite sides and by means of which a flowing fluid may be monitored by light passing through the windows, wherein the interior of the tube has a central section with a flat sided portion between and parallel to said windows, said interior having the flat sided portion flanked by two side portions which are thicker than said flat sided portion in planes perpendicular to a medial plane of the flat sided portion, the tube having end sections of circular cross section joined to the central section by intermediate sections which provide gradual transitions from the end sections to the central section.

4,678,279

# METHOD OF PRODUCING A PHOTORADIATOR DEVICE

Kel Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

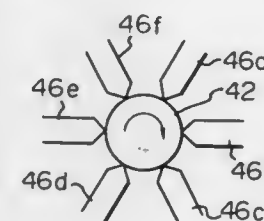
Filed May 2, 1983, Ser. No. 490,685

Claims priority, application Japan, May 11, 1982, 57-78809; May 11, 1982, 57-78810; Jun. 7, 1982, 57-97459; Jun. 10, 1982, 57-99775

Int. Cl.<sup>4</sup> G02B 00/00; B26D 3/06; C03B 9/46

U.S. Cl. 350—320

4 Claims



1. A method of producing a photoradiator for radiating converged light conducted therethrough radially outwardly to the ambience, comprising the steps of:

- supporting an elongate light conducting member means with its longitudinal axis substantially vertically disposed;
- supporting said vertically disposed elongate light conducting member means simultaneously at a plurality of axially spaced and a plurality of circumferentially spaced locations of the light conducting member means by axially spacing a plurality of cutting tool member means at substantially equal axial distances from each other along the axial length of said light conducting member means and circumferentially spacing said plurality of cutting tool member means at substantially equal angular distances from each other about the circumference of said light conducting member means by placing the cutting edges of said plurality of cutting tool member means in contact with the periphery of the light conducting member means

at said plurality of axially and circumferentially spaced locations of said light member means;

- machining the periphery of the vertically disposed light conducting member means simultaneously at a plurality of axially and circumferentially spaced locations of the light conducting member means utilizing said cutting edges of said plurality of cutting tool member means to simultaneously form a plurality of grooves in said light conducting member means so that the light advancing through the light conducting member means becomes radiated by reflection at a wall of said grooves, whereby said cutting tool member means holds the axis of said light conducting member means substantially fixed in position during said machining; and
- tensioning said light conducting member means during said machining step.

4,678,280

# METHOD OF CONSTRUCTING A SEGMENTED MIRROR

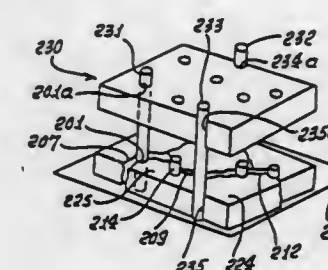
C. James Blom, Bakersfield, Calif., assignor to Roxor Corporation, Bakersfield, Calif.

Continuation-in-part of Ser. No. 578,688, Feb. 9, 1984, Pat. No. 4,560,256, which is a continuation of Ser. No. 385,544, Jun. 7, 1982, Pat. No. 4,470,665, which is a continuation-in-part of Ser. No. 233,106, Feb. 10, 1981, Pat. No. 4,368,951, which is a continuation-in-part of Ser. No. 109,970, Jan. 7, 1980, abandoned. This application Mar. 4, 1985, Ser. No. 708,527 The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.<sup>4</sup> G02B 5/08

U.S. Cl. 350—320

18 Claims



1. The method of constructing a segmented mirror, the mirror comprising, in combination

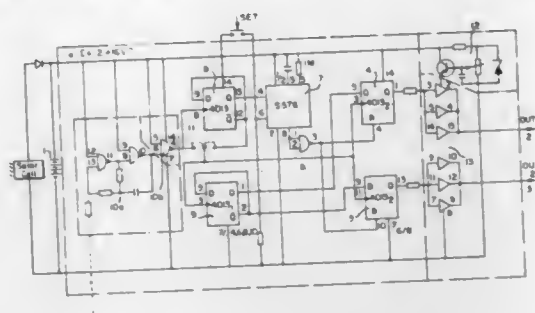
- a myriad of surfaces carried by the support, certain of said surfaces dimensionally offset from one another in a common direction generally parallel to the general direction of incident radiation to be reflected, said surfaces being radiation reflecting surfaces each oriented in such a way that as a group they collectively reflect radiation essentially as if they were a continuous reflecting surface,
- each of said surfaces having a periphery comprising a series of line segments which are connected, curved or linear, the peripheries of said surfaces, when projected in said common offset direction onto a plane perpendicular thereto, contiguously conforming to one another, said method including providing a die, used for casting the mirror segmented surface, and constructing the die from a casting of a continuous surface of the desired shape by cutting in said common direction said casting, or a casting thereof, into small segments, and the segment cross sections being of any outline except circular, in order that the segments may be translated with respect to contiguous segments while maintaining integrity of the composite reflection from all the translated surfaces, and wherein said segment sides define surfaces with irregular outlines which are substantially non-repetitive.

4,678,281  
CIRCUIT FOR THE ACTUATION OF LIQUID CRYSTAL LAYERS IN MIRRORS  
Rainer Bauer, D-6072 Dreieich, Am der Dampfmuhle 12, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,218  
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1984, 3411048

Int. Cl.<sup>4</sup> G02F 1/133  
U.S. Cl. 350—331 R

8 Claims



1. A dimmable composite pane comprising:  
two polarizing filter layers;  
two transparent support layers;  
a liquid crystal layer bounded on a first and a second side by conducting layers positioned between the two polarizing filter layers and arranged on the two transparent support layers;  
means for controlling the pane including first and second flip-flop means for feeding the first and second conducting layers, said flip-flop means having outputs connected to respective inputs of said conducting layers;  
dimmer means for simultaneous resetting, in a frequency dependent manner, of the flip-flop means connected to a reset input of the first and second flip-flop means;  
means for driving said flip-flop means including means for providing synchronously timed input signals such that the input signal for the first flip-flop means is 180 degrees out of phase with the input signal for the second flip-flop means and timing means for providing clock signals to said first and second flip-flop means at a rate twice the frequency of the synchronously timed input signals.

4,678,282  
ACTIVE DISPLAY MATRIX ADDRESSABLE WITHOUT CROSSED LINES ON ANY ONE SUBSTRATE AND METHOD OF USING THE SAME

Zvi Yaniv; Walter E. Chappelle, both of Southfield; Shui-Chih A. Lien, Clawson, and Mohshi Yang, Troy, all of Mich., assignors to Ovonic Imaging Systems, Inc., Troy, Mich.  
Filed Feb. 19, 1985, Ser. No. 702,996

Int. Cl.<sup>4</sup> G02F 1/133

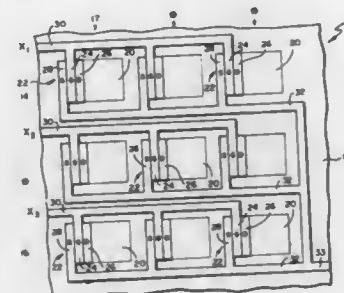
U.S. Cl. 350—334

39 Claims

1. A light influencing display comprising:  
first and second insulative surfaces;  
a plurality of pixels, each including a first electrode formed on the first surface and an opposing second electrode formed on the second surface, with said pixels being divided into a plurality of pixel groups, each consisting of a separate plurality of pixels;  
a corresponding plurality of three terminal control devices formed of deposited semiconductor material on the first surface, with one such control device being formed in association with each of said pixels, with each control device having two current path terminals and a control terminal which controls the conductivity between those two current path terminals, and with a first of the current path terminals of each control device being connected to the first pixel electrode of its associated pixel;  
a separate conductive voltage supply lead formed on the first

surface in association with each of said pixel groups, with each of said voltage supply leads being connected to the second current path terminals of the control devices associated with its pixel group;

a separate conductive control lead formed on the first surface in association with each of said pixel groups, with each of said control leads being connected to the control terminals of the control devices associated with its pixel group;  
a plurality of conductive data leads formed on the second surface, with a different one of such data leads being electrically connected to each separate second pixel electrode of a given pixel group for selectively supplying data voltages to the second pixel electrodes of said given



group, with individual ones of such data leads being connected to at least one second pixel electrode in each of a plurality of pixel groups;  
light influencing display material disposed between the first and second electrodes of each pixel; and  
the voltage supply leads and the control leads not crossing each other;  
whereby a desired voltage can be applied between the electrodes of a given pixel by using a selected control lead to turn on the conductivity of the control device associated with its pixel group, thus effectively connecting the pixel's first electrode to a voltage supply lead, and by using a selected data lead to supply a selected voltage to the pixel's second electrode.

4,678,283  
TRIALKANLOYLOXYSILANES  
Franz-Heinrich Kreuzer, Martinsried; Rudolf Eidenschink, Münster, and Georg Weber, Erzhhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany  
Filed Sep. 4, 1984, Ser. No. 647,210

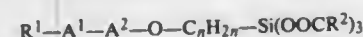
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1983, 3331515

Int. Cl.<sup>4</sup> G02F 1/13; C09K 19/56, 19/54; C07F 7/04

U.S. Cl. 350—340

19 Claims

1. A trialkanoyloxysilane of the formula



wherein R<sup>1</sup> is H, alkyl of 1-10 C atoms, alkyl of 1-10 C atoms wherein one or two non-adjacent CH<sub>2</sub> groups are replaced by oxygen atoms, F, Cl, Br or CN, R<sup>2</sup> is alkyl of 1-5 C atoms; A<sup>1</sup> and A<sup>2</sup> are independently each 1,4-phenylene (Phe) or 1,4-cyclohexylene (Cy) and n is 2, 3, 4, or 6.

15. A substrate useful in visual electronic display elements coated with a layer of a compound of claim 1.

16. A coated substrate of claim 15 which is a glass substrate.

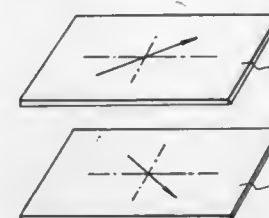
18. In an electro-optical visual electronic display element, comprising a liquid crystalline dielectric, and in contact therewith, a substrate coated with a layer which facilitates a homeotropic orientation in said dielectric, the improvement wherein the coated substrate is one of claim 16.

4,678,284  
ANTIFLOCCULATING AGENT FOR SPACERS IN LIQUID CRYSTAL DISPLAYS  
Yoshizo Tashiro, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jul. 16, 1984, Ser. No. 630,947  
Claims priority, application Japan, Jul. 16, 1983, 58-128726

U.S. Cl. 350—344

4 Claims



1. In a liquid crystal display having two sheets of plastic film, transparent electrodes respectively formed on one sides of the sheets and opposed to each other with spacer particles therebetween, and liquid crystal material sealed-in between the electrodes,

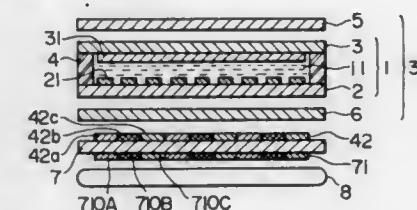
the improvement wherein the spacer particles is coated with a hot melt adhesive containing an antiflocculating agent and is fixed to the sheets of plastic film by the adhesive.

4,678,285  
LIQUID CRYSTAL COLOR DISPLAY DEVICE  
Wasaburo Ohta, Yokohama; Takamichi Enomoto, Kanagawa, and Kiyohiro Uehara, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,267  
Claims priority, application Japan, Jan. 13, 1984, 59-5094; Jun. 12, 1984, 59-120153; Oct. 11, 1984, 59-213175; Oct. 26, 1984, 59-225245; Oct. 26, 1984, 225246

Int. Cl.<sup>4</sup> G02F 1/13  
U.S. Cl. 350—345

19 Claims



1. A liquid crystal color display device for displaying a color image in response to a given image signal, comprising:

a liquid crystal cell composed of a liquid crystal material, a pair of transparent plates sandwiching said liquid crystal material therebetween, a transparent electrode mounted on one of said transparent plates and composed of plural electrode elements, and a flat transparent electrode mounted on the other transparent plate in confronting relation to said plural electrode elements;  
at least one polarizer;

a color filter composed of a plurality of filters for passing red, green, and blue fluorescent lights therethrough, said filters being disposed in alignment with respective of said electrode elements;

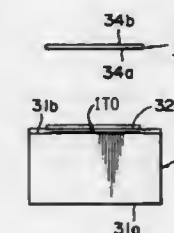
fluorescent light-emitting means comprising a fluorescent layer and a lamp for generating electromagnetic radiation, said fluorescent layer being composed of a plurality of fluorescent layer elements capable of emitting red, green, and blue fluorescent lights in response to application thereto of electromagnetic radiation from said lamp, said

fluorescent layer elements being aligned with respective of the plurality of filters of said color filter; and said liquid crystal cell, said at least one polarizer, and said lamp being successively arranged in the order named away from an observation side, said color filter being disposed more closely to the observation side than said fluorescent layer.

4,678,286  
SPATIAL LIGHT MODULATOR  
Tsutomu Hara, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan  
Filed Jul. 31, 1985, Ser. No. 761,093  
Claims priority, application Japan, Aug. 17, 1984, 59-171194

Int. Cl.<sup>4</sup> G02F 1/03  
U.S. Cl. 350—356

4 Claims



1. A spatial light modulator consisting an electron beam source formed within a vacuum envelope and an electro-optic crystal assembly to store electrons emitted from said electron beam source as a charge to change the optical property thereof, wherein said electro-optic crystal assembly consists of a pair of electro-optic crystal plates of the same material with different thickness combined through a transparent conductive film so that the surface of the thinner electro-optic crystal plate faces said electron beam source.

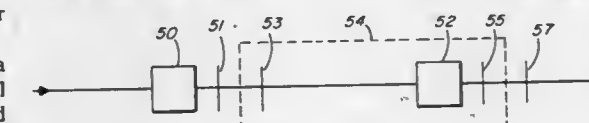
4,678,287  
METHODS OF AND APPARATUS FOR TUNING A BIREFRINGENT OPTICAL FILTER  
Carl F. Buhner, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 4, 1985, Ser. No. 794,901

Int. Cl.<sup>4</sup> G02B 27/28

U.S. Cl. 350—404

14 Claims



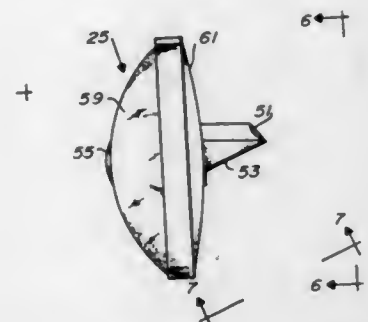
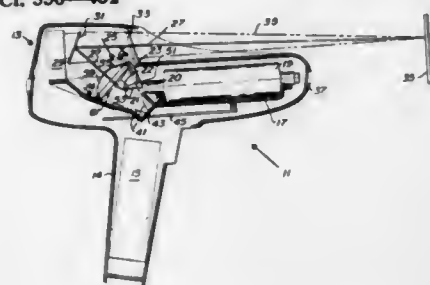
1. A method of simultaneous and equal tuning of two birefringent elements in a birefringent optical filter having an optical axis with birefringent elements and wave plates oriented therealong, by the rotation about said optical axis of a single contiguous group of all optical birefringent elements and wave plates between first and second points along said axis, said first point being positioned between first and second adjacent quarter-wave plates immediately adjacent one of said birefringent elements, and, said second point being positioned between third and fourth adjacent quarter-wave plates immediately adjacent the other of said birefringent elements.



4,678,288

**TRIFOCAL LENS FOR A LASER INSTRUMENT**  
 Randall J. Lonsdale, and Ronald A. Hellekson, both of Eugene, Oreg., assignors to Spectra-Physics, Inc., San Jose, Calif.  
 Filed Apr. 27, 1984, Ser. No. 604,916  
 Int. Cl.<sup>4</sup> B29D 13/18; G06K 7/10  
 U.S. Cl. 350—432

23 Claims



1. A composite, single piece, lens system for a laser instrument of the kind used to read or to detect light reflected from a target which is spaced from the laser instrument, said lens system comprising:

an optical axis for the composite, single piece, lens system, first optical means for receiving a laser beam which is generated and which is transmitted to the lens system at an angle which is off said optical axis and for routing the received laser beam onto said optical axis for transmission through the lens system toward the target, second optical means for collecting light reflected from the target and for imaging the collected light along said optical axis to detector means associated with the lens system, said first optical means including a beam expander element, a prism, and a focusing element, said second optical means including a collection lens having a first curved surface on a side which receives the light reflected from the target and a second curved surface on a side facing the detector means, and wherein the first optical means and the second optical means are embodied in a composite, single piece lens structure.

4,678,289

**APPARATUS FOR THE DEFLECTION OF A LIGHT BEAM**

Antoon Mattelin, Oostkamp, and Bert Paquet, Opwijk, both of Belgium, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany  
 Filed Sep. 12, 1985, Ser. No. 775,349  
 Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435167

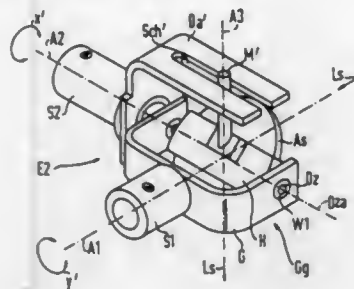
Int. Cl.<sup>4</sup> G02B 26/08

U.S. Cl. 350—486

19 Claims

19. An apparatus for the deflection of a light beam in two mutually perpendicular directions comprising:  
 a single deflection mirror;  
 a first means for rotating said mirror about a first axis;  
 a second means for rotating said mirror about a second axis perpendicular to said first axis;  
 rotation of said mirror by said first means having no effect on

a spatial position of said second means, and rotation of said mirror by said second means having no effect on a spatial position of said first means;



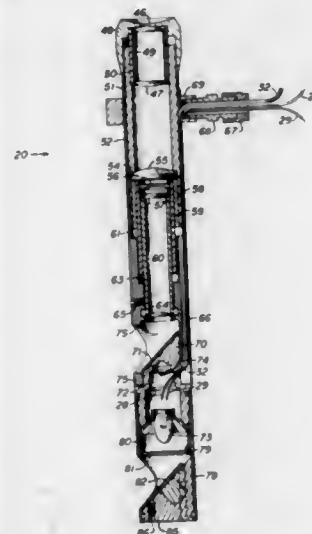
whereby rotation about each axis is accomplished independently.

4,678,290

**APPARATUS FOR VISUAL INSPECTION OF CLOSED MACHINERY**

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.  
 Filed Aug. 30, 1985, Ser. No. 771,349  
 Int. Cl.<sup>4</sup> A61B 1/00; G02B 23/00; F21L 7/00; F21V 29/00  
 U.S. Cl. 350—506

17 Claims



1. An inspection apparatus for visual inspection of the interior of poorly illuminated machinery through a small opening into the machinery, comprising:

- (a) an elongate housing having
  - (1) an optical system therein,
  - (2) a viewable field opening,
  - (3) an eye piece to enable viewing of a specified field width,
  - (4) wherein the optical system forms a view at the eye-piece of specified field determined by the azimuthal direction of the opening
- (b) closed chamber means in said housing;
- (c) light forming means in said chamber means;
- (d) light directing means supported by said housing and located to direct light from said chamber means away from said housing and in an azimuthal direction to illuminate the field viewed by said optical system;
- (e) wherein said housing has means to isolate said light forming means from the exterior outside said closed chamber means;

(f) wherein said light forming means and said chamber means are connected through a flow line to a source of nonflammable gas to establish an atmosphere of nonflammable gas surrounding said light forming means.

4,678,291

**OPTICAL ARRANGEMENT FOR MICROSCOPES**  
 Georg N. Nyman; Ferdinand Pauliny, and Klaus P. Schindl, all of Vienna, Austria, assignors to C. Reichert Optische Werke AG, Vienna, Austria

Filed Dec. 14, 1984, Ser. No. 681,780

Int. Cl.<sup>4</sup> G02B 7/02, 7/18, 21/18

U.S. Cl. 350—510

13 Claims



1. An optical arrangement for a microscope comprising a main beam path in which a microscope objective and an observation tube are located, a supplementary beam path which can be selectively interposed between the microscope objective and the observation tube in place of a portion of the main beam path, and an optical deflection element which can be inserted into the main beam path and withdrawn from the main beam path to select between the main beam path and the supplementary beam path whereby the beam from the microscope objective is deflected laterally away into the supplementary beam path when the optical deflection element is inserted into the optical main beam path, wherein said supplementary beam path includes at least first, second and third optical surfaces each deflecting the beam, the third optical surface deflecting the supplementary beam path into the observation tube, and a Bertrand lens and a field-limiting element associated with the Bertrand lens are provided between the optical deflection element and the third optical surface and wherein the first and second optical surfaces and the Bertrand lens are displaceable along the beam path to accommodate different microscope objectives, the position of the field-limiting element being unchanged.

4,678,292

**CURVED STRUCTURE AND METHOD FOR MAKING SAME**

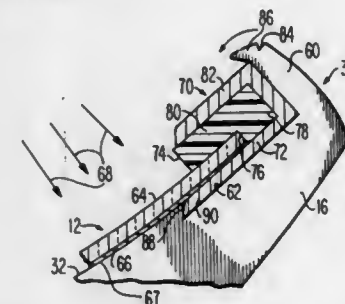
Kazuo Miyatani, and Isao Sato, both of Tokyo, Japan, assignors to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 259,515, May 1, 1981, abandoned. This application Jun. 27, 1984, Ser. No. 625,025

Int. Cl.<sup>4</sup> G02B 5/10; F24J 2/46

U.S. Cl. 350—609

19 Claims



15. An article of manufacture comprising:

a bent sheet of glass having substantially negligible cords and inclusions and internal compressive and tensile stresses tending to flatten said sheet, the neutral surface of

said bent sheet being about midway between the front and rear surfaces of the sheet;  
 a reflective coating deposited on a surface of said sheet, said coating having negligible support for said tensile stresses; and  
 means for retaining said sheet at its edges in the bent state, wherein the depth of the bend is greater than 5% the width dimension across the bend.

4,678,293

**REDUCED-WEIGHT MIRROR**

Pasari Jacques, Bris Sous Forges, France, assignor to Recherches et Etudes d'Optique et de Sciences Connexes, Longjumeau, France

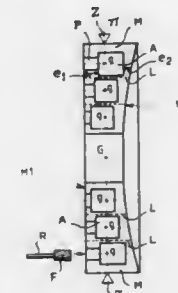
Filed Feb. 26, 1986, Ser. No. 833,206

Claims priority, application France, Oct. 23, 1985, 85 15747

Int. Cl.<sup>4</sup> G02B 5/10, 7/18

U.S. Cl. 350—609

7 Claims



1. A mirror having a non-plane reflecting face, said mirror being constituted by a mass of optical material having cells formed therein in such a manner that the center of gravity of the cell-surrounding portions of the mirror lie substantially in the same plane as the center of gravity of the mirror as a whole.

4,678,294

**MIRROR ASSEMBLY FOR DETERMINING DISTANCE TO PASSED VEHICLE**

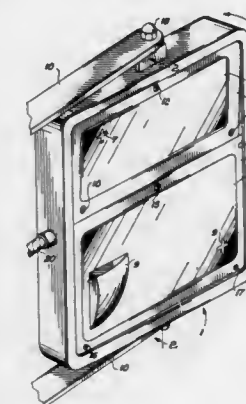
Willard R. Van Nostrand, 3737 Calle Cortez, Tucson, Ariz. 85716

Filed Dec. 3, 1985, Ser. No. 804,173

Int. Cl.<sup>4</sup> G02B 5/08

U.S. Cl. 350—611

10 Claims



1. A rearview mirror assembly for attachment to a passing vehicle, the rearview mirror assembly comprising in combination:

- (a) a first plane mirror;
- (b) first supporting means for supporting the first plane mirror in an orientation rearward and outward relative to

the passenger side of the passing vehicle such that an image of the headlights of a passed vehicle is reflected to the eye of a driver of the passing vehicle and appears to the driver to move diagonally across the first plane mirror, and to attain a predetermined relationship with the first plane mirror only when the passing vehicle is a predetermined distance ahead of the passed vehicle, and when the passed vehicle is in a driving lane of a road and the passing vehicle is in a passing lane adjacent to the driving lane;

- (c) a second plane mirror and second supporting means for supporting the second plane mirror to reflect an image of a distant rearward portion of the driving lane behind the passing vehicle to the driver of the passing vehicle;
- (d) unitary supporting means for supporting the first and second supporting means outside of the passing vehicle on a passenger side of the passing vehicle, relative to the unitary supporting means; and
- (e) adjustment means in each of the first and second supporting means, respectively, for effectuating individual adjustment of the first and second plane mirrors, respectively.

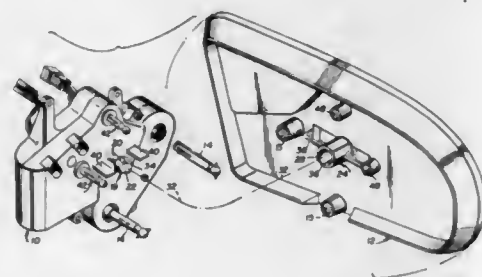
4,678,295

**MEMORY POSITIONING SYSTEM FOR REMOTE CONTROL REAR-VIEW MIRROR**  
Robert J. Fisher, Livonia, Mich., assignor to Magna International Inc., Downsview, Canada

Filed Apr. 5, 1985, Ser. No. 720,363  
Int. Cl.<sup>4</sup> B60R 1/06; G02B 7/18

U.S. Cl. 350-634

18 Claims



1. In a vehicle mirror of the type including a base, a mirror casing, means for mounting said mirror casing relative to said base for pivotal movement about first and second mutually perpendicular intersecting axes between limiting positions and against substantial movement about a third intersecting axis which is mutually perpendicular to said first and second axes, sensing means for sensing the position of pivotal movement of said mirror casing with respect to said base about said first and second axes, and automatic return means including electric motor means operable in response to said sensing means for moving said mirror casing with respect to said base about said first and second axes from any position thereof into a selected position previously sensed by said sensing means, the improvement which comprises

said sensing means including first and second elongated mirror position sensing members each having first and second ends, means for pivotally connecting the first end of said first sensing member to said mirror casing at a first effective point of connection lying on the second of said intersecting axes, means for mounting the second end of said first sensing member on said base for reciprocation therein along a first parallel axis spaced a first fixed distance in substantially parallel relation with said third axis in such a way as to accommodate the movement of the first effective point of connection of the first end thereof along an arcuate path of variable perpendicular distance from said third axis as the

mirror casing is pivoted between said limiting positions about the first of said intersecting axes, means for pivotally connecting the first end of said second sensing member to said mirror casing at a second effective point of connection lying on the first of said intersecting axes,

means for mounting the second end of said second sensing member on said base for reciprocation therein along a second parallel axis spaced a second fixed distance in substantially parallel relation with said third axis in such a way as to accommodate the movement of the second effective point of connection of the first end thereof along an arcuate path of variable perpendicular distance from said third axis as said mirror casing is pivoted between said limiting positions about the second of said intersecting axes,

said first and second effective points of connection each being a maximum perpendicular distance away from said third intersecting axis when at a position substantially midway between its limiting positions and being a minimum perpendicular distance away from said third intersecting axis when at its limiting positions,

said first and second distances each being generally equal to the average of the maximum and minimum perpendicular distances associated therewith.

4,678,296

**NIGHT DRIVING DAZZLE PROTECTION SYSTEM**  
Robert B. Smith, 140 Westland Ave., Rochester, N.Y. 14618  
Filed Nov. 1, 1984, Ser. No. 667,374

Int. Cl.<sup>4</sup> G02C 7/16

U.S. Cl. 351-45

17 Claims



1. A night driving dazzle protection system using screened and unscreened portions of right and left eyeglass regions in front of a driver's eyes, said protection system, as viewed by the driver, comprising:

- a. screened portions of said eyeglass regions having anti-dazzle screen material transmitting less than 40% of incident light;
- b. octants of said right and left eyeglass regions located between about 7:30 o'clock and about 9:00 o'clock being screened for the driver's left eyeglass region and unscreened for the driver's right eyeglass region;
- c. an upper portion of one of said eyeglass regions being screened from about 9:00 o'clock to about 3:00 o'clock; and
- d. a screened portion of said right eyeglass region being spaced from an optical axis aligned with the entrance pupil of the driver's right eye and a screened portion of said left eyeglass region intersecting an optical axis aligned with the entrance pupil of the driver's left eye.

4,678,297

**OPHTHALMIC INSTRUMENT**

Yasuyuki Ishikawa, Kawaguchi, and Isao Matsumura, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 555,528, Nov. 28, 1983, abandoned.

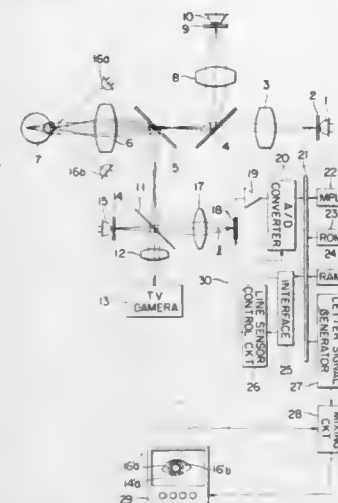
This application Apr. 10, 1986, Ser. No. 851,861

Claims priority, application Japan, Nov. 30, 1982, 57-210937

Int. Cl.<sup>4</sup> A61B 3/14, 3/10

U.S. Cl. 351-208

10 Claims



1. An ophthalmic instrument, comprising:  
an objective lens;

means for projecting an eye-measuring target mark at the position substantially conjugate with the fundus of an eye to be examined through said objective lens onto the fundus of the eye to be examined;

first and second beam splitting means each for splitting a light beam of the target mark and each being disposed to the side of said objective lens opposite to the side thereof on which the eye to be examined is disposed;

a first detecting system for measuring predetermined information about a refractive power of the eye by projecting the light of said target mark reflected at the fundus of the eye onto a first detecting device through said objective lens, said first detecting device being provided at the position substantially conjugate with the fundus of the eye in a branched optical path formed by said first beam splitting means; and

a second detecting system, including a second detecting device, for detecting the state of alignment between the eye to be examined and said ophthalmic instrument by projecting the light of said target mark reflected by the cornea of the eye onto said second detecting device through said objective lens, said second detecting device being provided at the position substantially conjugate with the corneal reflection image of said target mark in a branched optical path formed by said second beam splitting means.

4,678,298

**METHOD AND APPARATUS FOR THREE-DIMENSIONAL PHOTOGRAPHY**

Zoran Perisic, Gwynfenton, White Well, St. Teath, Nr. Bodmin, Cornwall, United Kingdom

Continuation-in-part of Ser. No. 553,709, Nov. 21, 1983, abandoned. This application Jan. 27, 1986, Ser. No. 822,872

Claims priority, application United Kingdom, Nov. 22, 1982, 8233258; Feb. 21, 1983, 8304715

Int. Cl.<sup>4</sup> G03B 35/02

U.S. Cl. 352-62

8 Claims

1. Apparatus for providing left and right eye images along

the lens axis of a camera whereby left and right eye images are recorded alternately on film strip so as to provide a three dimensional impression, the apparatus comprising first means for receiving a first eye image along a first axis, second means for receiving a second eye image along a second axis spaced from the first axis by a distance substantially consistent with the interocular distance of natural eyes, means for resolving said first and second eye images alternately along the lens axis of the camera, the first and second receiving means each including respective first and second wide angle lens means providing a horizontal angular spread consistent with the horizontal angular spread of vision of natural eyes of between 40° and 60°, and means for adjusting the convergence of the first and second axes, the first eye axis and second eye axis



being spaced from the lens axis, the first and second lens means being arranged to deflect their respective first and second eye images through 90°, and the resolving means comprising two reflective means, one reflective means aligned with the first eye axis whereby, via the first lens means, the first eye axis is deflected coincident with an optical path to the lens axis and intersects the second eye axis, and the other reflective means being positioned intermittently transverse to the optical path to the lens axis in synchronism with a drive motor of the camera at said intersection, whereby during the reflecting duration of the other reflective means the second eye image passes along the lens axis and, during the non-reflective duration thereof, the first eye image passes along the lens axis whereby left and right eye images may be recorded alternately on film strip.

4,678,299

**CAMERA DEVICE FOR ENCODING CONVENTIONAL FILM CARTRIDGE**

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 12, 1985, Ser. No. 775,271

Int. Cl.<sup>4</sup> G03B 7/00

U.S. Cl. 354-21

9 Claims

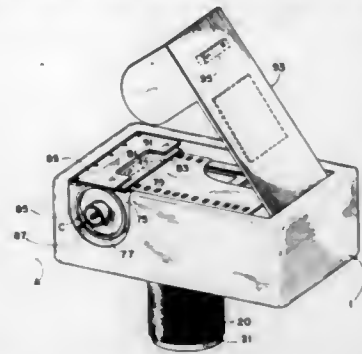
1. An improved photographic camera for use with a film cartridge, wherein said camera is of the type having a loading chamber for receiving the cartridge in an axial direction, wherein the improvement comprises:

continuously active encoding means for applying an alterable code mark to a film cartridge received in said loading chamber, said encoding means having a finite range of influence within which the received cartridge is encoded with the alterable mark; and

means supporting said encoding means for movement



towards the received cartridge at least until the cartridge is within the finite range of said encoding means, to encode the cartridge with the alterable mark, and for movement away from the received cartridge at least until the



cartridge is outside the finite range of said encoding means, to permit the cartridge to be removed in an axial direction from said loading chamber without said cartridge removal altering the encoded mark.

4,678,300

# APPARATUS AND METHOD FOR IDENTIFYING A FILM CARTRIDGE USED IN A PARTICULAR TYPE CAMERA

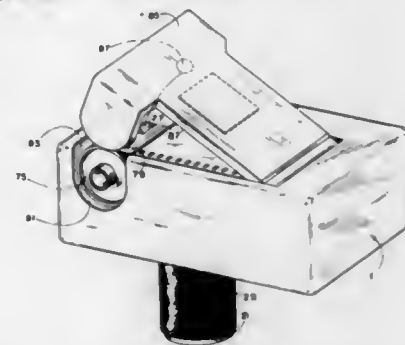
David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 12, 1985, Ser. No. 775,296

Int. Cl.<sup>4</sup> G03B 7/00

U.S. Cl. 354—21

8 Claims



1. In the combination of (a) a film cartridge, (b) a photographic camera having a loading chamber for receiving the cartridge, and (c) a back door supported for closing movement to cover said loading chamber, the improvement comprising: said cartridge including a discrete dedicated area on an exterior surface of the cartridge and indicator means arranged within said dedicated area for physical alteration to provide a visible indication that the cartridge was used in said camera; and said camera including means mounted on said back door for movement when the door is closed to substantially contact said indicator means of a cartridge in said loading chamber for physically altering the indicator means, whereby a visible indication will be provided on the cartridge to indicate that said cartridge was used in the camera.

4,678,301

# APPARATUS FOR IN-CAMERA IDENTITY MARKING OF FILM

Manuel Denner, 249 W. 29th St., New York, N.Y. 10001

Filed May 7, 1986, Ser. No. 860,522

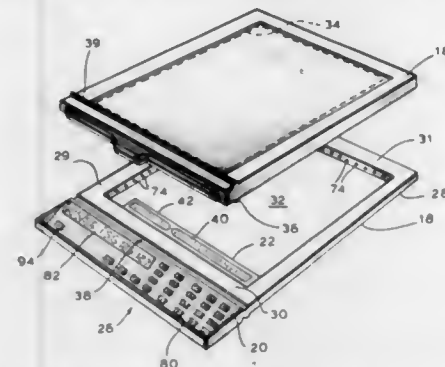
Int. Cl.<sup>4</sup> G03B 17/24, 17/26

U.S. Cl. 354—106

17 Claims

1. In a camera having a camera body with respective front

and rear ends, a background viewing screen unit carried on the rear end of said body, a film cassette for holding a rectangular-shaped strip of unexposed photographic film, said cassette being removably receivable in said body forwardly adjacent said viewing screen, and a frame member disposed in said body in front of said cassette, said frame member having a generally rectangular opening therein which registers with the strip of film and is defined by a correspondingly configured rectangular inner frame periphery, an encoder module for marking identification data on the film, the module being mounted on said frame at the inner periphery thereof and comprising a lightproof housing, the housing having a window therein which disposes in facing confrontation with an edge por-



tion of a cassette held film strip, and electrically operated means for generating and projecting discrete light beams of identification characters through said window onto said film strip edge portion to expose an identification image thereon, said generating and projecting means including circuit components and terminals therefor associated with operation of said generating and projecting means, said frame member having complementary terminal connector means receptive of said terminals in each of the frame inner peripheral sides whereby said module can be mounted selectively on any one of said inner peripheral sides and electrical power potential available at said terminal connector means communicated to said generating and projecting means for operating same.

4,678,302

# APPARATUS FOR HANDLING LIGHT-SENSITIVE PHOTOGRAPHIC SHEET MATERIAL IN AMBIENT LIGHT

Carl Koch, Stetten, Switzerland, assignor to Sinar AG Schaffhausen, Feuerthalen, Switzerland

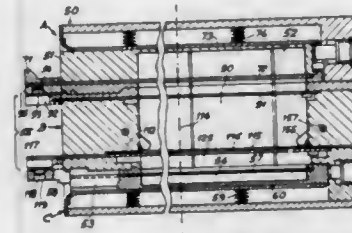
Filed Nov. 4, 1985, Ser. No. 794,797

Claims priority, application Switzerland, Nov. 3, 1984, 5262/84

Int. Cl.<sup>4</sup> G03B 17/24, 19/10; B65H 3/46

U.S. Cl. 354—107

29 Claims



1. An apparatus for handling light-sensitive photographic sheet material in ambient light, comprising a separating device for separating individual sheets from a stack comprising a plurality of sheets of the same shape and size, and for transferring the separated sheets into a cassette intended for mounting

on a photographic camera, or into a feed inlet of a developing apparatus, wherewith the separating device has an entrance opening for feeding sheet material and a delivery opening for delivering each individual sheet, and is provided with a movable separating organ for separating individual sheets from stack, said separating organ being disposed between said entrance opening and said delivery opening, and the separating device also is provided with connecting means, which connecting means allow the delivery opening of the separating device to be joined to the cassette or to a connecting piece on the feed inlet of the developing apparatus, said joining being releasable and being protected ambient light; characterized in that the separating device (55) has an accumulation space (90) for a stack of the sheet material, between the entrance opening of said separating device and the separating organ (112); further in that the entrance opening of the accumulating space (90) of the separating device (55) is provided with a closure organ (91) which is movable into a closed position which closes off the entrance opening in light-tight fashion, and into an open position which completely exposes the entrance opening; further in that support surfaces (150, 151) for supporting the edge parts of the instantaneously bottom-most sheet of the stack are provided in the separating organ (112) of the separating device (55); further in that the separating device (55) comprises hold-down organs (115) which extend into the accumulation space (90), for pressing the stack against the support surfaces (150, 151); further in that each of the hold-down organs (155) is movable from its pressing position into an inactive position in which it is disposed outside the accumulation space (90), in order to enable the stack to be inserted into the accumulation space; and in that drive means (157-174) are provided to move the hold-down organs (155) into their respective pressure positions and into their respective inactive positions, which drive means are controllable by the closure organ (91) associated with the entrance opening of the accumulation space (90), such that each of the hold-down organs (155) is automatically brought into its inactive position when the closure organ (91) is moved into its open position, and when the closure organ (91) is moved into its closed position each said hold-down organ is automatically moved into its pressure position.

4,678,303

# FILM-ON-SPOOL SENSOR FOR DETERMINING MODE OF OPERATION OF FILM TRANSPORT MECHANISM IN CAMERA

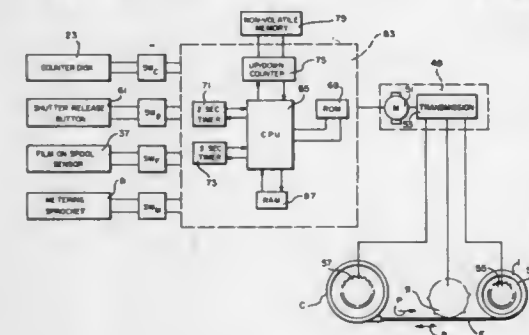
Stephen G. Malloy Desormaux, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1986, Ser. No. 871,040

Int. Cl.<sup>4</sup> G03B 1/18

U.S. Cl. 354—173.11

4 Claims



1. An improved photographic camera of the type wherein (a) motorized film transport means is operable in a load mode to first prewind a substantial length of an unexposed filmstrip from a light-tight cartridge onto a take-up spool without exposing any frames on the filmstrip and to then rewind a predetermined length of the filmstrip off said take-up spool to position a first frame for exposure and is operable in a picture-taking mode to rewind the filmstrip one frame at a time back into the cartridge after each frame is exposed, and (b) a shutter release member is actuatable to initiate operation of said motorized

film transport means in its load or picture-taking mode, and wherein the improvement comprises:

film-on-spool sensing means for sensing whether film is present on said take-up spool or the spool is empty; and control means, responsive to actuation of said shutter release member when said film-on-spool sensing means senses that said take-up spool is empty, for operating said motorized film transport means in its load mode, and responsive to actuation of said shutter release member when said film-on-spool sensing means senses that film is present on said take-up spool, for operating said motorized film transport means in its picture-taking mode, whereby said film-on-spool sensing means will determine the mode of operation of said motorized film transport means.

4,678,304

# INTERVAL SHOOTING DEVICE

Jiro Kazumi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

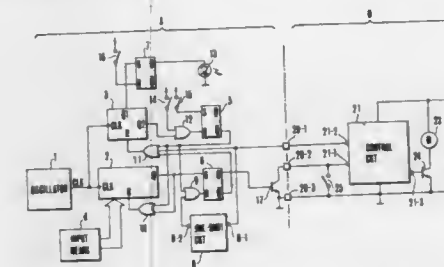
Filed Mar. 27, 1986, Ser. No. 844,823

Claims priority, application Japan, Apr. 2, 1985, 60-069472

Int. Cl.<sup>4</sup> G03B 1/12, 17/40

U.S. Cl. 354—173.11

10 Claims



1. An interval timer device for a camera in which a train of actuating signals for releasing the camera are produced with a prescribed period, comprising:

- a timer circuit responsive to termination of an exposure of the camera for counting time;
- a circuit for stopping said timer circuit from further counting time when a shutter charging operation or a film winding operation that follows the termination of the exposure by a motor circuit completes; and
- a prohibiting circuit for stopping said control operation of said interval timer device when the time counting of said timer circuit has been performed for a prescribed time.

4,678,305

# PHOTOGRAPHIC CAMERA

James F. Flitton, Lightwater, England, assignor to Photo-Me International PCL, Surrey, England

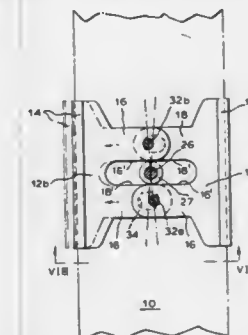
Filed Mar. 24, 1986, Ser. No. 843,319

Claims priority, application United Kingdom, Sep. 27, 1985, 8523912

Int. Cl.<sup>4</sup> G03B 17/00, 29/00

U.S. Cl. 354—203

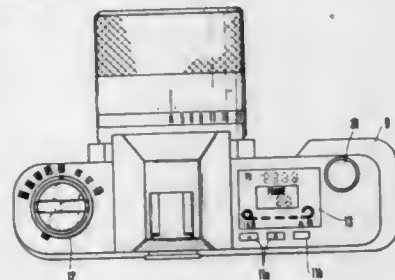
10 Claims



1. A photographic camera comprising two guides for engaging mutually opposite edge portions of photographic film at an

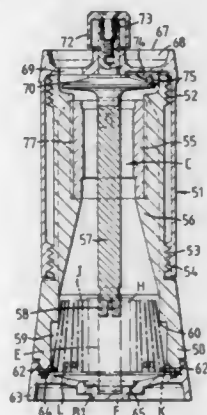
exposure plane where said film is exposed to take a photograph, means for supporting each guide in said position of engagement with mutually opposite edge portions and substantially simultaneously temporarily retracting each guide laterally of a respective edge portion so that the edge portions also may be exposed during the taking of said photograph.

**4,678,306**  
**FILM FEEDING INDICATION DEVICE FOR CAMERA**  
 Masayoshi Kluchi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
 Filed Oct. 15, 1985, Ser. No. 787,382  
 Claims priority, application Japan, Oct. 17, 1984, 59-217927  
 Int. Cl.<sup>4</sup> G03B 17/18, 17/36  
 U.S. Cl. 354—217



1. A film feeding indication device for a camera, comprising:
  - (a) monitor signal forming means for forming a monitor signal corresponding to the film feeding;
  - (b) detection means for generating an output when the signal of said monitor signal forming means reaches a predetermined value indicating a normal film feeding;
  - (c) indication means for instructing completion of the film feeding in response to the output of said detection means; and
  - (d) control means for causing said indication means to instruct completion of the film feeding irrespective of the output of the detection means when the film feeding by said film feeding means has been completed before the signal of said monitor signal forming means reaches the predetermined value.

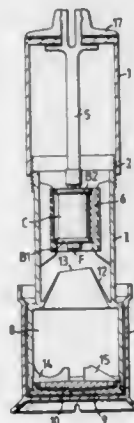
**4,678,307**  
**DEVICE FOR PROCESSING EXPOSED PHOTOGRAPHIC FILM COILED ON A SPOOL**  
 Brian F. Moss, Chelford; Richard J. Brent, Bramhall, and Ian B. Pilkington, Prestbury, NR Macclesfield, all of England, assignors to Ciba-Gelgy AG, Basel, Switzerland  
 Filed Oct. 15, 1985, Ser. No. 787,284  
 Claims priority, application United Kingdom, Oct. 26, 1984, 8427101  
 Int. Cl.<sup>4</sup> G03D 13/06  
 U.S. Cl. 354—313



1. A device for processing a roll of exposed film coiled on a

spool which comprises a cylindrical light-tight container of sufficient diameter and height to accommodate the film coiled on the spool, a light-tight lid to close the container, barb means attached to or adjacent to the internal wall of the container so located to retain the film when the film is placed in the container and means connected with the spool for enabling the spool with the coiled film to be rotated in either direction.

**4,678,308**  
**PROCESSING DEVICE**  
 Brian F. Moss, Chelford, and Richard J. Brent, Handforth, both of England, assignors to Ciba-Gelgy AG, Basel, Switzerland  
 Filed Feb. 26, 1986, Ser. No. 832,938  
 Claims priority, application United Kingdom, Mar. 7, 1985, 8505843  
 Int. Cl.<sup>4</sup> G03D 13/06  
 U.S. Cl. 354—313

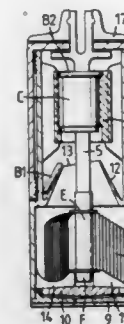


1. An apparatus for the processing of film contained in a cassette, the cassette comprising a substantially cylindrical body formed with protruding light-tight longitudinally extending film exit slot means and having a top-most end cap and a lowermost end cap and accommodating a spool with the film wound thereon, said apparatus comprising a light-tight columnar body having a longitudinal axis and a block accommodated by said columnar body having a central aperture for receiving the cassette and retaining the cassette body, and having a space sufficiently large to receive from said cassette the spool with the film wound thereon, and a plunger adapted for engaging the spool of said cassette and being movable to force the lowermost cap off said cassette body and to move said spool and the film wound thereon out of said cassette body and into said space, said space being adapted for containing liquid for processing the film, the apparatus being characterised in that there is present in the apparatus below the block, but above the space for containing liquid, a shelf which is adapted to catch and retain the lowermost end cap as it is pushed off the cassette, the said shelf having in its middle a circular hole of sufficient diameter to allow passage therethrough of the spool with the film wound thereon, but too small to allow the end cap to fall through the shelf.

**4,678,309**  
**DEVICE FOR PROCESSING A ROLL OF EXPOSED FILM COILED ON A SPOOL**  
 Brian F. Moss, Chelford, and Richard J. Brent, Handforth, both of England, assignors to Ciba-Gelgy AG, Basel, Switzerland  
 Filed Feb. 26, 1986, Ser. No. 832,939  
 Claims priority, application United Kingdom, Mar. 7, 1985, 8505896; Jun. 25, 1985, 85 16056  
 Int. Cl.<sup>4</sup> G03D 13/06  
 U.S. Cl. 354—313

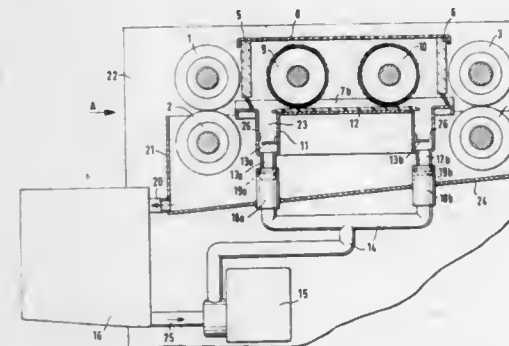
1. A device for processing a roll of exposed film coiled on a spool which comprises a cylindrical light-tight container

wherein the film on the spool is rotated and which is of sufficient diameter and height to accommodate the film loosely coiled on the spool, a light-tight lid to close the container, the device being characterised in that it comprises at least two radially extending raised members attached to the base of the



container so shaped that as the wound film is rotated in the container some of the convolutions of the film are at one instance bunched together whilst other convolutions are separated and means connectable to the spool for enabling the spool to be rotated when it is in the container.

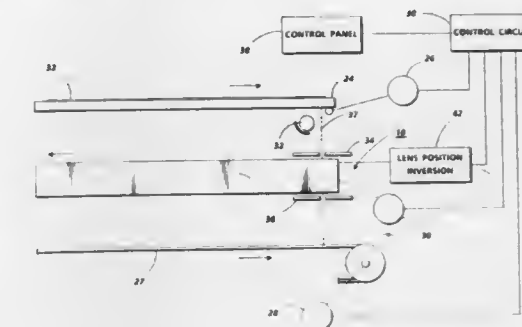
**4,678,310**  
**DEVICE FOR TREATING PRINTING PLATES WITH A FLUID**  
 Hans Heist, Wiesbaden; Dieter Toepfer, Heidenrod, and Sylvia Britzke, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
 Filed Oct. 4, 1985, Ser. No. 783,958  
 Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437329  
 Int. Cl.<sup>4</sup> G03D 3/06, 13/00  
 U.S. Cl. 354—319



1. A device for treating printing plates, comprising:
  - (1) a flooded trough having an inlet side and an outlet side and including:
    - a bottom comprising a guide plate table and an overflow channel extending around said table and being integral therewith;
    - a pair of side walls, a separate said wall located at each of said inlet side and outlet side of said flooded trough; and
    - a pair of containment elements, a separate said containment element supported on a separate said side wall, whereby said trough is adapted for passage of a printing plate horizontally therethrough;
  - (2) means for feeding fluid to said flooded trough;
  - (3) a collecting trough, having a bottom wall and being positioned below said flooded trough, for receiving overflow of fluid from said flooded trough; and
  - (4) means for releasably and rigidly engaging said fluid

feeding means through the bottom wall of said collecting trough.

**4,678,311**  
**MULTI-MAGNIFICATION SHORT FOCAL LENGTH IMAGING SYSTEM**  
 Robert P. Loce, Webster, and Melvin E. Deibler, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.  
 Filed Mar. 14, 1986, Ser. No. 839,666  
 Int. Cl.<sup>4</sup> G03B 27/00  
 U.S. Cl. 355—1



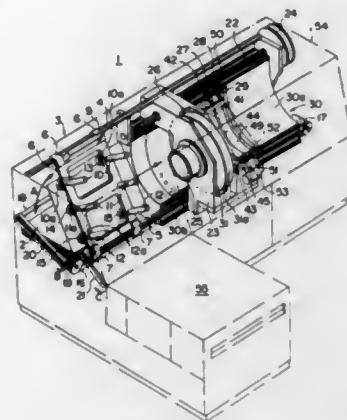
1. An optical system for an electrophotographic reproduction machine including a short focal length lens assembly for projecting an image of a document along an optical path onto a photosensitive image plane, said lens assembly comprising a planar unitary light transmissive member having a plurality of linear lens arrays formed integrally within said member, each lens array formed to project an image therethrough at a specific magnification value, (each array formed as an integral part of said lens assembly) and means adapted to form a light radiation field containing document information and to direct said field into the entrance face of a selected one of said lens arrays whereby an image of the document is projected onto the photosensitive image plane at the magnification value of the selected lens array.

**4,678,312**  
**ROTATABLE HEAD TYPE ELECTROPHOTOGRAPHIC APPARATUS, CORONA CHARGING ROTATABLE HEAD AND MOVEABLE ELECTROPHOTOGRAPHIC LIQUID DEVELOPMENT PROCESSING UNIT THEREFOR**  
 Etuo Shiozawa; Shigeo Harada; Shuichi Ohtsuka, and Masahiro Ohnishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan  
 Filed Jul. 27, 1984, Ser. No. 635,069  
 Claims priority, application Japan, Aug. 1, 1983, 58-140882; Aug. 1, 1983, 58-140883; Aug. 1, 1983, 58-140884; Aug. 1, 1983, 58-140885  
 Int. Cl.<sup>4</sup> G03G 15/00  
 U.S. Cl. 355—3 R

1. A rotatable head type electrophotographic apparatus comprising:
  - (i) a moveable table,
  - (ii) a rotatable head comprising a rotatable body which is rotatably supported on said moveable table, a corona charging electrode secured to said rotatable body to face outwardly of the circumferential surface of said rotatable body, and an electrostatic latent image forming light source secured to said rotatable body to face outwardly of the circumferential surface of said rotatable body,
  - (iii) a platen provided with an electrophotographic photosensitive material supporting surface extending in the axial direction of said rotatable head and curved to stand face to



- face with the circumferential surface of said rotatable head,
- (iv) a table movement means for moving said moveable table in the axial direction of said rotatable body,
- (v) an electrophotographic development processing unit supported on said moveable table close to an electrophotographic photosensitive material supported on said platen,



- (vi) a light source driving means for driving said light source in accordance with a predetermined modulating signal, and
- (vii) a light shielding member for shielding the electrophotographic photosensitive material from external light during charging, exposure and development.

4,678,313

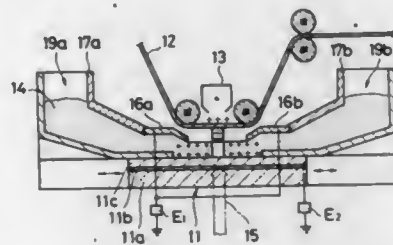
**ELECTROPHOTOGRAPHIC RECORDING APPARATUS**  
Tetsuro Konno; Yataka Kanai, and Tetsuya Fujita, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan  
Filed May 15, 1986, Ser. No. 863,599

Claims priority, application Japan, May 15, 1985, 60-103137; May 15, 1985, 60-103139

Int. Cl.<sup>4</sup> G03G 15/00

U.S. Cl. 355-3 R

5 Claims



1. An electrophotographic recording apparatus comprising:
- a pair of toner containers for accommodating a toner;
- a pair of electrode plates which are disposed in openings in both of said toner containers opening such as to face each other, to which voltage for charging the toner delivered from said openings is applied, and which has a function of adjusting the layer of said toner;
- a photosensitive member disposed such as to oppose at a lower portion of both of said toner containers the distal end of both of said electrode plates with a predetermined gap therewith and constituted by a transparent substratum, a transparent electrode, and a photoconductive layer, said photosensitive layer being reciprocated to the left and the right, and said toner in said toner containers, after being charged by said electrode plates, being supplied in a uniform thickness onto the surface of said photoconduc-

tive layer of said photosensitive member by virtue of the reciprocating movement of said photosensitive member; light irradiating means for applying light from the side of said transparent substratum of said photosensitive member, the toner in a portion irradiated with light being charged to a polarity opposite to that of the initial charges via a selected photoconductive layer whose electrical resistance has decreased by being subjected to light irradiation by said light irradiating means as well as said transparent electrode; and

transferring means for causing said selected toner charged to opposite polarity to be transferred onto a recording medium opposed to the toner adhered to the surface of said photoconductive layer.

4,678,314

**IMAGE FORMING APPARATUS**

Kohachi Uchida, Sagami-hara; Kunihiko Shibuya, Yokohama, and Hajime Nakamura, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

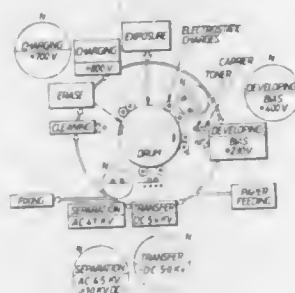
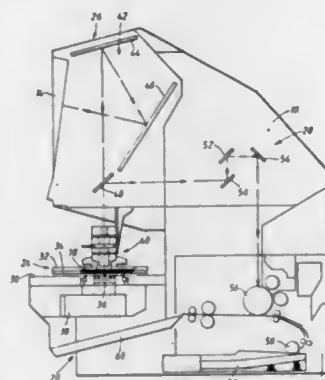
Filed Sep. 18, 1985, Ser. No. 777,447

Claims priority, application Japan, Oct. 3, 1984, 59-208587

Int. Cl.<sup>4</sup> G03G 15/00

U.S. Cl. 355-5

4 Claims



1. An image forming apparatus comprising:
- means for forming an electrostatic latent image with a first polarity on an image carrier;
- first developing means for depositing a first developer charged with a second polarity, different from the first polarity, onto the electrostatic latent image in order to perform direct developing;
- second developing means for depositing a second developer charged with the first polarity onto the electrostatic latent image in order to perform reverse developing;
- means for selectively energizing one of said first and second developing means so as to perform the selected developing;
- first biasing means for establishing a first biased voltage between said first developing means and the image carrier

to perform the direct developing by said first developing means;

second biasing means for establishing a second biased voltage, different from the first biased voltage, between said second developing means and the image carrier to perform the reverse developing by said second developing means; and

means for transferring the developer image formed on the image carrier by one of said first and second developing means onto a paper, said transferring means applying an electric discharge having a polarity of the first or second polarity respectively according to said energized first or second developing means, whereby the paper comes into contact with the surface of the image carrier.

4,678,315

**IMAGE FORMING APPARATUS**

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

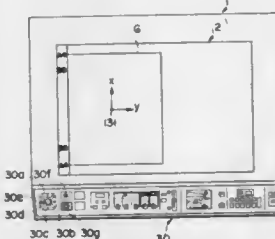
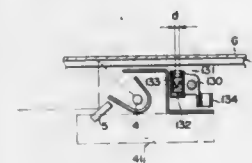
Filed Oct. 25, 1985, Ser. No. 791,459

Claims priority, application Japan, Oct. 27, 1984, 59-226158; Oct. 29, 1984, 59-227420

Int. Cl.<sup>4</sup> G03G 15/00

U.S. Cl. 355-7

15 Claims



1. An image forming apparatus, wherein an original is scanned, a photosensitive body which is uniformly pre-charged is exposed with light to form a charge pattern corresponding to an image of the original, and the charge pattern is developed to form a developed image, the apparatus comprising:

an original table on which an original is placed;

scanning means for scanning an original placed on said original table in a prescribed scanning direction;

indicator means including a spotlight source for indicating a specific position or range on a surface of the original placed on said original table by moving a spotlight from said spotlight source along a surface of the original table;

supporting means which is movable along said original table in the scanning direction for supporting said scanning means in a fixed manner in a direction normal to the scanning direction and for movably supporting said indicator means in the direction normal to the scanning direction;

driving means for driving said supporting means and said indicator means; and

erase means for erasing charges on the photosensitive body corresponding to the specific position or the range of said original indicated by said indicator means.

4,678,316

**IMAGE FORMING APPARATUS ADAPTED TO ENTER AN INTERRUPT COPYING MODE AND AN ENERGY SAVING MODE**

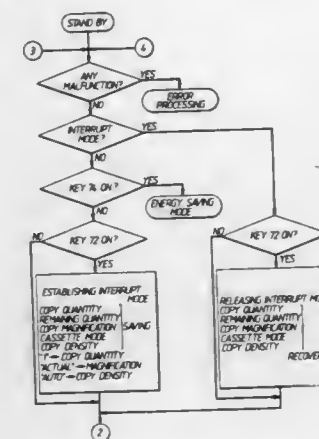
Yasuo Abuyama, Ebina, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 679,078, Dec. 6, 1984, abandoned. This application Jun. 10, 1986, Ser. No. 873,851

Claims priority, application Japan, Dec. 20, 1983, 58-238808 Int. Cl.<sup>4</sup> G03G 15/00

U.S. Cl. 355-14 C

2 Claims



1. An image forming apparatus adapted to enter an interrupt copying mode and an energy saving mode comprising:
- operator controlled means for applying the interrupt mode so as to interrupt a first copy run and execute a second copy run to be performed;
- means for storing a copying condition data related to at least one of the first and second copy run;
- means, responsive to the interrupt mode, for setting the copying condition data related to the second copy run in exchange for the first copy run into said storing means;
- means for forming an image on a recording medium in accordance with the copying condition data stored in said storing means;
- means for supplying a first level of electric power being sufficient to energize said image forming means for image forming operation;
- operator controlled means for establishing and terminating the energy saving mode wherein the electric power supplied to said image forming means is reduced to a second level lower than the first level so that less electric power is consumed than that for said image forming operation;
- control means, responsive to said establishing and terminating means, for causing said storing means to store a predetermined copying condition data regardless of the first and second copy run in said storing means; and
- means for inhibiting the establishing of the energy saving mode during the interrupt mode set by said applying means so as to prevent said control means from setting the predetermined copying condition data in said storing means.

4,678,317

**CHARGE AND BIAS CONTROL SYSTEM FOR ELECTROPHOTOGRAPHIC COPIER**

Israel Grossinger, Rehovot, Israel, assignor to Savin Corporation, Stamford, Conn.

Filed Nov. 4, 1985, Ser. No. 794,765

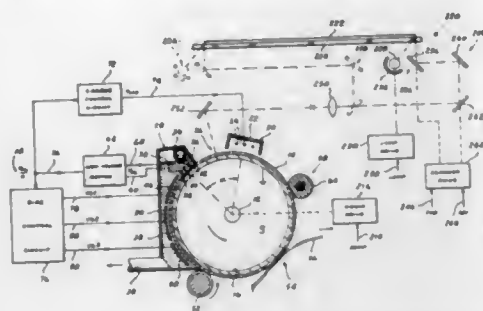
Int. Cl.<sup>4</sup> G03G 15/10

U.S. Cl. 355-14 D

12 Claims

1. Apparatus including in combination a photoconductor having a surface adapted to bear an electrostatic charge, means

for electrostatically charging said surface of said photoconductor, means for exposing a portion of said charged surface to a pattern of light and shade to form an electrostatic latent image while leaving a portion of said charged surface unexposed, means including a developing electrode for developing said latent image, means for biasing said developing electrode, means for moving said photoconductor along a path successively past said charging means, said exposing means, and said developing electrode, means disposed along said path between



said exposing means and said developing electrode for sensing the potential of said charged surface, first means for sampling said sensing means during the movement of said unexposed portion of said charged surface past said sensing means, means responsive to said first sampling means for controlling said charging means, second means for sampling said sensing means during the movement of said exposed portion of said surface past said sensing means, and means responsive to said second sampling means for controlling the said biasing means.

4,678,318

## IMAGE FORMING APPARATUS

Takashi Bisaiji, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

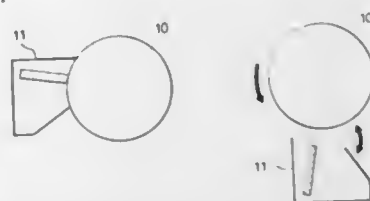
Filed Oct. 7, 1985, Ser. No. 785,066

Claims priority, application Japan, Oct. 5, 1984, 59-150191[U]

Int. Cl.<sup>4</sup> G03G 21/00

U.S. Cl. 355—15

4 Claims



1. An image forming apparatus comprising:  
a housing;  
a latent image carrier removably disposed in said housing;  
a cleaning unit removably disposed in said housing and having a cleaning blade held against said latent image carrier through a cleaning slot;  
means for coupling said latent image carrier and said cleaning unit in said housing such that said coupled unit may be removed from said housing;  
and wherein said cleaning unit further comprises means to angularly direct said cleaning slot upwardly when removed from said housing.

4,678,319

## MEASURING DEVICE FOR SELECTING THE FILTER IN PHOTOGRAPHIC ENLARGING OR COPYING APPARATUSES

Walther Reltzer, Vilpian, Italy, assignor to Durst Phototechnik GmbH, Bozen, Italy

PCT No. PCT/EP85/00274, § 371 Date Feb. 24, 1986, § 102(e) Date Feb. 24, 1986, PCT Pub. No. WO86/00149, PCT Pub. Date Jan. 3, 1986

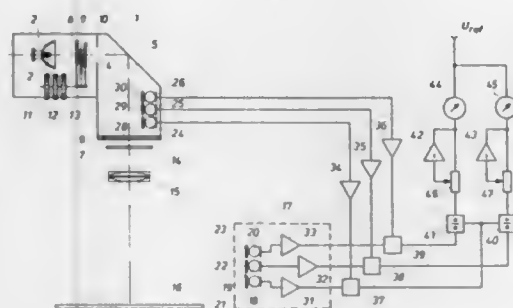
PCT Filed Jun. 7, 1985, Ser. No. 840,568

Claims priority, application Italy, Jan. 14, 1984, 4837 A/84

Int. Cl.<sup>4</sup> G03B 27/80

U.S. Cl. 355—38

5 Claims



1. A measuring device for selecting the color composition of the copying light when copying a film frame original in a photographic enlarging or copying apparatus, said measuring device comprising in combination:

- a first group of measuring cell means for selectively measuring the copying light intensity in the basic colors red, green and blue before said copying light passes through the film frame original, and providing a first set of red, green and blue measuring signals determined by the intensity of the colors red, green and blue, respectively, detected by said first group of measuring cell means;
- a second group of measuring cell means for selectively measuring the copying light intensity in the basic colors red, green and blue after said copying light passes through the film frame original, and providing a second set of red, green and blue measuring signals determined by the intensity of the colors red, green and blue, respectively, detected by said second group of measuring cells;
- operating means coupled to said first and second groups of measuring cell means and responsive to said first and second groups of measuring signals for providing a set of red, green and blue result signals, the red result signal being a combined function of the first red measuring signal and the second red measuring signal, the green result signal being a combined function of the first green measuring signal and the second green measuring signal, and the blue result being a combined function of the first blue measuring signal and the second blue measuring signal;
- ratio means coupled to said operating means and responsive to the red, green and blue result signals for forming ratio signals corresponding to the ratios of the red, green and blue result signals with respect to one another; and
- comparing means coupled to said ratio means and responsive to the ratio signals for comparing the ratio signals with preset reference values obtained from a reference original and indicating any deviation therefrom.

4,678,320

## COPYING MACHINE

Yoshihisa Fujii, Sakurai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

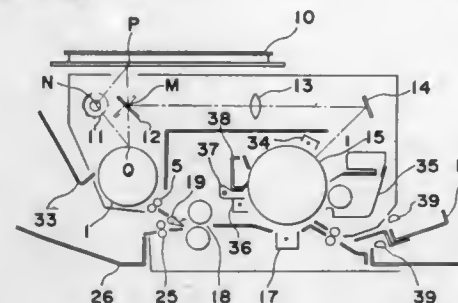
Filed Jan. 4, 1986, Ser. No. 870,385

Claims priority, application Japan, Jan. 6, 1985, 60-123995; Jun. 6, 1985, 60-123996

Int. Cl.<sup>4</sup> G03B 27/48, 27/50, 27/70

U.S. Cl. 355—49

3 Claims



1. A copying machine comprising an original platform on which an original is placed, an original cylinder around which an original is wound, a photosensitive body on which an image of the original is formed and an optical device, said optical device comprising:

- a source of light rotatably mounted in said copying machine for applying light therefrom to either of an exposure position set on said original platform or on said original cylinder;
- a reflecting mirror rotatably mounted in said copying machine for further reflecting reflected light at said respective exposure positions;
- a copying lens for refracting the reflected light from said reflecting mirror towards said photosensitive body; and
- means for synchronously rotating said source of light and said reflecting mirror, wherein the reflected light at either exposure position on said original platform or on said original cylinder is further reflected by said reflecting mirror onto the optical axis of said copying lens and refracted light therethrough is directed towards said photosensitive body to form the image of the original thereon in the copying operation.

4,678,321

## ANAMORPHIC FOCUSING SYSTEM

Toshiyuki Inokuchi, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

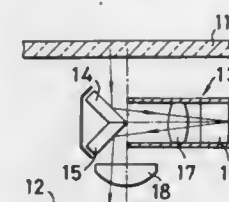
Filed Jan. 29, 1986, Ser. No. 823,788

Claims priority, application Japan, Feb. 1, 1985, 60-018404

Int. Cl.<sup>4</sup> G03B 27/68

U.S. Cl. 355—52

6 Claims



1. An anamorphic focusing system comprising:  
a focusing device including a roof-mirror-lens array for focusing an image of an object;  
a cylindrical lens disposed in an optical path extending from said focusing device toward the image for magnifying the image in a direction perpendicular to the longitudinal direction of said roof-mirror-lens array; and

a transparent plate for compensating the length of the optical path;  
wherein said cylindrical lens is movable into and out of said optical path and said transparent plate is movable into said optical path when said cylindrical lens is moved out of said optical path.

4,678,322

## METHOD AND APPARATUS FOR THE PREVENTION OF UNAUTHORIZED COPYING OF DOCUMENTS

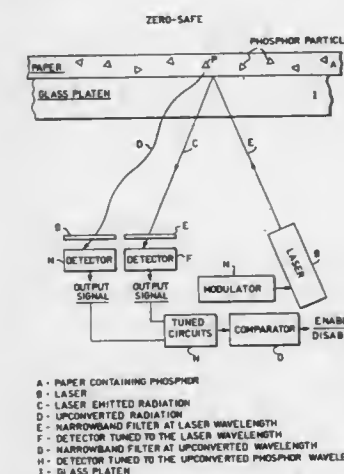
Joel R. Finkel, Woodland Hills; Paul F. Jacobs, La Crescenta; Kenneth I. Gustafson, Glendora, and William D. Green, Sunland, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 30, 1986, Ser. No. 868,983

Int. Cl.<sup>4</sup> G03G 15/00

U.S. Cl. 355—133

6 Claims



1. A method of prohibiting the copying of special documents on an office copier or the like comprising:  
directing a beam of light toward a document placed on said copier for copying,  
first detecting the presence of said light as reflected from said document,  
second detecting the presence of light as emitted by said document, and  
disabling the operation of said office copier upon the detection of the presence of both of said reflected light and said emitted light.

4,678,323

## DISTANCE MEASURING DEVICES AND LIGHT INTEGRATORS THEREFOR

Yuichi Sato, Tokyo; Tokuichi Tsunekawa, Yokohama, and Takashi Kawabata, Kamakura, all of Japan, assignors to Canon Kabushiki Kaisha

Filed Jul. 19, 1985, Ser. No. 757,137

Claims priority, application Japan, Jul. 20, 1984, 59-150647; Jul. 23, 1984, 59-152358; Jul. 31, 1984, 59-161050

Int. Cl.<sup>4</sup> G01C 3/08; G03B 3/00

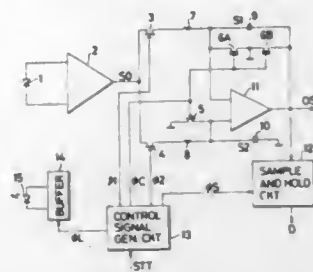
U.S. Cl. 365—4

56 Claims

1. A synchronous integrating device, comprising:  
projecting means for projecting a given intensity of light on an object during projection periods and reducing the intensity during space periods which occur at other times outside the projection periods;  
sensing means for sensing ambient and projected light from the object during projection periods and space periods;  
processing means responsive to said sensing means for producing space signals during the space periods and projection signals during projection periods, and for integrating



a plurality of the projection signals and a plurality of the space signals; and



timing means connected to said processing means and said projecting means for selecting the timing of projecting periods and space periods.

4,678,324

## RANGE FINDING BY DIFFRACTION

Thomas De Witt, Box 83, Aacramdale, N.Y. 12503  
Filed Dec. 4, 1985, Ser. No. 804,590

Int. Cl.<sup>4</sup> G01C 3/00; G01B 11/02

U.S. Cl. 356—45

7 Claims



1. A method for determining range by correlating the relationship between the distances of a diffraction grating from an illuminated target surface with the respective relative displacements of high order diffraction images from the position of the respective zero order image as observed through said grating.

4,678,325

## APPARATUS FOR MEASURING OPTICAL PROPERTIES OF PAPER

Olavi Lehtikoski, Sölvénkatu 8, SF-78300 Varkaus 30, and  
Matti Nissinen, SF-78880 Kuvansi, both of Finland  
Filed Apr. 24, 1984, Ser. No. 603,512

Claims priority, application Finland, May 5, 1983, 831543

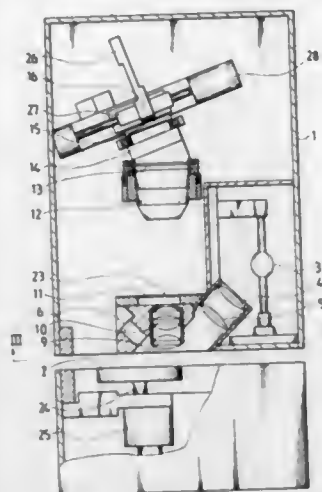
Int. Cl.<sup>4</sup> G01J 3/32; G01N 21/86

U.S. Cl. 356—73

12 Claims

1. An apparatus for measuring optical properties of paper, said apparatus comprising a housing, a background screen for supporting a paper sample, and, inside said housing, a light source, lenses for focusing the light from said light source on the background screen, a plurality of first detectors for measuring the intensities of light reflected off paper on said screen and of light penetrating said paper, an assembly for processing scattered light, and a second detector for measuring the intensity of scattered light, characterized in that said background screen is movable relative to said housing and is provided with elements for measuring optical properties and calibrating the apparatus, and said assembly for processing scattered light comprises a grid and a pair of limiters positioned between said second detector and said grid in immediate proximity of said second detector, whereby said grid projects a spectrum along a focal plane, said limiters comprising in conjunction with said grid a bandpass filter and being movable together with said

detector within the range of a spectrum, along a curved path determined by the focal plane, said second detector being



adapted to measure step by step the intensity of sections of desired width of the spectrum of light along the focal plane.

4,678,326

## APPARATUS FOR THE MEASUREMENT OF FLUORESCENCE, TURBIDITY, LUMINESCENCE OR ABSORPTION

Hannu Harjunmaa, Espoo, Finland, assignor to Labsystems Oy,  
Helsinki, Finland

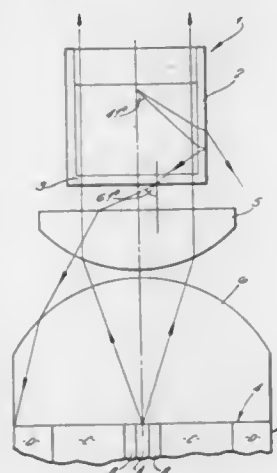
Filed May 17, 1984, Ser. No. 611,132

Claims priority, application Finland, May 30, 1983, 831936

Int. Cl.<sup>4</sup> G01N 21/49, 21/64, 21/59

U.S. Cl. 356—73

7 Claims



1. In an apparatus for measuring optical properties such as fluorescence, luminescence, turbidity and absorption of a liquid sample contained in a cylindrical cuvette having a central optical axis, the apparatus including a light source and at least one light sensor, the apparatus further comprising collimating means disposed adjacent said cuvette, the collimating means having an optical axis in alignment with both the central optical axis of the cuvette and a central optical axis of a fiber bundle, said fiber bundle having an end portion located adjacent to said collimating means and defining a plurality of independent light transmitting paths, said light transmitting paths extending along the length of said fiber bundle to its end portions, wherein said fiber bundle and collimating means transmit collimated light to said sample and selectively collect light

emanating therefrom, said collimating means having at least one lens means to focus light emanating from said sample upon the end portion of said fiber bundle adjacent thereto whereby a substantially equal proportion of light from a volume element of said sample is transmitted to said fiber bundle by way of said collimating means.

4,678,327

## METHOD FOR INSPECTING AN OPTICAL FIBER

Noriyuki Yoshida, and Kenichi Takahashi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

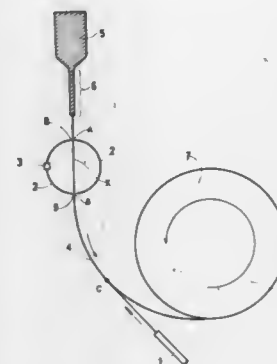
Filed Nov. 12, 1985, Ser. No. 797,015

Claims priority, application Japan, Dec. 24, 1984, 59-279335

Int. Cl.<sup>4</sup> G01N 21/89

U.S. Cl. 356—73.1

13 Claims



1. A method for inspecting an optical fiber during fabrication, comprising the steps of:  
drawing said optical fiber from a fiber fabrication apparatus to a winding device through an integration sphere having an inlet opening, an outlet opening, an inner diffuse reflection surface, and a photodetector;  
shooting from a light source a strong beam of light obliquely at a side surface of said optical fiber such that a portion of the light beam penetrates into the fiber core and is scattered by defects in said core so as to form an inspecting light which propagates in said fiber core;  
measuring the light power detected by said photodetector within said integration sphere; and  
determining the position of a defect in said optical fiber by estimating the amount of change of output power of said photodetector as a function of time.

4,678,328

## NON-OPTIMUM WAVEGUIDE OPTICAL SENSOR

Preston S. Craig, and William F. Arendale, both of Huntsville, Ala., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 17, 1986, Ser. No. 853,245

Int. Cl.<sup>4</sup> G01B 11/26; G01C 3/00; H01J 5/16

U.S. Cl. 356—141

6 Claims

1. A non-optimum waveguide optical sensor for measuring the separation between first and second optical sources emitting first and second optical signals, comprising:  
optical guiding means for selectively receiving the optical signals including first and second non-optimum optical waveguides each disposed along an optic axis and each having an inner core guide means and an outer cladding means, said core guide means refractive index selected to be less than or equal to said cladding means refractive index, said first and second non-optimum optical wave-

guides positioned so as to form a known angle therebetween; and



detector means positioned with respect to said optical guiding means so as to receive the optical signals therefrom and for providing electrical signal equivalents thereof.

4,678,329

## AUTOMATICALLY GUIDED VEHICLE CONTROL SYSTEM

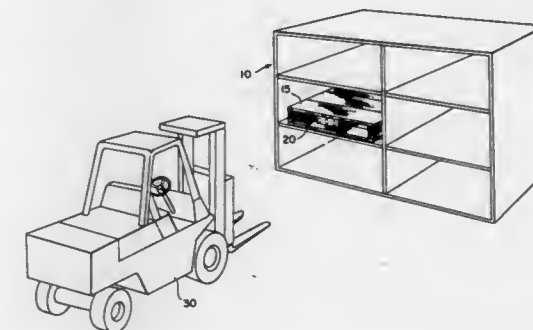
Frank J. Lukowski, Jr., Alden, and Harry B. Hammill, III, Williamsburg, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Oct. 18, 1985, Ser. No. 789,280

Int. Cl.<sup>4</sup> G01B 11/26

U.S. Cl. 356—152

5 Claims



1. Apparatus for use in determining the relative location of a vehicle with respect to a target, including:

a light source and a camera mounted on the vehicle, said target including at least three reflector elements, each selected to form an image of the light source, and all the images together defining a plane oriented other than normal to a line from the light source to the target;  
means for recording those images due to ambient light formed on the image plane of said camera;  
means for thereafter flashing the light source;  
means for comparing said images due to ambient light stored in said recording means and the images resulting both from ambient light and from the light source; and  
means for recording those images formed on the image plane of said camera due only to reflections of said light source.

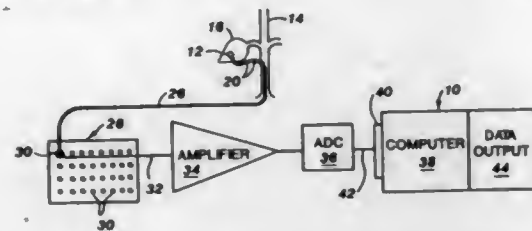
4,678,330

## METHOD AND APPARATUS FOR MEASURING SOLAR RADIATION IN A VEGETATIVE CANOPY

Vincent P. Gutschick; Michael H. Barron; David A. Waechter, and Michael A. Wolf, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
Filed Apr. 30, 1985, Ser. No. 729,022  
Int. Cl.<sup>4</sup> G01J 1/42

U.S. Cl. 356—222

13 Claims



1. An apparatus for measuring solar radiation received in a vegetative canopy, said apparatus comprising:
  - a multiplicity of sensors for selectively generating an electrical signal in response to impinging photosynthetically active radiation in sunlight, each of said sensors being insensitive to infrared radiation and being attached to an upper surface of a plant within the vegetative canopy, each of said sensors being sufficiently lightweight to permit substantially normal plant movement;
  - a junction box having a multiplicity of ports, each of said sensors being electrically connected to a different one of said ports;
  - a multiplicity of operational amplifiers for amplifying the electrical signals generated by said sensors, each of said ports being electrically connected to a different one of said operational amplifiers;
  - a multiplicity of analog-to-digital converters for digitizing the electrical signals, each of said analog-to-digital converters being electrically connected to a different one of said operational amplifiers;
  - a computer operatively connected to said analog-to-digital converters for accumulating and storing solar radiation data; and
  - data output means for displaying the solar radiation data, said data output means being operatively connected to said computer.

4,678,331

## MULTICUVETTE ROTOR ASSEMBLY

Matthew J. Perry, Libertyville, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.  
Filed Jun. 21, 1984, Ser. No. 623,057  
Int. Cl.<sup>4</sup> G01N 21/07

U.S. Cl. 356—246

3 Claims



1. A multicuvette rotor for use in a centrifugal chemistry analyzer comprising:
  - a substantially circular body member having a substantially planar upper surface, a lower surface, and a plurality of spaced apart recesses extending radially in the peripheral portion thereof;
  - a substantially circular cover member disposed adjacent the planar upper surface of said body member such that a plurality of enclosed chambers are defined by said cover member and said recesses;
  - said cover member having an upper surface, a substantially

planar lower surface, and a plurality of apertures through said cover member for filling the chambers with fluid; each of said enclosed chambers having a top wall defined by said cover member, a bottom surface defined by said body member, an inner end wall disposed toward the center of said body member, an outer end wall disposed at the periphery of said body member, sidewalls extending radially between said inner and outer end walls, and a barrier member disposed between said end walls and sidewalls;

said barrier member having an upstanding wall portion defining an inner chamber disposed toward the central portion of said body member, and an outer chamber disposed toward the peripheral portion of said body member; said apertures positioned in said cover member so that said inner and outer chambers may be independently filled with fluid;

said barrier member further comprising an inclined ramp surface having a lower edge portion disposed adjacent the bottom surface of said inner chamber, lateral edge portions disposed adjacent the radially extending chamber sidewalls, an upper edge portion defining the intersection between the upstanding wall portion and inclined ramp surface, and a fluid transfer passage defined by the top of said upstanding wall portion and the lower surface of said cover member, and wherein the ramp surface extends inwardly from each of the lateral edge portions to a first and second vertically depending inner sidewall respectively, said inner sidewall extending from the lateral edge ramp surface downwardly to an interior ramp surface extending between said inner sidewalls; and wherein the lateral edges of said upstanding wall portion disposed adjacent the radially extending chamber sidewalls extend from the bottom surface of said chamber to an area substantially adjacent the lower surface of said cover member.

4,678,332

## BROADBAND SPECTROMETER WITH FIBER OPTIC REFORMATTOR

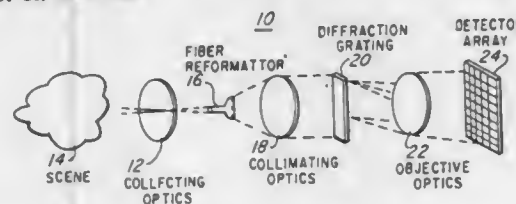
Dan Rock, 909 Torrance; Mark Roth, 1518 Burgundy St., both of Garland, Tex. 75040, and Stephen F. Sagan, 4633 Ringgold La., Plano, Tex. 75075

Filed Feb. 21, 1984, Ser. No. 581,950

Int. Cl.<sup>4</sup> G01J 3/18

U.S. Cl. 356—328

17 Claims



1. A broadband spectrometer apparatus for field use comprising:
  - a spectrometer means for dispersing radiation into its component wavelengths including: a collecting optics having a first numerical aperture for collecting electromagnetic energy and for focusing the collected electromagnetic energy according to the first numerical aperture, a fiber optics reformatting having a plurality of fibers arranged to form a front face forming a field stop for receiving the focused electromagnetic energy and a back face forming an entrance slit for the spectrometer means, and each single fiber optic of the plurality of fiber optics at the back face has a second numerical aperture having a mathematical relation to the first numerical aperture such that a value for the second numerical aperture is larger than the value of the first numerical aperture, the fiber optics reformatting being for reformatting the received and focused

electromagnetic energy and a means for dispersing the focused and reformatting electromagnetic energy into component wavelengths; and

- (b) detector means operatively connected to the spectrometer means for detecting the reformatting, received, dispersed and focused electromagnetic energy to obtain the dispersed radiation component wavelength thereby.

4,678,333

## DOUBLE-PASS OPTICAL INTERFEROMETER

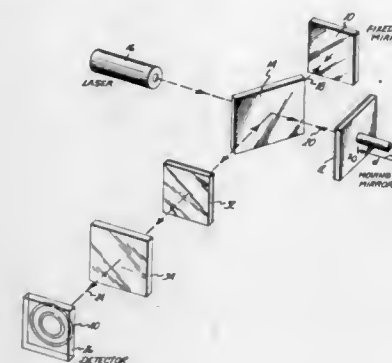
Charles R. Anderson, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed May 10, 1985, Ser. No. 732,603

Int. Cl.<sup>4</sup> G01J 3/45; G01B 9/02

U.S. Cl. 356—346

6 Claims



1. Apparatus for double passing an output beam of radiation through a Michelson-type interferometer, comprising:
  - beam splitter means for reflecting a first portion of the output beam of radiation back into the interferometer, and for propagating a second portion of the output beam of radiation; and
  - bandpass filter means for filtering from the propagated second portion of the output beam of radiation a portion which has been twice passed through the interferometer.

4,678,334

## SPICELESS OPTICAL FIBER RESONANT RING LASER GYROSCOPIC SYSTEM

Godfrey T. Coate, Belmont, and Joseph D. Coccoli, Sudbury, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

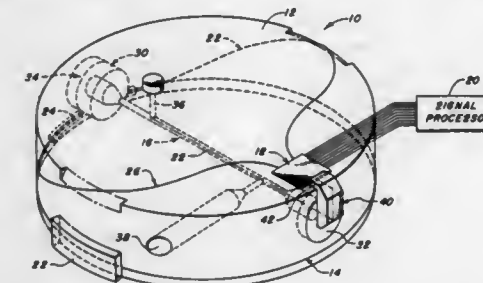
Filed May 20, 1983, Ser. No. 496,579

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> G01C 19/64; G01B 9/02

U.S. Cl. 356—350

8 Claims



1. A spliceless optical-fiber resonant-ring laser gyroscopic system, comprising:

a housing having an ultra-low coefficient of thermal expansion;

a selected length of optical-fiber mounted by coiling to said housing to provide an optical-fiber ring having at least one turn, the axis of the ring defining a rotation sensing direction;

an evanescent-wave directional coupler provided along a localized common contiguous region proximate the ends of said optical-fiber to provide a spliceless optical-fiber ring;

first means connected to said housing and coupled to the ends of the optical-fiber for selectively exciting the spliceless optical-fiber ring alternately in a clockwise and in a counterclockwise resonant mode; and

second means coupled to said spliceless optical-fiber resonant-ring and operative in response to said clockwise and counterclockwise resonant modes for providing a signal indication of the rate of angular rotation of said housing about the sensing direction.

4,678,335

## RING LASER GYRO BLOCK STIFFENER

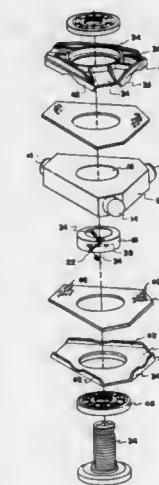
Ralph T. Berg, Ham Lake, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 20, 1984, Ser. No. 642,616

Int. Cl.<sup>4</sup> G01C 19/64

U.S. Cl. 356—350

5 Claims



1. A laser motion sensing device, comprising in combination:
  - a block with a passage formed therein defining a lasing path;
  - a cavity in said block with its longitudinal axis oriented generally perpendicular to the lasing path; and
  - a radially expandable ring shaped member in said cavity and engaging the walls of said cavity, said ring member including means for rigidly expanding said ring against said cavity walls with substantially zero axial deflection.

4,678,336

## APPARATUS FOR DETECTING IMAGE AREA OF THIN PLATE

Teruo Tsunoda, Chiba, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 656,158

Int. Cl.<sup>4</sup> G01B 11/28

U.S. Cl. 356—380

4 Claims

1. An apparatus for detecting an image area of a thin plate comprising:

a housing having a vertical side plate at one side thereof, said

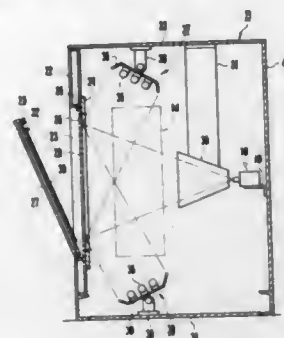
vertical side plate having an opening;

a door movable to close/open said opening;

a holder for removably mounting the thin plate such that



when said door is closed said plate covers at least a portion of said opening;  
photographic means mounted inside said housing so as to oppose said vertical side plate; and



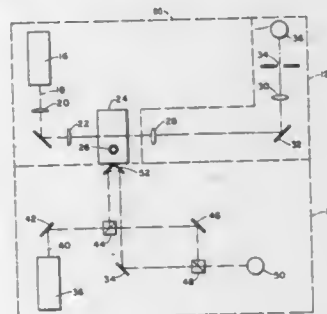
illumination means mounted on inner surfaces of upper and lower plates and side plates of said housing, each of said illumination means having three fluorescent lamps and being perpendicular to said vertical side plate in such a manner that illumination directions of said illumination means are directed toward said thin plate.

**4,678,337**  
**LASER BASED GAGING SYSTEM AND METHOD OF USING SAME**  
David A. Cohen, and David M. Papurt, both of Cambridge, Mass., assignors to Laser Metric Systems, Inc., Cambridge, Mass.

Filed May 3, 1985, Ser. No. 730,200  
Int. Cl.<sup>4</sup> G01B 11/02

U.S. Cl. 356-387

25 Claims



1. A method of measuring, comprising the steps of:  
providing a laser beam;  
moving an object to be measured through the beam;  
imaging onto a first plane a light pattern formed in a second plane, said light pattern including a diffraction pattern caused by interaction of the beam and the object, said second plane being adjacent the plane perpendicular to the beam that is first entered by the object;  
sampling the intensity of the light pattern in the first plane over a fraction of its extent said fraction being sufficiently small to enable resolution of the diffraction pattern;  
measuring the distance traveled by the object while the intensity is below a threshold value; and  
calculating the dimension of the object in the direction of movement of the object from the distance traveled by the object.

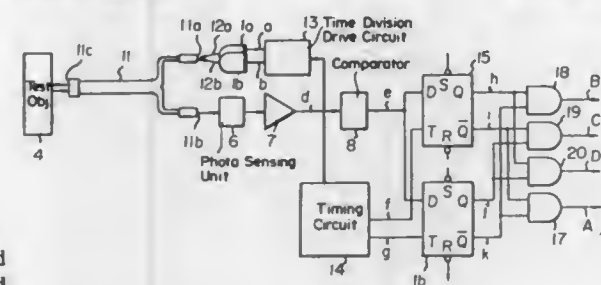
**4,678,338**  
**COLOR SENSOR**  
Kenichi Kitta, Tokyo; Yasunori Kanazawa, Hachioji, and Yoshiro Otomo, Mitaka, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Nov. 22, 1983, Ser. No. 554,363  
Claims priority, application Japan, Nov. 22, 1982, 57-203762; Nov. 22, 1982, 57-203763; Nov. 27, 1982, 57-206856; Nov. 27, 1982, 57-206857

Int. Cl.<sup>4</sup> G01J 3/50

U.S. Cl. 356-402

10 Claims



1. A color sensor for recognizing the relative color of an object comprising:  
first illumination means for supplying light of a first wavelength to said object;  
second illumination means for supplying light of a second wavelength different from said first wavelength to said object;  
means for monitoring said light of said first and second wavelengths from said object, and means for monitoring including,  
a single photosensor producing an output indicative of the quantity of light received from said object, and  
comparator means for comparing the output of said single photosensor to a reference value, the output of said comparator being a logical one when light supplied said photosensor exceeds said reference value and being otherwise a logical zero;  
timing control means for generating first and second alternate enable signals to enable said first and second illumination means, alternately; and  
hue determination means, operatively connected to said timing control means, for retaining the logical values developed by said comparator means, said hue determination means receiving first and second phase shifted latch timing signals developed by said timing control means to reset said hue determination means, said hue determination means developing at least three logical outputs, each representative of the presence or absence of a different color of said object.

**4,678,339**  
**SCREW EXTRUDER**  
Herbert Peiffer, Mainz, and Horst Eberhardt, Walluf, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
Filed Aug. 15, 1985, Ser. No. 765,720  
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430254

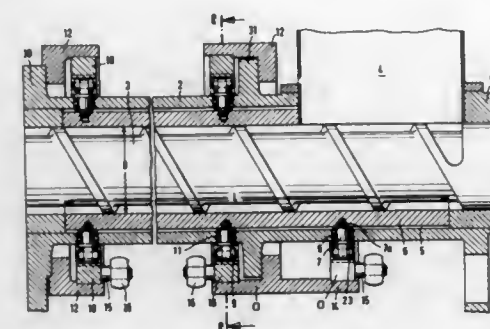
Int. Cl.<sup>4</sup> B29F 3/01, 3/02

U.S. Cl. 366-76

25 Claims

1. A screw extruder, comprising:  
a barrel;  
means defining a material intake in said barrel;  
an extruder screw positioned in said barrel;  
a feed bush, coaxially surrounding said extruder screw, having an inner circumference and a side opposite said material intake, and being positioned about the material intake;  
means defining a plurality of longitudinally extending

grooves circumferentially positioned about the inner circumference of said bush and having a predetermined depth;



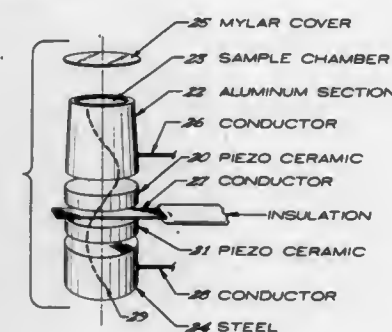
an adapter positioned in each of said plurality of grooves; and  
adjustment means for radially adjusting said adapters relative to said extruder screw over the depth of said grooves.

**4,678,340**  
**SAMPLE HOLDER FOR POWDER X-RAY DIFFRACTOMETER**  
Roland Boese, Essen, Fed. Rep. of Germany, assignor to Nicolet Instrument Corporation, Madison, Wis.  
Continuation of Ser. No. 655,330, Sep. 27, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,964

Int. Cl.<sup>4</sup> B01F 11/02

U.S. Cl. 366-111

11 Claims



1. An x-ray powder diffractometer comprising:  
x-ray source means;  
x-ray detector means; and  
sample holder means for positioning a sample to be analyzed intermediate said source means and detector means, said sample holder means comprising sample chamber means for accepting a sample to be analyzed and ultrasonic generator means operatively connected to said sample chamber means for inducing ultrasonic vibration within a sample within said sample chamber means.

**4,678,341**  
**INTEGRATED LIQUID DISTRIBUTION APPARATUS**  
William C. Stuckey, 1503 Virginia St., East, Charleston, W. Va. 25311

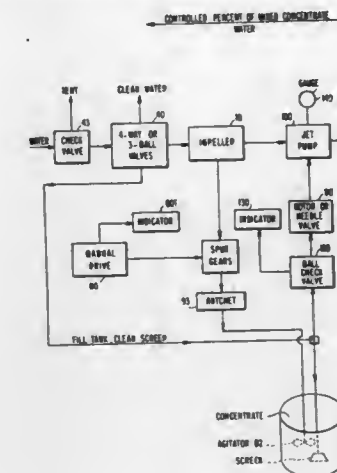
Filed May 16, 1985, Ser. No. 734,732  
Int. Cl.<sup>4</sup> B01F 15/00

U.S. Cl. 366-142

25 Claims

1. In a water operated dispersion system in which water under pressure drives a rotor coupled to an agitator immersed in a constituent to be mixed and dispersed with the water, and

water from said rotor operates a jet pump having a suction passage for suctioning said constituent from a container there-



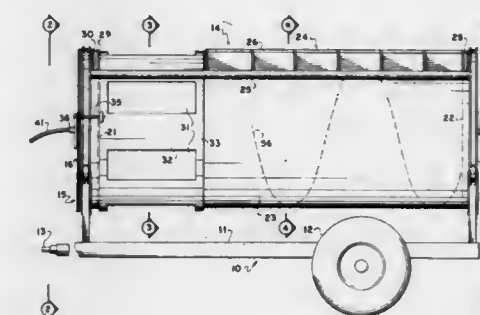
for, the improvement comprising, means for indicating to the user operation of said agitator means.

**4,678,342**  
**DRUM FOR MIXING AND DISPENSING FEED MATERIAL**  
Austin L. Dalman, Box 261, Baldur, Manitoba, Canada R0K 0B0

Filed Aug. 26, 1985, Ser. No. 769,426  
Int. Cl.<sup>4</sup> B01F 9/04, 15/02

U.S. Cl. 366-186

18 Claims



1. Apparatus for mixing and dispensing material comprising a cylindrical drum having end walls and a cylindrical peripheral wall for receiving and containing the material, means mounting the drum for rotation about a substantially horizontal axis arranged longitudinally of the drum, an inlet opening in the drum through which said material can be introduced into the drum, means for preventing escape of said material from said drum through said inlet opening during said rotation thereof for mixing said material, a plurality of separate outlet opening means in said peripheral wall at an axially aligned position, each extending angularly around the wall and each in angularly spaced relation to an adjacent opening whereby rotation of said drum causes said material to be deposited from said drum by gravity at said axially aligned position, cover means mounted on said drum for corotation therewith and movable relative thereto from a first position for closing said outlet opening means to a second position in which all of said outlet opening means are opened and conveyer means for collecting said deposited material and conveying it from the drum for dispensing.







a snubber preventing the pulley from moving in a direction that would result in a decreased cable tension, and means for disengaging the snubber from the pulley when the carriage is at one end of its range of motion to allow the cable tension to be decreased if it is greater than the predetermined tension.

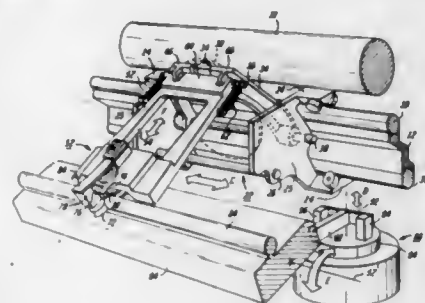
4,678,355

# PRINT TIP CONTACT SENSOR FOR QUIET IMPACT PRINTER

Andrew Gabor, Alamo; John C. Dunfield, San Jose; George W. Bowers, Jr., Hayward, and Richard G. Crystal, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.  
Filed Jul. 2, 1985, Ser. No. 751,349  
Int. Cl. B41J 9/36, 1/30

U.S. Cl. 400—389

4 Claims



1. An impact printer including a platen, selectable character elements, an impacting element movable toward and away from said platen, and means for driving said impacting element to impart a printing force to a selected character element, to drive it to deform said platen, said printer being characterized by:

- said impacting element including sensor means thereon for generating a signal indicative of the initiation of said deformation, and
- said means for driving comprising force applying means responsive to said signal for accelerating said impacting element to cause said deformation.

4,678,356

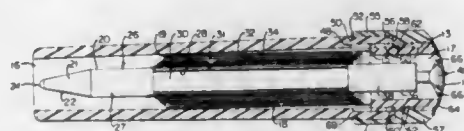
# EXTENDABLE WRITING INSTRUMENT

Thomas N. Garland, 617 W. Kiowa Ave., Fort Morgan, Colo. 80701

Filed Jul. 3, 1985, Ser. No. 751,690  
Int. Cl. B43K 23/00

U.S. Cl. 401—95

11 Claims



1. In an extendable writing implement, the combination comprising:

- a tubular housing having an inner surface, an outer surface, and first and second ends, a cylindrical writing element insertable within said housing having an operative end extendable through said first end of said housing, a support end releasably retainable in said second end of said housing and axially spaced external shoulders between said operative end and said support end;
- releasable retaining means disposed adjacent to said second end of said housing, said retaining means operative to

engage said support end and releasably retain said writing element within said housing; and

extension means received in said housing and disposed between said housing and said writing element, said extension means including a helical coil member having an outer portion engageable with said inner surface of said housing and an inner portion disposed in closely surrounding relation to said writing element between said shoulders on said element, said inner portion freely rotatable with respect to said writing element, said extension means being movable between a retracted position in which said support end of said writing element is retained in said second end of said housing and an extended position in which said operative end of said writing element is advanced beyond said first end of said housing, and said coil member pretensioned in a direction to urge said writing element toward said extended position.

4,678,357

# DEVICE FOR BINDING HOLED SHEETS

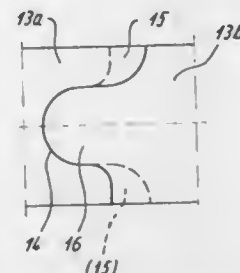
Karl-Helz Kissel, Espelkamp, and Siegfried Oevermann, Hille, both of Fed. Rep. of Germany, assignors to Robert Krause GmbH & Co. KG, Espelkamp, Fed. Rep. of Germany  
Filed Feb. 13, 1986, Ser. No. 829,696

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 8504460[U]

Int. Cl. B42F 3/04

U.S. Cl. 402—39

2 Claims



1. A device for binding holes sheets, comprising an elastic cover connectable to a book-binding cover; supporting elements elastically supported in said elastic cover; and at least two ring halves made of metallic wire and fastened in said supporting elements, said two ring halves having ends cooperating with each other and engageable with one another so as to form in a closed position a ring locked so that a displacement of said ring halves relative to each other in a direction transverse to a closing direction is prevented, said ends of said two ring halves each being provided with tooth-shaped projections extended in two different axes and with tooth-gap-shaped recesses receiving respective projections of the other ring half so as to form a locking connection, the direction of axes of recesses (14, 17) being offset by 90° to the direction of axes of said projections (15, 16), a toothed-shaped projection (15) of one ring half (13a) being positioned in a middle region of a tooth gap-shaped recess (14) of said one ring and a recess (17) of the other ring half (13b) being arranged in a middle region of a tooth-shaped projection (16) of said other ring half.

4,678,358

# GLASS COMPRESSION SEALS USING LOW TEMPERATURE GLASS

Francis W. Layher, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 15, 1985, Ser. No. 754,714

Int. Cl. C03C 27/08

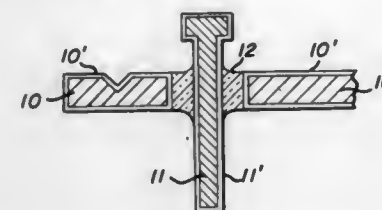
U.S. Cl. 403—28

6 Claims

1. A glass to metal compression seal for accommodating hermetically sealed lead-in conductors in a metal housing, said seal comprising:

a housing consisting of a metal shell having apertures located therein where said lead-in conductors are to be established;

a preplated lead-in conductor extending through each of said apertures; and



a low melting sealing glass, having a working temperature approximately below 480° C., located in said apertures and surrounding said lead-in conductors so as to mechanically secure them in hermetic relationship to said housing, said sealing glass having a thermal coefficient of expansion that is substantially lower than that of said metal shell whereby said seal is under compression after its formation.

4,678,359

# DEVICE COMPRISING A FRAME OF LENGTHS OF TUBE AND COUPLING PIECES AND COUPLING PIECE FOR THE SAME

Keen, Egbert, 27, Lijsterbesstraat, 9861 EA Grootegast, Netherlands

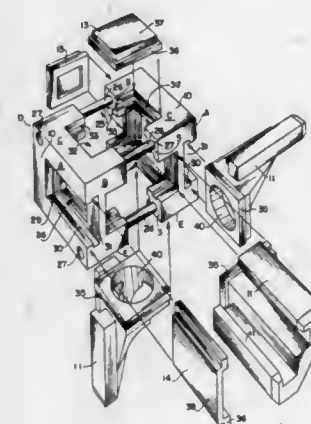
Filed Feb. 14, 1985, Ser. No. 701,510

Claims priority, application Netherlands, Feb. 17, 1984, 8400519

Int. Cl. F16D 1/00

U.S. Cl. 403—170

8 Claims



1. In a composite frame assembly, the combination of a coupling piece of hollow, cubic form presenting two parallel head faces and four side faces, said coupling piece being formed of two identical parts separated along a plane parallel to said head faces to allow said parts to be brought together into the cubic form and so that each side face is perpendicular to such plane; connecting means for securing said parts together; at least one of said side faces having a recess therein leading to the interior of said coupling piece and defining a pair of grooves in each part in which each pair of grooves is aligned with the other pair of grooves at said plane and extends therefrom toward but short of a head face of its corresponding part; an arm member having a base portion and an arm projecting perpendicularly from said base portion to define a longitudinal axis, said base portion defining parallel flanges held captive within said grooves when the parts are secured together so that the arm member may be oriented in one of at least two rotational positions about said axis relative to said one side face prior to said parts being brought together, said arm having a

tubing-receiving portion which is asymmetrical relative to said axis; and a length of tubing having an asymmetrical interior adapted to receive said tubing-receiving portion of the arm.

4,678,360

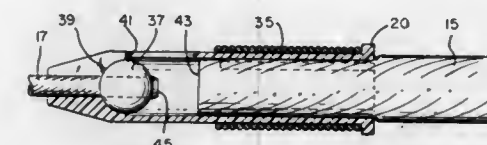
# QUICK CONNECT/DISCONNECT ELEMENT FOR LINES

James R. Miller, 4910-23rd Ave., W., Everett, Wash. 98203  
Filed Jul. 29, 1986, Ser. No. 891,243

Int. Cl. B25G 3/00

U.S. Cl. 403—353

8 Claims



1. An article for connecting first and second lines, wherein at least the second line is compressible and has a retainer element which is larger than the diameter of the second line secured thereto in the vicinity of one end thereof, the article comprising:

- a connector element having one portion adapted to receive the first line and being configured and arranged such that said first line can be permanently secured in said one portion and having another portion adapted to receive the second line, said another portion including an interior channel which extends into said connector element from one end thereof a distance which is substantially greater than the diameter of the second line and which terminates in an interior cavity, wherein said interior channel has a diameter which is large enough to accommodate the second line but not the retainer element and wherein said interior cavity is large enough to accommodate the retainer element, said connector element further including a slot which communicates said interior channel to the exterior of said connector element and which terminates in an opening which is large enough to admit the retainer element and communicates with said interior cavity, wherein the width of said slot is slightly smaller than the diameter of the second line when it is not compressed but large enough to pass the second line when it is compressed.

4,678,361

# SHAFT CONNECTION ARRANGEMENT

Reinhard Steinkämper, Stuttgart; Wolf Boll, Weinstadt, and Karl Peitsmeier, Neuhausen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

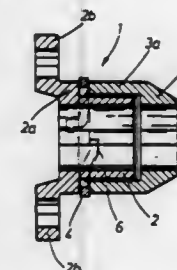
Filed Oct. 23, 1985, Ser. No. 790,516

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1984, 3438918

Int. Cl. B25G 3/28; F16B 3/00

U.S. Cl. 403—359

7 Claims



1. A driving connection for a safety steering column for a vehicle, comprising:



first coupling part means having axial guide means for guiding axial movement of said first coupling part means on a steering shaft means;

second coupling part means having axial guide means for guiding axial movement of said second coupling part means on said steering shaft means;

resilient means interposed between said first and second coupling part means for biasing said first coupling part means and said second coupling part means in opposite rotational direction with respect to one another;

wherein said coupling means is a two part bore hub comprised of a main hub part and additional hub part mounted around said shaft, wherein said shaft and said two part bore hub are splined; wherein said resilient means is a leg spring; and

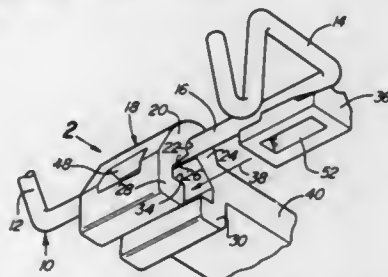
wherein said additional hub part includes a tension nut, and said main hub includes an externally threaded end section for threadably engaging said additional hub part, and wherein said leg spring biases said tension nut in the screwing direction.

**4,678,362**  
**SHAFT RETAINER**

Joseph T. Betterton, Arab, and Alfred H. Glover, Decatur, both of Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 14, 1986, Ser. No. 851,745  
Int. Cl.<sup>4</sup> F16B 7/08

U.S. Cl. 403—373



1. A shaft retainer adapted to encircle a shaft midportion without need of axial movement of the shaft end portions through the retainer, comprising:

a body portion of the retainer having circularly configured first channel means extending therethrough and laterally opened sufficiently to receive the midportion of the shaft; the body portion of the retainer being of sufficiently flexible material to laterally insert the midportion of the shaft into the first channel means for engagement between the retainer body and the shaft over more than 180 degrees of the shaft circumference;

the body portion further having a pair of substantially parallel leg portions which form an aperture therebetween through which the midportion of the shaft can be inserted prior to insertion into the first channel means, the leg means also defining a second channel means between the aperture and the first channel means which is interconnected with the first channel means and the aperture to define a substantially triangularly configured aperture through the body member in a cross-sectional aspect thereof;

a lock key member having a substantially triangular configuration conforming to the configuration of the second channel means so that the lock key member may slide within the body portion in the axial direction of the shaft midportion through the second channel means, the lock key member having an upper curved surface portion adapted to complement the surface of the circular first channel means to provide a full 360 degrees supporting contact with the midportion of the shaft;

window means formed in the body portion of the retainer extending to the second channel means therein;

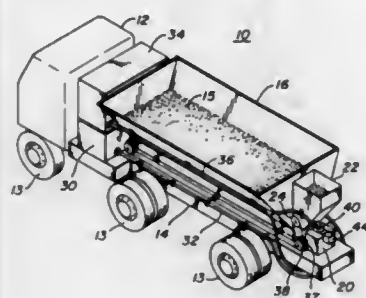
the lock key member having a raised surface means or pro-

jection thereon in a position to permit extension into the window means of the retainer body when the lock key member is in a desired axial position along the shaft when in an assembled position.

**4,678,363**  
**POTHOLE PATCHER AND ROAD SURFACING DEVICE**  
Carl L. Sterner, 20838 Nord Rd., Bakersfield, Calif. 93312  
Filed Jun. 12, 1986, Ser. No. 873,387  
Int. Cl.<sup>4</sup> E21C 19/05

U.S. Cl. 404—75

18 Claims



1. In a movable road repair and surfacing vehicle of the type having a frame, an aggregate material hopper mounted on said frame, a container for binder material, conveyor means associated with said hopper for carrying said aggregate material, a discharge chute associated with said conveyor means for receiving said aggregate material carried thereon and directing said material downwardly, a discharge outlet on said chute for dispensing said aggregate material therefrom for deposit on a roadway surface, and means for spraying said binder material on said dispensed aggregate material, the improved apparatus for applying asphalt coated aggregate to the roadway surface comprising:

- a hollow tube rotatably mounted within and extending below said outlet of said aggregate discharge chute,
- at least one projection mounted on the periphery of said hollow tube for premixing said aggregate material moving downwardly in said discharge chute,
- means attached to said hollow tube adjacent the bottom thereof for causing said aggregate material to swirl as it drops downwardly to said roadway surface from said discharge outlet, and
- means attached to said vehicle adjacent said discharge outlet for spraying said binder material on said swirling aggregate material after it leaves said discharge outlet but before it reaches said roadway surface.

**4,678,364**  
**TRACTOR-DRAWN FORMING TOOL FOR MAKING CONCRETE SLABS ON THE GROUND**

Yves Charonnat, Port Saint Pere, and Lucien Larribe, La Celle St. Cloud, both of France, assignors to VIAFRANCE and State of France as represented by the Ministry of Urban Planning, Housing and Transportation, Central Laboratory of Roads and Bridges, Paris, France

Filed Mar. 13, 1986, Ser. No. 839,354

Claims priority, application France, Mar. 14, 1985, 85 03729  
Int. Cl.<sup>4</sup> E01C 19/22

U.S. Cl. 404—105

10 Claims

1. A molding tool of the sliding mold type for the formation of cementitious concrete slabs from freshly deposited cementitious concrete, made to be tractor-drawn by any tractor-feeder unit able to deposit the cementitious concrete on the ground in a predetermined amount, comprising:

two hitching arms able to be mounted to pivot at their front end, for purposes of traction;

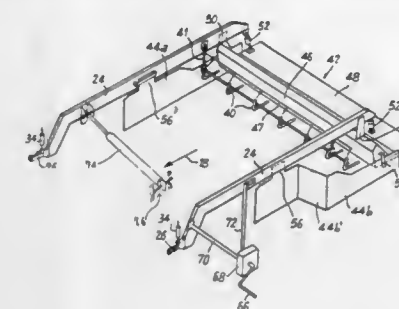
immersion vibration means mounted downstream from the

tractor-feeder unit and made to subject the freshly deposited cementitious concrete to a vibration; and

molding means, including:

side elements for confinement of the freshly deposited cementitious concrete;

an upper element having a back part forming an upper molding plate for floating said tool on an upper surface of a layer of freshly deposited cementitious concrete beneath said back part, means for transmitting a reac-



tion force of said layer of said freshly deposited cementitious concrete beneath said back part to said arms; and

a front part rigidly mounted in a region at a back end of said arms downstream from said immersion means, said front part and said back part being attached to each other along longitudinal edges thereof, said front part being upwardly inclined from said back part, whereby said tool is floatable and is supported solely upon said upper surface.

**4,678,365**  
**MATERIAL SPREADER**

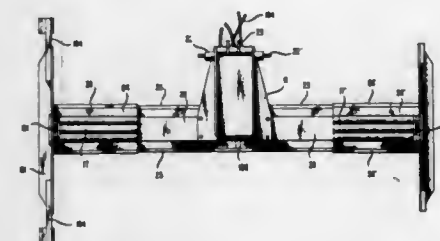
Thomas R. Ban, Redondo Beach; Ernest E. Dusterhoft, Culver City, and John E. Gilmore, Los Angeles, all of Calif., assignors to Tricon Industries, Los Angeles, Calif.

Filed Jan. 24, 1986, Ser. No. 822,276

Int. Cl.<sup>4</sup> E01C 19/22

U.S. Cl. 404—118

5 Claims



1. A spreader apparatus to be towed by a traction device comprising:

a main body section having forward and rear blade surfaces, at least three pipes longitudinally mounted in a horizontal manner within the main body,

two wings moveably mounted over said main body section, said wings having forward and rear blade surfaces, at least three pipes longitudinally mounted in a horizontal manner within each of said wings, said pipes positioned to slide coaxially within the main body pipes when the wings are mounted on the main body,

two independently operable hydraulic cylinders mounted within the main body and wings with one end of each hydraulic cylinder attached to the main body and the other end of each hydraulic cylinder attached to each wing, said hydraulic cylinders connected to a system to

operatively move the wings across the outer surface of the main body,

a second set of independently operable hydraulic cylinders each vertically mounted at the outer end of each of the wings,

end components moveably mounted to the outer ends of the wings and then secured to the tops of the vertically mounted hydraulic cylinders, said components moveable in a vertical direction,

said second set of hydraulic cylinders connected to a system to operatively move the end components in a vertical direction.

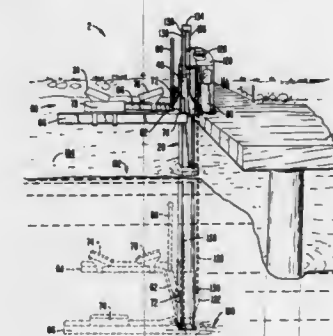
**4,678,366**  
**BOAT LIFT**

James W. Williamson, P.O. Box 93, Tahoe City, Calif. 95730  
Filed Jul. 31, 1985, Ser. No. 761,204

Int. Cl.<sup>4</sup> B63C 3/06

U.S. Cl. 405—3

29 Claims



1. A vessel lift comprising:

a vertical H-beam shaft having a central web and first and second flanges, the central web having first and second faces and the flanges having inner surfaces facing one another;

a slidable shaft housing fitted over said H-beam;

a vessel support frame mounted to said housing;

a vessel lifting mechanism operably coupled to the housing; and

low friction means, mounted to the housing, for engaging the first and second faces of central web and the inner surfaces of the flanges of the H-beam to transfer loading forces exerted by the vessel on the support frame from the housing to the H-beam.

**4,678,367**  
**RISER ASSEMBLY FOR A SUB-SURFACE IRRIGATION AND DRAINAGE SYSTEM**

James I. Warner, R.R. 2, Box 106, Fairfield, Iowa 52556  
Filed Jan. 29, 1986, Ser. No. 823,725

Int. Cl.<sup>4</sup> E02B 11/00, 13/00

U.S. Cl. 405—39

19 Claims

1. A riser assembly for a sub-surface irrigation and drainage system having at least one underground tile pipeline, the riser assembly comprising:

(a) a housing defining a hollow, elongated, upwardly opening cavity, the housing having an upstream side and downstream side;

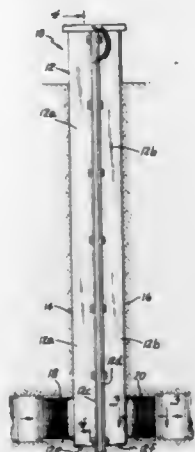
(b) an upstream tile section mechanically interlocked with the material forming the upstream side of the housing so as to be permanently attached thereto;

(c) a downstream tile section mechanically interlocked with the material forming the downstream side of the housing so as to be permanently attached thereto;

(d) a divider mounted within the housing and extending

generally parallel to the upstream and downstream sides so as to divide the elongated cavity into an upstream chamber communicating with the upstream tile section and a downstream chamber communicating with the downstream tile section, the divider defining a lower drainage opening and an upper weir opening;

(e) a first gate valve slidably attached to the divider adjacent



the lower drainage opening such that, as the gate valve is raised or lowered the drainage opening is opened or closed, respectively; and,

(f) a second gate valve slidably attached to the divider adjacent to the upper weir opening to adjust the height to which the water must rise to pass from the upstream chamber to the downstream chamber when the drainage opening is closed.

4,678,368

#### CANAL COVERING SYSTEM AND METHOD OF INSTALLING SAME

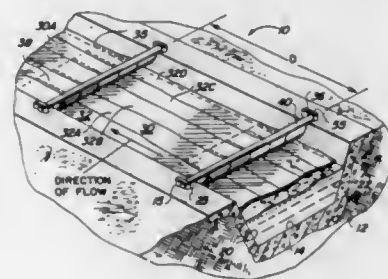
Frederick D. Helversen, 300 Sand Hill Cir. #206, Menlo Park, Calif. 94025

Filed Jul. 11, 1986, Ser. No. 884,648

Int. Cl.<sup>4</sup> E02B 5/00, 13/00

U.S. Cl. 405—118

10 Claims



1. A floating cover system for a water transportation canal having opposite banks and defining a channel therebetween for containing water with the surface of the water exposed to the environment, said cover system comprising:

(a) a first cover assembly including:

- (i) anchor means located at opposite banks;
- (ii) a transverse support member extending between said anchor means and removably received therein; and
- (iii) cover means having a free end and a fixed end secured at said support member and adapted to float upon and overlie the fluid surface;

(b) a second cover assembly including:

- (i) anchor means located at opposite banks;

- (ii) a transverse support member extending between said anchor means and removably received therein; and
- (iii) cover means having a free end and a fixed end secured at said support member and adapted to float upon and overlie the fluid surface; and
- (c) said second cover assembly being spaced from said first cover assembly a predetermined distance along said canal whereby a portion of the first cover assembly spaced from the said free end of the first cover assembly overlaps a predetermined portion of the second cover assembly when fluid is flowing in the said channel.

4,678,369

#### METHOD AND ARRANGEMENT FOR SEALING OFF DUMPS TO PREVENT SEEPAGE

Eberhard Gläser, Alchwald, Fed. Rep. of Germany, assignor to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

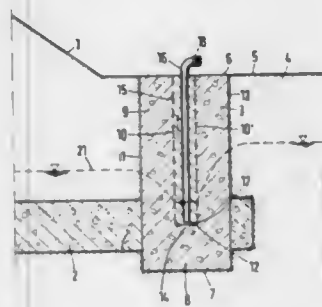
Filed May 17, 1985, Ser. No. 735,385

Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419163

Int. Cl.<sup>4</sup> B09B 1/00

U.S. Cl. 405—129

23 Claims



1. An apparatus for vertically sealing off dumps to prevent the seepage of water therefrom, including a sealing wall directed upwardly around the dump area which is to be sealed off; said apparatus comprising:

- at least one drainage sheet which extends circumferentially around the dump area including the peripheral length of said sealing wall, said drainage sheet having a permeability value greater than that of said sealing wall;
- means for producing in said sealing wall a hydraulic gradient relative to the surroundings via liquid level in said drainage sheet lying lower than liquid level in a region externally of the apparatus;
- means for collecting said seepage water in said at least one drainage sheet via said hydraulic gradient;
- means for determining in a controlled manner the occurrence and quantity of said seepage water; and
- means for withdrawing accumulated seepage water from said at least one drainage sheet of said sealing wall.

4,678,370

#### SEWER RENOVATION SYSTEM

Peter Allen, Queensland, Australia, assignor to Danby Pty. Ltd., Queensland, Australia

Filed Oct. 16, 1985, Ser. No. 788,019

Claims priority, application Australia, Dec. 4, 1984, PG8408; May 16, 1985, 42585/85

Int. Cl.<sup>4</sup> F16L 1/00, 9/16, 55/18

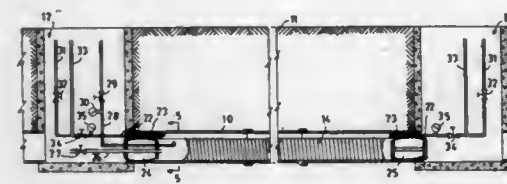
U.S. Cl. 405—154

3 Claims

1. A method of lining a sewer pipe including the steps of: continuously forming a liner of helically wound and inter-engaging strip and feeding it into a sewer to be lined; sealing the end portions of the thus formed liner to the sewer pipe;

setting removable plugs into the ends of the liner;

pressurizing the liner by introducing fluid thereinto under pressure, said plugs retaining such fluid in said liner; pumping a cementitious grout under pressure into the space between the liner and the pipe, the grout being introduced initially by inlet pipes to a lower part of the space while



permitting displaced air to be removed from the upper part of the space, and being subsequently introduced by further inlet pipes to the upper part of the space to totally fill the space; and removing the plugs from the ends of the liner after the grout has set.

4,678,371

#### BURYING DEVICE FOR SUBMARINE CABLES AND METHOD FOR GUIDING THE SAME

Kazuomi Yamamura, Yokohama; Hideo Isibara, Kamakura; Yoshinao Iwamoto, Fujimi; Shizuo Suzuki, Yokohama; Yuichi Sirasaki, Tokyo, and Kenichi Asakawa, Hachiohji, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

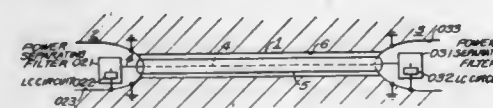
Continuation of Ser. No. 746,345, Jun. 19, 1985, abandoned, which is a division of Ser. No. 282,876, Jul. 31, 1981, Pat. No. 4,540,942. This application Jul. 10, 1986, Ser. No. 883,450

Claims priority, application Japan, Jul. 16, 1980, 55-96252; Jul. 16, 1980, 55-96253

Int. Cl.<sup>4</sup> F16L 1/04

U.S. Cl. 405—164

2 Claims



1. A method of guiding cable burying apparatus, for burying a submarine cable, comprising the steps of:

- (a) coupling a tracking signal supplying device having an exciter coil, to the submarine cable;
- (b) supplying an AC signal current to the exciter coil to thereby induce an AC signal current, as a tracking signal, in the submarine cable;
- (c) detecting the position of said submarine cable with an AC signal magnetic field generated by the induced AC signal current, with a magnetic sensor system on the cable burying apparatus; and
- (d) guiding the cable burying apparatus along the submarine cable in accordance with the detected position, the burying the submarine cable.

4,678,372

#### RAISING METHOD AND DEVICE, IN PARTICULAR FOR AN OIL EXPLOITING PLATFORM

Jean Pierre Cousty, Bezons, France, assignor to Technip Geoproduction, Paris La Defence, France

Filed Aug. 7, 1986, Ser. No. 894,120

Claims priority, application France, May 2, 1986, 86 06402

Int. Cl.<sup>4</sup> E02B 17/08

U.S. Cl. 405—196

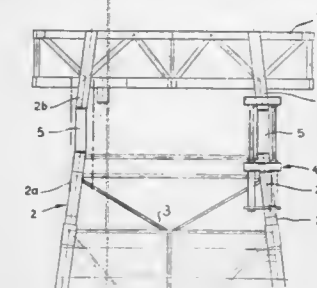
12 Claims

1. A method for raising in particular an offshore oil exploiting platform comprising legs bearing on the sea bed, and a deck carried by the legs, said method comprising the following steps:

- (a) fixing on each of the legs a raising device forming a

reinforcing device having regions of the fixing of the device to the respective leg which are located on each side of a region of the leg to be cut, and putting the raising device under load;

(b) effecting in said cutting region of the leg a cut so as to divide the leg into a lower portion which bears on the sea bed and an upper portion connected to the deck;



- (c) when all the legs of the platform have been cut, actuating the raising devices associated with the respective legs so as to shift the platform to an extent corresponding to the desired raising while controlling the attitude of the platform, and fixing between the ends of the portions of each leg a heightening element which again interconnects the two portions of the leg, and
- (d) removing the raising devices.

4,678,373

#### APPARATUS FOR AND METHOD OF SHORING A STRUCTURE

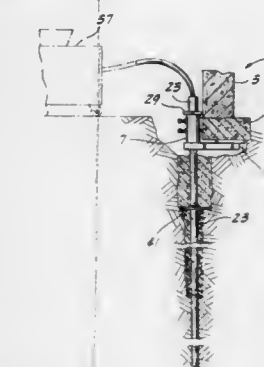
George F. Langenbach, Jr., Crestwood, Mo., assignor to Perma-Jack Company, St. Louis, Mo.

Filed Mar. 27, 1985, Ser. No. 716,746

Int. Cl.<sup>4</sup> E02D 5/20, 35/00

U.S. Cl. 405—230

20 Claims



1. A shoring system comprising support means engageable with a foundation or the like, a pile adapted to be driven into the ground adjacent the support means, said pile having a substantially uniform outer diameter, a plurality of footing structures, one or more of which are adapted to be selectively mounted in fixed position relative to the pile on the outside of the pile to extend circumferentially of the pile in a plane generally at right angles to the central longitudinal axis of the pile, each footing structure having an outer diameter substantially greater than the outer diameter of the pile and being engageable with the soil as the pile is driven downwardly thereby substantially to increase the load-bearing capability of the pile by increasing its resistance to downward movement through the soil whereby the depth to which the pile must be driven to shore the foundation is reduced, and means for securing the pile to said support means after said pile and said one or more



footing structures thereon have been driven to a depth sufficient to shore the foundation.

# 4,678,374 ROOF BOLT WITH EXPANSION SHELL AND THREADED NUT

Frank Calandra, Jr., Pittsburgh, Pa., assignor to Jenmar Corporation, Pittsburgh, Pa.  
Continuation of Ser. No. 808,874, Dec. 13, 1985, abandoned, which is a continuation of Ser. No. 644,347, Aug. 27, 1984, abandoned. This application Sep. 17, 1986, Ser. No. 908,338  
Int. Cl.<sup>4</sup> E21D 20/02

U.S. Cl. 405—261

10 Claims



1. Apparatus for supporting a rock formation comprising, an elongated rod positioned in a bore hole of a rock formation, said rod having a first threaded end portion and a second threaded end portion, said rod first threaded end portion being positioned adjacent the end of the bore hole, said rod second threaded end portion extending out of the bore hole, an expansion shell assembly engaged to said rod first threaded end portion, a bearing plate positioned on said rod second threaded end portion, a nut engaging said rod second threaded end portion below said bearing plate, stop means for abstracting axial movement of said nut beyond a first position on said rod second threaded end portion to permit said initial rotation in said preselected direction of said nut and said rod as a unit, said expansion shell assembly operable upon rotation of said rod in said bore hole to anchor said rod in a fixed position in said bore hole, said stop means being operable to permit axial movement of said nut on said rod second threaded end portion when a predetermined torque is exceeded during said continued rotation of said nut and said rod in said preselected direction, and said nut being rotatable relative to said rod and operable to advance during further rotation of said nut in said preselected direction to a second position on said rod second threaded end portion to urge said bearing plate against said rock formation and tension said rod.

# 4,678,375 COVERING OR LINER SYSTEM AND METHOD FOR CONSTRUCTING THE SAME

Duane W. Gagle, Bartlesville; Duane W. Gagle, Jr., Tulsa; Richard L. Gagle, Broken Arrow, all of Okla., and Paul L. Gomory, Bethesda, Md., assignors to Gagle Company, Inc., Broken Arrow, Okla.

Filed Mar. 5, 1984, Ser. No. 586,128

Int. Cl.<sup>4</sup> E02B 3/00

U.S. Cl. 405—270

29 Claims



1. A system composed by joining together as at their edges, a multiplicity of sections of impervious material comprising: an impervious liner layer of the joined sections which as being installed and joined together and thereafter can have a substantial portion of its area exposed to the atmosphere and which in position of said joined sections is able to withstand dislodgement or damage by wind and/or ground fluid, said liner layer being adapted to contain, retain, or to fend off a fluid from contact as with a substance below it; non-liner perforating anchoring means all of which is disposed entirely below said liner layer; said liner layer being attached to said anchoring means at a plurality of loci distributed throughout the area espoused by said portion of said system; said anchoring means being adapted to hold down and holding down said liner layer entirely from below said liner layer at each of said plurality of loci of said liner layer in a stable, fixed, desired position and in a manner such that at each said loci of said liner layer the acting fixing strength of said anchoring means is at least equal to the maximum force of said wind and/or fluid expected to act at any time at said loci regardless of whether any force is acting at said time at any other said loci of said liner layer; said loci being arranged at places at which said sections are joined together.

# 4,678,376 METHOD OF CONSTRUCTING MEANS FOR DIRECTING OR HOLDING WATER

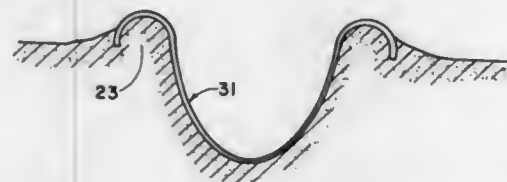
John D. Gavin, Jr., and Michael D. Meddaugh, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 30, 1981, Ser. No. 288,254

Int. Cl.<sup>4</sup> E02B 5/02

U.S. Cl. 405—270

8 Claims



1. A method of constructing a means suitable for directing, transporting, or holding water comprising  
(A) treating the surface soil of the earthen depression by spraying the surface with a first aqueous liquid silicone elastomeric emulsion curable at atmospheric conditions having a solids content of from about 10 percent to about 20 percent by weight, thereafter,  
(B) spraying the surface with a second aqueous liquid elastomeric emulsion curable at atmospheric conditions comprising  
(a) 100 parts by weight of an anionically stabilized, hy-

droxyl endblocked polydiorganosiloxane present as an oil-in-water emulsion,  
(b) from 1 to 150 parts by weight of colloidal silica,  
(c) from 0 to 200 parts by weight of filler other than colloidal silica, and  
(d) from 0.1 to 2.0 parts by weight of alkyl tin salt, said emulsion having a pH of from 9 to 11.5, the solids content of the emulsion being greater than 25 percent by weight based on the total weight of the emulsion, and simultaneously spraying chopped glass fibers into the emulsion at a rate sufficient to incorporate from 5 to 10 percent by volume of glass fibers based on wet emulsion coating;  
(C) allowing the emulsion coating to cure a reinforced membrane impervious to liquid water; then  
(D) stabilizing the membrane edges by burying.

# 4,678,377 DISPENSER FOR PARTICULATE MATTER

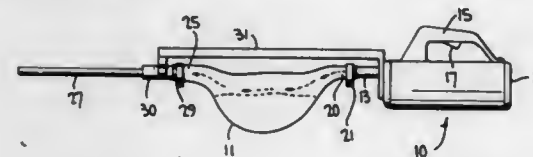
Antoine J. Bouchard, 131 Milford St., Ext., Apt. 6B, Plainville, Conn. 06062

Filed Apr. 19, 1985, Ser. No. 725,248

Int. Cl.<sup>4</sup> B65G 53/38

U.S. Cl. 406—139

6 Claims



1. Apparatus for dispensing particulate matter via a gaseous stream comprising:  
an amorphous, peripherally manipulable and flexible bag for containing said particulate matter, said bag having a gas inlet opening and a gas outlet opening;  
means for delivering a stream of gas into said bag via said inlet opening;  
means for discharging said gas from said bag via said outlet opening; and  
structural means for positioning said outlet opening in fixed spaced relation to said inlet opening;  
wherein said bag is manipulable to control the position of particulate matter therein to thereby control the amount of particulate matter discharged from said bag with said gaseous stream;  
wherein said means for delivering issues said stream of gas into said bag in a downstream direction, and wherein said structural means includes means for positioning said outlet opening generally downstream of said inlet opening;  
wherein said means for discharging is an air blower assembly having an air output port secured to said gas inlet inflow communication therewith, and wherein said structural means comprises:  
extension means rigidly secured to said air blower assembly and extending generally downstream from said air output port; and  
clamping means for securing said extension means to said bag proximate said outlet opening.

# 4,678,378 ADJUSTABLE DUAL DRILL ASSEMBLY

Jack B. Koczarski, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 2, 1986, Ser. No. 881,535

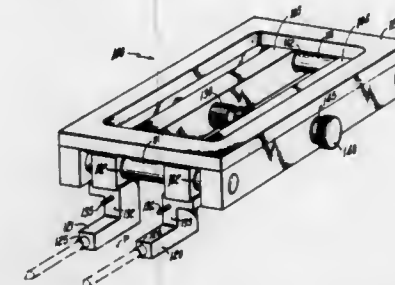
Int. Cl.<sup>4</sup> B23B 39/18, 41/00

U.S. Cl. 408—46

4 Claims

1. An assembly for a dual-bit drillgun having two flexible drive shafts and for drilling two holes spaced relative to a primary hole in a workpiece comprising:  
two guide shafts (110,111);

two bars (105,106) mounted on said guide shafts and movable relative to each other;  
two block assemblies (120,121) attached to each of said two bars (105,106);  
two rotatable shafts (125,126), each shaft passing through one of said block assemblies, each shaft having means adapted to receive a drill bit at one end thereof, and to be secured to a drive shaft at the other end thereof;



a threaded adjustment shaft means (130) interconnecting said bars (105,106) for varying the spacing between the bars; and  
a clamp assembly (200) mounted on said drill gun and including means (204,230,235,236,240,241) for releasably securing the block assemblies (120,121) at a selected spacing; and  
means for engaging the primary hole in a workpiece.

# 4,678,379 APPARATUS FOR MACHINING A VALVE'S SEAT

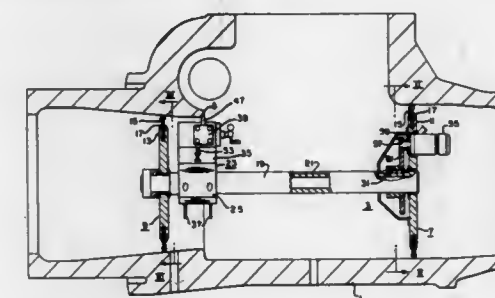
Lester R. Sunday, Springfield, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 26, 1986, Ser. No. 844,497

Int. Cl.<sup>4</sup> B23B 41/00

U.S. Cl. 408—83.5

1 Claim



1. Apparatus for machining a seat ring of a valve, said apparatus comprising:  
a pair of spiders having a plurality of adjustable arms which extend outwardly to contact an inner wall of said valve;  
a shaft having an end rotatably disposed in each of said spiders so that the shaft is axially aligned with the axis of said valve seat ring and having a keyway extending lengthwise along its length;  
means for rotating said shaft;  
a tool support affixed to said shaft at any location between said spiders by a key and split hub which clamps said shaft; said tool support having disposed thereon means for holding a cutting tool and for moving said cutting tool axially with respect to said shaft;  
said cutting tool being a single edge cutting tool, having a cutting edge ground to cut the proper shaped seat ring; and  
said tool support having means for radially adjusting the means for holding the cutting tool and moving it axially

with respect to the axis of the shaft to machine the seat ring of a valve.

4,678,380

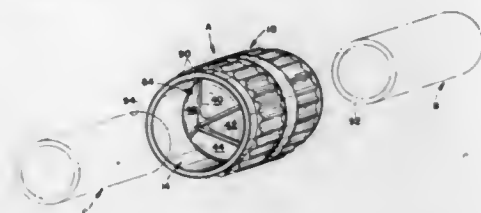
## DEBURRING TOOL

Emery J. Zahranec, Novelty, and James C. Musil, Sagamore Hills, both of Ohio, assignors to Crawford Fitting Co., Solon, Ohio

Filed Jan. 17, 1986, Ser. No. 819,722  
Int. Cl.<sup>4</sup> B23B 5/16; B23D 79/08

U.S. Cl. 408—211

14 Claims



1. A hand tool for deburring peripheral end portions of a generally cylindrical workpiece, said tool comprising:
  - a generally cylindrical housing having a longitudinal axis extending axially thereof, said housing having first and second open ends;
  - a generally conical blade support means disposed in said housing so as to have a base area adjacent said housing first end and an apex area spaced toward said housing second end at said longitudinal axis, said support means including plural apertures extending radially outward from said apex area in a first predetermined pattern and each having a predetermined unstressed width dimension;
  - a blade assembly mountingly supported by said support means, said blade assembly including a plurality of individual blades fixedly connected together so as to define a second predetermined pattern identical to said first pattern and received therein, each of said blades having first and second cutting surfaces spaced axially outward from inner and outer surfaces of said support means, each blade further having a predetermined thickness dimension which is substantially greater than said unstressed aperture width dimension whereby said blade assembly is retained in a desired supported position relative to said support means by a press fit relationship generated between each of said blades and respective apertures.

4,678,381

## PORTABLE MACHINING TURNTABLE

Earl D. Bailey, 2255 Montrose Ave., Montrose, Calif. 91020  
PCT No. PCT/US82/00381, § 371 Date Nov. 7, 1983, § 102(e)  
Date Nov. 7, 1983, PCT Pub. No. WO83/03378, PCT Pub.  
Date Oct. 13, 1983

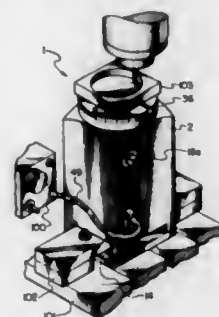
PCT Filed Mar. 29, 1982, Ser. No. 575,170  
Int. Cl.<sup>4</sup> B23Q 3/02, 17/00

U.S. Cl. 409—221

10 Claims

1. A portable machining turntable comprising:
  - (a) an integral elongated housing having two pairs of opposed parallel side walls forming a square cross section adapted to be clamped by a standard machine vise, and a top wall having a shallow third cavity or recess, said side walls and top forming a first cavity extending upwardly from the bottom, having a shallow second cavity extending over the opening of the first cavity, a first threaded bore located on one of the side walls of the first cavity in alignment with a second bore located on the opposite side wall, a third bore extending from the top of said housing and aligned with the center of the first cavity, a first threaded hole extending through one of the side walls in alignment with a second threaded hole through the oppo-

- site side wall, and a plurality of hold-down slots located in the lower outer sides of said side walls of said housing.
- (b) a first bushing and a second bushing inserted within the first bore and second bore respectively,
- (c) a worm drive assembly comprising:
  - (1) a worm shaft where the ends of said shaft are rotatably inserted and retained by said first bushing and said second bushing,
  - (2) a worm rigidly attached to said shaft,
  - (3) a first geared pulley rigidly attached to said shaft,
  - (4) a worm shaft retaining nut screwed into the first bore, where end of the worm shaft protrudes outside the nut,
  - (d) an electric stepping motor rigidly mounted to one of the inside walls in the first cavity of said housing,
  - (e) a second geared pulley rigidly attached to the shaft of said motor, and located on the same plane as said first geared pulley,
  - (f) a timing belt looped around and held tight by said first geared pulley and said second geared pulley,
  - (g) a first ball bearing race assembly having a plurality of bores housing an equal plurality of ball bearings and having a central bore extending therethrough where said assembly is set within the third cavity in said housing,
  - (h) a rotary head assembly comprising:
    - (1) a circular rotary head having a concentric first shaft and a contiguous second shaft of lesser diameter than the first shaft where a bottom of said head rests on top of said first ball bearing race assembly and where the first shaft extends through the bore in said first ball



- bearing race assembly and through the third bore in said housing,
- (2) a second ball bearing race assembly having a plurality of bores housing an equal plurality of ball bearings and having a central bore extending therethrough where said assembly is inserted about the second shaft of said rotary head,
- (3) a bushing inserted into the second shaft,
- (4) a pressure plate inserted onto the second shaft of said rotary head around said bushing and thus maintains the second ball bearing race assembly against the bottom of the first shaft,
- (5) a spacer inserted onto the second shaft where an upper end of said spacer rests against the bottom of said pressure plate,
- (6) a worm gear inserted onto the second shaft where its upper end rests against the bottom of said spacer, such that said worm gear meshes with said worm, where said worm gear is held radially stationary by a key lock and is maintained longitudinally in place by a combination compression washer and bolt inserted into the end of the second shaft,
- (i) a set of brakes and a corresponding set of brake adjusting screws inserted into the first threaded hole and second threaded hole in said housing,
- (j) an electrical female plug externally inserted through a fourth bore and attached to a wall of said housing, and
- (k) an electrical power cable having a corresponding male

connector that attaches to said female plug and supplies the power to operate said electric stepping motor.

4,678,382

## MACHINE TOOL SPINDLE AND TOOL HOLDERS SUITABLE FOR USE THEREWITH

Otto Eckle, Loebgau, Fed. Rep. of Germany, assignor to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

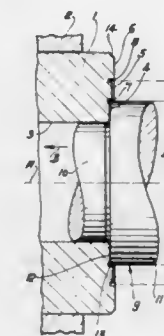
Filed Jun. 18, 1986, Ser. No. 875,852

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 8519794[U]

Int. Cl.<sup>4</sup> B23C 5/26; B23Q 3/12

U.S. Cl. 409—232

6 Claims



1. In a machine tool spindle and tool holders suitable for use therewith, which spindle has a cylindrical bore in its free end part and at least one annular supporting surface surrounding the receiving bore, disposed at right angles to the axis of the spindle and located at the front end of the latter, in which a tool holder capable of being inserted in the spindle has a cylindrical mating projection which fits accurately in the receiving bore, a cylindrical shank adjacent the mating projection and coaxial therewith, which shank is of larger diameter than the mating projection, and an annular surface located at the transition between the shank and the mating projection, arranged concentrically with the latter and extending at right angles to the axis of the shank, which annular surface after insertion of the mating projection in the receiving bore, abuts against the annular supporting surface, the improvement comprising wherein a plurality of annular supporting surfaces which are concentric with one another are formed on the front end of the spindle, which supporting surfaces are separated from one another by annular grooves formed in the front end surface and wherein the shanks of the tool holders, in cases where the mating projections are of equal diameter, have diameters which differ stepwise from one another, the outside diameter of each supporting surface being slightly smaller than the outside diameter of the annular surface of the corresponding tool holder and furthermore the radially further inwardly located supporting surface being arranged so that it is axially spaced from the opposite radial surface of the tool holder when the annular surface of a tool holder is in contact with the corresponding supporting surface.

4,678,383

## EXPANSION ANCHOR ASSEMBLY

Arndt Bergner, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 638,743, Aug. 8, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,652

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329732

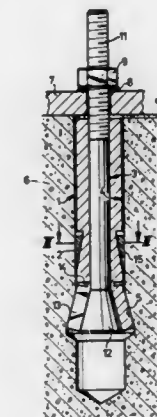
Int. Cl.<sup>4</sup> F16B 13/04

U.S. Cl. 411—32

3 Claims

1. An expansion anchor assembly to be secured in a bore with an undercut section located in the surface of the bore adjacent the base thereof, said expansion anchor assembly

comprises an axially elongated expansion sleeve having a first end arranged to be inserted first in the bore and a second end, said sleeve being slit in the axial direction for a portion of the axial length thereof from the first end toward the second end, said sleeve having an axially extending length so that the second end thereof is recessed inwardly from the opening into the bore, an axially elongated anchor bolt located within and extending completely through said expansion sleeve, said anchor bolt having a first end located in the region of the first end of said expansion sleeve and a second end extending outwardly from the second end of said expansion sleeve, said anchor bolt having an expansion cone formed on the first end thereof with said cone arranged to be drawn into the first end of said sleeve for radially outwardly expanding the slit portion of said sleeve into the undercut section in the bore formed on the second end of said anchor bolt for applying a load, said expansion sleeve having an axially extending cylindrically shaped outside surface of a constant diameter between the first and second ends thereof with a circumferentially extending annular recess formed therein extending radially inwardly from said outside surface, said recess is located in the axially extending part of said expansion sleeve spaced from and between said slit portion



thereof and the second end of said expansion sleeve, said annular recess having an annular base extending in the axial direction of said sleeve and spaced radially inwardly from the outside surface decreasing in the direction toward the first end of said expansion sleeve, and annular expansion element seated within said recess with a cylindrically shaped radially outer surface on said expansion element extending in the axial direction of said annular recess for a dimension less than the axial extent of said recess and said radially outer surface extending outwardly at least to the outside surface of said expansion sleeve, said expansion element has a radially inner surface and a radially outer surface with the radially inner surface in contact with the base of said recess and said sleeve whereby said inner surface tapers inwardly toward the axis of said sleeve in the direction toward the second end of said sleeve, and with the radially outer surface of said expansion element arranged to effect frictional contact with the surface of the bore during the radial expansion of said expansion sleeve for preventing axial displacement of expansion sleeve out of the bore while said expansion cone radially displaces and expands the slit portion of said sleeve into anchoring engagement with the undercut section of the bore.



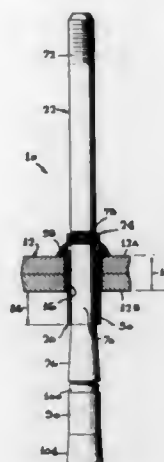
4,678,384

**CONTROLLED EXPANSION BLIND FASTENER DESIGN**  
Kenneth P. Sparling; David G. Richardson, both of Burbank; Angelo Incardona, Huntington Beach; Ronald E. Wood, Sepulveda; Garth D. Kikendall, Highland Park, and Leon Bakow, Sherman Oaks, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Jun. 13, 1986, Ser. No. 873,927  
Int. Cl. F16B 13/04

U.S. Cl. 411-43

5 Claims



1. A blind fastener for joining adjacent structural elements together, the structural elements having at least one aligned hole of a predetermined diameter for receiving the fastener, the fastener including:

- a hollow tubular sleeve including:
  - a shank portion having an outer diameter with a minimum and maximum allowable value;
  - an inner diameter of between 0.9000 times the minimum sleeve outer diameter and 0.8964 times the maximum sleeve outer diameter; and
  - a head portion for abutting against one side of the adjacent structural elements at one end of said shank portion and an opposite end for extending beyond the other side of the structural elements;

- a spindle including:
  - a stem portion having a diameter equal to or less than said inner diameter of said sleeve for pulling said spindle partially through said sleeve;

- a cold work mandrel portion for expanding said sleeve when drawn through said inner diameter, said mandrel portion having first and second ends with said first end attached to said stem portion said mandrel portion further having an increasing taper from said first end to said second end with said first end of said mandrel portion having a diameter between 0.8789 times said minimum sleeve outer diameter and 0.8756 times the maximum sleeve outer diameter and said second end of said mandrel portion having a diameter between 0.9684 times the minimum sleeve outer diameter and 0.9585 times the maximum sleeve outer diameter and a length of between 2.000 times the minimum sleeve outer diameter and 2.1000 times the maximum sleeve outer diameter;

- a shear pin portion having first and second ends, and a diameter between 0.9632 times the minimum sleeve outer diameter and 0.9534 times the maximum sleeve outer diameter, said first end of said shear pin portion frangibly attached to said second end of said mandrel portion;

- a sleeve expanding portion attached to said second end of said shear pin portion for expanding said opposite end of said sleeve when said spindle is partially drawn through said inner diameter; and

- locking means for locking said shear pin portion to said

sleeve when said spindle has been drawn partially through said sleeve.

4,678,385

FIXING PEG

Jean Ollivier, Valence, and Roland Almeras, Tournon, both of France, assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed May 14, 1986, Ser. No. 863,067

Int. Cl. F16B 15/06

U.S. Cl. 411-456

8 Claims



1. A fixing peg comprising a generally tubular shaped resilient body having a longitudinal slit and integral bearing means at one end of the body, said slit extending over a substantial portion of the length of said body, edges of said body adjacent said slit defining lips, abutment means for limiting constrictive movement of said lips, said abutment means including at least one tongue struck from a portion of said body opposite said slit and extending into said slit.

4,678,386

**THERMAL SHEET BINDING APPARATUS AND A METHOD FOR BINDING OF LOOSE SHEETS IN A FOLDER**

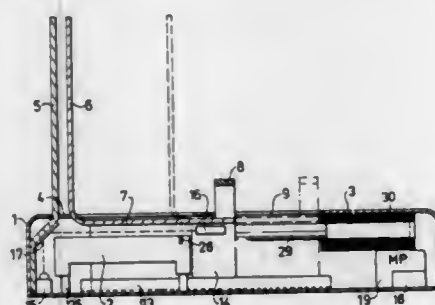
Sture H. Wiholm, Johannesbo, Sweden, assignor to Bind-O-Matic AB, Stockholm, Sweden

Continuation of Ser. No. 752,507, Jul. 5, 1985, abandoned. This application Jul. 17, 1986, Ser. No. 885,390

Int. Cl. B42C 19/00

U.S. Cl. 412-8

8 Claims



1. A sheet binding apparatus comprising  
a housing;  
a heating assembly supported in the housing;  
an opening in the housing above said heating assembly for insertion of one or more folders;  
a front support means and a rear support means restricting the width of said opening, said front support means being movable to adjust the opening width with respect to the number and/or thickness of folders inserted;  
an electric heating element means included in said heating assembly;  
a top surface of said heating assembly being heated by said heating means when said folder or folders is/are in touch with the top surface to activate a heat-sensitive binding agent provided in each folder for binding loose sheets inside the folder(s);  
an electric supply circuit feeding said heating means, and  
an electrical transformer having a movable yoke and means mechanically connecting said yoke to said front support

means included in the electric supply circuit and being dependent on the opening width to adjust the current supplied to the heating means in relation to the total thickness of the folder or folders inserted.

7. A method for binding in thermal binding apparatus of loose sheets in one or more folders having a heat-sensitive binding agent, the method comprising the following steps:

- (a) inserting one or more folders, each one including some loose sheets to be fixed to the folder, in the apparatus to touch with a heating assembly, thereby breaking a light beam detected by a photocell;
- (b) sending a start signal produced by said photocell to a micro-processor, thereby closing a power supply circuit to a heating element means of said heating assembly;
- (c) controlling the current from the power supply through a rheostat, the position of which is dependent on the thickness of folders inserted;
- (d) sending temperature indication signal generated by a thermistor in close connection to said heating assembly to the micro-processor for starting a timer when the heating assembly reaches a working temperature, said timer being set for a predetermined time;
- (e) sending an interruption signal obtained from the timer at the end of the predetermined time period to said micro-processor to open the power supply circuit; and
- (f) removing the folder(s) with the sheets now fixed thereto whenever wanted.

4,678,387

SIGNATURE STACKER

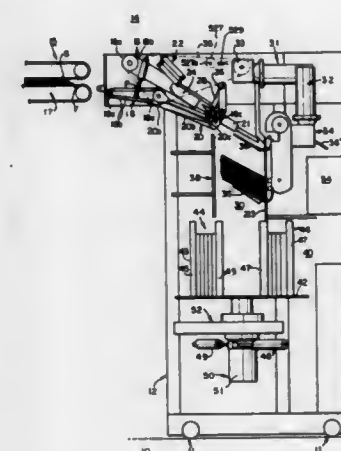
Christer A. Sjogren, Miami, and Carl D'Amico, Ft. Lauderdale, both of Fla., assignors to Qulpp Incorporated, Miami, Fla.

Filed Mar. 1, 1985, Ser. No. 707,494

Int. Cl. B65G 57/11; B65H 31/28

U.S. Cl. 414-47

25 Claims



1. Stacking apparatus comprising:  
a bucket for receiving and stacking signatures delivered thereto in an overlapping stream;  
drive means being energizable for selectively driving said bucket about a closed loop path;  
means for pivotally mounting said bucket to said drive means;  
cam means;  
cam follower means on said bucket including means for urging said cam follower means toward sliding engagement with said cam means;  
said cam means including an abrupt transition at a home position along the closed loop path;  
holding means for receiving said cam follower means at said home position;  
reciprocating means for moving said holding means in a first direction for swinging said bucket about said pivotal mounting means for swinging the free end of said bucket

into the path of movement of signatures being delivered to said stacking apparatus;

said holding means including a pair of spaced guides enabling movement of said cam follower means through said holding means and along a stacking portion of said closed loop path for receiving and stacking signatures on said bucket upon activation of said drive means.

4,678,388

**APPARATUS FOR COUNTING AND COLLECTING PAPER BOARDS**

Arifumi Okamoto, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

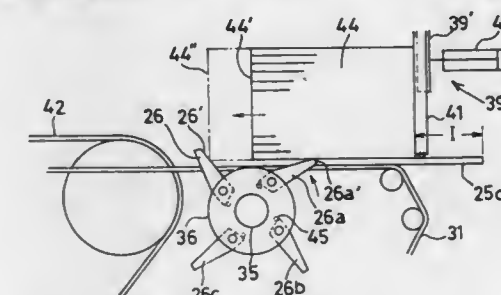
Continuation of Ser. No. 738,510, May 28, 1985, abandoned, which is a continuation of Ser. No. 460,981, Jan. 25, 1983, abandoned. This application Aug. 28, 1986, Ser. No. 902,077

Claims priority, application Japan, Feb. 2, 1982, 57-15155

Int. Cl. B65G 57/30

U.S. Cl. 414-92

5 Claims



1. An apparatus for counting and collecting paperboards comprising a suitably disposed device for counting said paperboards brought by a conveyor device, means for heaping said paperboards successively from the bottom thereof by restraining their movement including a stopper disposed on the surface of a conveyor, and means for transferring them to a further process each time they are collected in a predetermined number wherein said stopper is composed of a shaft for rotating through a predetermined angle of not more than about 45° intermittently in response to a signal from said counting device, a plurality of stopper members which are disposed around said shaft and are mounted on the shaft for rocking movement relative to the shaft and which are urged in the rotational direction of said shaft, and means, disposed on said shaft, for restraining the rocking movement of each stopper member in the vicinity of an upright position thereof, and wherein rotation of the shaft through the predetermined angle rotates a first stopper member from the upright position in which paperboards are heaped into a stack to an adjacent position in which the stack of paperboards are held between the first stopper member and a second stopper member, the second stopper member retaining the next paperboard which is to be the first paperboard of a new stack.

4,678,389

**FREIGHT VEHICLE WITH A CONVERTIBLE CARGO SPACE**

Timothy C. Bonerh, Orchard Park, N.Y., assignor to Vincent C. Bonerh, Boston, N.Y.

Continuation-in-part of Ser. No. 480,499, Mar. 30, 1983, Pat. No. 4,534,596. This application Nov. 21, 1984, Ser. No. 673,770. The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

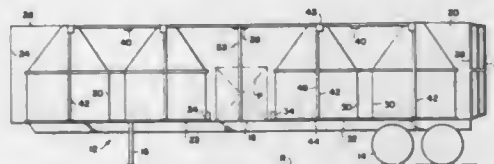
Int. Cl. B60P 1/56; B65G 65/30

U.S. Cl. 414-267

17 Claims

1. A freight vehicle having a cargo space convertible from a piece goods handling mode with a space suitable for piece goods to a bulk goods handling mode with space suitable for bulk material, the vehicle being of the type including means defining a cargo space having a bottom load-bearing floor, side

and end walls, and a roof, and door means providing access to the cargo space for loading and unloading piece goods cargo therein, characterized by means defining a discharge opening in the vehicle for emptying bulk material cargo from the cargo space, means defining a fill opening in the vehicle, an inflatable double-walled generally cup-shaped bag having an inner and an outer wall for containing bulk cargo, the bag having an outlet opening positionable to register with the discharge opening in the vehicle, means for connecting the fill opening to the top edge wall of the bag, inlet means for inflation and deflation of the bag, the inflation causing expansion of the inner bag wall to assist in gravity discharge of the material after its angle of repose is reached or the material stops flowing, a rigid bag bottom support platform supporting the bag bottom and removably secured to the floor when the cargo space is used in



a bulk material handling mode, mechanical means for maintaining the bag in an erected position when the bag support platform is on the floor and the cargo space is in the bulk-handling mode, hoisting means for raising the bag bottom support platform from the floor of the cargo space to an upper position with the bag support platform adjacent to the roof of the cargo space with the bag collapsed to convert the cargo space to space suitable for piece goods handling, and supplemental discharge means for discharging material remaining in the bag following full inflation of the bag, the supplemental discharge means including a supplemental inflatable flexible membrane connected to the support platform at the bag outlet and attached to the inner surface of the inner bag wall, the supplemental membrane having a supplemental inlet for inflation thereof.

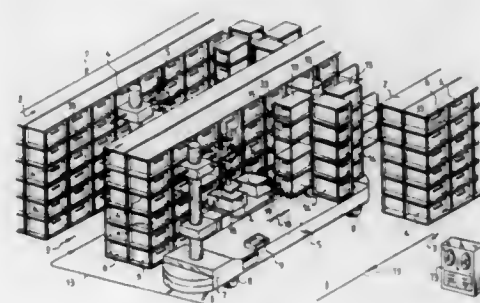
4,678,390

#### AUTOMATED SELF-POWERED MATERIAL HANDLING TRUCK

Marc Bonneton, Tourcoing, and Dominique Janvier, Lille, both of France, assignors to Societe Anonyme REDOUTE CATALOGUE, Roubaix, France  
Continuation-in-part of Ser. No. 652,348, Sep. 19, 1986, abandoned. This application Mar. 26, 1986, Ser. No. 844,455  
Int. Cl.<sup>4</sup> B65G 1/06

U.S. Cl. 414—282

15 Claims



1. An automated handling system intended for a storehouse, warehouse or other industrial premises in which miscellaneous articles are stored, for allowing either the restocking of the storehouse or the regrouping of articles picked up in the storehouse to constitute lots of articles corresponding to a customer's order, said storehouse comprising an assembly of modular racks, a plurality of lanes along which said modular racks are disposed, and a multiplicity of unitary stock bins in

which said articles are stocked according to their nature and reference symbol, said racks consisting of an assembly of juxtaposed columns in which said unitary stock bins are disposed in superposed relationship, said system comprising essentially:

- a central computer for managing and controlling the system and the customers' orders;
- at least one automated self-powered handling truck adapted to handle said bins in said storehouse and to pick up articles from the bins of said storehouse and constitute lots of articles and gather said orders, said self-powered truck comprising essentially:
- a motorized chassis and translation means for moving said truck along the lanes of said storehouse along said modular racks,
- an inboard computer in interactivated relationship with said central computer for managing the movements and stoppages of said truck in said storehouse and controlling its movements,
- an inboard store structure consisting of an assembly of columns adapted to receive and hold in superposed relationship a plurality of order receiving bins,
- said motorized chassis comprising essentially:
- a bin receiving platform adapted to carry at least one stock bin and/or one order receiving bin, said platform being movable at least linearly either in front of said racks of said storehouse or in front of at least one or said columns of said inboard store structure
- bin draw-out means adapted alternatively to transfer a unitary bin between said racks of said storehouse and said bin receiving platform, and to transfer an order receiving bin between said inboard store structure and said bin receiving platform,
- means for recentering said bin receiving platform so as to accurately position said draw-out means in both abscissa and ordinate in front of a bin disposed in said racks of said storehouse, and
- gripping means responsive to said inboard computer and adapted to pick-up one of the articles contained in said stock bin carried by said receiving platform for subsequently depositing said article into said order receiving bin.

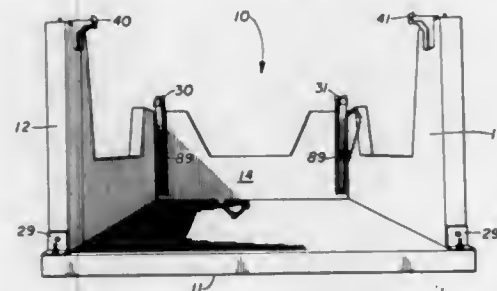
4,678,391

#### APPARATUS FOR CONVERTING A TRANSFER TRUCK TO A FLATBED OR THE LIKE

Warren M. Mooney, P.O. Box 43, Standard, Calif. 95373  
Filed Dec. 11, 1985, Ser. No. 807,751  
Int. Cl.<sup>4</sup> B65G 67/02

U.S. Cl. 414—389

7 Claims



1. In an apparatus for converting a transfer truck having a first truck module to a transfer truck ready to receive a second truck module, the invention comprising:

- a pair of upstanding spaced side walls;
- a rear wall interconnecting the side walls forming a large open area between all of the walls;
- a pair of vertically extending brackets mounted on said rear wall, one of said brackets being disposed adjacent the junction of said rear wall with one of said side walls and

the other of said brackets being disposed adjacent the junction of said rear wall with the other of said side walls, each of said brackets having a first upstanding portion secured to said rear wall and a second upper portion extending first horizontally from the upper end of said first upstanding portion then curving downwardly forming a ramp;

a pair of brackets mounted to the upper ends of each of said side walls at the forward ends thereof, each of said brackets including a flat plate secured to the upper surface of its respective side wall adjacent the end thereof remote from said rear wall and an angle flange pivotally secured to each of said flat plates, each of said flanges including a first portion pivotally connected to said flat plate and a second portion extending at generally a right angle to said first portion, one of said flat plates being secured to its respective side wall with its respective flange pivoting from a first position whereby its respective first portion overlies and abuts against said one of said flat plates to a second position whereby said respective first portion extends inwardly of said apparatus and generally coplanar with its respective flat plate, the other of said flat plates being similarly secured to its respective side wall with its respective flange pivoting from a first position whereby its respective first portion overlies and abuts against said one of said flat plates to a second position whereby said last mentioned respective first portion extends inwardly of said apparatus and generally coplanar with its respective flat plate and toward said first portion of said one of said flat plates;

whereby the conversion is accomplished by having a transfer truck, having a truck module thereon which module has rolling means on its underside and a built in hoisting means, backing up into said apparatus to engage the ramps subsequent to the removal of the standard hinge pin that attaches the truck module to the subframe of the transfer truck, such that the rolling means engage the second upper portion and then the first upper portion of the brackets that define the ramps, thus lifting the truck module off its subframe;

the brackets mounted to the upper ends of the side walls of the apparatus, side wall brackets, are pivoted to their respective flat plates;

the truck module is raised up above said side wall brackets using the built in hoist of the transfer truck;

the side wall brackets are pivoted away from their respective flat plates;

the truck module is lowered down using the said hoist, to a position such that the module's front end rests on the side wall brackets thereby permitting the transfer truck, after disconnection of the hoisting means from the truck module, to be driven away forwardly without the truck module.

4,678,392

#### WHEEL LIFT FOR A TOW TRUCK

Jerry W. Capers, Fort Worth; Donald L. Capers, Saginaw, and Douglas W. Capers, Lakeside, all of Tex., assignors to Hydra-Tech, Inc., Fort Worth, Tex.

Filed Sep. 20, 1985, Ser. No. 778,366

Int. Cl.<sup>4</sup> B60P 3/06

U.S. Cl. 414—563

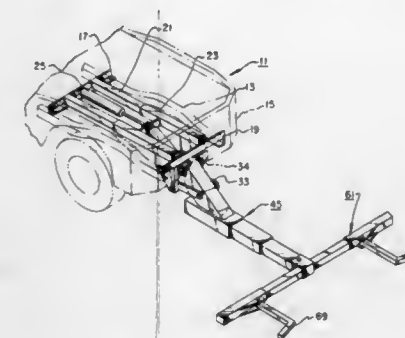
17 Claims

1. A vehicle wheel lifting apparatus for a tow truck having a frame and a bed mounted thereon, the apparatus comprising in combination:

- a pair of laterally spaced apart longitudinal rails mounted to the frame under the bed;
- a base movably carried on the rails under the bed;
- telescoping means, mounted to the base and having a forward end and a lateral member extending laterally in opposite directions from a rearward end, for extending the lateral member in a rearward direction from the bed;

a wheel support mounted on each end of the lateral member for supporting the wheels of a vehicle; and

power means, including a hydraulic cylinder connected between the frame and the base for moving the base longitudinally relative to the frame on the rails between the retracted position wherein a substantial portion of the telescoping means locates under the bed for storage, to an



extended position, wherein a substantial portion of the telescoping means locates rearward of the bed for towing, the base being fully supported by the rails and being located substantially under the bed in both the retracted and extended positions; and

elevating means for raising and lowering the telescoping means relative to the base to selectively lift and lower the wheel supports.

4,678,393

#### LOADING AND UNLOADING MECHANISM

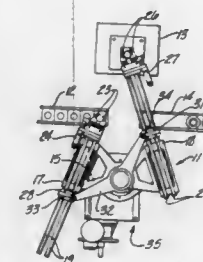
George Mink, 38296 Horseshoe Dr., Mt. Clemens, Mich. 48043  
Continuation of Ser. No. 544,085, Oct. 21, 1983, abandoned.

This application Feb. 24, 1986, Ser. No. 834,114

Int. Cl.<sup>4</sup> B65G 47/52; F16H 21/54, 25/18

U.S. Cl. 414—751

3 Claims



1. A material transfer device for sequentially moving articles from a first station to a second station and from said second station to a third station comprising a single driven member, motion transfer means for moving said single driven member between a first position and a second position, a supporting member having a pair of arms fixed at a predetermined angular relationship, first gripping means adapted to selectively grip and release an article, second gripping means adapted to selectively grip and release an article, means for supporting said first gripping means upon one arm of said supporting member for linear movement along a reciprocating path from a first position wherein an article at said first station may be gripped and a second position wherein a gripped article may be deposited at said second station, means for supporting said second gripping means upon the other arm of said supporting member for linear movement along a reciprocating path from a first position wherein an article at said second station may be gripped and a second position wherein the gripped article may be deposited at said third station, said paths of movement of said first and



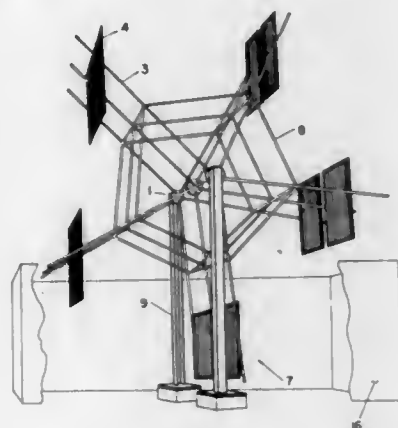
said second gripping means being nonparallel and intersecting, a driving member supported for movement in a first sense with said supporting member along an axis and for rotation relative to said supporting member about said axis, said driving member having a pair of arms fixed relative to each other and each carrying cam means cooperating with follower means on the respective of said gripping means for moving said first gripping means between its first position and its second position and said second gripping means between its first position and its second position in response to relative rotational movement of said driving member relative to said supporting member about said axis from a first angular position to a second angular position, and motion transmitting means for moving said supporting member and said driving member together along said axis from a first axial position to a second axial position and back to its first axial position and for rotating said driving member relative to said supporting member about said axis from its first angular position to its second angular position upon movement of said single driven member between its first position and its second position.

4,678,394

**FLUID CURRENT DRIVEN MACHINE EMPLOYING INDIVIDUALLY SELF-GOVERNING ENERGY PANELS**  
Francis E. Willoughby, Box 689, Pine Bluffs, Wyo. 82802  
Filed Jul. 30, 1985, Ser. No. 760,542  
Int. Cl.<sup>4</sup> F03D 3/04, 7/06

U.S. Cl. 415—2 R

4 Claims



1. A fluid powered traveling shaft machine adapted to be fixed in position within a fluid current and for developing rotational power therefrom, said machine comprising:

(A) a horizontal central rotating axis;

(B) a plurality of sets of support beams extending radially outwardly from said central axis at a corresponding plurality of circumferentially distributed positions thereabout;

1. each said set of support beams comprising at least two parallel support beams;

(C) panel support means carried by each of said support beams at equal radially outward distances from said central axis, said panel support means of a set of support beams cooperating to define a horizontal panel axis of rotation;

(D) at least one rectangular suspended panel rotatably supported by said panel support means in each said panel axis of rotation, said suspended panel having length and width dimensions, said suspended panel being supported by said panel support means at a position intermediate its said length and offset from the center thereof;

(E) adjustable gravity bias means for urging each said suspended panel to rotate about its said panel axis of rotation toward a vertical position in which the center of said

length of said panel is disposed below its said panel axis of rotation, said adjustable gravity bias means comprising:

1. discrete added weight means fixed to said suspended panel at the lower end thereof when said suspended panel is in said vertical position; and

(F) a screen shielding at least the lower one-third of the height of said machine from the fluid current.

4,678,395

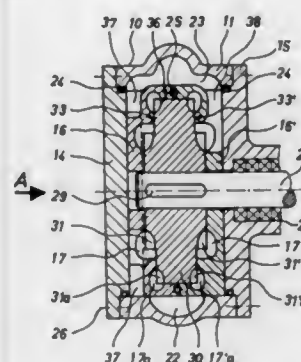
**REGENERATIVE PUMP WITH FORCE EQUALIZATION**  
Friedrich Schweinfurter, Bergstrasse 6, 8541 Röttenbach, Fed. Rep. of Germany  
Filed Jul. 23, 1985, Ser. No. 758,138

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1984, 3427112

Int. Cl.<sup>4</sup> F04D 5/00

U.S. Cl. 415—53 T

7 Claims



1. a regenerative pump comprising  
a casing having a casing inlet and a casing outlet,  
an impeller provided on a shaft and rotatably disposed within said casing,

at least one blade ring with radially and axially open blade compartments disposed on a first side and on a second side of said impeller,

side channels disposed within said casing and separated from one another by sealing gaps, each of said side channels being provided with an entrance port, an exit port, and an interrupter means, wherein said side channels are arranged with respect to the blade rings so that a conveying medium flows, in two substantially mutually separated conveying streams, through said side channels from a respective side channel entrance to a respective side channel exit, under increasing pressure, characterized in that said entrance ports are connected with said casing inlet, and said exit ports are connected with said casing outlet for subdividing and recombining said conveying streams, wherein said entrance ports, said exit ports, and said interrupters are arranged with respect to said first impeller side in the direction of rotation of said impeller, offset by an angular amount ( $\alpha$ ) with regard to their corresponding elements on said second impeller side so that the radial forces on said first impeller side, resulting from the pressure differences in said conveying streams between the inlets and outlets, are opposed by equal-size but oppositely directed radial forces on said second impeller side.

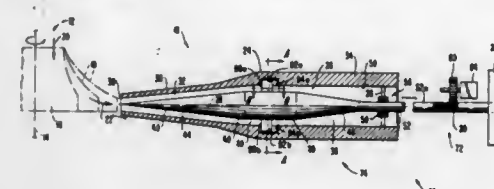
4,678,396

**MOVABLE SPIKE, VARIABLE ENTRANCE GEOMETRY PIPE DIFFUSER WITH VIBRATION SUPPRESSION**  
Rolf J. Mowill, Oslo, Norway, assignor to A S Kongsberg Vapenfabrikk, Kongsberg, Norway  
Continuation-in-part of Ser. No. 577,383, Feb. 6, 1984, Pat. No. 4,573,868, which is a division of Ser. No. 438,990, Nov. 4, 1982, Pat. No. 4,549,847. This application Mar. 26, 1985, Ser. No. 716,146

Int. Cl.<sup>4</sup> F04D 29/46

U.S. Cl. 415—148

13 Claims



1. Diffuser apparatus for use in conjunction with a compressor, the apparatus comprising:

(a) a housing having a diffusion channel with an axis and a cross-sectional flow area smoothly increasing in the flow direction, said housing also having an entrance for receiving gas at a relatively high velocity from the compressor,

(b) means for adjusting the channel flow area, wherein said area adjusting means includes:

(i) a spike member having a contoured axisymmetric face with an axially varying cross-sectional area, said spike being positioned in said channel along the channel axis for presenting said contoured face to oppose the gas flowing in the entrance to said housing, and

(ii) means for slidably positioning said spike member to selectively adjust the flow area of said channel; and

(c) means for constraining said spike member against flow-induced vibrations.

4,678,397

**VARIABLE-CAPACITANCE RADIAL TURBINE HAVING SWINGABLE TONGUE MEMBER**

Hiroshi Komatsu, Yokosuka, and Fumio Nishiguchi, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

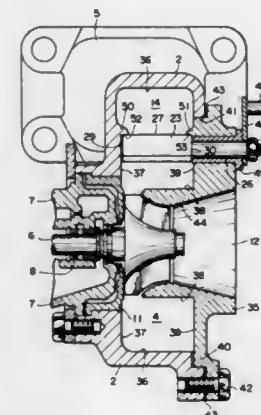
Filed Jun. 11, 1984, Ser. No. 619,481

Claims priority, application Japan, Jun. 15, 1983, 58-107248; Sep. 21, 1983, 58-172995; Sep. 21, 1983, 58-145082[U]

Int. Cl.<sup>4</sup> F01B 25/02

U.S. Cl. 415—151

24 Claims



1. A variable-capacitance radial turbine comprising:

a turbine wheel,  
housing means having a wheel chamber enclosing said turbine, a scroll fluid passage which extends from an up-

stream throat portion to a downstream end portion circumferentially around said turbine wheel and has an aperture for directing a fluid from said scroll passage to the periphery of said turbine wheel in said wheel chamber, a fluid inlet passage for introducing the fluid into said scroll passage, and a fluid outlet for discharging the fluid from said wheel chamber, said scroll passage being bounded radially by a scroll outer peripheral wall facing toward the axis of said turbine wheel, said scroll passage being bounded axially by right and left scroll sidewalls which are axially spaced from each other and confront each other, each of said scroll sidewalls being formed with a seat surface, said seat surfaces of said scroll sidewalls limiting the swing motion of said tongue member by abutting, respectively, on said sealing surfaces of said tongue member when said tongue member is swung to said predetermined position,

a tongue member swingably support on said housing means for varying a sectional area of said throat portion of said scroll passage, and having a width smaller than a distance between said right and left scroll sidewalls said tongue member having two sealing surfaces, said sealing surfaces of said tongue member being, respectively, in contact with said seat surfaces of said sidewalls when said tongue member is in a predetermined position, and;

a swingable tip end positioned on said tongue member and a base end portion having therein a pivot axis about which said tongue member can swing, said pivot axis being substantially parallel to the axis of said turbine wheel and said tip end being swingable toward and away from the axis of said turbine wheel, said tongue member longitudinally extending from said base end portion to said tip end along said scroll passage in a direction of a normal fluid flow in said scroll passage, said sealing surfaces extending substantially over the full longitudinal length of said tongue member on both sides of said tongue member, said seat surfaces extending longitudinally of said scroll passage, each of said sealing surfaces being in contact with the mating seat surface in such a manner that the area of contact therebetween has a width and a length which is substantially equal to the longitudinal length of said tongue member when said tongue member is in said predetermined position.

4,678,398

**HIGH EFFICIENCY TRANSONIC MIXED-FLOW COMPRESSOR METHOD AND APPARATUS**

John L. Dodge, Phoenix; Duane B. Bush, Tempe; Georges A. Pechuzal, Scottsdale, and Ambrish Ravindranath, Mesa, all of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed May 8, 1985, Ser. No. 732,195

Int. Cl.<sup>4</sup> F04D 21/00

U.S. Cl. 415—181

53 Claims



1. The method of pressurizing elastic fluid to increase the pressure level thereof from a first pressure level to a higher second pressure level; said method comprising the steps of:

(a) forming a first tubular stream of said fluid at said first pressure level and having a longitudinal axis, a first radially inner diameter, a first radially outer diameter, and a first relative velocity vector sum of meridional velocity

- and tangential velocity of at least Mach 1.2 with respect to a selected reference at said radially outer diameter;
- (b) subdividing said flow stream into a plurality of axially extending and circumferentially spaced apart substreams;
- (c) diffusing each of said substreams to a second supersonic relative velocity less than said first relative velocity while limiting deviation of radially outer local relative velocity vectors to no more than  $10^\circ$  with respect to said first relative velocity vector;
- (d) passing each of said substreams through a respective normal shock to a third relative velocity of less than Mach 1;
- (e) increasing progressively downstream from said normal shock both the radially inner and radially outer diameters of said flow stream as an aggregate of said substreams respectively above said first diameters while further diffusing the relative velocity of each of said substreams to a fourth subsonic relative velocity less than said third relative velocity and increasing the radially outward component of local meridional velocity;
- (f) limiting the downstream increase of said outer aggregate diameter to a constant axial rate while decreasing said radially outward component of local meridional velocity and effecting further diffusion of each substream to a fifth subsonic relative velocity less than said fourth relative velocity; and
- (g) reuniting said plurality of substreams into a respective second tubular stream of said fluid having a sixth subsonic absolute velocity vector sum of meridional and tangential velocities.

4,678,399

**RESISTANT COMPONENTS FOR SUBMERSIBLE PUMP STAGES**

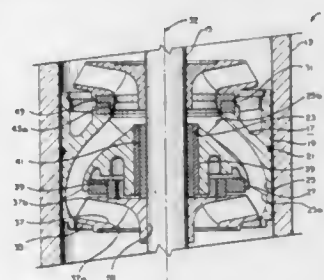
Joseph E. Vandevier; John L. Bearden; William F. Pranger, all of Claremore, Okla., and Harold L. Miller, Cary, Ill., assignors to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 585,059, Mar. 1, 1984, abandoned. This application Oct. 23, 1985, Ser. No. 792,618

Int. Cl.<sup>4</sup> F04D 29/62

U.S. Cl. 415—199.2

3 Claims



1. In a submersible centrifugal pump of the type having a housing, a drive shaft extending through the housing, a plurality of diffusers mounted stationarily in the housing, each diffuser having a plurality of passages with a lower inlet and an upper outlet, a plurality of impellers, each mounted to the shaft for rotation therewith, each impeller having a plurality of passages with an inlet for receiving fluid from the outlets of an adjacent lower diffuser and an upper outlet for discharging fluid to the inlets of an adjacent upper diffuser, the improvement comprising:

a tungsten carbide skirt insert secured to a lower side of each impeller surrounding the impeller passage inlet, the skirt insert having a downwardly facing flat surface and a flange portion with a cylindrical outer sidewall and depending downwardly from an inner edge of the flat surface, the skirt insert having an inner sidewall that has an upper edge flush with the impeller passage inlet and a lower edge at the lower end of the flange portion, the

inner sidewall extending to the lowermost portion of the impeller passage inlet and defining the outer surface of the impeller passage inlet for reducing erosion of the impeller passage inlet;

a tungsten carbide downward thrust insert secured to an upper side of each diffuser surrounding the diffuser passage outlets, located entirely outward of the depending flange portion of the skirt insert, the downward thrust insert having an upwardly facing flat surface that receives the skirt insert downwardly facing flat surface in sliding contact to transmit downward thrust from the impeller, and an inner sidewall that closely receives the outer sidewall of the flange portion of the skirt insert to provide radial support;

a cylindrical balance ring insert of tungsten carbide secured to an upper side of each impeller; and

a balance ring bore insert of tungsten carbide secured to a lower side of each diffuser, having a cylindrical inner wall that closely receives an outer wall of the balance ring insert to provide radial support.

4,678,400

**ROTARY MEANS FOR USE AS A HEAT SOURCE**

Nobuyoshi Kuboyama, 28-9-1, Shimomiyamori, Aza, Miyamori-Mura, Iwate-ken, Japan

Continuation of Ser. No. 480,706, Mar. 31, 1983, abandoned.

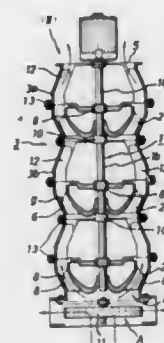
This application Dec. 3, 1984, Ser. No. 651,582

Claims priority, application Japan, Apr. 2, 1982, 57-55089

Int. Cl.<sup>4</sup> F04D 29/38

U.S. Cl. 415—199.4

7 Claims



1. Rotary means for use as a heat source in a sealable chamber wherein air pressure within said sealable chamber is reduced or pressurized at a balanced level by discharging air from the chamber or introducing air thereinto, comprising:

a first fan;

said first fan including a first fan vane affixed for rotation upon a first rotary shaft and a first tubular body enclosing said first fan vane;

at least a second fan;

said second fan including a second fan vane affixed for rotation upon a second rotary shaft and a second tubular body enclosing said second fan vane;

means for coupling said first and second rotary shafts together for concerted rotation thereof and of said first and second fan vanes;

means for joining said first and second tubular bodies to form a combined tubular body;

an air discharge opening from said combined tubular body in one of said first and second tubular bodies;

an air suction opening to said combined tubular body in the other of said first and second tubular bodies;

each of said first and second fans including an air friction heat generating means between its fan vane and its tubular body;

means for permitting air friction heat generated by said air

friction heat generating means to be added to said sealable chamber;

trailing rotary means disposed adjacent one of said air suction opening and said air discharge opening, said trailing rotary means being rotatable by rotation of air at said one of said air suction and said air discharge openings whereby air friction heat is distributed.

4,678,401

**ROTOR CONTROL SYSTEM**

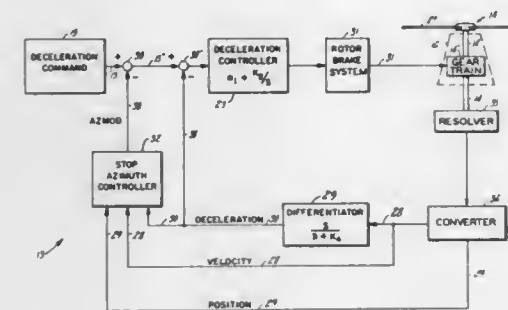
Michael P. Bradford, Orange, and Joseph R. Maciolek, West Haven, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 24, 1986, Ser. No. 822,353

Int. Cl.<sup>4</sup> B64C 27/24

U.S. Cl. 416—32

4 Claims



1. A control system for slowing the angular velocity and halting the rotary motion of a helicopter rotor at a selected azimuth position with a rotor brake, said rotor including a plurality of blades for rotatably carrying said helicopter, said control system comprising a deceleration controller for controlling the operation of the rotor brake, a deceleration command means for establishing a deceleration command indication for directing the operation of said deceleration controller, a detection means for establishing motion indications of said helicopter rotor, said indications including velocity and position indications, said detection means being responsive to the motion of said helicopter, a feedback means for differentiating said velocity indication to establish a deceleration value of the rotor, and means for reducing said deceleration command indication by the amount of said deceleration value and providing the difference to said deceleration controller, wherein said control system is characterized in that it further comprises means for determining a predicted stop azimuth position of said rotor, and adjustment means for adjustment of the value of said predicted stop azimuth position to a selected stop azimuth.

4,678,402

**VARIABLE PITCH PROPELLER**

Homer D. Roe, 421 Biscayne Dr., Wilmington, N.C. 28405

Filed Sep. 7, 1984, Ser. No. 648,052

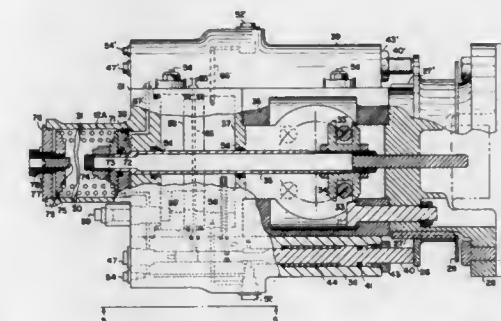
Int. Cl.<sup>4</sup> B64C 11/42

U.S. Cl. 416—157 R

3 Claims

1. In combination with a propeller including a hub with blades, each mounted for rotatable retention and pitch adjustment in said hub having complete hydraulic system control means with components symmetrically arranged therein for effecting pitch adjustment of said blades with an actuator and connecting means for operably connecting the actuator to the blades, said actuator urgeable by spring biasing means in one direction for adjusting pitch to low blade angles and being subjectable to fluid pressure for movement in the opposite direction against the action of the biasing means for adjusting pitch to high blade angles, said fluid pressure produced by two identical performing reciprocating hydraulic pumps mounted parallel to the hub rotating axis and symmetrically offset thereof, said hub providing attaching means for a propeller shaft adapter on said hub rotating axis for mounting a flanged

slidable sleeve keyseated on the adapter preventing relative rotational movement thereon with axial freedom and in equal bearing contact on forward flange face with two hydraulic operating pump plungers, each urged in outward thrust when normally seated by internal pump piston actuating spring biasing force on slidable sleeve stop means or conversely when transmitting incoming operational linear mechanical forces to overcome pump spring set biased forces which are likewise equally applied to the hydraulic pumps about the hub rotating axis, when such forces are engaged by anti-friction bearing contact on aft slidable sleeve flange surface and in operating contact therewith, also said operational forces acting from a fixed base secured bracket with pivoting lever axis supporting a two-pronged lever, each prong attaching a radial bearing whereby said bearings being located to act horizontally in planes parallel to and symmetrically spaced about the propeller shaft center line and centered in the vertical sense on the propeller shaft center line, said operating force lever when connected to fixed base operating means whereas from the null or



forwardmost position on the pronged operating lever arm exists a positive radial bearing contact clearance as required in the control rigging to prevent unwanted linear forces being transmitted to flange slidable sleeve; however, when powering to control propeller for pitch increase, said power activation is applied by impulses not to exceed the first two-thirds of the pump total stroke displacement to obtain such settings whereby increasing hydraulic pressure on said blade actuator is used for movement against the action of actuator spring biasing means; conversely, reduction of blade pitch angle change is obtained by applying various long impulse strokes which are effective during the final third of total impulse pump stroke displacement limits, whereby pump piston rods in said pump body mechanically activates the pressure unloading valves, thereby reducing hydraulic pressure acting against said biasing spring force means for reducing blade pitch angle change, and inaction of said control impulses at all hydraulic pressure levels conditions all fluid seals in the hydraulic system in the positive static sealing mode to effect blade pitch locking.

4,678,403

**LIQUID LEVEL SENSOR FOR CONTROLLING PUMP OPERATION**

Richard M. Rudy, 305 Timbercove Cir., Longwood, Fla. 32750, and Thomas J. Fitzgerald, 100 Elizabeth Ave., Altamonte Springs, Fla. 32701

Filed Aug. 1, 1985, Ser. No. 761,532

Int. Cl.<sup>4</sup> F04B 49/00

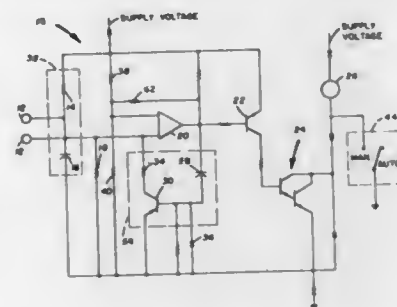
U.S. Cl. 417—12

5 Claims

1. A control system connected to a voltage supply and to a pump for pumping a liquid, the system comprising: two probes displaced a distance from each other, which when immersed in the liquid are connected by a conductive path created through the liquid;
- a timing means for charging a capacitor when said probes are immersed in a liquid;
- a discharging means for discharging said capacitor when said probes are not immersed in a liquid;



- a comparator means for turning "on" when said capacitor is charged to a certain first percentage of supply voltage and for turning from "on" to "off" when said capacitor is discharged to a certain second percentage of supply voltage; and,
- a switching means operably coupled to said comparator means and the pump for activating the pump while said comparator means is turned "on";
- a reset means, operably coupled to said capacitor and said comparator means, for completely and rapidly discharging said capacitor, said reset means is triggered when said comparator means turns from "on" to "off".
4. A control system connected to a voltage supply and to a pump for pumping a liquid, the system comprising:
- two probes displaced a distance from each other, which when immersed in the liquid are connected by a conductive path created through the liquid;



- a timing means for charging a capacitor when said probes are immersed in a liquid;
- a discharging means for discharging said capacitor when said probes are not immersed in a liquid;
- a comparator means for turning "on" when said capacitor is charged to a certain first percentage of supply voltage and for turning from "on" to "off" when said capacitor is discharged to a certain second percentage of supply voltage; and,
- a switching means operably coupled to said comparator means and the pump for activating the pump while said comparator means is turned "on" and wherein said two probes are mounted in a package having a triangular cross-sectional portion, said two probes extending from an edge of said triangular cross-sectional portion so that the two faces of said triangular cross-sectional portion slope down from said probes.

4,678,404

## LOW VOLUME VARIABLE RPM SUBMERSIBLE WELL PUMP

Jerzy A. Lorett, Beaumaris, Australia, and Joseph E. Vandevier, Claremore, Okla., assignors to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 546,719, Oct. 28, 1983, abandoned. This application Jan. 24, 1986, Ser. No. 822,358 Int. Cl.<sup>4</sup> F04B 49/06

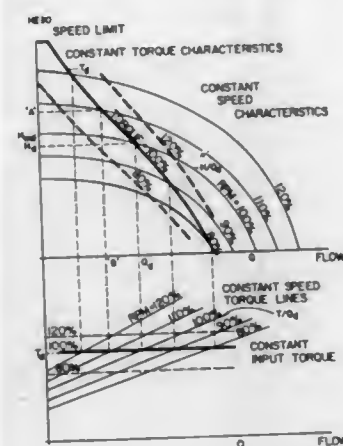
U.S. Cl. 417-45

5 Claims

1. A submersible pump assembly comprising in combination:
- a centrifugal pump having impeller means for producing at least two flow rates for a selected head when operated at constant speed, making the pump potentially unstable, and for requiring increasing torque to produce increasing flow rates;
- an electric motor connected directly to the pump for driving the pump;
- sensing means for sensing the torque output of the motor; and
- variable speed drive means for varying the speed of the motor in response to the torque sensed by the sensing means to maintain a constant torque output, the constant torque applied to the pump preventing the pump from

delivering more than one flow rate for a given head to stabilize the operation.

4. A method of pumping a well with a submersible pump assembly comprising in combination:
- providing a centrifugal pump with potentially unstable impellers of a type that will produce at least two flow rates for a selected head;
- connecting an AC electric motor directly to the pump for driving the pump;
- locating the pump and motor in the well and providing electrical cables that extend to the surface;



- connecting the cables to an electrical variable speed drive located at the surface, which is of a type that will vary the speed of the motor by varying the frequency of the electrical power supplied;
- sensing the torque output of the motor; and
- varying the variable speed drive and thus the speed of the motor to maintain constant torque output of the motor, the constant torque output applied to the pump, preventing the pump from delivering more than one flow rate for a given head, to stabilize the operation.

4,678,405

## LOW NET POSITIVE SUCTION HEAD PUMPS

Harvey G. Allen, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 14, 1984, Ser. No. 580,040 Int. Cl.<sup>4</sup> F04D 1/08

8 Claims

U.S. Cl. 417-245

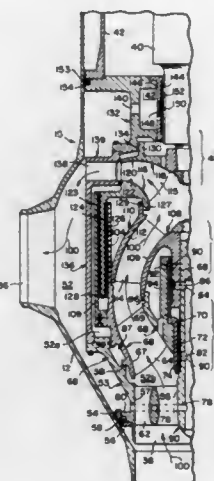
1. Apparatus for pumping a volatile fluid having a given vapor pressure, said pumping apparatus comprising:
- (a) a pump housing defining an axis and comprising an inlet for introducing the fluid at a relatively low static pressure level in to said pump housing, an outlet for discharging the fluid from said pump housing at a relatively high static pressure level, and means for defining a fluid path between said inlet and said outlet;
- (b) a center post supported within said pump housing about said axis by a plurality of struts, each strut affixed at its inner end to said center post and at its outer end to said pump housing;
- (c) a booster stage impeller rotatively mounted about said axis within said pump housing adjacent said inlet for drawing the fluid through said inlet and for pumping the fluid along said fluid path with an increased kinetic pressure;
- (d) a diffuser affixedly attached to said center post and comprising a plurality of stationary passages disposed to intercept the fluid directed along said fluid path by said booster stage impeller and to direct the fluid substantially along said axis, thus converting the kinetic pressure imparted to

the fluid by said booster stage impeller into increased static pressure;

(c) a pump motor;

(f) a main stage impeller rotatively mounted about said axis within said pump housing and coupled to said pump motor to be rotated at a relatively high speed to impart a relatively high static pressure to the fluid being introduced thereto from said diffuser and for discharging the fluid at a relatively high static pressure; and

(g) hydraulic coupling means disposed remotely from said fluid path for hydraulically coupling said main stage impeller and said booster stage impeller to rotate said booster



stage impeller at a relatively low speed selected to maintain the lowest positive suction pressure applied to the fluid at said inlet greater than said vapor pressure, said hydraulic coupling means comprising a cylindrically shaped drum affixed to said main impeller for rotation about an axis therewith, and a pair of cylindrical members affixed to said booster stage impeller for rotation about said axis, said pair of cylindrical members being spaced from each other for receiving said drum member therebetween, said stationary passages being formed to ensure that the low net positive suction head as established by said main impeller upon the fluid introduced thereto exceeds said vapor pressure.

4,678,406

## VARIABLE VOLUME RATIO SCREW COMPRESSOR WITH STEP CONTROL

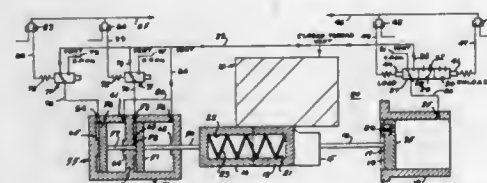
Joseph W. Pillis, Hagerstown, Md.; David A. Murphy, Chambersburg, Pa.; Peter C. Spellar, Hagerstown, Md., and Paul Nemit, Jr., Waynesboro, Pa., assignors to Frick Company, Waynesboro, Pa.

Filed Apr. 25, 1986, Ser. No. 855,676

Int. Cl.<sup>4</sup> F04B 49/02

U.S. Cl. 417-310

12 Claims



1. In a screw compressor having meshing helical rotors on parallel axes and mounted in a housing having intersecting cylindrical bores, a high pressure end wall at one end of said housing and a low pressure end wall at the other end thereof, the low pressure end wall having an inlet opening for the inlet of the compressor and the high pressure end wall having a

discharge opening for the outlet of the compressor, an axially extending recess in the housing in open communication with said bores and with the inlet opening, a slide valve member mounted for axial movement in the recess, said slide valve member having an inner face in sealing relationship with said rotors, said slide valve member having a discharge face at one end thereof which is adjacent to the high pressure end wall containing a radial discharge port opening and having a rear face at its other end, and a slide stop member mounted for axial movement in said recess, said slide stop member having an inner face in sealing relationship with said rotors, said slide stop member having a front face, the slide stop front face being adapted to engage the slide valve member rear face to form a continuous composite member which is selectively operative to close the axially extending recess to the inlet opening, said slide valve member and slide stop being movable apart to provide an opening therebetween of variable selected size and axial position in communication with the inlet opening, the improvement comprising,

said slide valve member having first piston means,

said first piston means received in a first cylinder,

high pressure means,

low pressure means,

the outer face of said first piston means communicating with said high pressure means,

first valve means,

first conduit means from said first valve means to said first cylinder,

said first valve means having selective means to connect said conduit means, alternatively, to said high pressure means, to a closed passage, or to said low pressure means,

actuating means for said first valve means, means responsive to the pressure at the inlet opening and operative to control said actuating means,

said slide stop member having second piston means, said second piston means received in a second cylinder having first and second spaced ports on opposite sides of said second piston means,

second valve means,

second conduit means from said second valve means to said first port of said second cylinder,

said second port of said second cylinder communicating with said low pressure means,

said second valve means having selective means to connect said second conduit means, alternatively, to said high pressure means or to said low pressure means,

actuating means for said second valve means, and means responsive to the pressure at the discharge opening and operative to control the actuating means for the second valve means.

4,678,407

## MULTI-TANDEM FREE PISTON MACHINE

Henry Benaroya, 41, Bld Commandant Charcot, 92200 Neuilly sur Seine, France

PCT No. PCT/FR80/00097, § 371 Date Feb. 17, 1981, § 102(e) Date Feb. 17, 1981, PCT Pub. No. WO81/00019, PCT Pub. Date Jan. 8, 1981

PCT Filed Jun. 23, 1980, Ser. No. 237,128

Claims priority, application France, Jun. 25, 1979, 79 16295 Int. Cl.<sup>4</sup> F01B 7/02, 1/00

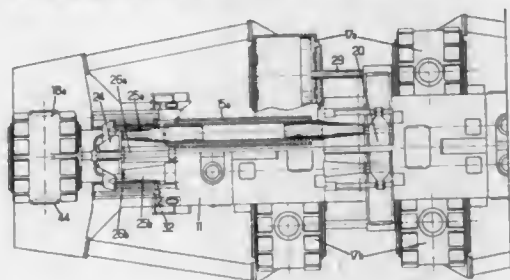
U.S. Cl. 417-341

10 Claims

1. Multi-tandem free piston machine, comprising:
- a stationary frame having a horizontal longitudinal axis and substantially symmetrical with respect to a vertical mid-plane, having a lower base member extending substantially throughout the complete length of the frame and an upper header and a central structure secured to said base member and header,
- an inner movable unit having a central cross member transverse to said axis and carried by said stationary frame for reciprocation along said axis, two sets of four inner drive

pistons connected to said central cross member, movable in respective drive cylinders whose axes are located at the corners of a rectangle and which are secured to said central structure, said two sets being on opposite sides of said central cross member, and two sets of compressor pistons connected to said central cross member, located on opposite sides of said cross member and slidably received in respective double action inner compressor cylinders whose axes are located outside said rectangle and which are securely connected to said central structure;

an outer movable unit comprising two outer cross members, tie rod means connecting said cross members, a set of four outer drive pistons carried by each said outer cross member and movable in four respective outer drive cylinders,



each said outer cross member being connected to two compressor pistons slidably received in respective double action outer compressor cylinders whose axes are located outside of said rectangle, and which are each located on the longitudinal side of the respective one of said outer cross members opposed to said midplane;

and means for time synchronizing the reciprocations of the two movable units in operation;

the axes of the two compressor pistons of said inner movable unit being in a plane orthogonal to the plane of the axes of the two compressor pistons of said outer movable unit and separated by a distance which is greater than the distance of the axes of the two compressor pistons of said outer movable unit.

4,678,408

# SOLENOID DRIVE APPARATUS FOR AN EXTERNAL INFUSION PUMP

Clyde K. Nason, Valencia, and Gordon W. Culp, Van Nuys, both of Calif., assignors to Pacsetter Infusion, Ltd., Sylmar, Calif. Continuation of Ser. No. 568,615, Jan. 6, 1984. This application Sep. 24, 1985, Ser. No. 779,733

Int. Cl.<sup>4</sup> F04B 9/06, 13/00

U.S. Cl. 417-410

11 Claims

1. A solenoid drive apparatus comprising:

a solenoid means responsive to applied electrical energy for moving a solenoid armature in a first linear direction;

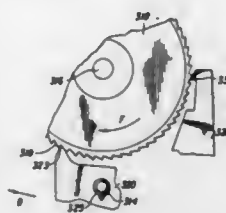
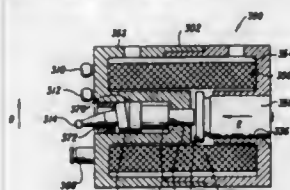
a push rod mechanically linked to said solenoid armature to cause said push rod to be pushed in said first linear direction by the movement of said solenoid armature;

a pawl having a base at one end thereof and a tip at an opposite end thereof, a portion of said base being in contact with said push rod, the movement of said push rod in said first linear direction thereby causing said pawl to rock on said base, thereby causing said tip of said pawl to move in a linear motion in a second direction essentially orthogonal to said first direction;

a pawl mechanically engaged with said tip of said pawl and mounted for slideable movement in said second direction;

a shaft having a longitudinal axis parallel to said first direction, said pawl having one end thereof coupled to the circumference of said shaft whereby the linear motion of

said pawl in said second direction translates to rotational motion of said shaft to cause said shaft to rotate; and



means for allowing said shaft to rotate in one direction and for preventing said shaft from rotating in the opposite direction.

4,678,409

# MULTIPLE MAGNETIC PUMP SYSTEM

Toshio Kurokawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

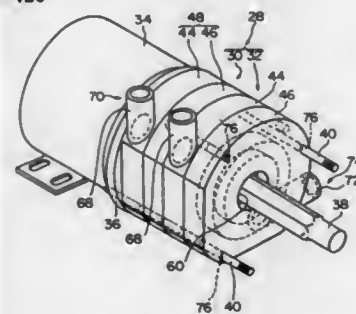
Filed Nov. 21, 1985, Ser. No. 799,770

Claims priority, application Japan, Nov. 22, 1984, 59-178060[U]; Aug. 22, 1985, 60-128151[U]

Int. Cl.<sup>4</sup> F04B 17/00

U.S. Cl. 417-420

9 Claims



1. A multiple magnetic pump system comprising:

a single rotatable driving shaft of a driving source;

a plurality of casings each defining a pump chamber; each of said casings comprising a pair of oppositely directed bowl bodies sealably connected to each other at their peripheries to form a pump chamber therebetween, one of said bowl bodies of said pair including an integral tubular member extending from a central portion thereof toward the other bowl body, said other bowl body having a hole at its center and said tubular member at its end remote from the central portion of said one bowl body being sealably coupled to the central portion of said other bowl body at said hole such that said tubular member of said one bowl body and said hole within the center of said other bowl body define a through hole, means for connecting said plurality of casings as an axial array with the through holes for said casings being axially aligned, said tubular member defining an axial through hole therein and partitioning said through hole from said pump chamber so as to allow said driving shaft to be insertably received within said through holes of said plurality of casings;

at least one driving magnetic material member connected to said driving shaft.

an impeller rotatably mounted on each tubular member in said each pump chamber;

a driven magnetic material member connected to each impeller and receiving a magnetic force from said driving magnetic material member so that said impeller is rotated by a rotation of said driving shaft; and

a pair of inlet and outlet ports provided in each said pump chamber.

4,678,410

# HAIR DRYER WITH AXIAL BLOWER

Albrecht Kullen, Wörthsee-Steinbach, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

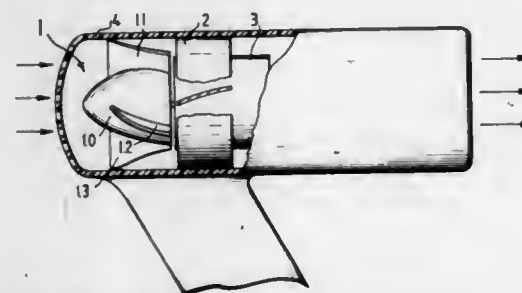
Filed Jul. 26, 1985, Ser. No. 759,424

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 3428650

Int. Cl.<sup>4</sup> F04B 17/00, 35/04

U.S. Cl. 417-423 R

7 Claims



1. A portable, hand-held hair dryer comprising structure defining an air inlet, an electric motor, an axial blower fanwheel mounted on said electric motor, said fanwheel having hub portion that is a body of rotation and a plurality of blades disposed on the outside circumference of said hub portion, the diameter of said hub portion, at least in the axial section where said blades are disposed, increasing constantly in the flow direction in such fashion that its surface is curved convexly in this direction, and said blades being smoothly curved and further having an entrance angle that increases with radial distance from the rotational axis of said hub, said angle being a function of the average axial flow velocity generated and the circumferential velocity of the fanwheel at the radial distance in question, and all cross sections of said blades perpendicular to the rotational axis of said fanwheel having midlines through the entire radial lengths of said blades, which midlines are straight lines and extensions of which intersect the rotational axis of said hub portion.

4,678,411

# OIL PUMP

Dieter Wieland, Remseck, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,180

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447091

Int. Cl.<sup>4</sup> F04B 7/06; F16N 13/20; F15B 16/24; F16C 1/10

U.S. Cl. 417-500

15 Claims

1. An oil pump for a motor-driven tool such as for supplying lubricating oil to the cutting chain of a chain saw, the oil pump comprising:

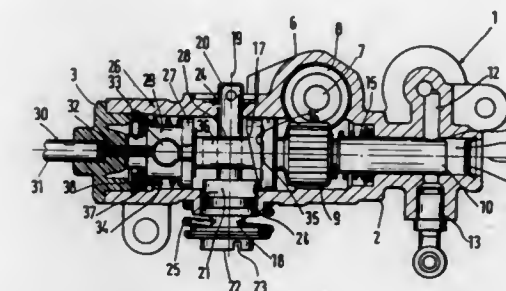
a housing defining a longitudinal housing axis;

a piston defining a longitudinal piston axis coincident with said longitudinal housing axis and being mounted in said housing so as to be displaceable along and rotatable about said axis;

drive means for rotatably driving said piston about said axis;

control cam means for reciprocally displacing said piston through a predetermined stroke along said axis as said piston is rotated about said axis;

a control slider slideably mounted in said housing for movement between a first position whereat said control slider limits the movement of said piston to a portion of said stroke thereby causing said piston to pump the lubricating oil at a first rate and a second position whereat said piston is free to move through the full excursion of said stroke thereby causing said piston to pump the lubricating oil at a second rate greater than said first rate;



actuator means for actuating said control slider for moving the same against the force of said slider spring from said first position to said second position, said actuator means including a manually actuated Bowden cable connected to said control slider;

said control slider having a projection extending outwardly therefrom in a direction away from said piston and along said housing axis, said housing being an elongated structure having a cover disposed at one end thereof adjacent said projection, said Bowden cable including a pull wire anchored in said projection and a casing surrounding said pull wire, said casing being supported on said cover.

4,678,412

# ADJUSTING APPARATUS FOR A VANE PUMP OR RADIAL PISTON PUMP

Jorg Dantlgraber, Lohr-Sackenbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth G.m.b.H., Lohr, Fed. Rep. of Germany

Continuation of Ser. No. 564,956, Dec. 23, 1983, abandoned.

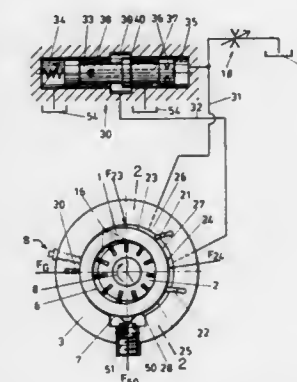
This application Feb. 21, 1986, Ser. No. 833,511

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247885

Int. Cl.<sup>4</sup> F04C 2/344, 15/04; F04B 49/08

U.S. Cl. 418-26

32 Claims



1. A pump for the conveyance of hydraulic operating fluid comprising:

a housing;



a rotor mounted rotatably in said housing;  
a plurality of pumping means carried by said rotor;  
an adjustable cam ring movable in two directions orthogonal to each other having an inside and an outside jacket and being disposed to surround said rotor;  
said cam ring being subjected to an operating force  $F_4$ , said operating force being generated by system pressure outwardly on said cam ring;  
first support means for supporting said cam ring in different positions, which correspond to different amounts of fluid being conveyed, by means of the hydraulic operating fluid acting directly onto said outside jacket of said cam ring at a pump regulating pressure, said pump regulating pressure being derived from the system pressure and being applied in a first direction for moving the cam ring into different positions along the first direction; and  
second support means for supporting said cam ring and for providing adjustment of the start of compression depending on the system pressure by means of the hydraulic operating fluid acting directly onto said outside jacket of said cam ring in a second direction which is substantially orthogonal to said first direction.

4,678,413

# VARIABLE DISPLACEMENT VANE PUMP OR MOTOR

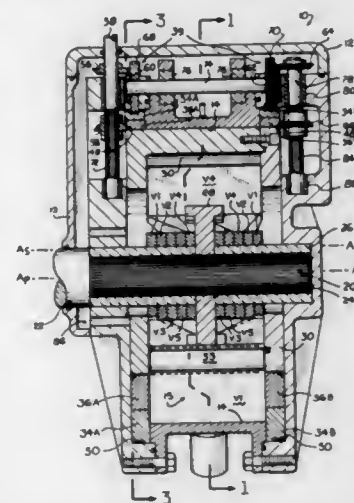
Edward Ries, 450 Porter La., San Jose, Calif. 95127

Filed Jan. 22, 1986, Ser. No. 821,485

Int. Cl.<sup>4</sup> F01C 21/16; F04C 15/04

U.S. Cl. 418—29

4 Claims



1. A variable displacement machine comprising:
  - a housing provided with a chamber having a substantially cylindrical surface and a pair of orifices opening on said chamber;
  - rotary shaft means extending into said housing and having a primary axis of rotation;
  - a plurality of vane means having first ends coupled to said shaft means for rotation therewith, said vane means extending substantially radially from said shaft means, said vane means having second ends which sweep along said substantially cylindrical surface as said shaft means rotates;
  - rotor means disposed within said chamber around said shaft means and within said cylindrical surface, said rotor means having a secondary axis of rotation which is substantially parallel to said primary axis of rotation, said rotor means being provided with a plurality of apertures, where said vane means extend through said plurality of apertures such that said rotor means rotates with said vane means and said shaft means; and
  - an adjustment means for adjusting the position of said rotor means relative to said primary axis, said adjustment means

including an outer eccentric member, an inner eccentric member and having a means for rotating said eccentric members in counter-rotating directions, said outer member having a first outer surface in engagement with the cylindrical surface of said chamber and having a first inner surface which is eccentric relative to said first outer surface, said inner member having a second outer surface in engagement with said first inner surface and having a second inner surface in engagement with said rotor means, said second inner surface being eccentric said second outer surface.

4,678,414

# PERISTALTIC DIAPHRAGM PUMP WITH CONICALLY SHAPED NUTATING MEMBERS

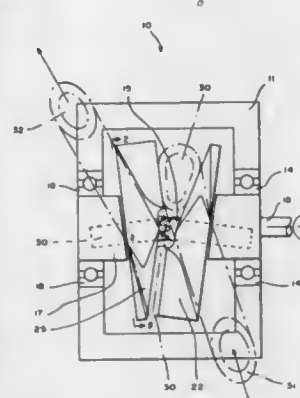
Charles Raymond, Jr., 312 Sixth St., Petaluma, Calif. 94952

Filed Dec. 8, 1986, Ser. No. 938,833

Int. Cl.<sup>4</sup> F01C 5/00

U.S. Cl. 418—45

7 Claims



1. A peristaltic diaphragm pump comprising
  - a drive shaft defining an axis of rotation,
  - a first nutating member having a first contact surface,
  - a second nutating member having a second contact surface,
  - means for mounting said first and second members for nutating movement with respect to said axis of rotation and with said contact surfaces in mutually facing relationship, and
  - a flexible tubular member having an inlet and an outlet at ends thereof, said tubular member disposed between said first and second contact surfaces and around said axis of rotation,
  - each of said contact surfaces being nearly conical with the slope linearly changing from a minimum angle to a maximum angle around an oblique axis with respect to said axis of rotation such that each of said nutating members nutates with respect to said axis of rotation to compress said tubular member peristaltically between said contact surfaces and to provide a linear radial sealing on said tubular member as said drive shaft is rotated around said axis of rotation.

4,678,415

# ROTARY TYPE FLUID MACHINE

Takahisa Hirano, and Kiyoshi Hagimoto, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed May 24, 1985, Ser. No. 738,049

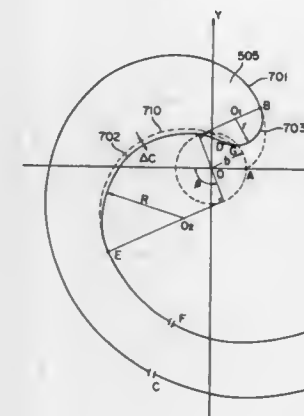
Claims priority, application Japan, May 25, 1984, 59-105970; May 28, 1984, 59-108008; May 31, 1984, 59-111658

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> F01C 1/02

U.S. Cl. 418—50

3 Claims



1. A rotary type fluid machine comprising stationary spiral means and revolving spiral means respectively having a substantially identical configuration and disposed 180 degrees apart from each other in mutually nested relationship, said revolving spiral means being adapted to revolve in solar motion relationship with said stationary spiral means with a radius  $\rho$  or revolutionary motion wherein said both spiral means are respectively formed by an outer curve consisting of an involute curve, an inner curve consisting of an involute curve having an inner arc of a radius  $R$ , and a connection curve having an arc of a radius  $r$  and connecting said outer curve and said arc having the radius  $R$  in a smooth manner so that fluid can be sucked into and delivered out of the fluid machine, characterized in that said both spiral means are respectively formed in accordance with the following equations; i.e.,

$$R = \rho + b\beta + d$$

$$r = b\beta + d$$

$$d = \frac{b^2 - \left(\frac{\rho}{2} + b\beta\right)^2}{2\left(\frac{\rho}{2} + b\beta\right)}$$

wherein

$$\beta \cong \frac{\pi + \sqrt{\pi^2 - 4}}{2} - \frac{\rho}{2b}$$

and  $b$  is the radius of a base circle of said involute curve.

4,678,416

# ROTARY TYPE FLUID MACHINE

Takahisa Hirano; Shoji Fukami, and Mitsutosho Maeda, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed May 24, 1985, Ser. No. 738,094

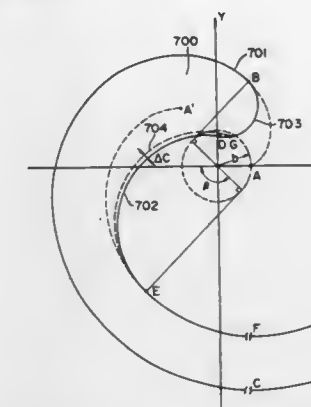
Claims priority, application Japan, May 25, 1984, 59-105971

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> F01C 1/04

U.S. Cl. 418—55

1 Claim



1. A rotary type fluid machine comprising stationary spiral means and revolving spiral means respectively having a substantially identical configuration and disposed 180 degrees apart from each other in mutually nested relationship, said revolving spiral means being adapted to revolve in solar motion relationship with respect to said stationary spiral means with a radius of revolutionary motion  $\rho$ , wherein said both spiral means are respectively formed by an outer curve consisting of an involute curve, an inner curve consisting of another involute curve having an inner arc of radius  $R$ , and an arc of a radius  $r$  connecting smoothly said outer curve and said arc having the radius  $R$ , in accordance with the geometrical relationship as given by the following equations;

$$R = \rho + b\beta + d$$

$$r = b\beta + d$$

$$d = \frac{b^2 - \left(\frac{\rho}{2} + b\beta\right)^2}{2\left(\frac{\rho}{2} + b\beta\right)}$$

where,

 $\beta \cong 135^\circ$ , and $b$  is the radius of a base circle of said involute curve.

4,678,417

# APPARATUS FOR COOLING TUBULAR PLASTIC FILM EXTRUDED FROM A FILM BLOWING HEAD

Hartmut Upmeyer, Lengerich of Westphalia, Fed. Rep. of Germany, assignor to Windmoller &amp; Holscher, Lengerich, Fed. Rep. of Germany

Continuation of Ser. No. 594,910, Mar. 29, 1984, abandoned.

This application Apr. 21, 1986, Ser. No. 857,390

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311932; Sep. 15, 1983, 3333397

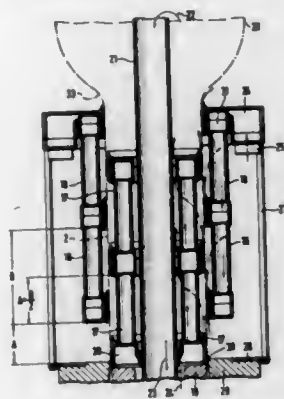
Int. Cl.<sup>4</sup> B29C 47/36

U.S. Cl. 425—72 R

13 Claims

1. Cooling apparatus for air-cooling tubular plastic film which has been extruded from a film blowing head including an annular extrusion die, which apparatus comprises: axially

spaced successive cooling rings, which in the direction of extrusion are downstream of the annular extrusion die of the film blowing head and are substantially concentric to a longitudinal axis of the extruded tubular film, the cooling rings including first rings having first convex annular air-guiding surfaces adjacent to and facing a surface of the tubular film and defining an annular flow passage with the film for conveying cooling air which flows in contact with said air-guiding surfaces and with the film, the air-guiding surfaces being convexly curved along substantially their entire length in a longitudinal sectional view of the first rings to define with the surface of the film an annular flow passage that converges and then diverges in an axial direction, and nozzle gaps defined by second rings positioned upstream of and spaced from the first rings and which are so arranged that a main cooling air flow discharged from said nozzle gaps flows into the converging portion of said annular



flow passage along the convexly curved air-guiding surfaces of said first rings and along the surface of the tubular film and approximately parallel to and in the same direction as the direction of travel of the tubular film, said nozzle gaps positioned at an outlet of a converging annular passageway defined by said first and second rings, said second rings having second convex annular air-guiding surfaces adjacent to and facing the surface of the film and over which an induced flow of ambient air passes as a result of an injection effect to provide additional cooling air that flows in the same direction as the direction of travel of the tubular film, and said first rings having an annular trailing edge defined by the junction of said first annular air-guiding surface and a second surface of said first ring over which an additional flow of ambient air is induced by the main cooling air flow to flow in the direction of travel of the tubular film.

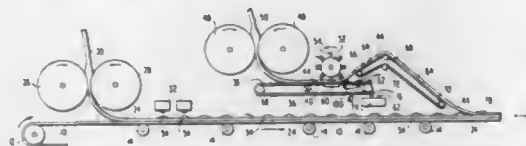
4,678,418

# APPARATUS FOR CONTINUOUSLY FORMING LATTICED PASTRY GOODS

Robert R. Thull, Wyckoff, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.  
Division of Ser. No. 743,380, Jun. 11, 1985. This application  
Oct. 28, 1985, Ser. No. 792,024  
Int. Cl. A21C 11/12

U.S. Cl. 425-115

9 Claims



1. Apparatus for continuously forming individual product pieces having filler therein and having perforations of substantial size in the top layer thereof, comprising:

- (a) means for forming a first continuous flat dough sheet;
- (b) means for transporting the first continuous flat dough sheet;
- (c) means for periodically depositing at least one portion of a natural filler or an artificial filler on the first continuous flat dough sheet;
- (d) means for forming a second continuous flat dough sheet;
- (e) conveyor belt means for transporting the second continuous flat dough sheet, the conveyor belt means having a conveyor belt of a material to which the dough of the second continuous flat dough sheet will adhere in response to pressure, the conveyor belt means being positioned above said transporting means along the axis of movement thereof after the filler depositing means;
- (f) means for moving cutting elements through the second continuous flat dough sheet to form a multitude of holes in the second continuous flat dough sheet, each such hole containing a dough piece therein, the cutting elements pressing the perimeter of each dough piece so that the perimeter of each dough piece adheres to said conveyor belt means;
- (g) means for lifting the second continuous flat dough sheet off said conveyor belt means without disturbing the cut out dough pieces, adhered to said conveyor belt thereby providing perforations in the second continuous flat dough sheet, the lifting means being positioned above the end portion of said conveyor belt means along the axis of movement of said conveyor belt means and above said transporting means;
- (h) means for placing the perforated, second continuous flat dough sheet on top of the first continuous flat dough sheet and deposits of filler thereon, thereby forming a continuous composite comprising the filler deposits enclosed between the perforated, second continuous dough sheet and the first continuous flat dough sheet; and
- (i) means for dividing the continuous composite into individual pieces, each individual piece having at least one deposit of filler enclosed between a segment of the perforated, second dough sheet and a segment of the first flat dough sheet.

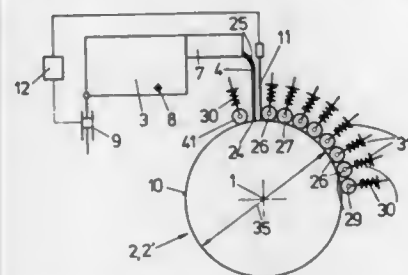
4,678,419

# ARRANGEMENT FOR THE PRODUCTION OF VITRIFIED SLAG

Bernhard Enkner, Dietmar Stephan, Leopold Schropp, all of Linz, and Wilhelm Stastny, Alberndorf, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria  
Filed Mar. 3, 1986, Ser. No. 835,160  
Claims priority, application Austria, Mar. 15, 1985, 775/85  
Int. Cl. B28B 17/00

U.S. Cl. 425-143

28 Claims



1. An arrangement for the production of vitrified slag, such as blast furnace slag, including a rotating cooling drum provided with an internal cooling and recesses on its surface adapted to receive molten slag impinging on said cooling drum on a site of impact located on said cooling drum approximately in its uppermost point, the improvement which comprises cooling drum webs for separating said recesses in the circumferential direction of said cooling drum, said recesses being closed in the end regions of said cooling drum in the axial

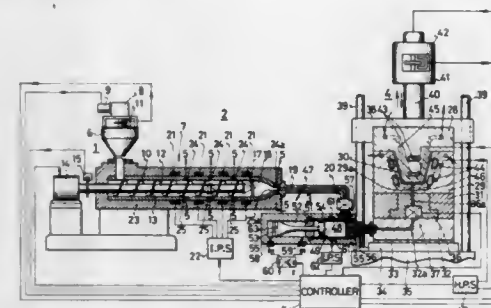
direction thereof, and a plurality of cooled counter rolls contacting said cooling drum webs by their surfaces and aligned with their axes parallel to the axis of said cooling drum, said counter rolls being arranged after said site of impact of said slag in the rotation direction of said cooling drum and one behind the other in the circumferential direction of said cooling drum.

4,678,420

# INJECTION MOLDING MACHINE WITH AUXILIARY PACKING MEANS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawaken, Japan  
Filed Feb. 5, 1985, Ser. No. 698,419  
Claims priority, application Japan, Feb. 6, 1984, 59-18488; Oct. 9, 1984, 59-210378  
Int. Cl. B29C 45/77, 45/78  
U.S. Cl. 425-144

6 Claims



1. An injection molding machine for molding a plastic material, comprising:
  - barrel means for melting the plastic material and for extruding a melt of the plastic material, said barrel means having two ends;
  - a heated cylinder within said barrel means for containing the plastic material, said cylinder having a screwed ram rotationally disposed therein;
  - a feeder for dispensing the plastic material into the heated cylinder, said feeder mounted on one end of said barrel means;
  - an outlet nozzle for extruding the plastic melt from said heated cylinder, said outlet nozzle located at the other end of said barrel means;
  - packing means for accepting an amount of said extruded plastic melt from said outlet nozzle, said packing means having a heated tubular housing;
  - a sliding member disposed in said tubular housing for sliding displacement, said sliding member and said tubular housing forming a packing chamber for accepting said plastic melt;
  - a mold cavity coupled to said packing means;
  - drive means associated with said packing means for displacing said sliding member to reduce the volume of said packing chamber for forcing the plastic melt contained in said packing chamber into said molding cavity;
  - control means for controlling the rotation rate of said screwed ram, the plastic material dispensing rate of said feeder, and the temperature of said heated cylinder;
  - a plurality of pressure sensors disposed along the length of said heated cylinder for sensing pressures along the interior length of the heated cylinder, said pressure sensors being electrically coupled to said control means to supply said control means with signals respecting the pressure profile along the interior length of said heated cylinder;
  - a plurality of temperature sensors disposed along the length of the interior of the heated cylinder for sensing temperatures along the interior length of the heated cylinder, said temperature sensors being electrically coupled to said control means to supply said control means with signals

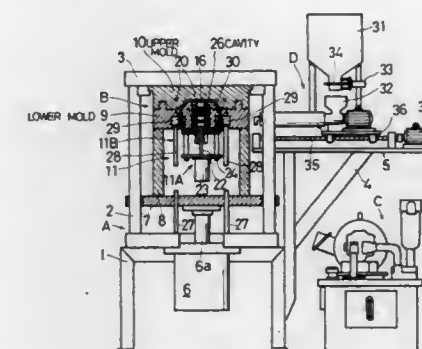
respecting the temperature profile along the interior length of said cylinder; and  
said control means being such as to regulate the rotation rate of said screwed ram, the plastic material feed rate of said feeder and the temperature of said heated cylinder in response to said sensed pressure and temperature profiles.

4,678,421

# RESIN MOLDING APPARATUS

Toru Kai, Inazawa, and Kouchi Kato, Ichinomiya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan  
Filed Nov. 25, 1985, Ser. No. 801,403  
Claims priority, application Japan, Nov. 26, 1984, 59-248860  
Int. Cl. B29C 45/03, 45/07  
U.S. Cl. 425-159

4 Claims



1. A resin molding apparatus comprising:
  - a frame member;
  - an upper mold secured to said frame member;
  - a lower mold mounted for up and down movement relative to said upper mold, said lower mold having a lifted position in which said lower mold is abutted with said upper mold and defines a mold cavity therewith;
  - a pouring pot means disposed within said lower mold said pouring pot means including a pot with a heating member provided therein and a piston member disposed for up and down movement within said pot and having a lifted position in which said piston defines part of said cavity; and
  - a material supply unit mounted on said frame member for back and forth movement between said upper and lower molds when said lower mold is at a lowered position thereof,
  - said material supply unit including:
    - a plasticizing cylinder for plasticizing a resin material,
    - a supply plunger for supplying the resin material into said pot of said pouring pot means,
    - a drive device provided for individually driving said plasticizing cylinder and said supply plunger, and
    - a ball screw member for moving said plasticizing cylinder, said supply plunger and said drive device back and forth as a unit.

4,678,422

# SYSTEMS AND METHODS FOR PRECISE, ACCURATE FORMATION OF PRODUCTS BY PHOTOABLATION

Kenneth K. York, Apt. No. 28, 1633 Amberwood Dr., Pasadena, Calif. 91030  
Filed Nov. 12, 1985, Ser. No. 797,228  
Int. Cl. B25B 17/00

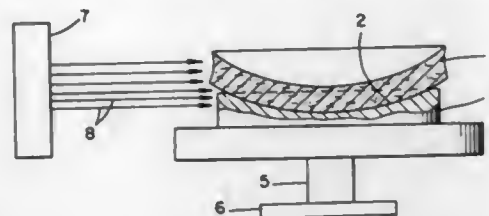
U.S. Cl. 425-174.4

7 Claims

1. A system for shaping a moldable photoablatable product blank into a finished product comprising mold means for holding a moldable photoablatable product blank, said mold means having an interior surface of predetermined size and shape, said mold means being substantially impervious to photoablating light; means for generating light capable of photoablating said



product blank; and means for directing light capable of photoablating said product blank across and against the opening of



said mold means to photoablate the portions of the product blank projecting from said opening without affecting the product blank inside the mold.

4,678,423

### DIE FOR HOT DIE FACE CUTTING THERMOPLASTIC POLYMERS

Franco Bertolotti, Milan, Italy, assignor to Montedison S.p.A., Milan, Italy

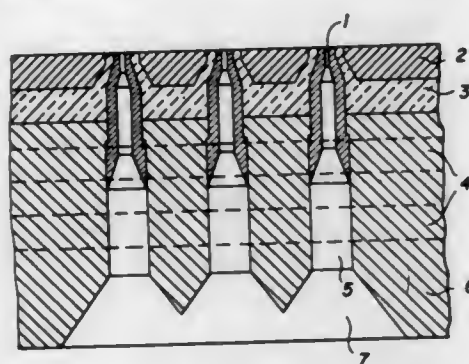
Filed Jan. 31, 1985, Ser. No. 696,740

Claims priority, application Italy, Feb. 2, 1984, 19387 A/84

Int. Cl.<sup>4</sup> B29B 9/00

U.S. Cl. 425-311

14 Claims



1. A die for hot die face cutting thermoplastic polymers, comprising:
  - a die body comprising a plurality of channels for polymer flow;
  - a bored plate fixed to a front part of said die body and bored at locations corresponding to each channel, said bored plate having an outer surface acting as a cutting counter-blade and an inner surface;
  - a layer of insulating material positioned between the die body and the bored plate;
  - said die body comprising a thermoregulating system for thermally regulating the die body at least an end part of said channels; and
  - a plurality of nozzles, each nozzle being (i) rooted inside the die body at each location corresponding to said channels, (ii) protruding from the die body, and (iii) extending through the insulating layer and the bored plate, said insulating material closely fitting around an external configuration of respective end parts of said nozzles and to said inner surface and bored locations of said plate, wherein said insulating material envelopes said nozzles up to said end parts of said nozzles such that said nozzles do not contact said bored plate at any point, and said nozzles being made of a metal material having thermal conductivity higher than 60 W/m²K.

### 4,678,424 CONTROLLED FAT INJECTION WITH STEAM IN A PELLET MILL

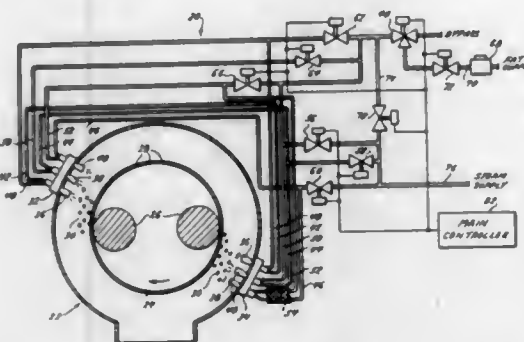
Joseph A. Volk, Jr., Florissant, and Mark R. Kneppmann, St. Louis, both of Mo., assignors to Beta Raven Inc., Hazelwood, Mo.

Filed Jul. 15, 1985, Ser. No. 755,082

Int. Cl.<sup>4</sup> A23P 1/02, 1/08

U.S. Cl. 425-331

20 Claims



1. In a pellet mill for processing a mash into pellets, said mill including a die, the die having a plurality of holes and at least one roller mounted inside the die and positioned substantially adjacent the die so that as the die and roller rotate, the roller squeezes the mash through the die holes to form pellets, the improvement comprising means to mix liquid fat with steam and spray the pellets with said heated fat mixture immediately after they are formed upon exiting through the die holes.

4,678,425

### RESILIENT SKIRTED SPINDLE NOSE AND PALLET WITH RECIPROCATABLE SPINDLE COMBINED THEREWITH

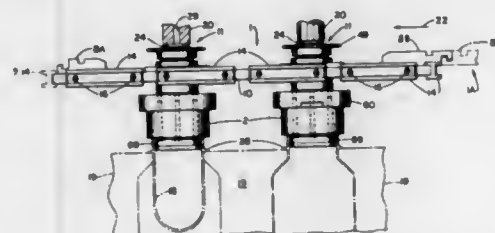
Joseph F. Gibbemeyer, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 27, 1986, Ser. No. 900,947

Int. Cl.<sup>4</sup> B29C 49/28

U.S. Cl. 425-522

19 Claims



1. A spindle nose for use in manufacturing or blow molding hollow plastic products from a hollow workpiece having a finish the inside diameter of which is engaged by a portion of the spindle nose, said spindle nose comprising:
  - a base;
  - a locating stud extending from one side of said base;
  - a flexible annular skirt extending from the other side of said base, said skirt being sufficiently resilient to maintain sealing engagement with the inside diameter of the workpiece finish during blow molding; and
  - an air passage extending completely through said locating stud, base, and flexible skirt.
2. An improved pallet assembly for use in a blow molding machine that uses a blow fluid, said assembly having an exchangeable chuck and permitting relative axial motion between the spindle and the pallet baseplate, said assembly comprising:

- a generally rectangular pallet baseplate;
- a plurality of spindle assemblies extending through and mounted in the baseplate;
- each spindle assembly having bearing means, a hollow spindle shaft with a passage therethrough mounted in said bearing means for rotation and axial reciprocation relative to a shaft axis and said baseplate, a shaft base at the bottom of said shaft, a reset means to urge said shaft to its beginning position after lineal movement, and a locating and seal recess within said shaft base and surrounding the passage at bottom end of said spindle shaft; and
- a spindle nose mounted on said shaft base for use in manufacturing or blow molding hollow plastic products from a hollow workpiece having a finish the inside diameter of which is engaged by a portion of the spindle nose, which portion further comprises:
  - a nose base;
  - a locating stud extending from one side of said nose base into said locating recess;
  - a flexible skirt extending from the other side of said nose base, said skirt being sufficiently resilient to maintain sealing engagement with the inside diameter of the workpiece finish during blow molding; and
  - a second air passage connected to the first said passage and extending through said locating stud, nose base, and flexible skirt.

from and surrounding the cone along at least a part of the axial extent of the cone, an axial tip sleeve collar on the delivery side and having an outer free end, said tip collar being outwardly spaced from and surrounding the tip along at least a portion of the axial extent of the tip, and a plurality of axial flow passages for injected plastic annularly distributed in the disc portion for communicating the space between said cone collar and cone on the receiving side with the space between said tip collar and tip on the delivery side,

The nozzle body being arranged in spaced relation to the internal wall defining the chamber with the cone adjacent yet spaced from the chamber entrance and the tip adjacent the mouth of the chamber exit, and being mounted in the chamber by positioning engagement of said cone collar free end and said tip collar free end with corresponding adjacent portions of the internal wall defining the chamber.

4,678,427

### AUTOMATIC SHUT OFF NOZZLE FOR PLASTIC EXTRUDER

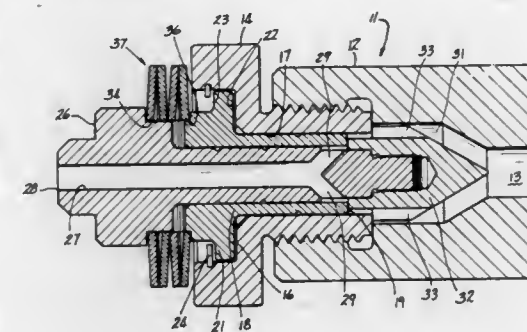
Klaus Fritzsche, Allistom, Canada, assignor to Husky Injection Molding System Ltd., Bolton, Canada

Filed Nov. 4, 1985, Ser. No. 794,287

Int. Cl.<sup>4</sup> B29C 45/22

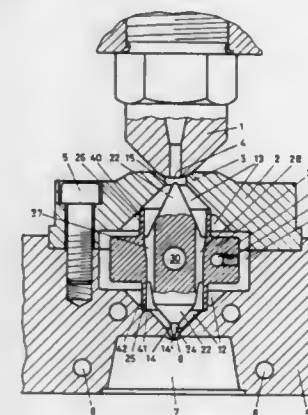
U.S. Cl. 425-562

11 Claims



1. A multi-position nozzle assembly for an injection molding machine operable to assume three distinct positions, namely a fully closed position, a partially open purging position and a fully open molding position, said nozzle assembly comprising:
  - a housing having an internal compound transmission channel, a housing extension connected to said housing, a sleeve member received slidably in said housing extension, stop means on said housing extension for limiting relative axial motion between the sleeve member and the housing extension and for establishing the partially open purging position, a torpedoes having a central through bore slidably disposed in said sleeve member, said central through bore having an inlet port and an outlet end said inlet port being operable to connect with said transmission channel, cap means carried by said torpedoes for effecting operating contact with said sleeve member, and a single power means operating continuously and directly on said torpedoes and on the sleeve member, said power means tending to urge the torpedoes relative to the sleeve member to maintain contact between said sleeve member and said cap means whereby said sleeve member overlays and closes said inlet port to establish said fully closed position while maintaining a predetermined axially spaced condition between the torpedoes and the sleeve member.

1. In a pellet mill for processing a mash into pellets, said mill including a die, the die having a plurality of holes and at least one roller mounted inside the die and positioned substantially adjacent the die so that as the die and roller rotate, the roller squeezes the mash through the die holes to form pellets, the improvement comprising means to mix liquid fat with steam and spray the pellets with said heated fat mixture immediately after they are formed upon exiting through the die holes.



1. Hot channel injector arrangement of a hot channel plastic injection molding machine having a machine supply nozzle and a mold cavity, comprising:
  - A hot channel injector having an internal wall defining an axial transfer chamber provided with a receiving end and a delivery end in axially opposed relation, a receiving entrance at the receiving end for receiving plastic from a supply nozzle of the machine and a delivery exit at the delivery end provided with a nozzle mouth opening directly into a mold cavity of the machine for delivering hot plastic thereto, and
  - An axial nozzle body in the chamber and having a heatable intermediate disc portion provided with a receiving side and a delivery side in axially opposed relation and containing a heating element accommodating intermediate radial passage bore therein, an axial sprue cone on the receiving side, an axial nozzle conical tip on the delivery side, an axial cone sleeve collar on the receiving side and having an outer free end, said cone collar being outwardly spaced

4,678,428

**MULTISTAGE FUEL BURNER HAVING A HELICALLY RISING COLUMN OF AIR-FUEL MIXTURE**

Eiichi Tanaka, Yamatokoriyama; Koro Farumai, Ikoma, and Fumitaka Kikutani, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

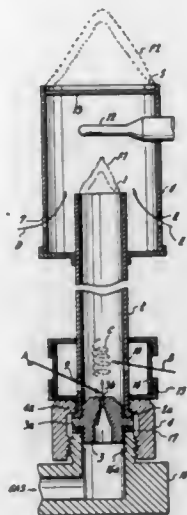
Filed Jan. 6, 1986, Ser. No. 816,630

Claims priority, application Japan, Jan. 10, 1985, 60-2325; Jun. 20, 1985, 60-134517

Int. Cl.<sup>4</sup> F23N 5/00

U.S. Cl. 431-76

7 Claims



1. A fuel burner comprising:  
a nozzle for ejecting fuel;

an inner tube having an inlet end for receiving the fuel from said nozzle, said inner tube having first and second air inlet ports adjacent to said nozzle and located in positions spaced longitudinally apart sequentially in the downstream direction of said inner tube and spaced angularly apart from said axis;

means, coaxing with said inner tube, for directing a first air flow into said inner tube through said first air inlet port with a velocity component in the upstream direction toward said fuel nozzle and for directing a second air flow into said inner tube through said second air inlet port with a velocity component in the downstream direction away from said nozzle to thereby produce a helically rising column of mixture of fuel and oxygen and providing primary combustion of the mixture at an outlet end thereof, said inner tube having no other air inlet ports upstream of said second air inlet port;

an outer tube surrounding and coaxial with the inner tube, the outer tube having secondary air inlet ports for introducing secondary air into the outer tube to provide secondary combustion at an outlet end thereof; and  
a sensor located between the outlet ends of said inner and outer tubes for detecting the presence of said primary combustion.

4,678,429

**DIE CASTING TORCH**

Kenneth P. Zecman, P.O. Box 39009, Redford, Mich. 48239

Filed Sep. 12, 1985, Ser. No. 775,146

Int. Cl.<sup>4</sup> F23Q 25/00

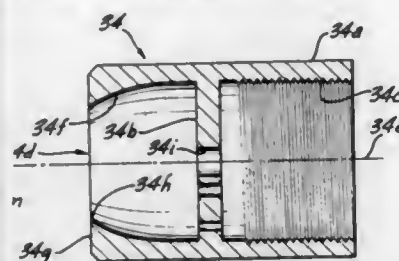
U.S. Cl. 431-144

12 Claims

11. An apparatus for limiting the temperature of the heat delivered to a nozzle of a die casting apparatus to avoid damaging the nozzle and avoid heating of the die cast metal above the temperature required for smooth flow, said apparatus comprising:

(A) a torch directed at the nozzle;

(B) a supply of pressurized air;  
(C) a supply of a pressurized combustible gas;  
(D) means for delivering said air and said gas to said torch in varying ratios of air pressure to gas pressure so that said air and said gas may be ignited to form a flame emitting from said torch for heating said nozzle; and



(E) means operative to extinguish said flame in response to an increase in said pressure ratio beyond a predetermined value;

(F) said torch including an elongated tubular torch tip having a transverse partition between its ends; and

(G) extinguishing means comprising means defining a mouth at the discharge end of said tip having a diameter that is less than the inner diameter of said tip at said partition.

4,678,430

**IGNITER FOR GAS DISCHARGE PIPE WITH A FLAME DETECTION SYSTEM**

Romeo E. Guerra, 6118 Walnut Hill La., Dallas, Tex. 75234

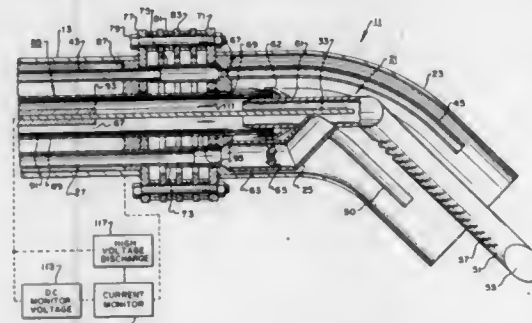
Division of Ser. No. 743,428, Jun. 11, 1985, Pat. No. 4,595,354.

This application May 5, 1986, Ser. No. 859,363

Int. Cl.<sup>4</sup> F23D 13/20

U.S. Cl. 431-202

4 Claims



1. An improved igniter for a gas discharge pipe, comprising in combination:

a tubular housing adapted to be mounted to the pipe;  
a nozzle secured to the upper end of the housing, having a laterally extending tip for discharging flame across the opening of the discharge pipe, the nozzle having a central conduit connected to the tip, a gas conduit connected to the central conduit, each conduit having a downwardly facing opening;

a stop member located in the upper end of the housing below the nozzle;

a frame extending through the housing, having an upper end adapted to engage the stop member;

an electrode mounted to the frame for insertion into the opening of the central conduit when the frame engages the stop member;

a gas line carried by the frame, having a lower end adapted to be connected to a source of gaseous fuel and an upper end that is adapted to telescopically insert into the gas conduit to deliver fuel to the nozzle;

an electrical power means for providing voltage to the electrode to create a spark to ignite the fuel;  
a brace;

mounting means for releasably securing the brace in the housing below the frame; and

compression means mounted to the brace for pressing against the frame to push it tightly against the stop member, allowing the frame and electrode to be removed for maintenance by removing the brace.

4,678,431

**VAPORIZATION BURNER FOR A HEATER OPERATED BY MEANS OF LIQUID FUEL**

Friedrich Wildemann, Munich, and Dieter Goerlich, Emmering, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH &amp; Co, Fed. Rep. of Germany

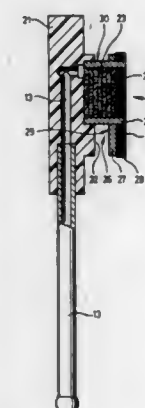
Filed Feb. 6, 1986, Ser. No. 826,813

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504291; Oct. 26, 1985, 3538201

Int. Cl.<sup>4</sup> F23B 3/40

U.S. Cl. 431-328

20 Claims



1. A vaporization burner for a heater operated by means of liquid fuel, particularly, a heater for vehicles, having an absorbent body to which fuel is supplied via fuel feeding device and which projects into a combustion chamber of the heater, wherein the absorbent body comprises a first vaporization part for very volatile fuel components and into which the fuel feeding device leads, and a second vaporization part for the least volatile fuel components located at an end of the absorbent body facing the combustion chamber, the two vaporization parts being separated from one another in an essentially fuel-impermeable way.

4,678,432

**HEAT TREATMENT METHOD**

Hideyuki Teraoka, Hikone, Japan, assignor to Dainippon

Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Sep. 5, 1985, Ser. No. 772,780

Claims priority, application Japan, Nov. 26, 1984, 59-248889

Int. Cl.<sup>4</sup> F27D 13/00

U.S. Cl. 432-12

4 Claims

1. In a method for heat treating an object wherein the object is carried into a heating furnace and is heat-treated by irradiation with light which is emitted from a light source disposed facing at least one side of said object in accordance with an output program which calls for a rise in temperature followed by a decrease in temperature, the improvement comprising:

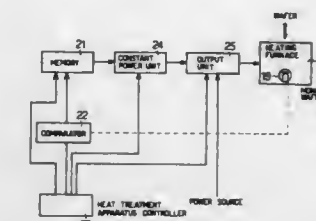
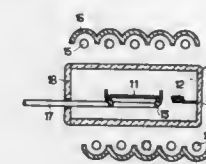
(a) preheating the furnace prior to carrying the object into the furnace by irradiating the furnace with light in accordance with the output program;

(b) measuring a first elapsed time between a first time when a first set-up temperature is reached in the course of the rise of furnace temperature, and a second time when a

second set-up temperature is reached in the course of the decrease in furnace temperature;

(c) repeating a cycle of steps a and b to measure a second elapsed time;

(d) comparing the difference between the first elapsed time and the second elapsed time with a specified value, wherein if the difference between the first elapsed time



and the second elapsed time is less than the specified value the preheating is terminated and an object is carried into the furnace, and wherein if the difference between the first elapsed time and the second elapsed time is greater than the specified value, step c is repeated to measure a subsequent elapsed time which is compared according to step d with the elapsed time measured in the immediately preceding cycle.

4,678,433

**OVEN SYSTEM HAVING A HEATED SNOOT AT ITS ENTRANCE END**

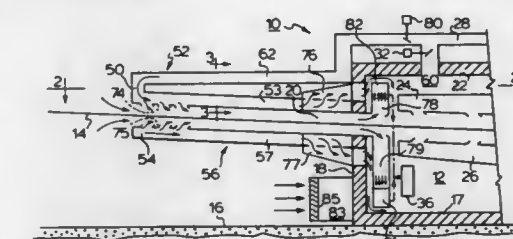
Keoneth Ellison, Brampton, Canada, assignor to Hunter Engineering (Canada) Ltd., Mississauga, Canada

Filed Dec. 30, 1985, Ser. No. 814,324

Int. Cl.<sup>4</sup> F27B 9/28

U.S. Cl. 432-59

6 Claims



1. An oven system for air curing coated product which is moved in a continuing manner through said oven and is coated with a heat-curable, solvent releasing coating material, comprising:

an oven line having at least one oven zone through which the coated product is arranged to travel, which zone is operated using only air at elevated temperatures;  
said oven line having an entrance end for said at least one oven zone and a port through which said coated product enters said oven line from outside said oven line;  
means for capturing substantially all indraft air entering said entrance end near said port;

air balance fan means for circulating said indraft air in at least a first volume to a heat exchanger for heating therein to at least said elevated oven temperature, and thence in a return line back to said oven line;



exhaust fan means adapted to withdraw solvent laden air from within said at least one oven zone and thence to deliver said solvent laden air to an afterburner having as its principal fuel source the volatile solvent released from said coating material and contained in said solvent laden air, said afterburner being the heat source for said heat exchanger; and a snout extending away from said entrance end in a direction opposite to the direction of flow of said coated product as it enters said port; said snout having therein at least one hollow duct with a surface portion of the duct positioned in close, facing proximity with a major portion of the area of the flow path along which said coated product moves within said snout; said hollow duct being adapted to receive at least a portion of the heated indraft air in said return line, to elevate the temperature of said duct outer surface to an infrared radiating condition for heating said product and to discharge said heated indraft air into at least one oven zone.

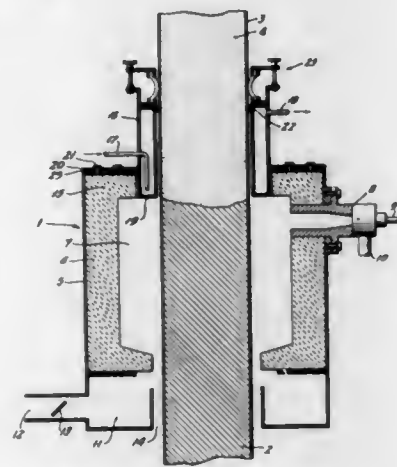
4,678,434

## BAKING FURNACE FOR ELECTRODES

Erik Q. Dahl; Arnfinn Vatland, and Olaf T. Vegge, all of Vågshygd, Norway, assignors to Elkem a/s, Norway  
Filed Aug. 7, 1986, Ser. No. 894,261  
Int. Cl. F27D 1/18

U.S. Cl. 432-242

8 Claims



1. A baking furnace for continuous production of elongated carbon bodies having uniform cross-section, said baking furnace being intended to be moved continuously or substantially continuously in relation to a casing containing unbaked carbonaceous electrode paste with a speed which corresponds to a preset baking speed for the carbon body, characterized in that the baking furnace (1) comprises an outer steel shell (5) and a refractory lining (6) arranged on the inside of the shell (5) said refractory lining (6) defining a combustion chamber (7), a cooling chamber (16) arranged between the upper part (15) of the refractory lining (6) and the casing (3), gas sealing means (23) arranged above the cooling chamber (16) and an off-gas channel (11) arranged below the refractory lining (6).

4,678,435

## TEMPORARY DENTAL CROWN AND METHOD OF FORMING THE SAME

Harry A. Long, 75 Mountain Spring Dr., Sparta, N.J. 07871  
Filed Jul. 28, 1986, Ser. No. 890,104  
Int. Cl. A61C 5/08

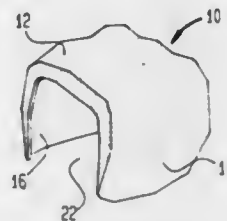
U.S. Cl. 433-218

4 Claims

1. A temporary dental prosthesis made of plastic material to

be fitted on a prepared tooth to receive a permanent crown comprising:

- a shell means of a generally fixed dimensional shape having a transverse wall means defining an occlusal layer configuration on the outer surface thereof, said transverse wall means having a buccal side and a lingual side,
- first sidewall means connected at one end to said buccal side of said transverse wall means and defining a buccal layer configuration on the outer surface thereof,
- said first sidewall means having a first shaped free edge remote from the end of the first sidewall means connected to the buccal side of the transverse wall means disposed in assembled position proximate to the gingival surface about said prepared tooth, and said first sidewall means reducing in thickness from said point of connection to the buccal side of said transverse wall means to said free edge on said first sidewall means,



- second sidewall means connected at one end to said lingual side of the transverse wall means and defining a lingual layer configuration on the outer surface thereof,
- said second sidewall means having a second shaped free edge remote from the end of the second sidewall means connected to said lingual side of the transverse wall means disposed in assembled position proximate to the gingival surface about said prepared tooth, and said second sidewall means reducing in thickness from said point of connection to the lingual side of said transverse wall means to said free edge on the second sidewall means,
- said shell means having fully formed openings at the mesial and distal ends thereof, and
- said transverse wall means, first sidewall means, and second sidewall means forming a cavity in the shell means fully open at the mesial end and the distal end of the shell means for receiving a self-curing acrylic resin.

4,678,436

## COLOR-CHANGEABLE CEMENT COMPOSITION FOR DENTAL USE

Kenji Kondo; Shigeru Katsuyama, both of Tokyo; Shoji Akahane, Higashikurume, and Kentaro Tomioka, Chofu, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Apr. 29, 1986, Ser. No. 857,162

Claims priority, application Japan, May 27, 1985, 60-113581  
Int. Cl. A61K 5/01

U.S. Cl. 433-228.1

7 Claims

1. A color-changeable cement composition for dental use comprising a first component comprising a metal oxide as a major ingredient, and a second component which reacts with the first component to form a set body, wherein said composition contains a substance which changes its color tone with the change in pH so that the color tone of said composition changes upon initial setting of said cement composition.

4,678,437

## CARTRIDGE AND TARGET DEVICE FOR MARKSMANSHIP TRAINING

Bentley N. Scott, Richardson; Vernon R. Porter, Plano, and Samuel R. Shortes, Lewisville, all of Tex., assignors to Technology Network International, Inc., Richardson, Tex.

Filed Sep. 27, 1985, Ser. No. 781,047

Int. Cl. G09B 9/00

U.S. Cl. 434-21

9 Claims



1. Marksmanship training apparatus for a weapon having a barrel, a cartridge chamber to hold a cartridge in position for firing and a firing mechanism for causing the cartridge to fire, said marksmanship training apparatus comprising:

an electrically conductive cartridge casing structured for disposition in the cartridge chamber of said weapon, said electrically conductive cartridge casing having a first end and a second end;

energy emitting means positioned to emit energy from said first end of said electrically conductive cartridge casing when activated, said energy being a pulse of energy with a rise time of less than 8 milliseconds;

a power source positioned within said electrically conductive cartridge casing and connected to said energy emitting means;

energy activation means positioned within said electrically conductive cartridge casing and electrically connected to complete an electrical circuit through said energy emitting means, said electrically conductive cartridge casing, said power source and said energy activation means when said energy activation means is activated to the on position by the firing mechanism of said weapon and thereby activate said energy emitting means; and

a transfer mechanism mounted for axial movement within said electrically conductive cartridge casing and positioned between said energy activation means and said second end of said electrically conductive cartridge casing to transfer the energy imparted by said firing mechanism to said energy activation means to activate said energy activation means;

said energy activation means comprises a snap action switch including a stationary terminal which is electrically connected to the power source and movable terminal which is positioned to be contacted by said transfer mechanism and moved to contact said stationary terminal to activate said energy activation means;

said movable terminal comprises a disc which is rigidly supported around the periphery thereof and includes a cupped portion which protrudes from said periphery in the direction of said transfer mechanism.

4,678,438

## WEIGHTLESSNESS SIMULATION SYSTEM AND PROCESS

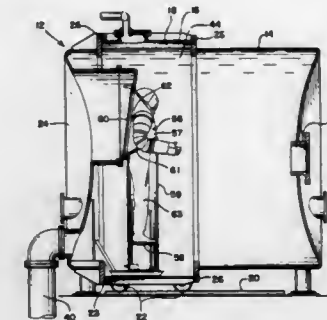
Hubert C. Vykukal, Los Altos, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 29, 1986, Ser. No. 924,398

Int. Cl. G09B 9/00

U.S. Cl. 434-34

13 Claims



1. A weightlessness simulation chamber, which comprises a chamber, a suit in said chamber connected to atmospheric pressure, means for hermetically sealing said chamber, means connected to said chamber for establishing a pressure in said chamber less than atmospheric pressure, and means connected to said chamber for supplying a body of water to said chamber.

4,678,439

## ENGINE INSTALLATION FOR USE IN A SHIP

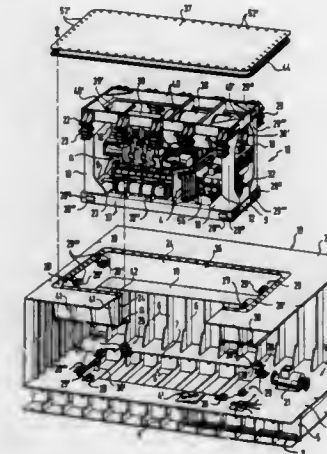
Norbert Schlichthorst, Beckdorf, Fed. Rep. of Germany, assignor to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany  
Filed Jul. 17, 1985, Ser. No. 756,032

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426333

Int. Cl. B63H 21/30

U.S. Cl. 440-11

42 Claims



1. A modular engine installation for driving a ship through water, said ship having hull means with a plurality of decks and propeller means being attachable to said modular engine installation, said hull means having opening means for receiving said modular engine installation, said modular engine installation comprising:

engine means being a primary source of power for propelling said ship through water;

a prefabricated modular container for containing said engine means;  
 said prefabricated modular container having a bottom means, side means and top means;  
 said side means having a plurality of portions, a first part of said portions being joined to one another to form corner portions therebetween; said bottom means having portions being joined to a second part of said portions of said side means to form corner portions between said bottom means and said side means;  
 means for attaching said prefabricated modular container to said hull means for taking up torque from and weight of said prefabricated modular container, said means for attaching being disposed at an upper portion of said prefabricated modular container, and for being disposed below an upper portion of said opening means to suspend said prefabricated modular container in said hull means;  
 said engine means having means for transferring torque to said propeller means of said ship;  
 said propeller means being separate from said modular engine installation and being attached to said hull;  
 said prefabricated modular container having means for permitting said torque transferring means to pass there-through;  
 removable cover means for covering said opening means in said hull means, at least when said prefabricated modular container is disposed in said hull means of said ship; and  
 said prefabricated modular container being insertable in and completely removable from said opening means and said hull means of said ship, substantially in toto, with said engine means being contained in said prefabricated modular container, whereby time required for refitting of said modular ship engine installation is minimized.

4,678,440

## BOAT AND PROPULSION SYSTEM

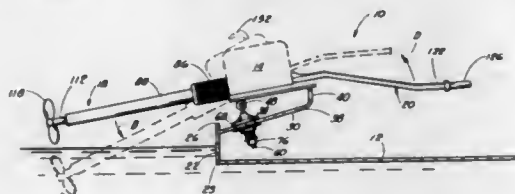
Roland Rodrigue, and Ronnie Rodrigue, both of 2233 N. Von Brann, Harvey, La. 70058

Continuation of Ser. No. 643,123, Aug. 22, 1984. This application Sep. 16, 1986, Ser. No. 911,748

Int. Cl.<sup>4</sup> B63H 5/12

U.S. Cl. 440—53

7 Claims



1. A boat and propulsion system, comprising:
  - a. a boat having a transom having a substantially planar horizontal upper surface extending side by side of said boat and being lower than the height of the gunnels of said boat, said transom transitioning from said substantially horizontal upper surface to substantially vertical surfaces at its extremities, said vertical surfaces merging with said gunnels;
  - b. a generally planar platform integrally attached to the side walls and said transom of said boat and defining a well area within said boat for receiving and draining backwash from said boat, said platform being inclined at an angle to the horizontal from said transom forward;
  - c. means for providing thrust to said boat, said means being removably mounted on said platform above and displaced forward of said transom and pivotal between a first neutral position and a second thrusting position;
  - d. means for limiting the angle of pivot of said thrusting means, said limiting means including said horizontal upper surface of said transom; and
  - e. means for limiting the rotational movement of said thrust-

ing means, said limiting means including said vertical surfaces of said transom.

4,678,441

## SYSTEM FOR DISCHARGING WATER FROM CRANK CHAMBER

Masaaki Murase, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

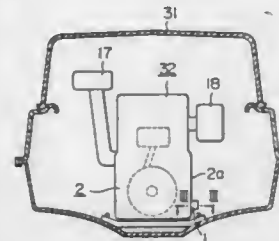
Filed Jan. 21, 1986, Ser. No. 820,176

Claims priority, application Japan, Jan. 24, 1985, 60-11644

Int. Cl.<sup>4</sup> B63H 21/10

U.S. Cl. 440—88

5 Claims



1. A system for discharging water from a crank chamber of a compression-type crank chamber two-cycle engine comprising:
  - a water discharge passageway for connecting a bottom portion of the crank chamber with an outside area;
  - valve means for opening and closing said passageway for allowing discharge of water accumulated in the crank chamber upon operation of a piston of the engine to create positive and negative pressures in the crank chamber while permitting normal operation of the engine with the crank chamber sealed including a first pressure-responsive valve mounted in said water discharge passageway and adapted to be brought to an open position to allow discharge of water through said passageway from the crank chamber by a positive pressure in the crank chamber produced by operation of the piston and adapted to be brought to a closed position to seal the crank chamber by a negative pressure in the crank chamber produced by operation of the piston;
  - a second valve mounted in said water discharge passageway for operation between open and closed positions; and
  - a manually operated member for manually opening and closing said second valve while said first valve is operating to allow discharge of water via said first valve through the passageway when the first valve is in an open position.

4,678,442

## APPARATUS RESPONSIVE TO SHORTAGE OF COOLANT IN AN ENGINE OF A BOAT

Hiroshi Nishida, Miki, and Mitsuhiro Yazaki, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jul. 3, 1985, Ser. No. 752,151

Claims priority, application Japan, Jul. 5, 1984, 59-101836[U]

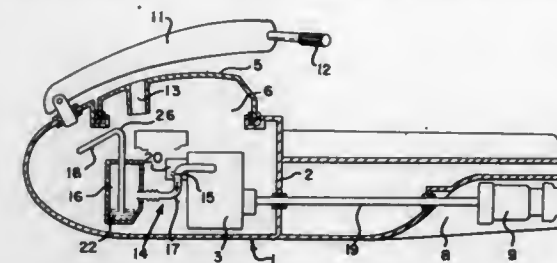
Int. Cl.<sup>4</sup> B63H 21/32

U.S. Cl. 440—89

3 Claims

1. In a boat including a hull forming an engine room, an internal combustion engine in said room, said room being substantially closed except for an air opening through which engine intake air flows into said room, whereby said engine is supplied with air from the room during operation, an exhaust system connected to said engine and extending to outside of said room, said engine including coolant flow means, cooling means in said room connected to said coolant flow means to receive coolant discharged from said engine and connected to inject said coolant into said exhaust system in said room, whereby the coolant is normally discharged during engine operation out of said room together with the exhaust gas from

said engine, and fuse means provided in said exhaust system in said room downstream from the location where the coolant is injected, said fuse means being fusible to form an opening



when the exhaust gas in said exhaust line exceeds a predetermined temperature, whereby exhaust gas enters said room through said opening and mixes with intake air entering the engine.

4,678,443

## INFLATABLE LIFERAFT

David V. Edwards, Billingshurst, and Michael A. Newman, Haslemere, both of England, assignors to RFD Limited, Surrey, England

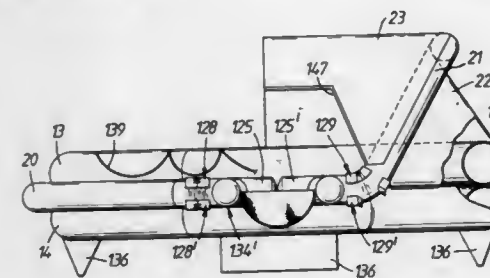
Filed Feb. 20, 1986, Ser. No. 831,330

Claims priority, application United Kingdom, Feb. 22, 1985, 8504628

Int. Cl.<sup>4</sup> B63B 35/58

U.S. Cl. 441—38

11 Claims



1. An inflatable liferaft comprising an inflatable buoyancy tube side wall structure and a floor so secured at its periphery to the side wall structure that the inflated liferaft can be used when deployed on water either way up, an inflatable protective tube structure, supply means to supply inflation medium to the side wall structure and the protective tube structure upon deployment of the liferaft to inflate the protective tube structure and the side wall structure together, said protective tube structure being so constructed and arranged in relation to the side wall structure that when inflated with the side wall structure it takes up a protective location in which it extends entirely round the outside of the side wall structure to protect the side wall structure from damage and from which it is displaceable either way to a canopy support location above the floor of the liferaft, and a canopy assembly so secured to the protective tube structure and to the side wall structure that when the protective tube structure moves to its canopy support location the canopy assembly deploys with the protective tube structure and is supported thereby.

184-021 O.G.-87-10

4,678,444

## WATER GLIDING SCOOTER BOARD

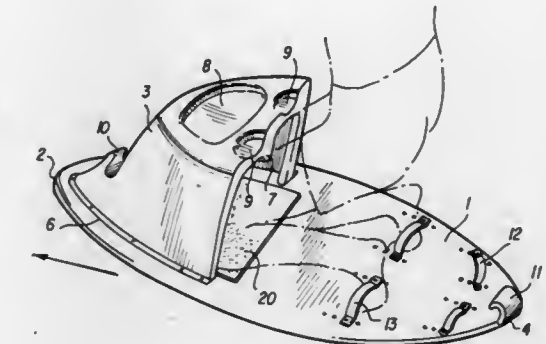
F. Javier Monreal, 4242 Barker Mill Rd., Jamesville, N.Y. 13078

Continuation-in-part of Ser. No. 672,813, Nov. 19, 1984, Pat. No. 4,629,434, and a continuation-in-part of Ser. No. 822,627, Jan. 27, 1986. This application Feb. 24, 1986, Ser. No. 832,389

Int. Cl.<sup>4</sup> A63C 15/00

U.S. Cl. 441—65

6 Claims



1. A sporting device, herein called water gliding scooter board, capable of accommodating a water gliding rider in the positions of low kneeling, high kneeling and high sitting, and of traveling in two opposite directions, comprising:
  - a floating oval board constructed of a seamless, foam-filled plastic sheeting unitary body measuring 4' to 5' in approximate length, 15" to 24" in approximate width at its widest middle section and 1" to 3" in thickness and having rounded contours;
  - a hard plastic hood mounted and screwed in place at one end of said oval board, said hood approximately shaped as a truncated irregular pyramid, enclosed and tapered to a point towards the end of the said board upon which it is mounted, and fully open in the direction facing the opposite end of said board; said plastic hood having a top surface elevated 10" to 14" above the upper surface of said board, said top surface of said hood having at the edge that faces the other end of the said board a pair of smoothly recessed indentations capable of accommodating the rider's knees when in a high kneeling position and traveling in a first direction; said plastic hood at its said top surface having a shallow and smoothly recessed dish-like indentation capable of accommodating the rider's buttocks when in a high sitting position facing the other end of said board and traveling in a second direction opposite the said first direction;
  - a first foot receiving means in the form of elastic strap(s) capable of accommodating the rider's feet when in a high kneeling position traveling in the said first direction;
  - a second foot receiving means in the form of elastic strap(s) capable of accommodating the rider's feet in a high sitting position traveling in the said second direction;
  - a first two-rope engaging means in the form of a smooth, hook-shaped protrusion placed at the said tapered enclosed end of the said hood, capable of receiving the pulling tow-rope when traveling in the said first direction;
  - a second two-rope engaging means in the form of a smooth, hook-shaped protrusion placed at the very tip of the said other end of said board, capable of receiving the pulling tow-rope when traveling the said second direction.



4,678,445

## WATER AND SNOW WISHBONE SHAPED SLED FOR ONE OR TWO

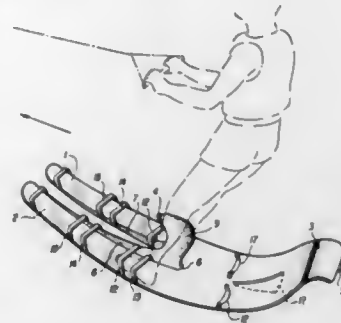
F. Javier Monreal, 4242 Barker Hill Rd., Jamesville, N.Y. 13078

Continuation-in-part of Ser. No. 751,599, Jul. 2, 1985, Pat. No. 4,603,870, and Ser. No. 672,813, Nov. 19, 1984. This application Dec. 9, 1985, Ser. No. 806,423

Int. Cl.<sup>4</sup> A63C 15/00

U.S. Cl. 441-72

9 Claims



1. A one piece water and snow gliding board, a sled, bifurcated as a wishbone or letter Y, capable of supporting one or two riders, one behind the other, in the positions of standing, sitting, kneeling or lying, and capable of traveling in either of two opposite directions, comprising:

- a pair of ski-like members that represent the front of said sled when traveling in a first direction, front part that, as a fork, has the two said ski members symmetrical to one another with a free space in between and which measures, from the front tips of said skis to the point of bifurcation or crotch,  $\frac{1}{2}$  to  $\frac{3}{5}$  of the total length of said sled;
- a wide section that is the rear of said sled when traveling in said first direction, wide section that is approximately as wide as the combined width of the two said ski members plus their in-between free space, being the front-to-rear length of said wide section, from said crotch of said sled to its rear end  $\frac{2}{5}$  to  $\frac{1}{2}$  of the total length of said sled;
- a humped up seat, extruded out of the said crotch area of the said sled, seat that rises 12" to 16" above said sled and which is capable of accommodating one sitting rider when said sled travels in either of said opposite directions;
- an extruded up-turned lip that is formed, as a continuum, by the medial edges of the two said ski members, up-turned lip that starts at zero at the front of each ski member and gradually rises to 3" to 4" towards the said crotch of said sled, at which crotch area said lip is built up to form said humped-up seat;
- a vertical, down-pointing fin parallel with both said directions of traveling, located at the undersurface of the said wide section of said sled;
- a first foot receiving means for engaging the feet of the front rider traveling in said first direction when said rider sits on said humped-up seat with his/her feet placed over the front of the said ski members;
- a second foot receiving means for engaging the feet of the said front rider when said rider stands at mid-length of the said ski members and traveling in the said first direction with a second rider accommodated at the rear of said sled;
- a third foot receiving means for engaging the feet of a single standing rider when said rider places his/her weight on the sides of the said humped-up seat and traveling in the said first direction;
- a fourth foot receiving means for engaging the feet of the rider in various positions of standing, sitting and kneeling and facing the said rear of said sled and traveling in the said second direction;
- a first tow-rope engaging means shaped as a down-pointing hook and mounted at the front tip of the said humped-up

seat, front of tip so considered when traveling in said first direction;

a second tow-rope engaging means shaped as a down-pointing hook and mounted at the very rear of said sled, rear so considered when traveling in said first direction;

a pair of hook/eye rings placed, each one respectively, at the very front tips of the said ski members, front tips so considered when traveling in said first direction.

4,678,446

## DEVICE FOR RESCUING PERSONNEL FROM WATERS

Paul C. Dahan, Pittstown, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

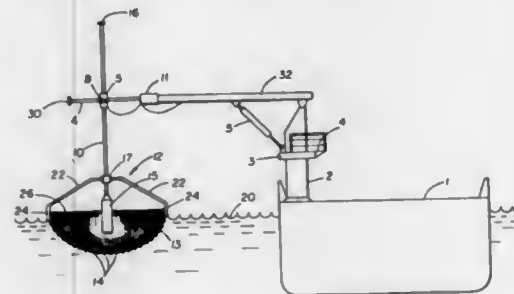
Continuation of Ser. No. 489,637, Apr. 28, 1983, abandoned.

This application Nov. 4, 1985, Ser. No. 794,329

Int. Cl.<sup>4</sup> B63C 9/00

U.S. Cl. 441-80

1 Claim



1. A device for rescuing personnel from water comprising: a crane on a boat, said crane including a horizontally and vertically movable boom;

an elongated rigid member vertically and freely movable with respect to said boom;

means connected to said boom for permitting inward and outward movement of said elongated member along the axis as defined by said crane arm;

buoyant means operatively connected to said elongated member for floating on the water;

a net extending below said buoyant means;

said buoyant means also defining the vertical relative position of said elongated member with respect to said boom while positioning individual(s) in said net; and

means for selectively locking said elongated member relative to said boom when said net is moved to or from said boat and for unblocking said elongated member relative to said boom when said buoyant means and net are placed in water, said permitting means comprising a pair of rails and a gimbal mechanism slidable on said rails, said gimbal mechanism being operatively connected to said elongated member for compensating for motion of said boat and the water surface, whereby said buoyant means and said net follow contour of the water surface.

4,678,447

## PROCESS OF MANUFACTURING FOR A HIGH-RESOLUTION COLOR CATHODE RAY TUBE

Charles J. Prazak, III, Elmhurst, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jun. 10, 1985, Ser. No. 743,184

Int. Cl.<sup>4</sup> H01J 9/227

U.S. Cl. 445-45

4 Claims

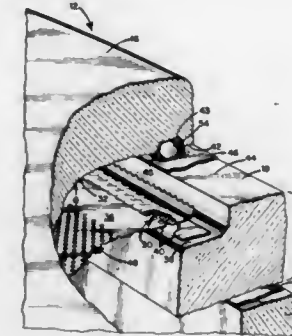
1. For use in a high-resolution color cathode ray tube, a front assembly comprising:

a faceplate with a target area for receiving at least one pattern of phosphor deposits, said faceplate having a sealing area circumscribing said target area including a plurality of first substantially radially oriented registration-affording V-grooves selectively oriented thereon;

a shadow mask support assembly having a frame ultimately

constituting a part of the tube envelope supporting a tensed foil shadow mask in precise adjacency to said target area, said frame having a sealing area geometrically matching said faceplate sealing area, and which has thereon a like plurality of second substantially radially oriented registration-affording V-grooves selectively located in alignment with said first V-grooves on said sealing area of said faceplate; and

a like plurality of balls disposed between the mated first and second registration affording V-grooves of said faceplate



and said frame for establishing precise registration between said faceplate and said shadow mask in the process of screening said pattern of phosphor deposits on said target area and later in the final assembly of said tube;

said faceplate assembly having a first cement composed of a vitrifying cement in the regions of said mated registration-affording V-grooves, and a second cement composed of a divitrifying cement elsewhere in said sealing area for permanent bonding of said faceplate and said frame, said vitrifying cement softening at a temperature below the divitrifying temperature of said devitrifying cement.

4,678,448

## KINESCOPE FUNNEL THUMPER AND FLUSH DEVICE

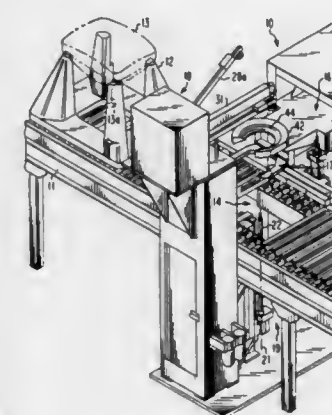
David E. Booth, New Providence; Steven G. Smith, Harrisburg, and John L. Adams, Sinking Springs, all of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 25, 1986, Ser. No. 855,601

Int. Cl.<sup>4</sup> H01J 9/38

U.S. Cl. 445-60

11 Claims



1. A device for simultaneously thumping and flushing a kinescope funnel having a faceplate and a neck, said device being situated in the proximity of a conveyance mechanism whereby said device removes said funnel from, and replaces said funnel on, said conveyance mechanism, said device comprising:

funnel lift means, said funnel lift means being horizontally

moveable between an empty position and a lift position, and vertically moveable between said lift position and a thump position; whereby said funnel lift means moves horizontally into engagement with a funnel and vertically to position said funnel at said thump position;

neck centering and orienting means arranged to move in unison with said funnel lift means, said neck centering and orienting means being configured to engage said neck to substantially center said neck with respect to a vertical axis, and to orient said neck substantially parallel to said axis;

fluid injection means arranged to move vertically along said axis to inject fluid into said funnel when said funnel is in said thump position; and

thumper means arranged to thump said faceplate when said funnel is in said thump position.

4,678,449

## TRACKWAY TOY ASSEMBLY

Yoshio Udagawa, 3-13, 3-Chome, Mama Ichikawa-Shi, Chiba-Ken, Japan

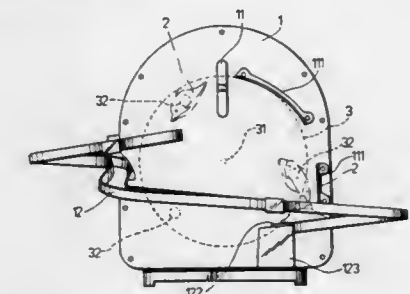
Filed Feb. 3, 1986, Ser. No. 825,324

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 8525183[U]

Int. Cl.<sup>4</sup> A63H 33/26

U.S. Cl. 446-136

4 Claims



1. A trackway toy assembly, which comprises:

a support having a plate-like member, the plate-like member including a viewable front face and a rear face opposite the viewable front face;

at least one movable toy piece which can be attracted by magnetic force;

an interrupted trackway for the toy piece to slide along, the trackway being mounted on the plate-like member, the trackway having a first end and a second end, the first and second ends being disposed on the viewable front face of the plate-like member, the first end being disposed at a level which is lower than that at which the second end is disposed so that the trackway slopes downwardly from the second end to the first end and so that the toy piece is adapted to slide along the trackway from the second end to the first end, the first and second ends defining a gap therebetween situated on the viewable front face of the plate-like member;

at least one magnetic means for magnetically attracting the toy piece; and

a rotatable circular member disposed on the rear face of the plate-like member and rotatable with respect thereto, the one magnetic means being mounted to the rotatable circular member and movable in a circular path therewith, the first and second ends of the interrupted trackway being further disposed along the circular path of the magnetic means, wherein the toy piece is adapted to be attracted to and carried by the magnetic means from the first end of the trackway to the second end in a circular motion upon rotation of the circular member, to give the impression that the toy piece is jumping across the gap from a lower level to a higher level, and wherein upon reaching the

second end, the toy piece slides along the trackway from the second end to the first end.

4,678,450

## TOY LIGHT SWORD

John E. Scolari, La Mesa; Robert T. Warner, Poway, and Joe E. Deavenport, San Diego, all of Calif., assignors to Life Light Systems, San Diego, Calif.

Continuation-in-part of Ser. No. 453,355, Dec. 27, 1982, abandoned. This application Jan. 7, 1984, Ser. No. 618,316

Int. Cl.<sup>4</sup> A63H 5/00, 33/26

U.S. Cl. 446—405

28 Claims



1. A toy light sword comprising:
  - an elongated, hollow, transparent blade;
  - a handle connected at one end of said blade;
  - flash lamp actuating means mounted to said handle;
  - a DC power source;
  - enabling switch means for selectively connecting said DC power source to said flash lamp actuating means for energization thereof;
  - high-intensity flash lamp means in said hollow blade for emitting a burst of high-intensity light when actuated by said flash lamp actuating means, said flash lamp means lighting the full length of said blade for a short duration, said blade appearing as a long, thin, short duration, glowing sword when viewed externally upon actuation of said flash lamp means; and
  - trigger switch means for selectively applying the energy in said flash lamp actuating means to said high-intensity flash lamp means to fire said lamp means;
  - said flash lamp actuating means comprising:
    - storage capacitor means connected across said flash lamp means;
    - means connected to said flash lamp means for triggering said flash lamp means into conduction;
    - oscillator means coupled to said source of DC power;
    - a DC/AC inverter connected to the output of said oscillator means;
    - an AC/DC converter and voltage multiplier connected between said DC/AC inverter and said storage capacitor means;
    - a feedback network;
    - comparator means connected between said feedback network and said oscillator;
    - means for coupling the voltage output from said voltage multiplier to said feedback network, said comparator means actuating said oscillator means when a predetermined reduction in the voltage on said storage capacitor means is detected;
    - whereby said storage capacitor means is maintained at a desired voltage level sufficient to actuate said flash lamp means as desired.

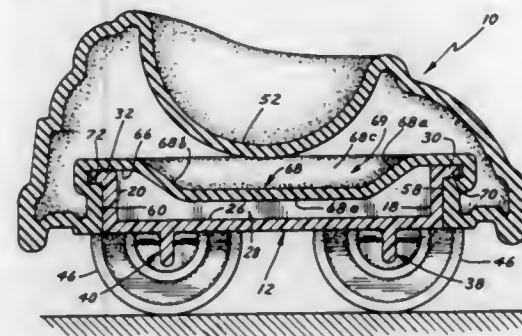
4,678,451  
INTERFITTING TOY VEHICLE BODY AND CHASSIS  
Frank D. Ventura, Newburyport, Mass., assignor to Kenner Parker Toys Inc., Beverly, Mass.

Filed Oct. 21, 1985, Ser. No. 789,817

Int. Cl.<sup>4</sup> A63H 17/26

U.S. Cl. 446—471

6 Claims



1. A toy vehicle comprising a chassis of relatively hard material including a box-like frame having oppositely directed first and second flanges thereon, and a body of relatively soft, resilient material having walls forming a downwardly facing recess, said walls being formed with first and second oppositely directed grooves for receiving therein said flanges, said first groove having a width substantially corresponding to the thickness of said first flange and said second groove having a width substantially corresponding to the thickness of said second flange, whereby said body can be deformed sufficiently to permit said flanges to be introduced into said grooves and remain received therein via which said body is attached to said chassis.

4,678,452

## OVERLOAD RELEASE CLUTCH

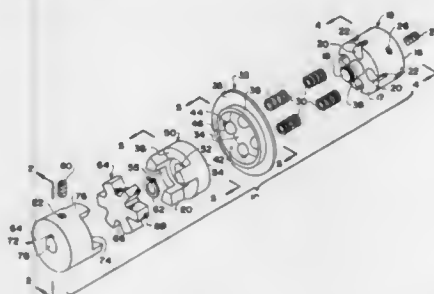
Richard D. Nelson, Safety Harbor, and James D. Evans, Clearwater, both of Fla., assignors to Performance Feeders, Inc., Clearwater, Fla.

Filed Jul. 26, 1985, Ser. No. 759,570

Int. Cl.<sup>4</sup> F16D 7/04, 3/68

U.S. Cl. 464—38

7 Claims



1. An overload release clutch assembly comprising
  - (a) a cylindrical spring housing and integral hub with a shaft mounted in the hub at a first end and an axially projecting integral shaft at a second end with a plurality of equally spaced spring seats at the periphery of the housing, each of sufficient depth to accommodate a coil spring and each having a groove exposing an upper portion of the spring seat through an outside wall of the spring housing;
  - (b) a detector ring having an annular opening sufficient to encompass the spring housing, the ring having an integral axially projecting flange with an inner and outer wall, multiple integrally connected bridging members joining a

detent bullet to the inner wall, the bridging members corresponding in number and spacing to the spring seats; (c) a bullet detent housing containing a central annular opening sufficient in diameter to accept the projecting shaft from the spring housing in a loaded mode and having on a first end engagable with the bullets, multiple shallow depressions corresponding in number and spacing to the detent bullets and on a second end, means for engaging a device for imparting rotary motion to the detent housing; (d) means mounted on the end of the spring housing integral shaft for holding the spring housing, detector ring and bullet detent housing together; and (e) a means for imparting rotary shaft motion to the detent housing.

4,678,453

CONSTANT VELOCITY RATIO UNIVERSAL JOINT  
Erich Aucktor, and Günter Gärtner, both of Offenbach am Main, Fed. Rep. of Germany, assignors to Löh & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

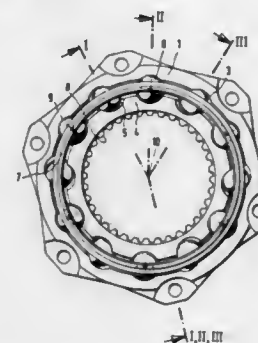
Continuation of Ser. No. 608,913, May 10, 1984, abandoned, which is a continuation of Ser. No. 341,479, Jan. 21, 1982, abandoned. This application Oct. 1, 1985, Ser. No. 783,057

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1981, 3102871

Int. Cl.<sup>4</sup> F16D 3/21

U.S. Cl. 464—144

5 Claims



1. In a rotary constant velocity universal joint having a joint center axis including an outer hollow joint member having an inner wall provided with outer grooves, an inner joint member arranged in said outer joint member, with said inner joint member having an outer wall with a number of inner grooves therein corresponding to the number of outer grooves in said outer joint member, with one groove of each of said outer and inner joint members jointly comprising a groove pair, with each groove pair, for torque transmitting purposes, receiving a ball which is guided by a cage arranged between said inner and outer joint members and whose center is maintained in a plane which bisects the angle between the axes of said inner and outer joint members, said groove pairs including oblique pairs each comprised of grooves which extend at an oblique angle relative to said center axis of said joint, and parallel groove pairs each comprised of grooves which are arranged to extend parallel to the direction of said joint axis, the improvement comprising that said oblique groove pairs and said parallel groove pairs are arranged to include adjoining oblique groove pairs with one parallel groove pair therebetween and that adjoining inner and outer grooves, respectively, of said oblique groove pairs are arranged at angles of inclination which extend transversely relative to each other.

4,678,454

## INERTIA CONTROLLED LOADING SYSTEM

John C. Gall, Chicago, Ill., assignor to Sears, Roebuck & Co., Chicago, Ill.

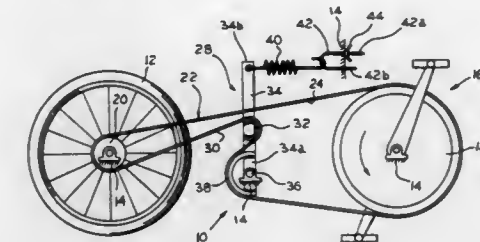
Continuation of Ser. No. 683,677, Dec. 19, 1984, abandoned.

This application Jun. 23, 1986, Ser. No. 879,530

Int. Cl.<sup>4</sup> F16H 7/08

U.S. Cl. 474—101

22 Claims



1. In a controllable loading system having a rotatable member mounted on a frame together with means for rotating the rotatable member, a drive pulley operatively associated with the rotating means and a driven pulley operatively associated with the rotatable member, and an endless belt member drivingly interconnecting the drive and driven pulleys, the belt member imparting rotation of the rotating means to the rotatable member through frictional resistance relative to the drive and driven pulleys, the belt member having a surface in frictional driving engagement with the drive and driven pulleys and having a tension side and a slack side, the improvement comprising:

means for providing a resistive load on the tension side of the belt member, said resistive load means including tension adjusting means for providing a fixed resistive load on the rotating means at any given constant speed of the rotatable member, the resistive load on the rotating means normally increasing or decreasing during any acceleration or deceleration of the rotatable member until the rotatable member again reaches a constant speed, said resistive load means also including friction altering means for providing enhanced variations in resistive load on the rotating means during any changes in speed of the rotatable member; said tension adjusting means being operatively associated with said friction altering means and the belt member being in arcuate engagement with said friction altering means on the tension side thereof; the variations of resistive load resulting from changes in speed of the rotatable member through the rotating means and the belt member being multiplied by a factor dependent upon the angle of arcuate engagement of the belt member with said friction altering means to provide the enhanced variations in resistive load; whereby the torque on the rotating means required to rotate the rotatable member through the belt member can be varied for both constant speed and changing speed operation by the controllable loading system.

4,678,455

## METHOD OF MAKING A FIBER-LOADED POLYMERIC SHEET

Gerald C. Hollaway, Jr., Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 574,439, Jan. 27, 1984, Pat. No. 4,634,413, which is a division of Ser. No. 281,153, Jul. 7, 1981, Pat. No. 4,445,949. This application Sep. 26, 1986, Ser. No. 912,032

Int. Cl.<sup>4</sup> F16G 1/10, 5/08

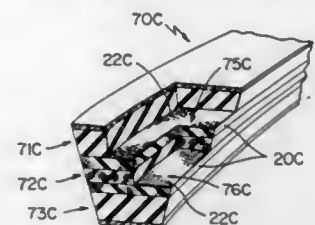
U.S. Cl. 474—263

20 Claims

1. In an endless power transmission belt having at least one part thereof comprised of polymeric material which has a plurality of elongate reinforcing fibers embedded therein with said polymeric material serving as a matrix for said fibers, the improvement in which said fibers comprise between 40% and



70% by weight of said one part and at least 70% of said fibers are disposed in parallel relation, said fibers each having a length that falls in the range between roughly one-fourth of an



inch and two inches and having a diameter that falls in the range between roughly five microns and several hundred microns.

4,678,456

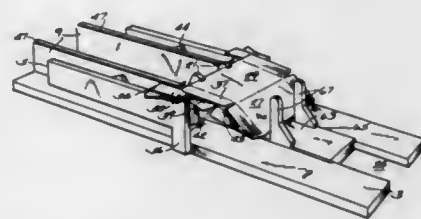
**CARTON OPENING APPARATUS**

Biagio Nigrelli, Sr., 14829 Moraine Rd., Kiel, Wis. 53042  
Filed Mar. 24, 1986, Ser. No. 843,016

Int. Cl.<sup>4</sup> B31B 1/78

U.S. Cl. 493-309

10 Claims



1. Apparatus for opening folded carbon blanks having sides and associated closure flaps extending from the ends thereof, the flaps of adjoining sides being separated by slits, the blanks being folded into an upper layer and a lower layer, each layer having two carton sides and associated flaps in facing contact with the sides and flaps of the other layer comprising:

- an elongated frame;
- stripper finger means translatable mounted to the frame for propelling a blank downstream along an opening path to thereby create leading and trailing edges and leading and trailing flaps in the blank;
- support plate means mounted to the frame for supporting the blank lower layer sides at a first level along a first section of the opening path, the support plate means terminating at a second section of the opening path, the blank flaps overhanging the support plate means;
- top guide means fixedly attached to the frame for maintaining contact between the blank lower layer sides and the support plate means;
- spring plate means mounted to the frame at the second section of the opening path proximate the support plate means termination point for inserting between the blank trailing upper and lower flaps and for supporting the blank upper trailing flaps at the first level at the second section of the opening path as the blank leading edge is propelled past the support plate means by the stripper finger means and for cooperating with the stripper finger means to maintain the blank trailing edge at the first level at the second section while leaving the unsupported blank leading edge free to tip slightly downwardly by gravity to a second level lower than the first level to thereby impart an oblique orientation to the blank and to partially open the blank; and
- carrier means translatable mounted to the frame for stationarily receiving the leading edge of the angularly oriented and partially opened blank at the second level as the blank unsupported leading edge falls downwardly from

the first to the second level when the stripper finger means propels the blank upper trailing flaps out of support contact with the spring plate means to permit continued downstream movement of the stripper finger means to open the blank into the opened condition.

9. A method of opening a folded carton blank having sides and associated closure flaps, the blank being folded into an upper layer and a lower layer, each layer having two sides and associated flaps, adjacent flaps having a slit therebetween comprising the steps of:

- supporting the sides of the blank lower layer at a first level with a first support;
- continuously propelling the supported blank in a downstream direction with the blank flaps projecting transversely to the direction of motion to create blank leading and trailing edges and leading and trailing sides with leading and trailing flaps flaps;
- inserting a pair of laterally spaced second supports at the first level under the upper layer trailing flaps;
- propelling the blank so that the leading sides and flaps move past support contact with the first support and the trailing upper flaps move into support contact with the second supports at the first level to permit the lower leading side to drop to partially open the blank and to permit the leading edge to tip by gravity downwardly to a second level lower than the first level to impart an oblique orientation to the blank;
- propelling the blank upper trailing flaps past support contact with the second supports;
- restraining the leading edge of the partially opened blank as it falls downwardly to the second level when the blank is propelled past support contact with the second supports; and
- propelling the partially opened angularly oriented blank trailing edge while restraining the leading edge to completely open the blank.

4,678,457

**APPARATUS FOR CONSTANT PRESSURE IN LINE-WEB CRUSH-SCORING**

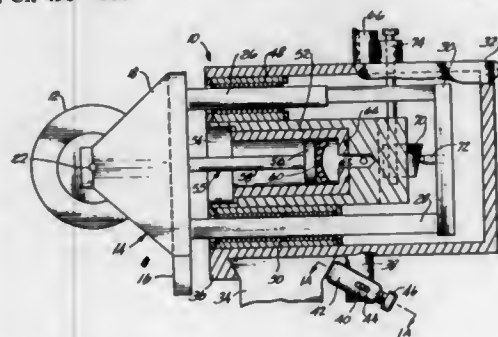
Yefim Slobodkin, Lyndhurst, Ohio, assignor to Avery International, Pasadena, Calif.

Filed Sep. 17, 1985, Ser. No. 776,850

Int. Cl.<sup>4</sup> B05B 1/14

U.S. Cl. 493-355

6 Claims



1. An apparatus for applying a constant force to a mounting bracket which comprises:

- a mounting bracket providing means for receiving axially rotatable pressure means, for operating on a substrate;
- a pair of guide rods attached to, and extending in a direction away from, the means for receiving axially rotatable pressure means, said guide rods being parallel to one another and in substantially the same direction;
- a support receiving the pair of guides in a corresponding pair of substantially frictionless bearings to enable the guides to move back and forth within the support substantially without friction;

- a substantially frictionless plunger means positioned between the guide rods and extending from the mounting bracket into the support; and
- means contained by the support for applying a predetermined unbiased force to the mounting bracket through the substantially frictionless plunger means.

4,678,458

**METHOD FOR AVOIDING MISTAKES DURING PLASMAPHERESIS**

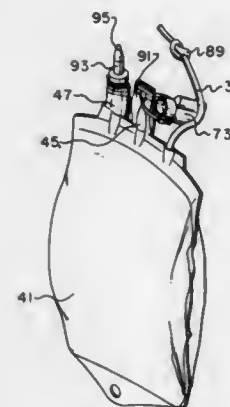
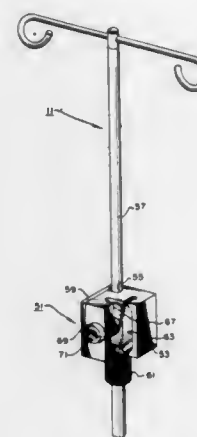
Terry M. Fredeking, 7520 David Dr., Fort Worth, Tex. 76118

Filed Jan. 9, 1986, Ser. No. 872,030

Int. Cl.<sup>4</sup> A61M 5/00

U.S. Cl. 604-6

13 Claims



1. A method for avoiding mistakes in returning red blood cells to the correct donor during plasmapheresis, the method comprising the steps of:

- collecting a quantity of the donor's whole blood in a whole blood collection container, the whole blood collection container being provided with a collecting port, a plasma removal port and a reinfusion port, and wherein the reinfusion port is sealed with a seal means bearing identifying indicia, the identifying indicia being unique to the donor;
- separating the whole blood in the blood collection container into plasma and red cells;
- removing the plasma from the blood collection container through the plasma removal port and sealing the plasma removal port;
- removing the seal means from the reinfusion port after verifying the identifying indicia with the correct donor;
- reinfusing the donor with the red cells; and
- wherein the identifying indicia comprise a key and lock.

4,678,459

**IRRIGATING, CUTTING AND ASPIRATING SYSTEM FOR PERCUTANEOUS SURGERY**

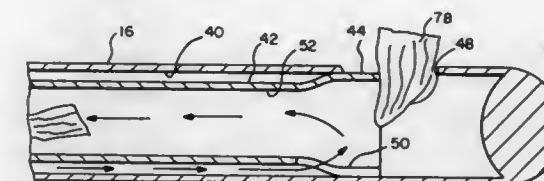
Gary Onik, San Francisco, and Leonard Ginsburg, Oakland, both of Calif., assignors to E-Z-EM, Inc., Westbury, N.Y. and Surgical Dynamics, Incorporated, San Leandro, Calif.

Filed Jul. 23, 1984, Ser. No. 633,514

Int. Cl.<sup>4</sup> A61B 17/32

U.S. Cl. 604-22

13 Claims



1. A surgical instrument comprising:

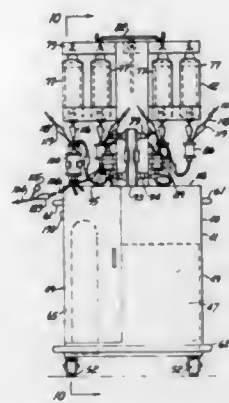
- a housing;
- a needle supported by said housing, said needle having a forward portion extending distally of said housing;
- said needle including a first elongated tubular wall member defining a first bore, and having a port formed entirely within the sidewall of the forward portion of said first tubular wall member;
- said needle including a second elongated tubular wall member defining a second bore sized to permit passage of tissue therethrough when said second tubular wall member is connected to a source of suction, said second tubular wall member having a forward portion extending radially outwardly and terminating in a cutting edge;
- said second tubular wall member being positioned within said first tubular wall member with said cutting edge in contact with the sidewall defining said first bore, the forward portion of said first bore adjacent said port defining a tissue receiving portion communicating with said second bore;
- said first and second tubular wall members being the only tubular wall members in said forward portion of said needle;
- the wall of said second tubular wall member spaced inwardly from the wall of said first tubular wall member to define the opposing walls of an annular passageway adapted to be connected to a source of irrigating fluid, said annular passageway being the sole annular chamber in said forward portion of said needle;
- said second tubular wall member being disposed for movement within said first tubular wall member to cause said cutting edge to move from a first position where tissue is drawn through said port into said tissue receiving portion of said first bore under suction to a second position where said cutting edge traverses said port to sever the tissue drawn therethrough, and to permit the severed tissue to be captured in said tissue receiving portion;
- said second tubular wall member having an opening formed in its sidewall adjacent said cutting edge to provide internal communication between said annular passageway and said second bore to permit direct passage within said needle of irrigating fluid between said annular passageway and said second bore;
- the forward portion of the sidewall of said first tubular wall member having no opening rearward of said cutting edge of said second tubular wall member when said cutting edge is in its first position;
- whereby the severed tissue is evacuated through said second bore with the aid of the irrigating fluid.

4,678,460  
**PORTABLE RAPID MASSIVE PARENTERAL FLUID  
 WARMING AND INFUSION APPARATUS**  
 Mark S. Rosner, 27400 Franklin, Apt. #821, Southfield, Mich.  
 48034

Filed Feb. 11, 1985, Ser. No. 700,389  
 Int. Cl.<sup>4</sup> A61M 5/00

U.S. Cl. 604—113

34 Claims



23. Apparatus for the rapid warming and infusion of massive amounts of a parenteral fluid into a patient under conditions where time is of the essence comprising in combination:

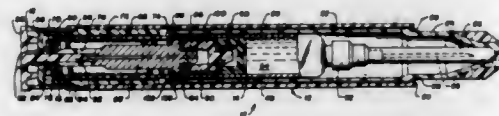
- pressurized parenteral fluid supply means for rapidly infusing a massive amount of parenteral fluid into a patient;
- means for warming the massive amount of parenteral fluid prior to the infusion of said fluid into the patient, said means for warming including a heat exchanger means operable for transferring heat to parenteral fluid by the circulation of thermal liquid therethrough and a reservoir containing a thermal liquid for circulation through said heat exchanger
- means responsive to the temperature of said liquid for controlling the temperature of the parenteral fluid; and
- means for controlling the rate of discharge of the parenteral fluid.

4,678,461  
**AUTOMATIC INJECTOR WITH IMPROVED GLASS  
 CONTAINER PROTECTOR**  
 Clarence M. Mesa, Rockville, Md., assignor to Survival Technology, Inc., Bethesda, Md.

Filed Nov. 1, 1984, Ser. No. 667,443  
 Int. Cl.<sup>4</sup> A61M 5/20

U.S. Cl. 604—157

6 Claims



1. In an automatic injector of the type including a housing having a glass container therein, a hypodermic needle connected with the forward end of said glass container, the rearward end portion of said glass container being defined by a generally cylindrical interior periphery, a generally cylindrical exterior periphery and an annular rear end edge between the rearward ends of said cylindrical peripheries, a plunger slidably sealingly mounted within the interior periphery of said container, a dosage of liquid medicament within said container forwardly of said plunger and a stressed spring actuating assembly releasable to transmit an axial force to said plunger to move the same forwardly so as to correspondingly move the glass container within said housing into a limiting position

wherein said needle is extended into the muscle tissue of a patient and thereafter to move said plunger within said glass container to discharge the medicament dosage therein through said needle and into the patient, the improvement which comprises

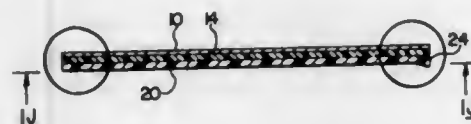
a glass container protecting sleeve of thin plastic material assembled in an operative position within said housing with respect to said glass container when said stressed spring actuating assembly is in an unreleased condition so as to protect the glass container against fracture (1) due to handling impacts prior to release of said stressed spring assembly and (2) due to the force transmitted to said plunger following the release of said stressed assembly, said sleeve including a cylindrical portion disposed in engagement with a cylindrical periphery of said glass container when said protective sleeve is in said operative position and an annular flange extending from the rear end of said cylindrical portion disposed in rearwardly adjacent relation to the rear end edge of said glass container when said protective sleeve is in said operative position.

4,678,462  
**STERILE CATHETER SECUREMENT DEVICE**  
 Vincent L. Vallancourt, 14 Bunyan Dr., Livingston, N.J. 07039  
 Filed Apr. 15, 1986, Ser. No. 852,179

Int. Cl.<sup>4</sup> A61M 25/02

U.S. Cl. 604—180

34 Claims



1. A sterile securement device for retaining an inserted and placed catheter and a connected tubular conductor to and from an IV supply and the like, this sterile securement device adapted for retaining and maintaining this assembled connection condition by an adhesively-coated film pressed to the skin of a patient, this sterile securement device including:

- a frame of sheet material and providing at least three outer-edge, flat-surface portions and establishing interior thereof and therebetween a determined space or area;
- a bottom thin and flexible film member sized to extend substantially to the outer extents of said frame, this film coated on one surface with an adhesive acceptable for contact attachment to the skin of a patient, this film with the adhesively-coated side secured to the flat-surface portions of the frame;
- a flexible release sheet sized to extend to the inner edges of the frame and secured to said flat-surface portions of the frame, with the bottom thin and flexible film protecting the adhesive surface of that bottom film interior of said frame-edge, flat-surface portions;
- a protector sheet member of flexible composition and having an adhesive capability of one surface, this protective sheet member sized to extend substantially to the outer edges of said frame, and with said device in an assembled condition this protector sheet is adhesively secured to an outer surface of the frame and flexible release sheet, and
- a tab section not secured to said frame, this tab providing means for gripping and separating the frame from the protective sheet, and when said protector member is secured to said frame and release sheet, this protector sheet member covers that space between the release sheet and frame so that this spacing is protected from the environment, and after this protector is secured in place a sterilization of device is conventionally made.

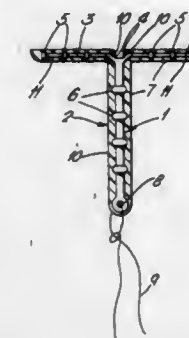
4,678,463  
**DEVICES FOR INSERTION INTO A BODY CAVITY OF  
 AN ANIMAL AND/OR APPLICATORS THEREFOR**  
 Thomas D. Millar, 10 Menzies Place, Hamilton, New Zealand  
 Continuation of Ser. No. 706,942, Mar. 1, 1985, abandoned. This application Sep. 16, 1986, Ser. No. 908,890

Claims priority, application New Zealand, Mar. 1, 1984, 207341

Int. Cl.<sup>4</sup> A61M 31/00

U.S. Cl. 604—285

6 Claims



1. A device for insertion into the vaginal cavity of an animal and for producing a controlled rate of release of chemicals into the body of the animal, said device comprising a spine having a body and two leg members hinged to said body, each leg member of said spine being hinged to said body by a separate integral stiffly resilient flexible hinge with a clearance space between inner faces of said leg members to assist each closure of said leg members towards each other, the spine being covered with a non-erodable matrix having at least some of the matrix forming part of the surface thereof or the matrix having incorporated therein an impregnated material impregnated with one or more chemical impregnants which are adapted to leach therefrom when exposed to body fluids, said covered leg members being of a size and foldable in a manner such that the cross sectional area and cross sections dimensions of the combined folded leg members when in a folded position are substantially the same as the cross sectional area and dimensions of the coated body of the device, said device having a withdrawal filament attached to said body at the end remote from said hinges.

4,678,464  
**ABSORBENT STRUCTURE WITH RESERVOIRS AND A  
 CHANNEL**  
 Dennis C. Holtman, Flemington, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 489,980, Apr. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 474,396, Mar. 11, 1983, Pat. No. 4,501,586, which is a continuation-in-part of Ser. No. 207,524, Nov. 17, 1980, abandoned. This application Feb. 22, 1985, Ser. No. 704,671 The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> A41B 13/02

U.S. Cl. 604—385 R

13 Claims



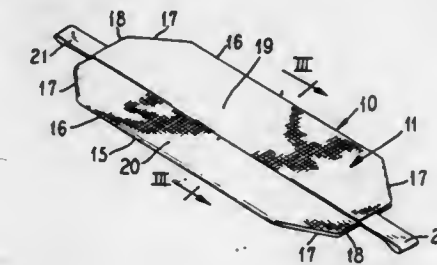
1. An absorbent structure comprising a loosely-compacted cellulosic fibrous batt substantially rectangular in shape and having a length at least about 1.5 times the width of the batt, the width not exceeding about 5 inches, one surface of said batt containing at least 2 reservoirs spaced apart with a connecting

channel, said reservoirs and the length of the channel being centered on the longitudinal axis of the batt, each reservoir (1) has a capacity of at least about 10 cc, (2) covers at least one square inch of surface, (3) is situated between the center and one transverse end of the substantially rectangular cellulosic fibrous batt, (4) covers less than about twenty-five percent (25%) of the surface area of the batt, and (5) is formed by compression of the cellulosic fibrous batt so that the depth of the reservoir is more than one-half (1/2) the thickness of the batt, the channel depth being at least one-half the depth of the reservoirs; a moisture-permeable facing covering the surface of the batt containing the reservoirs; and a moisture-impermeable backing covering at least the surface opposite the surface containing the reservoirs.

4,678,465  
**SANITARY PAD**  
 Katarina Avejic, Chicago, Ill., assignor to Dunromin Enterprises Unlimited, Inc., Chicago, Ill.  
 Filed Jan. 10, 1986, Ser. No. 817,538  
 Int. Cl.<sup>4</sup> A61F 13/18

U.S. Cl. 604—397

13 Claims



1. A washable reusable catamenial pad which comprises a pouch folded and stitched from a single strip of absorbent fabric having a rectangular bottom with folded over sides forming two top flaps overlying the bottom and freely overlapping each other along the longitudinal central length of the top of the pouch in the close position of the pouch, stitching securing together the flaps and bottom only at each end of the pouch, said flaps between said stitched ends being separable to open into an open mouth closed bottom bag by lifting and spreading the flaps apart, an impervious removable liner strip in the pouch overlying the bottom of the pouch, a soft absorbent strip covering the liner strip in the pouch, tapes secured to and extending from the stitched ends of the pouch at the longitudinal central portion thereof effective to close the pouch when tensioned, and said tapes being looped to receive fasteners of a support belt.

4,678,466  
**INTERNAL MEDICATION DELIVERY METHOD AND  
 VEHICLE**

Peter L. Rosenwald, 27-Broadview Rd., Cheshire, Conn. 06410  
 Continuation of Ser. No. 673,661, Nov. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 277,188, Jun. 25, 1981, Pat. No. 4,484,922. This application Dec. 27, 1985, Ser. No. 815,295

Int. Cl.<sup>4</sup> A61K 9/22

U.S. Cl. 604—891

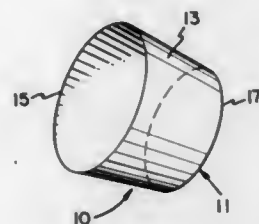
10 Claims

1. A method for delivering medication directly to a particular desired organ or site, both comfortably and efficiently, comprising the steps of:

- providing a thin walled, substantially continuous, non-allergenic, elongated, hollow body having a generally tubular shape with
  - a first proximal edge comprising a generally rounded shape and defining a first portal zone,
  - a second distal edge comprising a generally rounded shape and defining a second portal zone,



- c. a substantially continuous, elongated length of thin-wall material
1. extending between and interconnecting said proximal edge with said distal edge,
  2. comprising an outer peripheral surface and an inner peripheral surface, and a total thickness therebetween of between about 0.1 millimeters and 1 millimeter, and
  3. defining an elongated substantially continuous fluid flow zone
    - i. commencing at said first portal zone,
    - ii. terminating at said second portal zone, and
    - iii. peripherally surrounded and defined by said inner peripheral surface, and
  - d. conduit-engaging and position-anchoring means formed on the outer peripheral surface of said body;



B diffusing therapeutic medication throughout the body for retention therein and subsequent delivery to the desired site; and

C. implanting the medication delivery vehicle in the desired fluid-carrying conduit with the conduit-engaging and position-anchoring means thereof in secure, abutting locking engagement with the walls of the conduit, preventing unwanted movement of said vehicle, and with the continuous surface thereof being in aligned, cooperating relationship with said conduit,

whereby a medication delivery vehicle is attained which assures the delivery of medication directly to a particular desired organ or site, effectively and efficiently, delivering the medication directly to a particular site, without interfering with normal fluid flow through the conduit, and which is securely lockingly engaged in the precisely desired position.

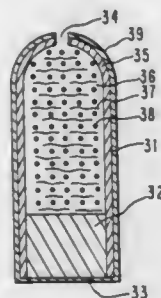
4,678,467

#### DISPENSER COMPRISING CAPSULE WITH VOLUME DISPLACING MEMBER

James B. Eckenhoff; Felix Theeuwes, both of Los Altos, and Joseph C. Deters, Mountain View, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.  
Division of Ser. No. 591,824, Mar. 21, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,351  
Int. Cl.<sup>4</sup> A61K 9/22

U.S. Cl. 604—892

2 Claims



1. A dispenser for delivering a beneficial agent formulation to a biological environment of use, wherein the dispenser comprises:
  - (a) a capsule member comprising a wall comprised of a

- gelatin composition that surrounds an internal compartment;
- (b) an opened mouth in the wall of the capsule;
  - (c) means for absorbing fluid positioned in the mouth of the capsule, said means, when the dispenser is in operation in the biological environment, imbibing fluid, increasing in volume and expanding into the internal compartment;
  - (d) a wall surrounding the exterior of the capsule member, said wall comprising in at least a part a semipermeable polymeric composition permeable to the passage of fluid and substantially impermeable to the passage of a beneficial agent; and,
  - (e) a passageway in the wall and in the capsule distant and separate from the opened mouth and out of contact with the means for absorbing fluid for connecting the internal compartment with the exterior of the dispenser.

4,678,468

#### CARDIOVASCULAR PROSTHESIS

Toshiki Hiroyoshi, Yao, Japan, assignor to Bio-Medical Co., Ltd., Japan

Filed Aug. 5, 1985, Ser. No. 762,168  
Claims priority, application Japan, Aug. 7, 1984, 59-165090  
Int. Cl.<sup>4</sup> A61F 2/06

U.S. Cl. 623—1

11 Claims

1. A cardiovascular prosthesis, wherein at least a part of its blood contact surface is formed by a polymer composition comprising a water soluble polymer and a crosslinked polysiloxane, at least a part of said water soluble polymer being entangled or intertwisted into polysiloxane networks.

4,678,469

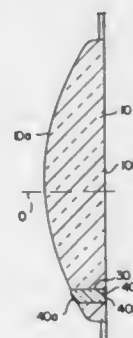
#### INTRAOCULAR LENS WITH GLARE-INHIBITING CLOSURE, THE METHOD OF INHIBITING GLARE, AND THE CLOSURE FOR SAME

Charles D. Kelman, 269 Grand Central Parkway, Floral Park, N.Y. 11005

Filed Oct. 20, 1986, Ser. No. 921,222  
Int. Cl.<sup>4</sup> A61F 2/16

U.S. Cl. 623—6

19 Claims



1. In an intraocular lens adapted to be inserted into an eye, a lens body for focusing light on the retina, said lens body comprising:

anterior and posterior optically polished surfaces shaped to focus, on the retina of the eye, light rays entering the eye, a through bore extending from one to the other of said surfaces, said through bore adapted to receive therein the tip of a surgical instrument used to manipulate the lens body within the eye, and

plug means adapted to be removably received in said bore after the lens is seated in the eye, said plug means being at least semi-opaque for preventing light rays from passing through the bore toward the retina in a recognizable form when said plug means is received therein, whereby the glare effect otherwise experienced as a result of light rays passing through such bore, adjacent to light rays passing

through the portion of the lens body immediately surrounding said bore, is, at least substantially, reduced.

bone surface thereby reducing the risk of rotational prosthetic failure.

4,678,470

#### BONE-GRAFTING MATERIAL

Aw S. Nashef, Costa Mesa, and Todd D. Campbell, Corona, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed May 29, 1985, Ser. No. 738,993

Int. Cl.<sup>4</sup> A61F 2/00

U.S. Cl. 623—16

27 Claims

1. A method of preparing a biocompatible, stable, and non-antigenic bone grafting material from allogenic or xenogenic bone stock comprising

- (a) machining a bone segment to the desired dimensions
- (b) tanning the bone segment by treating it with glutaraldehyde under tanning conditions.

4,678,471

#### METHOD AND APPARATUS FOR PREVENTING ROTATIONAL FAILURE OF ORTHOPEDIC ENDOPROSTHESES

Philip C. Noble, 2601 S. Braeswood, #103, Houston, Tex. 77025; Hugh S. Tullos, 2151 Troon Rd., Houston, Tex. 77019, and John P. Davidson, 10823 Emery Dr., Houston, Tex. 77099

Filed Aug. 22, 1985, Ser. No. 768,284

Int. Cl.<sup>4</sup> A61F 2/28

U.S. Cl. 623—16

5 Claims



1. A method for reducing the risk of rotational failure of a prosthesis positioned in the medullary canal of a bone, comprising:

- making a groove in the medullary canal surface of a bone; and
- inserting into the medullary canal a prosthesis securable in a desired position using the groove in the medullary canal

4,678,472

#### BALL AND SOCKET BEARING FOR ARTIFICIAL JOINT

Douglas G. Noiles, New Canaan, Conn., assignor to Joint Medical Products Corporation, Stamford, Conn.

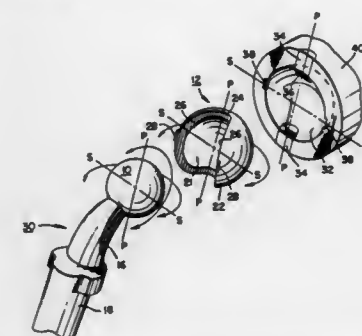
Continuation-in-part of Ser. No. 473,431, Mar. 8, 1983, Pat. No. 4,642,123. This application Nov. 21, 1983, Ser. No. 553,520

The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> A61F 2/30

U.S. Cl. 623—1.8

8 Claims



1. A ball and socket joint for implantation in a patient's body comprising a ball portion and a socket portion, the ball portion including:

- a ball; and
- first fixation means for attachment to a first bony structure, said fixation means being connected to said ball; and

the socket portion including:

- a bearing for receiving the ball;
- second fixation means for attachment to a second bony structure, said second fixation means having a cavity for receiving the bearing, said cavity having an opening defining a plane through which the bearing enters the cavity; and

means for securing the bearing to the second fixation means in any one of a plurality of selectable orientations after the second fixation means has been attached to the second bony structure, said plurality of selectable orientations being angularly displaced from one another about an axis which is perpendicular to the plane defined by the opening of the cavity of the second fixation means; the bearing being non-symmetric with regard to rotation about said axis and said lack of symmetry making at least one of the selectable angular orientations of the bearing more preferred for physiological reasons than others of said angular orientations, said means for securing allowing said bearing to be secured to said second fixation means in such a preferred orientation after said second fixation means has been attached to the second bony structure.

# CHEMICAL

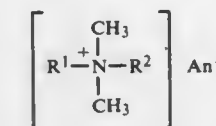
4,678,473  
**ARYLSULFONIUM CELLULOSIC FIBERS**  
**SUBSTANTIVE TO MANY DYE CLASSES**  
 Tyrone L. Vigo, New Orleans, and Eugene J. Blanchard, Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 3, 1986, Ser. No. 903,173  
 Int. Cl.<sup>4</sup> D06M 13/28; G06P 5/22

U.S. Cl. 8—480 51 Claims

1. A process for producing cellulosic fibers which are substantive to diverse dye classes comprising:  
 (a) immersing cellulosic fibers into a solution of aqueous alkali metal hydroxide of sufficient concentration for sufficient time and temperature to convert the cellulosic fibers to alkali metal cellulosate; then,  
 (b) reacting the alkali cellulosic fiber with a sufficient amount of an aqueous solution of thioarylsulfonium salts of sufficient concentration and temperature for sufficient time to produce a modified cellulosic fiber which is substantive to dyes of diverse classes.

compound is included in the composition in an amount sufficient to prevent the Violet dye from visibly staining skin.  
 20. A method of reducing yellowing of yellowed human hair with a violet dye-containing composition without substantial visible skin coloration comprising contacting human hair with a composition containing a liquid carrier; a tinctorially effective amount of a violet dye; and a di-fatty quaternary ammonium compound of the formula



wherein An<sup>-</sup> is any anion and R<sup>1</sup> and R<sup>2</sup> are the same or different straight chain alkyl radicals C<sub>n</sub>H<sub>2n+1</sub> wherein n is at least 12, wherein the quaternary ammonium compound is included in the composition in an amount sufficient to prevent the Violet dye from visibly staining skin.

4,678,474  
**METHOD FOR IMPROVING COLOR FASTNESS OF REACTIVE DYES ON CELLULOSE WITH ALLYLAMINE COPOLYMER**

Toshio Ueda; Kenji Kageno, both of Koriyama, and Susumu Harada, Tokyo, all of Japan, assignors to Nitto Boseki Co., Ltd, Fukushima, Japan

Filed Mar. 27, 1986, Ser. No. 844,809  
 Claims priority, application Japan, Apr. 1, 1985, 60-68795  
 Int. Cl.<sup>4</sup> D06P 5/08; C09B 62/00

U.S. Cl. 8—543 4 Claims

1. A method for improving the color fastness of a dyed cellulosic fiber having been dyed with a reactive dye which comprises treating the dyed product with a copolymer of an N-substituted secondary allylamine derivative represented by the following general formula:



wherein R represents a hydrocarbon group or a substituted hydrocarbon group and HX represents an inorganic or organic acid, and allylamine, diallylamine or dimethyldiallylammonium chloride.

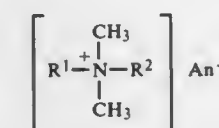
4,678,475  
**DYE-CONDITIONER COMPOSITION THAT IS NON-STAINING TO SKIN CONTAINING A CERTIFIED VIOLET DYE AND A QUATERNARY AMMONIUM COMPOUND**

Myra A. Hoshowski, Addison, and Chaitanya Patel, Hanover Park, both of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Filed Jan. 21, 1986, Ser. No. 820,124  
 Int. Cl.<sup>4</sup> A61K 7/13; D06P 1/642, 3/14

U.S. Cl. 8—606 20 Claims

1. A hair dye composition comprising a tinctorially effective amount of a Certified Violet dye and a quaternary ammonium compound of the formula:



wherein An<sup>-</sup> is any anion and R<sup>1</sup> and R<sup>2</sup> are the same or different straight chain alkyl radicals C<sub>n</sub>H<sub>2n+1</sub> wherein n is predominantly 12 to 16, wherein the quaternary ammonium

4,678,476  
**MIXTURES OF BLUE MONO-AZO DISPERSE DYE STUFFS AND THEIR USE FOR DYEING POLYESTER**

Horst Tappe, Dietzenbach; Hubert Kruse, Kelkheim; Reinhard Kühn, Frankfurt; Albert Bode, Schwalbach, and Margareta Boos, Hattersheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 26, 1986, Ser. No. 911,746

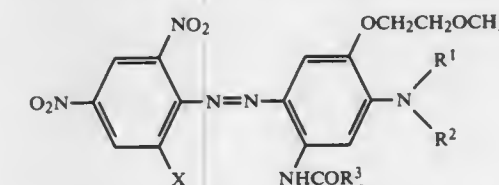
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539771

Int. Cl.<sup>4</sup> C09B 67/22, 29/00; D06P 1/04

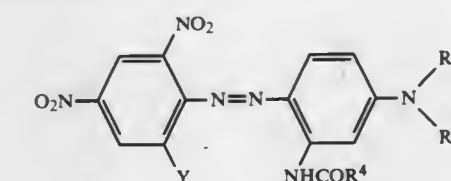
U.S. Cl. 8—639 11 Claims

1. Dyestuff mixture containing at least two separate dyestuffs (I) and (II) in a weight ratio of (I):(II) of from (20 to 99):(80:1) wherein:

(I) is at least one dyestuff of the formula



and  
 (II) is at least one dyestuff of the formula



in which

X and Y are the same or different and each is independently chloro or bromo:

R<sup>1</sup> and R<sup>2</sup> are the same or different and each independently denotes hydrogen, alkoxy having 1 to 4 carbon atoms, alkenyl having 3 or 4 carbon atoms, cyclohexyl, benzyl, chlorobenzyl, bromobenzyl, nitrobenzyl, cyanobenzyl, alkylbenzyl having 1 to 4 carbon atoms in the alkyl moiety, alkoxybenzyl having 1 to 4 alkoxy carbon atoms, alkyl having 1 to 11 carbon atoms, alkyl having 1 to 11 carbon atoms interrupted by 1 to 3 oxygen atoms or substituted alkyl having 1 to 11 carbon



atoms wherein the substituent is one selected from the group consisting of chloro, bromo, cyano, phenyl, phenoxy, hydroxy, (C<sub>1</sub>-to-C<sub>4</sub>-alkyl)-carbonyloxy; (C<sub>1</sub>-to-C<sub>4</sub>-alkoxy)-carbonyl, phenylcarbonyloxy, (C<sub>3</sub>-to-C<sub>5</sub>-alkenyl)-carbonyloxy, (C<sub>1</sub>-to-C<sub>4</sub>-alkoxy)-carbonyloxy, phenoxycarbonyloxy, tetrahydrofurfuryl, (C<sub>1</sub>-to-C<sub>4</sub>-alkyl)-tetrahydrofurfuryl, tetrahydrophorynyl and (C<sub>1</sub>-to-C<sub>4</sub>-alkyl)-tetrahydropyrynyl; R<sup>3</sup> and R<sup>4</sup> are the same or different and each is independently methyl, ethyl, n-propyl or i-propyl; R<sup>5</sup> and R<sup>6</sup> are the same or different and each is independently one of the definitions of R<sup>1</sup> and R<sup>2</sup> excepting hydrogen.

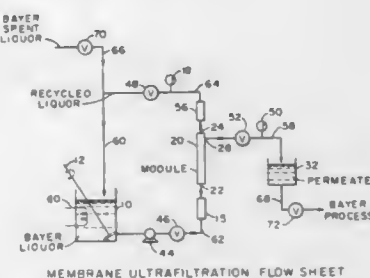
#### 4,678,477 PROCESS FOR LOWERING LEVEL OF CONTAMINANTS IN BAYER LIQUOR BY MEMBRANE FILTRATION

Paul J. The, Murrysville, and Chanakya Misra, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 6, 1986, Ser. No. 816,242  
Int. Cl.<sup>4</sup> B01D 13/01

U.S. Cl. 23—305 A

19 Claims



1. A method for purification of a caustic sodium aluminate solution to remove impurities comprising organic carbon, humate, and sodium oxalate therefrom which comprises bringing the caustic solution into contact with the outside of a plurality of coated porous hollow polysulfone fibers and collecting purified solution from an open end of the hollow fibers.

#### 4,678,478 METHOD FOR DESULFURIZATION OF COAL

David R. Kelland, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.  
Filed Apr. 14, 1986, Ser. No. 851,924  
Int. Cl.<sup>4</sup> C10L 9/00, 9/04

U.S. Cl. 44—1 SR

16 Claims

1. A method for treating coal which consists of organic carbonaceous material and inorganic minerals to substantially remove sulfur therefrom comprising the steps of:

- pulverizing the coal to liberate some of the inorganic minerals from the coal;
  - heating the pulverized coal to convert some of the sulfur in the inorganic minerals from the pyrite form of iron sulfide to the more catalytic form of troilite or pyrrhotite;
  - reacting the heated coal with a chemical agent containing elements which, in the presence of said catalytic forms of iron sulfide, combine with the sulfur to remove some of the sulfur from the organic material as gaseous compounds of sulfur; and
  - separating the remaining inorganic iron sulfides, now predominantly in the relatively higher magnetic form of pyrrhotite or troilite, by a magnetic separation process.
2. The method of claim 1 including the steps of treating the coal from Step (c) with a flocculating agent prior to the magnetic separation of Step (d) to associate non-pyritic minerals in the coal with the pyrrhotite or troilite forms.
3. The method of claim 1 wherein the heating in Step (b) is

a preferential heating of the inorganic sulfur in the presence of a flowing gas.

4. The method of claim 1 wherein one of the elements of the chemical agent is hydrogen.

#### 4,678,479 DIESEL FUEL COMPOSITION

Robert T. Holmes, 318 Hickory Post, Houston, Tex. 77079; Terence M. Evans, 8, Redhill Road, Kelsall, Tarporley, Cheshire CW6 0QP, United Kingdom; Keith King, 90, Green Lane, Vicars Cross, Chester, Cheshire CH3 5LE, United Kingdom, and Leonard B. Graff, Gateshead Hall, Tattenhall, Chester, Cheshire CH3 9AH, United Kingdom  
Filed Apr. 11, 1986, Ser. No. 850,658  
Claims priority, application United Kingdom, Apr. 24, 1985, 8510450

Int. Cl.<sup>4</sup> C10L 1/22

U.S. Cl. 44—57

16 Claims

1. A diesel fuel composition comprising a hydrocarbonaceous diesel fuel having a cetane number in the range of from 25 to 60, a polyolefin comprised of C<sub>3</sub>, C<sub>4</sub>, or C<sub>3</sub>-and C<sub>4</sub> olefins and a polyamine wherein at least one hydrocarbon chain has at least 25 carbon atoms bound directly to a nitrogen atom of said polyamine.

#### 4,678,480 PROCESS FOR PRODUCING AND USING SYNGAS AND RECOVERING METHANE ENRICHER GAS THEREFROM

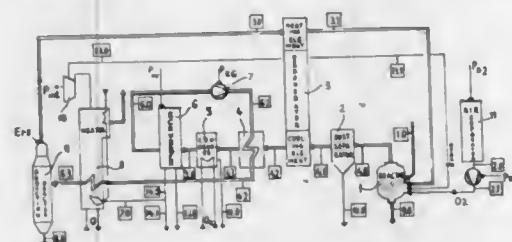
Peter Heinrich, Oberhausen; Klaus Knop, Geldern, and Friedbert Rube, Munich, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg AG, Fed. Rep. of Germany

Filed Oct. 23, 1985, Ser. No. 790,325  
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439487

Int. Cl.<sup>4</sup> C10J 3/46, 3/59; C22B 5/12

U.S. Cl. 48—197 R

2 Claims



1. A method of producing and using a high quantity of high grade syngas with very little power consumption, and using a gasification reactor a fuel containing carbon materials and producing a methane plus carbon dioxide containing syngas as a product and also using a 4-pole heat exchanger having two inputs and two outputs, a condenser, a regenerator having a cooling element and a heating element, and a PSA scrubber, comprising: passing the syngas from the gasification reactor to the cooling element of the regenerator for cooling the syngas; passing the cooled syngas into one of the inputs of the 4-pole heat exchanger and out through one of the outputs of the 4-pole heat exchanger for further cooling the cooled syngas; passing the further cooled syngas through the condenser for removing condensate from the further cooled syngas to produce a dry syngas; subjecting the dry syngas to scrubbing in the scrubber to remove separate portions of gas, one portion being high in methane and the other portion being high in carbon dioxide, and a hydrogen rich syngas leaving the scrubber; passing the hydrogen rich syngas through the other input of the 4-pole heat exchanger and out through the other output of the 4-pole heat exchanger for heating the hydrogen rich syngas to produce a heated hydrogen rich syngas subjecting

the heated hydrogen rich syngas to a partial oxidation in an ore reduction reaction to produce a waste gas, passing the waste gas through a heating element of the regenerator for heating the waste gas, and supplying the heated waste gas to the gasification reactor to react with the fuel containing carbon material, and wherein the heated hydrogen rich syngas is supplied to a steam generating heater to be further heated thereby before the heated hydrogen rich syngas is supplied to the ore reduction reactor and supplying some of the one portion of gas which is high in methane, as fuel, to the steam generating heater for generating steam.

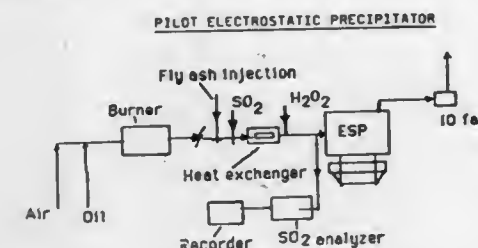
#### 4,678,481 H<sub>2</sub>O<sub>2</sub> AS A CONDITIONING AGENT FOR ELECTROSTATIC PRECIPITATORS

Daniel V. Diep, Aurora, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Sep. 2, 1986, Ser. No. 902,847  
Int. Cl.<sup>4</sup> B03C 3/01

U.S. Cl. 55—4

1 Claim



1. A method of improving the efficiency of electrostatic precipitators for removing high resistivity particulate matter from flue gases by treating said flue gases prior to contact with the electrostatic precipitator with an aqueous solution of hydrogen peroxide with the ratio of hydrogen peroxide to SO<sub>3</sub> being on a weight basis of at least 0.5/1.

#### 4,678,482 PROCESS FOR PURIFYING HYDROGEN CHLORIDE GAS

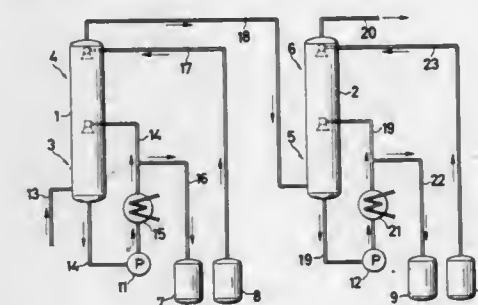
Heinz Müller, Brühl; Elmar Lohmar, Cologne, and Harald Scholz, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 885,013  
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1986, 3526801

Int. Cl.<sup>4</sup> B01D 53/14

U.S. Cl. 55—71

8 Claims



1. A process for decontaminating prepurified hydrogen chloride gas in two countercurrent scrubbing zones series-connected together, the hydrogen chloride gas obtained as a by-product in the production of chloroacetic acid by subjecting acetic acid to a catalytic chlorination reaction with chlorine gas in the presence of acetic anhydride and/or acetyl chloride, and prepurified still containing 0.1-3 vol % acetyl chloride and up to 0.1 vol % chloroacetyl chloride, which comprises: scrub-

bing the hydrogen chloride gas in the first scrubbing zone with concentrated hydrochloric acid and in the second scrubbing zone with concentrated sulfuric acid.

#### 4,678,483 METHODS OF PARTICULATE MEASUREMENT

Michael J. Dolan, Laurel Springs; Timothy L. Hilbert, Clementon, both of N.J., and John D. Snyder, Pittsburgh, Pa., assignors to Mobil Oil Corporation, New York, N.Y.  
Filed Dec. 30, 1981, Ser. No. 336,010  
Int. Cl.<sup>4</sup> G01N 33/00

U.S. Cl. 55—97

3 Claims

1. A method of pretreating a filter of a corrosion- and heat-resistant material used to collect particulates from a process stream comprising SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub>, said filter comprising substances which react chemically with components of said process stream, comprising the step of:

pretreating the filter by exposure to H<sub>2</sub>SO<sub>4</sub> prior to exposure to said process stream, whereby said reactions take place prior to exposure of the filter to the process stream.

#### 4,678,484 ELECTROFILTER

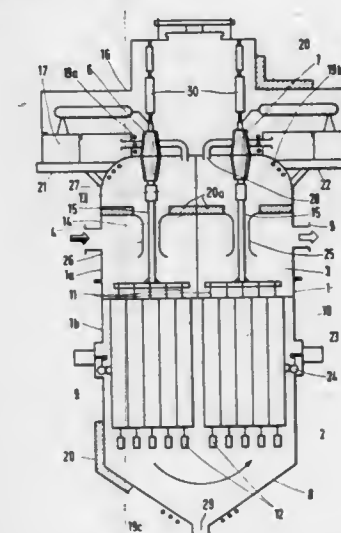
Wolfgang Hartmann, Frankfurt am Main, and Paul G. Goeth, Mörfelden/Walldorf, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,175  
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524861

Int. Cl.<sup>4</sup> B03C 3/76

U.S. Cl. 55—112

15 Claims



1. An electrofilter for the removal of dust from a gas at a pressure of up to 30 bar and a temperature up to 500° C., comprising:

- a vertically extending, gas tight cylindrical pressure vessel having an upper and a lower chamber, said lower chamber having a conically tapered dust collecting hopper and housing a plurality of precipitating electrodes and a corresponding number of spray electrodes in said lower chamber, the spray electrodes being disposed within said precipitating electrodes; insulators disposed in said upper chamber;
- separating means for separating a gas entry side from a gas exit side of the vessel;
- gas inlet and gas outlet means in said upper chamber so as to direct the gas through the electrodes of the gas entry side





the periphery of each open area, and each of said interconnections further including retainer means interconnecting the ends of the cross member and the associated lengthwise member, and wherein the side walls of said lengthwise and cross members are inclined so that the side walls and internal plate have the general form of an inverted A in cross section.

(b) a plurality of high efficiency air filters positioned on said interconnected members of said supporting latticework, with the filters covering respective ones of said open areas.

(c) a sealant disposed within the receptacles and upon the coextensive plates of said lengthwise and cross members of said latticework and continuously about the periphery of each open area, and so that the sealant is interposed between said members of said latticework and the periphery of each of said filters to form a seal therebetween, and means for introducing air above each of said filters of said filter bank such that the air flows downwardly through said filters at a predetermined flow rate.

4,678,488

## LIQUID SEPARATOR FOR GAS ANALYZER

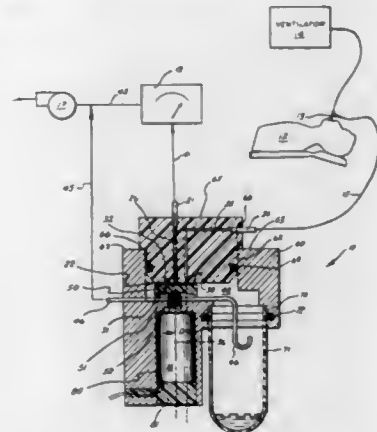
Charles P. Howard, Ann Arbor, Mich., and Donald H. Stedman, Englewood, Colo., assignors to Sensors, Inc., Saline, Mich.

Filed May 2, 1985, Ser. No. 729,635

Int. Cl.<sup>4</sup> B01D 45/14

U.S. Cl. 55—406

15 Claims



1. A liquid separator having a small gas flow rate for a gas analyzer comprising:

- a housing;
- a sample gas inlet disposed in said housing;
- a sample gas outlet disposed in said housing;
- a separation chamber disposed within said housing, said separation chamber being in fluid communication with said gas inlet and said gas outlet, said separation chamber having a smooth, planar first wall disposed in said housing and a smooth planar second wall disposed on a rotatable member journaled in said housing, said first and second walls being substantially parallel and having a small uniform clearance therebetween;
- a motor means disposed in said housing and connected to said rotatable member for imparting a rotational velocity to said second wall about a central axis normal to said planar first and second walls;
- said gas outlet being disposed on said central axis is said first wall;
- said gas inlet being positioned in said first wall with an offset from said central axis
- a pump means for establishing a vacuum, said pump means being in flow communication with said sample gas outlet for drawing sample gas through said separation chamber;
- a collection chamber disposed on said housing surrounding said separation chamber, said collection chamber being

positioned to receive liquids and other debris separated by contact with said second wall and centrifugal acceleration imparted thereto by rotation of said second wall;

said pump means being in flow communication with said collection chamber for applying a vacuum thereto;

a removable liquid sump disposed below and in fluid communication with said collection chamber.

4,678,489

## FILTERING SYSTEM FOR PAPER HANDLING MACHINES

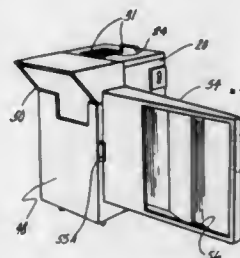
John C. Bertelsen, 3060 Baker Rd., Dexter, Mich. 48130, assignor to John C. Bertelsen, Dexter, Mich.

Continuation-in-part of Ser. No. 517,903, Jul. 28, 1983, abandoned, and a continuation-in-part of Ser. No. 708,649, Mar. 6, 1985, Pat. No. 4,563,943, which is a continuation-in-part of Ser. No. 443,122, Nov. 19, 1982, abandoned. This application Jul. 29, 1985, Ser. No. 759,757

Int. Cl.<sup>4</sup> B01D 46/42

U.S. Cl. 55—418

1 Claim



1. Filter means for removing paper dust, carbon black and the like from air being discharged in a first direction from a high-speed paper handling machine, comprising:

- a housing having a top opening and a lower inlet opening;
- a cover having a grille for passing filtered air from the housing, the cover being removably mounted on said top opening;
- an electrically energized squirrel cage fan;
- elongated fastener means having their upper ends connected to the cover and their lower ends connected to the fan such that the fan is suspended solely from the cover when the cover is mounted on said top opening, the fastener means and the fan being removable together with the cover from the housing, the fan being operative to move air from the paper handling machine toward the grille;
- filter pack means for removing material from air passing therethrough, said filter means being mounted in the housing between the grille and the lower inlet opening and including:
- filtering media in a four-sided unit;
- frame means including first, second, third and fourth elongated frame members, each of said frame members having a length generally corresponding to the length of a side of said unit;
- first hinge means connecting the first frame member to the second frame member;
- second hinge means connecting the second frame member to the third frame member;
- third hinge means connecting the third frame member to the fourth frame member;
- means for releasably connecting the fourth frame member to the first frame member to form a frame assembly in which each frame member is movable with respect to the other three of the frame members between an open position for receiving the filtering media, and a closed position in which the frame members are each disposed side-by-side with a corresponding side of the four-sided unit to engage the four sides of the filtering media unit such that the filtering media is disposed to filter air being passed from the lower inlet opening toward the grille by the fan;
- an elongated hollow duct hingedly mounted on the housing

and thereby reducing turbulence in said annular chamber.

4,678,491

## REDUCTION OF MATERIAL BUILDUP BY MEANS OF GAS JET

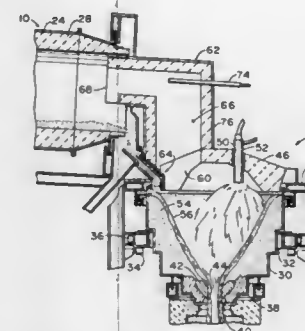
Yih-Wan Tsai, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 18, 1985, Ser. No. 799,227

Int. Cl.<sup>4</sup> C03B 1/00

U.S. Cl. 65—27

18 Claims



for guiding air from the paper handling machine to the filter housing, the duct having an inlet opening at one end thereof, and an outlet opening at the opposite end thereof adjacent the lower inlet opening of the housing for passing air from the duct to the housing, the duct inlet opening having a first cross-section, and the duct outlet opening having a lesser cross-sectional area than the cross-section of the inlet opening, the duct inlet opening being disposed for receiving air along a path generally at right angles to the longitudinal axis of the duct, the duct having a midsection between the duct inlet opening and the duct outlet opening for receiving air from the paper handling means and passing it through the duct midsection toward the duct outlet opening;

an elongated baffle member mounted within the duct parallel to the longitudinal axis of the duct;

the baffle member having an inlet edge disposed to divide the duct inlet opening into a first section and a second section, the area of the cross-section of the first section being greater than the area of the cross-section of the second section, and the first section being disposed between the second section and the duct outlet opening;

the baffle member having a downstream section between the duct inlet opening and the duct outlet opening disposed in a plane transverse to said first air direction;

whereby as the air enters the duct inlet opening, it changes direction from said first direction toward said second direction as it moves downstream from the inlet opening toward the duct outlet opening.

4,678,490

## APPARATUS FOR FORMING FIBERS

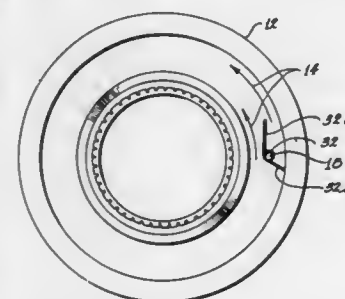
Charles H. Miller; Kunihiro Takeuchi, both of Newark, and Paul A. Goodridge, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 24, 1985, Ser. No. 791,000

Int. Cl.<sup>4</sup> C03B 37/04

U.S. Cl. 65—14

12 Claims



1. An apparatus for forming fibers from a liquid, said apparatus comprising:

- a. a rotatable spinner for generating fibers from a liquid supplied thereto, and
- b. an annular blower for pneumatically influencing fibers generated by said spinner, said blower comprising:
  - (1) an annular casing surrounding said spinner and defining an annular chamber;
  - (2) a gas inlet port in said casing for supplying a gas to said annular chamber, said gas when supplied normally tending along paths in said annular chamber in opposite arcuate directions from said inlet port whereby turbulence is generated in said annular chamber at a juncture of said paths diametrically opposite said inlet port;
  - (3) an annular gas outlet port in said casing in surrounding relationship to said spinner, said gas when supplied emerging from said gas outlet port to pneumatically influence said fibers, and
  - (4) a baffle in said annular chamber directing at least a major portion of said gas in one arcuate direction in said annular chamber when gas is supplied to said inlet port

4,678,492

## BLOWING PROCESS FOR EXPANDING A MOLTEN GLASS PARISON

Thomas V. Foster, Doncaster, United Kingdom, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 24, 1986, Ser. No. 821,942

Claims priority, application United Kingdom, Jan. 30, 1985, 8502371

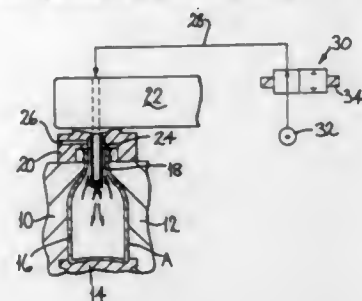
Int. Cl.<sup>4</sup> C03B 9/36

U.S. Cl. 65—74

3 Claims

1. A process for expanding a molten glass parison to the shape of a mold cavity in which the parison is contained, by directing air at a selected pressure into the parison to thereby form the parison into an article of glassware the supplied air being discharged from the parison comprising continuously supplying said pressurized air into the interior

of the parison until the pressure therein increases to said selected pressure, and thereafter, repetitively terminating said supplying of pressurized air for a duration predetermined to decrease the



pressure to a second pressure and at frequency selected so that the pressure within the parison following a termination will cycle between said selected pressure and said second pressure.

4,678,493

## VITRIFICATION OF ASBESTOS WASTE

David Roberts, and Henry S. Johnson, both of Sheffield, England, assignors to King Taudevin & Gregson (Holdings) Limited, Sheffield, England

Continuation of Ser. No. 672,475, Nov. 16, 1984, abandoned.

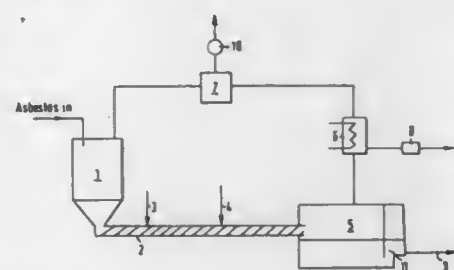
This application Aug. 25, 1986, Ser. No. 899,630

Claims priority, application United Kingdom, Nov. 21, 1983, 8331031

Int. Cl.<sup>4</sup> C03B 5/02; C03C 3/087

U.S. Cl. 65—134

11 Claims



1. A process for converting waste asbestos into a vitreous glass product which comprising the steps of:

providing an electrical glass melting furnace having two regions, a first region of said regions defining a closed melting chamber including means for feeding asbestos into the melting chamber and means for permitting the molten glass melt formed in said melting chamber to flow from said first region to a second region in said furnace comprising means in said furnace located between said first region and said second region for separating the furnace into said two regions capable of containing molten glass at a temperature of at least 1000° C., said two regions communicating with each other below the level of said melt; supplying asbestos and a source of glass into said first region of said furnace;

heating said asbestos and said source of glass to form a melt; maintaining said melt at less than atmospheric pressure, and a temperature of at least 1000° C. for a sufficient period of time to decompose the asbestos;

withdrawing the melt from said second region of the furnace at a preselected temperature of at least 1000° C. by permitting the melt to continuously flow from said first region maintained at a reduced pressure to said second region from which it is withdrawn by discharge from the said second region at atmospheric pressure;

said flow between said first and second regions being confined to flow of the melt below the surface of the melt, whereby during continuous operation of said process the restricted flow of said melt between the two regions of said furnace can occur while maintaining less than atmospheric pressure above said first region and while withdrawing a homogeneous melt from said second region containing substantially no undecomposed asbestos.

4,678,494

## BLOWHEAD ARRANGEMENT FOR A GLASSWARE CONTAINER MANUFACTURING MACHINE

Hermann H. Nebelung, Zurich, Switzerland, and Werner-Dieter Knoth, Essen, Fed. Rep. of Germany, assignors to Emhart Industries, Inc., Farmington, Conn.

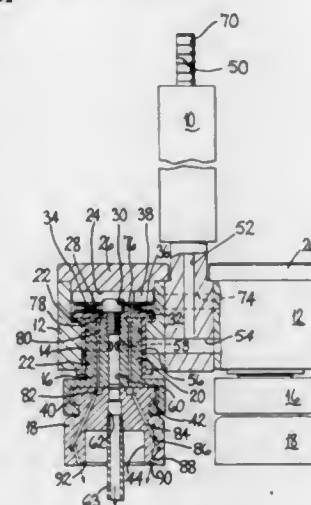
Filed Nov. 12, 1983, Ser. No. 553,941

Claims priority, application United Kingdom, Nov. 30, 1982, 8234097

Int. Cl.<sup>4</sup> C03B 9/14

U.S. Cl. 65—261

4 Claims



1. A blowhead arrangement for a glassware container manufacturing machine comprising a blowhead support, a blowhead mounted on said support, a first passage means in said support for connection to a first supply of air under pressure, a blowing passage means in said blowhead communicating with said first passage means so that, when the blowhead is positioned in the blowing position with the blowing passage means in communication with the opening of a glass parison in a mould cavity, air from the blowing passage blows the parison into the shape of the mould cavity, second passage means in said support for connection to a second supply of air under pressure, a series of means defining cooling passages in said blowhead communicating with said second passage means, the bottom surface of said blowhead having an upward and inwardly tapering recess, said cooling passages means having openings in said recess and an end portion on said bottom surface extending from said openings outwardly perpendicular to the surface of the tapering recess whereby air leaving the cooling passages impinges on the finish of the glass container.

4,678,495

## GLASS SHAPING MOLD

Hideo Yoshizawa, Kanagawa, Japan, assignor to Nippon Sheet Glass Co., Ltd., Japan

Filed Nov. 26, 1985, Ser. No. 801,786

Claims priority, application Japan, Nov. 26, 1984, 59-248967

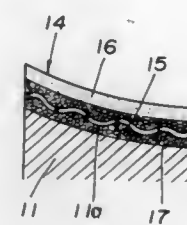
Int. Cl.<sup>4</sup> C03B 11/08

U.S. Cl. 65—287

21 Claims

1. A glass shaping mold comprising:  
a female mold member having a shaping surface;

a male mold member having a shaping surface complementary to said shaping surface of the female mold member; a felt sheet made of at least two different materials, said materials comprising steel fibers and composite fibers



including aramid fibers and carbon fibers, said felt sheet disposed on each of said shaping surfaces; and said female and male mold members being movable toward each other to shape a heat-softened glass object between the felt sheets on said shaping surfaces.

4,678,496

## CYCLOHEXANE DERIVATIVES HAVING PLANT-GROWTH REGULATING ACTIVITIES, AND USES OF THESE DERIVATIVES

Kenji Motojima, Kakegawa; Takeshige Miyazawa, Shizuoka; Yasufumi Toyokawa, Shizuoka; Masafumi Matsuzawa, Shizuoka; Hiroshi Hokari, Shizuoka, and Shoji Kusano, Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 534,827, Sep. 22, 1983, Pat. No. 4,560,403.

This application Aug. 1, 1985, Ser. No. 761,497

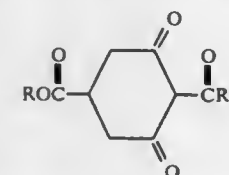
Claims priority, application Japan, Apr. 22, 1983, 58-71264

Int. Cl.<sup>4</sup> A01N 37/42, 43/10; C07C 62/26, 69/757, 87/68; C07D 332/24

U.S. Cl. 71—76

21 Claims

1. A cyclohexane compound of the general formula:



(I)

wherein R represents a hydrogen atom or an alkyl group, an alkylthioalkyl group or a phenyl group, a (C<sub>1</sub>-C<sub>4</sub>)alkylphenyl group, a haloalkyl group or a (C<sub>1</sub>-C<sub>4</sub>)alkoxyphenyl group and R<sup>1</sup> represents an alkyl group, a benzyl group, a (C<sub>1</sub>-C<sub>4</sub>)alkylbenzyl group, a halo-benzyl group or a (C<sub>1</sub>-C<sub>4</sub>)alkoxybenzyl group, a phenethyl group, a phenoxymethyl group, a 2-thienylmethyl group, an alkoxy-methyl group or an alkylthiomethyl group, or a salt of said cyclohexane compound.

21. A method of regulating the growth of plant, which comprises applying an effective amount of a cyclohexane compound of the formula (I) or a salt thereof as claimed in claim 1 to the foliage or seed of the plant to be treated or to the soil or locus where the plant to be treated is grown.

4,678,497

## TRIAZINE-SUBSTITUTED HERBICIDAL AZOBENZENESULFONAMIDES

Wallace C. Petersen, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 650,188, Sep. 13, 1984, Pat. No. 4,585,470.

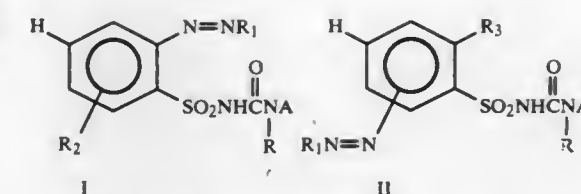
This application Jan. 13, 1986, Ser. No. 818,133

Int. Cl.<sup>4</sup> A01N 9/22; C07C 107/04, 113/04, 115/00

U.S. Cl. 71—86

12 Claims

1. A compound of Formulae I or II

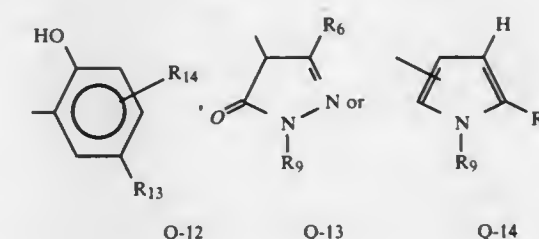
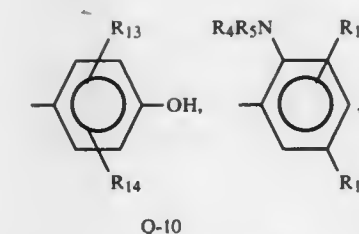
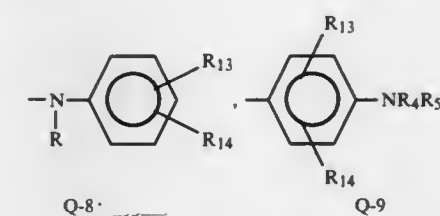
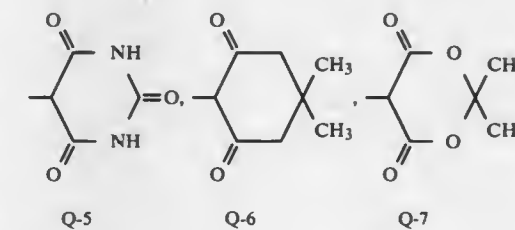
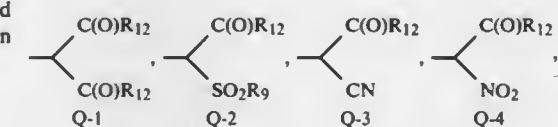


or an agriculturally suitable salt thereof, wherein:

R is H or CH<sub>3</sub>;

R<sub>1</sub> is NR<sub>4</sub>R<sub>5</sub>, N(CH<sub>3</sub>)OR<sub>6</sub>, NHCN, NRA, P(W)R<sub>4</sub>(W<sub>1</sub>R<sub>5</sub>), P(W)(W<sub>1</sub>R<sub>4</sub>)(W<sub>2</sub>R<sub>5</sub>), P<sup>+</sup>(C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, P<sup>+</sup>R<sub>6</sub>R<sub>7</sub>R<sub>8</sub>, SR<sub>9</sub>, SO<sub>2</sub>R<sub>9</sub>, C(R<sub>10</sub>)(R<sub>11</sub>)NO<sub>2</sub>, CH(CN)<sub>2</sub> or Q;

Q is



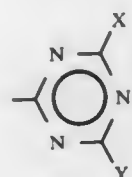
R<sub>2</sub> is H, F, Cl, Br, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, OCF<sub>2</sub>H, SCH<sub>3</sub>N(CH<sub>3</sub>)<sub>2</sub>, NO<sub>2</sub>, CH<sub>3</sub> or CF<sub>3</sub>;

R<sub>3</sub> is H, F, Cl, Br, C<sub>1</sub>-C<sub>4</sub> alkyl, CO<sub>2</sub>R<sub>15</sub>, NO<sub>2</sub>, CF<sub>3</sub>, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, SO<sub>2</sub>NR<sub>16</sub>R<sub>17</sub>, C<sub>1</sub>-C<sub>4</sub> alkylsulfonyl, C<sub>1</sub>-C<sub>4</sub> haloalkoxy, C<sub>1</sub>-C<sub>4</sub> alkylsulfonyloxy, C<sub>2</sub>-C<sub>5</sub> alkoxyalkyl or C<sub>3</sub>-C<sub>4</sub> alkenyloxy;

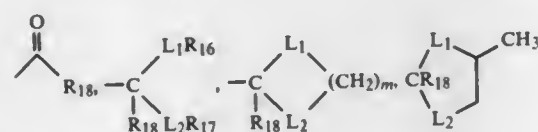
R<sub>4</sub> and R<sub>5</sub> are independently C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>2</sub>-C<sub>4</sub> alkyl substituted by 1 atom of Br or 1-3 atoms of F or Cl, C<sub>3</sub>-C<sub>5</sub> alkenyl, C<sub>3</sub>-C<sub>5</sub> cycloalkyl, OH, OCH<sub>3</sub>, CH<sub>2</sub>OH, CH<sub>2</sub>OR<sub>6</sub>, or CH<sub>2</sub>CH<sub>2</sub>OR<sub>6</sub>; or



R<sub>4</sub> and R<sub>5</sub> when taken together are  $-(CH_2)_4-$ ,  $-(CH_2)_5-$  or  $-(CH_2)_2O(CH_2)_2-$ ;  
 R<sub>6</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl;  
 R<sub>7</sub> and R<sub>8</sub> are independently C<sub>1</sub>-C<sub>4</sub> alkyl;  
 R<sub>9</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, phenyl or phenyl substituted with 1-3 atoms of F, Cl or 1 Br;  
 R<sub>10</sub> and R<sub>11</sub> are independently H, C<sub>1</sub>-C<sub>4</sub> alkyl, phenyl or phenyl substituted with 1 atom of Br or 1-3 atoms of F or Cl;  
 R<sub>12</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy or NHR<sub>9</sub>;  
 R<sub>13</sub> and R<sub>14</sub> are independently H, C<sub>1</sub>-C<sub>3</sub> alkyl, OR<sub>6</sub>, SR<sub>6</sub>, NHC(O)R<sub>6</sub>, F, Cl, Br or CO<sub>2</sub>R<sub>6</sub>;  
 R<sub>15</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>3</sub>-C<sub>4</sub> alkenyl, CH<sub>2</sub>CH<sub>2</sub>Cl or CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>;  
 R<sub>16</sub> and R<sub>17</sub> are independently C<sub>1</sub>-C<sub>2</sub> alkyl;  
 W is O or S;  
 W<sub>1</sub> and W<sub>2</sub> are independently O, S or NH;  
 A is



X is CH<sub>3</sub>, OCH<sub>3</sub>, OCH<sub>2</sub>CH<sub>3</sub>, CH<sub>2</sub>F, OCH<sub>2</sub>CH<sub>2</sub>F, OCH<sub>2</sub>CHF<sub>2</sub>, OCH<sub>2</sub>CF<sub>3</sub> or CF<sub>3</sub>;  
 Y is H, C<sub>1</sub>-C<sub>3</sub> alkyl, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, CH<sub>2</sub>OCH<sub>3</sub>, NHCH<sub>3</sub>, N(OCH<sub>3</sub>)CH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub>, CF<sub>3</sub>, SCH<sub>3</sub>, OCH<sub>2</sub>CH=CH<sub>2</sub>, OCH<sub>2</sub>C=CH, CH<sub>2</sub>OCH<sub>2</sub>CH<sub>3</sub>, OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>SH<sub>3</sub>.



SCF<sub>2</sub>H or cyclopropyl;  
 m is 2 or 3;  
 L<sub>1</sub> and L<sub>2</sub> are independently O or S;  
 R<sub>18</sub> is H or CH<sub>3</sub>;  
 provided that when Q is Q-11 or Q-12, then R<sub>13</sub> is other than H.

9. A method for the control of undesirable vegetation comprising applying to the locus of such vegetation an herbicidally effective amount of a compound of claim 1.

4,678,498

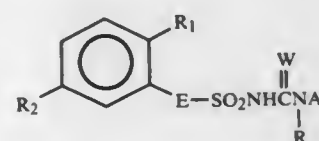
## HERBICIDAL SULFONAMIDES

Steven P. Artz, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 743,955, Jun. 12, 1985, abandoned. This application May 12, 1986, Ser. No. 860,229  
 Int. Cl.<sup>4</sup> A01N 43/54; C07D 239/69, 401/12, 413/12  
 U.S. Cl. 71-87

24 Claims

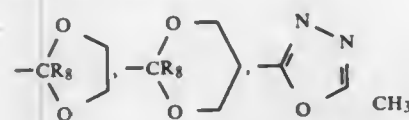
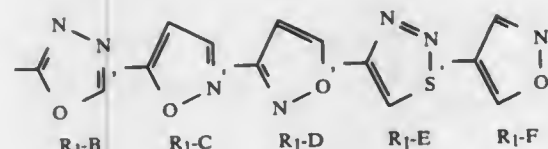
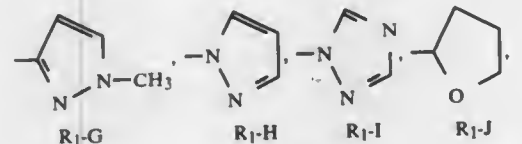
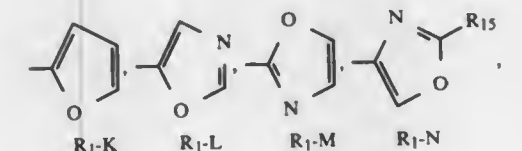
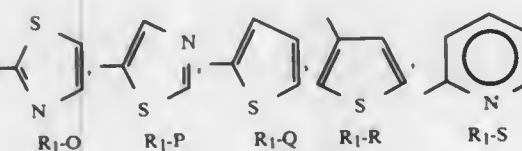
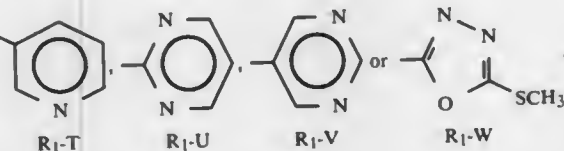
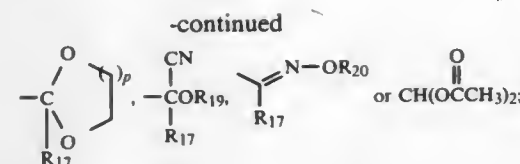
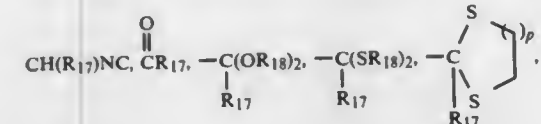
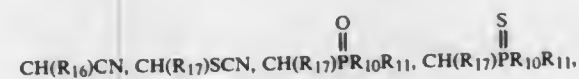
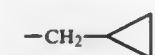
1. A compound of the formula:



wherein

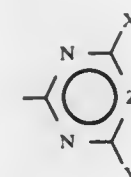
E is CH<sub>2</sub> or a single bond;  
 W is O or S;  
 R is H or CH<sub>3</sub>;  
 R<sub>1</sub> is F, Cl, Br, NO<sub>2</sub>, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>2</sub>-C<sub>4</sub> alkenyl, C<sub>2</sub>-C<sub>4</sub>

haloalkenyl, C<sub>2</sub>-C<sub>4</sub> alkynyl, C<sub>1</sub>-C<sub>4</sub> haloalkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, C<sub>1</sub>-C<sub>4</sub> haloalkoxy, C<sub>3</sub>-C<sub>4</sub> alkenyloxy, C<sub>2</sub>-C<sub>4</sub> haloalkenyloxy, C<sub>3</sub>-C<sub>4</sub> alkynyloxy, CO<sub>2</sub>R<sub>3</sub>, CONR<sub>4</sub>R<sub>5</sub>, SO<sub>2</sub>NR<sub>4</sub>R<sub>5</sub>, SO<sub>2</sub>N(OCH<sub>3</sub>)CH<sub>3</sub>, S(O)<sub>n</sub>R<sub>6</sub>, OSO<sub>2</sub>R<sub>7</sub>, C<sub>1</sub>-C<sub>2</sub> alkyl substituted with C<sub>1</sub>-C<sub>2</sub> alkoxy, OH or C<sub>1</sub>-C<sub>2</sub> alkylthio.

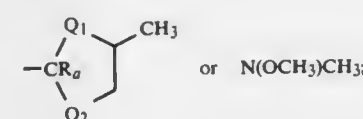
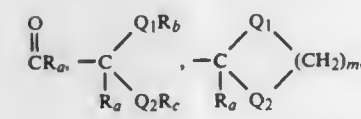
R<sub>1</sub>-AR<sub>1</sub>-BR<sub>1</sub>-CR<sub>1</sub>-DR<sub>1</sub>-ER<sub>1</sub>-FR<sub>1</sub>-GR<sub>1</sub>-HR<sub>1</sub>-IR<sub>1</sub>-JR<sub>1</sub>-KR<sub>1</sub>-LR<sub>1</sub>-MR<sub>1</sub>-NR<sub>1</sub>-OR<sub>1</sub>-PR<sub>1</sub>-QR<sub>1</sub>-RR<sub>1</sub>-SR<sub>1</sub>-TR<sub>1</sub>-UR<sub>1</sub>-VR<sub>1</sub>-WR<sub>2</sub> isR<sub>3</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>3</sub>-C<sub>4</sub> alkenyl, C<sub>3</sub>-C<sub>4</sub> alkynyl,

CH<sub>2</sub>CH<sub>2</sub>Cl, CH<sub>2</sub>CH<sub>2</sub>F, or C<sub>1</sub>-C<sub>2</sub> alkyl substituted with OCH<sub>3</sub> or SCH<sub>3</sub>;

R<sub>4</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl;  
 R<sub>5</sub> is H or C<sub>1</sub>-C<sub>3</sub> alkyl;  
 R<sub>6</sub> and R<sub>5</sub> may be taken together to form (CH<sub>2</sub>)<sub>3</sub> or (CH<sub>2</sub>)<sub>4</sub>;  
 R<sub>7</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl, CH<sub>2</sub>CH=CH<sub>2</sub> or CH<sub>2</sub>C=CH<sub>2</sub>;  
 R<sub>8</sub> is H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>3</sub>-C<sub>4</sub> alkenyl, C<sub>3</sub>-C<sub>4</sub> alkynyl, CH<sub>2</sub>CH<sub>2</sub>Cl, CH<sub>2</sub>CH<sub>2</sub>F, C<sub>1</sub>-C<sub>2</sub> alkyl substituted with OCH<sub>3</sub> or SCH<sub>3</sub> and C<sub>3</sub>-C<sub>6</sub> cycloalkyl;  
 R<sub>9</sub> is C<sub>1</sub>-C<sub>2</sub> alkyl;  
 R<sub>10</sub> and R<sub>11</sub> are independently C<sub>1</sub>-C<sub>2</sub> alkyl, C<sub>1</sub>-C<sub>2</sub> alkoxy, C<sub>1</sub>-C<sub>2</sub> alkylthio, NHCH<sub>3</sub> or N(CH<sub>3</sub>)<sub>2</sub>;  
 R<sub>12</sub> and R<sub>13</sub> are independently H or C<sub>1</sub>-C<sub>2</sub> alkyl;  
 R<sub>14</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl;  
 R<sub>15</sub> is H or CH<sub>3</sub>;  
 R<sub>16</sub> is H, C<sub>1</sub>-C<sub>2</sub> alkyl or F;  
 R<sub>17</sub> is H or C<sub>1</sub>-C<sub>2</sub> alkyl;  
 R<sub>18</sub> is C<sub>1</sub>-C<sub>2</sub> alkyl;  
 R<sub>19</sub> is H, Si(CH<sub>3</sub>)<sub>3</sub> or C<sub>1</sub>-C<sub>2</sub> alkyl;  
 R<sub>20</sub> is H or C<sub>1</sub>-C<sub>2</sub> alkyl;  
 p is 1 or 2;  
 n is 0, 1, or 2;  
 A is



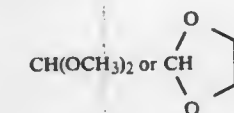
X is H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> haloalkoxy, C<sub>1</sub>-C<sub>4</sub> haloalkyl, C<sub>1</sub>-C<sub>4</sub> haloalkylthio, C<sub>1</sub>-C<sub>4</sub> alkylthio, halogen; C<sub>2</sub>-C<sub>5</sub> alkoxyalkyl, C<sub>2</sub>-C<sub>5</sub> alkoxyalkoxy, amino, C<sub>1</sub>-C<sub>3</sub> alkylamino or di(C<sub>1</sub>-C<sub>3</sub> alkyl)amino;  
 Y is H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> haloalkoxy, C<sub>1</sub>-C<sub>4</sub> haloalkylthio, C<sub>1</sub>-C<sub>4</sub> alkylthio, C<sub>2</sub>-C<sub>5</sub> alkoxyalkyl, C<sub>2</sub>-C<sub>5</sub> alkoxyalkoxy, amino, C<sub>1</sub>-C<sub>3</sub> alkylamino, di(C<sub>1</sub>-C<sub>3</sub> alkyl)amino, C<sub>3</sub>-C<sub>4</sub> alkenyloxy, C<sub>3</sub>-C<sub>4</sub> alkynyloxy, C<sub>2</sub>-C<sub>5</sub> alkylthioalkyl, C<sub>2</sub>-C<sub>5</sub> alkylsulfinylalkyl, C<sub>2</sub>-C<sub>5</sub> alkylsulfonylalkyl, C<sub>1</sub>-C<sub>4</sub> haloalkyl, C<sub>2</sub>-C<sub>4</sub> alkynyl, C<sub>3</sub>-C<sub>5</sub> cycloalkyl, azido, cyano,



m is 2 or 3;

Q<sub>1</sub> and Q<sub>2</sub> are independently O or S;

R<sub>a</sub> is H or C<sub>1</sub>-C<sub>3</sub> alkyl;  
 R<sub>b</sub> and R<sub>c</sub> are independently C<sub>1</sub>-C<sub>3</sub> alkyl;  
 Z is CH, CCH<sub>3</sub>, CC<sub>2</sub>H<sub>5</sub>, CCl or CBr;  
 and their agriculturally suitable salts; provided that  
 (1) when X is halogen, then Z is CH and Y is OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, NH<sub>2</sub>, NHCH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub>, OCF<sub>2</sub>H or N(OCH<sub>3</sub>)CH<sub>3</sub>;  
 (2) when X or Y is C<sub>1</sub> haloalkoxy, then Z is CH;  
 (3) when W is S, then R is H, Z is CH and Y is CH<sub>3</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, CH<sub>2</sub>OCH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, CF<sub>3</sub>, SCH<sub>3</sub>, OCH<sub>2</sub>CH=CH<sub>2</sub>, OCH<sub>2</sub>C=CH, OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>,



(4) when the total number of carbon atoms of X and Y is greater than four, then the combined number of carbons of R<sub>1</sub> and R<sub>2</sub> is less than or equal to six;  
 (5) when R<sub>2</sub> is C(O)R<sub>17</sub>, then R<sub>1</sub> is other than C<sub>1</sub>-C<sub>4</sub> haloalkyl or C<sub>2</sub> alkyl substituted with C<sub>1</sub>-C<sub>2</sub> alkoxy or C<sub>1</sub>-C<sub>2</sub> alkylthio, and Y is other than cyclopropyl;  
 (6) when Y is C<sub>2</sub>-C<sub>5</sub> alkylthioalkyl, C<sub>2</sub>-C<sub>5</sub> alkylsulfinylalkyl or C<sub>2</sub>-C<sub>5</sub> alkylsulfonylalkyl, then R<sub>2</sub> is other than CH(R<sub>17</sub>)NO<sub>2</sub>.

17. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,678,499

## HERBICIDAL SULFONAMIDES

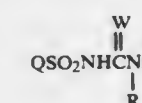
Robert J. Pasteris, and Ramaurthi Muthukrishnan, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 710,458, Mar. 11, 1985, abandoned. This application Jan. 30, 1986, Ser. No. 822,643  
 Int. Cl.<sup>4</sup> C07D 239/69, 239/42, 239/30, 239/48, 401/12, 405/12, 403/12; A01N 43/54

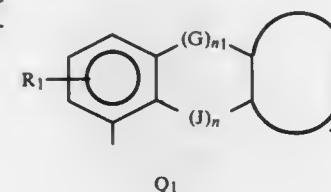
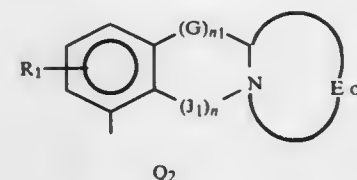
U.S. Cl. 71-90

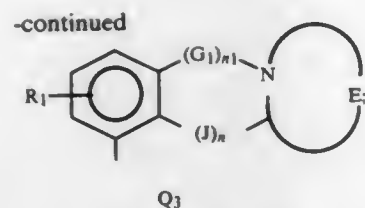
28 Claims

1. A compound of the formula:



wherein  
 W is O or S;  
 Q is

Q<sub>1</sub>Q<sub>2</sub>



G is CH<sub>2</sub>, CH<sub>2</sub>CH<sub>2</sub>, O, S, NH, NCH<sub>3</sub> or CH=CH;  
 G<sub>1</sub> is CH<sub>2</sub>, CH<sub>2</sub>CH<sub>2</sub> or CH=CH;  
 J is CH<sub>2</sub>, C=O, S(O)<sub>m</sub>, O, NH, NCH<sub>3</sub>, CHOH, CHOCH<sub>3</sub>, CH(CH<sub>3</sub>) or C(CH<sub>3</sub>)OH;  
 J<sub>1</sub> is CH<sub>2</sub>, C=O or SO<sub>2</sub>;  
 n and n<sub>1</sub> are independently 0 or 1;  
 m is 0, 1 or 2;

E is a bridge of 3 or 4 atoms containing 0 to 2 heteroatoms selected from the group consisting of oxygen, sulfur or nitrogen, wherein 1 atom of sulfur may take the form of SO or SO<sub>2</sub>, said bridge also containing 1 to 4 atoms of carbon wherein 1 atom of carbon may take the form of C=O, said bridge together with two attachment sites forming a non-aromatic heterocyclic or carbocyclic ring optionally substituted by 1 to 3 substituent groups selected from the group L, or E is a bridge of 3 or 4 atoms containing 1-1 heteroatoms of oxygen or sulfur and 0-3 heteroatoms of nitrogen, said bridge also containing 0-4 atoms of carbon, said bridge together with two attachment sites forming an aromatic heterocyclic or carbocyclic ring optionally substituted by 1 to 3 substituents selected from the group L, with the proviso that when E contains two oxygen atoms or two sulfur atoms said atom must be separated by at least one atom of carbon and that oxygen and sulfur are only linked to each other if the sulfur is in the form of SO or SO<sub>2</sub>;

L is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> haloalkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> haloalkoxy, C<sub>2</sub>-C<sub>8</sub> alkoxyalkoxy, halogen, N(CH<sub>3</sub>)<sub>2</sub>, cyano, nitro, phenyl or phenyl substituted with C<sub>1</sub>-C<sub>3</sub> alkyl, C<sub>1</sub>-C<sub>3</sub> haloalkyl, halogen, NO<sub>2</sub>, C<sub>1</sub>-C<sub>3</sub> alkoxy, C<sub>1</sub>-C<sub>3</sub> alkylthio, C<sub>1</sub>-C<sub>3</sub> alkylsulfinyl or C<sub>1</sub>-C<sub>3</sub> alkylsulfonyl;

R is H or CH<sub>3</sub>;

R<sub>1</sub> is H, C<sub>1</sub>-C<sub>3</sub> alkyl, C<sub>1</sub>-C<sub>3</sub> haloalkyl, halogen, nitro, C<sub>1</sub>-C<sub>3</sub> alkoxy, SO<sub>2</sub>NR<sup>II</sup>, C<sub>1</sub>-C<sub>3</sub> alkylthio, C<sub>1</sub>-C<sub>3</sub> alkylsulfinyl, C<sub>1</sub>-C<sub>3</sub> alkylsulfonyl, CO<sub>2</sub>R<sup>III</sup> or NR<sub>4</sub>R<sub>6</sub>;

R<sup>I</sup> is H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>2</sub>-C<sub>3</sub> cyanoalkyl, methoxy or ethoxy;

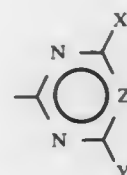
R<sup>II</sup> is H, C<sub>1</sub>-C<sub>4</sub> alkyl or C<sub>3</sub>-C<sub>4</sub> alkenyl; or

R<sup>I</sup> and R<sup>II</sup> may be taken together as -(CH<sub>2</sub>)<sub>3</sub>-, -(CH<sub>2</sub>)<sub>4</sub>-, -(CH<sub>2</sub>)<sub>5</sub>- or -CH<sub>2</sub>CH<sub>2</sub>OCH<sub>2</sub>CH<sub>2</sub>-;

R<sup>III</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>3</sub>-C<sub>4</sub> alkenyl, C<sub>3</sub>-C<sub>4</sub> alkynyl, C<sub>2</sub>-C<sub>4</sub> haloalkyl, C<sub>1</sub>-C<sub>3</sub> cyanoalkyl, C<sub>5</sub>-C<sub>6</sub> cycloalkyl, C<sub>4</sub>-C<sub>7</sub> cycloalkylalkyl or C<sub>2</sub>-C<sub>4</sub> alkoxyalkyl;

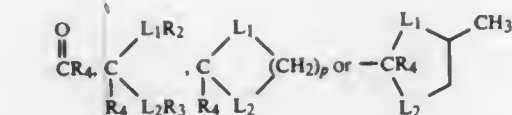
R<sub>4</sub> and R<sub>6</sub> are independently H or C<sub>1</sub>-C<sub>2</sub> alkyl;

A is



X is H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> haloalkoxy, C<sub>1</sub>-C<sub>4</sub> haloalkyl, C<sub>1</sub>-C<sub>4</sub> haloalkylthio, C<sub>2</sub>-C<sub>4</sub> alkylthio, halogen, C<sub>2</sub>-C<sub>5</sub> alkoxyalkyl, C<sub>2</sub>-C<sub>5</sub> alkoxyalkoxy, amino, C<sub>1</sub>-C<sub>3</sub> alkylamino or di(C<sub>1</sub>-C<sub>3</sub> alkyl)amino;

Y is H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> haloalkoxy, haloalkylthio, C<sub>1</sub>-C<sub>4</sub> alkylthio, C<sub>2</sub>-C<sub>5</sub> alkoxyalkyl, C<sub>2</sub>-C<sub>5</sub> alkoxyalkoxy, amino, C<sub>1</sub>-C<sub>3</sub> alkylamino, di(C<sub>1</sub>-C<sub>3</sub> alkyl)amino, C<sub>3</sub>-C<sub>4</sub> alkenyloxy, C<sub>3</sub>-C<sub>4</sub> alkynyloxy, C<sub>2</sub>-C<sub>5</sub> alkylthioalkyl, C<sub>1</sub>-C<sub>4</sub> haloalkyl, C<sub>3</sub>-C<sub>5</sub> cycloalkyl, C<sub>2</sub>-C<sub>4</sub> alkynyl, N(OCH<sub>3</sub>)CH<sub>3</sub>.



p is 2 or 3;

L<sub>1</sub> and L<sub>2</sub> are independently O or S;

R<sub>2</sub> and R<sub>3</sub> are independently C<sub>1</sub>-C<sub>2</sub> alkyl;

R<sub>4</sub> is H or CH<sub>3</sub>;

Z is CH;

and their agriculturally suitable salts; provided that

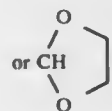
(a) when X is Cl, F, Br or I, then Y is OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, N(OCH<sub>3</sub>)CH<sub>3</sub>, NHCH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub> or OCF<sub>2</sub>H;

(b) n and n<sub>1</sub> cannot simultaneously be 0;

(c) when G or G<sub>1</sub> is CH<sub>2</sub>CH<sub>2</sub> or CH=CH, then n is 0;

(d) when Q is Q<sub>1</sub> and n is 1, then E must contain at least one heteroatom selected from oxygen, sulfur or nitrogen; and

(e) when W is S, then R is H, and Y is CH<sub>3</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, CH<sub>2</sub>OCH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, CF<sub>3</sub>, SCH<sub>3</sub>, OCH<sub>2</sub>CH=CH<sub>2</sub>, OCH<sub>2</sub>C=CH, OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, CH(OCH<sub>3</sub>)<sub>2</sub>



21. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,678,500

#### HERBICIDAL 2,6-DISUBSTITUTED BENZYL SULFONAMIDES AND BENZENESULFONAMIDES

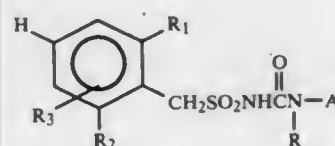
James V. Hay, Newark, and George Levitt, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 624,843, Jun. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 559,372, Dec. 8, 1983, abandoned. This application Aug. 21, 1985, Ser. No. 768,109

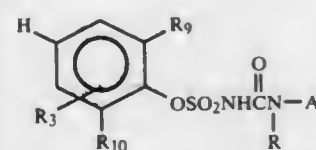
Int. Cl.<sup>4</sup> A01N 47/36; C07D 239/47

U.S. Cl. 71-92

1. A compound of the formula:



or



wherein

R is H or CH<sub>3</sub>;

R<sub>1</sub> is CO<sub>2</sub>R<sub>4</sub>, SO<sub>2</sub>NR<sub>5</sub>R<sub>6</sub>, SO<sub>2</sub>N(OCH<sub>3</sub>)CH<sub>3</sub>, SR<sub>7</sub>, SO<sub>2</sub>R<sub>7</sub>, NO<sub>2</sub>, OCF<sub>2</sub>H, OSO<sub>2</sub>R<sub>8</sub> or C(O)NR<sub>11</sub>R<sub>12</sub>;

R<sub>2</sub> is H, CO<sub>2</sub>R<sub>4</sub>, SO<sub>2</sub>NR<sub>5</sub>R<sub>6</sub>, SO<sub>2</sub>N(OCH<sub>3</sub>)CH<sub>3</sub>, SR<sub>7</sub>, SO<sub>2</sub>R<sub>7</sub>, NO<sub>2</sub>, OCF<sub>2</sub>H or OSO<sub>2</sub>R<sub>8</sub>;

R<sub>3</sub> is H, CH<sub>3</sub>, OCH<sub>3</sub>, Cl or F;

R<sub>4</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl, CH<sub>2</sub>CH=CH<sub>2</sub>, CH<sub>2</sub>CH<sub>2</sub>Cl or CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>;

R<sub>5</sub> and R<sub>6</sub> are independently C<sub>1</sub>-C<sub>2</sub> alkyl;

R<sub>7</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl, CF<sub>2</sub>H or CF<sub>3</sub>;

R<sub>8</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl, CF<sub>3</sub> or N(CH<sub>3</sub>)<sub>2</sub>;

R<sub>9</sub> is CO<sub>2</sub>R<sub>4</sub>, SO<sub>2</sub>NR<sub>5</sub>R<sub>6</sub>, SO<sub>2</sub>N(OCH<sub>3</sub>)CH<sub>3</sub>, SR<sub>7</sub>, SO<sub>2</sub>R<sub>7</sub>, OCF<sub>2</sub>H or OSO<sub>2</sub>R<sub>8</sub>;

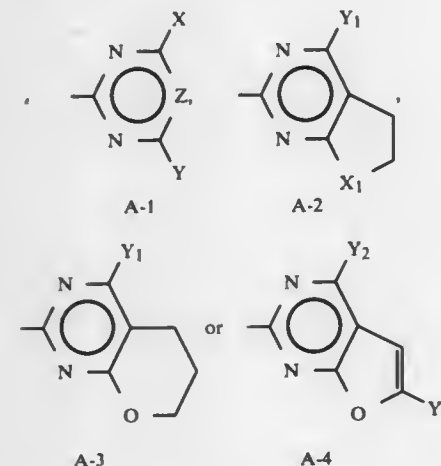
R<sub>10</sub> is CO<sub>2</sub>R<sub>4</sub>, SO<sub>2</sub>NR<sub>5</sub>R<sub>6</sub>, SO<sub>2</sub>N(OCH<sub>3</sub>)CH<sub>3</sub>, SR<sub>7</sub>, SO<sub>2</sub>R<sub>7</sub>, OCF<sub>2</sub>H or OSO<sub>2</sub>R<sub>8</sub>;

R<sub>11</sub> is H, C<sub>1</sub>-C<sub>2</sub> alkyl or CH<sub>2</sub>CH=CH<sub>2</sub>;

R<sub>12</sub> is H or C<sub>1</sub>-C<sub>2</sub> alkyl; or

R<sub>11</sub> and R<sub>12</sub> may be taken together to form -(CH<sub>2</sub>)<sub>4</sub>-, -(CH<sub>2</sub>)<sub>5</sub>- or -CH<sub>2</sub>CH<sub>2</sub>OCH<sub>2</sub>CH<sub>2</sub>;

A is



X is CH<sub>3</sub>, OCH<sub>3</sub>, OCF<sub>2</sub>H, F, Cl or Br;

Y is CH<sub>3</sub>, CH<sub>2</sub>CH<sub>3</sub>, OCH<sub>3</sub>, OCH<sub>2</sub>CH<sub>3</sub>, OCF<sub>2</sub>H, CH<sub>2</sub>OCH<sub>3</sub>, NH<sub>2</sub>, NHCH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub>, SCH<sub>3</sub> or OCH<sub>2</sub>CF<sub>3</sub>;

Z is CH;

X<sub>1</sub> is CH<sub>2</sub> or O;

Y<sub>1</sub> is CH<sub>3</sub>, OCH<sub>3</sub> or OCH<sub>2</sub>CH<sub>3</sub>; and

Y<sub>2</sub> is CH<sub>3</sub>, CH<sub>2</sub>CH<sub>3</sub>, OCH<sub>3</sub> or OCH<sub>2</sub>CH<sub>3</sub>; and

Y<sub>3</sub> is H or CH<sub>3</sub>;

and their agriculturally suitable salts; provided that

(a) when X is F, Cl or Br, then Y is OCH<sub>3</sub>, OCH<sub>2</sub>CH<sub>3</sub>, NH<sub>2</sub>, NHCH<sub>3</sub> or N(CH<sub>3</sub>)<sub>2</sub>;

(b) when R<sub>9</sub> is CO<sub>2</sub>R<sub>4</sub> or SR<sub>7</sub> and A is A-1 then R<sub>10</sub> is other than CO<sub>2</sub>R<sub>4</sub> or SR<sub>7</sub>; and

(c) when R<sub>2</sub> is H, R<sub>1</sub> must be C(O)NR<sub>11</sub>R<sub>12</sub>.

4,678,501

#### CERTAIN PYRAZINYL 1,3-CYCLOALKANEDIONE DERIVATIVES HAVING HERBICIDAL ACTIVITY

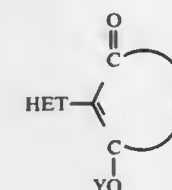
David T. Manning, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 288,335, Jul. 30, 1981, abandoned. This application Jan. 9, 1986, Ser. No. 817,177

Int. Cl.<sup>4</sup> A01N 43/60; C07D 241/00

U.S. Cl. 71-92

1. A compound of the formula:



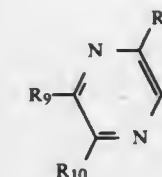
wherein

X is a 2 or 3 member alkylene chain;

Y is hydrogen, a salt forming cation, selected from Na<sup>+</sup>, NH<sub>4</sub><sup>+</sup> and Ca<sup>++</sup>, or



wherein Z is alkyl containing up to 7 carbon atoms; and HET is



wherein

R<sub>8</sub>, R<sub>9</sub>, and R<sub>10</sub> are independently hydrogen, C<sub>1</sub>-C<sub>3</sub> alkyl, or C<sub>1</sub>-C<sub>3</sub> alkoxy.

10. A method of controlling undesired plant growth which comprises subjecting said plant to a herbicidally effective amount of the compound of claim 1.

#### 4,678,502 HERBICIDAL ORTHO-ALKYL- AND ORTHO-ALKENYL-SUBSTITUTED BENZENESULFONAMIDES

Mary A. Hanagan, Blue Bell, Pa., and Mark E. Thompson, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

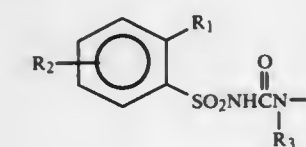
Division of Ser. No. 516,078, Jul. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 416,563, Sep. 10, 1982, abandoned. This application May 3, 1985, Ser. No. 730,157

Int. Cl.<sup>4</sup> A01N 43/66, 43/70; C07D 251/52, 251/16

U.S. Cl. 71-93

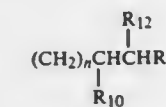
24 Claims

1. A compound of the formula:



wherein

R<sub>1</sub> is (CH<sub>2</sub>)<sub>n</sub>CH<sub>2</sub>CHR<sub>4</sub>R<sub>5</sub>,



CH=CHR<sub>9</sub>, CH=CHCO<sub>2</sub>CH<sub>3</sub> or CH=CF<sub>2</sub>;

R<sub>2</sub> is H, F, Cl, CH<sub>3</sub>, OCH<sub>3</sub> or CF<sub>3</sub>;

R<sub>3</sub> is H or CH<sub>3</sub>;

R<sub>4</sub> is H, F, Cl, Br or CH<sub>3</sub>;

R<sub>5</sub> is F, Br, OCH<sub>2</sub>φ, OSO<sub>2</sub>R<sub>6</sub>, OSO<sub>2</sub>CF<sub>3</sub>, OSO<sub>2</sub>C<sub>6</sub>H<sub>5</sub>R<sub>7</sub>, S(O)<sub>m</sub>R<sub>6</sub> or OSO<sub>2</sub>N(CH<sub>3</sub>)<sub>2</sub>;

R<sub>6</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl;

R<sub>7</sub> is H, F, Cl, Br, CH<sub>3</sub>, OCH<sub>3</sub> or CF<sub>3</sub>;

R<sub>9</sub> is OCH<sub>3</sub> or OCH<sub>2</sub>CH<sub>3</sub>;

R<sub>10</sub> is H, OCH<sub>3</sub> or OCH<sub>2</sub>CH<sub>3</sub>;

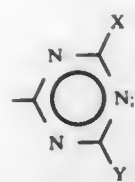
R<sub>12</sub> is H or CH<sub>3</sub>;

n is 0 or 1;

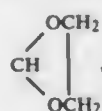
m is 0, 1 or 2;

A is





X is CH<sub>3</sub>, OCH<sub>3</sub>, CH<sub>2</sub>CH<sub>3</sub>, OCH<sub>2</sub>CH<sub>3</sub> or OCF<sub>2</sub>H;  
Y is H, NH<sub>2</sub>, NHCH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub>, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkyl substituted with 1-3 atoms of (a) F, (b) Cl or (c) Br, CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>OCH<sub>2</sub>CH<sub>3</sub>, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>2</sub> alkylthio, C<sub>3</sub>-C<sub>4</sub> alkenyloxy, C<sub>3</sub>-C<sub>4</sub> alkynyloxy, OCH<sub>2</sub>C<sub>2</sub>H<sub>5</sub>OCH<sub>3</sub>, CH(OCH<sub>3</sub>)<sub>2</sub>, CH(OCH<sub>2</sub>CH<sub>3</sub>)<sub>2</sub>.



OCH<sub>2</sub>CF<sub>3</sub>, OCH<sub>2</sub>CH<sub>2</sub>F, OCH<sub>2</sub>CH<sub>2</sub>Cl, OCH<sub>2</sub>CH<sub>2</sub>Br or GCF<sub>2</sub>T; wherein G is O or S and T is H, CHClF, CHBrF, CF<sub>2</sub>H or CHFClF<sub>3</sub>;

Z is N;

and their agriculturally suitable salts; provided that

- when R<sub>4</sub> is halogen, R<sub>5</sub> is the same halogen;
- when R<sub>5</sub> is halogen, R<sub>4</sub> is either hydrogen or the same halogen; and
- when R<sub>12</sub> is CH<sub>3</sub> and R<sub>10</sub> is alkoxy, R<sub>9</sub> is the same alkoxy.

9. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid inert diluent.

4,678,503

#### CONCENTRATED AQUEOUS SUSPENSIONS BASED ON NEBURON

Denis Barlet, Lyons, and Dini Alain, Villefranches, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

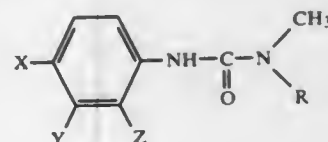
Filed Aug. 12, 1982, Ser. No. 407,464

Int. Cl.<sup>4</sup> H01D 25/22

U.S. Cl. 71-93

14 Claims

1. A herbicidal composition based on neburon, in the form of a concentrated aqueous suspension containing neburon and, optionally, thickening, wetting and/or dispersing adjuvants, which composition also contains a nonphytotoxic amount of from 1 to 10% by weight, relative to neburon, of a stabiliser of the formula:



in which:

X, Y and Z are identical or different and each represents a hydrogen atom, a halogen atom or an optionally halogenated alkyl radical containing from 1 to 4 carbon atoms and R represents an alkyl radical containing from 1 to 3 carbon atoms.

#### 4,678,504 O-SUBSTITUTED 3-OXYPYRIDINIUM SALTS, THEIR PREPARATION AND THEIR USE AS FUNGICIDES FOR CROP PROTECTION

Guenter Schulz; Eberhard Ammermann, both of Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 25, 1986, Ser. No. 878,218

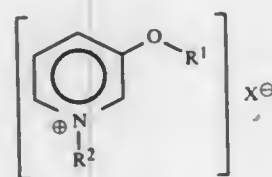
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 3522905

Int. Cl.<sup>4</sup> A01N 43/40; C07D 213/02

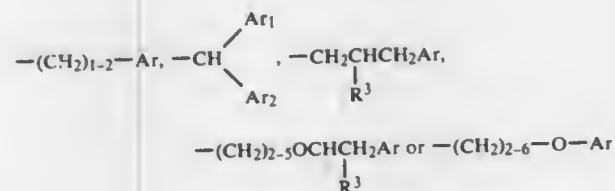
U.S. Cl. 71-94

4 Claims

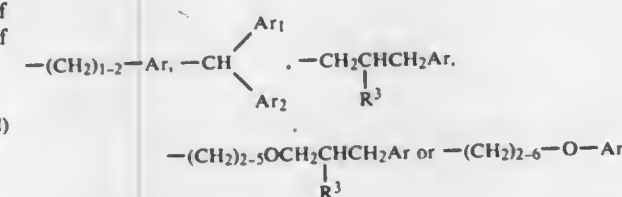
1. An O-substituted 3-oxypyridinium salt of the formula



where R<sup>1</sup> is an alkyl, alkenyl or alkynyl radical which contains a total of 8 to 20 carbon atoms and is unsubstituted or substituted by halogen, or is —C<sub>2</sub>—C<sub>10</sub>—alkyl—O—C<sub>5</sub>—C<sub>18</sub>—alkyl which contains a total of 10 to 20 carbon atoms and may contain 1 or 2 double bonds or one triple bond which are or is separated from O by one or more CH<sub>2</sub> groups, or R<sup>1</sup> is



where Ar, Ar<sub>1</sub> are each 1- or 2-naphthyl, biphenyl or phenyl, and the phenyl radical may be substituted by F, Cl, Br, NO<sub>2</sub>, CF<sub>3</sub>, CN, C<sub>1</sub>-C<sub>13</sub>—alkyl, C<sub>2</sub>-C<sub>4</sub>—alkenyl or C<sub>1</sub>— or C<sub>2</sub>—alkoxy and R<sup>3</sup> is H, C<sub>1</sub>— or C<sub>2</sub>—alkyl, C<sub>3</sub>-C<sub>5</sub>—alkenyl or C<sub>1</sub>-C<sub>5</sub>—alkoxy, R<sup>2</sup> is an alkyl, alkenyl or alkynyl radical of 1 to 2 or 3 to 8 carbon atoms which is unsubstituted or substituted by C<sub>1</sub>-C<sub>4</sub>—alkoxy or halogen, or R<sup>2</sup> is



where Ar, Ar<sub>1</sub> are each 1- or 2-naphthyl, biphenyl or phenyl, and the phenyl radical may be substituted by F, Cl, Br, NO<sub>2</sub>, CF<sub>3</sub>, CN, C<sub>1</sub>-C<sub>3</sub>—alkyl, C<sub>2</sub>-C<sub>4</sub>—alkenyl or C<sub>1</sub>— or C<sub>2</sub>—alkoxy, and X<sup>-</sup> is F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup> or I<sup>-</sup> or one equivalent of an anion of a non-phytotoxic acid.

3. A fungicidal composition for crop protection, containing a solid or liquid carrier and a fungicidally effective amount of an O-substituted 3-oxypyridinium salt as set forth in claim 1.

#### 4,678,505 PROCESS FOR FORMING SOLID SOLUTIONS

William R. Bushey, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 802,029, Nov. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 645,425, Aug. 29, 1984, abandoned. This application Nov. 24, 1986, Ser. No. 931,958

Int. Cl.<sup>4</sup> C22B 5/00

U.S. Cl. 75-0.5 A

12 Claims

1. A process for forming a solid solution of two or more metals or metal oxides by ionic reaction and simultaneous precipitation from the reaction medium comprising the steps of:

- in a high intensity mixing apparatus, forming a microdispersion of (1) an aqueous liquid solution of the metal ions and (2) at least a stoichiometric amount relative to the dissolved metal ions of a fluid co-reactant which is soluble in the aqueous solvent for the metals to effect liquid phase reactions between the dissolved metal ions and the fluid co-reactant, the rates of which reactions are pH sensitive, and formation in the liquid phase of the metals, the rate of forming the microdispersion being faster than the ionic reactions;
- simultaneously adjusting the pH of the microdispersion as necessary to maintain the reaction between the metal ions and the coreactant at a rate faster than the rate of precipitation of metals from the reaction medium;
- maintaining the microdispersion for a time sufficient to effect simultaneous precipitation of the formed metals or metal oxides and formation of finely divided particles of a single solid solution of the metals having the proportions of the initial metal reactants and dispersion in the reaction medium of the finely divided solid solution particles;
- removing reaction medium containing the dispersed solid solution particles from the mixing apparatus; and
- separating the particles of solid solution of the metals or metal oxides from the removed reaction medium.

4,678,506

#### PRODUCTION OF TITANIUM ARTICLES THAT ARE FREE FROM LOW DENSITY INCLUSIONS

Paul J. Bania, Boulder City, Nev., assignor to Titanium Metals Corporation of America (TIMET), Pittsburgh, Pa.

Filed Aug. 11, 1986, Ser. No. 895,446

Int. Cl.<sup>4</sup> C22B 4/00

U.S. Cl. 75-10.25

4 Claims

1. A method for producing arc melted titanium articles substantially free of low-density inclusions, said method comprising producing a partial charge of titanium sponge of a maximum particle size of —6 mesh and finer, forming said particles into an electrode and arc melting said electrode to form an ingot.

4,678,507

#### TREATMENT OF DROSS

Richard G. Hollis, Mount Isa, Australia, assignor to Mount Isa Mines Limited and Commonwealth Scientific & Industrial Organization, both of, Australia

PCT No. PCT/AU84/00235, § 371 Date Jun. 18, 1985, § 102(e) Date Jun. 18, 1985, PCT Pub. No. WO85/02204, PCT Pub. Date May 23, 1985

PCT Filed Nov. 16, 1984, Ser. No. 767,272

Claims priority, application Australia, Nov. 18, 1983, PG2452

Int. Cl.<sup>4</sup> C22B 13/00, 15/00

U.S. Cl. 75-24

7 Claims

1. A pyrometallurgical method for separating lead constituents including lead and lead sulfide from copper constituents including copper sulfide of a dross essentially free of alkali metal additives, the process comprising in sequence:

- melting the dross at a temperature in excess of 900° C.;
- waiting for the molten dross to separate into a layer of lead

bullion and a layer of matte, said matte containing copper and lead predominantly in the form of lead sulfide; removing the lead bullion layer; heating the matte layer after removal of the lead bullion layer to a temperature in excess of 1000° C. by means of a combustion lance submerged in said matte causing at least a major portion of said lead sulfide to leave said matte in the form of lead sulfide fume thereby producing a copper matte sufficiently low in lead assay to be sent to a copper recovery operation without further treatment; and recovering said lead sulfide as lead fume.

4,678,508

#### METHOD FOR FLUIDIZED BED REDUCTION OF IRON ORE

Osamu Saeki; Kenji Mori, both of Kobe; Mamoru Onoda, Hyogo; Ryo Watanabe, Kobe; Katsufumi Shinohara, Kobe; Takehiko Ashie, Kobe, and Nobuyuki Imanishi, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

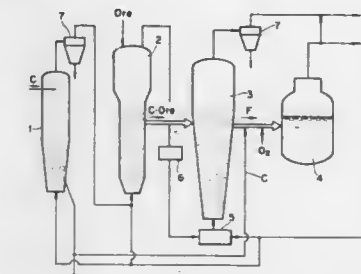
Filed Sep. 12, 1985, Ser. No. 775,394

Claims priority, application Japan, Sep. 12, 1984, 59-191330

Int. Cl.<sup>4</sup> C21B 13/02

U.S. Cl. 75-26

12 Claims



1. A method of reducing iron ore in a fluidized bed, comprising the steps of:

- pyrolyzing coal in a first fluidized bed reactor thereby producing char and a gaseous product which contains tar;
- thermally cracking said gaseous product in a second fluidized bed reactor which contains powdered iron ore, thereby depositing a carbonaceous material on the surface of the iron ore powder and producing a gas; and
- reducing said coated iron ore powder in a third bed which is fluidized by a gas mixture composed of a gas generated in a gas generating apparatus and said gas produced in the second, thermal cracking step.

4,678,509

#### CERTAIN PYRIDYLOXY OR THRIO-PHENOXY-PROPANOIC ACIDS OR SALTS THEREOF USEFUL AS HERBICIDES

Howard Johnston, Walnut Creek, and Lillian H. Troxell, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

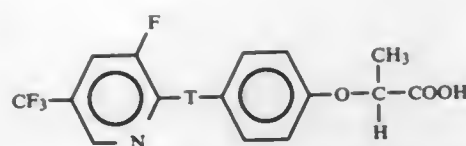
Continuation-in-part of Ser. No. 497,295, May 23, 1983, Pat. No. 4,565,568, which is a continuation-in-part of Ser. No. 389,840, Jun. 18, 1982, abandoned. This application Nov. 1, 1985, Ser. No. 793,865

Int. Cl.<sup>4</sup> A01N 43/40; C07D 213/04

U.S. Cl. 71-94

2 Claims

1. A method of killing and/or controlling the growth of undesired grassy plants which comprises providing in said plants a herbicidally effective amount of a compound having the formula



wherein T is O or S, in the acid or alkali or alkaline earth metal salt or ammonium or organic amine salt form.

4,678,510

## WEAR RESISTANT IRON POWDER ARTICLE

William F. Jandeska, Jr., Rochester, and Vadim Rezhetz, Southfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 813,055, Dec. 24, 1985, abandoned. This application Sep. 30, 1986, Ser. No. 913,488

Int. Cl.<sup>4</sup> C22C 29/14

U.S. Cl. 75—244

7 Claims



1. A powder metallurgical method for forming a wear resistant iron alloy article comprising compacting and sintering a powder mixture comprising, by weight of product metal, between about 1 and 2 percent carbon powder, optionally up to about 4 percent copper powder, a powdered boron source and the balance substantially low-carbon iron powder, said boron source comprising a metal boride containing a metal selected from the group consisting of nickel, cobalt and manganese and suitable for producing a transient liquid phase during sintering, said sintering being carried out at a temperature and for a time sufficient to bond said iron into an integral structure and to diffuse carbon and boron into said structure to produce a microstructure characterized by borocementite particles dispersed in an iron matrix formed predominantly of martensite or pearlite, said particles having a cross-sectional dimension greater than 1 micron and being present in an amount at least 4 volume percent to improve wear resistance.

4,678,511

## SPRAY MICROPELLETS

Junichi Yasuoka, Sumio Kamiyama, Kiyomi Ashida, and Ryoza Hata, all of Uji, Japan, assignors to Awamura Metal Industry Co., Ltd., Kyoto, Japan

Filed Sep. 5, 1985, Ser. No. 772,942

Claims priority, application Japan, Sep. 8, 1984, 59-188582

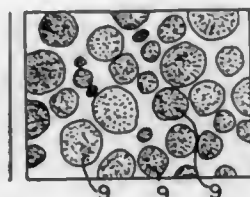
Int. Cl.<sup>4</sup> B22F 1/02

U.S. Cl. 75—251

17 Claims

1. Spray micropellets having a particle size of 5 to 150  $\mu$ m consisting essentially of micropelletized fine powder of high

carbon ferrochrome alloy having a particle size of 0.5 to 20  $\mu$ m, said alloy consisting essentially of 20 to 80 wt. % Cr, 15 to



75 wt. % Fe, 5 to 10 wt. % C, less than 10 wt. % Si and Ti and Mn as unavoidable impurities.

4,678,512

## MARINE COATING COMPOSITIONS AND METHOD

Ralph R. Grams, 2025 N.W. 24th St., Gainesville, Fla. 32605  
Continuation-in-part of Ser. No. 543,499, Sep. 21, 1983, Pat. No. 4,552,813, which is a continuation-in-part of Ser. No. 348,504, Feb. 12, 1982, abandoned. This application Oct. 15, 1985, Ser. No. 787,818

Int. Cl.<sup>4</sup> C09D 5/16

U.S. Cl. 106—18.32

12 Claims

1. An antifouling coating material for use on surfaces or objects subjected to seawater or fresh water, said coating material comprising a marine paint including a vehicle, a solvent and a pigment, said marine paint also having dispersed therein at least about 250 mg of polycyclic naphthacene carboxamide particles per quart of coating material.

4,678,513

## POLYOL COMPOSITIONS CONTAINING MOULD RELEASE AGENT

Giancarlo Bagaglio, Brussels; Jan V. Assche, Steenhuffel, and Arun Watts, Brussels, all of Belgium, assignors to Imperial Chemical Industries plc, London, United Kingdom

Continuation of Ser. No. 707,839, Mar. 4, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 902,030

Claims priority, application United Kingdom, Mar. 14, 1984, 8406677

Int. Cl.<sup>4</sup> B28B 7/36

U.S. Cl. 106—38.22

4 Claims

1. A stable polyol composition for use in reaction injection moulding (RIM) processing of polyurethanes, said composition consisting essentially on a weight basis of:

- 100 parts of a polymeric polyol selected from polyoxypropylene diols and triols and poly(oxypropyleneoxyethylene) diols and triols having hydroxyl equivalent weights of from 750 to 3000 and mixtures thereof;
- 1 to 10 parts of a polysiloxane mould release agent which consists essentially of 0.5–20 mol % of  $R_aR'_bSiO_4-(a+b)/2$  units and from 99.5–80 mol % of  $R'_cSiO_4-(4-c)/2$  units

where

- R is an isocyanate reactive organic radical,  
a has an average value of from 1–3,  
R' and R'' are hydrocarbon radical or a substituted organic radical,  
b has an average value of 0–2,  
a+b is from 1–3,  
c has an average value from 1 to 3, whereas

- the ratio of the total molecular weight to the total number of isocyanate reactive functional groups in the polysiloxane molecule ranges from 100–3500,
- the combined formula weights of all isocyanate reactive organic radicals R do not exceed 40% of the total molecular weight of the polysiloxane mould release agent,
- the combined formula weights of all non-isocyanate reactive radicals R' and R'' together do not exceed

- 40% of the total molecular weight of the polysiloxane mould release agent;  
(c) 1 to 5 parts of an ethylene oxide based surfactant having the formula



wherein Q represents an alkyl, alkylphenyl or alkanoyl residue containing from 8 to 30 carbon atoms and n has an average value of from 20 to 150.

4,678,514

## PROCESS FOR THE DISPOSAL OF COMBUSTIBLE REFUSES

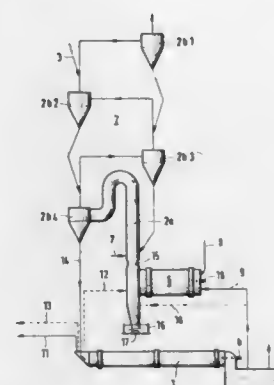
Henning Deyhle, Schlangenbad, and Alexaner Grisar, Mainz-Finthen, both of Fed. Rep. of Germany, assignors to Dyckerhoff Engineering GmbH, Wiesbaden, Fed. Rep. of Germany  
Filed Mar. 25, 1985, Ser. No. 715,437

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411144; Mar. 27, 1984, 3411148

Int. Cl.<sup>4</sup> C04B 7/43

U.S. Cl. 106—100

17 Claims



1. In the disposal of combustible refuse and the manufacture of cement clinker from cement raw meal by a process comprising the steps of

- preheating and calcining the cement raw material in a preheater,
  - feeding the preheated calcined cement raw material produced in (a) into a cement rotary kiln,
  - burning the calcined raw material in the rotary kiln to form clinker, and subsequently air cooling said clinker in a clinker cooler, thereby producing hot exhaust air, and
  - incinerating the combustible refuse in an incinerator generating flue gas and slag, and transferring heat from the flue gas to the cement raw material,
- the improvement which comprises
- feeding hot exhaust air from (c) to the incinerator in (d),
  - conducting the incineration in (d) to produce flue gas of 1000°–1400° C. and feeding it to (a), and
  - separating the slag produced in (d).

4,678,515

## FOAM GENERATING COMPOSITIONS

Harold A. Green, Havertown, Pa., and Morris Weinstein, Paramus, N.J., assignors to Stepan Company, Northfield, Ill.  
Division of Ser. No. 771,628, Sep. 3, 1985, Pat. No. 4,618,370.

This application Jul. 14, 1986, Ser. No. 885,297

Int. Cl.<sup>4</sup> C04B 24/00; B32B 5/20; B01V 13/00; B29C 27/60  
U.S. Cl. 106—111

2 Claims

1. In the method of making gypsum board wherein an aqueous slurry of calcined gypsum is spread between a pair of impervious barriers where it is hardened by re-hydration, the step of entraining microscopic air bubbles in the core of said gypsum board by incorporating into said slurry, prior to hardening an effective amount to produce a foam of relatively high

stability and volume of a composition comprising salt of a mixture of n-alkyl oxyethylated sulfuric acids, the salt being selected from the group consisting of sodium salt, ammonium salt and mixtures thereof, all of said salts having the formula  $CH_3(CH_2)_xCH_2(OCH_2CH_2)_yOSO_3^-M^+$ ,  $M^+$  being either the sodium or ammonium cation, x being an integer from about 6 to 12 and y being an integer of about 1 to 3.5, a major portion of said mixture consisting of those compounds in which x equals about 6 to 8 and a minor portion of said mixture consisting of those compounds in which x equals about 10 to 12 wherein the ratio of the combined weight of the compounds in which x equals about 6 to 8 to the combined weight of the compounds in which x equals about 10 to 12 is from about 2:1 to about 8:1, wherein the ratio of the weight of the compounds in which x equals about 6 to the weight of the compounds in which x equals about 8 is about 1:1, and wherein the ratio of the weight of the compounds in which x equals about 10 to the weight of the compounds in which x equals about 12 is from about 3:1 to about 1:3.

4,678,516

## SUSTAINED RELEASE DOSAGE FORM BASED ON HIGHLY PLASTICIZED CELLULOSE ETHER GELS

Daniel A. Alderman, and Troy D. Wolford, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 9, 1984, Ser. No. 658,964

Int. Cl.<sup>4</sup> A61K 31/715, 31/405

U.S. Cl. 106—197.1

14 Claims

1. A thermoformable sustained release matrix for the prolonged release of an active organic material, which matrix comprises (a) a thermoplastic water-soluble gel comprising a water-soluble hydroxypropyl methylcellulose homogeneously dispersed in an amount of a plasticizer for the cellulose ether sufficient to render the matrix thermoformable, and (b) dispersed in said gel, an effective amount of an active organic material.

4,678,517

## METHOD FOR CALCINING KAOLIN

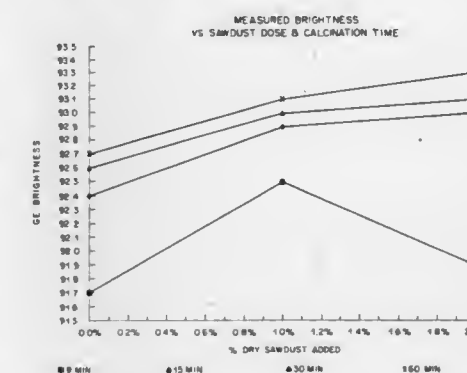
Weyman H. Dunaway, Sandersville, Ga., assignor to E.C.C. America Inc., Atlanta, Ga.

Filed Jul. 25, 1986, Ser. No. 890,151

Int. Cl.<sup>4</sup> C04B 14/00

U.S. Cl. 106—309

12 Claims



1. A method for improving brightness in a calcined kaolin pigment while minimizing detrimental effects on abrasiveness, comprising: intermixing with a kaolin calciner feed a particulate material which is oxidizable during calcining to provide a source of auxiliary thermal energy in the kaolin bed; and calcining the mixture at a temperature in the range of above 900° C., but below about 1100° C., in the presence of an oxidizing atmosphere throughout the calcining step.



4,678,518

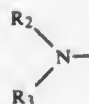
## NON-AQUEOUS DEGREASING AND CHROMATING SOLUTION FOR METAL TREATMENT

Nobuhiko Ayukawa, and Yasuhiko Konishi, both of Kanagawa, Japan, assignors to Nippon Dacro Shamrock Co., Ltd., Yokohama, Japan

Filed Jul. 11, 1985, Ser. No. 753,789

Claims priority, application Japan, Jul. 25, 1984, 59-153028  
Int. Cl.<sup>4</sup> B08B 3/08; C07C 17/42; C11D 7/50; C23G 5/02  
U.S. Cl. 148—6.2

1. A non-aqueous degreasing and chromating solution for metal treatment essentially consisting of 100 parts by weight of a chlorofluorocarbon solvent, containing not more than 2 carbon atoms, fluorine atoms and chlorine atoms and no hydrogen atom, 0.5–5 parts by weight of chromic acid anhydride, 0.001–0.1 part by weight of an organic carboxylic acid containing 1–20 carbon atoms represented by the general formula  $R(COOH)_n$ , wherein R is a straight-chained, branched or cyclic hydrocarbyl group, which may be substituted and n is an integer 1–3, and 1–20 parts by weight of an alcohol solubilizer containing 3–20 carbon atoms.



in which  $R_2$  and  $R_3$  may be identical or different from one another, each representing a hydrogen atom or having the significance of  $R_1$ , or at least one of the alkali or ammonium salts corresponding to the abovesaid alkane-phosphonic acids.

4,678,519

## METHOD OF ZINC PHOSPHATIZATION, ACTIVATION AND REFINING BATH USED IN SAID METHOD AND CORRESPONDING CONCENTRATE

Joseph Schapira, Paris; Victor Ken, Colombes; Denis Thery, Deuil la Barre, and Stéphane Jelodin, Argenteuil, all of France, assignors to Compagnie Francaise de Produits Industriels, Gennevilliers, France

Filed Oct. 31, 1985, Ser. No. 793,346

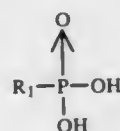
Claims priority, application France, Oct. 31, 1984, 84 16725  
Int. Cl.<sup>4</sup> C23C 22/80

U.S. Cl. 148—6.15 Z

10 Claims

1. In a method for the phosphatization with zinc of articles of large surface constituted by a metal selected from the group consisting of iron, zinc and their alloys, the said articles which are submitted successively to

- (1) at least one alkaline degreasing step,
- (2) at least one rinsing step with running city water,
- (3) an activating and refining step carried out by way of a bath having a pH from 7 to 9.5 and comprising in industrial water at least one Jernstedt salt in a proportion corresponding to about 1 to 100 ppm of titanium,
- (4) the zinc phosphatization step proper,
- (5) at least one rinsing step with water, being treated by immersion in the bath used in the activating and refining step, the improvement, which permits the use of industrial water despite of its hardness for the constitution of the said bath and without recourse to overflow necessitating the addition of Jernstedt salt proportional to the amounts of water added, while enabling an effect of refining and stability comparable with that obtained in demineralized water and according to which improvement the said bath comprises a proportion of 10 to 700 ppm of at least one alkane-phosphonic acid of formula



in which  $R_1$  represents an alkyl radical or an aryl radical possibly substituted by at least one of the substituents of the group comprising the hydroxyl radical, other phosphonic groups and amino groups of formula

4,678,520

## ELECTRICAL LEAD-INS FOR USE FOR ARC SUSTAINING ATMOSPHERES

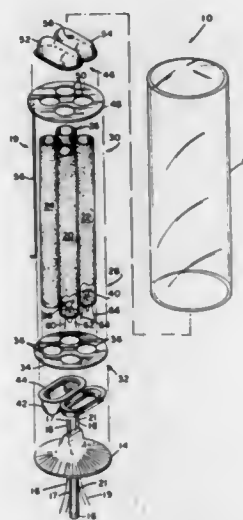
Andre C. Bouchard, Peabody; Paul A. Thibault, Danvers, and Radomir I. Lagushenko, Brookline, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Division of Ser. No. 481,689, Apr. 4, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 698,216

Int. Cl.<sup>4</sup> C23C 8/14

U.S. Cl. 148—6.35

3 Claims



1. The method of forming an insulating oxide coating on electrical lead-ins comprising the steps of: forming a given length of said lead-ins; and heating said given length of said lead-ins to a given temperature for a given amount of time with a gas-oxygen flame, said heating being sufficient to provide said insulating oxide coating having a contact resistance of about  $10^4$  ohms per centimeter of said given length of said lead-ins, said insulating oxide coating being sufficient to provide an arcing potential between said lead-ins that is greater than the normal operating potential between said lead-ins when said lead-ins are positioned in an arc sustaining atmosphere.

4,678,521

## PROCESS FOR PRODUCING ZIRCONIUM-BASED ALLOY AND THE PRODUCT THEREOF

Toshimi Yoshida; Hideo Maki, both of Katsuta; Hajime Umehara, Hitachi; Tetsuo Yasuda, Hitachi; Isao Masaoka, Hitachi; Iwao Takase, Tohoku; Masahisa Inagaki, Hitachi; Ryutarou Jimbow, Hitachi, and Keiichi Kuniya, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

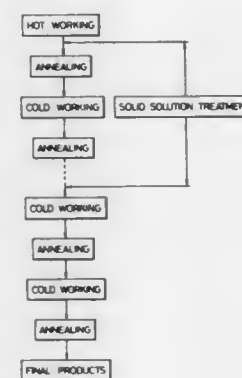
Continuation of Ser. No. 400,252, Jul. 21, 1982, abandoned. This application Mar. 3, 1986, Ser. No. 837,557

Claims priority, application Japan, Jul. 29, 1981, 56-119739; Jul. 29, 1981, 56-119740

Int. Cl.<sup>4</sup> C21D 8/00; C22C 16/00

U.S. Cl. 148—11.5 F

31 Claims



1. A process of producing a zirconium-based alloy consisting essentially of 1 to 2 wt% of Sn, 0.05 to 0.3 wt% of Fe, 0.05 to 0.2 wt% of Cr, up to 0.1 wt% of Ni and the balance being Zr, having improved corrosion resistance, including the steps of:

- (a) heating the zirconium-based alloy at a temperature within a range of the single  $\beta$  phase and quenching the heated alloy to effect a solid solution treatment;
- (b) after said solid solution treatment, hot plastic working the alloy;
- (c) subjecting the hot-worked alloy to another solid solution treatment in which it is heated for a heating time of 5 minutes or less, to a temperature within a temperature range capable of forming  $\alpha$  and  $\beta$  phases of the alloy, so as to transform the alloy to  $\alpha$  and  $\beta$  structures, and then quenched;
- (d) cold plastic working the solution-treated alloy at a temperature lower than the recrystallization temperature of the alloy, said another solid solution treatment being performed before the first cold plastic working but after the hot plastic working; and then
- (e) annealing the cold-worked alloy at a temperature of 400° to 640° C.;

and wherein the cold plastic working of step (d) and annealing of step (e) are repeated at least once, whereby the alloy is subjected to the cold plastic working and the annealing at least twice subsequent to said another solid solution treatment.

4,678,522

## COLD ROLLED STEEL SHEET HAVING EXCELLENT PRESS FORMABILITY AND METHOD FOR PRODUCING THE SAME

Tsuyoshi Kawano; Shiroh Sanagi, and Koe Nakajima, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

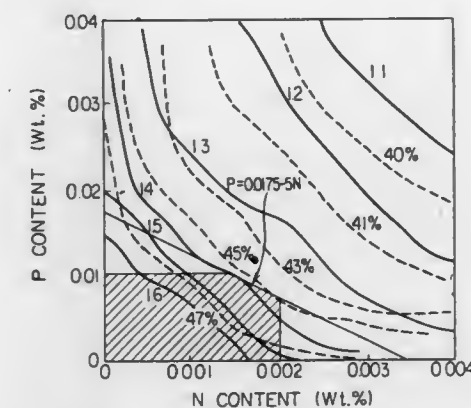
Continuation-in-part of Ser. No. 776,097, Sep. 16, 1985, Pat. No. 4,627,881, which is a continuation of Ser. No. 591,902, Mar. 21, 1984, abandoned, which is a continuation of Ser. No. 419,055, Sep. 16, 1982, abandoned. This application Aug. 7, 1986, Ser. No. 894,255

Claims priority, application Japan, Sep. 18, 1981, 56-146348; Sep. 18, 1981, 56-146349

Int. Cl.<sup>4</sup> C21D 7/02, 7/13

U.S. Cl. 148—12 C

4 Claims



1. A method for producing a cold rolled boron steel sheet having press formability which comprises: hot rolling at a temperature of at least 850° C. an Al-killed boron steel consisting of, by weight, not more than 0.050% C, 0.10–0.40% Mn, 0.010–0.050% Al, not more than 0.0020% N, not more than 0.010% P, not more than 0.02% Si, and B/N  $\leq 1.5$ , wherein the relation between P and N is such that  $P+5N \leq 0.0175\%$ , the remainder of steel being Fe and unavoidable impurities, cold rolling the hot rolled steel at a reduction of at least 50%, and subjecting the cold rolled steel to recrystallization continuous annealing at a temperature between the recrystallization temperature and the  $A_3$  point for not longer than five minutes.

4,678,523

## CORROSION- AND WEAR-RESISTANT DUPLEX STEEL

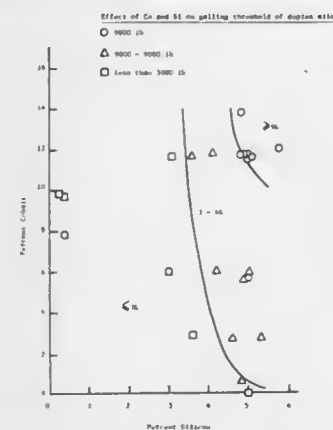
Narasi Sridhar, Carmel, and Paul Crook, Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Jul. 3, 1986, Ser. No. 882,552

Int. Cl.<sup>4</sup> C22C 38/52

U.S. Cl. 148—325

5 Claims



1. A stainless steel having a duplex structure consisting of about 5 to 60% ferrite and the balance essentially austenite

consisting essentially of, in weight percent, less than 0.1 carbon, 6 to 16 cobalt, 16 to 26 chromium, 7 to 20 nickel, 3 to 6 silicon, up to 4 molybdenum, up to 3 copper, less than 0.4 nitrogen, and the balance iron plus impurities, wherein the ratio of cobalt to silicon is between 1 and 4.5 to provide a desirable combination of wear and corrosion resistance to the steel.

4,678,524

**CAST EXPLOSIVE COMPOSITION AND METHOD**  
Don H. Cranney, South Jordan; David L. Gordon, American Fork, and Richard H. Hales, West Jordan, all of Utah, assignors to IRECO Incorporated, Salt Lake City, Utah  
Filed Jun. 18, 1986, Ser. No. 875,467  
Int. Cl.<sup>4</sup> C06B 45/02

U.S. Cl. 149-21

36 Claims

1. A method of formulating a cast explosive composition comprising forming a stable, fluid, water-containing, water-in-oil emulsion explosive and adding a desiccant in an amount sufficient to cause the emulsion explosive to solidify.

4,678,525

**PROCESS OF MANUFACTURING SLIDE FRAMES**  
Peter Mundt, Garmisch-Partenkirchen, and Arnold Neuhold, Farchant, both of Fed. Rep. of Germany, assignors to Gelmu-plast Peter Mundt GmbH. & Co. KG., Farchant, Fed. Rep. of Germany

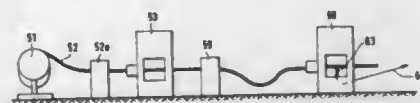
Filed Apr. 30, 1985, Ser. No. 729,119

Claims priority, application Fed. Rep. of Germany, May 7, 1984, 3416760; May 7, 1984, 3416761

Int. Cl.<sup>4</sup> B29C 65/08; G09F 1/12

U.S. Cl. 156-73.1

21 Claims



1. A process of manufacturing slide frames, which are adapted to be elastically expanded comprising the steps of: providing at least one extruded plastic sheet plastic web; forming a film bed from said plastic web, which is peripherally closed and which serves to receive a slide, by embossing; punching said plastic web to form picture gates; joining plastic web portions of said web by either gluing or ultrasonic welding to form a frame; and punching said joined webs to form the external contour of the frame.

4,678,526

**METHOD AND APPARATUS FOR FORMING DRAIN PIPES**

Manfred Hawerkamp, Altenrather Strasse 5, 5210 Troisdorf, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,486

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433931

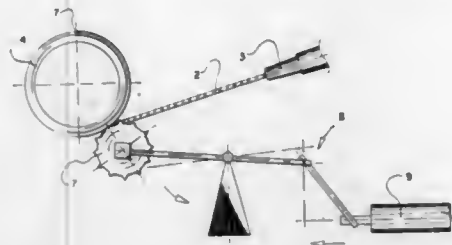
Int. Cl.<sup>4</sup> B32B 31/00

U.S. Cl. 156-195

2 Claims

1. A method for manufacturing drainage pipe for the dewatering and degassing of waste material, comprising extruding a plastic band of thermoplastic material, the plastic band being heated to the plastic state, winding the plastic band in a helical path on a winding spindle while the plastic band is still heated and in its plastic state, the helical path causing turns of the plastic band to overlap in a winding seam, the turns of plastic band becoming welded together at the winding seam, and

perforating the plastic band with perforations which extend entirely through the plastic band while the plastic band is still



in its plastic state and after the plastic band has been wound onto the winding spindle.

4,678,527

**METHOD FOR MAKING NONPLANAR ABSORBENT PRODUCTS**

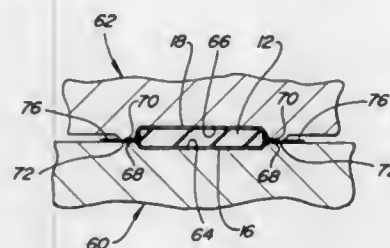
John Ulman, Woodbridge, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Sep. 17, 1984, Ser. No. 651,125

Int. Cl.<sup>4</sup> B32B 31/08

U.S. Cl. 156-213

11 Claims



1. A process for producing an arcuate shaped napkin having a concave body facing side and a convex garment facing side comprising:

delivery onto an arcuate shaped surface, a composite comprising a layer of absorbent core, said layer of absorbent core having a body facing side and a garment facing side; said composite further comprising a first layer of body facing side cover overlying said body facing side of said absorbent core and a second layer of garment facing side cover overlying said garment facing side of said absorbent core; said cover layers extending beyond the periphery of said absorbent core and being in face-to-face relationship to each other beyond said periphery and being unsealed to each other so as to be free to move relative to each other while still maintaining their face-to-face relationship; deforming said composite to conform to the arcuate shape of the arcuate shaped surface; and sealing said cover layers to each other about the periphery of said absorbent core while said composite is on said arcuate shaped surface.

4,678,528

**METHOD AND APPARATUS FOR MAKING A PRINTED AND EMBOSSED FLOOR COVERING USING A CAST WEAR LAYER**

Merrill M. Smith, Morrisville, Pa., and Donald C. Ferguson, Trenton, N.J., assignors to American Biltrite, Inc., Wellesley Hills, Mass.

Filed Mar. 5, 1985, Ser. No. 708,306

Int. Cl.<sup>4</sup> B32B 31/18, 31/22, 31/28; B44C 1/24

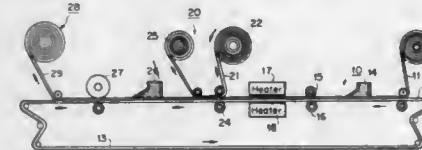
U.S. Cl. 156-220

20 Claims

1. A method of making, on a continuous basis, a composite tile having the sharp and vivid coloring characteristics of

ceramic tiles by transferring a printed cast wear layer onto a base web comprising the steps of:

forming a continuous printed cast wear layer on a release paper comprising the steps of:  
applying a continuous layer of clear liquid plastisol to a continuous moving sheet of release paper;  
forming a smooth surface on said clear liquid plastisol layer;  
gelling said clear liquid plastisol layer;  
transferring a printed design from a preprinted stable carrier sheet to the smooth surface of said clear plastisol layer, said printed design being formed by a material compatible with said clear plastisol layer, said printed



design including a first portion which constitutes a decorative design for said composite tile; and applying an opaque liquid plastisol backing layer to the printed surface of the clear plastisol layer;  
gelling said opaque liquid plastisol layer; forming a continuous base web on a supported surface traveling in a horizontal direction, said supported surface being made of a material such that the base web will adhere to the surface when the web is hot but can be removed from it when the web is cooled;

transferring the continuous printed cast layer from the continuous sheet of release paper to the base web; and laminating the printed cast wear layer to the base

4,678,529

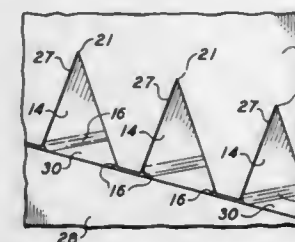
**SELECTIVE APPLICATION OF ADHESIVE AND BONDING PROCESS FOR INK JET PRINTHEADS**  
Donald J. Drake, Rochester; Michael R. Campanelli, and Dale R. Ims, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1986, Ser. No. 881,414

Int. Cl.<sup>4</sup> B32B 31/00

U.S. Cl. 156-234

10 Claims



1. A method of bonding mating surfaces of at least two components together, wherein at least one of the surfaces to be bonded contains recesses therein and wherein said recesses require minimum entrant into or minimum volume reduction by the adhesive after completion of the bonding of the components, the bonding method comprising the steps of:

(a) applying a relatively thin layer of an adhesive to a flexible substrate, the adhesive being of the type capable of having a state wherein its viscosity is lowered to a point that its molecule-to-molecule adhering forces are weaker than its molecule-to-interface bonding forces upon the application of a predetermined temperature within a predetermined time period after the adhesive layer is applied to the flexible substrate;  
(b) placing the adhesive layer that is on said flexible substrate on the surface of the component having the recesses and heating the adhesive layer so that it enters said state of low

viscosity within said predetermined time period, the adhesive layer contacting only the higher surface portions of the component having the recesses and not contacting any of the recess surfaces;

(c) peeling the flexible substrate away from the surface of the component having the recesses at an angle thereto such that high stress is placed on the adhesive layer at the peeled edge of the flexible substrate, the peeling being done within said predetermined time period and while the adhesive is in said low viscosity state, so that the adhesive layer fails cohesively leaving about half of the adhesive layer on the flexible substrate and the remainder of the adhesive layer coating the higher surface portions of the component having the recesses;  
(d) aligning and mating the surface of the component having the adhesive coating on its higher surface portions with a surface of the other component; and  
(e) curing the adhesive to bond the mated components together.

4,678,530

**METHOD OF MAKING LINER SECTIONS FOR ROTARY PULVERIZERS**

Richard E. Eroskey, Munroe Falls, and Larry G. Miller, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

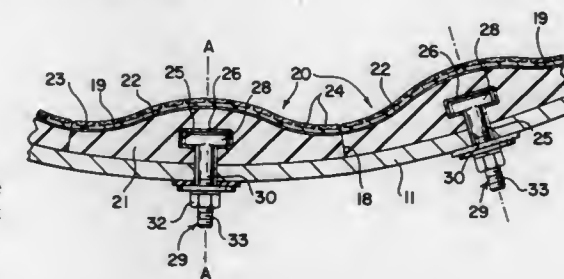
Division of Ser. No. 627,245, Jul. 2, 1984, Pat. No. 4,580,734.

This application Nov. 6, 1985, Ser. No. 795,554

Int. Cl.<sup>4</sup> B29C 63/26; B32B 31/26

U.S. Cl. 156-245

4 Claims



1. A method of making a liner section for use in a rotary pulverizer comprising the steps of positioning a plurality of flat ceramic tiles onto the bottom surface in a mold with clearance spaces between the respective tiles, pouring liquid cast polyurethane into the mold to fill said clearance spaces and provide a layer of polyurethane above said tiles to form a slab, curing said slab, positioning said slab into a second mold having a layer of rubber therein, molding said slab and said layer of rubber to shape said rubber layer into a concave form, and curing said slab and said layer of rubber into an integral unit.

4,678,531

**METHOD AND APPARATUS FOR SCREEN PRINTING SOLDER PASTE ONTO A SUBSTRATE WITH DEVICE PREMOUNTED THEREON**

David B. Metzger; Glenn S. Johnson, both of Kokomo, and Michael D. Bramel, Summitville, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1986, Ser. No. 843,030

Int. Cl.<sup>4</sup> B32B 31/12; B05C 17/06; B05D 5/12

U.S. Cl. 156-250

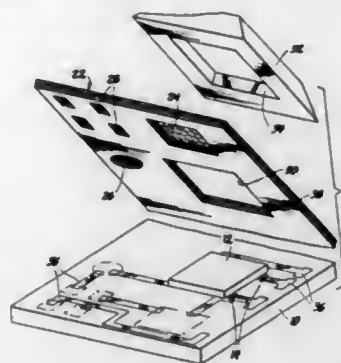
10 Claims

1. A method for screen printing an electrical fabrication substance onto a substrate surface to which a device having substantial height relative to the thickness of the printing screen has been previously mounted comprising the steps of:

(a) preparing a printing screen to permit through-flow of said bonding substance only in one or more pre-selected areas;



- (b) forming a hole in said screen of such size and location as to conform to said device;  
 (c) bonding a substance-impervious cap to the screen so as to cover said hole and said device;  
 (d) laying said screen over said substrate with the device being disposed within said hole;  
 (e) and thereafter applying said substance to the exposed surface of said screen to cause said substance to flow through said pre-selected areas.



4. Apparatus for applying an electrical fabrication substance by screen printing to selected areas of a surface of a substrate to which a device of substantial height relative to the printing screen thickness has previously been mounted comprising:  
 (a) a printing screen for overlying said substrate surface and which is impervious to the through-flow of said substance except in one or more pre-selected areas; said screen having an aperture formed therein to accommodate said device; and  
 (b) a substance-impervious cap for covering said device bonded to said screen over said aperture.

4,678,532

## TREATMENT OF WOOD VENEERS IN PLYWOOD MANUFACTURING

David A. Perry, and Richard D. Stratton, both of Pineville, La., assignors to Perkins Industries, Inc., Overland Park, Kans.  
 Filed Mar. 21, 1985, Ser. No. 714,437  
 Int. Cl.<sup>4</sup> C09J 5/04

- U.S. Cl. 156—314 14 Claims  
 1. A method of treating wood veneer in the manufacture of plywood to reduce the amount of adhesive required in the plywood, said method comprising the steps of:  
 drying the veneer;  
 applying to the veneer a wetting agent that is comprised of water;  
 allowing the veneer to stand for a preselected time period sufficient to permit the water to evaporate and be absorbed by the veneer;  
 applying adhesive to the veneer surface after elapse of said time period in an amount related to the water absorbed by the veneer; and  
 applying heat and pressure to the veneer to form plywood.

4,678,533

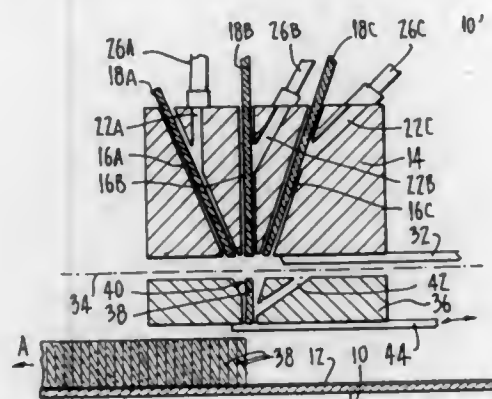
## APPARATUS FOR TUFTING YARN BITS

Ian G. Bartlett, Grovedale, and Donald A. Lymer, Highton, both of Australia, assignors to Tybar Engineering Pty. Ltd., Australia

Filed Mar. 1, 1985, Ser. No. 707,463  
 Claims priority, application Australia, Mar. 7, 1984, PG3952  
 Int. Cl.<sup>4</sup> D04H 1/00; B32B 5/00

- U.S. Cl. 156—435 4 Claims  
 1. An apparatus for manufacture of carpet, said apparatus including at least one yarn outlet situated above an adhesive covered backing, said at least one outlet including at least one guide means for guiding yarn through said at least one outlet from a yarn supply, a cutting device for severing said yarn emerging from said at least one outlet, a manifold extending

across the width of said adhesive covered backing, said manifold having a plurality of said guide means therein along the length of said manifold and each guide means being connected to a respective yarn supply, at least one further set of guide means extending along the length of said manifold, said at least one further set of guide means being aligned with said plurality of guide means with yarn emerging from said at least one further set of guide means adjacent respective outlets of said plurality of guide means, an air channel adapted to be connected to a compressed air supply leads into each guide means



- and forces said yarn through each guide means and an assembly block located between said manifold and said adhesive covered backing, said assembly block including a yarn bit collection zone located below aligned outlets of said plurality of guide means and said at least one further set of guide means, said assembly block including a dispenser means to control guidance of respective cut yarn bits onto said adhesive covered backing, said yarn bit collection zone being a plurality of funnel-shaped bores and said dispenser means including a moveable slide underneath said assembler block to control the movement of yarn bits through each respective funnel-shaped bore, and a further air channel opening into each funnel-shaped bore to force said yarn bits from each funnel-shaped bore.

4,678,534

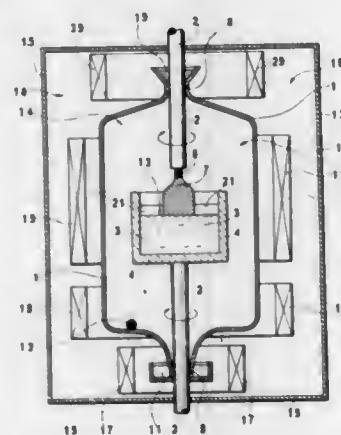
## METHOD FOR GROWING A SINGLE CRYSTAL

Koji Tada; Masami Tatsumi; Toshihiro Kotani, and Shinichi Sawada, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 13, 1985, Ser. No. 733,361  
 Claims priority, application Japan, Jun. 8, 1984, 59-117845  
 Int. Cl.<sup>4</sup> C30B 27/02

U.S. Cl. 156—607

4 Claims



1. A method for growing a single crystal of compound semiconductors in an apparatus comprising an inner vessel

having a top opening with a top cavity, and a bottom opening with a bottom cavity, and made of a material that does not chemically react with a Group V or Group II element a plurality of heaters each of said heaters surrounding said inner vessel at a vertically different position, an upper shaft passing through said top opening, said upper shaft being able to rotate and move up and down in said inner vessel, a lower shaft passing through said bottom opening, said lower shaft being able to rotate and move up and down in said inner vessel, a crucible supported by said lower shaft, and an outer vessel which encloses said inner vessel and said heaters, said method comprising the steps of:

- charging compound semiconductor material, and an encapsulant material into said crucible,
- placing a lump of an element of group V or group II in said inner vessel,
- charging encapsulant materials into said top and bottom cavities,
- supplying an inactive gas into said inner vessel and said outer vessel,
- sealing said inner vessel by heating the encapsulant materials in said top and bottom cavities to form liquid encapsulants,
- melting the encapsulant material in said crucible to form crucible liquid encapsulant and melting the compound semiconductor material in said crucible to form a material melt covered with the crucible liquid encapsulant,
- heating the lump of the element of group V or group II to keep the partial pressure  $Q_0$  of the gas of the element of group V or group II equal to or larger than the dissociation pressure  $Q_d$  of the element of group II or group V at a temperature for seeding,
- controlling the total gas pressure in said inner vessel so as to be equal to or greater than the gas pressure in said outer vessel,
- dipping a seed crystal into said material melt and,
- pulling up a single crystal.

4,678,535

## PROCESS FOR PRODUCING CRYSTALS

Hermenegild Mang, and Günter Engel, both of Graz, Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik mbH, Graz, Austria  
 Continuation-in-part of Ser. No. 479,081, Mar. 25, 1983, abandoned. This application Jun. 13, 1985, Ser. No. 744,303  
 Claims priority, application Austria, Mar. 30, 1982, 1260/82  
 Int. Cl.<sup>4</sup> C30B 29/14, 7/10; C01B 25/26

U.S. Cl. 156—623 R

4 Claims

1. A process for producing single crystals which have a comprehensive chemical formula of  $AP_2O_4$ , symbol A being a chemical element selected from Al and Ga, P being phosphorus, and O being oxygen, said process comprising the steps of  
 (1) preparing a solution of aluminum or gallium phosphate in 12.5–20 molar phosphoric acid and saturating said solution at a temperature of at least 110° C. and less than 190° C.,  
 (2) providing steam over said solution prepared in step (1) at a pressure equal to or greater than the prevailing static vapor pressure to maintain the actual acid concentration of said solution within the range of 12.5 to 20 mol/l,  
 (3) raising the temperature of said solution by at least 10° C. in increments of 0.1° to 3° C. per day, starting from the saturation temperature in step (1), until a temperature which is still below 190° C. is reached, and  
 (4) during steps (1) to (3), maintaining the total pressure over said solution at about atmospheric pressure until said crystals are formed from said solution.

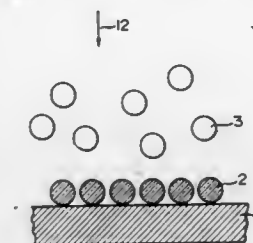
4,678,536

## METHOD OF PHOTOCHEMICAL SURFACE TREATMENT

Selichi Murayama, Kokubunji; Kanji Tsujii, Tokyo, and Yasuke Yajima, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 799,976

Claims priority, application Japan, Nov. 21, 1984, 59-244444  
 Int. Cl.<sup>4</sup> H01L 21/306; B05D 3/06; B44C 1/22; C03C 15/00  
 U.S. Cl. 156—635 4 Claims



1. A method of photochemically treating a surface of a material, comprising the steps of:  
 introducing a reaction gas into a reaction chamber having a substrate therein, to make the reaction gas be adsorbed on the surface of said substrate; and  
 exposing said substrate to radiation of a wavelength at which the absorption of radiation energy by the reaction gas existing in the inner space of said reaction chamber is negligibly small and the radiation energy is absorbed by the reaction gas adsorbed on the surface of said substrate, the kind of the reaction gas and the wavelength of the radiation being selected so that the surface of a predetermined material forming a pattern on said substrate can be selectively treated.

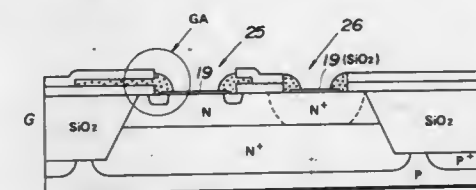
4,678,537

## METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Norikazu Ohuchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,295

Claims priority, application Japan, May 23, 1985, 60-111249; May 23, 1985, 60-111250; May 23, 1985, 60-111251  
 Int. Cl.<sup>4</sup> H01L 21/306; B44C 1/22; C03C 15/00, 25/06  
 U.S. Cl. 156—643 20 Claims

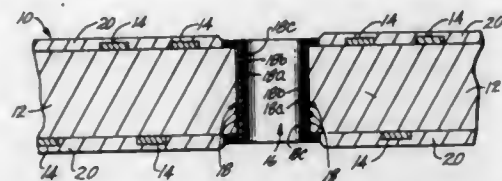


1. A method of manufacturing a semiconductor device, which comprises the following steps of:  
 (a) forming a first insulating layer on a semiconductor substrate including at least one active area;  
 (b) selectively forming a first conductive layer on said first insulating layer;  
 (c) forming a second insulating layer on said first conductive layer;  
 (d) forming at least one window through said first and second insulating layers and said first conductive layer on said active area of which peripheral portion is perpendicular to a surface of said semiconductor substrate;  
 (e) forming a third insulating layer on said active area exposed through said active area window;  
 (f) forming an oxide resistant layer all over said semiconductor substrate;





immersing a conductive substrate in the electroplating solution at a location spaced apart from the anode;  
immersing an electrically conductive screen in the electroplating solution, the screen extending across the electroplating tank between the anode and the substrate; and by means of a direct current source, simultaneously establishing a first potential difference between the anode and



the substrate for electrolytically depositing metal onto the substrate and a second potential difference between the anode and the screen, wherein the second potential difference is less than the first potential difference and the screen voltage is less positive than the anode voltage to thereby minimize the difference between the current density at the center of the substrate and at the periphery of the substrate.

4,678,546

# PROCESS FOR PROVIDING LITHIUM TANTALUM OXIDE COATED TANTALUM ARTICLES WITH IMPROVED WEAR RESISTANCE

Liu Yu-Zhong, Beijing, China, assignor to North China Research Institute of Electro-Optics, Beijing, China  
Filed Mar. 27, 1985, Ser. No. 716,803  
Int. Cl.<sup>4</sup> C25D 11/34

U.S. Cl. 204—32.1

16 Claims

1. A process for making an article made of a metal selected from the group consisting of tantalum, niobium and an alloy of tantalum and niobium coated with a film comprising polycrystalline lithium-containing metal oxide, the process comprising:  
(a) cleaning the surface of the metal article to remove surface impurities by:  
(i) washing with an organic solvent;  
(ii) etching with a solution of a strong acid selected from the group consisting of hydrofluoric acid and a mixture of hydrofluoric acid and nitric acid under an applied anodic voltage; or  
(iii) a combination of the above;  
(b) immersing the cleaned article in a bath of an oxygen containing inorganic salt of lithium at a high temperature in the range of 400° C. to 580° C., and applying an anodic voltage in the range of about 3 to 50 volts to maintain a current density of about 2 to 20 mA/cm<sup>2</sup> for a period of about 0.1 to 10 hours to form said film on the surface of the article; and  
(c) post-treating the article by:  
(i) aging at a temperature of about 170° C. to 400° C. for about 1 to 4 hours;  
(ii) immersing the article in a solution of about 0.05% by weight of phosphoric acid and ethylene glycol at a temperature of about 90° C. to 100° C. and applying an anodic voltage of about 500 volts to 600 volts for about 1 to 3 hours;  
(iii) immersing in dilute phosphoric acid at room temperature and applying an anodic voltage of about 350 volts to about 600 volts for at least 0.5 hours; or  
(iv) a combination of the above steps.

4,678,547

# ANODIZED MEMORY DISK SUBSTRATE AND METHOD OF MANUFACTURING THE SAME

Mitsuya Miyamoto, Kamakura; Yasuyuki Ooseki, Hiratsuka, and Motohiro Nabae, Nikko, all of Japan, assignors to Furukawa Aluminum Co., Ltd., Tokyo, Japan  
Filed Sep. 4, 1986, Ser. No. 903,480  
Claims priority, application Japan, Sep. 4, 1985, 60-193953  
Int. Cl.<sup>4</sup> C25D 5/50

U.S. Cl. 204—37.1

6 Claims

1. An anodized memory disk substrate having an anodic film thereon which has excellent hardness and heat resistance, said film having a thickness of not less than 3 μm, and said anodized memory disk being produced by the process of:  
(a) anodizing a substrate of aluminum or aluminum alloy at a temperature of from 30 to 90° C. and at a voltage of from 25 to 90V in a mixed acid solution comprising 10 to 200 g./l. of chromic acid and 0.1 to 50 g./l. of sulfuric acid to form the anodic film having a film thickness of not less than 4 μm on the surface of the substrate;  
(b) polishing said anodized substrate so as to leave behind the anodic film with a film thickness of at least 3 μm, and before or after said polishing;  
(c) heating said anodized substrate for not less than 10 minutes at a temperature in the range of 150 to 450° C.

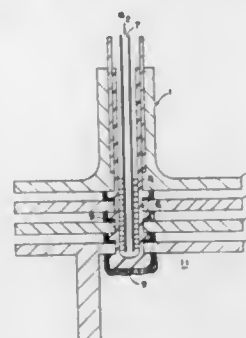
4,678,548

# CORROSION-RESISTANT SUPPORT APPARATUS AND METHOD OF USE FOR INERT ELECTRODES

Melvin H. Brown, Allegheny Township, Allegheny County, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.  
Filed Jul. 21, 1986, Ser. No. 887,637  
Int. Cl.<sup>4</sup> C25C 3/10

U.S. Cl. 204—67

9 Claims



8. A method for protecting an electrode positioning member from corrosive attack while immersed in a chemical bath, said positioning member being composed of an electrically nonconductive material and having an inside surface forming an internal cavity, comprising:  
(a) passing a clear coolant through said cavity along said inside surface; and  
(b) establishing wire in said cavity positioned normal to the path of said coolant and further positioned to provide a direct line of sight between said wire and said inside surface, said wire having a radiative absorbance and emittance of at least about 0.5.

4,678,549

# PROCESS FOR MAKING AMINO ALCOHOLS BY ELECTROCHEMICAL REDUCTION OF NITRO ALCOHOLS

Maurice Rignon, Givry; Jean-Claude Catonne, La-Celle-Saint-Cloud; Francoise Denisard, Elancourt, and Jean Malafosse, Saint Marcel, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France  
Filed Feb. 10, 1986, Ser. No. 828,558  
Claims priority, application France, Feb. 11, 1985, 85 01873  
Int. Cl.<sup>4</sup> C25B 3/04; B01D 13/02

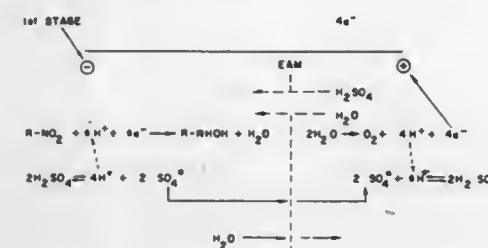
U.S. Cl. 204—74

13 Claims

1. A process for producing amino alcohols by electrochemi-

cal reduction of nitro alcohols in an electrodialysis apparatus having an anode compartment containing an anolyte comprising a dilute solution of sulfuric acid and a cathode compartment containing catholyte, the anode compartment being separated from the cathode compartment by an ion exchange resin, comprising:

- a. a first step of reacting a sulfuric acid solution of the nitro alcohol to form a hydroxylamine at the cathode, the cath-



- ode being made of a material having a strong hydrogen overpotential;  
b. reducing the hydroxylamine from the first step at a cathode having a higher electronegative potential than the cathode in the first step to form an amino alcohol;  
c. purifying the solution of amino alcohol produced by electrodialysis and removing concentrated sulfuric acid present in the anode compartment by eliminating water therefrom.

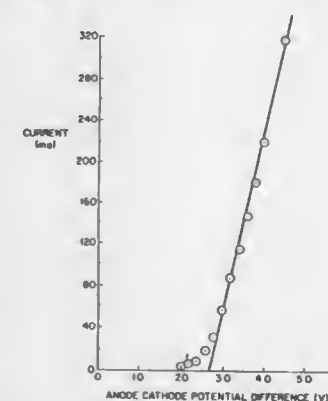
4,678,550

# OBTAINING ACCURATE AMOUNTS OF MERCURY FROM MERCURY COMPOUNDS VIA ELECTROLYTIC METHODS

Mark W. Grossman, Belmont, and William A. George, Rockport, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.  
Filed Dec. 31, 1985, Ser. No. 815,146  
Int. Cl.<sup>4</sup> C25C 1/00

U.S. Cl. 204—105 R

18 Claims



1. A method for obtaining a pre-determined quantity of Hg, which comprises:  
(a) dissolving a quantity of HgO in an electrolyte solution resulting in the dissociation of HgO and the formation of mercuric ions in solution, said electrolyte solution comprising glacial acetic acid and H<sub>2</sub>O, said quantity of HgO being sufficient to provide the pre-determined quantity of Hg plated on a cathode at an electrolyte cell upon substantially complete electrolytic reduction and plating thereof;  
(b) placing an anode and a cathode into the electrolyte solution;  
(c) applying an electric voltage across the anode and cathode, said electric voltage causing an electric current to flow from the anode through the electrolyte solution to the cathode, whereby mercuric ions are reduced and elemental Hg is plated onto said cathode;  
(d) continuing to apply the electric voltage across the anode

and cathode until the reduction of Hg ions is complete; and thereafter  
(e) recovering said cathode with the pre-determined quantity of Hg thereon.

4,678,551

# PROCESS FOR PRODUCING AN ALUMINUM SUPPORT FOR A LITHOGRAPHIC PRINTING PLATE

Haruo Nakanishi; Hirokazu Sakaki; Toru Yamazaki, and Yoshio Okishi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Oct. 10, 1985, Ser. No. 786,023  
Claims priority, application Japan, Oct. 11, 1984, 59-212916;  
Oct. 11, 1984, 59-212917

Int. Cl.<sup>4</sup> C25F 3/04

U.S. Cl. 204—129.75

14 Claims

1. A process for producing an aluminum support for a lithographic printing plate, comprising chemical graining of at least one side of an aluminum plate with an etching solution so as to form an average center-line roughness of from 0.3 to 1.3 μm, wherein the etching solution is an aqueous solution containing a mineral acid and from 40 to 95% by weight with respect to the saturation concentration of the mineral acid an unsaturated concentration of an aluminum salt of a mineral acid.

4,678,552

# SELECTIVE ELECTROLYTIC STRIPPING OF METAL COATINGS FROM BASE METAL SUBSTRATES

Johnson C. Chen, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.  
Filed Apr. 22, 1986, Ser. No. 855,043  
Int. Cl.<sup>4</sup> C25F 5/00

U.S. Cl. 204—146

7 Claims

1. A process for the selective electrolytic stripping of metal coatings selected from nickel, chromium, tin, lead, tin/lead alloy, cobalt, cadmium, aluminum, or mixtures thereof from a base-metal substrate selected from copper and its alloys and zinc and its alloys consisting essentially of immersing said coated base-metal substrate into an aqueous electrolyte solution of from about 45 to about 70 weight percent of an alkane-sulfonic acid of 1 to 4 carbons wherein said coated metal-base substrate is the anode and an electroconductive material is the cathode, impressing a direct current voltage across said electrolyte solution between the electrodes until the current decreases to about zero which occurs when the metal coating on the anode is completely stripped off leaving the base-metal substrate exposed.

4,678,553

# RENATURING REVERSIBLY DENATURED POLYPEPTIDES AND PROTEINS BY ELECTRODIALYSIS OF SOLUTIONS THEREOF IN DENATURANTS

Robert J. Mandle, Lexington, Mass., and Wayne A. McRae, Zurich, Switzerland, assignors to Ionics, Incorporated, Watertown, Mass.  
Filed Jul. 11, 1986, Ser. No. 884,942  
Int. Cl.<sup>4</sup> B01D 13/02

U.S. Cl. 204—182.6

15 Claims

1. A process for recovering at least one substantially renatured polypeptide from a solution of said polypeptide and/or its S-sulfonate derivative reversibly denatured in aqueous denaturant, said process comprising:  
(a) introducing said solution of said polypeptide and/or its S-sulfonate derivative into at least one renaturant compartment of an electrodialysis apparatus, said compartment defined by membranes each of which is substantially permeable to low molecular weight singly charged ions of at least one charge sign and substantially impermeable to said polypeptides and S-sulfonate derivatives, said membranes also defining rinsing compartments juxtaposed on each side of said renaturant compartment;

- (b) introducing second aqueous solutions into said juxtaposed rinsing compartments, said second solutions adapted in combination with said membranes to permit reduction of the chaotropy of said denaturant in said renaturant compartment upon the application of a direct electric current in at least one of the possible directions through said renaturant compartment and said juxtaposed rinsing compartments in series;
- passing a substantially direct electric current in series through said renaturant compartment and said juxtaposed rinsing compartments in a direction to cause reduction of the chaotropy of said denaturant in said renaturant compartment thereby reducing the chaotropy of said denaturant in said solution of polypeptide and/or S-sulfonate derivative to a level characterized by its ability to permit at least partial refolding of such polypeptide and/or S-sulfonate derivative which level is not less than that which would result in substantial precipitation of said polypeptide and/or its S-sulfonate derivatives out of said solution at pH's in the range of from about 4 to about 10, which pH's do not substantially decrease the solubility of said polypeptide and/or S-sulfonate derivative at said chaotropy level;
- (d) maintaining the pH of said solution of polypeptide and/or S-sulfonate derivative during electrodialysis at pH's in the range of from about 4 to about 10 which pH's are characterized by not substantially decreasing the solubility of said polypeptide and/or S-sulfonate derivatives at said reduced chaotropy level; and
- (e) removing from said renaturant compartment a solution of said polypeptide and/or S-sulfonate derivative having a substantially reduced chaotropy level.

4,678,554

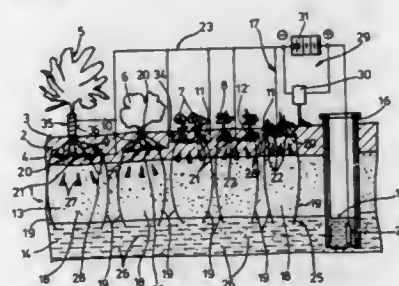
# METHOD AND INSTALLATION FOR GENERATING AN ELECTRICAL FIELD IN THE SOIL

Hans Oppitz, Mills, Austria, assignor to ELTAC Nogler & Daum KG, Innsbruck, Austria

Continuation of Ser. No. 704,138, Feb. 21, 1985, abandoned, which is a continuation of Ser. No. 464,721, Feb. 7, 1983, abandoned. This application Jan. 31, 1986, Ser. No. 825,055 Int. Cl.<sup>4</sup> B01D 13/02; C25B 11/0

U.S. Cl. 204—299 R

16 Claims



1. An installation for generating an electrical field of a large area in soil having a vegetation zone between the ends of roots of plants in the soil and the surface of the soil, which comprises at least one cathode having a high conductivity and a low transition resistance arranged in the vegetation zone, each one of the cathodes being a flexible net comprised of threads defining meshes of a sufficient size to accommodate the plants therein, the threads of the net being comprised of a core material selected from the group consisting of polyamide, acrylic resin and polyester, containing carbon or metal filaments embedded in an electrically conductive synthetic resin, an anode arranged in a deeper zone of the soil at a greater distance from the soil surface than each one of the cathodes, and an electrical conductor system connecting each one of the cathodes to the anode to enable an electric current to flow therebetween.

## 4,678,555 PREPARATION OF CELLULOSE ACETATE MEMBRANE AND ITS USE FOR POLAR SOLVENT-OIL SEPARATION

David L. Wernick, Elizabeth, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.  
Division of Ser. No. 561,287, Dec. 14, 1983, Pat. No. 4,541,972.  
This application Jul. 11, 1985, Ser. No. 754,005  
Int. Cl.<sup>4</sup> C10G 21/28; B01D 13/00

U.S. Cl. 208—36

5 Claims

1. A process for separating dewaxing solvent from dewaxed oil comprising the steps of contacting the dewaxed oil-dewaxing solvent combination under pressure with a cellulose acetate membrane wherein the cellulose acetate membrane is a cellulose 1.7-1.8 acetate membrane prepared by the steps of:
- dissolving 5 to 40 weight percent cellulose 1.7-1.8 acetate polymer in a dual casting solvent system comprising 15 to 50 weight percent solvent A and 20 to 80 weight percent solvent B wherein solvent B is a nonsolvent for the polymer while solvent A is either a solvent or nonsolvent for the polymer, but the mixture A plus B is a solvent for the polymer;
  - casting a film using the solution of step (a);
  - evaporating a portion of the more volatile solvent A from the film; and
  - gelling the partially evaporated film in a gelation solvent C which does not dissolve the polymer but is miscible with solvents A and B and further wherein the solvent combination of B+C is a nonsolvent for the polymer, wherein solvent A possesses three dimensional solubility parameters in the range of  $\delta_D$  3.2 to 10,  $\delta_P$  1 to 10 and  $\delta_H$  6 to 12 and solvents B and C possess three dimensional solubility parameters in the range of  $\delta_D$  7 to 10,  $\delta_P$  0 to 10 and  $\delta_H$  < 2.5, wherein all  $\delta$ 's are in (cal/cm<sup>3</sup>)<sup>1/2</sup>.

4,678,556

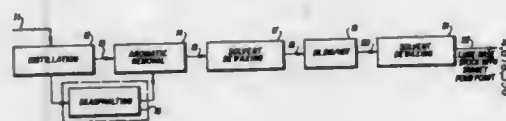
# METHOD OF PRODUCING LUBE STOCKS FROM WAXY CRUDES

Michael S. Hicks, West Deptford, and David L. Vannauker, Woodbury Heights, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,200  
Int. Cl.<sup>4</sup> C10G 55/06, 73/06

U.S. Cl. 208—96

19 Claims



14. A process for dewaxing lube feedstocks and for extending the cycle length of the dewaxing process, comprising the steps of:

- solvent dewaxing a waxy hydrocarbon feedstock having a pour point of 100° to 160° F., whereby high quality waxes are removed to produce a hydrocarbon stock having a first intermediate pour point;
- catalytically dewaxing said first intermediate pour point hydrocarbon stock by contacting said first intermediate pour point hydrocarbon stock with a crystalline silicate of the structure of ZSM-5 in the presence of added hydrogen at a temperature between 500° and 675° F. to remove a percentage of a wax contained in said lube oil stock to produce a hydrocarbon stock having a second intermediate pour point; and
- solvent dewaxing said second intermediate pour point hydrocarbon stock to produce a lube base stock having a targeted pour point of about 0° to 20° F.

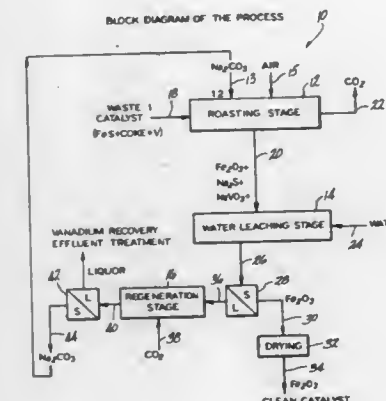
## 4,678,557 PROCESS FOR THE REGENERATION OF SPENT CATALYST USED IN THE UPGRADING OF HEAVY HYDROCARBON FEEDSTOCKS

Domingo Rodriguez, San Antonio de Los Altos, and Roberto Schemel, Los Teques, both of Venezuela, assignors to Intevp, S.A., Caracas, Venezuela

Filed Sep. 9, 1985, Ser. No. 773,802  
Int. Cl.<sup>4</sup> C10G 47/04, 47/06; B01J 23/94

U.S. Cl. 208—112

8 Claims



1. A process for the regeneration of a spent natural iron base catalyst used in the upgrading of heavy hydrocarbon feedstocks comprising:

- providing a spent natural iron base catalyst containing carbon, sulfur and vanadium as impurities;
- roasting said catalyst at a temperature of not more than 400° C. in the presence of a carbonate selected from the group consisting of sodium, potassium and mixtures thereof so as to eliminate carbon from said catalyst and obtain a roasted product comprising iron oxide and water soluble salts of sulfur and vanadium;
- water leaching said roasted product to dissolve the soluble salts of sulfur and vanadium; and
- separating said catalyst from said leaching liquor so as to obtain a regenerated catalyst substantially free of carbon and sulfur.

8. A hydrocracking process for the upgrading of a heavy crude feedstock comprising:

- hydrocracking said hydrocarbon feedstock in the presence of a natural iron base catalyst wherein said catalyst becomes contaminated with carbon, sulfur and vanadium;
- roasting said contaminated catalyst at a temperature of not more than 400° C. in the presence of a carbonate selected from the group consisting of sodium, potassium and mixtures thereof so as to eliminate carbon from said catalyst and obtain a roasted product comprising iron oxide and water soluble salts of sulfur and vanadium;
- water leaching said roasted product to dissolve the soluble salts of sulfur and vanadium;
- separating said catalyst from said leaching liquor so as to obtain a regenerated catalyst substantially free of carbon and sulfur; and
- recycling said regenerated catalyst to the hydrocracking stage.

## 4,678,558 METHOD USABLE IN PARTICULAR FOR WASHING AND DESORBING SOLID PRODUCTS CONTAINING HYDROCARBONS

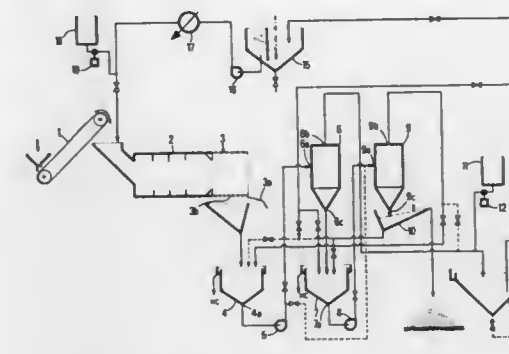
Jean-Pierre Belluteau, Noisy le Rio; Christian Bocard, Orgeval; Christian Such, Orsay, and Daniel Vaillant, Antony, all of France, assignors to Institut Français du Pétrole, Rueil-Malmaison and Laboratoire Central des Ponts et Chaussées, Paris, both of France

Filed Jul. 3, 1985, Ser. No. 751,589

Claims priority, application France, Jul. 4, 1984, 84 10730  
Int. Cl.<sup>4</sup> C10G 1/04

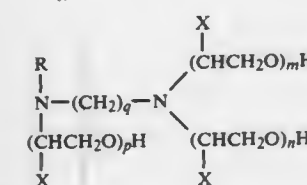
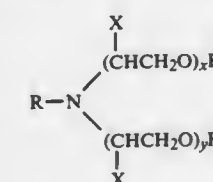
U.S. Cl. 208—390

11 Claims



1. A method for separating hydrocarbons from a mixture comprising sand, gravel, and hydrocarbons, said method comprising:

- contacting said mixture with an aqueous desorbent present in an amount between 0.5-5 wt% inclusive with respect to said sand, said aqueous desorbent comprising:
  - water;
  - 3-50 wt% with respect to said desorbent of a surfactant selected from group consisting of the following general formulae:



wherein:

- R is a linear aliphatic of 12-22 carbons,  
(x+y)=2-15,  
(m+n+p)=2-15,  
q=2-6, and  
X is hydrogen or methyl; and

- 50-97% wt with respect to said desorbent of a solvent for said hydrocarbon;
- 0.15 wt% with respect to said sand of a caustic material so as to alter basicity of the resulting mixture and form an aqueous phase, a desorbed hydrocarbon phase, and a washed sand and gravel phase;
- removing gravel from said sand and gravel phase leaving a washed sand product;
- separating said said product from adhering water and



hydrocarbons by at least one cyclone separation with a water/sand weight ratio between 2-15 so as to form an overflow stream comprising said hydrocarbons and an underflow comprising said sand; and  
(d) separating said overflow stream by decantation to recover said hydrocarbons in an overflow stream from residual sand in an underflow stream.

4,678,559

# TEST SPECIMEN CONTAINER FOR PASTY SPECIMEN MATERIAL

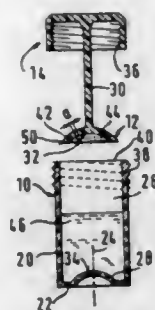
Andreas Szabados, Otto-Heilmann-Strasse 2, D-8022 Gruenwald, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,348

Int. Cl.<sup>4</sup> B03B 7/00; G01N 1/28, 33/48

U.S. Cl. 209-17

22 Claims



1. Sample-taking vessel for pasty sample material to be distributed in a suspension fluid within said vessel (10), said vessel including a vessel body having an open end (40) and a closed end (22) spaced from the open end and a first direction extending between the open and closed ends and including a vessel side wall (20) extending between the open end and the closed end in the first direction, and a vessel lid (14) for closing the open end, a sample-taking cup (12), said cup extending transversely of the first direction of said vessel and substantially filling the cross-section of said vessel transversely of the first direction, said cup (12) comprising a cup wall (42) extending transversely of the first direction with sieve openings (44) extending therethrough with the width of the openings being in the range of 0.5 to 2 mm, a stem (24) extends in the first direction between and connects said cup and said vessel lid, said cup having an interior formed by an inner side (32) facing toward the closed end of said vessel, an elevation (28) formed in the closed end of said vessel and projecting into said vessel in the first direction toward the open end, said elevation having a surface (34) facing toward the open end substantially complementary to the inner side of said cup, said cup having an outer side opposite said inner side and facing toward the open end of said vessel said inner side being arranged to seat over its full surface in contact with the surface of said elevation when said vessel lid closes the open end of said vessel, said cup having a circumferential edge (50) spaced inwardly from said vessel side wall (20) and forming with said vessel side wall an annular gap (52) having a width not greater than the width of the sieve openings in said cup wall.

4,678,560

# SCREENING DEVICE AND PROCESS

Kjell A. Stole; Arnstien Lovsland, and Egil Havig, all of Lillesand, Norway, assignors to Norton Company, Worcester, Mass.

Filed Aug. 15, 1985, Ser. No. 765,778

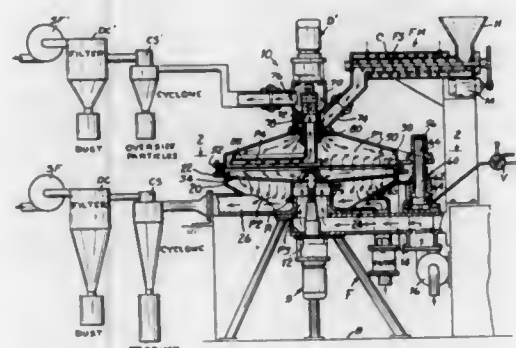
Int. Cl.<sup>4</sup> B07B 9/00, 3/00

U.S. Cl. 209-23

19 Claims

16. A method of screening and separating particulate material comprising the steps of:  
supporting a screen with openings of predetermined uniform size therein substantially horizontally between an upper

receiving chamber of an upper receiving housing and a lower collecting chamber of a lower collecting housing; distributing particulate material into the upper receiving chamber and onto the screen;  
rotating an air distributor rotor having at least one slotted hollow elongated radial air distributing arm in the lower collecting chamber, with an upper elongated slot therein located below and spaced from the screen;  
supplying and passing a first air flow at a predetermined volume and pressure into each rotating radial air distributing arm and out through the slot therein and the openings in the screen to fluidize the particulate material collecting on the screen and into the upper receiving chamber whereupon it is drawn downwardly and helps disperse the distributed particulate material onto the screen and passes with the undersize particles through openings in the screen and into and out of the lower collecting chamber; drawing the first air flow and an additional second air flow of lower volume together into the lower collection



chamber wherein the first and second air flows are combined and flow together to remove and carry the undersize particles through and out of the collecting chamber and create a lower air pressure in the lower collecting chamber whereby the first flow of air and any additional second outside air entering the upper receiving chamber at a higher pressure helps to disperse the distributed particles and is drawn downwardly to help gravity carry the undersize particles through the openings in the screen; periodically stopping distribution of the particulate material into the upper receiving chamber and drawing of the second air flow into the lower collecting chamber;  
rotating a slotted tubular oversize particle collector arm, with an elongated bottom slot therein, in the upper receiving chamber and above the screen; and  
drawing a third air flow of sufficient volume and pressure into and through the collector arm to draw, remove, and carry the oversize particles from the screen, and out of the upper receiving chamber.

4,678,561

# PROMOTORS FOR FROTH FLOTATION OF COAL

Robert O. Keys, Columbus, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Division of Ser. No. 585,176, Mar. 1, 1984, Pat. No. 4,589,980, which is a continuation-in-part of Ser. No. 434,243, Oct. 14, 1982, abandoned, and a continuation-in-part of Ser. No. 434,244, Oct. 14, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 830,374

Int. Cl.<sup>4</sup> B03D 1/06

U.S. Cl. 209-166

12 Claims

1. In a froth flotation process wherein solid coal particles are selectively separated under coal froth flotation conditions as a froth phase from remaining solid feed ash particles as an aqueous phase in the presence of a coal particle collector and a frother, the improvement characterized by the addition of an

effective proportion of a hydrophobic, non-ionic promoter comprising a C<sub>10</sub>-C<sub>30</sub> nitrile or polynitrile thereof.

4,678,562

# PROMOTORS FOR FROTH FLOTATION OF COAL

Robert O. Keys, Columbus, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Division of Ser. No. 585,176, Mar. 1, 1984, Pat. No. 4,589,980, which is a continuation-in-part of Ser. No. 434,243, Oct. 14, 1982, abandoned, and Ser. No. 434,244, Oct. 14, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 830,572

Int. Cl.<sup>4</sup> B03D 1/06

U.S. Cl. 209-166

9 Claims

1. In a froth flotation process wherein solid coal particles are selectively separated under coal froth flotation conditions as a froth phase from remaining solid feed ash particles as an aqueous phase in the presence of a coal particle collector and a frother, the improvement characterized by the addition of an effective proportion of a hydrophobic, non-ionic promoter comprising a C<sub>12</sub>-C<sub>30</sub> fatty alcohol or its C<sub>3</sub> or higher alkoxy-ated derivative.

4,678,563

# MODIFIED ALCOHOL FROTHERS FOR FROTH FLOTATION OF SULFIDE ORE

Robert O. Keys, Columbus, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Filed May 7, 1985, Ser. No. 731,713

The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.

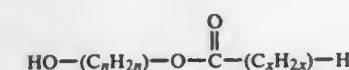
Int. Cl.<sup>4</sup> B03D 1/14

U.S. Cl. 209-166

13 Claims

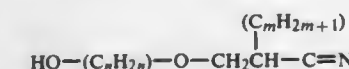
1. In a froth flotation process for concentration of a metal sulfide ore in the froth by subjecting an aqueous slurry of metal sulfide ore particles to sulfide ore froth flotation under sulfide ore froth flotation conditions comprising a metal sulfide ore collector, the improvement which comprises using an effective amount of a frothing agent selected from the group consisting of:

(a) the reactant product of a C<sub>5</sub>-C<sub>10</sub> diol and a C<sub>1</sub>-C<sub>7</sub> carboxylic acid in a ratio of one mole of carboxylic acid per mole of diol and having the predominant structural formula of



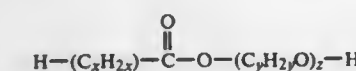
where n=5-10 and x=0-6;

(b) the reaction product of a C<sub>5</sub>-C<sub>10</sub> diol and an acrylonitrile in a mole ratio of one mole of acrylonitrile to one mole of diol such that the reaction product retains at least one hydroxyl group and having the predominant structural formula of



where n=5-10 and m=0-3;

(c) the reaction product of between about 1 and 10 moles of a C<sub>2</sub>-C<sub>3</sub> alkylene oxide per mole of a C<sub>1</sub>-C<sub>7</sub> carboxylic acid and having the predominant structural formula of



where x=0-6, y=2-3, and z=1-10;

(d) the reaction product of between about 1 and 10 moles of a C<sub>2</sub>-C<sub>3</sub> alkylene oxide and one mole of C<sub>5</sub>-C<sub>10</sub> diol and having the predominant structural formula of



where n=5-10, y=2-3, and z=1-10; and  
(e) mixtures thereof.

4,678,564

# CAST FILTER AND AUTOMATIC SELF-CLEANING BACKFLUSH CONTROL SYSTEM THEREFOR

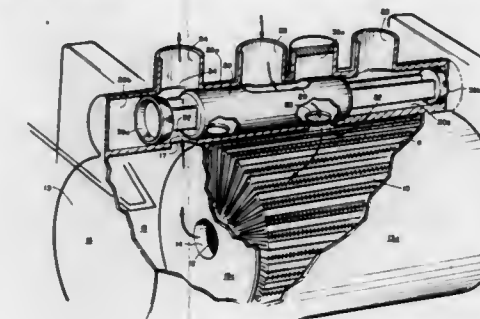
Jack F. Moorehead, San Diego, and Richard S. Campbell, Sr., El Cajon, both of Calif., assignors to Fairchild Filter Corporation, La Jolla, Calif.

Filed Nov. 15, 1985, Ser. No. 798,610

Int. Cl.<sup>4</sup> B01D 27/12

U.S. Cl. 210-108

22 Claims



1. In a filter, the combination comprising:

(a) structure providing a porous barrier between a first zone from which liquid to be filtered is supplied, and a second zone to which filtered liquid flows, via said barrier,

(b) said barrier including a series of elements defining grooves, and filtering media between said elements defining grooves, and filtering media between said elements and communicating with said grooves, said elements include first elements which are longitudinally elongated, and have generally rectangular cross sections in lateral planes, and second elements which are longitudinally elongated, and have wedge-shaped cross section in lateral planes, the grooves extending generally width-wise of said elements, said first elements sequentially alternate with said second elements, said filtering media comprises a membrane a membranes which extend in undulating folds between said first and second elements,

(c) said grooves of said first element being for reception of liquid flow therein from said first zone so that liquid flows from said grooves of said first barrier through said media,

(d) said grooves in said second barrier being presented for of flow from said media and for subsequent flow via said second barrier grooves to said second zone.

(e) control means for providing backflushing of said filter only as required, as an alternative to periodic backflushing.

16. Filter apparatus, comprising:

(a) structure providing a porous barrier between a first zone from which liquid to be filtered is supplied, and a second zone to which filtered liquid flows, via said barrier,

(b) control means communicating with said zones for controlling the direction of unfiltered liquid flow therebetween, via said barrier,

(c) said control means for providing backflushing of said porous barrier only as required, as an alternative to periodic backflushing, including a liquid pressure sensor, and valving that reverses the direction of said flow between said zones in response to operation of said sensor to sense build-up of a liquid pressure differential between such zones, above a predetermined level

(d) actuator structure for said valving and including a first piston surface responsive to fluid pressure application to displace the valving in one direction to filtering position,

and a second piston surface responsive to fluid pressure application to displace the valving in the opposite direction to backflush position,

(e) control fluid pressure connections including control valves to control fluid pressure application to one or the other of said piston surfaces as a function of the fluid pressure differential as between said zones,

(f) and means operatively connected with said control fluid pressure connections to slow the movement of said valving as it moves between backflush position and normal filtering position.

4,678,565

# PURIFIED WATER STORAGE SYSTEM WITH ACCUMULATOR TANK AND DIAPHRAGM RESPONSIVE VALVES

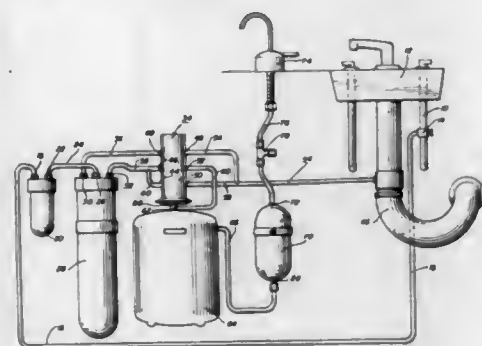
William W. Norton, Lincolnshire, Ill., assignor to Culligan International Company, Northbrook, Ill.

Filed Jan. 17, 1986, Ser. No. 819,799

Int. Cl.<sup>4</sup> B01D 13/00

U.S. Cl. 210—110

8 Claims



1. A purified water supply system which comprises:

a reverse osmosis device having a reverse osmosis membrane, an inlet, a purified water outlet, and a reject water outlet;

means for coupling the reverse osmosis device inlet to a supply of unpurified water;

water regulating means having inlets coupled to said purified water outlet and said reject water outlet, said water regulating means having a first outlet and a second outlet;

first means coupling said first outlet to drain;

only one accumulator tank having an inlet and an outlet;

means coupling said outlet to said accumulator tank inlet;

means coupling said accumulator tank outlet to a household faucet;

said water regulating means comprising a pair of valves movable in response to pressure in the accumulator tank for automatically directing a first amount of water from said purified water outlet to said first outlet and thereafter automatically discontinuing flow of the water to said first outlet and directing flow of the water from said purified water outlet to said second outlet;

said valves including means for providing two different configurations depending upon pressure in the accumulator tank;

including means a diaphragm responsive to pressure in the accumulator tank for direct mechanically linked operation of said valves without requiring another accumulator tank;

said water regulating means being operative to couple said reject water outlet to drain.

4,678,566

# APPARATUS FOR SEPARATING PROTEINS FROM BLOOD PLASMA

Masaharu Watanabe, Tama, and Hiroaki Ohe, Fuji, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

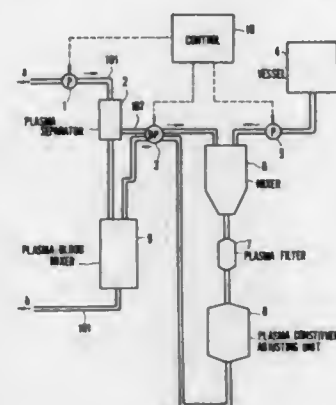
Filed Jul. 10, 1985, Ser. No. 753,713

Claims priority, application Japan, Jul. 20, 1984, 59-149311; Sep. 7, 1984, 59-187805

Int. Cl.<sup>4</sup> B01D 21/00; C07K 3/21

U.S. Cl. 210—143

6 Claims



1. An apparatus for separation and removal of proteins from blood plasma, comprising:

a vessel containing an agent for the precipitative separation of proteins from blood plasma, said agent comprising a mixture of an alkaline metal salt and an amino acid in an amount sufficient to promote a fractional precipitating effect of the alkaline metal salt with respect to plasma protein, said amino acid being selected from the group consisting of neutral amino acid, aspartic acid, cystine, N-acetyltryptophan, tyrosine and mixtures thereof;

means for introducing plasma into said vessel;

means for separating and removing a precipitate formed inside said vessel by bringing the separating agent and the plasma into contact therein; and

means for removing at least some of the separating agent constituent from a plasma component which remains following removal of the precipitate.

4,678,567

# ACTIVATED SLUDGE PROCESS BED

Iwao Ueda, Kyoto, Japan, assignor to Iwao Ueda and Chie Ueda, both of Kyoto, Japan

Filed Jul. 18, 1986, Ser. No. 886,922

Claims priority, application Japan, Jul. 24, 1985, 60-114458[U]

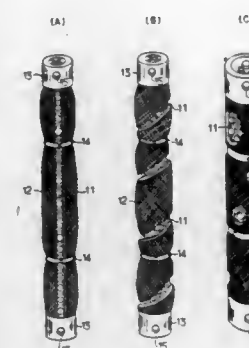
Int. Cl.<sup>4</sup> C02F 3/06

U.S. Cl. 210—150

2 Claims

1. In an activated sludge process bed in which a mesh-like or grid-like outer periphery of a cylindrical core composed of a hard synthetic resin resistant to corrosion over a long period of immersion in sewage water, said cylindrical core being wrapped with a porous member formed of a corrosion resistant synthetic resin, said core being tightened by tightening means, the improvement comprising: the outer periphery of the cylindrical core is not completely wrapped with the porous member but is partially exposed in a specified form, thereby ensuring communication between the inside and outside of the activated sludge process bed, said specified form being within a group consisting of a structure wherein (A) no more than one-third of an outer periphery of the cylinder is longitudinally exposed,

(B) a certain width of the outer periphery of the cylindrical core is spirally exposed and (C) plural portions of the porous



member are irregularly cut out so that exposed portions of the outer periphery of the cylindrical core are scattered.

4,678,568

# MULTI-USE AQUARIUM MAINTENANCE SYSTEM

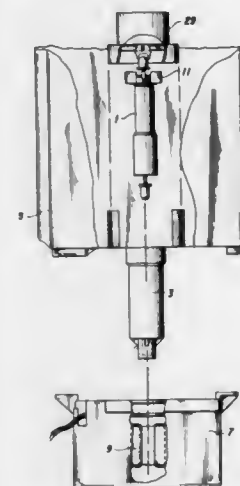
Jerome Goldman, New York; Marvin Goldman, Great Neck; Gerald Phillips, Glen Cove, and Terry Goldman, New York, all of N.Y., assignors to Penn Plax Plastics, Inc., Garden City, N.Y.

Filed Jun. 11, 1985, Ser. No. 743,348

Int. Cl.<sup>4</sup> E04H 3/16

U.S. Cl. 210—169

17 Claims



1. In an aquarium maintenance apparatus having the conventional components including

(a) an electrically powered means for suctioning water;

(b) a filter case removably attached to the water suction means in a manner so that the suctioned water enters the filter case;

(c) a lift tube formed of a segment of plastic tubing, removably attached to the water power suction means at a point inside the filter case in a manner which draws suctioned water through the lift tube, the lift tube having an open end within the filter case to allow the entry of the suctioned water from an aquarium into the filter case and an opposite opened end which may be placed inside the aquarium;

(d) a means for allowing the suctioned water to return to the aquarium, from the filter case, formed on the filter case the improvement comprising: enabling the maintenance apparatus to function as a multi-use aquarium maintenance system by providing a branched section of hollow tubing having a plurality of branches, removably attached to the

plastic lift tube to provide two or more branched lift tube segments each having an opened end.

4,678,569

# APPARATUS FOR SEPARATING HONEY AND BEESWAX

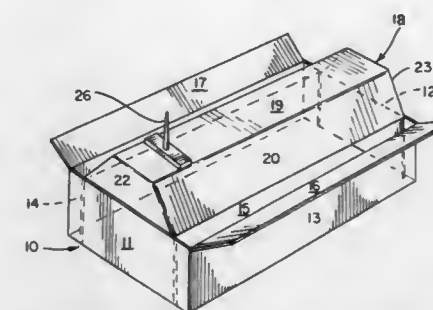
Howard W. Cunningham, Rte. 1, Box 249-E, Parkersburg, W. Va. 26101

Filed Feb. 28, 1986, Ser. No. 834,963

Int. Cl.<sup>4</sup> B01D 35/18

U.S. Cl. 210—187

10 Claims



1. A beeswax capping separator for recovering honey from beeswax and refuse in cappings, said apparatus comprising:

(1) means designed for inherently regulating the heat within the apparatus by the amount of cappings load in said apparatus such that, at high cappings load, heat is consumed by melting the wax in said cappings and, at low cappings load, heat is inherently vented from said apparatus thereby precluding honey-damaging heat buildup including

(a) a container having an open top, a bottom and side walls defining a chamber in said container;

(b) a cap spaced above the bottom of said container and covering part of the container below it, said cap being spaced from at least one side-wall of said container to define a feed opening therewith, said feed opening being adapted to receive said cappings;

(c) heating means mounted in said chamber beneath said cap for heating cappings in said chamber to melt the beeswax and release the liquid honey from said cappings, the resulting melted beeswax and released liquid honey flowing to form a layer of released liquid honey adjacent the bottom of said container, and a layer of melted beeswax overlying the honey layer;

(2) means for removing the melted beeswax from said container; and

(3) means for removing the released liquid honey from said container, said means for removing melted beeswax and said means for removing honey being adapted to maintain said cappings and layer of melted beeswax at a level spaced below said cap and heating means thereby permitting said capping to pass beneath said cap and heating means.

4,678,570

# PLANAR CENTRIFUGAL CHROMATOGRAPHY DEVICE

Sándor Mészáros; Gisela Verzár-Petri; Klara Nyiredy-Mikita; Ernő Tyihák, all of Budapest, Hungary; Szabolcs Nyiredy, Zurich, Switzerland; Beat Meier, Brütten, Switzerland; Otto Sticher, Zurich, Switzerland, and Karin Dallenbach-Toelke, Küsnacht, Switzerland, assignors to Petazon Inc., Zug, Switzerland

Filed Apr. 9, 1986, Ser. No. 849,939

Claims priority, application Switzerland, Apr. 15, 1985, 1588/85; Apr. 15, 1985, 1589/85

Int. Cl.<sup>4</sup> B01D 15/08

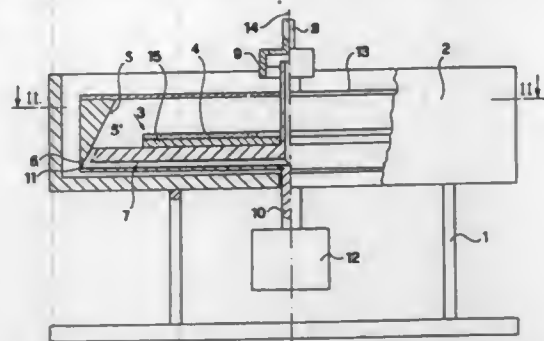
U.S. Cl. 210—198.2

7 Claims

1. In a planar centrifugal chromatography device which includes a chamber with a rotating rotor therein constructed as a chromatographical separating element having a support



plate, having an annular adsorbing medium arranged on the support plate, and having a collecting device arranged very close to the outer edge of the rotor within the chamber, the improvement comprising wherein the collecting device and the rotor are mounted fixedly on a common shaft and every individual point on an inner surface of the collecting device is farther from the axis of rotation than the point of the adsorbing medium of the rotor which is the farthest from the axis of



rotation, wherein the distances of the individual points on the inner surface of the collecting device from the axis of rotation vary, and at each point on the collecting device which is farther from the axis than two adjacent points there is arranged an output opening which is connected to an axially extending hollow part of the shaft of the rotor through a discharge channel, and wherein the device has a stationary discharge element which is connected to the hollow part of the shaft.

4,678,571

## WATER PURIFIER

Nobuyoshi Hosaka; Tasuku Shimizu; Kenzo Mikada; Kozo Tamura, and Masatoshi Tanabe, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

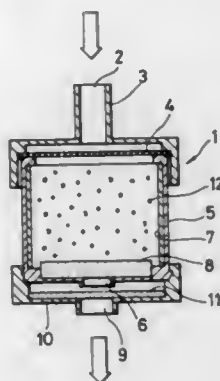
Filed Feb. 19, 1986, Ser. No. 830,753

Claims priority, application Japan, Feb. 20, 1985, 60-30323

Int. Cl.<sup>4</sup> C02F 1/28, 1/68

U.S. Cl. 210—202

6 Claims



1. A water purifier comprising a deodorization tank for removing ions and odorants by adsorption from running water, said tank having a water entrance and a water exit, and a mesh filter for removing dusts, said mesh filter being arranged at the water entrance of said deodorization tank, said deodorization tank containing an antibacterial membrane having a function of imparting an antibacterial activity to the water by supplying mineral ions to the running water and thereby alkalinizing the water, and the water exit of said deodorization tank being operatively associated with a mineral supply filter for supplying a mineral component to the running water, said mineral supply filter being prepared by molding a powder obtained by adhering a member selected from the group consisting of soda glass, quartz, vermiculite, perlite, pumice, and mixtures thereof to the surface of heat-decomposed calcium carbonate.

4,678,572

## VENTED COVER ASSEMBLY WITH FILTER INSERT FOR FLUID RESERVOIR

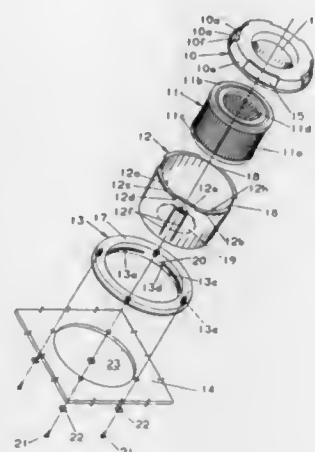
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Continuation of Ser. No. 823,470, Jan. 28, 1986, abandoned, which is a continuation of Ser. No. 701,624, Feb. 14, 1985, abandoned. This application Oct. 21, 1986, Ser. No. 921,334 Claims priority, application Fed. Rep. of Germany, Feb. 14, 1984, 3405105

Int. Cl.<sup>4</sup> B01D 27/08

U.S. Cl. 210—232

15 Claims



1. A vented cover assembly adapted for attachment to an aperture in a wall of a fluid reservoir, so as to close the aperture while allowing filtered air to pass into and out of the fluid reservoir, the cover assembly comprising in combination:

a socket ring adapted for clamping attachment to the edge of said aperture, the socket ring including a tubular wall portion defining a substantially cylindrical bore of a diameter which is smaller than the width of the aperture, the axis of said bore being oriented substantially perpendicular to the reservoir wall and defining a rotational center axis for the cover assembly;

a generally pot-shaped filter casing having a bottom wall and an adjoining substantially cylindrical side wall cooperating with the bore of the socket ring so as to be insertable therethrough and to extend to the inside of the fluid reservoir, with the bottom wall located at the inner axial end of the side wall;

first bayonet-type locking means defined between the socket ring and the filter casing, for the removable attachment of the filter casing to the socket ring;

a removable cap at the axially outer end of the filter casing; second bayonet-type locking means defined between the filter casing and the cap for the removable attachment of the cap to the filter casing; and

a filter cartridge arranged inside the filter casing and positioned between the bottom wall of the filter casing and the removable cap, the filter cartridge having an air-permeable filter wall; and wherein

the filter casing has in one of its walls a vent opening for the flow of air between the inside of the fluid reservoir and one side of the filter wall of the filter cartridge, and the cap has a vent opening for the flow of air between the outside of the fluid reservoir and the other side of said filter wall.

4,678,573

## FLUID SEPARATION MODULE

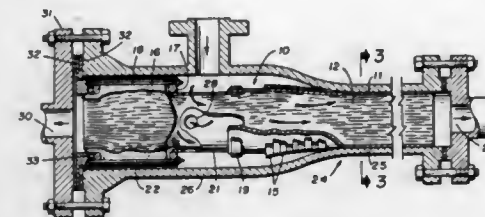
Roger S. Otstot, and Charles J. Runkle, both of Wake County, N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 332,911, Dec. 21, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,363 The portion of the term of this patent subsequent to Apr. 19, 2000, has been disclaimed.

Int. Cl.<sup>4</sup> B01D 13/01

U.S. Cl. 210—321.1

8 Claims



1. A fluid separation module, comprising  
(a) a cylindrical shell having an inner surface having a predetermined diameter,  
(b) a bundle of hollow fiber membranes positioned in said shell,  
(c) a tube sheet positioned at one end of the bundle of hollow fibers, said fibers extending through the tube sheet,  
(d) a sheet having the form of a slit tube surrounding the bundle of fibers, said sheet having sufficient resiliency that when free of restraint the slit tube will of its own expand into contact with the inner surface of the cylindrical shell, and  
(e) means in contact with the slit tube for holding said slit tube in a tubular configuration, said means being manually moveable relative to the slit tube so that said slit tube can be freed of restraint to expand into contact with the inner surface of the cylindrical shell.

4,678,574

## DISC FILTER

Tapani Niiranen, Savonlinna; Erkki Savolainen, Haapakallio, and Raimo Kohonen, Savonlinna, all of Finland, assignors to Enzo-Gutzeit OY, Helsinki, Finland

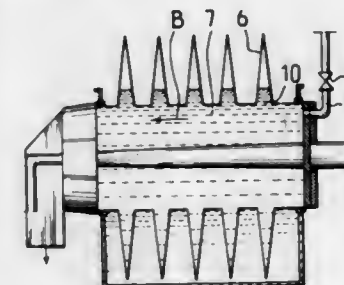
Filed Dec. 3, 1985, Ser. No. 804,349

Claims priority, application Finland, Dec. 3, 1984, 844765

Int. Cl.<sup>4</sup> B01D 33/26

U.S. Cl. 210—327

5 Claims



1. A method comprising removing filtrate from a disc filter for filtering fluids containing fiber-like solid materials for increasing the speed of rotation of the disc filter retarded by the presence of a vacuum therein and thereby increasing the capacity of the disc filter, by providing the filter having an axially extending central shaft forming an axially extending central channel (7), a plurality of hollow discs are arranged serially along the axial direction of and extend radially outwardly from the central shaft, the discs each include a number of sectors (6) extending radially outwardly from the central shaft and communicating with the central channel through apertures (10), the central shaft having a first end and a second end spaced apart in the axial direction and defining the opposite ends of the central channel (7), rotating the disc filter through

a body of fluid containing fiber-like material and having a fluid level so that the lower half of the disc filter is below the fluid level and the upper half of the disc filter is above fluid level, sucking the fluid out of the central passage at the first end of the central channel, and at the same time placing the sectors (6) and the central channel (7) located above the fluid level in communication with at least one of ambient air and blowing air therein.

4,678,575

## ROTATABLE FILTER DISC ASSEMBLY

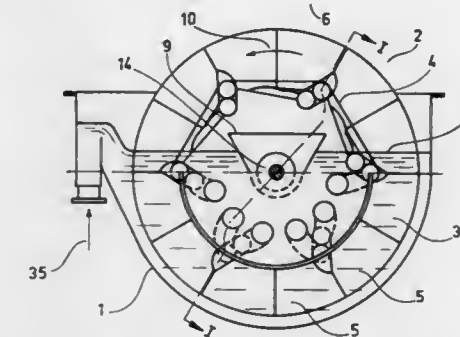
Rune H. Frykhult, Huddinge, Sweden, assignor to AB Cellico, Sweden

Continuation-in-part of Ser. No. 523,590, Aug. 16, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 755,784 Claims priority, application Sweden, Aug. 20, 1982, 8204770; Feb. 10, 1983, 8300708; Feb. 28, 1983, 8301082

Int. Cl.<sup>4</sup> B01D 33/26

U.S. Cl. 210—327

15 Claims



1. In a rotatable filter assembly for separation of fibers from a fiber suspension and including in combination, a plurality of annular filter discs each comprising a plurality of filter elements, a horizontal drum, means for rotating said drum about an axis, said filter discs being mounted on said drum in substantially parallel, axially spaced relation to each other, a container for said fiber suspension in which said drum is rotatable, each filter element being a hollow chamber having walls of filter cloth and radially inner and outer ends, means for each of said chambers defining a filtrate outlet at the radially inner end of each of said chambers, said drum being generally cylindrical and including a series of discharge tubes extending in an axial direction, said tubes forming a grating-like mantle wall of the drum, each hollow chamber communicating through its filtrate outlet with a discharge tube, and a collecting hopper extending into the drum through an open end thereof and surrounded by said filter discs, said hopper having an upwardly facing entrance opening extending along all of said filter discs, the interior of each filter element being subjected to a lower pressure than that outside said element during part of the drum's revolution, the improvement in which said discharge tubes, as seen in a cross-sectional view transverse to said axis, are arranged in a plurality of groups each including at least two tubes, the spacing between adjacent tubes in each group being substantially less than the spacing between adjacent groups.

4,678,576

## REUSABLE FILTER UNIT WITH RECOVERABLE FILTER MEMBRANE

Richard A. Leonecavallo, Pittsford, N.Y., assignor to Nalge Company, Rochester, N.Y.

Continuation of Ser. No. 505,609, Jun. 20, 1983, abandoned, which is a continuation of Ser. No. 302,823, Sep. 16, 1981, abandoned. This application Jun. 7, 1985, Ser. No. 715,853

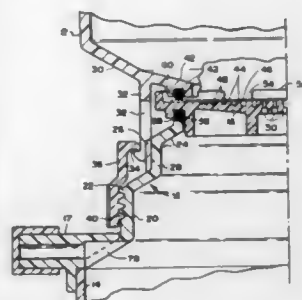
Int. Cl.<sup>4</sup> B01D 13/00

U.S. Cl. 210—433.2

10 Claims

1. A reusable filter unit, comprising a lower body forming a receptacle for receiving a filtrate and having an upstanding

collar terminating in a circular rim portion defining an open top of the lower body, an upper body forming a reservoir for receiving liquid to be filtered and having an inwardly extending internal shoulder defining a lower outlet of the upper body and a dependent cylindrical flange disposed outwardly of and around said internal shoulder terminating in a lower end, said flange having an inside surface, a perforated support plate supported between the upper and lower bodies upon said circular rim portion having an upper surface for supporting a filter membrane thereon, characterized in that the cylindrical



flange has a retaining shoulder which extends radially outwardly of the lower end of the flange, said upstanding collar having external threads and also an intermediate portion which extends into the flange so as to engage the inside surface of said flange as said lower and upper bodies are pulled axially together, and a rotatable locking ring having internal threads is retained on the flange by the retaining shoulder and is engageable with the external threads on the collar so as to draw the upper body into contact with the support plate and with the lower body in releasable clamping engagement without relative rotation of the upper and lower bodies.

4,678,577

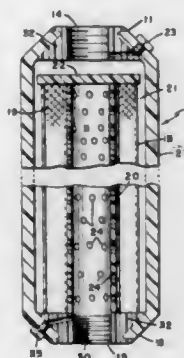
# SEAMLESS VESSEL FOR SELF CONTAINED FILTER ASSEMBLY

Dwight J. Thomas, Zionsville, and Charles J. Asbell, Lebanon, both of Ind., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Aug. 27, 1985, Ser. No. 769,927  
Int. Cl.<sup>4</sup> B01D 27/08

U.S. Cl. 210—441

8 Claims



## 1. A filter assembly comprising:

- a seamless main cylindrical vessel having wall portions with opposite conical shaped end portions and formed from a thermoplastic polymer material,
- means defining a fluid inlet opening in one of said end portions and means defining a filtrate discharge outlet at the other end portion of said vessel,
- a filter media arranged within said vessel,
- a molded base section of thermoplastic polymer material

in each of said end portions integrally merged to said wall portions of said vessel end portions, and  
c. at least one end of said filter media integrally molded to one of said base sections in sealed position within said vessel.

4,678,578

# FLAT FILTER ELEMENT FOR THE FILTRATION OF FLUIDS

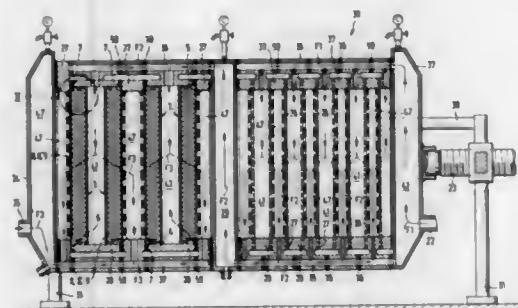
Rudolf Nodas, Böblingen, and Jürgen Hoffmann, Hardegsen-Ellierode, both of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,574  
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406735

Int. Cl.<sup>4</sup> B01D 27/06

U.S. Cl. 210—445

15 Claims



1. In a filter element for equipping framelike sections of a sheet filter device for filtration of flowing fluids, wherein a filter element is clamped by its edge in a leakproof and sandwichlike manner between a housing part on a sediment chamber side and a housing part on a filtrate chamber side, and is supported against a pressure gradient on a draining housing support plate whereby said sediment chamber and said filtrate chamber are provided with connections for supplying and emptying housing chambers, the improvement wherein said filter element is characterized by a replaceable flat selectively permeable filter element (1) formed by a flat filter band with parallel folds of folding openings (2, 2') and, web backs (3, 3') said flat filter band is adapted to inner dimensions of a housing part (30) in length, width and depth and is pleated into a plurality of close folds, in which open folds (2) and web backs (3) of one side of a pleating face of a sediment chamber and open folds (2') and web backs (3') of a second side face of a filtrate chamber and the pleating of at least a single-layer filter band blank (8, 8', 9), which pleating is formed to a flat cuboid is bordered in a framelike manner by a plastic seal on an edge to form a leakproof separation of sediment chamber (41) from filtrate chamber (47), said seal circumferentially surrounds two end fold sections (4) of said pleating and two front sides (5) of said pleating, and is provided with a plastic formed sealing flange (7) with which a filter cassette is formed and is clamped between housing parts (27, 30), and whereby support gridwork (10, 11) or foils (13', 13'') running transversally to fold edges are anchored at least on one side of the filter element (1) by their ends in two sides of circumferential plastic seal (6) located opposite one another and running parallel to the fold edges for stability and to influence flow.

4,678,579

# DISPOSABLE UNITARY CYTOLOGY CHAMBER AND FILTER CARD FOR CENTRIFUGATION OF FLUID SAMPLES AND METHOD OF MAKING SAME

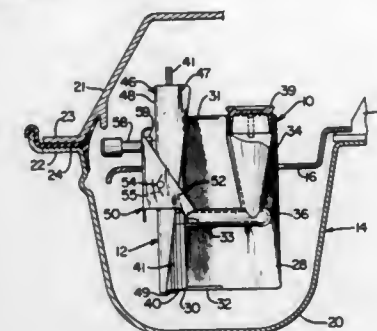
Daniel V. Griffin, Denver, Colo., assignor to Whale Scientific, Inc., Commerce City, Colo.

Filed Dec. 5, 1984, Ser. No. 678,262

Int. Cl.<sup>4</sup> B10D 23/00

U.S. Cl. 210—477

16 Claims



7. In a centrifuge wherein a plurality of filters are mounted on a rotating carrier, each said holder having clamping means for releasably receiving a cytology chamber and a microscopic slide therein, the improvement comprising:

- said cytology chamber defined by a disposable sample chamber having a liquid sample-receiving funnel and an end flange with a discharge port extending between said funnel and said flange;
- a filter card overlying said end flange including an opening therein; and
- securing means for permanently affixing said filter card to said end flange with said opening in said card aligned with said discharge port whereby said filter card is integrally united to said end flange and cannot be removed from said end flange without leaving segments of said filter card attached to said end flange, each said chamber positioned in one of said holders, and said clamping means releasably clamping said slide in overlying relation to said filter card.

4,678,580

# HYDROLYSIS OF FATS

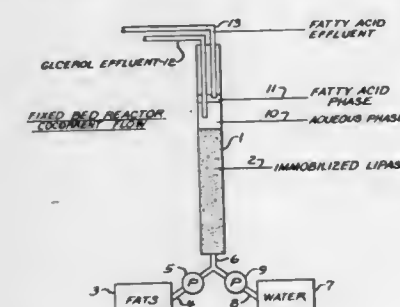
Catherine D. Brady, Downers Grove; Lincoln D. Metcalfe, Lagrange; Dale R. Slaboszewski, Joliet, and Dieter Frank, Naperville, all of Ill., assignors to Akzo America Inc., New York, N.Y.

Division of Ser. No. 823,114, Jan. 27, 1986, Pat. No. 4,629,742.  
This application Oct. 14, 1986, Ser. No. 899,279

Int. Cl.<sup>4</sup> B01D 25/04

U.S. Cl. 210—490

4 Claims



1. A diaphragm suitable for use in the hydrolysis of fats comprising:

- a first layer comprising of a hydrophobic filter cloth having openings from about 3 to about 5 microns in size;
- a second layer adjacent to said first layer comprising fibers

of a hydrophobic microporous thermoplastic polymer, having lipase immobilized on said fibers by adsorption from an aqueous solution either without pretreatment or following pretreatment of said fibers only by wetting with a polar water miscible organic solvent in which said polymer is insoluble and which does not deactivate said lipase; and

- a third layer adjacent to the side of said second layer opposite said first layer comprising a retaining means capable of maintaining said fibers of said second layer in place.

4,678,581

# POLYMETHYL METHACRYLATE HOLLOW FIBER TYPE ULTRAFILTRATION MEMBRANE AND PROCESS FOR PREPARATION OF THE SAME

Tatsuo Nogi; Tomonori Iwami, and Kazumi Tanaka, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP82/00422, § 371 Date Jun. 30, 1983, § 102(e) Date Jan. 30, 1983, PCT Pub. No. WO83/01632, PCT Pub. Date May 11, 1983

Continuation of Ser. No. 517,517, Jun. 30, 1983, abandoned.

This PCT application Oct. 28, 1982, Ser. No. 773,524

Claims priority, application Japan, Oct. 30, 1981, 56-173099; May 14, 1982, 57-80268

Int. Cl.<sup>4</sup> B01D 13/00

U.S. Cl. 210—500.23

15 Claims

1. A hollow fiber structure ultrafiltration membrane of substantially uniform cross section comprising a material of the polymethyl methacrylate series, said material being a mixture of a polymer rich in isotacticity and a polymer rich in syndiotacticity, said polymer having a molecular weight of 100,000 to 2,000,000 and containing substantially no ion pairs so that substantially no crosslinking is formed, and said membrane having a permeability of albumin of not less than 90% and a water UFBS of 2 to 30 l/hr-m<sup>2</sup>.mmHg.

4,678,582

# TREATMENT SYSTEM FOR LANDFILL LEACHATE

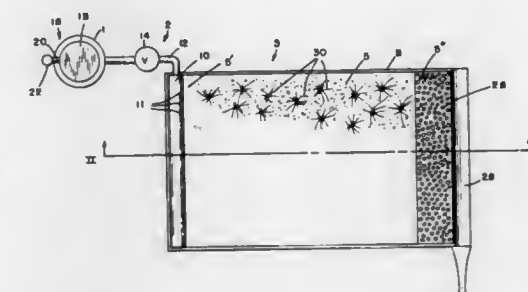
Ronald L. Lavigne, Norwich Lake, Huntington, Mass. 01050

Filed Jan. 24, 1986, Ser. No. 822,125

Int. Cl.<sup>4</sup> C02F 3/32, 3/04

U.S. Cl. 210—150

8 Claims



1. System for treating landfill leachate comprising:

- a leachate supply source,
- a treatment basis which slopes from a high end to a low end, and which includes a water impervious liner,
- a particulate treatment medium which includes peat moss to provide a substantially large surface area to enhance the fixation and proliferation of microbes and to support plants for growth,
- leachate tolerant plants growing in the treatment medium,
- inlet flow control means operatively connected to the leachate supply and the treatment basin and comprising:
  - a perforated tube at the high end of the treatment



medium which extends across the width of the treatment medium,

- (2) a conduit connecting one end of the tube to the leachate supply source, and
- (3) a flow control valve in the conduit for introducing leachate to the upper portion of the treatment medium at the high end of said treatment basin which allows the leachate to penetrate and flow vertically and horizontally through the treatment medium, and
- (f) outlet flow control means for draining the treated leachate from the treatment medium at the low end of the basin and for collecting the drained treated leachate at a point below said treatment medium said outlet flow control means comprising:
  - (1) a collection trough at the low end of said basin and below said treatment medium, and
  - (2) a drainage medium of relatively large coarse particles between the treatment medium and the collection trough.

4,678,583

#### USE OF HYDRATES FOR AQUEOUS SOLUTION TREATMENT

Richard C. Willson, III, Cambridge, Mass.; Eric Bulot, Nesle, France, and Charles L. Cooney, Brookline, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 12, 1986, Ser. No. 873,364

Int. Cl.<sup>4</sup> B01D 17/00

U.S. Cl. 210—638

35 Claims

1. A process for forming a purified solute from an aqueous mixture containing water and a solute comprising forming a mixture of an extractant, a hydrate former and said aqueous mixture, said hydrate former being capable of forming a hydrate with water at temperatures and pressures at which said solute does not form a hydrate, said hydrate former being present in an amount sufficient to permit hydrate formation with water in said aqueous mixture, said extractant being a solvent or adsorbant capable of taking up significant amounts of the solute from water, subjecting said mixture to conditions of temperature and pressure to form a hydrate of said hydrate former with water thereby forming a second mixture comprising a solid portion consisting of water hydrate of said hydrate former, a liquid portion comprising a water solution of said solute, a portion comprising hydrate former and a portion comprising extractant containing concentrated amounts of solute, removing at least some of said extractant portion from said solid portion and said liquid portion and separating said solute from said extractant to form a purified solute.

4,678,584

#### METHOD OF REMOVING HEAVY METAL FROM WASTEWATER STREAMS

Geraldine S. Elfine, Morrison, Ill., assignor to CX/OXYTECH, Inc., Yorkville, Ill.

Continuation-in-part of Ser. No. 747,008, Jan. 20, 1985, Pat. No. 4,612,125. This application Mar. 24, 1986, Ser. No. 843,109

The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> C02F 1/52

U.S. Cl. 210—719

19 Claims

1. A method of treating a heavy metal-containing liquid for removal of a substantial portion of heavy metal therefrom without the generation of a substantial quantity of sludge comprising:

contacting said liquid with a water-soluble trithiocarbonate in an amount sufficient to react with said heavy metal and cause precipitation of a substantial portion of insoluble heavy metal from said liquid, and separating the precipitate from the liquid.

4,678,585

#### PROCESS FOR ALUMINA RECOVERY

Neville J. Brownrigg, Wanneroo, Australia, assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 335,499, Dec. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 171,616, Jul. 23, 1980, abandoned. This application Jun. 20, 1984, Ser. No. 506,099

Int. Cl.<sup>4</sup> C02F 1/54

U.S. Cl. 210—727

8 Claims

1. A process for flocculating red muds from the Bayer alumina recovery circuit which comprises adding to at least a first stage of the caustic recovery circuit an effective amount of a flocculant selected from the group consisting of starch, homopolymers of acrylic acid or acrylates, copolymers of acrylic acid or acrylates containing at least 80 molar percent acrylic acid or acrylate monomers and combinations thereof and thereafter adding to some subsequent stage or stages of the caustic recovery circuit an effective amount of a copolymer containing from about 35 to 75 molar percent of acrylic acid or acrylate monomers and from about 65 to 25 molar percent of acrylamide monomers.

4,678,586

#### TREATMENT OF WASH WATER IN PAINT SPRAY BOOTHS

Thomas J. Kearney, 7 Oaklands, Green La, Malvern Wells, Worcester WR14 4JE, England

PCT No. PCT/GB85/00048, § 371 Date Oct. 2, 1985, § 102(e) Date Oct. 2, 1985, PCT Pub. No. WO85/03459, PCT Pub. Date Aug. 15, 1985

PCT Filed Jan. 31, 1985, Ser. No. 784,881

Claims priority, application United Kingdom, Feb. 7, 1984, 8403246

Int. Cl.<sup>4</sup> C02F 1/66

U.S. Cl. 210—743

7 Claims

1. In a method of treating wash water in a paint spray booth by addition of an alkaline solution including sodium hydroxide to the water for facilitating breakdown of the paint and eventual separation of the paint from the wash water, the improvement which comprises automatically controlling the amount and timing of the addition of alkaline solution to the water according to a predetermined program which includes the steps of establishing with a programmed timer successive water treatment cycles, each cycle lasting for a plurality of days, automatically adding an amount of alkaline solution to the water with a metering pump controlled by said timer during each cycle sufficient to maintain the pH value of the water at a level which minimizes corrosion of metal components of the paint spray booth by the water while the concentration of hydroxide ion in the water does not exceed 0.01M, and introducing, during each treatment cycle, a single discrete dose of alkaline solution that is over half the amount of alkaline solution to be added in that cycle to the water, with the remainder of the alkaline solution to be added in that cycle to the water being introduced at spaced intervals during that cycle.

4,678,587

#### WATER DISTILLATION METHOD

Jack L. Volnche, P.O. Box 3591, Lafayette, La. 70502, and James C. Martlen, 1275 Lurose Dr., Crowley, La. 70526

Filed Dec. 10, 1984, Ser. No. 679,767

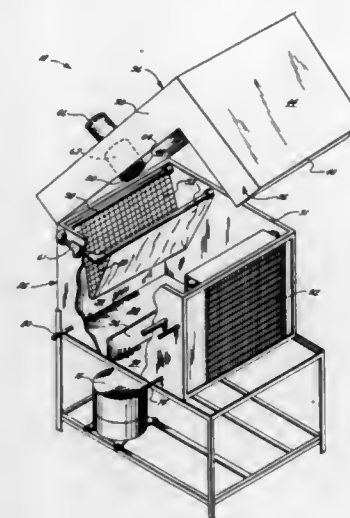
Int. Cl.<sup>4</sup> C02F 1/16

U.S. Cl. 210—748

12 Claims

1. A method of desalinating water, comprising the steps of: providing a closed loop refrigeration system, the system comprising a conduit loop through which a refrigerant fluid flows, the system having a cooling portion and a heating portion, wherein the refrigerant fluid in the system is compressed and supplied to a heating element for heating air, the heating element comprising conduit coils in fluid communicating relationship with the fluid in the heating portion of the system, the fluid moving through

the coils of the heating element and thereafter being expanded and passed through a cooling element; heating the water; flowing the water over an evaporation screen; heating a stream of air; saturating the stream of air with water by passing the stream



of air through the evaporation screen over which the water is flowing; passing the stream of saturated air through the cooling element to condense the water therein; and collecting the condensed water, wherein air which has passed through the cooling element is heated and passed through the evaporation screen.

4,678,588

#### CONTINUOUS FLOW CENTRIFUGAL SEPARATION

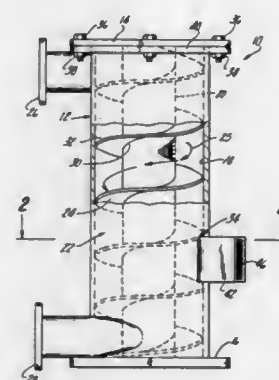
William C. Shortt, 24637 Farmington Rd., Farmington Hills, Mich. 48018

Filed Feb. 3, 1986, Ser. No. 825,620

Int. Cl.<sup>4</sup> B01D 45/12

U.S. Cl. 210—788

16 Claims



1. A centrifugal separator assembly (10) for separating a continuous flow of substances having differing densities along a helical course, said assembly (10) comprising:

a closed tubular helical conduit means (22) having a predetermined length defining a spiral path having top and bottom walls and for constraining the flow solely along said helical course (25) including inlet means (26) and outlet means (28) situated at opposite terminal ends of said conduit means and leading tangentially into and out of said conduit means, respectively; flow establishing means

for establishing a flow velocity along said helical course (25) between said inlet means and said terminal outlet means of sufficient force to inertially separate the substances of different densities and form a peripheral fraction; and shearing means for shearing off the entire peripheral fraction of the flow of substance from the remainder of the flow prior to the flow reaching the terminal outlet means, said shearing means including an opening (34) extending from said top wall to said bottom wall on said path spaced from said inlet means, said opening being disposed in an inner or outer periphery of said conduit means between said inlet (26) and terminal outlet (28) means for removing the peripheral fraction of the flow concentrated by centrifugal forces in said inner or outer periphery of said helical course, allowing the unremoved fraction of the flow to continue therealong through said terminal outlet means (28).

4,678,589

#### REMOVABLE IN-LINE SELF-CLEANING STRAINER FOR PIPING SYSTEMS

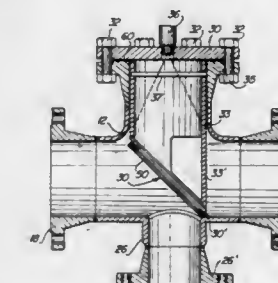
Walter D. Ayres, Jr., Chicago, Ill., assignor to Surgeco, Inc., Alsip, Ill.

Filed Mar. 20, 1986, Ser. No. 842,114

Int. Cl.<sup>4</sup> B01D 35/02

U.S. Cl. 210—797

14 Claims



1. In an in-line, inclined strainer device for piping systems, wherein said strainer device comprises a main housing having a hollow interior, a screen-mesh means for entrapping solids and particulates in the liquid flowing in the piping system, means for mounting said screen-mesh means within said main housing in an inclined orientation, said main housing having an inlet opening and an outlet opening with said screen-mesh means being interposed such that the liquid flowing in the piping system flows through said screen-mesh means, wherein the improvement comprises:

said main housing having a hollow extension extending at an angle with respect to the direction of the flow of the liquid through said main housing, said hollow extension cooperating with said hollow interior of the remainder of said main housing;

said means for mounting said screen-mesh means comprising a tubular member for insertion into and removal out of said hollow extension of said main housing, said tubular member mounting said screen-mesh means at one end thereof, said one end being substantially arcuate in cross-section and having a major axis and a minor axis thereof, so that a similarly-shaped screen-mesh means may be mounted directly thereto for insertion in said main housing along the path of flow of the liquid in the piping system;

cover-means for closing the upper end of said tubular member and the upper end of said hollow extension of said main housing;

said one end of said tubular member being elliptical in cross-section; said screen-mesh means comprising a grating of interconnected rods defining a plurality of open spaces,

and a screen-mesh mounted directly to said grating for fixed connection therewith; and said main housing comprising a drainage-pipe means positioned diametrically opposite to said tubular member, such that said drainage-pipe means is on the other side of said screen-mesh means as compared to said tubular member; said drainage-pipe means comprising means for closing an open end thereof, so that, during self-cleaning of said screen-mesh means, the effluent water carrying away the sediment and particulates may be carried away and drained into a refuse area for subsequent disposal.

4,678,590

## SOFTENER COMPOSITION

Kazuhito Nakamura; Hisami Sasaki, both of Yokohama; Masayoshi Chigira, Tokyo, and Kenji Yokoi, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Oct. 24, 1985, Ser. No. 790,958

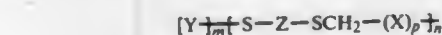
Claims priority, application Japan, Oct. 25, 1984, 59-224792

Int. Cl. D06M 13/46

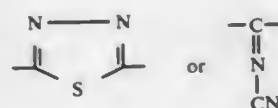
U.S. Cl. 252-8.8

17 Claims

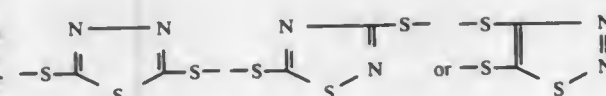
1. A softener composition having improved low temperature viscosity characteristics comprising (a) 7 to 50% by weight of cationic softening agent; (B) 0.05 to 10% by weight of alkylene oxide adducted nonionic surfactant having at least one unsaturated bond in its molecule and wherein the average number of moles of addition of alkylene oxide is 20 to 80; (c) 0.005 to 5% by weight of inorganic electrolyte; and (D) an aqueous vehicle.



wherein  
Z is

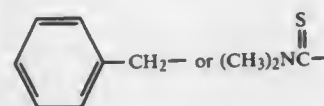


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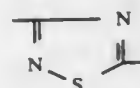


and p is zero or 1, provided that when p is 1 m is zero, n is an integer of 4-100; and

Y is



and m is zero or 1, provided that when m is 1 Z can also be



4,678,591

## TERPOLYMER COMPOSITION FOR AQUEOUS DRILLING FLUIDS

David M. Giddings, Sugar Land, and Charles D. Williamson, Houston, both of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 7, 1986, Ser. No. 848,527

Int. Cl. C09K 7/02

U.S. Cl. 252-8.514

3 Claims

1. A method of improving high temperature fluid loss and rheology stabilization of high calcium brine clay-containing aqueous oil well drilling fluids which comprises adding thereto a stabilizing amount of a water-soluble terpolymer composition comprising: a polymer prepared by polymerizing the following monomer ingredients:

Ingredients	% by Weight
[NaAMPS] 2-acrylamido-2-methylpropane sulfonic acid, sodium salt	72-3.8
N,N-dimethylacrylamide	13.5-0.7
Acrylonitrile	9.5-0.5

said composition containing lignin, modified lignin, brown coal or modified brown coal in an amount ranging between 5-95% with the brown coal or modified brown coal having been present during the polymerization of the water-soluble polymer, where the lignin, modified lignin, brown coal or modified brown coal is from the group consisting of lignites, sulphonated lignites, lignins, leonardites, lignosulfonates, alkali meta! humic acid salts, humic acids, and sulphonated humic acids.

4,678,593  
TRANSPARENT OR TRANSLUCENT TOILET BARS CONTAINING A SMECTITE-TYPE CLAY

Gordon Ridley, Cramlington, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 23, 1986, Ser. No. 889,452

Claims priority, application United Kingdom, Jul. 26, 1985, 8518910

Int. Cl. C11D 9/18, 9/20, 10/04, 17/00

U.S. Cl. 252-131

8 Claims

1. A transparent or translucent toilet bar composition incorporating from about 0.5% to about 10% smectite-type clay, said toilet bar containing from about 45% to about 95% of a soluble alkali metal soap of C<sub>8</sub>-C<sub>24</sub> fatty acids and from 0% to about 45% of a synthetic anionic surfactant, at least about 50% of said soap being in the beta-phase.

4,678,594

## METHOD OF ENCAPSULATING A BLEACH AND ACTIVATOR THEREFOR IN A BINDER

Eva H. Parfomak, Wallington, and Winston S. Uchlyama, Somers, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 19, 1985, Ser. No. 756,540

Int. Cl. C11D 3/39; B29C 67/24; C01B 15/12; D06L 3/02

U.S. Cl. 252-186.31

16 Claims

1. A method for preparing a granular detergent additive which contains each of a bleach compound and an activator for said bleach compound encapsulated in a binder, said method comprising mixing finely divided bleach compound and finely divided activator for said bleach compound, mixing the mixture of bleach compound and activator compound with a molten, normally solid water-soluble binder, extruding the resulting mixture, and cutting the extrudate into granules, whereby said bleach compound and activator compound in said granules will not react with each other until the granules are added to water at a temperature which will dissolve said binder.

4,678,595

## CARPET SHAMPOO OR UPHOLSTERY CLEANING COMPOSITION

Arshad H. Malik; Allen D. Urfer; Robert S. McDaniel, and Donald L. Johnson, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Aug. 26, 1985, Ser. No. 769,631

Int. Cl. C11D 1/83, 3/37

U.S. Cl. 252-174.17

5 Claims

1. A liquid detergent composition suitable for use as a carpet shampoo and/or as an upholstery cleaning formulation, said composition comprising:

- from about 1 to about 50 parts by weight of a surfactant ingredient which comprises, on a surfactant ingredient weight basis, from about 5 to about 70 weight percent of a glycoside surfactant and from about 30 to about 95 weight percent of an anionic surfactant;
- from about 1 to about 50 parts by weight of a normally solid water soluble or water dispersible addition polymer selected from the group consisting of styrene/maleic anhydride copolymers and neutralized or partially esterified derivatives thereof; and
- from about 50 to about 98 parts by weight of water.

4,678,596

## RINSE AID FORMULATION

Jean Dupre, Levittown, and Andrea C. Keenan, Plymouth Meeting, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 1, 1986, Ser. No. 858,614

Int. Cl. C11D 3/37

U.S. Cl. 252-174.24

4 Claims

1. A stable aqueous rinse aid dispersion comprising from about 0.5 to about 20 weight percent poly(meth)acrylic acid polymer having a weight average molecular weight ranging from greater than 1000 to less than about 50,000, from about 5 to about 60 weight percent nonionic surfactant, from about 0.3 to about 5.0 weight percent of a substantially alkali neutralized compatibilizer polymer formed from about 25 to about 70 weight percent methacrylic acid and from about 75 to about 30 weight percent of one or more copolymerizable lower alkyl acrylates or methacrylates and having a weight average molecular weight of at least about 500,000, and the balance being water.

4,678,597

## CHEMICAL CLEANING SOLUTION AND METHOD

Michael A. Kiener, Denville, N.J., assignor to AM International, Inc., Chicago, Ill.

Filed Mar. 17, 1986, Ser. No. 840,182

Int. Cl. C11D 7/54, 7/18

U.S. Cl. 252-100

28 Claims

1. A chemical cleaning composition for photographic processors, consisting of a solution of:  
a hydroxycarboxylic acid and  
a peroxymonosulfate compound dissolved in water wherein said hydroxycarboxylic acid comprises between about 20 weight percent and 75 weight percent of the total weight of said hydroxycarboxylic acid and said peroxymonosulfate compound and said peroxymonosulfate compound is present in a sufficient concentration to dissolve silver deposits in a photographic processor developer tank.

4,678,598

## LIQUID SHAMPOO COMPOSITION

Hidekazu Ogino, Funabashi, and Hajime Hirota, Tokyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 890,547

Claims priority, application Japan, Aug. 6, 1985, 60-172992; Sep. 17, 1985, 60-204981

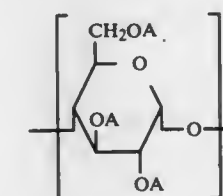
Int. Cl. C11D 3/22, 17/08

U.S. Cl. 252-174.17

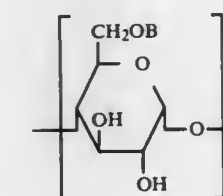
6 Claims

1. A liquid shampoo composition comprising the following three components (A), (B) and (C):

- 5 to 30 wt % of at least one surface active agent,
- 0.05 to 5 wt % of a skin sensation inducing aromatic chemical selected from the group consisting of menthol, camphor, methyl salicylate, cineol, menthone, piperitone, borneol, beta-pinene, menthyl acetate and varylamide nonylate,
- 1 to twenty times by weight based on the amount of component (B) of a modified cyclodextrin represented by the following formula (I) or (II):

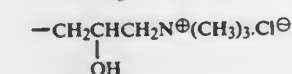


(I)



(II)

in which n represents a number from 6 to 9, A represents a hydrogen atom or a methyl group, and B represents a hydrogen atom or the group (III)



(III)

with the proviso that neither an ether substitution number of methyl group nor a substitution number of group (III) is less than 1.



4,678,599

# USE OF COPOLYMERS OF POLYOXYALKYLENE ETHERS OF ALLYL AND/OR METHALLYL ALCOHOL AND VINYL ESTERS AS DEMULSIFIERS FOR WATER-CONTAINING CRUDE OIL

Jürgen Fock, Düsseldorf, and Hans Rott, Essen, both of Fed. Rep. of Germany, assignors to TH. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,029

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338923

Int. Cl.<sup>4</sup> B01D 17/04; C07C 69/66

U.S. Cl. 252—343

20 Claims

1. A demulsifier for water-containing crude oil comprising a demulsifying effective amount of one or more copolymers obtained by copolymerizing at least one polyoxyalkylene ether of allyl alcohol or methallyl alcohol with vinyl esters of lower carboxylic acids, or mixtures of vinyl esters of lower carboxylic acids, with up to 50 mole percent of a compound selected from the group consisting of esters of acrylic or methacrylic acid, ethers of allyl or methallyl alcohol with fatty alcohols, wherein the quotient of the average molecular weight of the polyoxyalkylene ethers corresponding to their molar fraction and the number of moles of the compounds to be copolymerized is from 20 to 200.

4,678,600

# HEAT EXCHANGE REFORMING PROCESS AND REACTOR

Henrik O. Stahl, Fasanvaenget 514, DK-2980 Kokkedal, and Jens R. Rostrop-Nielsen, Søndervej 74, DK-2830 Virum, both of Denmark

Filed Mar. 19, 1986, Ser. No. 841,251

Claims priority, application Denmark, Mar. 21, 1985, 1266/85

Int. Cl.<sup>4</sup> C01B 3/32

U.S. Cl. 252—373

5 Claims

1. A process for the steam reforming in a reforming reactor of hydrocarbons by passing a feed stream comprising steam and one or more hydrocarbons as process gas at steam reforming conditions and under external supply of heat through a given volume of steam reforming catalyst to form a product stream rich in hydrogen, said process comprising

- passing the process gas through a first portion of the steam reforming catalyst constituting 25–75% thereof, heat needed for the endothermic reactions occurring in the process gas and for heating the process gas being supplied partly from a moderately hot flue gas as defined under (b) and partly from the product stream, and
- subsequently passing the process gas partly reformed in step (a) through the remaining portion of the steam reforming catalyst, the heat needed for the further endothermic reactions and heating of the process gas being supplied by a hot flue gas generated by combustion of a fluid fuel, the hot flue gas being hereby cooled to form the moderately hot flue gas employed in step (a).

4,678,601

# ELECTROCONDUCTIVE POLYMER-LATEX COMPOSITES

George E. Ham, Wu-Nan Chen, and John M. McIntyre, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 16, 1985, Ser. No. 776,199

Int. Cl.<sup>4</sup> A01B 1/00

U.S. Cl. 252—500

15 Claims

- A polymer-latex composite comprising:
  - a poly-conjugated unsaturated organic polymeric material capable of being doped to provide an organic electroconductive material;
  - a latex into which the organic polymeric material is dispersed; and

- a dopant in an amount sufficient to make the organic polymeric material electroconductive.

4,678,602

# HIGHLY CONDUCTIVE STYRENIC RESIN COMPOSITION

Kazunobu Tanaka, and Kyoze Mori, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed May 14, 1984, Ser. No. 609,946

Claims priority, application Japan, May 16, 1983, 58-85211

Int. Cl.<sup>4</sup> C07C 143/02, 143/16

U.S. Cl. 252—513

9 Claims

1. An electrically conductive, thermoplastic resin composition consisting essentially of a blend of (A) a copolymer consisting essentially of (1) units of vinyl aromatic monomer, (2) from 2 to 35% by weight, based on the weight of (A), of units of an unsaturated dicarboxylic acid anhydride monomer which is copolymerizable with said vinyl aromatic monomer, and (3) an elastomer, said copolymer (A) containing at least 50% by weight of said vinyl aromatic monomer (1), based on the sum of the weights of (1) and (3), and (B) particles of a metallic filler effective to impart electrical conductivity to said resin composition, said resin composition having been prepared by melt blending said copolymer (A) and said particles (B) in an extruder.

4,678,603

# COLOGNE COMPOSITION

Hiroshi Ishii, Yokohama, and Bunichiro Hosoda, Tokyo, both of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1986, Ser. No. 836,502

Int. Cl.<sup>4</sup> A61K 7/46; C11B 9/00

U.S. Cl. 252—522 R

3 Claims

1. A cologne composition comprising 10 to 35% by weight of refined grape wine having pH of 5 to 6 which is obtained by treating unrefined grape wine with 10 to 25 grams of calcium carbonate per one liter of said unrefined grape wine.

4,678,604

# 2-(1'-HYDROXYIMINO-ETHYL)-1,3,3,4,4-PENTAMETHYLCYCLOPENTENE AND FRAGRANCE COMPOSITIONS CONTAINING SAME

Roman Kaiser, Uster, Switzerland, assignor to Glaxo Corporation, Clifton, N.J.

Filed Aug. 26, 1986, Ser. No. 900,555

Claims priority, application Switzerland, Sep. 13, 1985, 3974/85

Int. Cl.<sup>4</sup> C11B 9/00

U.S. Cl. 252—522 R

10 Claims

1. 2-(1'-Hydroxyimino-ethyl)-1,3,3,4,4-pentamethylcyclopentene.

4,678,605

# CATIONIC SURFACTANTS BASED ON QUATERNARY AMMONIUM COMPOUNDS AND METHODS OF USING SAME

Juergen Geke, Düsseldorf, and Horst Rutzen, Langenfeld, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 17, 1986, Ser. No. 820,281

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1985, 3501775

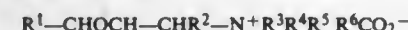
Int. Cl.<sup>4</sup> C11D 1/62

U.S. Cl. 252—547

9 Claims

1. A cleaning composition for metal surfaces comprising at least one surfactant, a diluent, and a quaternary ammonium cationic compound in at least an amount effective to de-emulsify with respect to anionic contamination, impart an anticorrosive effect, impart a defoaming effect, impart hydrophobic properties to a cleaned surface, impart antistatic properties to a

cleaned surface, or a combination thereof, said compound having the formula:



wherein

- R<sup>1</sup> is a linear or branched alkyl residue having from 1 to 22 carbon atoms;  
 R<sup>2</sup> is hydrogen or a linear or branched alkyl residue having from 1 to 21 carbon atoms, the total number of carbon atoms of both the substituents R<sup>1</sup> and R<sup>2</sup> being in the range of from 8 to 22;  
 R<sup>3</sup> and R<sup>4</sup> each represent methyl, ethyl, 2-hydroxyethyl or 2-hydroxypropyl;  
 R<sup>5</sup> represents an alkyl residue having from 4 to 6 carbon atoms or a phenalkyl residue having from 1 to 3 carbon atoms in the alkyl residue; and  
 R<sup>6</sup> represents a linear or branched alkyl residue having from 4 to 15 carbon atoms.

4,678,606

# LIQUID CLEANSING COMPOSITION

Lalarkh Akhter, Newcastle upon Tyne; Ronald E. Atkinson, Hexham, both of England; Dwight E. Wages, Wilbraham, Mass., and Harold H. Beyer, Montgomery, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 749,065, Jun. 26, 1985, abandoned.

This application Oct. 24, 1985, Ser. No. 790,717

Claims priority, application United Kingdom, Jul. 3, 1984, 8416884

Int. Cl.<sup>4</sup> C11D 1/83, 3/37

U.S. Cl. 252—542

19 Claims

1. An aqueous, liquid personal cleansing composition consisting essentially of:

- from about 8% to about 50% of primary surfactant selected from the group consisting of anionic, cationic, zwitterionic, amphoteric and semi-polar surfactants and mixtures thereof;
- from about 0.1% to about 6% of auxiliary surfactant selected from ethoxylated aliphatic alcohols having an average alkyl chain length of from 6 to 13 carbon atoms;
- from about 0.1% to about 2% of a water-soluble polymeric thickening agent; wherein the thickening agent is selected from the group consisting of nonionic: guar gum, hydroxypropyl guar gum, methyl cellulose, methyl hydroxypropyl cellulose, hydroxypropyl cellulose, locust bean gum, starch, starch amylose, hydroxyethylamylose and polyoxyethylene; and cationic: hydroxypropyltrimethylammonium guar gums, quaternized cellulose ethers, homopolymers of dimethyl diallyl ammonium chloride, co-polymers of dimethyl diallyl ammonium chloride and acrylamide, quaternized vinyl pyrrolidone acrylate or methacrylate copolymers of amino alcohol, and polyalkylene imines, and mixtures thereof; and
- from about 0.1% to about 10% of polyoxy(C<sub>2</sub>-C<sub>3</sub>)alkyleneglycol having an average molecular weight in the range from about 200 to about 15,000.

4,678,607

# ETHYLENE COPOLYMERS WITH ENHANCED FIRE RESISTANT PROPERTIES

Robert R. Reitz, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 25, 1986, Ser. No. 889,470

Int. Cl.<sup>4</sup> C09K 21/02, 21/10; C09D 5/18

U.S. Cl. 252—609

3 Claims

- A flame retardant composition comprising
  - a matrix comprising 10–40 percent by weight of at least one ethylene copolymer,
  - 35–89 percent by weight of compositions (a), (b), and (c) of a mixture of
    - alumina trihydrate and
    - calcium carbonate or calcium-magnesium carbonate or

- both, said mixtures containing a percent weight ratio of (i) or (ii) of 30/70 to 70/30, and
- 1–25 percent by weight of composition of (a), (b), and (c) of a melamine/formaldehyde resin.

4,678,608

# CHEMILUMINESCENT COMPOSITION

Charles H. Dugliss, Westchester, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 15, 1985, Ser. No. 723,590

Int. Cl.<sup>4</sup> C09K 11/00; A01K 97/12

U.S. Cl. 252—700

16 Claims

1. A composition intended to be reacted with hydrogen peroxide in the presence of an organic solvent to produce visible chemiluminescent light comprising a solvent solution of (1) an oxalate, (2) a fluorescer and (3) from about 5×10<sup>-4</sup> to 5×10<sup>-3</sup> percent, by weight, based on the total weight of the composition, of a soluble perylenedicarboximide dye, the mole ratio of said perylenedicarboximide dye to said fluorescer ranging from about 3.45×10<sup>-3</sup> to 8.15×10<sup>-1</sup> to 1.

4,678,609

# PROCESS FOR THE PREPARATION OF CORTICOSTEROID-21-PHOSPHORIC ACIDS AND THEIR SALTS AND THE CORTICOSTEROID-21-PHOSPHORIC ACID TRIESTERS

Joachim Engels, Kronber, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 6, 1985, Ser. No. 795,542

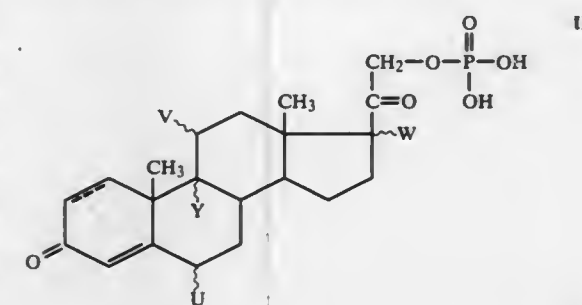
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1984, 3440794

Int. Cl.<sup>4</sup> C07J 00/00

U.S. Cl. 260—397.45

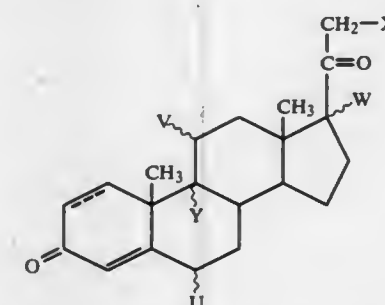
4 Claims

1. A process for the preparation of corticosteroid-21-phosphoric acids of the general formula III



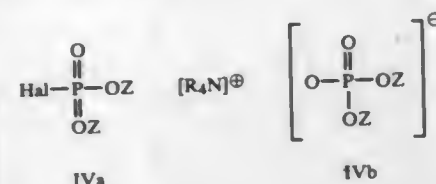
and of pharmaceutically active salts thereof, in which formula III

- U denotes H or CH<sub>3</sub>,  
 V denotes H, OH, O or halogen,  
 W denotes H or OH and  
 Y denotes H or F,  
 which comprises reacting a corticosteroid of the formula I



in which U, V, W and Y have the meaning indicated and X

represents OH or halogen, with an organic phosphoric acid ester of the formula IVa or IVb

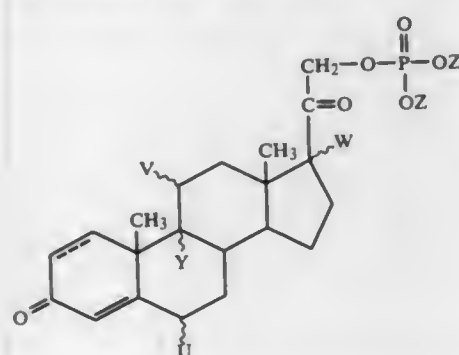


in which

Z is C<sub>1-8</sub>-alkyl which is unsubstituted or substituted in the α-position by phenyl which in turn is unsubstituted or substituted by Cl, Br, CN or NO<sub>2</sub>, alkyl radicals having at least 2 carbon atoms being unsubstituted or monosubstituted in the β-position by CN, nitrophenyl or SO<sub>2</sub>-C<sub>1-4</sub>-alkyl or disubstituted or trisubstituted by Cl and/or Br, and

Hal denotes halogen and R denotes C<sub>1-8</sub>-alkyl, but a radical R can also be benzyl and/or hydrogen,

and thus preparing a compound of the formula II



in which U, V, W, Y and Z have the meanings mentioned, and saponifying this compound II to give the compound III and, if appropriate, neutralizing the latter to give the salt.

4,678,610

#### SILICONARYLOZIDES AND SILICONARYLISOCYANATES

Jonathan D. Rich, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

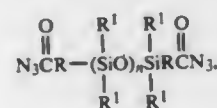
Filed Jun. 3, 1985, Ser. No. 740,687

Int. Cl.<sup>4</sup> C07F 7/18, 117/06

U.S. Cl. 260—349

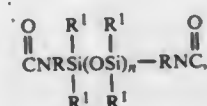
4 Claims

1. Siliconarylazide having the formula,



where R is a C<sub>(6-13)</sub> divalent arylene radical, R<sup>1</sup> is a C<sub>(1-13)</sub> monovalent hydrocarbon radical and n is an integer equal to 5 to 2000 inclusive.

2. Siliconarylisocyanate having the formula,



where R is a C<sub>(6-13)</sub> divalent aromatic arylene radical, R<sup>1</sup> is a

C<sub>(1-13)</sub> monovalent hydrocarbon radical and n is an integer equal to 5 to about 2000 inclusive.

4,678,611

#### NOVEL DYESTUFF INTERMEDIATES AND USE THEREOF FOR THE MANUFACTURE OF NOVEL AZO DYES

Rudolf Hurter, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 370,227, Apr. 20, 1982, abandoned, which is a division of Ser. No. 217,277, Dec. 16, 1980, Pat. No. 4,360,460, which is a division of Ser. No. 23,514, Mar. 23, 1979, Pat. No. 4,288,363. This application Jan. 17, 1986, Ser. No. 820,751

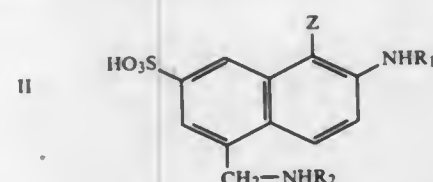
Claims priority, application Switzerland, Apr. 3, 1978, 3537/78

Int. Cl.<sup>4</sup> C07C 143/56; C09B 29/00

U.S. Cl. 260—510

4 Claims

1. Dyestuff intermediates of the formula



wherein R<sub>1</sub> represents hydrogen, an alkyl radical of 1 to 8 carbon atoms or a phenyl radical, R<sub>2</sub> represents hydrogen or an acyl radical, and Z represents hydrogen or a sulfo group.

4,678,612

#### PROCESS FOR THE PRODUCTION OF ARYLSULFONYL HALIDES

Louis F. Bolzan, Briarcliff Manor, and Edward D. Weil, Hastings-on-Hudson, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 31, 1986, Ser. No. 824,741

Int. Cl.<sup>4</sup> C07C 143/70

U.S. Cl. 260—543 R

10 Claims

1. A process for the production of arylsulfonyl halides which comprises:

- adding to an arylsulfonic acid an effective amount of a phosphorus-containing additive, said additive capable of yielding phosphoric acid under conditions of oxidation or hydrolysis,
- reacting the arylsulfonic acid/phosphorus-containing additive mixture of (a) with a sulfur halide and a halogen.

4,678,613

#### PROCESS FOR THE PURIFICATION OF TRIPHENYLMETHANE COMPOUNDS

Robert J. Flores, Cincinnati, Ohio, assignor to PMC Specialties Group, Inc., Rocky River, Ohio

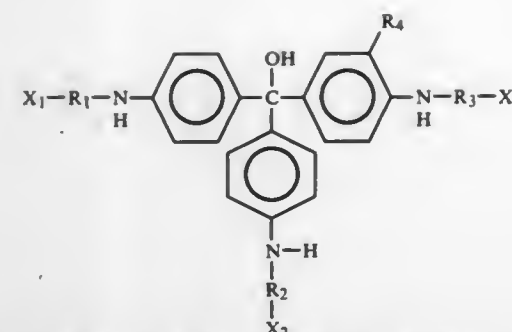
Division of Ser. No. 328,899, Dec. 9, 1981, abandoned. This application Dec. 23, 1982, Ser. No. 452,679

Int. Cl.<sup>4</sup> C09B 11/10

U.S. Cl. 260—391

30 Claims

1. A process for purifying crude triphenylmethane compounds having unreacted aromatic amine associated therewith as an impurity or a solvent, wherein the triphenylmethane compound has the following structure:



wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are direct linkages, phenyl, or naphthyl groups; R<sub>4</sub> is hydrogen or methyl; X<sub>1</sub>, X<sub>2</sub> and X<sub>3</sub> are hydrogen, halogen, alkyl of 1 to 4 carbons or alkoxy of 1 to 4 carbons; provided that at least one of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> is not a direct linkage and provided that X<sub>1</sub>, X<sub>2</sub> or X<sub>3</sub> is hydrogen when the corresponding R<sub>1</sub>, R<sub>2</sub> or R<sub>3</sub> is a direct linkage; and wherein said purification process comprises:

- (1) heating the triphenylmethane compound in its carbinol form in the presence of aqueous acid at an effective temperature to form the acid salt; and
- (2) separating the salt from the aqueous acid solution; and
- (3) washing the salt with water to remove water-soluble impurities; and
- (4) heating the salt in the presence of an aqueous base at temperatures above about 100° C. and at pressures above atmospheric pressure to produce the triphenylmethane compound in its carbinol form; and
- (5) separating the triphenylmethane compound in its carbinol form from the aqueous base solution.

4,678,614

#### HYDROCARBON-SOLUBLE ORGANOMETALLIC COMPLEXES OF MAGNESIUM AND ALKALI METALS AND METHOD OF PRODUCING SAME

Conrad W. Kamienski, Gastonia, and B. Troy Dover, Kings Mountain, both of N.C., assignors to Lithium Corporation of America, Inc., Bessemer City, N.C.

Filed Nov. 27, 1985, Ser. No. 803,104

Int. Cl.<sup>4</sup> C07F 3/02

U.S. Cl. 260—665 R

26 Claims

1. A process for preparing an alkali metal trialkylmagnesiolate comprising simultaneously adding to a stirred dispersion of an alkali metal in an inert liquid hydrocarbon solvent a soluble dialkylmagnesium compound and a 2-alkyl substituted C<sub>4</sub>-C<sub>18</sub> primary alkyl halide.

4,678,615

#### COOLING STACK FOR COOLING TOWERS

Lyuben K. Stambolov, Sofia; Sotir Y. Chaushev, and Dilyan L. Simitchlev, both of Burgas, all of Bulgaria, assignors to DSPIE "D. Blagoev", Kardjall, Bulgaria

Filed Jul. 23, 1986, Ser. No. 888,860

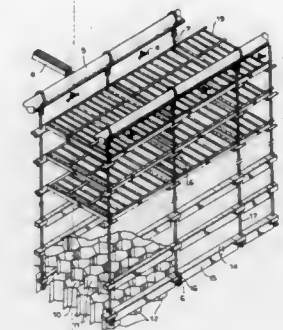
Int. Cl.<sup>4</sup> B01F 3/04

U.S. Cl. 261—111

4 Claims

1. A cooling stack for a cooling tower comprising a volumetric polymer block of flow-around type having polyhedron shaped cells, said block comprising two flow-around layers, each layer comprising a plurality of rows of cellular components, said components being mounted detachably by means of connecting teeth to connecting seats of carrying bars, said bars being fastened to connecting strips,

said strips being hung on vertical suspension devices attached to a carrying construction,



said layers being disposed at a distance from one another vertically by spacing sleeves on said suspension devices.

4,678,616

#### METHOD OF PRODUCING PERMANENT MAGNET

Gliichi Kawashima, Takatsuki, Japan, assignor to Sumitomo Bakelite Company Limited, Tokyo, Japan

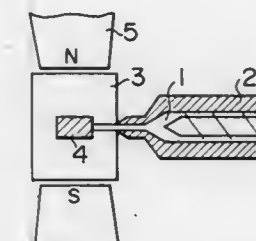
Filed Oct. 30, 1985, Ser. No. 792,856

Claims priority, application Japan, Nov. 7, 1984, 59-233303

Int. Cl.<sup>4</sup> B29C 35/08

U.S. Cl. 264—24

2 Claims



1. A method of producing a permanent magnet in which a material containing ferromagnetic powder is molded into a columnar or cylindrical molded body through injection molding, compression molding, or the like, in a magnetic field capable of orienting and magnetizing the ferromagnetic powder, said method comprising the steps of:

applying a magnetic field to the molded body in the unidirectional perpendicular to an axis of rotation of the molded body to orient and magnetize the molded body so as to have two magnetic poles of N and S; demagnetizing the magnetized molded body so as to permit divisional remagnetizing of the molded body; and then divisionally remagnetizing the demagnetized molded body on its outer or inner surface to form at least two strips of N and S poles arranged alternately and extending parallel to the axis of rotation of the molded body.



4,678,617

# METHOD FOR CONVERTING AN EXPENDED THERMOPLASTIC ARTICLE INTO A USEFUL ARTICLE

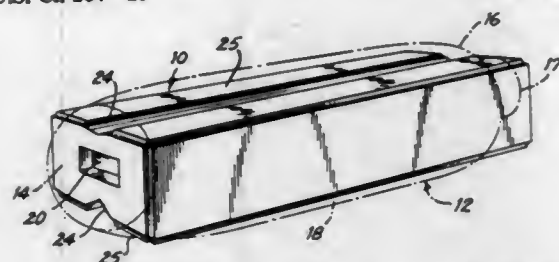
Donald J. Sykes, Upper Saddle River, N.J., assignor to Marpac Industries, Inc., Waldwick, N.J.

Filed Jan. 28, 1985, Ser. No. 749,818

Int. Cl.<sup>4</sup> H05B 6/00; B29B 17/00; B29C 49/00

U.S. Cl. 264—25

10 Claims



1. Converting an expended, hollow article of thermoplastic material, in the form of an expended container, the article having opposite end walls establishing an original configuration, into a new article, in the form of a building block, having a new configuration, by utilizing the steps of heating the expended article to a temperature above the softening temperature of said material, applying external forming forces inwardly against said article while the temperature of the article remains above said softening temperature, and maintaining an elevated pressure within said article while said forming forces are being applied, to urge said walls outwardly against said forming forces, for effecting conversion from said original configuration to said new configuration.

4,678,618

# INDIVIDUAL SOURCE POSITIONING MECHANISM FOR A NUCLEAR REACTOR FUEL ASSEMBLY

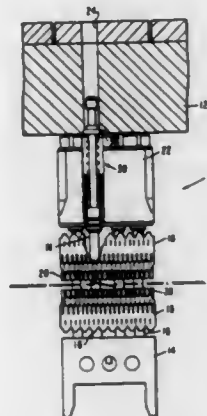
John F. Wilson, Murrysville Boro; Robert K. Gjertsen, Monroeville Boro, and Samuel Cerni, Churchill Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 20, 1984, Ser. No. 642,607

Int. Cl.<sup>4</sup> G21C 7/34

U.S. Cl. 376—156

8 Claims



1. In a nuclear reactor including a fuel assembly, at least one elongated neutron source rod and an upper core plate, said fuel assembly having top and bottom nozzles with a plurality of guide thimbles extending between and interconnecting said nozzles, said upper core plate being positioned adjacent to and above said top nozzle of said fuel assembly and having a multiplicity of flow openings therethrough to allow passage of coolant from said fuel assembly, at least some of said openings being aligned over respective ones of said guide thimbles with seating means defined about said openings on a lower side of said core plate, a separate mechanism for positioning each individual neutron source rod in a respective guide thimble

aligned with one of said openings defined through said upper core plate, comprising:

- locating means registering against said core plate seating means; and
- resilient holddown means extending at least partially into said guide thimble and coupling said source rod with said locating means in a manner which restrains said source rod in a lateral direction and positions said rod in a stationary axial relationship within said guide thimble.

4,678,619

# NUCLEAR REACTOR

Alvin Radkowsky, Ramat Gan, Israel, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

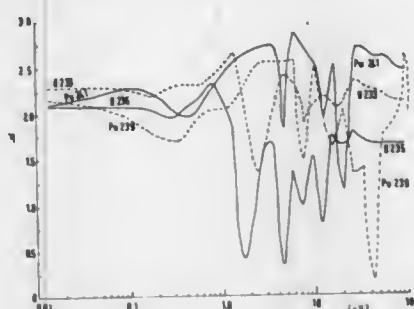
Filed May 7, 1979, Ser. No. 37,400

Claims priority, application Fed. Rep. of Germany, May 4, 1978, 2819734

Int. Cl.<sup>4</sup> G21C 1/00, 3/58

U.S. Cl. 376—173

1 Claim



1. An epithermal nuclear breeder reactor comprising an active core and means containing a body of pressurized water as a moderator for cooling said core, wherein: said core is composed of a plurality of unit subassemblies each composed of a seed region with moderator to fuel volume ratio of the order of 0.5 and a blanket region with moderator to fuel volume ratio of the order of 0.3, each said region comprising fuel rods of fissile and fertile materials; each said fuel rod in said region is composed of two parts which are configured and movable relative to one another in a manner to vary the number of neutrons leaking from said seed region into said blanket region; said fissile material comprises plutonium having an initial isotope composition such that the ratio of Pu<sup>241</sup> to Pu<sup>239</sup> is of the order of 30% and the ratio of Pu<sup>240</sup> to Pu<sup>239</sup> is of the order of 40%, said fertile material comprises U<sup>238</sup>; said seed region contains plutonium in a concentration of 8 to 14%, by weight; and said blanket region contains plutonium in a concentration of 2 to 6%, by weight.

4,678,620

# HATCH ASSEMBLY

James R. Marshall, Penn Hills, and Roy T. Hardin, Jr., Greensburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1984, Ser. No. 633,812

Int. Cl.<sup>4</sup> G21C 13/00

U.S. Cl. 376—203

15 Claims

14. In a nuclear reactor installation including means defining a fuel handling area and means defining a containment area separated from the fuel handling area and including a refuelling cavity; the improvement comprising

- a fuel transfer tube connecting the refuelling cavity with the fuel handling area; said fuel transfer tube having a first end in the fuel handling area and a second end in the refuelling cavity;
- valve means for opening and closing said first end; and

4,678,621

# METHOD AND MEANS FOR MONITORING THE CONTINUITY OF A FLUID-FILLED NETWORK OF CONDUITS AND VALVES

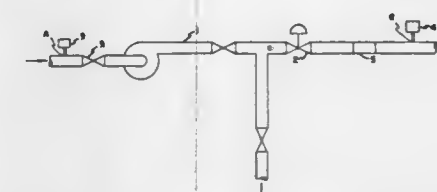
Vincent M. Callaghan, West Granby, and Melvin J. Wolpert, III, Westogue, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 29, 1984, Ser. No. 594,964

Int. Cl.<sup>4</sup> G21C 17/00; F16K 37/00

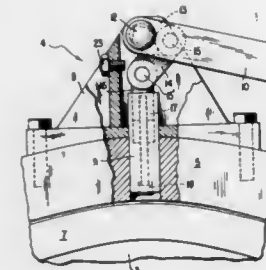
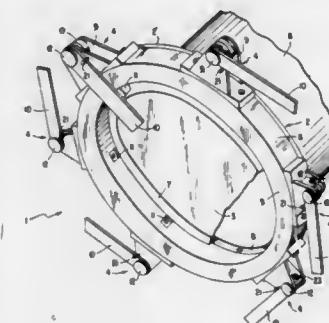
U.S. Cl. 376—245

6 Claims



(c) a hatch assembly mounted on said second end; said hatch assembly including

- a hatch ring affixed to said fuel transfer tube at said second end thereof; said hatch ring having an integral annular seat surrounded by said hatch ring and defining a hatch opening in said second end of said fuel transfer tube;
- a hatch cover adapted to be positioned on said annular seat for covering the hatch opening;
- a plurality of latching units supported on said hatch ring about said hatch opening, each said latching unit including
  - a slidably supported locking bolt movable generally radially inwardly with respect to said annular seat into a hatch cover locking position and generally radially outwardly with respect to said annular seat into a hatch cover releasing position; in said hatch cover locking position at least one length portion of



said locking bolt extending over said hatch cover for maintaining said hatch cover on said annular seat;

- a crankshaft supported for rotation;
- operating means for transmitting a locking torque and an opposite, releasing torque to said crankshaft;
- coupling means for connecting said crankshaft with said locking bolt and for converting rotary motion of said crankshaft to linear motion of said locking bolt, said coupling means including spring means for transmitting the locking torque from said crankshaft as a radially inwardly oriented resilient force to said locking bolt; and
- means for resolving the radially inwardly oriented resilient force to a component force in said hatch cover locking position and for transmitting said component force from said locking bolt to said hatch cover for pressing said hatch cover against said annular seat.

4,678,622

# TRANSIENT MONITOR FOR NUCLEAR REACTOR

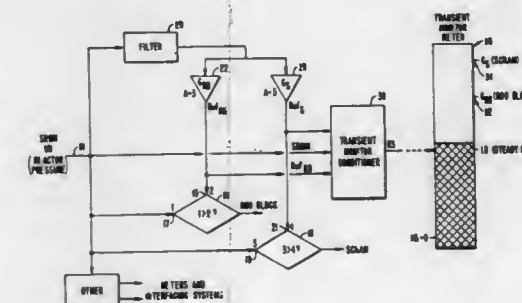
William S. Rowe, and Fred C. Chao, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 20, 1985, Ser. No. 767,551

Int. Cl.<sup>4</sup> G21C 17/00

U.S. Cl. 376—259

18 Claims



14. The apparatus for monitoring neutron density in a nuclear reactor comprising:

- a startup range neutron density monitor;
- a first comparator having two inputs and a binary output to initiate rod withdrawal blockage;
- a second comparator having two inputs and a binary output to initiate plant SCRAM;

the output of said startup neutron monitor being input to each of said comparators at one input thereof;  
a filter for having a preselected time constant for processing the monitored neutron range density;  
a first amplifier;  
said filter passing its output to said first amplifier having an amplification level to the other input of said first comparator to initiate rod block when said directly monitored signal exceeds said filtered signal;  
a second amplifier;  
said filter having a second output to said second amplifier for initiating plant SCRAM when said directly monitored output exceeds said filtered and amplified input to said comparator.

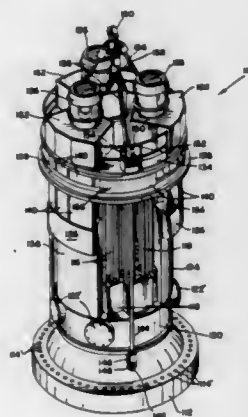
4,678,623

# MODULAR HEAD ASSEMBLY AND METHOD OF RETROFITTING EXISTING NUCLEAR REACTOR FACILITIES

Louis J. Malandra, Elizabeth Township, Allegheny County, Pa.; Robert J. Leduc, Columbia, Md.; Michael F. Hankinson, Monroeville, and Edward F. Kowalski, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Feb. 3, 1984, Ser. No. 576,676  
Int. Cl.<sup>4</sup> G21C 19/00, 1/01

U.S. Cl. 376-260

18 Claims



1. A method of retrofitting existing nuclear reactor facilities so as to form a modular closure head assembly for a nuclear reactor pressure vessel, wherein said existing nuclear reactor facilities comprise control rod drive mechanism cooling systems which include vertically extending elbow air ducts interconnecting vertically spaced upper and lower air manifolds, wherein said elbow air ducts extend radially beyond the peripheral envelope of said closure head, comprising the steps of:  
removing said upper air manifold;  
removing said vertically extending elbow air ducts;  
capping the air ports of said lower air manifold which ports were previously fluidically connecting said lower air manifold to said vertically extending elbow air ducts;  
disposing vertically upwardly extending air exhaust ducts above said lower air manifold in such a manner that said air exhaust ducts are disposed within said peripheral envelope of said closure head;  
fluidically connecting exhaust fans to the upper regions of said air exhaust ducts;  
fluidically connecting said lower regions of said air exhaust ducts to said lower air manifold;  
permanently securing lift rods to said closure head at positions disposed radially outwardly of said lower air manifold;  
attaching a seismic support platform to said lift rods;  
providing fluidic passage of said vertically extending air exhaust ducts through said seismic support platform;

attaching a missile shield plate to said lift rods; and  
providing fluidic passage of said vertically extending air exhaust ducts through said missile shield plate.

4,678,624

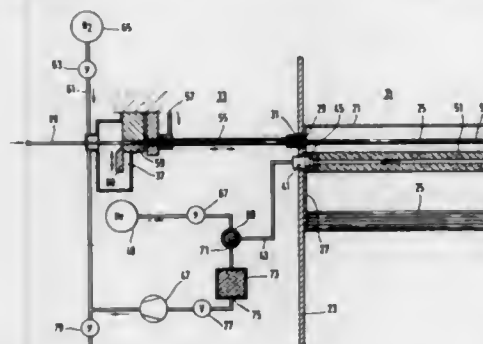
# METHOD FOR LOADING FUEL RODS INTO A CONTAINER

Helfrid Lahr, Karlsdorf, and Bernd Pontani, Alzenau, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany  
Division of Ser. No. 767,180, Aug. 19, 1985. This application Jul. 1, 1986, Ser. No. 881,007

Claims priority, application France; Aug. 17, 1984, 3430244  
Int. Cl.<sup>4</sup> G21C 19/00; G21F 5/00

U.S. Cl. 376-261

5 Claims



1. Method of loading a container with individual fuel rods separated from an irradiated nuclear reactor fuel element, the container having an end wall with an opening formed therein close to the inner periphery thereof, the method comprising:  
positioning said container in a horizontal position so that said opening is above the lower inner wall surface of said container;  
feeding said fuel rods into said container through said opening in a substantially horizontal direction; and  
dropping said fuel rods inside said container so as to cause the same to fall down toward said lower inner wall surface thereby causing said fuel rods to pile up inside said container.

4,678,625

# METHOD OF STRAIGHTENING BOWED IRRADIATED FUEL ASSEMBLIES

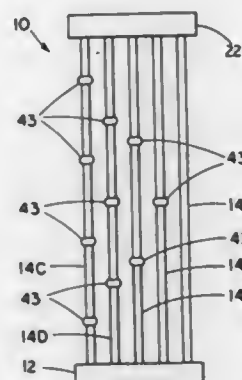
John F. Wilson, Murrysville Boro, and Robert K. Gjertsen, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 5, 1985, Ser. No. 762,745

Int. Cl.<sup>4</sup> G21C 19/00, 3/32

U.S. Cl. 376-261

11 Claims



1. A method of straightening a fuel assembly having at least

a pair of tubular structural members in which at least one member is bowed and thus greater in length than the other of said members so as to cause said fuel assembly to have a bowed configuration, said straightening method comprising the steps of:

- determining the length adjustment required for shortening said bowed tubular structural member in order to make its length generally the same as said other member; and
- forming at least one circumferential expansion bulge in said bowed member so as to shorten its length by the amount of said length adjustment.

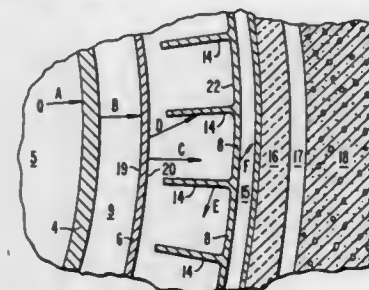
4,678,626

# RADIANT VESSEL AUXILIARY COOLING SYSTEM

John H. Germer, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.  
Filed Dec. 2, 1985, Ser. No. 803,353  
Int. Cl.<sup>4</sup> G21C 15/18

U.S. Cl. 376-298

5 Claims



1. An improved radiant vessel passive cooling system for liquid-metal pool-type modular nuclear reactors having a reactor vessel and a surrounding containment vessel spaced apart from said reactor vessel to form a first interstitial region containing an inert gas, the improvement comprising:  
a shell spaced apart from and surrounding said containment vessel to form a second interstitial region comprising a circulatory air passage, said circulatory air passage having an air inlet at a first position and an air outlet at a second position which is vertically higher than said first position, said second interstitial region lying between said shell and said containment vessel; and  
surface area extension means in said shell longitudinally disposed from said shell into said second interstitial region towards said containment vessel to receive thermal radiation from said containment vessel, said surface area extension means spaced apart from the external surface of said containment vessel whereby heat radiated from said containment vessel is received at said surface extension means for convection, conduction and radiation to air in said circulatory passage.  
5. An improved passive cooling system for sodium or sodium-potassium cooled pool-type modular nuclear reactors having a primary vessel and a surrounding secondary containment vessel spaced apart from said primary vessel to form a first interstitial region impregnated with an inert gas; the improvement comprising:  
a shell spaced apart from and surrounding said containment vessel to form a second interstitial region between said containment vessel and said shell, said shell further comprising an air inlet at a first position and an air outlet at a second position which is vertically higher than said first position; and longitudinal, radially and inwardly extending fins spaced along the interior surface of said shell to project into said second interstitial region towards said containment vessel to form an extended surface for receiving radiation from said containment vessel whereby heat radiated from said containment vessel is received at said longitudinal, radial and inwardly extending fins for con-

vection, conduction, and radiation to air in said second interstitial region.

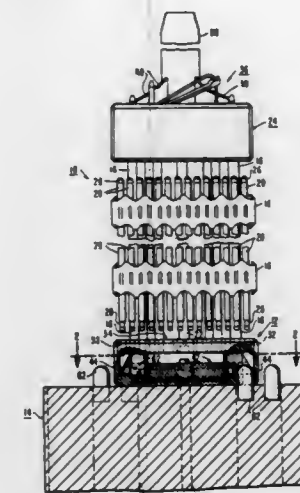
4,678,627

# DEBRIS-RETAINING TRAP FOR A FUEL ASSEMBLY

John A. Rylatt, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Apr. 4, 1985, Ser. No. 720,109  
Int. Cl.<sup>4</sup> G21C 19/42

U.S. Cl. 376-313

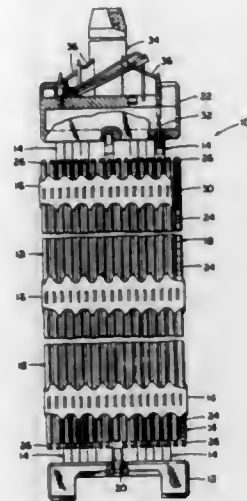
22 Claims



1. In a fuel assembly for a nuclear reactor including a plurality of nuclear fuel rods, at least one grid supporting said fuel rods in an organized array, an end flowing through said end nozzle and into said fuel assembly, a trap for capturing and retaining debris carried by said flowing coolant to prevent entry of debris into said fuel assembly, said debris trap comprising:  
(a) a hollow enclosure disposed adjacent said end nozzle on an opposite side thereof from said grid, said enclosure being composed of a material which is permeable to the liquid coolant but impermeable to debris carried by the coolant;  
(b) said hollow enclosure having upper and lower walls spaced apart and interconnected at their peripheries so as to extend across the direction of liquid coolant flow through said end nozzle and define a debris capturing and retaining chamber within said enclosure;  
(c) means on said hollow enclosure defining at least one opening into said chamber of said enclosure through said lower wall, said opening being of a size sufficient to allow passage of debris into said chamber which could not otherwise pass through said material of said hollow enclosure, said opening also being disposed in a predetermined positional relationship with respect to the direction of coolant flow such that debris carried by said liquid coolant flow will enter said chamber of said enclosure through said opening;  
(d) lower debris-retaining means located within said chamber of said hollow enclosure and surrounding said opening into said chamber, said lower debris-retaining means having a configuration which serves to retain debris carried by coolant into said chamber through said opening from exiting through said opening; and  
(e) upper flow-diffusing means located within said chamber of said hollow enclosure and being spaced generally above and aligned with said lower debris-retaining means and said opening, said upper flow-diffusing means having a configuration which substantially uniformly distributes across the bottom nozzle the flow of coolant into said chamber through said opening.



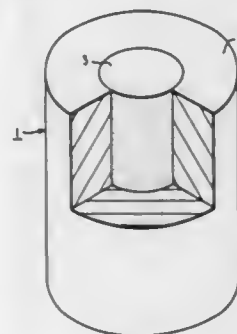
**4,678,628**  
**NUCLEAR REACTOR CONTROL ROD CLUSTER FOR ENTHALPY RISE COMPENSATION**  
 Thomas R. Freeman, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Filed Mar. 3, 1986, Ser. No. 835,672  
 Int. Cl.<sup>4</sup> G21C 7/10  
 U.S. Cl. 376—333 7 Claims



1. A control arrangement for use with a nuclear fuel assembly having a plurality of guide thimbles to provide enthalpy rise compensation, comprising:

- a spider assembly; and
- a plurality of control rodlets containing neutron absorber material, being supported at their upper ends from said spider assembly in a pattern which matches that of said guide thimbles and extending generally parallel to one another downwardly therefrom for insertion into said guide thimbles of said fuel assembly;
- said control rodlets being arranged in a cluster having a higher axial neutron absorption capability at an upper portion than at a lower portion thereof; said each control rodlet varying in axial neutron absorption capability from every other rodlet.

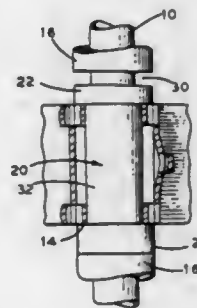
**4,678,629**  
**NUCLEAR FUEL PELLET CONTAINING GADOLINIA**  
 Frank D. Popa, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Filed Sep. 5, 1985, Ser. No. 772,826  
 Int. Cl.<sup>4</sup> G21C 3/00  
 U.S. Cl. 376—419 10 Claims



1. A nuclear fuel pellet comprising:  
 an annular outer pellet;  
 a cylindrical inner pellet;

said cylindrical inner pellet located inside of said outer pellet;  
 said annular outer pellet consisting essentially of  $\text{UO}_2$  enriched in U-235;  
 said cylindrical inner pellet consisting essentially of about 4 to about 18 w/o  $\text{Gd}_2\text{O}_3$  with the remainder consisting essentially of  $\text{UO}_2$  containing uranium selected only from the group consisting of natural uranium, depleted uranium and their mixtures with each other;  
 and said cylindrical inner pellet forming between 10 and 50 w/o of said nuclear fuel pellet.

**4,678,630**  
**SPACER GRID INSERT**  
 Raymond A. King, Lynchburg; Jeffrey G. Larson, Rustburg, and Lewis A. Walton, Forest, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.  
 Continuation of Ser. No. 520,022, Aug. 3, 1983, abandoned. This application Nov. 15, 1985, Ser. No. 798,148  
 Int. Cl.<sup>4</sup> G21C 3/32  
 U.S. Cl. 376—438 2 Claims

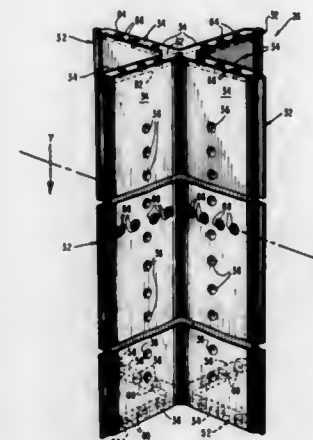


1. An improved floating spacer grid in combination with a nuclear fuel assembly of the type having a plurality of parallel fuel rods and at least one guide tube maintained in a laterally spaced array by axially spaced spacer grids, the fuel rods and guide tube extending through the spacer grids, the guide tube having a uniform circular outer surface, the spacer grids being movably mounted to the guide tube to permit axial displacement of the spacer grids relative to the guide tube, saddles formed from and within the spacer grids at top and bottom edges of the grids, a spacer sleeve positioned concentrically about the guide tube intermediate the adjacent ones of the axially-spaced spacer grids for limiting axial displacement of the spacer grids, and the spacer sleeve having opposite ends closely spaced from the edges of the adjacent spacer grids to define a displacement space therebetween, the improvement comprising, in combination therewith, a plurality of tubular inserts, each insert mounted to the guide tube within each of the spacer grids, each insert including a tubular portion positioned by the saddles to circumscribe the guide tube within the spacer grid and a circular flange portion at one end of the tubular portion, the flange portion being positioned in the displacement space and abutted to the edge of the spacer grid on the saddles, intermediate the spacer grid and spacer sleeve, and the circular flange portion having substantially the same outer diameter as the spacer sleeve thus precluding direct contact of the spacer sleeve with the spacer grid, and whereby the inserts carry all axial through-grid loads and prevent a horizontal vector force component applied against said grids.

**4,678,631**  
**BOILING WATER NUCLEAR REACTOR FUEL ASSEMBLY**  
 Rusi P. Taleyarkhan, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Filed May 2, 1985, Ser. No. 729,602  
 Int. Cl.<sup>4</sup> G21C 3/32  
 U.S. Cl. 376—444 16 Claims

1. In a fuel assembly having a plurality of elongated fuel rods disposed in side-by-side relationship so as to form an array of

spaced fuel rods, an outer tubular flow channel surrounding said fuel rods so as to direct flow of coolant/moderator fluid along said fuel rods, and a hollow water cross extending through said outer flow channel and having a plurality of hollow panels extending radially from a central axis thereof, said panels being composed of respective pairs of spaced apart sheet members interconnected together at their inner and outer ends so as to define an open inner cruciform flow channel for subcooled moderator fluid flow through said fuel assembly and interconnected with said outer tubular flow channel so as to

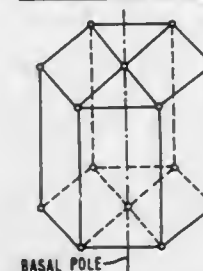


divide said array of fuel rods into a plurality of fuel rod subassemblies, said respective pairs of sheet members having bottom and top ends which together respectively define an open inlet into and an open outlet from said inner flow channel of said water cross, the improvement which comprises:

partial closure means connected with said bottom and top ends of said sheet members of said water cross so as to limit said top outlet to an open area less than the open area of said bottom inlet so as to distribute hydraulic losses between said inlet and outlet of said water cross.

**4,678,632**  
**NUCLEAR FUEL ASSEMBLY GRID WITH PREDETERMINED GRAIN ORIENTATION**  
 Harry M. Ferrari, Edgewood Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Continuation-in-part of Ser. No. 741,425, Jun. 5, 1985. This application Oct. 15, 1985, Ser. No. 786,986  
 Int. Cl.<sup>4</sup> G21C 3/34  
 U.S. Cl. 376—462 9 Claims

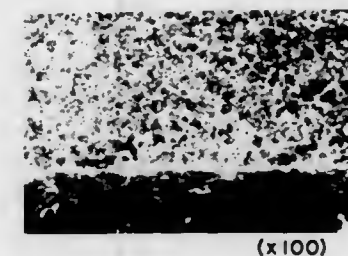
ZIRCONIUM CRYSTAL STRUCTURE



1. In a fuel assembly support grid including interleaved straps fabricated from fully recrystallized material which upon irradiation grows differently in different directions depending on the texture of the material and defining a multiplicity of cells, each cell adapted to receive a fuel rod therethrough in a direction generally along an axis of said cell and to exert a predetermined spring force on said fuel rod in a direction along a cross-section of said cell which is sufficient for holding the said fuel rod in a predetermined position, the improvement which comprises:  
 said fully recrystallized material of said grid straps having

respective predetermined "f-factor" values in said direction along said cross-section of said grid cell and in said direction along said axis of said grid cell such that upon irradiation of said grid any stress relaxation thereof in said direction along said axis of each of said grid cells will be substantially offset by shrinkage of said grid strap material in said direction along said cross-section of each of said grid cells and thereby maintain said predetermined spring force on each of said fuel rods.

**4,678,633**  
**PROCESS FOR FORMING A SINTERED LAYER ON A SUBSTRATE OF IRON-BASED MATERIAL**  
 Sigemi Osaki; Norio Yousina; Tsuyoshi Morishita, all of Hiroshima, and Yasuhumi Kawado, Iwakuni, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan  
 Filed Oct. 11, 1985, Ser. No. 786,804  
 Claims priority, application Japan, Oct. 15, 1984, 59-215594; Oct. 15, 1984, 59-215595; Oct. 15, 1984, 59-215596  
 Int. Cl.<sup>4</sup> B22F 7/00  
 U.S. Cl. 419—8 6 Claims



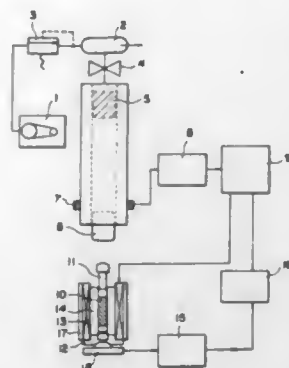
1. A process for forming a sintered layer on a substrate of iron-based, carbon-containing material, including steps of providing a sheet of powders of an Fe-M-C type alloy, M being at least one of Mo, Cr, B and P, applying said sheet on said substrate and heating said sheet to a sintering temperature to produce a sintered layer by said sheet, said sintered layer containing a carbide produced in the heating step, the alloy powders in said sheet producing a liquid phase during the heating step so that the sintered layer is firmly fitted to the substrate, the improvement comprising a step of providing a lamina beneath the sheet prior to the heating step, said lamina being formed by injecting active beams to a surface of the substrate to convert carbon into a carbide and able to suppress diffusion of carbon from said substrate to said sheet during the heating step.

**4,678,634**  
**METHOD FOR THE PREPARATION OF AN ANISOTROPIC SINTERED PERMANENT MAGNET**  
 Yoshio Tawara, and Ken Ohashi, both of Fukui, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan  
 Filed Apr. 14, 1986, Ser. No. 851,529  
 Claims priority, application Japan, Apr. 18, 1985, 60-83524; Apr. 18, 1985, 60-83525  
 Int. Cl.<sup>4</sup> B22F 1/00  
 U.S. Cl. 419—30 10 Claims

1. A method for the preparation of an anisotropic permanent magnet by a powder of metallurgical technique which comprises the steps of:

- applying a magnetic field to a mass of anisotropically magnetic particles in a pulse-wise manner so as to orient the particles to have the easy magnetization axes thereof aligned in the direction of the magnetic field;
- applying an impacting compressive force to the mass of the thus oriented anisotropically magnetic particles in the direction substantially parallel to the direction of the

pulse-wise magnetic field, the impacting compressive force being started and ended during the period in which



the pulse-wise magnetic field is sustained, so as to compact the particles into a shaped green body; and  
(c) heating the green body into a sintered body.

4,678,635

## METALLIC JOINING MATERIAL

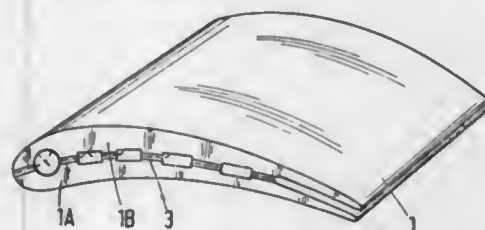
Bernd Jahnke, Neckargemuend, Fed. Rep. of Germany, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Dec. 17, 1985, Ser. No. 810,312

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446479

Int. Cl.<sup>4</sup> C22C 19/05

U.S. Cl. 420-449



1. Metallic joining material suitable particularly for joining parts made of an oxide-dispersion-hardened alloy, said metallic joining material consisting essentially of 20% by weight chromium, between 1 and 30% by weight cobalt, 1.5% by weight boron, 4% by weight silicon, 4% by weight W or Mo or Ta, 1% by weight iron, 0.1% by weight nitrogen, 0.4% by weight oxygen, 0.015% by weight carbon, between 5 and 7% by weight aluminum, 1% by weight titanium, 0.5% by weight zirconium and nickel as the balance of the alloy.

4,678,636

## DUCTILE BRAZING ALLOY CONTAINING REACTIVE METALS PRECIOUS METALS

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 672,057, Nov. 16, 1984, Pat. No. 4,604,328, which is a continuation of Ser. No. 422,625, Sep. 24, 1982, abandoned. This application Jan. 31, 1986, Ser. No. 835,838

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.<sup>4</sup> C22C 5/02, 9/00, 19/03, 30/00

U.S. Cl. 420-456

4 Claims

1. A brazing alloy consisting essentially of from about 0.25% to about 5% by weight of a reactive metal selected from the group consisting of titanium, vanadium, zirconium and mix-

tures thereof, from about 25% by weight to about 85% by weight of a gold-palladium mixture and from about 15% by weight to about 70% by weight of a third metal selected from the group consisting of copper, nickel and mixtures thereof.

4,678,637

## COPPER-CHROMIUM-TITANIUM-SILICON ALLOY AND APPLICATION THEREOF

Wolfgang Duerrschabel, Bellenberg; Franz Puckert, Illerrieden; Heinrich Stueer, Voehringen, and Max Blieschacher, Voehringen-Illerberg, all of Fed. Rep. of Germany, assignors to Welland-Werke AG, Ulm, Fed. Rep. of Germany

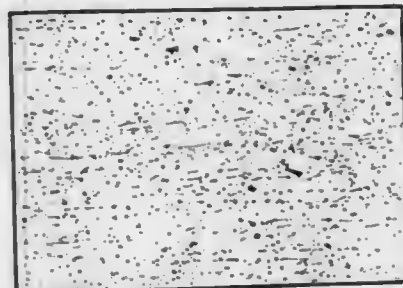
Filed Jul. 9, 1986, Ser. No. 883,871

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3527341

Int. Cl.<sup>4</sup> C22C 9/00

U.S. Cl. 420-490

4 Claims



1 Claim

1. Copper-chromium-titanium-silicon alloy, consisting essentially of 0.1 to 0.5% chromium, 0.05 to 0.5% titanium, 0.01 to 0.1% silicon, and the remainder being copper and usual impurities.

4,678,638

## HIGHLY BRANCHED AMINO HEXAHYDROPYRIDINES

Benjamin T. Outlaw, Webster Groves, and Bernardus A. Oude Alink, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

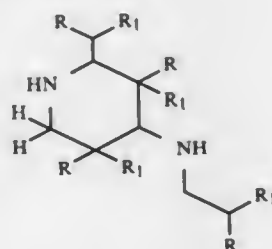
Continuation-in-part of Ser. No. 758,196, Jul. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 239,075, Feb. 27, 1981, abandoned. This application Apr. 28, 1986, Ser. No. 856,267

Int. Cl.<sup>4</sup> C07D 211/58; C23F 11/06

U.S. Cl. 422-13

12 Claims

1. A compound of the formula



wherein R and R1 are the same or different and independently represent alkyl, phenyl or alkylphenyl.

11. Method of inhibiting corrosion of metal which comprises intimately contacting said metal with a corrosion inhibiting amount of a composition comprising a compound of claim 1.

4,678,639

## APPARATUS FOR PERIODICALLY MONITORING THE COMPOSITION OF A PLURALITY OF SAMPLES

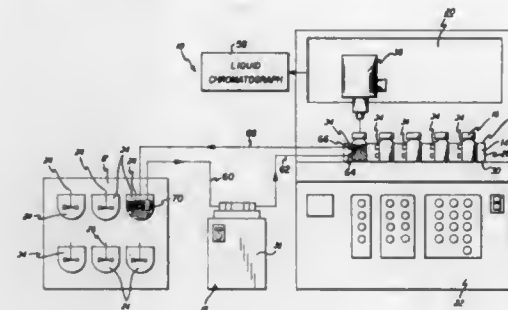
Michael W. Dong, Norwalk; Stanley K. Yarbrow, Newtown, and Frank Vandermark, Shelton, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 2, 1984, Ser. No. 585,797

Int. Cl.<sup>4</sup> G01N 21/05, 33/15, 35/08

U.S. Cl. 422-81

3 Claims



1. An apparatus for periodically monitoring the composition of a plurality of samples, said apparatus comprising, in combination:

- a plurality of sample holders each for holding a sample to be tested;
- a plurality of sample flow-through vials, each of said flow-through vials having an inlet and outlet and further including means for enabling the insertion into and withdrawal from each of said flow-through vials of a sample aspirating means;
- a plurality of return conduits, each of said return conduits coupling one of said outlets from one of said flow-through vials to one of said sample holders;
- a plurality of sample delivering means each of said delivery means including conveying means for causing fluid from one of said sample holders to be delivered into one of said sample flow-through vials, the fluid being returned to the same holders via a return conduit coupled between said one of said flow-through vials and said one of said holders; means, including sample aspirating means, for selectively withdrawing sample fluid from each of said flow-through vials; and
- means for analyzing sample fluid withdrawn by said aspirating means whereby said composition of said sample fluid from each of said sample holders is periodically monitored.

4,678,640

## INDICATOR FOR DETECTING RESIDUAL ETHYLENE OXIDE

Masanori Hamano, Koshigaya; Siro Takeuchi, Gyoda, and Ichiro Inoue, Hino, all of Japan, assignors to Ekika Carbon Dioxide Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 355,368, Mar. 8, 1982, abandoned. This application Nov. 18, 1985, Ser. No. 799,198

Claims priority, application Japan, Mar. 17, 1981, 56-37318

Int. Cl.<sup>4</sup> G01N 31/22

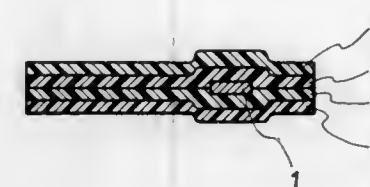
U.S. Cl. 422-56

10 Claims

1. An indicator for estimating concentrations of ethylene oxide remaining in medical instruments or sanitary goods during or after aeration following sterilization of said instruments or goods with ethylene oxide comprising:

- (a) a substrate formed by impregnating a paper body with a solution consisting of about 0.5-5% by weight of 4-(4-nitrobenzyl)-pyridine in an organic solvent and removing said solvent; and
- (b) an envelope enclosing said substrate, said envelope comprising a transparent, heat-sealable single layer or compos-

ite plastic film having a low permeability to ethylene oxide and a permeability to carbon dioxide of not more than about 200 ml/100 in <sup>2</sup>/mil/24 hours at 25° C. under 1 atmosphere and at 50% relative humidity, said substrate



sequentially changing color step-wise following the exposure of the indicator to ethylene oxide gas, with the color change of said substrate during the aeration being controlled by said envelope having a low permeability to ethylene oxide.

4,678,641

## ISOLATION LIQUID LAYER RETENTION DEVICE

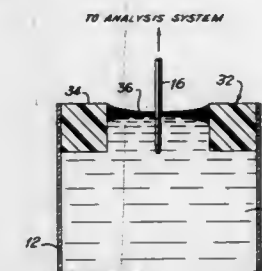
Michael M. Cassaday, Valhalla, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jun. 30, 1986, Ser. No. 879,918

Int. Cl.<sup>4</sup> B01L 11/00

U.S. Cl. 422-101

14 Claims



1. In an open container which contains a quantity of a first liquid and a layer of a denser isolation liquid which is generally immiscible with said first liquid and which is disposed atop said first liquid in surface contact therewith, the improvements comprising, an isolation liquid layer retention device operatively associated with said container, said device comprising a porous member which surrounds the surface of said liquid quantity and which contacts said first liquid and said isolation liquid layer to retain said isolation liquid layer in position atop said liquid quantity.

4,678,642

## BALLISTIC SEPARATION OF PARTICLES IN A PROGRESSIVE FLOW REACTOR

Donald M. Lee, Huntington, W. Va., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jan. 10, 1985, Ser. No. 690,236

Int. Cl.<sup>4</sup> F27B 15/08

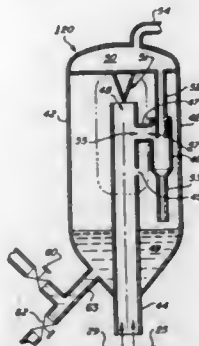
U.S. Cl. 422-144

16 Claims

1. In an apparatus for the separation of solid particulates suspended in a gaseous medium which comprises: a disengaging chamber serving as a reservoir for the collected solid particulates; a progressive flow reactor having means defining an upstream end and means defining a downstream end which further includes an axial opening wherein at least a portion of said reactor including said downstream end is enclosed within said disengaging chamber; means for effecting the flow of a gas-solid stream from the upstream end of said reactor towards said downstream end; and a take-off conduit in fluid communication with said reactor located at a position proximate said axial opening and which is connectable to a cyclone separator means, wherein the improvement comprises: providing means



defining a vapor pathway within said portion of said flow reactor through which vapors in a dilute phase within said disengaging chamber are induced to enter said reactor because



of a differential in pressure between said reactor and said disengaging chamber, wherein the ratio of the cross-sectional flow area of said pathway to the cross-sectional flow area of said take-off conduit is in the range of about 1:4 to about 1:8.

4,678,643

#### APPARATUS FOR CATALYTIC CLEANING OF EXHAUST GASES FROM A FURNACE SYSTEM

Wolfgang Fetzter, Heidelberg, Fed. Rep. of Germany, assignor to Svenska Rotor Maskiner Aktiebolag, Stockholm, Sweden  
PCT No. PCT/EP85/00063, § 371 Date Aug. 16, 1985, § 102(e) Date Aug. 16, 1985, PCT Pub. No. WO85/03645, PCT Pub. Date Aug. 29, 1985

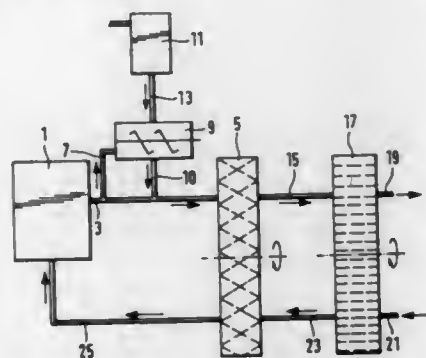
PCT Filed Feb. 21, 1985, Ser. No. 769,630

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406657

Int. Cl.<sup>4</sup> B01J 8/10

U.S. Cl. 422-175

23 Claims



1. Apparatus for selectively eliminating oxides of nitrogen in exhaust gases of furnace systems, comprising:  
a rotary catalytic converter having catalyst elements disposed in a movable carrier;  
exhaust gas connection means for supplying exhaust gases emerging from a furnace system to said catalytic converter in a first direction; chemical feed means and blending means coupled to said exhaust gas connection means upstream of said catalytic converter for introducing and blending at least one chemical compound with said exhaust gas emerging from a furnace system prior to said exhaust gases reaching said catalytic converter;  
a cleaning gas connection means coupled to said catalytic converter for introducing at least one cleaning gas flow into said catalytic converter countercurrent to the exhaust gas flow through said catalytic converter;  
said catalytic converter having a first zone through which said exhaust gases flow, and a second zone through which said at least one cleaning gas flows; and  
rotatable drive means coupled to said carrier for moving said carrier of said catalytic converter relative to said exhaust

and cleaning gas connection means such that said carrier is rotatable relative to said exhaust and cleaning gas connection means to thereby vary the location of catalytic converter segments through which the exhaust gases flow and through which the current of cleaning gas flows.

4,678,644

#### APPARATUS AND METHOD FOR PLASMA TREATMENT OF RESIN MATERIAL

Kenji Fukuta; Takaoki Kaneko, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation of Ser. No. 583,207, Feb. 24, 1984, abandoned.

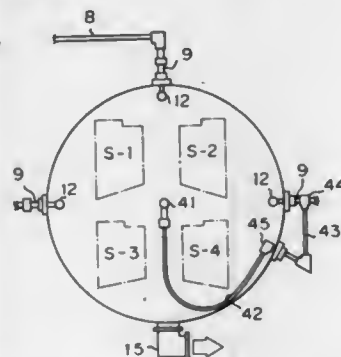
This application Jan. 30, 1986, Ser. No. 825,941

Claims priority, application Japan, Feb. 25, 1983, 58-29370; Apr. 13, 1983, 58-63733; Apr. 13, 1983, 58-63734; Apr. 13, 1983, 58-63735; Jun. 28, 1983, 58-115273; Jun. 28, 1983, 58-115274; Jul. 25, 1983, 58-134416

Int. Cl.<sup>4</sup> B01J 19/08

U.S. Cl. 422-186.05

9 Claims



1. An apparatus for plasma-treating works of resin material by irradiating the surfaces of the works with a microwave discharge plasma within a vacuum reaction chamber having an inner wall, comprising at least one first plasma-irradiating pipe fixed to the inner wall of the reaction chamber, said first plasma-irradiating pipe being provided with numerous small holes distributed along the length of said pipes, the distribution of said nozzle holes having a predetermined angular configuration within 7.5° to 45° along the length of said tubular pipes, and at least one second plasma-irradiating pipe formed of flexible material and having a free end, wherein said second plasma-irradiating pipe is movable so that said free end may be adjusted to an optional position within the reaction chamber.

4,678,645

#### CONVERSION OF LPG HYDROCARBONS TO DISTILLATE FUELS OR LUBES USING INTEGRATION OF LPG DEHYDROGENATION AND MOGDL

Clarence D. Chang; Joe E. Penick, both of Princeton, and Richard F. Socha, Trenton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 650,473, Sep. 14, 1984, Pat. No. 4,542,247.

This application May 30, 1985, Ser. No. 739,407

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> B01J 8/04; C07C 2/12, 2/74

U.S. Cl. 422-190

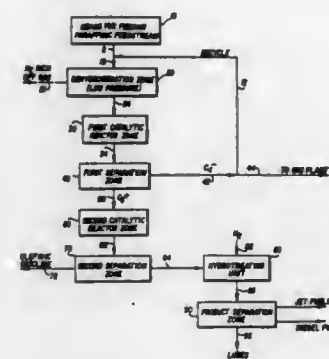
12 Claims

1. An apparatus for producing distillates or lubes from paraffins, which comprise:

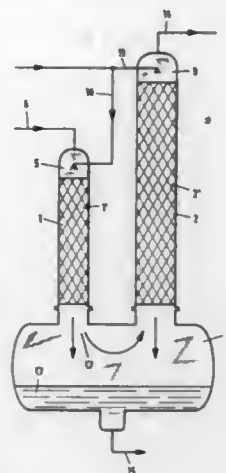
- a dehydrogenation reactor including means for passing a paraffinic feedstock stream into a dehydrogenation zone at conditions of pressure and temperature selected to convert the paraffins to an olefin rich effluent stream comprising at least one of the group consisting of propylene and butylene;
- a low pressure oligomerization catalytic reactor including means for contacting said olefin rich effluent stream in

a low pressure oligomerization catalytic reactor zone with a crystalline zeolite oligomerization catalyst at conditions of pressure and temperature selected to convert olefins to a first reactor effluent stream rich in liquid olefinic gasoline range hydrocarbons;

- a first means for separating the first reactor effluent stream to form a substantially liquid C<sub>5</sub><sup>+</sup> rich stream and a C<sub>4</sub><sup>-</sup> rich stream;
- means for passing said C<sub>5</sub><sup>+</sup> rich stream to a high pressure oligomerization catalytic reactor zone;
- a high pressure oligomerization catalytic reactor including means for contacting the substantially liquid C<sub>5</sub><sup>+</sup> rich



solution of alkanolamine in an absorption column containing structured packings each including a plurality of parallel corrugated plates having angularly disposed corrugations disposed in criss-crossing relation to a facing corru-



gated plate whereby the solvent absorbs the hydrogen-sulphide; collecting the hydrogen-sulphide loaded solvent; and removing the hydrogen-sulphide depleted gas.

4,678,649

# PROCESS FOR THE MANUFACTURE OF MONOPOTASSIUM PHOSPHATE

Josef Alexander, and Menachem Bar-on, both of Arad, Israel, assignors to Negev Phosphates Ltd., Israel

Filed Jun. 6, 1986, Ser. No. 872,061

Claims priority, application Israel, Jul. 10, 1985, 75767

Int. Cl.<sup>4</sup> C01B 15/16, 25/26

U.S. Cl. 423—308

9 Claims

1. A process for the manufacture of substantially pure monopotassium phosphate without utilizing organic solvents which comprises the steps of:

- reacting in at least two stages, at a temperature in the range of between 40 to 100 degrees centigrade monopotassium sulfate with a phosphate constituent selected from the group consisting of phosphate rock, dicalcium phosphate or mixtures thereof in the presence of phosphoric acid and in the absence of free sulfuric acid to form a slurry containing phosphoric acid, monopotassium phosphate and calcium sulfate, and separating out the formed calcium sulfate to obtain a filtrate containing phosphoric acid and monopotassium phosphate, the amount of phosphoric acid being in the range of between 5% and 35% of the total  $P_2O_5$ ;
- neutralizing at a pH in the range of between 3 to 7 the filtrate obtained in step (a) with a calcium-containing compound comprising  $Ca(OH)_2$ ,  $CaO$  or  $CaCO_3$  or mixtures thereof to obtain a slurry containing dicalcium phosphate, and separating out the dicalcium phosphate; and
- crystallizing, from the filtrate obtained in step (b) substantially pure monopotassium phosphate.

## PROCESS FOR MAKING AN ALKALI PHOSPHATE SOLUTION

Reinhard Gradl, and Gero Heymer, both of Erfstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 715,167

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413020

Int. Cl.<sup>4</sup> C01B 15/16

U.S. Cl. 423—309

3 Claims

1. In the process for making an aqueous alkali phosphate solution wherein an organic phase comprising a solution of phosphoric acid in a solvent immiscible or only partially miscible with water is countercurrently mixed with an aqueous phase containing an alkali compound dissolved therein, the organic phase and aqueous phase being used in a volume ratio larger than 1:1, and the resulting aqueous alkali phosphate solution being separated from the remaining organic phase, the improvement which comprises:

- mixing and simultaneously reacting the said two phases fed into at least one reaction zone comprising in each case a mixing zone and separating zone, the upper end of said mixing zone terminating inside or immediately below the separating zone and said mixing zone communicating directly with the separating zone;
- continuously dispersing in the aqueous phase the organic phase being in total larger in volume than the aqueous phase by introducing, prior to starting the reaction, an aqueous alkali phosphate solution having the composition desired for the final product into the mixing and separating zones;
- maintaining a volume excess of aqueous phase in the mixing zone by introducing feed material into the mixing zone and taking effluent material from the reaction zone in quantities sufficient for the layer separating the two phases from one another to reach considerably beyond the upper end portion of the mixing zone; and
- feeding the said two phases into the reaction zone in an overall quantity sufficient to provide a volume ratio of organic phase to aqueous phase of 4:6 to 2:8, in the mixing zone.

4,678,651

# PROCESS FOR PREPARATION OF FAUJASITE ZEOLITE

Hiroshi Miyazaki, Shinnanyo; Junji Arika, Tokuyama, and Michiyuki Almoto, Kadamatsu, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Jul. 11, 1985, Ser. No. 753,998

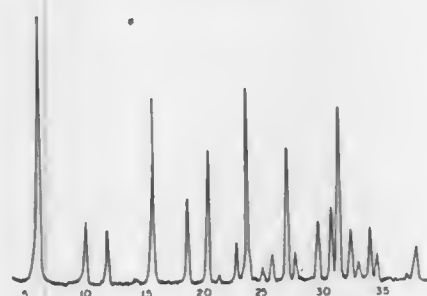
Claims priority, application Japan, Jul. 11, 1984, 59-142289

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> C01B 33/28

U.S. Cl. 423—329

3 Claims



1. A process for the preparation of a faujasite zeolite wherein a reaction mixture comprising a silica source, an alumina source and an alkali metal source is crystallized at an elevated temperature, characterized in that a transparent faujasite germ

solution is incorporated in the reaction mixture to be crystallized, and the reaction mixture having the transparent faujasite germ solution incorporated therein is then crystallized with stirring, said transparent faujasite germ solution being obtained by mixing and aging an aqueous solution of an alkali metal silicate, an aqueous solution of an alkali metal aluminate and an aqueous solution of an alkali metal hydroxide and having an oxide molar composition represented by the following oxide molar ratios:

$$SiO_2/Al_2O_3 = 8 \text{ to } 14,$$

$$M_2O/Al_2O_3 = 7 \text{ to } 30,$$

and

$$H_2O/M_2O = 10 \text{ to } 14,$$

wherein M represents an alkali metal, and the amount of said transparent faujasite germ solution being 1% to 30% by weight as  $Al_2O_3$  based on the resulting faujasite zeolite.

4,678,652

# PROCESS FOR PRODUCING SILICA IN FINE POWDER FORM

Hiroynki Tamenori, Kawanishi; Akihiko Hattori, Itami, and Mitsugi Yoshiyagawa, Yokkaichi, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Oct. 9, 1985, Ser. No. 785,806

Int. Cl.<sup>4</sup> C01B 33/12

U.S. Cl. 423—339

17 Claims

1. A process for producing silica in powder form, which comprises

- adding at least one water-miscible alcohol selected from water-miscible monohydric and dihydric alcohols to an aqueous solution of an alkali metal silicate having an  $SiO_2$  concentration of 9 to 20% by weight until a solid precipitate forms and the solution begins, or is about, to become turbid,
- adding a mineral acid to the resulting mixture in an amount 35 to 80% of the stoichiometrical amount required to neutralize the alkali metal silicate to precipitate silica as a fine powder, and
- thereafter bringing the resulting slurry into contact with a mineral acid under an acidity of at least 1N.

4,678,653

# PROCESS FOR PREPARING CHLORINE DIOXIDE

Maria G. Norell, and Johan C. Wanngård, both of Sundsvall, Sweden, assignors to KemaNord AB, Stockholm, Sweden

Filed Apr. 23, 1985, Ser. No. 726,330

Claims priority, application Sweden, Apr. 1, 1985, 8501615

Int. Cl.<sup>4</sup> C01B 7/01, 11/02, 17/74

U.S. Cl. 423—478

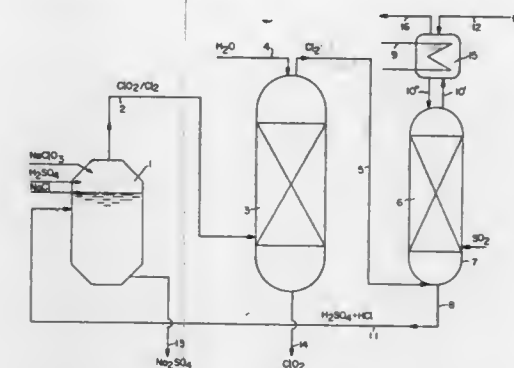
3 Claims

1. A process for production of chlorine dioxide which comprises:

- reacting in a chlorine dioxide generator sodium chlorate with chloride ions and sulfuric acid in an acid normality of about 2 to about 4.8 normal, said chloride ions being provided by hydrochloric acid or by a mixture of hydrochloric acid and sodium chloride, in proportions to generate chlorine dioxide,
- maintaining said reaction medium at a temperature from about 50° C. to about 100° C.,
- subjecting the reaction solution to a subatmospheric pressure sufficient to effect evaporation of water,
- precipitating sodium sulfate from the reaction medium and removing it from the reaction zone,
- withdrawing a mixture of chlorine dioxide, chlorine and water vapour and forming an aqueous solution of the chlorine dioxide and a gaseous chlorine stream therefrom,
- forwarding at least part of said chlorine to a reactor to exothermically react with sulfur dioxide in the presence of

water in order to produce a mixture of hydrochloric acid and sulfuric acid,

- removing heat from said exothermic reaction by keeping the reactor at a temperature at or above the boiling point of the mixed acid produced and evaporating 0.15 to 0.35 parts by weight of water based on one part by weight of the produced mixed acid and condensing the vapour withdrawn from the reactor in a condenser,



- introducing the condensed phase from the condenser to the top of the reactor,
- withdrawing produced mixed acid at the bottom of the reactor and
- introducing at least part of the produced mixed acid from step (i) into the chlorine dioxide generator.

4,678,654

# PROCESS FOR PRODUCTION OF CHLORINE DIOXIDE

Ulla-Kari M. Holmström, Sundsvall; Lage M. Sandgren, Kvissleby; Maria G. Norell, Sundsvall, and Peter A. Axegård, Solna, all of Sweden, assignors to KemaNord AB, Stockholm, Sweden

Filed Apr. 23, 1985, Ser. No. 726,327

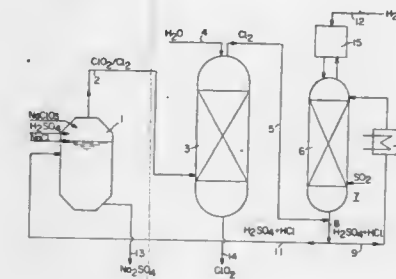
Claims priority, application Sweden, Mar. 4, 1985, 8501046

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> C01B 7/01, 11/02, 17/74

U.S. Cl. 423—478

10 Claims



1. A process for production of chlorine dioxide which comprises:

- reacting in a chlorine dioxide generator sodium chlorate with chloride ions and sulfuric acid in an acid normality of about 2 to about 4.8 normal, said chloride ions being provided by hydrochloric acid or by a mixture of hydrochloric acid and sodium chloride, in proportions to generate chlorine dioxide;
- maintaining said reaction medium at a temperature from about 50° C. to about 100° C.;
- subjecting the reaction solution to a subatmospheric pressure sufficient to effect evaporation of water;



- (d) precipitating sodium sulfate from the reaction medium and removing it from the reaction zone;
- (e) withdrawing a mixture of chlorine dioxide, chlorine and water vapour and forming an aqueous solution of the chlorine dioxide and a gaseous chlorine stream therefrom;
- (f) forwarding said chlorine to a production zone for hydrochloric acid and sulfuric acid comprising a primary reaction zone and a secondary reaction zone;
- (g) introducing sulfur dioxide and chlorine into the lower part of the primary reaction zone in contact with a fluid stream which contains hydrochloric acid and sulfuric acid, at least a portion of said chlorine coming from the secondary reaction zone, whereby said sulfur dioxide reacts with the chlorine in said primary reaction zone to form a fluid mixture of hydrochloric acid and sulfuric acid containing residual sulfur dioxide;
- (h) forwarding said fluid mixture of acids, which contains residual sulfur dioxide, from said primary reaction zone, to the secondary reaction zone and introducing chlorine, in an amount sufficient for gaseous chlorine to leave said secondary reaction zone and in an amount exceeding that which stoichiometrically corresponds to the reduction of the sulfur dioxide content in the mixed acid, into the lower part of said secondary reaction zone downstream of the sulfur dioxide feed stream in the primary reaction zone and in contact with said fluid mixture, the chlorine reacting with the sulfur dioxide and thereby reducing the sulfur dioxide content in the mixture of acids flowing through said secondary reaction zone, the chlorine and the sulfur dioxide being introduced into the production zone in substantially stoichiometrically equal amounts; and
- (i) forwarding at least part of the mixture of acids passing through said secondary reaction zone to the chlorine dioxide generator, and withdrawing gaseous chlorine from the top of the secondary reaction zone and passing it to the lower portion of the primary reaction zone.

4,678,655

## ACID RECOVERY IN CHLORINE DIOXIDE GENERATION

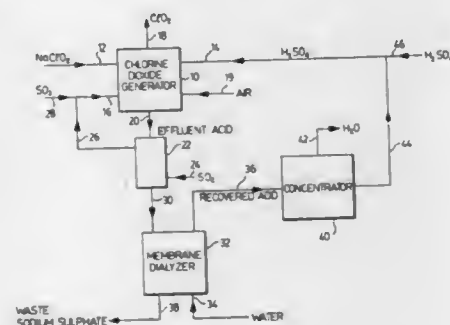
Zbigniew Twardowski, Mississauga, Canada, assignor to ERCO Industries Limited, Islington, Canada

Filed Aug. 1, 1984, Ser. No. 636,506

Int. Cl.<sup>4</sup> C01B 11/02; B01D 13/00; C02F 1/70

U.S. Cl. 423-478

24 Claims



1. A process for the production of chlorine dioxide, which comprises:
- reducing sodium chlorate in an aqueous sulphuric acid-containing reaction medium to which chlorine dioxide-generating reactants are continuously fed,
- continuously removing a sulphuric acid- and sodium sulphate-containing aqueous effluent stream from said reaction zone,
- continuously effecting preferential sulphuric acid migration from said effluent stream across an anion-exchange membrane to a recipient aqueous medium which has a lesser

acid concentration than the effluent stream to the extent of at least about 70% of the sulphuric acid in said effluent stream to form a sulphuric acid stream having a concentration of at least about 3.0 molar  $H_2SO_4$  and simultaneous preferential sodium sulphate retention in the effluent stream, whereby there is recovered from said effluent stream a sulphuric acid stream which can be concentrated to about 65%  $H_2SO_4$  without precipitation of sodium sulphate therefrom,

concentrating said sulphuric acid stream to a concentration of at least about 65%  $H_2SO_4$  without precipitating sodium sulphate therefrom to provide a concentrated sulphuric acid stream suitable for feed as one of said chlorine dioxide-generating reactants to said aqueous reaction medium, and

recycling said concentrated sulphuric acid stream to said aqueous reaction medium.

4,678,656

## FORMATION OF DENSE CHLORINE HYDRATE

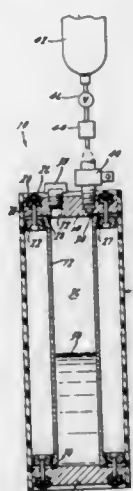
Harry K. Bjorkman, Jr., and Peter Carr, both of Greensboro, N.C., assignors to Energy Development Associates, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 673,223, Nov. 20, 1984, abandoned, which is a continuation of Ser. No. 475,184, Mar. 14, 1983, abandoned. This application Jul. 5, 1985, Ser. No. 752,349

Int. Cl.<sup>4</sup> C01B 7/01; H01M 8/06

U.S. Cl. 423-500

12 Claims



1. A method of forming chlorine hydrate, comprising the steps of:
- (a) providing a vessel capable of being sealed off from the ambient environment;
- (b) adding a quantity of an aqueous liquid to said vessel;
- (c) adding liquid chlorine into said vessel in a quantity such that a portion of the liquid chlorine evaporates until the pressure in said vessel is below 100 psig, but above those chlorine vapor pressures necessary for the formation of chlorine hydrate in the temperature range  $+6^\circ C.$  to  $+20^\circ C.$ , and said pressure is maintained throughout the formation of chlorine hydrate;
- (d) sealing the vessel;
- (e) allowing the quantity of aqueous liquid to react with the remaining liquid chlorine to form chlorine hydrate; and
- (f) removing the heat of hydrate formation to an environment having a temperature of approximately  $+6^\circ C.$  up to a room temperature of approximately  $26^\circ C.$

4,678,657

## PRODUCTION OF HIGH PURITY SUBSTANTIALLY SPHERICAL METAL HYDROXIDE/OXIDE PARTICLES FROM THE HYDROLYSIS OF A METAL ALKOXIDE AEROSOL USING METAL HYDROXIDE/OXIDE SEED NUCLEI

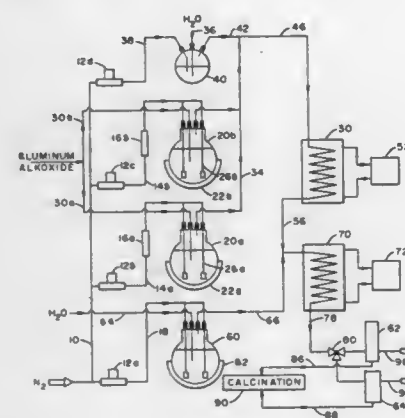
Ajay Sood, Ross Township, Allegheny County, and Robert A. Marra, Penn Hills, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 10, 1985, Ser. No. 742,770

Int. Cl.<sup>4</sup> C01E 7/02, 7/30, 7/36; C01B 13/14

U.S. Cl. 423-600

13 Claims



1. A process for the production of high purity substantially spherical metal oxide particles using seed nuclei consisting of particles of the same metal, which is in the hydroxide form, as produced by the process without introducing impurities which comprises:

- (a) forming a metal alkoxide vapor;
- (b) reacting said vapor with a non-reactive gas containing sufficient water vapor to hydrolyze a portion of the metal alkoxide vapor to form solid seed nuclei of metal hydroxide;
- (c) cooling the remaining metal alkoxide vapor containing the metal hydroxide seed nuclei sufficiently to form an aerosol comprising finely divided metal alkoxide liquid condensed on said solid metal hydroxide seed nuclei;
- (d) hydrolyzing said metal alkoxide aerosol while maintaining said aerosol under a turbulent flow condition, by contact with water vapor to hydrolyze said metal alkoxide liquid on said solid metal hydroxide seed nuclei to form substantially spherical metal hydroxide particles; and
- (e) calcining said substantially spherical metal hydroxide particles to form the corresponding metal oxide.

4,678,658

## AEROSOL GERMICIDE AND DYE

Irene Casey, Dept. 1013, P.O. Box 90020, Houston, Tex. 77290, and Daniel Tusé, Fremont, Calif., assignors to Larry Casey and Irene Casey, both of Houston, Tex.

Continuation-in-part of Ser. No. 738,082, May 24, 1985, abandoned. This application Nov. 26, 1986, Ser. No. 935,236

Int. Cl.<sup>4</sup> A61K 9/12, 7/46, 7/50; A01N 25/00

U.S. Cl. 424-7.1

7 Claims

1. A biocide aerosol spray dispensing unit for disinfecting a surface with a fine spray consisting essentially of
- a fluid biocide;
- a sufficiently airtight container for said fluid biocide;
- said fluid biocide including a lower alkyl alcohol having 1 to 4 carbon atoms, an effective amount of a disinfecting surfactant, a pH sensitive dye, and alkali means for adjusting the pH of the fluid to produce a color in the liquid in the dye so that upon neutralization the dye loses color; and

a propellant system to disperse a fine spray of said biocide on the surface to be disinfected.

4,678,659

## THERAPEUTIC DEVICES INCORPORATING WATER SOLUBLE GLASS COMPOSITIONS

Cyril F. Drake, Harlow, and John R. Brocklehurst, Bishop's Stortford, both of England, assignors to STC, plc, London, England

Continuation-in-part of Ser. No. 673,273, Nov. 20, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,067

Claims priority, application United Kingdom, Nov. 26, 1983, 8331661

Int. Cl.<sup>4</sup> A61K 9/00; A01N 11/04

U.S. Cl. 424-451

7 Claims

1. A therapeutic device for oral administration to the alimentary tract, the device being readily soluble in that part of the alimentary tract where low pH conditions pertain but which is of low solubility under high pH conditions, the device comprising a sealed capsule of a water soluble glass containing a therapeutic material, wherein said glass comprises phosphorus pentoxide as the glass forming oxide, a first glass modifying oxide ( $M_2O$ ) selected from the group consisting of alkali metal oxides and mixtures thereof, and a second glass modifying oxide ( $M'O$ ) selected from the group consisting of alkaline earth metal oxides, zinc oxide, cupric oxide and mixtures thereof, and wherein the glass has a composition selected from the range 25.0 to 40.3 mole %  $M_2O$ , 25.0 to 35.0 mole %  $M'O$  and 33.5 to 45 mole %  $P_2O_5$ , the composition being such that the ratio of the dissolution rates of the glass at pH 2 and at pH 6 is at least 60 to 1, whereby in use, when in contact with a part of the alimentary tract where low pH conditions pertain, rapid dissolution of the capsule is effected to provide release of the therapeutic material as a single dose.

4,678,660

## THERMOPLASTIC POLYURETHANE ANTICOAGULANT ALLOY COATING

Charles W. McGary, Centerville, and Donald D. Solomon, Spring Valley, both of Ohio, assignors to Deseret Medical, Inc., Franklin Lakes, N.J.

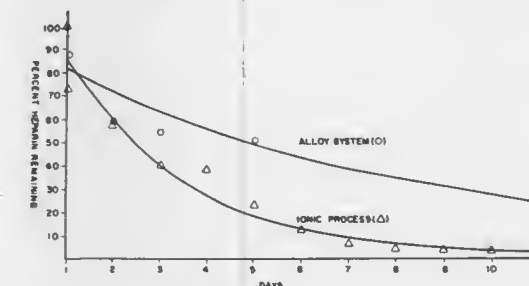
Continuation-in-part of Ser. No. 679,160, Dec. 7, 1984. This application Aug. 14, 1985, Ser. No. 765,612

The portion of the term of this patent subsequent to Jan. 30, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> C08L 5/10; A61K 31/75

U.S. Cl. 424-25

15 Claims



1. A thermoplastic polyurethane product possessing long-term antithrombogenic and antibiotic properties, comprising
- (a) a polyurethane alloy complex formed in a solvent solution;
- (b) said polyurethane alloy complex including
- (1) a thermoplastic polyurethane;
- (2) a material dispersed throughout said thermoplastic polyurethane;
- (3) said dispersed material being selected from the group consisting of an antithrombogenic material, an antibiotic material, and mixtures thereof;

- (4) said dispersed material ionically bonded to said thermoplastic polyurethane by a quaternary ammonium compound;
- (c) a solid polyurethane substrate separate from said thermoplastic polyurethane in said polyurethane alloy complex comprised of a material not soluble in said solvent solution for said polyurethane alloy complex; and
- (d) said polyurethane alloy complex being in the form of a surface layer on said separate polyurethane substrate.

4,678,661

## EFFERVESCENT COMPOSITION AND METHOD OF MAKING SAME

Gerhard Gergely; Thomas Gergely, and Irmgard Gergely, all of Gartengasse 8, A1050 Wien, Austria  
Continuation-in-part of Ser. No. 655,919, Sep. 27, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,081  
Claims priority, application Austria, Sep. 28, 1983, 3450/83; Fed. Rep. of Germany, Sep. 21, 1984, 3434774; May 21, 1986, 3617058

Int. Cl. A61K 33/10

U.S. Cl. 424-44

32 Claims

1. An effervescent granulate comprising:  
a core of solid, edible organic acid crystals,  
a first layer of calcium carbonate bonded to said core by means of a reaction product bonding layer produced by a reaction at the interface between said core and said first layer of calcium carbonate, and  
a second layer of a carbonate or bicarbonate enveloping said first layer.

4,678,662

## PYROPHOSPHATE COATING PROCESS FOR CALCIUM CARBONATE DENTAL ABRASIVES

Albert S. C. Chan, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 9, 1985, Ser. No. 785,702

Int. Cl. C01F 11/18; C08K 9/02; C09C 1/02; A61K 7/16

U.S. Cl. 424-57

20 Claims

1. A treated calcium carbonate abrasive being the product of the method comprising contacting pulverized calcium carbonate having an average particle size of 0.2-30 microns in a liquid dispersion with an alkali metal pyrophosphate source under reactive conditions fostering the limited production of a pyrophosphate derivative selected from the group consisting of calcium pyrophosphate, calcium alkali metal pyrophosphate, and mixtures thereof so as to provide a coated calcium carbonate particle wherein the coating comprises from about 1-50% by weight of the particle of the pyrophosphate derivative.

4,678,663

## HYDROQUINONE COMPOSITION HAVING ENHANCED BIO-AVAILABILITY AND PERCUTANEOUS ADSORPTION

Richard A. Scott, Burbank; Mitchell S. Wortzman, Los Angeles, both of Calif., and Eric Jungermann, Phoenix, Ariz., assignors to Nuetrogena Corporation, Los Angeles, Calif.

Filed Feb. 6, 1984, Ser. No. 577,513

Int. Cl. A61K 7/44, 7/135, 31/74

U.S. Cl. 424-62

8 Claims

1. A pharmaceutical preparation having enhanced bioavailability and percutaneous adsorption comprising a mixture containing from about 20% up to about 40% (w/w) fatty alcohol having 12 to 22 carbon atoms or mixtures thereof; from about 30% up to about 60% (w/w) of a volatile silicone; from about 0.1% up to about 10% (w/w) of hydroquinone and from about 1% to about 10% of an ingredient selected from a preservative, an emulsifier or a mixture thereof.

4,678,664

## MINERAL OIL GELS

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Corporation, Wyandotte, Mich.

Filed Sep. 30, 1982, Ser. No. 430,175

Int. Cl. A61K 7/32, 7/34, 7/36, 7/38

U.S. Cl. 424-65

10 Claims

1. In a mineral oil gel composition the improvement for achieving a stable, homogeneous gel which does not require high speed mixing, wherein said composition consists essentially of by weight about 1 to 20 percent mineral oil, about 10 to 25 percent of a polyoxyethylene-polyoxybutylene block copolymer designated as copolymer A, about 2 to 10 percent of a polyoxyethylene-polyoxybutylene block copolymer designated as copolymer B wherein said block copolymers are cogeneric mixtures of conjugated polyoxybutylene-polyoxyethylene compounds containing in their structure oxybutylene groups, oxyethylene groups and an organic radical derived from a water-soluble organic compound containing a plurality of reactive hydrogen atoms and 2 to 12 carbon atoms wherein copolymer A has a molecular weight of the polyoxybutylene portion of at least about 1800 and the polyoxyethylene portions contribute from about 60 to 80 percent by weight of the compound and copolymer B has a polyoxybutylene portion with a molecular weight of at least about 600 and the polyoxyethylene portion contributes from about 20 to 40 percent by weight of the compound, 0 to about 25 percent of other additives, balance water.

4,678,665

## POLYANIONIC COMPOUNDS DERIVED FROM AROMATIC ETHERS OF POLYGLYCEROLS

Guy Vanlerberghe, Claye Souilly, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Aug. 2, 1984, Ser. No. 637,025

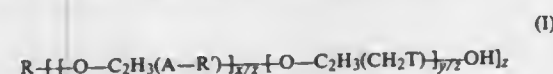
Claims priority, application Luxembourg, Aug. 2, 1983, 84 941  
The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl. A61K 7/09; C07C 149/273

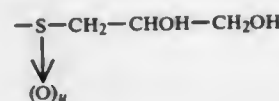
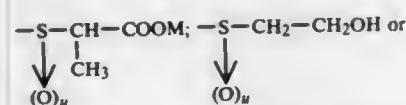
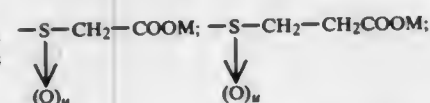
U.S. Cl. 424-72

22 Claims

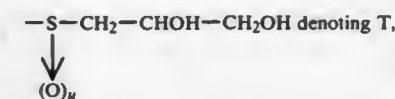
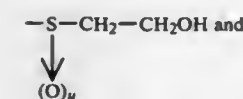
1. A product comprising a compound of formula (I)



- in which R denotes an aromatic or alkylaromatic radical of valency z, of 6 to 18 carbon atoms;  
A denotes CH<sub>2</sub> or CH<sub>2</sub>-O;  
R' denotes H, an aliphatic radical having from 1 to 16 carbon atoms, or a phenyl radical, with the proviso that R' cannot denote H if A denotes CH<sub>2</sub>-O;  
x denotes an integer or decimal number from 1 to 8;  
y denotes an integer or decimal number from 1 to 20;  
z is an integer from 1 to 3; and  
T denotes

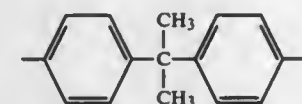


in which M denotes an alkali metal, an ammonium group or a substituted ammonium group; and  
u denotes zero or 1, such that, in the product, the groups



if present, are present in a total amount of 1% to 50% by weight of the T groups.

6. The product of claim 1 wherein R represents

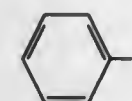


R' represent C<sub>9</sub>H<sub>19</sub>, A represents CH<sub>2</sub>, T represents -S-CH<sub>2</sub>-COONa, x=2, y=13 and z=2.

13. The product of claim 1 wherein R represents



R' represents



A represents CH<sub>2</sub>O, T represents -S-CH<sub>2</sub>-CH<sub>2</sub>-COONa, x=5, y=5 and z=1.

4,678,666

## TOPICAL ANTI-INFLAMMATORY COMPOSITIONS

Shigenori Nozawa; Katsumi Ohaya, both of Aichi, and Toshiji Kawazoe, Inuyama, all of Japan, assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 646,403, Sep. 4, 1984, abandoned,

which is a continuation of Ser. No. 509,114, Jun. 29, 1983,

abandoned. This application Aug. 14, 1986, Ser. No. 896,370

Claims priority, application Japan, Jul. 13, 1982, 57-121853

Int. Cl. A61K 31/78

U.S. Cl. 424-81

4 Claims

1. A topical anti-inflammatory composition in gel ointment form comprising in an aqueous system an effective anti-inflammatory amount of piroxicam; from about 10% to about 50% by weight of a lower alkanol having from one to four carbon atoms; from about 0.2% to about 2.0% by weight of carboxyvinyl polymer; from about 5% to about 40% by weight of at least one polyhydric alcohol selected from the group consisting of lower alkylene glycol having from two to six carbon atoms, glycerine and polyethylene glycol having an average molecular weight of 200 to 2,000; and a piroxicam-solubilizing amount of from about 1.0% to about 3.0% by weight of at least one alkanolamine having from one to four carbon atoms, dialkanolamine having from two to eight carbon atoms and trialkanolamine having from three to twelve carbon atoms; and from about 0.2% by weight to about 2.0% by weight of at least one film-forming agent selected from the group consisting of car-

boxymethyl cellulose, hydroxyethyl cellulose and polyvinylpyrrolidone, and sufficient water to total 100%, said composition having a pH range of from about 6.5 to about 9.0.

4,678,667

## MACROCYCLIC BIFUNCTIONAL CHELATING AGENTS

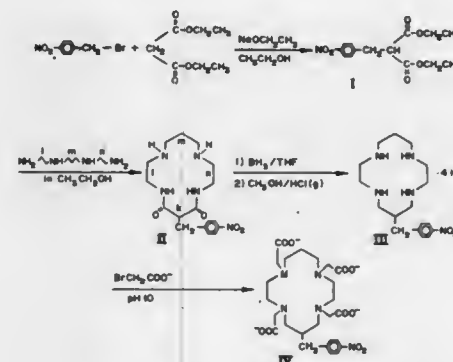
Claude F. Meares, Davis; Sally J. DeNardo, El Macero, both of Calif.; William C. Cole, Houston, Tex., and Min K. Mol, Davis, Calif., assignors to 501 Regents of the University of California, Berkeley, Calif.

Filed Jul. 2, 1985, Ser. No. 751,769

Int. Cl. A61K 39/00, 39/42, 43/00, 49/00

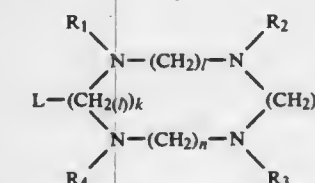
U.S. Cl. 424-85

14 Claims



1. A copper chelate conjugate for diagnostic or therapeutic applications which involve Cu(II) localization via the systemic route, comprising:

a Cu(II) chelate of a bifunctional macrocyclic polyamine having the form:



where k, l, m, and n=1-4, and at least two of R<sub>1</sub>-R<sub>4</sub> are -CH<sub>2</sub>CO<sub>2</sub><sup>-</sup> acid groups, the remainder are -CH<sub>2</sub>CO<sub>2</sub><sup>-</sup> or -H, L is a linker attached at one end to a ring carbon in the polyamine, and having at its other end, a chemically reactive group capable of reacting with a biomolecule, to form a chemical linkage therewith, and CH<sub>2</sub>(<sub>l</sub>) indicates that the ring carbon to which the linker is attached has only one hydrogen, and chemically linked to the linker, a biomolecule selected from the group consisting of antibodies, antibody fragments, serum proteins, and bleomycin.

4,678,668

## METHOD OF REDUCING SOFT TISSUE SWELLING AND PAIN

Robert L. Darras, San Pedro, Calif., assignor to MD Associates, Rolling Hills Estates, Calif.

Filed Oct. 28, 1985, Ser. No. 792,001

Int. Cl. A61K 37/48

U.S. Cl. 424-94.75

6 Claims

1. A method for reducing soft tissue swelling and pain of animals comprising administering topically to the animal a composition comprising from 10 to 100 units of a proteolytic enzyme selected from the group consisting of papain, trypsin, chymotrypsin, hyaluronidase or mixtures thereof dissolved in



a transfer vehicle in an amount sufficient to transport the proteolytic enzyme through the soft tissue of the animal.

protein being a non-crosslinked protein or a crosslinked protein, said conjugate having been formed by coupling a protein

4,678,669

**METHOD OF USING IMMUNIZING COMMENSALS**  
Jacques J. L. Ricard, Sigtuna, Sweden, assignor to Suoma Ricard and Thomas Ricard, both of Sigtuna, Sweden  
Continuation of Ser. No. 269,765, Jun. 3, 1981, abandoned, which is a continuation-in-part of Ser. No. 76,061, Sep. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 883,272, Mar. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 722,767, Sep. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 593,355, Jul. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 489,874, Jul. 18, 1974, abandoned, which is a continuation of Ser. No. 32,281, Apr. 27, 1970, abandoned. This application Feb. 2, 1984, Ser. No. 576,171

Claims priority, application United Kingdom, Apr. 29, 1969, 21834/69; France, Mar. 3, 1977, 77 06300; Sep. 22, 1978, 78 27197

Int. Cl.<sup>4</sup> A01N 63/00, 63/02; A61K 37/00

**U.S. Cl. 424-93**  
1. A method for controlling soil-borne pathogens in plants comprising treating said plants with a mixture containing a viable culture of *Trichoderma* together with the partially digested growth medium of the culture containing the propagules and metabolic products resulting from growth of the organism, which digested medium enables said *Trichoderma* to grow internally within the plant, said *Trichoderma* being present in the mixture at a concentration of at least  $10^8$  spores/grams of the mixture and being antagonistic with respect to the soil-borne pathogens to be controlled.

4,678,670

**PHARMACEUTICAL COMPOSITIONS FOR THE TREATMENT OF DIABETES AND OF HEPATIC DISEASES AND MALFUNCTIONS**  
Dobrovoje Tomic, 11, Dell'Oro Street, Caldaro (Bolzano), Italy  
Filed Feb. 5, 1985, Ser. No. 698,406  
Claims priority, application Italy, Feb. 17, 1984, 19681 A/84  
Int. Cl.<sup>4</sup> A61K 31/00

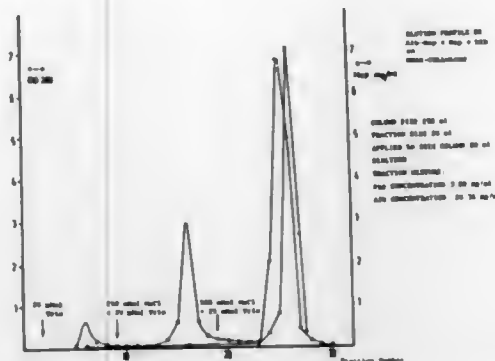
**U.S. Cl. 424-127**  
6 Claims  
1. A pharmaceutical composition for the therapy of diabetes and viral hepatitis and malfunctions which consists of component (a) sodium nitrate; component (b) which is a monosaccharide or a disaccharide which is cane sugar, saccharose, lactose, glucose or honey; the ratio of component (a) and (b) being in the ratio of 1:3-3:1 and at least one excipient.

4,678,671

**CONJUGATES OF ANTICOAGULANT AND PROTEIN**  
Jan Feijen, Hengelo, and Wilhelmus E. Hennink, Enschede, both of Netherlands, assignors to Cordis Europa N.V., Roden, Netherlands  
Division of Ser. No. 716,197, Mar. 26, 1985, Pat. No. 4,634,762, which is a division of Ser. No. 449,248, Dec. 13, 1982, Pat. No. 4,526,714. This application Sep. 9, 1986, Ser. No. 905,573  
Int. Cl.<sup>4</sup> A61K 37/00; C07C 103/52

**U.S. Cl. 424-443**  
2 Claims  
1. An article including a surface having an enhanced blood compatibility coating, wherein the coating is effected from a conjugate of anticoagulant and a water soluble protein, said

component and an anticoagulant with an amide bond forming agent.



4,678,672

**REDUCED CALORIE CRACKERS AND PROCESSES FOR PRODUCING SAME**  
Clemence K. Dartey, Oakland, and Richard H. Biggs, Paterson, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.  
Continuation-in-part of Ser. No. 589,588, Mar. 14, 1984. This application May 21, 1985, Ser. No. 736,355  
Int. Cl.<sup>4</sup> A21D 2/00, 8/02, 10/00

**U.S. Cl. 426-19**  
78 Claims  
1. A dough composition for producing reduced calorie crackers, the composition comprising:  
(a) from about 25 to about 85 percent by weight of flour;  
(b) from 0 to about 10 percent by weight fat or shortening;  
(c) from about 5 to about 20 percent by weight of a water-soluble polydextrose;  
(d) from 0 to about 5 percent by weight of at least one emulsifier;  
(e) from about 0.5 to about 5 percent by weight of a leavening system, the leavening system comprising yeast and a material which releases carbon dioxide during baking; and  
(f) from about 1.5 to about 10 percent by weight of a cellulosic bulking agent,  
said percentages being based upon the total weight of the dough, the total amount of the fat, shortening and emulsifier being from about 3 to about 10 percent by weight of the dough.

4,678,673

**FERMENTED OILSEED PRODUCT FOR PREPARING IMITATION DAIRY PRODUCTS**  
Wayne E. Marshall, Spring Grove, and Constance J. Hofmann, Arlington Heights, both of Ill., assignors to Kraft, Inc., Glenview, Ill.  
Filed Mar. 9, 1984, Ser. No. 587,982  
Int. Cl.<sup>4</sup> A23L 1/20; A23C 11/06, 20/00

**U.S. Cl. 426-46**  
8 Claims  
1. A method for producing an oilseed product containing diacetyl and acetylmethylcarbinol for use in preparing imitation dairy products, comprising the steps of grinding and combining with water an oilseed material selected from the group consisting of whole peanuts, cottonseeds, rapeseeds, sunflower seeds, soybeans and mixtures thereof, to provide a ground aqueous oilseed slurry comprising from about 9 percent to about 18 weight percent of the oilseed component, pasteurizing the aqueous slurry, inoculating the oilseed slurry with *Lactobacillus casei* ssp *rhannosus* ATCC 39595 or diacetyl and acetylmethylcarbinol-producing microorganisms derived therefrom at an inoculum concentration level in the range of

from about  $5 \times 10^5$  to about  $1 \times 10^9$  cells per milliliter of the slurry, fermenting said slurry for a period of less than 8 hours, at a pH in the range of from about 6 to about 7 at a temperature in the range of from about 75° F. to about 90° F., and pasteurizing the fermented slurry to provide a fermented oilseed product having a flavor suitable for use in an imitation dairy product, a smooth texture and enhanced quantities of diacetyl and acetylmethylcarbinol.

4,678,674

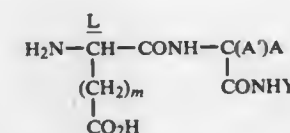
**SWEETENING WITH L-AMINODICARBOXYLIC ACID AMIDES**

Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 795,377, Nov. 5, 1985, which is a division of Ser. No. 723,600, Apr. 15, 1985, Pat. No. 4,572,799. This application Oct. 16, 1986, Ser. No. 919,907  
Int. Cl.<sup>4</sup> A23L 1/236

**U.S. Cl. 426-548**  
25 Claims

1. A composition comprising an edible composition and an effective sweetening amount of compound represented by the formula:



wherein

A is  $\text{CO}_2\text{R}$  wherein R is alkyl containing 1-3 carbon atoms;  
A' is hydrogen or alkyl containing 1-3 carbon atoms;  
Y is  $-(\text{CHR}_2)_n-\text{R}_1$  or  $-\text{CHR}_3\text{R}_4$ ;  
R<sub>1</sub> is cycloalkyl, cycloalkenyl, lower alkyl substituted cycloalkyl or cycloalkenyl, bicycloalkyl, bicycloalkenyl or tricycloalkyl containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;  
R<sub>2</sub> is H or alkyl containing 1-4 carbon atoms;  
R<sub>3</sub> and R<sub>4</sub> are each cycloalkyl containing 3-4 ring carbon atoms;  
n is 0 or 1; and  
m is 0 or 1;  
and food acceptable salts thereof.

4,678,675

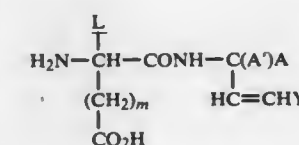
**SWEETENING WITH L-AMINODICARBOXYLIC ACID ALKENES**

Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 730,968, May 6, 1985, Pat. No. 4,652,676. This application Oct. 14, 1986, Ser. No. 918,417  
Int. Cl.<sup>4</sup> A23L 1/236

**U.S. Cl. 426-548**  
24 Claims

1. A composition comprising an edible composition and an effective sweetening amount of compound represented by the formula:



wherein

A is hydrogen, alkyl containing 1-3 carbon atoms or alkoxy-methyl wherein the alkoxy contains 1-3 carbon atoms;  
A' is hydrogen or alkyl containing 1-3 carbon atoms;  
A and A' taken together with the carbon atom to which they

are attached form cycloalkyl containing 3-4 carbon atoms;

Y is  $-(\text{CHR}_2)_n-\text{R}_1$  or  $-\text{CHR}_3\text{R}_4$ ;

R<sub>1</sub> is cycloalkyl, alkyl-substituted cycloalkyl, cycloalkenyl, alkyl-substituted cycloalkenyl, bicycloalkyl, alkyl-substituted bicycloalkyl, bicycloalkenyl, or alkyl-substituted bicycloalkenyl containing up to 7 ring carbon atoms and up to a total of 12 carbon atoms;

R<sub>2</sub> is H or alkyl containing 1-4 carbon atoms;

R<sub>3</sub> and R<sub>4</sub> are each cycloalkyl containing 3-4 ring carbon atoms;

n is 0 or 1; and

m is 0 or 1;

and food acceptable salts thereof.

4,678,676

**METHOD OF PRODUCING CHEESE-LIKE EMULSIFIED FOOD**

Waichi Ishizuka, and Ryoichi Aoki, both of Yokohama, Japan, assignors to Taiyo Yushi K.K., Yokohama, Japan  
Filed Oct. 4, 1984, Ser. No. 657,496

Claims priority, application Japan, Oct. 4, 1983, 58-185697

Int. Cl.<sup>4</sup> A23J 3/00, 1/14; A23C 20/02

**U.S. Cl. 426-573**  
9 Claims

1. A method of producing a cheese-like emulsified food, comprising:

- preparing a tofu containing 10-50% soybean solids by preparing a soy milk by extracting whole soybeans or dehulled soybeans with hot water, deodorizing the soy milk and precipitating soybean solids from the milk by adding a salt thereto;
- preparing a mixture of (1) from 3-30%, based on the emulsified mixture prepared prior to heating step (c), of said tofu, (2) from 5-40% of oils and fats selected from the group consisting of animal oils and fats, vegetable oils and fats and processed animal and vegetable oils and fats, (3) from 0.1 to 10% of at least one heat coagulable protein selected from the group consisting of egg white protein, blood plasma protein, whey protein concentrate, wheat gluten and fish protein in an irreversible gel forming amount and (4) from 0.1 to 5% of at least one stabilizer, the amounts of said heat coagulable protein, said oil and fat ingredient and said stabilizer being based on the amount of emulsified product produced; and
- blending and deaerating said mixture and thereafter heating said mixture at a temperature and for a time period sufficient to effect gelation of protein components and to effect sterilization of the resulting product.

4,678,677

**PROCESS FOR PREPARING TOFU CHARGED INTO A CONTAINER**

Ko Sugisawa; Yasushi Matsumura; Koji Sengoku, and Yoshiaki Nagatome, all of Nara, Japan, assignors to House Food Industrial Company Limited, Higashiosaka, Japan  
Filed Jun. 3, 1985, Ser. No. 740,414

Claims priority, application Japan, Jul. 4, 1984, 59-138481

Int. Cl.<sup>4</sup> A23L 1/20; A23J 3/00

**U.S. Cl. 426-634**  
4 Claims

1. A process for preparing tofu charged into a container which comprises forming a mixture by adding a coagulant to a solution selected from the group consisting of soybean milk and aqueous solution of isolated soybean protein; homogenizing the mixture within 30 minutes after addition of the coagulant, under a homogenizing pressure of no less than 30 kg/cm<sup>2</sup> by a pressure-type homogenizer; and coagulating the mixture by heating after it has been charged into a packaging container and sealed therein.

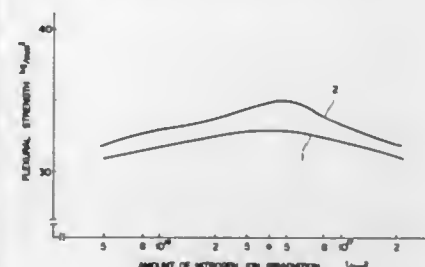
4,678,678

## METHOD OF STRENGTHENING CERAMICS

Osami Kamigaito; Haruo Doi; Shoji Noda; Tatsumi Hloki; Akio Itoh, and Mitsutaka Kakeno, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusbo, Aichi, Japan  
 Filed Jan. 25, 1985, Ser. No. 694,759  
 Claims priority, application Japan, Feb. 22, 1984, 59-31880  
 Int. Cl.<sup>4</sup> B05D 3/06

U.S. Cl. 427-38

11 Claims



1. A method of strengthening a ceramic material as structural material, comprising forming a metal film on the surface of the ceramic material selected from the group consisting of alumina ( $\text{Al}_2\text{O}_3$ ), zirconia ( $\text{ZrO}_2$ ), silicon nitride ( $\text{Si}_3\text{N}_4$ ), and silicon carbide ( $\text{SiC}$ ), and irradiating the surface of said metal film with high energy ions of a substance which is gaseous at ambient temperature, said ions having an energy of 1 KeV to 3 MeV, so as to reduce fracture sensitivity.

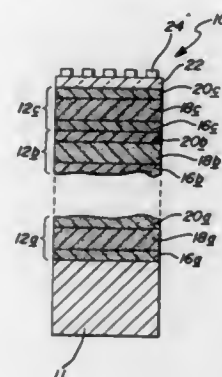
4,678,679

## CONTINUOUS DEPOSITION OF ACTIVATED PROCESS GASES

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.  
 Filed Jun. 25, 1984, Ser. No. 623,858  
 Int. Cl.<sup>4</sup> B05D 3/06

U.S. Cl. 427-38

26 Claims



1. A method of continuously depositing thin films of high quality semiconductor alloy material, said method comprising the steps of:

- providing a deposition chamber;
- maintaining a reduced pressure within the chamber;
- providing a plurality of activation regions in the chamber;
- providing at least one deposition region in the chamber, said deposition region proximately disposed relative to the activation regions;
- movingly disposing substrate material in the deposition region for the continuous deposition of semiconductor alloy material thereupon;
- introducing semiconductor precursor material into one of the activation regions;

introducing density of states reducing material into a different one of the activation regions;

exciting the semiconductor precursor material and the states reducing material in respective ones of the activation regions by a flux of energetic gas; and,

directing the activated semiconductor precursor material and the states reducing material to the deposition region within the lifetime of the activated species, whereby a thin film of semiconductor material characterized by specifically tailored properties, including a low density of defect states, tetrahedral coordination and substantially stress-free bonding, is continuously deposited onto the substrate material.

4,678,680

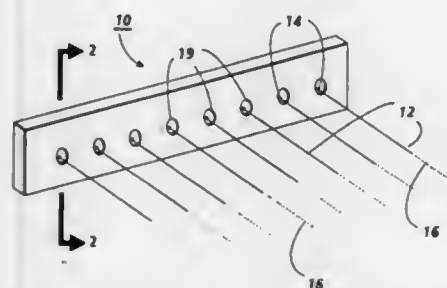
## CORROSION RESISTANT APERTURE PLATE FOR INK JET PRINTERS

Gerald Abowitz, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 20, 1986, Ser. No. 831,212  
 Int. Cl.<sup>4</sup> B05D 3/06

U.S. Cl. 427-38

5 Claims



1. A method of producing a corrosion resistant aperture plate having a plurality of nozzles through opposing surfaces thereof which provide passageways therethrough having internal surfaces, such an aperture plate being suitable for use in a continuous stream type ink jet printer, said method comprising the steps of:

- (a) cleaning the aperture plate in a clean room, and maintaining the cleanliness of the aperture plate until the method is complete;
- (b) uniformly subjecting one of the surfaces of the aperture plate and some portions of the surfaces of its nozzles to an ion bombardment having an energy level of 30-50 KEV to cause at least some of said ions to penetrate at least a portion of the aperture plate and nozzle surfaces to a predetermined depth and with a predetermined density without causing embrittlement or warpage thereof through overheating, said ions becoming implanted among the molecular lattice structure of the aperture plate material, so that the corrosion protecting ion do not change the area dimension of the nozzles;
- (c) rotating said one surface of the aperture plate at an angle relative to the direction of ion flow during step (b), in order to enable ion implantation substantially uniformly along at least a portion of the nozzle surfaces, as well as the surface of the aperture plate which confronts and receives the ions;
- (d) inverting the aperture plate to enable the other surface thereof to confront the ion flow; and
- (e) repeating step (c) so that both surfaces of the aperture plate and the entire surface of each nozzle is substantially uniformly implanted by the ions of said ion beam generating device.

4,678,681

## PROCESS FOR PREPARATION OF WATER-PROOF SHEETS

Tsutomu Obayashi, Tokyo; Shinobu Watanabe, Gunma, and Kazuhide Ino, Soka, all of Japan, assignors to Hiraoka & Co. Ltd., Tokyo, Japan

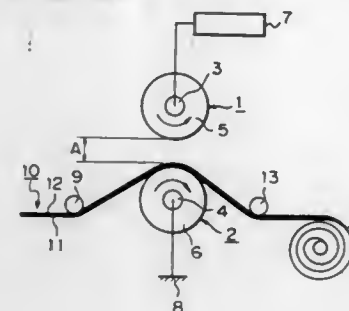
Filed Oct. 1, 1985, Ser. No. 782,355

Claims priority, application Japan, Oct. 5, 1984, 59-208356;  
 Nov. 20, 1984, 59-243361

Int. Cl.<sup>4</sup> B05D 3/06

U.S. Cl. 427-38

11 Claims



1. A process for the preparation of water-proof sheets from textile fibers which have been formed into a fabric, through the use of weaving, knitting or non-woven fabric forming techniques, the process comprising the steps of forming a polymer coating on both the surfaces of a fibrous fabric substrate, wherein the fibrous substrate is first treated with a water repellent, both the surfaces of the fabric are subjected to low temperature plasma treatment, and a polymer coating is then formed on both the surfaces of the fabric.

4,678,682

## PROCESS FOR PRODUCING MAGNETIC RECORDING MEDIUM

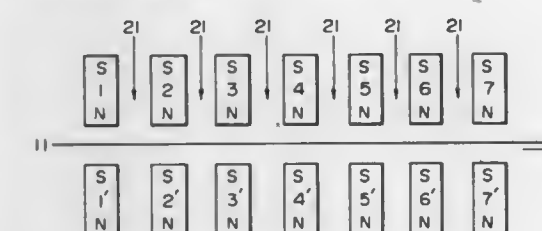
Takamitsu Asai; Goro Akashi; Tatsuji Kitamoto; Hiroshi Chikamasa, and Tsunehiko Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
 Filed May 20, 1983, Ser. No. 496,734

Claims priority, application Japan, May 20, 1982, 57-84063;  
 May 21, 1982, 57-84919

Int. Cl.<sup>4</sup> B05D 3/14

U.S. Cl. 427-48

3 Claims



1. A process of producing a magnetic recording medium by drying a web having a magnetic layer containing ferromagnetic particles on a nonmagnetizable support in an undried state while orienting the magnetic layer in a magnetic field in the direction perpendicular to the web surface, comprising: passing said web through a magnetic field formed by plural pairs of opposite pole type magnets disposed in the travelling direction of the web with a gap between the pairs of magnets, while supplying drying air through said gaps onto the travelling web, to perform the magnets, while supplying drying air through said gaps onto the travelling web, to perform the magnetic orientation of the magnetic layer and at least substantially complete the drying of the magnetic layer while said web is within said magnetic field, wherein a partition is inserted in each gap between the magnets disposed above the travelling

web so that the lower end of the partition lies close to the upper surface of the travelling web, to thereby divide each gap into a front section and a back section, the drying air being separately passed through the front and back sections of each gap.

4,678,683

## PROCESS FOR COFIRING STRUCTURE COMPRISED OF CERAMIC SUBSTRATE AND REFRACTORY METAL METALLIZATION

Wayne D. Pasco, Scotia, and Ronald H. Arendt, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1985, Ser. No. 808,707

Int. Cl.<sup>4</sup> B05D 5/12

U.S. Cl. 427-123

31 Claims

1. A process for producing a sintered structure comprised of a ceramic substrate and an adherent electrically conductive refractory metal metallization wherein said substrate is free of voids greater than about 5 microns and has a porosity of less than about 10% by volume which comprises forming a liquid phase sinterable ceramic composition consisting essentially of a ceramic powder and a liquid-forming material, said liquid-forming material containing an oxidizing agent and a member selected from the group consisting of silica, a source thereof and a mixture thereof, said member being present in an amount of at least about 0.5% by weight of said ceramic composition, admixing said composition with an organic binding material, said organic binding material pyrolyzing at an elevated temperature ranging to less than about 800° C. leaving a residue of elemental carbon, said oxidizing agent being selected from the group consisting of alkali metal sulfate, alkaline earth metal sulfate and mixture thereof and being used in an amount at least sufficient to react with the total amount of said residue of carbon, forming said mixture into a sheet, contacting said sheet with a refractory metal metallization material, firing the resulting structure at an elevated pyrolyzing temperature ranging to less than about 800° C. pyrolyzing said organic binding material leaving a residue of elemental carbon in the sheet, increasing the firing temperature to a decarburizing temperature ranging from about 800° C. to about 1200° C. but below the temperature at which closed porosity forms in the sheet reacting said oxidizing agent with said carbon thereby decarburizing the sheet, and increasing the firing temperature to a sintering temperature ranging from above 1300° C. to about 1900° C. producing said sintered structure, said liquid-forming material being a solid material which forms a liquid in situ at said sintering temperature in an amount which enables liquid phase sintering of said ceramic composition, said liquid-forming material being present in an amount ranging from about 1% by weight to about 15% by weight of said ceramic composition, said firing being carried out in an atmosphere or vacuum which is nonoxidizing with respect to said refractory metal.

4,678,684

## METHOD FOR IMPREGNATING A THERMOPLASTIC POLYMER

Michael L. Sand, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 729,729, May 2, 1985, Pat. No. 4,598,006.

This application Mar. 21, 1986, Ser. No. 842,596

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> A01N 17/08, 9/00; C11B 9/00; C08K 3/18

U.S. Cl. 427-213.36

11 Claims

1. A method of forming an impregnated thermoplastic polymer, comprising:

- dissolving an impregnation material in a volatile swelling agent maintained at or near supercritical conditions for the volatile swelling agent, said impregnation material being selected from the group consisting of fragrances, pest control agents and pharmaceuticals; said swelling agent



being selected from the group consisting of carbon dioxide, nitrous oxide;  
swelling the thermoplastic polymer by contacting it with the impregnation material-laden volatile swelling agent at or near supercritical conditions of temperature and pressure for the volatile swelling agent; and  
reducing the pressure whereby the volatile swelling agent diffuses out of the impregnated thermoplastic polymer.

4,678,685

# METHOD FOR RAPID CONTROLLED COATING OF THE INNER SURFACES OF PIPES WITH A TENACIOUS CALCITE LINING

David Hasson, Haifa, and Mordechai Karmon, Petach-Tikva, both of Israel, assignors to Technion Research & Development Foundation, Ltd., Haifa and Mekoroth Water Co., Tel-Aviv, both of Israel

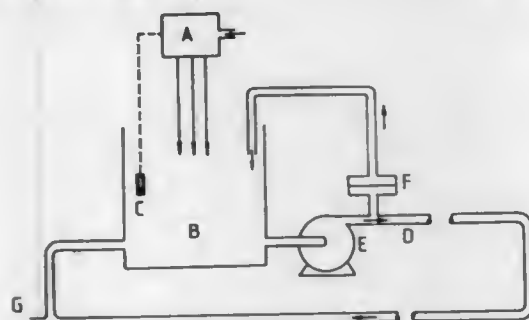
Filed Sep. 11, 1985, Ser. No. 775,036

Claims priority, application Israel, Oct. 9, 1984, 73198

Int. Cl. B05D 7/22

U.S. Cl. 427-235

24 Claims



1. A method for obtaining a tenacious in situ coating deposition of calcite having a thickness of above 50 microns on the inner surface of pipes, the lining being deposited at a rate of at least 5 microns/hour, the lining having a bulk density of at least 1.5 gram/cm<sup>3</sup>, by delivering through said pipes at a flow velocity of above 1 m/sec. an aqueous lining solution supersaturated with respect to calcium carbonate containing dissolved calcium and carbonate ions each at a concentration level of above about 80 ppm expressed as CaCO<sub>3</sub>, comprising maintaining substantially stoichiometric concentrations of the CO<sub>3</sub><sup>-2</sup> and Ca<sup>+2</sup> ions, wherein the concentration of suspended CaCO<sub>3</sub> particles is less than 50 ppm, and the excess suspended particles generated in the system are removed by physical particle removal means.

4,678,686

# TREATMENT OF FORMALDEHYDE-CONTAINING WOOD PANEL PRODUCTS

David W. Park, 1446 Heather Ct., Puyallup, Wash. 98372  
Filed Apr. 15, 1986, Ser. No. 852,370

Int. Cl. B05D 1/18, 3/00; C23C 16/00

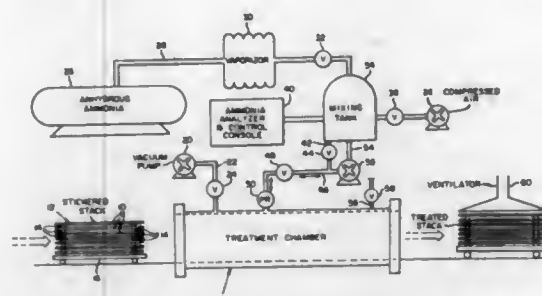
U.S. Cl. 427-254

10 Claims

1. A process for treating a porous formaldehyde-containing wood panel to control formaldehyde emissions from the panel comprising:

placing the panel in a chamber and with closing of the chamber evacuating the chamber to establish a subatmospheric pressure therein, with the evacuation removing atmospheric gases from the chamber and gases from the pores of the panel including free formaldehyde and further producing a subatmospheric pressure within these pores, then introducing gases ammonia into the evacuated chamber and with such introduction establishing a superatmospheric pressure therein, and with the superatmospheric

pressure established permeating the panel pores with ammonia and reacting ammonia with a residual formalde-



hyde to convert the formaldehyde to a relatively stable hexamine residual.

4,678,687

# THERMAL TRANSFER PRINTING SHEETS CONTAINING CERTAIN COATING COMPOSITIONS THEREOF

Shadi L. Malhotra, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1984, Ser. No. 666,702

Int. Cl. B41M 5/26

U.S. Cl. 427-261

7 Claims

1. A process for obtaining transparencies with an image thereon in thermal transfer printing systems which comprises providing a donor sheet, generating an image on the donor sheet, developing this image, and subsequently transferring the developed image to a transparency comprised of a transparent substrate containing a coating thereover of a polymer selected from the group consisting of poly(vinyl ethers), poly(acrylic acid esters), poly(methacrylic acid esters), and poly(vinylacetate).

4,678,688

# METHOD FOR FORMING A SURFACE FILM OF CURED ORGANOSILICON POLYMER ON A SUBSTRATE SURFACE

Kunio Itoh; Shohel Kozakai; Yoshinori Hida; Hiroshi Okino-shima; Fumio Okada; Toshio Oba; Hisashi Shimizu; Yuji Hinoto, and Hiroshi Yoshioka, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 686,301, Dec. 26, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,906

Claims priority, application Japan, Dec. 28, 1983, 58-251952;

Jan. 10, 1984, 59-2374; Apr. 17, 1984, 59-77155

Int. Cl. B05D 3/02

U.S. Cl. 427-387

3 Claims

1. A method for forming a cured polymeric film on the surface of a substrate which comprises: coating the substrate surface with an organosiloxane polymer comprising room temperature-curable organosilicon polymer comprising

(a) at least one organosiloxane unit represented by the unit formula



and

(b) at least one organosilazane unit represented by the unit formula



in which R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are each a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group, not all of them being simultaneously hydrogen atoms, and the subscript a is a positive integer of 1, 2 or 3;

and subjecting the coating film to exposure to an atmosphere containing moisture.

4,678,689

# TRANSPARENCY LAMINATION PROCESS

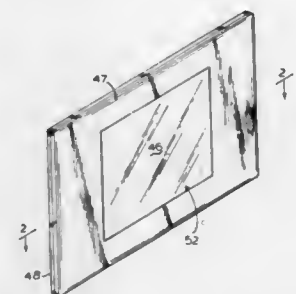
Randall Phillips, 40 W. 22nd St., 11th Floor, New York, N.Y. 10010, assignor to Randall Phillips and Sumiko Phillips, a part interest

Filed Jun. 20, 1985, Ser. No. 746,857

Int. Cl. B44F 1/02, 1/06

U.S. Cl. 428-13

11 Claims



1. A laminated transparency comprising:  
a transparency having a top and bottom face;  
clear plastic sheets extending over the top and bottom face of the transparency;  
a mat finish on the bottom face of the bottom plastic sheet;  
and,  
lamination means for laminating the sheets and transparency together to provide a completely sealed transparency for viewing and to protect the transparency.

4,678,690

# PREMASKED DECAL

Emery A. Palmer, Matthews; Michael A. Shimanski, Charlotte; Thomas M. Ellison, Charlotte, and Jack P. Everidge, Charlotte, all of N.C., assignors to Rexham Corporation, New York, N.Y.

Filed Jan. 10, 1986, Ser. No. 817,671

Int. Cl. B44C 1/165

U.S. Cl. 428-31

17 Claims



1. A premasked decal, comprising:  
a decal transfer; and  
a strippable tinted transparent premask adhered to the front surface of said decal transfer with the decal transfer being visible therethrough, said premask having a neutral optical density of from 0.1 to 0.9 to impart to the premask a readily visible contrasting appearance against any adjacent background color so as to visually indicate the need for removal of the premask from the installed decal transfer.

4,678,691

# ELECTROFORMING PROCESS AND PRODUCT

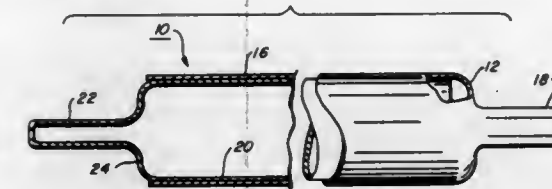
William G. Herbert, Jr., Williamson; Henry G. Grey, Webster, and Bruce C. Reynolds, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 24, 1985, Ser. No. 791,043

Int. Cl. B41C 3/08; B32B 31/00

U.S. Cl. 428-36

15 Claims



1. A composite metal article comprising a first elongated electroformed hollow member and a second electroformed elongated hollow member, each of said hollow members comprising at least a first sleeve and a second sleeve, one sleeve of each of said hollow members having a perimeter smaller than the perimeter of the other sleeve of the same member, at least a segment of the outer surface of one sleeve of the second elongated hollow member being adjacent to and substantially surrounded by at least a segment of the inner surface of one sleeve of the first elongated hollow member.

4,678,692

# MULTILAYER PROTECTION SYSTEM

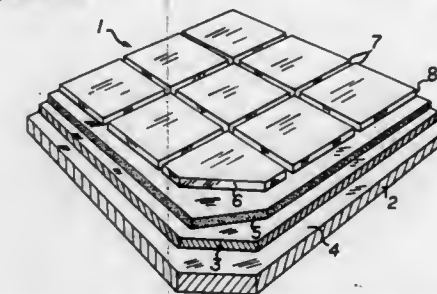
Julian Porter, 4674 Alvarado Cyn Rd., San Diego, Calif. 92120

Filed Apr. 29, 1985, Ser. No. 728,472

Int. Cl. B32B 3/00, 15/04

U.S. Cl. 428-78

10 Claims



1. A series of coatings for providing protection of an underlying metal structure which comprises:  
a corrosion protection layer fixed to said underlying metal structure composed of a material more anodic than said underlying metal structure;  
an insulating layer composed of an impermeable electrically insulating material which fully covers and is fixed to said corrosion protection layer; and  
a discontinuous fouling protection layer composed of biologically fouling resistant material segments which are fixed to and cover the majority of said insulating layer.

4,678,693

# INSULATING FABRIC AND METHOD OF MANUFACTURE THEREOF

Philip Kemp, Closter, N.J., assignor to J. E. Morgan Knitting Mills, Inc., Tamaqua, Pa.

Filed Jan. 29, 1986, Ser. No. 823,674

Int. Cl. B32B 33/00

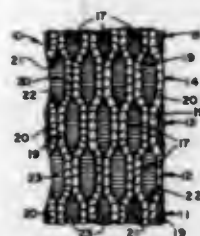
U.S. Cl. 428-91

10 Claims

1. An insulating fabric having an inner fabric face of soft texture formed of a high bulk yarn and an outer fabric face formed of a combined synthetic and cotton yarn, said insulating fabric being characterized by an increase in thickness as the

result of plural washings to enhance its heat insulating quality and comprising

- (a) a base fabric constituted of a knitted thermal fabric having air-entrapping cells,
- (b) said base fabric being knitted of a napped high bulk yarn



in selected courses and being knitted of a combined synthetic and cotton yarn in courses intervening between the selected courses.

- (c) the combined synthetic and cotton yarns forming a knitted framework for anchoring and stabilizing the high bulk yarn in the fabric.

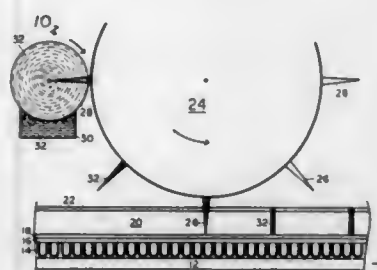
4,678,694

#### ANTISTATIC CARPET TILE AND METHOD OF MANUFACTURING SUCH CARPET TILE

Johannes A. H. Claessen, Leusden, Netherlands, assignor to Heoga Holding b.v., Scherpenzeel, Netherlands  
Filed Apr. 7, 1986, Ser. No. 848,775

Int. Cl. B32B 3/00

U.S. Cl. 428-95



1. An antistatic carpet tile having an electrical resistivity of about  $1 \times 10^8$  ohms square or less, which carpet tile comprises:
  - (a) an electrically conductive fibrous-face material;
  - (b) a primary backing sheet, the fibrous-face material secured to the primary backing sheet;
  - (c) an electrically conductive precoat layer secured to the primary backing sheet;
  - (d) a polymeric electrically insulating backing layer having a back surface;
  - (e) a plurality of spaced-apart thin columns of a solid electrically conductive material extending generally perpendicularly to the plane of the carpet tile face from the back surface of the backing layer through the backing layer and to the precoat layer, to provide an electrical conductivity pathway from the precoat layer to the back surface of the backing layer;
  - (f) a secondary backing sheet secured to the back surface of the backing layer; and
  - (g) an electrically conductive coating layer on the secondary backing sheet and connected to a plurality of the ends of the columns on the back surface, to provide an electrical pathway to the electrically conductive fibrous face, through the electrically conductive precoat layer and through said columns to ground.

#### ENCAPSULATED FLATTOP RETROREFLECTIVE SHEETING AND METHOD FOR PRODUCING THE SAME

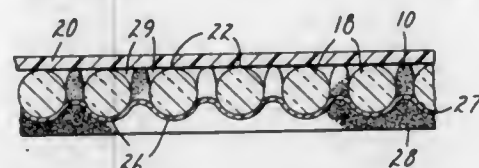
Chi F. Tung, Mahtomedi, and Chester A. Bacon, Jr., Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 23, 1985, Ser. No. 812,523

Int. Cl. B32B 7/00, 15/00; G02B 5/124, 5/128

U.S. Cl. 428-120

15 Claims



1. A retroreflective sheet comprising a monolayer of microspheres supported in a layer of binder material, a layer of reflective material disposed behind said microspheres, and a cover film disposed in spaced relation in front of said microspheres, wherein additional binder material forms a network of walls extending from said layer of binder material into adherent contact with said cover film and at least some microspheres are individually surrounded by said walls.

4,678,696

#### WEATHER STRIP

Kunio Maeno, Aichi, and Hisayuki Kisanuki, Ichinomiya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

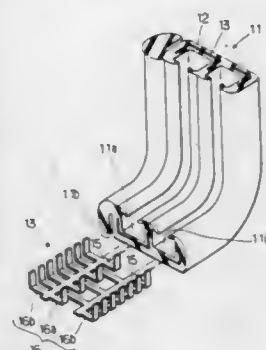
Filed Apr. 9, 1986, Ser. No. 849,944

Claims priority, application Japan, Apr. 10, 1985, 60-53249[U]

Int. Cl. E06B 7/16

U.S. Cl. 428-122

2 Claims



1. A weather strip comprising:
  - (a) an insert made of metal and having W section; and
  - (b) a cover member adapted to cover said insert and made of polymeric resilient materials;
 said insert being formed from a metal piece, said metal piece including two longitudinally extending primary portions in parallel relation and a multiplicity of secondary portions extending perpendicularly to said primary portions, each of said secondary portions having a connecting portion interconnecting said primary portions and two projecting portions extending outwardly from opposite ends of said connecting portion, said projecting portions being bent upwardly while preselected connecting portions being cut off from one of said primary portions and bent upwardly at their centers.

4,678,697

#### MAGNETIC RECORDING MEDIUM

Takahito Miyoshi; Masaaki Fujiyama; Toshimitsu Okutsu; Kenichi Masuyama, and Norio Nasu, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

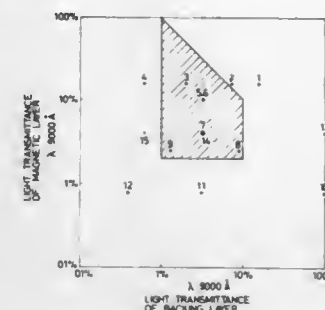
Filed Feb. 19, 1985, Ser. No. 702,550

Claims priority, application Japan, Feb. 17, 1984, 59-28135

Int. Cl. G11B 5/68

U.S. Cl. 428-141

12 Claims



1. A magnetic recording medium comprising a nonmagnetic support having coated on each surface thereof a magnetic layer containing a magnetic substance and a binder-containing backing layer, wherein the backing layer has a thickness of 2  $\mu$ m or less, wherein the magnetic layer has a light transmittance of 2% or more for light having a wavelength of 900 nm, the backing layer has a transmittance of from 1 to 10% for light having a wavelength of 900 nm, and the magnetic recording medium as a whole has a transmittance of 1% or less for light having a wavelength of 900 nm, and the backing layer has a center line average roughness (Ra) of 0.05  $\mu$ m or less at a cut-off value of 0.08 mm, wherein one or both of the magnetic layer and the backing layer contains colored particles, at least the magnetic layer containing the colored particles in an amount of not more than 10 parts by weight per 100 parts by weight of the ferromagnetic substance, the magnetic layer further containing Co-containing magnetic iron oxide particles having a specific surface area ( $S_{BET}$ ) of not less than 35 m<sup>2</sup>/g.

4,678,698

#### CONTACT LENS CLEANING ARTICLE

Arlene J. Mencke, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 729,288, May 1, 1985, Pat. No. 4,622,258, which is a division of Ser. No. 484,163, Apr. 12, 1983,

Pat. No. 4,539,399. This application Jul. 30, 1986, Ser. No. 891,865

Int. Cl. B32B 5/14

U.S. Cl. 428-171

18 Claims

1. An article comprising a non-woven fibrous web selected from webs of the group consisting of polyalkylene, polyvinyl chloride, polyamide, polystyrene, polyarylsulfone, polyester, and polyurethane fibers and combinations, blends and copolymers thereof, said non-woven fibrous web having an average fiber diameter up to 50 microns and the web further comprises a surfactant physiologically acceptable to the eye, said article being a contact lens cleaner.

4,678,699

#### STAMPABLE POLYMERIC COMPOSITE CONTAINING AN EMI/RFI SHIELDING LAYER

Gina R. Kritchevsky, Scotch Plains; John A. Gregor, Basking Ridge; Manfred W. Gruendig, Long Valley; Gregory J. Sellers, Clinton, and Barbara Liss, Verona, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 436,238, Oct. 25, 1982, abandoned.

This application Jan. 11, 1985, Ser. No. 690,388

Int. Cl. H05K 9/00

U.S. Cl. 428-175

16 Claims

1. A stamped thermoplastic composite comprising: at least one thermoplastic layer; and at least one shielding layer, the shielding layer comprising at least one layer of thermoplastic woven fiber containing metal fiber and having an elongation to break of at least 8 percent and an EMI/RFI shielding effectiveness of at least 30 dB, and the stamped composite having been elongated at least 8 percent without holes formed by tearing of the shielding layer during stamping.

4,678,700

#### FIBROUS COMPOSITE MATERIALS

Kevin T. McAloon, and Allan T. Brew, both of Cheshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 28, 1985, Ser. No. 738,647

Claims priority, application United Kingdom, Jun. 6, 1984, 8414439

Int. Cl. B32B 27/14, 9/00; C03B 37/00

U.S. Cl. 428-198

13 Claims

1. A fibrous composite material consisting essentially of carbon fibers and lamellae of chemically delaminated vermiculite wherein the fibers comprise at least 10% by weight of the composite.

4,678,701

#### RESISTIVE PRINTING RIBBON HAVING IMPROVED PROPERTIES

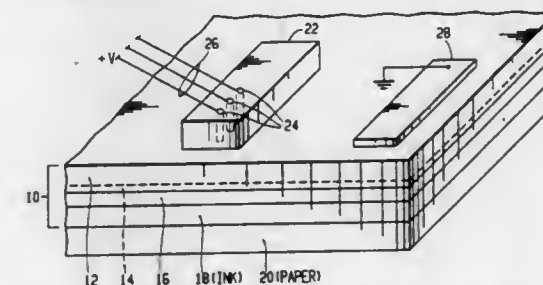
Keith S. Pennington, Somers; Ali Afzali-Ardakani, White Plains, and Krishna G. Sachdev, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,525

Int. Cl. B41M 5/26

U.S. Cl. 428-213

15 Claims



1. A resistive ribbon for thermal transfer printing, comprising: a resistive layer through which electrical current passes to effect said printing, said resistive layer including a phase separated surface region imparting enhanced mechanical and thermal properties to said resistive layer, said phase separated surface region including a material selected from the group consisting of graphite fluoride, fluorocarbon resins, and CeF<sub>4</sub>, a thin layer of an electrically conductive material through which said electrical current passes, said thin layer being adjacent said phase separated surface region and



a thermally fusible ink layer capable of being melted once said electrical current flows through said resistive layer.

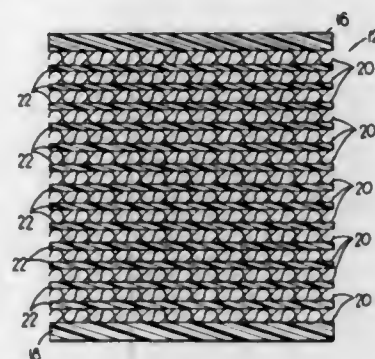
4,678,702

## PROTECTIVE LAMINATE

Robert L. Lancaster, Atlanta, and Raymond E. Shaw, Roswell, both of Ga., assignors to Petro Products, Inc., Atlanta, Ga.  
Filed Jul. 30, 1986, Ser. No. 891,455  
Int. Cl.<sup>4</sup> B32B 7/00

U.S. Cl. 428—252

14 Claims



1. A laminate comprising layers of a fabric woven from yarn of poly-(p-phenylene terephthalamide) bonded together by intervening layers of an ionic copolymer which is the product of the reaction of an olefin and metallic salt of an unsaturated monocarboxylic acid.

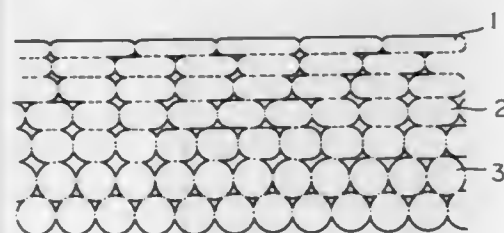
4,678,703

## NONWOVEN SHEET HAVING SMOOTH FILMY SURFACE LAYER

Akio Shibasaki, Moriyama, and Hirofumi Iwasaki, Ashiya, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan  
Filed Mar. 15, 1985, Ser. No. 712,239  
Claims priority, application Japan, Mar. 16, 1984, 59-49229  
Int. Cl.<sup>4</sup> B32B 5/00, 31/22; D04H 1/54, 3/14

U.S. Cl. 428—288

8 Claims



1. A nonwoven sheet consisting essentially of polyethylene terephthalate filaments with a birefringence index within the range of from 0.02 to 0.07 and constructed by entangling the filaments in a three-dimensional state wherein at least one of the surface layers thereof is a smooth filmy layer of an average roughness of 25 $\mu$  or below, formed by flattening said surface layer so that the filaments forming the same surface layer crush flat and bury each other at the crossing sections and are fused at the intersecting surfaces, and the layer next to said surface layer consists of a plurality of filaments adhering closely to each other and practically maintaining the original form thereof.

4,678,704

## IMPREGNATED SUBSTRATE INCORPORATING AN INDICATOR DYE

Adrian N. Fellows, Hedben Bridge, England, assignor to Fibre Treatments (Holding) Limited, Burnley, England  
Filed Jul. 24, 1986, Ser. No. 889,793  
Claims priority, application United Kingdom, Jul. 24, 1985, 8518736

Int. Cl.<sup>4</sup> B32B 27/00

U.S. Cl. 428—289

11 Claims

1. An impregnated fabric material comprising a fabric substrate to which has been bonded an active cationic impregnant characterized in that there has also been applied to the substrate an anionic indicator dye in combination with a further cationic component, and in that the dye bonds to the further cationic component more readily than to the substrate and that the further cationic component competes with the impregnant for bonding to the dye.

4,678,705

## COMPOSITION AND METHOD FOR MAKING MAGNETIC RECORDING ELEMENTS

Hendrikus F. Huisman, Teteringen, and Henricus J. M. Pigmans, Eindhoven, both of Netherlands, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Filed Jul. 3, 1985, Ser. No. 751,675

Claims priority, application Netherlands, Jul. 5, 1984, 8402136

Int. Cl.<sup>4</sup> G11B 5/708

U.S. Cl. 428—315.9

2 Claims

1. A method for manufacturing magnetic recording elements which comprises the sequential steps of

- a. coating onto a surface of a nonmagnetic carrier a layer of a composition which comprises
  - (1) finely divided particles of magnetic particles dispersed in a liquid medium comprising
  - (2) film-forming polymeric binder,
  - (3) 0.2–20% wt. lubricant, basis solvent-free layer,
  - (4) 0.5–6% wt. dispersing agent, basis magnetic pigment, and
  - (5) porosity control agent selected from metal salts of carboxylic acids, nonionogenic diurethanes, calcium-containing micellar organic complexes and mixtures thereof, all of (2) through (5) being dispersed in
  - (6) volatile organic solvent;
- b. removing essentially all of the volatile organic solvent by evaporation from the coated layer;
- c. compressing the solvent-free coated layer, thus forming in the layer a structure of pores having a diameter of 5–100 nm, a pore volume which is 5–50% of the volume of the compressed layer, and a pore surface area which is at least 100 times the free surface area of the compressed layer.

2. A magnetic recording element which comprises a non-magnetic carrier having coated on at least one surface thereof a compressed solvent-free layer of finely divided magnetic pigment particles dispersed in a porous matrix containing a polymeric binder, lubricant, dispersing agent, and a porosity control agent selected from metal salts of carboxylic acids, nonionogenic diurethanes, calcium-containing micellar organic complexes and mixtures thereof, the pores of the layer having a diameter of 5–100 nm, a volume which is 5–50% of the volume of the compressed layer and surface area which is at least 100 times the free surface area of the exposed surface of the compressed layer.

4,678,706

## MAGNETIC RECORDING MEDIUM

Fumihiko Tokunaga, Takamitsu Asai, and Masaaki Fujiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Oct. 24, 1985, Ser. No. 791,174

Claims priority, application Japan, Oct. 24, 1984, 59-222233  
Int. Cl.<sup>4</sup> G11B 5/72

U.S. Cl. 428—323

17 Claims

1. A magnetic recording medium comprising a non-magnetic support, a magnetic recording layer on one side of the support, and a backing layer on the opposite side of the support to the magnetic recording layer, wherein said backing layer comprises a binder and a powder dispersed in the binder, wherein the powder is a powdered oxide represented by the formula  $M^1.M^2.O_{2+x}$ , wherein  $M^1$  is at least one element selected from the group consisting of Ba, Sr, Pb and Ca;  $M^2$  is at least one element selected from the group consisting of Ti, Zr and Sn; and  $x$  is in the range of from 0 to 0.9, or a mixture of said powdered oxide and carbon black, wherein the ratio of the total amount of the powder in the backing layer to the total amount of the binder in the backing layer is in the range of from 0.3:1 to 2:1 by weight, the mixing ratio of the powdered oxide to the carbon black is 1:9 or more by weight and wherein the powdered oxide has an average particle diameter of 0.5  $\mu$ m or less.

4,678,708

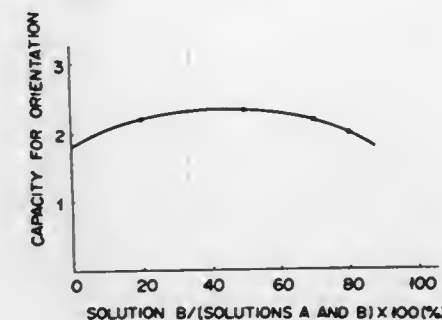
## MAGNETIC RECORDING MEDIUM

Shigeru Shimada, Saku; Masaharu Nishimatsu, Komoro; Hiroyuki Arioka, Saku, and Yuichi Kubota, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan  
Continuation-in-part of Ser. No. 804,223, Nov. 27, 1985, abandoned, which is a continuation of Ser. No. 645,043, Aug. 28, 1984, abandoned. This application Dec. 11, 1985, Ser. No. 807,825

Claims priority, application Japan, Sep. 2, 1983, 58-160416  
Int. Cl.<sup>4</sup> G11B 5/702

U.S. Cl. 428—336

9 Claims



1. A magnetic recording medium produced by
  - A. modifying a four component copolymer of (A) vinyl chloride, (B) a vinyl carboxylate, (C) an unsaturated carboxylic acid and (D) an unsaturated carboxylic anhydride, containing 50 to 80% by weight of (A) based on the total of (A) and (B), 10 to 30% by weight of (D) based on the total of (C) and (D) and a total of 1 to 5 parts by weight of (C) and (D) based on 100 parts by weight of (A) and (B) and having an average polymerization degree of 100 to 400 with a radiation polymerizable monomer to produce a radiation sensitive curing copolymer, B. mixing the radiation sensitive curing polymer with another polymer which is not radiation sensitive to produce a polymer mixture containing from 10% to 80% by weight of the radiation copolymer,
  - C. mixing the polymer mixture resulting from Step B with a magnetic powder to produce a magnetic paint,
  - D. applying the magnetic paint to a non-magnetic substrate, and
  - E. exposing resulting coating to radiation thereby curing the polymer mixture.

4,678,709

## ELECTRICAL INSULATION

Stephen L. Tondre, Menlo Park, and Hans E. Lunk, Fremont, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 536,919, Sep. 27, 1983, Pat. No. 4,521,485, which is a continuation-in-part of Ser. No. 418,355, Sep. 15, 1982, abandoned. This application May 28, 1985, Ser. No. 738,622

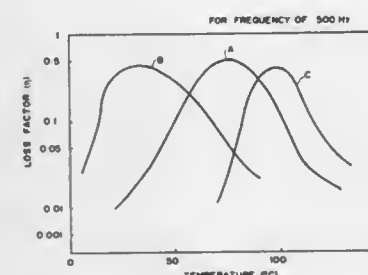
The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> B32B 15/08; H01B 7/00

U.S. Cl. 428—380

19 Claims

1. An insulated electrical article, comprising
  - (a) a metal conductor;
  - (b) a melt-shaped inner insulating layer comprising a first organic polymer component which is a cross-linked olefin polymer, and
  - (c) a melt-shaped outer insulating layer which contacts the inner insulating layer and which comprises a second organic polymer component which is a substantially linear aromatic polymer having a glass transition temperature of at least 100° C.



1. A vibration damping composite laminate of the constrained layer damping type comprising:
  - two layers of a metal in parallel arrangement; and
  - a layer of a viscoelastic polymer composition which is closely interposed between the two metal layers and comprises a polyvinyl acetal resin blended with particulate carbon in an amount of 10 to 80% of the polymer composition, the ratio of the mean particle size of said particulate carbon to the thickness of the polymer composition layer being in the range from 0.5 to 1.7, said mean particle size being determined by the equation  $R=100 \exp(-D_p/D_{p0})^n$  wherein  $n$  is a constant determined by the type of particulate carbon being used and  $D_{p0}$  is the particle size at which  $R$  becomes 36.8%, and wherein the value of  $D_p$  when  $R$  becomes 50% is the mean particle size of the particulate carbon before mixing, said polymer being electrically conductive so that the laminate can be spot-welded to metal structures.

4,678,710

## COATED PARTICULATE MATERIALS AND METHOD FOR MANUFACTURE THEREOF

Seiichi Sakimoto, Kazuo Fujita, Yutaka Yamauchi, and Hiroshi Matsue, all of Kawasaki, Japan, assignors to Showa Denko K. K., Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,195

Claims priority, application Japan, Oct. 22, 1984, 59-220538  
Int. Cl.<sup>4</sup> B05D 7/00; B32B 5/16; C08K 9/00; C08F 32/00

U.S. Cl. 428—407 6 Claims

1. Coated particulate materials, comprising:
  - (A) water-soluble particulate materials and
  - (B) a coating deposited on the entire surface of said particulate materials and consisting essentially of a copolymer of
    - (a) either (1) cyclopentadiene oligomer or (2) an addition product-containing cyclopentadiene oligomer formed of cyclopentadiene and up to 5% by weight, based on cyclopentadiene, of a chain conjugate diene formed by the Diels-Alder type addition polymerization and (b) an unsaturated fatty acid oil
- wherein the ratio of said cyclopentadiene oligomer or said addition-product to said unsaturated fatty acid oil is 0.2–5.0 parts of said oligomer or said addition-product to one part of said unsaturated fatty acid oil, and
- wherein said cyclopentadiene oligomer or said addition-product has a molecular weight in the range of 200–5,000.

4,678,711

## PROCESS FOR PROMOTING THE ADHESION OF EPOXY BONDED FIBER REINFORCED PLASTICS

Kenneth E. Atkins, South Charleston; Raymond C. Gandy, St. Albans, and William A. Larek, Scott Depot, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 3, 1985, Ser. No. 783,535

Int. Cl.<sup>4</sup> B32B 25/38; C09J 5/04

U.S. Cl. 428—414 22 Claims

1. A process of bonding shaped fiber reinforced polymer substrates together, comprising:
  - applying a self-crosslinkable acrylic polymer latex primer to the bonding surface of each of said substrates and allowing said primer to dry,
  - applying an epoxy adhesive, in an amount sufficient to effect adhesion, to the bonding surfaces thus primed, and
  - contacting the bonding surfaces thus primed and epoxied with one another, under conditions sufficient to cure the epoxy, to achieve bonding.

4,678,712

## CURABLE COATING COMPOSITION AND EPOXY RESIN ADDUCT USEFUL THEREIN

Brian W. Elliott, Alconbury, Great Britain, assignor to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/GB85/00167, § 371 Date Feb. 3, 1986, § 102(e) Date Feb. 3, 1986, PCT Pub. No. WO85/04666, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 12, 1985, Ser. No. 815,081

Claims priority, application United Kingdom, Apr. 13, 1984, 8409670

Int. Cl.<sup>4</sup> C08G 59/64

U.S. Cl. 428—418 5 Claims

1. A curable coating composition comprising (1) a component having more than one 1,2-epoxy group and (2) a component having more than one group reactive with the epoxy groups of component (1), wherein component (2) is an adduct formed by reacting an epoxy resin, a polyhydric phenol and an aliphatic hydroxyl-containing amine wherein at least 1.2 equivalents of the polyhydric phenol are employed for each equivalent of the epoxy resin, the equivalents of epoxy resin being based on the number of epoxy groups which are not reacted with the amino hydrogens of the aliphatic hydroxyl-containing amine, said adduct having terminal aliphatic —OH groups, and having epoxy groups or groups reactive with an epoxy group.

4,678,713

## CO-EXTRUDED LAMINATES CONTAINING CARBON MONOXIDE INTERPOLYMERS

Gerald M. Lancaster, Surfside, and James A. Allen, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 645,990, Aug. 31, 1984, Pat. No. 4,601,948, which is a continuation-in-part of Ser. No. 531,110, Sep. 12, 1983, Pat. No. 4,600,614. This application May 28, 1985, Ser. No. 738,007

Int. Cl.<sup>4</sup> B32B 27/00

U.S. Cl. 428—421 34 Claims

1. A co-extruded, multi-ply laminate comprising at least two different extrudable polymers wherein at least one ply comprises a carbon monoxide-containing polymer which is adhered to a ply comprising at least halopolymer.

4,678,714

## PHOTOMASK MATERIAL

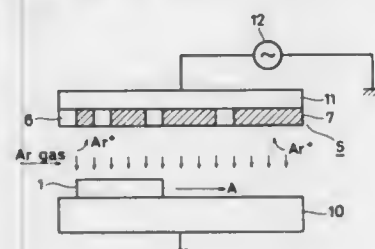
Yaichiro Watakabe, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1986, Ser. No. 819,104

Claims priority, application Japan, Jan. 28, 1985, 60-16206

Int. Cl.<sup>4</sup> B22B 15/00

U.S. Cl. 428—432 3 Claims



1. A photomask material comprising a transparent glass substrate and a metal silicide film formed on said transparent glass substrate, the metal silicide film having a lower surface contacting the substrate and an upper surface opposed to the lower surface, the improvement wherein the rate of deposition of silicon in relation to metal contained in said metal silicide film is continuously varied so as to increase the amount of metal toward the upper surface of the metal silicide film.

4,678,715

## PROCESS FOR IMPROVING WOOD AND USE OF THE IMPROVED WOOD

Eberhard Giebler, Mülheim, and Gerhard Wilhelm, Ladenburg, both of Fed. Rep. of Germany, assignors to Ruetgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 10, 1986, Ser. No. 817,932

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504898

Int. Cl.<sup>4</sup> B32B 21/04, 21/06; B05D 1/18, 3/02

U.S. Cl. 428—537.1 17 Claims

1. A process for improving wood to impart dimensional stability and resonant properties thereto comprising subjecting wood babies to controlled conditions of elevated temperature and pressure in a closed reaction zone, introducing controlled amounts of at least one polymerizable monomer into said reaction zone under conditions whereby said monomer will polymerize and thereby to deposit a thermoset polymer into the capillary walls of the wood without clogging the capillary passages of the wood, said controlled amount being 0.1 to 2.5 weight percent relative to the dry weight of the wood.
16. Wood improved according to the method of claim 1.

4,678,716

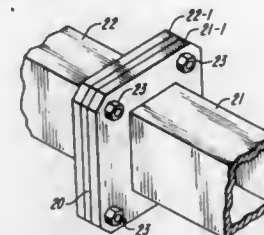
## ELECTROMAGNETIC SHIELDING

Wen-Shian V. Tzeng, Reading, Mass., assignor to Chomerics, Inc., Woburn, Mass.

Filed Aug. 6, 1985, Ser. No. 762,962

Int. Cl.<sup>4</sup> R22F 3/00

U.S. Cl. 428—551



1. An electrically conductive particle for use as a conductive filler in a resin matrix suitable for electromagnetic shielding use, said particle comprising an inner core of an aluminum silicon alloy having from 5 to 20 percent by weight of silicon, an intermediate layer of a metal selected from the group consisting of mercury, palladium, copper, chromium, platinum, gold, nickel, tin, zinc and mixtures thereof, and an outer layer of a highly electrically conductive metal.

4,678,717

## POWDER METAL AND/OR REFRACTORY COATED FERROUS METALS

Richard A. Nickola, Highland; Brian A. Sok, Cedar Lake, and Shashi B. Agarwal, Griffith, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

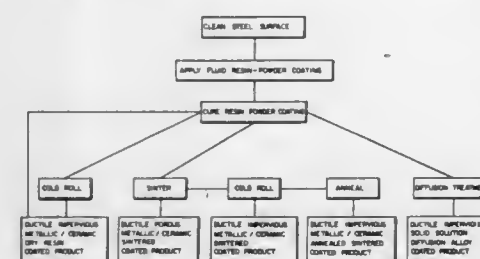
Division of Ser. No. 511,570, Jul. 7, 1983, Pat. No. 4,542,048.

This application Sep. 17, 1985, Ser. No. 776,786

Int. Cl.<sup>4</sup> B22F 7/04

U.S. Cl. 428—553

13 Claims



1. A solid solution iron-aluminum diffusion alloy coated steel strip comprising a low carbon low titanium alloy steel strip which has a solid solution iron-aluminum diffusion alloy surface coating formed in situ by diffusion heating in a nonoxidizing atmosphere a strip of said steel having a surface coating of powder metal selected from the group consisting of aluminum, aluminum and silicon mixture containing between about 5 and 12 wt. % silicon, and aluminum-silicon alloy containing between about 5 and 12 wt. % silicon, said diffusion heating being effected without adversely increasing the grain size of the steel, said diffusion alloy coating having a surface concentration of aluminum of at least about 8 wt. % aluminum and said coating being directly bonded to the steel without an intervening subsurface layer, and said diffusion alloy coated steel strip being adapted to be severely deformed at room temperature without objectionable crazing or cracking of said coating and being

resistant to high temperature oxidation after such deformation.

4,678,718

## PROCESS AND USAGE OF CERIATED TUNGSTEN ELECTRODE MATERIAL

Ju-Zhen Wang, Shanghai, China, assignor to Shanghai Lamp Factory, Shanghai, China

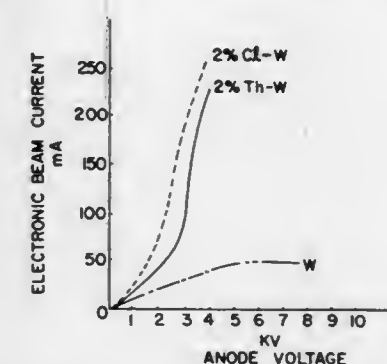
Filed Sep. 3, 1985, Ser. No. 771,743

Claims priority, application China, Apr. 1, 1985, 85100484

Int. Cl.<sup>4</sup> B22F 7/04

U.S. Cl. 428—560

13 Claims



1. A process utilizing a powder metallurgical technique in forming a ceriated-tungsten electrode including the steps of
  - (a) preparing a quantity of tungsten trioxide,
  - (b) preparing a cerium nitrate solution,
  - (c) adding a sufficient quantity of cerium nitrate solution to the tungsten trioxide to provide 1–4.5% by weight cerium oxide to the ceriated-tungsten electrode material,
  - (d) drying and calcining the resulting mixture, then reducing the dried and calcined mixture in a reducing atmosphere,
  - (e) pressing the reduced product into bar form,
  - (f) presintering and sintering the bar under reducing conditions,
  - (g) forging and annealing the bar,
  - (h) preparing a wire by drawing the bar to a diameter of less than 3.0 mm, and
  - (i) recovering the ceriated tungsten product.

4,678,719

## METHOD AND APPARATUS FOR CONTINUOUS CASTING OF CRYSTALLINE STRIP

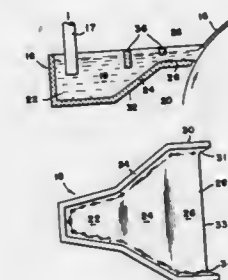
Robert H. Johns, and John D. Nauman, both of Natrona Heights, Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 560,373, Sep. 13, 1984, abandoned. This application Jun. 18, 1986, Ser. No. 876,308

Int. Cl.<sup>4</sup> B22D 11/06, 11/10

U.S. Cl. 428—593

29 Claims



1. Method of directly casting molten metal to continuous strip of crystalline metal, comprising:
  - supplying molten metal to a receiving end of a casting vessel having a receiving end and an exit end, the exit end being adjacent to a casting surface and having edges thereof



parallel to the casting surface and having a substantially uniform cross-sectional area over a length; moving the cooling casting surface generally upwardly past the exit end;

feeding molten metal with a gradually increasing width of flow while maintaining a substantially uniform cross-sectional area or a slightly increasing cross-sectional area of flow from the receiving end to the exit end to provide a pool of molten metal having a substantially uniform flow and a free upper surface in the exit end of the casting vessel;

flowing molten metal from the exit end onto the moving casting surface with a substantially uniform flow across the width of the exit, the surface tension of the flowing metal forming all the surfaces of the strip to be cast, the surface tension of the free surface of the molten metal pool forming the top of the cast strip, the surface tension of the molten metal leaving the bottom of the exit end maintaining a meniscus between an inside surface of the bottom of the exit end and the casting surface to form the bottom of the cast strip; the surface tension of the molten metal leaving two sides of the exit end forming the edges of the cast strip and being about as wide as the strip being cast; controlling the depth of molten metal in the exit end of the vessel and the distance between the exit end and the casting surface to maintain the surface tension of the molten metal on the top, bottom and sides; and removing cast strip from the moving casting surface.

15. An apparatus for directly casting molten metal to continuous strip of crystalline material, comprising: movable casting surface; casting vessel having a receiving end, an exit end, and an intermediate section therebetween, said vessel having a cross-sectional area from receiving end to exit end being substantially uniform or slightly greater at the exit end; means for supplying molten metal to the receiving end of the casting vessel;

said casting vessel having an exit end having a generally U-shaped structure adjacent the casting surface and edges thereof substantially parallel thereto, and an intermediate section having a gradually increasing width to the exit end to facilitate a substantially uniform flow of molten metal from the receiving end to the exit end, the U-shaped structure of the exit end having a planar bottom wall and diverging inside sidewalls opening upwardly and having a width between the inside surfaces about as wide as the strip to be cast, the exit end having fixed width along the bottom wall between the inside surfaces of the sidewalls and a substantially uniform cross-sectional area over a length sufficient to provide a substantially uniform flow of molten metal from the exit end; said casting surface movable generally upwardly past the exit end of the casting vessel at a distance of between 0.005 to 0.060 inches therefrom and at a speed of 20 to 500 feet per minute.

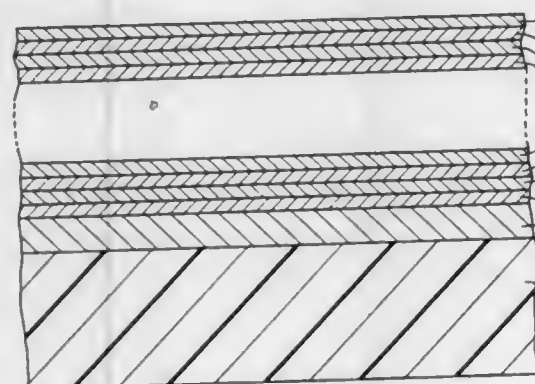
28. A continuous strip of crystalline metal directly cast from molten metal having a substantially uniform flow and free upper surface onto a single moving casting surface wherein the molten metal flows from a vessel which has a receiving end and an exit end with a gradually increasing width of flow while maintaining a substantially uniform cross-sectional area or a slightly increasing cross-sectional area from the receiving end to the exit end and substantially uniform cross-sectional area of flow over a length at the exit end, the strip comprising an upper surface and a lower surface which contacted the casting surface, both the upper and lower surfaces in the as-cast condition being smooth and uniform, edges of the strip being substantially flat and smooth, the as-cast thickness ranging from 0.010 to 0.100 inch, and the internal structure having relatively small columnar cells oriented in the direction from one strip surface to the other strip surface.

4,678,720  
**SILVER-COPPER-TITANIUM BRAZING ALLOY**  
Shih C. Hsu, Wellesley, and Ramas V. Raman, Framingham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.  
Continuation of Ser. No. 688,679, Jan. 4, 1985, abandoned. This application Aug. 11, 1986, Ser. No. 895,525  
Int. Cl.<sup>4</sup> B23K 35/34, 35/362; C22C 1/02, 5/08  
U.S. Cl. 428—606 9 Claims



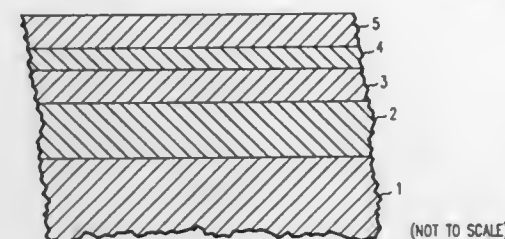
1. A silver-copper-titanium brazing foil preform comprising from about 10 to about 50 weight percent copper, from about 0.1 to about 9.5 weight percent titanium and the balance silver; said preform having very fine and uniformly distributed grains; said foil preform having been fabricated by heating titanium, silver and copper in a crucible to form a melt; said crucible having had an orifice, said crucible having been positioned above a revolving chill wheel; said melt having been ejected upon said wheel by an overpressure of a gas to form a ductile foil from about 0.0008 inches to about 0.006 inches thick; and said ductile foil having been punched to form said brazing foil preform.

4,678,721  
**MAGNETIC RECORDING MEDIUM**  
Friedrich J. A. den Broeder, Henricus J. G. Draaisma, and Alexander Kahle, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.  
Filed Jun. 2, 1986, Ser. No. 869,483  
Claims priority, application Netherlands, Apr. 7, 1986, 8600869  
Int. Cl.<sup>4</sup> B21C 37/00  
U.S. Cl. 428—607 12 Claims



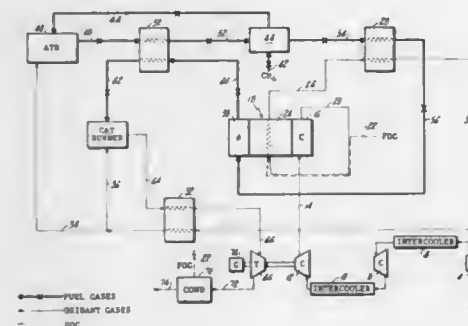
1. A magnetic recording medium comprising: a nonmagnetic substrate; and a thin magnetic layer on the substrate, said magnetic layer having a perpendicular anisotropy, said magnetic layer comprising alternating layers of Pd and Co; characterized in that in the magnetic layer: the thickness of each Pd layer is between 0.2 and 2.0 nm; and each layer of Co consists of at least a monolayer of Co atoms but has a thickness less than 0.3 nm.

4,678,722  
**RECORD MEMBER WITH METALLIC ANTIFRICTION OVERCOAT**  
Uri Cohen, 765 San Antonio Rd., Unit 53, Palo Alto, Calif. 94303  
Continuation-in-part of Ser. No. 670,135, Nov. 13, 1984, abandoned, which is a continuation of Ser. No. 405,062, Aug. 4, 1982, abandoned. This application Jun. 21, 1985, Ser. No. 747,612  
Int. Cl.<sup>4</sup> G11B 5/72  
U.S. Cl. 428—642 28 Claims



1. A magnetic recording member comprising: a substrate; a magnetic film deposited on said substrate; and an antifriction metallic overcoat over said magnetic film for presenting a soft, low-friction metallic surface for contacting a movable member, said overcoat having a thickness greater than 50 Å and less than 10,000 Å and comprising an alloy, said alloy comprising silver and a metal selected from the group consisting of cadmium, indium, tin and lead.

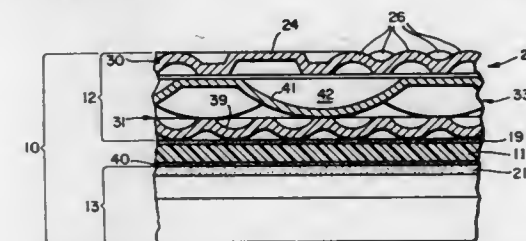
4,678,723  
**HIGH PRESSURE LOW HEAT RATE PHOSPHORIC ACID FUEL CELL STACK**  
Ronald J. Wertheim, Hartford, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.  
Filed Nov. 3, 1986, Ser. No. 926,164  
Int. Cl.<sup>4</sup> H01M 8/04  
U.S. Cl. 429—17 7 Claims



1. A high pressure phosphoric acid fuel cell stack assembly comprising: (a) a stack of fuel cells for producing electricity, said stack including cathode means, anode means, and heat exchange means; (b) means for delivering pressurized air to said cathode means; (c) means for delivering a hydrogen rich fuel gas to said anode means for electrochemically reacting with oxygen in the pressurized air to produce electricity and water; (d) first conduit means connected to said cathode means for exhausting a mixture of oxygen-depleted air and reaction water from said cathode means; (e) second conduit means connected to said first conduit means for delivering a water fog to said first conduit

means for entrainment in said mixture of oxygen-depleted air and reaction water to form a two phase coolant having a gaseous air phase and an entrained water droplet phase; (f) means for circulating said coolant to said heat exchange means to cool said stack solely through vaporization of said water droplet phase in said heat exchange means whereby a mixed gas exhaust of air and water vapor is exhausted from said heat exchange means; and (g) means for heating said mixed gas exhaust and delivering the heated mixed gas exhaust at reformer reaction temperatures to an autothermal reformer in said stack assembly for autothermal reaction with a raw fuel to form said hydrogen rich fuel.

4,678,724  
**FUEL CELL BATTERY WITH IMPROVED MEMBRANE COOLING**  
James F. McElroy, Hamilton, Mass., assignor to United Technologies Corporation, Hartford, Conn.  
Continuation of Ser. No. 391,800, Jun. 23, 1982. This application Apr. 19, 1984, Ser. No. 601,743  
Int. Cl.<sup>4</sup> H01M 2/00, 8/12  
U.S. Cl. 429—34 1 Claim

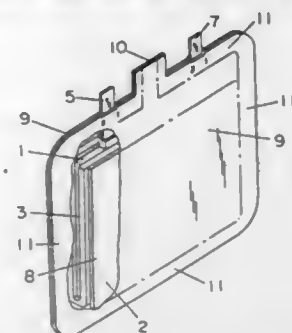


1. A fuel cell battery comprising at least two adjoining fuel cells of the type including a membrane having anodes and cathodes in intimate electrical contact therewith: (a) means to supply fuel and oxygen gases to the anode and cathode electrode of each cell, (b) means to maintain the anode side of the membrane cooler than the cathode side, and cooler than it would normally be to minimize anode side drying of the membrane, consisting of electrically conductive bipolar separators positioned between electrodes of adjacent cells opposite sides of said separators having projections contacting said electrodes, said bipolar separators including means for differentially cooling opposite sides of said separators, the cooler side of said bipolar nonperforated separator contacting the anode in contact with the membrane of one cell and the other side contacting cathode of the adjacent cell whereby an increased temperature differential is established across each membrane.

4,678,725  
**HERMETICALLY SEALED STORAGE BATTERY**  
Yoichi Kikuchi, Fujisawa, and Kenji Kobayashi, Oiso, both of Japan, assignors to Matsushita Electric Industrial Co., Inc., Osaka, Japan  
PCT No. PCT/JP84/00538, § 371 Date Jun. 30, 1986, § 102(e) Date Jun. 30, 1986, PCT Pub. No. WO86/03060, PCT Pub. Date May 22, 1986  
PCT Filed Nov. 8, 1984, Ser. No. 882,982  
Claims priority, application Japan, May 11, 1983, 58-83108  
Int. Cl.<sup>4</sup> H01M 2/12 8 Claims

1. A hermetically sealed storage battery comprising a plate group consisting of a positive plate, negative plates and a separator separating said plates from each other, an electrolyte retained by said plate group, a housing constituted by an electrolyte-resistant, heat-weldable synthetic resin film or sheet, a sealing portion formed in the portion of said housing that surrounds the periphery of said housing, a pair of terminal

pieces protruding out through said sealing portion, and a safety valve formed in a portion of said sealing portion, said sealing portion being constituted by a heat-welded portion formed by welding members of said resin film or sheet together, and said



safety valve having an adhesion portion formed by members of said resin film or sheet laid one on the other whereby when the internal pressure of the cell becomes excessive, the gas in the cell forces open said adhesion portion to escape out.

4,678,726

# **MULTICELL ELECTRIC STORAGE BATTERY WITH COMBINED MEANS FOR WASTE-GAS DRYING AND FLAME-PROTECTION**

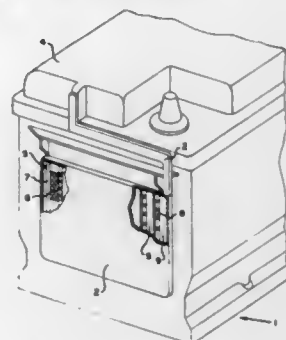
Eckart Boder, Neustadt; Hans-Ulrich Metz, Bad Münden, and Dieter Übermeier, Hanover, all of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 821,497

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3503014

Int. Cl.<sup>4</sup> H01M 2/12

U.S. Cl. 429—88



1. In a multicell electric battery comprised of a block casing and cover defining a plurality of individual cells which are capable of releasing gases via a common gas canal passing through the block cover of the battery to the outside, the improvement wherein the gas canal communicates with a container located on an outer side of the block casing of the battery, and wherein the container is internally subdivided into at least two spaces in the direction of gas flow including a first space containing means for acid separation and collection, for removing moisture from the gases generated during overcharging, and a second space provided with flame protection means.

4,678,727

# **SODIUM-SULFUR CELL BLOCK**

Mitsuo Kawakami, and Hiroyuki Kawamoto, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,194

Claims priority, application Japan, Nov. 28, 1984, 59-251378

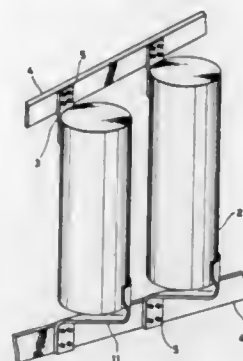
Int. Cl.<sup>4</sup> H01M 2/30

U.S. Cl. 429—104

11 Claims

1. A sodium-sulfur cell block having a plurality of sodium-

sulfur cells, both ends of each cell in the direction of its long axis, being firmly attached to common terminals, characterized in that at least one end of said sodium-sulfur cell in said direction of the long axis is secured to one of said common terminals by a cell terminal comprising an elongated member, one end of said elongated member being secured to said one common terminal and the other end of said elongated member being



secured to said cell, said elongated member projecting as a cantilever in a direction transverse to the long axis of a cell so that said other of the elongated member is spaced from said one common terminal to form a cantilever region extending between a portion of said one common terminal secured to one end of said elongated member and a portion of said cell secured to the other end of said elongated member.

4,678,728

# **INTERCONNECTOR DEVICE**

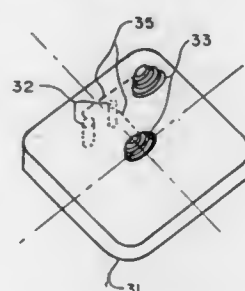
John A. Christopoulos, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 17, 1986, Ser. No. 909,364

Int. Cl.<sup>4</sup> H01M 2/20

U.S. Cl. 429—121

2 Claims



1. An interconnector device that allows a lithium-type battery to be substituted for a Leclanche battery, said Leclanche battery being of predetermined dimensions and having a pair of coil spring connection terminals at predetermined locations on the top surface thereof, said lithium battery being of different predetermined dimensions than said Leclanche battery and having a pair of female connection sockets positioned at a predetermined off-center location on the top surface thereof, the locations of said coil spring terminals and said connection sockets of the respective batteries being at substantially different non-matching positions, comprising a thin flat wafer of non-conductive material of predetermined size and configuration, said wafer having the same cross-section dimensions as said Leclanche battery, a pair of prongs on the underside surface of said wafer and at locations which correspond to the locations of the female connection sockets of said lithium battery, the prongs being received into said female connection sockets when the interconnector device is mounted on said lithium battery, a pair of coil spring connection terminals

mounted on the opposite or top surface of said wafer and having a configuration which matches that of the connection terminals of said Leclanche battery and being positioned at locations which corresponds to the locations of the coil spring connection terminals of the Leclanche battery, and a pair of electrical conductors plated on the underside surface of said wafer for respectively interconnecting the pair of prongs and the pair of coil spring connection terminals in parallel.

4,678,729

# **SEPARATOR BASKET PREFORMS FOR PRIMARY CELLS AND METHODS OF FORMING AND INSERTING SAME**

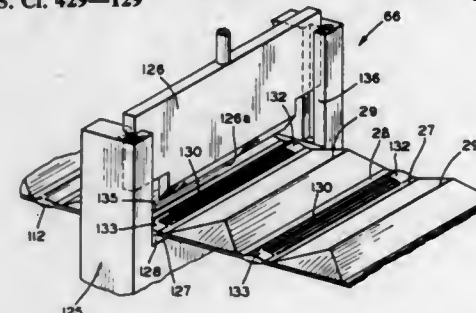
R. D. Simonton, Fremont; John D. Cattano, Castalia, and Robert K. Mason, Gibsonburg, all of Ohio, assignors to Fremont Special Machine Co., Inc., Fremont, Ohio

Continuation-in-part of Ser. No. 707,887, Mar. 4, 1985, Pat. No. 4,618,546. This application Jun. 9, 1986, Ser. No. 871,867

Int. Cl.<sup>4</sup> H01M 2/18; B65H 20/00

U.S. Cl. 429—129

24 Claims



1. An elongate strip of a plurality of preforms for primary cell separator baskets comprising first and second walls of ionically permeable sheet material, said second wall overlaying said first wall; a joint between said first and second walls along one longitudinal margin of said strip; a bond for each of said preforms extending transverse of said strip between said first and second walls; and at least one of said walls having a detent associated with each preform of said strip to facilitate the feed of said strip in processing said preform.

4,678,730

# **TUBULAR PLATE ELECTRODE SLURRY FILLING PROCESS AND APPARATUS FOR LEAD-ACID CELLS**

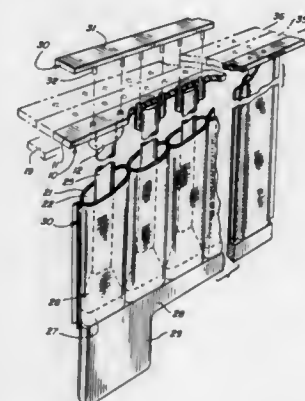
Mark L. Eggers, Schaumburg, Ill., assignor to KW Battery Company, Skokie, Ill.

Filed Dec. 4, 1985, Ser. No. 804,496

Int. Cl.<sup>4</sup> H01M 4/76

U.S. Cl. 429—140

18 Claims



1. A tubular plate electrode foot for installation on a tubular plate electrode assembly comprising a plurality of lead spines

extending from a conductive bar, each said spine enveloped by a porous tubular sheath, said foot comprising:

- a generally rectangular base portion;
- a plurality of projections extending from said base portion, the cross-sectional configuration of each said projection corresponding to the cross-sectional configuration of said porous tubular sheaths, and each said projection provided with a spine recess conforming to the configuration of said spines; and
- a plurality of slurry access ports penetrating said foot, with at least one said slurry access port in each said projection.

4,678,731

# **ELECTROPHOTOGRAPHIC PHOTSENSITIVE MEMBER HAVING BARRIER LAYER COMPRISING MICROCRYSTALLINE SILICON CONTAINING HYDROGEN**

Shuji Yoshizawa, Tokyo; Wataru Mitani; Mariko Yamamoto, both of Yokohama; Akira Sanjoh, Aichi, and Tatsuya Ikezue, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 23, 1986, Ser. No. 877,519

Claims priority, application Japan, Jun. 25, 1985, 60-138207; Jun. 25, 1985, 60-138208; Jun. 25, 1985, 60-138209; Jun. 25, 1985, 60-138214

Int. Cl.<sup>4</sup> G03G 5/14

U.S. Cl. 430—65

18 Claims

1. An electrophotographic photosensitive member comprising:

- a conductive substrate;
- a barrier layer provided on the conductive substrate, at least part of said barrier layer being formed of microcrystalline silicon containing hydrogen, an element included in group III or V of the periodic table, and at least one element selected from carbon, oxygen, and nitrogen; and
- a photosensitive layer provided on the barrier layer, at least part of said photosensitive layer being formed of microcrystalline silicon.

4,678,732

# **METHOD FOR MANUFACTURE OF PHOTO-SEMICONDUCTOR**

Tadashi Sekiya, Nagoya; Akihiro Tsuzuki, Toyota, and Yasuyoshi Torii, Nagoya, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,393

Claims priority, application Japan, Sep. 12, 1984, 59-191115

Int. Cl.<sup>4</sup> H01B 1/06

U.S. Cl. 430—136

2 Claims

1. A rapid quenching method using roller for the manufacture of a photo-semiconductor capable of decreasing the electric resistance thereof by exposure to a light and exhibiting the smallest magnitude of electric resistance to the light of a wavelength in the neighborhood of 500 nm, which method comprises molding, firing, and thermally fusing one powdered member selected from the group consisting of 95Bi<sub>2</sub>O<sub>3</sub>.5SiO<sub>2</sub>, 97.5Bi<sub>2</sub>O<sub>3</sub>.2.5V<sub>2</sub>O<sub>5</sub>, 95-97.5Bi<sub>2</sub>O<sub>3</sub>.2.5-5Nb<sub>2</sub>O<sub>5</sub>, 95-97.5Bi<sub>2</sub>O<sub>3</sub>.2.5-5Ta<sub>2</sub>O<sub>5</sub>, 95Bi<sub>2</sub>O<sub>3</sub>.5MoO<sub>3</sub>, 95Bi<sub>2</sub>O<sub>3</sub>.5WO<sub>3</sub>, 95Bi<sub>2</sub>O<sub>3</sub>.5ZrO<sub>2</sub>, 6Bi<sub>2</sub>O<sub>3</sub>.CeO<sub>2</sub>, Bi<sub>2</sub>O<sub>3</sub>.9.F<sub>0.2</sub> and 95Bi<sub>2</sub>O<sub>3</sub>.5YF<sub>3</sub>, and causing the resultant metal to drop in the form of beads between two rollers kept in rotation at a high speed thereby rolling and rapidly quenching said beads and obtaining thin oriented and crystallized pieces containing sigma- or beta-type phase crystals.





tuted alkyl group, a cyloalkyl group, a substituted or unsubstituted alkenyl group, an aralkyl group, a substituted or unsubstituted aryl group, a heterocyclic group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, or a substituted or unsubstituted amino group, or R<sup>11</sup> and R<sup>12</sup> combine with each other to form a 5- or 6-membered ring; Q represents a hydrogen atom, an alkyl group, or an aryl group; TIME represents a timing group; PUG represents a photographically useful agent moiety; n represents 0 or an integer; and Z represents atoms forming a benzene ring.

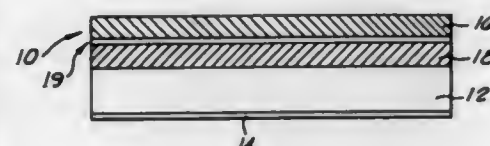
4,678,740

**METHOD FOR MAKING PHOTOGRAPHIC MATTES**  
James N. Catania, 7523 Hollywood Blvd., Apt. 212, Los Angeles, Calif. 90046

Filed Apr. 29, 1985, Ser. No. 728,330  
Int. Cl.<sup>4</sup> G03C 7/02, 7/18, 7/32, 7/20

U.S. Cl. 430—356

21 Claims



1. For use in traveling matte photography, a process for making a photographic matte corresponding to an image of a foreground and a screen of a predetermined screen color, comprising:

- recording a screen color separation of said image on a first layer of a photographic film;
- recording a separation of a second and different color on a second layer of said film that is coextensive with said first layer; and
- developing one of said layers to form a positive image and developing the other of said layers to form a negative image, whereby said images overlap and reinforce each other.

4. The process of claim 1 wherein one of said layers is subjected to color development using a dye coupler and the other of said layers is subjected to black dye-destruct development.

4,678,741

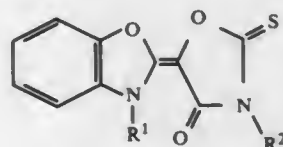
**SILVER HALIDE PHOTOGRAPHIC MATERIALS**  
Sumito Yamada, and Masaki Okazaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Continuation of Ser. No. 630,149, Jul. 12, 1986, abandoned. This application Apr. 14, 1986, Ser. No. 851,020

Claims priority, application Japan, Jul. 12, 1983, 58-126387  
Int. Cl.<sup>4</sup> G03C 1/06, 1/10

U.S. Cl. 430—445

23 Claims

1. A silver halide photographic material having on a support at least one hydrophilic colloid layer and at least one silver halide emulsion layer containing tabular silver halide grains having a grain diameter of at least 5 times the thickness of the grains and at least one compound represented by general formula (I)



wherein R<sup>1</sup> represents a methyl group and R<sup>2</sup> represents an alkyl group, a substituted alkyl group, an aryl group, or a substituted aryl group.

4,678,742

# PHOTOGRAPHIC PRINTING PAPER SUPPORT

Shigehisa Tamagawa; Tetsuro Fuchizawa, and Hisamasa Abe, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 13, 1985, Ser. No. 733,331

Claims priority, application Japan, May 11, 1984, 59-95267  
Int. Cl.<sup>4</sup> G03C 1/76

U.S. Cl. 430—523

5 Claims

1. A photographic printing paper support comprising a base paper having a polyolefin layer formed on both surfaces thereof, said support having coated on the polyolefin layer on the back surface thereof a writing property providing layer composed of (a) inorganic pigment having an average particle diameter of from 0.1 to 2.0 μm and an oil absorption degree of 100 cc/100 g or less, and (b) an acrylic emulsion having a glass transition point of from 20° C. to 50° C., wherein the acrylic emulsion is composed of a copolymer of an acrylic ester and at least one monomer selected from styrene and methyl methacrylate and wherein said support has a photographic emulsion coated on the surface thereof opposite the back surface.

4,678,743

**SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL**  
Kohzaburo Yamada; Seiji Ichijima, and Hideo Usui, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 30, 1985, Ser. No. 793,064

Claims priority, application Japan, Oct. 30, 1984, 59-228642  
Int. Cl.<sup>4</sup> G03C 1/40, 7/32

U.S. Cl. 430—551

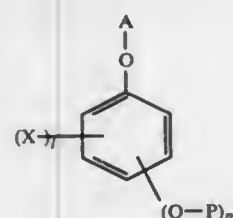
9 Claims

1. A silver halide color photographic material comprising a support having thereon at least a light-sensitive silver halide and a coupler represented by the following general formula (I):

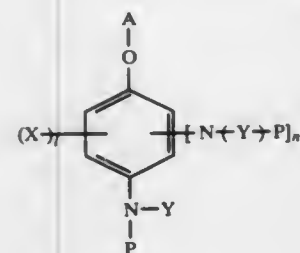


(I)

wherein A is a coupler residue capable of cleaving RED-P on reacting with an oxidized color developing agent, P is a group capable of releasing RED after cleavage of RED-P from A, and RED is a group capable of undergoing an oxidation reduction reaction with the oxidized color developing agent only after the cleavage of A and P, wherein said coupler represented by general formula (I) is represented by the following general formula (II), (III) or (IV):

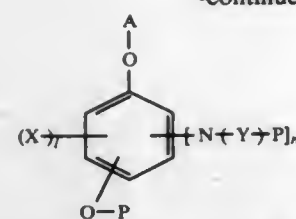


(II)



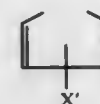
(III)

-continued



wherein A is the same as defined in the general formula (I); l is 0, 1, 2 or 3;

X represents an aliphatic group, an aromatic group, a heterocyclic group, a halogen atom, an alkoxy group, an aryloxy group, an arylthio group, an alkoxy carbonyl group, a cyano group, a nitro group, a carbamoyl group, a sulfamoyl group, an acyloxy group, a heterocyclic thio group, an alkylthio group, a sulfonyl group, an aryloxy carbonyl group, an acyl group, or when l is 2, a group



where X' has the same definition as X;

Y is a hydrogen atom, an aliphatic group, an aromatic group, or a heterocyclic group, a group —COR, or a group —SO<sub>2</sub>R wherein R represents an aliphatic group, an aromatic group or a heterocyclic group;

P is a group which is cleavable by an alkali or other additive contained in the developer;

m is 1 or 2;

n is 0, 1 or 2;

in general formula (II) the —O—P group is in the ortho- or para-position of the phenol group, and in general formula (IV) at least one of the —O—P group and the —N—Y—P group is at the ortho-position or para-position of the phenoxy group, provided that in formula (IV) the P moiety of the group —O—P and the group —N—Y—P are the same or different, and the substituent P may be linked to both the O and N atoms to form a ring.

4,678,744

**SPLASH-PREPARED SILVER HALIDE EMULSIONS WITH A UNIFORM PARTICLE SIZE DISTRIBUTION**  
Douglas L. Wilhite, and Daniel J. Mickewich, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 647,808, Sep. 6, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 821,171

Int. Cl.<sup>4</sup> G03C 1/02

U.S. Cl. 430—569

8 Claims

1. In a process for preparing silver halide emulsions with a narrow particle size distribution and highly disordered crystals, wherein silver nitrate solution is added to a solution of halide salt dispersed in a protective colloid in a series of rapid additions, at least one of said additions containing ammonia, the improvement comprising adding monodisperse silver halide seed crystals prepared by a BDJ process to said halide salt solution prior to the addition of said silver nitrate solution.

(IV)

4,678,745

**PROCESS FOR PRODUCING SILVER HALIDE EMULSION AND SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING THE SAME**

Sumito Yamada; Hiroyuki Mifune, and Shigeharu Urabe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 14, 1985, Ser. No. 744,596

Claims priority, application Japan, Jun. 15, 1984, 59-122981  
Int. Cl.<sup>4</sup> G03C 1/02

U.S. Cl. 430—569

24 Claims

1. A process for producing a tabular silver halide emulsion using a sulfur-containing silver halide solvent that promotes growth of silver halide grains, which comprises using an oxidizing agent capable of reducing or eliminating the grain growth effect of said sulfur-containing silver halide solvent.

4,678,746

**MONOCLONAL ANTIBODIES TO EPIZOOTIC HEMORRHAGIC DISEASE VIRUS ANTIGEN**

Michael M. Jochim, Arvada, and Suzanne C. Jones, Lakewood, both of Colo., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 5, 1985, Ser. No. 708,613

Int. Cl.<sup>4</sup> G01N 33/577; C12Q 1/70

U.S. Cl. 435—5

11 Claims

1. A hybridoma which produces and secretes monoclonal antibody which is group-specific to epizootic hemorrhagic disease virus (EHDV) antigen and does not cross-react with bluetongue virus (BTV) antigen, said hybridoma further identified as ATCC HB 8378.

4,678,747

**MONOCLONAL ANTIBODIES FOR DETECTION OF AN H (O) BLOOD GROUP ANTIGEN**

Kenneth O. Lloyd, Bronx; Lloyd J. Old, New York, both of N.Y.; Karl-Anders Karlsson, Gothenburg, Sweden; Goran Larson, Gothenburg, Sweden; Nicklas Stromberg, Gothenburg, Sweden; Jan Thurin, Gothenburg, Sweden; Bernd R. Anger, Krelensen, Fed. Rep. of Germany, and Herbert F. Oettgen, New Canaan, Conn., assignors to Sloan-Kettering Institute, New York, N.Y.

Continuation of Ser. No. 467,999, Feb. 18, 1983, abandoned.

This application Feb. 28, 1983, Ser. No. 470,815

Int. Cl.<sup>4</sup> G01N 53/00; C12N 15/00

U.S. Cl. 435—7

14 Claims

1. F-3 monoclonal antibodies recognizing difucosyl-type 2-H antigen of human cells.

2. Antibody-producing hybridoma cell line characterized by the production of the antibodies claimed in claim 1.

4,678,748

**PROCESS FOR THE PRODUCTION OF IMMUNOBIOLOGICAL PREPARATIONS APPLICABLE IN THE DIAGNOSIS, PREVENTION AND/OR TREATMENT OF CANDIDA GUILLIERMONDII INFECTIONS**

Pal Sutka, and Klara Sutka, both of 60/c Meszaros u., Budapest 1016, Hungary

Filed Nov. 9, 1981, Ser. No. 319,711

Int. Cl.<sup>4</sup> C12P 21/00; G01N 33/569; C12N 1/16; A61K 39/00  
U.S. Cl. 435—68

6 Claims

1. A process for producing immunobiological preparations for the diagnosis, prophylaxis and/or treatment of *Candida guilliermondii* infections comprising the steps of:

- a. cultivating a *Candida guilliermondii* strain for 48–72 hours under aerobic conditions at 24°–42° C. on a culture medium containing assimilable carbon and nitrogen sources;
- b. maintaining the resulting populations under aerobic conditions at 24°–42° C. for further cultivation of about 15 days



until they are bacterium-free and contain toxins of *Candida guilliermondii*;

c. separating, washing, and mechanically rupturing the bacterium-free culture;

d. separating and treating the resulting extract with a polar organic solvent; and

e. converting the resulting precipitate into an immunobiological preparation.

4,678,749

# LIGANDS FOR AFFINITY CHROMATOGRAPHIC PURIFICATION OF ALDOSE REDUCTASE

Eric R. Larson, Mystic, and Todd W. Siegel, Milford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

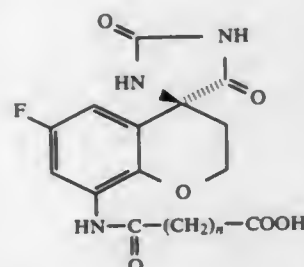
Filed Nov. 13, 1986, Ser. No. 930,590

Int. Cl.<sup>4</sup> C12N 9/00, 9/02, 9/96

U.S. Cl. 435—183

13 Claims

11. A method for purification of aldose reductase from crude extracts containing it which comprises subjecting said crude extract to affinity chromatography using an aminoalkyl carrying solid support to which a compound having the formula (I)



wherein n is 2, 3 or 4 has been coupled.

4,678,750

# METHOD AND COMPOSITIONS FOR USE IN THE TREATMENT OF FIREBLIGHT

Peter A. Vandenberg, Sarasota, Fla., and Anne K. Vidaver, Lincoln, Nebr., assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed Oct. 18, 1984, Ser. No. 662,065

Int. Cl.<sup>4</sup> C12N 9/24, 7/00; A61K 37/48, 39/12

U.S. Cl. 435—200

19 Claims

1. A composition for the treatment of fireblight in plants which is caused by an *Erwinia amylovora* having the characteristic of producing a capsular polysaccharide responsible for the fireblight in the plants which comprises in admixture:

- a phage which lyses the *Erwinia amylovora*; and
- an isolated polysaccharide depolymerase enzyme produced by a phage which lyses the *Erwinia amylovora*, wherein the composition contains at least  $10^6$  pfu of the phage per gram of the composition.

12. The method of treatment of fireblight in affected plants caused by an *Erwinia amylovora* having the characteristic of producing a capsular polysaccharide responsible for the fireblight in the plants which comprises applying to the plants an effective amount of a composition which comprises:

- a phage which lyses an *Erwinia amylovora*; and
- a depolymerase enzyme for depolymerizing the polysaccharide produced by a phage which lyses the *Erwinia amylovora*.

4,678,751

# HYBRID HUMAN LEUKOCYTE INTERFERONS

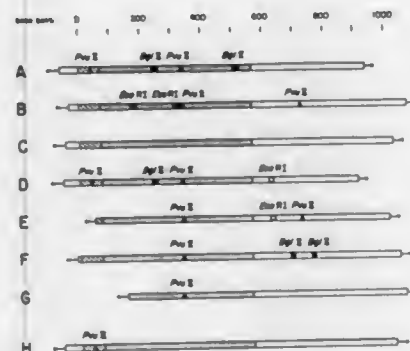
David V. Goeddel, Burlingame, Calif., assignor to Genentech, Inc., San Francisco, Calif.

Continuation of Ser. No. 305,657, Sep. 25, 1981, Pat. No. 4,456,748, which is a continuation of Ser. No. 237,388, Feb. 23, 1981, Pat. No. 4,414,150, and Ser. No. 205,579, Nov. 10, 1980, abandoned. This application Jun. 20, 1984, Ser. No. 623,061

Int. Cl.<sup>4</sup> C12N 1/00, 15/00, 5/00, 5/02, 1/20; C12P 21/00, 21/02, 21/04, 19/34; C12R 1/13, 1/19; C07H 21/04

U.S. Cl. 435—243

2 Claims



1. A replicable plasmidic expression vehicle capable, in a transformed microorganism, of expressing a polypeptide of approximately 165–166 amino acids, the amino acid sequence of said polypeptide comprising, in sequence, discrete sub-sequences corresponding in amino acid identity and number to sub-sequences of different, naturally occurring leukocyte interferons, the amino acid sequence of said polypeptide differing in overall sequence from the amino acid sequence of naturally occurring leukocyte interferons.

4,678,752

# AUTOMATIC RANDOM ACCESS ANALYZER

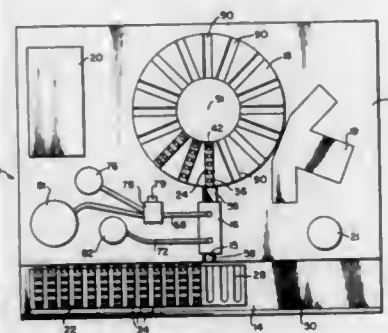
Gale H. Thorne, Bountiful; Charles V. Owen, Highland; Randall W. Smith, Sandy; Ruth D. Goldberg, Salt Lake City; Scott D. Miles, Orem, and Michael J. Claus, Salt Lake City, all of Utah, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 18, 1985, Ser. No. 799,238

Int. Cl.<sup>4</sup> C12M 1/34

U.S. Cl. 435—291

37 Claims



1. An automated apparatus for analysis of samples comprising: an introduction station for the placement of a rack containing a plurality of reagent packages, each package having a plurality of receptacles at least one of which includes a sample liquid, and at least one of which includes a liquid reagent for forming a reaction mixture with said sample liquid, said introduction station including a platform for

holding an elongate rack having a plurality of slots aligned in substantially parallel arrangement along the longitudinal axis of said rack, said reagent packages being removably positioned in said slots;

a liquid transfer station for the transfer of liquid contained in one or more receptacles of a reagent package among the different receptacles of said one reagent package so that a reaction mixture may be formed;

an incubation storage area for holding a plurality of reagent packages which have passed through said liquid transfer station;

a shuttle system for moving said rack so that each package therein is positionable adjacent said liquid transfer station and for removing one of said packages at a time from the rack and moving it into said transfer station and into said incubation storage area, said shuttle system being further operative to move individual packages from the storage area into said transfer station and into said rack in the introduction station; and

a detector for analyzing the reaction mixture contained in one of the receptacles of any of said packages for determining a characteristic of the sample.

4,678,753

# BLOOD-CULTURE FLASK WITH INTEGRATED SUBCULTURE

Hans D. Hempel, Mainaschaff; Jürgen Horn, Egelsbach; Wilfried Rothermel, Dietzenbach; Hans H. Sonneborn, Heusenstamm; Michael Becker, Offenbach, and Ullrich Müller, Rüsselsheim, all of Fed. Rep. of Germany, assignors to Biotest-Serum-Institut GmbH, Frankfurt/M, Fed. Rep. of Germany

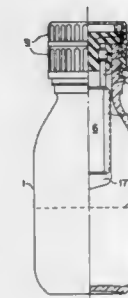
Filed Aug. 26, 1985, Ser. No. 769,908

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 8425171[U]

Int. Cl.<sup>4</sup> C12M 1/24

U.S. Cl. 435—296

8 Claims



1. A blood-culture flask with an integrated subculture comprising a flask 2 that can be filled with a liquid nutrient solution and has a neck 3 with an outside thread 5 and an upper edge 4, a support 6 for a solid culture medium, a resilient stopper 7 with an edge 8 that projects at one end, and a screw cap 9 comprising a bottom 10 that is open above and below and has an inside thread 11 with an inside flange 12 above the inside thread and a top 13 that is open below, the inside thread 11 being dimensioned so that it can be screwed down over the outside thread 5 on the neck 3 of the flask in such a way that the flange 12 is above the outside thread 5 and is below the upper edge 4 of the neck 3 when screwed on, the resilient stopper 7 being positioned inside the bottom 10 of the screw cap 9 so that the bottom surface of its resilient projecting edge 8 comes to rest against the flange 12 above the outside thread when not screwed on and its lower section is dimensioned so that it can be introduced tightly into the neck 3 of the flask, the support 6 having two surfaces that can be coated with a solid culture medium on opposite sides and which are provided with retainer surfaces 16 on at least the two longitudinal sides, overlapping the solid culture medium, the support being fastened to the bottom of the resilient stopper 7, and extending in

use only over part of the height of the flask 2, the top 13 of the screw cap in assembled state forcing the resilient projecting edge 8 of the stopper 7 tightly against the upper edge 4 of the neck 3 of the flask.

4,678,754

# LIQUID CLINICAL CONTROL STANDARD, AND REAGENT PRODUCTS

Michael K. Hoskins, Orange, Calif., assignor to Ciba Corning Corp., Medfield, Mass.

Division of Ser. No. 740,861, Jan. 3, 1985, Pat. No. 4,643,976. This application Nov. 3, 1986, Ser. No. 926,467

Int. Cl.<sup>4</sup> G01N 31/00

U.S. Cl. 436—15

3 Claims



1. A process for making stable clinical protein-based liquid solutions comprising simultaneously filling a storage pouch, having a reservoir and connected to the reservoir at least one heat-sealed filling inlet and at least one heat-sealed dispensing outlet, with a clinical protein-based liquid having a temperature below its denaturation point and an inert gas having a temperature below ambient temperature which is sufficient to cool either the liquid or the pouch such that the heat sealing of the inlet and the outlet does not substantially denature the clinical proteins in the liquid.

4,678,755

# AUTOMATIC CHEMICAL ANALYZER

Hiroo Shinohara, Ootawara, and Toshiaki Imai, Tochigi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

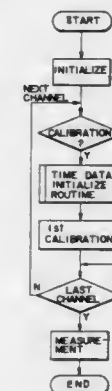
Filed Jul. 29, 1985, Ser. No. 760,148

Claims priority, application Japan, Jul. 30, 1984, 59-161377

Int. Cl.<sup>4</sup> G01N 35/00

U.S. Cl. 436—43

8 Claims



1. In an automatic chemical analyzer having means for containing a sample to be analyzed, means for forming a reaction solution comprised of a mixture of the sample and a reagent corresponding to an analysis item, and means for analyzing the analysis item in the above mixture and wherein an output is provided in response to a quantitative analysis result obtained

by comparing a measured reaction of said solution to a calibration curve corresponding to a respective analysis item, the improvement of:

- means for storing the identity of a plurality of analysis items;
- means for storing data indicating the time of a previous calibration of the calibration curve for each of the identified analysis items;
- means for storing data corresponding to a predetermined time interval following the calibration of each calibration curve, said time interval corresponding to the time from a previous calibration that the calibration curve can be reliably substantially effective for analysis;
- control means including counting means for checking periodically the time interval remaining for each previous calibration of the calibration curve for a respective analysis item; and
- means governed by said counting means for outputting data representative of the reliability of each checked calibration curve.

4,678,756

# CHEMILUMINESCENT SULFUR DETECTION APPARATUS AND METHOD

Robert E. Parks, Houston, Tex., assignor to Atek Instruments, Inc., Houston, Tex.

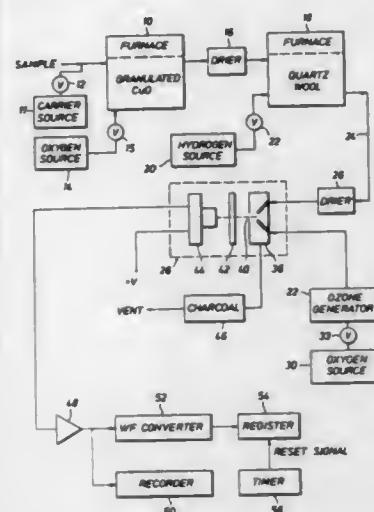
Division of Ser. No. 232,891, Feb. 9, 1981, Pat. No. 4,352,779.

This application Jun. 9, 1982, Ser. No. 386,712

Int. Cl.<sup>4</sup> G01N 21/76

U.S. Cl. 436-123

11 Claims



I. A method for determining the total chemically combined sulfur in a specimen which comprises the steps of:

- introducing the specimen in the presence of a carrier gas into a furnace operated at an elevated temperature above 300° C. into the presence of a metal oxide to convert at least a portion of the chemically bound sulfur into oxides of sulfur;
- thereafter passing the specimen from the furnace through a dryer to remove at least a portion of the water therein;
- after water removal, exposing the specimen to a hydrogen rich atmosphere within a furnace at an elevated temperature to convert the specimen including chemically combined sulfur into hydrogen sulfide;
- exposing the hydrogen sulfide produced from step (c) to ozone to form a chemiluminescent reaction; and
- measuring the magnitude of the chemiluminescent reaction by observing quanta of light to obtain the quantity of chemically combined sulfur in the specimen.

## 4,678,757 DEVICE AND METHOD FOR WHOLE BLOOD SEPARATION AND ANALYSIS

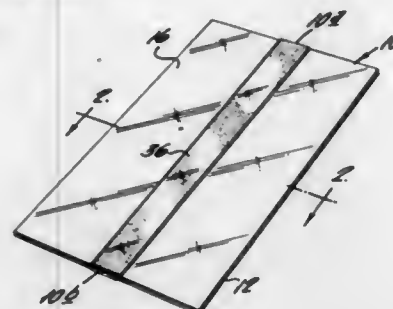
Myron C. Rapkin, Cupertino; Ronald J. Schoengold; David R. Shockey, both of San Jose, and Pierre C. Van Rysselberghe, Palo Alto, all of Calif., assignors to SmithKline Diagnostics, Inc., Sunnyvale, Calif.

Filed Apr. 11, 1985, Ser. No. 722,231

Int. Cl.<sup>4</sup> G01N 1/18, 21/77, 31/22

U.S. Cl. 436-169

6 Claims



1. A test device for separating the fluid portion from whole blood and detecting soluble components in whole blood which comprises a first impermeable carrier having applied thereon a sugar and a second impermeable carrier having incorporated thereon a test reagent specifically reactable with a component to be detected, said first and second carriers being affixed to one another substantially along their entire juxtaposed peripheral edges defining an opening there-between and so layered that the sugar and reagent are in contiguous facing relationship, wherein said opening and carriers permit capillary and longitudinal transport of the blood.

5. A method for separating whole blood into fluid and cellular fractions which comprises applying the blood to the device of claim 1 whereby the cellular fraction remains in close proximity to the site of contact and the fluid fraction migrates in a longitudinal fashion away from said site.

4,678,758

# POROUS CERAMIC FILTER BODY AND MANUFACTURING METHOD THEREFOR

Konrad Kampfer, Thayngen; Wolfhart Rieger, Buch; Ludwig Gauckler, and Marco Dellapina, both of Schaffhausen, all of Switzerland, assignors to Swiss Aluminum Ltd., Chippis, Switzerland

PCT No. PCT/CH84/00012, § 371 Date Oct. 2, 1984, § 102(e) Date Oct. 2, 1984, PCT Pub. No. WO84/03056, PCT Pub. Date Aug. 16, 1984

PCT Filed Jan. 27, 1984, Ser. No. 668,724

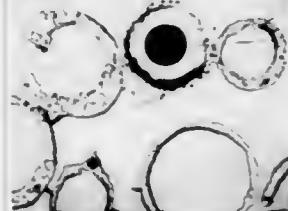
Claims priority, application Switzerland, Feb. 11, 1983, 809/83

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> C04B 38/08; B01D 39/20

U.S. Cl. 501-80

15 Claims



1. Ceramic, open, porous body for the filtration of metals which comprises a sintered porous body having a macroscopically homogeneous structure and a temperature resistance of at least 1600° C. with a linear coefficient of thermal expansion lying between  $3 \times 10^{-6}$  and  $7 \times 10^{-6}/^{\circ}\text{C.}$ , wherein said porous

body is formed from (A) hollow fused spherical particles having at least one void of minimum one refractory material in homogeneous distribution, and (B) another refractory material different from the refractory phase material of the spherical particles in powder form as binding phase which combines during sintering at high temperature by chemical reaction with the spherical particles to form a still further refractory phase (C) which is more refractory than said binding phase and is homogeneously distributed throughout the porous body, wherein after the sintering temperature treatment said porous body retains a macroscopically homogeneous structure without a macroscopic shrinkage.

4,678,759

# ZrB<sub>2</sub> COMPOSITE SINTERED MATERIAL

Otojiro Kida, and Yutaka Segawa, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Division of Ser. No. 749,829, Jun. 28, 1985. This application Oct. 7, 1986, Ser. No. 916,225

Claims priority, application Japan, Jul. 10, 1984, 59-141400; Aug. 14, 1984, 59-168812; Sep. 14, 1984, 59-191815

Int. Cl.<sup>4</sup> C04B 35/56, 35/58

U.S. Cl. 501-92

6 Claims

1. A ZrB<sub>2</sub> composite sintered material consisting essentially of (a.) from 1 to 12% by weight of SiC, (b.) from 1 to 49% by weight of BN, the rest (c.) being substantially ZrB<sub>2</sub>, provided that the total amount of SiC and BN is from 2 to 50% by weight.

4,678,760

# METHOD OF FORMING A SUBSTANTIALLY INTERWOVEN MATRIX CONTAINING A REFRACTORY HARD METAL AND A METAL COMPOUND

Siba P. Ray, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 604,913, Apr. 27, 1984, which is a continuation-in-part of Ser. No. 423,673, Sep. 27, 1982, Pat. No. 4,454,015. This application Oct. 21, 1985, Ser. No. 789,435

Int. Cl.<sup>4</sup> C04B 35/00, 35/58, 35/10, 35/46

U.S. Cl. 501-96

23 Claims



1. In a process wherein a first reactant comprising one or more metals or metal compounds exothermically reacts with at least one or more metals or metal compounds in the presence of a third reactant to form a substantially interwoven matrix of a conductive material and an insulating material; the improvement which comprises locally applying, to a selected region of a shaped body formed from a mixture of said reactants, sufficient energy to initiate said exothermic reaction which propagates throughout the remainder of said body to form said interwoven matrix.

184-021 O.G.-87-13

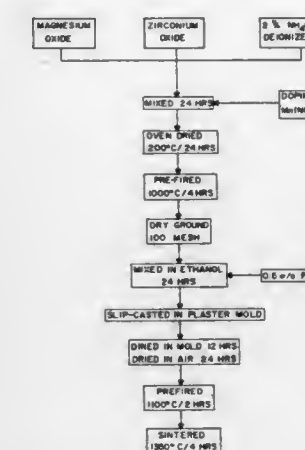
## 4,678,761 SINTERABLE AND STRENGTHENED MAGNESIUM OXIDE CERAMIC MATERIALS

Anil Virkar, and Thomas C. Yuan, both of Salt Lake City, Utah, assignors to The Dow Chemical Company, Midland, Mich. Continuation-in-part of Ser. No. 665,912, Oct. 29, 1984. This application Oct. 29, 1985, Ser. No. 792,479

Int. Cl.<sup>4</sup> C04B 35/48

U.S. Cl. 501-104

19 Claims



1. A sintered ceramic body comprising magnesium oxide and a very minor amount of a metal oxide having the formula AO<sub>x</sub> wherein A is a metal selected from the class consisting of manganese and iron which has a valence state greater than +2 and has an ionic radius substantially similar to the magnesium ion and x is a number having a value greater than one-half the valence state of A.

4,678,762

# VERY SMOOTH AND FLAT POLYCRYSTALLINE ALUMINA SUBSTRATES FROM DIRECT FIRING

Anil K. Agarwal, Camarillo, Calif., and Robert A. Hay, Dudley, Mass., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 698,219, Feb. 4, 1985, abandoned. This application Oct. 15, 1985, Ser. No. 787,240

Int. Cl.<sup>4</sup> C04B 35/10

U.S. Cl. 501-127

10 Claims

1. An as-fired thin, flat, water-impermeable sintered polycrystalline ceramic body consisting essentially of at least 99.5% by weight alpha-alumina said ceramic body having a density of at least 3.9 Mg/m<sup>3</sup> and an average surface roughness on both major surfaces not greater than 44 nm said alumina being made from generally uniformly sized particles such that 98% have a size of less than 1 micron and more than 90% are within a size range of about 0.3 microns or less.

5. In a process for the production of thin, flat, water-impermeable sintered polycrystalline ceramic substrates by tape casting a slurry of ceramic powder, drying to give a greenwave substrate, and firing to give a coherent ceramic substrate, the improvement wherein the ceramic powder used to prepare said slurry is processed to obtain a narrow particle size dispersion such that the ceramic powder in such slurry has at least 90% of its particles within a size range not broader than 0.3 microns and also 98% of its particles are less than 1 micron in size.



4,678,763

## METHOD FOR RECLAIMING HEAT-DAMAGED CATALYSTS

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 631,352, Jul. 16, 1984, abandoned. This application Jan. 17, 1986, Ser. No. 819,944  
Int. Cl.<sup>4</sup> B01J 29/38, 38/66, 29/28, 38/48

U.S. Cl. 502—26 9 Claims

1. A method for reclaiming an unbound catalyst that because of heat damage has lost at least 10% of its activity for cracking normal hexane, said catalyst comprising a zeolite having a Constraint Index of 1 to about 12 and a silica-to-alumina ratio of about 20:1 to less than about 500:1, said damaged catalyst being further characterized by a measurable increase in hexane cracking activity when base exchanged at about 80° C. with an ammonium salt followed by conversion to the hydrogen form, said method consisting essentially of:

contacting said heat-damaged catalyst with liquid water at a temperature of about 80° C. to about 370° C. for about 1 to 100 hours, said combination of temperature and time being effective to augment said measurable increase in hexane cracking activity by at least about 5 alpha units; and, converting said contacted catalyst to the ammonium form by ion exchange with an ammonium salt at a temperature of about 50° C. to about 100° C.

3. The method described in claim 1 wherein said contacting is at a temperature of about 80° C. to 150° C.

5. The method described in claim 1 wherein said zeolite is ZSM-5.

4,678,764

## REACTIVATION OF NOBLE METAL-ZEOLITE CATALYSTS

Quang N. Le, Cherry Hill, N.J.; Ying-Yen P. Tsao, Langhorne, Pa., and Stephen S. Wong, Medford, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 21, 1985, Ser. No. 800,581

Int. Cl.<sup>4</sup> B01J 29/38, 23/96, 38/66, 38/60

U.S. Cl. 502—26 24 Claims

1. A method for reactivating a sulfur oxide-poisoned, oxidatively regenerated, noble metal-containing zeolite catalyst whereby dispersion of said noble metal is enhanced, which comprises removing at least some of said sulfur oxides from said catalyst by contacting said catalyst with an aqueous solution containing a Bronsted acid compound having a dissociation constant ranging from about  $1 \times 10^{-14}$  to about  $2 \times 10^{-1}$  which has been added such that the resulting aqueous solution has a pH below about 7 and thereafter exposing said catalyst to noble metal dispersing conditions which comprise contacting said catalyst with halogen containing gas containing 2 to 20 torr chlorine, 200 to 4000 torr oxygen and above 0 to 50 torr water.

2. The method of claim 1 wherein said compound is an ammonium salt.

4. The method of claim 1 wherein said compound is selected from the group consisting of nitric acid, carbonic acid and hydrogen peroxide.

4,678,765

## CATALYTIC CRACKING CATALYSTS FOR HIGH OCTANE GASOLINE PRODUCTS

Robert L. Chiang, Oakland, N.J., and Mark T. Stanulis, Peekskill, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 3, 1984, Ser. No. 657,482

Int. Cl.<sup>4</sup> B01J 29/06

U.S. Cl. 502—65 7 Claims

1. A cracking catalyst comprising a zeolitic aluminosilicate having a mole ratio of oxides in the dehydrated state of

(0.85–1.1)  $M_{2/3}O \cdot Al_2O_3 \cdot xSiO_2$ 

wherein "M" is a cation having a valence of "n"; "x" has a value greater than 6.0 to about 7.0; has an x-ray powder diffraction pattern having at least the d-spacings of Table A; has extraneous silicon atoms in the crystal lattice in the form of framework  $SiO_4$  tetrahedra; an inorganic oxide matrix; has an effective amount between greater than zero to less than 5 weight percent, based on the weight of the aluminosilicate employed in the catalyst, expressed as the oxide, of at least one rare earth cation selected from the group consisting of cerium, lanthanum, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium; and less than 1.2 weight percent  $Na_2O$  based on the weight of the aluminosilicate employed in the catalyst.

4,678,766

## ENHANCEMENT OF SHAPE SELECTIVITY OF ZEOLITES

Edward J. Rosinski, Pedricktown, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 543,549, Oct. 19, 1983, abandoned, which is a continuation of Ser. No. 543,547, Oct. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 355,420, Mar. 8, 1982, abandoned. This application Feb. 22, 1985, Ser. No. 704,694

Int. Cl.<sup>4</sup> B01J 29/38

U.S. Cl. 502—85 25 Claims

1. A method for enhancing the selectivity for dewaxing of a porous crystalline zeolite selected from the group consisting of ZSM-5, ZSM-35, and ZSM-38 having a silica to alumina mol ratio greater than about 10 and a crystal size ranging from about 2 to 5 microns which comprises:

(a) calcining said zeolite between the temperature of about 300° C. and about 900° C.;

(b) impregnating said calcined zeolite at 80° to 150° C. with an aqueous solution of ammonium fluoride which yields available fluoride ions to provide between about 2.0 to about 30% by weight of elemental fluorine in the final treated product of (c);

(c) calcining said fluoride treated zeolite at a temperature between about 300° C. and about 900° C.;

(d) contacting said calcined, fluoride treated zeolite with an aqueous solution of an ammonium salt; and

(e) calcining said ammonium treated zeolite.

9. A method for enhancing the selectivity for dewaxing of a crystalline zeolite having a silica-to-alumina mol ratio greater than 10, a crystal size ranging from about 2 to 5 microns and selected from the group consisting of ZSM-5, ZSM-35, and ZSM-38, which method comprises:

contacting said zeolite with an amount of aqueous solution of ammonium fluoride, said amount containing sufficient salt to provide between about 2.0 to about 30 percent by weight of said zeolite of fluorine, said contacting being for a time and at a temperature effective to enhance said selectivity; and;

calcining said contacted zeolite at a temperature of about 300° C. to 900° C.

4,678,767

## PROCESS FOR PRODUCING A CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Mamoru Tachikawa; Satoshi Ueki; Masato Sakuma, all of Saitama; Chihito Imai, Kanagawa, and Tokuo Makishima, Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1985, Ser. No. 802,659

Claims priority, application Japan, Nov. 30, 1984, 59-251740

Int. Cl.<sup>4</sup> C08F 4/64

U.S. Cl. 502—104 17 Claims

14. A process for producing a catalyst component for the

polymerization of olefins which comprises contacting (a) a metal oxide of a metal selected from Groups II to IV of the Periodic Table and (b) an organomagnesium compound represented by the formula  $RMgR'$  wherein R represents a hydrocarbyl group selected from an alkyl group, cycloalkyl group, aryl group, arylalkyl group, alkenyl group, or cycloalkenyl group having from 1 to 16 carbon atoms, R' represents a hydrocarbyl group selected from an alkyl group, cycloalkyl group, aryl group, arylalkyl group, alkenyl group, or cycloalkenyl group having from 1 to 16 carbon atoms and may be the same or different from R, or a halogen atom selected from chlorine, bromine, fluorine, or iodine, contacting the contact product therefrom with (c) carbon dioxide and contacting the contact product therefrom with (d) a titanium compound represented by the formula  $TiX_p(OR^1)_{4-p}$  wherein  $0 \leq p \leq 4$ , X is a halogen and R<sup>1</sup> is an alkyl or aryl group having from 1 to 10 carbon atoms.

4,678,768

## CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Masahito Fujita; Makoto Miyazaki; Masami Kizaki; Yukio Nagashima, all of Saitama, and Yuichi Shimbori, Kanagawa, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,618

Claims priority, application Japan, Jun. 21, 1984, 59-126378  
The portion of the term of this patent subsequent to Oct. 29, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> C08F 4/64

U.S. Cl. 502—119 25 Claims

4. A catalyst component for polymerizing alpha-olefins obtained by contacting a product obtained by contacting (A)  $Mg(OR)(OR')$ , (B) a silicon compound having at least one silicon-hydrogen bond, (C) a divalent, trivalent, or tetravalent titanium compound selected from titanium halides and alkoxy titanium halides, and (E) an electron donor selected from a carboxylic acid, a carboxylic acid ester, a carboxylic acid anhydride and a carboxylic acid halide, with (D) one of (a) a hydrocarbon, (b) a halogenated hydrocarbon, (c) a halide of a metal selected from the metals of Groups IIIa, IVa and Va of the Periodic Table, or mixtures thereof, wherein R and R', which may be the same or different, are radicals selected from alkyl, alkenyl, cycloalkyl, aryl and aralkyl radicals.

8. The catalyst component of claim 4 wherein R and R' are alkyl radicals having from one to eight carbon atoms, (B) the silicon compound is a hydrosilane represented by the formula  $H_mR_nSi_x$ , wherein R is a hydrocarbon group,  $R^2O-$ ,  $R^3R^4N-$ , or  $R^5COO-$ , X is a halogen atom, wherein the hydrocarbon groups represented by R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> and C<sub>1</sub> to C<sub>16</sub> alkyl, alkenyl, cycloalkyl, aryl and aralkyl groups, m is an integer of 1 to 3,  $0 \leq r \leq 4$ , and  $m+n+r=4$ , (E) the electron donor is an alkyl ester of an aromatic carboxylic acid and (C) the titanium compound is  $TiCl_4$ .

4,678,769

## APPARATUS FOR CATALYST PREPARATION BY REACTIVE SUBLIMATION

Bonnie J. King, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 762,646, Aug. 5, 1985, abandoned. This application Jun. 9, 1986, Ser. No. 873,842

Int. Cl.<sup>4</sup> B01J 27/06, 8/02

U.S. Cl. 502—231 4 Claims

1. A process for preparing tantalum and/or niobium halide supported catalysts utilizing an apparatus which comprises:

(a) a sealed hollow first tube having a top and a bottom, said first tube having an inlet port at the top of said first tube and an outlet port at the bottom of said first tube,

(b) a second tube having a top and a bottom, said second tube being fitted tightly inside said first tube and located at the bottom of said first tube, said second tube having a porous membrane at the top and bottom of said second

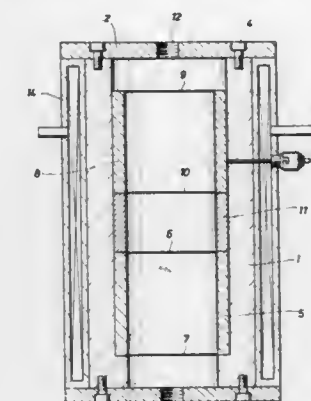
tube whereby gas is permeable and catalyst pellets are not permeable through said porous membrane,

(c) a spacing means,

(d) a third tube having a top and a bottom, said third tube being fitted tightly inside said first tube and separated from said second tube by said spacing means, said third tube having a porous membrane at the top and bottom of said third tube whereby gas is permeable,

(e) a means for heating (b) and (d) to adjust the temperature of said second and third tubes,

which process comprises: placing a catalyst support selected



from the group consisting of silica, alumina and silica-alumina into said second tube, placing tantalum and/or niobium halide into said third tube, passing gas into said inlet port of said first tube and out at said outlet port of said first tube, subliming said tantalum and/or niobium halide by heating said third tube at a temperature ranging from about 140° C. to about 230° C. to form a tantalum and/or niobium halide vapor, and allowing said tantalum and/or niobium vapor to pass through said spacing means to allow expansion and dispersion of said tantalum and/or halide vapor into said second tube and contact with said catalyst support for a length of time sufficient to yield a tantalum and/or niobium halide supported catalyst.

4,678,770

## THREE-WAY CATALYST FOR LEAN EXHAUST SYSTEMS

Chung-Zong Wan, Somerset; Joseph C. Dettling, Howell, and Kenneth I. Jagel, Stanton, all of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Continuation of Ser. No. 696,950, Jan. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 620,415, Jun. 14, 1984, abandoned. This application Mar. 17, 1986, Ser. No. 842,746

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> B01J 23/10, 23/42, 23/44, 23/46

U.S. Cl. 502—304 60 Claims

1. An improved three-way catalyst, suitable for simultaneously oxidizing both gaseous hydrocarbons and carbon monoxide while reducing nitrogen oxides, said catalyst comprising a washcoat comprising rhodium dispersed on particles of gamma alumina, an amount of a rare earth oxide effective for enhancing oxidation of carbon monoxide and a second platinum group metal selected from the group consisting of platinum, palladium and mixtures thereof, the second platinum group metal being dispersed on particles selected from the group consisting of particles of rare earth oxide, particles of alumina, particles of gamma alumina stabilized with rare earth oxide and mixtures thereof; wherein the improvement comprises a substantial portion of the rhodium being dispersed on particles which are substantially rare earth oxide free, said

substantial portion of said rhodium being dispersed as crystallites having an initial particle size greater than about 2 nm.

4,678,771

## ADSORPTION LAYER

Eberhard Beltzinger, Stuttgart, and Eberhard Glaser, Aichwald, both of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart-Möhringen, Fed. Rep. of Germany  
Filed Feb. 13, 1986, Ser. No. 829,524

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505076

Int. Cl.<sup>4</sup> B01J 20/20, 20/26

U.S. Cl. 502-402 16 Claims

1. A combination of a plastic sealing membrane and an adsorption layer in which said adsorption layer reduces permeability and extends functional lifespan of a plastic sealing membrane if a medium to be retained contains organic hydrocarbons in a gaseous and/or liquid phase, such adsorption layer being installed for retaining predominantly liquid or gaseous organic hydrocarbons prior to such matter reaching the plastic sealing membrane which is a sealing sheet of synthetic material; said adsorption layer comprising:

a layer of activated carbon that is disposed, when viewed in the direction of flow of said matter that is to be retained, ahead of and upstream in relation to the direction of flow relative to said plastic sealing membrane.

4,678,772

## COMPOSITIONS CONTAINING GLYCYRRHIZIN

Ruth Segal, Sara Pisanty, and Emma Azaz, all of Jerusalem, Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel  
Continuation-in-part of Ser. No. 470,293, Feb. 28, 1983, abandoned. This application Sep. 25, 1984, Ser. No. 654,148  
Int. Cl.<sup>4</sup> A61K 31/70

U.S. Cl. 514-25 2 Claims

2. A method for the treatment of lesions caused by herpes simplex comprising topically administering to the affected areas in the oral cavity of a patient having lesions caused by herpes simplex about 0.2% by weight of idoxuridine in about 2.0% by weight of glycyrrhizin.

4,678,773

## ANTITUMOR AGENT

Hiroko Usami, Akihiro Yamamoto, both of Tokyo; Yutaka Sugawara, Saitama; Shozo Kotani, Osaka, and Keijiro Kato, Okayama, all of Japan, assignors to Chugai Seryaku Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 16, 1984, Ser. No. 641,217

Claims priority, application Japan, Aug. 26, 1983, 58-155010; Aug. 26, 1983, 58-155011

Int. Cl.<sup>4</sup> A61K 31/70, 31/66, 31/045, 39/02

U.S. Cl. 514-25 11 Claims

1. A method for inducing the production of TNF in a mammal comprising administering to the mammal a sufficient amount of lipoteichoic acid (LTA) to induce TNF in the mammal.

4,678,774

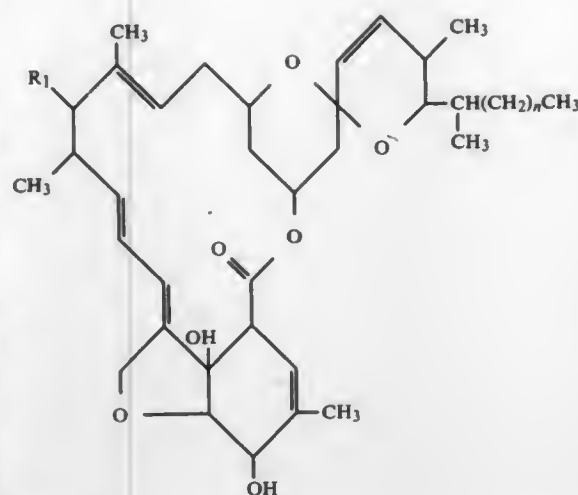
## NOVEL SYNERGISTIC COMPOSITIONS

Irving Putter, Martinsville, N.J., and Daniel M. Stout, Kirkwood, Mo., assignors to Merck & Co., Inc., Rahway, N.J.  
Filed Jan. 6, 1985, Ser. No. 731,926

Int. Cl.<sup>4</sup> A01N 43/04, 25/00

U.S. Cl. 514-30 4 Claims

1. An insecticidal synergistic composition consisting of an avermectin compound having the formula:



wherein

n is 0 or 1; and

R<sub>1</sub> is α-L-oleandrosyl-α-L-oleandrosyloxy; absorbed onto highly dispersed, hydrophilic amorphous silicon dioxide which has a surface area of from 35 to 400 m<sup>2</sup> per gram, an average particle size of from 7 to 40 nanometers and a standard uncompressed density of about 40 to 130 g/l and wherein the avermectin compound is present on the silicon dioxide at a ratio of from 10<sup>-3</sup> to 10<sup>2</sup> μg of the avermectin per mg of the silicon dioxide.

4,678,775

## METHOD OF CONTROLLING PESTS

James A. Nathanson, P.O. Box 719, 1 Grove St., Wellesley, Mass. 02181

Filed May 1, 1984, Ser. No. 605,847

Int. Cl.<sup>4</sup> A01N 43/04, 43/00, 43/84, 43/58

U.S. Cl. 514-47 21 Claims

1. A method of controlling an invertebrate pest which comprises bringing into contact with said pest a pest-controlling amount of an agent selected from the group consisting of

- (1) a non-formamidine-p-octopamine agonist having substantial activity toward an octopamine receptor present in said pest;
- (2) a compound directly and substantially stimulating the enzyme, adenylate cyclase; and
- (3) a cyclic adenosine monophosphate (cAMP) analogue.

4,678,776

## PYRIDYL-THIONOPHOSPHORIC ACID ESTER USEFUL AS PESTICIDES

Fritz Maurer, Wuppertal; Bernard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

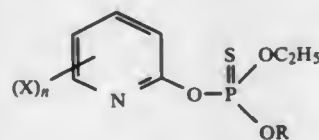
Filed Dec. 6, 1985, Ser. No. 806,159

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446104

Int. Cl.<sup>4</sup> A61K 31/44, 31/675; C07F 9/06

U.S. Cl. 514-89 13 Claims

1. A 2-pyridyl-thionophosphoric acid ester of the formula



in which

R is i-propyl or sec.-butyl,

X chlorine is and

n is 0, 1, 2, 3 or 4.

11. An insecticidal, acaricidal or nematocidal composition comprising an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,678,777

## PEST-COMBATING AGENTS CONTAINING PHOSPHORUS-HETEROCYCLIC COMPOUNDS

Bernd-Wieland Krüger; Hellmut Hoffmann, both of Wuppertal; Ernst Roos, Odenthal, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

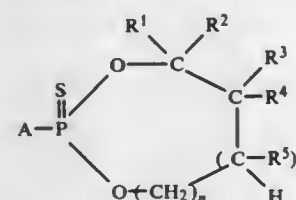
Filed Aug. 6, 1985, Ser. No. 762,979

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431256

Int. Cl.<sup>4</sup> A01N 57/36

U.S. Cl. 514-110 10 Claims

1. An arthropodocidal composition comprising an arthropodocidally effective amount of (A) an arthropodocidally active compound selected from the group consisting of arthropodocidally active carbamic acid esters, carboxylic acid esters, phosphoric acid esters and phosphonic acid esters and (B) a synergist compound of the formula



in which

A is C<sub>1</sub>-C<sub>4</sub>-alkyl or C<sub>1</sub>-C<sub>6</sub>-alkoxy,R<sup>1</sup> is hydrogen, C<sub>1</sub>-C<sub>4</sub>-alkyl or halogen-substituted C<sub>1</sub>-C<sub>4</sub>-alkyl,R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> each independently is hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl, and

n and m each independently is 0 or 1 wherein the ratio of A to B is 1:5 to 5:1.

4,678,778

## TRITHIOPHOSPHONATE INSECTICIDES

Alexandra B. Shortt, Houston, Tex., and William G. Haag, Pleasant Hill, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

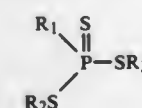
Continuation of Ser. No. 704,814, Feb. 25, 1985, abandoned.

This application Aug. 21, 1986, Ser. No. 898,544

Int. Cl.<sup>4</sup> A01N 57/02; C07F 9/40

U.S. Cl. 514-141 18 Claims

1. A compound having the formula



in which R<sub>1</sub> is methyl or ethyl; R<sub>2</sub> is C<sub>3</sub>-C<sub>5</sub> alkyl or mono-bromo-C<sub>4</sub>-alkyl and R<sub>3</sub> is C<sub>1</sub>-C<sub>4</sub> mono-bromoalkyl or 2,2,2-trifluoroethyl.

2. A method for controlling insects comprising applying to said insect or to a locus at which control is desired an insecticidally effective amount of a compound according to claim 1.

4,678,779

## WEIGHT CONTROL METHOD

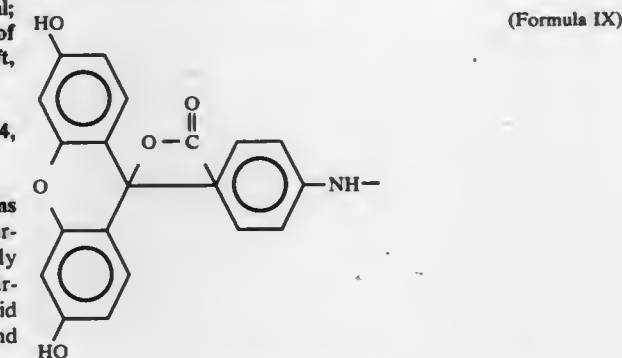
Vera K. Meyers, University of Wisconsin-Parkside, Box No. 2000, Kenosha, Wis. 53141, and Ahmet Koman, Department of Pharmacology, Uppsala University Biomedicum Box 591, 751 24 Uppsala, Sweden

Filed Jan. 31, 1985, Ser. No. 697,212

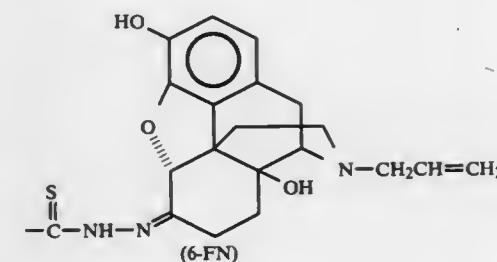
Int. Cl.<sup>4</sup> A61K 31/58, 31/44

U.S. Cl. 514-176 6 Claims

1. A method for controlling weight in a mammal comprising administering to said mammal a weight control agent for inhibiting weight gain, wherein said agent comprises a compound corresponding to the formula:



(Formula IX)



4,678,780

## ANTI-SPASMODIC AGENTS HAVING A RING IN THE MAIN CHAIN

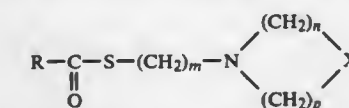
William M. Davis, Tucson, Ariz., assignor to United Pharmaceuticals, Inc., Tucson, Ariz.

Division of Ser. No. 703,264, Feb. 20, 1985. This application Oct. 27, 1986, Ser. No. 923,623

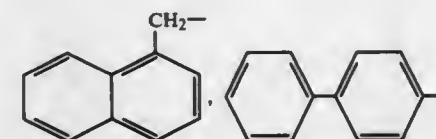
Int. Cl.<sup>4</sup> A61K 31/55

U.S. Cl. 514-183 5 Claims

1. A method of treating a patient suffering smooth muscle spasm comprising administering to the patient an effective anti-spasmodic amount of a compound having the formula:



wherein R is selected from the group consisting of:





4,678,781

## 3-SUBSTITUTED-AMINOMETHYL CEPHALOSPORIN DERIVATIVES

Frederic Jung, le Moulin Cligot, France, assignor to ICI Pharma, Enghien-les-Bains, France

Filed Jun. 4, 1984, Ser. No. 616,891

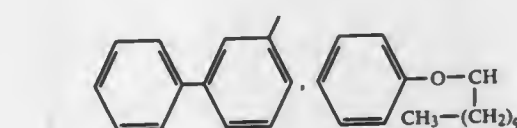
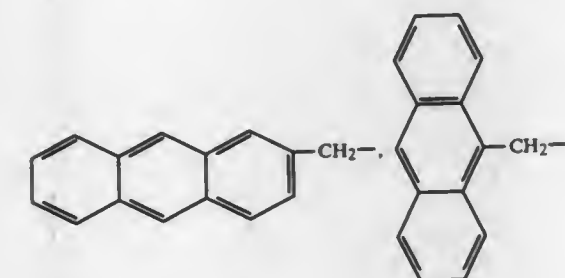
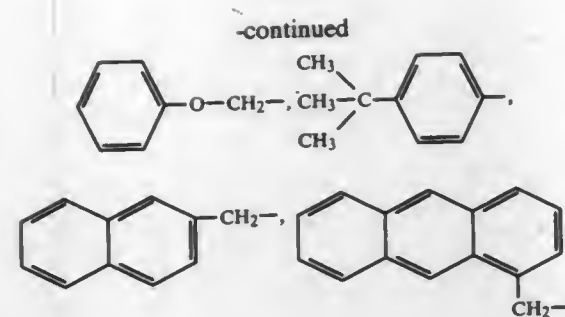
Claims priority, application European Pat. Off., Jan. 3, 1983, 83401135.5

Int. Cl. A61K 31/545; C07D 501/18, 501/38

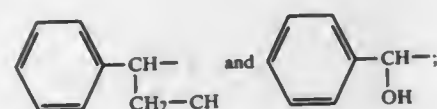
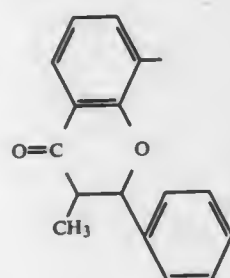
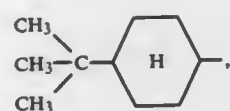
U.S. Cl. 514-200

11 Claims

1. A cephalosporin compound of the formula I:



wherein q is an integer from 1 to 4,

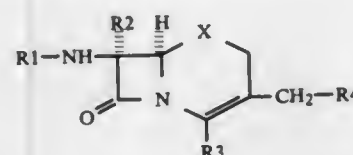
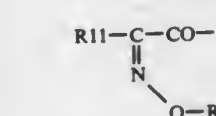
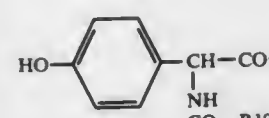
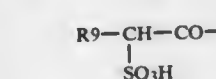
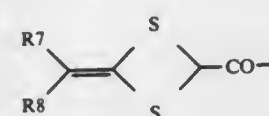
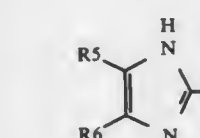


the total number of carbon atoms in R is equal to or less than 20, and wherein

m is an integer from 1 to 4;

n is an integer from 1 to 4;

p is an integer from 1 to 4; and

X may be nonexistent such that an acyclic di(C<sub>1</sub>-C<sub>4</sub>)alkylamino group results or may be O, S, NH or CH<sub>2</sub> or a pharmaceutically acceptable salt thereof, but when X is nonexistent the terminal group in both the n-chain and the p-chain is a methyl group.in which  
X is sulphur or sulphinyl (R or S configuration);  
—R1 is of the formula II, III, IV, V, or VI:

in which

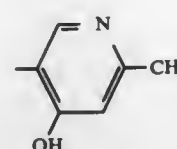
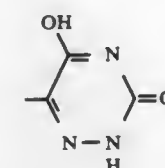
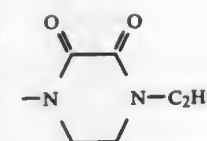
R5 and R6, are same or different, are hydrogen, halogen, cyano, hydroxy, carboxy, pyridyl, (1-6C)alkyl, (1-6C)aminoalkyl, (1-6C)hydroxyalkyl, (2-6C)alkoxycarbonyl, (2-10C)alkylaminoalkyl, (3-15C)dialkylaminoalkyl, or phenyl optionally substituted by 1 or 2 radicals selected from halogen, nitro, amino, hydroxy, carboxy, cyano, (1-6C)alkyl or (2-6C)alkoxycarbonyl;

R7 is carboxy, (2-6C)alkoxycarbonyl, benzyloxycarbonyl, carbamoyl, (2-6C)alkylcarbamoyl, (3-8C)dialkylcarbamoyl carbazoyl, cyano or (2-6C)alkoxycarbonylamino;

R8 is hydrogen, (1-4C)alkyl, (1-4C)alkoxy, (2-5C)alkanoyl, (1-4C)alkylthio, (1-4C)alkylsulphinyl, (1-4C)alkylsulphonyl, phenyl, benzoyl, carboxy, (2-6C)alkoxycarbonyl, benzyloxycarbonyl, carbamoyl, carbazoyl, cyano, (2-5C)alkenyl, sulphonamoyl, (1-4C)hydroxyalkyl, (2-4C)carboxyalkyl, benzyl, hydroxyphenyl, (1-4C)alkoxyphenyl, pyridyl or (methylthio)thiadiazolyl;

R9 is hydrogen, (1-6C)alkyl or phenyl;

R10 is of the formula VII, VIII or IX:

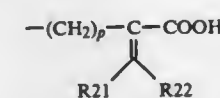


R11 is 2-aminothiazol-4-yl or 2-aminooxazol-4-yl each optionally substituted in the 5-position by fluorine, chlorine or bromine, or R11 is 5-aminoisothiazol-3-yl, 5-amino-1,2,4-thiadiazol-3-yl, 3-aminopyrazol-5-yl, 3-aminopyrazol-4-yl, 2-aminopyrimidin-5-yl, 2-aminopyridin-6-yl, 4-aminopyrimidin-2-yl, 2-amino-1,3,4-thiadiazol-5-yl or 5-amino-1-methyl-1,2,4-triazol-3-yl;

R12 is hydrogen, (1-6C)alkyl, (3-8C)cycloalkyl(1-3C)alkyl, (3-6C)cycloalkyl, (3-6C)cycloalkyl(1-3C)alkyl, (3-6C)alkenyl, (5-8C)cycloalkenyl, (3-6C)alkynyl, (2-5C)alkylcarbamoyl, phenylcarbamoyl, benzylcarbamoyl, triphenylmethyl, (1-3C)haloalkyl, (2-6C)hydroxyalkyl, (1-4C)alkoxy(2-4C)alkyl, (1-4C)alkylthio(2-4C)alkyl, (1-4C)alkanesulphinyll(1-4C)alkyl, (1-4C)alkanesulphonyll(1-4C)alkyl, (2-6C)aminoalkyl, (1-4C)alkylamino(2-6C)alkyl, (2-8C)dialkylamino(2-6C)alkyl, (1-5C)cyanoalkyl, (1-4C)azidoalkyl, (2-5C)ureidoalkyl, 3-amino-3-carboxypropyl, 2-(amidinothio)ethyl, 2-(N-aminoamidinothio)ethyl, tetrahydropyran-2-yl, thietan-3-yl or 2-oxotetrahydrofuran-3-yl, or

—R12 is of the formula —(CH<sub>2</sub>)<sub>n</sub>—R13 in which n is 1 to 4 and R13 is piperidino, pyrrolidino, morpholino, piperazino or N-methylpiperazino, each value of R13 being optionally substituted by (1-4C)alkyl, phenyl or benzyl, or—R12 is of the formula —(CH<sub>2</sub>)<sub>m</sub>—W—R14 in which m is 0 to 3, W is sulphur or a direct bond, and R14 is phenyl or pyridinio(1-4C)alkylene or R14 is pyridyl, imidazolyl, 1,3,4-thiadiazolyl, tetrazolyl, 1-(1-4C)alkyltetrazolyl, thiazolyl, isothiazolyl or isoxazolyl in which the link with W is via a carbon or uncharged nitrogen, each value of R14 being optionally substituted, where possible, by one or two groups selected from (1-4C)alkyl, amino, hydroxy, carboxyl, carbamoyl, nitro, (2-5C)alkoxycarbonyl, cyano or sulphonyl, or—R12 is of the formula —(CH<sub>2</sub>)<sub>n</sub>—CO—R15 in which n is 1 to 4 and R15 is (1-4C)alkyl, phenyl or benzyl, or—R12 is of the formula —COR16 or —(CH<sub>2</sub>)<sub>n</sub>—OCO—R16 in which n is 1-4 and R16 is hydrogen, (1-4C)alkyl, (1-4C)haloalkyl, phenyl or benzyl, or—R12 is of the formula —G—CH<sub>2</sub>—R17 in which G is carbonyl or a direct bond and R17 is phthalimido, or

—R12 is of the formula X:



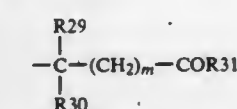
in which p is 1 or 2 and R21 and R22 are hydrogen or (1-4C)alkyl, or

—R12 is of the formula —P(O)R23R24 in which R23 is hydroxy, (1-4C)alkoxy, (2-8C)dialkylamino, phenoxy,

VII

VIII

IX

phenylamino or one of the values given above for R13, and R24 is (1-4C)alkyl, (1-4C)alkoxy, (2-8C)dialkylamino, phenoxy, phenylamino, piperidino, pyrrolidino, morpholino, piperazino or N-methylpiperazino, or —R12 is of the formula —CH<sub>2</sub>P(O)R25R26 in which R25 and R26 are hydroxy or (1-4C)alkoxy, or —R12 is of the formula —CH(SR27)COOR28 in which R27 is (1-4C)alkyl and R28 is hydrogen or (1-6C)alkyl, or —R12 is of the formula XI:

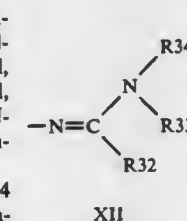
XI

in which m is 0-3, R29 is hydrogen, (1-3C)alkyl or methylthio, R30 is hydrogen, (1-3C)alkyl, (3-7C)-cycloalkyl, cyano, carboxy, (2-5C)carboxyalkyl or methanesulphonylamino, or phenyl optionally substituted by amino or hydroxy, or R29 and R30 are joined to form, together with the carbon to which they are attached, a (3-7C)carbocyclic ring and R31 is hydroxy, amino, (1-4C)alkoxy, (1-4C)alkylamino, phenylamino or of the formula R13 given above or of the formula NHOR32 in which R32 is hydrogen, (1-4C)alkyl, phenyl or benzyl, provided that when R12 contains phenyl, and unless otherwise stated, the phenyl is optionally substituted by 1 or 2 groups selected from halogen, hydroxy, amino, carboxy, nitro, carbamoyl, cyano, or aminomethyl;

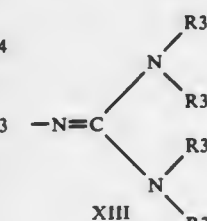
R2 is hydrogen or methoxy;

R3 is carboxy or a biodegradable ester thereof or where R4 carries a positive charge, a carboxylate anion;

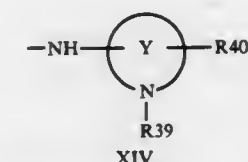
—R4 is of the formula XII, XIII or XIV:



XII



XIII



XIV

or a tautomeric form thereof, in which the radical of the formula XIV may carry a positive charge, and in which R32 is hydrogen, (1-6C)alkyl, phenyl, naphthyl or —(CH<sub>2</sub>)<sub>q</sub>—COOR41 in which q is 1 to 6 and R41 is hydrogen or (1-6C)alkyl;R33 and R34 are selected from hydrogen, (1-6C)alkyl, hydroxy, cyano, phenyl, naphthyl, phenyl(1-6C)alkyl, heteroaryl or —(CH<sub>2</sub>)<sub>q</sub>—COOR41 in which q and R41 have the meanings given above, or

R33 and R34 are joined to form, together with the nitrogen to which they are attached, a pyrrolidine, piperidine, morpholine or hexahydroazepine ring, said ring being optionally fused to a benzene ring, or

R32 and R33 are joined by a carbon chain to form, together with the carbon and nitrogen to which they are attached, a 5- or 6-membered saturated ring to which may optionally be fused a benzene ring;

R35 and R37 are selected from hydrogen, (1-6C)alkyl, phenyl(1-6C)alkyl or —(CH<sub>2</sub>)<sub>q</sub>—COOR41 in which q is 1 to 6 and R41 is hydrogen or (1-6C)alkyl;

R36 and R38 are selected from hydrogen, (1-6C)alkyl, phenyl, naphthyl or phenyl(1-6C)-alkyl; or R36 and R37 are joined as a carbon chain to form, together with the nitrogen-carbon-nitrogen chain to which they are attached, a saturated or partially unsaturated 5- or 6-membered ring to which may optionally be fused a benzene ring;

ring Y is pyridine, pyrimidine, oxazole, thiazole, isoxazole, isothiazole or imidazole to each of which is optionally fused, when possible, a benzene, cyclopentane or cyclohexane ring;

R39 is hydrogen, amino, (1-6C)alkyl, (3-6C)cycloalkyl, (3-6C)alkenyl, (2-8C)alkoxyalkyl,  $-(CH_2)_q-COOR41$ ,  $-(CH_2)_q-CONH_2$ ,  $-(CH_2)_q-S(O)_2-R42$  or  $-(CH_2)_q-NHCO-R42$  in which q is 1 to 6, R41 is hydrogen or (1-6C)alkyl, s is 0, 1 or 2 and R42 is (1-6C)alkyl or (1-6C)alkoxy, or

R39 is (3-8C)alkanoylmethyl, benzoylmethyl, hydroxy(1-6C)alkyl and amino(1-6C)alkyl, (1-4C)alkylamino(1-6C)alkyl, di(1-4C)alkylamino(1-6C)alkyl, (1-6C)alkoxy, (1-6C)alkylamino, phenyl(1-6C)alkyl, 4-nitrobenzyl, phenyl(1-6C)alkoxy, (1-4C)alkoxy(1-4C)alkyl, (1-4C)alkoxy(2-4C)alkoxy(1-4C)alkyl, or the formula  $(CH_2)_n-N=CR43NR44R45$  or  $(CH_2)_nC(NR43)NR44R45$  (or a tautomer thereof) in which n is 1 to 4 and R43, R44 and R45, same or different, are hydrogen or (1-4C)-alkyl;

R40 is hydrogen or one or two substituents selected from halogen, amino, nitro, (1-6C)alkyl, carboxy, (2-6C)alkoxycarbonyl, (1-6C)alkoxy, cyano, carbamoyl, (1-6C)haloalkyl, (1-6C)azidoalkyl, (1-6C)aminoalkyl, (2-4C)aminoalkylthio(1-4C)alkyl, (2-6C)alkanoylamino, (2-6C)alkanoylamino(1-4C)alkyl, (2-6C)alkanoyloxy(1-4C)alkyl, benzyl, benzyloxy or heteroarylthio;

wherein when R33, R34, R35, R36, R37, R38, R39 or R40 individually is or contains phenyl or naphthyl, the phenyl or naphthyl is optionally substituted by one or two radicals selected from halogen, nitro, cyano, carboxyl, hydroxy, carbamoyl, (1-6C)alkyl, (1-6C)alkoxy or (2-6C)alkoxycarbonyl, and wherein when R33 and R34 is heteroaryl, or R40 is heteroarylthio, the heteroaryl ring is a 5- or 6-membered ring containing 1, 2 or 3 heteroatoms selected from Oxygen, nitrogen or sulphur, provided that not more than one hetero atom shall be selected from the group consisting of oxygen and sulphur;

and, when the compound of the formula I does not carry a positive charge, the pharmaceutically-acceptable acid addition salts thereof, and where the compound of the formula I carries a carboxy, the pharmaceutically-acceptable base-addition salts thereof.

4,678,782

### 3S-FORMAMIDO AZETIDINONE ANTIBACTERIAL AGENTS, THEIR PREPARATION AND USE

Roger J. Ponsford; Michael J. Pearson, both of Horsham, and Stephen C. Finch, Redhill, all of England, assignors to Beecham Group p.l.c., England

Division of Ser. No. 459,675, Jan. 20, 1983. This application Dec. 7, 1984, Ser. No. 679,574

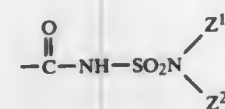
Claims priority, application United Kingdom, Jan. 22, 1982, 8201752

Int. Cl. C07D 205/08, 403/12; A61K 31/395, 31/495 U.S. Cl. 514-210 15 Claims

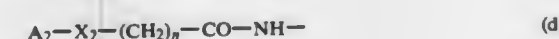
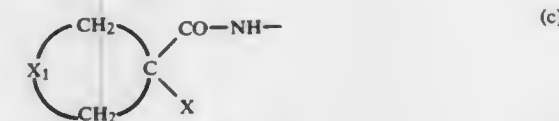
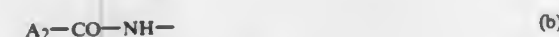
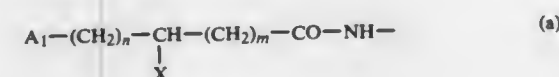
1. A compound of the Formula (I):



or a pharmaceutically acceptable salt thereof wherein R is:



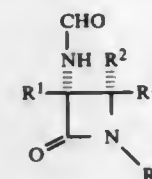
wherein Z<sup>1</sup> and Z<sup>2</sup> are the same or different and each is hydrogen, alkyl of 1 to 6 carbon atoms, aryl, amino or alkoxy of 1 to 6 carbon atoms; R<sup>1</sup> is amino, t-butylcarbonylamino, benzyloxycarbonylamino or benzyldeneamino, or is selected from the sub-formulae (a)-(f):



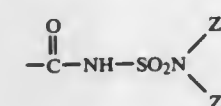
wherein n is zero, one or two, m is zero, one or two; A<sub>1</sub> is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkenyl of 4 to 7 carbon atoms, cyclohexadienyl, phenyl, hydroxyphenyl, thienyl or pyridyl; X is a hydrogen, bromo, chloro, carboxy or a pharmaceutically acceptable ester thereof, sulfo, tetrazolyl, azido, hydroxy, acyloxy, amino, acylamino, heterocyclamino, ureido, guanidino or acylureido group; A<sub>2</sub> is phenyl, 2,6-dimethoxy-phenyl, 2-alkoxy-1-naphthyl, 3-arylisoxazolyl, isothiazolyl or 3-aryl-5-methyl isoxazolyl; X<sub>1</sub> is CH<sub>2</sub>OCH<sub>2</sub>, CH<sub>2</sub>SCH<sub>2</sub> or (CH<sub>2</sub>)<sub>n</sub>; X<sub>2</sub> is an oxygen or sulphur atom; A<sub>3</sub> is phenyl or aminothiazolyl; and A<sub>4</sub> is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, arylaminocarbonyl, alkylaminocarbonyl of 1 to 6 carbon atoms, alkanoyl of 1 to 6 carbon atoms, alkoxy-carbonyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, carboxyalkyl of 1 to 6 carbon atoms, alkylsulphonyl of 1 to 6 carbon atoms or di-alkylphosphatomethyl of 1 to 6 carbon atoms in each alkyl moiety; wherein heterocyclyl means a 5- or 6-membered heterocyclyl group containing one to three heteroatoms selected from sulphur, oxygen or nitrogen, said group being optionally substituted by one, two or three substituents selected from hydroxy, amino, halo and alkoxy of 1 to 6 carbon atoms; R<sup>4</sup> is a phenyl, thienyl or phenoxy group; R<sup>5</sup> is methyl; and R<sup>2</sup> and R<sup>3</sup> are independently selected from hydrogen or a hydrocarbon group of 1 to 18 carbon atoms.

9. A method of treating bacterial infections in humans and

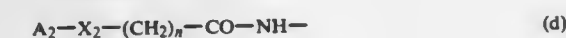
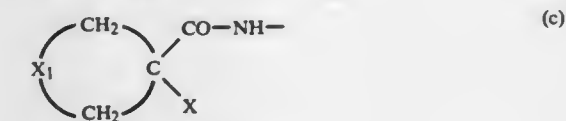
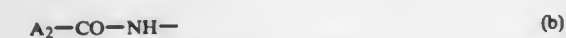
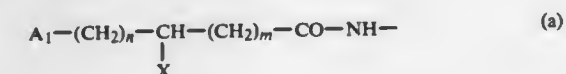
animals which comprises administering to a human or animal in need thereof an antibacterially effective amount of a compound of the Formula (I):



or a pharmaceutically acceptable salt thereof wherein R is:



wherein Z<sup>1</sup> and Z<sup>2</sup> are the same or different and each is hydrogen, alkyl of 1 to 6 carbon atoms, aryl, amino or alkoxy of 1 to 6 carbon atoms; R<sup>1</sup> is amino, t-butylcarbonylamino, benzyloxycarbonylamino or benzyldeneamino, or is selected from the sub-formulae (a)-(f):



wherein n is zero, one or two, m is zero, one or two; A<sub>1</sub> is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkenyl of 4 to 7 carbon atoms, cyclohexadienyl, phenyl, hydroxyphenyl, thienyl or pyridyl; X is a hydrogen, bromo, chloro, carboxy or a pharmaceutically acceptable ester thereof, sulfo, tetrazolyl, azido, hydroxy, acyloxy, amino, acylamino, heterocyclamino, ureido, guanidino or acylureido group; A<sub>2</sub> is phenyl, 2,6-dimethoxy-phenyl, 2-alkoxy-1-naphthyl, 3-arylisoxazolyl, isothiazolyl or 3-aryl-5-methyl isoxazolyl; X<sub>1</sub> is CH<sub>2</sub>OCH<sub>2</sub>, CH<sub>2</sub>SCH<sub>2</sub> or (CH<sub>2</sub>)<sub>n</sub>; X<sub>2</sub> is an oxygen or sulphur atom; A<sub>3</sub> is phenyl or aminothiazolyl; and A<sub>4</sub> is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, arylaminocarbonyl, alkylaminocarbonyl of 1 to 6 carbon atoms, alkanoyl of 1 to 6 carbon atoms, alkoxy-carbonyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, carboxyalkyl of 1 to 6 carbon atoms, alkylsulphonyl of 1 to 6 carbon atoms or di-alkylphosphatomethyl of 1 to 6 carbon atoms in each alkyl moiety; wherein heterocyclyl means a 5- or 6-membered heterocyclyl group containing one to three heteroatoms selected from sulphur, oxygen or nitrogen, said group being optionally substituted by one, two or three substituents selected from hydroxy, amino, halo and alkoxy of 1 to 6 carbon atoms; R<sup>4</sup> is a phenyl, thienyl or phenoxy group; R<sup>5</sup> is methyl; and R<sup>2</sup> and R<sup>3</sup> are independently selected from hydro-

4,678,783

### SUBSTITUTED ISOQUINOLINESULFONYL COMPOUNDS

Hiroyoshi Hidaka, Tsu, and Takanori Sone, Nobeoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

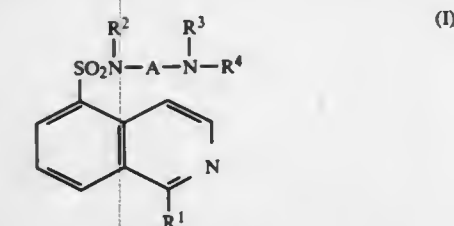
Filed Dec. 27, 1985, Ser. No. 813,973

Claims priority, application Japan, Dec. 27, 1984, 59-273908; Apr. 2, 1985, 60-68512

Int. Cl. A61K 31/495, 31/47; C07D 401/12, 217/22

U.S. Cl. 514-218 19 Claims

19. A method of increasing the diameter of a human blood vessel which comprises intravenously or orally administering to human body an isoquinolinesulfonyl compound represented by the formula (I):



(b) wherein R<sup>1</sup> represents a hydrogen atom, a chlorine atom or a hydroxyl group; and

(c) when R<sup>1</sup> represents a hydrogen atom, A represents an ethylene group unsubstituted or substituted with an alkyl group having 1 to 6 carbon atoms, a phenyl group or a benzyl group.

R<sup>2</sup> and R<sup>3</sup> are directly bonded with each other, thereby forming a trimethylene group unsubstituted or substituted with an alkyl group having 1 to 6 carbon atoms, a phenyl group or a benzyl group, and

R<sup>4</sup> represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; and

when R<sup>1</sup> represents a chlorine atom or a hydroxyl group, A represents an alkylene group having 2 to 6 carbon atoms, said group being unsubstituted or substituted with an alkyl group having 1 to 6 carbon atoms,

R<sup>2</sup> and R<sup>3</sup> are not bonded with each other and each independently represent a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, or R<sup>2</sup> and R<sup>3</sup> are directly bonded with each other, thereby forming an ethylene group unsubstituted or substituted with an alkyl group having 1 to 6 carbon atoms or a trimethylene group unsubstituted or substituted with an alkyl group having 1 to 6 carbon atoms, and

R<sup>4</sup> represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or an amidino group; or an acid salt thereof.

4,678,784

### METHOD FOR THE TREATMENT OF LHRH DISEASES AND CONDITIONS

Chih Y. Ho, Lansdale, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 599,095, Apr. 11, 1984, Pat. No. 4,547,497, and a continuation-in-part of Ser. No. 721,723, Apr. 10, 1985, Pat. No. 4,587,244. This application Oct. 7, 1985, Ser. No. 784,963

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

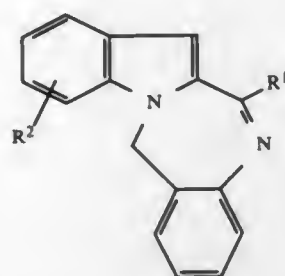
Int. Cl. A61K 31/55; C07D 243/14

U.S. Cl. 514-219 5 Claims

1. A method for antagonizing LHRH in a mammal which

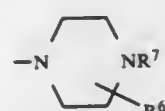


comprises administering to a mammal in need thereof an effective amount of a pharmaceutical composition comprising a pharmaceutically acceptable diluent or carrier in association with a benzodiazepine of the following formula (I):



wherein

R<sup>1</sup> is an amine function of the formula



R<sup>2</sup> is hydrogen, alkoxy having 1-6 carbons, alkyl having 1-6 carbons, trifluoromethyl, halogen, nitro, hydroxy or dialkylamino having 2-10 carbons;

R<sup>6</sup> is hydrogen, alkyl having 1-8 carbons, carboxy, alkoxy-carbonyl wherein the alkoxy group has 1-6 carbons or phenyl; and

R<sup>7</sup> is hydrogen, alkyl having 1-8 carbons, alkoxy-carbonyl wherein the alkoxy group has 1-6 carbons or alkyl having 1-8 carbons substituted by hydroxy, halogen, alkoxy having 1-6 carbons, phenoxy or alkoxy-carbonyl wherein the alkoxy group has 1-6 carbons;

and the pharmaceutically acceptable salts thereof.

4,678,785

#### THIADIAZINE COMPOUNDS

Hideki Ao; Minoru Obata, both of Oita, and Jun Inui, Saitama, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Oct. 29, 1985, Ser. No. 792,402

Claims priority, application Japan, Oct. 29, 1984, 59-227300

Int. Cl.<sup>4</sup> C07D 417/04; A61K 31/54

U.S. Cl. 514-222

4 Claims

1. 5-(3,4-dihydrocarbostyryl-6-yl)-3,6-dihydro-1,3,4-thiadiazin-2-one.

3. A pharmaceutical composition comprising the compound of claim 1 in a therapeutically effective amount as a coronary vasodilator and a pharmaceutically acceptable carrier.

4,678,786

#### PHARMACEUTICAL COMPOSITIONS HAVING $\beta$ -ADRENOCEPTOR ANTAGONIST ACTIVITY EMPLOYING PYRIDAZINONE DERIVATIVES

Anthony M. Roe, Hatfield; William J. Coates, Welwyn Garden City; Robert A. Slater, Letchworth; Stephen P. Breukelman, Bristol, and George D. Meakins, Oxford, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Continuation of Ser. No. 642,979, Aug. 21, 1984, abandoned.

This application Aug. 13, 1986, Ser. No. 896,498

Claims priority, application United Kingdom, Sep. 2, 1983, 8323553

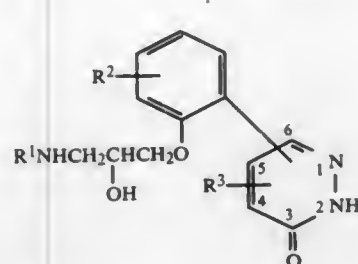
Int. Cl.<sup>4</sup> A61K 31/50

U.S. Cl. 514-247

11 Claims

1. A pharmaceutical composition in dosage unit form having  $\beta$ -adrenoceptor antagonist activity comprising an effective

amount to produce said activity of a compound of formula (I):



or a pharmaceutically acceptable salt thereof, wherein the substituted phenyl is attached at the 5-position of the 3[2H]-pyridazinone;

R<sup>1</sup> is isopropyl or tertiary-butyl;

R<sup>2</sup> is hydrogen, C<sub>1-4</sub> alkyl, C<sub>1-4</sub> alkoxy, hydroxy or amino; and

R<sup>3</sup> is hydrogen or methyl; and a pharmaceutically acceptable carrier.

4,678,787

#### 4H-1-BENZOPYRAN-4-ONES AND THEIR SULFUR CONTAINING ANALOGS

Juan C. Jaen, Plymouth, and Lawrence D. Wise, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 696,364, Jan. 30, 1985,

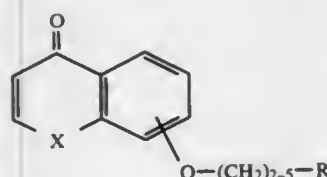
abandoned. This application Nov. 22, 1985, Ser. No. 799,580

Int. Cl.<sup>4</sup> A61K 31/495; C07D 405/14, 409/14

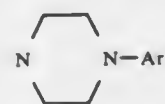
U.S. Cl. 514-253

23 Claims

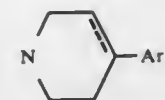
1. A compound having the formula



wherein X is oxygen or sulfur; and R is



or



wherein Ar is (a) phenyl, (b) phenyl substituted by lower alkyl, lower alkoxy, lower thioalkoxy, halogen, or trifluoromethyl, or (c) Het wherein Het is 2-, 3-, or 4-pyridinyl or 2-, 3-, or 4-pyridinyl substituted by lower alkyl, lower alkoxy, or halogen; 2-, 4-, or 5-pyrimidinyl or 2-, 4-, or 5-pyrimidinyl substituted by lower alkyl, lower alkoxy, or halogen; 2-pyrazinyl or 2-pyrazinyl substituted by lower alkyl, lower alkoxy, or halogen; 2- or 3-thienyl or 2- or 3-thienyl substituted by lower alkyl or halogen; 2- or 3-furanyl or 2- or 3-furanyl substituted by lower alkyl or halogen, or 2- or 5-thiazolyl or 2- or 5-thiazolyl substituted by lower alkyl or halogen; and  $\text{---}$  is a single or double bond; and  $\text{---O(CH}_2)_2\text{---R}$  is at the 5, 6, 7, or 8 position

of the fused ring system; or pharmacologically acceptable acid addition salts thereof.

22. A method of treating psychosis in a subject suffering therefrom comprising administering to said subject an effective amount of a compound as claimed in claim 1 in unit dosage form.

4,678,788

#### N-SUBSTITUTED 2-CHLORO-7-FLUORO-10-PIPERAZINO-10,11-DIHYDRODIBENZO (B,F) THIEPINS AND ACID ADDITION SALTS THEREOF

Miroslav Protiva; Jiri Jilek; Irena Cervena; Antonin Dlabac; Martin Valchar, and Josef Pomykacek, all of Prague, Czechoslovakia, assignors to Spofa, Spojene Podniky Pro Zdravotnickou Vyrobu, Prague, Czechoslovakia

Filed Jan. 24, 1986, Ser. No. 821,992

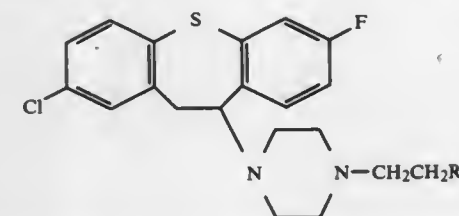
Claims priority, application Czechoslovakia, Jan. 24, 1985, 516-85

Int. Cl.<sup>4</sup> A61K 31/495; C07D 409/04

U.S. Cl. 514-254

6 Claims

6. Composition useful for the treatment of schizophrenia in humans comprising an antidopaminergic and neuroleptic effective amount of an N-substituted 2-chloro-7-fluoro-10-piperazino-10,11-dihydrodibenzo(b,f)thiepin of the formula



in which R is selected from the group consisting of an amino-carbonyl, amino-oximinomethyl, 1,3-dioxolan-2-yl and 1,3-dioxan-2-yl group, and its addition salt with a pharmaceutically acceptable organic or inorganic acid, in a pharmaceutically acceptable carrier.

4,678,789

#### TRIAZOLE ANTIFUNGAL AGENTS

Kenneth Richardson, and Peter J. Whittle, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,525

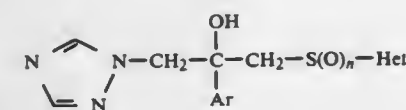
Claims priority, application United Kingdom, Apr. 7, 1982, 82 10312

Int. Cl.<sup>4</sup> C07D 401/12, 403/12, 417/12; A61K 31/41

U.S. Cl. 514-262

11 Claims

1. A compound of the formula:



wherein

Ar is 2,4-dichlorophenyl;

n is 0, 1 or 2; and

Het is 2-imidazolyl, 2-thiazolyl, 3-(1,2,4-triazolyl), 5-tetrazolyl, 2-(1,3,4-thiadiazolyl), 2-, 3- or 4-pyridyl, 2- or 4-pyrimidinyl, quinolyl, benzothiazolyl or purinyl, each being optionally mono- or di-substituted by halo, CF<sub>3</sub>, C<sub>1-4</sub> alkyl, amino, alkanoylamino or thio groups; and their pharmaceutically acceptable salts.

4,678,790

#### CERTAIN $\alpha$ -BENZYL-3-PYRIDYLMETHANOLS, N-OXIDES THEREOF AND THEIR FUNGICIDAL USE

Franz Dorn, Dielsdorf; Albert Pfiffner, Bülach, and Beat Zehnder, Kaiseraugst, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 1, 1984, Ser. No. 655,812

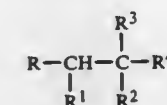
Claims priority, application Switzerland, Oct. 7, 1983, 5458/83; Jul. 26, 1984, 3620/84

Int. Cl.<sup>4</sup> C07D 213/30; A01N 43/40

U.S. Cl. 514-277

19 Claims

1. A compound of the formula



wherein

R is mono-, di- or trisubstituted phenyl, the substituents being selected from the group consisting of halogen, C<sub>1-3</sub>-alkyl, C<sub>1-3</sub>-alkoxy and combinations thereof with the proviso that there are no more than two of the alkyl or alkoxy substituents on the trisubstituted phenyl;

R<sup>1</sup> is C<sub>1-6</sub>-alkyl, C<sub>3-6</sub>-alkenyl, C<sub>3-6</sub>-alkynyl, phenylthio, C<sub>1-6</sub>-alkylthio, C<sub>3-6</sub>-alkenylthio, C<sub>3-6</sub>-alkynylthio, C<sub>3-6</sub>-alkynylthio monosubstituted with C<sub>1-4</sub>-alkoxy, or a mono-, di- or trisubstituted phenylthio, the substituents being selected from the group consisting of halogen, C<sub>1-3</sub>-alkyl, C<sub>1-3</sub>-alkoxy, nitro and combinations thereof with the proviso that there is no more than one nitro substituent on the di- or trisubstituted phenylthio and that there are no more than two C<sub>1-3</sub>-alkyl or C<sub>1-3</sub>-alkoxy substituents on the trisubstituted phenylthio;

R<sub>2</sub> is hydroxy; R<sub>3</sub> is C<sub>2-6</sub>-alkenyl,  $\text{---C=CR}^5$ , phenyl-C<sub>1-3</sub>-alkyl or mono-, di- or trisubstituted phenyl-C<sub>1-3</sub>-alkyl, the substituents being selected from the group consisting of halogen, C<sub>1-3</sub>-alkyl, C<sub>1-3</sub>-alkoxy, nitro and combinations thereof with the proviso that there is no more than one nitro substituent on the di- or trisubstituted phenyl-C<sub>1-3</sub>-alkyl and that there are no more than two C<sub>1-3</sub>-alkyl or C<sub>1-3</sub>-alkoxy substituents on the trisubstituted phenyl-C<sub>1-3</sub>-alkyl;

R<sup>4</sup> is 3-pyridyl or 3-pyridyl 1-oxide; and

R<sup>5</sup> is hydrogen, phenyl, vinyl, bromine, iodine, C<sub>1-6</sub>-alkoxy, C<sub>1-10</sub>-alkyl, C<sub>1-10</sub>-alkyl disubstituted with C<sub>1-3</sub>-alkoxy, C<sub>1-10</sub>-alkyl monosubstituted with C<sub>1-3</sub>-alkoxy, chlorine or bromine, or mono-, di- or trisubstituted phenyl, the substituents being selected from the group consisting of halogen, C<sub>1-3</sub>-alkyl, C<sub>1-3</sub>-alkoxy and combinations thereof with the proviso that there are no more than two of the alkyl or alkoxy substituents on the trisubstituted phenyl; or an acid addition salt thereof.

10. A method for combating plant fungi which comprises treating the locus to be protected with an effective amount of a compound in accordance with claim 1.

4,678,791

#### 6-PHENYL-1,2,3,4,4A,5,6,10B-OCTAHYDROBENZ(H)ISOQUINOLINES USEFUL FOR TREATING DEPRESSION

James J. Napier, Chilli, and Ronald C. Griffith, Pittsford, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

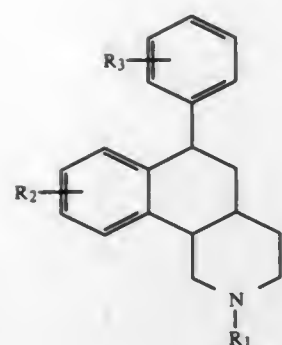
Filed May 7, 1985, Ser. No. 731,426

Int. Cl.<sup>4</sup> A61K 31/47; C07D 221/10

U.S. Cl. 514-290

7 Claims

1. A compound of the formula



wherein

R<sub>1</sub> is hydrogen, C<sub>1</sub>-C<sub>7</sub> alkyl, or C<sub>4</sub>-C<sub>8</sub> cycloalkylmethyl;  
R<sub>2</sub> is hydrogen or a single or multiple substitution of hydroxyl, halogen, C<sub>1</sub>-C<sub>7</sub> alkoxy, or C<sub>1</sub>-C<sub>7</sub> alkyl; and  
R<sub>3</sub> is hydrogen or a single or multiple substitution of hydroxyl, halogen, C<sub>1</sub>-C<sub>7</sub> alkoxy, phenoxy, C<sub>1</sub>-C<sub>7</sub> alkyl, or trifluoromethyl; all stereoisomeric forms and mixtures thereof, and pharmaceutically acceptable addition salts thereof.

7. The method of treating depression comprising the administration of an effective amount of a compound of claim 1 to a human in need of such treatment.

#### 4,678,792 QUATERNARY 3,4-DIHYDRO-ISOQUINOLINIUM SALTS

Josef Nickl; Erich Muller; Benthold Narr; Helmut Ballhause, and Walter Haarmann, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,579

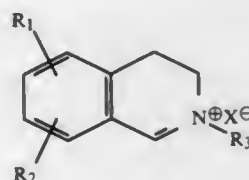
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1984, 3407955

Int. Cl.<sup>4</sup> A61K 31/47

U.S. Cl. 514-307

15 Claims

1. A pharmaceutical composition containing an amount effective to prevent or treat a thromboembolic disease of a 3,4-dihydroisoquinolinium salt of formula I



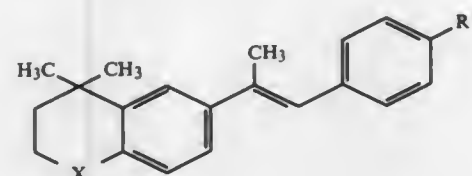
wherein

R<sub>1</sub> and R<sub>2</sub> are each independently hydrogen, C<sub>1</sub>-C<sub>3</sub> alkyl or C<sub>1</sub>-C<sub>3</sub> alkoxy;  
R<sub>3</sub> is a C<sub>7</sub>-C<sub>9</sub> aralkyl, the phenyl nucleus of which can be mono-, di- or trisubstituted by halogen, C<sub>1</sub>-C<sub>3</sub> alkyl or C<sub>1</sub>-C<sub>3</sub> alkoxy; and

X represents the anion of a pharmaceutically acceptable inorganic or organic acid, together with one or more pharmaceutically acceptable carriers or diluents.

4,678,793  
HETEROCYCLIC COMPOUNDS  
Michael Klaus, Weil am Rhein, Fed. Rep. of Germany, and Peter Loeliger, Muttentz, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.  
Division of Ser. No. 491,618, May 5, 1983. This application Apr. 1, 1985, Ser. No. 718,674  
Int. Cl.<sup>4</sup> A61K 31/47; C07D 215/14  
U.S. Cl. 514-311 17 Claims

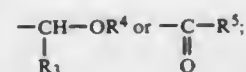
1. A compound of the formula:



wherein X is

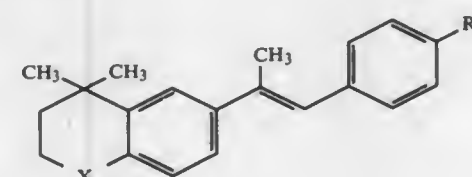


R<sup>1</sup> is methyl,



R<sup>2</sup> is hydrogen or lower alkyl; R<sup>3</sup> is hydrogen or methyl;  
R<sup>4</sup> is hydrogen, lower alkyl or alkanoyl; R<sup>5</sup> is hydrogen, lower alkyl, amino, lower alkylamino, di(lower alkyl)-amino or OR<sup>6</sup>; and R<sup>6</sup> is hydrogen or lower alkyl;  
or pharmaceutically acceptable salts thereof.

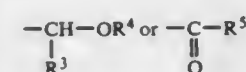
6. A method for combatting acne or psoriasis comprising administering to a patient an effective amount of a compound of the formula



wherein X is

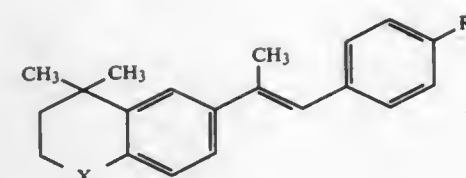


R<sup>1</sup> is methyl,



R<sup>2</sup> is hydrogen or lower alkyl; R<sup>3</sup> is hydrogen or methyl;  
R<sup>4</sup> is hydrogen, lower alkyl or alkanoyl; R<sup>5</sup> is hydrogen, lower alkyl, amino, lower alkylamino, di(lower alkyl)-amino or OR<sup>6</sup>; and R<sup>6</sup> is hydrogen or lower alkyl;  
or pharmaceutically acceptable salts thereof.

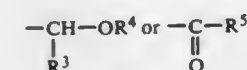
11. A method for combatting neoplasms comprising administering to a patient in an effective amount of a compound of the formula:



wherein X is



R<sup>1</sup> is methyl,



R<sup>2</sup> is hydrogen or lower alkyl; R<sup>3</sup> is hydrogen or methyl;  
R<sup>4</sup> is hydrogen, lower alkyl or lower alkanoyl; R<sup>5</sup> is hydrogen, lower alkyl, amino, alkylamino, di(lower alkyl)-amino or OR<sup>6</sup>; and R<sup>6</sup> is hydrogen or lower alkyl;  
or pharmaceutically acceptable salts thereof.

in which

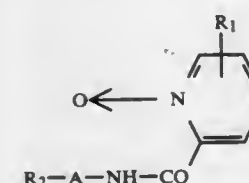
R is a hydrogen atom or a lower alkyl group,  
X is a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkylthio group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, a lower alkenyl group, a lower alkynyl group, a phenyl, phenoxy, phenylthio, naphthyl, naphthoxy or naphthylthio group; a halogen substituted phenyl, phenoxy, phenylthio, naphthyl, naphthoxy or naphthylthio group; or a benzyl, phenethyl or naphthylmethyl group.

l is 1, 2, 3 or 4, and  
n is 0, 1, 2 or 3,  
or a salt thereof.

4,678,794  
N-PYRIDYL-SUBSTITUTED  
PYRIDINE-2-CARBOXAMIDE-1-OXIDES  
Roger Crossley, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England  
Filed Nov. 5, 1985, Ser. No. 795,065  
Claims priority, application United Kingdom, Nov. 6, 1984, 8428007

Int. Cl.<sup>4</sup> C07D 401/12; A61K 31/44  
U.S. Cl. 514-332 10 Claims

1. A pharmaceutical composition useful as an anti-ulcer agent comprising an effective amount of a compound having the formula I



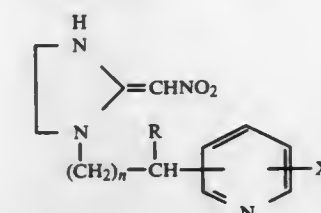
or a pharmaceutically acceptable acid addition salt thereof wherein R<sub>1</sub> is selected from hydrogen and lower alkyl, A is selected from a direct bond and lower alkylene and R<sub>2</sub> is selected from pyridinyl and pyridinyl monosubstituted by lower alkyl, in association or combination with a pharmaceutically acceptable carrier.

4,678,795  
1-PYRIDYLMETHYL-2-NITROMETHYLENE-1,3-DIAZACYCLOALRANE INSECTICIDES  
Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Shinzo Kagabu, Tokyo, and Koichi Moriya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Apr. 8, 1985, Ser. No. 720,838  
Claims priority, application Japan, Apr. 13, 1984, 59-72966; Jun. 29, 1984, 59-132943

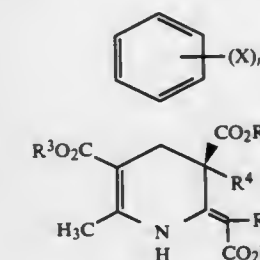
Int. Cl.<sup>4</sup> C07D 401/02; A61K 31/415  
U.S. Cl. 514-341 9 Claims

1. A nitromethylene derivative of the formula



4,678,796  
2-ALKYLIDENE DERIVATIVES OF  
1,2,3,4-TETRAHYDRO-PYRIDINE-2,5-PYRIDINE  
CARBOXYLIC ACID DIALKYL ESTERS USEFUL FOR  
TREATMENT OF CARDIOVASCULAR DISORDERS  
Michael D. Taylor, Ann Arbor, and Edward W. Badger, Dexter, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.  
Continuation of Ser. No. 677,150, Nov. 30, 1984, abandoned.  
This application Sep. 3, 1986, Ser. No. 903,882  
Int. Cl.<sup>4</sup> C07D 211/90, 401/12, 405/12; A61K 31/455  
U.S. Cl. 514-356 5 Claims

1. A compound having the formula (I)



wherein R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are independently alkyl of from one to six carbons, inclusive; R<sup>4</sup> and R<sup>5</sup> are hydrogen or alkyl of from one to six carbons, inclusive; n is an integer of one to five inclusive, X may be the same of different and is selected from one to three carbons, inclusive; NO<sub>2</sub>, fluorine, chlorine, bromine, trifluoromethyl, methoxy, amino, and alkylamino of from one to six carbons, inclusive; or a pharmaceutically acceptable salt thereof.



3. A pharmaceutical composition for the treatment of congestive heart failure, coronary heart disease, myocardial ischemia, angine, or hypertension comprising an effective amount for use to increase myocardial contractility, and as an anti-myocardial ischemic, antianginal, or antihypertensive, of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

4,678,797

# BIOLOGICALLY ACTIVE AGENTS CONTAINING SUBSTITUTED ISOXAZOLIDINES

Axel Ingendoh, Velbert; Friedrich Berschauer, Wuppertal; Benedikt Becker, Mettmann; Wilhelm Stendel, Wuppertal; Bernhard Homeyer, Leverkusen; Martin Scheer; Anno de Jong, both of Wuppertal; Gerd Hänsler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed May 10, 1985, Ser. No. 733,449

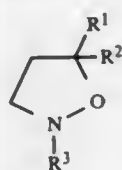
Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418395

Int. Cl.<sup>4</sup> A61K 31/42

U.S. Cl. 514—378

8 Claims

1. A method of combating insects, arachnids, nematodes or fungi which comprises applying to such insects, arachnids, nematodes or fungi or to a habitat thereof an insecticidally, arachnidically, nematocidally or fungicidally effective amount of a substituted isoxazolidine of the formula



in which

R<sup>1</sup> represents C<sub>1-5</sub>-alkyl, C<sub>3-6</sub>-cycloalkyl, phenyl-C<sub>1-4</sub>-alkyl, phenyl, naphthyl or pyridyl, which can be substituted by nitro, OH, CN, halogen, C<sub>1-4</sub>-alkyl, C<sub>3-6</sub>-cycloalkyl, C<sub>1-4</sub>-alkoxy, C<sub>1-4</sub>-alkylthio, C<sub>1-4</sub>-halogenoalkyl, C<sub>1-4</sub>-alkoxycarbonyl, carboxyl (COOH), amino, C<sub>1-4</sub>-alkylamino, di-C<sub>1-4</sub>-alkylamino, phenylamino, phenyl-C<sub>1-4</sub>-alkylamino, aminocarbonyl-C<sub>1-4</sub>-alkyl, (—NHCOC<sub>1-4</sub>-alkyl), C<sub>1-4</sub>-alkylsulfonylamino (—NHSO<sub>2</sub>C<sub>1-4</sub>-alkyl), C<sub>1-4</sub>-halogenoalkoxy, C<sub>1-4</sub>-halogenoalkylthio, C<sub>1-4</sub>-alkylenedioxy, C<sub>1-4</sub>-halogenoalkylenedioxy, phenyl, naphthyl, phenoxy or naphthoxy, or represents a radical of the formula —COR<sup>4</sup>,

R<sup>4</sup> represents C<sub>1-4</sub>-alkyl, phenyl, C<sub>1-4</sub>-alkylthio, phenoxy, phenylthio, amino, C<sub>1-4</sub>-alkylamino, di-C<sub>1-4</sub>-alkylamino, phenylamino, naphthylamino, phenyl-C<sub>1-4</sub>-alkylamino, diphenylamino, C<sub>3-6</sub>-cycloalkylamino, morpholino or piperidino,

R<sup>2</sup> represents hydrogen or one of the radicals mentioned under R<sup>1</sup>, and

R<sup>3</sup> represents C<sub>1-10</sub>-alkyl, C<sub>3-6</sub>-cycloalkyl, C<sub>2-4</sub>-alkenyl, C<sub>2-6</sub>-alkinyl, phenyl or naphthyl, or represents C<sub>1-6</sub>-alkyl, which is substituted by halogen, OH, CN, amino, C<sub>1-4</sub>-alkylamino, C<sub>1-4</sub>-di-alkylamino, C<sub>1-4</sub>-alkoxy, C<sub>3-6</sub>-cycloalkyl, phenyl, naphthyl, phenoxy, phenylthio or C<sub>1-4</sub>-alkyl-carbonyloxy; or represents phenyl which is substituted by halogen, NO<sub>2</sub>, CN, OH, amino, C<sub>1-4</sub>-alkylamino, di-C<sub>1-4</sub>-alkylamino, or (—COOC<sub>1-4</sub>-alkyl), or represents phenoxy, naphthoxy or biphenyloxy, or an acid addition salt thereof.

4,678,798

# N-(AZOLYL-CARBAMYL)-HYDROXYLAMINES AND FUNGICIDES CONTAINING THESE COMPOUNDS

Costin Rentzea, Heidelberg; Hubert Sauter, Mannheim; Stefan Karbach, Ludwigshafen; Wolfgang Will, Mannheim; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany  
Filed Apr. 18, 1985, Ser. No. 724,761

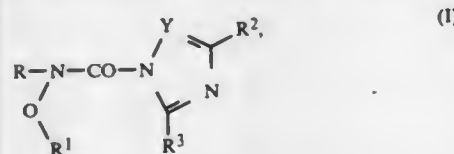
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415138

Int. Cl.<sup>4</sup> C07D 249/08, 233/56; A61K 31/41

U.S. Cl. 514—383

3 Claims

1. An N-(azolyl-carbamyl)-hydroxyamine of the formula



where R is a member selected from the group consisting of alkyl, alkenyl, alkoxyalkyl, cycloalkyl, alkyl substituted by cycloalkyl or cycloalkyl substituted by alkyl, each member consisting of not more than 12 carbon atoms, or phenyl, phenyl-C<sub>1-4</sub>-alkyl, phenyl-C<sub>2-3</sub>-alkenyl or phenoxy-C<sub>1-6</sub>-alkyl, each of which is unsubstituted or substituted by halogen, cyano, nitro, trifluoromethyl, C<sub>1-4</sub>-alkyl or C<sub>1-4</sub>-alkoxy, R<sup>1</sup> is a member selected from the group consisting of alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, cycloalkyl or cycloalkyl-alkyl, each member consisting of not more than 12 carbon atoms, or benzyl which is unsubstituted or substituted by halogen, C<sub>1-4</sub>-alkyl, C<sub>1-4</sub>-alkoxy, trifluoromethyl, nitro or cyano, Y is CH or N, and R<sup>2</sup> and R<sup>3</sup> are identical or different and are each hydrogen or alkyl of 1 to 5 carbon atoms.

4,678,799

# 1,2-(1,4)-DIMETHYL-4(2)-(2-HYDROXYETHYL)-5-NITRO-IMIDAZOLE ANTIPROTOZOAL AGENTS WITH REDUCED MUTAGENICITY

Gerald T. Miwa, Maplewood, and John S. Walsh, Avenel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 24, 1984, Ser. No. 685,944

Int. Cl.<sup>4</sup> A61K 31/415; C07D 233/94

U.S. Cl. 514—398

5 Claims

1. A compound selected from the group consisting of:  
(A) 1,4-dimethyl-2-(2-hydroxyethyl)-5-nitroimidazole; and  
(B) 1,2-dimethyl-4-(2-hydroxyethyl)-5-nitroimidazole.

5. A method for the treatment of parasitic infections in animals which comprises administering to an animal with parasitic infections, an effective amount of a compound of claim 1.

4,678,800

# GAMMA-R-GLUTAMOYL DERIVATIVES

James L. Stanton, Ossining, and Gary M. Ksander, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

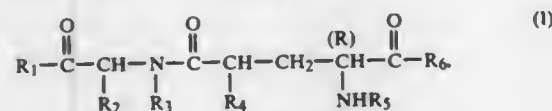
Filed Jun. 15, 1984, Ser. No. 621,302

Int. Cl.<sup>4</sup> C07D 209/12; A61K 31/40

U.S. Cl. 514—412

11 Claims

1. A compound of the formula



wherein R<sub>1</sub> represents hydroxy, C<sub>1-4</sub>-alkoxy, di-C<sub>1-4</sub>-alkylamino-C<sub>2-4</sub>-alkoxy, pyrid-2-, -3- or -4-yl-methoxy, or amino; R<sub>2</sub> and R<sub>3</sub> together with the adjacent —CH— group

and the adjacent N-atom form an octahydroindolyl or a dihydroindolyl moiety; R<sub>4</sub> represents hydrogen; R<sub>5</sub> is carbamoyl, C<sub>1-4</sub>-alkanoyl, nicotinoyl, isonicotinoyl, picolinoyl, C<sub>1-4</sub>-alkoxycarbonyl, benzyloxycarbonyl, C<sub>1-4</sub>-alkylsulfonyl, benzenesulfonyl or p-toluenesulfonyl; and R<sub>6</sub> represents hydroxy, C<sub>1-4</sub>-alkoxy, de-C<sub>1-4</sub>-alkylamino-C<sub>2-4</sub>-alkoxy, pyrid-2-, -3- or -4-ylmethoxy; or a pharmaceutically acceptable salt of a compound of the formula I that has a free carboxy group or a basic salt forming group.

2. A compound according to claim 1 wherein R<sub>1</sub> represents hydroxy, C<sub>1-4</sub>-alkoxy, di-C<sub>1-4</sub>-alkylamino-C<sub>2-4</sub>-alkoxy, pyrid-2-, -3- or -4-ylmethoxy, or amino; R<sub>2</sub> and R<sub>3</sub> together with the adjacent —CH— group and the adjacent N-atom form an octahydroindolyl or dihydroindolyl moiety; R<sub>4</sub> represents hydrogen, R<sub>5</sub> represents C<sub>1-4</sub>-alkanoyl, nicotinoyl, isonicotinoyl, benzyloxycarbonyl, mesyl, benzenesulfonyl, or p-toluenesulfonyl; and R<sub>6</sub> represents hydroxy or C<sub>1-4</sub>-alkoxy; or a pharmaceutically acceptable salt of a said compound of the formula I that has a free carboxy group or has a basic salt forming group.

9. A method for the treatment of cardiovascular diseases responsive to angiotensin-converting enzyme inhibition in a mammal comprising administering to a mammal in need of said treatment an effective angiotensin-converting enzyme inhibiting amount of a compound of claim 2 or of a pharmaceutical composition comprising said compound together with one or more pharmaceutically acceptable carriers.

4,678,801

# NOVEL 2-OXOPYRROLIDINE COMPOUNDS, SALTS THEREOF PROCESS FOR THE PREPARATION THEREOF AS WELL AS PHARMACEUTICAL AGENT COMPRISING THE COMPOUND

Masayasu Kurono, Mie; Motohide Hayashi, Kasugai; Tsunemasa Suzuki, Kumamoto; Kenji Miura, Kasugai; Yoshihiro Kumagai, Kasugai; Yukiharu Matsumoto, Kasugai; Seiji Miyano, Fukuoka, and Kunihiro Sumoto, Ohnojo, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

Filed Jul. 10, 1986, Ser. No. 884,125

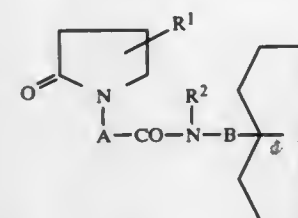
Claims priority, application Japan, Jul. 23, 1985, 60-161213

Int. Cl.<sup>4</sup> A61K 31/40; C07D 487/06

U.S. Cl. 514—413

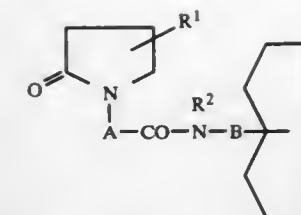
14 Claims

1. A 2-oxopyrrolidine compound represented by the formula



wherein R<sub>1</sub> and R<sub>2</sub> are independently hydrogen, straight-chain alkyl of 1-10 carbon atoms, branched-chain alkyl of 3-5 carbon atoms, or cycloalkyl of 3-6 carbon atoms, A is straight-chain alkylene of 1-3 carbon atoms; branched-chain alkylene of 2-10 carbon atoms, each of said alkylene being unsubstituted or substituted with a phenyl group, and B is straight-chain alkylene of 1-3 carbon atoms or branched-chain alkylene of 2-10 carbon atoms, or a non-toxic acid-addition salt thereof.

8. An agent for preventing and curing a cerebral dysfunction, which comprises, as an effective component, a cerebral dysfunction preventing amount of at least one 2-oxopyrrolidine compound represented by the formula



wherein R<sup>1</sup> and R<sup>2</sup> are independently hydrogen, straight-chain alkyl of 1-10 carbon atoms, branched-chain alkyl of 3-5 carbon atoms, or cycloalkyl of 3-6 carbon atoms, A is straight-chain alkylene of 1-3 carbon atoms; branched-chain alkylene of 2-10 carbon atoms, each of said alkylene being unsubstituted or substituted with a phenyl group, and B is straight-chain alkylene of 1-3 carbon atoms or branched-chain alkylene of 2-10 carbon atoms, or a pharmaceutically acceptable non-toxic acid-addition salt thereof and a pharmaceutically acceptable diluent.

4,678,802

# 1-ACYLCARBAMOYLOXINDOLE-3-CARBOXAMIDES AS ANTIINFLAMMATORY AGENTS

Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

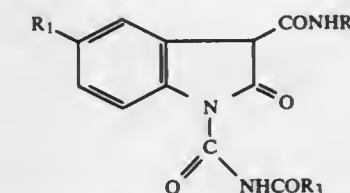
Continuation-in-part of Ser. No. 753,200, Jul. 9, 1985. This application Jan. 31, 1986, Ser. No. 825,017

Int. Cl.<sup>4</sup> C07D 209/12; A61K 31/40

U.S. Cl. 514—418

8 Claims

1. A compound of the formula



and a pharmaceutically acceptable base salt thereof, wherein R<sub>1</sub> is selected from the group consisting of hydrogen, acetyl, methyl, fluoro, chloro, bromo and methoxy; R<sub>2</sub> is selected from the group consisting of phenyl and mono- and disubstituted phenyl wherein said substituents are selected from the group consisting of chloro and fluoro; and R<sub>3</sub> is selected from the group consisting of alkyl having one to four carbon atoms and phenyl.

4,678,803

# OPTICAL ISOMERS, PROCESSES FOR PRODUCTION THEREOF AND PHARMACEUTICAL COMPOSITION THEREOF

Masami Shiratsuchi, Musashimurayama; Kiyoshi Kawamura, Tokorozawa; Toshihiro Akashi; Hiroshi Ishihama, both of Higashimurayama, and Yasumi Uchida, Ichikawa, all of Japan, assignors to Kowa Company, Ltd., Nagoya, Japan

Filed Mar. 27, 1985, Ser. No. 716,462

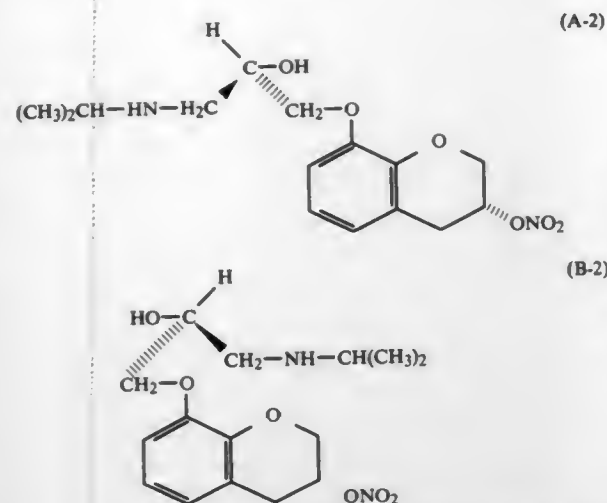
Claims priority, application Japan, Mar. 31, 1984, 59-62177

Int. Cl.<sup>4</sup> A61K 31/35; C07D 311/64

U.S. Cl. 514—456

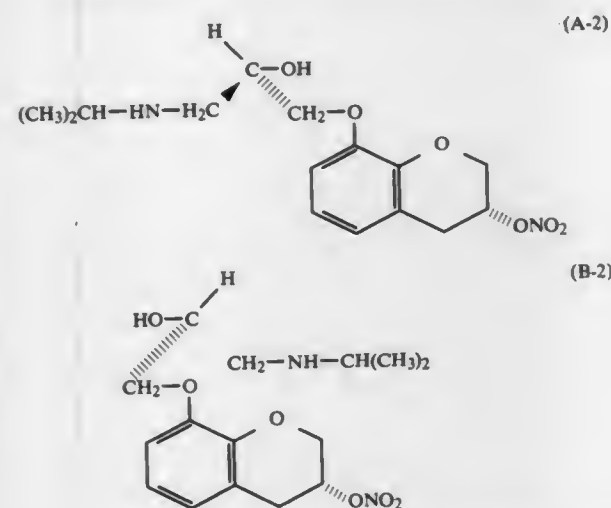
3 Claims

1. An optical isomer selected from the group consisting of (2'R),(3R)-3,4-dihydro-8-(2'-hydroxy-3'-isopropylamino)propoxy-3-nitroxy-2H-1-benzopyran represented by the following formula (A-2), (2'S),(3R)-3,4-dihydro-8-(2'-hydroxy-3'-isopropylamino)propoxy-3-nitroxy-2H-1-benzopyran represented by the following formula (B-2)



and pharmaceutically acceptable acid addition salts of these isomers.

2. A pharmaceutical composition comprising
- (1) an amount, effective for the treatment of cardiovascular diseases, of an optical isomer selected from the group consisting of (2'R),(3R)-3,4-dihydro-8-(2'-hydroxy-3'-isopropylamino)propoxy-3-nitroxy-2H-1-benzopyran represented by the following formula (A-2), (2'S),(3R)-3,4-dihydro-8-(2'-hydroxy-3'-isopropylamino)propoxy-3-nitroxy-2H-1-benzopyran represented by the following formula (B-2)



- or a pharmaceutically acceptable acid addition salt of said isomer, and
- (2) a pharmaceutically acceptable diluent or carrier.

4,678,804

## FUNGICIDAL BENZYLTHIOSTANNANES

William F. King, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

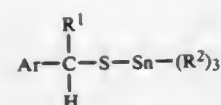
Filed Oct. 2, 1985, Ser. No. 783,300

Int. Cl. C07F 7/22; A01N 55/04; A61K 31/32

U.S. Cl. 514-493

17 Claims

1. compound of the formula:



wherein Ar is monohalophenyl, dihalophenyl, tolyl or dimethylphenyl; R<sup>1</sup> is hydrogen or lower alkyl of 1 to 3 carbon atoms; R<sup>2</sup> is lower alkyl of 1 to 6 carbon atoms, lower cycloalkyl of 3 to 8 carbon atoms, aralkyl of 7 to 11 carbon atoms or aryl of 6 to 10 carbon atoms.

12. A fungicidal composition which comprises an inert carrier and a fungicidally effective amount of a compound of claim 1.

4,678,805

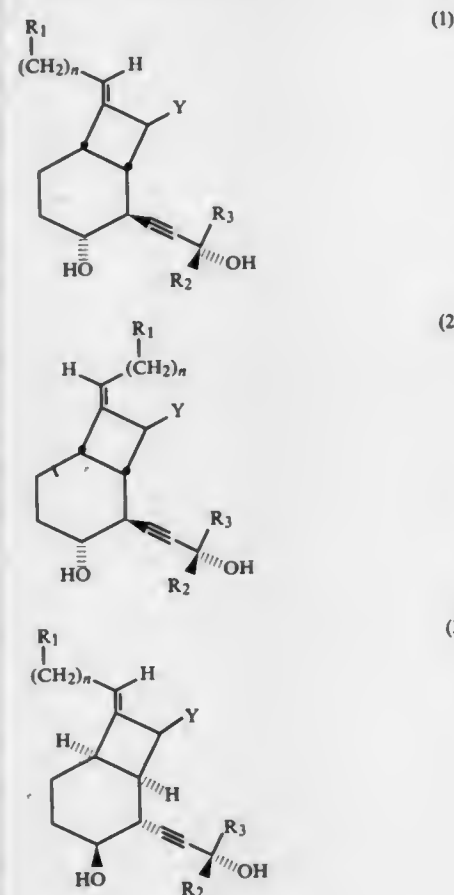
## NOVEL 8-(LOWER ALKYL)BICYCLO[4.2.0]OCTANE DERIVATIVES WITH VALUABLE THERAPEUTIC PROPERTIES

Arthur F. Kluge, Los Altos, and Helen Y. Wu, San Jose, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif. Continuation-in-part of Ser. No. 716,872, Mar. 27, 1985, Pat. No. 4,608,388. This application Jul. 28, 1986, Ser. No. 891,509 Int. Cl. C07C 69/74

U.S. Cl. 514-510

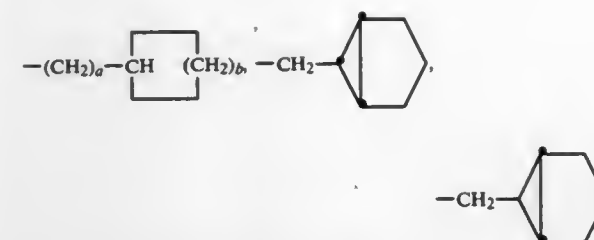
1. A compound of formula (1), (2) or (3)

27 Claims



wherein:

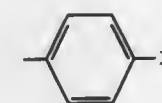
- Y is exo-(lower alkyl) or endo-(lower alkyl);  
n is 2 or 3;  
R<sub>1</sub> is CH<sub>2</sub>OH, CHO, CO<sub>2</sub>R or CO<sub>2</sub>H;  
R<sub>2</sub> is hydrogen or methyl; and  
R<sub>3</sub> is linear or branched alkyl having 5-10 carbon atoms,



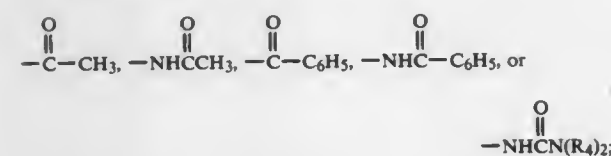
or -(CH<sub>2</sub>)<sub>m</sub>-phenyl optionally substituted with lower alkyl, lower alkoxy, trifluoromethyl, or halogen.

in which

- a is 0, 1 or 2;  
b is 3-7;  
m is 1 or 2; and  
R is



wherein X is



in which each R<sub>4</sub> is independently hydrogen or lower alkyl having 1-6 carbon atoms, and the pharmaceutically acceptable, non-toxic salts and esters thereof.

4,678,806

## PRODRUGS OF ANTIHYPERCHOLESTEROLEMIC COMPOUNDS

John J. Baldwin, Gwynedd Valley; Wasyl Halczenko, Hatfield; George Hartman, and Steven M. Pitzenger, both of Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

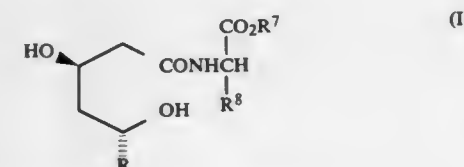
Filed Sep. 2, 1986, Ser. No. 902,895

Int. Cl. A61K 31/235; C07C 101/72

U.S. Cl. 514-539

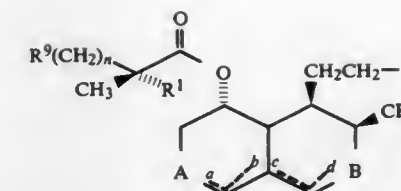
21 Claims

1. A compound represented by the general structural formula (I):



wherein R is selected from a group consisting of:

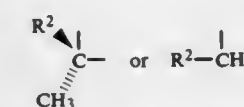
(a)



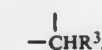
wherein  
n is 1 to 6;  
R<sup>1</sup> is hydrogen or methyl;  
R<sup>9</sup> is hydrogen, hydroxy or



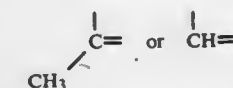
A is



in which R<sup>2</sup> is hydrogen or hydroxyl;  
B is



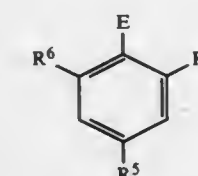
in which R<sup>3</sup> is hydrogen or hydroxyl;  
a, b, c and d represent single bonds, one of a, b, c and d represent a double bond or both a and c or both b and d represent double bonds, provided that when a is a double bond, A is



and when d is a double bond, B is



or  
(b)



wherein:  
E is -CH<sub>2</sub>-, -CH<sub>2</sub>CH<sub>2</sub>- or -CH=CH-;  
R<sup>4</sup> and R<sup>5</sup> are independently C<sub>1</sub>-alkyl, fluoro, bromo or chloro; and  
R<sup>6</sup> is phenyl, benzyloxy, substituted phenyl or substituted benzyloxy in which the phenyl group in each case is substituted with one or more substituents selected from C<sub>1</sub>-alkyl, hydroxy-C<sub>1</sub>-alkyl fluoro, bromo or chloro;  
R<sup>7</sup> is hydrogen or C<sub>1</sub>-alkyl; and



R<sup>8</sup> is C<sub>1</sub>-alkyl, hydroxy-C<sub>1</sub>-alkyl, phenyl-C<sub>1</sub>-alkyl, hydroxyphenyl-C<sub>1</sub>-alkyl amido-C<sub>1</sub>-alkyl, C<sub>1</sub>-alkoxy carbonyl-C<sub>1</sub>-alkyl, imidazol-4-yl-C<sub>1</sub>-alkyl, C<sub>1</sub>-alkylthio-C<sub>1</sub>-alkyl, 2-((C<sub>1</sub>-alkoxycarbonyl)pyrrolidin-4-yl)-C<sub>1</sub>-alkyl or indol-3-yl-C<sub>1</sub>-alkyl;

the amido ester moiety of which is in the L-configuration of a pharmaceutically acceptable salt of the compound of the formula (I) wherein R<sup>7</sup> is hydrogen.

18. A hypocholesterolemic, hypolipidemic pharmaceutical composition comprising a nontoxic therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

20. A method of inhibiting cholesterol biosynthesis comprising the administration to a subject in need of such treatment a nontoxic therapeutically effective amount of a compound of claim 1.

4,678,807

# METHOD FOR DIRECTED VISCERAL METABOLISM OF MEDIUM CHAIN TRIGLYCERIDES

Richard Cotter, Libertyville; Robert C. Johnson, Westchester; W. Bruce Rowe, Chicago, and Susan K. Young, North Chicago, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 1, 1984, Ser. No. 584,974  
Int. Cl.<sup>4</sup> A61K 31/23

U.S. Cl. 514—552

14 Claims

1. A method of providing caloric nutrition to a dysfunctional visceral organ comprising parenterally administering to a patient with a dysfunctional visceral organ an effective amount of a lipid emulsion containing about from 10% to 50% by weight of LCT and the remaining lipid being MCT to thereby shift the supply of MCT energy substrates to the visceral organs and limit the availability of MCT to the peripheral organs.

4,678,808

# RAPID ACTING INTRAVENOUS EMULSIONS OF OMEGA-3 FATTY ACID ESTERS

Michael V. Ward, McHenry, and Richard Cotter, Libertyville, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 15, 1985, Ser. No. 787,741  
Int. Cl.<sup>4</sup> A61K 31/20, 31/685

U.S. Cl. 514—560

17 Claims

1. A lipid emulsion for parenteral use comprising an emulsifier, water and a marine oil comprising at least one omega 3 fatty acid ester wherein the concentration of free fatty acid in the emulsion is below about 5 meq/l and wherein the concentration of marine oil is between about 5% to about 50%.

4,678,809

# INJECTABLE FORMULATIONS OF DISULFIRAM FOR THE TREATMENT OF ALCOHOLISM

Michael Phillips, 1740 Hinman Ave., Apt. 3B, Evanston, Ill. 60201

Filed Feb. 1, 1985, Ser. No. 697,103  
Int. Cl.<sup>4</sup> A61K 31/16, 9/22, 9/30, 9/32

U.S. Cl. 514—599

2 Claims

1. A process for preparing an injectable composition containing disulfiram as the active ingredient, which comprises: sterilizing the disulfiram with gamma irradiation, and then suspending the sterile disulfiram in sterile normal saline to form a slurry.

4,678,810

# MEDICAL USES OF

## HALOGENOBENZOHENONE-OXIME DERIVATIVES

Bernard Danr  , Poissy, France, assignor to Institut de Recherches Chimiques et Biologiques of Appliqu  s (I.R.C.E.B.A.), Paris, France

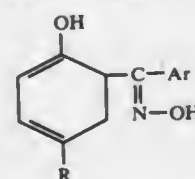
Continuation-in-part of Ser. No. 662,285, filed as PCT FR84/00018 on Jan. 27, 1984, published as WO84/02844 on Aug. 2, 1984, abandoned. This application Feb. 26, 1986, Ser. No. 833,015

Claims priority, application PCT Int'l Appl., Jan. 27, 1984, PCT/FR84/00018; France, Jan. 28, 1983, 83 01365  
Int. Cl.<sup>4</sup> A61K 31/15

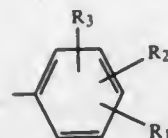
U.S. Cl. 514—640

3 Claims

1. A method of treating infectious disease caused by Gram+ bacteria and Neisseria Gram— bacteria comprising administering to a patient in need of such a treatment a pharmaceutically effective amount of a compound of the formula.



wherein R is a C<sub>3</sub>–C<sub>8</sub> alkyl group with a branched hydrocarbon chain and Ar represents a halogenophenyl group of the formula



wherein R<sub>1</sub> is F, Cl or Br, and R<sub>2</sub> and R<sub>3</sub>, which may be identical or different, represent each H, F, Cl or Br.

4,678,811

# SUBSTITUTED BENZYLETHERS, PESTICIDES CONTAINING THESE COMPOUNDS AND METHOD FOR THEIR PREPARATION

Helga Franke; Heinrich Franke; Hans-Rudolf Kr  ger, and Hartmut Joppjen, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,285

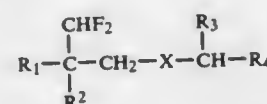
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, 3438483

Int. Cl.<sup>4</sup> A01N 31/14; C07C 43/225, 43/115

U.S. Cl. 514—721

46 Claims

1. A compound of the formula



wherein

R<sub>1</sub> is aryl or aryl substituted by C<sub>1</sub>-alkyl, halo-C<sub>1</sub>-alkyl, phenyl-C<sub>1</sub>-alkyl, C<sub>2</sub>-alkenyl, halo-C<sub>2</sub>-alkenyl, phenyl-C<sub>2</sub>-alkenyl, C<sub>2</sub>-alkynyl, halo-C<sub>2</sub>-alkynyl, phenyl-C<sub>2</sub>-alkynyl, C<sub>1</sub>-alkoxy, halo-C<sub>1</sub>-alkoxy, phenyl-C<sub>1</sub>-alkoxy, C<sub>2</sub>-alkenyloxy, halo-C<sub>2</sub>-alkenyloxy, phenyl-C<sub>2</sub>-alkenyloxy, C<sub>2</sub>-alkynyloxy, halo-C<sub>2</sub>-alkynyloxy, phenyl-C<sub>2</sub>-alkynyloxy, halo, nitro, aryloxy, haloaryloxy, C<sub>1</sub>-alkyl-aryloxy, or nitroaryloxy.

R<sub>2</sub> is hydrogen or C<sub>1</sub>-alkyl,

R<sub>3</sub> is hydrogen, or ethynyl,

R<sub>4</sub> is phenyl or phenyl substituted by one or more of

C<sub>1</sub>-alkyl, halo-C<sub>1</sub>-alkyl, phenyl-C<sub>1</sub>-alkyl, C<sub>1</sub>-alkyl interrupted by an O-, atom, C<sub>2</sub>-alkenyl, halo-C<sub>2</sub>-alkenyl, phenyl-C<sub>2</sub>-alkenyl, C<sub>1</sub>-alkoxy, halo-C<sub>1</sub>-alkoxy, phenyl-C<sub>1</sub>-alkoxy, C<sub>2</sub>-alkenyloxy, halo-C<sub>2</sub>-alkenyloxy, phenyl-C<sub>2</sub>-alkenyloxy, C<sub>2</sub>-alkynyloxy, halo-C<sub>2</sub>-alkynyloxy, phenyl-C<sub>2</sub>-alkynyloxy, aryloxy, haloaryloxy, C<sub>1</sub>-alkyl-aryloxy, aryl, haloaryl, C<sub>1</sub>-alkyl-aryl or halo and

X is oxygen, and R<sub>1</sub>-aryl is phenyl, 1-naphthyl or 2-naphthyl, and R<sub>4</sub>-aryl is phenyl.

4,678,812

# TREHALOSE AS STABILIZER AND TABLETING EXCIPIENT

Ernest Bollin, Jr., Bear, and Mark G. Fletcher, New Castle, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 30, 1986, Ser. No. 868,668

Int. Cl.<sup>4</sup> A61K 45/08

U.S. Cl. 514—777

1 Claim

1. In the method of tableting powders for diagnostic applications, wherein the powders are the product of an S-1 spray freezing process for obtaining frozen diagnostic droplets by spraying an aqueous solution of ingredients useful in diagnostic applications onto the surface of a moving bath of boiling perfluorocarbon liquid, followed by lyophilization of the droplets to dried powders suitable for tableting, the improvement comprising tableting the dried powders with the use of trehalose as tableting excipient and stabilizer.

4,678,813

# HYDROPHILIZED POROUS POLYOLEFIN MEMBRANE AND PRODUCTION PROCESS THEREOF

Hajime Itob, Hiroshima, and Kazutami Mitani, Ohtake, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 928,163

Claims priority, application Japan, Nov. 11, 1985, 60-252203; Nov. 12, 1985, 60-253561

Int. Cl.<sup>4</sup> C08J 9/26

U.S. Cl. 521—61

5 Claims

1. A process for the production of a hydrophilized porous polyolefin membrane, which comprises the steps of holding a monomer which has an HLB value of 2–20 and contains at least one unsaturated polymerizable bond and a polymerization catalyst on at least a part of the pore walls of a starting porous polyolefin membrane and heating them to polymerize the monomer.

4,678,814

# POLYACROLEIN MICROSPHERES

Alan Rembaum, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 520,313, Aug. 4, 1983, Pat. No. 4,622,362, Division of Ser. No. 248,899, Mar. 30, 1981, Pat. No. 4,413,070.

This application Jul. 1, 1985, Ser. No. 750,028

Int. Cl.<sup>4</sup> C08F 2/54, 16/34

U.S. Cl. 522—175

21 Claims

1. A method of preparing small polymeric microspheres comprising the steps of:

forming a solution of less than 5% by weight of a monomer mixture containing at least 10% by weight of an unsaturated aldehyde selected from the group consisting of acrolein and C<sub>1</sub> to C<sub>8</sub> aryl, alkyl and cycloalkyl derivatives thereof and at least 20% by weight of at least one addition copolymerizable monomer having a hydrophilic substituent selected from hydroxyl amino or carboxyl and 0.1 to 20% of a polyunsaturated crosslinking agent; irradiating the solution with radiation capable of initiating polymerization; and recovering said microspheres.

4,678,815

# AQUEOUS SILICONE EMULSIONS AS BLADDER LUBRICANTS

Michael J. Hoffman, Clinton, Mich., assignor to Stauffer-Wacker Silicones Corporation, Adrian, Mich.

Filed Jun. 27, 1985, Ser. No. 749,256

Int. Cl.<sup>4</sup> C08K 5/10; C08L 83/06

U.S. Cl. 523—122

9 Claims

1. An aqueous organopolysiloxane emulsion comprising (1) from 20 to 70 percent by weight based on the weight of the organopolysiloxane emulsion of a hydroxyl-terminated organopolysiloxane gum having a plasticity value of from 50 to 100; (2) from 0.5 to 25 percent by weight based on the weight of the organopolysiloxane emulsion of an organohydrogen-polysiloxane fluid having a viscosity of from 10 to 100 mPa.s at 25° C. and an average of at least 3 Si-bonded hydrogen atoms per molecule; (3) from 0.05 to 5 percent by weight of a lubricant having a melting point of from 25° to 80° C., based on the weight of the organopolysiloxane emulsion; (4) from 2 to 12 percent by weight based on the weight of the organopolysiloxane emulsion of a thickening agent; (5) from 4 to 10 percent by weight based on the weight of the organopolysiloxane emulsion of a surfactant; and (6) from 15 to 60 percent based on the weight of the organopolysiloxane emulsion of water.

2. The organopolysiloxane emulsion of claim 1, wherein the organopolysiloxane emulsion contains from 0.05 to 0.3 percent by weight of a bactericide based on the weight of the organopolysiloxane emulsion.

7. The organopolysiloxane emulsion of claim 1, wherein the lubricant is lanolin.

4,678,816

# MOULD MATERIAL BINDING AGENT SYSTEM WHICH COLD-HARDENS WITH FORMATION OF POLYURETHANE

Marek Torbus, D  sseldorf, Fed. Rep. of Germany, assignor to H  ttenes-Albertus Chemische Werke GmbH, Fed. Rep. of Germany

Filed Dec. 12, 1985, Ser. No. 808,456

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445687

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> C08L 75/00

U.S. Cl. 523—142

3 Claims

1. A mould material binding agent composition for the manufacture of foundry mould parts comprising a solution of a phenol-containing polyol having at least two OH-groups in the molecule and a polyisocyanate component having at least two NCO-groups in the molecule, said polyol and polyisocyanate component reacting with each other to form a cold-hardening binding agent, the polyisocyanate component containing a member of the group consisting of substituted and unsubstituted diphenyl-4, 4'-diisocyanates together with an addition of a member of the group consisting of acid chlorides and chlorosilanes and mixtures thereof, said polyisocyanate component also containing more than 10% by weight of a member of the group consisting of substituted and unsubstituted diphenyl-2, 4'-diisocyanates and mixtures thereof, the percentage relating to the total quantity of polyisocyanate component.

4,678,817

# NOVEL DESENSITIZED KETONE PEROXIDE COMPOSITIONS AND THEIR USE IN THE MANUFACTURE OF FOUNDRY CORES OR MOULDS

John Meijer, Deventer, Netherlands, assignor to Akzo NV, Arnhem, Netherlands

Filed Jul. 9, 1986, Ser. No. 883,705

Claims priority, application Netherlands, Jul. 16, 1985, 8502042

Int. Cl.<sup>4</sup> B22C 11/22; C01B 15/00

U.S. Cl. 523—144

5 Claims

1. A desensitized ketone peroxide composition which contains as desensitizing agent a monocarboxylic acid diester of an alkane diol, characterized in that the diester consists of 2,2,4-trimethyl-1,3-pentanediol diisobutyrate.

4. A process for the manufacture of a foundry core or mould, in which process a composition comprising a granular filler, a synthetic resin which is curable under the influence of an acid and a desensitized ketone peroxide composition is formed into the desired foundry core or mould and treated with sulphur dioxide, characterized in that the ketone peroxide composition contains 2,2,4-trimethyl-1,3-pentanediol diisobutyrate as desensitizing agent.

4,678,818

# FRICTION MATERIAL AND METHOD OF MAKING SUCH MATERIAL

Mitsubiko Nakagawa, and Fumiaki Nitto, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

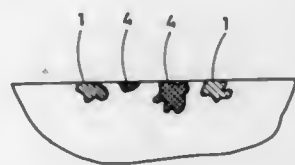
Filed Nov. 19, 1985, Ser. No. 799,404

Claims priority, application Japan, Dec. 13, 1984, 59-263641

Int. Cl.<sup>4</sup> C29C 29/00, 29/12; C10M 125/02, 125/04

U.S. Cl. 523—157

2 Claims



1. A friction material, comprising in percent by volume 10 to 35% of a matrix forming binder material, a separate combination of graphite and 0.5 to 15% of a metal or metal alloy softer than steel, said combination being prepared prior to any embedding in said matrix forming binder material, by separately mixing a graphite powder with said metal or metal alloy softer than steel to form an intermediate product, solidifying and then crushing said intermediate product to form said combination which is then embedded in said matrix material, and 5 to 35% of a friction causing component selected from the group consisting of steel fibers, steel powder, asbestos fibers, glass fibers, rock wool, glass wool, carbon fibers, acrylic fibers, and aramid fibers also embedded in said matrix forming binder material, the remainder being said graphite and a filler.

4,678,819

# COMPOSITIONS FOR ARTIFICIAL MARBLES AND PROCESS FOR PRODUCING ARTIFICIAL MARBLES THEREFROM

Isao Sasaki, Hiroshima, and Nobuhiro Mukai, Ohtake, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,433

Claims priority, application Japan, Aug. 30, 1984, 59-181389; Aug. 31, 1984, 59-182968

Int. Cl.<sup>4</sup> C08K 7/14, 3/00, 9/04, 9/00

U.S. Cl. 523—171

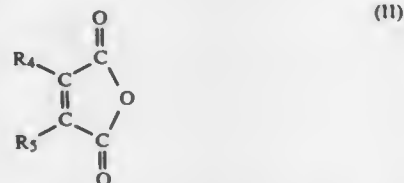
19 Claims

1. A composition for artificial marble which comprises a polymer composition, in which an inorganic substance and an organic polymer are firmly bound in one body, and a vinyl

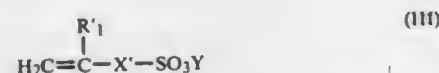
compound comprising methyl methacrylate, said polymer composition being obtained by heterogeneously polymerizing methyl methacrylate or a mixture of methyl methacrylate and other vinyl monomer susceptible to radical polymerization, in the presence of at least one monomer selected from the group consisting of carboxylic acid monomers represented by the general formula (I):



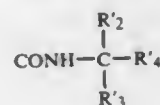
wherein R<sub>1</sub> and R<sub>2</sub> are H, C<sub>1</sub>-C<sub>15</sub> alkyl group, COOY where Y is H, NH<sub>4</sub>, or alkali metal atom, halogen atom, phenyl group, or substituted phenyl group; R<sub>3</sub> is H, C<sub>1</sub>-C<sub>15</sub> alkyl group, halogen atom, phenyl group, or substituted phenyl group; and X is H, NH<sub>4</sub>, or alkali metal atom, or by the general formula (II):



wherein R<sub>4</sub> and R<sub>5</sub> are H, C<sub>1</sub>-C<sub>15</sub> alkyl group, halogen atom, phenyl group, or substituted phenyl group, and sulfonic acid monomers or sulfonate monomers represented by the general formula (III):



wherein R'<sub>1</sub> is H, C<sub>1</sub>-C<sub>20</sub> alkyl group, phenyl group, substituted phenyl group, or halogen atom; X' is CONH,



where R'<sub>2</sub> and R'<sub>3</sub> are H or C<sub>1</sub>-C<sub>15</sub> alkyl group, and R'<sub>4</sub> is C<sub>1</sub>-C<sub>15</sub> alkylene group, COO(CH<sub>2</sub>)<sub>m</sub> where m is an integer of 1 to 20, or (CH<sub>2</sub>)<sub>n</sub> where n is an integer of 0 to 20; and Y is H, NH<sub>4</sub>, or alkali metal atom, in an aqueous polymerization system containing the inorganic substance dispersed therein, said composition further comprising at least one of silane, titanate, aluminate and zircoaluminate coupling agents in an amount of 0.01 to 10 wt. % based on the total weight of the composition.

4,678,820

# AMORPHOUS HYDRATED METAL OXIDE PRIMER FOR COMPOSITE FIBERS

Roscoe A. Pike, Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 9, 1985, Ser. No. 774,257

Int. Cl.<sup>4</sup> C08K 7/04, 3/04

U.S. Cl. 523—200

6 Claims

1. A fiber reinforced polymeric matrix composite material wherein the improvement comprises:

- utilizing as the fiber reinforcement fibers having a layer thereon the layer of amorphous hydrated metal oxide formed by deposition onto the fiber and subsequent hydrolysis of a layer of M<sub>2</sub>OR<sub>y</sub> where
  - x is 1;
  - y is 3 or 4;

- M is any metal capable of forming a stable alkoxide; and
  - R is an organic radical;
- resulting in a composite having wet strength retention.

4,678,821

# COMPOSITES

Francis M. Logullo, Sr., Hockessin, Del.; Ynn-Tai Wu, Newtown Square, Pa., and George E. Zaher, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1985, Ser. No. 739,861

Int. Cl.<sup>4</sup> C08K 9/00

U.S. Cl. 523—205

4 Claims

1. A rigid composite comprising an epoxy resin matrix reinforced with continuous p-aramid filaments coated with from about 0.2 to 2 percent by weight of a solid adhesion modifier, said coated filaments when embedded in an epoxy matrix and tested in accordance with ASTM D234476 exhibit a short beam shear strength of between about 2.5 and 5.5 Kpsi.

4,678,822

# RESIN IMPREGNATED FIBRE BATT

Richard L. Lewellin, Somerville, Australia, assignor to Maxwell Victor Lane and George Kaddis, both of Dandenong, Australia

Continuation-in-part of Ser. No. 623,094, Jun. 21, 1984, abandoned. This application Oct. 31, 1985, Ser. No. 793,348

Int. Cl.<sup>4</sup> C04B 43/00, 43/12; C09K 3/28; A01N 25/34

U.S. Cl. 524—12

12 Claims

1. A method for forming a batt of bonded fibers for use as thermal insulation, which comprises the steps of:

- ragging, teasing and doffering fibers which include from an amount from 0 to 95% wool, together with fibers selected from the group consisting of monoacrylic, acrylic, polyamide, polyester and natural fibers;
- forming a sliver of randomly dispersed fibers;
- feeding the sliver onto a lapper;
- oscillating the lapper at a rate which will deliver the sliver to a conveyor on which the sliver is lapped into a multi-layered matt;
- oscillating a spray boom in sequence with the oscillating sliver to maintain the spray boom at the same distance from said sliver at all times as the sliver is delivered from the lapper;
- providing a second boom, which emits a cushion of air against said sliver on the side of said sliver opposite said spray boom to maintain the sliver in correct alignment with the conveyor;
- supplying a resin-emulsion comprising a fireproofing resin, a smoke retardant and pesticide to said spray boom;
- spraying said oscillating sliver with said resin-emulsion so that the matt formed by the lapped sliver is thoroughly impregnated with said resin-emulsion;
- conveying the impregnated matt to a drying means;
- evaporating or removing up to 80% of the water content of said matt while maintaining the temperature of the matt below the minimum temperature at which the fiber is substantially unimpaired by heat;
- curing the resin content of the matt to form a substantially rigid matt; and
- cutting the matt to form batts of desired length.

4,678,823

# ASPHALT COMPOSITIONS CONTAINING SPURTED POLYOLEFIN FIBERS WITH IMPROVED DISPERSIBILITY IN HYDROCARBONS

Harold Jabloner, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 586,891, Mar. 12, 1984, which is a continuation of Ser. No. 365,719, Apr. 5, 1982, abandoned. This application Jun. 2, 1986, Ser. No. 869,553

Int. Cl.<sup>4</sup> C08L 95/00

U.S. Cl. 524—62

11 Claims

1. In a cutback asphalt composition comprising asphalt and a hydrocarbon solvent, the improvement wherein the composition also comprises a water-dispersible spurted polyolefin pulp having precipitated thereon a natural rubber or synthetic elastomer that is swellable in hydrocarbon solvents.

4,678,824

# REMOISTENABLE ADHESIVE COMPOSITIONS

Vincent A. Lauria, Somerville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Feb. 13, 1986, Ser. No. 829,599

Int. Cl.<sup>4</sup> C08L 3/02; C08J 3/02; C09J 3/06

U.S. Cl. 524—48

7 Claims

1. Remoistenable adhesive compositions comprising at least 15% by weight of a dextrin emulsified ethylene vinyl acetate resin latex having a T<sub>g</sub> of at least 0° C., 0.5-5% humectant, and sufficient phosphoric acid to lower the pH to about 2; the remainder of the composition comprising water and optional post-added dextrin.

4,678,825

# STABILIZATION OF AROMATIC POLYESTERS WITH DIMERCAPTOTHIAZOLE

Jerold C. Rosenfeld, Tonawanda, N.Y., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 25, 1986, Ser. No. 833,921

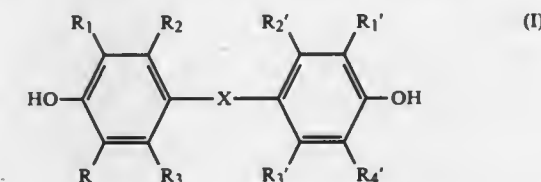
Int. Cl.<sup>4</sup> C08K 5/34

U.S. Cl. 524—83

21 Claims

1. A resin composition comprising:

- an aromatic polyester produced by polymerization of a substantially equimolar mixture of the monomeric components
  - terephthalic acid and/or an acid halide, dialkyl ester or diaryl ester thereof and/or isophthalic acid and/or an acid halide, dialkyl ester or diaryl ester thereof, with the terephthalic acid unit/isophthalic acid unit mole ratio being about 9:1 to about 1:9; and
  - at least one bisphenyl of the general formula (I)



wherein —X— is selected from the group consisting of —O—, —S—, —SO<sub>2</sub>—, —SO—, —CO—, an alkylene group containing 1 to 4 carbon atoms or an alkylidene group containing 1 to 4 carbon atoms, and R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>1</sub>', R<sub>2</sub>', R<sub>3</sub>', and R<sub>4</sub>', which may be the same or different, each is selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom or an alkyl group containing 1 to 4 carbon atoms, or a metal salt or diester of said bisphenol of the general formula (I), and

- about 0.01 to less than about 2% by weight, based on the aromatic polyester (A) of a stabilizer comprising 2,5(dimercapto)-1,3,4-thiadiazole.



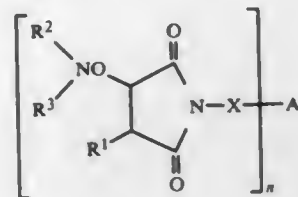
4,678,826  
SUBSTITUTED-(AMINOXY)-PYRROLIDINE-2,5-DIONE  
STABILIZERS

Stephen D. Pastor, Yonkers, N.Y., and Edward T. Hessel, Norwalk, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 24, 1986, Ser. No. 822,179  
Int. Cl.<sup>4</sup> C08K 5/34

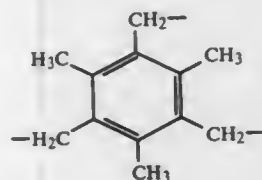
U.S. Cl. 524—104

1. A compound of the formula



wherein

- R<sup>1</sup> is hydrogen or alkyl of 1 to 3 carbon atoms;  
R<sup>2</sup> and R<sup>3</sup> independently are hydrogen, alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 36 carbon atoms;  
X is a direct bond or phenyl;  
n is 1-3;  
A, when n is 1, is hydrogen, alkyl of 1 to 30 carbon atoms, aryl, cycloalkyl of 5 to 8 carbon atoms, aralkyl of 7 to 9 carbon atoms, said aralkyl substituted by alkyl of 1 to 30 carbon atoms or 2,5-dioxo-1H-pyrrole;  
A, when n is 2, is alkylene of 1 to 12 carbon atoms, phenylene, cycloalkylene of 6 to 10 carbon atoms or alkylarylenealkylene of 8 to 10 carbon atoms; and  
A, when n is 3, is alkanetriyl of 3 to 6 carbon atoms or



4,678,827  
FLAME-RETARDANT SILICONE RUBBER  
COMPOSITION

Kunio Itoh, Kiyoshi Imai, Takeo Yoshida, and Motoo Fukushima, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 846,260  
Claims priority, application Japan, Apr. 2, 1985, 60-69549  
Int. Cl.<sup>4</sup> C08K 5/54

U.S. Cl. 524—188

3 Claims

1. A flame-retardant silicone rubber composition which comprises:
- 100 parts by weight of an organopolysiloxane represented by the average unit formula  $R_nSiO_{(4-n)/2}$ , in which R is a monovalent hydrocarbon group and the subscript n is a positive number in the range from 1.90 to 2.05;
  - from 20 to 200 parts by weight of a finely divided silica filler;
  - platinum or a platinum compound in an amount from 1 to 200 ppm by weight as platinum based on the amount of the component (a);
  - an organosilicon compound having at least one nitrogen-containing organic group and at least one aliphatically unsaturated group in a molecule in such an amount that 1

to 500 moles of nitrogen atoms are provided per mole of the platinum in the component (c); and  
(e) an organic peroxide or an organohydrogenpolysiloxane curing agent.

4,678,828  
VIBRATION-DAMPING RUBBER COMPOSITION

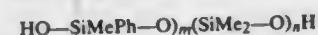
Tsutomu Nakamura, Takasaki, and Kiyoshi Imai, Annaka, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,418  
Int. Cl.<sup>4</sup> C08K 5/24; C08L 43/00

U.S. Cl. 524—265

3 Claims

1. A vibration-damping rubber composition which comprises:
- 100 parts by weight of a synthetic rubbery polymer;
  - from 10 to 100 parts by weight of a finely divided siliceous powder having a specific surface area of at least 50 m<sup>2</sup>/g; and
  - from 3 to 20 parts by weight of a diorganopolysiloxane terminated at both molecular chain ends with a silanolic hydroxy group and represented by the formula



in which Me is a methyl group, Ph is a phenyl group, the subscript m is a positive integer not larger than 20 and the subscript n is zero or a positive integer not larger than 20 with the proviso that m+n is 2 or larger.

4,678,829  
METAL CONTAINER COATING COMPOSITIONS  
COMPRISING STABLE EMULSIONS OF WATER  
RESISTANT POLYVINYL ALCOHOL-STABILIZED  
VINYL CHLORIDE-ETHYLENE COPOLYMERS

John G. Iacoviello, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 622,592, Jun. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 572,726, Jan. 20, 1984, abandoned. This application Jun. 20, 1985, Ser. No. 747,134

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> C08F 2/16; C08K 3/20

U.S. Cl. 524—459

10 Claims

1. A metal container coating composition comprising
- about 45 to 95 wt% of a stable aqueous vinyl chloride-ethylene copolymer emulsion, the copolymer having a T<sub>g</sub> from 0° to 50° C., consisting of (i) about 65 to 90 wt% vinyl chloride and (ii) ethylene, and prepared by emulsion polymerization of vinyl chloride monomer and ethylene in the presence of an emulsifying system consisting essentially of about 3 to 15 wt% polyvinyl alcohol which is 70 to 91 mole% hydrolyzed, which emulsion polymerization process comprises forming an aqueous emulsion reaction mixture in a reaction vessel containing substantially all the polyvinyl alcohol and at least 5% to no more than about 60% of the total vinyl chloride monomer, pressurizing the reaction mixture with an ethylene pressure sufficient to provide the copolymer with the requisite ethylene content, initiating the reaction mixture by the addition of a free radical generating source and continuing polymerization until the rate of polymerization begins to decrease, adding the remaining vinyl chloride monomer over a period of time while continuing polymerization until the reaction is no longer self-sustaining, and removing the unreacted ethylene and reducing the vinyl chloride free monomer content of the emulsion,
  - about 5 to 40 wt%, based on emulsion solids, of a cross-linking resin,
  - up to about 10 wt% organic cosolvent, and

(d) 0 to 5 wt% acid catalyst.

4,678,830  
TIRE TREAD RUBBER COMPOSITION

Susumu Sato, Tokyo, and Keizo Okamoto, Higashikurume, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 826,059  
Claims priority, application Japan, Apr. 5, 1985, 60-71066  
Int. Cl.<sup>4</sup> C08L 7/00, 9/00; C08K 3/04

U.S. Cl. 524—495

1 Claim

1. A rubber composition characterized in that with respect to 100 parts of natural rubber alone or a blend rubber consisting of natural rubber and not more than 50% by weight of at least one kind of a diene base synthetic rubber, carbon black having the following properties is blended in an amount from 35 to 55 parts by weight:

- A nitrogen adsorption specific surface area (N<sub>2</sub>SA) of from 115 to 135 m<sup>2</sup>/g;
- A strength (ΔDBP) of the agglomerates defined by the following formula of not more than 18 ml/100 g,

$$\Delta DBP(\text{ml}/100\text{ g}) = DBP - 24M4DBP$$

- An oil absorption at 24M4DBP of from 95 to 110 ml/100 g;
  - A ratio of the nitrogen adsorbing specific surface area (N<sub>2</sub>SA) (m<sup>2</sup>/g) to the iodine adsorbing specific surface area (IA) (mg/g) of from 1.05 to 1.20,
- wherein said composition has a rubber hardness of 55 to 67.

4,678,831  
BLOCK COPOLYMERS AND RESIN COMPOSITIONS

Jubeiji Kawabata; Toshinori Sugie, both of Takaishi; Fumihiro Kobata, Izumi, and Akira Hirayama, Chiba, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,455

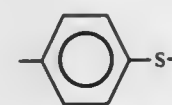
Claims priority, application Japan, Mar. 30, 1985, 60-67726; Apr. 26, 1985, 60-90678; Nov. 19, 1985, 60-257870; Nov. 22, 1985, 60-261309

Int. Cl.<sup>4</sup> C08K 3/04

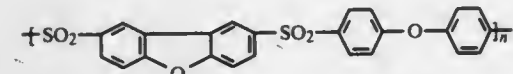
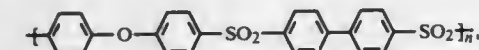
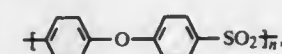
U.S. Cl. 524—496

10 Claims

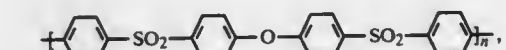
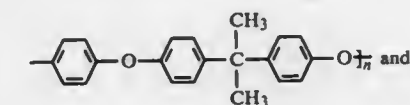
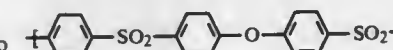
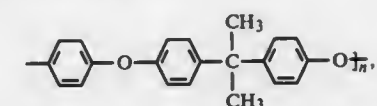
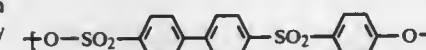
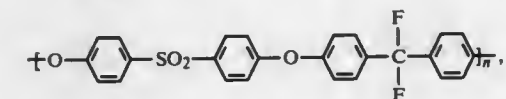
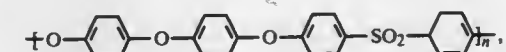
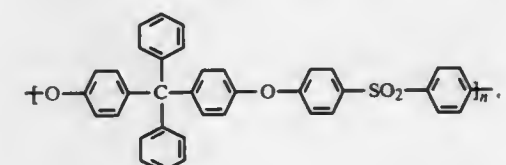
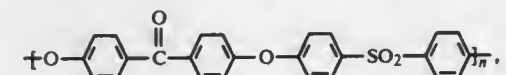
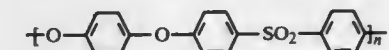
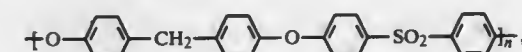
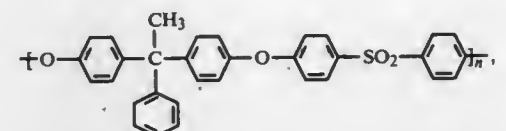
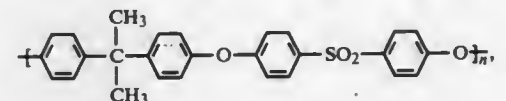
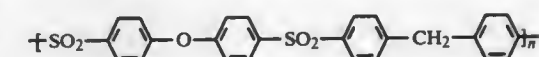
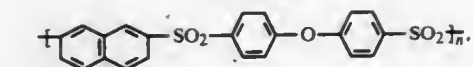
1. A block copolymer comprising 1 to 99% by weight of a polyphenylenesulfide portion and 99 to 1% by weight of a polysulfone portion, and having a logarithmic viscosity [η] in the range of 0.03 to 1.0, said polyphenylenesulfide portion containing at least 70 mol% of structural units represented by the formula



and having a logarithmic viscosity [η] in the range of 0.03 to 0.80, said polysulfone portion having a structural formula selected from the group consisting of



-continued



wherein n is an integer of 10 more, and having a reduced viscosity [η]<sub>sp</sub>/C in the range of 0.05 to 1.0, said logarithmic viscosity [η] being a value calculated by the equation

$$[\eta] = \ln(\text{relative viscosity}) / \text{polymer concentration}$$

from a relative viscosity measured at 206° C. for a solution of a polymer in  $\alpha$ -chloronaphthalene in a polymer concentration of 0.4 g/100 ml, and said reduced viscosity  $[\eta_{sp}/C]$  being a value calculated by the equation

$$[\eta_{sp}/C] = (\text{relative viscosity} - 1) / \text{polymer concentration}$$

from a relative viscosity measured at 25° C. for a solution of a polymer in chloroform in a polymer concentration of 0.2 g/100 ml.

4,678,832

# HOT-MELT ADHESIVES OF PARTIALLY SAPONIFIED VINYL ESTER COPOLYMERS

Günther Pospich, and Richard Gutte, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 479,890, Mar. 29, 1983, abandoned. This application Nov. 1, 1984, Ser. No. 667,069

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211915

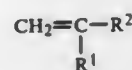
Int. Cl. C08F 16/06

U.S. Cl. 525—60

23 Claims

1. A process for preparing hot-melt adhesive based on polyvinyl alcohol by alcoholizing a vinyl ester polymer while stirring it in solution in the presence of a basic catalyst, which comprises:

subjecting a vinyl ester copolymer (dissolved in solvent) to alcoholysis with a lower alcohol until a completely homogeneous admixture results with a polyvinyl alcohol which has an average degree of hydrolysis of from 50 to 70 mole percent, and thereafter removing the solvent therefrom; the copolymer being that of vinyl acetate and a comonomer of the formula



in which  $\text{R}^1$  denotes a hydrogen atom ( $-\text{H}$ ) or a methyl radical and

$\text{R}^2$  represents (a) an alkylcarbonyloxy radical having from 3 to 18 carbon atoms, (b) an alkoxy radical having from 1 to 4 carbon atoms, (c) a nitrile group, (d) a hydrogen atom ( $-\text{H}$ ), (e) a hydrocarbon radical having from 1 to 8 carbon atoms or (f) a vinyl radical,

and having a weight average molecular weight within the range of from 60,000 to 400,000;

said copolymer optionally being in admixture with a vinyl ester homopolymer which has a weight average molecular weight within the range of from 30,000 to 200,000; and the copolymer having therein an amount of comonomer which is from 0.5 to 2 percent by weight based on said copolymer and any homopolymer (prior to alcoholysis).

4,678,833

# MISCIBLE POLYMER BLENDS CONTAINING POLY(2-ALKYL-2-OXAZOLINE)

Kathleen M. McCreedy, Midland, Mich.; Henno Keskkula, Austin, Tex.; James C. Pawloski, Bay City, and Edward H. Yonkers, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 736,591, May 21, 1985, abandoned, which is a division of Ser. No. 552,211, Nov. 15, 1983, Pat. No. 4,547,580. This application Jun. 19, 1986, Ser. No. 876,025

Int. Cl. C08L 51/04, 79/04

U.S. Cl. 525—66

13 Claims

1. A blend of polymeric components comprising a polymer of a 2-oxazoline and at least one water-insoluble thermoplastic polymer which is not a polymer of 2-oxazoline and which

other polymer is miscible with said 2-oxazoline polymer in the relative proportions thereof present in said polymeric composition, wherein the weight ratio of said 2-oxazoline polymer to said thermoplastic polymer in said composition is from about 19:1 to about 1:19 and the blend exhibits a single glass transition temperature.

4,678,834

# BLENDS OF POLYOLEFINS WITH POLYMERS CONTAINING REACTIVE AGENTS

Daniel W. Bolvin, Toronto, and Ronald A. Zelinka, Kingston, both of Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Jul. 18, 1985, Ser. No. 756,223

Claims priority, application Canada, Jun. 27, 1985, 485651

Int. Cl. C08L 23/26; C08K 5/14; C08J 3/24, 5/00

U.S. Cl. 525—74

30 Claims

1. A mixture comprising, in physical admixture, a major portion of particles of a polyethy/ylene and a minor portion of particles of a composition of a second polymer, in which the polyethylene is selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and at least one  $\text{C}_4$ - $\text{C}_{10}$  higher alpha-olefin, and mixtures thereof, and said second polymer is a normally solid thermoplastic polymer having a melting point of less than 185° C. and a shear viscosity that is not more than 30% of that of said polyethylene when measured at 200° C. and a shear rate of 400  $\text{sec}^{-1}$ , with the proviso that said second polymer is not homopolymer or copolymer derived solely from hydrocarbon alpha-olefin having 2-10 carbon atoms, and said composition being a composition of the second polymer and a cross-linking agent said cross-linking agent being capable of reacting with said polyethylene in a molten state, the ratio of the polyethylene to the second polymer being in the range of from 10:1 to 100:1.

4,678,835

# COATING COMPOSITION CONTAINING AN UNGELLED REACTION PRODUCT AS A CURATIVE

Wen-Hsuan Chang, Gibsonia; Edward L. Dufford, Sarver; J. Alden Erikson, Gibsonia, and Paul J. Prucnal, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1986, Ser. No. 824,040

Int. Cl. C08F 8/00

U.S. Cl. 525—100

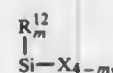
30 Claims

1. A coating composition comprising at least 40 percent by weight of an ungelled reaction product of

(i) at least 2 percent by weight of an amine having in a molecule thereof at least one amino hydrogen atom, and at least one silicon atom directly bonded to a hydrolyzable group;

(ii) at least 4 percent by weight of a material containing at least one epoxide group, at least 30 percent of said epoxide group containing material being essentially free of hydroxyl groups; and

(iii) a material selected from vinylalkoxysilanes; nonfunctional organosilanes which are represented by the following structural formula:



wherein

$\text{R}^{12}$  is hydrogen, alkyl, aryl, alkylaryl, arylalkyl, or arylalkoxyalkyl;

$\text{X}$  is  $-\text{OR}^1$ ,

4,678,837

# MULTILITHIUM POLYMERIZATION INITIATORS

Paul A. Mancinelli, Aston, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 23, 1985, Ser. No. 768,670

Int. Cl. C08F 2/00, 297/04

U.S. Cl. 525—250

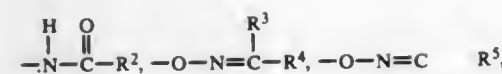
8 Claims

1. A process for forming star-block copolymers having a pre-determined number of arms, consisting essentially of (a) oligomerization of 3 to 6 moles of a polyvinyl aromatic compound using one mole of a first organomonolithium initiator to form a mini-block having a pre-determined number from 3 to 6 of pendant vinyl groups;

(b) activation within 5 to 20 seconds of the pendant vinyl groups by the addition of stoichiometric amounts of a second organomonolithium initiator to form a multi-lithium initiator having pre-determined number of active sites;

(c) addition of 0-100% by weight based on total monomer of conjugated diene monomer and/or 100-0% by weight based on total monomer of vinyl aromatic monomer to form a star-block block copolymer; and

(d) termination of the copolymer to recover said star-block copolymer.



and the monohydroxyl cyclic  $\text{C}_2$ - $\text{C}_3$  residue of a 1,2- or 1,3-glycol, wherein

$\text{R}^1$  is  $\text{C}_1$ - $\text{C}_3$  alkyl,

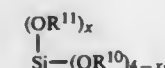
$\text{R}^2$  independently is H or  $\text{C}_1$ - $\text{C}_4$  alkyl,

$\text{R}^3$  and  $\text{R}^4$  independently are H,  $\text{C}_1$ - $\text{C}_4$  alkyl,  $\text{C}_6$ - $\text{C}_8$  aryl, and

$\text{R}^5$  is  $\text{C}_4$ - $\text{C}_7$  alkylene, and

$m$  is an integer ranging from 1 to 2;

organosilicates which are represented by the following structural formula:



wherein

$\text{R}^{10}$  is  $\text{C}_1$  to  $\text{C}_3$  alkyl;

$\text{R}^{11}$  is an alkyl radical having at least 4 carbon atoms, aryl, alkylaryl, arylalkyl, aryloxyalkyl, or alkoxyalkyl and  $x$  is an integer from 0 to 2;

and partial hydrolysis products thereof; the percentages by weight being based on the total weight of the resin solids of the coating composition including (i), (ii), and (iii).

4,678,836

# BLENDS OF ETHYLENE/ACRYLIC ACID COPOLYMERS WITH LINEAR LOW DENSITY POLYETHYLENE

Osborne K. McKinney; James A. Allen, and David P. Flores, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 567,721, Jan. 3, 1984, abandoned. This application Sep. 20, 1985, Ser. No. 777,997

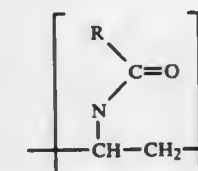
Int. Cl. C08L 23/18, 33/02, 23/08

U.S. Cl. 525—221

20 Claims

1. A homogeneous binary blend of an ethylene polymer and an ethylene/acrylic acid interpolymer, wherein the blend consists of between 80% to about 99% of the ethylene/acrylic acid interpolymer, the remainder being said ethylene polymer, said ethylene polymer being characterized as a linear low density ethylene interpolymer, prepared using a coordination catalyst acting as a polymerization initiator in the interpolymerization of ethylene with at least one alpha-olefin comonomer having from 3 to about 12 carbon atoms in each comonomer unit, the amount of said comonomer being an amount sufficient to constitute about 3% to about 20% by weight of the interpolymer and also sufficient to impart a low density in the range of about 0.90 up to about 0.94 gms/cc to the interpolymer, said interpolymer being further characterized as having a melt flow value of from about 0.1 gm/10 min. as measured by ASTM D-1238 (Condition E) to about 50 gm/10 min. as measured by ASTM D-1238 (Condition D).

said ethylene/acrylic acid interpolymer being characterized as a random interpolymer prepared at high pressure by the action of a free-radical polymerization initiator, acting on a mixture of ethylene monomer and acrylic acid monomer, said random interpolymer being further characterized as containing about 0.5 to about 50 weight percent of the acrylic acid moiety, the remainder being the ethylene moiety, a density in the range of about 0.91 to about 1.3 gms/cc, and a melt flow value of from about 150 gm/10 min. as measured by ASTM D-1238 (Condition B) to about 0.1 gm/10 min. as measured by ASTM D-1238 (Condition E).



where  $\text{R}$  is alkylene of 2 to 8 carbon atoms,  $n$  is about 40 to about 4000, and wherein said derivative contains an average of between about 0.5 to about 20 hydroperoxy equivalents per mole of poly-N-vinyl lactam; said derivative being the result of the process comprising contacting a particulate polymer having units of formula I with ozone.

4,678,839

# MIXTURES INCLUDING POLYPHENYLENE ETHERS AND LACTAMS AND RESINOUS COMPOSITIONS PREPARED THEREFROM

John E. Hallgren, Scotia; Peter P. Pollicastro, Schenectady; Herbert S. Chao, Watervliet, and Bruce C. Johnson, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 8, 1985, Ser. No. 752,744

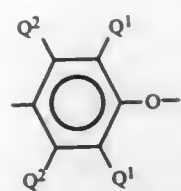
Int. Cl. C08L 71/04

U.S. Cl. 525—390

23 Claims

1. A polymerizable composition comprising a mixture of: at least one lactam; at least one polyphenylene ether resin consisting essentially of structural units having the formula





wherein in each of said units independently, each  $Q^1$  is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl, aminoalkyl, hydrocarbonoxy, or halohydrocarbonoxy wherein at least two carbon atoms separate the halogen and oxygen atoms; and each  $Q^2$  is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl, hydrocarbonoxy or halohydrocarbonoxy as defined for  $Q^1$ ; and grafted and coupled derivatives thereof; and a lactam polymerization catalyst.

4,678,840

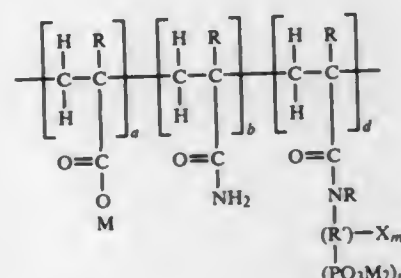
**PHOSPHONIC ACID-CONTAINING POLYMER**  
Dodd W. Fong, Naperville, and David J. Kowalski, LaGrange Park, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 24, 1986, Ser. No. 831,962  
Int. Cl.<sup>4</sup> C08F 8/40

U.S. Cl. 525-340

14 Claims

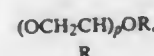
1. A process to synthesize water-soluble phosphonated polymer having randomly repeated mer units represented by the formula:



wherein

$R'$  is a multi-covalent hydrocarbonaceous bridging group having from one to sixteen carbon atoms and being chosen from bridging groups which are linear alkyl, branched alkyl, cyclic, alkaryl, arylalkyl, aromatic, heterocyclic, olefinic or mixtures thereof;

$X$  is chosen from Cl, Br, I,  $-\text{COOM}$ ,  $-\text{SO}_3\text{M}$ ,  $-\text{OR}$ ,



R

or mixtures thereof;

$R$  is individually chosen at each occurrence from H or lower alkyl ( $\text{C}_1-\text{C}_4$ ) groups;

$M$  is chosen from hydrogen, lower alkyl ( $\text{C}_1-\text{C}_4$ ) groups, alkali metal, an equivalent amount of alkaline earth metals, tertiary amines, quaternary amines, ammonium ion, or mixtures thereof;

and wherein,

$a$ ,  $b$ , and  $d$  are integers with the following relationships;

$a/b$  is from zero to 100

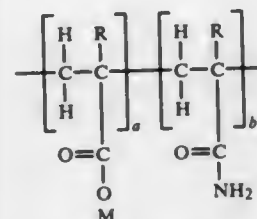
$b/d$  is from 0.01 to 100

$a/d$  is from zero to 100,

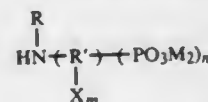
and the sum of  $a+b+d$  is sufficient to provide a weight average molecular weight of at least 500,

and the ratio of  $d:(a+b)$  is from 100:1 to 1:100;

and wherein  
(I)  $p$  ranges between 1 and 16,  
 $m$  ranges between 0 and 16, and  
 $n$  ranges between 1 and 16, provided that when  $m$  is zero, the sum of  $m+n$  is from 1 to 20;  
which process comprises reacting, in a common solvent, at a temperature of at least  $100^\circ\text{C}$ .;  
A. a polymer having a weight average molecular weight of at least 500, and having pendant amide functional groups, and represented by the structure:



wherein  $R$ ,  $M$ ,  $a$ ,  $b$  have the same meanings as above; with  
B. a chemical reactant having the structure:



wherein  $R$ ,  $R'$ ,  $M$ ,  $X$ ,  $m$ , and  $n$  have the meanings above; and wherein the mole ratio of chemical reactant to pendant amide groups in the polymer ranges between about 5:1 to about 1:100; and reacting for an effective amount of time to accomplish at least a 25 percent conversion of chemical reactant to phosphonated pendant groups on the polymer; and then recovering the water-soluble phosphonated polymer.

4,678,841

**METHOD OF PRODUCING A CYCLIZED POLYDIENE**  
Tamae Yoshizawa; Kiyoto Otsuka; Shiro Nagata, all of Kurashiki, and Hideo Takamatsu, Hasaki, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Mar. 4, 1985, Ser. No. 707,843  
Claims priority, application Japan, Mar. 5, 1984, 59-42434;  
Jul. 13, 1984, 59-146554; Jan. 14, 1985, 60-4461

Int. Cl.<sup>4</sup> C08F 8/48

U.S. Cl. 525-353

16 Claims

1. A method for producing a cyclized polydiene, comprising cyclizing a polydiene which is at least one member selected from the group consisting of polyisoprenes and polybutadienes, wherein the said polydiene has a weight average molecular weight of from 10,000 to 1,000,000, and wherein the said cyclizing is performed in an organic solvent in the presence of a binary catalyst which comprises a Lewis acid which is at least one member selected from the group consisting of tin halides and titanium halides and a Bronsted acid which is at least one member selected from the group consisting of sulfonic acids of the generic formula  $R-\text{SO}_3\text{H}$ , where  $R$  is a  $\text{C}_{1-10}$  alkyl or a  $\text{C}_{6-10}$  aryl group.

4,678,842

**POLY(FLUOROACETYLENE) CONTAINING POLYMERS**

Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 29, 1984, Ser. No. 676,122

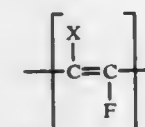
Int. Cl.<sup>4</sup> C08F 8/26

U.S. Cl. 525-359.1

6 Claims

1. A process for dehydrofluorinating a fluorine substituted polymer to provide a dehydrofluorinated polymeric composition

tion which comprises treating a starting polymer selected from the group of starting polymers consisting essentially of a homopolymer of vinylidene fluoride monomeric units or trifluoroethylene monomeric units, copolymers or terpolymers containing a major portion of vinylidene fluoride monomeric units with at least one copolymerized monomeric unit selected from the group consisting essentially of hexafluoropropylene, trifluoroethylene, vinyl fluoride, vinyl chloride, chlorotrifluoroethylene, and mixtures of the homopolymer, copolymer, and terpolymer; with a basic solution containing alkali hydroxides, organic amines, or quaternary ammonium hydroxides of pH 10 to 14 at a temperature within the range of  $20^\circ\text{C}$ . to  $100^\circ\text{C}$ . for a sufficient period of time of at least 5 minutes to remove HF from the polymer to provide a dehydrofluorinated polymer having at least 5 monomeric mol percent of the dehydrofluorinated unit



wherein  $X$  is H or F and the dehydrofluorinated units form conjugated double bonds that impart electrical conductivity to articles prepared from the dehydrofluorinated polymer.

4,678,843

**PROCESS FOR THE AMMONIUM HYDROXIDE HYDROLYSIS OF POLYMERS OF ACETOXYSTYRENE TO POLYMERS OF VINYLPHENOL**

Jimmy D. Elmore, and Elizabeth S. Goff, both of Louisville, Ky., assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 29, 1986, Ser. No. 912,039

Int. Cl.<sup>4</sup> C08F 8/12

U.S. Cl. 525-378

16 Claims

1. A process which comprises:

a. reacting a polymer of 4-acetoxystyrene with ammonia at a temperature of about  $50^\circ\text{C}$ . to about  $150^\circ\text{C}$ . for a time sufficient to hydrolyze the acetoxy groups to phenol groups;

b. contacting the polymer with wet carbon dioxide gas at a temperature of about  $110^\circ\text{C}$ . to about  $180^\circ\text{C}$ . to form ammonium carbonate which immediately decomposes to ammonia, carbon dioxide and water; and

c. removing the decomposition products by sparging with nitrogen or by distillation.

4,678,844

**CHELATE, CROSSLINKED POLYETHYLENEIMINE RESIN HAVING 2-HYDROXY BENZOYL GROUP**

Masako Sakuragi, Sakuramura, and Kunihiro Ichimura, Yatabemachi, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 832,346

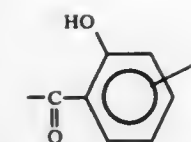
Claims priority, application Japan, Mar. 4, 1985, 60-42490

Int. Cl.<sup>4</sup> C08G 73/00; C08J 3/24

U.S. Cl. 525-417

5 Claims

1. A chelate resin, comprising a high molecular compound of granules of cross-linked polyethyleneimines obtained by suspending an aqueous polyethyleneimine solution in an organic solvent and cross-linking and insolubilizing said polyethyleneimine by addition of a cross-linking agent to the resultant suspension, said resin having a 2-hydroxybenzoyl group of the general formula:



wherein  $X$  stands for one member selected from the class consisting of hydrogen atom, hydroxyl group, and nitro group linked to the nitrogen atom in the imine chain of said high molecular compound.

4,678,845

**MIXED POLYCARBONATE RESIN COMPOSITION**  
Masayoshi Takamatsu, Hino; Kouji Hashimoto, Matsuyama; Akiyoshi Manabe, Matsuyama, and Hideoyuki Ichihana, Matsuyama, all of Japan, assignors to Teijin Chemicals, Ltd., Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,169

Claims priority, application Japan, May 17, 1984, 59-97516

Int. Cl.<sup>4</sup> C08L 69/00

U.S. Cl. 525-462

13 Claims

1. A composition comprising a blend of

(A) 1 to 70% by weight of polycarbonate resin derived from 2,2-bis(4-hydroxyphenyl)propane based on the total weight of (A) and (B), and

(B) 30 to 90% by weight of a polycarbonate resin derived from 1,1-bis(4-hydroxyphenyl)ethane based on the total weight of (A) and (B).

4,678,846

**ACRYLATE OR METHACRYLATE-ESTER-MODIFIED ORGANOPOLYSILOXANE MIXTURES, THEIR PREPARATION AND USE AS ADHESIVE COATING COMPOSITIONS**

Christian Weitmeyer, Essen, and Jürgen Jachmann, Herne, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Fed. Rep. of Germany

Filed Jul. 15, 1985, Ser. No. 755,281

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1984, 3426087

Int. Cl.<sup>4</sup> C08L 83/07; C08F 230/08

U.S. Cl. 525-477

14 Claims

1. Mixtures of compounds which are acrylate or methacrylate ester modified organopolysiloxane mixtures with improved adhesive properties comprising a mixture of essentially equilibrated organopolysiloxanes with, on the average, a first fraction containing more than 25 to less than 200 silicon atoms, and 2 to 30 weight percent of a second fraction of organopolysiloxanes with, on the average, 2 to 25 silicon atoms, and 2 to 30 weight percent of a third fraction of organopolysiloxanes with, on the average 200 to 2,000 silicon atoms.

4,678,847

**PROCESS FOR PREPARING A TERPOLYMER OF TETRAFLUOROETHYLENE, ETHYLENE AND A THIRD MONOMER**

Yun-xiang Zhang; Xing-yi Dai; Zhi-kang Lu, and Sen Zeng, all of Shanghai, China, assignors to Shanghai Institute of Organic Chemistry, Academia Sinica, Shanghai, China

Filed Apr. 1, 1986, Ser. No. 846,795

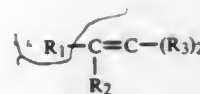
Claims priority, application China, Apr. 1, 1985, 85100468

Int. Cl.<sup>4</sup> C08F 2/14

U.S. Cl. 526-206

21 Claims

1. A process for preparing a terpolymer by solution precipitation comprising reacting tetrafluoroethylene, ethylene and a third monomer having the formula  $\text{CF}_2\text{XCOCF}_2\text{X}'$  or



wherein  $X = X' = Cl$  or  $F$ ,  $R_1 = CF_3$  or  $CH_3$ ,  $R_2 = CH_3$ ,  $CH_3$  or  $H$  and  $R_3 = H$ ,  $F$  or a mixture thereof to form the terpolymer, said reacting being conducted in a reaction medium comprised of 1,1,2-trichloro-1,2,2-trifluoroethane and in the presence of a gaseous telomeric agent in an amount sufficient to control the average molecular weight of the terpolymer, said gaseous telomeric agent having the molecular formula  $C_nR_{2n+2}$  wherein  $n=0$ , 1 or 2, and  $R=H$ ,  $Cl$ ,  $F$  or a mixture thereof provided that said gaseous telomeric agent is not  $CHCl_3$  or  $CCl_4$ .

4,678,848

# PROCESS FOR PREPARING SULFUR-MODIFIED CHLOROPRENE POLYMERS

Henry C. Walter, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 117,504, Feb. 1, 1980, abandoned. This application Apr. 1, 1981, Ser. No. 249,907

Int. Cl.<sup>4</sup> C08F 8/34

U.S. Cl. 526—220

17 Claims

1. A method of preparing sulfur-modified polychloroprene by copolymerization chloroprene with sulfur, in alkaline aqueous emulsion and in the presence of a free-radical initiator, an organic polysulfide selected from the class consisting of

- (a) tetra-alkylthiuram disulfides in which the alkyl group contains from about 3 to 6 carbon atoms; and the said polysulfide is introduced before the initiation of the polymerization in proportions of between about 0.3 and 2 to 100 parts, by weight, of chloroprene charged.

4,678,849

# HEAT-CURABLE MIXTURE CONTAINING SUBSTITUTED BICYCLO(2.2.1)HEPT-5-ENE-2,3-DICARBOXIMIDE AND POLYMALEIMIDE

Marie W. Liu, Fountain Valley, and Victor Ho, Huntington Beach, both of Calif., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

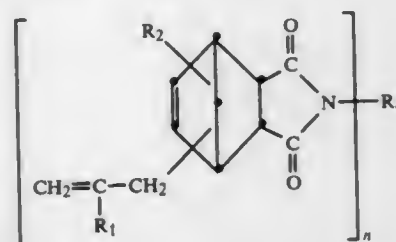
Filed Feb. 21, 1986, Ser. No. 831,687

Int. Cl.<sup>4</sup> C08F 26/06

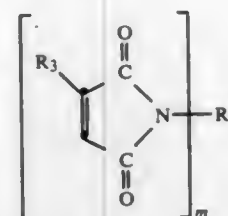
U.S. Cl. 526—259

18 Claims

1. A heat-curable mixture comprising
- (a) at least one compound of formula I



(b) at least one compound of formula II

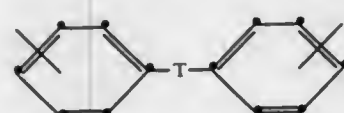


(c) at least one alkenyl phenol or alkenyl phenol ether, and (d) triallylisocyanurate,

in which formulae (I) and (II) above

$n$  is 1 or 2 and  $m$  is 2 or 3,

$R$  wherein  $n$  is 1, is a hydrogen atom,  $C_1$ – $C_{12}$ alkyl,  $C_3$ – $C_6$ alkenyl,  $C_3$ – $C_6$ cycloalkyl,  $C_6$ – $C_{10}$ aryl or benzyl, or wherein  $n$  is 2, is  $-C_pH_{2p}-$ , wherein  $p$  is 2 to 20, or is  $C_6$ – $C_{10}$ arylene or a group of the formula III



wherein

$T$  is methylene, isopropylidene,  $-CO-$ ,  $-O-$ ,  $-S-$  or  $-SO_2-$ ,

$R'$  is an organic radical of valency  $m$  which contains 2 to 30 carbon atoms, and

$R_1$ ,  $R_2$  and  $R_3$  are each independently a hydrogen atom or a methyl group.

4,678,850

# HALOGENATED POLYSTYRENES FOR ELECTRON BEAM, X-RAY AND PHOTO RESISTS

Michael Hatzakis, Chappaqua; John J. Liutkus, Yorktown Heights; Jurij R. Paraszczak, Ossining, all of N.Y., and Jane M. Shaw, Ridgefield, Conn., assignors to International Business Machines Corp., Armonk, N.Y.

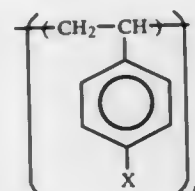
Continuation of Ser. No. 373,839, May 3, 1982, abandoned. This application Oct. 19, 1984, Ser. No. 662,962

Int. Cl.<sup>4</sup> C08F 14/02, 14/16

U.S. Cl. 526—293

8 Claims

1. A polymer useful in forming a negative lithographic resist mask, said polymer having the general formula



wherein  $X$  is chlorine, bromine or iodine,  $n$  represents a number in the range of from about 750 to about 7,500, wherein the molecular weight ( $M_w$ ) of the polymer is in the range of from about  $1 \times 10^5$  to about  $1 \times 10^6$ , the dispersivity ( $M_w/M_n$ ) of the polymer is in the range of from about 1.5 to about 2.5 and the contrast is about 3.5.

4,678,851

# METAL DYE COMPLEXES CONTAINING AN AZO OR AZOMETHINE DYE AND A COLORLESS LIGAND WITH THE $C=N-N=C$ GROUP

Gerhard Back, Lörrach, Fed. Rep. of Germany; Hans U. Schütz, Basel, Switzerland, and Ulrich Schlesinger, Binzen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 28, 1985, Ser. No. 717,743

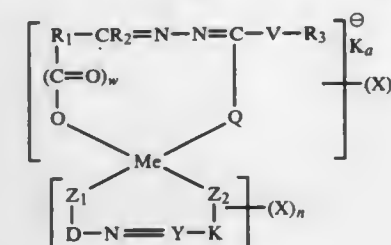
Claims priority, application Switzerland, Apr. 6, 1984, 1750/84

Int. Cl.<sup>4</sup> C09B 62/012, 62/032, 62/095, 62/477

U.S. Cl. 534—619

19 Claims

1. A chromium or cobalt complex of the formula



wherein

$D$  is a benzene, naphthalene or heterocyclic radical of a diazo component;

$Y$  is nitrogen or  $-CH$ ;

$K$  is a radical of a coupling component if  $Y$  is nitrogen, or an  $\alpha$ -hydroxyaldehyde radical if  $Y$  is  $-CH$ ;

$K_a$  is a cation;

$Me$  is chromium or cobalt;

$Z_1$  is  $-O-$  or  $-COO-$  ortho to  $N=Y$

$Z_2$  is  $-O-$  or  $-NR$  vicinal to  $N=Y$ , wherein  $R$  is hydrogen,  $C_1$ – $C_4$  alkyl or phenyl;

$X$  is a fiber reactive radical which is bound directly to or through an amino group to the complex and which contains removable substituents that react with hydroxyl groups in cellulosic or with the  $NH_2$  groups in polyamide fiber materials;

$R_1$  is a direct bond or a  $C_1$ – $C_8$ -alkyl,  $C_1$ – $C_8$ -alkenyl, or aryl radical or heterocyclic radical containing 1 to 3 sulfur, oxygen or nitrogen atoms;

$R_2$  is hydrogen,  $C_1$ – $C_8$ -alkyl or aryl;

$R_3$  is hydrogen, a  $C_1$ – $C_8$ -alkyl, aryl or amino radical, or a heterocyclic radical containing 1 to 3 sulfur, oxygen or nitrogen atoms;

$V$  is a direct bond or oxygen;

$Q$  is oxygen or sulfur;

$w$  is 0 or 1;

$n$  is 0, 1, 2, 3 or 4, and

$p$  is 0, 1, 2

with the proviso that the sum of  $n+p$  is at least 1.

4,678,852

# PROCESS FOR REACTING CYANURIC CHLORIDE WITH AMMONIA OR WITH AMINES

Marianne Punzar, Bottmingen; Franz Marti, Dornach; Robert Mercier, Basel; Paul Tobler, and Rudolf Büttiker, both of Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 493,920, May 12, 1983, Pat. No. 4,552,959. This application Oct. 30, 1984, Ser. No. 710,621

Claims priority, application Switzerland, May 18, 1982, 3082/82; May 24, 1982, 3184/82

Int. Cl.<sup>4</sup> C07D 251/44, 251/50

U.S. Cl. 544—194

6 Claims

1. A process for reacting cyanuric chloride with ammonia or with amines by bringing melted cyanuric chloride into contact with an aqueous ammonia or amines solution or suspension, which process comprises spraying through a nozzle, which is

immersed in the liquid, melted cyanuric chloride, into an aqueous ammonia or amine solution or suspension.

4,678,853

# 1-(3,4-DIMETHYLBENZYL)-2-(N-ALKYL)-CARBAMOYL TETRAHYDROISO QUINOLINES

Chavdar B. Ivanov; Donka M. Mondeshka; Nikolina D. Berova; Rossitza S. Rakovska; Yordanka T. Panova; Marko T. Markov; Radi G. Ovcharov; Petko D. Usunov, and Orhideya B. Zabunova, all of Sofia, Bulgaria, assignors to T P O "Pharmachim", Sofia, Bulgaria

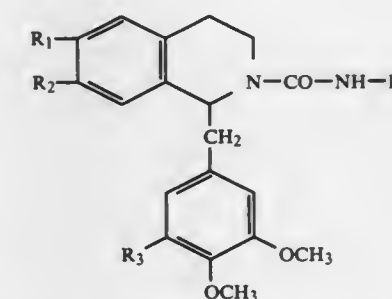
Filed Jan. 13, 1986, Ser. No. 818,489

Int. Cl.<sup>4</sup> C07D 217/06

U.S. Cl. 546—146

4 Claims

1. 1-benzyl-2-(N-substituted)-carbamoyl-tetrahydroisoquinoline of formula:



in which  $R_1$  and  $R_2$  are hydroxyl or methoxyl,  $R_3$  is hydrogen or methoxy,  $R_4$  is methyl or chloroethyl.

4,678,854

# COBALT COMPLEXES AND THEIR USE AS NUTRITIONAL SUPPLEMENTS

Mahmoud M. Abdel-Monem, St. Paul, Minn., assignor to Zinpro Corporation, Chaska, Minn.

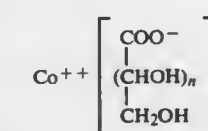
Filed Nov. 25, 1986, Ser. No. 748,851

Int. Cl.<sup>4</sup> C07F 15/06

U.S. Cl. 556—149

5 Claims

1. Cobalt complex salts of the formula:



wherein  $n$  is from 1 to 5.

4,678,855

# SUBSTITUTED BENZENESULFONAMIDES

Kenneth L. Shepard, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

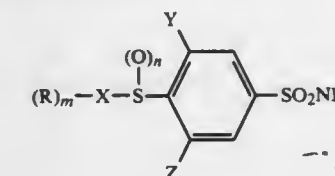
Filed Oct. 9, 1985, Ser. No. 785,924

Int. Cl.<sup>4</sup> C07C 149/443; A61K 9/06

U.S. Cl. 564—85

6 Claims

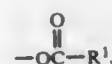
1. A compound of structural formula:



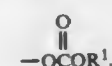


or an ophthalmologically acceptable salt thereof, wherein: amount of the compound of claim 1 or an ophthalmologically acceptable salt thereof.

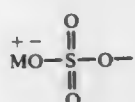
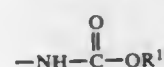
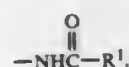
X is a straight, branched or cyclic, saturated hydrocarbon of up to 10 carbon atoms,  
m is 1 or 2;  
n is 0, 1 or 2;  
R is  
(1) —OH,



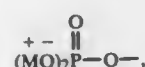
wherein R<sup>1</sup> is hydrogen or C<sub>1-4</sub>alkyl,



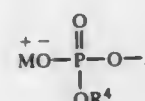
(4) —N(R<sup>1</sup>)<sub>2</sub> wherein the R<sub>1</sub> groups are the same or different, and if loweralkyl, can be joined together to form, with the nitrogen atom to which they are attached, a 5- or 6-membered heterocycle,



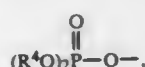
wherein M<sup>+</sup> is an ophthalmologically acceptable cation selected from sodium, potassium ammonium, tetra(C<sub>1-4</sub>alkyl)ammonium, pyridinium, imidazolium, pralidoxime, and thiamine



wherein M<sup>+</sup> is as previously defined;



wherein R<sup>4</sup> is C<sub>1-3</sub> alkyl or phenyl —C<sub>1-3</sub> alkyl; or



wherein R<sup>4</sup> is as previously defined, and the two may be the same or different.

Y and Z are independently;

- (1) hydrogen,
- (2) halo, such as chloro, bromo, or fluoro,
- (3) nitro,
- (4) C<sub>1-3</sub>alkanoyl,
- (5) C<sub>1-3</sub>alkyl,
- (6) C<sub>1-3</sub>alkylthio,
- (7) C<sub>1-3</sub>alkylsulfonyl, or
- (8) amino.

4. An ophthalmic formulation for the treatment of elevated intraocular pressure comprising an ophthalmologically acceptable carrier and an effective intraocular pressure lowering

4,678,856  
**METHOD OF MANUFACTURING AROMATIC URETHANE AND INTERMEDIATE PRODUCT THEREOF**

Takao Ikariya, Tokyo; Masanori Itagaki, Yokohama; Masatsugu Mizuguchi, Kawasaki; Itaru Sakai, Yokohama, and Osamu Tajima, Kamakura, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1986, Ser. No. 902,527

Claims priority, application Japan, Sep. 4, 1985, 60-195306; Sep. 4, 1985, 60-195307; Sep. 4, 1985, 60-195308; Nov. 8, 1985, 60-250497; Nov. 8, 1985, 60-250499

Int. Cl.<sup>4</sup> C07C 125/065, 125/067, 125/073, 125/075

U.S. Cl. 560—24 9 Claims

1. A method of manufacturing aromatic urethane, comprising:
  - (5) the urea producing step of reacting an aromatic mononitro-compound, an aromatic primary amine, and carbon monoxide by using a catalyst having a platinum group metal-containing compound as a major constituent to prepare N,N'-di-substituted urea and of separating and recovering the resultant N,N'-di-substituted urea from a reaction solution;
  - (7) the step of reacting the N,N'-di-substituted urea as an intermediate product prepared in the urea producing step with an organic compound containing a hydroxyl group to prepare an aromatic primary amine and aromatic urethane, and of separating the aromatic primary amine from the aromatic urethane, thereby obtaining the aromatic urethane; and
  - the step of recirculating the separated aromatic primary amine in the urea producing step.
6. A method of manufacturing ureas by reacting an aromatic primary amine, an aromatic nitro-compound, and carbon monoxide by using a catalyst essentially consisting of a platinum group metal-containing compound.

4,678,857  
**PROCESS FOR SEPARATION OF PRODUCT RESULTING FROM HYDROFORMYLATION**

Roger G. Dureanleau, Georgetown, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,543

Int. Cl.<sup>4</sup> C07C 45/50

U.S. Cl. 568—454 10 Claims

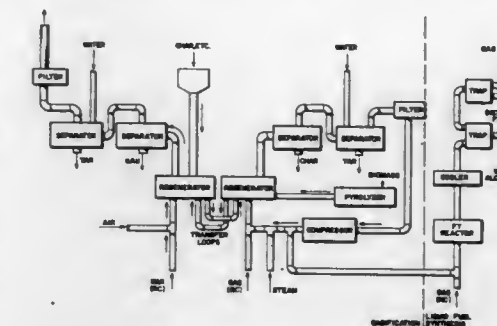
1. In a process for hydroformylation of allyl alcohol to 4-hydroxybutanal by reaction with carbon monoxide and hydrogen in the presence of a rhodium-containing catalyst with excess triphenylphosphine at a temperature in the range of from about 50° to 110° C. and at a pressure in the range from about 5 atm to 100 atm, the improvement comprising using a solvent from the group consisting of halogenated aromatic alkyl ethers, halogenated aromatics, halogenated ethers, halogenated aliphatic solvents, and aromatic solvents from the group consisting of benzene, toluene, tetralin and mixed xylenes which preferably exhibit a large density differential compared with water, thus allowing rapid separation of the aqueous phase and organic phase, as well as improved selectivity and yield of the desired 4-hydroxybutanal product.

4,678,858  
**PROCESS FOR PRODUCING ETHANOL**  
Nobuo Isogai; Takashi Okawa; Motoyuki Hosokawa; Tomoji Tsuji, and Natsuko Wakui, all of Niigata, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan  
Filed Mar. 26, 1986, Ser. No. 844,008  
Claims priority, application Japan, Jun. 10, 1985, 60-124268  
Int. Cl.<sup>4</sup> C07C 29/00, 31/08

U.S. Cl. 568—902 9 Claims

1. A process for producing ethanol which comprises reacting methanol, carbon monoxide and water in the presence of a catalyst consisting of cobalt or a cobalt compound and a tertiary phosphine as an effective component, which catalyst has been preliminarily activated by heat-treating at 180°–280° C. and under 50–500 Kg/cm<sup>2</sup>G in the presence of mixed gas comprising hydrogen and carbon monoxide, wherein the molar ratio of hydrogen to carbon monoxide is more than 0.25, and solvent, and in the substantial absence of methanol and water.

group consisting of alumina, silica, kiesulguhr and diatomaceous earths to form a water/alcohol binary and said liquid



hydrocarbon fuel; and separating said liquid hydrocarbon fuel from said water/alcohol binary.

4,678,859  
**SYNTHESIS OF FLUOROCHLOROMETHANES**  
Charles G. Rudershausen, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Filed Jul. 25, 1986, Ser. No. 889,468  
Int. Cl.<sup>4</sup> C07C 17/24

U.S. Cl. 570—163 5 Claims

1. A process comprising contacting, in the vapor phase, fluorodichloromethane and carbon tetrachloride with an effective amount of a catalyst comprising an activated mixture of iron oxide and rare earth metal oxides at a sufficient temperature and pressure and for an adequate time to produce a reaction product containing fluorotrichloromethane, difluorodichloromethane, difluorochloromethane and chloroform.

4,678,860  
**PROCESS OF PRODUCING LIQUID HYDROCARBON FUELS FROM BIOMASS**  
James L. Kuester, Scottsdale, Ariz., assignor to Arizona Board of Regents, Tempe, Ariz.  
Filed Oct. 4, 1985, Ser. No. 784,269  
Int. Cl.<sup>4</sup> C10L 1/16

U.S. Cl. 585—14 23 Claims

1. A process for producing liquid hydrocarbon fuels consisting essentially of C<sub>7</sub>–C<sub>17</sub> paraffinic hydrocarbons free of oxygenated compounds from an oxygen-containing biomass comprising: feeding comminuted biomass into a pyrolyzer heated to a temperature of from about 1,200° to 2,000° F. to produce an intermediate synthesis gas containing in mole percent from 10 to 53 percent hydrogen, from about 6 to 60 percent carbon monoxide, from 5 to 39 percent olefins, from 6 to 33 percent paraffins, and from 4 to 26 percent carbon dioxide; thereafter directing said unseparated intermediate synthesis gas into a catalytic reactor operating at about 500° F. 140 psig, and containing a catalyst consisting of an active ingredient selected from the group consisting of cobalt, ruthenium, nickel and iron disposed upon a compatible support structure selected from the

4,678,861  
**PROCESS FOR PRODUCING A CYCLOOLEFIN**  
Osamu Mitsui, and Yohei Fukuoka, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan  
Filed Oct. 23, 1985, Ser. No. 790,521  
Int. Cl.<sup>4</sup> C07C 5/10, 5/11

U.S. Cl. 585—266 29 Claims

1. A process for producing a cycloolefin which comprises partially hydrogenating a monocyclic aromatic hydrocarbon in the presence of water, an alkaline agent and a ruthenium catalyst composed of a solid carrier and a ruthenium component supported thereon, said solid carrier consisting essentially of at least one rare earth element compound, said rare earth element being selected from the group consisting of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Sc and Y, said carrier supporting thereon 0.01 to 10 wt. % of said ruthenium component, based on said solid carrier.

4,678,862  
**MOLTEN SALT HYDROCARBON CONVERSION PROCESS USING OXYGEN CONTAINING FEED**  
Harry Mazurek, Bala Cynwyd, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.  
Filed Jan. 31, 1986, Ser. No. 825,029  
Int. Cl.<sup>4</sup> C07C 2/00

U.S. Cl. 585—500 6 Claims

1. A method useful for conversion of methane to higher hydrocarbons which comprises contacting a gas comprising methane and molecular oxygen with a molten salt mixture containing at least one reducible metal oxide at conditions to convert methane to said higher hydrocarbons while maintaining said reducible metal oxide in active form.

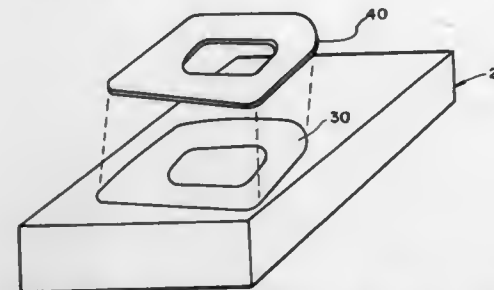
# ELECTRICAL

**4,678,863**  
**CORROSION RESISTANT CONDUCTIVE ELASTOMERS**  
 Robert M. Reese, Philadelphia, Pa., and Norman R. Landry,  
 Mount Laurel, N.J., assignors to RCA Corporation, Prince-  
 ton, N.J.

Filed Jan. 27, 1985, Ser. No. 749,271  
 Int. Cl.<sup>4</sup> H05K 9/00

U.S. Cl. 174—35 GC

14 Claims



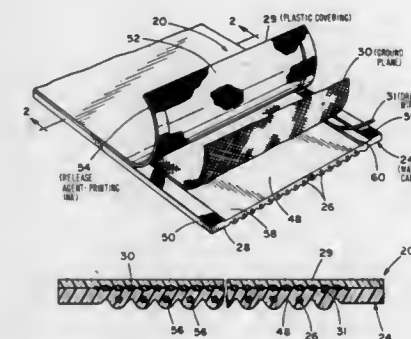
1. A corrosion resistant resilient electrically conductive member comprising:
  - a body of a conductive elastomer containing metal particles which contain silver; and
  - a protective conductive coating on any of said silver-containing metal particles which are exposed at the surface of said body.

**4,678,864**  
**MASS TERMINABLE FLAT CABLE ASSEMBLY WITH READILY SEPARABLE GROUND PLANE**  
 Albert R. Cox, Centerville, Ind., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 27, 1985, Ser. No. 750,523  
 Int. Cl.<sup>4</sup> H01B 7/08, 7/34

U.S. Cl. 174—36

10 Claims



1. A flat cable assembly for use with a mass termination connector having a plurality of regularly spaced terminal elements, said flat cable assembly comprising:
  - a main cable including a plurality of conductors held in regularly spaced parallel relationship in a sheet of insulation to match the terminal element spacing of a connector having a plurality of regularly spaced terminal elements, said cable including a first surface, a second surface and lateral edges with said surfaces extending between said lateral edges;
  - a plastic covering having an interior surface facing said cable second surface, a release agent being printed on at least one of said interior surface and said second surface so that portions of the printed-upon surface are coated by said release agent and other portions of said printed-upon surface are uncoated, said flat cable assembly having lateral edges with the printing of said release agent extending to the lateral edges of said assembly, said printing of said release agent extending the entire width of said assembly so that said covering and said main cable are separated

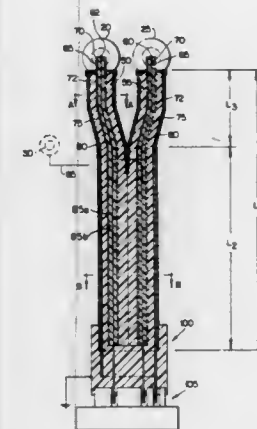
by said release agent the entire width of said assembly permitting manual stripping of said covering without the use of any tools or any cutting; and  
 a metallic ground plane disposed between said main cable and said covering, said plastic covering being bonded to said second surface at said uncoated portions.

**4,678,865**  
**LOW NOISE ELECTROENCEPHALOGRAPHIC PROBE WIRING SYSTEM**  
 Gary W. Sherwin, South Huntingdon Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,060  
 Int. Cl.<sup>4</sup> H01B 11/18

U.S. Cl. 174—36

2 Claims



1. A low noise electroencephalographic (EEG) probe wiring system for connection between an amplifier and at least a pair of EEG probes, comprising:
  - a pair of coaxial cables each having a length and including:
    - a central conductor having one end for connection to one pair of EEG probes and a second end for connection to an amplifier;
    - a graphite coated polyethylene layer positioned around and bonded to the central conductor;
    - a first conductive braid shield positioned about the graphite coated layer along said length, having a first end and a second end;
    - a PTFE jacket positioned around said first conductive braid shield along said length; and
  - said coaxial cables being positioned in contact with each other along a substantially parallel path and along a first portion of said length of said coaxial cables;
  - a second conductive braid shield having a first braid portion positioned around said pair of coaxial cables and along said first portion of said length, and a second braid portion positioned around respective ones of said coaxial cables along the remaining portion of said length of said cables, said second conductive braid shield having a first end connected to said first end of said first conductive braid shield, a second end and a junction between said first and second braid portions of said second conductive braid shield;
  - heat shrink tubing positioned around said second conductive braid shield;
  - a reference lead, connected to said second conductive braid shield at said junction, for connection to an additional reference EEG probe; and
  - gold contact metal jacket means for connecting the second end of each of said coaxial cables and the second end of said second conductive braid shield to the amplifier, a portion of the jacket means being connected to a ground potential.



4,678,866

## FORMING OF CABLE SPLICE CLOSURES

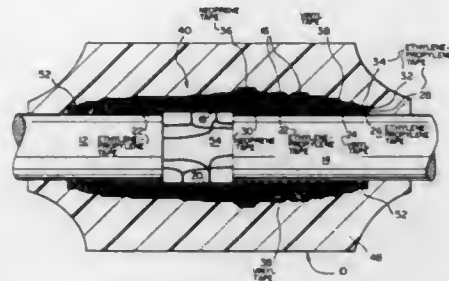
Leonard J. Charlebois, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 8, 1985, Ser. No. 752,747

Int. Cl.<sup>4</sup> H02G 15/08

U.S. Cl. 174-88 R

7 Claims



1. A method of forming an encapsulated splice region joining two cable ends comprising:

locating two cable end portions close together and substantially in axial alignment;

electrically connecting conductors of one cable with those of the other to form splices and sealing each individual splice within dielectric sealing material to electrically isolate it from other splices;

covering the splices by surrounding the cable end portions at each axial side of the splices with a barrier layer which extends also over the splices and between the cable end portions to enclose a region between the cable end portions; and

forming a plastic molded encapsulation extending around the cables and over the splices so as to enclose the barrier layer with the barrier layer preventing the encapsulation material from penetrating into the region between cable end portions and into regions of the splices, and the materials of the encapsulation and of the barrier layer being separate and distinct from one another at any interfacial regions of the materials.

7. An assembly of two telecommunications cables disposed with conductors of each cable electrically connected together to form splices with the splices sealed within dielectric sealing material so as to be electrically isolated from one another, a barrier layer extending over the splices, surrounding adjacent end portions of both cables axially at each side of the splices extending between the adjacent cable end portions to enclose a region between the end portions, and a molded plastic encapsulation extending over the cable end portions and enclosing the barrier layer, the encapsulation and barrier layer being separate and distinct from one another at any interfacial regions of the materials and said region between the cable end portions being free of encapsulation material.

4,678,867

## ELECTRICAL DEVICE WITH PROTECTIVE SHROUD FOR FLEXIBLE ELECTRICAL CABLE EXTENDING THEREFROM

James A. Bongard; Michael J. Delaney, both of Milwaukee; Eugene F. Duncan, Wauwatosa; Cheryl A. Fredricks, Milwaukee; John P. Groves, Milwaukee; Daniel J. Kalista, Milwaukee; Paul Klingseisen, Milwaukee; Joseph Lazzaro, Milwaukee; and Gregory L. Nadolski, Brookfield, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 1, 1986, Ser. No. 892,007

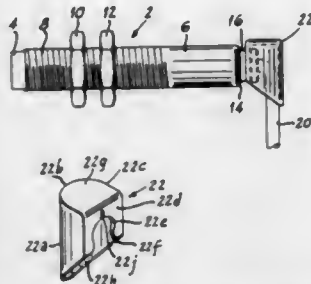
Int. Cl.<sup>4</sup> H01R 13/56

U.S. Cl. 174-135

5 Claims

1. An electrical device with protective shroud for flexible electrical cables comprising, in combination:  
an electrical device mounted on a support structure, said electrical device having a cylindrical projection extending

therefrom and a flexible electrical cable extending axially from said cylindrical projection;  
an annular groove in said cylindrical projection;  
a shroud comprising a first wall having first, second and third contiguous sides and a second wall extending between said first and third sides;



a snap-in slot complementary to said annular groove and having a constricted opening formed in said second wall; said shroud being attached to said cylindrical projection by pressing said constricted slot into said groove, said first wall enveloping said cable adjacent said projection on at least three sides which are directed away from said support structure.

4,678,868

## HERMETIC ELECTRICAL FEEDTHROUGH ASSEMBLY

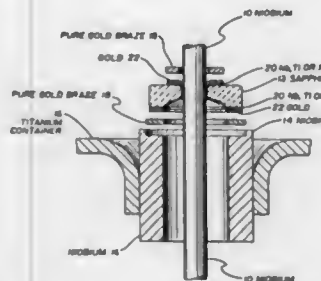
Robert E. Kraska, Minneapolis; Frank J. Wilary, Plymouth, and Joseph F. Lessar, Coon Rapids, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 51,987, Jun. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 7,153, Jan. 29, 1979, abandoned. This application Jul. 30, 1984, Ser. No. 635,576

Int. Cl.<sup>4</sup> H01B 17/30; C03C 27/04

U.S. Cl. 174-152 GM

5 Claims



1. An electrical feedthrough comprising an electrical lead-wire consisting essentially of niobium; an alumina insulator around a portion of the lead-wire; a ferrule consisting essentially of niobium positioned around at least a portion of the alumina insulator for receiving same, and brazes joining the lead-wire to the insulator and the insulator to the ferrule, the brazes consisting essentially of substantially pure gold, the alumina insulator being first metallized with a metal selected from the group consisting of niobium, titanium and niobium/titanium at the brazed areas and wherein the metallizations have a thickness of from about 2,000 to about 40,000 angstroms when they are niobium, from about 5,000 to about 40,000 angstroms when they are titanium and from about 2,000 to about 40,000 angstroms when they are niobium/titanium.

4,678,869

## POSITION RESPONSIVE APPARATUS, SYSTEM AND METHOD HAVING ELECTROGRAPHIC APPLICATION

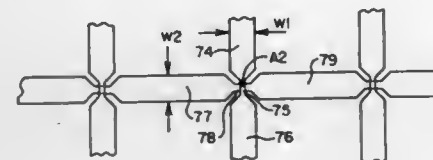
Robert G. Kable, Dublin, Ohio, assignor to Scriptel Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 791,324, Oct. 25, 1985, abandoned. This application May 27, 1986, Ser. No. 865,661

Int. Cl.<sup>4</sup> G08C 21/00

U.S. Cl. 178-19

31 Claims U.S. Cl. 178-19



11. Position responsive apparatus, comprising:

an insulative support;

an x-coordinate array of elongate, transparent grid elements extending between first and second borders and located in mutually spaced parallel relationship from first to last upon said support means;

a y-coordinate array of elongate, transparent grid elements extending between third and fourth borders spaced from said x-coordinate array of grid elements and located in mutually spaced parallel relationship from first to last upon said support means;

first x-coordinate resistor means coupled at said first border with adjacently disposed grid elements of said x-coordinate array for providing discrete resistance therebetween;

second x-coordinate resistor means coupled at said second border with adjacently disposed grid elements of said x-coordinate array for providing discrete resistances therebetween;

x-coordinate terminal means coupled with said first and second x-coordinate resistor means adjacent said first and last grid elements for conveying excitation signals thereto;

first y-coordinate resistor means coupled at said third border with adjacently disposed grid elements of said y-coordinate array for providing discrete resistances therebetween;

second y-coordinate resistor means coupled at said fourth border with adjacently disposed grid elements of said y-coordinate array for providing discrete resistances therebetween;

y-coordinate terminal means coupled with said first and second y-coordinate resistor means adjacent said first and last grid elements for conveying said excitation signals thereto;

a time varying excitation source of select frequency;

switching means controllable for selectively applying an excitation signal corresponding to said source to said x-coordinate terminal means during a first operational mode and for selectively applying said excitation signal to said y-coordinate terminal means during a second operational mode;

locator means movable in adjacency about said support for select interaction with said x-coordinate and y-coordinate arrays of said grid elements during said first and second modes to effect the derivation of position signals;

detector circuit means responsive to said position signals for deriving digital position signals; and

control means for controlling said switching means and treating said digital position signals to derive coordinate pair output signals with respect thereto.

4,678,870

## POSITION DETECTING DEVICE

Yoshinori Taguchi, and Tsuguya Yamanami, both of Kuki, Japan, assignors to Wacom Co., Ltd., Saitama, Japan

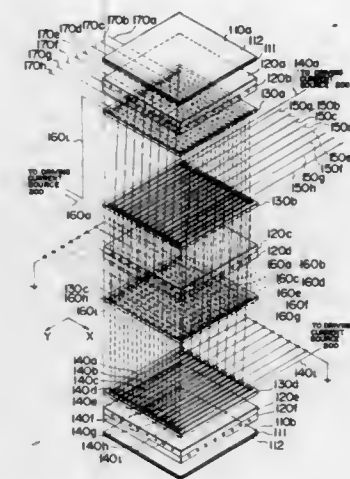
Filed Dec. 11, 1985, Ser. No. 807,715

Claims priority, application Japan, Dec. 13, 1984, 59-263496;

Dec. 27, 1984, 59-274020

Int. Cl.<sup>4</sup> G08C 21/00

9 Claims



1. A position detecting device comprising:

a tablet portion including a magnetic member composite having a pair of insulating substrates with a plurality of long magnetic members sandwiched therebetween, said magnetic members being substantially parallel to each other; and two conductive member composites, each having a plurality of conductive members substantially parallel to each other, each of said two conductive member composites being placed on opposite side of said magnetic composite in such a manner that said conductive members are disposed orthogonally with respect to said magnetic members; and said conductive members on one of said two conductive member composites connected with the corresponding ones, on another of said conductive member composites, alternately constitute exciting lines and detecting lines;

a driving current source for applying an alternating current of a predetermined frequency to each of said exciting lines;

a position designating magnetic generator for generating a stationary magnetic field passing through the tablet portion; and

a position detecting circuit for detecting, by calculation, the position which is indicated by said position designating magnetic generator.

4,678,871

## REVERSING SWITCH FOR RECHARGEABLE HAND TOOL

Jun G. Wong, Villa Park, Ill., assignor to Skil Corporation, Chicago, Ill.

Filed Jul. 22, 1985, Ser. No. 757,334

Int. Cl.<sup>4</sup> H01H 19/10, 21/18

U.S. Cl. 200-1 V

21 Claims

1. A rechargeable hand tool having a housing with access ports, a rechargeable battery, an electric motor having parallel motor leads and a reversing switch between the motor and the battery, the switch comprising:

a stationary mounting support located in the housing;

a switch actuator pivotally mounted to the stationary mounting support;

an upper transfer terminal forming an integrally formed

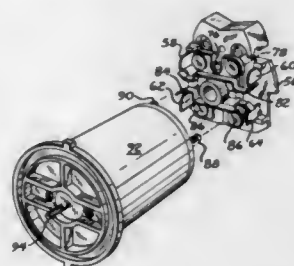
structure comprising a first upper forward post, a second upper forward post, and a first recharging post, the upper transfer terminal being connectable to a second battery terminal;

a lower transfer terminal forming a second integrally formed structure comprising a first lower forward post, a second lower forward post, and a second recharging post, the lower transfer terminal being connectable to a first battery terminal opposite the second battery terminal;

a contact carrier rotatably mounted on the stationary mounting support so that pivoting the switch actuator rotates the contact carrier;

upper and lower pivot contacts attached to the contact carrier, the pivot contacts being electrically insulated from one another;

wherein the pivot contacts are oriented to define a space in which the motor leads are situated so the upper pivot



contact connects one upper forward post with a first motor lead and the lower pivot contact connects one lower forward post with a second motor lead when the actuator is in a first position, and when the actuator is in a second position the upper pivot contact connects one of the upper forward posts with the second motor lead and the lower pivot contact connects one of the lower forward posts with the first motor lead; and

wherein the first and second recharging posts are disposed near the access ports and application of an electromotive force between the recharging posts would supply a charge to the battery;

whereby a battery in contact with the transfer terminals would drive the motor in one direction when the actuator is in a first position and drive the motor in an opposite direction when the actuator is in a second position and whereby the battery can be recharged by easy access to the recharging posts and without removing the battery.

4,678,872

## BUTTON SET AND SWITCH

Robert F. Gutman, Detroit, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Sep. 10, 1986, Ser. No. 905,604

Int. Cl.<sup>4</sup> H01H 9/00

U.S. Cl. 200—5 R

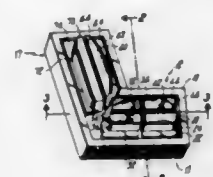
13 Claims

1. A switch comprising:

a one-piece molded button set having a series of buttons each connected by a hinge means integral to a frame means extending about the perimeter of the button set such that each button extends inwardly from the frame means and each button may be displaced independently, said buttons being arranged in a pattern to emulate a seat back and a seat bench of an automobile power seat and each button including an actuator portion; and

a circuit means mounted to the button set and including a series of switch means positioned to be engaged by the

actuator portion of each button for providing a signal indicating that a button was displaced and that the opera-



tor desires the seat back or seat bench to be displaced in accordance with the particular button displaced.

4,678,873

## LOW-VOLTAGE CIRCUIT BREAKER HAVING A SWITCHING MECHANISM ARRANGED IN A SEPARATE CHAMBER

Bernhard Preuss, and Klaus-Gunther Berndt, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

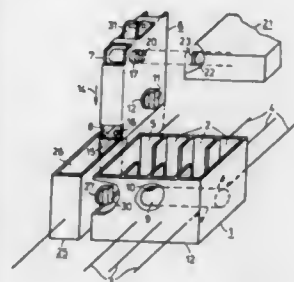
Filed Jan. 14, 1986, Ser. No. 818,883

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501480

Int. Cl.<sup>4</sup> H01H 71/16

U.S. Cl. 200—18

8 Claims



1. A low-voltage circuit breaker comprising:

housing means of insulating material having a plurality of parallel disposed chambers, contact means for electrical current being provided in all but one of said chambers, switching mechanism means for operating the contact means being arranged in the remaining chamber, a control shaft coupling the switching mechanism means and each of the contact means, said control shaft means being provided for operating the contact means;

carrier means supporting said switching mechanism means, said carrier means comprising a one-piece U-shaped part having cutouts for fastening means provided in a central part thereof;

said control shaft comprising a pole control shaft coupled to the contact means and a drive shaft extending from one side of the switching mechanism means;

the pole control shaft and said drive shaft of the switching mechanism means having adjacent ends thereof facing each other provided with coupling parts cooperating in a form-locking manner.

4,678,874

## ANTI-BURGLARY DEVICE FOR AUTOMOBILE RADIOS AND CASSETTES

Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559

Filed Apr. 3, 1986, Ser. No. 847,960

Int. Cl.<sup>4</sup> H01H 9/28

U.S. Cl. 200—43.12

14 Claims

4,678,875

## STEERING COLUMN SWITCH FOR MOTOR VEHICLES

Herbert Erdelitsch, and Walter Hecht, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to WSWF Auto-Electric GmbH, Bissingen, Fed. Rep. of Germany

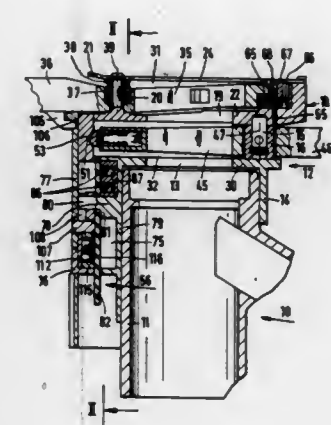
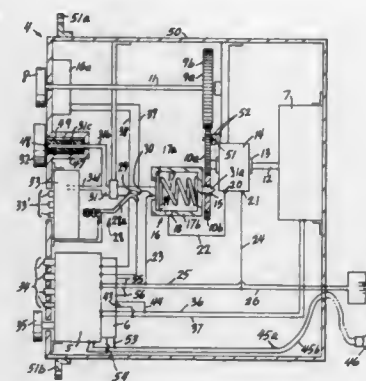
Filed Nov. 8, 1985, Ser. No. 796,648

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1984, 3440763

Int. Cl.<sup>4</sup> H01H 9/00, 25/04

U.S. Cl. 200—61.54

29 Claims



1. An anti-burglary device comprising in combination: a dashboard-mountable audio electronic means for an electronic audio function including reproducing cassette or radio audio sound, said audio electronic means including audio elements adapted to reproduce audio sound; a lever means for intermittent alternate switching from an inoperative position for said electronic function to an alternate operative position required to achieve said electronic function, said lever means including an interior inaccessible portion connected to an accessible exterior manual manipulation portion arranged to make possible manual movement of the interior inaccessible portion; a dial-type combination lock means for securing and unsecuring said lever means at said inoperative position at which said electronic function cannot be achieved, said dial-type lock means having locking elements having dials adapted for dialing said locking means to and from alternate unlocked and locked positions, said dial-type lock means being additionally for manual movement alternately from and to release and securing of the lever means in said inoperative position when said dials have been dialed to said unlocked position; and durable protective enclosure means for structurally substantially enclosing protectively each of said electronic means and said dial-type lock means and said interior inaccessible portion of said lever means such that the enclosed said electronic means and the enclosed said dial-type lock means and the enclosed said interior inaccessible portion are inaccessible and protectively shielded from access and from by-passing of the dial-type lock means from an exterior space and such that said dials and said manipulation portion are each accessible from an exterior of said enclosure means, and such that the anti-burglary device is in locked positions, it being impossible to utilize operatively the lever means and the audio electronic means in an effort to gain access thereto through its enclosure means; and mounting means for mounting the electronic means within said enclosure means and for mounting the enclosure means within or on an automobile dashboard.

1. A steering column switch comprising:

a housing having a central aperture;

first and second switching members independently supported in said housing one above the other, said first switching member being swivellable about a first axis, said second switching member being swivellable about a second axis, and first and second axes defining a swivelling plane, said first and second axes being parallel and substantially diametrically opposite each other relative to said aperture, said first and second switching members each being independently tiltable perpendicularly to said swivel plane;

first switch means comprising a first switch plate including an insulating plate supported in said housing and having conductors thereon, one end of said first switch plate forming an electrical plug part; first contact means movable by said first switching member on said first switch plate to a plurality of first switching positions;

second switch means comprising a second switch plate including a second insulating plate supported in said housing and having conductors thereon, one end of said second switch plate forming a second electrical plug part; second contact means movable by said second switching member on said second switch plate to a plurality of second switching positions;

said switch operating such that tilting said first switching member causes said first switch means to change from one switching position to a second switching position; swivelling of said first switching member causes said first switch means to change from one switching position to another switching position; tilting said second switching member causes said second switch means to change from one switching position to a second switching position; and swivelling of said second switching member causes said second switch means to change from one switching position to another switching position.



4,678,876

# ISOLATING SWITCH APPARATUS FOR A HIGH-VOLTAGE SWITCHING SYSTEM WHICH MAY BE INSULATED WITH SF<sub>6</sub> GAS

Paul Westbrook, Gelnhausen-Meerholz, and Theo Peltz, Hanau, both of Fed. Rep. of Germany, assignors to BBC Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

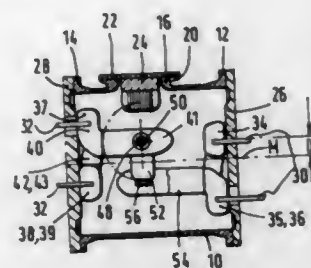
Filed Jun. 11, 1984, Ser. No. 619,070

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321146

Int. Cl.<sup>4</sup> H01H 33/60

U.S. Cl. 200-148 R

14 Claims



1. Isolating switch apparatus, comprising an encapsulation having first and second opposite sides, at least one disconnection point and a plurality of contact points corresponding to a given number of phases therein, a plurality of phase conductors at least partially disposed in said encapsulation for a plurality of phases, first and second connection pieces connected to said phase conductors in said encapsulation for each contact point of each phase, said first connection piece projecting from said first side to a given point in said encapsulation, said second connection piece projecting from said second side to a point beyond said given point causing said first and second connection pieces to be partially overlapped, mutually spaced apart and substantially mutually parallel, a contact piece disposed on said second connection piece, an insulated drive shaft passing through a hole formed through said first connection piece, said second connection piece extending beyond said drive shaft, and a contact blade attached to and rotatable by said drive shaft into a switched-on position in which said contact blade is substantially perpendicular to said first and second connection pieces, is disposed between said first and second connection pieces, and contacts said contact piece.

4,678,877

# OPERATING MECHANISM FOR A CIRCUIT-BREAKER, AND A CIRCUIT-BREAKER FITTED WITH THE MECHANISM

Dante Nicoloso, Jonage, France, assignor to Alsthom, Paris, France

Filed Oct. 23, 1986, Ser. No. 922,225

Claims priority, application France, Oct. 23, 1985, 85 15751

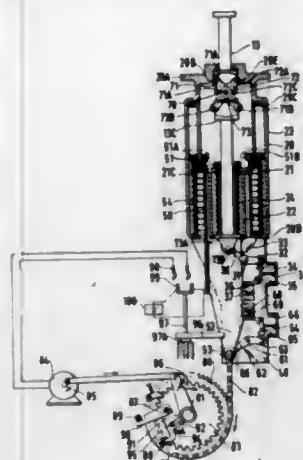
Int. Cl.<sup>4</sup> H01H 33/42

U.S. Cl. 200-148 F

5 Claims

1. A mechanism for operating a circuit-breaker and suitable for causing a circuit-breaker to perform a rapid opening-closing-re-opening cycle, said circuit-breaker including a set of fixed contacts and a set moving contacts, said operating mechanism including an operating rod for connection to said set of moving contacts, a first spring imparting motion, when it expands, to said rod in a direction corresponding to circuit-breaker opening, a second spring capable of storing at least twice as much energy as said first spring and imparting motion, when it expands, to said rod in a direction which corresponds to said circuit-breaker closing said mechanism further including means for ensuring that expansion of said second spring causes said first spring to be re-compressed, and each of said first and second springs being associated with a respective controllable locking member, said circuit-breaker operating mechanism including the improvement whereby it further includes a first cylinder having said operating rod passing

axially therethrough, a second cylinder coaxial with said first cylinder, fixed relative thereto, and containing said first spring therein, and a third cylinder coaxial with said first and second cylinders and disposed between said first cylinder and said second cylinder and being movable relative thereto, said sec-



ond spring being disposed between said first and second cylinders said third cylinder including a collar serving as an abutment for said second spring, and enabling said third cylinder to slide in said first cylinder and co-operating with a set of levers which are hinged on and fixed to said rod for driving said rod when said second spring expands.

4,678,878

# GAS PRESSURE CIRCUIT BREAKER

Helmut Beier, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

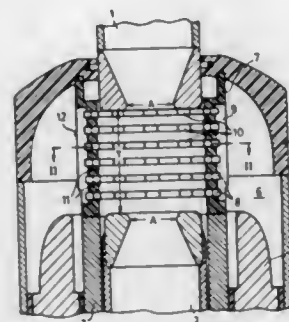
Filed Oct. 29, 1986, Ser. No. 924,632

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1985, 3538955

Int. Cl.<sup>4</sup> H01H 33/88

U.S. Cl. 200-148 A

9 Claims



1. A gas pressure circuit breaker comprising a break gap formed by two fixed contacts and having an insulation tube surrounding the gap at least at times and having sheath-side openings for the distribution of a quenching gas flowing into the break gap, the insulation tube being internally and externally grooved, the inner and outer grooves forming crossings and have a depth such that they penetrate each other at the crossings, thereby forming the openings.

4,678,879

# PANEL MOUNTED APPARATUS WITH FRONT OPERATED CLAMPING MEANS

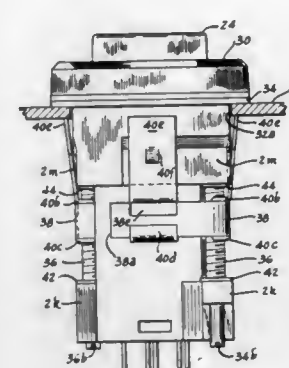
Sidney Kenway, Fountain Valley, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 10, 1986, Ser. No. 827,997

Int. Cl.<sup>4</sup> H01H 13/04

U.S. Cl. 200-295

5 Claims



1. Apparatus adapted to be front mounted to a panel through a hole in said panel comprising, in combination:  
a rectangular housing comprising a forward end having a transverse profile larger than said hole in said panel, an intermediate portion having a transverse profile substantially corresponding to said hole in said panel, and a rear portion having a reduced transverse profile relative to said intermediate portion, said housing being open to said forward end;  
a pair of screws rotatably supported within said intermediate portion of said housing at diagonally opposed locations and extending rearwardly along diagonally opposed corners of said rear portion exteriorly thereof, said screws having tool engagable drive means accessible through said open forward end of said housing;  
a pair of nuts each comprising a pair of arms joined together at a right angle at an apex and having a threaded opening for receiving a respective one of said screws in said apex, said arms engaging exterior surfaces of respective adjacent sides of said rear portion of said housing for preventing rotation of said nuts, and said nuts being movable forwardly and rearwardly along said exterior surfaces of said rear portion of said housing in response to rotation of said screws;  
a plurality of clamping straps, respective ones of said straps being affixed to a respective arm of said nuts at a midpoint of a respective side of said housing and extending forwardly along said exterior surface of said rear portion of said housing and within respective recesses in exterior side surfaces of said intermediate portion of said housing; and cam means on each said clamping strap cooperable with said intermediate portion of said housing upon forward movement of said nuts for deflecting said clamping straps outwardly of said intermediate portion of said housing;  
said apparatus being insertable through said hole in said panel wherein said forward end abuts a front face of said panel adjacent said hole, said intermediate portion is located in said hole, and forward ends of said clamping straps are deflected outwardly of said intermediate portion of said housing and drawn into engagement with a rear surface of said panel at a midpoint of each of four respective sides of said rectangular housing upon appropriate rotation of said screws for clamping said device to said panel.

4,678,880

# KEYBOARD SWITCH

Haruyuki Koizumi, and Koichi Omae, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

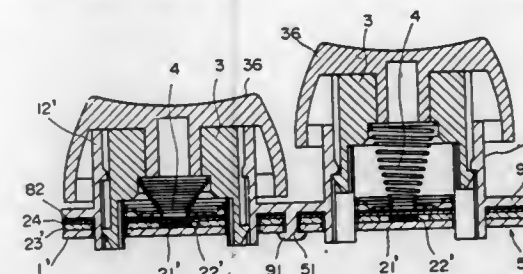
Filed Apr. 17, 1985, Ser. No. 724,308

Claims priority, application Japan, Apr. 18, 1984, 59-79119; Apr. 18, 1984, 59-79120; Nov. 1, 1984, 59-231992

Int. Cl.<sup>4</sup> H01H 3/12

U.S. Cl. 200-340

6 Claims



1. A keyboard switch comprising:  
a substrate having on an upper surface thereof a flexible switch which has a pair of spaced engageable contacts, at least one of said contacts being fixed to a flexible sheet, at least two guide posts passing through respective apertures in said substrate and being secured to said substrate at mutually opposed positions on either side of said contacts, a key plunger having spaced extending leg portions respectively fitted vertically movably in said guide posts, said key plunger being capable of reciprocal up and down movement with said leg portions being guided by said guide posts and moving through said substrate during said reciprocal movement, and  
a coil spring interposed between said key plunger and said substrate, said coil spring pushing said flexible switch, when compressed by a depression of said plunger, to cause said paired contacts to come into contact with each other and, when uncompressed, returning said key plunger to an initial position to separate said paired contacts.

4,678,881

# INDUCTION APPARATUS FOR HEATING AND MIXING A FLUID

John T. Griffith, Mold, United Kingdom, assignor to The Electricity Council, London, England

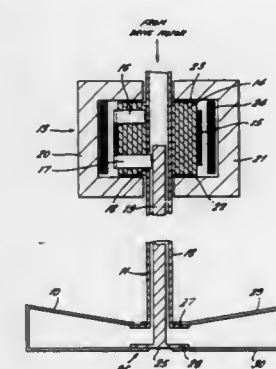
Filed May 28, 1986, Ser. No. 867,994

Claims priority, application United Kingdom, May 28, 1985, 8513505

Int. Cl.<sup>4</sup> H05B 6/10

U.S. Cl. 219-10.51

7 Claims



1. Apparatus for heating and mixing a fluid, comprising a vessel for fluid to be heated and mixed, a mixing paddle in the

vessel and rotatable on a shaft to mix the fluid, a magnetic rotor core mounted on the shaft to rotate with the shaft, an electric conductor circuit formed of a rotor winding on the rotor core in series with a heating conductor in the paddle, and induction means to generate, at least on rotation of the shaft, a varying magnetic flux in the rotor core to induce a heating current in said rotor winding and the heating conductor in the paddle.

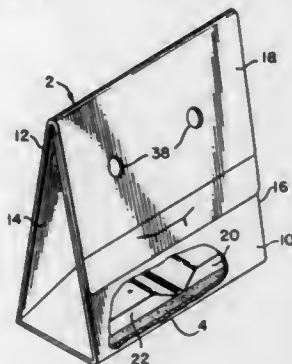
**4,678,882**  
**PACKAGING CONTAINER FOR MICROWAVE POPCORN POPPING**

Timothy H. Bohrer; Thomas D. Pawlowski, both of Neenah, and Richard K. Brown, Appleton, all of Wis., assignors to James River-Norwalk, Norwalk, Conn.  
Continuation of Ser. No. 735,576, May 20, 1985, abandoned, which is a division of Ser. No. 510,735, Jul. 5, 1983, Pat. No. 4,553,010. This application Jan. 3, 1986, Ser. No. 815,318  
The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> H05B 6/80

U.S. Cl. 219—10.55 E

11 Claims



1. A package for shipping and microwave popping of popcorn, comprising:
  - (a) a predetermined quantity of popcorn kernels which will occupy a predictable volume when popped;
  - (b) a package containing said predetermined quantity of popcorn and, when used for popping corn, having a predetermined internal volume at least equal to said predictable volume occupied by said popcorn kernels when popped, said package having a wall adapted to rest in a generally flat horizontal configuration upon a horizontal support surface in a microwave oven, said wall having an interior surface that is large enough for said predetermined quantity of unpopped popcorn to be spread thereon in a generally unclumped manner; and
  - (c) a microwave converting means integrally connected with said package for converting microwave energy into heat for transfer in a sufficient amount to the popcorn kernels when unclumped to reduce substantially the number of burned or unpopped kernels that could result if the kernels were popped solely by direct impingement of microwave energy, said microwave converting means including a microwave interactive material whose temperature increases in response to impinging microwaves, said microwave interactive material being connected with said wall and co-extensive with an area of said interior surface which is sufficiently large to permit said predetermined quantity of popcorn to be spread thereon in said unclumped manner.

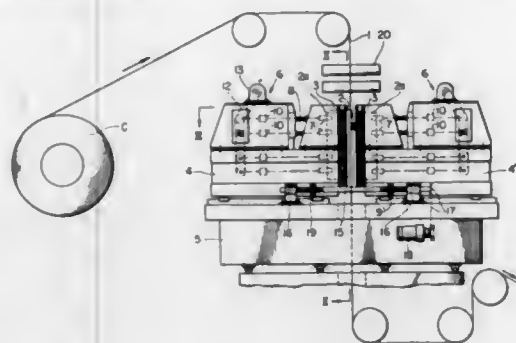
**4,678,883**  
**ELECTROMAGNETIC-INDUCTION HEATER WITH MAGNETIC FIELD CONTROL**

Hajime Saitoh, and Morio Maeda, both of Niihama, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan  
Filed Jun. 10, 1986, Ser. No. 872,573

Claims priority, application Japan, Aug. 9, 1985, 60-174256  
Int. Cl.<sup>4</sup> H05B 6/40

U.S. Cl. 219—10.61 R

4 Claims



1. An electromagnetic-induction heater comprising:
  - a strip which is transferred in a predetermined direction;
  - electromagnets disposed on both sides of said strip in a face-to-face relationship to heat said strip by electromagnetic induction, said electromagnets including
    - a plurality of magnetic-pole segments disposed transverse to the direction of travel of said strip, said plurality of magnetic-pole segments being individually movable toward and away from said strip,
    - a plurality of common coils, each common coil surrounding a group of said magnetic-pole segments;
  - non-magnetic movable shield plate to reduce a fringing field generated by each of said magnetic-pole segments, said shield plate being disposed adjacent to at least one end portion of each electromagnet near said strip, said shield plate being movable forward and backward parallel to and transversely to the length of said strip; and
  - means for moving said non-magnetic movable shield plate, said means for moving said shield plate including
    - at least two rods connected near an edge of said shield plate,
    - connected rods for interconnecting said at least two rods,
    - screw means for interconnecting said connecting rods, and
    - screw driving means for driving said screw means so said at least two rods are moved through said connecting rod to change the displacement of said shield plate.

**4,678,884**  
**WIRE DISCHARGE MACHINING POWER SOURCE**  
Haruki Obara, Sagami-hara; Masaya Ito, and Masashi Tonamura, both of Hino, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Filed Nov. 22, 1985, Ser. No. 807,509

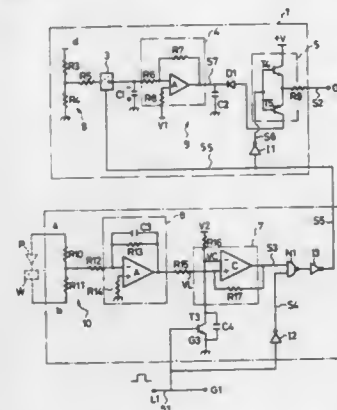
Claims priority, application Japan, Mar. 26, 1984, 59-56135  
Int. Cl.<sup>4</sup> B23H 1/02

U.S. Cl. 219—69 P

13 Claims

1. A wire discharge machining power source for turning on a switching element to apply a voltage from a first power supply between a wire electrode and a workpiece during machining so as to cause an electric discharge, and for applying a reverse voltage, having a polarity opposite to that of the voltage applied during machining, when the switching element is turned off, the reverse voltage being applied from a second power supply between the wire electrode and the workpiece through a series circuit consisting of a transistor and a resistor and connected in series with the second power supply, comprising:

- a reverse voltage application time control circuit, coupled to the wire electrode and the workpiece, for detecting a value of an average machining voltage applied between the wire electrode and the workpiece, and for generating a pulse with a pulse width corresponding to the average machining voltage value; and
- a reverse voltage regulating circuit, coupled to the transistor and said reverse voltage application time control circuit, and having a sample/hold circuit for detecting and holding a difference between a reference voltage and a voltage



across the series circuit upon application of the reverse voltage, the voltage across the series circuit being increased and decreased upon a decrease and an increase, respectively, in the voltage applied between the wire electrode and the workpiece, said reverse voltage regulating circuit for generating an output with a value corresponding to a holding voltage of said sample/hold circuit, the output from said reverse voltage regulating circuit being generated for a period corresponding to the pulse width of the pulse from said reverse voltage application time control circuit.

**4,678,885**  
**POWER SUPPLY CIRCUIT FOR SPARK EROSION**  
Silvano Dresti, Cannobio, Italy; Ernst Buhler, and Rene Derighetti, both of Losone, Switzerland, assignors to AG fur Industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

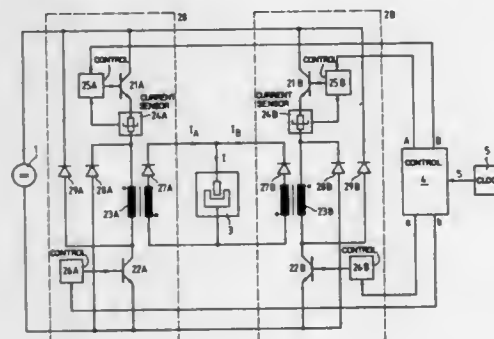
Filed May 10, 1985, Ser. No. 733,006

Claims priority, application Switzerland, May 11, 1984, 2353/84

Int. Cl.<sup>4</sup> B23H 1/02; G05F 1/44

U.S. Cl. 219—69 C

6 Claims



1. A spark generator for the machining of an electrically conductive workpiece in a spark erosion plant across a spark gap formed between the workpiece and a tool electrode with substantially no ballast resistance, comprising a direct current power supply; at least one switching circuit connected in parallel with the power supply; and a control device connected

to each switching circuit; each switching circuit comprising first and second switching elements, each switching element having a conductive and a nonconductive state; a pulse transformer having a primary and secondary winding, the switching elements and the primary winding being connected in series circuit so that current from the power supply is applied to the primary winding when the switching elements are placed in the conductive state, and the secondary winding being connected in parallel with the spark gap; and a unidirectional current conducting means associated with each switching element and operatively connected across the primary winding and the associated switching element to place the pulse transformer in a freewheeling state when only the associated switching element of the first and second switching elements is in the conductive state; the control device being operatively connected to each switching element and adapted to selectively place each switching element in the conductive state in accordance with a predetermined pattern.

**4,678,886**  
**AUTOMATIC SOLDERING DEVICE**  
Seiji Kawaguchi, 22-203, Nishiminecho 21, Ota-ku, Tokyo, 146, Japan

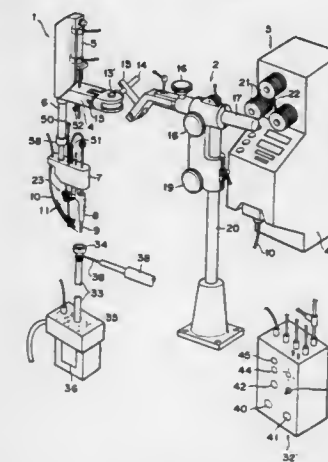
PCT No. PCT/JP85/00083, § 371 Date Nov. 13, 1985, § 102(e) Date Nov. 13, 1985, PCT Pub. No. WO85/03866, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 25, 1985, Ser. No. 810,338

Int. Cl.<sup>4</sup> B23K 1/02, 1/04

U.S. Cl. 219—85 R

8 Claims



1. In an automatic soldering system wherein soldering is conducted by lowering a soldering iron having a tip toward a work surface by means of an air cylinder, supplying thread solder in a predetermined amount from a solder feeder installed separately via a feeding tube at a timing coincided with the lowering of the iron, controlling both the preheating and heating times of the iron and dividing the supply of thread solder in two stages, an automatic soldering device characterized by the fact that an end portion of said feeding tube for guiding the thread solder is supported near and directed toward the iron tip by means of a holder including a holder plate and said holder plate is supported by a base plate by means of a spring, and the holder can be freely adjusted with respect to its position and angularity horizontally, vertically and obliquely relative to the iron tip in all directions by adjusting the protrusion of plural screws provided on the base plate to modify the force exerted by said spring upon said holder plate.



4,678,887

## METHOD AND APPARATUS FOR RESISTANCE WELDING

Gregory L. Nagel, Royal Oak; Anthony Lee, West Bloomfield, and Warren D. Hill, Lake Orion, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 9, 1986, Ser. No. 883,781

Int. Cl.<sup>4</sup> B23K 11/24

U.S. Cl. 219—117.1

## 14 Claims METHOD OF LASER TRIMMING IN SEMICONDUCTOR WAFER

Hiroshi Yamanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

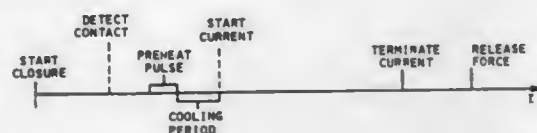
Filed Nov. 6, 1985, Ser. No. 795,609

Claims priority, application Japan, Nov. 6, 1984, 59-233805

Int. Cl.<sup>4</sup> B23K 26/00

U.S. Cl. 219—121 LJ

3 Claims



1. A method of resistance spot welding comprising the steps of:
  - moving weld electrodes into contact with a workpiece and applying electrode force to the workpiece;
  - determining a preheat pulse time in the period following contact of weld electrodes with the workpiece and prior to attaining full electrode force;
  - applying a preheat current pulse at the preheat pulse time and extending for a time sufficient to vaporize coatings and melt the workpiece surfaces at the interfaces;
  - inhibiting further weld current for a cooling period after the preheat pulse to allow heat dissipation from the hot interfaces; and then
  - applying a predetermined weld current schedule.

4,678,888

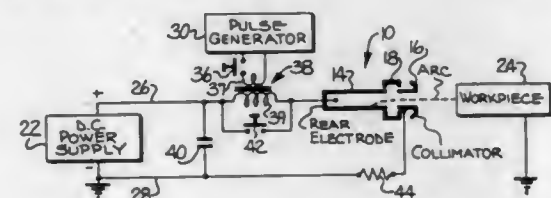
## POWER CIRCUIT APPARATUS FOR STARTING AND OPERATING PLASMA ARC

Salvador L. Camacho, and David P. Camacho, both of Raleigh, N.C., assignors to Plasma Energy Corporation, Raleigh, N.C. Continuation-in-part of Ser. No. 460,062, Jan. 21, 1983, Pat. No. 4,549,065. This application Oct. 21, 1985, Ser. No. 789,398

Int. Cl.<sup>4</sup> B23K 15/00

U.S. Cl. 219—121 PW

11 Claims



1. An apparatus for starting and maintaining a plasma arc which is characterized by the use of a power supply of relatively low capacity and cost, and comprising
  - a plasma torch comprising a rear electrode composed of a tubular metal member having a closed inner end and an open outer end, a front tubular metal member having a bore therethrough and mounted in coaxial alignment with and separated from said open outer end of said rear electrode, and gas vortex generating means disposed intermediate said rear electrode and said front tubular member for generating a vortical flow of a gas therebetween;
  - an electrical power supply;
  - circuit means operatively interconnecting said power supply to said plasma torch and including a first line connecting one terminal of said power supply to said rear electrode, and a second line connecting the other terminal of said power supply to said front tubular member; and
  - electrical pulse generator means operatively connected to said circuit means in series with said plasma torch for selectively applying direct current pulses of relatively high energy to said circuit means and which is sufficient to initiate an electrical arc between said rear electrode and

said front tubular member, said pulse generator means including a secondary transformer coil connected in said circuit means, and bypass switch means for selectively removing said secondary transformer coil from said circuit means.

4,678,889

## METHOD OF LASER TRIMMING IN SEMICONDUCTOR WAFER

Hiroshi Yamanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

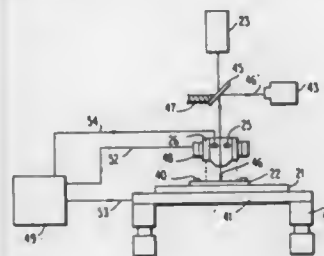
Filed Nov. 6, 1985, Ser. No. 795,609

Claims priority, application Japan, Nov. 6, 1984, 59-233805

Int. Cl.<sup>4</sup> B23K 26/00

U.S. Cl. 219—121 LJ

3 Claims



1. A method of laser trimming in a semiconductor wafer by a laser trimming apparatus, said semiconductor wafer having a plurality of semiconductor pellets, each said semiconductor pellet including a first programmable link positioned at a first position thereof and a second programmable link positioned at a second portion apart from said first portion, said laser trimming apparatus having an X-Y stage which is movable horizontally in X and Y directions and a laser beam means provided above said X-Y stage for irradiating a laser beam downward at predetermined periods along a fixed axis which is kept invariable, said method comprising the steps of:
  - mounting said semiconductor wafer on said X-Y stage;
  - conducting a first series of trimming operations, said first series of operations including moving said X-Y stage such that said first programmable links of said semiconductor pellets successively intersect said fixed axis, stopping said X-Y stage for a first duration of time whenever such one of the first programmable links that is to be disconnected is positioned under said fixed axis, and irradiating said laser beam along said fixed axis during said first duration of time in order to disconnect the first programmable link; and
  - conducting a second series of trimming operations after the first programmable links that are to be disconnected are all disconnected by said first series of operations, said second series of operations including moving said X-Y stage such that said second programmable links of said semiconductor pellets successively intersect said fixed axis, stopping said X-Y stage for a second duration of time whenever such one of the second programmable links that is to be disconnected is positioned under said fixed axis, and irradiating said laser beam along said fixed axis during said second duration of time in order to disconnect the second programmable link to be disconnected.

4,678,890

## HERMETICALLY SEALED METAL FILM RESISTOR

Billy B. Sorrow, Mineral Wells, Tex., assignor to North American Philips Corporation, New York, N.Y.

Filed May 9, 1986, Ser. No. 861,780

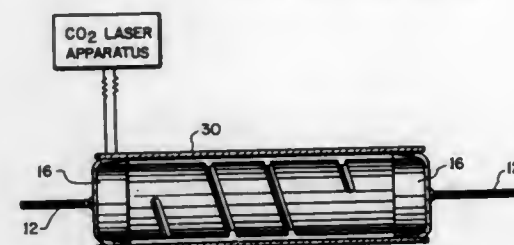
Int. Cl.<sup>4</sup> B23K 26/00

U.S. Cl. 219—121 L

8 Claims

1. A hermetically sealed, glass encapsulated heat sensitive electrical component having metal end caps at opposed ends thereof, comprising:

a glass sleeve sized to surround said component and having circumferential ends abutting said metal end caps;



a hermetic seal between the circumferential ends of said glass sleeve and the side edges of said end caps, said seal being made by a focused laser beam.

4,678,891

## METHOD FOR ADJUSTING AN ELECTRICAL DEVICE BY ELECTRODE TRIMMING

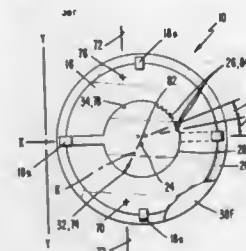
Robert D. Caruso, Derry, N.H., and Joseph A. Messina, North Andover, Mass., assignors to American Telephone and Telegraph Company, AT&T Technologies, Berkeley Heights, N.J.

Filed Oct. 18, 1984, Ser. No. 661,985

Int. Cl.<sup>4</sup> B23K 26/00

U.S. Cl. 219—121 LJ

10 Claims



1. A method of adjusting an electrical device to a desired value, wherein the electrical device includes a circular electrode of a known radius formed on a substrate, which method comprises the steps of:
  - locating the electrical device in a coordinate system;
  - causing relative movement between the electrical device and an electrode edge-engaging means to cause the electrode edge-engaging means to engage spaced first and second edge portions of the circular electrode associated with first and second coordinate positions, respectively;
  - detecting the engagement of the spaced first and second electrode edge portions by the electrode edge-engaging means;
  - measuring the relative distances traveled by the electrical device and the electrode edge-engaging means with respect to the first and second coordinate positions until the electrode edge-engaging means engages the spaced first and second electrode edge portions, respectively, to determine the coordinate positions of the electrode edge portions;
  - utilizing the coordinate positions of the spaced first and second electrode edge portions and the known radius of the circular electrode to determine coordinate positions on the electrode which define at least one arc which extends on the electrode adjacent a peripheral edge of the electrode; and
  - removing material from the circular electrode along the defined arc to change the value of the electrical device.

4,678,892

## COMBINATION CLEANER SAFETY CIRCUIT

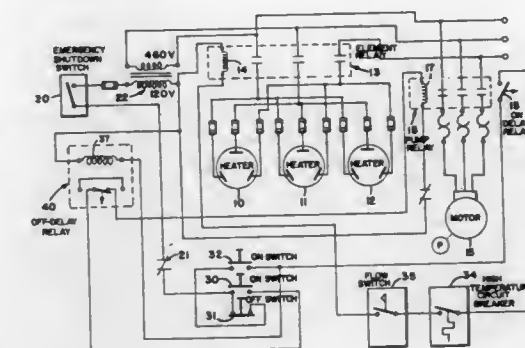
John F. Finger, and Glen A. Lawrenson, both of Beresford, S. Dak., assignors to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed Oct. 7, 1985, Ser. No. 785,341

Int. Cl.<sup>4</sup> H05B 1/02; F24H 1/08

U.S. Cl. 219—272

7 Claims



1. A steam cleaner, comprising:
    - a water heating chamber;
    - electrical heating elements disposed in said heating chamber;
    - an electrical pump for circulating water through said heating chamber;
    - means for selectively supplying electrical energy to said elements and said pump including:
      - a pump relay having a coil;
      - an element relay having a coil;
      - an on-time delay relay operative to close a predetermined time interval after said pump relay closes;
      - an off-time delay relay having a coil and being operative to open a predetermined time interval after its coil is de-energized;
    - a pressure-sensitive circuit breaker located in said cleaner to sense dangerously high pressures;
    - a first on-switch connected on one side to a source of electrical energy through said pressure-sensitive circuit breaker and on the other side to one side of said off-time delay relay, the other side of said off-time delay relay being connected to the coil of said pump relay;
    - a second on-switch having two sides;
    - an off-switch connected on its one side to said one side of said first on-switch and on the other side to one side of said second on-switch, said second on-switch being connected on its other side to one side of said on-time delay relay and to the coil of said off-time delay relay whereby closing said second on-switch energizes said pump and closes said off-time delay relay; and
    - a flow-switch and a heat-sensitive circuit breaker connected in series between said on-time delay relay and the coil of said element relay, said flow switch being mounted in said cleaner to detect and close in response to the flow of water through said water heating chamber, said heat-sensitive circuit breaker mounted proximate said heating elements and operative in response to temperatures in excess of a desired threshold to open;
- whereby said means for selectively supplying electrical energy to said elements and pump prevents said heating elements from being energized prior to the filling of said heating chamber with water, and whereby said pump is maintained in operation for a predetermined time following the de-energizing of the heating elements as accomplished by operating said off-switch.

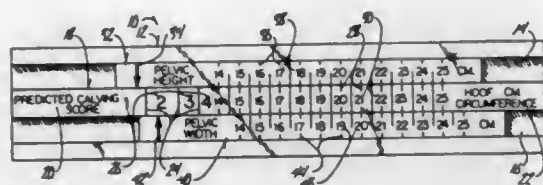
4,678,893

**METHOD AND MEANS FOR DETERMINING THE EASE WITH WHICH A COW MAY GIVE BIRTH TO A CALF**  
Marshall V. Ruble, Kelley, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Apr. 22, 1986, Ser. No. 854,536  
Int. Cl.<sup>4</sup> G06G 1/02

U.S. Cl. 235—70 R

4 Claims



1. A device for calculating a predicted calving score for a cow which is about to give birth to a calf; comprising:
  - a frame means;
  - a first elongated member on said frame means and having a first end, a second end, a front face, an upper edge and a lower edge, said front face of said first elongated member having a predicted calving score scale at said first end thereof and a hoof circumference scale at said second end thereof;
  - a second elongated member having first and second opposite ends and a front face, said front face of said second elongated member having an indicator mark adjacent said first end thereof and having a pelvic height scale thereon;
  - a third elongated member having first and second opposite ends and having a front face, said front face of said third elongated member having an indicator mark adjacent said first end thereof and having a pelvic width scale thereon;
  - all of said pelvic height scale, said pelvic width scale, and said hoof circumference scale being divided into equal units of length;
  - said predicted calving score being divided into units of length which are unequal to each other and which are unequal to said units of length of said pelvic height, pelvic width, and hoof circumference scales;
  - said second elongated member being movably mounted on said frame means adjacent said upper edge of said first elongated member for longitudinal sliding movement with respect thereto to a plurality of positions where selected units of said pelvic height scale are in register with selected units of said hoof circumference scale and said indicator mark of said second elongated member is in register with one of said units of said predicted calving score scale;
  - said third elongated member being movably mounted on said frame means adjacent said lower edges of said first elongated member for longitudinal sliding movement with respect thereto to a plurality of positions where selected units of said pelvic width scale are in register with selected units of said hoof circumference scale and said indicator mark of said third elongated member is in register with one of said units of said predicted calving score scale, whereby said predicted calving score may be calculated by extending a line from said indicator mark of said second elongated member across said predicted calving score scale to said indicator mark of said third elongated member, said average predicted calving score being indicated by the one of said units of said predicted calving score scale located at the midpoint of said line.

4,678,894

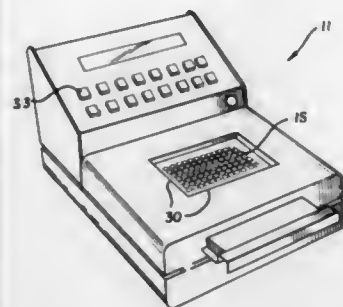
**SAMPLE IDENTIFICATION SYSTEM**

John C. Shafer, Milford, Mass., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 18, 1985, Ser. No. 724,389  
Int. Cl.<sup>4</sup> G06F 15/20

U.S. Cl. 235—375

23 Claims



1. Apparatus for use with a plurality of individual materials comprising:
  - material-identification means for individually identifying each of said plurality of individual materials;
  - receiving means for receiving said plurality of individual materials, said receiving means including a plurality of individual receiving locations in an array, each receiving location for receiving an individual material; location-identification means for identifying the unique location of each of said receiving locations within said array;
  - insertion means for inserting an individual material from said plurality of individual materials into one of said individual receiving locations, said insertion means including a means for depositing said individual material into said individual receiving locations;
  - insertion-detection means for detecting when insertion is occurring in an individual receiving location as identified by said location-identification means; and
  - recording means for recording deposition of said individual material by said insertion means into said individual receiving locations, said recording means recording the identification of said unique location in which said individual material has been deposited as determined by said location identification means and for recording the individual identity of said material as determined by said material identification means.

4,678,895

**SYSTEM FOR MAKING PAYMENTS FOR TRANSACTIONS**

Kazuma Tateisi, Ukyo, and Yoshitsugu Shinohara, Shiga, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 27, 1983, Ser. No. 545,912

Claims priority, application Japan, Oct. 29, 1982, 57-191048  
Int. Cl.<sup>4</sup> G06F 15/30

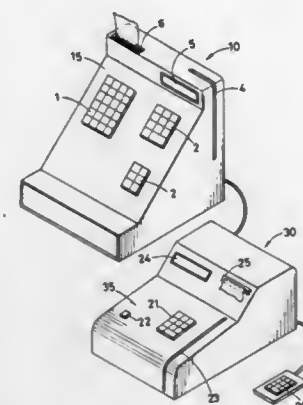
U.S. Cl. 235—379

12 Claims

1. A system for making payments for transactions comprising:
  - (A) an electronic cash register comprising:
    - means for entering data relating at least to the prices of goods,
    - means for calculating the total sum of the prices entered as the sum to be paid, and
    - a first card reader for reading data from bank cards each having recorded therein at least data relating to the account number of the holder of the card, data relating to the bank where the account is opened and data for identifying the holder, and
  - (B) a payment making terminal device connected to the electronic cash register for connection with a control

center provided with a file having stored therein data relating to the accounts of users and stores and with the function of transferring sums payable from the accounts of users to the accounts of stores, the terminal device comprising:

first memory means for storing paired data transferred from the electronic cash register and including the bank card data and sum payable, a second card reader for reading the data recorded in the bank card, means for searching the first memory means for paired data including the card data which has a predetermined



relationship with respect to the data read by the second card reader, second memory means having stored therein data relating to the account numbers of a plurality of stores, means for reading out data from the second memory means relating to the account number of a selected store, and means for transmitting to the control center data relating at least to the account number of the user and the sum payable and data relating to the account number of a selected store read out from the second memory means.

4,678,896

**POINT-OF SALE MECHANISM**

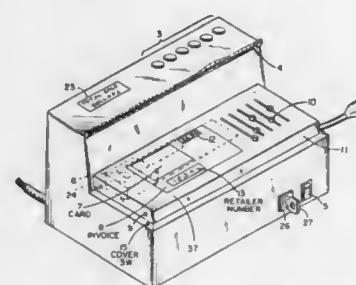
Steven R. Carlson, and Paul R. Carlson, both of 417 2nd Ave., SE., Beach, N. Dak. 58621

Filed Oct. 6, 1986, Ser. No. 915,055

Int. Cl.<sup>4</sup> G06K 5/00

U.S. Cl. 235—380

8 Claims



1. A secured point-of-sale mechanism comprising:
  - (a) a closable two compartment housing having a secured portion including a plurality of signal devices indicating the condition of a plurality of circuits contained in said secured portion of said housing;
  - (b) an unsecured door portion cooperating with said secured portion for completing said two compartment housing;
  - (c) a monetary negotiable instrument section disposed within said secured portion having a first part for retaining a credit card, a second part for retaining an invoice of a point-of-sale transaction, a third part for retaining a check

for a point-of-sale transaction, a fourth part for retaining any monetary negotiable instrument, a fifth part for identifying the payee of said transactions, and a sixth part for establishing the transaction selling price;

- (d) a transaction price index settable to the correct sales amount purchased by a customer;
- (e) a first plurality of switching mechanisms having a first part fixed in said secured portion of said housing and a second part extending into said unsecured portion of said housing to be actuated by said unsecured door portion;
- (f) a second plurality of switching mechanisms having a first part fixed in said secured portion of said housing and a second part extending into said unsecured portion of said housing to be actuated by a combination of monetary negotiable instruments;
- (g) and a locking mechanism connected to said plurality of switching mechanisms and disposed between said secured and unsecured portions of said housing for securing said housing against invasion as long as said plurality of switching mechanisms are actuated.

4,678,897

**PROCESSES AND DEVICES FOR READING MAGNETIC ACCESS CONTROL CARDS OR SIMILAR**

Jacques Lewiner, 5, rue Bory d'Arnes, 92210 Saint Cloud, and Claude Hennion, 18, rue Flatters, 75005 Paris, both of France

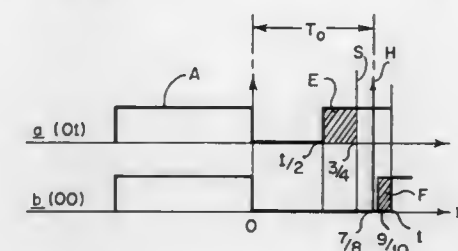
Filed May 1, 1984, Ser. No. 605,810

Claims priority, application France, May 6, 1983, 83 07626

Int. Cl.<sup>4</sup> G06K 7/00

U.S. Cl. 235—436

10 Claims



- I. A process for reading coded sequences of magnetic signals recorded on cards or similar carriers, which sequences are formed of bits of identical duration the reading of which results respectively, for some—called 0 hereafter—by a single change of level of an electric voltage or other given parameter and, for the others—called 1 hereafter—by two changes of level of said parameter regularly spaced apart in time, according to which the real duration of each bit read is measured and the time of identification for reading each bit is adjusted depending on the real duration  $t_0$  of the "preceding bit", characterized in that to time  $T$  which separates the end of reading of this "preceding bit" and said identification time is given:
  - if the preceding bit is a 1, a value  $T_1$  between  $0.6 t_0$  and  $0.75 t_0$ ,
  - and if said preceding bit is a 0, a value  $T_0$  between  $0.75 t_0$  and  $15/16 t_0$ .



4,678,898

# IDENTIFICATION CARD WITH IMPROVED CONCEALED CODING AND AN OPTICAL SWIPE READER HOUSING FOR USE WITH IT

Peter E. Rudland, Broadstone, England, assignor to Time and Data Systems International Limited, Poole, England  
Filed Oct. 4, 1984, Ser. No. 657,670

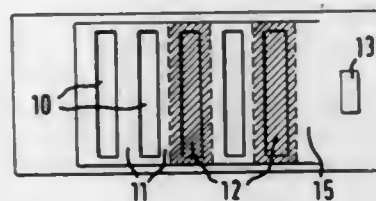
Claims priority, application United Kingdom, Oct. 7, 1983, 8326874

The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> G06K 7/10

U.S. Cl. 235-468

11 Claims



1. A housing for the optoelectronic components required to read a concealed code of a card or badge arranged along a line parallel to one edge of the card, said housing being formed with two internal chambers that accommodate an infra-red light emitting diode and a photosensor respectively, the two chambers being provided with holes disposed on opposite sides of an external slot to facilitate a beam of infra-red radiation passing through the holes and across the slot to read the code embodied in the aforesaid card or badge as the edge of the card is advanced through the slot and at the surface at the bottom of the slot sloping upwards from the periphery of the housing to a point of maximum height mid-way through the slot that is immediately below the point at which the infra-red beam passes across the slot so that the beam reads the code even when the edge of the card is slightly misaligned.

4,678,899

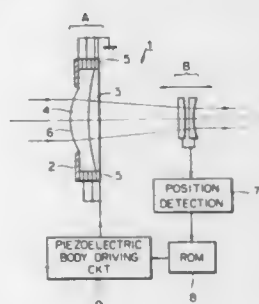
# AFOCAL VARIABLE MAGNIFICATION OPTICAL SYSTEM

Takeshi Baba, Yokohama, and Shigeyuki Suda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Sep. 26, 1985, Ser. No. 780,577

Claims priority, application Japan, Sep. 28, 1984, 59-203612  
Int. Cl.<sup>4</sup> G01J 1/20; G02B 3/00

U.S. Cl. 230-201

13 Claims



1. An afocal variable magnification optical system comprising:  
a first optical system having at least one variable refracting power element which is capable of continuously changing its refracting power;  
a second optical system, the optical axes of said first and second optical systems being common and said second optical system being spaced from said first optical system along the common optical axis; and

said space between said first and second optical systems along the common optical axis being variable.

4,678,900

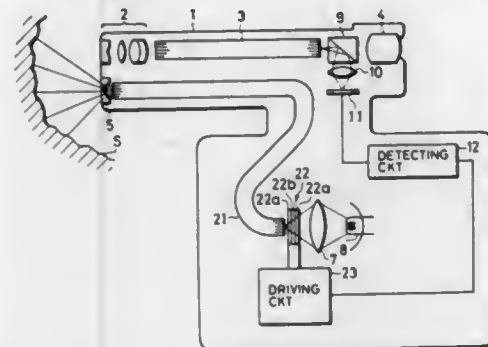
# ILLUMINATING OPTICAL SYSTEM FOR ENDOSCOPES

Kimihiro Nishioka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed Jul. 2, 1985, Ser. No. 751,240

Claims priority, application Japan, Jul. 5, 1984, 59-137983  
Int. Cl.<sup>4</sup> A61B 1/06; G01J 1/32

U.S. Cl. 250-205

14 Claims



1. An illuminating optical system for endoscopes, comprising:  
a light guide with first and second ends, said light guide being comprised of a plurality of optical fibers arranged such that a light input at said first end of said light guide corresponds to a light output at said second end of said light guide;  
a light source disposed opposite said first end of said light guide;  
electro-optic means disposed between said light source and said first end of said light guide, said electro-optic means being divided into a plurality of segments, each of said segments corresponding to at least one of said optical fibers, said segments being controllable as to their light transmissivity;  
detecting means for detecting a brightness distribution of the light output at said second end of said light guide on an object to be observed; and  
driving means, responsive to said detecting means, for controlling said electro-optic means such that the quantity of light transmitted by a segment to said corresponding optical fibers is reduced when said detecting means detects that the quantity of light transmitted through said corresponding optical fibers is greater than a predetermined value.

4,678,901

# OPTICAL SENSOR FOR MONITORING CIGARETTE GROUPS

Heinz Focke, Verden, and Hugo Mutschall, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,469

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407168

Int. Cl.<sup>4</sup> H01J 40/14

U.S. Cl. 250-223 R

8 Claims

1. A device for monitoring the completeness of groups of cylindrical elongated cigarettes being conveyed along a conveying path in a direction parallel to the longitudinal dimension of the cigarettes, each group consisting of at least an upper layer and a lower layer of cigarettes, the upper layer being complete when it has a predetermined number of cigarettes therein arranged side-by-side with their longitudinal axes parallel to one another, said device comprising:  
optical scanning means, including a plurality of light transmitters and light receivers, for optically scanning the

4,678,903

# SELF ALIGNING FIBER OPTIC MICROBEND SENSOR

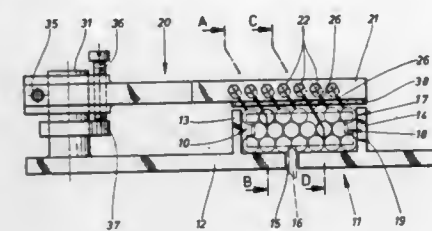
Marek T. Wlodarczyk, Sterling Heights; Mark K. Krage, Royal Oak, and Michael J. O'Rourke, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 27, 1986, Ser. No. 822,340

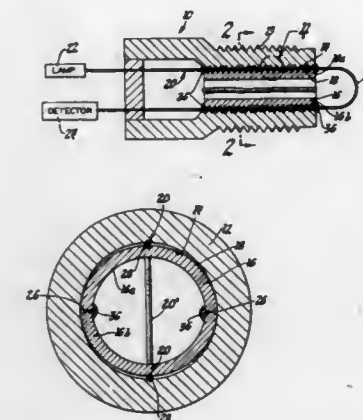
Int. Cl.<sup>4</sup> G01L 1/24

U.S. Cl. 250-227

5 Claims



said receivers being positioned to receive reflected light beams respectively reflected from the cylindrical surfaces of corresponding cigarettes in the upper layers, so that the lack of receipt of a reflected light beam by any one of said receivers causes to be triggered a signal indicative of an incomplete upper layer of cigarettes.



1. A self aligning microbend sensor comprising a tubular housing having internal threads, an expandable insert with external threads loosely threaded into the housing with sufficient tolerance to allow expansion of the insert in response to a parameter being measured, and a fiber optic element between the housing and the insert and extending transverse to the threads, such that upon expansion of the insert the fiber optic element experiences microbending due to deformation by the threads.

4,678,902

# FIBER OPTIC TRANSDUCERS WITH IMPROVED SENSITIVITY

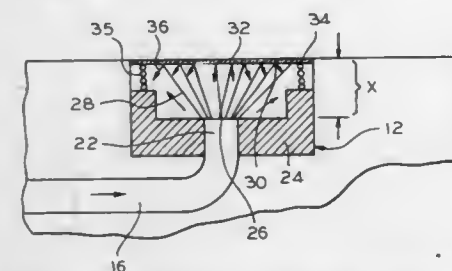
Alfred R. Perlin, Highland Park, Ill., assignor to Metatech Corporation, Northbrook, Ill.

Filed Apr. 30, 1985, Ser. No. 729,155

Int. Cl.<sup>4</sup> H01J 5/16

U.S. Cl. 250-227

7 Claims



1. A fiber optic transducer comprising a single optical fiber and a movable member having a reflective surface thereon, said single optical fiber providing means for transmitting light in a first direction toward a first end of said fiber where the transmitted light is projected out of the fiber as a cone of light which impacts said reflective surface of said movable member and is reflected off of said surface as a modulated cone of light directed toward said first end of said fiber at which a portion of said modulated reflected cone of light reenters the fiber and is transmitted through said fiber in a second direction toward a second end thereof and means in the structure of the fiber for producing said cone of light comprising a bend in the fiber adjacent said first end thereof whereby an expanded cone of light which is asymmetric to the axis of the fiber is projected out of the fiber and whereby sensitivity to movement of said reflective surface of said movable member is enhanced.

4,678,904

# OPTICAL MEASURING DEVICE USING A SPECTRAL MODULATION SENSOR HAVING AN OPTICALLY RESONANT STRUCTURE

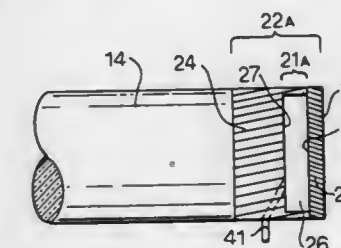
Elric W. Saaski, Bothell, and James C. Hartl, Woodinville, both of Wash., assignors to Technology Dynamics, Inc., Woodinville, Wash.

Filed Jul. 6, 1984, Ser. No. 628,813

Int. Cl.<sup>4</sup> H01J 5/16

U.S. Cl. 250-227

50 Claims



1. An optical measuring device for measuring a range of values for a sensed physical parameter, comprising:  
a source of input measuring light of at least two wavelengths;  
an optically resonant structure having an optically sensitive physical characteristic which changes as a function of said sensed physical parameter, said optically resonant structure producing spectrally modulated output measuring light by spectrally modulating said input measuring light as a function of said changes of said optically sensitive physical characteristic by means of corresponding micro-

shifts produced by said changes on at least one operating segment on an output curve, said output curve representing at least one of the reflectivity and transmissivity curves of said optically resonant structure;

said input measuring light, said optically resonant structure and said at least one operating segment being selected such that: (1) said at least two wavelengths of said input measuring light fall substantially within said at least one operating segment which, over said range of values for said sensed physical parameter, is less than about one resonance cycle in length and is microshifted less than about one resonance cycle, and such that (2) said spectrally modulated output measuring light of said optically resonant structure bears a unique one-to-one relation to said sensed physical parameter over said range of values; detector means for deriving two electrical signals corresponding to any two different wavelength portions of said spectrally modulated output measuring light and for taking the ratio of said two electrical signals to provide an output measuring electrical signal which is a function of said sensed physical parameter; and

light transmission means for conveying said input measuring light from said source to said optically resonant structure and for conveying said spectrally modulated output measuring light from said optically resonant structure to said detector means.

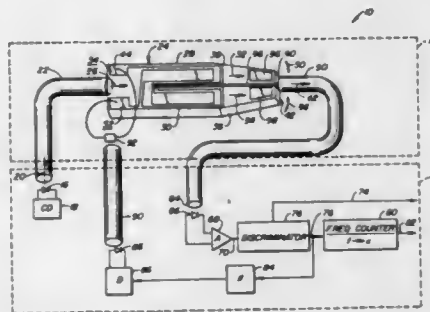
#### 4,678,905 OPTICAL SENSORS FOR DETECTING PHYSICAL PARAMETERS UTILIZING VIBRATING PIEZOELECTRIC ELEMENTS

Stephen R. Phillips, Walnut Creek, Calif., assignor to Luxtron Corporation, Mountain View, Calif.

Filed May 18, 1984, Ser. No. 612,060  
Int. Cl.<sup>4</sup> G01D 5/34; G01L 9/00

U.S. Cl. 250—227

61 Claims



1. A transducer apparatus for detecting a physical parameter comprising:
  - a piezoelectric member which transmits light; means for supplying light to the member, so that the light supplied is transmitted through the member;
  - means for vibrating the member in a direction transverse to the light transmitted in the member so that the vibrations of the member is modulated by the physical parameter, and so that said modulations of the vibrations also modulate the intensity of the light transmitted by the member; and
  - means for detecting modulations of the intensity of the light transmitted by the member to detect said physical parameter.

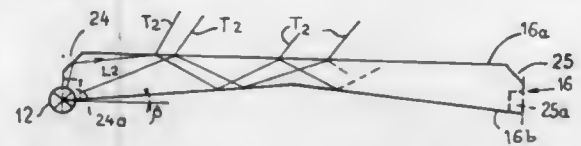
#### 4,678,906 DEVICE FOR TRANSMITTING THROUGH AN OPTICAL COUPLING DATA ISSUING FROM A STEERING WHEEL TO AN ELEMENT MOUNTED ON A VEHICLE

Alain Rudi, Esert, and Maurice Bertot, Montbellard, both of France, assignors to Aciars et Outillage Peugeot, Audincourt, France

Filed Nov. 22, 1985, Ser. No. 800,871  
Claims priority, application France, Nov. 27, 1984, 84 18064  
Int. Cl.<sup>4</sup> H01J 5/16

U.S. Cl. 250—227

5 Claims



1. A device, in combination with a plurality of control elements which are mounted on a steering wheel of a motor vehicle and which emit data and a system recognizing said data and mounted on the vehicle, for transmitting said data from said control elements to said system, said device comprising a plurality of light sources mounted on the steering wheel and respectively connected to said control elements, annular means coaxial with the steering wheel, photosensitive detectors mounted on the vehicle and corresponding to said light sources, said light sources being disposed in such manner as to cooperate with said annular means so as to transmit light to said corresponding detectors irrespective of the position of each photosensitive detector relative to the light source with which it is coupled, said photosensitive detectors being adapted to actuate loads corresponding to the actuated ones of said control elements, each of the light transmitting annular means comprising a planar side disposed in confronting relation to the corresponding photosensitive detector and in which side is formed at least one notch, and a side for reflecting the light propagated in said annular means in which reflecting side is provided at least one recess in which at least one light source is disposed, and wherein said rereflecting side corresponds in projection, when viewed from a side, to two straight lines defining a wide V-shaped recess.

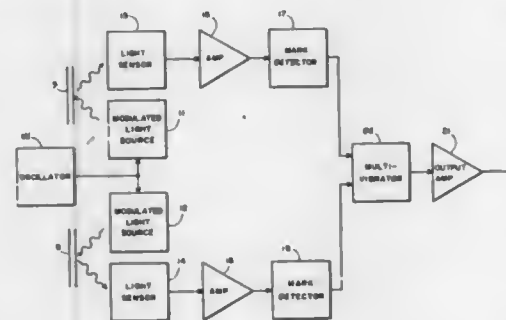
#### 4,678,907 OPTICAL SCANNER AND SENSOR FOR MONITORING POWER CONSUMPTION

Jerzy A. Lipski, Coquitlam, and Ian R. Bardsley, Port Coquitlam, both of Canada, assignors to Microtel Limited, Burnaby, Canada

Filed Jun. 21, 1984, Ser. No. 622,897  
Int. Cl.<sup>4</sup> G01D 5/34

U.S. Cl. 250—231 SE

12 Claims



1. An optical scanner/pulse initiator for electric power meters of a type having a rotor that may be marked with a non-reflective coating, said scanner comprising:
  - first and second light source means respectively having first and second light beams capable of being modulated ON

and OFF, said first and second beams positioned to reflect off of spatially separated points on said rotor such that when said rotor rotates said non-reflective mark will traverse said spatially separated points;

oscillator means for modulating said first and second light source means ON and OFF at a rate R and with an OFF period of P;

first light sensor means positioned to receive said first light beam after being reflected by said rotor, said first light sensor means providing an indication when the period of time said first beam is OFF is greater than P;

second light sensor means positioned to receive said second light beam after being reflected by said rotor, said second light sensor means providing an indication when the period of time said second beam is OFF is greater than P;

output means responsive to said first and second light sensor means and providing an output signal upon receiving said indication from each of said first and second light sensor means.

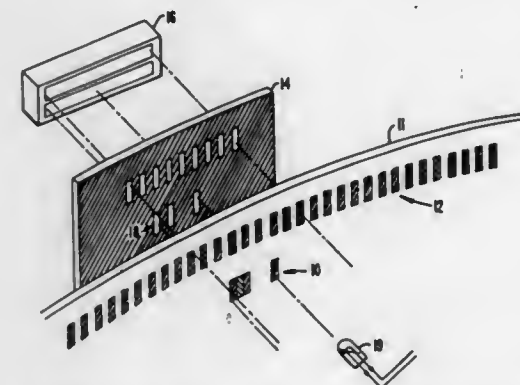
#### 4,678,908 ZERO REFERENCE GENERATING METHOD AND APPARATUS FOR OPTICAL ENCODERS

Dale LaPlante, Goleta, Calif., assignor to BEI Electronics, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 517,322, Jul. 25, 1983, Pat. No. 4,602,155. This application Dec. 5, 1984, Ser. No. 678,499  
Int. Cl.<sup>4</sup> G01D 5/34

U.S. Cl. 250—231 SE

14 Claims



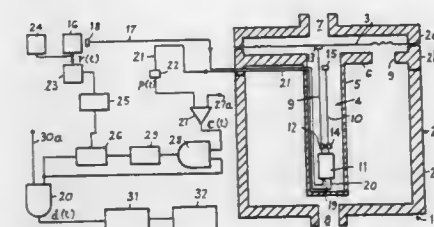
1. An encoder for providing positional information about a moveable member comprising
  - code member means couplable to the moveable member for movement with the moveable member;
  - reference member means positioned to be stationary relative to the code member;
  - an index sequence positioned at a single zero position on the code member means and on the reference member means comprising a plurality of index patterns, wherein each of the plurality of index patterns comprises a mask component positioned on the reference member means and a corresponding code disk component positioned on the code member means, and wherein for each of the plurality of index patterns the mask component includes a plurality of unit width indicia and the code disk component includes a different plurality of unit width indicia, and further wherein the mask components of each of the plurality of index patterns are separated from one another, and the code disk component of each of the plurality of index patterns are separated from one another, by predetermined spacings; and
  - means for detecting the degree of registration between the mask and code disk components of the index sequence.

4,678,909  
OPTICAL PRESSURE SENSING APPARATUS  
David A. Jackson, Canterbury, England; Michael Corke, Wheaton, Ill.; Alan D. Kersey, Washington, D.C., and Julian D. C. Jones, Sittingbourne, England, assignors to Kent Scientific and Industrial Projects Limited, Canterbury, England  
PCT No. PCT/GB85/00136, § 371 Date Nov. 25, 1985, § 102(e) Date Nov. 25, 1985, PCT Pub. No. WO85/04473, PCT Pub. Date Oct. 10, 1985

PCT Filed Apr. 1, 1985, Ser. No. 810,324  
Claims priority, application United Kingdom, Mar. 31, 1984, 8408383

Int. Cl.<sup>4</sup> G01B 11/02  
U.S. Cl. 250—231 P

10 Claims



1. Optical pressure sensing apparatus comprising in combination:
  - a resilient pressure responsive element,
  - means mounting said pressure responsive element for displacement in response to differential pressure applied to said pressure responsive element,
  - optical fibre interferometer means arranged to sense pressure induced displacement of said pressure responsive element, said interferometer means including an optical fibre signal arm, an optical fibre reference arm, optical input means for launching light into said signal and reference arms to propagate light beams therein, and output means for combining said light beams propagated in said signal and reference arms to produce an interference signal at said output means,
  - said signal and reference arms being mounted to respond similarly to physical perturbations other than the pressure measurand,
  - means coupling said signal arm to said pressure responsive element so that the length of the optical path defined by said signal arm changes relatively to that of said reference arm in response to said pressure induced displacement of said pressure responsive element,
  - a light source coupled to said input means of said interferometer device, and
  - processing means coupled to said output means for monitoring said interference signal at said output means to determine the optical phase shift between said light beams propagated in said signal and reference arms and produce an output signal corresponding to said differential pressure.

4,678,910  
REFERENCE POSITION-DETECTING DEVICE FOR  
PHOTOELECTRIC ENCODER  
Masato Hara, and Atsumi Kaneko, both of Tokyo, Japan, assignors to Asahi Optical Co., Ltd., Tokyo, Japan  
Filed Mar. 8, 1985, Ser. No. 709,590

Claims priority, application Japan, Apr. 27, 1984, 59-87434  
Int. Cl.<sup>4</sup> G01D 5/34

U.S. Cl. 250—237 G

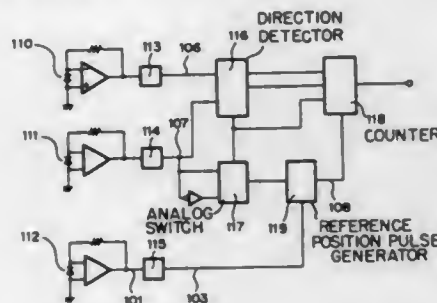
3 Claims

1. A reference position-detecting device for use with a photoelectric, incremental encoder including a main scale having a first pattern of open and closed regions alternately arranged at regular intervals with the regions having the same widths; an index scale having a second pattern of open and closed regions; first light emitting and receiving means for producing a sinu-



soidal signal from said first and second patterns when said scales move relative to each other; said reference position-detecting device comprising:

- a first random pattern of open and closed regions on said main scale and associated with said first regular pattern;
- a second random pattern of open and closed regions on said index scale similar to said first random pattern and associated with said second regular pattern;
- second light emitting and receiving means for producing a first electric signal when said random patterns are generally in a reference position;
- first pulse generating means responsive to said first electrical signal for producing a first pulse electrical signal;
- second pulse generating means responsive to said sinusoidal signal for producing a second pulse electrical signal having leading and trailing edges;

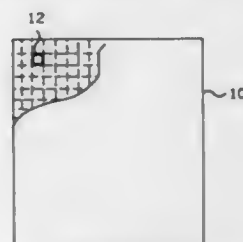


third pulse generating means responsive to said sinusoidal signal for producing a third pulse electrical signal having leading and trailing edges, said second and third pulse electrical signals being 90° out of phase with each other; direction detection means coupled to said second and third pulse electrical signals for determining the direction of movement of said main and index scales relative to each other and for producing an output signal; and fourth pulse generating means responsive to said first, second and third pulse electrical signals and said direction detecting means for producing a fourth pulse electrical signal corresponding to an edge of said second and third pulse electrical signals when said first pulse electrical signal is present, thereby indicating that said main and index scales are substantially in said reference position.

**4,678,911**  
**METHOD OF COLLECTING AND PROCESSING SPECTRAL DATA FOR THE EARTH'S SURFACE**  
Kenneth R. Sundberg, and Keith H. Patton, both of Bartlesville, Okla., assignors to Phillips Petroleum, Bartlesville, Okla.  
Filed Jan. 10, 1985, Ser. No. 690,424  
Int. Cl. G01V 5/00

U.S. Cl. 250-253

8 Claims



1. A method of collecting and processing spectral data for a section of the earth's surface, the section being divided into a plurality of subsections hereinafter denoted as pixels, said method comprising the steps:

- (a) detecting the intensity of electromagnetic radiation in a first wavelength range reflected from each pixel such that an intensity is detected for each pixel, the first wavelength range being in a band 4 waveband of from about 500 nm to about 600 nm, the intensity as detected for each pixel in

- this step being denoted as a band 4 intensity value, and wherein there exists a mean band 4 intensity value;
- (b) detecting the intensity of electromagnetic radiation in a second wavelength range reflected from each pixel such that an intensity is detected for each pixel, the second wavelength range being in a band 5 waveband of from about 600 nm to about 700 nm, the intensity as detected for each pixel in this step being denoted as a band 5 intensity value, and wherein there exists a mean band 5 intensity value;
- (c) computing for each pixel the value of a function  $F_4(x)$  corresponding to a band 4 intensity value as detected in step (a), the function  $F_4(x)$  being a generally monotonic function of intensity, intensity being represented by variable  $x$ , wherein for at least one range of band 4 intensity values which includes the mean band 4 intensity value,  $F_4(x)$  changes in value in a first direction as the band 4 intensity increases in value, said change in value in the first direction being either an increasing or decreasing change in value;
- (d) computing for each pixel the value of a function  $F_5(x)$  corresponding to a band 5 intensity value as detected in step (b), the function  $F_5(x)$  being a generally monotonic function of intensity  $x$ , wherein for at least one range of band 5 intensity values which includes the mean band 5 intensity value,  $F_5(x)$  changes in value in said first direction;
- (e) computing for each pixel the value of an alteration index  $H$ , each pixel having corresponding  $F_4(x)$  and  $F_5(x)$  values as calculated in steps (c) and (d), where

$$H(x) = K[F_4(x) - F_5(x)]$$

and where  $K$  is constant.

**4,678,912**  
**APPARATUS FOR POSITIONING AN EXTERNAL RADIOACTIVE STANDARD IN A LIQUID SCINTILLATION COUNTER**

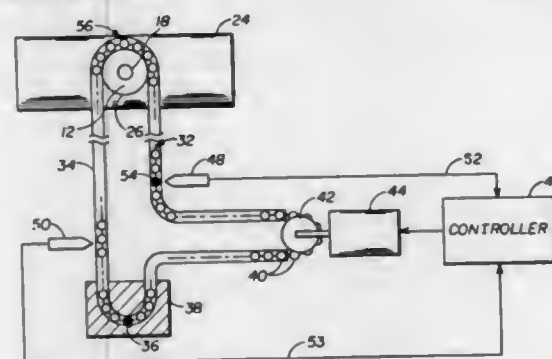
Donald L. Horrocks, Placentia, and Richard S. Kampf, Costa Mesa, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 483,203, Apr. 11, 1983, abandoned, which is a continuation of Ser. No. 277,791, Jan. 29, 1981, abandoned, which is a continuation of Ser. No. 166,225, Jul. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 166,223, Jul. 7, 1980, abandoned. This application Sep. 28, 1983, Ser. No. 537,311

Int. Cl. G01T 1/00

U.S. Cl. 250-328

12 Claims



1. In a liquid scintillation counter having a counting chamber for receiving a sample containing a scintillator substance and a sample of a radioactive substance to be counted, improved apparatus for positioning a radioactive source in an operating location to irradiate the sample in the counting chamber comprising, in combination:

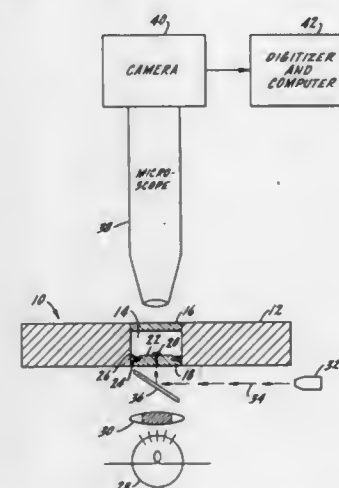
- (1) a continuous bidirectionally flexible conveyor forming a

- closed loop for conveying the radioactive source through on operating location and a storage location;
- (2) means supporting the radioactive source at a position along the flexible conveyor for conveyance thereby;
- (3) guide means for supporting the conveyor and for guiding conveyor movement along a selected path, said path traversing at spaced positions the storage location for the radioactive source remote from the counting chamber and the operating location for the radioactive source near to the counting chamber; and
- (4) drive means coupled to said continuous flexible conveyor to draw the conveyor around said path for conveying the radioactive source through said spaced storage and operating locations.

**4,678,913**  
**METHOD AND APPARATUS FOR ANALYZING THE NATURE OF A SAMPLE**  
Jack G. Dodd, Jr., and Jeffrey J. Dodd, both of Hamilton, N.Y., assignors to Walter C. McCrone Associates, Inc., Chicago, Ill.  
Filed Jan. 6, 1986, Ser. No. 816,262  
Int. Cl. G01J 1/00

U.S. Cl. 250-341

20 Claims



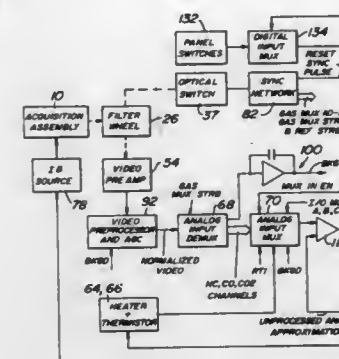
1. An apparatus for analyzing the absorption spectra of a sample, comprising

- a. a container for retaining the sample, said container including
  - i. a carrier,
  - ii. a sealed, hollow sample enclosure formed in the carrier,
  - iii. means forming a transparent path through said enclosure, said path being transparent to both infrared and visible radiation,
  - iv. a working fluid disposed within said enclosure, said fluid being transparent to infrared radiation,
- b. a source of tunable infrared radiation oriented to pass infrared radiation through said enclosure along said path,
- c. a visible light source oriented to pass visible radiation through said enclosure, and
- d. means for capturing and storing an image of a sample within said enclosure.

**4,678,914**  
**DIGITAL IR GAS ANALYZER**  
Richard C. Melrose, and Lionel D. McIntosh, both of Huntsville, Ala., assignors to Environmental Tectonics Corporation, Southampton, Pa.  
Filed Apr. 30, 1984, Ser. No. 605,702  
Int. Cl. G01J 1/00

U.S. Cl. 250-343

6 Claims



1. Digital IR gas analyzer, comprising:
  - a sample cell having an inlet port and an outlet port for conducting a gas sample therethrough,
  - an IR radiation source,
  - means for producing a series of IR radiation samples of the constituents of said gas sample,
  - means for generating a fixed-amplitude non-background-compensated reference pulse,
  - means for producing a series of non-background-compensated normalized video pulses corresponding to said constituent radiation samples, said video pulse being normalized with respect to a precision reference voltage and the amplitude of said reference IR pulse,
  - means for converting said normalized video pulse into digital signals,
  - means for digitally processing said digital signals, including means for compensating said digital signals for background IR radiation,
  - means for converting the processed digital signals to analog signals, and
  - means for driving one or more analog meters in response to the analog signals.

**4,678,915**  
**SYSTEM AND PROCESS FOR MEASURING AND CORRECTING THE VALUES OF A PARAMETER OF A SHEET MATERIAL**

John Dahlquist, Palo Alto; John Goss, San Jose, and Gunnar Wennerberg, Cupertino, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 379,377, May 17, 1982, abandoned.

This application Mar. 14, 1985, Ser. No. 711,880

Int. Cl. G01N 27/72; G01R 33/00; G01F 23/00

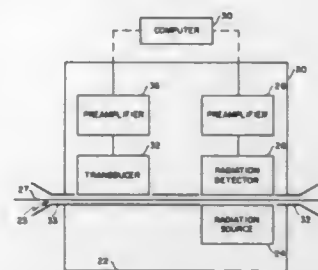
U.S. Cl. 250-358.1

17 Claims

7. A system for measuring the values of a parameter of a sheet of material at various points by a sensor system including head means and for correcting the measured values of the parameter to account for variability of the separation of parts of the head means without measuring the distance from the sensor system to the sheet, the system comprising:

- (a) head means having a first part disposed on a first side of the sheet and a second part disposed on a second side of the sheet;
- (b) distance sensing means coupled to the head means to measure the distance between the two parts of the head means by transmitting a signal through the sheet;

(c) sensor means coupled to the head means for measuring the values of a parameter of the sheet but not the distance between said sensor means and the sheet to produce uncorrected, measured values;



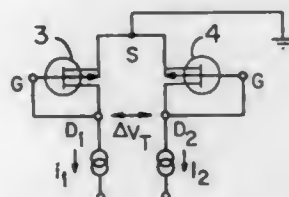
(d) parameter determination means coupled to receive signals from the sensor means and from the distance sensing means for correcting the uncorrected, measured values according to the distance between said two parts of said head means but not according to the distance between the head means and the sheet.

#### 4,678,916 DOSIMETER

Ian Thomson, Nepean, Canada, assignor to Thomson & Nielsen Electronics Ltd., Kanata, Canada  
Filed Feb. 10, 1986, Ser. No. 827,509  
Claims priority, application Canada, Sep. 18, 1985, 491,034  
Int. Cl.<sup>4</sup> G01T 1/24

U.S. Cl. 250—370

24 Claims



1. A radiation dosimeter comprising a pair of silicon insulated gate field effect transistors integrated into the same substrate, each having a gate, a source, and a drain, means for measuring a first differential threshold voltage between the transistors, means for forward biasing the gate of the first transistor and inhibiting operation of the second, while allowing both to be subjected to ionizing radiation, means for measuring a second differential threshold voltage between the transistors following said irradiation, the difference between said differential threshold voltages being indicative of the radiation dosage.

#### 4,678,917 INSTANTANEOUS READING MULTICHANNEL POLYCHROMATIC SPECTROPHOTOMETER METHOD AND APPARATUS

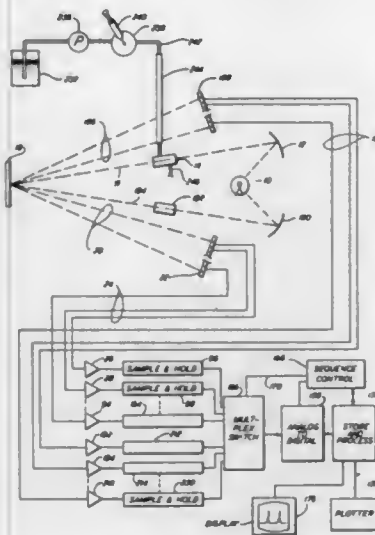
Charles C. Helms, Trumbull; Ralph D. Conlon, Wilton, and Edward B. Delany, Ridgefield, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.  
Filed Feb. 19, 1985, Ser. No. 703,260  
Int. Cl.<sup>4</sup> G01J 3/36

U.S. Cl. 250—373

22 Claims

5. An improved wide-spectrum spectrophotometer which is operable for substantially instantaneous polychromatic detection and storage of a plurality of spectral segments of radiation to be analyzed comprising a liquid sample cell for containing a sample to be analyzed in solution, a radiation source means for directing a beam of radiation into said sample cell, a diffraction means positioned and arranged to receive illumination emanat-

ing from said sample cell as a result of said beam of radiation from said radiation source means, said diffraction means being operable to diffract the emanated radiation into a polychromatic spatially divergent beam, a linear array of photodetectors positioned and arranged to intercept said polychromatic beam with different spectral segments of said beam being intercepted by different photodetectors of said array, a separate signal channel means for each of said photodetectors, each of said signal channel means including a sample-and-hold cir-



cuit connected to receive and store signals from each photodetector of said array, control means operable to substantially simultaneously actuate said separate signal channel means and said sample-and-hold circuits for all of said photodetectors, analog to digital conversion means connected to said sample-and-hold circuits and operable in response to said control means for converting the held signals to digital form, and digital data storage and processing means connected to receive and store and process the converted stored signals so as to provide spectra analysis information.

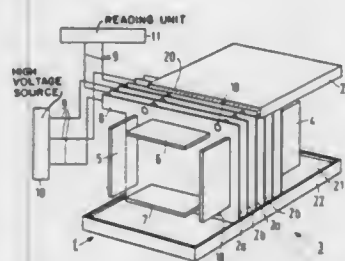
#### 4,678,918 INTEGRATED RADIATION DETECTOR

Joannes L. G. Hermens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
Filed Sep. 16, 1985, Ser. No. 776,329  
Claims priority, application Netherlands, Sep. 26, 1984, 8402927

Int. Cl.<sup>4</sup> G01T 1/185

U.S. Cl. 250—374

18 Claims



1. An integrated radiation detector having a detection space which is divided into detector chambers by a number of electrode plates mounted at a mutual distance, characterized in that the electrode plates comprise slots in which electrically insulating gas-tight strips extending through all electrode plates are provided, one of said strips constituting an input window and the remaining strips constituting walls of the detection space,

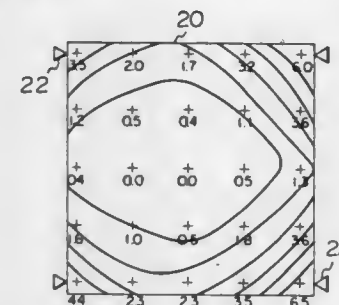
said strips, together with gas-tight connections between each pair of adjacent electrode plates and the facing edges of the strips, enclosing the detection space.

#### 4,678,919 ELECTRON BEAM EXPOSURE METHOD AND APPARATUS

Kenji Sugishima, Kawasaki, and Kenji Nakagawa, Isehara, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan  
Continuation of Ser. No. 574,726, Jan. 27, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 883,425  
Claims priority, application Japan, Jan. 31, 1983, 58-014086  
Int. Cl.<sup>4</sup> H01J 37/24

U.S. Cl. 250—491.1

10 Claims



1. An electron beam exposure method for forming a pattern on a workpiece mounted on supporting points, comprising the steps of:

- obtaining level data of a surface of said workpiece when said workpiece is subjected to an elastic deformation;
- applying correction data to a predetermined pattern data according to which said pattern is formed; and
- exposing said elastically deformed workpiece with an electron beam in accordance with the corrected pattern data, so that said pattern is formed on said workpiece when said workpiece is not deformed.

#### 4,678,920 MACHINE VISION METHOD AND APPARATUS

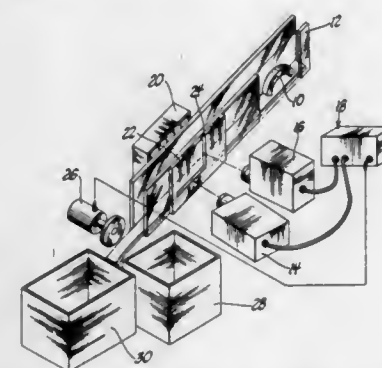
Rene M. Iadipalo, Southfield, and Richard J. Tkaczyk, Plymouth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 17, 1985, Ser. No. 745,079

Int. Cl.<sup>4</sup> G01N 21/86

U.S. Cl. 250—560

8 Claims



1. Machine vision apparatus for acquiring the image of a moving object comprising:  
means for moving the object along a predetermined path, a first linear sensor arranged to track the progress of the object along the path and for generating signals representing object position,  
a second linear sensor arranged to sense portions of the

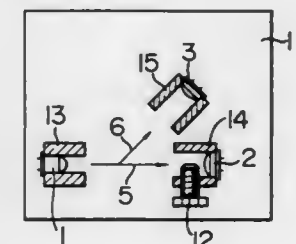
object in a plane transverse of the path for generating streams of data representing line images in the plane, and synchronizing means coupled to the sensors and responsive to the signals for outputting streams of data from the second sensor at predetermined object positions whereby as the object advances through the plane the second sensor obtains many line images which cumulatively represent an image of the object.

#### 4,678,921 PHOTO-ELECTRIC SMOKE DETECTOR WITH LIGHT SHIELDING ELECTRODE

Takehiro Nakamura, Nishio; Susumu Sato, Okazaki; Tadashi Hattori, Okazaki; Teiichi Nabeta, Okazaki, and Minoru Kato, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of Japan  
Filed Feb. 11, 1985, Ser. No. 700,383  
Claims priority, application Japan, Feb. 13, 1984, 59-25357  
Int. Cl.<sup>4</sup> G01N 15/06

U.S. Cl. 250—574

8 Claims



4. A photoelectric smoke detector comprising:  
a chamber defining a flow path for smoke;  
light emitting means provided in said chamber;  
first light receiving means arranged at a predetermined angle relative to said light emitting means, for receiving only a scattered light;  
second light receiving means arranged in line with said light emitting means, for receiving light directly therefrom;  
regulation means for regulating an amount of light incident on said second light receiving means; and  
said second light receiving means having an electrode acting as a light shielding member for shielding only a part of a light receiving surface thereof, said second light receiving means having a light shielded area, which is larger than a light shielded area of said first light receiving means, and having a light sensitivity of which is smaller than a light sensitivity of said first light receiving means.

#### 4,678,922 AIR MOTOR HAVING INTEGRAL GENERATOR

Jon J. Leininger, P.O. Box 12, DePere, Wis. 54115  
Filed Dec. 5, 1985, Ser. No. 792,821  
Int. Cl.<sup>4</sup> F03B 13/00

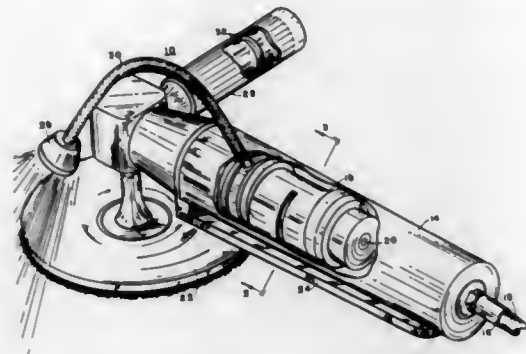
U.S. Cl. 290—54

8 Claims

1. An improved air tool, comprising:  
A. a tool housing having a closed outer wall;  
B. a motor for powering the tool positioned within said housing, including:  
1. a rotor assembly comprising:  
a. a shaft mounted for rotation within said housing; and  
b. a rotor body affixed to said shaft; and  
c. a plurality of vanes connected to said rotor body;  
2. means integrally formed in said housing for allowing compressed air to enter and for directing said compressed air against said vanes thereby causing said rotor assembly to rotate by the force of compressed air against said vanes;  
C. generator means comprising a stator positioned within said housing coaxially with said rotor assembly, said rotor



assembly having magnetic means for cooperating with said blades will decrease the inclination of said strips and cause said stator and thereby generating electrical energy for rotation of each blade about its longitudinal axis relative to said



powering an electrical appliance connected to the tool while said rotor assembly is rotated by said compressed air.

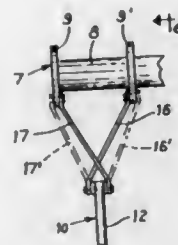
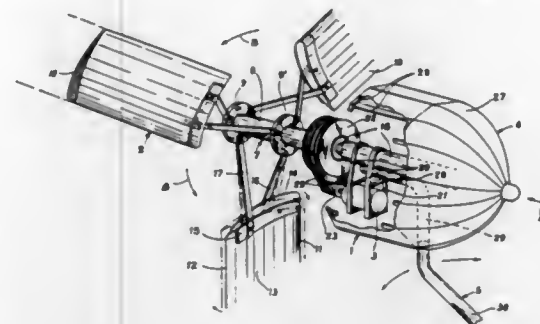
#### 4,678,923 WINDMILL

Fernand Trepanier, 680 - 30th Street, St. Georges Ouest, Beauce County, Quebec, Canada G5Y 4H4  
Filed Nov. 13, 1985, Ser. No. 841,479  
Int. Cl.<sup>4</sup> F03D 7/00

U.S. Cl. 290-55

5 Claims

1. In a windmill, a variable pitch air-screw comprising a hub, a generally horizontally-supported stationary shaft on which said hub is mounted for free rotation, a resilient support for connecting said shaft to a ground-standing supporting tower; at least two rotatable blades, each blade radially extending from said hub and defining a root radially spaced from said hub; one and another collar fixedly mounted axially spacedly on said hub on respective opposite sides of the rotational plane of said blades; each blade having an air-foil profile with a thicker leading edge; a thinner trailing edge; a main concave surface and an opposite convex surface; first and second resilient strips for each blade, the first strip rigidly connected at one end to said one collar and at its other end to the convex surface of one blade root proximate the blade leading edge, the second strip rigidly connected at one end to said another collar and at its other end to the concave surface of the same one blade root proximate its trailing edge; said strips being oppositely inclined to each other and each crossing the rotational plane of said blades; whereby increase of the centrifugal force exerted on



hub, to thereby increase the pitch of the blades with increase of the rotational speed of said air-screw.

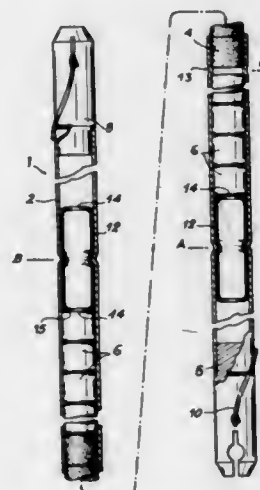
#### 4,678,924 METHOD OF SETTING A STOP MEANS INSIDE OF A TUBULAR ELEMENT

Pierre Lorient, Venelles; Michel Rendu; Jean Rousseau, both of Aix en Provence, and Alain Samoel, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 418,180, Sep. 14, 1982, abandoned. This application Jul. 3, 1985, Ser. No. 751,431  
Claims priority, application France, Sep. 30, 1981, 81 18414  
Int. Cl.<sup>4</sup> G21C 21/00

U.S. Cl. 29-407

2 Claims



1. Method of affixing a stop means to the inside of a nuclear reactor fuel rod can having a length, said method being characterized in that:

the said stop means is a hollow cylinder of deformable but undeformed walls;  
the said nuclear reactor fuel rod can has a deformable wall, but it is likewise undeformed;  
and in that it includes the following successive steps:  
providing a reference mark or level at a certain point along the length of the can;  
introduction of said undeformed stop means into the nuclear reactor fuel rod can;  
positioning a reference surface of said undeformed stop means inside of the nuclear reactor fuel rod can between an upper and a lower predetermined positioning limit, or at least level with said upper positioning limit, each of said upper and lower predetermined positioning limit being located at a predetermined distance, respectively, from said reference mark or level; and  
performing a simultaneous operation of setting the nuclear reactor fuel rod can and the stop means at a position located at a predetermined distance from said predetermined mark or level along the length of the said nuclear reactor fuel rod can;  
the stop means having a length at least equal to the distance between the said upper and lower predetermined limits.

#### 4,678,925 DASHBOARD LIGHTING ADJUSTMENT FOR A MOTOR VEHICLE

Diethelm Grocke, Schnieglinger Str. 132, Nuremberg 90, Fed. Rep. of Germany 8500

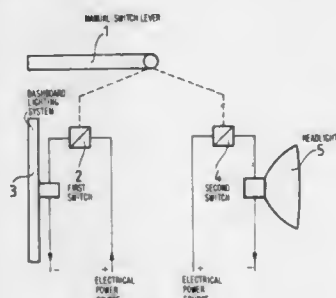
Filed Jan. 13, 1986, Ser. No. 818,330

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1985, 3500918

Int. Cl.<sup>4</sup> H02G 3/00

U.S. Cl. 307-10 LS

2 Claims



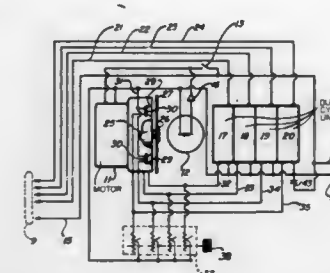
1. An illuminating system for a motor vehicle, comprising: headlamps which are selectively actuatable to selectively operate on low beam and high beam illumination;  
a dashboard illumination means which is adjustable between a first stage which produces relatively dim dashboard lighting, and a second stage which produces relatively bright dashboard illumination;  
a first switch means for switching said headlamps between said low beam and said high beam illumination;  
a second switch means for switching said dashboard illumination means between said first stage which produces relatively dim lighting and said second stage which produces relatively bright lighting;  
a manually operated control means for operating said first switch means and said second switch means in a single operation of said manually operated control means;  
whereby said low beam illumination is switched on along with said first stage which produces said dim dashboard illumination; and said high beam illumination is switched on along with the second stage which produces relatively bright dashboard illumination.

#### 4,678,926 CHRISTMAS TREE LIGHTING CONTROL

George B. Davis, 7512 Marbury Rd., Bethesda, Md. 20034  
Filed Feb. 5, 1986, Ser. No. 826,369  
Int. Cl.<sup>4</sup> H02J 3/00

U.S. Cl. 307-11

2 Claims



1. An ornamental lighting control including in combination, a plurality of solid state duty cycle units having a common input and respectively variable duty cycle outputs, connector means respectively connected to each unit's output for connecting thereto an ornamental lighting source with the duty cycle of the output determining the light output intensity of a lighting source connected therewith, an RC gating circuit included in each duty cycle unit and wherein the resistance value of the gating circuit resistor determines the duty cycle of the unit and output thereof, a plurality of photoelectric cells with each of said cells being respectively connected within the RC gating circuitry of each of said duty cycle units and responsive individually to varying light intensities applied thereto vary respectively in resistance as required to effect corresponding duty cycle changes in its associated duty cycle unit and output thereof, light applying means positioned to apply light respectively to each of said cells, light control means operable to effect random like occurring variations in the light as respectively applied to each of said cells whereby the applied varying light pattern between cells differ one from the other for a predetermined operating interval of said light control means and a variable resistor respectively connected in parallel with each of said photoelectric cells and manually adjustable in resistance to vary selectively the duty cycle of its related duty cycle unit and output thereof.

#### 4,678,927 CIRCUIT ARRANGEMENT FOR LARGE POWER TRANSFORMERS

Werner Stein, Nuremberg, and Walter Müller, Schwabach, both of Fed. Rep. of Germany, assignors to Transformatoren Union Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany  
Filed Oct. 18, 1984, Ser. No. 662,239

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338149

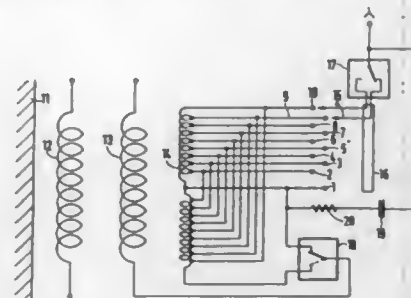
Int. Cl.<sup>4</sup> H01F 37/00

U.S. Cl. 307-104

4 Claims

1. Circuit arrangement for large power transformers with a low-voltage winding, a main high-voltage winding and a step winding as well as a step switching device at a Y-point side thereof, comprising, at a location between the center of the step winding connecting the step winding to the high-voltage main winding and the Y-point of the transformer, a capacitor in series with a resistor connected electrically parallel to respectively voltage-addingly connected current-carrying steps of the step winding, said capacitor and said resistor being of such dimensions as to decrease resonance amplitudes of said con-

necting point to ground, said capacitor being constructed of spirally wound strip lines formed of a resistance alloy, said



strip lines being also of such dimensions as to reduce resonance amplitudes of said connecting points.

4,678,928

### CONTROLLER FOR AUTOMATICALLY EFFECTING DISENGAGEMENT OF BUCKLE DEVICE

Yuji Nishimura, Akinori Fujiwara, and Shigeyasu Kanada, all of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

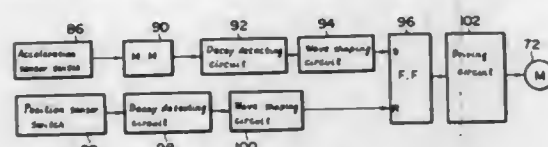
Filed Dec. 18, 1985, Ser. No. 810,205

Claims priority, application Japan, Dec. 26, 1984, 59-199396[U]

Int. Cl.<sup>4</sup> B60R 21/00

U.S. Cl. 307—10 SB

16 Claims



1. A controller for automatically effecting disengagement of a buckle device in a vehicle, comprising: moving means for moving a lock plate which is engaged with a tongue plate; emergency sensor means for detecting an emergency situation of the vehicle; door sensor means for detecting whether a door of the vehicle is opened or closed; normal disengagement control means for activating said moving means when said door sensor means detects that the door is opened to move said lock plate in a direction in which said lock plate and said tongue plate are disengaged from each other; and emergency disengagement control means for activating said moving means when a predetermined period of time has elapsed after an emergency situation of the vehicle has been detected by said emergency sensor means to move said lock plate in a direction in which said lock plate and said tongue plate are disengaged from each other by a driving force larger than a driving force produced by said moving means in response to said normal disengagement control means.

4,678,929

### RADIO FREQUENCY SWITCH

Feroz K. Alpaipwalla, and Robert H. Begeman, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1985, Ser. No. 781,633

Int. Cl.<sup>4</sup> H01H 63/36; H04N 5/22

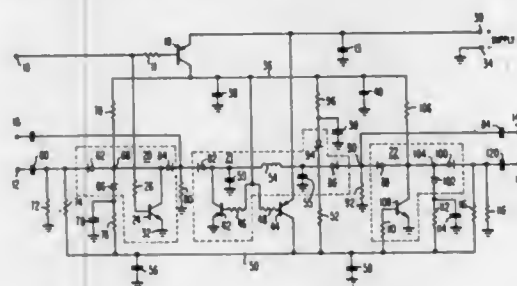
U.S. Cl. 307—112

18 Claims

1. A system including a signal input port and a signal output port; a control input for receiving a mode selection signal; and signal switch apparatus for coupling a signal between said input port and said output port when a first operating mode is

selected in response to said mode selection signal and substantially not coupling said signal between said ports when said second operating mode is selected in response to said mode selection signal, said signal switch apparatus comprising:

- a pair of diodes having respective first electrodes of a first type and respective second electrodes of a second type, said diodes being coupled in series with said respective first electrodes being coupled to a circuit point and said respective second electrodes being coupled to respective ones of said input port and said output port;
- a shunt diode having a first electrode of said first type and a second electrode of said second type, said first and second electrodes of said shunt diode being coupled to a point of reference potential and to said circuit point, respectively;
- transistor means having a control electrode and having a principal controllable conduction path coupled between said circuit point and said point of reference potential; and



control means coupled to said control input and being responsive to said mode selection signal selecting said first operating mode for applying bias potential tending to forward bias said pair of diodes and tending to reverse bias said shunt diode, and for applying control potential to the control electrode of said transistor means for rendering substantially non-conductive the principal controllable conduction path thereof;

said control means being responsive to said mode selection signal selecting said second operating mode for applying bias potential tending to forward bias said shunt diode, tending to reverse bias said pair of diodes and for applying control potential to the control electrode of said transistor means for rendering substantially conductive the principal controllable conduction path thereof.

4,678,930

### MICROWAVE OVEN TIMER

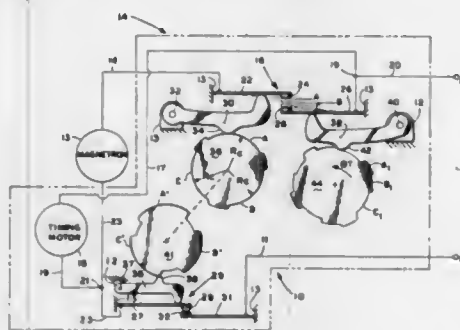
Joseph J. Mahon, Libertyville, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 5, 1986, Ser. No. 826,434

Int. Cl.<sup>4</sup> H01H 43/00

U.S. Cl. 307—141

22 Claims



1. A programmable control system for an electrically energized appliance comprising:

- (a) load means operable upon connection to a power line to perform a predetermined function;
- (b) switch means series connected with said load means and operable upon actuation to connect said load means to said power line for electrical current flow thereto and operable upon deactuation to disconnect said load means from said power line, said switch means having a pair of electrical contacts each mounted on a moveable blade means and having:
  - (i) interval cam means including follower means contacting said switch means and knob means operable upon appliance user selection of one of a first second and third rotary positions of said knob means to move one of said moveable switch blades to one of a first, second and third predetermined positions for a selecting power level for load means operation and said selection of said cam means position also operable to include selection of the time duration of said interval for programming said load means;
- (d) a timing motor and speed reducer means;
- (e) cam advance means connected to said speed reducer means operable to advance said cam means at a predetermined rate for time out of said selected interval;
- (f) sub-interval cam means operable upon cyclic advance to move the other of said moveable blade means through a first, second and third positions for effecting cyclic actuation of said pair of contacts;
- (g) sub-interval advance means connected to said speed reducer means and operable to cyclically advance said sub-interval cam means at a certain multiple of the rate of said cam advance means;
- (h) said one blade means in said first position operable to provide a first fractional duty cycle for said load means during said selected program interval, said one blade means in said second position operable to provide a second fractional duty cycle substantially greater than said first fraction for said load means during said selected program interval, and said one blade means in said third position operable to provide 100% duty cycle, or full "ON", for said load means during said selected program interval.

4,678,931

### ARMATURE WINDING FOR LARGE TURBINE GENERATOR

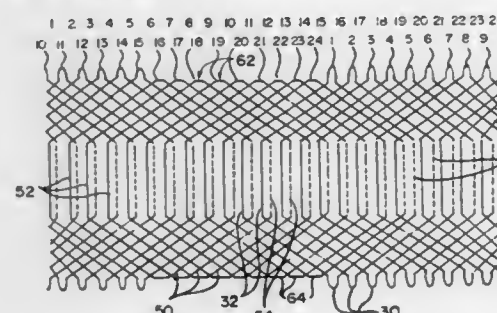
Dwight Olsen, Concord, Calif., and Robert L. Wall, Delanson, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 789,183, Oct. 18, 1985, Pat. No. 4,635,350. This application Jul. 29, 1986, Ser. No. 890,240

Int. Cl.<sup>4</sup> H02K 3/04

U.S. Cl. 310—201

6 Claims



1. A dynamoelectric machine comprising, in combination:
  - A. a magnetizable member having a cylindrical surface;
  - B. a plurality of axially extending slots uniformly spaced in said member and opening into said surface, each of said slots having upper and lower slot positions; and
  - C. a winding including a first segment comprised of a succe-

sion of diamond coils and a second segment comprised of a succession of bar coils,

- (1) said diamond coils each having first and second coil sides integrally interconnected by end turn sections, said diamond coils being placed on said member with said first coil sides disposed in upper slot positions of respective ones of said slots and said second coil side disposed in lower slot positions of respective different ones of said slots, the number of said slots circumferentially separating said first and second coil sides of each said diamond coil being equal to the pitch thereof,
- (2) said bar coils each having first and second bars electrically interconnected at their respective terminations by separate end turn electrical joints, said first bars disposed in respective lower slot positions of those of said slots whose upper slot position are occupied by said first coil sides of the initially placed group of said diamond coils equal in number to said diamond coil pitch, and said second bars disposed in respective upper slot positions of those of said slots whose lower slot positions are occupied by said second coil sides of the lastly placed group of said diamond coils equal in number to said diamond coil pitch.

4,678,932

### SNUBBER CIRCUIT FOR GTO THYRISTOR

Minoru Tanaka, and Yuzuru Yonehata, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

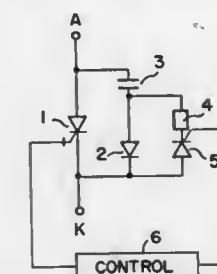
Filed Apr. 29, 1986, Ser. No. 857,049

Claims priority, application Japan, Apr. 30, 1985, 60-92710

Int. Cl.<sup>4</sup> H03K 17/72

U.S. Cl. 307—633

4 Claims



1. A snubber circuit for a GTO thyristor comprising a series-connected member of a capacitor and a diode connected in parallel with a GTO thyristor and a series-connected member of a resistor and a thyristor connected in parallel with said diode.

4,678,933

### SOLID STATE RELAY FOR AEROSPACE APPLICATIONS

Alessandro Pedone, L'Aquila, Italy, assignor to Selenia Spazio SpA, L'Aquila, Italy

Filed Jan. 16, 1985, Ser. No. 692,037

Claims priority, application Italy, Jan. 23, 1984, 35532/84[U]

Int. Cl.<sup>4</sup> H03K 17/60, 3/45

U.S. Cl. 307—254

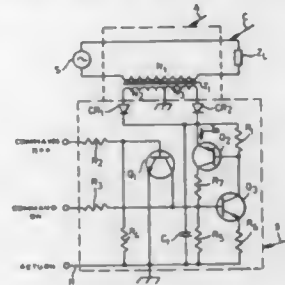
6 Claims

1. A solid state relay for controlling an alternating current circuit having an alternating current source and an alternating current load, said solid state relay comprising:

- a current transformer having
- a primary winding connected in series with said source and said load, and
- a secondary winding having a center-tap at ground potential and a pair of terminals;
- a pair of diodes each having two sides, one side of each diode being connected to a respective one of said terminals;
- a first transistor circuit having a first transistor with a base,



an emitter and a collector, the other sides of said diodes being connected to said emitter of said first transistor; a second transistor circuit having a second transistor with an emitter and a collector forming an emitter/collector path of said second transistor circuit, and further having a base, the base of said first transistor being connected to said emitter/collector path of said second transistor circuit; a third transistor circuit having a third transistor with an emitter and a collector forming an emitter/collector path of said third transistor circuit, and further having a base, said base of said second transistor being connected to the emitter/collector path of said third transistor circuit;



resistive means connected to the collector of said first transistor and to the base of said second transistor; means for applying an ON command to said base of said second transistor so as to short-circuit said secondary winding to render said primary winding conductive to alternating current; and means for applying an OFF command to said base of said third transistor so as to open-circuit said secondary winding for blocking alternating current flow through said primary winding.

4,678,934

## FLIP-FLOP CIRCUIT

Koichi Magome; Haruki Toda; Hiroyuki Kolsuma, all of Yokohama; Hiroshi Sahara, Tokyo; Kiminobu Suzuki, Yokohama; Shigeo Ohshima, and Kenji Komatsu, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

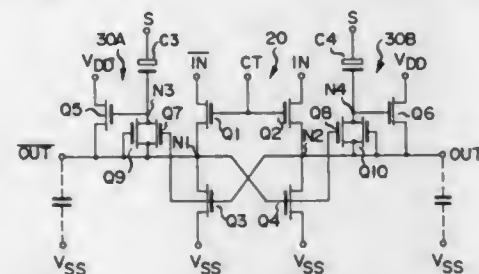
Filed Jul. 11, 1986, Ser. No. 884,629

Claims priority, application Japan, Jul. 16, 1985, 60-156513

Int. Cl.<sup>4</sup> H03K 3/26, 17/687, 19/094; G11C 7/00

U.S. Cl. 307-279

16 Claims



1. A flip-flop circuit comprising:
  - a first power terminal set at a potential of a first level;
  - first and second output terminals;
  - latching means for charging one of said first and second output terminals to a potential of the first level and discharging the other one of said first and second output terminals to a potential of a second level lower than the first level, thereby latching an input signal; and
  - a first potential compensation means for compensating a potential drop of said first output terminal, said potential compensation means including:
    - a first pull-up transistor having an insulated gate and a cur-

rent path connected between said power and first output terminal, a first charging means for charging said insulated gate while the potential of said second output terminal is changed from the first level to the second level, a first bootstrap means for bootstrapping the potential of said insulated gate to turn on said pull-up transistor, and a first diode means, connected in the forward direction from said first output terminal to said insulated gate, for charging said insulated gate when the potential of said insulated gate is dropped by at least a predetermined level in comparison with that of said first output terminal.

4,678,935

## INNER BIAS CIRCUIT FOR GENERATING ECL BIAS VOLTAGES FROM A SINGLE COMMON BIAS VOLTAGE REFERENCE

Kazumasa Nawata, Kawasaki, and Yasunori Kanai, Inagi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

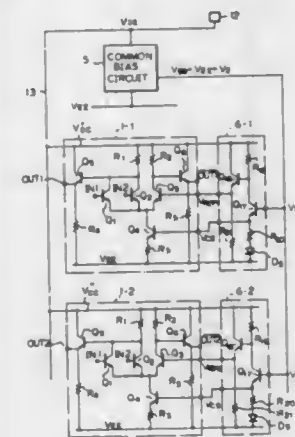
Filed Sep. 14, 1984, Ser. No. 650,527

Claims priority, application Japan, Sep. 21, 1983, 58-173197

Int. Cl.<sup>4</sup> H03K 17/16, 19/086

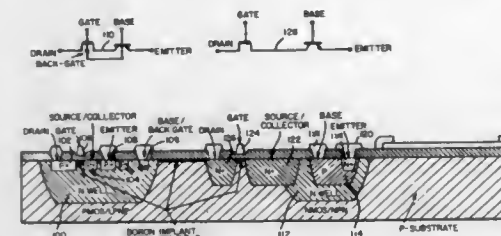
U.S. Cl. 307-297

13 Claims



1. An integrated circuit device comprising:
  - a cell unit array having a plurality of cell units disposed in a central portion of a semiconductor chip;
  - a first power supply line and a second power supply line on said chip; and
  - at least one common bias generating portion disposed on said chip at the periphery of said cell unit array, each said common bias generating portion generating a respective single common bias voltage which differs from the potential of said second power supply line by a first constant value;
- each of said cell units including:
  - at least one logic circuit portion each having at least a pair of logic transistors which are connected to said first power supply line and whose emitters are mutually connected, and a constant current source means connected to said second power supply line for supplying a constant current to said logic transistors; and
  - an inner bias circuit which receives said common bias voltage and which generates a first inner bias voltage that is supplied to the base of a first one of the logic transistors and a second inner bias voltage that is supplied to said constant current source means;
- wherein the value of the respective second inner bias voltage differs from said common bias voltage by a second constant value, and the value of the respective first inner bias voltage differs from the potential of said first power supply line at the respective cell unit by a value determined according to the characteristic values of elements in the respective inner bias circuit and by said common bias voltage at the respective cell unit.

4,678,936  
MOS-CASCODED BIPOLAR CURRENT SOURCES IN NON-EPITAXIAL STRUCTURE  
Peter R. Holloway, Andover, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.  
Division of Ser. No. 581,288, Feb. 17, 1984. This application Sep. 29, 1986, Ser. No. 912,315  
Int. Cl.<sup>4</sup> H03K 3/20, 3/353; H01L 27/02; G05F 3/04  
U.S. Cl. 307-303 12 Claims



8. In a monolithic integrated circuit formed on a substrate, an MOS-cascode bipolar current source connected as part of said monolithic integrated circuit to supply current of fixed value to elements thereof and comprising:

- first and second regions of one conductivity type diffused in said substrate to serve as the drain and the source of an MOS device, respectively;
- a gate positioned between said first and second diffused regions;
- a third region of said one conductivity type diffused in said substrate separate from said first and second regions, said third diffused region serving as the emitter of a bipolar transistor;
- a fourth region of a conductivity type opposite said one conductivity type diffused in said substrate between said second and third diffused regions to serve as the base of said bipolar transistor;
- said second diffused region serving as the collector of said bipolar transistor as well as serving as the source of said MOS device;
- first and second power supply terminals for said integrated circuit; and
- circuit means connecting said current source in series with said integrated circuit elements and between said power supply terminals so that said current source controls the flow of power supply current through said elements.

4,678,937

## ELECTRICAL ISOLATION CIRCUIT

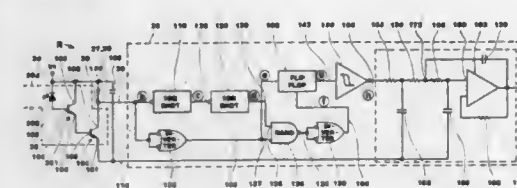
Timothy D. Price, Barnham, England, assignor to Rosemount Engineering Company Limited, England

Filed Feb. 3, 1984, Ser. No. 576,909

Int. Cl.<sup>4</sup> H03K 3/42; G02B 27/00; G02F 1/00

U.S. Cl. 307-311

26 Claims



1. An isolator circuit for providing dielectric isolation for an input signal which has a leading edge and a trailing edge spaced apart in time, the circuit comprising:
  - first means for receiving the input signal and for providing a first signal representative of the leading edge of the input signal and for providing a second signal representative of the trailing edge of the input signal; and
  - isolation means having an isolation input coupled to the first means and having a single isolation output for providing a

first isolated signal representative of the leading edge of the input signal and a second isolated signal representative of the trailing edge of the input signal and distinct from the first isolated signal, the isolation means providing signal transmission and dielectric isolation between the isolation input and the isolation output such that the first and second isolated signals are dielectrically isolated from the input signal and the time spacing between the leading edge and the trailing edges is substantially preserved in the isolation output.

4,678,938

## SOLID-STATE IMAGE SENSING APPARATUS HAVING AN AUTOMATIC CONTROL LOOP

Junichi Nakamura, Nagano, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

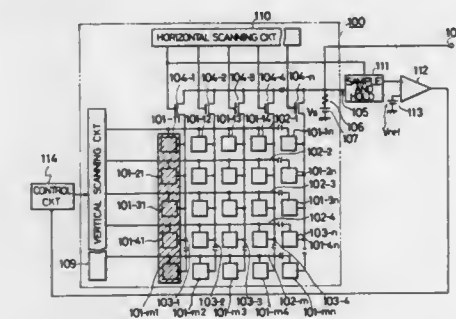
Filed Sep. 5, 1985, Ser. No. 772,787

Claims priority, application Japan, Sep. 28, 1984, 59-203718

Int. Cl.<sup>4</sup> H03K 3/42; H01L 29/78, 27/14; H01J 40/14

U.S. Cl. 307-311

5 Claims



1. A solid-state image sensing apparatus comprising:
  - a plurality of row lines;
  - means for applying row selecting control signals to said row lines;
  - a plurality of column lines;
  - means for applying column selecting control signals to said column lines;
  - a plurality of picture elements, including at least one light-shielded picture element, each of said picture elements comprising normally-on type static induction transistors, each of said static induction transistors comprising a first layer of a substrate forming a first main electrode, a second layer of a channel disposed on said substrate, a source formed on the surface of the second layer forming a second main electrode and a gate formed within the second layer adjacent said channel, an insulator disposed on said gate, gate electrodes disposed on said insulator forming a capacitor therebetween, said second main electrode connected to a corresponding one of said column lines; said first main electrode connected commonly to respective first electrodes of other on-type static induction transistors, said channel being disposed between said main electrodes, and said capacitor connected between said gate of each of said static induction transistors and the corresponding one of said row lines;
  - means for reverse-biasing said gates when a signal is read out from each of said picture elements; and
  - automatic control loop means for controlling the output of each of said light-shielded picture elements such that said output becomes zero and for automatically controlling the output voltage of each of said means for applying row selecting control signals in accordance with the output of a corresponding light-shielded picture element.

# 4,678,939 OUTPUT CIRCUIT FOR SIGNAL TRANSMISSION SYSTEMS

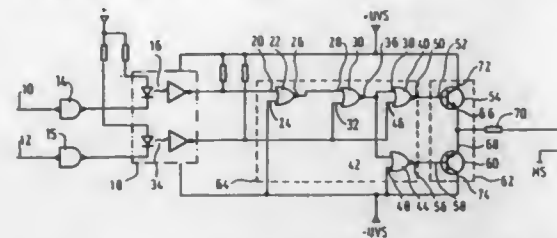
Hans-Bodo Laue, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany  
Filed Aug. 14, 1985, Ser. No. 765,735

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430338

Int. Cl.<sup>4</sup> H03K 19/20, 3/26, 19/14

U.S. Cl. 307—445

3 Claims



1. In an improved circuit for signal transmission systems employed to generate a bipolar, transmission-ready transmit signal for delivery to a signal transmission line of a signal transmission system, by driving a power output stage by a data signal and a transmitter release signal via an isolation stage and a logic circuit, whereby the output of the power stage is switched to low resistance in the presence of said transmitter release signal and to high resistance in the absence of said transmitter release signal, the improvement wherein the power output stage (62) is composed of two complementary transistors (54, 60), each of said transistors (54, 60) including a base (52, 58), a collector (72, 74) and an emitter (66, 68), said emitters (66, 68) being connected to a signal transmission line through a common resistor (70), said bases (52, 58) being each separately controlled from and directly connected to an output (50, 56) of the logic circuit (64) so that only one of the two transistors (54, 60) is switched to conducting in the presence of a transmitter release signal corresponding to the polarity of the output signal to be produced, and that both transistors (54, 60) are switched off, independent of the data signal in the absence of a transmitter release signal, and wherein the logic circuit (64) contains a first and second logic element (30, 40) receiving first and second input signals, the first logic element (30) receiving the transmitter release signal and the data signal as the first input signals, the output signal of the first logic element (30) driving both an input (38) of the second logic element (40) and the base of one of the transistors (60), and the second logic element (40) receiving the transmitter release signal as the second input signal and driving the base (52) of the other transistor (54) with its output signal, the first logic element (30) being driven with the data signal via a third logic element (22), an input (24) of the third logic element (22) being driven by a line side supply voltage.

# 4,678,940 TTL COMPATIBLE MERGED BIPOLAR/CMOS OUTPUT BUFFER CIRCUITS

Nader Vasseghi, Mountain View; Donald G. Goddard, Cupertino, and Robert E. Eccles, Santa Clara, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 8, 1986, Ser. No. 817,228

Int. Cl.<sup>4</sup> H03K 19/08, 19/003, 17/16, 17/56

U.S. Cl. 307—446

25 Claims

5. An output buffer circuit formed of bipolar transistors and CMOS transistors to provide two output states compatible with TTL levels comprising:

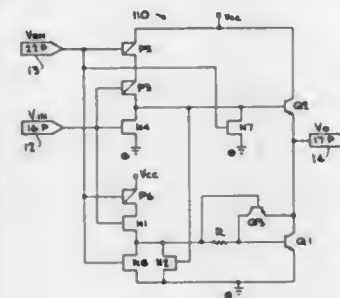
- a P-channel MOS transistor having its gate connected to an input terminal and its source connected to a supply potential;
- a first bipolar transistor having its collector connected to the supply potential, its base connected to the drain of said

P-channel transistor, and its emitter connected to an output terminal;

an N-channel MOS transistor having its gate connected to the input terminal and its drain connected to the supply potential;

a second bipolar transistor having its collector connected to the output terminal, its base connected to the source of said N-channel transistor via a resistor, and its emitter connected to a ground potential;

first discharge means operatively connected to the base of



said first bipolar transistor for quickly turning off the same so as to speed up a low-to-high transition at the output terminal;

second discharge means operatively connected to the base of said second bipolar transistor for quickly turning off same so as to speed up an high-to-low transition at the output terminal; and

anti-saturation means connected between the base and collector of said second bipolar transistor for preventing said second bipolar transistor from being forced further into the saturation region.

# 4,678,941 BOOST WORD-LINE CLOCK AND DECODER-DRIVER CIRCUITS IN SEMICONDUCTOR MEMORIES

Hu H. Chao, Pleasantville West, and Nicky Chan-Chun Lu, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1985, Ser. No. 727,301

Int. Cl.<sup>4</sup> H03K 19/096

U.S. Cl. 307—449

6 Claims

1. A boost word-line clock generator and decoder-driver structure for a semiconductor memory of the type including a row circuit clock signal  $\Phi_{RAS}$  a reset clock signal  $\Phi_B$ , comprising:

- a boost word-line clock generator circuit including means responsive to said  $\Phi_{RAS}$  and  $\Phi_B$  signals for producing a boost circuit preset clock signal  $\Phi_C$ , and a boost trigger clock signal  $\Phi_D$ ,
- means responsive to said  $\Phi_C$  signal for producing a delayed  $\Phi_C$  signal,
- means for summing said delayed  $\Phi_C$  and  $\Phi_D$  signal,

means for producing a delayed  $\Phi_D$  signal,

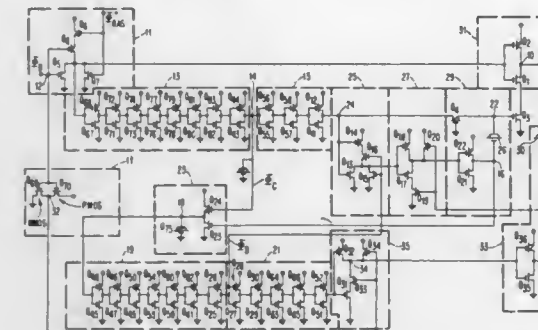
means responsive to said  $\Phi_B$  signal for producing a delayed  $\Phi_B$  signal,

means for providing a first NAND function on said delay  $\Phi_B$  signal and delayed  $\Phi_D$  signals,

an external boosting means connected to the output of said NAND means for producing an external boost signal,

means for providing a second NAND function on the outputs of said second summing means and said external boost signal,

an internal boost circuit connected to the output of said



second NAND means for producing an internal boost signal,

a clock driver circuit responsive to said delayed  $\Phi_C$  signal, the output of said external boost circuit, the output of said internal boost circuit and the output of said summing means for producing a word-line boosting clock signal, and

a decoder-driver means connected to the output of said clock driver circuit of said word-line clock generator circuit, for decoding word-line input signals for producing boost word-line signals for output word-lines of said semiconductor memory.

# 4,678,942 EMITTER COUPLED LOGIC CIRCUIT WITH HIGH DRIVABILITY FOR CAPACITIVE LOAD

Yasunori Kanai, Inagi, and Taichi Saitoh, Yokohama, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

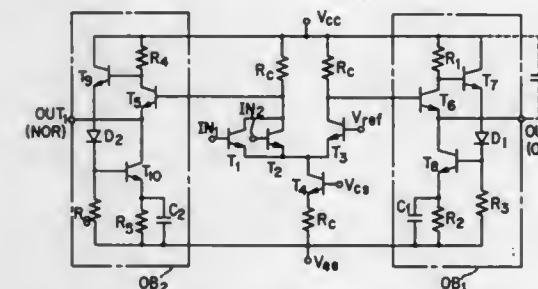
Filed Sep. 23, 1985, Ser. No. 779,356

Claims priority, application Japan, Sep. 25, 1984, 59-198606

Int. Cl.<sup>4</sup> H03K 19/01, 19/086

U.S. Cl. 307—455

11 Claims



1. An emitter coupled logic (ECL) circuit comprising:

at least a pair of transistors having the emitters thereof coupled together;

an emitter follower transistor for providing an output, said emitter follower transistor having a base connected to the collector of one of said pair of transistors;

an output terminal connected to the emitter of the emitter follower transistor;

a current control transistor connected to the emitter follower transistor; and

a control circuit means coupled to the collector of said

emitter follower transistor for detecting the collector current of said emitter follower transistor, and

said control circuit means being connected to the base of said current control transistor for controlling the current through said current control transistor in accordance with the collector current of the emitter follower transistor, so that said current control transistor pulls down the output voltage when the collector current becomes small.

# 4,678,943 INVERTING LOGIC BUFFER BICMOS SWITCHING CIRCUIT USING AN ENABLING SWITCH FOR THREE-STATE OPERATION WITH REDUCED DISSIPATION

Akira Urugami, Takasaki; Yukio Suzuki, Hinode; Shinji Kadono, Fussa; Masahiro Iwamura, Hitachi; Ikuro Masuda, Hitachi, and Tatsumi Yamauchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

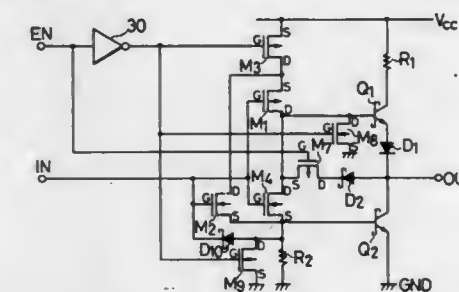
Filed Feb. 22, 1985, Ser. No. 704,209

Claims priority, application Japan, Feb. 24, 1984, 59-32357

Int. Cl.<sup>4</sup> H03K 17/04

U.S. Cl. 307—473

13 Claims



1. A switching circuit comprising:

an output stage having first and second bipolar transistors and having the collector-emitter paths thereof connected in series between a first operating potential and a second operating potential;

a pre-stage circuit having a first field effect transistor having the drain output thereof coupled to the base of said first bipolar transistor to control conduction and non-conduction of said first bipolar transistor and a second field effect transistor having a conductivity type opposite to that of said first field effect transistor and the source output thereof coupled to the base of said second bipolar transistor to control conduction and non-conduction of said second bipolar transistor, the gates of said first and second field effect transistors being commonly connected to an input node and being driven in common by an input signal applied to said input node;

a switching element connected between the source of said first field effect transistor as well as the drain of said second field effect transistor in said pre-stage circuit and said first operating potential, and having the conduction and non-conduction thereof controlled by an enable control signal to thereby control whether or not said pre-stage circuit receives said first operating potential;

a third field effect transistor having a conductivity type opposite to that of said first field effect transistor, receiving said input signal at the gate thereof and having the drain thereof connected to the base of said first bipolar transistor and the source thereof connected to the base of said second bipolar transistor; and

impedance means connected between the base of said second bipolar transistor and said second operating potential.

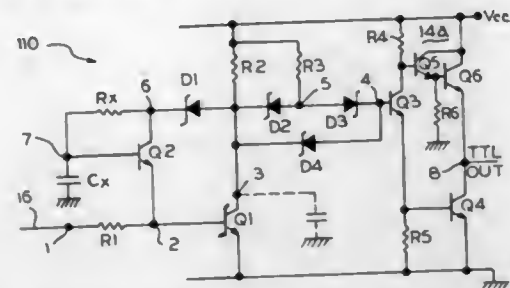


**4,678,944**  
**CIRCUIT FOR IMPROVING PERFORMANCE OF AN ECL-TO-TTL TRANSLATOR**  
 Bertrand J. Williams, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 13, 1985, Ser. No. 733,681  
 Int. Cl.<sup>4</sup> H03K 19/092, 19/088

U.S. Cl. 307-475

12 Claims



1. A logic level translator having a fast rising edge at its output for converting ECL logic levels into TTL logic levels, said translator comprising:

- a switching transistor having its base connected to one end of a first resistor, its collector connected to a supply potential via a second resistor, and its emitter connected to a ground potential;
- the other end of said first resistor being connected to receive an ECL signal;
- a first diode having its cathode connected to the collector of said switching transistor and its anode connected to the supply potential via a third resistor;
- a second diode having its anode connected to the anode of said first diode and its cathode connected to an output node;
- a third diode having its cathode connected to the cathode of said first diode and its anode connected to the cathode of said second diode;
- clamp delay means interconnected between the collector and the base of said switching transistor for inhibiting the transistor from receiving feedback current to its base so as to cause a faster turn-off, whereby a fast rising edge response is obtained at TTL logic levels during a high-to-low transition of the input logic level signal;
- said clamp delay means including a fourth diode, a second transistor, a fourth resistor and a capacitor; and
- said fourth diode having its anode connected to the collector of said switching transistor, the collector of said second transistor being connected to the cathode of said fourth diode and to one end of the fourth resistor, the emitter of said second transistor being connected to the base of said switching transistor, the other end of said fourth resistor being connected to one end of the capacitor and to the base of said second transistor, the other end of said capacitor being connected to the ground potential.

**4,678,945**  
**UNIDIRECTIONAL SINGLE-FLUX-QUANTUM LOGIC CIRCUIT**  
 Takao Sogano, Yoichi Okabe, Hideharu Mlyake, all of Tokyo, and Naoki Fukaya, Kawasaki, all of Japan, assignors to University of Tokyo, Tokyo, Japan

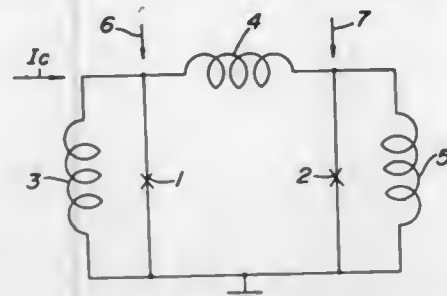
Filed Feb. 14, 1985, Ser. No. 701,488  
 Claims priority, application Japan, Mar. 24, 1984, 59-56549  
 Int. Cl.<sup>4</sup> H03K 19/195

U.S. Cl. 307-476

11 Claims

1. A method of unidirectionally transmitting signal through a superconducting logic circuit, which logic circuit includes a first one-Josephson-junction SQUID (superconducting quantum interference device), a second one-Josephson-junction SQUID having a critical current of the junction larger than that of the first SQUID, the Josephson junctions of said first and second SQUID's having one side superconductors thereof

directly connected to each other, and a superconducting inductor connecting the opposite side superconductors of the Josephson junctions of said first and second SQUID's, inductance of said superconducting inductor being larger than the inductance of said second SQUID; the method comprising



steps of applying a flat bias current to the Josephson junction of the first SQUID while applying a second bias current larger than the first bias current to the second SQUID, and applying an input signal to the first SQUID, whereby the input signal is unidirectionally transmitted to the second SQUID.

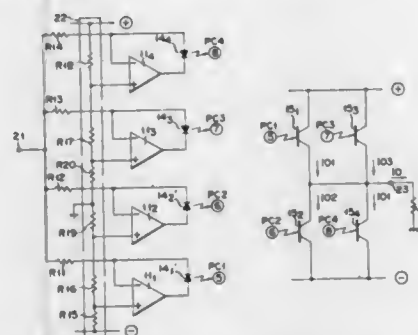
**4,678,946**  
**CIRCUIT IN WHICH OUTPUT CIRCUIT AND OPERATIONAL AMPLIFIER EQUIPPED INPUT CIRCUIT ARE ELECTRICALLY ISOLATED**  
 Katsumi Nagano, Shimonoeki, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Division of Ser. No. 668,832, Nov. 6, 1984, Pat. No. 4,636,655.  
 This application Jun. 13, 1986, Ser. No. 874,092  
 Claims priority, application Japan, Nov. 11, 1983, 58-211876;  
 Dec. 27, 1983, 58-246342

Int. Cl.<sup>4</sup> G06G 7/12; H03K 3/42

U.S. Cl. 307-490

6 Claims



1. A function generator having a circuit input terminal and a circuit output terminal comprising:

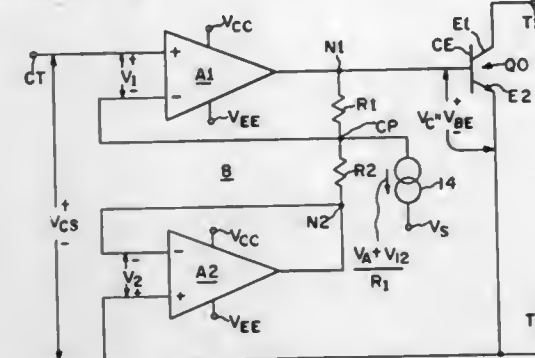
- a plurality of operational amplifiers, each having a first input terminal, a second input terminal, and an output terminal;
- a reference voltage generating circuit for applying different reference voltages to said first input terminals of said plurality of amplifiers, individually;
- a resistor connected between said second input terminal of each of said plurality of operational amplifiers and said circuit input terminal to which an input voltage is applied;
- an electrophoto-converting element connected between said output terminal and said second input terminal of each of said plurality of amplifiers;
- an output circuit having a plurality of photoelectric-converting elements, optically coupled with said electrophoto-converting elements, which operate when the corresponding electrophoto-converting elements operate to form a current path between a power source for said output circuit and said circuit output terminal; and
- a load element for converting the output current of said plurality of photoelectric-converting elements into voltage.

**4,678,947**  
**SIMULATED TRANSISTOR/DIODE**  
 Johan H. Huijsing, A B Den Hoorn, Netherlands, and Timothy A. Dhayvetter, San Jose, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Oct. 5, 1984, Ser. No. 658,333  
 Int. Cl.<sup>4</sup> G06G 7/12; H03K 3/01, 3/26

U.S. Cl. 307-490

17 Claims



1. A circuit in which current flow between first and second flow terminals thereof is controlled in response to an input voltage between a control terminal thereof and the second terminal, the circuit comprising:

- a main transistor having a first flow electrode coupled to the first terminal, a second flow electrode coupled to the second terminal, and a control electrode for regulating current transmission between the flow electrodes;
- a first resistor coupled between a control point and a first node which is coupled to the control electrode;
- a second resistor coupled between the control point and a second node; and
- control means for regulating the voltage at the control point in response to the input voltage and for supplying current to/from the nodes without substantially affecting the currents at the flow terminals, the control means coupled to the nodes, the control point, and the control terminal which are all separate from one another,  $V_{CS}$  being approximately  $V_C/B$  where  $V_C$  is the input voltage,  $V_C$  is the voltage between the control and second electrodes and  $B$  equals one plus the ratio of the value of the first resistor to the value of the second resistor.

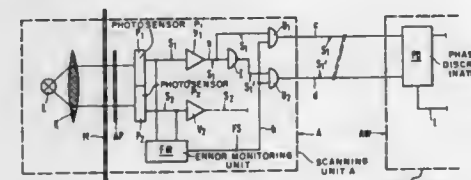
**4,678,948**  
**MEASURING DEVICE ERROR MONITORING SYSTEM**  
 Walter Schmitt, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heldenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,508  
 Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323281

Int. Cl.<sup>4</sup> H03K 1/00; G01B 11/14

U.S. Cl. 307-511

6 Claims



5. In a measuring system for measuring the relative position of two objects, of the type comprising a scale and a scanning unit wherein relative movement of the two objects causes the scanning unit to scan the scale to produce at least one measuring signal indicative of the relative movement of the two objects, the system further comprising an evaluating unit which evaluates the at least one measuring signal, means for detecting errors in the at least one measuring signal, and means for gener-

ating an error signal in response to the detected errors, the improvement comprising:

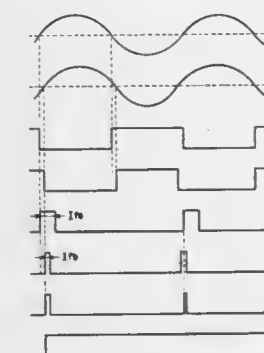
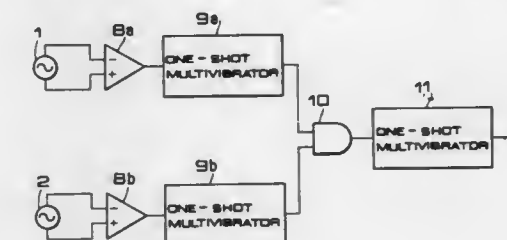
- means for generating an inverted signal, opposite in phase to the measuring signal;
- a first AND gate having a first input coupled to receive the measuring signal, a second input coupled to receive the error signal, and a first output which carries a gated measuring signal;
- a second AND gate having a first input coupled to receive the inverted signal, a second input coupled to receive the error signal, and a first output which carries a gated inverted signal;
- means, included in the evaluating unit and coupled to the first outputs of the first and second AND gates, for generating a first signal when the gated measuring signal is in phase with the gated inverted signal;
- said error signal generating means, inverted signal generating means, and first and second AND gates cooperating to insure that the measuring signal and the inverted signal are out of phase when the error signal is absent and are in phase when the error signal is present.

**4,678,949**  
**SYNCHRONISM DETECTOR CIRCUIT**  
 Kelichi Oshikiri, and Tooru Nakamura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1985, Ser. No. 760,540  
 Int. Cl.<sup>4</sup> H03K 5/26

U.S. Cl. 307-527

4 Claims



1. A synchronism detector circuit for indicating a state of synchronism between two a.c. voltages comprising:

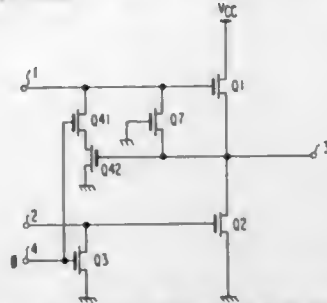
- first and second comparators for detecting zero cross points of said two a.c. voltages, respectively;
- first and second one-shot multivibrators triggered by outputs from said first and second comparators, respectively, for providing pulses having the pulse widths set up in correspondence with the respective synchronous detection allowances;
- an AND circuit for providing the logical product of the outputs from said one-shot multivibrators; and
- a third retriggerable one shot multivibrator triggered by the output from said AND circuit and maintaining an altered state so long as there is relative synchronism between said a.c. voltages as determined by the tolerance allowances of said first and second one-shot multivibrators.

4,678,950

## OUTPUT CIRCUIT HAVING AN IMPROVED PROTECTING CIRCUIT

Kenjiro Mitake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,177

Claims priority, application Japan, May 13, 1983, 58-83533  
Int. Cl.<sup>4</sup> H03B 1/04; H03F 21/00; H01L 29/78; H02H 3/20  
U.S. Cl. 307-550 11 Claims

1. In an output circuit having a first switching transistor coupled between a first voltage terminal and an output terminal, a second switching transistor coupled between said output terminal and a second voltage terminal, first means for supplying a gate of said first transistor with a first data signal, second means for supplying a gate of said second transistor with a second data signal having an opposite phase to said first data signal, and control means responsive to a control signal for clamping the gates of said first and second transistors at a potential that makes said first and second transistors non-conducting, the improvement comprising:

protection means coupled between said gate of said first transistor and said output terminal, said protection means providing a current path between said gate of said first transistor and said output terminal when an abnormal voltage is applied to said output terminal, said protection means comprising a third transistor having a source-drain current path coupled between said gate of said first transistor and said output terminal and having a gate connected to a reference voltage, and wherein said control means comprises a fourth transistor coupled between the gate of said second transistor and said second voltage terminal and having a gate receiving said control signal, and a series circuit of fifth and sixth transistors coupled between said gate of said first transistor and said second voltage terminal, a gate of said fifth transistor receiving said control signal, a gate of said sixth transistor being coupled to said output terminal.

4,678,951

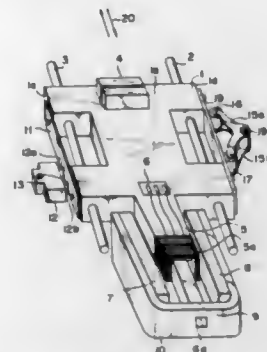
## LINEAR MOTOR

Akira Nikaido, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,822

Claims priority, application Japan, Nov. 29, 1983, 58-224758  
Int. Cl.<sup>4</sup> H02K 41/00 4 Claims

U.S. Cl. 310-13



1. A linear motor for driving a carriage used in a magnetic memory, said linear motor comprising a linearly movable

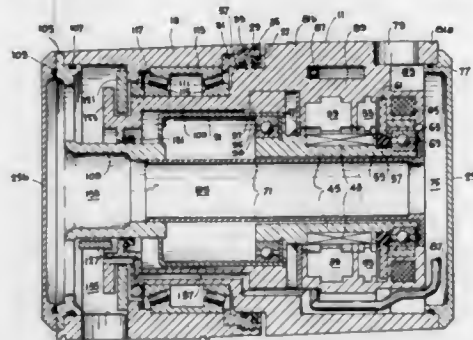
member including a coil frame of a hollow sleeve configuration which is formed integrally on the carriage which is movably supported by the frame body of the magnetic memory, said coil frame further being provided at a side opposite to a magnetic head mounting portion of said carriage, and a driving coil wound around said coil frame; stator means on the frame body of said magnetic memory and including a central yoke disposed within said coil frame along the direction of carriage movement, a U-shaped yoke surrounding said driving coil with the opposite legs thereof being parallel to said central yoke, and a pair of permanent magnets; position sensor means including a magnetic scale provided on one side of said carriage in the direction of carriage movement, and a sensor means provided on the frame body of said magnetic memory and having a pair of magnetic reluctance heads located on said sensor means at the side opposed to said magnetic scale; guide means including a guide plate provided on said carriage at an opposite side from said magnetic scale in the direction of carriage movement and biasing means on the frame body of the said magnetic memory for biasing said guide plate in a direction perpendicular to the direction of movement of said carriage.

4,678,952

## SEALED JOINT FOR A ROBOT AND THE LIKE

Thomas W. Peterson, Corvallis; David B. Hole, Albany, and S. Stanley Mintz, Corvallis, all of Oreg., assignors to Intellex Incorporated, Corvallis, Oreg.

Filed Aug. 13, 1985, Ser. No. 765,867

Int. Cl.<sup>4</sup> B25J 1/10; F16H 1/28; H02K 5/128  
U.S. Cl. 310-83 19 Claims

1. A sealed joint as for a robot comprising, first and second closed, laterally adjacent sleeves mounted for a rotation about a common axis, the sleeves separated by a rotary seal having two contacting members, one associated with each sleeve, and means for adjustably positioning the seal between the sleeves, a motor having a rotor and a stator mounted within the first sleeve, the rotor parallel to the axis of the sleeves, the second sleeve having a driven member, the two sleeves having a link member internally joining the rotor and the driven member, whereby the rotor transfers power to the link member so that the first sleeve drives the second sleeve, and means for sealing the two sleeves containing the motor, driven member, and link member assembly, and a fluid coolant tube extending into a sealable port of the first sleeve and communicating thermally with said motor.

4,678,953

## MOTOR MOUNT ASSEMBLY

Raymond A. Johnson, Box 100, Agema, Saskatchewan, Canada SOC 1Y0

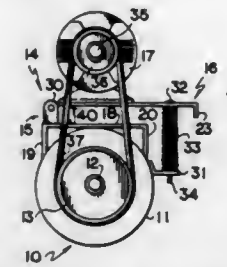
Filed May 28, 1986, Ser. No. 867,458

Claims priority, application Canada, Jun. 3, 1985, 483027  
Int. Cl.<sup>4</sup> H02K 5/00 12 Claims

U.S. Cl. 310-91

1. A motor mount assembly for driving devices such as grain augers, unloading augers, transfer augers and the like, comprising in combination a base plate secured to the device in opera-

tive position thereon, a motor support plate, means to attach and detach said support plate to said base plate for pivotal movement through an arc, and spring means operatively connected between said support plate and said device for urging said support plate in an arc away from said base plate, said means to attach and detach said support plate to said base plate including a pair of spaced apart mounting means on said base



plate, and a pivot shaft secured across said support plate, said pivot shaft having a portion extending upon each side edge of said support plate, said extending portions pivotally engaging said mounting means, means on said shaft limiting the endwise movement of said shaft and said support plate in one direction, and means on said base plate selectively limiting the movement of said shaft and said support plate in the other direction.

4,678,954

## ROTOR WITH PERMANENT MAGNETS HAVING THERMAL EXPANSION GAPS

Tamio Takeda, Yokkaichi; Toshio Gokyu, Mie; Yuji Mizutani, Kuwana, and Jun Nakashima, Mie, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

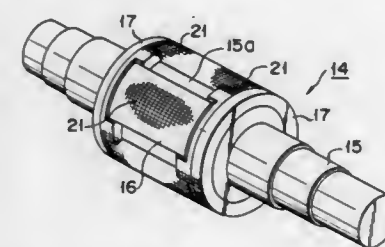
Filed Jun. 2, 1986, Ser. No. 869,336

Claims priority, application Japan, Mar. 5, 1986, 61-31524[U]; Mar. 5, 1986, 61-31525[U]

Int. Cl.<sup>4</sup> H02K 21/14, 1/18

U.S. Cl. 310-156

10 Claims



1. A rotor with permanent magnets, said rotor comprising:

- (a) a shaft;
- (b) a pair of positioning rings axially spaced on the outer peripheral surface of said shaft; and
- (c) permanent magnets bonded onto the outer peripheral surface of said shaft between said pair of positioning rings, said permanent magnets being disposed such that gaps are left between said permanent magnets and said positioning rings, said gaps serving to absorb thermal expansion of said permanent magnets and/or said positioning rings.

4,678,955

## PIEZOELECTRIC POSITIONING DEVICE

Minoru Toda, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 18, 1986, Ser. No. 853,751

Int. Cl.<sup>4</sup> H01L 41/08

U.S. Cl. 310-328

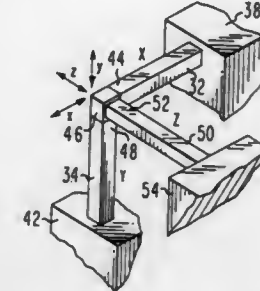
6 Claims

1. A relatively stiff piezoelectric positioning device comprising:

- a first piezoelectric member having first and second opposing ends wherein, in response to an applied first control signal, one of said ends displaces relative to the other end in a given first direction parallel to an axis through said ends;

a second piezoelectric member having third and fourth opposing ends wherein, in response to an applied second control signal, one of said third and fourth ends displaces relative to the other end in a given second direction parallel to an axis through said third and fourth ends;

a third piezoelectric member having fifth and sixth ends wherein, one of said fifth and sixth ends displaces in a third



4,678,956

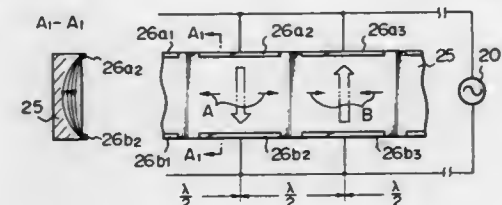
## VIBRATION WAVE MOTOR

Kazuhiro Izukawa, Yokohama; Takayuki Tsukimoto, Fujisawa, and Ichiro Okumura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 697,937

Claims priority, application Japan, Feb. 10, 1984, 59-24022  
Int. Cl.<sup>4</sup> H01L 41/08 4 Claims

U.S. Cl. 310-323



1. A motor comprising:

- (a) an electro-mechanical energy converting element for generating a travelling vibration wave;
- (b) a pair of electrodes formed on said electro-mechanical energy converting element and extending in a direction parallel with the advancing direction of said travelling vibration wave, said travelling vibration wave being generated by the application of AC voltages which have relatively different phases, to said pair of electrodes; and
- (c) a movable element contacting said electro-mechanical energy converting element and driven by said travelling vibration wave.

4,678,957

## PIEZOELECTRIC CERAMIC SWITCHING DEVICES AND SYSTEMS AND METHODS OF MAKING THE SAME

John D. Harnden, Jr., Schenectady, and William P. Kornrumpf, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 24, 1986, Ser. No. 879,495

Int. Cl.<sup>4</sup> H01L 41/08

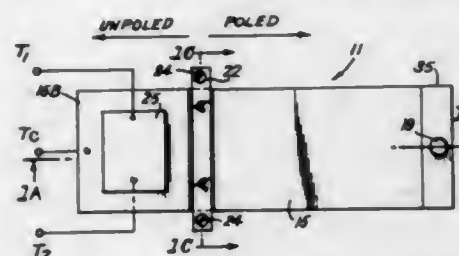
U.S. Cl. 310-332

10 Claims

1. A piezoelectric ceramic switching device including in combination at least one piezoelectric ceramic bender-type switching device having a movable piezoceramic bender member comprised by at least two planar selectively prepoled



piezoelectric plate elements secured in opposed parallel relationship sandwich fashion on opposite sides of at least one central conductive surface and having respective outer conductive surfaces that are insulated from each other and the central conductive surface by the respective intervening piezoelectric plate element thicknesses, said bender-type piezoelectric switching device further including at least one set of coacting electrical switch contacts opened and closed by the prepolarized movable bender member of the piezoelectric ceramic switching device, and clamping means securing a different non-poled portion of the piezoelectric ceramic plate elements adjacent to and mechanically supporting the selectively prepoled movable bender member portion in a cantilever manner for opening and closing the set of coacting electrical



cal contacts, the different non-poled portions of the piezoelectric ceramic plate elements disposed under said clamping means remaining non-movable as being mechanically unstrained and electrically neutral, wherein the unpoled piezoelectric plate element portions extend beyond the clamped portion thereof in a direction opposite from the prepoled movable bender portion and wherein the further unpoled piezoelectric plate element portions between the respective outer conductive surfaces and the central conductive surface form capacitors having any desired capacitance value in the range of tenths of a microfarad and greater dependent upon power rating and usable as circuit components in an electrical circuit for controlling operation of the piezoelectric bender-type switching device or otherwise.

4,678,958

# HIGH PRESSURE SODIUM VAPOR LAMP WITH IMPROVED COLOR REPRODUCTION INDEX

Miklós Csapody, Budapest, Hungary, assignor to Tungsram Rt., Budapest, Hungary

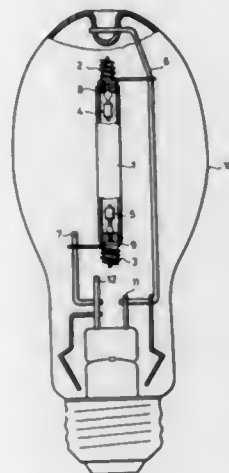
Filed May 23, 1985, Ser. No. 737,260

Claims priority, application Hungary, Jun. 12, 1984, 2256/84

Int. Cl.<sup>4</sup> H01J 1/02

U.S. Cl. 313-15

1 Claim



1. A high pressure sodium vapour lamp with improved color reproduction index, which comprises a ceramic discharge vessel in an outer envelope having at least a pair of electrodes and a filling comprising at least one additive material, such as sodium introduced exclusively in the form of an amalgam, as well as an ignition gas, a pair of conductors for the current

supply of the electrodes, characterized in that at both ends of the discharge vessel and externally thereof a heating element is arranged, which during the entire operation of the discharge vessel are connected in series therewith, wherein each heating element is coupled to the electrode at the adjacently lying end of the discharge vessel as well as with one of the current conductors, said heating elements being formed as resistance coils and being arranged on closure elements which are provided for the closing of the discharge vessel, said heating elements incandescing and forming a mixed light lamp with said discharge vessel.

4,678,959

# DEVICE FOR COOLING THE PINCH SEAL OF AN ELECTRIC LAMP, AND AN ELECTRIC LAMP AND AN IRRADIATION APPARATUS PROVIDED WITH THIS COOLING DEVICE

Jan A. C. Mewissen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

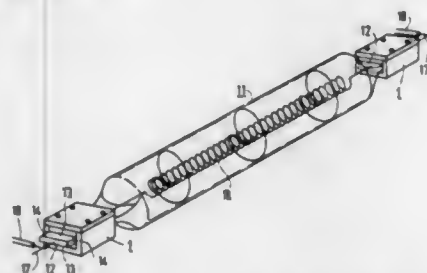
Filed Oct. 28, 1985, Ser. No. 791,676

Claims priority, application Netherlands, Nov. 15, 1984, 8403486

Int. Cl.<sup>4</sup> H01J 7/24, 1/34; H01K 1/58

U.S. Cl. 313-17

21 Claims



1. A device for cooling a pinch seal of an electric lamp comprising a lamp vessel enclosing an interior space and sealed by a pinch seal, and at least one current supply conductor extending longitudinally through said pinch seal, said device comprising a metal sleeve arranged for surrounding said pinch seal with a given clearance, along at least a portion of the length thereof, and a compliant thermally conductive mass arranged inside said sleeve for filling the clearance space between said pinch seal and said sleeve, said thermally conductive mass comprising metal fibers.

4,678,960

# METALLIC HALIDE ELECTRIC DISCHARGE LAMPS

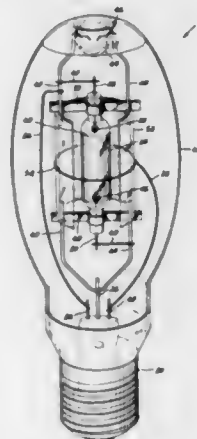
Gilbert H. Reiling, Chardon, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1985, Ser. No. 761,251

Int. Cl.<sup>4</sup> H01J 61/34, 61/35

U.S. Cl. 313-25

10 Claims



1. A gaseous electric discharge lamp comprising: an hermetically sealed vitreous light-transmissive outer en-

velope having electrical terminal means sealed thereinto for making electrical connection from an external power source to the interior of said envelope;

a sealed, vitreous arc tube disposed within said outer envelope;

first and second non-liquid metallic arc electrodes disposed within said arc tube and connected to electrical lead means sealed into said arc tube for making electrical connection through respective ends of said arc tube;

a quantity of mercury disposed within said arc tube sufficient upon complete evaporation thereof during operation of said lamp to yield a particle pressure of approximately 101 to 1520 pascals within said arc tube;

an ionizable medium disposed within said arc tube comprising a plurality of metallic halides; each metallic halide including a metal which emits electromagnetic radiation in the visible range of wavelengths in one of a plurality of predetermined multiple narrow emission lines, such that the total radiation emitted appears as white light;

reflector means comprising a reflective coating disposed on the exterior surface of said arc tube to reflect long wavelength ultraviolet radiation and short wavelength infrared radiation having a wavelength of less than 1500 nanometers; and a cylindrical reflector disposed within said outer envelope and surrounding said arc tube and comprising a material which blocks transmission of infrared radiation having a wavelength of at least 1500 nanometers, said reflective coating and said cylindrical reflector cooperating for reflecting infrared and ultraviolet wavelengths inward so that said infrared and ultraviolet wavelengths are substantially removed from the light output of said lamp; and

conductive means for supporting said arc tube within said outer envelope and making electrical connection from said electrical terminal means to said electrical lead means.

4,678,961

# PROJECTION TELEVISION DISPLAY TUBE WITH IMPROVED COOLING

Albert A. Comberg, and Johann Schröder, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

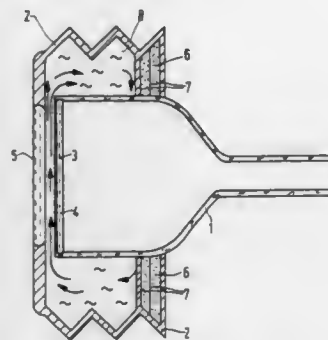
Filed Nov. 7, 1985, Ser. No. 796,350

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1985, 3510021

Int. Cl.<sup>4</sup> H01J 29/86, 7/28

U.S. Cl. 313-36

13 Claims



1. A projection television display tube comprising an evacuated envelope having a display window with a display screen disposed on its inside, a transparent second window disposed in front of the outside of said display window to define a space between the display window and the second window, a transparent coolant flowing through said space, a cooling member retaining said coolant in a closed cooling system about said evacuated envelope, said cooling member dissipating heat from the display window to the atmosphere, and

a latent heat accumulator in said cooling member, whereby said coolant is in thermally conducting contact with said latent heat accumulator, said latent heat accumulator including a latent heat accumulator agent.

4,678,962

# IMAGE PICKUP TUBE

Masatake Hayashi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

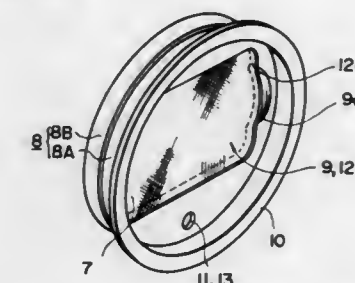
Filed Nov. 6, 1985, Ser. No. 795,315

Claims priority, application Japan, Nov. 7, 1984, 59-234599

Int. Cl.<sup>4</sup> H01J 29/08, 31/38

U.S. Cl. 313-383

1 Claim



1. An image pick-up tube, comprising a glass bulb, a face plate, a target surface, a mesh electrode arranged in opposition to the target surface and a mesh holder to support said mesh electrode comprising a pair of elements each having an opening of rectangular form, wherein one pair of diametrically opposing sides constituting said opening in each of said elements is formed with a segmental spherical surface including a portion of said sides, whereby said mesh electrode is curved between said elements such that the tension is non-uniform over said mesh electrode and the tension of said electrode has anisotropy.

4,678,963

# SHADOW MASK FOR A COLORED IMAGE TUBE AND IMAGE TUBE COMPRISING THE SAME

Carlo L. Fonda, Anagni, Italy, assignor to Videocolor, Montrouge, France

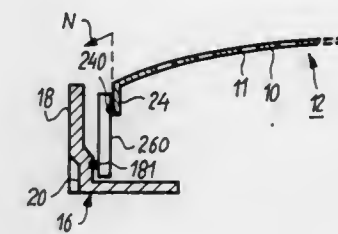
Filed Nov. 21, 1984, Ser. No. 673,825

Claims priority, application France, Nov. 25, 1983, 83 18853

Int. Cl.<sup>4</sup> H01J 29/07

U.S. Cl. 313-405

7 Claims



1. A colored image tube comprising: a glass tube envelope; a frame attached to an interior surface of the envelope, adjacent to a screen section of the envelope; a shadow mask having a peripheral edge and made of material similar to that of the frame so that both mask and frame exhibit substantially the same coefficient of thermal expansion; a plurality of planar bimetallic strips welded at opposite end portions thereof to the frame and the mask edge; the bimetallic strips exhibiting displacement upon initial operational warm-up of the tube to compensate for greater expansion of the mask relative to the frame during initial tube warm-up.

4,678,964

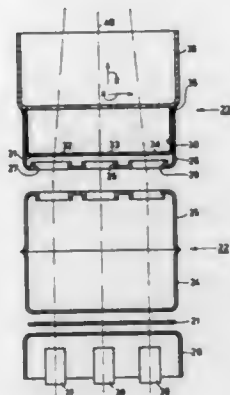
## COLOR DISPLAY TUBE

Antonius H. P. M. Peels, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
Continuation of Ser. No. 516,016, Jul. 22, 1983, abandoned. This application Jan. 17, 1986, Ser. No. 821,113  
Claims priority, application Netherlands, Aug. 25, 1982, 8203322

Int. Cl.<sup>4</sup> H01J 29/51, 29/62

U.S. Cl. 313—414

6 Claims



1. In a color display tube comprising an evacuated envelope containing a luminescent screen and an electron gun system for producing a central electron beam and first and second outer electron beams lying in a single plane, said electron gun system including first and second spaced-apart cup-shaped focusing lens electrodes having respective first and second facing bottom plates, each plate including central and first and second outer apertures through which the corresponding electron beams pass, said electrodes cooperating to produce respective central and first and second outer focusing lenses for individually focusing the corresponding electron beams;

the combination with at least one of said electrodes of correction means for correcting astigmatic focusing and misconvergence of the electron beams, said correction means comprising a correction plate disposed within the respective cup-shaped electrode and parallel to its apertured bottom plate, said correction plate including central and first and second outer apertures through which the respective electron beams pass, at least one of said apertures begin elongate and having an individual height and width selected relative to each other to correct for astigmatic focusing of the respective electron beam, said outer apertures being located relative to said central aperture to correct for misconvergence of the electron beams.

4,678,965

## ELECTRON TUBE

Michael J. C. van Weert, and Gerardus C. S. W. van Limpt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,885

Claims priority, application Netherlands, Nov. 15, 1984, 8403485

Int. Cl.<sup>4</sup> H01J 29/48

U.S. Cl. 313—451

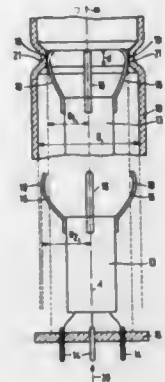
2 Claims

1. An electron tube including a tubular glass envelope portion having a central axis and an inside diameter D, an electrode system in the envelope portion having a central axis, means for axially positioning the electrode system in the envelope portion, and centering means for positioning the electrode system in the envelope portion such that the electrode system axis substantially coincides with the envelope portion axis; characterized in that said centering means comprises:

(a) a plurality of predefined contact surfaces in the envelope portion, each disposed at a predetermined axial position

and spaced from the envelope portion axis by a distance  $R_1$  which is smaller than  $D/2$ ; and

(b) a plurality of resilient elements extending from the electrode system and having free ends radially spaced from the electrode system axis by a distance  $R_2$  when the resilient elements are in a relaxed state, where  $R_1 < R_2 < D/2$ , said resilient elements being positioned and dimensioned



such that their free ends are depressed radially inward by respective ones of the contact surfaces when the electrode system is fully installed in the envelope portion; said centering means enabling installation of the electrode system without any contact between the centering means and the envelope portion except at the predefined contact surfaces.

4,678,966

## FLUORESCENT LAMP HAVING TWO PHOSPHOR LAYERS

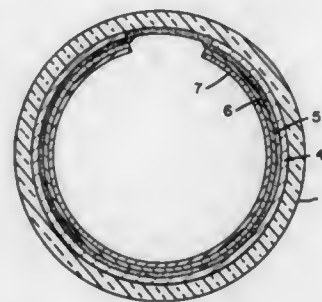
Eric L. Mager, Beverly, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Jun. 13, 1980, Ser. No. 159,025

Int. Cl.<sup>4</sup> H01J 1/62

U.S. Cl. 313—487

1 Claim



1. A fluorescent lamp comprising a glass envelope having electrodes at its ends and containing a discharge-sustaining filling of mercury and inert gas, and two layers of different phosphors on the inner surface of the lamp envelope, the underlying phosphor layer increasing the maintenance of the overlying phosphor to a greater extent than if the underlying layer comprised the same phosphor as that of the overlying layer or if the only phosphor present were that of the overlying layer and in a weight about equal to that of both layers, wherein the overlying phosphor comprises manganese-activated magnesium gallate and the underlying phosphor comprises cerium terbium magnesium aluminate.

4,678,967

## FLUORESCENT DISPLAY PANEL

Yoichi Kadota, c/o NEC Corporation, 33-1, Shiba 5-chome, Minato-ku, Tokyo, Japan

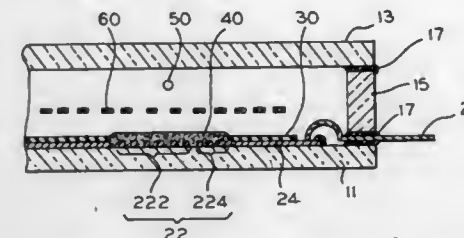
Filed Mar. 6, 1985, Ser. No. 708,676

Claims priority, application Japan, Mar. 6, 1984, 59-32025[U]

Int. Cl.<sup>4</sup> H01J 63/04

U.S. Cl. 313—497

11 Claims



1. A fluorescent display panel comprising: a transparent substrate having an anode segment formed thereon, said anode segment having phosphor provided thereon, said phosphor being excitable to emit light responsive to an electron bombardment thereof, means for forming a vacuum envelope enclosing said anode segment and phosphor, and means positioned above said phosphor for producing said electron bombardment within said envelope, said anode segment having first and second regions adjacent each other to pass predetermined amounts of said light therethrough, said second region of said anode forming a dim shadow image region of said light, said first region of said anode forming a bright main image region of said light, said shadow image and said bright main image forming a combined display pattern of bright and dim light observed through said transparent substrate, said dim shadow image of light being a reduced amount of said light which gives a sense of perspective to said bright light in said display pattern.

4,678,968

## HIGH INTENSITY DISCHARGE LAMP STARTING AND OPERATING APPARATUS

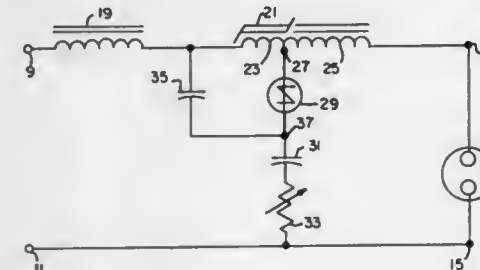
James N. Lester, Rockport, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Feb. 15, 1985, Ser. No. 702,107

Int. Cl.<sup>4</sup> H05B 37/00

U.S. Cl. 315—290

23 Claims



1. A high intensity discharge lamp starting and operating apparatus comprising:

a first pair of terminals formed for connection to an AC voltage source;

a second pair of terminals formed for connection to a high intensity discharge lamp;

a series-connected ballast means and step-up transformer coupled to one of said first and one of said second pair of terminals, said step-up transformer having primary and secondary windings with a tap therebetween;

a series-connected bilateral switch and AC impedance coupled to said step-up transformer tap and to the other one of

said first and the other one of said second pair of terminals; and

a charge storage means coupled to the junction of said ballast means and step-up transformer and to the junction of said bilateral switch and AC impedance whereby relatively high currents are converted to relatively high voltages and applied to a high intensity discharge lamp, said primary winding of the step-up transformer including a saturable core whereby voltage buildup on said charge storage means is effected.

4,678,969

## PSEUDO-RASTER WEATHER DISPLAY APPARATUS

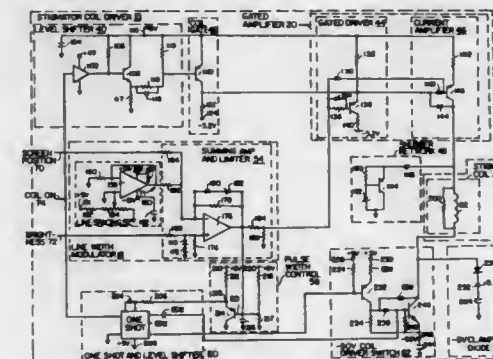
Kurt R. Schwerdt, Bolton, and Gerald B. Levine, Hudson, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 22, 1983, Ser. No. 506,928

Int. Cl.<sup>4</sup> H01J 29/38

U.S. Cl. 315—382

23 Claims



1. A display system comprising:

means for generating lines in a raster pattern with an energy beam on said display system;

means for defocusing said energy beam primarily in a direction normal to a movement of said beam for substantially filling in spaces between said lines in accordance with a control signal.

4,678,970

## POWER AS REQUIRED BEAM DEFLECTION SYSTEM FOR CRT DISPLAYS WITH RASTER SUPPLY SWITCHING

Winston W. Goldman, Scottsdale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed May 1, 1986, Ser. No. 858,149.

Int. Cl.<sup>4</sup> H01J 29/70, 29/76

U.S. Cl. 315—397

9 Claims

1. An electron beam magnetic deflection system for a cathode ray tube controllably operable to provide linear deflection in a stroke mode for random deflection of the beam and a raster mode for periodic deflection of the beam in a sequential pattern of raster lines, comprising:

input means for receiving an input signal indicative of a desired deflection of the beam and for providing an output signal responsive to said input signal,

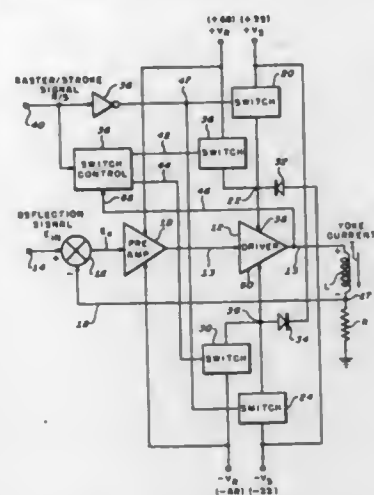
output means coupled to receive said output signal for providing a further output signal for controlling current in a deflection coil operatively coupled to said electron beam, and a desired beam deflection in a predetermined direction in accordance with the polarity of said further output signal,

first and second raster mode switches and first and second stroke mode switches,

means for applying stroke voltage sources of a predetermined magnitude and of a first polarity and an opposing polarity to said first and second stroke mode switches respectively in said stroke mode,



means for applying raster voltage sources of a further predetermined magnitude greater than said predetermined magnitude and of a first polarity and an opposing polarity respectively to said first and second raster mode switches in said raster mode, switch control means responsive to a raster/stroke signal for sequentially commanding said stroke mode or said raster mode of operation and further responsive to said further output signal from said output means for alternately en-



abling and disabling said first and second raster mode switches in said raster operating mode when generating said raster lines in accordance with the polarity of said further output signal, and for enabling said first and second stroke mode switches in said stroke mode, and first coupling means for coupling said output means to one of said stroke voltage sources, when one of said first and second raster mode switches is disabled in said raster mode of operation when generating said raster lines.

4,678,971

**LINEAR MOTOR AND CONTROL METHOD THEREOF**  
Hiroshi Kanazawa, Hitachi; Seizi Yamashita, Katsuta, and Kunio Miyashita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

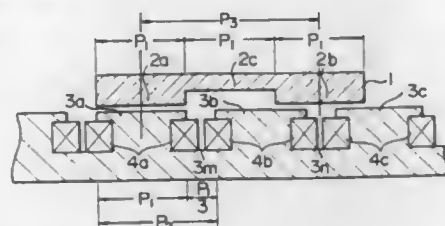
Filed Jan. 10, 1986, Ser. No. 817,623

Claims priority, application Japan, Jan. 14, 1985, 60-3370; Jan. 14, 1985, 60-3371; Jan. 14, 1985, 60-3372

Int. Cl.<sup>4</sup> H02K 41/00

U.S. Cl. 318-135

11 Claims



1. A linear motor comprising:

- a first magnetic pole including a plurality of first magnetic pole teeth of magnetic material having protruded and recessed parts extending in a longitudinal direction, each first magnetic pole tooth having a predetermined longitudinal length; and
- a second magnetic pole including a yoke, a plurality of second magnetic pole teeth of magnetic material having protruded and recessed parts, a coil assembly having a plurality of coils, a respective coil being wound on a

respective one of said second magnetic pole teeth, and permanent magnets, said yoke and said second magnetic pole teeth being opposed to said first magnetic pole teeth with slight gaps, a relative position of said first and said second magnetic pole teeth in a longitudinal direction being changeable, a longitudinal length of said protruded and recessed parts of said first magnetic pole and said protruded parts of said second magnetic pole being substantially equal to each other, a longitudinal length of said recessed parts of said second magnetic pole being substantially one-third of the longitudinal length of said protruded parts of said first magnetic pole, and a number of said protruded parts of said first magnetic pole being a multiple of two.

4,678,972

# SELF-STARTING SINGLE-PHASE BRUSHLESS DC MOTOR AND CONTROL THEREFOR

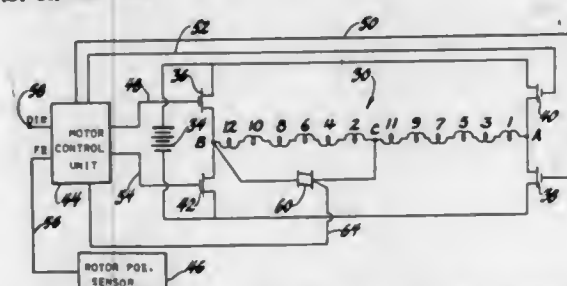
Richard N. Lehnhoff, Kettering, and Jack W. Savage, Centerville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 18, 1986, Ser. No. 908,730

Int. Cl.<sup>4</sup> H02P 1/22

U.S. Cl. 318-254

3 Claims



1. A self-starting brushless DC motor with symmetrical stator and rotor air gap geometry and control arrangement therefor, comprising in combination:

- a permanent magnet rotor, a multi-pole stator having a single-phase full winding disposed thereon, such full winding comprising two serially connected sections relatively displaced on the stator such that energization of the full winding defines a run mode magnetic field pole substantially midway between similar field poles of adjacent winding sections, a controlled switch element connected across one of the serially connected stator winding sections and selectively actuatable to short circuit such section, and a controller effective to energize the full winding with a source of direct current in accordance with the rotary position of the rotor to produce torque for turning the rotor in a desired direction, the controller being further effective when energizing the winding to initiate rotation of the rotor to momentarily actuate said controlled switch element if the rotor is in a null position for which such energization fails to produce sufficient torque for turning the rotor, thereby to momentarily shift the magnetic field pole in proportion to the relative displacement of the stator winding sections, and provide increased torque for successfully initiating turning of the rotor.

4,678,973

# SENSORLESS STARTING CONTROL FOR A BRUSHLESS DC MOTOR

James O. Elliott, Beavercreek, and Michael B. Monahan, West Carleton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1986, Ser. No. 916,369

Int. Cl.<sup>4</sup> H02P 6/02

U.S. Cl. 318-254

2 Claims

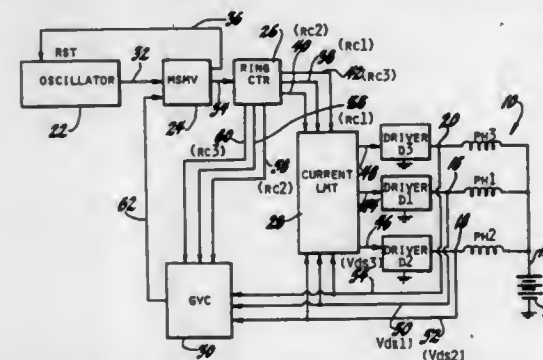
1. For a brushless DC motor having a permanent magnet

rotor, and three phase stator windings energizable to develop a magnetic field for producing torque for rotating the rotor, a controller for energizing the phase windings with a source of direct current for initiating the rotation of the rotor in a desired direction without the use of rotor position sensors, such controller comprising:

counter means defining a phase winding energization sequence corresponding to the sequence of generated voltages which occurs in said phase windings when the rotor is turning in the desired direction, such counter means being effective when clocked to deenergize the currently energized phase winding and energize the next winding of the energization sequence;

synchronous acceleration means effective if at the initiation of the current winding energization, the generated voltage in the next winding of the energization sequence is less than the generated voltage in the previous winding of the energization sequence, thereby indicating that the rotor is turning in the desired direction, for permitting the energization to continue, and thereafter for clocking the counter means in relation to the point at which the generated voltage in such next winding of the sequence becomes greater than the generated voltage in such previous winding of the sequence, whereby such energization produces positive synchronous torque if the rotor is turning in the desired direction; and

synchronous deceleration means effective if at the initiation of the current winding energization, the generated voltage in the next winding of the energization sequence is already



greater than the generated voltage in the previous winding of the energization sequence, thereby indicating that the rotor is turning in the wrong direction and that such energization is producing positive torque for accelerating the rotor in the wrong direction, for clocking the counter means substantially without delay, whereby if the rotor is turning in the wrong direction, the production of positive torque is interrupted, and the energization sequence is effectively reversed to produce synchronous negative torque by energizing the next winding of the sequence.

2. For a brushless DC motor having a permanent magnet rotor, and three phase stator windings energizable to develop a magnetic field for producing torque for rotating the rotor, a method of energizing the phase windings with a source of direct current for initiating the rotation of the rotor in a desired direction without the use of rotor position sensors, such method comprising the steps of:

- defining a phase winding energization sequence corresponding to the sequence of generated voltages which occurs in said phase windings when the rotor is turning in the desired direction;
- initially energizing a given one of said phase windings without knowledge of the rotor position or direction of rotation, and comparing the generated voltages thereby produced in the two deenergized phase windings;
- continuing the energization of said given phase winding until a time determined in relation to the point at which the generated voltage in the next winding of the energization sequence becomes greater than the generated voltage in the previous winding of the energization sequence, if upon

energization of the given phase winding, the generated voltage in such next winding is less than the generated voltage in such previous winding, thereby indicating that the rotor is turning in the desired direction, whereby the energization of said given winding produces synchronous positive torque for accelerating the rotor if such energization causes the rotor to turn in the desired direction; and interrupting the energization of said given phase winding substantially without delay and energizing the next winding of the energization sequence, if upon energization of the given phase winding, the generated voltage in the next winding of the energization sequence is already greater than the generated voltage in the previous winding of the energization sequence, thereby indicating that the rotor is turning in the wrong direction and that the energization of the given winding is producing positive torque for accelerating the rotor in the wrong direction, whereby the defined energization sequence is effectively reversed to produce synchronous negative torque for decelerating the rotor if the energization of the given winding causes the rotor to turn in the wrong direction.

4,678,974

# PULSATING CURRENT ELECTROMOTOR WITHOUT COMMUTATOR

Fausto Guastadini, Frazione Tuffo Centro, 6, 14023 Cocconato (AT), Italy

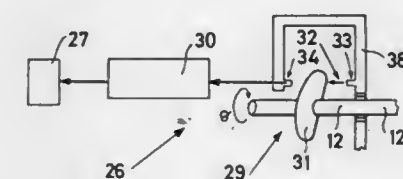
Continuation of Ser. No. 668,166, Nov. 1, 1984, abandoned. This application May 14, 1986, Ser. No. 865,902

Claims priority, application Italy, Nov. 7, 1983, 68156 A/83

Int. Cl.<sup>4</sup> H02K 29/10

U.S. Cl. 318-254

3 Claims



1. A pulsating current brushless electric motor comprising: a rotor fixed to a rotating shaft, said rotor comprising magnetic poles diametrically opposed to one another relative to the shaft and extending over the greater part of the circumference of said shaft, the poles having an opposite polarity with respect to one another; a stator formed by a substantially cylindrical hollow body within which the rotor is arranged, the stator comprising stator slots uniformly spaced about the inner circumference of said stator, distinct stator multiple layer windings contained within said slots, each distinct stator winding following the internal perimeter of said stator slots so as substantially to cover the internal surface of the stator, and which, at the outlet from each slot, are traversed by current always in the same direction; detector means comprising an opaque member fixed to said shaft, said member having an arcuate extent equal to 360° divided by said number of windings, said member cooperating with photodiodes, one photodiode being associated with each of said multiple layer windings, such that said opaque member alternately interrupts and restores a beam of light transmitted by each of said photodiode, said photodiode further being uniformly distributed about the circumference of the shaft; electronic means controlling power distribution to the stator windings, said electronic means being responsive to the angular displacement of the rotor as communicated by the interruption of the photodiode beam corresponding to its associated stator winding; and a power source from which the motor components receive their power.

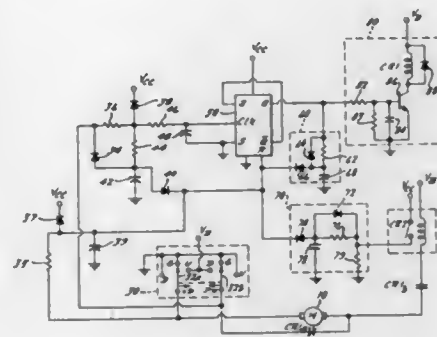
# 4,678,975 MOTOR CONTROL CIRCUIT FOR MOTOR DRIVEN POWER WINDOWS

Robert J. Vrabel, Sterling Heights; Jeffery L. Vajgart, Dearborn; Lawrence E. Staszal, Dearborn Heights; Henry J. Ewald, Livonia; Norman M. Haygood, Jr., Canton, and Leon M. Misewicz, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 6, 1986, Ser. No. 816,659  
Int. Cl. H02P 1/22, 3/08

U.S. Cl. 318—266

9 Claims



7. A one-touch down control circuit for controlling the electrical energization of a window drive motor in an automotive vehicle comprising:

a manually actuated switch means defining an unactuated "OFF" position and separately actuated "UP" and "DOWN" positions;

means connected between said switch means and said motor for automatically energizing said motor to drive said window in its downward direction when and after said switch means is actuated to its "DOWN" position for a time period that does not exceed a first predetermined period of time and for deenergizing said automatically energized motor after said switch means is subsequently actuated and returned to its "OFF" position; and

means connected to said energizing means for sensing current levels in said motor and to cause said energizing means to deenergize said automatically energized motor when said current level in said motor exceeds a predetermined level for a second predetermined period of time.

9. A motor control circuit for energizing a reversible D.C. motor comprising:

a source of D.C. energy;

switching means being manually actuatable to control the direction of rotation of said motor through the application of D.C. energy from said source to selected terminals of said motor;

circuit means connected to said switching means, said source and said motor for responsively applying energy from said source to said motor when said switching means is actuated to control the rotation of said motor in a first predetermined direction and the duration of actuation is less than a first predetermined period of time and continuing said application for a second period of time that extends past said first predetermined period of time;

said circuit means also being responsive to subsequent actuation and release of said switching means during said second period of time to deenergize said motor and responsive to the actuation of said switching means for a duration longer than said first predetermined period of time to apply energy from said source to said motor only for said longer duration.

# 4,678,976 PATH-CONTROLLED MACHINING METHOD

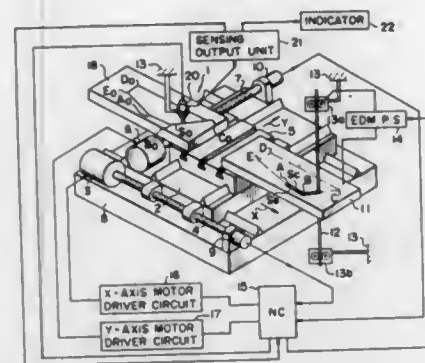
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Inc., Kanagawa, Japan

Continuation-in-part of Ser. No. 646,623, Aug. 31, 1984, Pat. No. 4,605,886. This application Mar. 13, 1986, Ser. No. 839,792  
Claims priority, application Japan, Sep. 2, 1983, 58-160419; Sep. 16, 1983, 58-169395

Int. Cl. G05B 19/36

U.S. Cl. 318—577

6 Claims



1. A method of machining a workpiece to generate a desired contour therein by means of a numerically path-controlled machine tool having first support means for supporting an electrically conductive workpiece, tool-support means supported by second support means for positioning a tool member in machining relationship with said workpiece in a machining operation and drive means drivingly coupled with at least one of said first and second support means and operable in response to a predetermined sequential set of numerical commands for relatively displacing the first and second support means to correspondingly relatively displace said tool member and said workpiece along a prescribed machining feed path as to generate a desired machined contour in said workpiece during said machining operation, said method comprising the steps of:

in a preliminary operation in advance of said machining operation, furnishing said drive means with said predetermined sequential set of numerical commands whereby the consequent relative displacement between said first and said second support means results in the generation of output signals representing the actual relative movements of a tool member and a workpiece respectively affixable to said second and first support means;

recording said output signals and generating with the thus-recorded output signals a visible trace upon an electronic display screen;

in said machining operation, disposing and maintaining sensing means in a fixed positional relationship with one of said support means and in sensing relationship with a given point fixedly related to the other of said support means so that said sensing means outputs a position signal monitoring the actual contour formed by said tool means in said workpiece during said machining operation;

displaying a visible trace representing said position signal progressively with advance of said machining contour on said screen in superimposition at least in part with the first-mentioned trace as said drive means relatively displaces said first and second support means in said machining operation by said predetermined sequential set of numerical commands, the coincidence of said traces representing proper progress of the machining operation; and terminating the machining operation upon deviation of the visible trace on said screen representing said position signal from the first-mentioned trace by more than a predetermined degree.

# 4,678,977 SETPOINT CONTROLLER

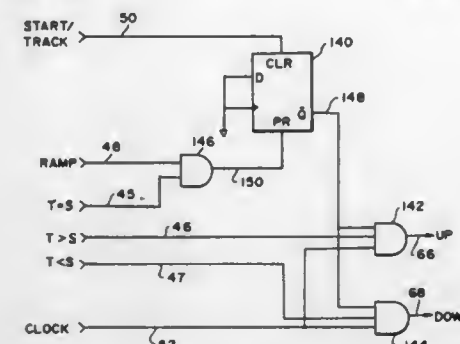
Harry H. Burlingame, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 15, 1985, Ser. No. 787,519

Int. Cl. G05B 19/28

U.S. Cl. 318—601

15 Claims



1. A setpoint controller, comprising:  
target means operative to store a digital target value;  
control means for enabling an operator of the setpoint controller to control the target value;  
setpoint means operative to store a digital setpoint value; and  
comparison means operative when the setpoint value is not equal to the target value for causing the setpoint value to change at a selected rate toward the target value.

# 4,678,978 QUIETING CIRCUITS FOR PERMANENT MAGNET SYNCHRONOUS MOTORS

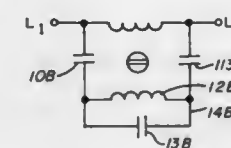
Harold W. Curtis, Stoughton, Mass., assignor to Brookfield Engineering Laboratories, Inc., Stoughton, Mass.

Continuation of Ser. No. 537,099, Sep. 29, 1983, abandoned, which is a continuation of Ser. No. 241,399, Mar. 6, 1981, abandoned. This application Jul. 12, 1985, Ser. No. 754,334

Int. Cl. H02K 19/02

U.S. Cl. 318—690

10 Claims



1. A quieting circuit with a permanent magnet, fully synchronous absolute speed electric motor, the circuit including a first lead provided with a coil between first and second lines, a parallel lead between the first and second lines provided with a phase shifting capacitor and a phase shifted coil, and a lead in parallel with the phase shifted coil between the phase shifting capacitor and the second line and including means to bypass a minor percentage of the total watts motor input, said means including at least one capacitor.

# 4,678,979 APPARATUS FOR CONTROLLING THE CARRIAGE OF A PRINTER

Masaaki Hori, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 3, 1986, Ser. No. 881,613

Claims priority, application Japan, Jul. 4, 1985, 60-147372

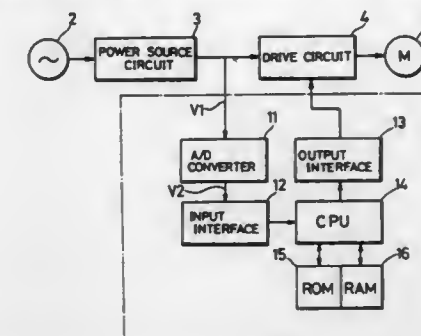
Int. Cl. H02P 8/00

U.S. Cl. 318—696

3 Claims

1. An apparatus for controlling the carriage of a printer with a stepping motor, for reciprocating the carriage having a printing head mounted thereon, comprising a power source circuit, a drive circuit for driving said stepping motor with electric

power supplied from said power source circuit, and a controller which controls said drive circuit;  
wherein said controller is provided with voltage detecting means for detecting the magnitude of the voltage supplied



from said power source circuit, and delay control means for delaying the initiating of the drive of said stepping motor at each end of the reciprocating motion of said carriage according to said magnitude of detected voltage supplied from said voltage detecting means.

# 4,678,980 POWER FAILURE STOP CIRCUIT FOR A CONVERTER

Shigeyuki Sugimoto, Masayuki Kato, and Katsuhiko Chonan, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

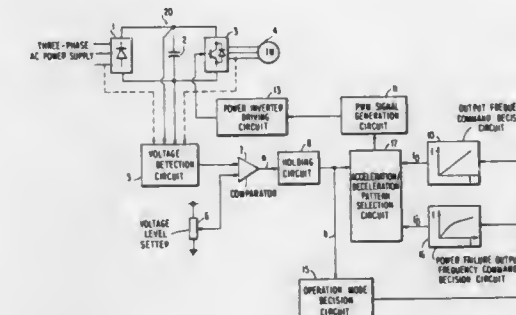
Filed Oct. 27, 1986, Ser. No. 923,543

Claims priority, application Japan, Oct. 31, 1985, 60-244613

Int. Cl. H02P 3/18

U.S. Cl. 318—759

5 Claims



1. A power failure stop circuit for a converter (20) including a power rectifier unit (1) and a power inverter unit (3), comprising:

(a) a voltage detection circuit (5) for detecting an operating voltage in said converter;

(b) a voltage level setter (6) for establishing a reference voltage signal;

(c) a comparator (7) for comparing the reference voltage signal with the converter operating voltage, and for outputting a power failure signal when said operating voltage becomes lower than said reference voltage;

(d) an operation mode decision circuit (15) for comparing a target speed command ( $f_r$ ) with an output frequency command ( $f_o$ ) to determine a normal operating mode for said converter and for outputting an overriding deceleration mode signal irrespective of the normal operating mode at the time of a power failure;

(e) an output frequency command decision circuit (10) for generating a first frequency command in accordance with said normal operating mode determination;

(f) a power failure output frequency command decision



circuit (16) for generating a second frequency command in accordance with an internally stored deceleration pattern established exclusively for power failures in response to an overriding deceleration mode signal from the operation mode decision circuit;

- (g) an acceleration/deceleration pattern selection circuit (17) for selecting the first frequency command from the output frequency command decision circuit when no power failure signal is present, and the second frequency command from the power failure output frequency command decision circuit when a power failure signal is present;
- (h) a PWM signal generation circuit (11) responsive to a frequency command selected by the acceleration/deceleration pattern selection circuit for generating a converter control signal; and
- (i) a driving circuit (13) for switching power inverter unit elements to control a motor speed in accordance with the control signal from the PWM signal generation circuit such that a deceleration mode is automatically implemented in the event of a power failure to regeneratively brake the motor.

4,678,981

# PORTABLE POWER SOURCE FOR MOBILE STORAGE CARRIAGE

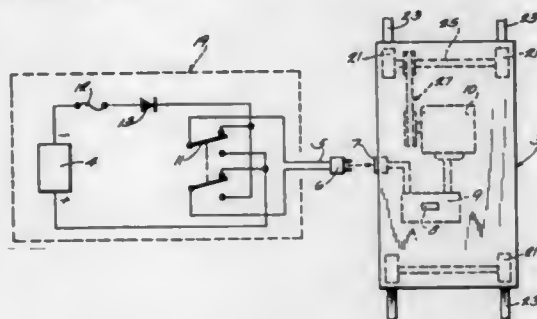
William P. Murray, Ft. Atkinson, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Aug. 1, 1986, Ser. No. 891,617

Int. Cl.<sup>4</sup> A43B 53/00, 87/00

U.S. Cl. 320—2

7 Claims



1. In combination with a mobile storage system having at least one carriage mounted for movement along rails; motor means for powering the carriage along the rails; and circuit means for controlling the motor means, apparatus for providing electrical power to the carriage comprising:

- a portable source of electrical power comprising:
  - at least one electric battery;
  - switch means in series with the battery for controlling the polarity of the electric current from the battery;
  - a hand held casing enclosing the battery and switch means; and
  - connector means extending from the casing for distributing the electric power from the switch means;
- an electrical receptacle mounted to the carriage, the receptacle being adapted to receive the connector means of the portable power source, the receptacle being electrically connected to the circuit means for controlling the motor means and connected to the motor means; and
- an electrical switch in series with the circuit means for controlling the motor means and a associated with the receptacle, the switch being operable to open when the connector means is inserted into the receptacle to thereby open the circuit means for controlling the motor means, so that the portable source of power provides electric power to the motor means for moving the carriage in selected directions along the rails.

4,678,982

# SUPPLEMENTAL AUTOMOTIVE VEHICULAR HEATER SYSTEM AND METHOD OF PROVIDING SAME

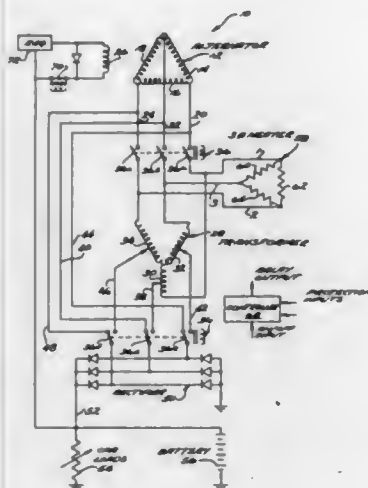
Stephen B. Offler, 222A Park St., Attleboro, Mass. 02703; Peter G. Berg, 60 Towne St., and Keith W. Kawate, 12 Virginia St., both of Attleboro Falls, Mass. 02763

Filed Apr. 16, 1986, Ser. No. 852,484

Int. Cl.<sup>4</sup> H02J 7/14; B60L 1/02

U.S. Cl. 322—8

14 Claims



1. An automotive vehicle having an engine and a plurality of electrical loads, an alternator having a field winding driven by the engine to provide electrical power for such loads, a voltage regulator for controlling the field winding energization, a battery for supplementing the electrical power provided by the alternator when needed and for turning over the engine upon start up, the alternator having a stator with three windings, the windings coupled together to provide a three phase output on three output lines, the output lines connected to a rectifier which in turn is connected to a circuit including the plurality of electrical loads and the battery, the voltage regulator controlling the level of energization of the alternator field in order to provide a selected voltage level in the circuit characterized in that transformer means are coupled between the three windings and the rectifier and an electrical resistor heater is coupled to the output lines intermediate the windings and the transformer means.

4,678,983

# DC POWER SUPPLY WITH ADJUSTABLE OPERATING POINT

Christian Rouzies, Toulouse, France, assignor to Centre National d'Etudes Spatiales, Paris, France

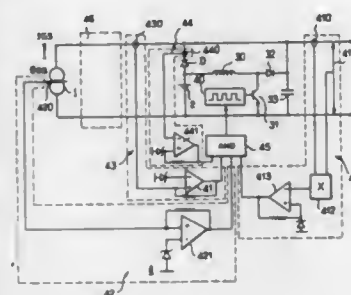
Filed Jan. 24, 1986, Ser. No. 822,215

Claims priority, application France, Jan. 25, 1985, 85 01062

Int. Cl.<sup>4</sup> G05F 5/00

U.S. Cl. 323—222

13 Claims



1. A DC power supply having an adjustable current/voltage

(I/V) operating point comprising a source of electrical energy, of a current generator type connected in parallel with a buffer storage assembly comprising a constant voltage element connected in series with a one-way conductor said power supply being intended to power a useful load assembly having a hyperbolic power consumption characteristic of a rectangular hyperbola type ( $I=P/V$ , where P is its power consumption), and said source of electrical energy having an output characteristic of current as a function of voltage I(V) having two points of intersection with said hyperbolic power consumption characteristic, and voltage-raising means having an output connected in parallel with said useful load, and capable of temporarily raising the power supply voltage fed to said load.

4,678,984

# DIGITAL POWER CONVERTER INPUT CURRENT CONTROL CIRCUIT

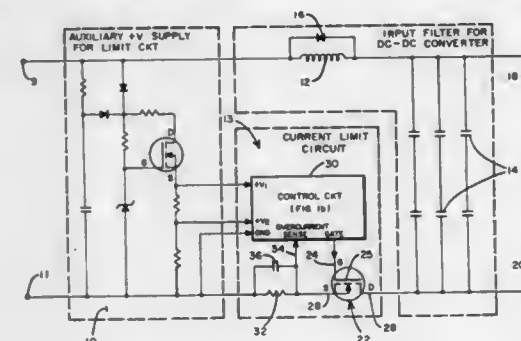
Christopher P. Henze, Eagan, Minn., assignor to Sperry Corporation, Blue Bell, Pa.

Filed Apr. 21, 1986, Ser. No. 854,243

Int. Cl.<sup>4</sup> G05F 1/44

U.S. Cl. 323—285

4 Claims



1. An input current control having a normal operating range, coupled between an input power supply means connectable to a source of electrical power and output means connectable to a load, comprising current limit means comprising control means, current regulating means having a control terminal and a current path coupled between said input power supply means and said output means which may be selectively opened and closed in response to a control signal applied to said control terminal wherein said control signal determines whether said current path is opened or closed, and said control signal controls the magnitude of current flowing in said current path when said path is closed, inrush/normal, operation circuit means coupled to said input power supply means constructed to supply said control signal to said control terminal so as to cause said regulating means to close said current path between said input power supply means and said output means when said control signal reaches a predefined threshold magnitude, and so as to cause said regulating means to control the current flowing in said current path during normal operation of said input current control circuit, current sensing means for sensing the current flowing through said current path and signal-control means coupled to said current sensing means and to said control terminal for assuming control of said current regulating means in response to said current sensing means such that said current path will be opened upon the sensing by said current sensing means of a current flowing through said current path which is greater than a predefined overcurrent magnitude.

4,678,985

# TWO-TERMINAL LINE-POWERED CONTROL CIRCUIT

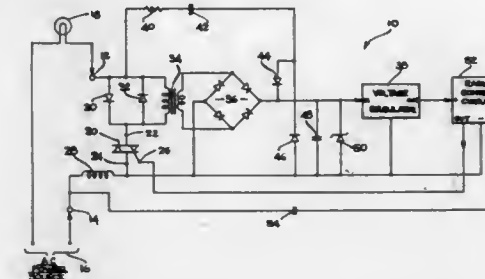
Jeffrey M. Moskin, Los Angeles, Calif., assignor to Novitas, Inc., Santa Monica, Calif.

Filed Oct. 31, 1986, Ser. No. 925,607

Int. Cl.<sup>4</sup> G05F 3/02

U.S. Cl. 323—324

5 Claims



1. A control circuit comprising in combination: bidirectional switch means having first and second main terminals and a control terminal used for triggering the switch means into conduction; bidirectional voltage regulator means for maintaining a relatively constant voltage drop across said means over a wide range of current passing through said means in either direction; means for connecting the bidirectional switch means in series with the bidirectional voltage regulator means to form a first series circuit whereby a bidirectional current path is established through the first series circuit when the switch means is triggered into conduction; first and second circuit terminals; means for connecting the circuit terminals to a load circuit which includes a load connected in series with an AC power source; means for connecting the first series circuit to the circuit terminals, whereby when the bidirectional current path is established, the load is energized by the power source; transformer means having a primary and a secondary winding; first rectifier means; means for connecting the primary winding of the transformer in parallel with the bidirectional voltage regulator means; means for connecting the first rectifier means to the transformer secondary winding to rectify the voltage appearing across said winding, said rectified voltage appearing at a first pair of rectified voltage terminals when the switch means is conducting; second rectifier means; current limiter means; means for connecting the current limiter means and the second rectifier means to the two circuit terminals to provide a current limited and rectified voltage to a second pair of rectified voltage terminals in response to the voltage appearing across the circuit terminals when the switch means is not conducting; means for connecting the first pair of rectified voltage terminals in parallel with the second pair of rectified voltage terminals; energy storage means; means for connecting the energy storage means to the first pair of rectified voltage terminals to filter the rectified voltage appearing thereacross; controller means for providing a control signal; means for connecting the controller means to the control terminal of the switch means whereby the control signal acts to trigger the switch means into conduction; and means for connecting the controller means to the energy

storage means, whereby the controller means derives its operating power from the filtered rectified voltage.

4,678,986

# ELECTRIC TRANSFORMER WITH SELECTIVELY ENERGIZED MODULAR CIRCUITS

Louis Barthelemy, Résidence Longchamp, 78770 Thoiry, France  
Continuation of Ser. No. 497,013, May 23, 1983, abandoned.

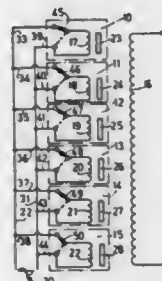
This application Apr. 24, 1986, Ser. No. 856,449

Claims priority, application France, May 25, 1982, 82 08998

Int. Cl.<sup>4</sup> G05F 3/00

U.S. Cl. 323-343

7 Claims



1. An electric transformer for supplying an adjustable electric output magnitude, including several modules having therebetween a binary progression relationship with respect to their power handling capability and being associated with respective switching means for selectively rendering them operative or inoperative, each module having at least one primary circuit input coil, said primary circuit input coils being connected through said switching means in parallel to a common AC voltage supply source, the primary coils of each of said modules cooperating with one single secondary circuit output coil which is common to all of said modules, through respective separate magnetic circuits, said switching means being so connected as to neutralize the effect of the electric induction of the respective primary coils on said common secondary output coil, while maintaining the magnetic activity of said magnetic circuits.

4,678,987

# FEATURE EXTRACTOR FOR QUASI-PERIODIC SIGNALS

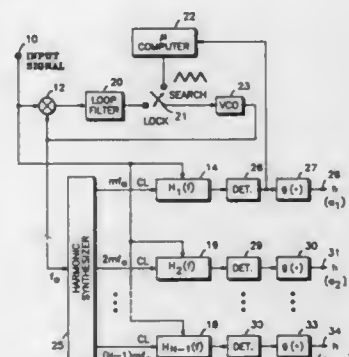
Jerald L. Bauck, Urbana, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Oct. 7, 1985, Ser. No. 784,970

Int. Cl.<sup>4</sup> G01R 23/16

U.S. Cl. 324-77 R

8 Claims



1. A feature extractor comprising:  
a feature extractor signal input adapted to have a quasi-peri-

odic signal applied thereto, said quasi-periodic signal including a fundamental frequency and harmonics thereof; fundamental frequency generating means connected to said feature extractor signal input for receiving a quasi-periodic signal applied thereto and generating a fundamental frequency signal therefrom;

harmonic synthesizer means connected to said fundamental frequency generating means for receiving the generated fundamental frequency signal and providing at separate outputs the fundamental frequency signal and harmonic frequency signals equal in frequency to the harmonics of the quasi-periodic signal; and

a plurality of clocked bandpass filters each having a signal input, a signal output and a clock input, the signal inputs of said first and second filters being connected to said feature extractor signal input, the clock input of said first filter being connected to the fundamental frequency signal output of said harmonic synthesizer means, the clock inputs of said remaining filters being connected to the corresponding harmonic frequency signal outputs of said harmonic synthesizer means, and the signal outputs of said filters providing indications of the amount of fundamental frequency and harmonic, respectively, in the received quasi-periodic signal.

4,678,988

# METHOD AND APPARATUS FOR SPECTRAL ANALYSIS OF A SIGNAL AT A MEASURING POINT

Hans-Detlef Brust, Dudweiler, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Manich, Fed. Rep. of Germany

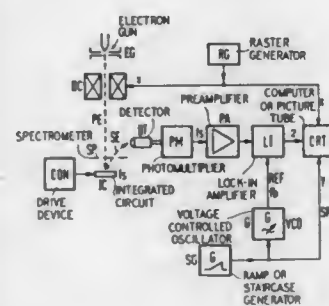
Filed Mar. 28, 1985, Ser. No. 717,104

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420269

Int. Cl.<sup>4</sup> G01R 31/28

U.S. Cl. 324-158 R

13 Claims



1. A method for detecting and imaging a measuring point of a specimen which carries a voltage of at least one frequency, with the assistance of a microscope, comprising the steps of:  
radiating the measuring point with a primary beam to cause emission of secondary radiation representing the voltage at the measuring point;  
detecting and converting the secondary radiation into a signal representing the voltage at the measuring point;  
applying a reference signal to a variable-frequency filter to define the center frequency of the filter;  
filtering the detected and converted signal with the variable-frequency filter to produce a measuring signal dependent on the center frequency of the filter;  
applying a reference signal to a recording device to define the center frequency; and  
applying the measuring signal to and recording the measuring signal with the recording device.

4,678,989

# OPTICAL ABSORPTION SPECTROSCOPY FOR SEMICONDUCTORS

Peter Blood, Dorking, England, assignor to U.S. Philips Corporation, New York, N.Y.

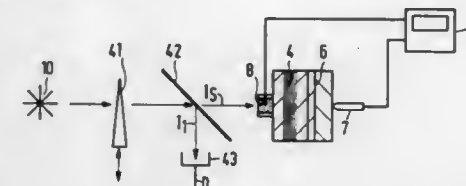
Filed Mar. 19, 1985, Ser. No. 713,525

Claims priority, application United Kingdom, Apr. 23, 1984, 8407621

Int. Cl.<sup>4</sup> G01R 31/26, 15/12

U.S. Cl. 324-158 D

26 Claims



13. An apparatus for spectroscopically analyzing optical absorption in a semiconductor sample comprising

a substrate, a first cladding layer on said substrate, a semiconductor sample layer on said first cladding layer, and a second cladding layer on said sample layer, said first and second cladding layers having a larger band gap than said sample layer, wherein said sample layer and said first and second cladding layers are all of one conductivity type, and said substrate is of an opposite conductivity type, and wherein a p-n junction between said substrate and said first cladding layer is sensitive to optical radiation of a wavelength above absorption edges of said first and second cladding layers,

first electrode means for contacting said substrate, second electrode means transparent to optical radiation for contacting said second cladding layer, radiation means for directing monochromatic optical radiation to said sample layer through said transparent second electrode means, and

first means for deriving a signal from said first and second electrode means, said signal being related to a voltage generated across said p-n junction by a photovoltaic effect, and said signal indicating absorption in said semiconductor sample layer of said optical radiation.

4,678,990

# MOTOR MONITOR SIGNAL ANALYSIS SYSTEM

John Bicknell, Rudgwick, and Stephen O'Brien, Horsham, both of England, assignors to Bonar Bray Limited, Hertfordshire, England

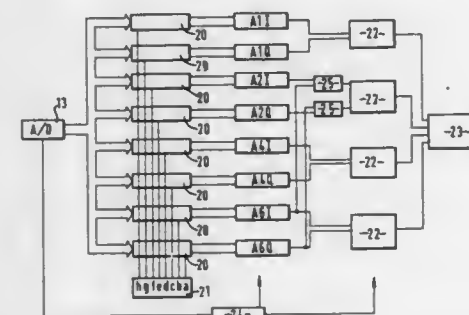
Filed Nov. 5, 1985, Ser. No. 795,197

Claims priority, application United Kingdom, Nov. 8, 1984, 8428199

Int. Cl.<sup>4</sup> G01R 31/12, 23/16, 23/00

U.S. Cl. 324-158 MG

10 Claims



1. A magnetic field motor monitor for monitoring a motor driven by a line supply having a line frequency, said monitor

having a signal analysis system comprising means for taking instantaneous samples of the motor magnetic field at accurately determined and equally spaced times synchronized with the line frequency driving the motor, a plurality of separate memories, means for adding the current instantaneous sample value to or subtracting it from the contents of each separate memory, addition or subtraction taking place in dependence on which of the samples is being processed, and each said addition or subtraction for the sample being processed being performed before the occurrence of the next sample, means coupled to the memories for providing from the contents of the memories signals indicative of respective amplitudes of a number of harmonically related frequency components of the motor magnetic field and register means for holding a status word which determines whether the next sample is to be added to or subtracted from each separate memory.

4,678,991

# INDUCTIVE DISPLACEMENT TRANSDUCER WITH UNIPOLAR OUTPUT

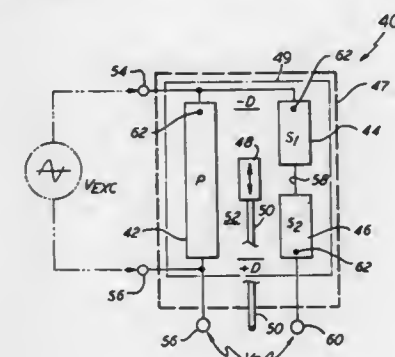
Samuel Schmidt, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 18, 1985, Ser. No. 799,534

Int. Cl.<sup>4</sup> G08C 19/08, G01B 7/14

U.S. Cl. 324-207

8 Claims



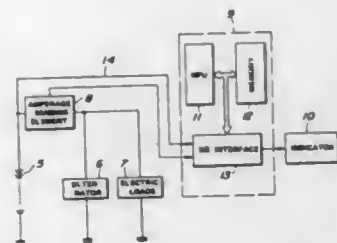
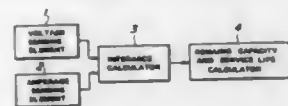
1. Apparatus for providing a signal indication of the position of the shaft of a controlled displacement device, within a range of displacement, in a system having a source of alternating current (AC) voltage excitation signals, comprising:

a housing; and  
an inductive displacement transducer enclosed within said housing and having a bobbin assembly with a central air gap, a movable magnetic core having a shaft extending through said housing and adapted for movement through said air gap in response to movement of said shaft, a primary winding disposed on said bobbin and connected through first and second transducer terminals to the source of AC voltage excitation signals, and two series opposed secondary windings disposed on said bobbin and connected between said first terminal and a third transducer terminal, in series with said primary winding, for providing oppositely phased secondary voltage signals by transformation of the primary winding AC voltage excitation signal at said first and second terminals, said secondary voltage signals varying oppositely in amplitude between minimum and maximum values in response to displacement of said core through said air gap, to provide the sum magnitude of said primary winding signal and said series opposed secondary signals, as a unipolar signal indication of core position over the range of displacement, at said second and third terminals.





extracting frequency components the detected terminal voltage and amperage signals at predetermined frequencies; computing internal impedances of the storage battery at said predetermined frequencies from the voltage and amperage frequency components; and



determining the remaining capacity and remaining service life of the storage battery at said predetermined frequencies derived from the computed internal impedances, said determining step being carried out in accordance with predetermined relationships between the internal impedance, remaining capacity and remaining service life of the storage battery for each of said frequencies.

4,678,999

## CHARGE DEPLETION METER

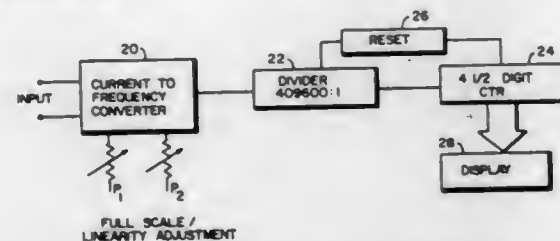
Josef F. Schneider, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 27, 1984, Ser. No. 675,174

Int. Cl.<sup>4</sup> G01N 27/46

U.S. Cl. 324-427

6 Claims



1. A charge depletion meter apparatus comprising in combination:

- a sensing means connected to a battery source to sense the amount of charge flowing therethrough, said sensing means providing a charge signal,
- a current to frequency converter means coupled to said sensing means to receive said charge signal therefrom, said current to frequency converter means converting said charge signal to a digital signal which is representative thereof,
- a divider means coupled to said current to frequency converter means to receive said digital signal therefrom, said divider means dividing said digital signal by a predetermined number, said divider means providing an output pulse signal,
- a decimal counter means coupled to said divider means to receive said output pulse signal, said decimal counter means accumulating said output pulse signal,
- reset means coupled respectively to said divider means and said decimal counter means for manually resetting both to zero, and,
- a display means coupled to said decimal counter means to

receive said output pulse signal therefrom, said display means displaying said output pulse signal.

4,679,000

## BIDIRECTIONAL CURRENT TIME INTEGRATION DEVICE

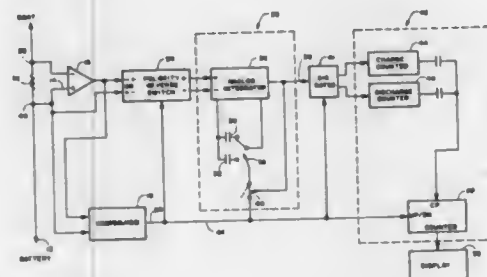
Robert Clark, 1341 Rosecrans St., San Diego, Calif. 92106

Filed Jun. 20, 1985, Ser. No. 746,751

Int. Cl.<sup>4</sup> H02J 7/00; G01R 11/00

U.S. Cl. 324-428

9 Claims



1. A bidirectional current-time integration device for use in a circuit in which current direction changes repeatedly, the device comprising:

- current sensor means connected in series with a circuit in which the current direction changes repeatedly, for producing a source signal proportional to the current through the circuit which changes polarity when the current changes direction;
- integrator means which includes an amplifier responsive to said source signal for producing a stream of output pulses at a rate dependent on the magnitude of current through the current sensor means, each pulse representing the accumulation of a given unit of integrated current-time;
- bidirectional counter means including a first storage means for accumulating said source signal with time when said current is in one direction and a second storage means for accumulating said source signal when said current is in the opposite direction, said first and second storage means comprise a pair of integration capacitors, and integrator switch means for selectively switching from one storage means to the other storage means each time the current changes direction, said integrator switch means comprises a switch responsive to said current direction for selectively connecting one of said capacitors across said amplifier and disconnecting the other capacitor each time the current changes direction, such that any partial charge on the disconnected capacitor is stored, one of said capacitors being connected across said amplifier when the current is in one direction and the other capacitor being connected across the amplifier when the current is in the opposite direction, said amplifier having inputs from connection to said source signal, polarity reversing switch means being connected across said input and responsive to changes in current direction to reverse the polarity of said amplifier inputs, said first and second storage means storing any partial unit of integrated current-time present on said storage means when disconnected until the next current direction change.

4,679,001

## ADAPTIVE STOP-NOTCH FILTER

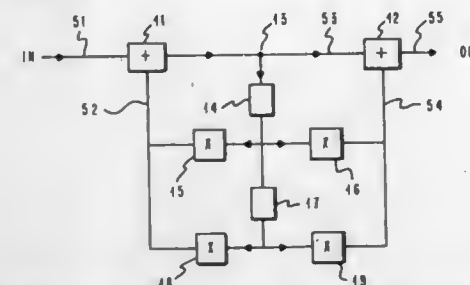
Lynn P. West, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,912

Int. Cl.<sup>4</sup> H03B 1/04

U.S. Cl. 328-167

7 Claims



1. A filter for suppressing energy at time varying frequencies, comprising:

- at least two multiplier sections the first of said two multipliers sections being connected in a feedback path between the output and an input of a first adder and the second being connected between a delayed output of said just adder and said input thereof; and,
- means for dynamically varying said at least two multiplier sections for operation between at least two time varying frequencies, whereby said filter dynamically suppresses energy at said at least two time varying frequencies.

4,679,002

## ELECTROMAGNETICALLY SHIELDED NARROW BAND ELECTROENCEPHALOGRAPHIC AMPLIFIER

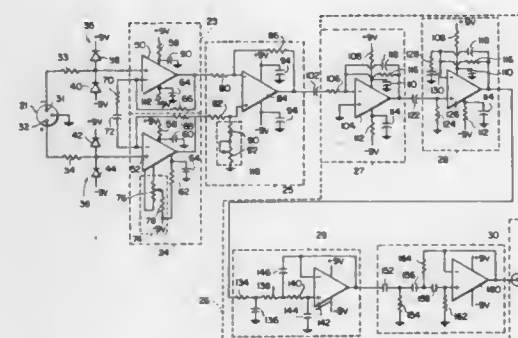
Gary W. Sherwin, South Huntingdon Township, Westmoreland County, and John M. Zomp, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,056

Int. Cl.<sup>4</sup> H03F 1/00; A61B 5/04

U.S. Cl. 330-66

10 Claims



1. An amplifier receiving first and second input signals indicating electrical potential of skin at two locations, said amplifier comprising:

- first and second impedance means, operatively connectable to receive the first and second input signals, respectively, for providing a constant impedance to the first and second input signals and for outputting first and second internal signals, respectively, the constant impedance provided by each of said first and second impedance means being substantially equal;
- differential amplifier means for subtracting the first internal signal from the second internal signal to produce a third internal signal;
- filter means for filtering and amplifying the third internal signal to produce a narrow band output signal;
- internal power source means for providing power to said

first and second impedance means, said differential amplifier means and said filter means; and

shield means for completely surrounding and electromagnetically shielding said first and second impedance means, said differential amplifier means, said filter means and said internal power source means from external electrical and magnetic signals, said shield means comprising:

- a metal enclosure completely surrounding said first and second impedance means, said differential amplifier means and said filter means thereon;
- a ground plane circuit board, enclosed by said metal enclosure, for mounting said first and second impedance means, said differential amplifier means and said filter means thereon;

an input jack, having an electromagnetic shield case mounted on said metal enclosure, operatively connectable to receive the first and second input signals;

first and second clipping means, mounted on said ground plane circuit board, surrounded by said metal enclosure and operatively connected to said first and second impedance means, respectively, and to said input jack, for clipping the first and second input signals, respectively, at predetermined voltage levels; and

electromagnetically shielded output means for penetrating said metal enclosure to provide egress for the narrow band output signal.

4,679,003

## FREQUENCY DIVIDER CIRCUIT AND FREQUENCY SYNTHESIZER USING THE SAME

Morikazu Sagawa, Hachioji; Yoshikazu Mori; Motoi Ohba, both of Kawasaki; Mitsuo Makimoto, Yokohama, and Sadahiko Yamashita; Sagami-hara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

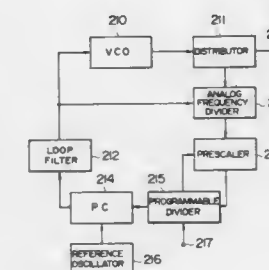
Division of Ser. No. 709,288, Mar. 7, 1985. This application Sep. 9, 1986, Ser. No. 905,262

Claims priority, application Japan, Mar. 9, 1984, 58-45802; Mar. 9, 1984, 59-45803; Jul. 27, 1984, 59-157827

Int. Cl.<sup>4</sup> H03L 7/04

U.S. Cl. 331-1 A

14 Claims



1. A frequency synthesizer comprising:

- a voltage-controlled oscillator oscillating at a frequency corresponding to an input voltage;
- a first analog frequency divider for frequency dividing an output of said oscillator;
- a second frequency divider for frequency dividing an output of said first frequency divider;
- a phase comparator for comparing an output of said second frequency divider with an output of a reference oscillator and for generating an output proportional to a phase difference between the output of said second frequency divider and the output of said reference oscillator; and
- a loop filter for eliminating an AC component from the output of said phase comparator, an output of said loop filter being applied to said voltage-controlled oscillator and to said analog frequency divider.

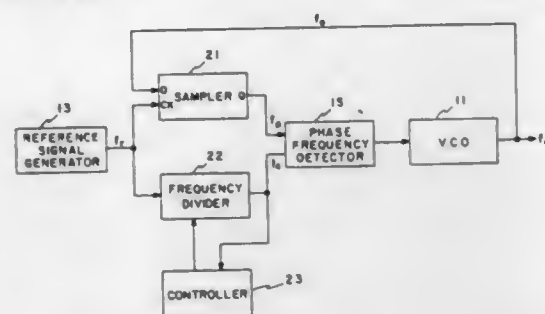


4,679,004  
**FREQUENCY SYNTHESIZER OF A PHASE-LOCKED TYPE WITH A SAMPLING CIRCUIT**  
 Atsushi Takahara; Tomoyoshi Ishikawa; Hiroyuki Tanaka, and Tamio Okui, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Sep. 2, 1986, Ser. No. 903,212  
 Claims priority, application Japan, Sep. 3, 1985, 60-194093; Sep. 1, 1986, 61-205464

Int. Cl.<sup>4</sup> H03L 7/18  
 U.S. Cl. 331-14

7 Claims



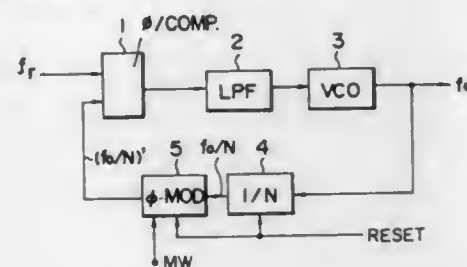
1. A frequency synthesizer of a phase-locked loop type for synthesizing an output oscillation signal having a desired frequency from a reference signal having a constant reference frequency, said frequency synthesizer comprising:  
 oscillation generating means controlled by a control signal for generating, as said output oscillation signal, a controlled oscillation signal of a frequency dependent on said control signal;  
 reference signal generating means for generating said reference signal;  
 sampling means for sampling said controlled oscillation signal by said reference signal to produce a sampled signal;  
 frequency divider means for frequency dividing said reference signal by a first division factor to produce a first divided signal;  
 control means for controlling said frequency divider means to adjust said first division factor to a value determined by said desired frequency and said reference frequency; and  
 detecting means for detecting a phase difference between said sampled signal and said first divided signal to produce a D.C. voltage signal dependent on said difference, said D.C. voltage signal being negatively fed back, as said control signal, to said oscillation generating means.

4,679,005  
**PHASE LOCKED LOOP WITH FREQUENCY OFFSET**  
 Mitsushige Tatami, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 17, 1986, Ser. No. 819,850  
 Claims priority, application Japan, Jan. 23, 1985, 60/009263; Feb. 13, 1985, 60/009267

Int. Cl.<sup>4</sup> H03L 7/18  
 U.S. Cl. 331-16

7 Claims



1. In a phase-locked loop for generating an output signal

whose phase is locked onto that of a reference signal and the frequency of which is equal to an offset added to an integral multiple of the frequency of the reference signal, said phase-locked loop comprising:

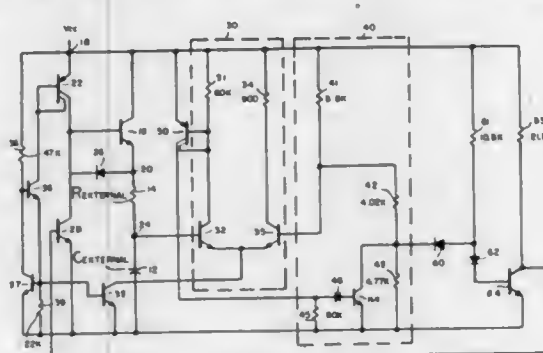
- a variable frequency oscillator for generating said output signal in response to a control signal controlling the frequency of said output signal;
- a frequency divider having a changeable dividing ratio and being supplied with said output signal for frequency dividing the output signal;
- a resettable shift control signal generator for generating a shift control signal;
- a phase modulator supplied with the output of said frequency divider and said shift control signal for shifting the phase of the output of said frequency divider by an amount which is increased with time until said shift control signal generator is reset;
- a phase comparator supplied with the reference signal and the output of said phase modulator and comparing the same for generating, as a result of such comparison, said control signal supplied to said variable frequency oscillator; and
- means for changing the dividing ratio of said frequency divider and resetting said shift control signal generator at intervals determined by said offset.

4,679,006  
**50% DUTY CYCLE RELAXATION OSCILLATOR WITH LATCH-UP PREVENTION CIRCUIT**  
 James P. Skoutas, North Kingstown, R.I., assignor to Cherry Semiconductor Corporation, Greenwich, R.I.

Filed May 14, 1986, Ser. No. 863,123  
 Int. Cl.<sup>4</sup> H03K 3/282, 3/295

U.S. Cl. 331-111

13 Claims



1. An oscillator circuit for charging and discharging a timing capacitor comprising:  
 a source voltage terminal;  
 a charging transistor having a collector connected to said source voltage terminal and an emitter connected to a first terminal;  
 a discharging diode means having an anode and a cathode, the anode being connected to said first terminal,  
 a discharging transistor having a collector, a base and an emitter, the collector connected to the cathode of said discharging diode means and the emitter of said discharging transistor connected to ground;  
 limit setting means for setting an upper voltage limit and a lower voltage limit;  
 comparator means connected between a second terminal and said limit setting means for comparing the voltage at the second terminal with the voltage limit set by said limit setting means, said timing capacitor being connected to said second terminal;  
 limit switching means for causing said limit setting means to change the limit it has set in response to an indication from

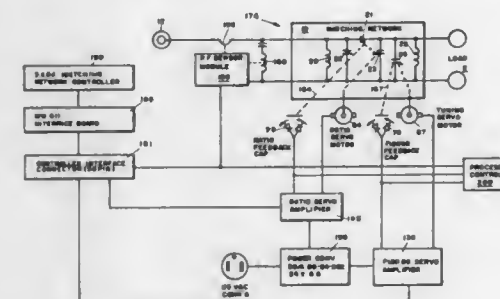
said comparator means that the present voltage limit has been reached at said second terminal;  
 means for switching said discharging transistor on or off; and  
 means for delaying the switching of said discharging transistor in response to a change in the limit set by said limit setting means, such that said discharging transistor switches on or off after said limit setting means has changed the limit.

4,679,007  
**MATCHING CIRCUIT FOR DELIVERING RADIO FREQUENCY ELECTROMAGNETIC ENERGY TO A VARIABLE IMPEDANCE LOAD**  
 George Reese, Wyoming, Mich.; Richard Spielmaker, and Douglas Schatz, both of Ft. Collins, Colo., assignors to Advanced Energy, Inc., Ft. Collins, Colo.

Filed May 20, 1985, Ser. No. 736,215  
 Int. Cl.<sup>4</sup> H03H 7/40

U.S. Cl. 333-17 M

17 Claims

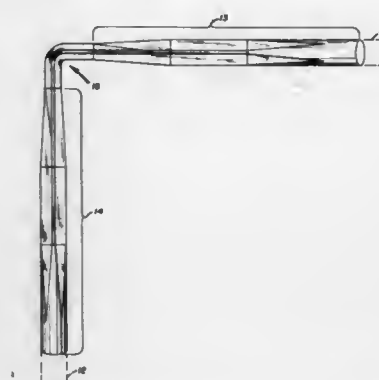


1. A matching circuit for delivering radio frequency electromagnetic energy to a discharge process comprising:  
 a variable impedance load;  
 a radio frequency power supply for applying radio frequency power to said load; and  
 a matching network for coupling and impedance matching said power supply to said load said matching network comprising:  
 (i) a ratio control means for directly establishing a voltage ratio between said power supply and said load, said ratio control means comprising:  
 a first ratio inductance electrically connected parallel to said load;  
 a first variable ratio capacitance electrically connected in series with said load;  
 a second variable ratio capacitance electrically connected parallel to said load;  
 a third variable ratio capacitance electrically connected parallel to said load; and  
 (ii) a tuning control means for directly tuning out a complex portion of the reactance of said load, said tuning control means comprising:  
 a variable tuning capacitance electrically connected parallel to said load; and  
 a tuning inductance electrically connected parallel to said load.

4,679,008  
**SHARP MODE-TRANSDUCER BEND FOR OVERMODED WAVEGUIDE**  
 Edward P. Irzinski, Gaithersburg; Jerry A. Krill, Ellicott City, and William H. Zinger, Columbia, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.  
 Filed Dec. 27, 1984, Ser. No. 686,782  
 Int. Cl.<sup>4</sup> H01P 1/02, 1/16

U.S. Cl. 333-21 R

8 Claims

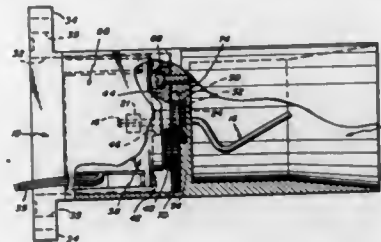


1. A mode-transducing bend structure comprising,  
 a first transducer means for converting a first waveguide supporting a circular TE<sub>01</sub> mode into a first multiport waveguide supporting the rectangular TE<sub>10</sub> mode,  
 a second transducer means for converting a second multiport waveguide supporting the rectangular TE<sub>10</sub> mode back into a second waveguide supporting a circular TE<sub>01</sub> mode,  
 said first and second multiport waveguide each having an equal plurality of rectangular TE<sub>10</sub> mode supporting waveguides whose extending ends terminate in a common plane perpendicular thereto and are arranged along a line adjacent to and in substantial alignment with one another within said common plane, with certain of said rectangular waveguides supporting an E-field parallel to said line and others of said rectangular waveguides supporting an E-field transverse to said line, and  
 rectangular TE<sub>10</sub> mode supporting waveguide bend means configured at a predetermined bend angle for interconnecting the first and second multiport waveguide of said first and second transducer means respectively,  
 said rectangular TE<sub>10</sub> mode supporting waveguide bend means including an equal plurality of bent rectangular TE<sub>10</sub> mode supporting waveguides with opposite ends connecting respectively the extending ends of the rectangular TE<sub>10</sub> mode supporting waveguides of said first and second multiport waveguide about said predetermined bend angle while maintaining said substantial alignment, certain of said bent rectangular waveguides being H-plane bends for supporting said parallel E-field and others of said bent rectangular waveguides being E-plane bends for supporting said transverse E-field.

4,679,009  
**POLARIZED SIGNAL RECEIVING APPARATUS**  
 Donald C. Cloutier, Exeter, N.H., assignor to M/A-COM, Inc., Burlington, Mass.  
 Continuation of Ser. No. 644,513, Aug. 27, 1984, Pat. No. 4,574,258. This application Feb. 27, 1986, Ser. No. 833,960  
 The portion of the term of this patent subsequent to Apr. 3, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> H01P 1/161; H01Q 3/02  
 U.S. Cl. 333-21 A  
 1. A polarized signal receiving apparatus comprising;

a first means including means for transmitting polarized signals,  
a second means including means for receiving polarized signals at one end thereof,  
means for securing the first means to the second means, an antenna means having integrally formed portions including a receiver probe portion associated with the second



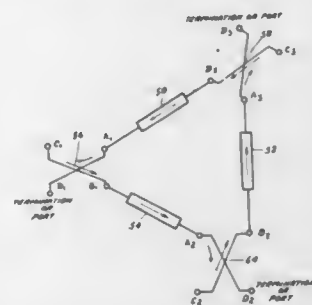
means, for receiving one polarization of the incident signal, a launch probe portion associated with the first means for launching said signal therein, and a drive portion intermediate the receiver and launch probe portions, said drive portion including a mechanical driven means, and a drive source comprising a drive means adapted to intercouple with the driven means for driving the antenna means.

**4,679,010**  
**MICROWAVE CIRCULATOR COMPRISING A PLURALITY OF DIRECTIONAL COUPLERS CONNECTED TOGETHER BY ISOLATION AMPLIFIERS**  
Inder J. Bahl, Roanoke, Va., assignor to ITT Gallium Arsenide Technology Center, a division of ITT Corporation, Roanoke, Va.

Filed Dec. 20, 1985, Ser. No. 811,923  
Int. Cl.<sup>4</sup> H03H 7/52, 11/02

U.S. Cl. 333-109

3 Claims

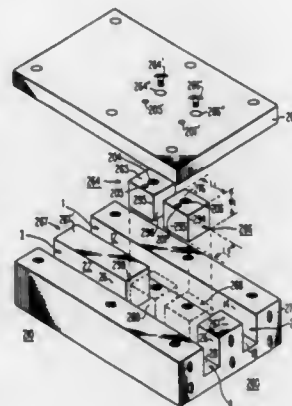


1. A circulator comprising at least three hybrid directional couplers, each of said hybrid directional couplers having four ports, one of said ports receiving a microwave signal which is transmitted to a diagonally opposite second port, the third port receiving a fixed fraction of the power and the fourth port receiving effectually no power, at least three isolator means, each of said isolator means connecting said second port of one of said at least three hybrid directional couplers to said third port of another of said at least three hybrid directional couplers so that each directional coupler is connected to another via an isolator means to form a circulator having at least three arms, each of said isolator means being configured to transmit a microwave signal from said second port of one of said hybrid directional couplers to said third port of said another of said hybrid directional couplers and imposing a substantial insertion loss in any reflected signals transmitting in a direction opposite thereto.

**4,679,011**  
**WAVEGUIDE DIRECTIONAL COUPLER FAMILY WITH A COMMON HOUSING HAVING DIFFERENT SETS OF CONDUCTIVE BLOCK INSERTABLE THEREIN**  
Krishna Praba, and Charles E. Profera, Jr., both of Camden County, N.J., assignors to RCA Corporation, Princeton, N.J.  
Filed Mar. 21, 1986, Ser. No. 842,773  
Int. Cl.<sup>4</sup> H01P 5/18

U.S. Cl. 333-111

2 Claims



2. A waveguide branch directional coupler arrangement having coupling value selectable among a plurality of values, comprising:

a conductive housing defining the walls of first and second elongated mutually parallel waveguides defining parallel axes, and a chamber extending between said first and second waveguides, each of said first and second waveguides having a cross section in the form of a rectangle having a width and a height, said cross sections of said first and second waveguides having the same width, said chamber having a width equal to said width of said cross sections of said first and second waveguides, said chamber including first and second walls which are perpendicular to the walls of said first and second waveguides, the length of said chamber in a direction parallel to said axes being fixed;

at least two separate sets of conductive blocks, each said set including at least one conductive block, all blocks of each said set being in the form of rectangular parallelepipeds, each said set of conductive blocks including fastening means for fastening the blocks of that set at predetermined positions within said chamber to define at least two branch waveguides extending orthogonally between said first and second waveguides to define one coupling value of said plurality of coupling values, whereby one said set of conductive blocks is used at any one time within said conductive housing to define a coupling value, and the remainder of said sets of conductive blocks are not used within said housing at said time but another set can be substituted for said one set to define another coupling value.

**4,679,012**  
**MAGNETOSTATIC-WAVE DEVICE**  
Daniel C. Buck, Anne Arundel, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Mar. 31, 1986, Ser. No. 845,919  
Int. Cl.<sup>4</sup> H01P 1/20, 9/00, 1/218

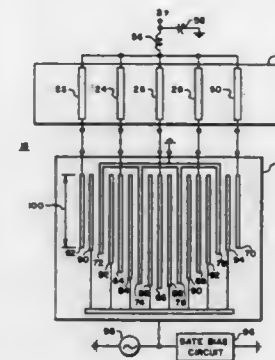
U.S. Cl. 333-161

22 Claims

1. A magnetostatic-wave device for propagating at least one microwave signal between input and output terminals, said device comprising:

a ferrimagnetic material through which said microwave signal travels from an input end to an output end;  
means for applying a magnetic field to said ferrimagnetic material between said input and said output ends;

an output transducer located at said output end of said ferrimagnetic material, said output transducer transferring said microwave signal in said ferrimagnetic material to said output terminal;  
an input conductive layer located at said input end of said ferrimagnetic material, said conductive layer having a plurality of separate finger structures extending across



said ferrimagnetic material in a direction perpendicular to the direction of travel of said microwave signal; and  
an active transistor controlled exciting means for separately controlling the amplitude and phase of the input microwave signal applied to each separate finger of said separate finger structures extending across said ferrimagnetic material.

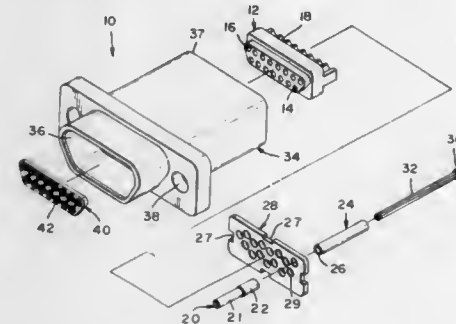
**4,679,013**  
**FILTERED ELECTRICAL CONNECTOR**  
John C. Farrar, Harrisburg; Reuben E. Ney, Mount Joy, and James L. Schroeder, III, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1985, Ser. No. 811,605

Int. Cl.<sup>4</sup> H03H 7/01; H01R 13/66

U.S. Cl. 333-182

20 Claims



7. A filtered electrical assembly comprising:  
a dielectric housing means having a plurality of terminal receiving passageways extending therethrough;  
electrical terminal means disposed in said terminal receiving passageways, said terminal means being terminated onto insulated electrical conductor means;  
filter means disposed on and electrically coupled to exposed conductive portions of said conductor means; and  
grounding means electrically coupled to said filter means.

**4,679,014**  
**FILTER FUNCTIONING WITH ACOUSTIC WAVES**  
Wolf-Eckhart Bulst, Vaterstetten; Mira Erthel, and Peter Zibis, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

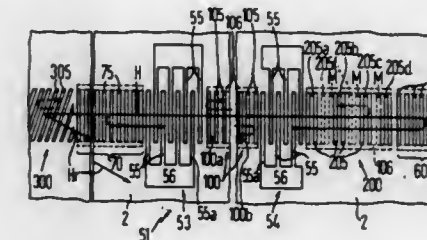
Filed Jan. 16, 1986, Ser. No. 819,304

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501977

Int. Cl.<sup>4</sup> H03H 9/145, 9/25, 9/64; H01L 41/04

U.S. Cl. 333-195

12 Claims



1. An electric acoustic wave filter, comprising:  
a digital structure comprising a plurality of strip-shaped coatings on a surface of a substrate;  
said digital structure being situated along a running direction of propagated waves in the filter;  
the digital structure being one of the elements selected from the group consisting of a transducer or resonator structure;

a group of additional strip-shaped coatings similar to the strip-shaped coatings of the digital structure, said group being arranged directly adjacent an end of the digital structure and also along said running direction of said propagated waves in the filter;  
said group of additional coatings being dimensioned and arranged such that it functions in a reflection-free manner so as not to affect normal operation of the filter; and  
said group of additional coatings being dimensioned and positioned with respect to the end of the digital structure such that during manufacture of the digital structure through an exposure technique, coatings of the digital structure at the end adjacent the group of additional coatings are exposed to substantially a same degree as more centrally located fingers of the digital structure so that exposure is levelled during production of the interdigital structure.

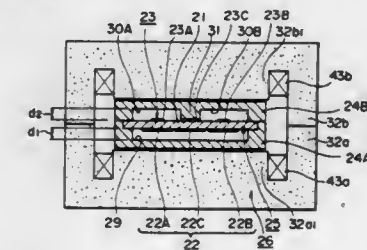
**4,679,015**  
**FERROMAGNETIC RESONATOR**  
Yoshikazu Murakami, Kanagawa; Seigo Ito, Tokyo; Hiromi Okamoto, Kanagawa, and Hideo Tanaka, Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan  
Filed Mar. 27, 1986, Ser. No. 844,984

Claims priority, application Japan, Mar. 29, 1985, 60-65874

Int. Cl.<sup>4</sup> H01P 7/08

U.S. Cl. 333-219

2 Claims



1. A ferromagnetic resonator comprising:  
a nonmagnetic substrate,



a ferrimagnetic thin film element formed on a major surface of said nonmagnetic substrate,  
a strip line disposed at another major surface of said nonmagnetic substrate and electromagnetically coupled to said ferrimagnetic thin film element,  
a conductive wall of ground potential facing said strip line, and spaced at a predetermined distance therefrom,  
an end of said strip line being connected to said conductive wall of ground potential, and  
bias magnetic field means applying a D.C. magnetic field to said ferrimagnetic thin film perpendicular to said major surface thereof.

4,679,016

# INTERCHANGEABLE MECHANISM FOR MOLDED CASE CIRCUIT BREAKER

Ronald D. Ciarcia, Southington; Gregory T. DiViacenzo; Richard E. Bernier, both of Plainville, and Joseph G. Nagy, New Britain, all of Conn., assignors to General Electric Company, New York, N.Y.

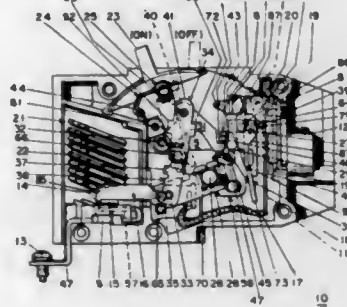
Filed Jan. 8, 1986, Ser. No. 817,213

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> H01H 67/02

U.S. Cl. 335—132

21 Claims



1. An operating mechanism for a molded case circuit breaker of the type consisting of a trip unit arranged in series with a fixed contact and a movable contact said operating mechanism comprising in combination:

- a U-shaped handle yoke for supporting an operating handle and a pair of operating springs;
- a pair of opposing side frames separated by means of a cradle stop pin;
- a knee-shaped cradle member pivotally arranged intermediate said side frames and mounted on a cradle support pivot at one end perpendicularly extending between said side frames;
- an upper link member pivotally attached to said cradle member on an upper link pivot intermediate said cradle support pivot and a cradle hook on said cradle at an opposite end from said cradle support pin;
- a latch assembly comprising a primary latch and a secondary latch, said primary latch engaging with said cradle hook and said secondary latch being pivotally arranged at a top end intermediate said side frames for interaction with said trip circuit by means of a trip bar arranged at a bottom end of said secondary latch;
- a lower link member pivotally arranged intermediate a movable contact arm carrier, comprising a pair of slotted yoke members arranged on a crossbar pivot, and said upper link, said operating springs connecting between said U-shaped handle yoke and said lower link for moving said upper link and said lower link to ON and OFF positions in response to movement of said operating handle; and
- a movable contact arm supporting a movable contact, said movable contact arm terminating at a pin at one end opposite from said movable contact, said pin being cap-

tured within said pair of slots at an end of said movable contact arm carrier supporting said movable contact arm and allowing said movable contact arm to rotate independent of said movable contact arm carrier, said lower link member including a slot at one end for arranging over a pin in said movable contact arm end and said movable contact arm carrier.

4,679,017

# EMERGENCY MANUAL ACTUATION MECHANISM FOR A SOLENOID

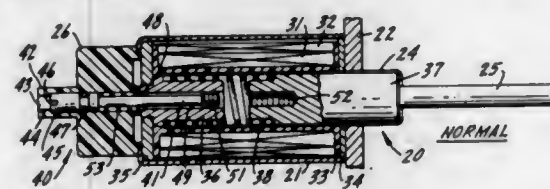
Ralph E. Mishler, Deerfield, and Peter J. Stocco, Lombard, both of Ill., assignors to Synchro-Start Products, Inc., Skokie, Ill.

Filed Mar. 19, 1986, Ser. No. 841,166

Int. Cl.<sup>4</sup> H01H 9/20

U.S. Cl. 335—164

37 Claims



1. In a solenoid of the kind comprising an elongated housing, a magnetic plunger disposed within the housing and axially movable between an initial position and an actuation position, one end of the plunger being accessible through one end of the housing for connection to an external apparatus, spring means biasing the plunger toward its initial position, and solenoid coil means for driving the plunger to its actuation position, an emergency manual actuation mechanism comprising:

- a retraction rod axially movably mounted in the other end of the solenoid housing in alignment with the plunger, the retraction rod having a normal position in which the retraction rod is effectively disengaged from the plunger and does not interfere with or react to plunger movement; connecting means for interconnecting the retraction rod and the solenoid plunger;
- means for moving the retraction rod from its normal position through an intermediate position to a retraction position, such movement of the retraction rod to its intermediate position engaging the connecting means and such further movement of the retraction rod to its retraction position driving the plunger from its initial position to its actuation position;
- and retainer means for retaining the retraction rod and the plunger in their respective retraction and actuation positions.

4,679,018

# CIRCUIT BREAKER WITH SHOCK RESISTANT LATCH TRIP MECHANISM

Jere L. McKee, Scott Township, Lawrence County, and Glenn R. Thomas, Brighton Township, Beaver County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1986, Ser. No. 818,947

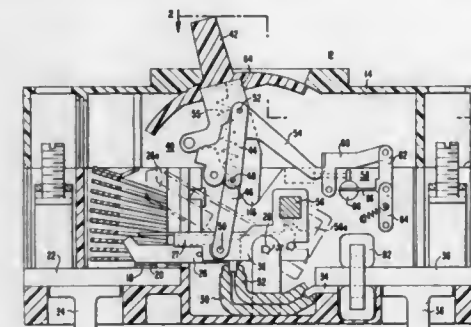
Int. Cl.<sup>4</sup> H01H 71/14

U.S. Cl. 335—167

4 Claims

1. A circuit breaker comprising:
- (a) a housing including a mounting frame;
  - (b) a circuit breaker structure having a pair of separable contacts and having a releasable lever operable between latched and unlatched positions to open the separable contacts;
  - (c) operating means for actuating the contact arm and comprising a first toggle linkage between the releasable lever and the contact arm;
  - (d) manually operable means to open and close the contacts when the releasable lever is in the latched position;

- (e) a trip bar operable automatically in response to overload current conditions above a predetermined value to release the releasable lever from the latched position to the unlatched position to open the contacts;
- (f) latching means for latching the releasable lever including a latch lever detachably connected to the releasable lever;
- (g) the latching means also including a second toggle linkage comprising a first link pivotally connected to the latch lever, a second link pivotally connected to the mounting



frame, and the first and second links having pivotally connected end portions forming a pivot joint;

- (h) the trip bar having a projection for releasably engaging the second toggle linkage so as to cause latching and unlatching of the releasable lever upon rotation of the trip bar; and
- (i) the manually operable means being operable to move the releasable lever from the tripped position to the latched position following release of the releasable lever.

4,679,019

# TRIP ACTUATOR FOR MOLDED CASE CIRCUIT BREAKERS

Frank A. Todaro, Clinton; Roger N. Castonguay; Alexander A. Krajewski, both of Terryville, and Robert A. Morris, Burlington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 14, 1986, Ser. No. 862,929

Int. Cl.<sup>4</sup> H01H 9/00

U.S. Cl. 335—172

19 Claims



1. A molded case circuit breaker comprising:
- an insulative case containing a pair of separable contacts operatively connected with an operating mechanism for opening and closing said contacts;
  - a circuit breaker latch at a first location within said mecha-

- nism for holding said contacts closed against the bias of an over-center operating spring;
- a trip actuator comprising a first and a second lever arranged for rotation about a common pivot under the urgency of an actuator spring, said first lever arranged for contacting said circuit breaker latch to displace said circuit breaker latch to a second location thereby articulating said operating mechanism and causing said contacts to open under urgency of said operating spring, said second lever abutting said actuator spring;
- a crosspiece attached to said first and second levers for engagement with a latch-piece to retain said first and second levers from rotation against the bias of said actuator spring; and
- a magnetic module operatively connected with said latch-piece for moving said latch-piece out of engagement with said crosspiece thereby allowing said first and second levers to rotate under the urgency of said actuator spring.

4,679,020

# SUPERCONDUCTING SOLENOID AND METHOD OF MAKING SAME

Toshimi Kawamura, and Takashi Satow, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

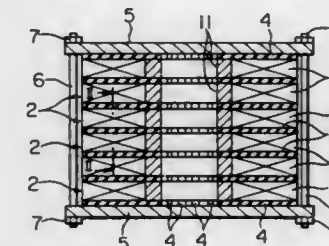
Filed May 27, 1986, Ser. No. 867,068

Claims priority, application Japan, May 31, 1985, 60-119121

Int. Cl.<sup>4</sup> H01K 7/22

U.S. Cl. 335—216

10 Claims



1. A superconducting solenoid comprising: a plurality of coil elements each in the form of a pancake laminated one over another in concentric relation with each other, each of said coil elements including a winding frame in the form of a cylinder, and filamentary conductors wound around said winding frame and then heat treated, and a supporting structure formed of a resinous material impregnated in between said wound filamentary conductors; spacer means formed of an electrically insulating material and interposed between adjacent coil elements for providing electrical insulation and conduits for a cooling medium; and means for assembling together said laminated coil elements and said spacers.

4,679,021

# MAGNETIC RETENTION PLATE WITH PERMANENT MAGNETS

Philibert M. Brailion, Montmelian, France, assignor to Brailion & Cie (Societe Anonyme), Montmelian, France

Filed Jun. 20, 1986, Ser. No. 876,920

Claims priority, application France, Jul. 3, 1985, 85 10682

Int. Cl.<sup>4</sup> H01F 7/04

U.S. Cl. 335—295

6 Claims

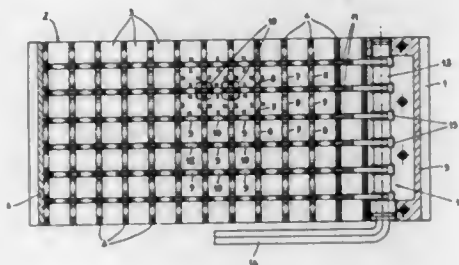
1. In a magnetic retention plate for selectively retaining a magnetically attractable body thereon, said magnetic retention plate comprising a planar array of pole pieces, end faces of said pole pieces defining a planar retention surface, an array of fixed permanent magnets magnetized in a common direction and positioned to apply a magnetic field to said pole pieces, an array of movable permanent magnets magnetized in a direction perpendicular to said common direction, an actuating mechanism for the translational displacement of said array of mov-

able permanent magnets for displacing said movable permanent magnets relative to said fixed permanent magnets between a first position in which lines of force of said arrays of permanent magnet close within the interior of said plate, and a second position wherein lines of force of said arrays close externally of said plate through said end faces of said pole pieces, the improvement wherein:

all of said pole pieces are fixed, disposed in a checked pattern of orthogonal rows of pole pieces, and separated by partitions having edges defining said planar retention surface with said end faces;

the permanent magnets of said array of fixed permanent magnets are located below said partitions in pairs of mutually parallel rows with the fixed permanent magnets of one row of each pair being poled oppositely to the fixed permanent magnets of the other row of the respective pair and being of alternating direction of polarity along the respective row from fixed permanent magnet to fixed permanent magnet therealong, all said fixed permanent magnets being magnetized parallel to a longitudinal dimension of said plate;

the permanent magnets of said array of movable permanent magnets are located below said partitions in pairs of mutually parallel rows with the movable permanent magnets of



one row of each pair being poled oppositely to the movable permanent magnets of the other row of the respective pair and being of alternating direction of polarity along the respective row from movable permanent magnet to movable permanent magnet therealong, all said movable permanent magnets being magnetized parallel to a transverse dimension of said plate;

each of said pole pieces has four sides, a first two opposite sides of which are juxtaposed with faces of the fixed permanent magnets of the same polarity and another two opposite side of which are flanked by a said pair of rows of said movable permanent magnets; and

said actuating mechanism is constructed and arranged to displace said movable permanent magnets by a stroke corresponding to a pitch of separation of said pole pieces parallel to said longitudinal dimension whereby in said first position faces of opposite movable permanent magnets are juxtaposed with said other two opposite sides and have opposite polarity to the fixed magnet faces juxtaposed with the first two opposite sides of each pole piece, and whereby in said second position faces of opposite movable permanent magnets are juxtaposed with said other two opposite sides and have the same polarity as the fixed magnet faces juxtaposed with the first two opposite sides of each pole piece.

#### 4,679,022 MAGNETIC FIELD GENERATING DEVICE FOR NMR-CT

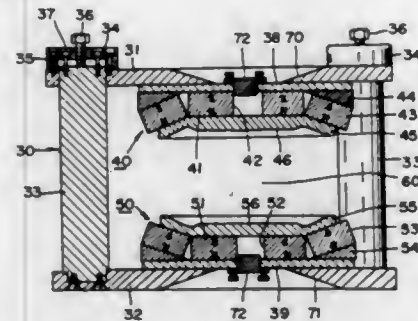
Toshinobu Miyamoto; Hiroo Hayashi; Hideya Sakurai; Hirofumi Takabayashi, and Youichi Ohnishi, all of Mishima, Japan, assignors to Sumitomo Special Metal Co. Ltd., Osaka, Japan

Filed Sep. 19, 1986, Ser. No. 909,327

Claims priority, application Japan, Dec. 27, 1985, 60-203549[U]; Apr. 30, 1986, 61-99938[U]  
Int. Cl.<sup>4</sup> H01F 7/02

U.S. Cl. 335—296

13 Claims



1. A magnetic field generating device for nuclear magnetic resonance-computerized tomography of the type wherein permanent magnet assemblies of a pair opposing mutually to define an air gap therebetween are magnetically coupled together by yoke means to create a magnetic field within said air gap, characterized in that

each of said permanent magnet assemblies comprises a flat plate-like central permanent magnet and a plurality of peripheral permanent magnets arranged around said central permanent magnet and inclined toward the inside of said air gap,

the magnetic pole surface of each of said permanent magnet assemblies forms a curved concave face with respect to said air gap, and

each of said permanent magnets is magnetized in the direction perpendicular to the corresponding magnetic pole surface.

#### 4,679,023 OVER-TEMPERATURE CONTROL FOR A THERMOSTAT

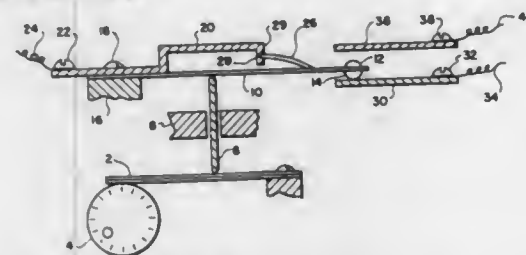
Marvin D. Nelson, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 14, 1986, Ser. No. 896,351

Int. Cl.<sup>4</sup> H01H 61/08, 71/14

U.S. Cl. 337—140

5 Claims



1. A thermostat comprising

a cantilevered spring means having an unactuated first position carrying electrical contacts at a free end thereof, a heat responsive means including a memory material element having a first shape below a predetermined critical temperature and a second shape above said temperature, means connecting said heat responsive means to said spring means to enable said heat responsive means to urge said spring means into a predetermined second position above

said temperature to transfer the electrical contacts from a first position to a second position and bi-metallic temperature responsive means connected to said spring means for transferring said electrical contacts on said spring means between said first and second positions independently of said heat responsive means.

#### 4,679,024 POTENTIOMETER CONTACT WIPER

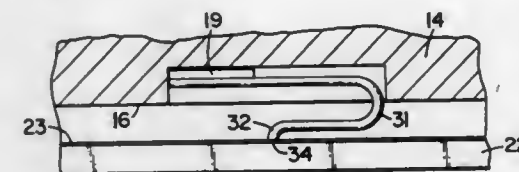
Karl A. Kittleson, Northwood, Iowa, assignor to Northern Engineering, Inc., Northwood, Iowa

Filed Sep. 27, 1985, Ser. No. 781,266

Int. Cl.<sup>4</sup> H01C 10/30

U.S. Cl. 338—160

19 Claims



1. A potentiometer comprising:  
a housing;

a substrate mounted in said housing and having a resistance element and a conductive element disposed on a surface thereof;

a contact wiper including a plurality of wire contact fingers each connected at a first end to a bus bar and free at the other end;

means for moveably supporting said contact wiper in said housing for wiping contact with said resistance element and said conductive element whereby a circuit is formed from said conductive element to said resistance element; and

said fingers in contact with said resistance element supported so that the endpoint of each finger contacts the resistance element with a resilient force.

#### 4,679,025 CONSTRUCTION FOR ELECTRICAL CONTROL PANEL

Yoshihiro Ohashi, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

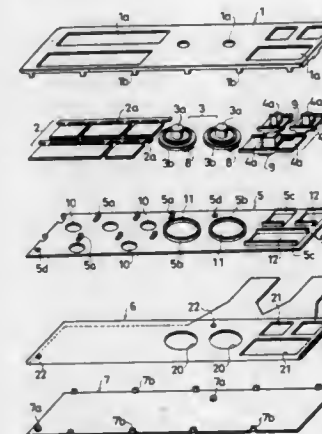
Filed Dec. 2, 1985, Ser. No. 803,542

Claims priority, application Japan, Dec. 1, 1984, 59-181554[U]; Dec. 1, 1984, 59-181555[U]; Dec. 1, 1984, 59-181556[U]

Int. Cl.<sup>4</sup> H01C 10/00

U.S. Cl. 338—197

3 Claims



1. A construction for an electrical control panel comprising

a circuit pattern on one side of an insulating sheet, a sliding member slidable on said circuit pattern of said insulating sheet, a rotary operating member for operating said sliding member, said sheet being sandwiched between a pair of support plates with one of said support plates disposed on said circuit pattern side of said insulating sheet, and means for slidably and engagedly holding said rotary operating member in position for operating said sliding member, including an operating hole formed through said one support plate and an upturned annular holding wall surrounding said operating hole and having an inner annular surface for holding said operating member rotatably and engagedly with said operating member projecting from said operating hole provided in said one support plate.

#### 4,679,026 CAR RADIO THEFT ALARM SYSTEM

Rolf Knakowski, Hildesheim, and Dieter Fahlbusch, Dieckholzen, both of Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

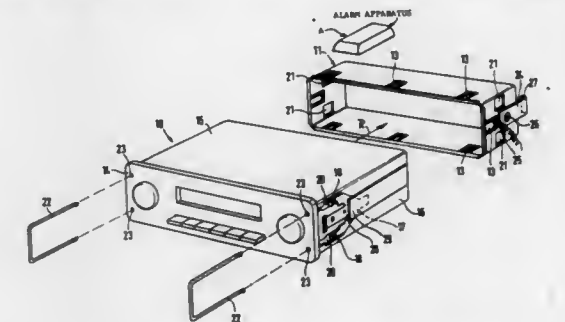
Filed Nov. 18, 1985, Ser. No. 799,028

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443650

Int. Cl.<sup>4</sup> G08G 13/14

U.S. Cl. 340—63

8 Claims



1. Electric theft alarm system for accessory apparatus installed in a vehicle, particularly automobile audio apparatus in which the accessory apparatus includes a housing (15), and the vehicle has an alarm apparatus, and a receiving frame (11) is provided within the vehicle for telescopically receiving the housing (15) of the accessory apparatus, said receiving frame and the accessory apparatus being formed with releasable engagement means (17, 18, 21) for securing the accessory apparatus in the frame and hence in the vehicle,

wherein, in accordance with the invention, the housing (15) of the accessory apparatus and the receiving frame (11) are connected into an electrical circuit, coupled to the alarm apparatus, and form a switch which changes state upon relative movement of the housing of the accessory apparatus and the receiving frame to actuate the alarm apparatus upon movement of the housing of the accessory apparatus in a direction of removal from the frame,

wherein the switch includes a contact leaf spring (24) having a free end (27), which free end is bent or bowed out of the major plane of the leaf spring, said bent or bowed end forming a switch terminal contact.

#### 4,679,027 VIDEO DISPLAY CONTROL UNIT

Keizo Higuchi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,218

Claims priority, application Japan, Jul. 24, 1984, 59-156017

Int. Cl.<sup>4</sup> G09G 1/00

U.S. Cl. 340—723

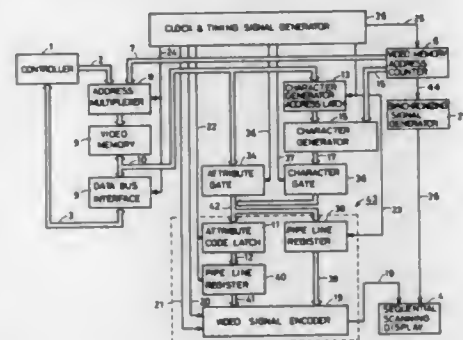
3 Claims

1. A video display control unit for displaying picture images



on a sequential scanning display unit, said video display control unit comprising:

- a character generator for generating character information;
- a video memory including storage regions for storing both character address information to be supplied to said character generator to specify a character to be displayed and attribute information for qualifying said character to be displayed, said video memory for storing data defining said picture images to be periodically displayed on the screen of said display unit;
- reading means for reading said data stored in said video memory synchronously with a scanning sequence of said screen including means for reading said character information and said attribute information from said video memory and for reading corresponding character information from said character generator on the basis of said read character address information;



multiplexing and outputting means to multiplex said character information and said read attribute information and output the same including first gate means for gating said attribute information, second gate means having an output end commonly connected to an output end of said first gate means for gating said character information, and timing signal generator means for sequentially switching said first and second gate means thereby to generate timing signals for multiplexing said attribute information and said character information;

delay means for delaying said data multiplexed by said multiplexing and outputting means by a predetermined period thereby to synchronously output data pairs of said character information and said attribute information in parallel; and

a video encoder for receiving said data in parallel, said data having been delayed by said delay means thereby to convert said data into video signals to be supplied to said display unit.

4,679,028

**FAULT DETECTION ALGORITHM FOR SUCCESSIVE-APPROXIMATION A/D CONVERTERS**  
Timothy J. Wilson, Bartlett, and Paul M. Erickson, Hanover Park, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.  
Filed Mar. 31, 1986, Ser. No. 846,385  
Int. Cl. N03M 1/10

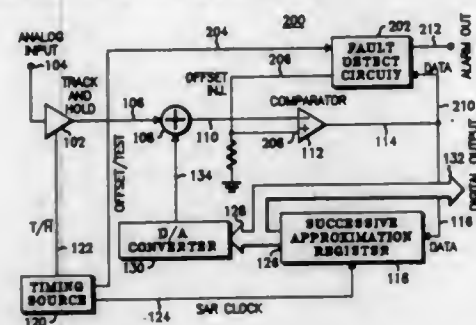
U.S. Cl. 340—347 CC

18 Claims

1. A method for achieving self-test capability in a successive approximation A/D converter having a comparator which has accessible a pair of inputs and an output therein, the method comprising the steps of:

- injecting into an input of said comparator at the end of each conversion cycle an offset having a sign that alternates for each conversion cycle and a small magnitude that slightly exceeds a level discernible as one least significant bit; and
- verifying that the output of the comparator shifts in a man-

ner corresponding to the alternating sign of said injected offset, thereby achieving self-test of virtually all of the



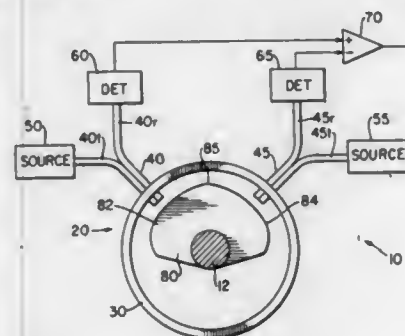
A/D converter elements over a wide range of input values in a fraction of an entire conversion cycle.

4,679,029

**OPTOELECTRONIC ROTATIONAL POSITION SENSOR**  
David A. Krohn, Hamden; David R. Maack, Madison; Edmond I. Vinarub, Cheshire, and John R. Ellison, Jr., Bethany, all of Conn., assignors to Eotec Corporation, West Haven, Conn.  
Filed Sep. 4, 1984, Ser. No. 647,031  
Int. Cl. H03K 13/02

U.S. Cl. 340—347 P

8 Claims



1. Apparatus for sensing the rotational position of a shaft, comprising:

- light source means;
- first light detecting means for producing an electrical output signal in response to light received at a sensing portion thereof;
- second light detecting means for producing an electrical output signal in response to light received at a sensing portion thereof;
- circuit means differentially responsive to the output signals of said first and second light detecting means for producing a signal indicative of rotational position of said shaft;
- means for providing a first light transmission path between said light source means and said first light detecting means;
- means for providing a second light transmission path between said light source means and said second light detecting means; and
- means mechanically coupled to said shaft for varying the length of the paths of said first and second means for providing a light transmission path, the length of said first and second light transmission paths being varied in relationship to the rotational displacement of said shaft from a predetermined reference position so that one of said paths is lengthened while the other is shortened.

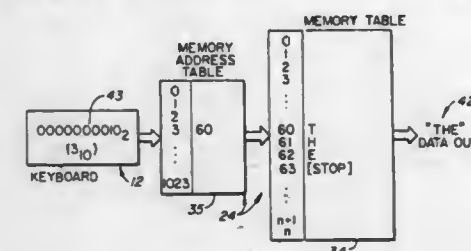
4,679,030

**CHORDING KEYBOARD FOR GENERATING BINARY DATA**

William M. Volnak, 50 Birch St., Mill Valley, Calif. 94941  
Continuation of Ser. No. 373,569, Apr. 30, 1982, Pat. No. 4,467,321. This application Jul. 3, 1984, Ser. No. 627,380  
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.  
Int. Cl. G06F 3/02

U.S. Cl. 340—365 A

10 Claims



1. A computer data entry keyboard comprising:

exactly ten key switches, each key switch corresponding to a particular terminating member of a pair of operator's hands, and adapted to be selectively operated by such corresponding terminating member, said switches being selectively operable singly and in combination to generate a 10-digit binary number, each digit of said binary number corresponding to a particular terminating member of said operator's hands;

memory table means including read-only first memory means and read/write second memory means for storing and retrieving respective first and second sets of character and character combinations;

memory address table means, having an input and an output, for providing addressed in said memory table means at said output in response to 10-digit binary numbers at said input, wherein each location in said memory address table means corresponds uniquely to a different 10-digit binary number and contains an address in said first and second memory means said address corresponding to a character or character combination stored in said memory table at that address;

means, coupled to said memory table means and to the output of said memory address table means for applying the address provided at said output to said memory table means; and

means, associated with said read/write second memory means and responsive to said key switches, for allowing operation of said memory means in a write mode wherein operation of said key switches stores characters and character combinations each corresponding to a particular one of said 10-digit binary numbers, and operation in a read mode wherein operation of said key switches retrieves character and character combinations, operation in said write mode being initiated by the occurrence of an access code and terminated by the occurrence of an exit code, each of said access and exit codes being particular ones of said 10-digit binary numbers.

4,679,031

**DEVICE TO FACILITATE THE ARMING OF AN ALARM SYSTEM AND TO PROVIDE LOCK-OUT PROTECTION**  
Shih-Ming Hwang, No. 11, Alley 12, Lane 7, Ching-Tyan St., Taipei, Taiwan

Filed Aug. 29, 1985, Ser. No. 770,752

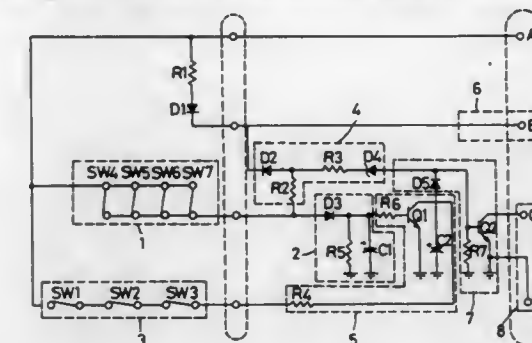
Int. Cl. G08G 23/00; E05B 45/06

U.S. Cl. 340—501

3 Claims

1. A device to facilitate the activation of an alarm system, including a first set of reed switches operable to generate a correct signal and a second set of reed switches operable to generate an incorrect signal, a driving circuit to arm the alarm system in response to either said correct or said incorrect signal

and responsive to said correct signal when the alarm system is armed to disarm the alarm system, and a correct signal disable timing circuit responsive to said incorrect signal to disable said



correct signal from disarming the alarm system when the correct signal is given within a preset lock-out time after the receipt of said incorrect signal.

4,679,032

**PROCEDURE AND MEANS FOR PRODUCING A CONTRAST IMAGE**

Nils-Robert Roschler, Vantaa, Finland, assignor to Elevator GmbH, Baar, Switzerland

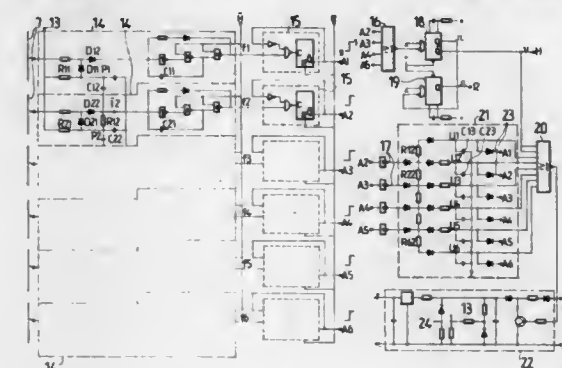
Filed Dec. 5, 1984, Ser. No. 679,032

Claims priority, application Finland, Dec. 14, 1983, 834600

Int. Cl. G08B 13/26

U.S. Cl. 340—562

16 Claims



1. A procedure for producing an image based on contrast discrimination in an image forming means of at least one-dimensional image filed with discrete picture elements, comprising:

- detecting an image signal for each said picture element to produce an output thereof;
- applying a first electric current to an image forming channel having a tapping point with a voltage, said first current affecting a second current, having an output frequency, flowing into said tapping point of said image forming channel;
- connecting said tapping point to corresponding tapping points of other image forming channels and simultaneously affecting said voltage of said tapping point, in such a manner that the product of said second current value and said voltage value is proportional to said first current value, and wherein the output related to said picture element has an output frequency proportional to the output frequency of said second current;
- supplying a suitable current to an interaction network connecting, by means of suitably selected impedances, said tapping point of said image forming channel to the tapping points of the image forming channels of other picture

elements, such that a desired contrast heightening of the image is achieved and such that said output frequency of each said image forming channel combine to form a frequency image, which becomes the basic information for interpretation of the image by digital means.

4,679,033

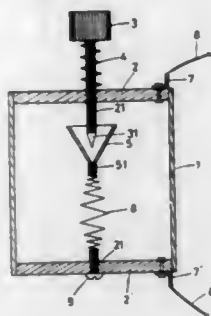
## STRUCTURE OF VIBRATION SENSOR

Shih-Ming Hwang, No. 11, Alley 12, Lane 7, Ching-Tyan St., Taipei, Taiwan

Filed Mar. 18, 1986, Ser. No. 840,851

Int. Cl.<sup>4</sup> H01H 35/02, 35/14

U.S. Cl. 340—566



1. A base, an electrically conductive hopper, a spring in the form of a winding extending between said hopper and said base and supporting said hopper over said base, an electrically conducting element extending into said hopper without touching said hopper when said spring is in an equilibrium position at rest, said winding of said spring having its greatest diameter at a middle point of said spring between said hopper and said base and decreasing in diameter proceeding from said middle point toward said hopper and said base, said winding having its least density at said middle point and increasing in density proceeding from said middle point to said hopper and said base.

4,679,034

## INFRARED INTRUSION SENSOR WITH PRELIMINARY AND PRIMARY ALARMS

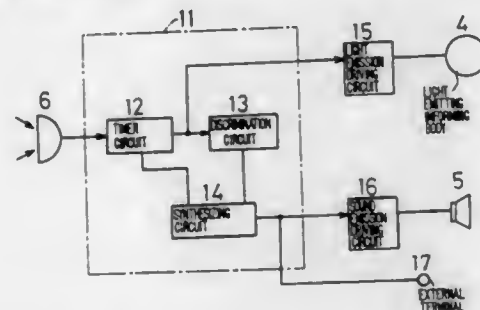
Daikichi Kamada, Osaka, Japan, assignor to Kamada Signal Appliances Co., Ltd., Osaka, Japan

Filed Aug. 14, 1985, Ser. No. 765,947

Int. Cl.<sup>4</sup> G08B 13/18

U.S. Cl. 340—567

5 Claims



1. An intrusion alarming apparatus comprising: a main body case of horn shape having an opening at one end thereof, an infrared ray sensor disposed substantially in the center of the opening of the main body case, a first alarming means for producing preliminary alarm of a predetermined period of time, a second alarming means for producing primary alarm following said preliminary alarm signal, a control unit for receiving an output from said infrared ray sensor, said control unit including a timer circuit having a

re-triggerable function, a discrimination circuit and synthesizing circuit, whereby preliminary alarm is produced upon detecting an intrusion and primary alarm is followed only if such intrusion continues for a predetermined period of time.

4,679,035

## TRI-SIGNAL ELECTROMAGNETIC ARTICLE SURVEILLANCE SYSTEM

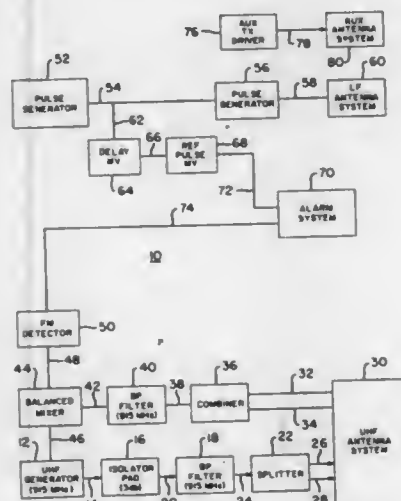
Paul H. Pfaff, Lighthouse Point; Richard N. Spagna, Pompano Beach; Robert A. Clucas, Lauderdale-By-The-Sea; Paul Coulson, Deerfield Beach, and Ezra D. Eskandry, Miami, all of Fla., assignors to Sensomatic Electronics Corporation, Deerfield Beach, Fla.

Filed Jul. 30, 1985, Ser. No. 760,680

Int. Cl.<sup>4</sup> G08B 13/18

U.S. Cl. 340—572

29 Claims



1. A system for electronic article surveillance in an area having a surveillance zone and an article display zone adjacent said surveillance zone, said system including:

- means for transmitting into said area a high-frequency signal;
- means for transmitting into said area a primary low-frequency signal comprised of a carrier with a modulation characteristic;
- receptor-radiator means affixed to articles in said area for transmitting output signals having content corresponding to transmitted signals incident thereon and inclusive of said modulation characteristic and such low-frequency carrier;
- receiver-detector means in said surveillance zone for receiving such receptor-radiator means transmitted signals and having capability for providing output indication of said modulation characteristic therein if same is in predetermined ratio to low-frequency carrier content thereof and thereupon to generate an alarm condition; and
- means for transmitting into said area an auxiliary low-frequency signal comprised of an unmodulated carrier for selectively increasing low-frequency carrier content of said receptor-radiator means transmitted signals for receptor-radiator means in said article display zone to cause the ratio of said modulation characteristic in such selected receptor-radiator means transmitted signals to low-frequency carrier content thereof to be less than said predetermined ratio and thereupon to preclude generation of said alarm condition.

4,679,036

## SIGNALLING DEVICE FOR INDICATING A NURSED PERSON IN A BAD SLEEPING CONDITION

Tseng-Yng Cheng, 31, Lane 98, Chien Hsing Road, Chung Li City, Taiwan

Filed Apr. 29, 1985, Ser. No. 728,178

Int. Cl.<sup>4</sup> G08B 23/00

U.S. Cl. 340—573

3 Claims



1. A signalling device for indicating a person, who is being nursed, in a bad sleeping condition comprising: means for detecting said bad sleeping condition, adapted to be mounted on the body of said person for outputting a voltage signal when said bad sleeping condition is detected; a switching circuit coupled to said detecting means; a signal generating circuit coupled to said switching circuit for being turned on by said switching circuit in response to said voltage signal from said detecting means in order to output an alarm signal; and a frequency modulating circuit coupled to said switching circuit for being turned on thereby in response to said voltage signal, and also coupled to said signal generating circuit for receiving said alarm signal and frequency modulating it to radiate out a radio wave which is adapted to be received and reproduced by an FM receiver in order to signal that said nursed person is in said bad sleeping condition; the detecting means consisting of a detecting circuit containing a combination of sensors, one of said sensors being sensitive to light, one of said sensors being sensitive to temperature, and one of said sensors being sensitive to urination, any which of said sensors being capable of detecting a bad sleeping condition, wherein the temperature sensor is a thermistor capable of varying its resistance value in accordance with the temperature value on said person's body is provided, and a comparator is coupled to said thermistor at one input terminal thereof, connected to a reference voltage at the other input terminal, and coupled to said switching circuit at the output section thereof, so that when said quilt is moved away from the person's body, the temperature value around said thermistor decreases, causing said comparator to actuate said switching circuit to turn on said signal generating circuit and said frequency modulating circuit in response to the variation of resistance value of said thermistor.

4,679,037

## ATTACHMENT FOR SMOKE ALARMS

Horace Bryan, 12 Brighton La. 10, Brooklyn, N.Y. 11235, and Nicholas Giardina, 50-11 Poyer St., Elmhurst, N.Y. 11373

Filed Dec. 16, 1985, Ser. No. 809,320

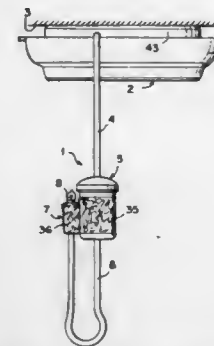
Int. Cl.<sup>4</sup> G08B 17/10, 21/00

U.S. Cl. 340—693

11 Claims

1. In an attachment for use with smoke alarms of the type to be mounted in an elevated position in a space to be monitored for occurrence of smoke and which comprise a housing carrying an electrically operated signal device, a smoke responsive device, and circuit means connected to the signal device and the smoke responsive device and including a connector for connection to a battery, the combination of an elongated flexible electrical lead; switch means supported by the lead; connector means at an end of the lead spaced a substantial distance from the switch means and operative for connect-

ing a battery to the circuit means of the smoke alarm only when the connector means is connected to the connector of the circuit means of the smoke alarm and the switch means is in a predetermined first condition, the switch means being operative to have a second condition disabling the smoke alarm; the combination of the electrical lead, switch means and connector means constituting a flexible pendant which can depend from the smoke alarm with the switch means in a first position substantially below the smoke alarm



when the connector means is connected to the connector of the circuit means of the smoke alarm; and releasable means for releasably securing the switch means in a second position substantially above said first position, the switch means being in said first condition when occupying said second position, the switch means being in a second condition, in which the smoke alarm is disabled, when the switch means occupies said first position.

4,679,038

## BAND BUFFER DISPLAY SYSTEM

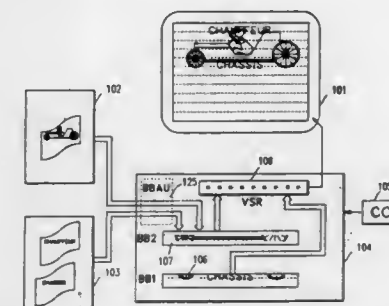
David F. Bantz, Chappaqua, N.Y.; Davey L. Malaby, Danbury, Conn., and Paul N. Sholtz, Brewster, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 18, 1983, Ser. No. 514,429

Int. Cl.<sup>4</sup> G09G 1/16

U.S. Cl. 340—721

4 Claims



1. A composite display system of the multi-port type, having a composite display as a primary display selectively modified by one or more superimposed or inset secondary displays, the composite display being a video raster including K multiple-line video bands, the system having video input means matched to the display, and having a source of pixel representations for the primary display, the system comprising:

- band buffer means including at least a temporarily assigned "next" band buffer for accumulating a band of the composite display as a plural line subimage of actual pixel representations;
- image memory means for providing to said band buffer means actual pixel representations of the secondary display;









4,679,048

## ADAPTIVE SPREAD SPECTRUM RADAR

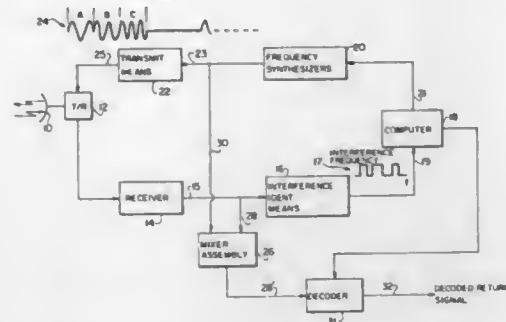
Robert W. Brandsetter, Levittown; Jakob Schwarz, Flushing, and Arnold Seldon, Syosset, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 25, 1985, Ser. No. 727,323

Int. Cl.<sup>4</sup> G01S 13/02

U.S. Cl. 342—61

8 Claims



1. An adaptive radar system capable of identifying interference frequencies and changing the system operating frequencies to permit radar operation in interference-free portions of the frequency spectrum, the system comprising:

- means for receiving a radar signal;
- means connected at its input to the receiving means output for identifying those frequencies where interference exists;
- computing means connected at its input to the identifying means output for determining and storing data relating to non-interference frequencies;
- synthesizer means driven by the computing means for generating synthesized signals at the non-interference frequencies; and
- means connected between the output of the frequency synthesizer and an antenna for generating a transmitted signal at an effective frequency band composed of juxtaposed frequency bands straddling identified interference bands synthesizing a single broad band frequency range sufficient to handle a transmitted signal.

4,679,049

## DELAY SIMULATOR FOR FM-CW RANGE MEASURING APPARATUS

Michel M. R. Riffiod, Fontenay Aux Roses, France, assignor to U.S. Philips Corporation, New York, N.Y.

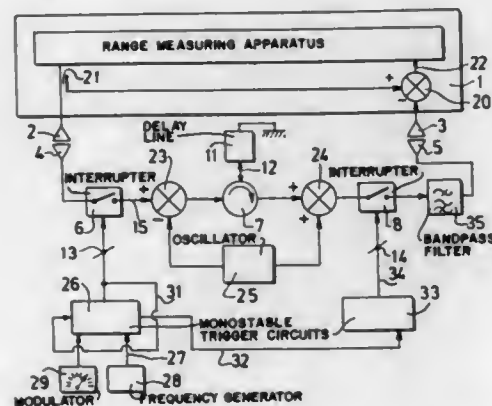
Filed Nov. 7, 1985, Ser. No. 795,962

Claims priority, application France, Nov. 13, 1984, 84 17271

Int. Cl.<sup>4</sup> G01S 7/40

U.S. Cl. 342—172

4 Claims



1. A delay simulator for a FM-CW range measuring apparatus, said apparatus effecting, during real time operation, a

frequency comparison between a transmitted wave and a wave received after reflection from a target or retransmission by a responder, in such manner as to generate a beat signal  $F_b$  at the frequency  $f_b$ , said simulator being intended for connection to said apparatus for testing its proper operation, characterized in that it comprises, arranged between a transmission portion and a receiving portion, a signal processing link including a first interruptor for very high frequencies, a circulator and a second interruptor for very high frequencies, said link further including:

- a delay line electrically connected to the circulator and operating in the reflecting mode for delaying the wave at a given frequency by a time equal to  $\tau$ ; and
- control means for said interruptors effecting opening thereof at a frequency  $f_r$  at least equal to  $2f_b$ , the first interruptor being opened during a time interval  $\delta$  distinctly less than  $1/f_r$ , and the second interruptor being opened during a time interval  $\delta'$ , the phase shift of the predetermined operations between the two interruptors corresponding to a controllable time interval  $\tau'$  between the beginning of the time intervals  $\delta$  and  $\delta'$ , said interval  $\tau'$  being such that the time intervals  $\delta$  and  $\delta'$  are separated and that at least an echo of the order  $P$  of the delay line is defined by the equation:

$$P\tau = k/\tau + \tau'$$

where  $k$  is a small integer.

4,679,050

## PULSE RADAR APPARATUS

Jan Bergman, Haaksbergen, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

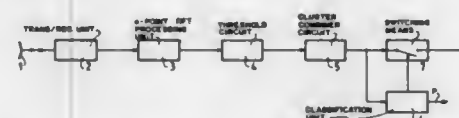
Filed Nov. 25, 1985, Ser. No. 801,367

Claims priority, application Netherlands, Dec. 11, 1984, 8403758

Int. Cl.<sup>4</sup> G01J 13/00

U.S. Cl. 342—196

2 Claims



1. Pulse radar apparatus provided a transmitting and receiving unit, whereby the received target echoes are sampled and digitized after detection; an  $n$ -point DFT processing unit; a threshold circuit; and a cluster combiner circuit comprising means for combining radar cells, collectively covering one single target, to form a cluster from the signals obtained from the threshold circuit, for determining a signal representing the target covered by the cluster and hence the target range and azimuth, characterized in that: the pulse repetition period of the radar apparatus contains  $m$  wobbles; the cluster combiner circuit comprises means for determining the magnitude of the local maximum values present in the DFT spectrum covered by the target-representing signal, as well as an indication which of the DFT processor output channels produces said maximum values; a classification unit connected to the cluster combiner circuit is incorporated for defining a target as being a  $k$ -time-around target subject to the conditions that: for the target-representing signals produced by the cluster combiner circuit the difference in the cluster-defined target ranges correspond or substantially correspond with a particular wobble period; the difference in azimuth of the clusters is within predefined narrow limits; the magnitudes of said local maximum values of the DFT spectra are equal or substantially equal to each other; and said local maximum values are present in either the same DFT processor output channel or output channels differing in frequency from each other a value of  $(k/m)$ , times the bandwidth of the output channels concerned, where  $k=1, 2, \dots, m-1$ .

4,679,051

## MICROWAVE PLANE ANTENNA

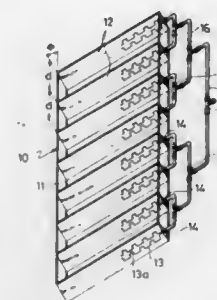
Yasuo Yabu, Hirakata; Toshio Abiko, Ibaragi, and Masayuki Matsuo, Kobe, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 22, 1985, Ser. No. 790,241

Claims priority, application Japan, Nov. 1, 1984, 59-230875; Dec. 19, 1984, 59-269299

Int. Cl.<sup>4</sup> H01Q 1/00

U.S. Cl. 343—700 MS



1. A microwave plane antenna comprising antenna bodies respectively of a dielectric material and carrying thereon at least a pair of substantially parallel microstrip lines cranked at mutually staggered positions, a frame for supporting two or more of said antenna bodies, a power supply circuit branched and connected to one end of each of said pairs of said microstrip lines for their tournament connection, and means for adjustably positioning the antenna bodies relative to said supporting frame by shifting the respective antenna bodies in a plane including a first axis vertical to a plane of the antenna body and a second axis in the width direction of the pair of the microstrip lines.

4,679,052

## AUTOMOBILE ANTENNA DEVICE

Junzo Ohe, and Hiroshi Kondo, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

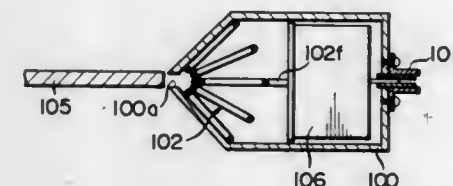
Filed Nov. 26, 1985, Ser. No. 801,771

Claims priority, application Japan, Nov. 27, 1984, 59-251244

Int. Cl.<sup>4</sup> H01Q 1/32

U.S. Cl. 343—712

7 Claims



1. An automobile antenna device comprising: an electrostatic shield case having an opening to face to a metal plate of the automobile body; and a loop antenna being internally arranged in said electrostatic shield case so that said loop antenna can be facing provided to said opening in its close vicinity, in order to detect the surface current induced in the surface of the automobile body by broadcasted waves, wherein said loop antenna is equipped with a plurality of loops which are respectively formed by wound antenna wires, and said respective loops are sectorially arranged with one side portions thereof are concentrated in the vicinity of the opening and the other side portions thereof are separately disposed in an approximately same distance.

4,679,053

## THERMAL VARIABLE VELOCITY PRINTER SYSTEM

Jonji Katsurai, Hachioji; Masao Monma, Kanagawa, and Tetsuo Takaku, Tsurugashima, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 682,265, Dec. 17, 1984, abandoned.

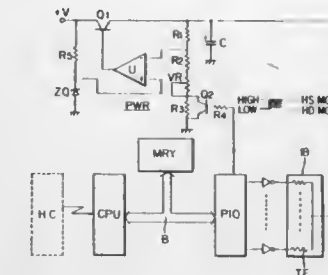
This application Dec. 6, 1985, Ser. No. 806,119

Claims priority, application Japan, Dec. 29, 1983, 58-249904

Int. Cl.<sup>4</sup> G01D 15/10; B41J 3/20

7 Claims U.S. Cl. 346—1.1

13 Claims



1. In a method of recording with a thermal printer having a thermal head having heating elements, wherein a printing is performed by selectively driving said heating elements, said method of recording comprising:

- generating a driving electric power signal and selectively applying said power signal to said heating elements;
- selectively setting one of at least two given recording character modes, each of which sets a given different recording speed; and
- controlling at least the pulse amplitude of said driving electric power signal applied to said heating elements of said thermal head in accordance with said set recording character mode while keeping the pulse cycle of said driving electric power signal at a predetermined substantially constant period, said pulse amplitude having a higher value when recording at a higher speed and a lower value when recording at a lower speed.

4,679,054

## PRINT HEAD

Yoshitaka Yoshikawa, Hirakata; Masahide Tsukamoto, Nara; Yutaka Nishimura, Kadoma; Hitoshi Ooo, Hirakata, and Tetsuhiro Sano, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

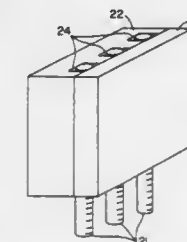
Continuation-in-part of Ser. No. 654,244, Sep. 25, 1984. This application Jul. 9, 1986, Ser. No. 883,017

Claims priority, application Japan, Sep. 27, 1983, 58-178537; Sep. 27, 1983, 58-178536; Sep. 29, 1983, 58-182126

Int. Cl.<sup>4</sup> G01D 15/06

U.S. Cl. 346—76 PH

16 Claims



1. A print head for printing on a printing medium an image corresponding to an electric signal, comprising: elongated electrical conductors to which said electric signal is applied; and fixing means for fixing said electrical conductors so that one end of each of said electrical conductors is exposed at a

surface of said fixing means to be in contact with said printing medium.  
wherein said fixing means is made of a sintered body containing hexagonal boron nitride so that both of said surface of said fixing means and said end of each of said electrical conductors are worn during printing, thereby keeping said end of each of said electrical conductors in contact with said printing medium.

4,679,055

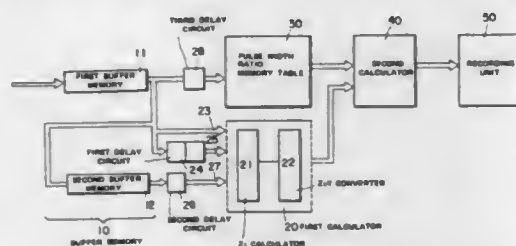
# METHOD AND APPARATUS FOR THERMAL HALF-TONE PRINTING

Toshiharu Inui, and Haruhiko Moriguchi, both of Ebina, Japan, assignors to Fuji Xerox, Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 634,707, Jul. 26, 1984, abandoned. This application Mar. 31, 1986, Ser. No. 846,515

Claims priority, application Japan, Jul. 28, 1983, 58-138362  
Int. Cl.<sup>4</sup> G01D 15/10

U.S. Cl. 46-76 PH

8 Claims



1. A method of thermal half tone printing of picture elements in lines wherein each picture element is made up of a plurality of dots, and the number of printed dots in said picture element and the size or brightness of respective printed dots are varied in accordance with a tone of a picture element to be printed so as to represent a half tone image, the method comprising the steps of:

- determining printing energy ratios between respective dots in said picture element in accordance with respective tones;
- calculating a heat accumulation state of the heat generating members corresponding to a picture element to be printed in accordance with at least the tones of picture element in the neighborhood of and in the same lines as said picture element to be printed, and
- controlling the printing energy supplied to said heat generating members corresponding to respective dots of said picture element to be printed in accordance with both said printing energy ratio and said calculated heat accumulation state.

4,679,056

# THERMAL HEAD WITH INVERTIBLE HEATING RESISTORS

Mikiya Kobayashi, Sagami-hara; Takeshi Nakada, Chiba, and Michio Arai, Koganei, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,290

Claims priority, application Japan, Oct. 4, 1984, 59-207097  
Int. Cl.<sup>4</sup> G01D 15/10; H01C 7/10; H05B 1/02

U.S. Cl. 346-76 PH

4 Claims



1. A thermal head comprising heating resistors with their temperature coefficient of resistance being negative at normal

temperature and invertible to be positive as the temperature rises, wherein the temperature coefficient of resistance of the heating resistors is from -500 to 0 ppm/° C. for 25°-150° C. and from 100 to 500 ppm/° C. for 25°-300° C., as represented by the average temperature coefficient of resistance.

4,679,057

# LASER RECORDING APPARATUS

Akiyoshi Hamada, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

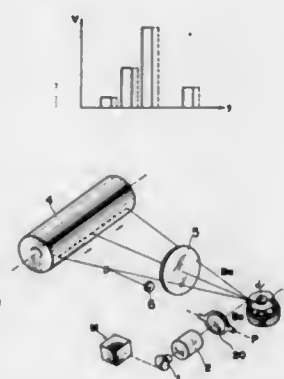
Filed Nov. 20, 1985, Ser. No. 799,916

Claims priority, application Japan, Nov. 22, 1984, 59-247278;  
Nov. 22, 1984, 59-247279

Int. Cl.<sup>4</sup> G01D 15/14; H04N 1/21

U.S. Cl. 346-76 L

16 Claims



1. A laser recording apparatus being adapted to modulate a laser beam by a multi-tone image signal and to scan the beam across a recording medium, said apparatus comprising:

- a laser light source,
- first means for producing a first pulse signal modulated in amplitude in accordance with the image signal,
- second means for producing a second pulse signal modulated in pulse width in accordance with the image signal,
- means for composing the first and second pulse signals to produce a pulse signal modulated in amplitude and width,
- means for modulating the laser beam in response to the pulse signal from the composing means, and
- means for scanning the beam across the recording medium.

4,679,058

# CASSETTE-TYPE PRINTING HEAD WITH PERFORATED FILM MEMBER

Kellechi Hori, Tokyo, Japan, assignor to Elm Company Ltd., Tokyo, Japan

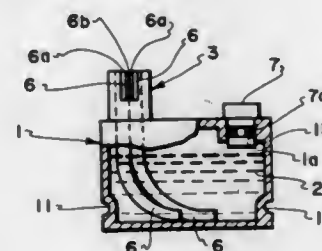
Filed May 7, 1985, Ser. No. 732,179

Claims priority, application Japan, May 22, 1984, 59-101845;  
Jun. 6, 1984, 59-114685

Int. Cl.<sup>4</sup> G01D 15/16, 15/10; B41J 31/14

U.S. Cl. 346-140 R

11 Claims



1. A cassette-type printing head comprising in combination:

a fluid ink; at least one cassette body having a cavity for housing said ink; at least one ink guiding member in which one end thereof is immersed in said cavity containing said ink; and a film member having a plurality of through openings for at least temporarily capturing said ink, said film member being slidably contacted by said ink guiding member; and, a thermal head having a plurality of elements cooperatively associated with said film member, with several of said through openings of said film member alignable with each of said thermal head elements for heating said temporarily captured ink in said through openings and jetting said ink into a sheet material.

4,679,060

# IONIC PRINT CARTRIDGE AND PRINTER

Robert S. McCallum, R.R. #1, Terra Cotta, Ontario, Canada L0P 1N0; Paul E. Plasschaert, R.R. #1, Limehouse, Ontario, Canada L0P 1H0; Dolf Landheer, 26 Euclid Avenue, Ottawa, Ontario, Canada K1S 2W3, and Hemant M. Gandhi, #12, 60 Wasdale Crescent, Toronto, Ontario, Canada M6A 1W8

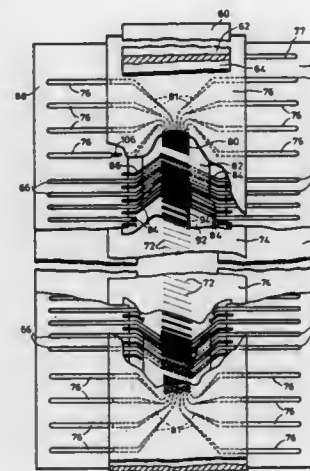
Filed Nov. 28, 1984, Ser. No. 675,664

Claims priority, application Canada, Dec. 9, 1983, 442946

Int. Cl.<sup>4</sup> G01D 15/06

U.S. Cl. 346-159

8 Claims



1. An ionographic print cartridge for use in placing discrete dots of electrostatic charge on a drum to build a latent image for subsequent toning, the print cartridge comprising:

- a substrate of a dielectric material having sufficient rigidity to resist deformation during assembly;
- driver electrodes printed on the substrate and consisting of parallel conductors extending longitudinally and lead portions terminating at the conductors and extending generally transversely from ends of the conductors for making electrical connections to the driver electrodes;
- a dielectric layer covering at least the conductors so that the conductors are at a first side of the layer;
- finger electrodes at the opposite side of the dielectric layer, the finger electrodes defining edge structures straddling the driver electrodes and having individual contacts to the sides of the driver electrodes for making electrical connections to the finger electrodes.

4,679,061

# SUPERLATTICE PHOTOCONDUCTOR

Federico Capasso, Westfield; Alfred Y. Cho, Summit; Albert L. Hutchinson, Piscataway, and Khalid Mohammed, North Plainfield, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 14, 1985, Ser. No. 745,277

Int. Cl.<sup>4</sup> H01L 27/12

U.S. Cl. 357-4

6 Claims

- 1. A photoconductive device comprising:  
a superlattice having interleaved well and barrier layers, said

4,679,059

# HIGH SPEED INK JET PRINTER WITH IMPROVED ELECTRICAL CONNECTION TO THE NOZZLES

Glandomenico Dagna, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Division of Ser. No. 631,950, Jul. 18, 1984. This application

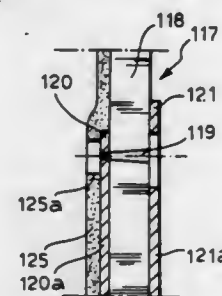
Mar. 10, 1986, Ser. No. 838,167

Claims priority, application Italy, Jul. 20, 1983, 67783 A/83

Int. Cl.<sup>4</sup> G01D 15/16

U.S. Cl. 346-140 R

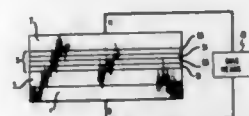
8 Claims



1. An ink jet printer including a reservoir made of insulating material for an electrically conductive ink, a common electrode in contact with ink in said reservoir, a plate member defining a wall portion of said reservoir, said plate member comprising a laminar substrate of rigid electrically insulating material and a plurality of metal coatings on the outer surface of the substrate, a coating of vitreous material on the outer surface of said substrate and over said plurality of metal coatings, a plurality of capillary nozzles associated with said metal coatings and formed as holes each of which passes through said substrate, one of said metal coatings and said vitreous coating, said metal coatings forming individual electrodes associated with said nozzles, and a pulse generating circuit for selectively generating voltage pulses applied between the common electrode and the individual electrodes for causing the ejection of ink droplets through the associated nozzles, wherein the improvement includes: each of said plurality of metal coatings on said outer surface extending to an edge of said substrate, an additional metal coating on the inner surface of said substrate to form said common electrode and having a portion extended to an edge of said substrate to define an edge portion, and a plurality of additional metal coating portions at the edge of said substrate to define edge portions and individually electrically connected with the metal coatings of said outer surface, said edge portion of said additional coating forming said common electrode and the edge portions connected to said metal coatings being electrically connected to said pulse generating circuit.



superlattice having differential conductivity for electrons and holes, said barrier layers having a first bandgap;



first and second semiconductor layer disposed on opposite sides of said superlattice, at least one of said layers being heavily doped.

4,679,062

## THIN FILM TRANSISTOR

Kotaro Okamoto, Hino, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

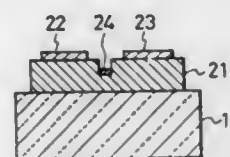
Filed Dec. 16, 1985, Ser. No. 809,677

Claims priority, application Japan, Dec. 28, 1984, 59-279986

Int. Cl.<sup>4</sup> H01L 29/80

U.S. Cl. 357-22

7 Claims



1. A thin film transistor comprising:
  - a substrate;
  - an impurity-doped hydrogenated amorphous silicon semiconductor layer formed on the substrate;
  - a source and drain electrode formed apart from one another on the amorphous silicon semiconductor layer in ohmic contact therewith;
  - a gate electrode formed on the amorphous silicon semiconductor layer in Schottky contact therewith between the source and drain electrodes, the portion of said amorphous silicon semiconductor layer underlying the gate electrode being 0.1 to 1.0  $\mu\text{m}$  thick; and
  - an impurity-undoped amorphous silicon semiconductor layer interposed between the impurity-doped amorphous silicon semiconductor layer and the substrate.

4,679,063

## INFRA RED DETECTORS

Anthony M. White, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 22, 1983, Ser. No. 534,692

Claims priority, application United Kingdom, Sep. 23, 1982, 8227180

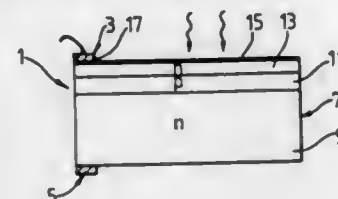
Int. Cl.<sup>4</sup> H01L 27/14

U.S. Cl. 357-30

15 Claims

1. An infrared photoconductive detector comprising:
  - (1) an n-type semiconducting emitter region of infrared photo-sensitive material;

- (2) a collector region, the emitter and collector region materials being of the same majority carrier type;
- (3) emitter and collector contacts; and
- (4) a barrier region connecting the emitter and collector regions, said barrier region:
  - (a) comprising p-type semiconductor material,
  - (b) having a valence band substantially common with the emitter material valence band,



- (c) having a wider band gap than the emitter material and providing a heterostructure conduction band discontinuity with the emitter region, and
- (d) being arranged such that electron flow between the emitter and collector regions is impeded while corresponding hole flow is substantially unimpeded.

4,679,064

## CIRCUIT FOR CHANGEABLE PROLONGATION OF THE RUNNING TIME OF AN ULTRASOUND DELAY LINE

Heinz Hess, Weiterstadt, and Horst Peth, Alsbach-Häheleln, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE85/00067, § 371 Date Jul. 18, 1985, § 102(e) Date Jul. 18, 1985, PCT Pub. No. WO85/04303, PCT Pub. Date Sep. 26, 1985

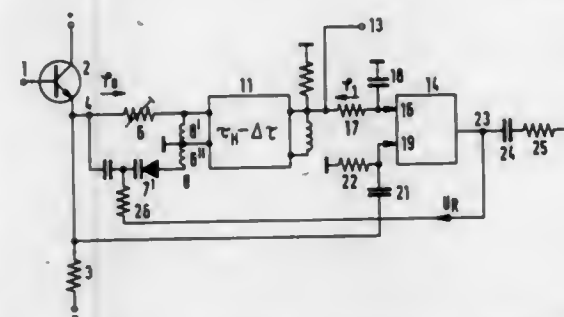
PCT Filed Mar. 4, 1985, Ser. No. 765,433

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1984, 3408821

Int. Cl.<sup>4</sup> H04N 9/66

U.S. Cl. 358-24

5 Claims



1. Circuit for a changeable prolongation of the (phase-) running time of an ultrasound delay line with a delay duration of somewhat less than a line duration for color television signals in the range of the color carrier frequency, comprising a source of a signal to be processed, a changeable resistor which is connected between said source and a first input of the ultrasound delay line; a coil which is disposed between the first input and a second input of the delay line, said second input being connected to a reference potential; the coil being a first winding (8') of a transformer, (8), said transformer having a second winding (8'') connected at one end thereof to the reference potential and, at the other end thereof, through a changeable capacity (7) to a connection point of the changeable resistor (6) and the signal source.

4,679,065

## AUTOMATIC WHITE CONTROL CIRCUIT FOR COLOR TELEVISION RECEIVER

Toshimitsu Umezawa, Kazo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 9, 1984, Ser. No. 628,985

Claims priority, application Japan, Jul. 11, 1983, 58-124608

Int. Cl.<sup>4</sup> H04N 9/64, 9/20, 9/16

U.S. Cl. 358-29

7 Claims

4,679,067

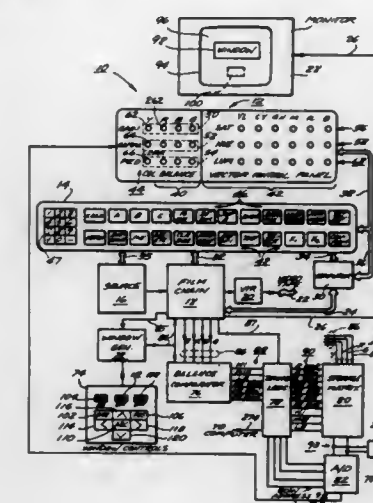
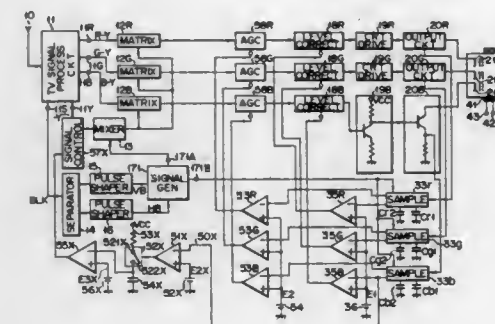
## COLOR CORRECTION SYSTEM AND METHOD WITH LOCALIZED COLOR SAMPLING

Armand Belmares-Sarabia, Oak Beach, N.Y., and Stanley J. Chayka, Parsippany, N.J., assignors to Corporate Communications Consultants, Inc., Fairfield, N.J.

Filed Apr. 9, 1984, Ser. No. 598,468

Int. Cl.<sup>4</sup> H04N 9/73

19 Claims



4,679,066

## COLOR IMAGE PICKUP DEVICE

Makoto Masunaga; Tomotaka Muramoto, both of Tokyo, and Kenichi Nagasawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

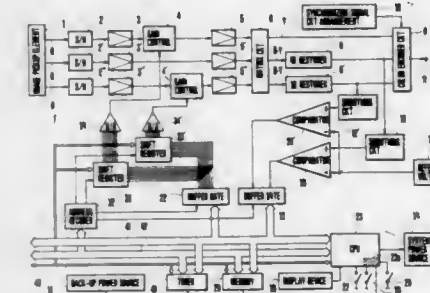
Continuation of Ser. No. 501,985, Jun. 7, 1983, abandoned. This application Oct. 30, 1986, Ser. No. 926,807

Claims priority, application Japan, Jun. 9, 1982, 57-99851; Jun. 9, 1982, 57-99852; Jun. 9, 1982, 57-99860; Mar. 29, 1983, 58-53009; Mar. 29, 1983, 58-53010

Int. Cl.<sup>4</sup> H04N 9/73

U.S. Cl. 358-29

27 Claims



1. A color image pickup system comprising:
  - image pickup means for obtaining a color video signal from an optical image;
  - hue adjusting means for adjusting the hue of the color video signal produced by said image pickup means;
  - first memory means for determining the state of said hue adjusting means according to data stored therein;
  - control means for varying the data stored in said first memory means by utilizing the output of said image pickup means;
  - second memory means for storing the data of said first memory means; and
  - further including judging means for judging the validity of data stored in said second memory means.

1. Apparatus for color-correcting video picture signals having red, green, and blue color component signals and a luminance signal, said apparatus comprising, in combination, display means for displaying on a video monitor screen a picture composed of said video picture signals, means for detecting the color characteristics of selected ones of said signals, selecting means for selecting the ones of said video picture signals for which said color characteristics are detected as those which create picture elements within a predetermined area which is less than the area of the entire picture, means for selectively moving and locating said predetermined area within said picture, said means for selectively moving and locating including means for selectively changing the size and position of said predetermined area, and automatic color balancing means for automatically developing color balance signals for said selected picture signals, said automatic color balancing means including means for comparing each of said red, green, and blue color signals with said luminance signal, and means for adjusting each of said red, green, and blue color signals to attain a predetermined relationship with said luminance signal.

4,679,068

## COMPOSITE VISIBLE/THERMAL-INFRARED IMAGING SYSTEM

Robert D. Lillquist; Joseph M. Pimbley, and Thomas L. Vogel-song, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 25, 1985, Ser. No. 758,981

Int. Cl.<sup>4</sup> H04N 5/33, 9/07; H01L 25/00

U.S. Cl. 358-44

25 Claims

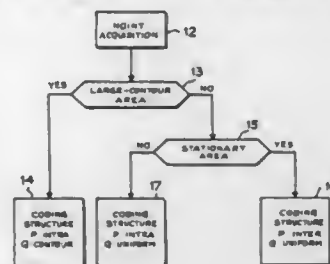
1. Multispectral imaging apparatus comprising a wavelength-independent focus reflective optical system for receiving visible and infrared radiation from a scene and for focusing the visible and infrared radiation at a common focal plane; detector means responsive to both the visible and the infrared radiation focused at the common focal plane, the detector means providing first and second signals representative, respectively, of the visible and the infrared radiation received by the detector means; and means responsive to the first and second signals for displaying a composite image of the scene,







image and being coded at the transmitter by means of a differential coding device of the type comprising at least one predictor, at least one quantizer, a device for reconstruction of the transmitter data and a code allocator, said data being decoded at the receiver by a differential decoder comprising at least one code converter, a predictor and a device for reconstruction of the transmitted data, wherein said method comprises coding the data relating to each current point to be transmitted by means of a first predictor and a first quantizer when the point belongs to a contour area, coding the data relating to each point of a uniform or slightly textured area by means of at least a second predictor and a second quantizer, and decoding each received data code at the receiver by means of a prediction



characteristic providing a prediction value which is identical with the value previously computed at the transmitter for decoding the received data code, in comparing the prediction errors of each predictor of the transmitter and of the receiver with at least one predetermined error threshold value in order to code the current point data at the transmitter by means of different code words of fixed length, depending on whether the results of comparisons of the errors of prediction of the points adjacent to the current point already transmitted to the receiver indicate that the point is in a contour area or in a uniform area and in order to switch the receiver to a predictor which has the same prediction characteristic as the predictor employed earlier for coding the current point data at the transmitter.

4,679,080

## FIELD BLANKING PULSE MODIFIER

Dennis J. Bashford, and Geoffrey H. Blackham, both of Hordsham, England, assignors to Rediffusion Simulation Limited, England

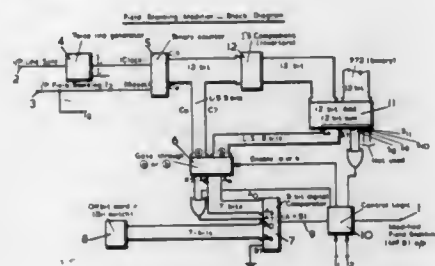
Filed Sep. 6, 1985, Ser. No. 773,249

Claims priority, application United Kingdom, Sep. 6, 1984, 8422548

Int. Cl. H04N 5/06

U.S. Cl. 358—150

2 Claims



1. A field blanking pulse modifier comprising means for deriving clock pulses from line synchronizing pulses of a conventional television signal, means for deriving a field blanking pulse from the television signal, a counter providing an output count which is reset by the derived field blanking pulse and counts the clock pulses, means for setting an offset count corresponding to half a predetermined difference between the duration of a modified field blanking pulse to be generated and the duration of the derived field blanking pulse, means for initiating the modified field blanking pulse before the derived field blanking pulse when a difference between the counter output count and a predetermined count which is equal to the number of the clock pulses which occur between two successive derived field blanking pulses becomes less than the offset count,

and for terminating the modified field blanking pulse after the derived field blanking pulse when the counter output count becomes equal to the offset count, wherein the means for initiating and terminating the modified field blanking pulse comprises a control logic circuit, a comparator for comparing the offset count and the output from a gate to produce a comparator output, and a subtractor receiving the counter output count and the predetermined count, wherein the gate receives the counter output count and the output of the subtractor and is controlled by the control logic circuit to alternately provide as the gate output the two outputs supplied to it, said control logic circuit being responsive to the comparator output to generate the modified field blanking pulse during a period when the gate output is less than the offset count.

4,679,081

## SYSTEM FOR CODING VIDEO SIGNAL IN BLOCK UNIT

Syuzo Tsugane, and Mitsuo Nishiwaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

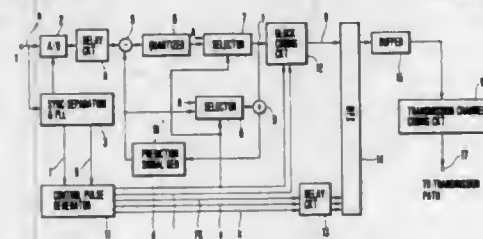
Filed Nov. 12, 1985, Ser. No. 796,690

Claims priority, application Japan, Nov. 9, 1984, 59-236226

Int. Cl. H04N 1/40, 7/12

U.S. Cl. 358—138

5 Claims



1. A coding system to divide a frame of a video signal into a plurality of blocks per a predetermined number of lines to encode each area divided into block, said coding device comprising:

synchronization detector means for detecting a frame synchronization signal from said picture signal;

block formation means operative to divide said video signal in block units per said predetermined number of lines by using a picture frame synchronization signal detected by said synchronization detector means as a reference such that when the number of lines included in a block immediately before the subsequent picture frame synchronization signal is less than said predetermined number of lines, said block formation means is operative to designate said block as an ineffective block;

coding means operative to apply a coding processing to the blocks except for said ineffective block designated by said block formation means in accordance with a predetermined coding procedure; and

transmission means operative to multiplex coded data outputted from said block formation coding means, position information of the first block immediately after said picture frame synchronization signal, and the number of lines within said ineffective block to transmit the multiplexed signal thus obtained, whereby when said input video signal is asynchronously switched, an operation is executed to vary the number of lines included within only said ineffective block in the signal picture frame immediately after said switching, thus always maintaining an area to be coded at the rate of said predetermined number of lines.

4,679,082

## CODE TRANSMISSION SYSTEM CHARACTER BROADCASTING RECEIVER

Takeshi Shibasaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,520

Claims priority, application Japan, Apr. 27, 1984, 59-86826

Int. Cl. H04N 7/04; G06F 11/00

U.S. Cl. 358—147

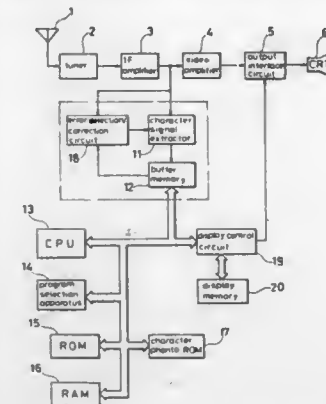
2 Claims

1. A receiver for a code transmission system broadcast signal

transmitted during the vertical blanking period of a television video signal, comprising:

means for extracting a character signal inserted in the video signal;

means for detecting the existence of a code error in the character signal simultaneously with the extraction of said



character signal, and outputting a detection signal corresponding thereto; buffer memory means for temporarily storing the character signal and detection signal corresponding thereto; and correction means, responsive to said detection signal, for correcting the code error in said character signal stored in said buffer memory means.

4,679,083

## TELETEXT DEVICE WITH REDUCED PAGE-ACCESS TIME

Herman J. R. Schmitz; Marcellinus J. J. C. Annegarn, and Wilhelmus F. Fekkes, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

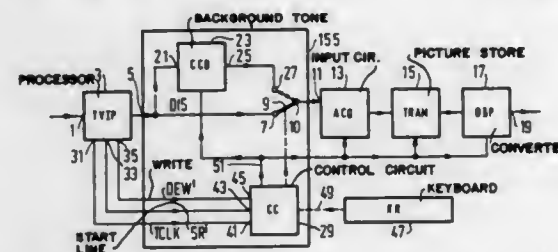
Filed Mar. 1, 1984, Ser. No. 585,335

Claims priority, application Netherlands, Mar. 2, 1983, 8300764; Apr. 1, 1983, 8301174

Int. Cl. H04N 7/087

U.S. Cl. 358—147

17 Claims



1. An apparatus for generating video text data carried on a television signal during a time interval of each field, said video text data including a plurality of magazines, each magazine including a plurality of numbered pages and numbered rows of text, comprising:

a processor for deriving said text data from said television signal;

an input circuit for processing said text data;

a picture store connected to receive and store a selected page of said text data from said input circuit;

a background store connected to said processor for storing at least two pages additional to said selected page of said video text data;

a switch connected to deliver said text data from said processor, and said background store to said input circuit;

a control circuit connected to control said switch, whereby said input circuit receives either said processor text data or said background store data, and further connected to control writing of said background store; and

keyboard means connected to said control circuit from

which to send a selected page number of said text data to said control circuit, whereby said control circuit identifies, in response to a single page selection, a magazine containing said pages to be written into said background memory, and said control circuit further identifies whether said processor text data or background store data is to be delivered to said picture store.

4,679,084

## METHOD AND APPARATUS FOR FREEZING A TELEVISION PICTURE

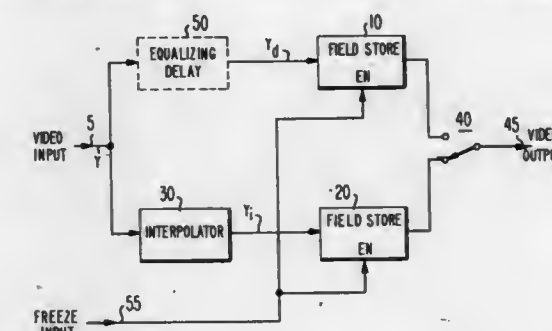
Robert J. Topper, Hatboro, Pa., and Robert A. Dischert, Burlington, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 20, 1986, Ser. No. 876,432

Int. Cl. H04N 5/14

U.S. Cl. 358—160

6 Claims



1. A method of freezing a television picture comprising the steps of:

storing one of successive fields of at least one component of an input video signal;

generating successive fields of motion compensated frame averaged interstitial lines from said input video signal;

storing one of said successive fields of interstitial lines which correspond to said stored field of said input video signal;

repetitively sequencing lines from said stored fields of said input video signal and interstitial lines to form a video signal representing a frozen television picture.

4,679,085

## DIGITAL INTEGRATED ELECTRONIC STORAGE SYSTEM FOR VIDEO AND AUDIO PLAYBACK

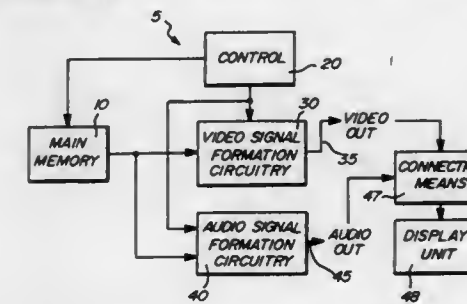
Robert R. Johnson, Franklin, and Walter E. Chapelle, Southfield, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Dec. 4, 1984, Ser. No. 678,165

Int. Cl. H04N 5/14, 7/04

U.S. Cl. 358—160

117 Claims



1. A hand holdable, portable, integral memory system comprising:

a supporting substrate;

electrically addressable memory means supported on said substrate for storing information in binary bit form;

addressing means supported on said substrate for addressing said memory means at selected bit locations thereof;



timing means supported on said substrate for controlling said addressing means in a preselected sequence; coupling means supported on said substrate for interconnecting said memory means, said addressing means and said timing means; connection means supported on said substrate for providing an external connection to said system; digital to analog conversion means supported on said substrate for converting said binary bit information into analog form for external read-out; and parallel-in serial-out shift register means supported on said substrate and coupled between said memory means and said conversion means for providing said conversion means with discrete pluralities of binary bit information from said memory means.

4,679,086

## MOTION SENSITIVE FRAME INTEGRATION

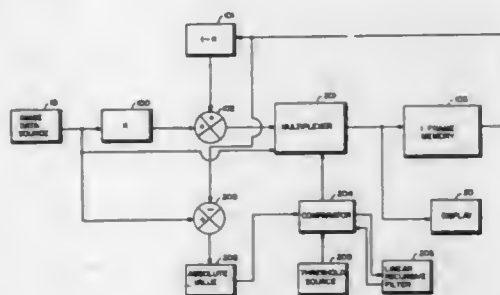
Roger A. May, Longwood, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 24, 1986, Ser. No. 831,894

Int. Cl.<sup>4</sup> H04N 5/213

U.S. Cl. 358—167

6 Claims



1. An image noise suppression system which receives and conducts image data from a signal source to a display, said image noise suppression system comprising:

- a discriminating means which receives said image data from said signal source and produces a discriminating signal indicating when said image data depicts moving objects for pixels and said discriminating signal indicating when said image data depicts stationary objects for pixels;
- a memory means which receives, stores and outputs noise suppressed image data;
- a means for frame integration which receives said image data from said signal source, and noise suppressed image data from said memory means, said integration means outputting a frame integrated signal comprised of one half of said image data plus one half of said noise suppressed image data from said memory means; and
- a multiplexer which outputs noise suppressed image data to said memory means and said display by receiving said discriminating signal from said discriminating means and conducting said frame integrated signal from said integration means to said display and said memory means when said discriminating signal indicates said image data depicts stationary objects for pixels, said multiplexer conducting said image data directly to said display and said memory means when said discriminating signal indicates that said image data is depicting moving objects for pixels.

4,679,087

## METHOD AND APPARATUS FOR PHOTOGRAPHING VIDEO IMAGES OF EITHER POLARITY WITHOUT CRT BRIGHTNESS OR CONTRAST READJUSTMENT

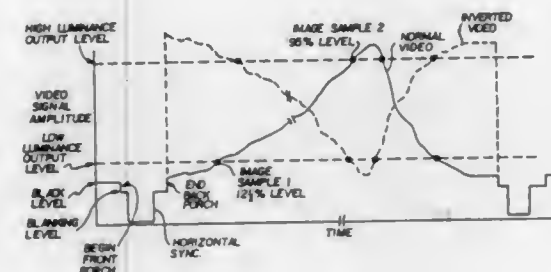
Michael A. Torrano, Jr., Albany; George E. Lyon, San Francisco, and David H. Haddick, Berkeley, all of Calif., assignors to LogE/Duna Instruments, Inc., San Francisco, Calif.

Filed Mar. 12, 1984, Ser. No. 588,473

Int. Cl.<sup>4</sup> H04N 5/14, 5/18, 5/84

U.S. Cl. 358—168

10 Claims



1. In a video display for generating normal and inverted images for photographing, a circuit for maintaining a video signal within a range required to produce a desired image brightness and contrast comprising:

- a detector circuit for sampling said video signal at first and second amplitude levels, said detector circuit producing HISS and LISS levels corresponding to said amplitude levels;
- a multiplier circuit having first and second voltage inputs for multiplication of two received voltages;
- a differential amplifier connected to receive an output level from said multiplier, and a reference signal, said reference signal controlling the output DC level of said differential amplifier;
- a drive amplifier connected to receive an output signal from said differential amplifier;
- a sample circuit connected to detect a signal from said drive amplifier during a blanking interval, said sample circuit providing a clamped voltage reference signal to said differential amplifier based on a sampled level of the signal from said drive amplifier, whereby during the remaining interval of said video signal, said differential amplifier output voltage is clamped to a known DC level by said clamped reference signal;
- a contrast control connected to apply a voltage level to said multiplier second input; and
- a switch for applying, during a blanking interval of said video signal one of said HISS or LISS levels, whereby said clamped voltage reference signal is produced, and during monitor CRT calibration selectively applying in sequence following said blanking interval, one of said HISS or LISS levels to said multiplier first input, depending on the polarity of the image to be produced, whereby the brightness adjustment for said image is selected under excitation of one of said HISS or LISS levels and the contrast adjustment is selected under excitation of the other of said HISS and LISS levels to establish an image brightness within said range.

4,679,088

## IMAGE SENSOR WITH MEANS TO ADJUST CAPACITANCE OF SIGNAL LEADS

Hitoshi Chiyoma, Okegawa; Zensaku Watanabe, Yokohama, and Masahiro Nakagawa, Chofu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

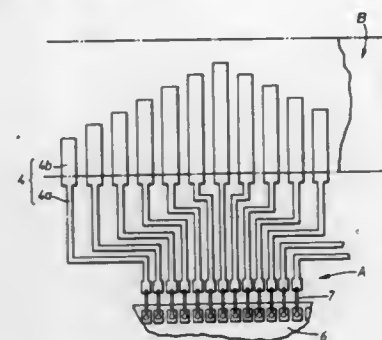
Filed Nov. 25, 1985, Ser. No. 802,160

Claims priority, application Japan, Nov. 28, 1984, 59-250879; Jun. 25, 1985, 60-136991

Int. Cl.<sup>4</sup> H04N 1/024

U.S. Cl. 358—213.18

16 Claims



1. In an image sensor comprising:

- a substrate;
- a photoelectric conversion section formed from an array of individual photoelectric conversion elements formed on said substrate;
- a drive circuit section reading the output signals from said photoelectric conversion elements; said photoelectric conversion section and said drive circuit section being connected by a plurality of conductive strips of which the wiring length of at least one of the strips formed on said substrate is different from the length of another of the strips, the improvement comprising capacitance adjustment conductive strips which correct the wiring length of at least one of said connecting conductive strips, are positioned underneath or close to said photoelectric conversion section, and equalize substantially the stray capacitance of each of said connecting conductive strips.

4,679,089

## SOLID STATE IMAGE SENSOR HAVING AN ANTI-BLOOMING ISOLATION ELECTRODE

Toshiaki Kato, Miura, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

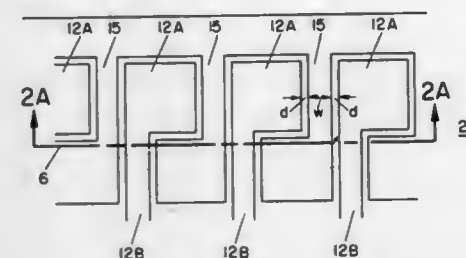
Filed Feb. 11, 1986, Ser. No. 828,288

Claims priority, application Japan, Feb. 15, 1985, 60-27771

Int. Cl.<sup>4</sup> H04N 3/14

U.S. Cl. 358—213.19

3 Claims



1. An image sensor comprising a large area electrode, a layer of a photosensitive material, overlying the large area electrode and an array of spaced discrete electrodes overlying the layer of photosensitive material, characterized in that an isolation electrode also overlies the layer of photosensitive material including portions in the spaces between the discrete electrodes but separated from the discrete electrodes.

4,679,090

## CCD CIRCUITRY FOR LINE-SEQUENTIAL READ OUT OF A PHOTOSENSOR ARRAY

Harry G. Erhardt, East Windsor, N.J., assignor to RCA Corporation, Princeton, N.J.

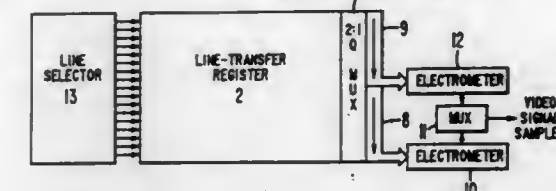
Filed Jan. 23, 1986, Ser. No. 824,556

Int. Cl.<sup>4</sup> H04N 3/14

U.S. Cl. 358—213.26

18 Claims

CHARGE MULTIPLEXER 7 TIME-DIVISION-MULTIPLEXES ODD & EVEN NUMBERED LINES OF CHARGE PACKETS AT FIELD RATE



1. A method for preventing line selection artifacts from occurring in the line trace portions of the video signal samples supplied from a CCD imager of the type using side-loaded CCD shift register circuitry for providing a plurality of charge transfer paths, from the output ports of a parallel array of the charge transfer channels in a line-transfer register, to the input port of a charge sensing stage generating said video signal samples as responses at its output port, said method comprising the steps of:

- introducing respective charge packet contents into the charge transfer channels of said line-transfer register during times that those charge transfer channels are not forward clocked;
- selectively forward clocking said charge transfer channels over respective intervals of time sufficient to serially transfer their charge packet contents to their output ports; and
- keeping the delay of said video signal samples attributable to side loading said CCD shift register circuitry, short enough that said delay does not exceed the length of a line retrace interval.

4,679,091

## MULTIPLE SCANNING TYPE TELEVISION RECEIVER Masafumi Kikuchi; Toshio Onodera; Sumio Toyama, all of Kanagawa, and Hiroshi Sakamoto, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 10, 1985, Ser. No. 786,249

Claims priority, application Japan, Oct. 15, 1984, 59-215856

Int. Cl.<sup>4</sup> H04N 5/68

U.S. Cl. 358—242

10 Claims

- 1. A television receiver comprising:
- video signal receiving means for receiving a video signal, a vertical synchronizing signal and a horizontal synchronizing signal;
- a signal processing circuit for supplying said video signal to a cathode ray tube;
- a vertical deflection circuit for supplying a vertical deflection signal to said cathode ray tube in response to said vertical synchronizing signal;
- a horizontal deflection circuit for supplying a horizontal deflection signal to said cathode ray tube in response to said horizontal synchronizing signal;
- frequency detecting means connected to said video signal receiving means for detecting the frequency of said horizontal synchronizing signal and deriving a control signal in response thereto; and
- control means connected between said frequency detecting means and said horizontal deflection circuit for controlling the latter in response to said control signal from the former;





a rotary cylinder so that said first magnetic head first scans a predetermined video track and thereafter said second magnetic head scans the same predetermined video tracks, said method comprising the steps of:

- recording said video signal on said predetermined video track by said first magnetic head so that said first signal is recorded to extend to a substantial depth in said magnetic layer;
- recording said audio signal on said predetermined video track by said second magnetic head, wherein said second magnetic head has a gap length which is shorter than that of said first magnetic head so that said audio signal is recorded in a shallower part of said magnetic layer throughout said predetermined video track, said video signal remaining in said magnetic layer at a part below said shallower part; and
- reproducing said video and audio signals overlapping on said predetermined video track by said first and second magnetic heads, respectively.

4,679,098

### VIDEO TAPE TRANSPORT SERVO FOR VARIABLE TAPE SPEED CONTROL

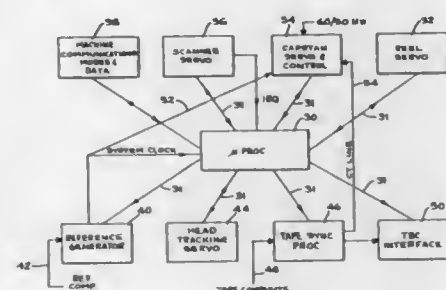
Marshall Williams, Fremont, and David R. Rodal, Palo Alto, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 768,164, Aug. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 419,631, Sep. 17, 1982, abandoned. This application Mar. 6, 1986, Ser. No. 837,520

Int. Cl.<sup>4</sup> H04N 5/782; G11B 15/46

U.S. Cl. 360—10.1

12 Claims



1. A capstan servo for moving video tape with variable speed during reproducing, said capstan servo being capable of detecting and responding to a recording control track signal, a stable reference vertical signal, a sync/async select line, and a high rate clock, said servo comprising:

- input means for inputting a specified time period to said capstan servo;
- programmable counting means clocked by the high rate clock for providing a controllable vertical sync output signal for use in providing a closed loop control track locked tape drive, said counting means having a synchronous mode of operation using the stable reference vertical signal as a synchronizing input, having means to disable said synchronizing input, and having a free-wheeling mode of operation when said synchronizing input is disabled, the enabling and disabling being responsive to the state of the sync/async line;
- processing means for programming said counting means with a presettable count, said presettable count determining the frequency of said controllable vertical sync signal; tape speed override means for enabling and disabling said synchronizing input in response to the signal carried on the sync/async select line; and
- conversion means for converting said specified time period to said presettable count and providing said presettable count to said processing means.

### 4,679,099 INFORMATION SIGNAL REPRODUCING APPARATUS

Hiroo Edakubo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

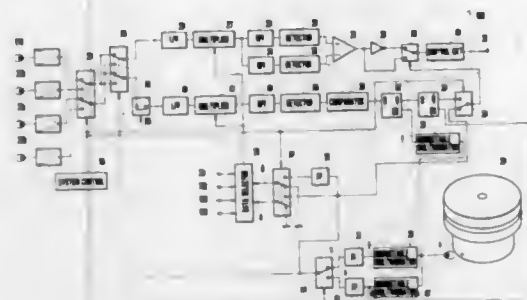
Filed Jul. 24, 1984, Ser. No. 633,799

Claims priority, application Japan, Jul. 28, 1983, 58-138549

Int. Cl.<sup>4</sup> G11B 5/56

U.S. Cl. 360—10.2

18 Claims



1. An information signal reproducing apparatus, for reproducing information signals from a recording medium having formed thereon a plurality of tracks having successively recorded thereon four pilot signals with frequencies different from one another along with information signals, comprising:
  - (a) reproducing means for tracing said plurality of recorded tracks for reproducing the information signals;
  - (b) moving means for moving the recording medium in a direction intersecting said plurality of recorded tracks;
  - (c) change-over means for switching said apparatus between a first reproducing mode and a second reproduction mode wherein:

- in said first reproduction mode said moving means moves said recording medium at a first speed with which said number of tracks are formed; and
- in said second mode said moving means moves the recording medium at a speed different from said first speed;
- (d) generation means for selectively generating four reference signals having different frequencies;
- (e) selection control means for controlling said generation means so as always to generate a single reference signal in said second mode and to periodically and sequentially generate four reference signals in said first mode;
- (f) signal processing means for forming a tracking control signal for said reproducing means by using said signal of the reference signals obtained from said generation means and the pilot signals reproduced by said reproducing means; and
- (g) tracking control means for controlling the tracking of said reproducing means based on said tracking control signal.

10. An information signal reproducing apparatus, for reproducing information signals from a recording medium having formed thereon a number of tracks on which four pilot signals having frequencies different from one another are recorded and on which information signals are recorded, comprising:

- (a) reproducing means for tracing said plurality of recorded tracks for reproducing the information signals;
- (b) signal processing means for forming a tracking control signal for said reproducing means by using said pilot signals reproduced at a first timing by said reproducing means;
- (c) process control means for controlling processing characteristics of said signal processing means by using pilot signals reproduced by a second timing different from the first timing; and
- (d) tracking control means for controlling the tracking of said reproducing means based on said tracking control signal.

### 4,679,100 ROTARY HEAD TYPE MAGNETIC RECORDING AND REPRODUCING DEVICE

Hiroshi Yokota, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

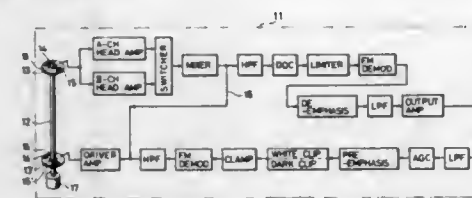
Filed Aug. 27, 1985, Ser. No. 769,905

Claims priority, application Japan, Aug. 31, 1984, 59-180707

Int. Cl.<sup>4</sup> G11B 5/86, 27/02

U.S. Cl. 360—15

2 Claims



1. A magnetic recording and reproducing device in which a reproducing signal outputted by first rotary head means is recorded by second rotary head means, comprising: a drum motor; a single rotary shaft rotated by said motor; a first rotary disk on which said first rotary head means is mounted; a second rotary disk on which said second rotary head means is mounted, said first and second rotary disks being mounted on said single rotary shaft in such a manner that said first and second rotary disks are rotated by said drum motor; first and second magnetic heads borne by said first and second rotary disks, respectively; first and second head amplifiers; means for coupling outputs of said first and second magnetic heads to said first and second head amplifiers, respectively; switching means receiving as inputs outputs of said first and second head amplifiers; mixer means receiving as an input an output of said switching means; and means for driving said second rotary head means in response to an output of said mixer means.

### 4,679,101 INFORMATION RECORDING OR ERASING APPARATUS

Nobuo Tezuka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

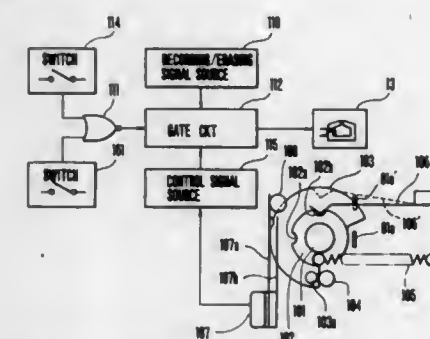
Filed Aug. 24, 1983, Ser. No. 526,038

Claims priority, application Japan, Aug. 25, 1982, 57-147290

Int. Cl.<sup>4</sup> G11B 5/02, 5/09

U.S. Cl. 360—60

26 Claims



1. An apparatus for use with a recording medium housed in a cassette, said cassette having settable means for indicating inhibition of recording or erasing operation, said apparatus comprising:

- (A) means for recording signals or erasing recorded signals on or from said recording medium;
- (B) first means responsive to said settable means of said cassette for inhibiting said means for recording or erasing from recording or erasing the signals on or from said recording medium when said settable means is set to indicate inhibition of the recording or erasing operation;
- (C) second means for enabling said means for recording or

- erasing to record or erase signals on or from said recording medium in a condition that said first means is inhibiting the recording or erasing of the signals; and
- (D) third means for resetting said second means from its operated state at which the second means enables said means for recording or erasing to record or erase the signals regardless of said first means to its nonoperated state.

### 4,679,102 METHOD AND MEANS FOR PARKING READ/WRITE HEADS IN A DISC DRIVE USING THE BACK-EMF OF THE SPINDLE MOTOR TO OPERATE A STEPPER MOTOR

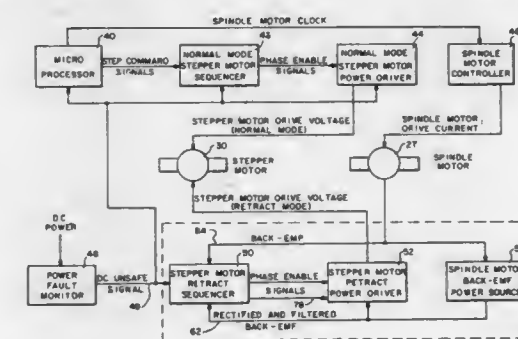
William E. Wevers; James N. Krause, both of Santa Clara County, and Ramgopal Battu, Los Angeles County, all of Calif., assignors to Seagate Technology, Scotts Valley, Calif.

Filed Nov. 20, 1985, Ser. No. 800,060

Int. Cl.<sup>4</sup> G11B 5/54, 21/02

U.S. Cl. 360—75

16 Claims



1. In a disc drive comprising a plurality of discs mounted for rotation within a disc drive housing, a spindle motor for driving said discs in rotation, an actuator for reciprocally driving a transducer array relative to the discs, said actuator including a carriage for said transducer array and a stepper motor drivingly connected to the carriage for positioning the carriage and transducer array relative to the discs and a circuitry for detecting removal of power, means for parking the transducer array at a defined park position relative to the discs after power is removed from the drive comprising circuitry for disabling normal stepper motor control and a stepper motor retract sequencer circuit coupled between the spindle motor and selected windings of the actuator stepper motor and responsive to an output of said spindle motor to energize said windings of the stepper motor to move the transducer array to a defined position.

### 4,679,103 DIGITAL SERVO CONTROL SYSTEM FOR A DATA RECORDING DISK FILE

Michael L. Workman, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1986, Ser. No. 857,263

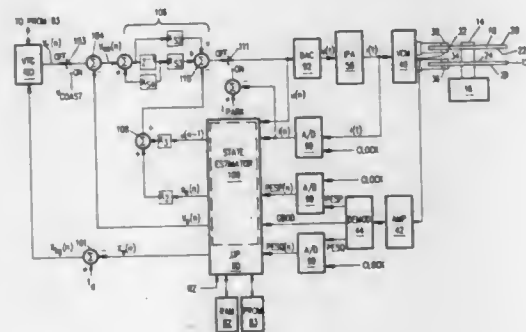
Int. Cl.<sup>4</sup> G11B 5/55, 5/56

U.S. Cl. 360—77

16 Claims

1. A method for controlling the data track seeking and following of a head in a data recording disk file of the type having a disk with servo information thereon defining data track centerlines, a head for reading samples of the servo information during rotation of the disk, an actuator connected to the head and responsive to an input signal for positioning the head to the centerline of a target track during track seeking and maintaining the head over the centerline of the target track during track following, the method comprising the steps of: generating from the servo information a sampled head posi-

tion error signal (PES) representative of the position of the head relative to the centerline of the nearest track; estimating, for each PES sample, the absolute head position, relative to a fixed reference, and the head velocity; estimating, for each PES sample, the equivalent actuator input signal required to compensate for bias forces acting on the actuator; measuring, for each PES sample, the input signal to the actuator; computing, for each PES sample, a commanded head velocity as a function of the distance from the estimated absolute head position to the target track; computing, for each PES sample, the head velocity error as a function of the difference between the commanded head velocity and the estimated head velocity; estimating, for each PES sample, the head acceleration as a function of the measured actuator input signal and estimated bias force equivalent actuator input signal; generating, for each PES sample, a control signal as a function of the head velocity error, the estimated head acceleration, and the control signal generated for the prior PES sample; integrating the control signal;



#### 4,679,104 METHOD AND ARRANGEMENT FOR POSITIONING A MAGNETIC HEAD TO VARIOUS TRACKS OF A MAGNETIC TAPE

Ole C. Dahlerud, Oslo, Norway, assignor to Tandberg Data A/S, Oslo, Norway

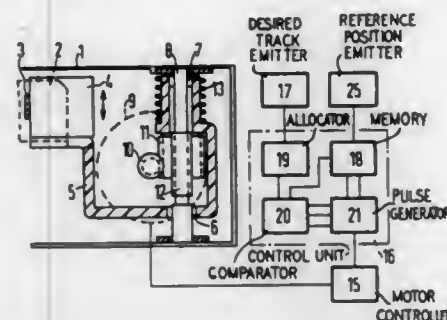
Filed Jan. 16, 1986, Ser. No. 819,496

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504384

Int. Cl.<sup>4</sup> G11B 5/55

U.S. Cl. 360—78

14 Claims



1. A method for positioning a magnetic head to various tracks of a magnetic tape in a magnetic tape recorder, comprising the steps of:

positioning said magnetic head to said various tracks perpendicular to a moving direction of said magnetic tape by use of a positioning device provided with an electric motor; defining a reference position on the magnetic tape; identifying substantially exact desired position of a write/read head of said magnetic tape during a measuring procedure by a positioning to at least one track relative to said reference position; determining desired positional values corresponding to said substantially exact desired positions; and during normal operation of said magnetic tape recorder, generating actual positional values corresponding to actual positions of the write/read head, and control signals for a motor controller connected to the motor being derived by a comparison of the actual positional values to said desired positional values so as to drive said electric motor of said positioning device until the actual and desired positional values correspond.

#### 4,679,105 HEAD POSITIONING ASSEMBLY FOR A DISK DRIVE

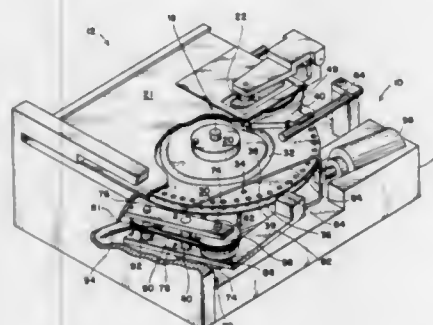
Christopher J. Maryatt, 175 Calvert Dr. No. N-203, Cupertino, Calif. 95014

Filed Jan. 25, 1985, Ser. No. 695,084

Int. Cl.<sup>4</sup> G11B 5/012

U.S. Cl. 360—97

36 Claims



1. A positioning assembly for positioning a point element on a rotating member, comprising:

providing the integrated control signal as the input signal to the actuator; storing, for each PES sample, the estimated absolute head position, the estimated head velocity, the estimated bias force equivalent actuator input signal, the measured actuator input signal and the control signal; predicting, for each PES sample, the absolute head position and the head velocity as functions of prior control signals, the prior estimated absolute head position, the prior estimated head velocity, the prior estimated bias force equivalent actuator input signal and constants representative of physical parameters of the actuator, the predicted absolute head position and velocity for each PES sample being used during the step of estimating the absolute head position and head velocity for the subsequent PES sample; and predicting, for each PES sample, the bias force equivalent actuator input signal as a function of the prior estimated bias force actuator input signal, the predicted bias force equivalent actuator input signal for each PES sample being used during the step of estimating the bias force equivalent actuator input signal for the subsequent PES sample.

a carriage member mounted such that it is permitted to move only along a radial segment with respect to the rotating member, the carriage supporting the point element to be positioned and further including a cam follower; a locating disk having a cam groove formed on the surface thereof, with the groove forming a closed path about the origin of the locating disk and having varying radial separation therefrom, such that said cam follower rides within said cam groove in a manner such that the carriage is caused to move as the locating disk is rotated; and means for selectively causing said locating disk to rotate in a predetermined manner.

#### 4,679,106 SPRING LOADED EJECTOR FOR DISC CARTRIDGE

Masao Okita, Furukawa, Kunihiko Gunji, Tajiri, and Yukio Saito, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 626,316, Jun. 29, 1984, abandoned.

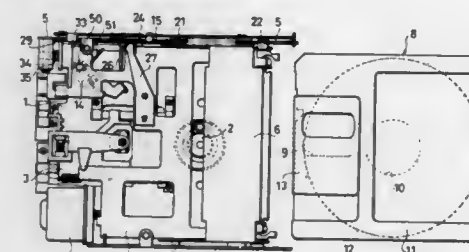
This application Nov. 10, 1986, Ser. No. 930,035

Claims priority, application Japan, Jun. 29, 1983, 58-99335[U]

Int. Cl.<sup>4</sup> G11B 5/012, 5/016, 23/03

U.S. Cl. 360—99

3 Claims



1. In a recording and reproducing device using a disk cartridge of the type having a case with a front end to be inserted in the recording and reproducing device, a magnetic disk enclosed in the case, a magnetic head insertion hole in an upper wall at the front end of the case for exposing the magnetic disk to a magnetic head in the recording and reproducing device, and a shutter plate at the front end of the case covering the hole at a covering position which is movable in one sideways direction to an uncovered position to expose the insertion hole when the disk cartridge is inserted in the recording and reproducing device, and plate biasing means connected to the shutter plate for returning it to the covered position when the cartridge is removed from the recording and reproducing device, and

the recording and reproducing device being of the type having a frame with a front insertion slot for the disk cartridge, a cartridge holder mounted in the frame for receiving a disk cartridge inserted therein at an eject position, loading means for moving the cartridge holder to a loaded position when the cartridge has been inserted to a fully inserted position in the holder, holding means for holding the cartridge holder in the loaded position, a magnetic head positionable through the insertion hole of the cartridge at the loaded position for recording on and reproducing from the disk, and releasing means for releasing the cartridge holder from the loaded position to the eject position when the cartridge is to be ejected from the frame,

the improvement comprising a single eject lever supported rotatably at a rear position inside the cartridge holder having an abutting portion which is positioned to abut against a portion of the shutter plate as the cartridge is inserted in the holder, said abutting portion remaining engaged with said shutter plate as said cartridge continues to be inserted in the holder to the fully inserted position and said lever rotating therewith in a direction corresponding to the resulting movement of the shutter plate in said sideways direction to the uncovered position so as to

expose said insertion hole in the cartridge, wherein said magnetic head can be positioned in said insertion hole when said cartridge holder is moved by said loading means to the loaded position, and a spring member mounted with the eject lever for biasing it with a stored spring force as it is rotated by insertion of the cartridge to the fully inserted position so as to provide a returning force for rotating the eject lever in the direction for ejecting the cartridge from the holder when the holder is released by said releasing means from the loaded position to the eject position,

whereby said single eject lever and spring member obtains both the functions of opening the shutter plate of the disk cartridge and ejecting the cartridge from the holder, while being movable with the cartridge and holder between the eject and loaded positions so as to avoid frictional forces with other parts of the recording and reproducing device.

#### 4,679,107 MAGNETIC TRANSDUCER HEAD UTILIZING MAGNETORESISTANCE EFFECT

Shigeyoshi Imakoshi, Yutaka Soda, Hideo Suyama, and Yasuhiro Iida, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

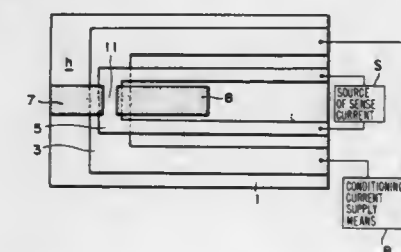
Filed Aug. 23, 1984, Ser. No. 643,398

Claims priority, application Japan, Aug. 25, 1983, 58-155484

Int. Cl.<sup>4</sup> G11B 5/127, 5/33

U.S. Cl. 360—113

2 Claims



1. A magnetic transducer head utilizing the magnetoresistance effect, comprising:

a magnetoresistance effect element for sensing a magnetic field during each of a plurality of readout operations; source means for supplying a sense current to said magnetoresistance effect element for sensing resistance change of said magnetoresistance effect element during each readout operation; a conductor for applying a bias magnetic field to said magnetoresistance effect element by being supplied with a bias current; and an alternating current source for supplying a decaying alternating current superimposed on said bias current to said conductor prior to each readout operation wherein said magnetic field is to be sensed by said magnetoresistance effect element.

#### 4,679,108 PORTABLE PLAYBACK SYSTEM WITH ACTIVE TAPE DRIVE TENSIONING FEATURE

Keith E. Thomas, San Fernando, Calif., assignor to Capitol Records, Inc., Hollywood, Calif.

Filed Feb. 2, 1983, Ser. No. 463,290

Int. Cl.<sup>4</sup> G11B 15/60

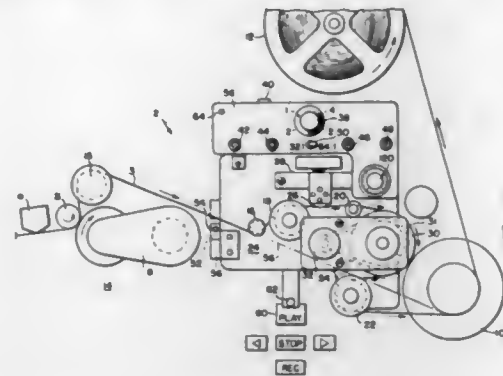
U.S. Cl. 360—130.31

16 Claims

1. An apparatus for use in monitoring signals recorded on a recording tape by a tape recorder, the tape recorder operating during a recording mode to transport the recording tape past a recording device on the tape recorder while applying a preselected tension to the recording tape, said apparatus comprising: mounting means for positioning said apparatus relative to



the tape recorder during the operation of the tape recorder in its recording mode;  
a head means disposed on said mounting structure for detecting signals recorded on the recording tape and for generating playback signals in response to the signals so detected, and;



a drive means also supported by said mounting means in fixed relation to said head means for guiding the recording tape along a predetermined path through said apparatus while the tape recorder is operating in its recording mode and for pulling the recording tape past said head means with a tension which is independent of the preselected tension applied to the recording tape by the tape recorder.

4,679,109

## TAPE CASSETTE DRIVEN RIB DEVICE

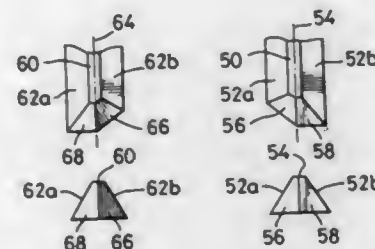
Masatoshi Okamura, Saku, and Haruo Shiba, Komoro, both of Japan, assignors to TDK Corporation, Tokyo, Japan  
Filed Aug. 14, 1985, Ser. No. 765,586

Claims priority, application Japan, Aug. 23, 1984, 59-127812[U]

Int. Cl.<sup>4</sup> G11B 15/32, 23/04

U.S. Cl. 360—132

3 Claims



1. A tape cassette including a pair of reels for a magnetic tape, each reel having a center opening, a plurality of first ribs extending radially into said opening from a peripheral wall of said opening, a pair of parallel drive spindles of a recorder deck, said drive spindle being adapted for insertion into one said opening, each drive spindle having a second rib, said second rib being adapted for engagement with said first rib, said first rib comprises an end face having a planar surface on a trailing side of said first rib, said trailing side being defined with respect to a tape-slacking removing rotational direction, said planar surface being inclined in such a manner that insertion of said spindles into said opening whereby said second rib engages said first rib, creates a force which drives said reel in said tape-slacking removing rotational direction.

4,679,110  
BRAKE AND TAPE TENSIONING MEANS FOR TAPE CASSETTES HAVING FLANGED REELS, AND A TAPE CASSETTE, IN PARTICULAR A MAGNETIC TAPE CASSETTE, INCLUDING THESE MEANS

Klaus Schoettle, Heidelberg; Kurt Schmidts, Kehl; Eugen Kamm, Appenweiler, and Heinz Berger, Kehl, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

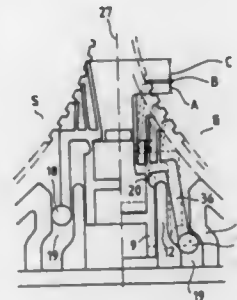
Filed Jul. 5, 1985, Ser. No. 751,809

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 8420207

Int. Cl.<sup>4</sup> G11B 23/02

U.S. Cl. 360—132

13 Claims



1. Brake and tape tensioning means for tape cassettes having a housing and flanged reels contained therein, in which at least one flange of each reel carries toothing at its periphery and a spring element for each reel having a braking position and a release position, said spring element engaging said toothing in said braking position but not in said release position, for use with a recording apparatus having an actuating element, said actuating element entering the cassette housing and transferring the spring element from its braking position to its release position, and positioning elements being provided on the cassette which guide each spring element from the braking position to the release position and vice versa.

wherein the spring element comprises two locking elements of different lengths, in a tangential direction to the periphery of the toothed flange, said locking elements having two ends, one being an attached end and the other being a free end, locking points being provided at said free ends and the distance between the first and second locking points being determined by the relationship

$$x_1 - x_2 = t(n + 1),$$

where

t is the tooth spacing and  
n is the integer 0, 1, 2, 3 etc.,

whereby for the same tooth spacing an increase in the effective minimum tape take-up is achieved.

4,679,111

## RESISTANCE TO GROUND CHECKER

Karl C. Koch, Swissvale, and Charles W. Elnoff, Jr., Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 12, 1985, Ser. No. 797,335

Int. Cl.<sup>4</sup> H02H 7/08

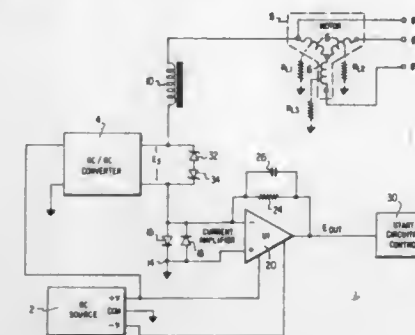
U.S. Cl. 361—31

14 Claims

14. In combination: a motor having at least one normally ungrounded coil; and a circuit arrangement for checking the resistance to ground of said normally ungrounded coil, said circuit arrangement comprising:

a source of a low-level d.c. voltage, said source being independent of said motor and having first and second output terminals between which the d.c. voltage is established;

means for establishing a conductive connection between said first output terminal and said coil;  
grounding means connected to a point at ground potential relative to said coil;  
current responsive means connected between said grounding means and said second output terminal of said source



for producing an output signal proportional to the amplitude of current flow between said second terminal and said grounding means; and  
motor control means connected for receiving the output signal and preventing operation of said motor when the output signal reaches a selected value.

4,679,112

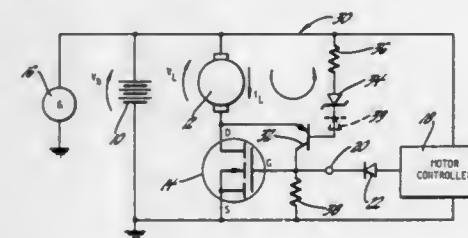
TRANSISTOR PROTECTION CIRCUIT FOR  
AUTOMOTIVE MOTOR CONTROL APPLICATIONS  
Gale M. Craig, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 31, 1986, Ser. No. 891,011

Int. Cl.<sup>4</sup> H02H 7/09, 3/18

U.S. Cl. 361—33

4 Claims



1. In an automotive control circuit including a storage battery, and the serial combination of an electric motor and a power transistor connected across the battery, the power transistor being biasable to a conductive state in which current is supplied from the battery to the motor through the primary conduction circuit of the power transistor when a conduction producing control voltage is applied across its conduction control terminals, a protection circuit which protects the power transistor from damage due to the generation of transient inductive voltage across the motor when the conduction producing control voltage is removed from the conduction control terminals, the protection circuit comprising:

a protection transistor having an emitter-collector circuit connected in series with a resistor across the primary conduction circuit of the power transistor, the resistor being connected across the conduction control terminals of the power transistor, and a Zener diode connected in series with the emitter-base circuit of the protection transistor across the motor, the Zener diode being poled to oppose current flow through such emitter-base circuit, such that when a transient inductive voltage is generated across the motor upon removal of the control voltage, the reverse breakdown voltage of the Zener diode is exceeded and the protection transistor is biased conductive to per-

mit current flow in a circuit comprising the battery, the motor, the emitter-collector circuit of the protection transistor, and the resistor, thereby to generate a voltage across the resistor which biases the power transistor to a partially conductive state for reducing the rate of decrease in current through the motor and the magnitude of the resulting transient inductive voltage.

4,679,113

## ELECTRICAL DISTRIBUTION APPARATUS HAVING DRAW-OUT SURGE ARRESTER

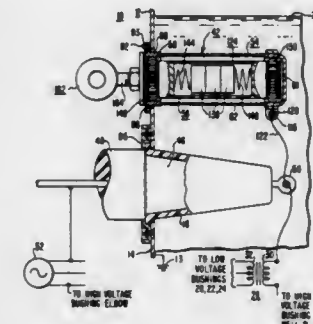
William J. Book; Julian C. Scott, and James A. Grace, all of Jefferson City, Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 18, 1985, Ser. No. 799,040

Int. Cl.<sup>4</sup> H02H 7/04

U.S. Cl. 361—40

8 Claims



1. Electrical distribution apparatus, comprising: an electrically grounded metallic tank having an opening, an electrical element in said tank, and an arrester assembly including a housing which extends into said tank via said tank opening, and a draw-out surge arrester in said housing having first and second insulatively spaced electrical contacts, said housing including first and second insulatively spaced metallic means, said first metallic means of said housing mechanically mounting said housing to said tank and electrically connecting the first electrical contact of said draw-out surge arrester to said grounded metallic tank, said second metallic means of said housing electrically connecting the second electrical contact of said draw-out surge arrester to said electrical element.

4,679,114

## METHOD AND EQUIPMENT FOR LIGHTNING PROTECTION THROUGH ELECTRIC POTENTIAL NEUTRALIZATION

Roy B. Carpenter, Jr., 9444 Tierra Blanca, Whittier, Calif. 90603

Filed Apr. 9, 1986, Ser. No. 849,790

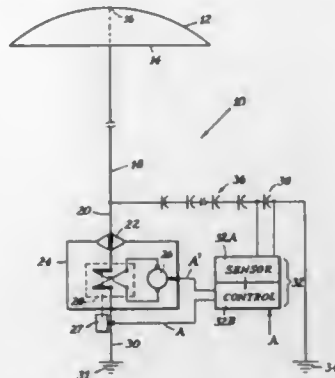
Int. Cl.<sup>4</sup> H02H 3/22

U.S. Cl. 361—117

3 Claims

1. A method for the protection of areas and objects arranged on them against lightning strikes through electric potential neutralization comprising: sensing the presence, the magnitude and the polarity of at least one electric charge above an area intended to be protected, setting controls upon the sensing of said at least one electric charge, activating a d.c. high-potential power source to an output potential of a magnitude and in a polarity so as to neutralize said electric charge in accordance with said control setting,

adjusting the magnitude and the polarity of said output potential in accordance with any changes of the magnitude and the polarity, respectively, of said charge as sensed and as commanded by said control upon being activated by said sensor for the duration of each charge presence,



terminating said d.c. high-potential power source operation and its output upon the cessation of charge magnitude and polarity sensing and of the control activation, restoring said sensor, said control and said d.c. high-potential power source for a subsequent operation.

4,679,115

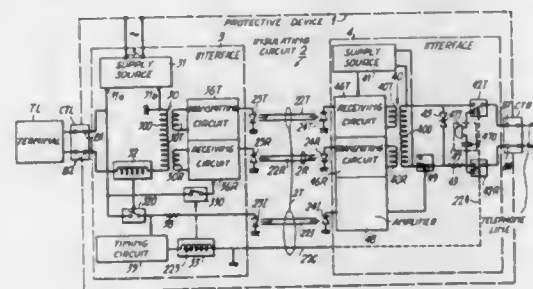
**ELECTRICAL DISTURBANCE PROTECTIVE DEVICE BETWEEN A TERMINAL AND A TELEPHONE LINE**  
Jean-Louis Connan, Apartment AD 222, rue d'Anjou, and Jean-Yves Huiban, Ker-Squivel-Izillan, Ploulech, both of, 22300 Lannion, France

Filed Feb. 27, 1985, Ser. No. 706,287

Claims priority, application France, Mar. 5, 1984, 84 03381  
Int. Cl.<sup>4</sup> H02H 3/22

U.S. Cl. 361-119

15 Claims



1. An electrical disturbance protective system connected between a terminal (TL) and a telephone line (TR), comprising:

- (a) first (3) and second (4) interfaces connected with the terminal and with the telephone line via first (CTL) and second (CTR) telephone circuit closers, respectively, said first interface including first transmitting means (23T) for converting first electrical signals delivered from said terminal into first optical signals, and said second interface means including first receiving means (24T) for re-converting said first optical signals back into said first electrical signals for introduction into the telephone line; said second interface including second transmitting means (24R) for converting electrical signals supplied by said telephone line into second optical signals, and said first interface including second receiving means (23R) for re-converting said second optical signals back into said second electrical signals for transmission to said terminal; said first interface including third transmitting means (23I) for

transmitting third optical pulses corresponding with current loop pulses derived from the terminal during a dialing period thereof, said second interface including third receiving means (24I) for re-converting said third optical pulses into current loop pulses for transmission into the telephone line;

- (b) first (22T), second (22R) and third (22I) electrical insulating means for guiding said first, second, and third optical signals, respectively, between said first and second interfaces;
- (c) said first interface including first supply circuit means (31) for supplying power from an alternating current source thereof (S) to said first and third transmitting means and said second receiving means, said first supply circuit means also supplying power to said terminal via said first telephone circuit closer (CTC);
- (d) said second interface further including second supply circuit means (41) for supplying from said telephone line remote power to said second transmitting means and said first and third receiving means.

4,679,116

**CURRENT CONTROLLING DEVICE FOR ELECTROMAGNETIC WINDING**

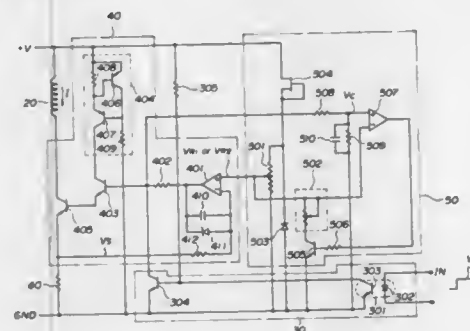
Hidekazu Oshizawa, and Masami Kondoh, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,240

Claims priority, application Japan, Dec. 18, 1984, 59-265415  
Int. Cl.<sup>4</sup> H01H 47/32

U.S. Cl. 361-154

7 Claims



1. A current controlling device for an electromagnetic winding comprising:

- an input circuit for receiving a driving signal;
- reference voltage supply means, responsive to said driving signal, for supplying a first reference voltage or a second reference voltage lower than the first reference voltage, said first and second reference voltages being controlled at substantially constant respective values, said first reference voltage being supplied until a predetermined time after the receipt of said driving signal, said second reference voltage being supplied from said predetermined time after the receipt of said driving signal until said driving signal is no longer received;
- a detecting resistor, connected to said electromagnetic winding, for detecting current flowing through said electromagnetic winding and providing a detected voltage representative thereof;
- comparison amplifier circuit means, responsive to said driving signal, for supplying as an output a first analog control output or a second analog control output, said comparison amplifier circuit means receiving said detected voltage and either one of said first or second reference voltages, whichever is supplied by said reference voltage supply means, providing said first analog control output when receiving said first reference voltage, said first analog

control output causing the difference between said first reference voltage and said detected voltage to become zero, and providing said second analog control output when receiving said second reference voltage, said second analog control output causing the difference between said second reference voltage and said detected voltage to become zero; and

driving circuit means, responsive to said first and second analog control outputs, for controlling a starting current flowing through said electromagnetic winding at a substantially constant value in accordance with said first analog control output and for controlling a holding current flowing through said electromagnetic winding at another substantially constant value in accordance with said second analog control output, said holding current being lower in value than said constant value of said starting current.

4,679,117

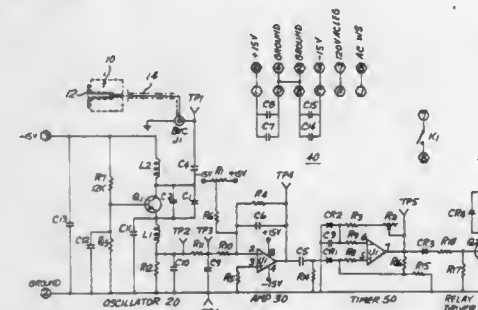
**TOUCH SENSOR FOR WIRE STRIPPER**

William T. Butcher, Redmond; James J. Furlong, Seattle; Dwayne E. Howe, Kent, all of Wash.; Gerald T. Snell, Hillsboro, Oreg., and Calvin M. Yara, Kaneohe, Hi., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 362,020, Mar. 25, 1982, abandoned. This application Mar. 14, 1986, Ser. No. 839,661  
Int. Cl.<sup>4</sup> H01H 47/12

U.S. Cl. 361-181

1 Claim



1. An adjustable picofarad detector circuit comprising in combination:

- a capacitance sensing probe having an electrically conductive plate member;
- an oscillator circuit coupled to said capacitance sensing probe;
- a timer circuit;
- an inverse amplifier circuit coupled between said oscillator circuit and said timer circuit for providing a discrete level output signal thereby triggering said timer circuit;
- a relay driver circuit responsive to said timer circuit for an adjustable time period; and
- further including an air solenoid, and a mercury wetted relay coupled between said relay driver circuit and said air solenoid, said air solenoid when actuated permitting pneumatic mechanism cycling for wire stripping.

4,679,118

**ELECTRONIC CHIP-CARRIER HEAT SINKS**

Philip A. Johnson, Exeter, and Alfred F. McCarthy, Belmont, both of N.H., assignors to Aavid Engineering, Inc., Laconia, N.H.

Continuation of Ser. No. 638,415, Aug. 7, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 890,890

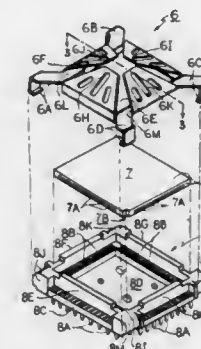
Int. Cl.<sup>4</sup> H05K 7/20

U.S. Cl. 361-386

6 Claims

1. An electronic chip-carrier mounting and heat sink, comprising a socket of insulating material having an outwardly-projecting array of electrical leads disposed for connection with circuit-board wiring and an inner array of electrical

contacts framing an upwardly-opened recess in said socket and disposed to engage edge contacts of a leadless chip carrier which may be nested therein and thereby couple such edge contacts with said leads, and a single-piece composite heat-sink and cover means stamped from sheet metal having good thermal conductivity and adapted for dissipation of heat from such a carrier which may be nested in said recess and for movements between a closed position in which it presses against and closes over such a carrier and an open position in which it releases such a carrier from said socket, said composite heat-sink and cover means including a relatively broad-area central heat-sink portion having a substantially planar and uninterrupted lower heat-transfer surface disposed to press against a surface of the same size and shape as the top of such a carrier nested in said



recess and further having stamped sheet-metal heat-radiating members integral therewith along edges thereof bent to extend upwardly away from said surface and from the top of such a carrier, said heat-transfer surface of said central portion conducting heat from such a carrier laterally to said heat-radiating members along said edges thereof and said heat-radiating members in turn convectively releasing the heat to an ambient atmosphere, and said composite heat-sink and cover means including fastener means disposed laterally beyond the periphery of said central heat-sink portion, said fastener means selectively cooperating with fastener provisions on said socket in allowing said composite heat-sink and cover means to move between the said open and closed positions and in releasably holding it closed over such a carrier.

4,679,119

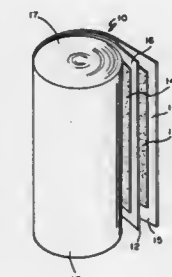
**DIELECTRIC FLUID FOR ELECTRICAL CAPACITORS**  
Vandos Shedigian, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Jun. 13, 1986, Ser. No. 873,975

Int. Cl.<sup>4</sup> H01G 4/22

U.S. Cl. 361-315

2 Claims



1. In a capacitor, a dielectric fluid consisting of dioctyl phthalate and an addition of epoxidized linseed oil in an amount of from 0.1 to 30% by weight of the dioctyl phthalate



and a second additive of up to 0.05% by weight of an antioxidant.

4,679,120

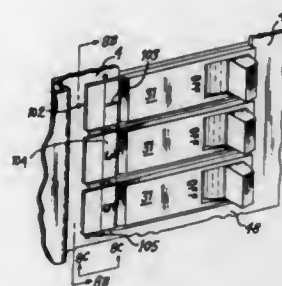
# **LIGHTING CIRCUIT BREAKER PANELBOARD MODULAR ASSEMBLY INCLUDING CIRCUIT BREAKER INDICATING CLIPS**

Rodney D. Raabe; Joseph J. Mrowka; Jon P. McCuin, all of Bristol, and Joseph F. Noonan, Manchester, all of Conn., assignors to General Electric Company, New York, N.Y.  
Division of Ser. No. 705,454, Feb. 25, 1985, Pat. No. 4,631,634.  
This application Aug. 4, 1986, Ser. No. 892,607

Int. Cl.<sup>4</sup> H02B 1/06

U.S. Cl. 361—358

2 Claims



1. A circuit breaker panelboard assembly comprising: closure means housing at least one main circuit breaker and a plurality of branch circuit breakers; access means movably arranged on said closure means for providing access to said main and said branch circuit breakers from outside of said closure means; mounting means within said closure supporting said branch circuit breakers and providing electrical connection between said branch circuit breakers and electrical bus bars within said closure means and connectable with an external circuit; and shield means intermediate said access means and said main and branch circuit breakers preventing contact with electrical terminals on said main and branch circuit breakers; said shield means further including a plurality of marking means carrying indicia to identify each of said branch circuit breakers, said marking means comprising plastic clips, each clip attached to opposing surfaces of said shield means.

4,679,121

# **ASSEMBLY SYSTEM FOR COMMUNICATIONS DEVICE HAVING PLUG-IN CIRCUIT BOARDS CONNECTED IN MULTIPLE STAGES**

Josef Schomers, Backnang; Kurt Erbele, Weissach, and Wernfried Bonk, Anenwald, all of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jan. 24, 1986, Ser. No. 864,418

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 3502295

Int. Cl.<sup>4</sup> H05K 1/14

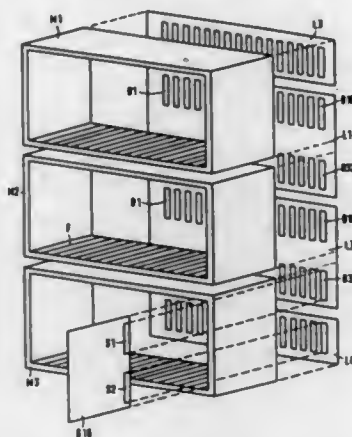
U.S. Cl. 361—413

3 Claims

1. In an assembly system for an electrical device composed of plug-in circuit boards each having an edge and being provided with a plurality of plug-in connectors at such edge, the plug-in connectors presenting input and output terminals; a plurality of magazines each mounting a plurality of the plug-in circuit boards, the magazines each having a rear side and being disposed adjacent to one another, each plurality of plug-in circuit boards being mounted in a respective one of the magazines so that the plug-in connectors are located at the rear side; and rear wall circuit boards fastened to the rear sides of the magazines and including plug-in counterconnectors for mating

with corresponding ones of the plug-in connectors at the edges of the plug-in circuit boards, wherein electrical connections are formed between input and output terminals of plug-in circuit boards located in adjacent magazines, the improvement wherein:

the plug-in connectors of each said plurality of plug-in circuit boards define separate regions at the rear side of each said magazine, and at least one rear wall circuit board is fastened to two adjacent magazines and covers only two adjacent ones of said regions, one each from said two



4,679,122

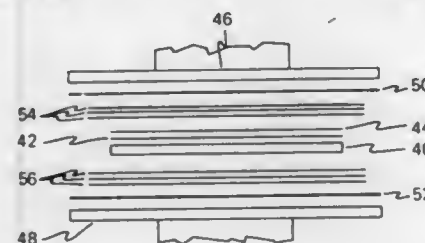
# **METAL CORE PRINTED CIRCUIT BOARD**

Robert E. Belke, Jr., Clay; Raymond A. Shirk, North Syracuse; Hsin H. Lin, Syracuse, and Louis Zakraysek, Cicero, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.  
Continuation of Ser. No. 658,744, Oct. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 455,109, Jan. 3, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 886,751

Int. Cl.<sup>4</sup> H05K 1/05

U.S. Cl. 361—414

15 Claims



1. A printed circuit board for subsequent solder processing comprising:

- (1) a planar thermally and electrically conductive metallic substrate;
- (2) a layer of conductive metal foil patternable to form said electrical interconnections, and
- (3) an insulating layer of polyetherimide thermoplastic resin, an engineering plastic based on bisphenol A dianhydride

reacted with metaphenylene diamine, having a glass transition temperature in excess of 200 degrees C. to permit exposure to soldering not exceeding said temperature, said resin wetting metallic surfaces at temperatures in excess of said glass transition temperature which upon cooling to ambient temperatures forms a bond, said resin being bonded to said metal substrate and to said foil by high temperature wetting accompanied by pressure.

4,679,123

# **CABLE ORGANIZING AND PROTECTION SYSTEM AND METHOD**

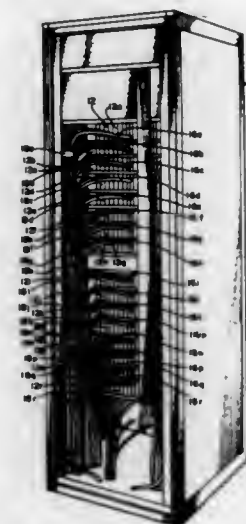
William K. Young, Norwalk, Conn., assignor to T-Bar Incorporated, Wilton, Conn.

Filed Mar. 10, 1986, Ser. No. 838,178

Int. Cl.<sup>4</sup> H02B 1/20

U.S. Cl. 361—428

12 Claims



1. A cable organizing and protection system for use in high conductor density equipment comprising:

- a frame for supporting equipment in at least one multi-level array wherein each component equipment is organized in a generally linear configuration within the array and a plurality of cables are connected into each component equipment, said frame providing entrance for cables and a clear cable path generally parallel to the array; and
- at least one cable bundle retainer for each component equipment supported on the frame generally at the level of each component equipment to which that cable bundle is to be connected, said bundle retainers also being individually in a stepped array progressively outwardly from the component equipment such that the retainer most remote from the cable entrance is further from component equipment to which its supported cables are to be connected.

4,679,124

# **SOLID ELECTROLYTIC CAPACITORS**

Susumu Yoshimura; Yasuo Kudoh, both of Yokohama; Soji Tsuchiya, Kanagawa; Toshikuni Kojima, and Shohzoh Takahashi, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 13, 1986, Ser. No. 818,592

Claims priority, application Japan, Jan. 14, 1985, 60-4288; Jan. 14, 1985, 60-4289; Jan. 14, 1985, 60-4290

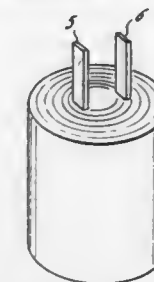
Int. Cl.<sup>4</sup> H01G 9/05

U.S. Cl. 361—433

11 Claims

1. In a solid electrolytic capacitor which comprises a valve metal anode anodized on the surfaces thereof, a cathode arranged in face-to-face relation with said anode, and a layer of a solid electrolyte formed between said anode and said cath-

ode, the improvement characterized in that said electrolyte consists essentially of a complex salt of 2 molecules of 7,7,8,8-tetracyanoquinodimethane and one molecule of a cation selected from the group consisting of quinoline and isoquinoline



4,679,125

# **HEADLAMP-INDICATOR UNIT FOR MOTOR VEHICLES**

Heinz Dick, Odenthal, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

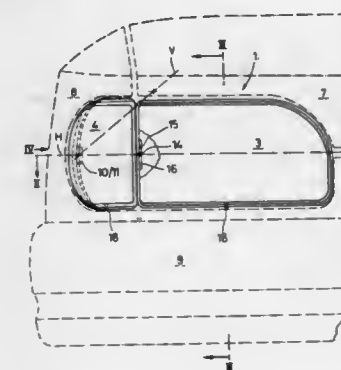
Filed Jul. 31, 1985, Ser. No. 761,226

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428467

Int. Cl.<sup>4</sup> F21V 3/18

U.S. Cl. 362—66

4 Claims



1. A headlamp-indicator unit for assembly into the body of a motor vehicle, including a reflector unit having defined therein a pair of closed lamp chambers with corresponding reflector walls and openings for lamp sockets for a main headlamp and a flashing direction indicator positioned laterally outwardly from the main headlamp in the vehicle body intermediate the main headlamp in the side of the vehicle body proximate a front corner thereof, the chambers being covered by a corresponding diffusion and light lenses respectively, the headlamp-indicator unit being adjustable through adjustment means interposed between the unit and the body of the motor vehicle, both about a horizontal and about a generally vertical pivot axis, characterized in that the headlamp indicator unit is in part supported by a rounded supporting edge formed as a protrusion on a front fender portion of the vehicle body and a corresponding supporting groove formed on an adjacent portion of the reflector unit which receives the supporting edge in a support plane generally parallel to the longitudinal median plane of the vehicle, the edge in the groove being located on the intersection of the plane and an arc having a center of curvature on the horizontal pivot axis, and in that the light lens of the flashing direction indicator is extended around the front

corner of the vehicle body and, as viewed from the side of the motor vehicle body, has a rear edge having an arcuate profile which matches and is concentric with a corresponding receiving recess formed in the adjacent fender portion of the vehicle body.

#### 4,679,126 MINIATURE LAMP ARRAYS HAVING IMPROVED LAMP RETENTION FEATURES

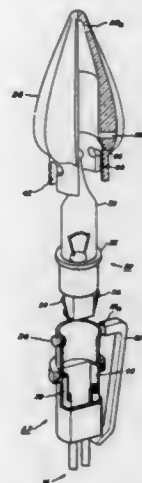
Robert H. Van Sicker, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 21, 1986, Ser. No. 820,774

Int. Cl.<sup>4</sup> H01R 33/00

U.S. Cl. 362-226

15 Claims



1. A decorative string set comprising:
  - (a) a plurality of incandescent lamps, each having lead-in wires and a plug-in base having an upper rim;
  - (b) a plurality of housings spaced along said decorative string set, said housings having affixed therein electrical sockets providing a first means for complementary acceptance and respective connection to said lead-in wires of said incandescent lamps;
  - (c) a separate means for locking the connection of said lamps having said plug-in base to said sockets.

4,679,127

#### HEADLIGHT FOR MOTOR VEHICLES

Hans-Otto Ernst, Lippstadt, and Helmut Jakobsmeier, Paderborn-Elsen, both of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Sep. 22, 1986, Ser. No. 910,397

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540130

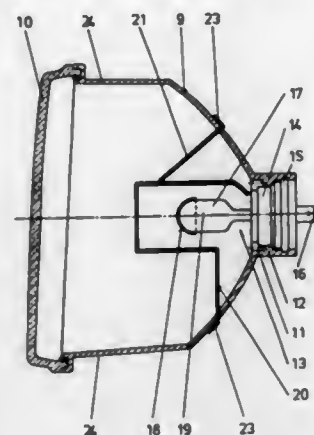
Int. Cl.<sup>4</sup> F21V 29/00

U.S. Cl. 362-294

11 Claims

1. A headlight for motor vehicles comprising: a reflector with a vertex and an opening in said vertex; a cover plate covering said reflector; an incandescent lamp fitting in said opening in said vertex; a substantially U-shaped enclosure comprised of sheet metal and positioned in vicinity of said lamp; flanks on said enclosure; a web between said lamp and said cover plate for connecting said flanks, said flanks extending above and below said lamp without contacting said lamp after assembly of said headlight; sections on said reflector generating diffused light, one flank comprising a screen for screening off said sections of said reflector; one of said flanks being positioned below said lamp and comprising substantially a supporting arm for said enclosure; another one of said flanks being positioned above said lamp and having a free terminal section; a base on said lamp screened off by said free terminal

section; a tongue punched and bent out of an area of said U-shaped enclosure between said lamp and said cover plate,



said tongue comprising an upper supporting arm securable to said reflector.

4,679,128

#### HEADLAMP BULB RETAINING ARRANGEMENT

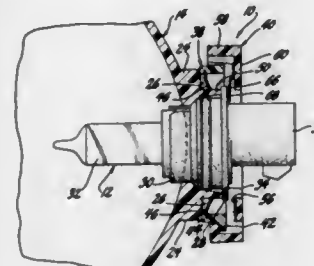
Paul D. Van Duyn, and John D. Geddie, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1986, Ser. No. 888,990

Int. Cl.<sup>4</sup> F21V 7/00

U.S. Cl. 362-306

3 Claims



1. A retaining arrangement for maintaining a bulb assembly within a socket located in the rear of a vehicle headlamp reflector, said bulb assembly having an annular flange, said socket being defined by a cylindrical boss having an opening for receiving said bulb assembly with said flange located in a predetermined angular position in engagement with the terminal end of said boss, said retaining arrangement including a grip member in the form of a ring having a plurality of blades extending radially inwardly from said grip member for permitting said grip member to be press fitted onto said cylindrical boss and maintained thereon, a plurality of circumferentially spaced lock tabs formed on the peripheral surface of said grip member, and an annular lock nut having a plurality of cam slots formed therein, a plurality of radially inwardly extending spring fingers formed with said lock nut, said lock nut adapted to be mounted on said grip member so that the cam slots receive the lock tabs after which the lock nut is rotated causing said lock nut to move axially towards said grip member and through said spring fingers press the flange of said bulb firmly into engagement with said terminal end of said boss.

4,679,129

#### SERIES RESONANT CONVERTER

Kazuhiko Sakakibara, Tokorozawa, and Yutaka Kuwata, Kodaira, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

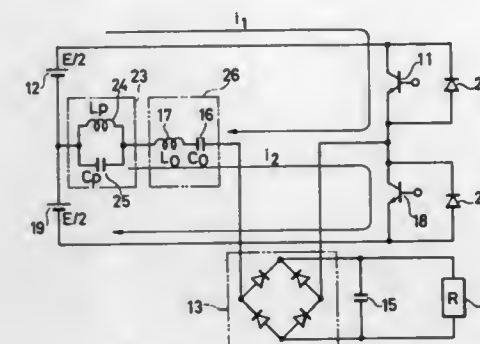
Filed May 5, 1986, Ser. No. 859,680

Claims priority, application Japan, May 10, 1985, 60-98997; Mar. 3, 1986, 61-45725; Apr. 28, 1986, 61-99807

Int. Cl.<sup>4</sup> H02M 3/335

U.S. Cl. 363-17

20 Claims



1. A series resonant converter comprising:
  - a first series resonant loop including a first switch element;
  - a second series resonant loop including a second switch element;
  - series resonant means inserted in said first and second series resonant loops and having a frequency significantly higher than an audible frequency range;
  - a rectifier inserted commonly in said first and second series resonant loops in series thereto;
  - power supply means for causing current through said first series resonant loop through control of said first switch element and causing current through said second series resonant loop through control of said second switch element; and
  - parallel resonant means inserted in said first and second series resonant loops in series with said series resonant means and having a parallel resonant frequency significantly lower than the series resonant frequency of said first and second series resonant loops and slightly higher than the audible frequency range.

4,679,130

#### PROGRAMMABLE POWER SUPPLY

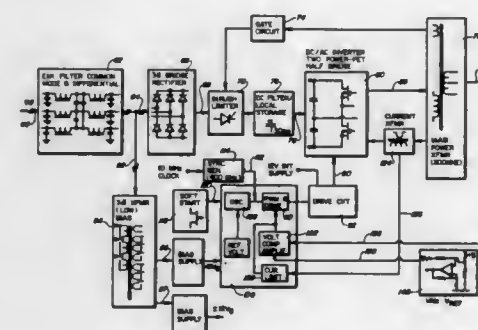
Poldi Moscovici, Woodcliff Lake, N.J., assignor to Superior Manufacturing & Instrument Corporation, Maspeth, N.Y.

Filed Jun. 4, 1986, Ser. No. 870,379

Int. Cl.<sup>4</sup> H02M 3/335

U.S. Cl. 363-17

30 Claims



1. A programmable power supply which comprises:
  - a switching power supply having an output;

said switching power supply including a pulse modulator, a main power transformer, and means responsive to said pulse modulator for varying the input to the main power transformer;

a linear power supply having an output;

said linear power supply including an active element coupled to the output of said switching power supply;

first feedback means responsive to the output of the active element for providing a first feedback signal;

means for providing a voltage programming signal representing the voltage to be programmed;

means for controlling the active element in response to said first feedback signal and said voltage programming signal;

means for controlling said pulse modulator;

second feedback means for providing a second feedback signal responsive to the voltage drop across said active element;

said pulse modulator control means being responsive to said first feedback signal and said second feedback signal; and

means for controlling the output from said switching power supply in response to the output from said pulse modulator.

4,679,131

#### REGULATING POWER SUPPLY FOR VIDEO DISPLAY APPARATUS

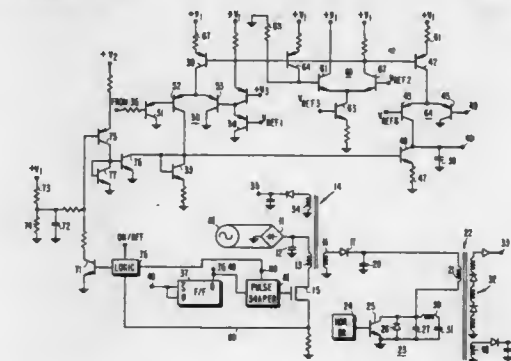
Paul D. Filliman, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed May 10, 1985, Ser. No. 733,447

Int. Cl.<sup>4</sup> H02M 3/335

U.S. Cl. 363-21

9 Claims



1. A power supply for a video display apparatus comprising:
  - a source of unregulated voltage;
  - a transformer winding;
  - switch means for coupling said source of unregulated voltage to said transformer winding in response to input pulses; and
  - a pulse generator coupled to said switch means comprising:
    - a source of current providing a predetermined current level;
    - a first current path including a capacitor;
    - a second current path coupled to said first current path; means, responsive to the voltage level across said capacitor, for coupling said source of current to said first and second current paths when said capacitor is discharged below a first predetermined voltage level for charging said capacitor and for uncoupling said source of current from said first and second current paths when said capacitor is charged above a second predetermined voltage level; and means responsive to a reference voltage level for controlling the amount of current flow through said second current path, in order to divert a controlled amount of charging current away from said capacitor when said source of current is coupled to said first and second current paths, for controlling the charging time of said capacitor, said second current path discharging said capacitor when said source of



current is uncoupled from said first and second current paths, said control means controlling the discharge time of said capacitor.

4,679,132

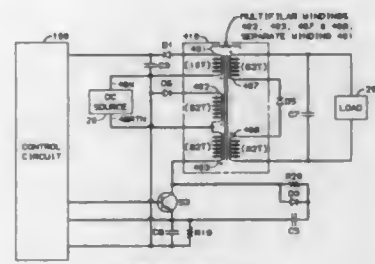
# FLOATING BATTERY FEED CIRCUIT USING MULTIFILAR TRANSFORMER

Howard F. Jirka, Crystal Lake, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 8, 1985, Ser. No. 763,668  
Int. Cl. H02M 3/335

U.S. Cl. 363-21

13 Claims



BATTERY FEED CIRCUIT 30

1. A battery feed circuit for supplying power from a source of potential having first and second terminals, to an electrical load having first and second terminals, said circuit comprising transformer means comprising first, second, third and fourth magnetically coupled winding means multifilar wound around a single core, each of said first, second, third and fourth winding means having a first polarity end and a second polarity end, the second polarity end of said first winding means and the first polarity end of said second winding means both being connectible to said first terminal of said source, the first polarity end of said third winding means being connectible to the second polarity end of said fourth winding means, the second polarity end of said third winding means being connectible to said first terminal of said load, and the first polarity end of said fourth winding means being connectible to said second terminal of said load, switching means operative for cyclically connecting the first polarity end of said first winding means to said second terminal of said source, and unidirectional current means serially connected with said third and fourth winding means for allowing only unidirectional current flow through said third and fourth winding means for supplying power to said load; whereby an electrical noise component coupled, during said cyclic connecting by said switching means, from said first winding means to said load, is reduced by an opposite polarity electrical noise component coupled from said second winding means to said load.

4,679,133

# SYSTEM FOR ALLEVIATING HARMONIC DISTORTION

Poldi Moscovici, Woodcliff Lake, N.J., assignor to Superior Manufacturing & Instrument Corporation, Maspeth, N.Y.

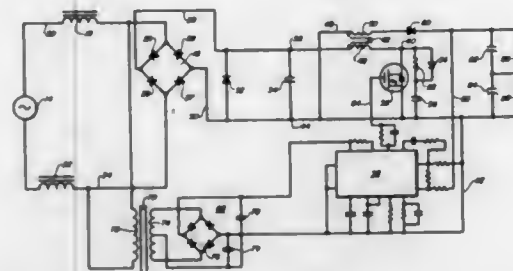
Filed Jun. 4, 1986, Ser. No. 870,378  
Int. Cl. H02M 1/12

U.S. Cl. 363-46

15 Claims

1. In a power supply having an AC input waveform with a first frequency, a full wave rectifier having an output for providing rectified voltage, and a filter capacitor, a system for alleviating harmonic distortion to fill in gaps between voltage and current, which comprises:  
means for chopping the rectified voltage at a frequency cycle that is higher than the first frequency and with the

higher frequency cycle having a positive portion and a negative portion;  
timing means for providing said higher frequency cycle;  
an inductor device for storing the chopped and rectified voltage during one of the positive and negative portions of the higher frequency cycle; and



means for transferring stored energy from the inductor device to the filter capacitor during the other of the positive and negative portions of said higher frequency cycle, whereby the gaps between voltage and current are substantially filled in.

4,679,134

# INTEGRATED DUAL CHARGE PUMP POWER SUPPLY AND RS-232 TRANSMITTER/RECEIVER

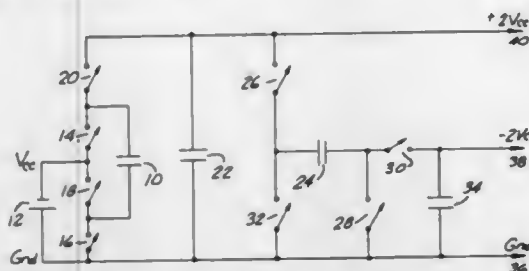
David Blingham, San Jose, and Charles M. Allen, Sunnyvale, both of Calif., assignors to Maxim Integrated Products, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 782,953, Oct. 1, 1985. This application Jun. 25, 1986, Ser. No. 878,233

Int. Cl. H02M 3/18

U.S. Cl. 363-61

2 Claims



1. A circuit, integrable on a single piece of semiconductor substrate material, for providing a bipolar voltage output at substantially double the voltage of a unipolar voltage input source, including:

first and second voltage input terminals,  
first and second positive transfer capacitor connection terminals,  
a first set of MOS semiconductor switches for selectively connecting said first voltage input terminal to said first and second positive transfer capacitor connection terminal and said second voltage input terminal to said second positive transfer capacitor connection terminal,  
first and second positive reservoir capacitor connection terminals,  
a second set of MOS semiconductor switches for selectively connecting said first voltage input terminal to said second positive transfer capacitor connection terminal and for selectively connecting said second voltage input terminal to said first positive reservoir capacitor connection terminal and said first positive transfer capacitor connection terminal to said second positive reservoir capacitor connection terminal,  
first and second negative transfer capacitor connection terminals,  
a third set of MOS semiconductor switches for selectively

connecting said first positive reservoir capacitor connection terminal to said first negative transfer capacitor connection terminal and said second positive reservoir capacitor connection terminal to said second negative transfer capacitor connection terminal.

first and second negative reservoir capacitor connection terminals, said first negative reservoir capacitor connection terminal connected to said first positive reservoir capacitor connection terminal,

a fourth set of MOS semiconductor switches for selectively connecting said first negative transfer capacitor connection terminal to said second negative reservoir capacitor connection terminal and second negative transfer capacitor connection terminal to said first negative reservoir capacitor connection terminal,

selection circuitry for selectively activating said first, second, third and fourth sets of MOS semiconductor switches,

means for clamping said second positive reservoir capacitor terminal to a voltage no more negative than a voltage approximately equal to the voltage appearing on said first voltage input terminal,

means for clamping said second negative reservoir capacitor to a voltage no more positive than a voltage approximately equal to the voltage appearing on said second voltage input terminal,

means for inhibiting latch-up of forward biased four layer devices created as a result of layout of said circuit on a single piece of semiconductor substrate material,

at least one RS-232 transmitter circuit, disposed in said semiconductor substrate material, having positive, negative and ground potential power conductors connected to said second positive reservoir capacitor terminal, said second negative reservoir capacitor connection terminal, and said first positive reservoir capacitor terminal, respectively, a data input connection terminal connected to said transmitter circuit for providing data to said transmitter, and a data output terminal connection for providing an output from said transmitter.

4,679,135

# CONTROL APPARATUS

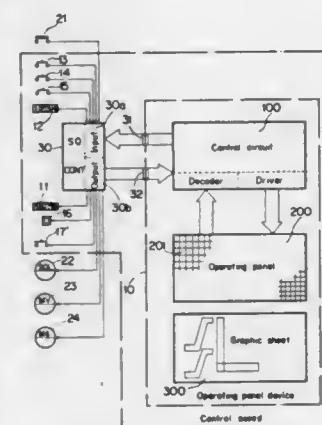
Takeshi Kobayashi, Hadano; Ryouichi Ishii, and Tomoyoshi Kitamoto, both of Hiratsuka, all of Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,356

Claims priority, application Japan, Dec. 26, 1983, 58-243776  
Int. Cl. G05B 19/10, 23/02, 19/02

U.S. Cl. 364-146

7 Claims



1. A control apparatus comprising:  
an operating panel means having illuminable switches which produce operation data upon operation by an operator and

which display by illumination the status of operation of a machine equipment to be controlled, and

an external control means which controls the machine equipment in a sequential manner according to a predetermined program on the basis of the operation data provided from said operating panel means and detection signals provided from the machine equipment and which illuminates the illuminable switches of said operating panel means,

said operating panel means having an operating panel composed of a large number of said illuminable switches arranged in a matrix form,

wherein a specific operation data is produced by operation of a predetermined illuminable switch in said operating panel and the status of operation of the machine equipment is displayed by illumination of the operated illuminable switch and

wherein said operating panel means is further provided with a storage means for temporarily storing the operation data produced by the operation of the illuminable switches and illumination data for specifying the illuminable switch to be illuminated, and a control section which controls the write and read of data to and from said storage means in accordance with a predetermined program and which controls in accordance with a predetermined program the delivery of the operation data stored in said storage means to said external control means and illumination of the illuminable switches based on the illumination data stored in said storage means.

4,679,136

# DYNAMIC ERROR COMPENSATING PROCESS CONTROLLER

Takashi Shigemasa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

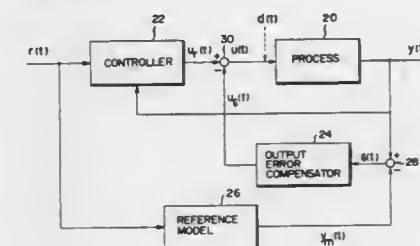
Filed Jan. 10, 1985, Ser. No. 690,259

Claims priority, application Japan, Apr. 13, 1984, 59-73982; Apr. 13, 1984, 59-73983; Apr. 13, 1984, 59-73984

Int. Cl. G05B 13/04, 13/02, 13/00

U.S. Cl. 364-150

6 Claims



1. A process control apparatus comprising:  
controller means for performing a control operation including an integral operation for a set point signal supplied to a process and an output signal from the process;  
a reference model having a desired transfer function of a control system including said process and said controller means and receiving the set point signal;  
first subtracting means for subtracting an output signal of the reference model from the output signal of said process to obtain an output error;  
output error compensating means for performing control operation including an integral operation for an output error generated from said first subtracting means and for generating a compensation signal such that the output error becomes zero; and  
second subtracting means for subtracting an output of said output error compensating means from an output of said controller means and for supplying a subtraction result as a control signal to said process.



4,679,137

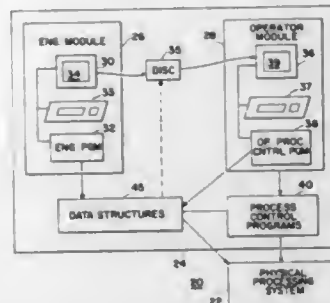
## PROCESS CONTROL INTERFACE SYSTEM FOR DESIGNER AND OPERATOR

Leslie A. Lane, Santa Clara; Lynn V. Lybeck, Moss Beach; David S. Perloff, Sunnyvale, and Chester L. Mallory, Campbell, all of Calif., assignors to Prometrix Corporation, Santa Clara, Calif.

Filed Apr. 30, 1985, Ser. No. 729,153  
Int. Cl. G06F 15/46

U.S. Cl. 364—188

32 Claims



18. In a method for displaying and selecting menu items on a computer display device, the steps of:
- defining a plurality of separate main menu items;
  - defining a plurality of separate groups of auxiliary menu items, each being associated with at least one of said main menu items;
  - establishing at least three separate menu display regions on said computer display device, each being capable of displaying multiple menu items and an associated selectably positionable pointer to an individual menu item;
  - displaying in a first one of said menu display regions at least a plurality of said main menu items together with said associated pointer positioned at one of said displayed main menu items;
  - displaying simultaneously in a second one of said menu display regions at least a portion of one of said groups of auxiliary menu items associated with the main menu item being selected at in said first menu display region together with said associated pointer positions at one of said displayed auxiliary menu items;
  - automatically responding to a position change of said pointer in said first menu display region to point at a new main menu item by altering said second menu display region to display at least a portion of one of said groups of auxiliary menu items associated with the new main menu item being pointed at;
  - defining a plurality of groups of tertiary menu items, each group being associated with at least one of said auxiliary menu items;
  - displaying simultaneously in a third one of said menu display regions at least a portion of one of said groups of tertiary menu items associated with said auxiliary menu item being pointed at in said second menu display regions together with said associated pointer positioned at one of said displayed tertiary menu items;
- wherein
- said step of automatically responding to a position change of said pointer in said first menu display region further includes the step of simultaneously altering said third menu display region to display at least a portion of one of said groups of tertiary menu items associated with said second menu item being pointed at in said second display region; and
- said method further includes the step of automatically responding to a position change of said pointer in said second menu display region without a position change of said pointer in said first menu display region by simultaneously altering said third menu display region to display at least a portion of one of said groups of tertiary menu items

- associated with said new secondary menu item being pointed at in said second display region.
27. In a method of controlling a process using a programmed digital computer, the steps of:
- (a) establishing a set of process control programs, each having associated therewith a set of predefined parameters required for its operation;
  - (b) defining a parameter data structure format for each of said process control programs, including parameter denoting means for denoting each of said predefined parameters as an operator unalterable parameter having a fixed value, an operator alterable parameter having a default value, or a forced operator entry parameter that must be supplied with a value before the process is run; and parameter value storing means for storing a value for each of said predefined parameters;
  - (c) storing, for each of a multiplicity of specified processes, a parameter data structure in accordance with the parameter data structure format for a specified one of said process control programs;
  - (d) entering into said parameter denoting means of said parameter data structure for a specified process a value for each of said predefined parameters to specify it as an operator unalterable parameter, an operator alterable parameter, or a forced operator entry parameter;
  - (e) entering fixed values for said operator unalterable parameters and default values for said operator alterable parameters;
  - (f) selecting one of said processes;
  - (g) entering values for said operator alterable and forced operator entry parameters for said selected process; and
  - (h) enabling the running of the process control program corresponding to said selected process only after values have been entered for all said forced operator entry parameters corresponding to said selected process.

4,679,138

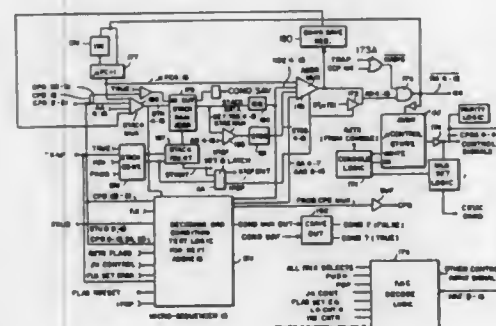
## MICROSEQUENCER IN A DATA PROCESSING SYSTEM USING STACK STORAGE FOR CONTROLLING THE SEQUENCING OF MICROROUTINES

David I. Epstein, Framingham, and Charles J. Holland, Northboro, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 23, 1981, Ser. No. 256,714  
Int. Cl. G06F 9/22

U.S. Cl. 364—200

8 Claims



1. In a data processing system having macroinstruction decoding means for decoding a macroinstruction to provide a sequence of microinstructions comprising one or more microroutines, a microsequencing control means for controlling the provision of said sequence of microinstructions, said microsequencing control means including
- stack storage means for temporarily storing data for use in said microroutines, the final microinstruction of a mi-

croroutine being a request to retrieve or remove data from said stack storage means;

first logic means connected to said stack storage means and responsive to the data request of the final microinstruction of a microroutine for producing a stack empty signal when no data remains in said storage means; and

second logic means connected to said first logic means and responsive to said stack empty signal and to said data request for generating an output signal for requesting a new macroinstruction.

4,679,139

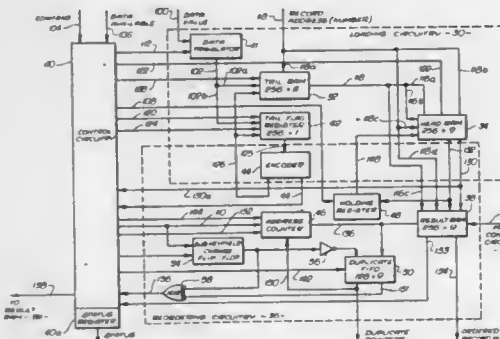
## METHOD AND SYSTEM FOR DETERMINATION OF DATA RECORD ORDER BASED ON KEYFIELD VALUES

James W. Durbin, Fortuna, Calif., assignor to Canevari Timber Co., Inc., Fortuna, Calif.

Filed May 1, 1984, Ser. No. 605,788  
Int. Cl. G06F 7/22, 12/00

U.S. Cl. 364—200

27 Claims



14. A system for arranging record numbers corresponding to a plurality of data records wherein each record is comprised of a plurality of bits and is identified by a unique record number, wherein a portion of each record comprises a keyfield, wherein each keyfield is divided into a plurality of sub-keyfields, each of said sub-keyfields having a different order of significance, and wherein the record numbers of the plurality of records are arranged in accordance with the value of said keyfields, said system comprising:

- a. intermediate storage means including:
  - (i) a head memory means having a plurality of individually accessible storage areas, wherein each individually accessible storage area has a location address corresponding to a different record number; and
  - (ii) a tail memory means having a plurality of individually accessible storage areas, wherein each individually accessible storage area has a location address corresponding to a different subkeyfield value;
- b. first control means for receiving the record number and sub-keyfield value of each record in a group of records, and, for each unique subkeyfield value received:
  - (i) for the first record number received that is associated with such sub-keyfield value, for loading the record number into the storage area of the tail memory means having a location address corresponding to the sub-keyfield value and also into the storage area of the head memory means having a location address corresponding to said first record number; and
  - (ii) for all subsequent record numbers received that are associated with such sub-keyfield value, for loading the record number currently stored in the storage area of the tail memory means having a location address corresponding to the sub-keyfield value, into the storage area of the head memory means having a location address corresponding to said subsequent record number, and for loading said subsequent record number into the

- storage area of the tail memory means having a location address corresponding to the sub-keyfield value.
- c. Second control means for successively accessing from the intermediate storage means, for each storage area of the tail memory means having a record number stored therein in accordance with the location addresses of said storage areas which correspond to the sub-keyfield values, a group of one or more record numbers, wherein the first record number in the group is accessed from the storage area of the tail memory means having a location address corresponding to that sub-keyfield value, and wherein each succeeding record number in the group is accessed from the storage area of the head memory means having a location address corresponding to the immediately preceding record number;
- d. final memory means having a plurality of individually accessible storage areas each having a different location address;
- e. third control means including a receiving means for receiving an address from a fourth control means, a loading means for loading each record number accessed by the second control means in the order accessed into consecutive storage areas of the final memory means, and a recording means for recording, for each group of more than one record number accessed by the second control means, each record number in the group and the location address of the storage area of the final memory means where the first record number in the group is loaded; and
- f. fourth control means for initially providing, for each record, the record number and sub-keyfield value of greatest significance of that record to the first control means and the location address of the first storage area of the final memory means to the third control means, and, for subsequently providing, separately for each group of more than one record number recorded by the third control means, each record number in the group and its corresponding sub-keyfield value of next greatest significance to the first control means and the location address of the storage area of the final memory means recorded for the group by the third control means.

4,679,140

## DATA PROCESSOR WITH CONTROL OF THE SIGNIFICANT BIT LENGTHS OF GENERAL PURPOSE REGISTERS

Shizuo Gotou, Hachioji; Toyohiko Kagimasa, Kokubunji; Seichi Yoshizumi, Hino, all of Japan, and Yooichi Shintani, Pittsburgh, Pa., assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,785

Claims priority, application Japan, Dec. 23, 1983, 58-242018; Oct. 3, 1984, 59-206235

Int. Cl. G06F 12/04

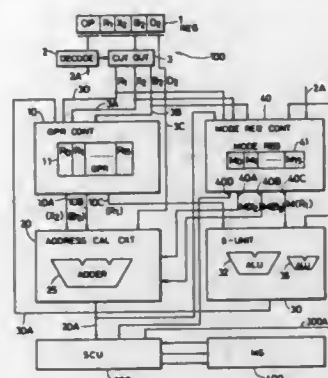
U.S. Cl. 364—200

13 Claims

1. A data processor for performing data processing operations in response to program instructions, comprising:
- a plurality of general registers, each having a first predetermined bit length;
  - mode signal storage means for holding a plurality of mode signals each indicating a significant bit length for data stored in a respective one of said general registers;
  - mode reading means responsive to a program instruction for reading out of said mode signal storage means at least one mode signal corresponding to one of the general registers designated by the program instruction as one which should be accessed for read-out or write-in of data;
  - register accessing means connected to said general registers and responsive to program instructions for accessing selected ones of said general registers to read-out or write-in data;
  - data use means connected to said general registers for processing data from one of the general registers accessed by said register accessing means in response to a program instruction which requests a read-out of data from the



general registers, including means responsive to a first mode signal read out by said mode reading means in response to the program instruction for changing the significant bit length of the data read out from a first general register adding bits thereto; and data supply means connected to said general registers for writing data in one of the general registers accessed by



said register accessing means in response to a program instruction which requests write-in of data in said general registers, including means responsive to a second mode signal read out by said mode reading means in response to the program instruction for changing the significant bit length of the data to be written into the general register by adding bits thereto.

4,679,141

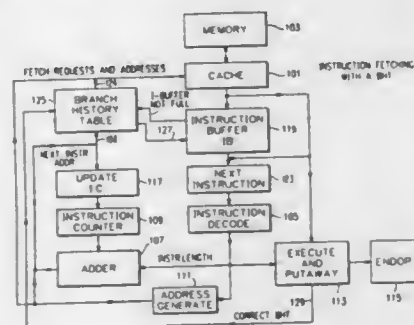
## PAGEABLE BRANCH HISTORY TABLE

James H. Pomerene, Chappaqua, N.Y.; Thomas R. Puzak, Cary, N.C.; Rodolph N. Rechtschaffen, Scarsdale; Philip L. Rosenfeld, Briarcliff Manor, both of N.Y., and Frank J. Sparacio, North Bergen, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,424  
Int. Cl. G06F 9/00

U.S. Cl. 364-200

7 Claims



1. In a branch history table which is divided into two sections, with groups of instructions being divided into segments and with the branch information for a segment forming a segment entry, the combination comprising:

- an active high speed section in which  $n$ , where  $n$  is an integer, segment entries are stored, including means for processing branch information in said segment entries;
- a slower speed backup section which stores the remaining segment entries of said branch history table; and
- means for updating the active high speed section from the slower speed section based on analyzing branch information in segment entries to determine entries to be used in the future.

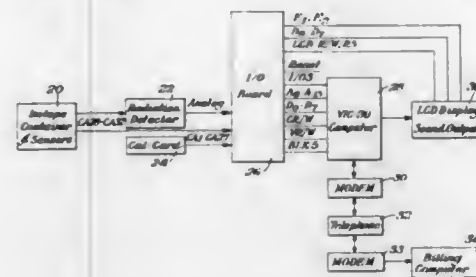
4,679,142  
RADIOACTIVE MATERIAL BILLING SYSTEM AND METHOD

Denny L. Y. Lee, Andover, Mass., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 2, 1984, Ser. No. 627,867  
Int. Cl. G01R 21/00; G06F 15/20, 15/24

U.S. Cl. 364-406

19 Claims



1. A system for billing based on the usage of radioactive material held in a dispensing container comprising:
  - a radiation shielded chamber adapted to receive the container,
  - a sensor for providing a signal each time the chamber is accessed,
  - a detector means for detecting radiation emitted from the container while in the chamber,
  - a control unit responsive to the sensor and detector means for measuring the level of radiation in the container (a) periodically and (b) each time the chamber is accessed,
  - memory means responsive to the control unit for storing each of the radiation measurements together with the time of the access event, and
  - means responsive to the control unit and memory means for calculating the radioactive material actually removed from the container based on the periodic and access measurements.

14. A method of measuring dispensed doses of a radioactive material from a dispensing container adapted to be held in a shielded chamber with a removable access lid using a radiation detector to measure radioactivity in the chamber comprising the steps of:

- first measuring the radioactivity in the chamber when a dispensing container is first loaded into the chamber, recording the first measurement and its time and date,
- second measuring the radioactivity in the chamber each time the lid is removed,
- recording each second measurement and its time and date,
- third measuring the radioactivity in the chamber each time the lid is restored on the chamber,
- recording each third measurement and its time and date, and
- calculating the radioactive material actually used based on such measurements.

4,679,143

## CONTROL DEVICE FOR GAME MACHINE

Takashi Hagiwara, Zama, Japan, assignor to Sigma Enterprises, Inc., Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,677

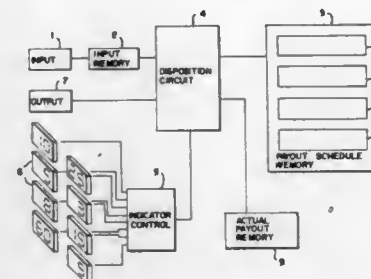
Claims priority, application Japan, Nov. 29, 1982, 57-208849  
Int. Cl. G07F 17/34; A63F 5/04, 7/00; G06F 15/44

U.S. Cl. 364-412

8 Claims

1. Apparatus for providing a specific payout based on a predetermined payout schedule comprising input means for a player to select a selected object of a plurality of objects in a first payout schedule, disposition means for receiving a signal indicative of said selected object and determining whether the selected object results in a payout in accordance with said first payout schedule, means connected to said disposition means for determining the actual payout history of the apparatus,

memory means connected to said disposition means for recording a plurality of payout schedules, each of said payout schedules having a payout for each of a plurality of objects, the total payout for each schedule being different from the total payout for each of the other schedules, display means for showing



each payout corresponding to each object in a present payout schedule, said disposition means comparing said actual payout history with a predetermined limit and replacing said first payout schedule with a second payout schedule if said actual payout history exceeds said limit.

4,679,144

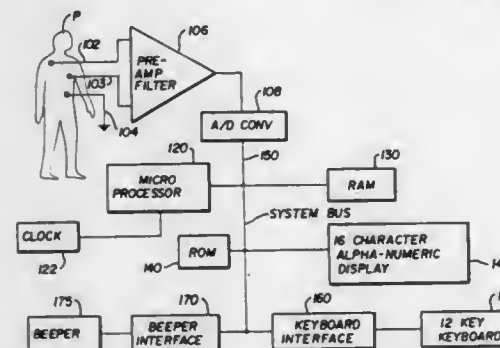
## CARDIAC SIGNAL REAL TIME MONITOR AND METHOD OF ANALYSIS

Michael W. Cox, Lincroft, N.J.; Richard I. Levin, New York, N.Y.; David J. Cohen, Sag Harbor, N.Y., and William R. Frisbie, East Hampton, N.Y., assignors to Q-Med, Inc., Clark, N.J.

Filed Aug. 21, 1984, Ser. No. 642,690

Int. Cl. G06F 15/42; G06G 7/60; A61B 5/04  
U.S. Cl. 364-417

40 Claims



1. A method of evaluating a curve having a rapidly changing value by determining the positive or negative quality of the slope of said curve and by determining when the value of said curve is above or below a predetermined threshold value, comprising the steps of:

- determining a frequency of sampling;
- determining the slope of the curve between a first sampling and a successive later sampling by subtracting the value of the curve at each first sampling from the value of the curve at said later sampling;
- providing four shift registers each having space for a plurality of bits and for a Flag Bit;
- assigning a shift register to each of the curve values of positive slope, negative slope, above threshold and below threshold;
- feeding an appropriate bit value to each shift register at each sampling;
- determining a numerical value represented by said plurality of bits arrayed in each shift register;
- providing a table of values correlating the status of said Flag Bit to each one of the numerical values possibly represented by said array of bits;

finding said determined numerical value in said table; changing, as needed, the status of said Flag Bit in accordance with said determined numerical value found in said table; and performing at each sampling said sequence of steps so that the status of said Flag Bit may be changed as needed.

4,679,145

## METHOD AND APPARATUS FOR CONTROLLING A CLUTCH-TRANSMISSION UNIT

Peter op de Beeck, Nokere, Belgium; Rainer Wnest, Wiersheim, and Norbert Stelter, Weissach, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

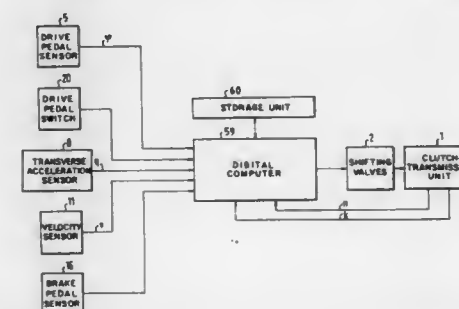
Filed Nov. 19, 1984, Ser. No. 672,612

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1983, 3341652

Int. Cl. B60K 41/08; G06F 15/20

U.S. Cl. 364-424.1

40 Claims



26. An apparatus for the control of a clutch transmission unit of a vehicle equipped with an internal combustion engine, in which the internal combustion engine is adapted to be influenced by a drive pedal, comprising

- drive pedal computer means operable to scan drive pedal signal values, to continuously update the drive pedal signal values scanned over scanning intervals and stored in a first memory means, and to calculate from said drive pedal values the drive pedal activity,
- first characteristic curve converter means for changing the limit values of shifting decisions as a function of the drive pedal activity,
- sensor means for detecting signals indicative of at least several of transverse acceleration, braking operation, coasting operation, vehicle velocity from which a deceleration signal is obtained by means of a differentiator, transmission output rotational speed and the engaged gear,
- transmission translator means for deriving, from the transmission output rotational speed and the engaged gear, the signals of transmission input rotational speed, transmission input rotational speed in the next higher gear and transmission input speed in the next lower gear,
- second characteristic curve converter means for producing a desired output value signal determined from the drive pedal position,
- program control means for controlling a clutch transmission unit,
- means for processing said detected and calculated signals and applying the processed signals to said program control means, and
- means for determining the waiting period for a shifting-up operation which is determined by a third characteristic curve converter means from the drive pedal activity and is applied to the program control means.

**4,679,146**  
**ANTI-SKID BRAKE CONTROL SYSTEM AND METHOD**  
**FEATURING VEHICLE BATTERY PROTECTION**  
 Jun Kubo, Hino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

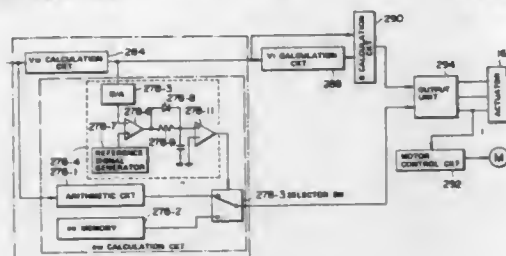
Filed Apr. 17, 1984, Ser. No. 601,293

Claims priority, application Japan, May 16, 1983, 58-84092

Int. Cl.<sup>4</sup> B60T 8/34

U.S. Cl. 364-426

8 Claims



1. An anti-skid brake control system for an automotive vehicle comprising:

- a hydraulic brake circuit including a wheel cylinder for applying braking pressure to a vehicle wheel;
- a pressure control valve disposed within said hydraulic brake circuit for increasing the fluid pressure in said wheel cylinder in a first position thereof, decreasing the fluid pressure in a second position thereof and holding the fluid pressure constant value in a third position thereof;
- first means for detecting wheel speed and producing a first signal having a value representative of the wheel speed;
- a second means for detecting wheel acceleration producing a second signal having a value representative of the wheel acceleration;
- a third means for deriving a control signal for selecting one of said first, second and third positions of said pressure control valve based on said first and second signals, said third means producing said control signal to place said pressure control valve at said second position when said second signal value decreases smaller than a given deceleration threshold;
- a fourth means, receiving said first signal, for producing a command to replace said second signal value with a predetermined value which is greater than said deceleration threshold, when said first signal value becomes less than a given wheel speed threshold; and
- a fifth means responsive to increases of said first signal above said wheel speed threshold to disable said fourth means for a predetermined period of time after the first signal value has exceeded the wheel speed threshold.

**4,679,147**  
**NAVIGATION SYSTEM WITH CAPABILITY OF**  
**INSTRUCTING RUNNING DIRECTION**  
 Fumio Tsujii, Yoji Matsuoka, both of Mito; Takanori Shibata, Hitachi; Akira Endo, Mito, and Hiroshi Shirai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,259

Claims priority, application Japan, Mar. 28, 1984, 59-58301

Int. Cl.<sup>4</sup> G06F 15/50

U.S. Cl. 364-449

7 Claims

1. A navigation system for displaying, on a display screen, road map information and a running trace of a car superimposed thereon comprising:

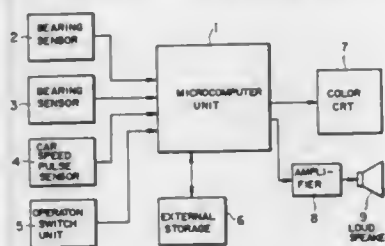
- display means including a cathode ray tube for displaying road map information and information regarding the car running trace;
- at least one bearing sensor means for detecting the running direction of the car;
- running distance detector means for detecting the running distance of the car; and
- control means, connected to receive output signals from said

bearing sensor means and said running distance detector means, for computing a current position of the car, for controlling car running information, such as the road map information, a running trace and a running bearing corresponding to the current position of the car, and for displaying the car running information on said cathode ray tube,

said control means including:

- (a) external storage means for storing the road map information and the car running information;
- (b) a central control unit for controlling said external storage means, said computation of the current position of the car and said display of the road map information; and
- (c) means for instructing the driver as to the desired running direction; and wherein:

said central control unit comprises means for setting spec-



fied areas centered on respective crossings of roads on said road map information stored in said external storage means, means for calculating a running position of the car in accordance with the output signals of said bearing sensor means and said running distance detector means, means for detecting the arrival of the car at an entrance of the specified area by comparing the calculated value of the running position with data indicating the boundary of the specified area, means for determining the angular difference between the current running direction of the car and a destination bearing at the entrance of the specified area in accordance with the output signal of said bearing sensor means at said entrance and information of the destination bearing stored in said external storage means, and means for controlling said running direction instructing means to indicate to the driver the desired running direction at a crossing in accordance with said determined angular difference.

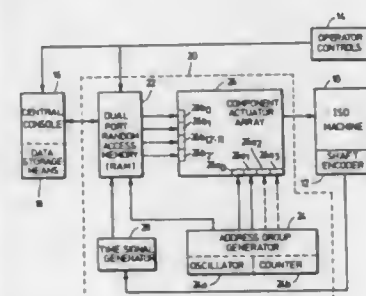
**4,679,148**  
**GLASS MACHINE CONTROLLER**  
 Charles L. Wood, Muncie, Ind., assignor to Ball Corporation, Ind.

Filed May 1, 1985, Ser. No. 729,394

Int. Cl.<sup>4</sup> C03B 9/40; G06F 15/46

U.S. Cl. 364-473

4 Claims



1. A programmable automatic controller for controlling at least one section of a glassware-forming machine including a

plurality of movable components that operate in timed relationship with respect to one another to form rigid glassware articles from gobs of molten glass, comprising

- means for generating digital indications of the increments of time elapsed in each cycle of operation of the machine;
- a dual port random access memory with sufficient memory locations for storing the on/off statuses of each of the plural machine components in each increment of time in each cycle of operation of the machine, said memory providing grouped memory locations to provide multiple address locations in the memory for each increment of time and having two separate sets of input/output ports allowing independent and substantially simultaneous storage and retrieval for each of the memory locations;
- an address group generator to develop a series of sequential address group signals in each increment of time to permit differentiation between the groups of plural components stored in the random access memory during each increment of time;

a plurality of component actuators, said component actuators being connected in plural groups with each plural group sharing a common activating terminal, and with one component actuator in each plural group sharing a common actuating terminal, said activating terminals of each group being connected with the address group generator and said shared actuating terminals of the component actuators being connected with the output ports of the random access memory;

wherein each of the machine components may be efficiently actuated by the on/off status stored in the random access memory in each increment of time.

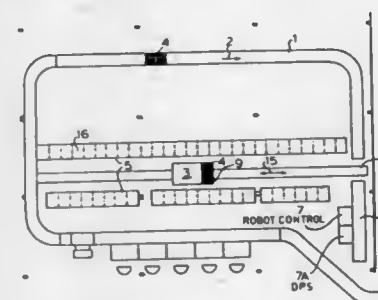
**4,679,149**  
**COMMISSIONING SYSTEM**  
 Arthur Merz, Bad Hersfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
 Filed Mar. 4, 1985, Ser. No. 707,569

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1984, 3408081

Int. Cl.<sup>4</sup> G06F 15/24

U.S. Cl. 364-478

4 Claims



- (a) the transport unit having disposed thereon and transportable therewith an industrial robot, a code reader and a receptacle for a multiplicity of said articles with readable coding;
- (b) a controller for said transport unit and robot;
- (c) said controller programmed to issue a command to said robot to cause it to grab one of the articles from said loaded receptacle and position it with its coding in front of said code reader;
- (d) said controller programmed to derive from the coding

read, a travel command for the transport unit and the robot to a respective deposition compartment;

- (e) means for, simultaneously with the execution of the travel command, transferring the coding read to a data processing system;
- (f) said controller responsive to an output from said data processing system after the travel command is executed and a destination address is received, which is determined by the data processing system on the basis of plausibility, to cause the industrial robot to deposit the grabbed material in the respective compartment; and
- (g) said controller programmed to repeat the control cycle until a predetermined number of articles is taken from the receptacle and to then direct the transport unit with the receptacle device to travel to a loading station.

**4,679,150**  
**AUTOMATIC VENDING MACHINE WITH DISCOUNT**  
**FUNCTION**

Yukichi Hayashi; Eiji Itako, both of Sakado, and Masahiro Yasuhara, Saitama, all of Japan, assignors to Kabushiki Kaisha Nipponconico, Tokyo, Japan

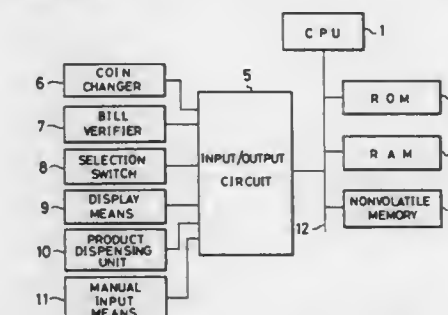
Filed Mar. 7, 1985, Ser. No. 709,040

Claims priority, application Japan, Apr. 17, 1984, 59-75748

Int. Cl.<sup>4</sup> G06F 15/20; G07F 5/02, 5/00

U.S. Cl. 364-479

6 Claims



1. An automatic vending machine with a discount function, said automatic vending machine being provided with continuous sale control means for subtracting a regular sales price from a total amount of money deposited in the automatic vending machine every time a product is sold and for continuously dispensing a selected product so long as an outstanding balance is larger than the regular sales price, comprising:

- a first determining means for determining whether or not money is deposited in the vending machine;
- a second determining means for determining whether or not the outstanding balance is decreased to zero;
- single sale operation memory means responsive to results of determinations effected by said first and second determining means for storing single sale operations until the outstanding balance is decreased to zero;
- a third determining means for determining whether or not said single sale operation memory means stores the single sale operations;
- means for counting the number of products sold while it is determined by said third determining means that said single sale operation memory means stores single sale operations;
- reference number detecting means for determining whether or not a count of said counting means reaches a predetermined reference number and for generating an output when the predetermined reference number has been reached; and
- product sales price output means for supplying a price output to said continuous sale control means, said price output being changed from a first output indicative of the regular sales price of a product to a second output indicative of a discount price which is obtained by subtracting a predetermined amount from the regular sales price while









4,679,162

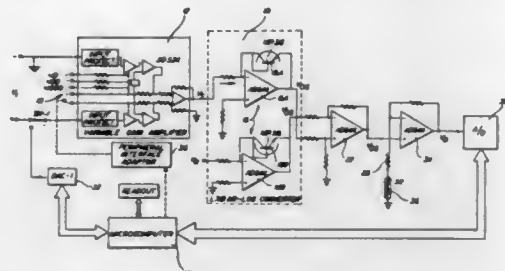
## WIDE DYNAMIC RANGE LINEAR TO LOG CONVERTER WITH MICROCOMPUTER CONTROL

Alan C. Ferber, Hillside, and Morteza M. Chamran, deceased, late of Elmhurst, both of Ill. (by Delories M. Chamran, executrix), assignors to Perkin-Elmer Corp., Norwalk, Conn.

Filed Sep. 14, 1984, Ser. No. 651,190  
Int. Cl.<sup>4</sup> G06F 7/02; H03M 1/06

U.S. Cl. 364-571

10 Claims



1. A method comprising the steps of: introducing an analog data input signal into the input of a switchable variable gain instrumentation amplifier; introducing the output from said switchable variable gain instrumentation amplifier into the data input of a linear-log converter, the output signal of which being a log function of the input signal; amplifying said output log signal in such a manner as to correct for the initial offset and for temperature drift; introducing said corrected log signal to the input of an analog to digital converter to digitize said corrected log signal; delivering said corrected digitized log signal subsequently to a microcomputer for examining the magnitude of said digitized log signal and for generating a command to switch the gain of said variable gain amplifier, if required, to such a commanded gain value that said digitized log signal magnitude does not exceed a preselected log value; and simultaneously delivering to a readout device a corrected log signal value which corresponds to said digitized log signal magnitude to which is added a value which is substantially the log of said commanded gain value, thus extending the range of said log signal as shown on the readout by the log of said commanded gain.

4,679,163

## INVERSE DISCRETE COSINE TRANSFORM CALCULATION PROCESSOR

Emmanuel Arnould, Villarsaux, and Jean-Pierre Dugré, San Clenente, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Mar. 8, 1985, Ser. No. 709,857

Claims priority, application France, Mar. 9, 1984, 84 03667

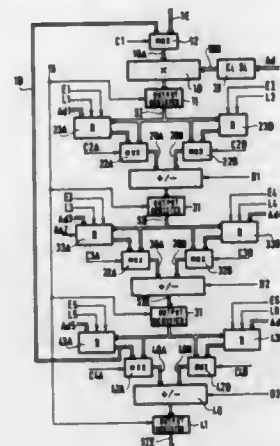
Int. Cl.<sup>4</sup> G06F 15/332

U.S. Cl. 364-725

3 Claims

1. Inverse discrete cosine transform calculation processor for calculating the transform of a sequence of  $N$  digital data points also called coefficients where  $N=2^n$  and  $n$  is an integer greater than two, comprising four successive calculation stages each assigned to a single operation and together constituting a processor module controlled by a programmed store, wherein a first stage, the module input stage, comprises a multiplication unit connected to an associated addressable store holding sine and cosine function values and an input multiplexer selectively connecting an input bus of the module receiving said coefficients or a loopback bus internal to the module to said multiplication unit, said multiplication unit delivering the successive results obtained over a stage output bus, and each of the second, third and fourth stages comprises an addition/subtraction unit having two input buses and a stage output bus, the output

bus of said fourth stage constituting the output bus of the module, two addressable storage registers loaded from the output bus of the stage immediately preceding the stage concerned on its input side, and two stage input multiplexers each



4,679,164

## DIGITAL HIGH SPEED PROGRAMMABLE CONVOLVER

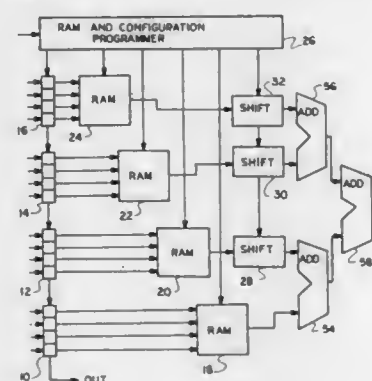
Thomas C. Rearick, Roswell, Ga., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1984, Ser. No. 682,126

Int. Cl.<sup>4</sup> G06F 15/336, 7/52

U.S. Cl. 364-728

4 Claims



3. A digital high speed programmable convolver module comprising: a plurality of digital random access memory modules; each of said random access memory modules having a 320 bit capacity; a digital register associated with each of said random access memory modules; programming means; said programming means providing to each random access memory module all products of a constant factor multiplied by all combinations of  $N$  bits; each of said registers having a capacity of  $N$  bits;

said programming means providing to each register  $N$  bits of a variable factor;  
a shift register associated with each of said random access memory modules except one;  
said programming means providing to each of said shift registers directions of the number of spaces its input is to be shifted;  
each of said random access memory modules delivering to its associated shift register the product identified by the  $N$  bits of its associated register;  
an adder associated with each pair of shift registers and the remaining shift register and digital random access memory module; and  
an adder associated with each pair of adders.

4,679,165

## MULTIPLICATION UNIT AND METHOD FOR THE OPERATION THEREOF

Alois Rainer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

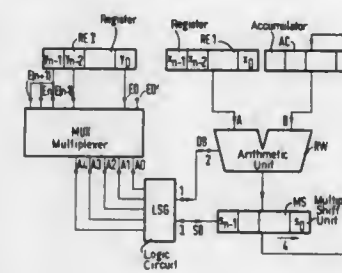
Filed Jul. 6, 1984, Ser. No. 628,585

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335424

Int. Cl.<sup>4</sup> G06F 7/54

U.S. Cl. 364-760

7 Claims



1. A multiplication unit for multiplying two  $n$ -place binary numbers comprising: a first register containing the multiplicand; an accumulator for storing intermediate results; an arithmetic unit having inputs respectively connected to the outputs of said first register and said accumulator for undertaking iterative combinations of the contents of said first register and said accumulator, said arithmetic unit further having an instruction input; a multiple shift means having an input connected to the output of said arithmetic unit for receiving the result of each combination in said arithmetic unit therefrom, and an output connected to the input of said accumulator, and further having a control input; a second register containing the multiplier; a multiplexer having a plurality of inputs respectively connected to the outputs of said second register for receiving the  $n$  bits of said multiplier from said second register, and having a selected plurality of outputs, said multiplexer further having a first multiplexer input connected so as to always exhibit a logic "0" and two additional multiplexer inputs connected for always exhibiting the highest order bit for said multiplier, said multiplexer through-connecting a selected plurality of adjacent bits of said multiplier to said selected plurality of outputs; and a logic circuit having a plurality of inputs respectively connected to said selected plurality of outputs of said multiplexer, said logic circuit generating an instruction signal based on said selected bits of said multiplier which is supplied from said logic circuit to said instruction input of said arithmetic unit for instructing the combination to be undertaken on the inputs of said arithmetic unit, said logic circuit further generating a control signal based on said selected bits of said multiplier which is supplied to said

control input of said multiple shift means for controlling transfer of the contents of said multiple shift means to said accumulator.

4,679,166

## CO-PROCESSOR COMBINATION

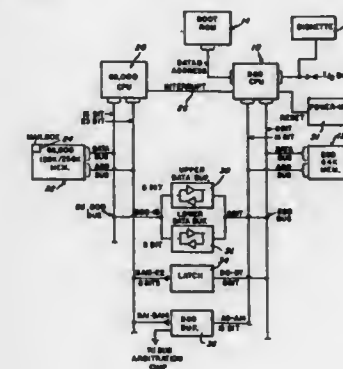
Michael F. Berger, Fort Worth, and Sammy D. Sawyer, Arlington, both of Tex., assignors to Tandy Corporation, Fort Worth, Tex.

Continuation of Ser. No. 458,541, Jan. 17, 1983, Pat. No. 4,590,556. This application Nov. 12, 1985, Ser. No. 796,760

Int. Cl.<sup>4</sup> G06F 9/00

U.S. Cl. 364-900

23 Claims



1. A microprocessor system comprising: a first processor, a second processor, means intercoupling the first and second processors including an address bus and a data bus associated with the first processor and an address bus and a data bus associated with the second processor, a first memory associated with the first processor and coupled thereto via the first processor address bus and data bus, a second memory associated with the second processor and coupled thereto via the second processor address bus and data bus, a third memory associated with the first processor and comprising a read-only memory for storing a boot strap control program, power-up reset circuit means including means for generating a reset signal and means coupling the reset signal to the first processor causing first processor instruction operation in accordance with the boot strap control program to load the operating system into the first memory, means responsive to said program after loading of the operating system to terminate operation in accordance with the boot strap control program and commence operation in accordance with the operating system, and control means responsive to a first operating system type code for establishing control of said microprocessor system in said first processor and holding said second processor in an inactive state, and responsive to a second operating system type code for transferring control of said microprocessor system to said second processor.



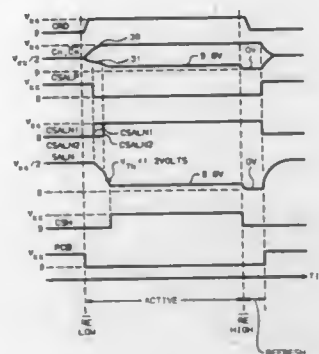


**4,679,172**  
**DYNAMIC MEMORY WITH INCREASED DATA**  
**RETENTION TIME**

Howard C. Kirsch, Emmaus, and Frank J. Procyk, Center Valley, both of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.  
Filed May 28, 1985, Ser. No. 738,664

U.S. Cl. 365—222

## 11 Claims



1. An integrated circuit dynamic memory comprising memory cells arranged in rows and columns, and row decoding means for selecting a row of said cells by applying a voltage to a row conductor; wherein said cells comprise an access transistor having a control electrode connected to a row conductor, a first controlled electrode connected to an information storage capacitor, and a second controlled electrode connected to a column conductor; and further comprising means for latching a column conductor in a low voltage state in response to a voltage level stored in a memory cell,

CHARACTERIZED IN THAT:

said integrated circuit further comprises means for maintaining the voltage on a column conductor that is latched in the low voltage state at a level in excess of zero volts for at least a majority of the active portion of a memory cycle, and still further comprises means for reducing the voltage on said column conductor latched in the low voltage state to essentially zero volts during a refresh operation.

4,679,173

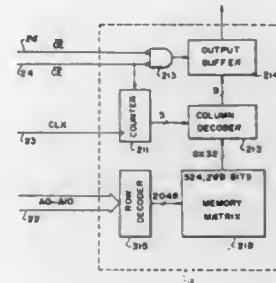
**SEQUENTIAL ACCESS LSI MEMORY CIRCUIT FOR  
PATTERN GENERATOR**

Kazuyuki Sato, Tokyo, Japan, assignor to Kabushiki Kaisha  
Toshiba, Kawasaki, Japan

Filed Mar. 12, 1985, Ser. No. 710,687  
Claims priority, application Japan, Mar. 13, 1984, 59-47903  
Int. Cl.<sup>4</sup> G11C 7/00, 8/00, 11/40

U.S. CI, 365-233

## 2 Claims



1. A sequential access LSI memory circuit for a pattern generator, comprising:

- a memory matrix for outputting, upon receipt of a row address, row data specified by said row address;
- a row address decoder for receiving and decoding an externally-supplied address and supplying the decoded address, as said row address, to said memory matrix;
- a counter for sequentially counting from a predetermined value in response to an externally-supplied clock signal, said counter being reset by an externally-supplied chip enable signal;
- a column address decoder, coupled to said memory matrix and said counter which supplies a count output corresponding to a column address to said column address decoder, for receiving memory output data from said memory matrix corresponding to the row address and for generating column data specified by said column address supplied from said counter; and
- an output buffer for receiving the column data from said column address decoder and for outputting the column data in response to an externally-supplied output signal.

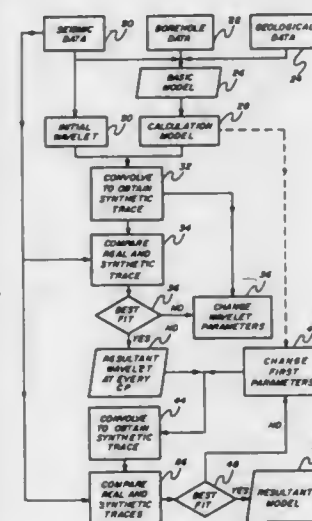
4,679,174  
METHOD FOR SEISMIC LITHOLOGIC MODELING  
Valery A. Gelfand, Houston, Tex., assignor to Western Geo-

Valery A. Gelfand, Houston, Tex.; assignor to Western Geophysical Company of America, Houston, Tex.  
Continuation of Ser. No. 604,375, Apr. 26, 1984, abandoned.

This application Feb. 4, 1986, Ser. No. 825,698

U.S. Cl. 367-73

### 8 Claims



1. A method for optimizing a lithologic model of subsurface earth layers, said lithologic model being derived from a real previously fully migrated seismic section consisting of a plurality of real wavelet-processed, zero-offset seismic traces from a corresponding plurality of seismic stations distributed in a survey area at or near the surface of the earth, comprising:  
preparing an initial lithologic model of subsurface earth layers by combining non-seismic data with the lithologic model derived from seismic recordings;  
assigning an initial set of layer parameters to said subsurface earth layers;  
selecting a plurality of model points among the plurality of seismic stations in the survey area;  
establishing a plurality of calculation points between said model points within a zone of interest within said subsurface earth layers,  
assigning layer parameters to the subsurface earth layers at each said calculation point by interpolation between adjacent model points;  
calculating a reflectivity series at each said seismic station

within said zone of interest by interpolation of layer parameters between calculation points;  
generating a synthetic seismic trace from said reflectivity series at each said seismic station to create a synthetic seismic section;  
measuring the goodness of fit between said synthetic seismic section and a corresponding real seismic section;  
systematically perturbing the layer parameters, at each said calculation point;  
generating new synthetic seismic traces after each perturbation to create a new synthetic seismic section and measuring the average goodness of fit between said new synthetic seismic section and said real seismic section;  
continuing the perturbative process until the average goodness of fit between said synthetic and real seismic sections is optimized to create an optimal lithologic model; and  
displaying said optimal model.

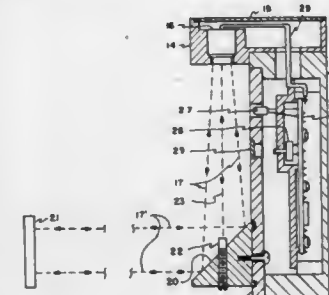
**4,679,175**  
**ULTRASONIC DISTANCE SENSOR WITH DUAL BURST**  
**NOISE REJECTION**

**Kenneth C. Eder, New Brighton, and Robert V. Krzyanowski, Plymouth, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

Filed Dec. 13, 1984, Ser. No. 681,163  
Int. Cl.<sup>4</sup> G01S 9/66, 9/68

U.S. Cl. 367-98

### 13 Claims



1. An ultrasonic sensor comprising:

transducer means including an electroacoustic transducer for transmitting burst of acoustic energy along a predetermined path in response to electrical drive pulses and converting echoes of the transmitted burst into corresponding electrical signals;

a reference target located in the predetermined path closer to said transducer means than any intended target object for reflecting a portion of the acoustic energy transmitted by said transducer means back toward said transducer means;

transmit circuitry having a control terminal, said transmit signal circuitry being operable in response to a first signal at the control terminal to supply a first electrical drive pulse to said electroacoustic transducer so as to cause it to transmit a first burst of acoustic energy;

transmit a first burst of acoustic energy, said receiver circuitry connected to receive electrical signals produced by said electroacoustic transducer, said receiver circuitry being operable to supply a second signal to the control terminal of said transmit circuitry in response to receipt by said transducer means of an echo from said reference target of the first burst of acoustic energy, thereby causing said transmit circuitry to supply a second electrical driver pulse and said transducer means to transmit a second burst of acoustic energy, said receiver circuitry including a peak detector operable to establish a peak reference level in response to a first echo signal resulting from receipt of an echo of the first burst of acoustic energy from a target object, said receiver circuitry further including comparator means operable to pass a second echo signal resulting from receipt of an echo of the second burst of acoustic energy from the target

object if the level of the second echo signal exceeds a predetermined fraction of the peak reference level; oscillator means for producing periodic clock signals; counter means operable to accumulate a first count of the clock signals occurring during a time interval commencing at a predetermined time relative to transmission of the second burst of acoustic energy and ending at a predetermined time relative to receipt of the second echo provided that the second echo signal is passed by said comparator means; and output means connected to said counter means for producing an indication of distance to the target object based on the first count of clock signals.

4,679,176  
ULTRASONIC RECEIVING APPARATUS

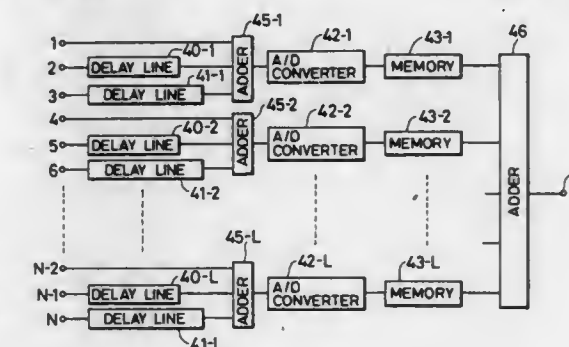
**Toshio Ogawa, Itukaichi; Shinichi Kondo; Shinichiro Umemura,**  
both of Hachioji, and Kageyoshi Katakura, Meguro, all of  
Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corpo-  
ration, both of Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,945

Claims priority, application Japan, Nov. 24, 1983, 58-219461;  
Nov. 30, 1983, 58-224198; Jan. 27, 1984, 59-11976  
Int. Cl.<sup>4</sup> G01S 3/80

U.S. Cl. 367-119

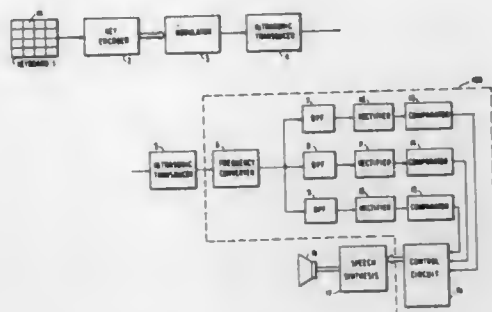
## 23 Claims



1. An ultrasonic wave receiving apparatus comprising:  
a plurality of transducer elements arranged regularly;  
a plurality of sample and hold circuits for sampling and holding signals respectively received by the transducer elements or groups of signals obtained by adding a predetermined number of the signals together; and  
controller means for generating control signals respectively for controlling said sample and hold circuits so as to sample said receiving signals or groups of signals at a time corresponding to the phases of said signals or groups of signals, said controller means including means for comparing a sampling time interval corresponding to a time between the respective phases of receiving signals from the transducer elements adjacent to each other or the groups of signals adjacent to each other with a predetermined value determined in accordance with a settling time of the sample and hold circuits and for generating control signals for enabling sampling of the receiving signals from the transducer elements adjacent to each other or the groups of signals adjacent to each other at the same time when the sampling time interval is less than the predetermined value.

4,679,177

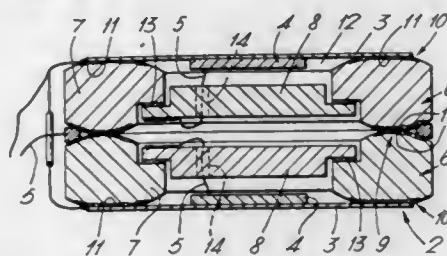
**UNDERWATER COMMUNICATION SYSTEM**  
Masaru Aoyagi, and Makoto Saitoh, both of Tokyo, Japan,  
assignors to NEC Corporation, Tokyo, Japan  
Filed Feb. 20, 1986, Ser. No. 831,204  
Claims priority, application Japan, Feb. 20, 1985, 60-30627  
Int. Cl.<sup>4</sup> H04B 11/00  
U.S. Cl. 367-132 1 Claim



1. An underwater communication system comprising:  
a transmitter including message inputting means having keys each being assigned to each word, code converting means for converting a key input entered through said inputting means to a code assigned to the key input, modulator means responsive to the code, for performing modulation, and transmit transducer means for converting an output of said modulator means to an acoustic wave, and  
a receiver including receive transducer means for reconverting the incoming acoustic wave from said transmitter to an electric signal, demodulator means for demodulating the code from the electric signal, speech synthesis means responsive to the demodulated code for producing a word corresponding to the code, and speaker means for outputting the synthesized speech.

4,679,178

**ARRANGEMENT IN HYDROPHONE**  
Egil Larsen, Horteu; Eldar Lien, Kjoisdalen, both of Norway,  
and Clive Snook, Oegstgeest, Netherlands, assignors to Geo-  
physical Company of Norway A.S., Hovik, Norway  
Filed Sep. 19, 1985, Ser. No. 777,673  
Claims priority, application Norway, Sep. 19, 1984, 843743  
Int. Cl.<sup>4</sup> H04R 17/00; H01L 41/04, 41/08, 41/18  
U.S. Cl. 367-157 7 Claims



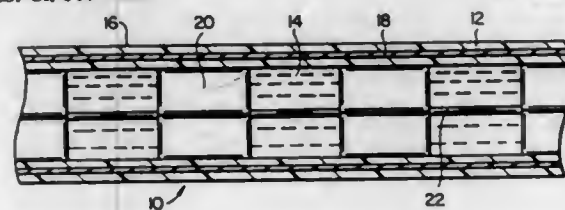
1. An arrangement in a piezoelectric hydrophone having a protective outer housing, in which a water-proof casing is provided comprising two mutually opposed and parallel diaphragm wafers on inner surfaces on which piezoelectric crystals with poles are secured and are coated on their outer surfaces, and where connecting wires extend from the casing through a hollow central portion, and wherein  
(a) the central portion of the casing comprises at least two joined ceramic elements, extending in a plane parallel with the diaphragm wafers and being provided with a metalization in areas of mutual contact,  
(b) in the cavity of the two joined ceramic elements respec-

tively, a stiffening ceramic plate is inserted and secured to said two joined ceramic elements by matching projections, and

- (c) the poles of the piezoelectric crystals facing inward are conductively connected to the metalization in the connecting plane of the two joined ceramic elements with an additional conductive connection from the metalization externally, whereas the poles of the piezoelectric crystals facing outward are joined outside the casing via said diaphragm wafers.

4,679,179

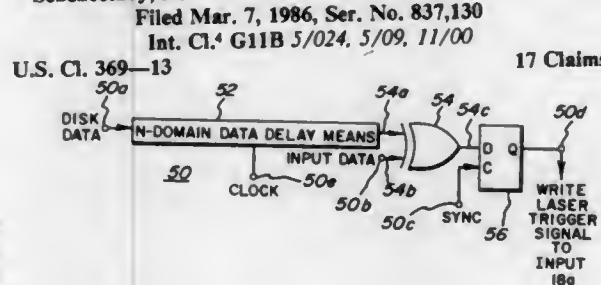
**SONAR DETECTION APPARATUS**  
Thomas P. Lally, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.  
Continuation of Ser. No. 388,763, Jun. 15, 1982, abandoned.  
This application Mar. 29, 1985, Ser. No. 717,489  
Int. Cl.<sup>4</sup> H04R 1/28, 1/44; C08L 75/08, 9/02  
U.S. Cl. 367-162 9 Claims



1. Sonar detection apparatus suitable for towing behind a ship and comprising:  
(1) a longitudinally reinforced tube composed of a radiation cross-linked polymeric composition which comprises  
(a) 40 to 70 percent by weight, based on the total polymer, of a radiation cross-linked elastomer having a glass transition temperature of  $-40^{\circ}\text{C.}$  to  $+15^{\circ}\text{C.}$ ; and  
(b) 60 to 30 percent by weight, based on the total polymer, of a segmented urethane block polymer and which has a damping coefficient of at least 0.1 at at least one frequency in the range from 1 Hz to 100 Hz at at least one temperature, in the range from  $0^{\circ}\text{C.}$  to  $25^{\circ}\text{C.}$ ;  
(2) a plurality of hydrophones within said tube; and  
(3) an acoustic coupling fluid between the tube and the hydrophones.

4,679,180

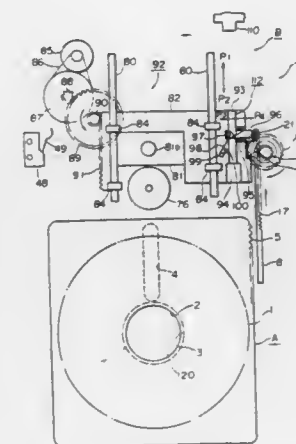
**PROCESS FOR DIRECT OVER-WRITING OF DIGITAL DATA RECORDED ON MAGNETO-OPTICAL RECORDING MEDIA**  
Mark H. Kryder, Allegheny, and Han-Ping D. Shieh, Pitts-  
burgh, both of Pa., assignors to General Electric Company,  
Schenectady, N.Y.  
Filed Mar. 7, 1986, Ser. No. 837,130  
Int. Cl.<sup>4</sup> G11B 5/024, 5/09, 11/00  
U.S. Cl. 369-13 17 Claims



1. A method for writing each of a new sequence of digital data bit values over a binary data bit value presently stored in an associated region of a sequence of storage regions in a magneto-optic melting temperature and a compensation temperature greater than ambient temperature, comprising the steps of:  
(a) receiving a next data bit value of the new sequence;

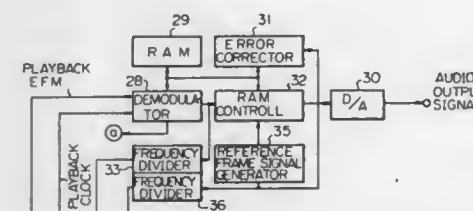
4,679,182

**DISC PLAYBACK DEVICE**  
Yasuhiko Kamoshita; Takuya Tamaru; Mikio Ogusu, and Kazuo Urata, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan  
Filed Sep. 10, 1985, Ser. No. 774,288  
Claims priority, application Japan, Sep. 14, 1984, 59-193525; Sep. 14, 1984, 59-193526; Sep. 14, 1984, 59-139850[U]; Oct. 3, 1984, 59-150096[U]  
Int. Cl.<sup>4</sup> G11B 3/36, 17/04  
U.S. Cl. 369-77.2 14 Claims



**4,679,181**  
**METHOD FOR DETECTING AN ERROR IN LOADING A RECORDING DISC**

Ryuichi Naito, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan  
Continuation of Ser. No. 542,189, Oct. 14, 1983, Pat. No. 4,611,319. This application Sep. 8, 1986, Ser. No. 904,614  
Claims priority, application Japan, Oct. 15, 1982, 57-180633; 57-180634; 57-180635; 57-180636  
Int. Cl.<sup>4</sup> G11B 7/00  
U.S. Cl. 369-44 2 Claims



1. A method for detecting an error in loading a recording disc on which an information carrying signal including a synchronizing signal is recorded, in an optical information reading system having a focus servo system operative to focus a read light beam on an information bearing layer of said recording disc and a playback system for playing back said information, including a pickup for receiving a reflection of said read light beam from said recording disc and producing a read signal, comprising:

- a first step for generating a start signal of a lead-in operation of said focus servo system;
- a second step for detecting whether said information carrying signal is present in said read signal at a time a predetermined time period after said generation of said start signal of said lead-in operation;
- a third step for detecting whether said synchronizing signal is present in said information carrying signal retrieved from said read signal when the presence of said information carrying signal in said read signal is detected at said second step; and
- a fourth step for determining an erroneous loading of said record disc when the presence of at least one of said information signal and said synchronizing signal is not detected at one of said second and third steps.

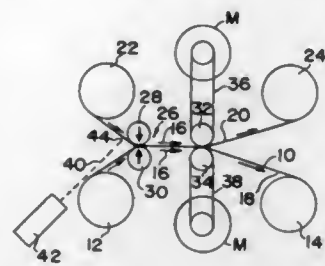
4,679,183

**SOUND RECORDING APPARATUS FOR BLANK FILMS AND TAPES**  
Marcel Staar, Brussels, Belgium, assignor to Staar Development Company S.A., Brussels, Belgium  
Filed Aug. 2, 1985, Ser. No. 761,833  
Claims priority, application Belgium, Aug. 7, 1984, 900.312  
Int. Cl.<sup>4</sup> G11B 11/18 7 Claims

1. An apparatus for reproducing sound recordings on blank films and tapes of plastic materials comprising:  
(a) a continuous master film having imprints containing the sound recordings to be reproduced;  
(b) reproducing means for transferring the imprints on said master film onto blank film including means for pressing one film against the other and for moving said films continuously and in synchronism past a pressure applying station;  
(c) heating means directing heat against the blank film and not the master film for heating to soften only local zones of the blank film which will receive the imprints a fraction



of a second before the imprints in said master film and the local zones of the blank film are pressed together in the



pressure applying station, said local zones being linearly aligned to receive the imprints from said master film.

4,679,184

**OPTICAL RECORDING AND REPRODUCING APPARATUS HAVING ERASING BEAM SPOT WITH ASYMMETRICAL INTENSITY DISTRIBUTION**  
Tomio Yoshida, Katano, and Shunji Ohara, Higashiosaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

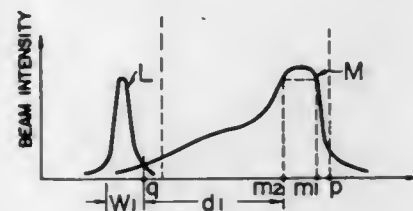
Filed May 31, 1985, Ser. No. 739,872

Claims priority, application Japan, Jun. 8, 1984, 59-118531; Aug. 31, 1984, 59-181782

Int. Cl. G11B 7/00

U.S. Cl. 369-112

10 Claims



4. An optical recording and reproducing apparatus having an erasing function, comprising: a light emitting element; a means for transforming light emitted by said element into an erasing beam spot on a recording medium which is scanned by the erasing beam spot, said erasing beam spot being elongated in the direction of relative scan of said recording medium by said erasing beam spot and exhibiting the highest intensity at its leading end portion as viewed in the direction of said scan; and a means for scanning, with a substantially circular beam spot for recording or reproduction, the portion of said recording medium which has been scanned by said erasing beam spot.

4,679,185

**PIVOTAL-ARM DEVICE FOR A DISC SCANNING UNIT**  
Robert N. J. van Sluys, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Jul. 19, 1985, Ser. No. 756,537

Claims priority, application Netherlands, Apr. 22, 1985, 8501154

Int. Cl. G11B 3/10, 3/32

U.S. Cl. 369-255

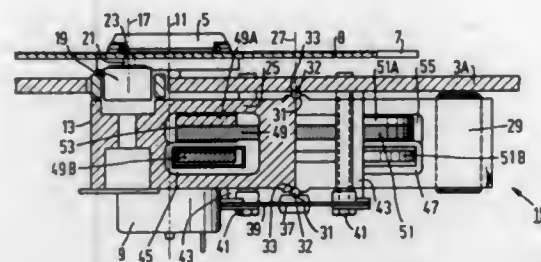
8 Claims

1. A pivotal-arm device for a scanning unit for recording and/or reading information in/from a recording surface of a disc-shaped record carrier, which device comprises a deck plate, a pivotal arm comprising means for securing the scanning unit, pivotal-arm bearing means which pivotally supports the pivotal arm for pivotal movement about a pivotal axis, the pivotal-arm bearing means comprising two bearings,

which are disposed on opposite sides of the pivotal arm, and

a resilient element, which is secured to the deck plate, for supporting one of the bearing and for urging the bearings towards one another,

characterized in that at least one of the bearings comprises a spherical bearing element and two facing bearing members which each have a recess to receive a part of the



bearing element, one of the bearing members being disposed on the pivotal arm and at least one of the bearing members having a concave bearing surface having a radius which is larger than that of the spherical bearing element receives therein so that a gap is formed between said concave bearing surface and the bearing element, which gap widens towards the edge of said concave bearing surface and contains a viscous medium.

4,679,186

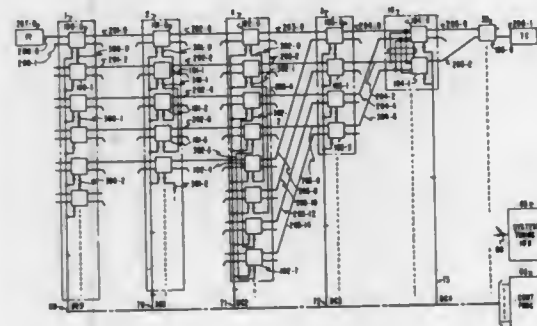
**ALTERNATE SELF-ROUTING PACKET SWITCHING NODE HAVING FAULT DETECTION CAPABILITIES**  
Chin-Tau A. Lea, Lisle, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 26, 1984, Ser. No. 654,764

Int. Cl. H04J 1/16, 3/14

U.S. Cl. 370-14

12 Claims



1. An alternate-path, self-routing, packet and circuit switching system for switching packets and circuit switched information from a plurality of digital data units and for detecting failures within said system, said system comprising:

a switching network having a plurality of stages each comprising interconnected switch nodes;

a plurality of distributed controllers each for interfacing connecting an individual one of said digital data units to one of said switch nodes;

each of said controllers responsive to a receipt of one of said packets and start of circuit switched information for transmitting address signals to establish a path through said switching network;

each of said switch nodes of one stage being interconnected to a set of switch nodes in the next sequential stage;

each of said switch nodes responsive to receipt of said ad-

dress signals and a multipath signal for setting up said path via any one of a subset of said set of switch nodes in said next sequential stage; and each of said switch nodes responsive to receipt of said address signals and a unipath signal for setting up said path via a predetermined one of said set of switch nodes in said next sequential stage.

4,679,187

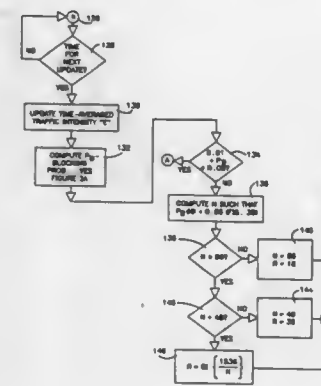
**ADAPTIVE TRUNK-COMPRESSION SYSTEM WITH CONSTANT GRADE OF SERVICE**  
David R. Irvin, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,880

Int. Cl. H04J 1/16

U.S. Cl. 370-17

12 Claims



1. In a telephone switching system having a trunk for carrying messages from a plurality of telephone lines a method for partitioning the trunk into channels so that each telephone line is assured access to a channel comprising the steps of:

- (a) determining the message intensity in said trunk;
- (b) utilizing said message intensity to compute a blocking probability ( $P_b$ ) with said  $P_b$  indicating the likelihood of a message being blocked within said trunk;
- (c) correlating the blocking probability with a desired range of values; and
- (d) adjusting the number of channels in said trunk only if the blocking probability falls outside of the desired range.

4,679,188

**DIGITAL TRANSMISSION SYSTEM**  
Misao Fukuda, Tokyo; Toshitaka Tsuda, Yokohama; Kazuo Murano, Tokyo, and Yutaka Awata, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 24, 1985, Ser. No. 779,639

Claims priority, application Japan, Sep. 26, 1984, 59-201021; Dec. 28, 1984, 59-276354; Mar. 28, 1985, 60-064371; May 31, 1985, 60-117860

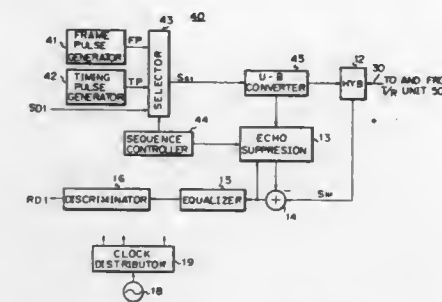
Int. Cl. H04B 1/56; H04J 3/02; H04L 7/00

U.S. Cl. 370-29

31 Claims

1. A digital transmission system, comprising: at least two transmitting-receiving (T/R) units; a single transmission line connected therebetween, the system being operated under a full duplex communication mode; and at least one of said T/R units comprising a timing control means and a first transmission control means, said timing control means for synchronizing an internal clock of the at least one T/R unit, only during a predetermined period, with a received signal applied to the at least one T/R unit;

and said first transmission control means for inhibiting, only during said predetermined period, a transmission of a



send signal from the at least one T/R units to be supplied to the other T/R unit.

4,679,189

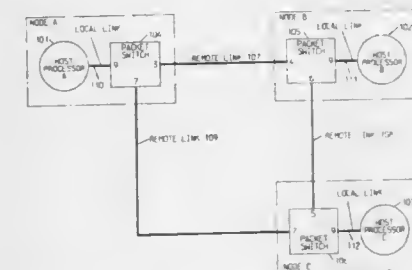
**ALTERNATE ROUTING ARRANGEMENT**  
Jeffrey J. Olson; Stephen R. Peck, and David P. Seaton, all of Boulder, Colo., assignors to American Telephone and Telegraph Company and AT&T Information Systems, Inc., both of Holmdel, N.J.

Filed Nov. 27, 1985, Ser. No. 802,573

Int. Cl. H04Q 11/04; H04J 3/24

U.S. Cl. 370-60

29 Claims



1. A method for providing for the alternate routing of messages transmitted from an originating node to a destination node in a packet switching system having a plurality of nodes wherein each node stores routing information, said method comprising the steps of:

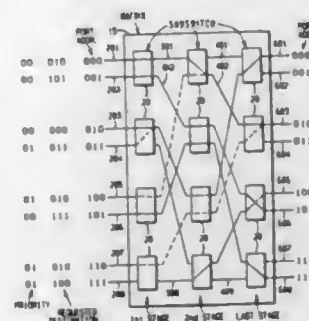
- (A) inserting a message to be transmitted into a first field of a multifield frame,
- (B) inserting alternate routing control control into a second field of said frame,
- (C) transmitting said frame from said originating node over a path towards said destination node via an intermediate node,
- (D) using said alternate routing control information in said transmitted frame to access said stored routing information at said intermediate node specifying a plurality of paths available for transmitting said frame from said intermediate node towards said destination node,
- (E) selecting one of said specified paths under control of said stored routing information, and
- (F) transmitting said message frame from said intermediate node towards a destination node via said selected specified path.

4,679,190

**DISTRIBUTED VOICE-DATA SWITCHING ON MULTI-STAGE INTERCONNECTION NETWORKS**  
Daniel M. Dias, Mahopac; Manoj Kumar, Crompond; Yeong-Chang L. Lien, Briarcliff Manor, and Kiyoshi Maruyama, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Apr. 28, 1986, Ser. No. 856,321  
Int. Cl. H01Q 11/04

U.S. Cl. 370—60

13 Claims



1. A method of switching packets through a multistage interconnection switching network, comprising the steps of:

- assigning a packet, for a circuit connection, the highest assignable priority level only after a corresponding packet, for the circuit connection, with the second highest assignable priority level, was successfully transmitted from a corresponding input of a subswitch of the first stage of the switching network to a corresponding output of a subswitch of the last stage of the switching network;
- transmitting each packet at the input of each subswitch of the first stage of the switching network to an output of the same corresponding subswitch, which output is indicated by a respective address bit in the respective packet, a given packet being transmitted as provided for in this step of this claim, only if no other packet, at the same corresponding subswitch, requests the same output of the sub-switch;
- transmitting the packet with the highest priority level of all the packets at the inputs of each subswitch of the first stage of the switching network to the output of the same corresponding subswitch, which output is indicated by the respective address bit in the respective packet being transmitted, a given packet being transmitted as provided for in this step of this claim only if other packets at the same corresponding subswitch with different priority levels request the same output of the corresponding subswitch;
- transmitting, for each subswitch of the first stage of the switching network, any one, of a number of packets transmitted to the inputs of the respective subswitch of the first stage of the switching network, to the output of the respective subswitch indicated by a respective address bit in the one packet, if the number of packets are of the same priority level and request the same output of the respective subswitch; and
- repeating steps b, c, and d for packets at inputs of subswitches of subsequent stages of the switching network until the packets reach respective outputs of subswitches of the last stage of the network, the outputs of the respective subswitches of any of the subsequent stages being requested by respective subsequent address bits in the respective packets so that packets are transmitted from the inputs of the subswitches of the first stage of the multistage interconnection network to the respective outputs of the last stage of the interconnection network.

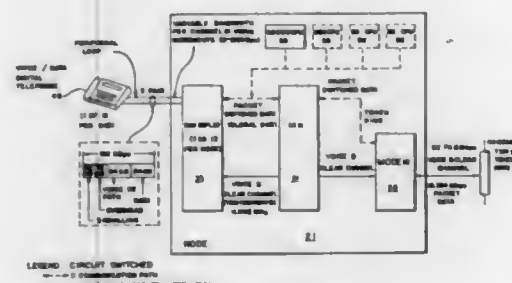
4,679,191

**VARIABLE BANDWIDTH SWITCHING SYSTEM**  
Gary A. Nelson, Irvine; Patrick N. Godding, Tustin; Richard E. Schumaker, Orange; Keith D. Walter, Huntington Beach; Edward S. Marrone, Los Angeles; Stillman E. Gates, Capistrano Beach; Everett O. Rigsbee, III, San Rafael, and Michael D. Teener, Irvine, all of Calif., assignors to CXC Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 491,551, May 4, 1983, Pat. No. 4,587,651, Ser. No. 582,182, Feb. 21, 1984, and Ser. No. 582,069, Feb. 21, 1984, Pat. No. 4,598,397. This application May 17, 1984, Ser. No. 611,462  
Int. Cl. H04J 3/22, 3/16

U.S. Cl. 370—84

25 Claims



1. A digital communications system for transfer of a variable bandwidth of information from within a network signal stream comprised of said information to a digital communication device, said communications system comprising:

- at least one network path for carrying the network signal stream, the network path having a first bandwidth;
- a plurality of digital communication devices at least one of which has a lower bandwidth than the first bandwidth, a first of said communication devices being operative to generate a message signal for communication to a second of said communication devices;
- at least one first controller operative to interpret the message signal and to generate bandwidth allocation control signals defining portions of the first bandwidth which are to be allocated to a communications path between the first and second digital communication devices; and
- plural nodes connected to the network path and each connected to at least one of the digital communication devices, the nodes being responsive to the allocation control signals for selectively transferring a variable bandwidth of information between the network path and at least one digital communication device, at least one of said plural nodes comprising:
  - means for transferring information between said network path and a plurality of network highways;
  - means for selectively transferring information between said network highways and a plurality of node highways, said node highways having a lower bandwidth than said first bandwidth of said network path; and
  - means for selectively transferring information between said node highways and a digital communication device connected to said node.

4,679,192

**ARRANGEMENT FOR TRANSMITTING DIGITAL DATA**  
Jean-Pierre C. R. Vanbrabant, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1986, Ser. No. 821,938

Claims priority, application Netherlands, Feb. 19, 1985, 8500462

Int. Cl. H04J 3/02, 3/16

U.S. Cl. 370—85

4 Claims

1. An arrangement for transmitting digital data, comprising a plurality of stations which together with a main station are

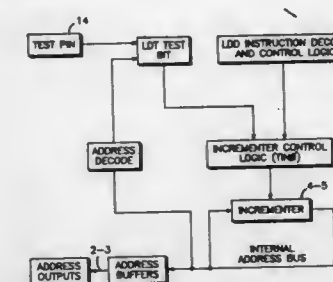
4,679,194

**LOAD DOUBLE TEST INSTRUCTION**  
Tulley M. Peters, Round Rock, and William C. Bruce, Jr., Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

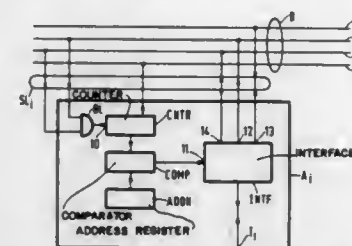
Filed Oct. 1, 1984, Ser. No. 656,564  
Int. Cl. G06F 11/00

U.S. Cl. 371—16

10 Claims



connected to a common communication path, these stations comprising a data transmitter, a data receiver and addressing means, characterized in that said main station comprises a disableable clock pulse generator, that said addressing means of each station comprise a clock pulse counter for counting the clock pulses transmitted by said clock pulse generator via a clock channel which forms part of said communication path, that said addressing means further comprise an address register and a comparator arrangement for comparing the instantaneous counting position of said clock pulse counter with the



content of said address register, that when there is equality between said counting position and said content and a communication request is present at an addressed station a switching signal is generated by the addressed station which signal disables said clock pulse generator via a SEND-channel forming part of said communication path, that said addressed station transmits digital data via a data channel forming part of said communication path to a second addressed station and that after the data transmission has ended the disabling of said clock pulse generator is cancelled via said SEND-channel which forms part of said communication path.

4,679,193

**RUNT PACKET FILTER**

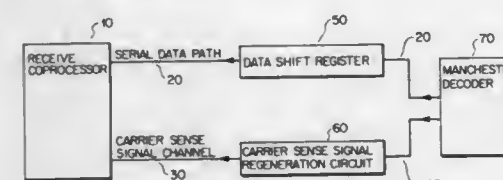
Gordon A. Jensen; Stephen P. Reames; Jerry D. Morris, all of Colorado Springs, and Scott S. Neal, Woodland Park, all of Colo., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Nov. 14, 1985, Ser. No. 798,204  
Int. Cl. H04J 3/24, 3/06; H04B 3/36

U.S. Cl. 370—94

5 Claims

U.S. Cl. 371—29



1. A circuit for preventing local area network packets shorter than n bits from being received by a local area network coprocessor, said circuit comprising:

- a local area network coprocessor having a serial data input port for receiving serial input data along a serial data path from a local area network decoder, and having a carrier-sense-signal input port for receiving a carrier-sense-signal generated by said local area network decoder, said carrier-sense-signal serving to alert said coprocessor that serial input data is present on said serial data path;
- an n bit data-shift register for intercepting said serial-input-data from said decoder, said register implementing an n clock cycle delay in said serial input data's progress toward said serial data input port; and
- a carrier-sense-signal-regeneration means for intercepting said carrier-sense-signal from said decoder and for modifying said carrier-sense-signal.

4,679,195

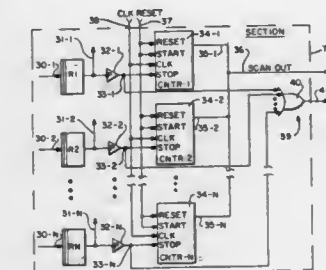
**ERROR TRACKING APPARATUS IN A DATA PROCESSING SYSTEM**

Loren G. Dewey, Sunnyvale, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Filed Apr. 10, 1985, Ser. No. 721,564  
Int. Cl. G06F 11/00

U.S. Cl. 371—29

12 Claims



1. In a data processing system, including a plurality of data locations, through which data are propagated in system clock cycles in response to a system clock signal, an error tracking apparatus comprising:

- a plurality of error detection means, each in communication with an associated data location, for detecting errors in the associated location and for generating an error signal upon detection of an error;
- a plurality of counter means, each in communication with an associated error detection means and responsive to the system clock signal, for counting system clock cycles and storing a system cycle count for the data location associated with the respective error detection means, each of



said counter means including means, responsive to an error signal from the associated error detection means, for disabling the counter means to freeze the system cycle count indicating the system clock cycle during which the error signal was generated;

interrupt means, responsive to the error signals, for disabling the system clock signal, whereby the system cycle count in each of said plurality of counter means is indicative of the system clock cycle during which the system clock signal was disabled, or during which an error signal was generated at its associated data location.

4,679,196

# SEMICONDUCTOR MEMORY DEVICE WITH A BIT ERROR DETECTING FUNCTION

Jun-ichi Tsujimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

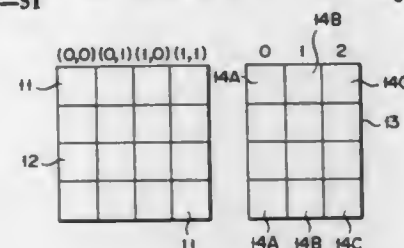
Filed Feb. 26, 1985, Ser. No. 705,788

Claims priority, application Japan, Mar. 1, 1984, 59-39507

Int. Cl.<sup>4</sup> G06F 11/10

U.S. Cl. 371-51

6 Claims



1. A semiconductor memory device with a bit error detecting function comprising:

- a data memory circuit including a plurality of data cells which are arrayed in rows and columns in a matrix fashion, said plurality of data cells respectively having row and column addresses each expressed by a plurality of bits;
- a first parity memory circuit including a plurality of rows of parity storage cells, each row of parity storage cells corresponding to a different one of the rows of data cells, for storing parity bits which correspond to the parity of data stored in the corresponding row of data cells, said stored parity bits each being specified by the parity of a unique combination of data cells, in that selected bits of the column addresses of each of the data cells in each combination are at a predetermined logical level.

4,679,197

# GYRO FREE ELECTRON LASER

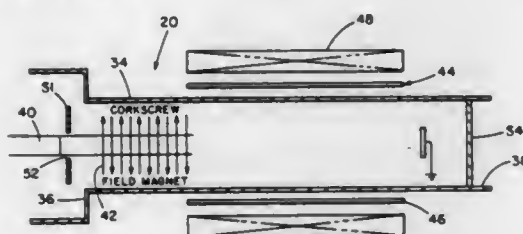
Jang-Yu Hsu, Solana Beach, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Mar. 13, 1985, Ser. No. 711,237

Int. Cl.<sup>4</sup> H01S 3/00

U.S. Cl. 372-2

6 Claims



1. A source of coherent radiation in the infrared, visible light and ultraviolet frequency range comprising:  
an evacuated drift tube having an input end for receiving a

beam of relativistic electrons and an output end for providing coherent radiation;  
electron supply means for providing a beam of relativistic electrons to the drift tube input end;  
magnetic field means for causing said relativistic electrons to spiral;  
azimuthal wiggler means for causing the spiraling electrons to undergo accelerations, said magnet field means also controlling the gyroradii of the spiraling electrons acted upon by said wiggler means.

4,679,198

# SOLID-STATE TUNABLE LASER

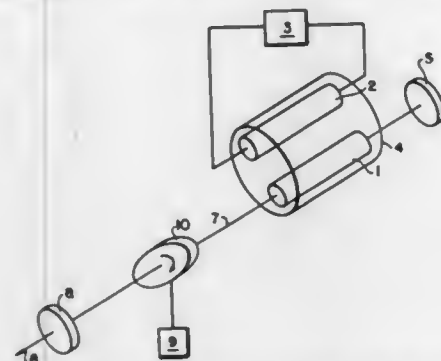
Michael F. Shoen, Yorktown Heights, N.Y., and Gabriel M. Lolacoo, Franklin Lakes, N.J., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 4, 1986, Ser. No. 848,367

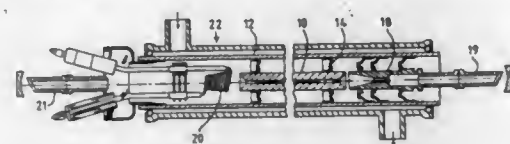
Int. Cl.<sup>4</sup> H01S 3/16

U.S. Cl. 372-41

14 Claims



cathode adjacent opposite ends of the outer tube generally on the axis of said outer tube;  
Brewster window stubs carried by the anode and cathode supports;  
a beryllia inner tube having a precision ground, continuous, axial bore, and



a plurality of axially spaced copper discs brased to both the outer and inner tubes and locating the inner tube within the outer tube between the anode and cathode with the continuous bore entered along the anode/cathode axis.

4,679,203

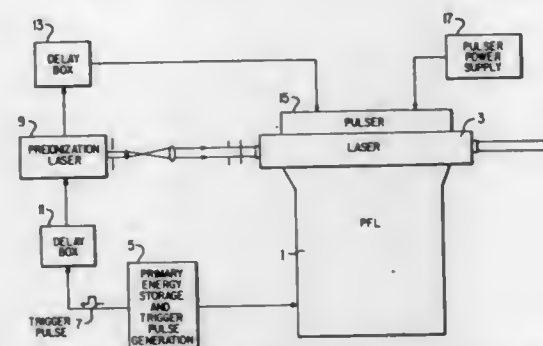
### MAGNETICALLY INDUCED PULSER LASER EXCITATION SYSTEM

Roderick S. Taylor, Gloucester, and Kurt E. Leopold, Carp, both of Canada, assignors to Canadian Patents and Development Limited, Ontario, Canada

Filed Jun. 17, 1985, Ser. No. 745,652  
Int. Cl.<sup>4</sup> H01S 3/097, 3/223

U.S. Cl. 372-86

19 Claims



1. An apparatus for exciting a laser having first and second electrodes and containing a gas mixture therein, comprising: preionization means for preionizing the gas mixture, primary energy storage means for storing a sufficient electrical energy for the operation of the said laser, energy transfer means connecting the primary energy storage means and the first electrode in an impedance matching manner for transferring the said sufficient electrical energy therebetween in the form of a main discharge voltage pulse, trigger pulse generating means forming a part of the said primary energy storage means and for generating a trigger pulse in response to the said main discharge voltage pulse, secondary energy storage means for storing an electrical energy, electromagnetic energy transfer means connected between the secondary energy storage means and the second electrode for transferring electromagnetically the electrical energy therebetween in the form of a high voltage pulse which breaks down the gas mixture, switching means connected to the electromagnetic energy transfer means for initiating the electromagnetic energy transfer in response to the trigger pulse, the main discharge voltage pulse being longer in duration than the high voltage pulse, and the said two pulses being coincidental for a period of time to produce gas breakdown in the laser and to permit the said energy transfer means for transferring the sufficient energy from the primary energy storage means to the laser.

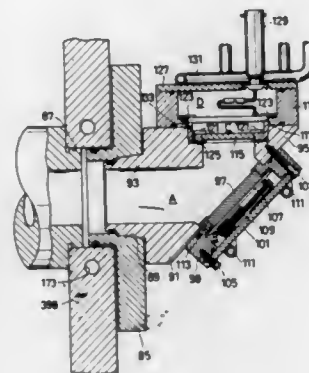
### 4,679,204 REAR MIRROR HOLDER DEVICE FOR A LASER GENERATOR

Ryoji Koseki, Buena Park, Calif., assignor to Amada Engineering Service Co., Inc., LaMirada, Calif.

Filed Dec. 31, 1985, Ser. No. 814,982  
Int. Cl.<sup>4</sup> H01S 3/08

U.S. Cl. 372-107

8 Claims



1. A rear mirror holder device for a laser generator comprising:  
a support plate, a rear mirror holder supported on said support plate, a mirror mounting member removably mounted to said rear mirror holder and having a first chamber formed therein for the passage of the beam generated by said laser generator;  
a support member installed on said mirror mounting member, said support member housing a rear mirror, said rear mirror having a front side and a rear side, the front side of said mirror facing said first chamber, said support member being provided with a first pressure balance orifice formed on one end section of said support member, and said support member having a second chamber formed on the rear side of said rear mirror whereby said first and second chambers communicate with each other through the first pressure balance orifice.

4,679,205

### TILTABLE METALLURGICAL FURNACE VESSEL

Peter Heidenreich, Mülheim; Karl-Heinz Helten, Siegen; Wolfgang Müller, Siegen, and Heinz Veuhoff, Siegen, all of Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 27, 1985, Ser. No. 717,161

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412077

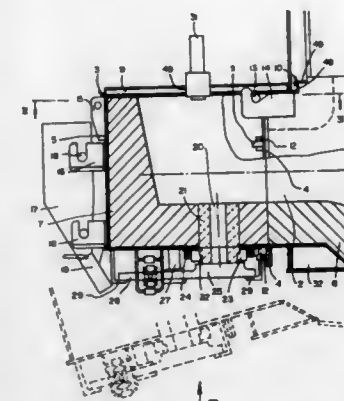
Int. Cl.<sup>4</sup> F27D 3/14

U.S. Cl. 373-84

27 Claims

1. In a tiltable metallurgical furnace vessel provided with a completely closed lateral protrusion having an underside with a closable discharge opening, the improvement wherein:  
said furnace vessel is provided with a flange;  
the protrusion is a removable, heatable fore-hearth which is constricted in the form of a casting spout, said forehearth having a flange and an essentially box shape;  
pivoting means is provided for pivotally disposing said fore-hearth on said furnace vessel; and  
fastening means is provided for fastening said flanges of said

fore-hearth and said furnace together, said fastening means including bolts having openings therein and



wedges inserted into said openings, said bolts being affixed to one of said flanges.

4,679,206

### ELECTRODE JOINT THREAD FORM

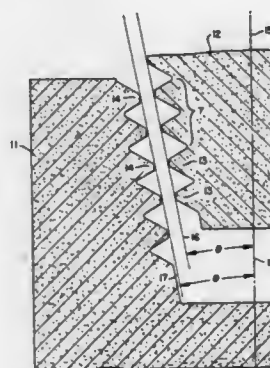
William H. Burwell, Olmstead Falls, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 734,107, May 15, 1985. This application Jun. 17, 1986, Ser. No. 875,252

Int. Cl.<sup>4</sup> H05B 7/14

U.S. Cl. 373-91

14 Claims



1. A method for joining a first carbon or graphite electrode having a tapered threaded projection on at least one end to a second carbon or graphite electrode having a tapered threaded socket in at least one end, the projection and socket comprising a thread crest, thread flanks, and a thread root, the thread flank angles being greater than zero, and the thread crest being essentially parallel to the electrode axis, said method comprising the steps of:

- axially aligning said first and second electrodes,
- longitudinally advancing at least one of said electrodes toward the other electrode until the thread crest of said first electrode contacts the thread crest of said second electrode,
- further longitudinally advancing at least one of said electrodes toward the other electrode until the thread crest of one electrode is in approximate longitudinal alignment with the thread root of the other electrode, and
- still further longitudinally advancing at least one of said electrodes toward the other electrode while simultaneously rotating at least one of said electrodes relative to the other electrode about the electrode axis, the rates of said still further advance and rotation being coordinated to be the equivalent of the advancement of the electrode

threads, until the threaded projection of said first electrode is screwed fully into the threaded socket of said second electrode.

4,679,207

### SINGLE CHANNEL TRACKING FOR FREQUENCY HOPPING COMMUNICATION SYSTEMS

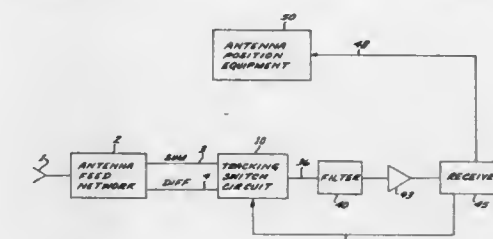
George I. Tsuda, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 24, 1985, Ser. No. 758,601

Int. Cl.<sup>4</sup> H04L 27/30; G01S 13/52

U.S. Cl. 375-1

19 Claims



1. An antenna tracking system for a frequency-hopping system employing agile synchronization pulses of a certain duration and a system receiver, comprising:  
an antenna feed network for providing respective sum and difference signals at respective sum and difference ports; and  
an RF switching circuit coupled to said sum and difference ports of said feed network and to the system receiver, said switching circuit for coupling the sum signal to said receiver during a first portion of said synchronization pulse and for coupling said difference signals to said receiver during a subsequent portion of said pulse;  
wherein said receiver comprises processing means for providing antenna position error signals in dependence on said sum and difference signals.

4,679,208

### EQUALIZATION SYSTEM TUNING DEVICE WHICH UPDATES EQUALIZER COEFFICIENTS BASED ON SELECTED DECISION REGIONS

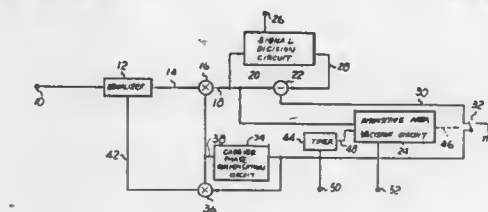
Shigetaka Tanaka, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 760,116

Claims priority, application Japan, Jul. 31, 1984, 59-158570  
Int. Cl.<sup>4</sup> H04B 3/10

U.S. Cl. 375-13

5 Claims



1. A tuning device for an equalization system in which a known training pattern is transmitted to facilitate equalization of subsequently transmitted data whenever said data is to be transmitted, comprising:  
equalizer means for equalizing a signal received over a signal transmission channel with respect to a characteristic of said signal transmission channel;  
first multiplier means supplied with the received signal which has been equalized by said equalizer means;  
signal decision means for discriminating a phase of an output



signal of said first multiplier means in relation to the phase of a reference signal;  
 subtractor means for providing a difference, or error, between the output signal of the first multiplier means and an output signal of the signal decision means which is representative of a discriminated phase, and producing an error signal;

second multiplier means supplied with the error signal from said subtractor means for supplying an output signal of said second multiplier means to the equalizer means;  
 carrier phase compensation means supplied with the error signal from the subtractor means for applying an output of said carrier phase compensation means to the first and second multiplier means;

insensitive area decision means supplied with the output signal of the first multiplier means for, when the output signal of the first multiplier means lies in a sensitive area defined as a predetermined region of a phase plane in which convergence of equalizer coefficients to desired values is relatively likely to occur, causing the error signal from the subtractor means to be applied to said carrier phase compensation means and the second multiplier means and, when the output signal of the first multiplier means lies in an insensitive area defined as regions of the phase plane outside of the sensitive area where convergence of equalizer coefficients to the desired values is less likely to occur than in the sensitive area, interrupting the supply of the error signal from the subtractor means to the carrier phase compensation means and the second multiplier means thereby disabling operation of the carrier phase compensation means and the second multiplier means, said insensitive area decision means comprising means for producing decision lines which define boundaries of said sensitive and insensitive areas; and means for varying said decision lines during reception of said training pattern so that the sensitive area is increased.

4,679,209

## DIGITAL LINE RECEIVER

John G. Hogeboom, and Terence N. Thomas, both of Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada

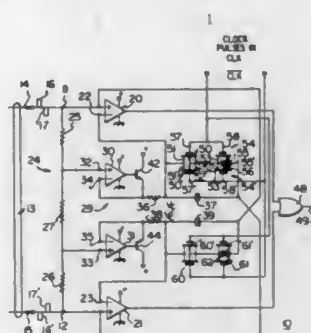
Filed Jul. 19, 1985, Ser. No. 756,680

Claims priority, application Canada, Feb. 13, 1985, 474246

Int. Cl. H04L 25/34; H03K 3/53

U.S. Cl. 375-17

11 Claims



1. A digital line receiver, comprising:

comparator means having a pair of differential inputs including a pair of signal terminals connectable to a source of bipolar signals, and a pair of corresponding reference terminals each cross-coupled to an opposite one of the signal terminals, and an output producing a train of pulses in response to the bipolar signals having a first predetermined voltage;

peak detector means having a pair of input terminals each coupled to a corresponding one of the signal terminals and adapted to receive the bipolar signals at a second predetermined voltage, and a pair of corresponding outputs each producing a threshold voltage in response thereto and

coupling the threshold voltage to the corresponding reference terminal of the comparator means; and  
 capacitor means connected between each reference terminal and its opposite signal terminal for coupling therebetween the bipolar signals at a third predetermined voltage in serial relation with the threshold voltage and receiving a charge corresponding to the threshold voltage, whereby bipolar signals input to the signal terminals are algebraically summed in the comparator means with the corresponding threshold voltages and the bipolar signals of the third predetermined voltage.

4,679,210

## SOFT-LIMITED DIGITAL PULSE COMPRESSOR

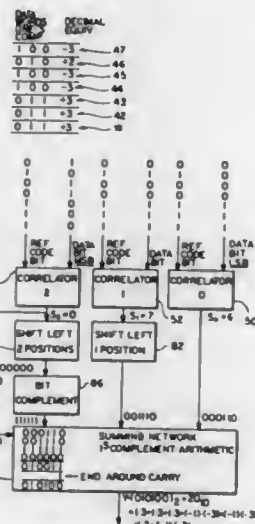
Devdas D. Rathi, Los Angeles, Calif., assignor to ITT Gilfillan, a division of ITT Corporation, Van Nuys, Calif.

Filed Jul. 18, 1985, Ser. No. 756,480

Int. Cl. G06F 15/34

U.S. Cl. 375-96

15 Claims



8. Apparatus for generating an output indicating the degree of correlation, in both amplitude and phase, between a reference phase code which comprises a series of binary levels, or bits, and a received data signal which varies in both amplitude and phase, comprising:

means responsive to a received data signal for generating a series of multi-bit data words, each data word representing both the phase and the amplitude of the received signal at a given time, with one bit of each word being a phase bit representing the phase of the signal and the other bit positions of each word being amplitude bits representing the amplitude of the signal;

a plurality of amplitude correlator means, each having a first input for receiving a single amplitude bit of predetermined significance of each data word generated by said generating means, and each having a second input for receiving a series of bits of a reference phase code, for generating a digital correlator output number representing the degree of correlation of a series of bits of the same significance in said series of data words with the series of bits of the reference phase code;

means for leftward shifting the output of each amplitude correlator means by a number of places equal to the position of the bit of the data word received by that correlator means, wherein the output of the correlator means that receives the least significant bit is shifted by zero, the output of the correlator means that receives the next to least significant bit is shifted by one, and so forth for any additional amplitude correlator means, to produce a multiplied correlator means output for each correlator means, and means for adding the multiplied correlator means outputs.

4,679,211

## REGULATION OF PICTURE SIZE WITH VARYING SCAN FREQUENCY

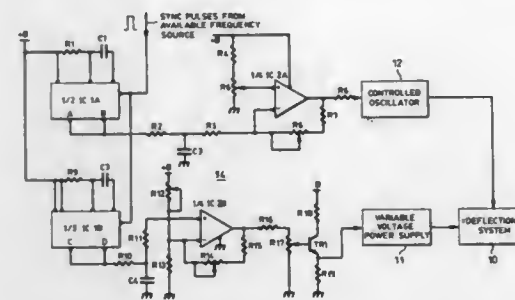
Walter Kurz, Kitchener, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Jan. 27, 1985, Ser. No. 749,518

Int. Cl. H01J 29/70, 29/76

U.S. Cl. 315-399

12 Claims



1. In combination with a scanning system for a CRT, said system including a deflection coil and being of either the resonant efficiency magnetic type including a damper diode, a tuning capacitor and switching means or of the linear magnetic (non-resonant) type; a variable output voltage power supply responsive to a control signal for supplying a variable power supply voltage to said scanning system; a frequency responsive control signal generator; and means for supplying a variable frequency signal (i) to said scanning system to produce a scan of variable frequency and (ii) to said frequency responsive control signal generator to produce a control signal which decreases said power supply voltage in response to a decrease in frequency of said variable frequency signal and increases said power supply voltage in response to an increase in frequency of said variable frequency signal, thereby to maintain the magnitude of the peak to peak deflection current in said deflection coil substantially constant.

4,679,212

## METHOD AND APPARATUS FOR USING SURFACE TRAP RECOMBINATION IN SOLID STATE IMAGING DEVICES

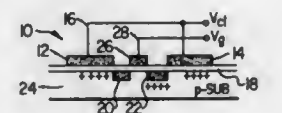
Jaroslav Hyneczek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1984, Ser. No. 636,425

Int. Cl. G11C 19/28

U.S. Cl. 377-58

9 Claims



1. A charge transfer imaging device having charge removal capabilities comprising:

a semiconductor substrate of one conductivity type having a pair of spaced regions of higher impurity level of said one conductivity type and including means to effect charge transfer along a channel therein,  
 an insulating layer on said substrate over said channel, at least two electrodes disposed over said insulating layer, said spaced regions being disposed between said electrodes,

first means coupled to said electrodes for receiving and

applying to said electrodes charge transfer clocking pulses,  
 a charge removal gate disposed between said spaced regions and adjacent and spaced from said electrodes, and  
 second means operable in a first mode to apply pulses of a first amplitude sufficient to remove charge to reduce blooming and operable in a second mode to apply pulses of a higher amplitude than said first amplitude in order to provide imaging exposure control coupled to said charge removal gate for applying pulses to said charge removal gate in order to remove charge through electron-hole recombination through interface traps of electrons and holes.

4,679,213

## ASYNCHRONOUS QUEUE SYSTEM

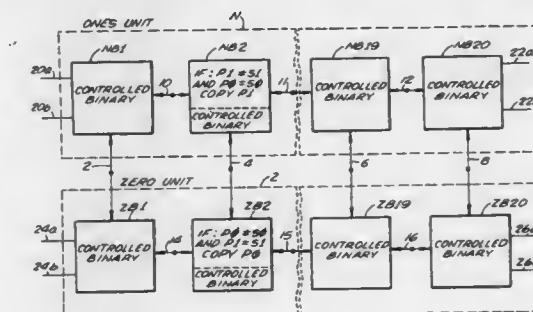
Ivan E. Sutherland, 1035 Devon Rd., Pittsburgh, Pa. 15213

Filed Jan. 8, 1985, Ser. No. 689,635

Int. Cl. H03K 23/58; G11C 19/00

U.S. Cl. 377-66

14 Claims



1. A register for binary digital data comprising:  
 a first series of binaries for registering one binary digit;  
 a second series of binaries individually associated with binaries of said first series and for registering another binary digit;  
 control means intercoupling said first and second series of binaries for causing a binary to assume the state of its predecessor when its predecessor and successor are in different states and the predecessor and successor of its associated binary are in the same state.

4,679,214

## SHIFT REGISTER FOR REFRESHING A MIS DYNAMIC MEMORY

Yoshihiro Takemae, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

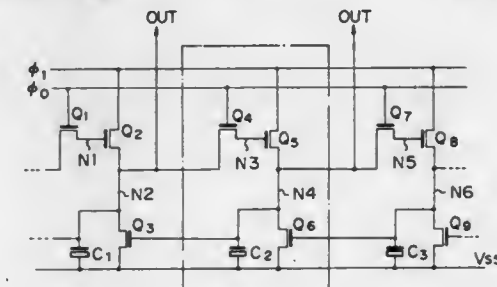
Filed Sep. 10, 1984, Ser. No. 648,506

Claims priority, application Japan, Sep. 20, 1983, 58-172096

Int. Cl. G11C 19/28

U.S. Cl. 377-80

9 Claims



1. A shift register having a plurality of circuit stages connected in cascade and receiving first and second clock signals

different in phase from each other for driving the shift register, each of said circuit stages comprising:

- a first transistor, having a source and having a drain, one of said source and drain operatively connected to receive an input signal, and having a gate operatively connected to receive the first clock signal, for transferring the input signal in response to the first clock signal;
- a second transistor having a gate operatively connected to the other one of said source and drain of said first transistor, having a source and having a drain, one of said source and drain of said second transistor receiving the second clock signal, the other one of said source and drain of said second transistor providing an output signal; and
- a third transistor having a source, having a drain and having a gate, one of said source and drain of said third transistor being operatively connected to the other one of said source and drain of said second transistor for resetting the output signal, the other one of said source and drain of said third transistor operatively connected to a low level source of potential, said gate of said third transistor operatively connected to receive the output signal from a corresponding second transistor in a succeeding circuit stage and the terminal providing the output signal being connected to the input of said succeeding stage for resetting the input signal input to a corresponding first transistor in the succeeding circuit stage, the output signal of one of the circuit stages providing the input signal to the corresponding first transistor of the succeeding circuit stage.

4,679,215

#### EXCEEDANCE COUNTING INTEGRATING PHOTO-DIODE ARRAY

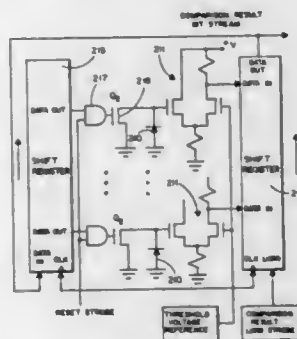
Max E. Nielsen, Littleton, Colo.; Joseph H. Labrum, West Jordan, and Patrick S. Grant, Orem, both of Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Dec. 6, 1985, Ser. No. 805,930

Int. Cl.<sup>4</sup> G11C 19/00

U.S. Cl. 377-95

8 Claims



1. A charge accumulating measuring system comprising a plurality of charge accumulating means the output of which are coupled in parallel,
- a like plurality of threshold detecting means each coupled to the output of a respective one of said charge accumulating means and constructed to provide a logic level signal representative thereof, wherein each of said logic level signals is at a first logic level when a predetermined amount of charge has not been accumulated by its associated charge accumulating means and is at a second logic level when said predetermined amount of charge has been accumulated by its associated charge accumulating means,
- a like plurality of discharge means each coupled to a respective one of said charge accumulating means for selectively discharging the charge accumulated by said charge accumulating means,
- output storage means coupled to the output of each of said threshold detecting means for periodically sampling the states of all of said charge accumulating means and for

storing all of said logic level signals that are present during said sampling, discharge drive means coupled to said storage means and to all of said discharge means for receiving the information stored in said storage means subsequent to its storage therein, said discharge drive means being constructed to periodically selectively discharge only those ones of said charge accumulating means which had accumulated a charge in excess of its associated threshold at the time said charge accumulating means were sampled.

4,679,216

#### SYNCHRONOUS BINARY COUNTER

Tetsuya Iida, and Takayoshi Ikarashi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

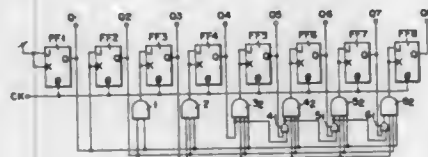
Filed Aug. 7, 1986, Ser. No. 894,210

Claims priority, application Japan, Aug. 19, 1985, 60-181397

Int. Cl.<sup>4</sup> H03K 23/40

U.S. Cl. 377-116

9 Claims



1. A synchronous binary counter comprising: a counter including J-K flip-flops constituting lower l bit stages and higher m bit stages, a common clock pulse being fed to a clock terminal of each of said flip-flops; first logic means for feeding, to J and K input terminals of each of flip-flops among said lower l bit stage flip-flops higher than the second bit stage, an AND of non-inverted outputs of all the lower stage flip-flops than the pertinent stage;
- second logic means for feeding, to the J and K input terminals of the first stage flip-flops among said higher m bit stage flip-flops, a first logical product of the non-inverted output of a one bit lower stage flip-flop and non-inverted outputs of the first to (l-1)-th bit stage flip-flops among said lower bit stage flip-flops; and
- third logic means for feeding, to the J and K input terminals of flip-flops among said higher m bit stage flip-flops higher than the second stage, a second logical product of non-inverted outputs of the lower first to (l-1)-th bit stage flip-flops and a third logical product, said third logical product being a logical product of an non-inverted output of a flip-flop lower by one bit than each of said flip-flops lower than the second stage and a fourth logical product, and said fourth logical product being a logical product of non-inverted outputs of flip-flops lower by more than two bit stages in said higher bit stage flip-flops.

4,679,217

#### X-RAY CASSETTE STRUCTURE

Richard A. Fairchild, Stoughton, Mass., assignor to Fairchild Medical Systems, Inc., Stoughton, Mass.

Filed Apr. 8, 1985, Ser. No. 721,070

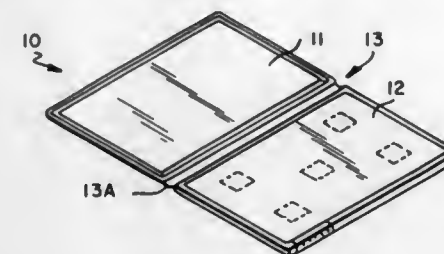
Int. Cl.<sup>4</sup> G03B 42/04

U.S. Cl. 378-97

20 Claims

1. A cassette structure capable of being positioned behind at least one selected region of an object and used for determining the radiation received by the selected region of said object, said structure comprising: a single housing means including a front and rear cover, radiation which is directed at the selected region of said object being received at said front cover when said structure is positioned behind the selected region; image producing means positioned within said housing means and responsive to said radiation for producing an image of the selected region of said object;

photovoltaic detection means fixedly positioned, within said housing means in fixed alignment with said image producing means and responsive substantially only to the image



produced by such image producing means for providing an output signal the value of which can be used to determine the radiation received at the selected region of said object.

4,679,218

#### X-RAY DIAGNOSTIC INSTALLATION HAVING A CONTROL SYSTEM FOR THE X-RAY TUBE HIGH VOLTAGE

Klaus Brunn, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

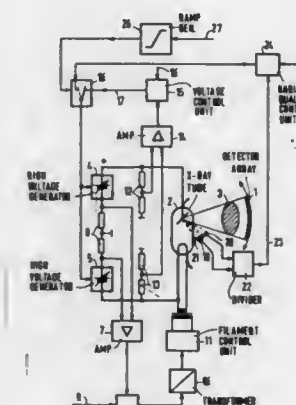
Filed Jun. 24, 1985, Ser. No. 748,235

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3424055

Int. Cl.<sup>4</sup> H05G 1/10

U.S. Cl. 378-101

10 Claims



1. A control system for a variable means for generating high voltage for operating an x-ray tube generating an x-ray field in an x-ray diagnostic installation comprising: first control means connected to the output of said means for generating high voltage for generating a control signal proportional to the actual voltage output thereof; second control means including at least two radiation detectors disposed in said x-ray field, a divider connected to the outputs of said radiation detectors for generating a signal proportional to the radiation quality detected, and a radiation quality control unit connected to an output of said divider, said radiation quality control unit having an input for receiving a nominal radiation quality value, and said radiation quality control unit generating a control signal for varying said means for generating high voltage for matching the actual radiation quality detected by said detectors to said nominal radiation quality value; means for switching connected to each of said first and second control means and to said means for generating high voltage for through-connecting one of said first or

second control means to said means for generating high voltage for varying said means for generating high voltage in accordance with the control signal therefrom; and switch control means for changing the state of said means for switching at a selected time after start-up of said installation.

4,679,219

#### X-RAY TUBE

Hidemichi Ozaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

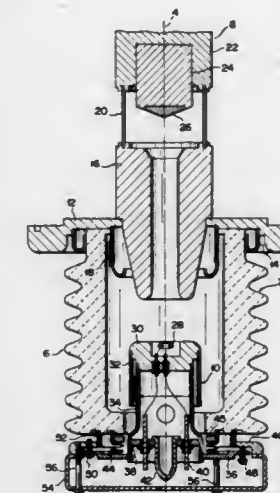
Filed Jun. 12, 1985, Ser. No. 744,066

Claims priority, application Japan, Jan. 15, 1984, 59-89005[U]; Sep. 29, 1984, 59-147461[U]

Int. Cl.<sup>4</sup> H01J 35/04, 35/10

U.S. Cl. 378-121

7 Claims



1. An X-ray tube comprising: an evacuated envelope having opposed ends; a cathode assembly provided at one end of said evacuated envelope and including a uniplanar spiral filament for generating an electron beam with a beam axis, and a pair of terminals for supplying a current to the spiral filament, one of the terminal ends of said spiral filament being located in the proximity of the center thereof; a pair of supporting leads connected to said terminals, respectively, each of which has a diameter larger than that of the filament, central and peripheral portions of said spiral filament being maintained at a temperature lower than the other portions of said spiral filament by heat dissipation into said supporting leads; and an anode assembly provided at the other end of said evacuated envelope and facing said cathode assembly, said anode assembly including conical target means, including a tip located substantially along said beam axis, for spherically radiating X-rays.

4,679,220

X-RAY TUBE DEVICE WITH A ROTATABLE ANODE  
Katsuhiko Ono, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 17, 1986, Ser. No. 819,822

Claims priority, application Japan, Jan. 23, 1985, 60-10470; Jun. 29, 1985, 60-143773

Int. Cl.<sup>4</sup> H01J 35/10

U.S. Cl. 378-132

15 Claims

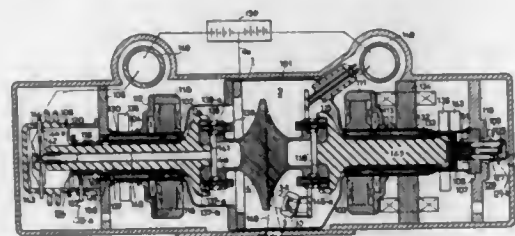
1. An X-ray tube device with a rotatable anode comprising: an evacuated envelope;



at least one cathode which emits electrons, arranged in said evacuated envelope;  
 a rotatable anode target which radiates X-rays by bombardment of said electrons, arranged facing said cathode;  
 a magnetic bearing freely and rotatably supporting said anode target;  
 a drive mechanism driving said anode target in rotation; and  
 voltage means for applying voltage to said anode target through said envelope;

the improvement comprises:

said envelope comprising a chamber portion, from which the X-rays are radiated, and tubular portions extending from both ends of the chamber portion, where the diameter of the chamber is larger than that of the tubular portions; said anode target arranged in said chamber portion;  
 a first shaft and a second shaft of insulating material fixed on both sides of said anode target, extending to mutually opposite sides in the direction of a tube axis, and arranged within said tubular portions in the neighborhood of the region where they are fixed to said anode target, at least one of said shafts having a conductor



axially provided through said shaft and electrically coupling with the anode target;

a metal tube circumscribing said first shaft and mounted at the periphery of said first shaft, said metal tube comprising a first metal tube mounted to form a gap between it and the circumference of said first shaft, and a second metal tube provided unitary with the circumference of the first tube, constituting a rotor of said magnetic bearing, and said first metal tube comprising an elastic metal tube provided with cut-away portions at its end edges and whose two end edges elastically contact the circumference of said first shaft and a supporting metal tube which supports said rotor by fitting onto its circumference;

a magnetic field generating device containing a stator and arranged on the outside of said tubular portion corresponding to said metal tube for forming said magnetic bearing together with said metal tube; and  
 said drive mechanism arranged in the neighborhood of said magnetic field generating device and outside of said tubular portion corresponding to said metal tube, and that drives said anode target in rotation by driving said second metal tube by generating a drive magnetic field.

4,679,221

# CT X-RAY COLLIMATOR INCLUDING A REINFORCED COLLIMATOR BLADE ASSEMBLY

Thomas P. O'Brien, Deerfield, and Richard T. Bernardi, Prospect Heights, both of Ill., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 8, 1985, Ser. No. 763,624

Int. Cl.<sup>4</sup> G21K 1/02, 3/00

U.S. Cl. 378-148

12 Claims

1. A collimator for a computed tomographic X-ray scanner including:

(a) a plurality of generally rectangular blades of X-ray beam stopping material each having a longitudinal slot for passing X-rays from a source to a target, said plurality of

blades being mounted in star-shaped configuration lengthwise along a rotatable axle;  
 (b) motor means for rotating said star-shaped configuration of blades; and



(c) means for minimizing vibration of said blades while maximizing the proximity of said slots to one lengthwise edge of each of said blades, said means comprising an X-ray penetrable reinforcing member affixed to each said blade to extend transversely across at least a portion of each of said slots.

4,679,222

# METHOD AND MEANS FOR MARKING X-RAY FILM WITH IDENTIFYING INDICIA

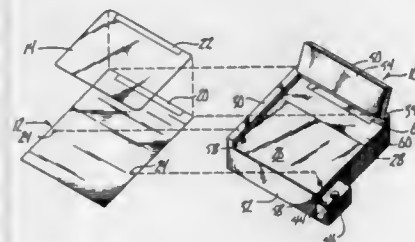
Robert C. Knopp, 1693 Loras Blvd., Dubuque, Iowa 52001

Filed Oct. 21, 1985, Ser. No. 789,390

Int. Cl.<sup>4</sup> G03B 42/02

U.S. Cl. 378-166

2 Claims



1. A method for marking X-ray film with patient identifying indicia comprising:

filling out a patient history form having a patient identification portion and a patient medical history portion, said patient history form being light translucent, said filling out of said patient history form being accomplished by marking light opaque indicia on both said patient identification portion and said medical history portion, said patient identification portion having a predetermined size and shape;

exposing an X-ray portion of said X-ray film to X-rays with an object to be X-rayed placed between the source of said X-rays and said film;

blocking out an identifying area of said film corresponding in size and shape to said predetermined size and shape of said patient identification portion of said history form during said exposure to said X-rays so as to maintain said identifying area of said film in an unexposed condition; placing a light shield over a window of an exposure box having a light source below said window, said light shield having an opening therein corresponding in size and shape

to said patient identification portion of said medical history form, said shield being made of a material capable of preventing film exposing light rays from passing there-through;

placing said patient history form over said shield on said window with at least two registration holes in said history form being fitted over two registration posts on said exposure box so as to cause said patient identification portion of said history form to be in registered alignment over said opening of said shield and so as to cause said medical history portion of said history form to be shielded by said shield from light emanating from said light source;

placing said X-ray film over said patient history form in a darkroom environment which protects said film from exposure;

registering said unexposed identifying portion of said film over said patient identification portion of said history form and over said opening of said shield with said exposed X-ray portion of said film being shielded from said light source by said shield;

actuating said light source to cause light to pass through said window, said opening of said shield, and only said patient identification portion of said history form whereby only said identifying area of said film will be exposed and the images of said light opaque indicia on only said identification portion of said history form will be transferred to said identification area of said film;

said filling out of said patient identification portion of said history form with said light opaque indicia being the only transcription of said light opaque indicia in the entire process of transferring the images of said light opaque indicia from said identification portion of said history form to said film.

4,679,223

# METHOD FOR DAMPING THE NATURAL OSCILLATIONS OF A PILLAR-STAND CARRYING X-RAY EQUIPMENT, OCCURRING WHEN MAKING POSITIONAL ADJUSTMENTS THERETO; AND A PILLAR STAND

Carl-Eric Ohlson, Solna, and Günther Behnke, Skärholmen, both of Sweden, assignors to AO Medical Products AB, Stockholm, Sweden

PCT No. PCT/SE84/00278, § 371 Date Apr. 23, 1985, § 102(e) Date Apr. 23, 1985, PCT Pub. No. WO85/01181, PCT Pub. Date Mar. 14, 1985

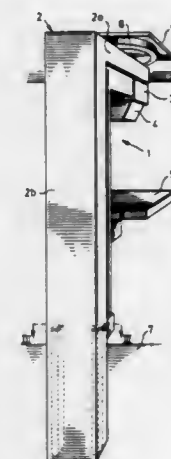
PCT Filed Aug. 16, 1984, Ser. No. 726,895

Claims priority, application Sweden, Aug. 25, 1983, 8304617

Int. Cl.<sup>4</sup> H05G 1/02

U.S. Cl. 378-195

5 Claims



1. A movably mounted pillar-stand for carrying X-ray equip-

ment, such as X-ray exposure equipment, a hospital bed, and the like, said pillar-stand comprising:

(a) mounting means for mounting a pillar-stand on a mounting surface for movement relative to the mounting surface;

(b) a supporting stand connected to the mounting means and extending outwardly from the mounting surface for supporting X-ray apparatus adapted for use with equipment for taking X-ray exposures, the supporting stand having a center of mass spaced from the mounting means; and

(c) a mass carried by the pillar-stand at a mass mounting position on the supporting stand, the mass mounting position spaced from the mounting means and from the supporting stand center of mass, the mass having mounting means for mounting the mass on the supporting stand at the mass mounting position for pivotal movement relative to the mass mounting position and having a center of mass spaced from the mass mounting position, the mass being movable relative to the supporting stand upon natural oscillatory movement of the supporting stand to execute a counter-directional damped pendulating movement in a manner to rapidly extinguish said natural oscillatory movement.

4,679,224

# TELEPHONE LINE TESTING CIRCUIT

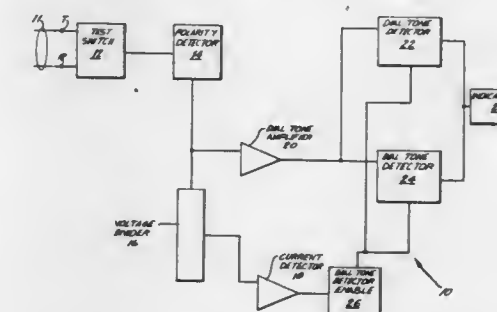
Daniel Lynch, Jackson, and Steven B. Perry, Highlands, both of N.J., assignors to Keptel, Inc., Ocean, N.J.

Filed Dec. 2, 1985, Ser. No. 803,714

Int. Cl.<sup>4</sup> H04B 3/46

U.S. Cl. 379-26

27 Claims



1. A telephone line testing device for determining whether a fault exists in a telephone line entering a user's premises or in the user's wiring and equipment, comprising:

a. switching means for operably connecting the telephone line to the remainder of the testing device, the switching to make said connection actuating a testing cycle;

b. a plurality of detector elements which receive the telephone line signal from the switching means from which each element detects a characteristic of the telephone line different than the other detector elements; and

c. means for indicating that each detector element has detected that the respective characteristic of the telephone line is in the correct operating range and has the correct operating status during a testing cycle.

4,679,225

# SIGNAL TRANSMISSION APPARATUS FOR A MULTIPLE CHANNEL SYSTEM AND METHOD FOR USING THE SAME

Mitsuo Higashiyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 18, 1985, Ser. No. 745,943

Claims priority, application Japan, Jun. 25, 1984, 59-129388

Int. Cl.<sup>4</sup> H04M 11/00, 11/06; H04Q 7/04

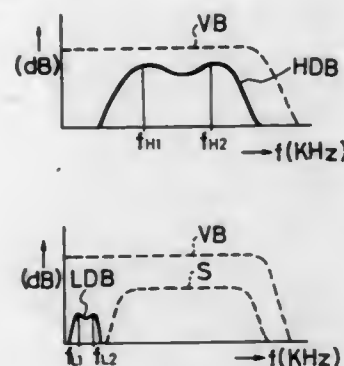
U.S. Cl. 379-62

16 Claims

1. In a communications system having a plurality of trans-

mitters for transmitting information signals including audio signals over any one of a plurality of transmission channels, and further having a plurality of receivers for receiving said information signals transmitted over any of said transmission channels, each of said transmission channels having a respective total frequency range including an allocated range for transmitting said audio signals; signal transmission apparatus for establishing a selected transmission channel between a predetermined one of said transmitters and a predetermined one of said receivers, said apparatus comprising:

- means at the predetermined transmitter for selecting one of said transmission channels;
- means for transmitting at least a control signal indicative of the identity of said predetermined transmitter over the selected transmission channel, said means for transmitting initially transmitting said control signal by using substantially all of the allocated range of said selected transmission channel;



the predetermined receiver including means for establishing the selected transmission channel between it and said predetermined transmitter only in response to the receipt of said transmitted control signal identifying said predetermined transmitter; and

means at said predetermined transmitter for confirming that said selected transmission channel has been established with said predetermined receiver and for generating a confirmation output thereon;

said predetermined transmitter being responsive to said confirmation output for transmitting said audio signals by using a first portion of said allocated range; and

said means for transmitting being responsive to said confirmation output for transmitting said control signal by using a second portion of said allocated range separate from said first portion.

4,679,226

## COMPUTER SECURITY GUARD CIRCUIT

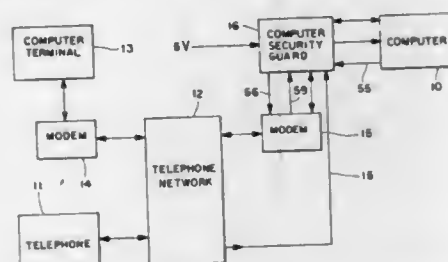
Thomas C. Muehleisen, Cuyahoga Falls, Ohio, assignor to Alltel Corporation, Hudson, Ohio

Filed Jun. 17, 1985, Ser. No. 745,782

Int. Cl.<sup>4</sup> H04M 11/00; H04L 9/00

U.S. Cl. 379-95

24 Claims



1. A system of communicating with a computer over a communications network comprising a computer terminal, a first modem connecting said computer terminal to the communications network, a second modem, a computer security

guard circuit connected between said second modem and the computer, said computer security guard circuit also being directly connected to the communications network to receive a first call through the network and connecting said second modem to the computer upon the receipt thereof, said second modem being connected to the communications network to receive a second call through the network from said first mode, said second call passing from said second modem to said computer security guard circuit, and timing means within said computer security guard circuit to disconnect the second modem from the computer if said second call is not received by said computer security guard circuit within a predetermined time period after the receipt of said first call.

4,679,227

## ENSEMBLE MODEM STRUCTURE FOR IMPERFECT TRANSMISSION MEDIA

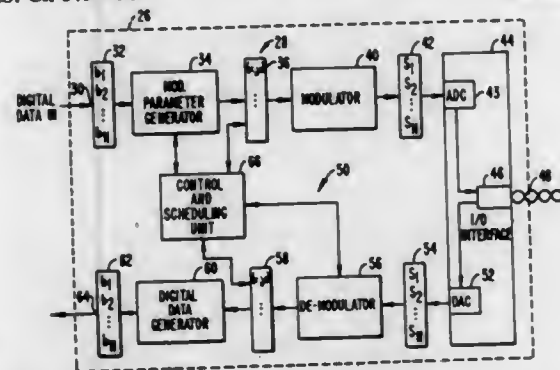
Dirk Hughes-Hartogs, Morgan Hill, Calif., assignor to Telebit Corporation, Cupertino, Calif.

Filed May 20, 1985, Ser. No. 736,200

Int. Cl.<sup>4</sup> H04M 11/00; H04B 15/00; H04L 5/00

U.S. Cl. 379-98

17 Claims



1. In a high speed modem, for transmitting data over a telephone line, of the type that encodes data elements on an ensemble of carrier frequencies, a method for allocating data and power to the carrier frequencies, said method comprising the steps of:

- determining the equivalent noise component for every carrier frequency in the ensemble;
- determining the marginal power requirement to increase the complexity of the data element on each carrier from  $n$  information units to  $n+1$  information units,  $n$  being an integer between 0 and  $N$ ;
- ordering the marginal powers of all the carriers in the ensemble in order of increasing power;
- assigning available power to the ordered marginal powers in order of increasing power;
- determining the value,  $MP(max)$  at which point the available power is exhausted; and
- allocating power and data to each carrier frequency where the power allocated is equal to the sum of all the marginal powers less than or equal to  $MP(max)$  for that carrier and the number of data units allocated is equal to the number of marginal powers for that carrier less than or equal to  $MP(max)$ .

7. In a high speed modem, for transmitting data in the form of a QAM ensemble of carrier frequencies on a VF telephone line, of the type that measures the magnitude of a system parameter prior to transmission, a method for tracking deviations in the magnitude of the system parameter during the receipt of data, said method comprising the steps of:

- generating QAM constellations for a plurality of carrier frequencies;
- constructing a demodulation template for one of said plurality of carrier frequencies comprising a plurality of first regions with one of the points of said constellation positioned within each of said first regions;
- forming a set of tracking regions where each first region has a first and second tracking region disposed therein;

demodulating said ensemble of carriers to obtain the demodulation points positioned in said set of first and second tracking regions;

counting the number of points disposed in said set of first tracking regions and the number of points disposed in said set of second tracking regions;

determining the difference in the number of counts disposed in said set of first tracking regions and disposed in said tracking regions to construct an error characteristic; and

utilizing said error characteristic to adjust the magnitude of said signal parameter during the receipt of data.

4,679,228

## SPEAKERPHONE SENSING CIRCUIT

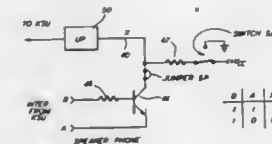
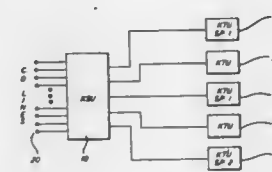
Vincent V. Korsky, Shelton, and Ronald M. Keenan, Woodbury, both of Conn., assignors to Tie/Communications, Inc., Shelton, Conn.

Filed Mar. 29, 1985, Ser. No. 717,688

Int. Cl.<sup>4</sup> H04M 3/22

U.S. Cl. 379-165

6 Claims



1. Apparatus for enabling a central service unit of a telephone system, the system including a central service unit and a plurality of station sets, to determine whether a station set of the system contains a speakerphone and whether the speakerphone is a first or second type comprising:

- first control means having an input line coupled via resistor means to a selected one of a high or low logic level; and
- switch means coupled between said input line and a first interrogation line for receiving a first signal from the central service unit and having a control input which receives a second interrogation signal from the central service unit, said second interrogation signal controlling the state of the switch means, the state of the switch means and the selected one of the logic levels to which the input line is coupled indicating to the control means whether the station set includes a speakerphone and the type of speakerphone, said control means including means for transmitting said indication to the central service unit.

4,679,229

## RINGING DETECTION CIRCUIT

Sbingo Yamaguchi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,141

Claims priority, application Japan, Apr. 15, 1985, 60-78440

Int. Cl.<sup>4</sup> H04M 1/00

U.S. Cl. 379-373

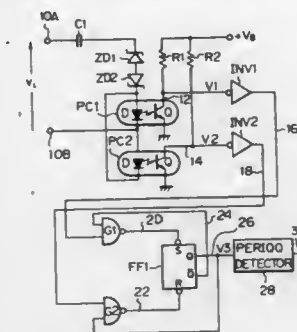
1 Claim

1. A ringing detection circuit for detecting a ringing having

184-021 O.G.-87-18

opposite polarities which arrives over a telephone subscriber's line, comprising:

- first threshold detector means connected to the subscriber's line for producing an output when detected that the ringing has exceeded a first threshold value in one of the polarities;
- second threshold detector means also connected to the sub-



scriber's line for producing an output when detected that the ringing has exceeded a second threshold value in the other polarity; and

identification means responding to a variation of an output of one of said first and said second threshold detector means and then to a variation of an output of the other threshold detector means, so as to identify reception of the ringing on the basis of a repetition period of one of the variations.

4,679,230

## ECHO CANCELLER AND CENTER CLIPPER CONTROL ARRANGEMENT

Jean Lassaux, Lannion, and Christian Dagorn, Perros Guirec, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

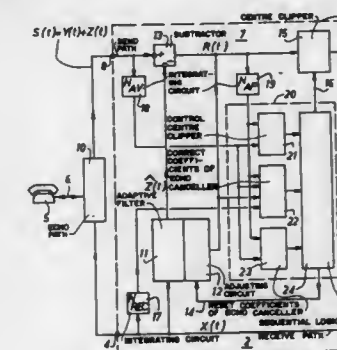
Filed May 7, 1985, Ser. No. 731,640

Claims priority, application France, May 15, 1984, 84 07499

Int. Cl.<sup>4</sup> H04B 3/20

U.S. Cl. 379-411

18 Claims



1. Apparatus for controlling an echo canceller and a centre clipper, in a telephone circuit, comprising:

- a. a receive path for transmitting a receive signal having a level  $N_{REC}$ ; and
- b. a send path for transmitting a send signal having a level  $N_{AV}$ , in which send path there is an echo signal of the receive signal;
- c. the echo canceller including:
  - i. an adaptive filter, coupled with the receive path, having an output signal, and containing coefficients for approximately the echo signal; and
  - ii. a subtractor connected in the send path, for subtracting the output signal of the adaptive filter from the send



signal, the subtractor having an output with a level  $N_{AV}$  and coupled to a first input of the centre clipper;

iii. an adjusting circuit coupled with the adaptive filter for automatically adjusting the coefficients so that the adaptive filter supplies an approximated echo signal;

d. a control arrangement having first and second outputs at which a centre clipper control signal and an adjusting circuit control signal, respectively, are provided, the control arrangement including:

- means for comparing:
  - $N_{AV}$  to two fixed levels  $N_{AV0}$  and  $N_{AV1}$ ; and
  - $N_{AP}/N_{AV}$  to a threshold  $a$ ; and
- a decision unit, responsive to the means for comparing, supplying the adjusting circuit control signal at the second output and supplying the centre clipper control signal at the first output so that the centre clipper control signal activates the centre clipper according to a clipper threshold, when the means for comparing indicates that  $N_{AV}$  is between  $N_{AV0}$  and  $N_{AV1}$  and when the means for comparing indicates that  $N_{AP}/N_{AV}$  is less than  $a$ .

4,679,231

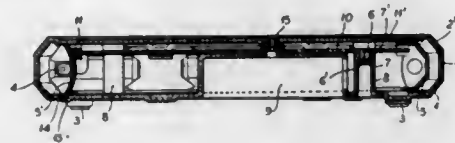
## TELEPHONE ACCESSORY HOUSING

Hans Reichle, Wetzikon, Switzerland, assignor to Reichle + De Massari AG Elektroingenieure, Wetzikon, Switzerland  
Filed Aug. 30, 1985, Ser. No. 771,285  
Claims priority, application Switzerland, Sep. 5, 1984, 4230/84

Int. Cl.<sup>4</sup> H04M 1/00

U.S. Cl. 379-396

7 Claims



1. A casing for a telephone accessory for optically displaying a signal representing an incoming call, comprising:

- a bottom portion;
- a cover portion;
- connecting means for detachably fastening said cover portion to said bottom portion so that upon connecting said cover portion and said bottom portion an interior space is defined;
- a frame accommodated within said interior space;
- optical means connected to said frame for supporting a circuit-carrying print card within said interior space, said cover portion being provided around its periphery with an oblique surface which serves as a viewing window aligned with said optical means.

4,679,232

## METHOD AND APPARATUS FOR PROVIDING A GROUND REFERENCE FOR TELEPHONE CUSTOMER SPECIAL CIRCUITS POWERED FROM A FLOATING BATTERY FEED

Kenneth L. Brooks, Naperville; Paul R. Bufkin, Wheaton; David G. Mihal, Oswego, and Jerry G. Miller, Wheaton, all of Ill., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 2, 1985, Ser. No. 761,888

Int. Cl.<sup>4</sup> H04M 9/00

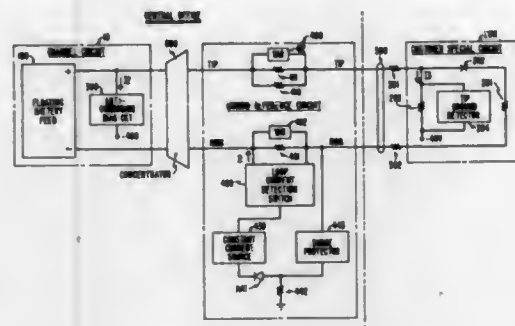
U.S. Cl. 379-413

16 Claims

5. A ground reference circuit for interfacing a floating battery feed via a customer loop comprising tip and ring conductors, to a customer circuit, said ground reference circuit comprising

means for supplying a constant ground current to said ring conductor of said loop, said constant ground current being independent of a voltage on said ring conductor and a

portion of said constant ground current being supplied via said loop to said customer circuit and means responsive to a loop current in said loop for enabling the supplying of said constant ground current from said supplying means to said ring conductor.



wherein said enabling means comprises switch means responsive to said loop current in said loop for coupling said supplying means to said ring conductor.

4,679,233

## MICROPHONE

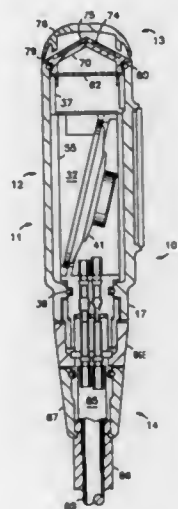
Charles P. Richardson, Coral Springs; Virgil Kuhl, Lauderdale; Bernard Gasparaitis, Tamarac; Bruce Staple, Coral Springs, and Larry M. Krieg, Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Fla.

Filed Aug. 30, 1985, Ser. No. 771,097

Int. Cl.<sup>4</sup> H04B 1/38; H01Q 1/22, 1/24

U.S. Cl. 379-433

15 Claims



1. A speaker, antenna and microphone assembly comprising, a housing having a top sound port, a microphone element mounted within the housing, a speaker means mounted within the housing, and an antenna element mounted within the housing including a surface positioned in front of the speaker to reflect sounds from the speaker toward the top sound port.

4,679,234

## TELEPHONE CORD TWIST RESTRAINER

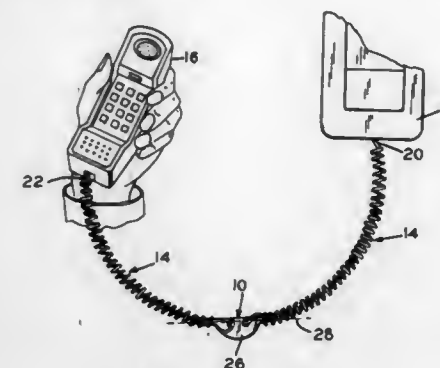
Donald E. Earwood, Sr., 2219 NW. Troost, Roseburg, Oreg. 97470

Filed Apr. 9, 1986, Ser. No. 849,700

Int. Cl.<sup>4</sup> H04M 1/15; H04R 1/06; H01B 7/06

U.S. Cl. 379-438

7 Claims



1. A telephone cord twist restrainer, used in combination with a coiled telephone cord having continuous coils and a longitudinal axis, which cord connects a telephone handset to a telephone base, the telephone cord twist restrainer comprising:

- a stabilizing plate, which plate, when inserted in said coiled telephone cord, extends out from said longitudinal axis of said coiled telephone cord beyond the periphery of said continuous coils on a single side only; and
- means for attaching said plate to said coiled telephone cord.

4,679,235

## TELEVISION SIGNAL TRANSMISSION SYSTEM

Takashi Okada, Kanagawa; Takao Mogi; Hiroyuki Kobayashi, both of Tokyo, and Katsuyuki Ohi, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

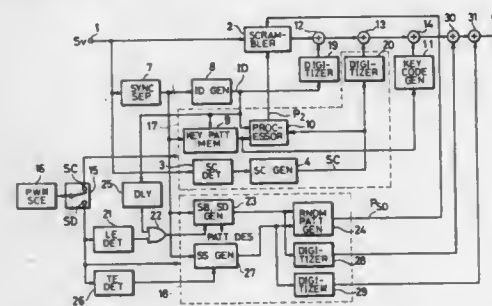
Filed Jun. 27, 1984, Ser. No. 625,291

Claims priority, application Japan, Jul. 7, 1983, 58-123615

Int. Cl.<sup>4</sup> H04N 7/167

U.S. Cl. 380-20

6 Claims



1. Apparatus for scrambling a television signal by inversion thereof, comprising:

- means for detecting a change in the scene represented by the television signal and generating a scene change identification signal in response thereto;
- means for generating a key code signal having a predetermined pattern;
- means for combining said scene change identification signal and said key code signal to produce a first control signal;
- means for producing a second control signal, said second control signal having a random pattern including a plural-

ity of periods each having an inversion portion and a non-inversion portion;

means for scrambling the television signal in response to a selected one of said first control signal and said second control signal;

switching means for supplying a selected one of said first control signal and said second control signal to said scrambling means; and

means for generating a starting code signal and a stopping code signal which respectively indicate the start and the end of said second control signal, said starting and stopping code signals being produced in response to said switching means and supplied to said second control signal producing means.

4,679,236

## IDENTIFICATION VERIFICATION METHOD AND SYSTEM

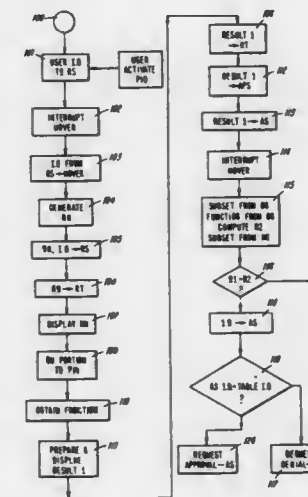
Richard E. Davies, 2031 Brooks Dr., Forestville, Md. 20747

Filed Dec. 21, 1984, Ser. No. 684,918

Int. Cl.<sup>4</sup> H04L 9/00; G06K 5/00

U.S. Cl. 380-23

21 Claims



12. In a limited access identification verification apparatus for authorizing access to a secure facility including a plurality of remote access means and a host processing means having access number generating means, the improvement comprising:

means within each of said remote access means for performing a mathematical function on data input thereto to obtain a first result,

selecting means within said host processing means for selecting for each user a different subset of digits of a random number generated by said generating means, said subset being less than the whole random number, and for selecting and performing a specified mathematical function in accordance with a specified user on the selected digits of said random number to obtain a second result;

means for receiving said first and second results from said remote access means and from said selecting means; and

means for comparing said received first and second results and for providing a control signal to activate said secure facility only if said first and second results match one another, thereby authorizing access thereto only if a user successfully provides a proper user identification corresponding to a specific remote access means and if the user further selects a proper subset of digits of said random number, corresponding to said user identification, for input to said specific remote access means.

4,679,237

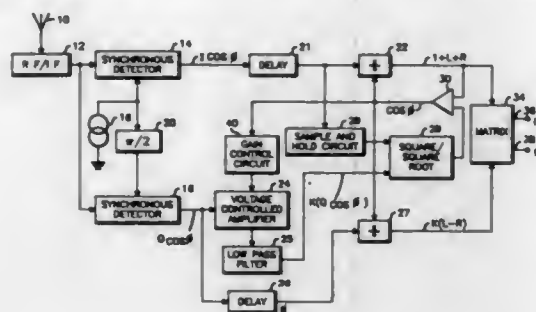
## CORRECTION CONTROL CIRCUIT FOR AM STEREOPHONIC RECEIVERS

Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 2, 1985, Ser. No. 761,730  
Int. Cl.<sup>4</sup> H04H 5/00

U.S. Cl. 381-15

15 Claims



1. Correction control circuit for an AM stereophonic receiver and comprising:
  - input means for providing first and second input signals which were transmitted in quadrature with each other;
  - first and second corrector means coupled to correct each of the respective input signals;
  - a correction signal source coupled to derive a correction signal from at least said input signals and to provide said correction signal to said corrector means; and
  - means for controlling the amount of second input signal coupled from the input means to the correction signal source in response to the correction signal level.

4,679,238

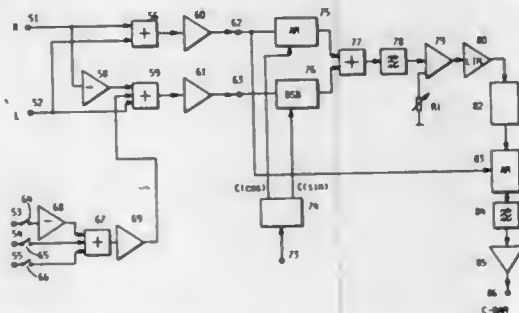
## METHOD AND SYSTEM FOR SIGNALLING ADDITIONAL INFORMATION BY AM MEDIUM WAVE BROADCASTING

A. Markovic, Belgrade; M. Temerinac, Novisad, both of Yugoslavia, and Peter Braegas, Hildesheim, Fed. Rep. of Germany, assignors to Blaupunkt Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Apr. 25, 1985, Ser. No. 727,371  
Int. Cl.<sup>4</sup> H04H 5/00

U.S. Cl. 381-16

23 Claims



1. Method for signalling information, in an amplitude modulated (AM) medium wave broadcasting system, in addition to audio information, comprising:
  - generating an amplitude modulation medium wave broadcast carrier;
  - amplitude modulating the carrier with audio signals;
  - generating a stereo pilot tone having a frequency  $f_{PT}$  below the audible range;
  - generating a first sinusoidal signal having a frequency  $f_1$  according to the formula:  $f_1 = (m_1/n) \cdot f_{PT}$ ;

generating a second sinusoidal signal having a frequency  $f_2$  according to the formula:

$$f_2 = (m_2/n) \cdot f_{PT}$$

wherein

$n$  is an integer;

$m_1$  is an integer other than  $n$ ; and

$m_2$  is an integer other than  $n$  and  $m_1$ ;

modulating the carrier with said stereo pilot tone in the range of a predetermined permitted modulation index, modulating the carrier with said first and second sinusoidal signals with amplitudes which, when added, do not essentially exceed the amplitude of the stereo pilot tone which is being modulated on the carrier, and wherein the phases of the first and second sinusoidal signals are different.

4,679,239

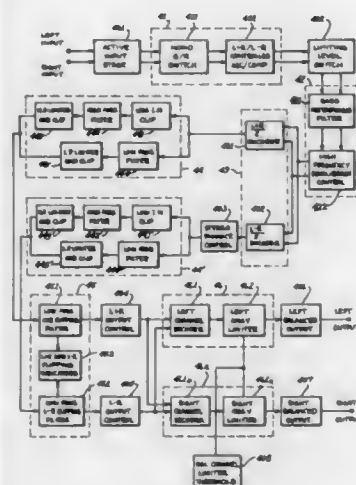
## APPARATUS AND METHOD FOR PROCESSING STEREO SIGNALS FOR APPLICATION TO AN AM STEREO BROADCASTING UNIT

Ronald R. Jones, Phoenix, Ariz., assignor to National Communications Research Center, Inc., Tempe, Ariz.

Filed Aug. 22, 1984, Ser. No. 643,071  
Int. Cl.<sup>4</sup> H04H 5/00

U.S. Cl. 381-16

3 Claims



1. In a system for processing signals from an audio source, left channel stereo signals and right channel stereo signals for application to an AM stereo exciter and transmitter unit, signal processing apparatus comprising:

AGC/compressor means coupled to said audio source for gain control;

filter/equalizer means coupled to said AGC/compressor means for passing high frequencies and for boosting bass frequencies;

encoding means coupled to said filter equalizer means for encoding said left and said right channel signals into a left plus right signal and a left minus right signal, said left plus right signal controlling said AGC/compressor means;

means for enhancing said left minus right signal;

means for processing said left plus right signal;

means for processing said left minus right signal;

decoding means for developing a left channel signal, and a right channel signal, for said processed left minus right signal and said left plus right signal; and

limiting means for limiting a negative peak signal of said processed left and said processed right signal.

4,679,240

## TOUCH SENSITIVE HEARING AID VOLUME CONTROL CIRCUIT

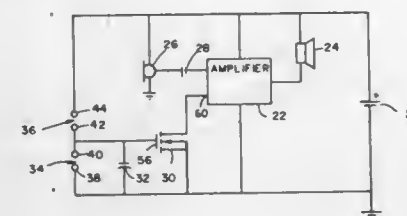
Jorgen Heide, Cordoba, Tenn., assignor to Richards Medical Company, Memphis, Tenn.

Filed Apr. 15, 1985, Ser. No. 723,579

Int. Cl.<sup>4</sup> H04R 25/02, 25/00; H03G 3/72

U.S. Cl. 381-68.6

25 Claims



1. A hearing aid, comprising:
  - a housing;
  - a sound sensing means located in the housing and having an output signal;
  - a sound producing means located in the housing and having a signal input;
  - an amplifier located in the housing and having a gain control input responsive to a change in the impedance connected to the gain control input, a signal input and an amplified signal output, with the sensing means output signal connected to the signal input and the amplified signal output connected to the producing means signal input;
  - a direct current voltage source located in the housing and having a positive and a negative terminal
  - a field effect transistor having a gate, a source and a drain located in the body, the source being coupled to one of (a) the negative terminal of the voltage source or (b) the gain control input of the amplifier and the drain being correspondingly coupled to the other of (a) the negative terminal of the voltage source or (b) the gain control input of the amplifier;
  - a first capacitor located in the housing and connected between the gate and the negative terminal of the voltage source;
  - a first and a second contact set, each contact set being mounted on the housing and comprising at least two conductive contacts spaced sufficiently close to be bridged by touch, the first contact set being connected between the gate and the negative terminal of the voltage source and the second contact set being connected between the gate and the positive terminal of the voltage source so that when the first contact set is touched the impedance from the drain to the source of the transistor increases and when the second contact set is touched the transistor drain to source impedance decreases.

4,679,241

## METHOD AND APPARATUS FOR CORRECTING X-Y POSITION MEASUREMENTS

Lawrence J. Lukis, Prior Lake, Minn., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation-in-part of Ser. No. 419,517, Sep. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 217,130, Dec. 17, 1980, abandoned. This application Mar. 11, 1985, Ser. No. 710,408

Claims priority, application United Kingdom, Mar. 17, 1981, 8108288

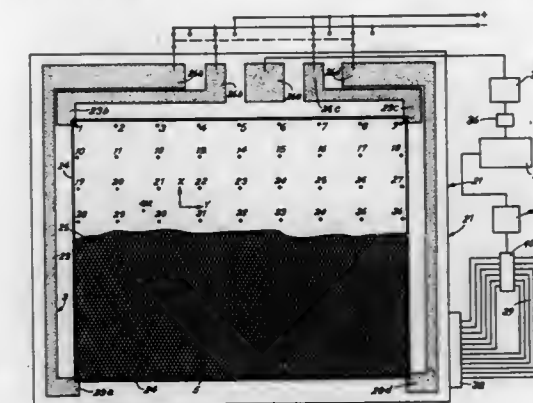
Int. Cl.<sup>4</sup> G06K 9/28, 9/18

U.S. Cl. 382-13

4 Claims

1. The method of generating an electrical signal representa-

tive of the actual position of a moveable member comprising, in combination, the steps of applying an electrical potential across a substantially planar resistive sheet to establish a current flow through said sheet, measuring the electrical potential induced by said current at each of a plurality of predetermined positions on said surface, calculating, for each given one of said predetermined posi-



tions, a correction factor which relates the potential measured at said given position with the potential to be expected as said given position, storing each of said calculated correction values in a digital memory, measuring the magnitude of the potential on said sheet at the position of said moveable member, and combining said magnitude with at least one of said stored correction values to produce said signal representative of said actual position.

4,679,242

## CONVERTIBLE COOLER AND CUSHION

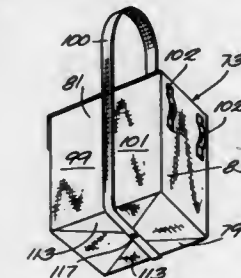
Peter B. Brockhaus, Rte. 1, Owen, Wis. 54460

Filed Oct. 17, 1984, Ser. No. 661,926

Int. Cl.<sup>4</sup> A45C 7/00; B65D 30/20, 81/38; A47J 41/00

U.S. Cl. 383-4

1 Claim



1. A variable volume insulated container for insulating items from ambient temperatures comprising:

a. an insulator fabricated into a back panel, a front panel, two side panels, a bottom panel, and a top flap, the back, front, and side panels defining an opening to the interior of the container, the insulator including at least one sheet of thin flexible material embossed on one side with a multiplicity of indentations, each indentation having an open side and a crown side, and a skin of thin flexible reflecting metallic foil bonded to the embossed sheet on the open side of the indentations to encapsulate the air therein to create a layer of encapsulated air bubbles;

b. a cover of flexible material joined to the exterior faces of the panels and the top flap;

c. an inside flap joined to each side panel adjacent the con-



tainer opening, the inside flap being covered with flexible material on the external face thereof; and  
d. means for releasably retaining the inside flaps in contact with the top flap when the top flap is in the closed position,

and wherein the cover and insulator are joined along the longitudinal center line of each side and bottom panel to create a pair of partial panels symmetrical about each respective center line, and the side and bottom panels are foldable outwardly along the respective center lines thereof to thereby render the container fully collapsible into a substantially flat seat,

and wherein the insulator is cut from a blank having the bottom panel interposed between and joined to the back panel and the front panel along respective fold lines between the bottom panel and the back and front panels, the blank back and front panels each being interposed between and joined to a side panel partial panel and having the longitudinal edges thereof coincident with the respective center lines of the side panels, the lower end of each partial side panel being colinear with the fold line between the bottom panel and the respective back and front panels, so that when the seat is unfolded the insulated container thereby produced has full insulation on all interior faces thereof and means forming triangular tabs in the cover material during the unfolding process at the junction of the bottom and side panels, said tabs being devoid of insulation and are thereby flexible for each unfolding of the seat without bunching of insulation in the triangular tabs, and wherein the cover and insulator are joined along the longitudinal center lines of the bottom and side panels to enhance foldability, and wherein:

- an elongated narrow piece of flexible material is joined to the side panels along the longitudinal center lines thereof and is looped over the container opening to create a carrying handle;
- the flexible narrow piece of material extends beyond the bottom panel of the container to form a pair of short ends; and
- the short ends are provided with fastening means for releasably fastening the short ends to each other, so that the flexible triangular tabs inherently produced in the cover material during the process of unfolding the collapsed seat to create an insulated container may be folded and held together in place under the bottom panel thereof by the fastening means.

4,679,243

#### DATA TRANSMISSION USING A TRANSPARENT TONE-IN-BAND SYSTEM

Joseph P. McGeehan, Corsham, and Andrew Bateman, Bath, both of England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 617,733, Jun. 6, 1984. This application Aug. 12, 1985, Ser. No. 764,984

Claims priority, application United Kingdom, Aug. 17, 1984, 8421025

Int. Cl. H04B 1/68

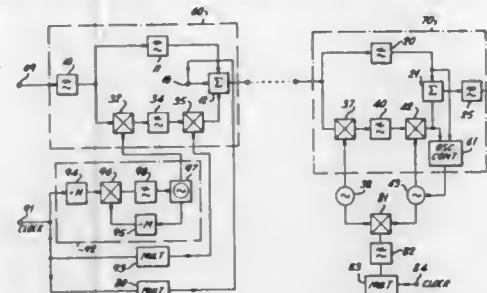
U.S. Cl. 455-47

20 Claims

17. A communication system comprising:

- a transmitter including: (a) means for causing a band of frequencies to carry information, means for dividing said band into upper and lower portions with a frequency notch portion between said upper and lower portions by frequency translating at least part of said band which corresponds to one of said portions, and (b) control means, responsive to a control input signal to vary the width of the notch portion, and

a receiver comprising a receiver processor for recovering said information, said receiver processor including means



for providing an output signal representative of the width of the notch portion.

4,679,244

#### METHOD OF TRANSMITTING TERMINATING CALL SIGNALS WITHIN A RESTRICTED DURATION AND A BASE STATION AND A PORTABLE UNIT FOR USE IN THE SAME

Ryoji Kawasaki, Kanagawa; Kazuhiro Yoshizawa, Chiba; Akio Yotsutani, Tokyo; Noboru Saegusa, Tokyo; Koichi Ito, Tokyo, and Syozi Huse, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation; NEC Corporation and Kabushiki Kaisha Toshiba, all of Japan

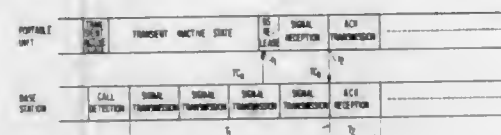
Filed Feb. 26, 1985, Ser. No. 705,944

Claims priority, application Japan, Feb. 29, 1984, 59-38029

Int. Cl. H04B 7/00

U.S. Cl. 455-54

4 Claims



1. A method of calling a portable unit from a base station through a radio control channel, said method comprising the steps of repeatedly producing in said base station a terminating call signal as a call signal sequence, periodically putting said portable unit into transient active and inactive states during a first time interval and during a second time interval following said first time interval, respectively, and keeping said portable unit into a continuous active state when one of said terminating call signals is received during said first time interval, wherein the improvement comprises the steps of: measuring in said base station a first time duration longer than said second time interval; and producing said call signal sequence only within said first time duration.

4,679,245

#### RADIO RECEIVER

Kazuyoshi Imazeki, and Nobuaki Yokoyama, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Division of Ser. No. 661,025, Oct. 15, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 853,472

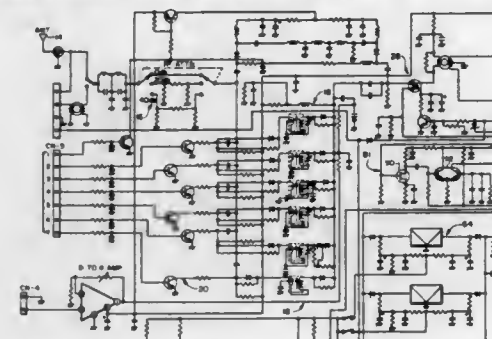
Int. Cl. H04B 1/16

U.S. Cl. 455-155

4 Claims

1. A signal strength meter linearity control system for a radio receiver, said radio receiver including an automatic gain control circuit for producing an automatic gain control signal and a signal strength meter coupled for response to said automatic gain control signal; said control system comprising:

current controlling circuit means coupled with said signal strength meter and responsive to a predetermined current control signal for controlling the current flow through said signal strength meter in a predetermined fashion so as to increase the linear range of response of said signal strength meter to the automatic gain control signal; and signalling circuit means coupled with said automatic gain control circuit and



with said current controlling circuit means and responsive to said automatic gain control signal for producing said predetermined current control signal in a predetermined systematic fashion; wherein said current controlling circuit means comprises resistive means and switching means for alternately switching said resistive means into and out of series circuit with said signal strength meter.

4,679,246

#### ONE-SHOT TUNING CIRCUIT

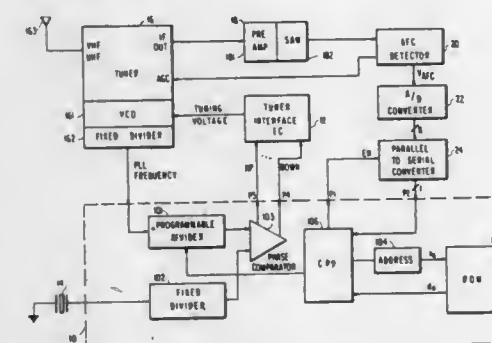
Tzong K. Jeng, North Canton, Ohio, assignor to General Electric Company, Portsmouth, Va.

Filed May 1, 1985, Ser. No. 729,336

Int. Cl. H04B 1/16

U.S. Cl. 455-183

3 Claims



1. In a microprocessor controlled phase locked loop tuning system of the type wherein the microprocessor is responsive to a user input station or channel selection to produce an output to a programmable frequency divider in the phase locked loop which determines the nominal local oscillator frequency and the intermediate frequency of the tuning system is detected to produce an error voltage indicative of the deviation of the intermediate frequency from a designed value, the improvement comprising:

analog-to-digital converter means for converting said error voltage to a digital number; and  
table look-up means addressed by said digital number for providing an offset value for loading in said programmable frequency divider, said programmable frequency divider thereafter providing an output which determines the final local oscillator frequency and the intermediate frequency of the tuning system to complete the tuning process.

4,679,247

#### FM RECEIVER

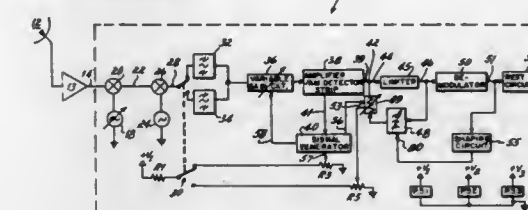
Clyde Washburn, Jr., Cincinnati, Ohio, assignor to Cincinnati Microwave, Inc., Cincinnati, Ohio

Filed Mar. 27, 1985, Ser. No. 717,250

Int. Cl. H04B 1/16; H03D 3/24

U.S. Cl. 455-210

16 Claims



1. An FM receiver including: a limiter adapted to receive on a first input an FM signal having a predetermined center frequency, said limiter having a first output; demodulator means having a second input coupled to said limiter output for providing on a second output signals corresponding to the baseband modulation of said FM signal including the information and the noise therein; signal shaping means responsive to said demodulator means output signals for providing a first control signal component relatively highly correlated to the noise in said baseband modulation, said first control signal component having a relatively low correlation to said information in said baseband modulation; and electrically tunable bandpass filter means connected between said limiter output and said limiter input to provide regenerative feedback around said limiter, said electrically tunable bandpass filter means being responsive to said first control signal component whereby said electrically tunable bandpass filter means is tuned, in part, by said noise.

4,679,248

#### TEST EQUIPMENT FOR SIMULATING MULTIPATH INTERFERENCE

James H. A. McKeown, Ipswich, England, assignor to British Telecommunications public limited company, Great Britain

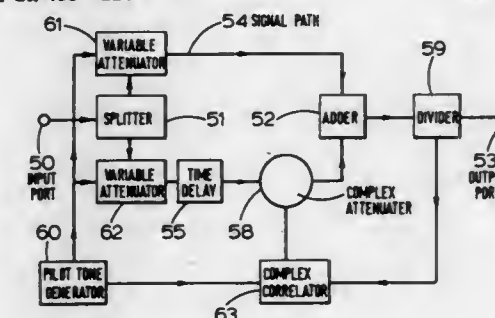
Filed Apr. 2, 1985, Ser. No. 718,978

Claims priority, application United Kingdom, Apr. 4, 1984, 8408620

Int. Cl. H04B 17/00

U.S. Cl. 455-226

26 Claims



1. Equipment for simulating multipath interference of various depths which comprises: (a) first means for simulating multipath interference by simulating a deep notch in the frequency domain response of an input signal transmitted therethrough to produce an intermediate signal; (b) second means for delaying and for combining a delayed or undelayed attenuated copy of said input signal with said intermediate signal to produce an output signal having a

predetermined severity of maximum attenuation at said notch in the frequency domain.

4,679,249

# WAVEGUIDE-TO-MICROSTRIP LINE COUPLING ARRANGEMENT AND A FREQUENCY CONVERTER HAVING THE COUPLING ARRANGEMENT

Toshihide Tanaka, Ikoma; Hiroshi Saka, Osaka; Yoshikazu Yoshimura, Osaka, and Yasuhumi Shiomi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

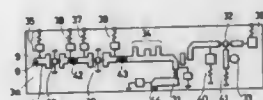
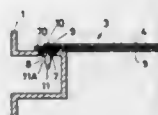
Filed Feb. 14, 1985, Ser. No. 701,912

Claims priority, application Japan, Feb. 15, 1984, 59-26301; Feb. 15, 1984, 59-26302

Int. Cl.<sup>4</sup> H04H 1/26; H01P 5/107

U.S. Cl. 455—328

13 Claims



## 8. A microwave frequency converter comprising:

- a waveguide having a pass band covering an RF signal frequency and a cutoff band covering a local oscillator signal frequency which is lower than that of said RF signal frequency, one end of said waveguide being short-circuited;
- a microwave integrated circuit attached to an outer surface of a wall of said waveguide, said microwave integrated circuit having a microstrip line including a ground plane, a dielectric substrate and a center strip conductor which are stacked in sequence, said center strip conductor having a semicircular end whose radius corresponds to one half the width of said center strip conductor, said microstrip line extending along said outer surface of said wall, extending from the short-circuited end of said waveguide such than said ground plane, is in contact with said waveguide;
- a metallic post having cylindrical portions, said post having one end adjacent to and connected to said center strip conductor, said metallic post extending from a center of a circle defined by said center conductor, said circle having a half portion which corresponds to said semicircular end of said center conductor, to the inside of said waveguide via circular through-holes made in said dielectric substrate, said ground plane, and said wall of said waveguide, said circular through-holes being coaxial with said metallic post, and the diameter of said circular through-hole made in said ground plane being made smaller than that of said circular through-hole made in said wall of said waveguide, said cylindrical portions of said metallic post including a large-diameter portion interposed between first and second small-diameter portions;
- an annular cylindrical dielectric member fitted in said circular through-hole of said wall of said waveguide such that said first small-diameter portion of said metallic post penetrates said annular cylindrical dielectric member and

said annular cylindrical dielectric member is supported by one end surface of said large-diameter portion; and  
(e) a local oscillator and a mixer both formed within said microwave integrated circuit for converting said RF signal from said waveguide into an IF signal.

4,679,250

# OPTICAL REPEATERS

Aurthur A. Davis, Harrold Wood, and Robert W. Eady, London, both of England, assignors to Standard Telephones and Cables plc, London, England

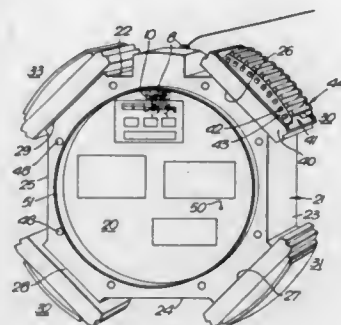
Filed Jan. 18, 1985, Ser. No. 692,394

Claims priority, application United Kingdom, Jan. 19, 1984, 8401432

Int. Cl.<sup>4</sup> H04B 9/00

U.S. Cl. 455—601

6 Claims



1. A digital repeater comprises an outer housing, a chassis within the housing, electrical and opto-electronic components supported on the chassis, said chassis being at a d.c. level different from that of the housing while the repeater is in use, and a plurality of heat transfer arrangements which, when the repeater is in use, transfer heat between the chassis and the housing, each said heat transfer arrangement comprising an electrically insulating heat transfer device able to maintain electrical insulation between the chassis and the housing at a voltage of several thousand volts, and a resiliently-biased metallic element, said insulating heat transfer device being located between the chassis and said resiliently-biased metallic element and comprising an open-box-shaped heat conductive insulator, said metallic element protruding above and in good heat-transfer-connection with said insulator.

4,679,251

# OPTICAL RECEIVER

David P. M. Chown, Great Dunmow, Great Britain, assignor to International Standard Electric Corporation, New York, N.Y.

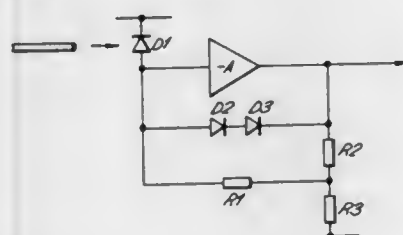
Filed Sep. 30, 1985, Ser. No. 781,831

Claims priority, application United Kingdom, Sep. 29, 1984, 8424642

Int. Cl.<sup>4</sup> H04B 9/00

U.S. Cl. 455—619

3 Claims



1. An optical receiver for the reception of a modulated light beam, which comprises a PIN diode on to which the modulated light beam is directed to produce therein an electrical

current proportional to the modulated beam, an amplifier to an input of which the diode is connected and the output of which is applied to the detection circuitry of the receiver, a resistive load connected across the amplifier, and the series combination of a non-linear Schottky diode and a PIN diode connected across the resistive load, the two series-connected diodes having their cathodes pointing in the same direction, wherein the Schottky diode acts as a dynamic load to prevent saturation of the amplifier under high input signal conditions and the PIN diode minimizes the deleterious effects of the leakage and self-capacitance characteristics of the Schottky diode.

4,679,252

# FIBER OPTIC RECEIVER HAVING A METHOD AND AN APPARATUS FOR DATA CLOCK EXTRACTION

John M. Holland, Shawsville, Va., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 11, 1984, Ser. No. 570,048

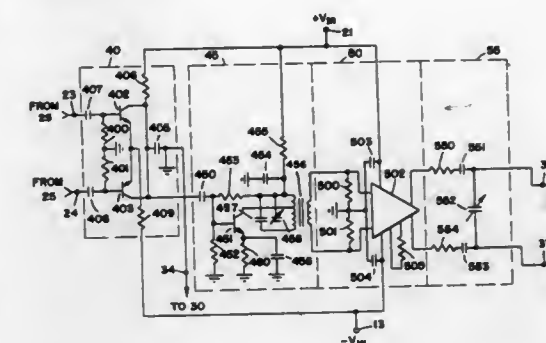
Int. Cl.<sup>4</sup> H04D 9/00

U.S. Cl. 455—619

8 Claims

1. A data clock extractor comprising:  
a full wave rectifier providing an output signal having peaks indicative of transitions in a data stream;

a peak detector for detecting peaks coupled to receive signals from said full wave rectifier;  
an oscillator; and



means, coupled between said peak detector and said oscillator, for synchronizing said oscillator with said peaks from said peak detector to extract a data clock.



**DESIGN PATENTS**

**GRANTED JUL. 7, 1987**

**ERRATA**

**For**  
**CLASS**  
D15-069 .....

**See**  
**PATENT NO.**  
290,711

# DESIGNS

JULY 7, 1987

290,660

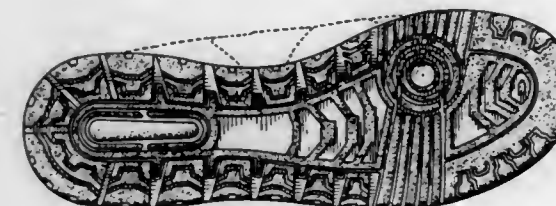
SHOE SOLE

Lawrence Selbiger, Portland, Oreg., assignor to PENSA, Inc.,  
Portland, Oreg.

Filed Aug. 22, 1986, Ser. No. 898,979

Term of patent 14 years

U.S. Cl. D2—320



290,662

MIRROR

Vicki L. Basil, 1825 Morton Ave., Los Angeles, Calif. 90026, and  
Roma Palacios, 444 S. Manhattan Pl., Los Angeles, Calif.  
90020

Filed May 15, 1984, Ser. No. 610,515

Term of patent 14 years

U.S. Cl. D6—310



290,663

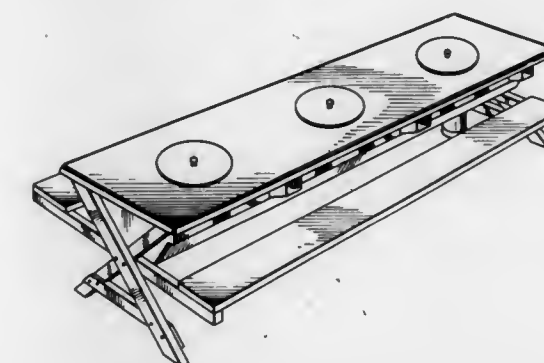
COMBINED PICNIC TABLE AND BARBEQUE GRILL  
Kwan S. Jung, 54-18, 1-Ka, Myong dong, Chung-Ku, Seoul, Rep.  
of Korea

Filed Jan. 4, 1985, Ser. No. 688,860

Claims priority, application Rep. of Korea, Jul. 5, 1984,  
84-7908

Term of patent 14 years

U.S. Cl. D6—337



290,661

CARRIER FOR COLORING BOOKS AND CRAYONS  
Mel Appel, Livingston, and George Kress, Scotch Plains, both of  
N.J., assignors to The Mel Appel Company, Short Hills, N.J.

Filed Nov. 19, 1984, Ser. No. 672,947

Term of patent 14 years

U.S. Cl. D3—73



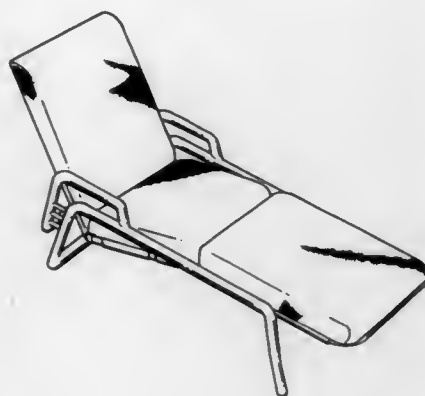


290,664  
CHAISE LOUNGE

Babette L. Strousse, Manhattan Beach, and Stephen H. Kamin-  
ski, Burbank, both of Calif., assignors to Samsonite Corpora-  
tion, Denver, Colo.

Filed Sep. 11, 1984, Ser. No. 649,563  
Term of patent 14 years

U.S. Cl. D6—361



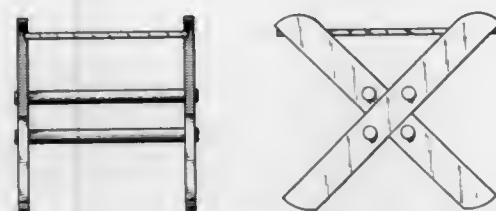
290,666  
SUPPORT STAND

Jacob E. Joseph, 3401 S. Salem Church Rd., Dover, Pa. 17315

Filed Feb. 7, 1985, Ser. No. 699,190

Term of patent 14 years

U.S. Cl. D6—449



290,667

CHEST FREEZER

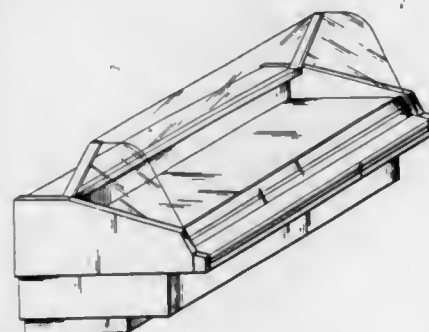
Ivano De Zolt, Bribano, Italy, assignor to Costan S.p.A., Italy

Filed Jul. 26, 1984, Ser. No. 634,508

Claims priority, application Italy, Feb. 6, 1984, 20750/84[U]

Term of patent 14 years

U.S. Cl. D6—472



290,665

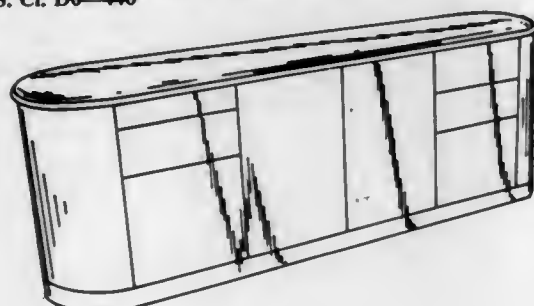
CREDENZA

Warren H. Snodgrass, 223 Woodland Rd., Kentfield, Calif.  
94904

Filed Nov. 16, 1984, Ser. No. 672,014

Term of patent 14 years

U.S. Cl. D6—446



290,668

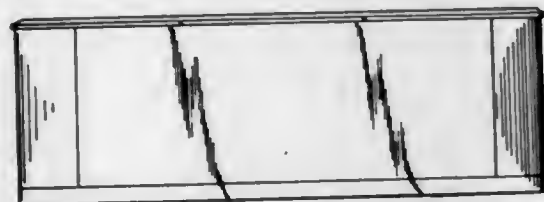
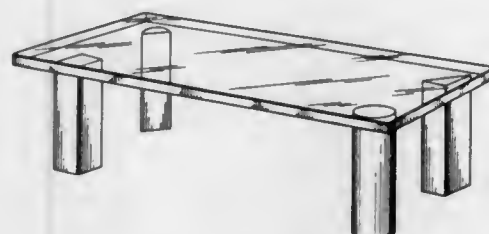
COFFEE TABLE

Maureen E. Lundy, 2401 Pennsylvania Ave., Wilmington, Del.  
19806

Filed Dec. 18, 1984, Ser. No. 682,891

Term of patent 14 years

U.S. Cl. D6—484



290,669

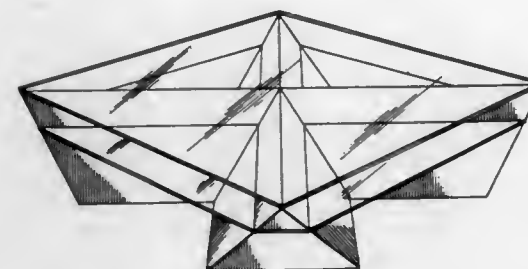
TABLE

Peter Lacoux, Box 85, Oldwick, N.J. 08858

Filed Feb. 11, 1985, Ser. No. 700,461

Term of patent 14 years

U.S. Cl. D6—488



290,670

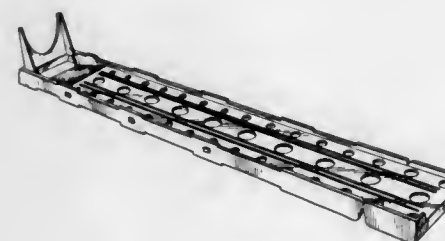
SLIDE TRACK FOR A DISPENSER FOR CANS OR  
BOTTLES

Walter Nathan, Glencoe, and Armand S. Zucker, Skokie, both of  
Ill., assignors to RTC Industries, Inc., Chicago, Ill.

Filed Mar. 26, 1985, Ser. No. 716,327

Term of patent 14 years

U.S. Cl. D6—511



290,673

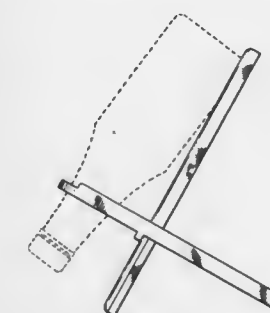
BOTTLE DRAINER RACK

Alex Imatt, 715 Williamsburg Ct., Oak Brook, Ill. 60521

Filed Jun. 11, 1985, Ser. No. 743,665

Term of patent 14 years

U.S. Cl. D7—70



290,671

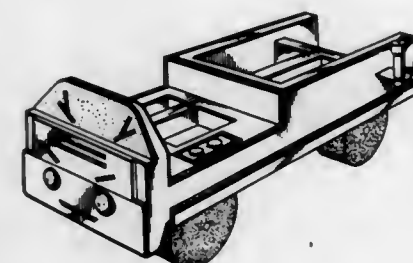
HOLDER FOR TOOTHBRUSHES, TOOTHPASTE AND  
OTHER DENTAL ARTICLES

Eric I. Siegel, 2800 Jasmine Ct., NE., Atlanta, Ga. 30345

Filed Sep. 3, 1985, Ser. No. 772,015

Term of patent 14 years

U.S. Cl. D6—527



290,674

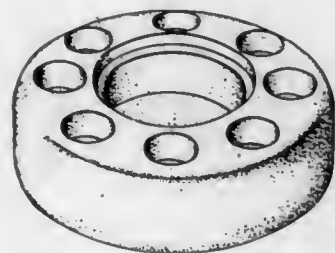
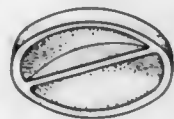
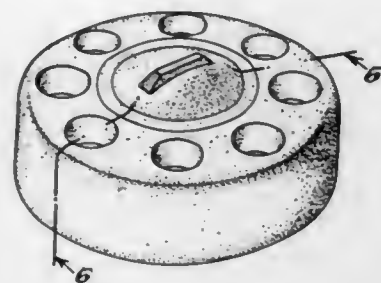
**FLOATABLE TRAY FOR BEVERAGE CONTAINERS**

Jennifer Valov, 8343 Loch Lomond Dr., Pico Rivera, Calif. 90660

Filed Dec. 17, 1984, Ser. No. 682,748

Term of patent 14 years

U.S. Cl. D7-71



290,675

**MICROWAVE OVEN**

Jong S. Choi, Kyungki, Rep. of Korea, assignor to Gold Star Company, Ltd., Seoul, Rep. of Korea

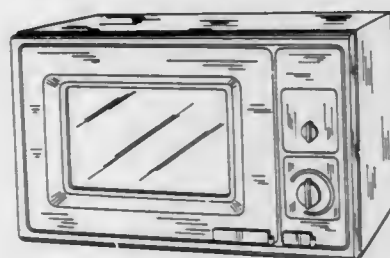
Filed Jul. 5, 1984, Ser. No. 627,903

Claims priority, application Rep. of Korea, Mar. 17, 1984, 2833-84

The portion of the term of this patent subsequent to Aug. 13, 1999, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7-351



290,676

**FOOD PROCESSOR**

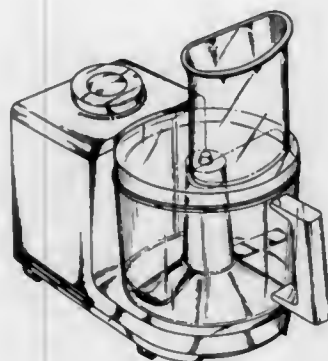
Franz A. Stutzer, and Michael Knochner, both of Offenbach am Main, Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 28, 1984, Ser. No. 675,674

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1984, 5MR 10542

Term of patent 14 years

U.S. Cl. D7-384



290,677

**FOOD PROCESSOR**

Franz A. Stutzer, and Michael Knochner, both of Offenbach am Main, Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 28, 1984, Ser. No. 675,673

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 5MR 10541

Term of patent 14 years

U.S. Cl. D7-384



290,678

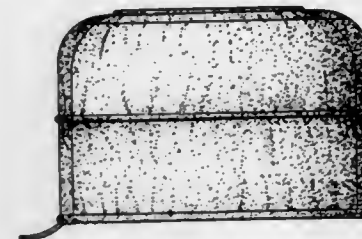
**BARBECUE PIT COVER**

James Johnson, and Edna M. Johnson, both of 1305 Shallowford Rd., Herndon, Va. 22070

Filed Nov. 2, 1983, Ser. No. 482,777

Term of patent 14 years

U.S. Cl. D7-387



290,679

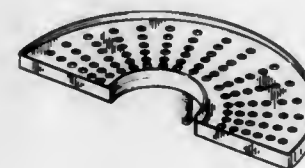
**DRAIN PAN**

James E. Thorpe, 1910 Mineola, Colorado Springs, Colo. 80915

Filed Jun. 11, 1984, Ser. No. 619,307

Term of patent 14 years

U.S. Cl. D7-397



290,680

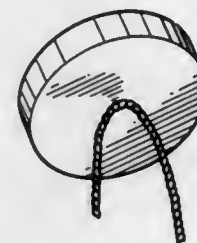
**HYDROPONIC WAFER AND WICK THEREFOR OR SIMILAR ARTICLE**

R. Louis Ware, 2108 Middlefork, Northfield, Ill. 60093

Filed Nov. 9, 1981, Ser. No. 319,288

Term of patent 14 years

U.S. Cl. D8-1



290,681

**CAULKING GUN**

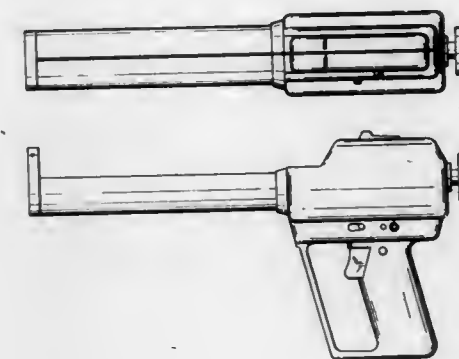
Horst Pudwill, Stolzestr. 14, 3000 Hannover, Fed. Rep. of Germany

Filed Jun. 19, 1984, Ser. No. 622,153

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 82 MR 2654

Term of patent 14 years

U.S. Cl. D8-14.1



290,682

**CORK RETRIEVER**

Jay J. Rogers, 205-470 Granville Street, Vancouver, British Columbia, Canada (V6C 1V5)

Filed Jan. 30, 1985, Ser. No. 696,409

Claims priority, application Canada, Aug. 10, 1984, 10-08-84-12

Term of patent 14 years

U.S. Cl. D8-42



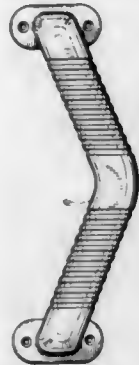


290,683  
GRAB BAR

Adrian Dartnall, Loughborough, England, assignor to Gordon Ellis & Company, Derbyshire, England  
Filed Aug. 9, 1985, Ser. No. 764,190  
Claims priority, application United Kingdom, Mar. 1, 1985, 1025345

Term of patent 14 years

U.S. Cl. D8—319

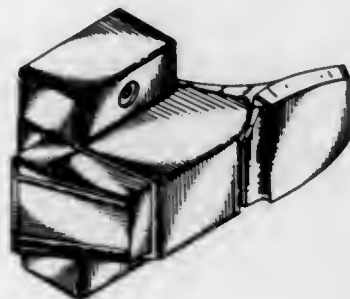


290,684  
DOOR LATCH

Leo F. Wildgen, Minneapolis, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.  
Filed Dec. 21, 1984, Ser. No. 684,615

Term of patent 14 years

U.S. Cl. D8—331

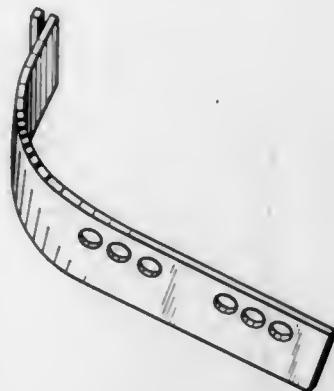


290,685  
SHOWER CURTAIN HOLDER

Herbert A. Houston, 1280 Wylie Rd., West Chester, Pa. 19380  
Filed Jul. 2, 1984, Ser. No. 627,224

Term of patent 14 years

U.S. Cl. D8—368



290,686  
BOTTLE

John R. Board, Sherburn in Elmet, England, assignor to Samuel Smith Old Brewery, Tadcaster, England  
Filed Oct. 29, 1984, Ser. No. 665,956

Claims priority, application United Kingdom, Aug. 29, 1984, 1021767

Term of patent 14 years

U.S. Cl. D9—355



290,687  
PERFUME BOTTLE

Jacques Llorente, La Garenne Colombes, France, assignor to Comptoir Nouveau de la Parfumerie, Paris, France  
Filed Jan. 23, 1985, Ser. No. 693,943

Claims priority, application France, Aug. 2, 1984, 843 466

Term of patent 14 years

U.S. Cl. D9—385



290,688  
CAN

Thomas E. Moloney, Wheaton; Nelson N. Chernikoff, Richton Park; Edward S. Traczyk, Lockport; Michael M. Shulski, Northfield; Edward K. Cassidy, Palatine, and John M. Mann, Downers Grove, all of Ill., assignors to National Can Corporation, Chicago, Ill.  
Continuation-in-part of Ser. No. 523,514, Aug. 15, 1983, Pat. No. Des. 283,011. This application Mar. 28, 1984, Ser. No. 594,610

Term of patent 14 years

U.S. Cl. D9—398



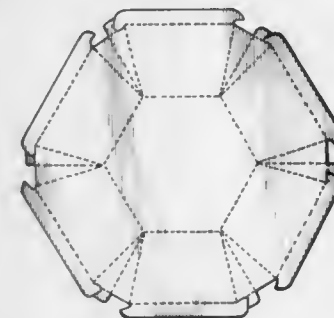
290,689  
BLANK FOR HEXAGONAL TRAY

Hampton E. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,204

Term of patent 14 years

U.S. Cl. D9—433



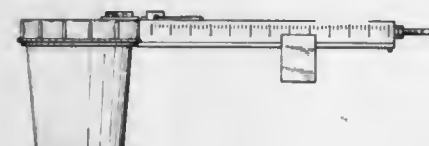
290,690  
SEED SCALE

James W. McDowell, General Delivery, Gordondale, Alberta, Canada (T0H 1V0)

Filed Dec. 3, 1984, Ser. No. 677,944

Term of patent 14 years

U.S. Cl. D10—90



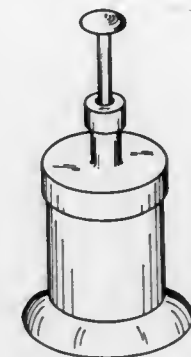
290,691  
BINGO CHIP BELL

William Coralline, 5235 W. Wabash Ave., Brown Deer, Wis. 53223

Filed Dec. 18, 1984, Ser. No. 683,001

Term of patent 14 years

U.S. Cl. D10—116

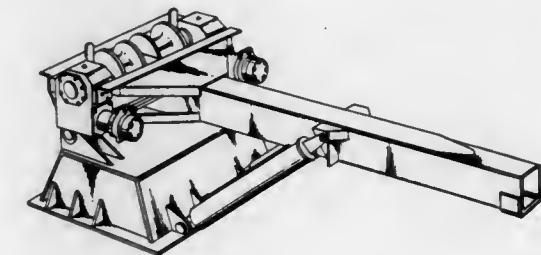


290,692  
HYDRAULIC WRECKER AND BOOM HOUSING  
Fleming V. Cannon, Jr., Flintstone, Ga., assignor to Dover Corporation, Chattanooga, Tenn.

Filed Dec. 14, 1984, Ser. No. 681,900

Term of patent 14 years

U.S. Cl. D12—14

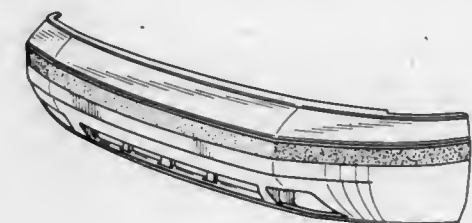


290,693  
FRONT BUMPER FOR AN AUTOMOBILE  
Tokno Fukulchi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 5, 1985, Ser. No. 762,538

Term of patent 14 years

U.S. Cl. D12—169



290,694

**PROGRAMMABLE CONTROLLER**

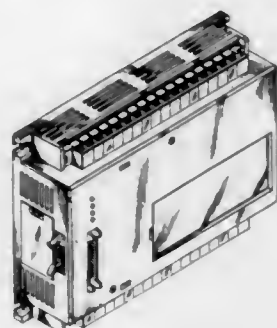
Norio Shimizu, and Yuichi Watanabe, both of Tokyo, Japan, assignors to Koyo Electronics Industries Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 696,192

Claims priority, application Japan, Aug. 27, 1984, 59-35404

Term of patent 14 years

U.S. Cl. D13—12



290,695

**VIDEO CASSETTE RECORDER**

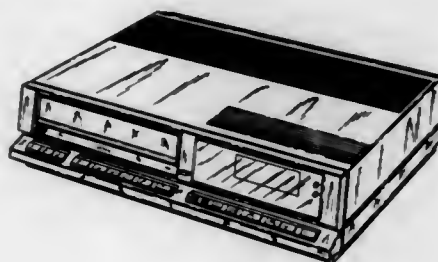
Peter J. Doodson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,889

Claims priority, application United Kingdom, Oct. 12, 1984, 1,022,653

Term of patent 14 years

U.S. Cl. D14—2



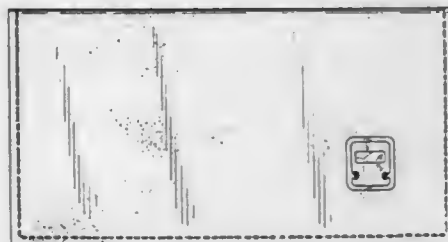
290,696

**COMBINED CHECKBOOK HOLDER WITH TIMEPIECE**  
Eric W. Lund, and Raymond W. Young, both of West Bend, Wis., assignors to Amity Leather Products Company, West Bend, Wis.

Filed Sep. 4, 1984, Ser. No. 647,103

Term of patent 14 years

U.S. Cl. D19—11



290,697

**SPEAKER**

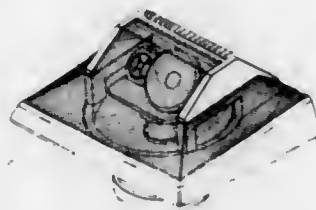
Akio Tanaka, Aichi, and Akira Katsuno, Tokyo, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,621

Claims priority, application Japan, Apr. 25, 1984, 59-16981

Term of patent 14 years

U.S. Cl. D14—30



290,698

**LOUDSPEAKER**

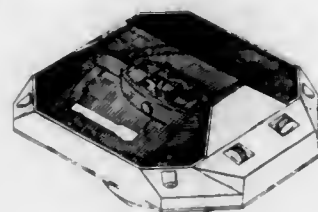
Yon Takagi, Kanagawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,588

Claims priority, application Japan, May 30, 1984, 59-22075

Term of patent 14 years

U.S. Cl. D14—30



290,699

**LOUDSPEAKER**

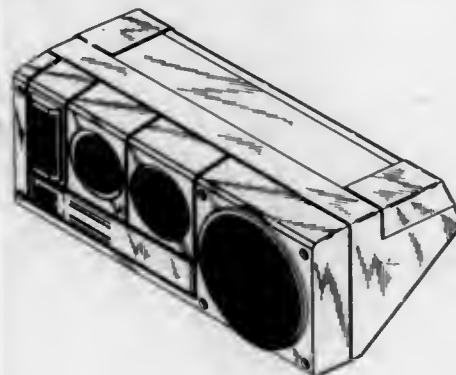
Hitoshi Nakamura, and Tetsuo Ohtsuji, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 11, 1984, Ser. No. 659,758

Claims priority, application Japan, Apr. 12, 1984, 59-14684

Term of patent 14 years

U.S. Cl. D14—34



290,700

**TELEPHONE SET**

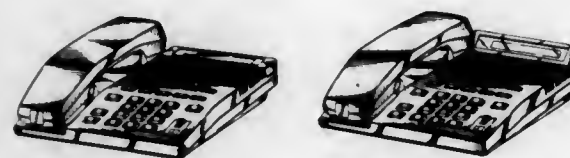
Richard Lindahl, Malmö, Sweden, assignor to Televerket, Farsta, Sweden

Filed Mar. 27, 1985, Ser. No. 716,420

Claims priority, application Sweden, Oct. 1, 1984, M84-2627

Term of patent 14 years

U.S. Cl. D14—53



290,701

**RADIO TUNER**

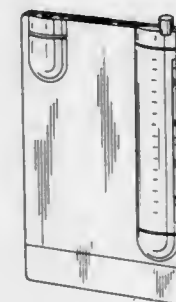
Masanori Hamada; Takao Okada; Takako Uchida, all of Osaka, and Kikuo Ohta, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 22, 1984, Ser. No. 663,618

Claims priority, application Japan, May 8, 1984, 59-18718

Term of patent 14 years

U.S. Cl. D14—68



290,702

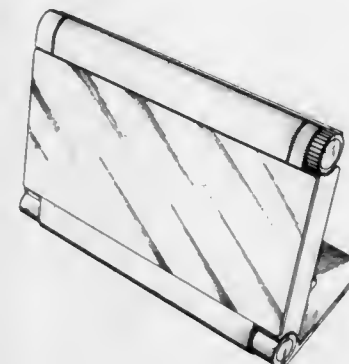
**DISPLAY TERMINAL**

Timothy R. Stern, Southfield, Mich., and Vladimir Selepouchin, Cedar Grove, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1984, Ser. No. 683,683

Term of patent 14 years

U.S. Cl. D14—113



290,703

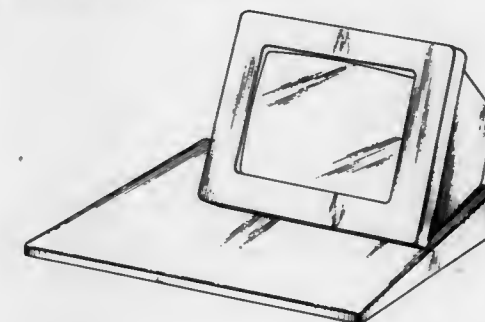
**COMPUTER DISPLAY TERMINAL OR SIMILAR ARTICLE**

Alvin D. Day, San Jose, Calif.; Stephen G. Miggels, Wyckoff, N.J.; Michael J. Nattall, Palo Alto, Calif., and Gordon E. Sylvester, Jamaica, N.Y., assignors to American Telephone and Telegraph Company, New York, N.Y.; AT&T Information Systems Inc., Morristown, N.J. and Convergent Technologies, Inc., Santa Clara, Calif.

Filed Mar. 22, 1985, Ser. No. 715,191

Term of patent 14 years

U.S. Cl. D14—113



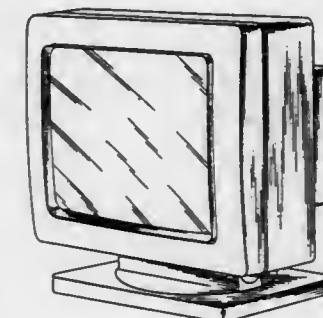
290,704

**CRT DISPLAY MONITOR OR SIMILAR ARTICLE**  
David L. Schaum, Woodstock, N.Y., and Joseph P. Taylor, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 10, 1985, Ser. No. 733,277

Term of patent 14 years

U.S. Cl. D14—113



290,705

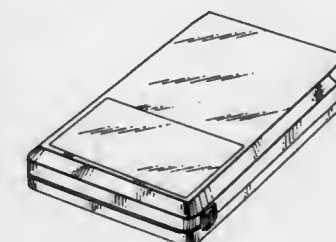
**ROM CARTRIDGE FOR LASER BEAM PRINTER**  
Takashi Yomo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,764

Claims priority, application Japan, Dec. 1, 1983, 58-52188

Term of patent 14 years

U.S. Cl. D14—114

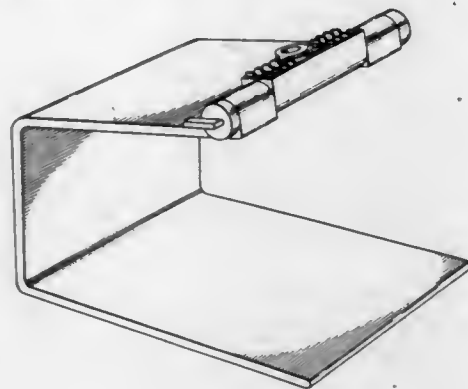




290,706  
MONITOR STAND

Stephen Peart, Los Gatos, and Man Van-Dinh, Campbell, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.  
Filed Apr. 20, 1984, Ser. No. 602,655  
Term of patent 14 years

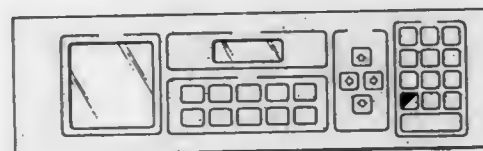
U.S. Cl. D14—114



290,707  
KEYBOARD AND DISPLAY PANEL FOR  
INTERSECTION CONTROLLER

Robert S. Allen, Livermore; Richard G. Freeman, Pleasanton, and Thomas W. Seabury, Diablo, all of Calif., assignors to Multisonics, Inc., Dublin, Calif.  
Filed May 23, 1984, Ser. No. 613,129  
Term of patent 14 years

U.S. Cl. D14—115

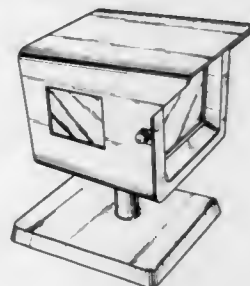


290,708  
APPARATUS FOR CONVERTING MOVIE FILMS TO  
VIDEO TAPE

Arthur Rea, Oyster Bay, N.Y., assignor to B.P. Electronics, Inc., Hauppauge, N.Y.

Filed Jan. 10, 1985, Ser. No. 690,139  
Term of patent 14 years

U.S. Cl. D16—14



290,709  
SHOULDER-STOCK SCOPE AND CAMERA MOUNT

John D. Hedrick, 11304 Redcedar Dr., San Diego, Calif. 92131  
Filed Apr. 23, 1985, Ser. No. 726,696  
Term of patent 14 years

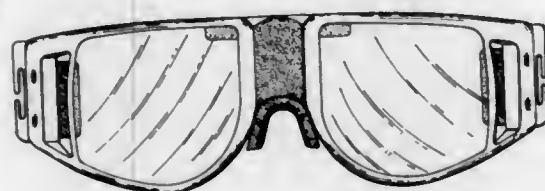
U.S. Cl. D16—44



290,710  
ATHLETIC GOGGLES

Alvino Aliberti, 64 Mill St., Southbridge, Mass. 01550  
Filed Jul. 16, 1984, Ser. No. 631,409  
Term of patent 14 years

U.S. Cl. D16—107



290,711  
SEWING MACHINE

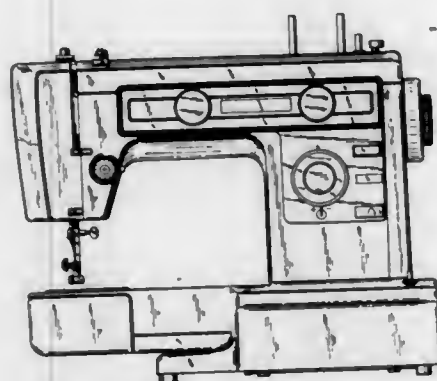
Koji Uchida, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 584,093

The portion of the term of this patent subsequent to Jun. 9, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D15—69



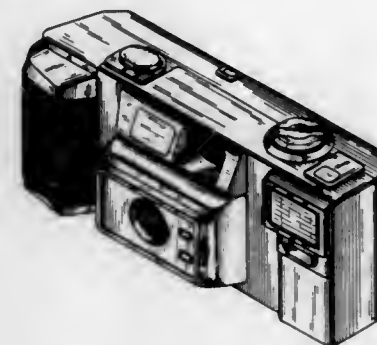
290,712  
CAMERA

Tom Y. Shis, Taipei, Taiwan, assignor to Wizen Industry Co., Ltd., Taipei, Taiwan

Filed Sep. 13, 1984, Ser. No. 650,054

Term of patent 14 years

U.S. Cl. D16—6



290,713  
TYPEWRITER

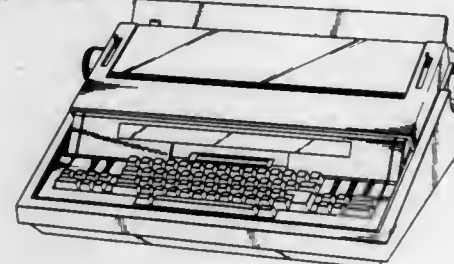
Isshin Miyamoto; Yasuo Nagamatsu; Toshiya Miroshima, and Masaharu Sakamoto, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 29, 1985, Ser. No. 696,128

Claims priority, application Japan, Jul. 31, 1984, 59-32913

Term of patent 14 years

U.S. Cl. D18—1



290,714  
COMBINED TYPEWRITER AND GRAPHMAKER

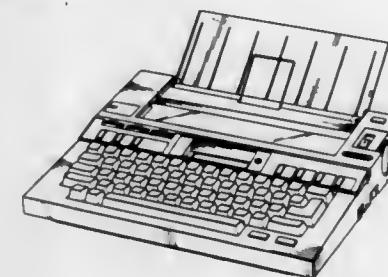
Isshin Miyamoto; Yasuo Nagamatsu; Toshiya Morioka, and Masaharu Sakamoto, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 25, 1985, Ser. No. 694,736

Claims priority, application Japan, Jul. 30, 1984, 59-32297

Term of patent 14 years

U.S. Cl. D18—1



290,715  
INK RIBBON CASSETTE

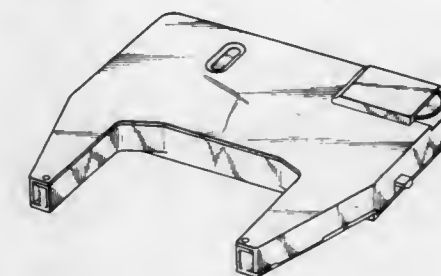
Seiichi Omioo, Tokyo, and Noboru Shimoyama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1985, Ser. No. 745,224

Claims priority, application Japan, Dec. 20, 1984, 59-52575

Term of patent 14 years

U.S. Cl. D18—12



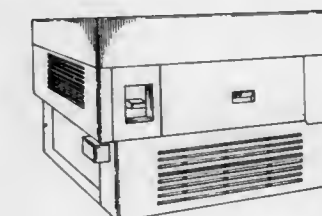
290,716  
LASER PRINTER

Stephen Peart, Los Gatos; Sigmar Willnauer, Campbell, and Terrence B. Christensen, Mountain View, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jul. 2, 1985, Ser. No. 751,316

Term of patent 14 years

U.S. Cl. D18—13



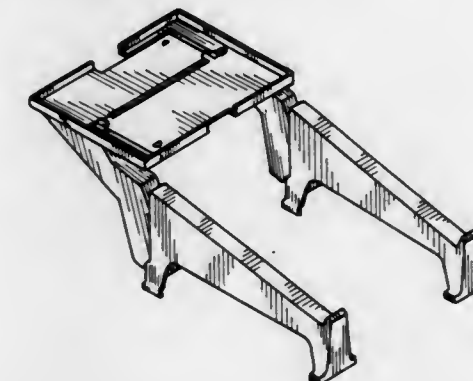
290,717  
PRINTER STAND

Thomas W. Judd, Peterborough, N.H., assignor to Curtis Manufacturing Company, Inc., Peterborough, N.H.

Filed Nov. 3, 1986, Ser. No. 926,408

Term of patent 14 years

U.S. Cl. D18—23



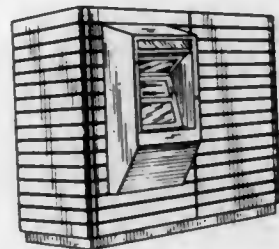
290,718  
VENDING MACHINE

Kim D. Nyegaard, and Ib Nyegaard, both of 8380 Miramar Rd.,  
#200, San Diego, Calif. 92126

Filed Sep. 27, 1984, Ser. No. 655,143

Term of patent 14 years

U.S. Cl. D20-1



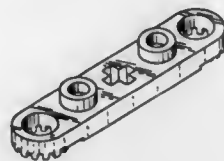
290,721  
TOY CONSTRUCTION PIECE

Jan Ryaa, Billund, and Ole V. Poulsen, Vejle, both of Denmark,  
assignors to Interlego A.G., Baar, Switzerland

Filed Dec. 4, 1985, Ser. No. 805,308

Term of patent 14 years

U.S. Cl. D21-108



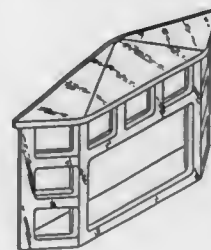
290,722  
SIMULATIVE TOY CONSTRUCTION ELEMENT

Philip M. Kushner, Greve Strand, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Dec. 4, 1985, Ser. No. 805,350

Term of patent 14 years

U.S. Cl. D21-108



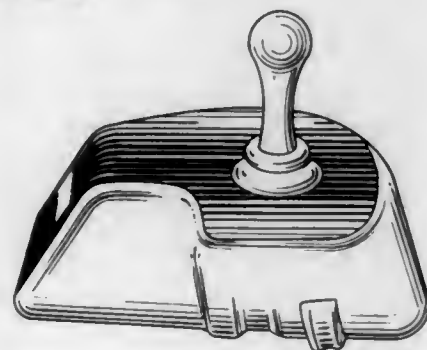
290,719  
COMPUTER JOYSTICK

Wynford Holloway, Wavell Close, United Kingdom, assignor to  
Creative Devices Research, Ltd., Tredegar Gwent, United  
Kingdom

Filed May 8, 1986, Ser. No. 862,396

Term of patent 14 years

U.S. Cl. D21-48



290,723  
RECONFIGURABLE TOY VEHICLE

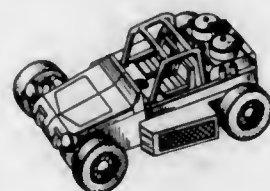
Akio Kitamura, Tokyo, Japan, assignor to Takara Co., Ltd.,  
Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 715,064

Claims priority, application Japan, Oct. 25, 1984, 59-44102

Term of patent 14 years

U.S. Cl. D21-150



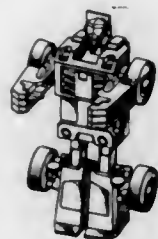
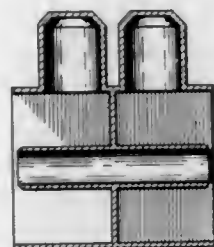
290,720  
TOY CONSTRUCTION BLOCK

Vic Bertrand, Dollard-des-Ormeaux, Canada, assignor to The  
Ritvik Group Inc., Dorval, Canada

Filed Dec. 2, 1985, Ser. No. 803,479

Term of patent 14 years

U.S. Cl. D21-108



290,724  
DOLL

Howard N. Bollinger; Susan M. Holthaus; Cathy L. Veness;  
Andrea McSweeney, all of Cincinnati, Ohio; Cheryl L. Cozad,  
Lenexa, Kans., and Yacoba C. Oliver, Raytown, Mo., assign-  
ors to Kenner Parker Toys Inc., Beverly, Mass.

Filed Feb. 8, 1985, Ser. No. 699,693

Term of patent 14 years

U.S. Cl. D21-166



290,726  
DOLL

Howard N. Bollinger; Susan M. Holthaus; Cathy L. Veness;  
Jane C. Abbott, all of Cincinnati, Ohio; Michael J. Spindle,  
Camarillo, Calif.; Cheryl L. Cozad, Lenexa, Kans.; Yacoba C.  
Oliver, Raytown; Geraldine Oliveira, Kansas City, both of  
Mo., and Jeanne Slater, Fairway, Kans., assignors to Kenner  
Parker Toys Inc., Beverly, Mass.

Filed Feb. 8, 1985, Ser. No. 699,691

Term of patent 14 years

U.S. Cl. D21-166



290,727  
CLOWN IN A BARREL FIGURE

Patrick Rylands, London, England, assignor to Simon Gompes  
Filed Dec. 31, 1984, Ser. No. 687,917

Term of patent 14 years

U.S. Cl. D21-173



290,725  
DOLL

Howard N. Bollinger; Susan M. Holthaus; Cathy L. Veness;  
Jane C. Abbott, all of Cincinnati, Ohio; Michael J. Spindle,  
Camarillo, Calif.; Cheryl L. Cozad, Lenexa, Kans.; Yacoba C.  
Oliver, Raytown; Geraldine Oliveira, Kansas City, both of  
Mo., and Jeanne Slater, Fairway, Kans., assignors to Kenner  
Parker Toys Inc., Beverly, Mass.

Filed Feb. 8, 1985, Ser. No. 699,697

Term of patent 14 years

U.S. Cl. D21-166

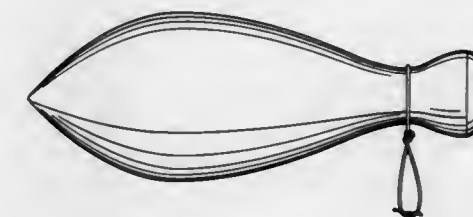


290,728  
INFLATABLE CLUB

Henry L. Einhorn, 3446 Page St., San Diego, Calif. 92115  
Filed Oct. 19, 1984, Ser. No. 662,904

Term of patent 14 years

U.S. Cl. D21-211





290,729

## INFLATABLE CLUB

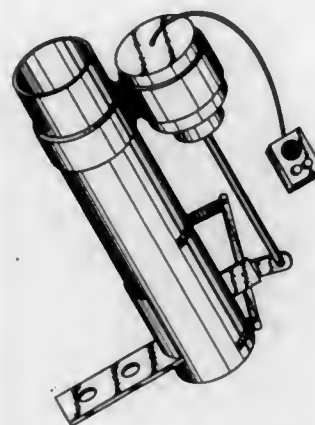
Henry L. Einhorn, 3446 Page St., San Diego, Calif. 92115  
 Filed Oct. 22, 1984, Ser. No. 663,553  
 Term of patent 14 years  
 U.S. Cl. D21—211



290,731

## BUOY MARKER LAUNCHER

Albert E. Canady, P.O. Box 282, Midland, Ind. 47445  
 Filed Oct. 26, 1984, Ser. No. 665,147  
 Term of patent 14 years  
 U.S. Cl. D22—113



290,732

## FISHING REEL SPOOL

Kaname Yamaguchi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan  
 Filed Dec. 28, 1984, Ser. No. 687,399  
 Claims priority, application Japan, Jul. 17, 1984, 59-29756  
 Term of patent 14 years  
 U.S. Cl. D22—137

290,730

## GOLF CLUB GRIP

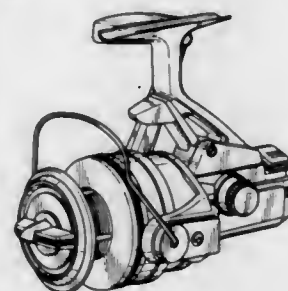
Karsten Solheim, 501 Wakonda Ln., Phoenix, Ariz. 85023  
 Filed Feb. 7, 1985, Ser. No. 699,329  
 Term of patent 14 years  
 U.S. Cl. D21—222



290,733

## FISHING REEL

Kanji Inuma, Tokyo, Japan, assignor to Daiwa Seiko Inc., Tokyo, Japan  
 Filed Nov. 28, 1984, Ser. No. 675,590  
 Claims priority, application Japan, May 28, 1984, 59-21702  
 Term of patent 14 years  
 U.S. Cl. D22—141



290,734

## FISHING ROD

Yoshiyuki Matsui, Higashi-Kurume, Japan, assignor to Daiwa Seiko, Inc., Japan  
 Filed Oct. 30, 1984, Ser. No. 666,294  
 Claims priority, application Japan, May 2, 1984, 59-17864  
 Term of patent 14 years  
 U.S. Cl. D22—142



290,736

## HANDLE FOR A FAUCET

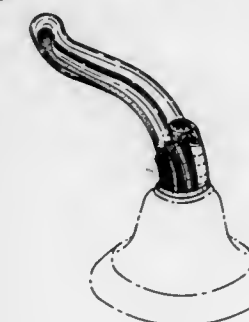
Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.  
 Filed Jul. 12, 1985, Ser. No. 754,604  
 Term of patent 14 years  
 U.S. Cl. D23—28



290,737

## FAUCET HANDLE

Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.  
 Filed Jul. 12, 1985, Ser. No. 754,605  
 Term of patent 14 years  
 U.S. Cl. D23—29



290,735

## FISHING ROD

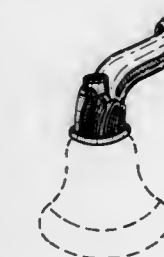
Yoshiyuki Matsui, Higashi-Kurume, Japan, assignor to Daiwa Seiko, Inc., Japan  
 Filed Oct. 30, 1984, Ser. No. 666,549  
 Claims priority, application Japan, May 2, 1984, 59-17862  
 Term of patent 14 years  
 U.S. Cl. D22—142



290,738

## FAUCET HANDLE

Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.  
 Filed Oct. 3, 1985, Ser. No. 784,327  
 Term of patent 14 years  
 U.S. Cl. D23—29



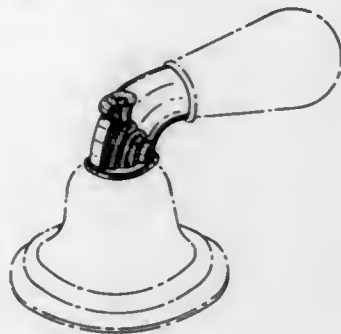
290,739

## HEAD FOR A FAUCET HANDLE

Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Dec. 6, 1985, Ser. No. 806,087  
Term of patent 14 years

U.S. Cl. D23—29



290,740

## FAUCET HANDLE

Holly K. Yost, Van Nuys, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.

Filed Mar. 7, 1985, Ser. No. 709,126  
Term of patent 14 years

U.S. Cl. D23—29



290,741

## SINK SPRAYER

Larry I. Fairchild, New Wilmington, Pa., assignor to Universal-Rundle Corporation, New Castle, Pa.

Filed Nov. 12, 1985, Ser. No. 804,800  
Term of patent 14 years

U.S. Cl. D23—35



290,742

## GAS FIRE

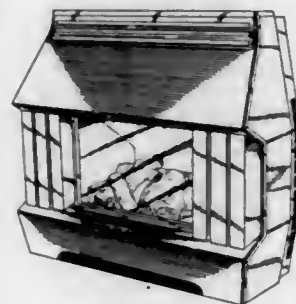
Roger Tucker, Kidderminster; Paul A. Gillam, Great Barr; Peter Wright, Sutton Coldfield; Donald Whitehouse, Castle Bromwich; Michael C. Broadbent, West Heath, and Charles Moran, Willenhall, all of England, assignors to Valor Heating Limited, London, England

Filed Mar. 20, 1985, Ser. No. 714,074

Claims priority, application United Kingdom, Oct. 3, 1984, 1022430; Nov. 7, 1984, 1023151

Term of patent 14 years

U.S. Cl. D23—97



290,743

## HEATING STOVE

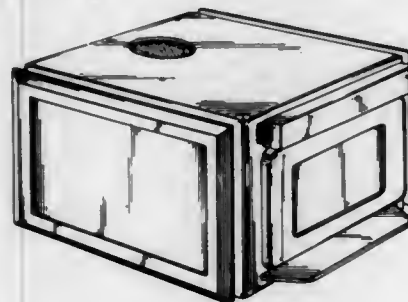
Graeme J. Ord, and Robert N. Lockhart, both of Auckland, New Zealand, assignors to Kent Heating Limited, Mangere, New Zealand

Filed Nov. 14, 1984, Ser. No. 671,285

Claims priority, application New Zealand, May 18, 1984, 19109

Term of patent 14 years

U.S. Cl. D23—97



290,744

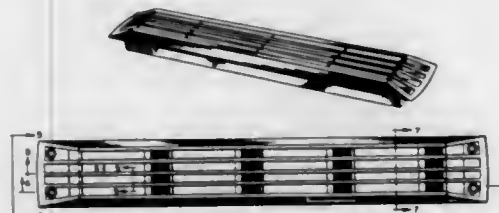
## VENTURI LOUVERED VENT

Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.

Filed May 6, 1985, Ser. No. 730,795

Term of patent 14 years

U.S. Cl. D23—115



290,745

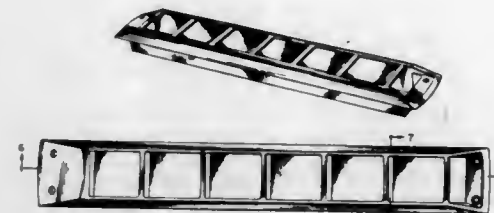
## LOUVERED BOAT VENT

Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.

Filed May 6, 1985, Ser. No. 730,801

Term of patent 14 years

U.S. Cl. D23—115



290,746

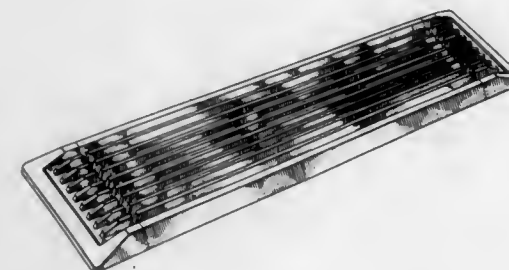
## LOUVERED VENT FOR BOATS

Warwick M. Whitley, II, Lynn Haven, Fla., assignor to Attwood Corporation, Lowell, Mich.

Filed Aug. 1, 1986, Ser. No. 891,678

Term of patent 14 years

U.S. Cl. D23—115



290,747

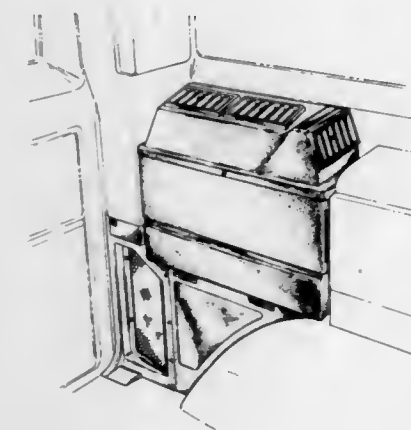
## HOUSING FOR AUTOMOTIVE AIR CONDITIONER

Robert H. Tigner, Arlington, and Carl C. Richardson, Fort Worth, both of Tex., assignors to A.R.A. Manufacturing Company of Delaware, Inc., Grand Prairie, Tex.

Filed Nov. 1, 1985, Ser. No. 794,405

Term of patent 14 years

U.S. Cl. D23—142



290,748

## COMBINED CEILING FAN AND LIGHT

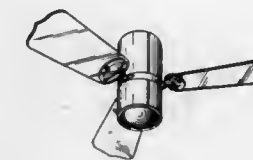
Yuzo Kawai, Naraken, Japan, assignor to Kabushiki Kaisha Suiden, Tennojiku, Japan

Filed Sep. 30, 1985, Ser. No. 781,877

Claims priority, application Japan, May 30, 1985, 60-22767

Term of patent 14 years

U.S. Cl. D23—158



290,749

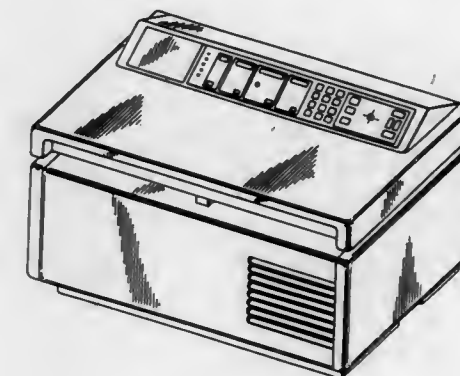
## CENTRIFUGE

Günter Eberle, Tuttlingen, Fed. Rep. of Germany, assignor to Firma Andreas Hettich, Tuttlingen, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 645,971

Term of patent 14 years

U.S. Cl. D24—22



290,750

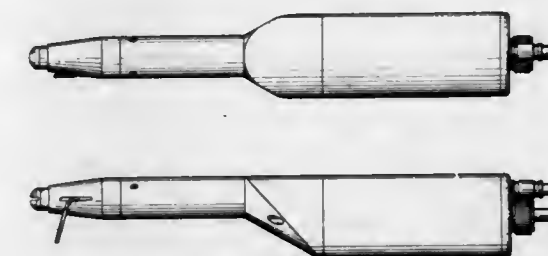
## SURGICAL SAW HANDPIECE

Paul DiCarlo, Jacksonville, Fla., and John Halt, Aurora, Colo., assignors to Xomed Inc., Jacksonville, Fla.

Filed May 3, 1984, Ser. No. 606,792

Term of patent 14 years

U.S. Cl. D24—28





290,751

**ELECTRICAL BODY STIMULATOR**

Anthony P. Montalbano, Glen Cove, and David E. Conroy, City Island, both of N.Y., assignors to Bioelectron, Inc., Hackensack, N.J.

Filed May 7, 1984, Ser. No. 607,460  
Term of patent 14 years

U.S. Cl. D24-41



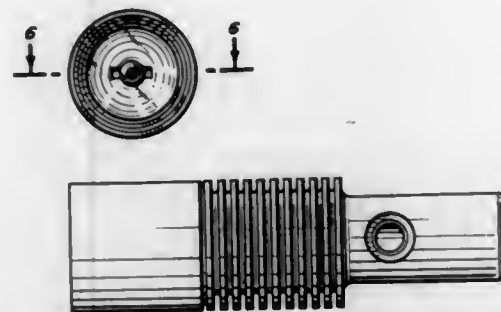
290,754

**LIGHTING FIXTURE**

Hiroshi Kira, 6135 Fairview Pl., Agoura, Calif. 91301  
Filed May 17, 1985, Ser. No. 735,271

Term of patent 14 years

U.S. Cl. D26-24



290,752

**SYNTHETIC RESIN TUBE**

Kouji Inoue, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,725

Claims priority, application Japan, Jul. 25, 1984, 59-31236

Term of patent 14 years

U.S. Cl. D25-73

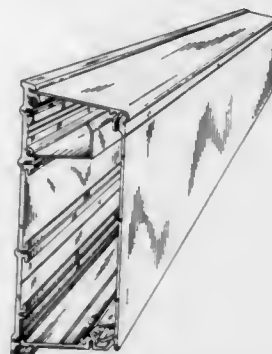
290,753  
PANEL

Lars A. H. Nilsson, Bagshot, England, assignor to M.T.D. Medical Technology and Development Ltd., Nicosia, Cyprus  
Filed Mar. 21, 1984, Ser. No. 591,700

Claims priority, application Sweden, Sep. 21, 1983, 83-2433  
Int. Cl. D25-80

Term of patent 14 years

U.S. Cl. D25-80



290,755

**MINI FLUORESCENT LANTERN**

Kung C. Hung, Tsuen Wan, Hong Kong, assignor to Freezinhot Bottle Co., Ltd., Tsuen Wan, Hong Kong  
Filed Sep. 27, 1984, Ser. No. 655,054

Claims priority, application United Kingdom, Sep. 4, 1984, 1021889

Term of patent 14 years

U.S. Cl. D26-42



290,756

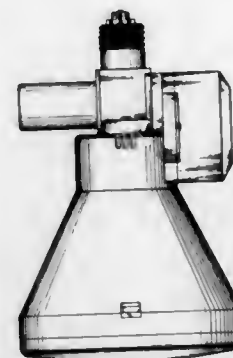
**FLUORESCENT LIGHT FOR RECESSED LIGHTING OR THE LIKE**

Roy K. Fujitaki, Altadena, and Hiroshi Fukushima, Monterey Park, both of Calif.

Filed Aug. 16, 1984, Ser. No. 641,533

Term of patent 14 years

U.S. Cl. D26-74



290,757

**LIGHTER**

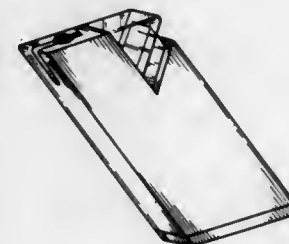
Franz A. Stützer, Offenbach am Main, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Jul. 23, 1985, Ser. No. 758,212

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 5 MR 10587

Term of patent 14 years

U.S. Cl. D27-36



290,759

**CASE FOR COSMETIC PRODUCTS**

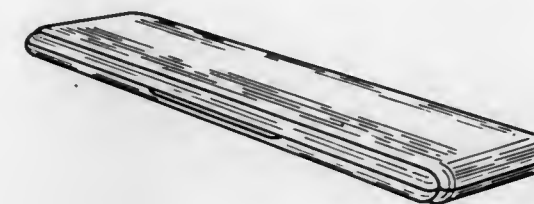
Roberto Trabattini, Petit-Lancy, Switzerland, assignor to Trasi S.A., Petit-Lancy, Switzerland

Filed Aug. 14, 1984, Ser. No. 640,691

The portion of the term of this patent subsequent to Dec. 9, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D28-83

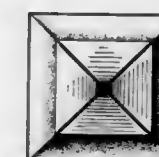
290,760  
COMPACT

Janis Goberman, New York, N.Y., assignor to L'Oreal, S.A., Paris, France

Filed Feb. 4, 1985, Ser. No. 697,780

Term of patent 14 years

U.S. Cl. D28-83



290,758

**ELECTRIC SHAVER**

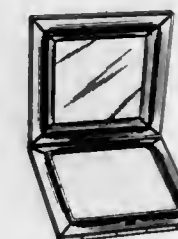
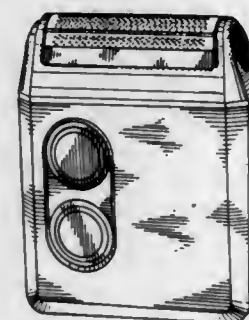
Toyomi Arita, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Mar. 21, 1985, Ser. No. 714,718

Claims priority, application Japan, Sep. 27, 1984, 59-40169

Term of patent 14 years

U.S. Cl. D28-49

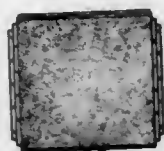


290,761  
COSMETIC COMPACT

Janis Goberman, New York, N.Y., assignor to L'Oreal, S.A., Mark L. Walsh, Chicago, Ill., assignor to Dacor Corporation, North Chicago, Ill.

Filed Jun. 12, 1985, Ser. No. 744,111  
Term of patent 14 years

U.S. Cl. D28—83

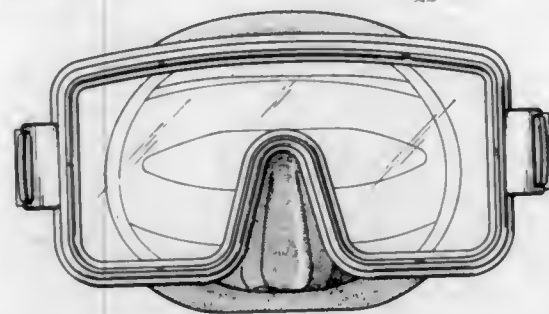


290,763  
DIVING MASK

Mark L. Walsh, Chicago, Ill., assignor to Dacor Corporation, North Chicago, Ill.

Filed Apr. 30, 1984, Ser. No. 605,145  
Term of patent 14 years

U.S. Cl. D29—9

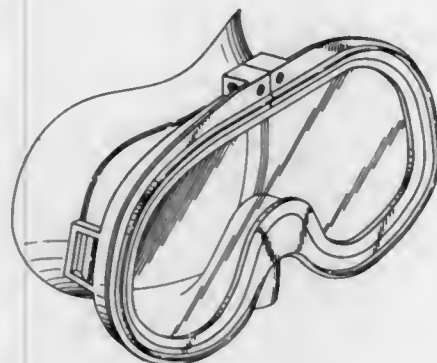


290,764  
AVIATOR-STYLE SWIM MASK

Steven M. Berenson, Sharon, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.

Filed Feb. 25, 1985, Ser. No. 704,604  
Term of patent 14 years

U.S. Cl. D29—9



290,762  
LIPSTICK DISPENSER

Thomas F. Holloway, Southbury, Conn., assignor to Risdon Corporation, Naugatuck, Conn.

Filed Jun. 10, 1985, Ser. No. 742,932  
Term of patent 14 years

U.S. Cl. D28—89

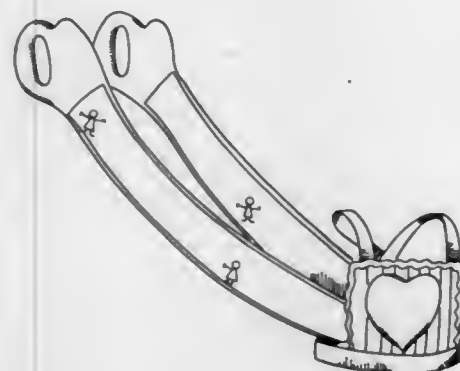


290,765  
CHILD RESTRAINT HARNESS

Anne E. Callahan, 1618 Peruvian La., Winter Park, Fla. 32792

Filed Aug. 13, 1984, Ser. No. 639,707  
Term of patent 14 years

U.S. Cl. D29—11



290,766  
FOREARM PROTECTOR

Alfred R. Pierce, Jr., 25 Argyle Ave., Blackwood, N.J. 08012

Filed Dec. 31, 1984, Ser. No. 687,746  
Term of patent 14 years

U.S. Cl. D29—20

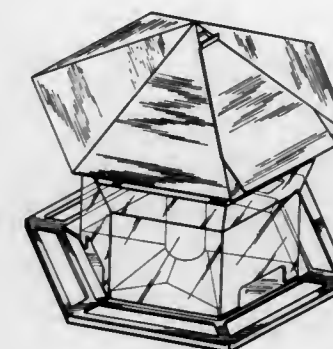


290,769  
BIRD FEEDER

William D. Taylor, Whitefish, Mont., assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Jun. 15, 1984, Ser. No. 621,281  
Term of patent 14 years

U.S. Cl. D30—13

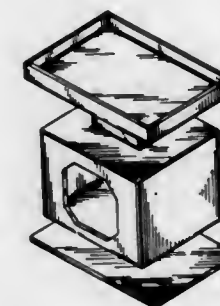


290,767  
COMBINED CAT HOUSE AND PLATFORM

Michael A. Duffek, 1240 Hadsell Ave., Vineland, N.J. 08360

Filed Aug. 12, 1985, Ser. No. 764,307  
Term of patent 14 years

U.S. Cl. D30—1

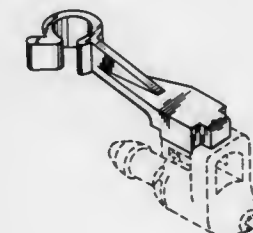


290,770  
STABILIZING ARM FOR POULTRY WATERING UNITS

Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.

Filed Jan. 24, 1985, Ser. No. 694,416  
Term of patent 14 years

U.S. Cl. D30—13

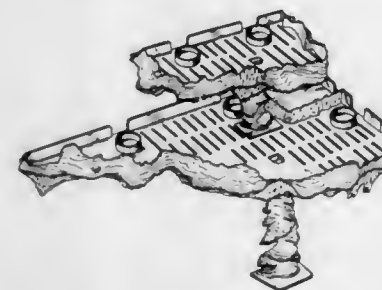


290,768  
SHELF UNIT FOR AQUARIUMS

Jerome Goldman, New York; Marvin Goldman, Great Neck; Gerald Philips, Glen Cove, and Joseph Pesin, Brooklyn, all of, NY, assignors to Penn Plax Plastics, Inc., Garden City, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,634  
Term of patent 14 years

U.S. Cl. D30—12

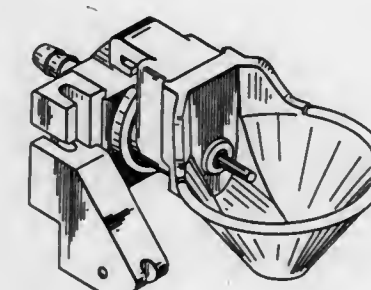


290,771  
CAGE MOUNTED POULTRY WATERING UNIT

Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.

Division of Ser. No. 688,363, Jan. 2, 1985. This application Nov. 19, 1986, Ser. No. 932,385  
Term of patent 14 years

U.S. Cl. D30—14



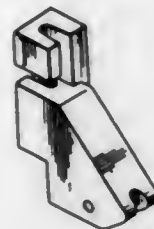


290,772

**SUPPORT BRACKET FOR A CAGE MOUNTED  
POULTRY WATERING DEVICE OR SIMILAR ARTICLE**  
Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems,  
Inc., Middlebury, Ind.

Division of Ser. No. 688,363, Jan. 2, 1985. This application Nov.  
19, 1986, Ser. No. 932,387  
Term of patent 14 years

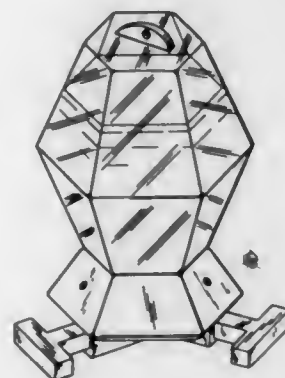
U.S. Cl. D30—14



290,773

**BIRD FEEDER OR SIMILAR ARTICLE**  
Frederic J. Liethen, P.O. Box 296, Appleton, Wis. 54912  
Filed Apr. 4, 1985, Ser. No. 719,871  
Term of patent 14 years

U.S. Cl. D30—15

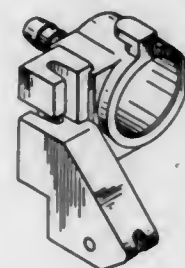


290,774

**COMBINED SUPPORT BRACKET AND HOLDER FOR A  
CAGE MOUNTED WATERING UNIT**  
Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems,  
Inc., Middlebury, Ind.

Division of Ser. No. 688,363, Jan. 2, 1985. This application Nov.  
19, 1986, Ser. No. 932,386  
Term of patent 14 years

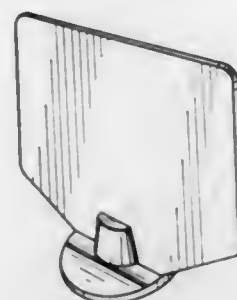
U.S. Cl. D30—14

290,775  
EAR TAG

Michael J. Scott, Feilding, New Zealand, assignor to Allflex  
International Limited, New Zealand  
Filed Mar. 29, 1984, Ser. No. 594,753

Claims priority, application New Zealand, Oct. 3, 1983, 18644  
Term of patent 14 years

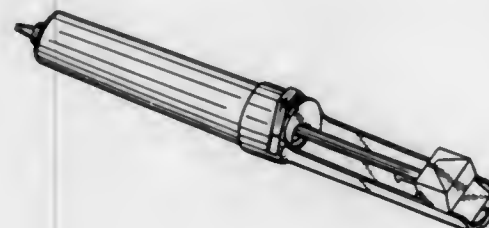
U.S. Cl. D30—43



290,776

**SUCTION TOOL FOR REMOVING TIN DURING  
DESOLDERING OPERATION**  
Rolf Wallin, Järfälla, Sweden, assignor to Rolf Lundell, Jarfalla,  
Sweden

Filed Apr. 10, 1984, Ser. No. 598,720  
Term of patent 14 years  
U.S. Cl. D32—17



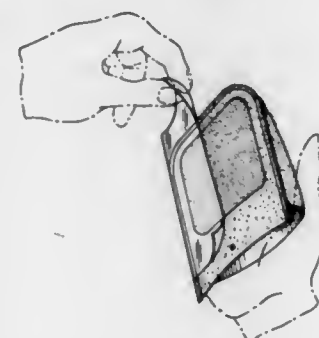
290,777

POLISH APPLICATOR MITT

Peter P. Lee, 2267 Clementina Dr., Hacienda Heights, Calif.  
91745

Filed Apr. 22, 1985, Ser. No. 725,476  
Term of patent 14 years

U.S. Cl. D32—40



290,778

BAKERY BASKET

Charles P. Tabler, Hamilton, Ohio, assignor to Buckhorn Mate-  
rial Handling Group Inc., Cincinnati, Ohio and Ekco Prod-  
ucts, Inc., Wheeling, Ill.  
Continuation-in-part of Ser. No. 591,874, Mar. 21, 1984, Pat.  
No. 4,600,103. This application May 29, 1984, Ser. No. 615,103  
Term of patent 14 years

U.S. Cl. D34—40

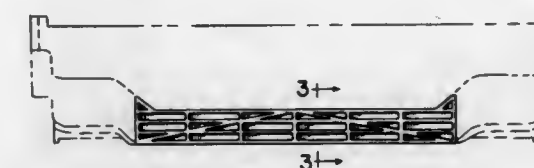


290,779

**FRONT PANEL FOR A BAKERY PRODUCT CONTAINER  
OR SIMILAR ARTICLE**

Elmer W. Kreeger, Howell, Mich., assignor to Pinckney  
Molded Plastics, Inc., Howell, Mich.  
Filed Dec. 31, 1984, Ser. No. 687,926  
Term of patent 14 years

U.S. Cl. D34—40



# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF JULY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A. E. Staley Manufacturing Company: See—  
Malik, Arshad H.; Urfer, Allen D.; McDaniel, Robert S.; and Johnson, Donald L., 4,678,595, Cl. 252-174.170.
- A S Kongsberg Vapenfabrikk: See—  
Mowill, Rolf J., 4,678,396, Cl. 415-148.000.
- Aalto, Erkki; and Yla-Hemmila, Veikko, to Halton Oy. Flow regulator. 4,678,005, Cl. 137-499.000.
- Aavid Engineering, Inc.: See—  
Johnson, Philip A.; and McCarthy, Alfred F., 4,679,118, Cl. 361-386.000.
- AB Cellico: See—  
Frykhult, Rune H., 4,678,575, Cl. 210-327.000.
- Abdel-Monem, Mahmoud M., to Zinpro Corporation. Cobalt complexes and their use as nutritional supplements. 4,678,854, Cl. 556-149.000.
- Abe, Hisamasa: See—  
Tamagawa, Shigehisa; Fuchizawa, Tetsuro; and Abe, Hisamasa, 4,678,742, Cl. 430-523.000.
- Abe, Tatsuhiko: See—  
Yamada, Keiichi; and Abe, Tatsuhiko, 4,678,160, Cl. 251-129.020.
- Abiko, Toshio: See—  
Yabu, Yasuo; Abiko, Toshio; and Matsuo, Masayuki, 4,679,051, Cl. 343-700.0MS.
- Abowitz, Gerald, to Xerox Corporation. Corrosion resistant aperture plate for ink jet printers. 4,678,680, Cl. 427-38.000.
- Abuyama, Yasuo, to Kabushiki Kaisha Toshiba. Image forming apparatus adapted to enter an interrupt copying mode and an energy saving mode. 4,678,316, Cl. 355-14.00C.
- ACF Industries, Incorporated: See—  
Dugge, Richard H.; and Cordani, Eugene J., 4,677,917, Cl. 105-248.000.
- Aciers et Outillage Peugeot: See—  
Escaravage, Gerard, 4,677,715, Cl. 24-637.000.  
Monsigny, Jean, 4,677,716, Cl. 24-641.000.  
Rudi, Alain; and Bertot, Maurice, 4,678,906, Cl. 250-227.000.
- Adachi, Yoshiharu; Fujimori, Fumio; Kondo, Toshio; Uemura, Hiroshi; and Shibata, Juichi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Sealing boot for use in disc brake assembly. 4,678,064, Cl. 188-73.450.
- Adams, John L.: See—  
Booth, David E.; Smith, Steven G.; and Adams, John L., 4,678,448, Cl. 445-60.000.
- Adell, Robert, to U.S. Product Development Company. Door edge guard. 4,677,790, Cl. 49-462.000.
- Adleman, George L.: See—  
Neil, Robert B.; and Adleman, George L., 4,679,039, Cl. 340-728.000.
- Advanced Energy, Inc.: See—  
Reese, George; Spielmaker, Richard; and Schatz, Douglas, 4,679,007, Cl. 333-17.00M.
- Advanced Micro Devices, Inc.: See—  
Vasceghii, Nader; Goddard, Donald G.; and Eccles, Robert E., 4,678,940, Cl. 307-446.000.  
Williams, Bertrand J., 4,678,944, Cl. 307-475.000.
- AE PLC: See—  
Philby, Jonathan D., 4,677,900, Cl. 92-212.000.
- Aeroquip Corporation: See—  
Smith, Donald E.; and Haunhorst, Greg A., 4,678,219, Cl. 294-82.330.
- Afzali-Ardakani, Ali: See—  
Pennington, Keith S.; Afzali-Ardakani, Ali; and Sachdev, Krishna G., 4,678,701, Cl. 428-213.000.
- AG fur industrielle Elektronik AGIE Losone b. Locarno: See—  
Dresti, Silvano; Buhler, Ernst; and Derighetti, Rene, 4,678,885, Cl. 219-69.00C.
- Agarwal, Anil K.; and Hay, Robert A., to Norton Company. Very smooth and flat polycrystalline alumina substrates from direct firing. 4,678,762, Cl. 501-127.000.
- Agarwal, Shashi B.: See—  
Nickola, Richard A.; Sok, Brian A.; and Agarwal, Shashi B., 4,678,717, Cl. 428-553.000.
- Agency of Industrial Science and Technology: See—  
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Tsuji, Tomoji; and Wakui, Natsuko, 4,678,858, Cl. 568-902.000.  
Sakuragi, Masako; and Ichimura, Kunihiro, 4,678,844, Cl. 525-417.000.  
Sekiya, Tadashi; Tsuzuki, Akihiro; and Torii, Yasuyoshi, 4,678,732, Cl. 430-136.000.
- Agnello, Joseph A., Jr.: See—  
Kaye, Gordon E.; and Agnello, Joseph A., Jr., 4,677,782, Cl. 42-100.000.
- Agoston, Agoston, to Tektronix, Inc. Equivalent time pseudorandom sampling system. 4,678,345, Cl. 368-119.000.
- Ahlswede, Thomas E.: See—  
Robinson, John S.; Ahlswede, Thomas E.; and Cornelius, Charles A., 4,679,153, Cl. 364-523.000.
- Ahmad, Eddress; and Pack, Roger N. Footwear with pivotal toe. 4,677,769, Cl. 36-117.000.
- Ahmed, M. Mushtaq: See—  
Archer, David H.; and Ahmed, M. Mushtaq, 4,677,829, Cl. 60-39.020.
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- Aida Engineering, Ltd.: See—  
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- Aigo, Seichiro. Spin drier for semiconductor material. 4,677,758, Cl. 34-58.000.
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- Air Products and Chemicals, Inc.: See—  
Iacoviello, John G., 4,678,829, Cl. 524-459.000.
- Shenoy, Thirthahalli A.; and Tao, John C., 4,677,827, Cl. 60-648.000.
- Aisin Seiki Kabushiki Kaisha: See—  
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- Akahane, Shoji: See—  
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- Akashi, Toshihiro: See—  
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- Aktiengesellschaft Brown, Boveri & Cie: See—  
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- Akzo America Inc.: See—  
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- Akzo NV: See—  
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- Alain, Dini: See—  
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- Albrecht, Ernst: See—  
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- Alcatel: See—  
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- Alfred Teves GmbH: See—  
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- Allegheny Ludlum Corporation: See—  
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- Allen, Charles M.: See—  
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- Allen, Harvey G., to Westinghouse Electric Corp. Low net positive suction head pumps. 4,678,405, Cl. 417-245.000.



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- Allen, James A.: See—  
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- Allen, Peter, to Danby Pty. Ltd. Sewer renovation system. 4,678,370, Cl. 405-154.000.
- Allen, Sammy G., to Sewalt, Ronny. Musical baby bottle. 4,678,093, Cl. 215-11.00R.
- Allert, Kurt, to Kurt Allert GmbH & Co. KG. Hose clamp with tightener. 4,677,712, Cl. 24-274.00R.
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- Reichardt, Manfred; and Loss, Rolf D., 4,678,262, Cl. 439-857.000.
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- Allison, James A. Clay pigeon launcher. 4,677,961, Cl. 424-5.000.
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- Alltel Corporation: See—  
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- Almblad, Donald: See—  
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- Alps Electric Co., Ltd.: See—  
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- Tashiro, Yoshizo, 4,678,284, Cl. 350-344.000.
- Alshareedah, Ebrahem. Forged spur gear with web connected teeth. 4,677,870, Cl. 74-431.000.
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- ALTA S.p.A.: See—  
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- Aluminum Company of America: See—  
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- Hochbein, David E., 4,677,727, Cl. 29-402.060.
- Knapp, David J.; and Waltz, Marion D., 4,678,023, Cl. 164-452.000.
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- Ray, Siba P., 4,678,760, Cl. 501-96.000.
- Soed, Ajay; and Marra, Robert A., 4,678,657, Cl. 423-600.000.
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- ALZA Corporation: See—  
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- AM International, Inc.: See—  
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- Amada Engineering Service Co., Inc.: See—  
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- Amana Refrigeration, Inc.: See—  
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- Amdahl Corporation: See—  
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- American Biltrite, Inc.: See—  
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- American Cyanamid Company: See—  
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- Dugliss, Charles H., 4,678,608, Cl. 252-700.000.
- American Greeting Corporation: See—  
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- American Hospital Supply Corporation: See—  
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- American Motors Corporation: See—  
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- American Telephone and Telegraph Company: See—  
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- American Telephone and Telegraph Company AT&T Bell Laboratories: See—  
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- Capasso, Federico; Cho, Alfred Y.; Hutchinson, Albert L.; and Mohammed, Khalid, 4,679,061, Cl. 357-4.000.
- Jirka, Howard F., 4,679,132, Cl. 363-21.000.
- Kirsch, Howard C.; and Procyk, Frank J., 4,679,172, Cl. 365-222.000.
- Lea, Chin-Tau A., 4,679,186, Cl. 370-14.000.
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- Ameur, Hanafi. Arrangement for safety belt. 4,678,134, Cl. 242-107.40A.
- Ammermann, Eberhard: See—  
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- Amoco Corporation: See—  
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- Amon, Leopold: See—  
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- AMP Incorporated: See—  
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- Douty, George H.; and Landis, John M., 4,678,121, Cl. 439-610.000.
- Farrar, John C.; Ney, Reuben E.; and Schroeder, James L., III, 4,679,013, Cl. 333-182.000.
- Ampex Corporation: See—  
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- Analog Devices, Incorporated: See—  
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- Anderson, Andrew G.; Bullen, David A.; and Ferguson, Robert G., to Canadian Fram Limited. Accessory drive with band brake. 4,677,877, Cl. 74-785.000.
- Anderson, Carl E.; and Killop, James T., to Anderson-Cook, Inc. Apparatus for flanging and splining a thin-walled power transmission member. 4,677,836, Cl. 72-88.000.
- Anderson, Carl R.; and Seaman, Gary G., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Apparatus and methods for handling bulk arrays of articles. 4,678,073, Cl. 198-396.000.
- Anderson, Charles R., to Nicolet Instrument Corporation. Double-pass optical interferometer. 4,678,333, Cl. 356-346.000.
- Anderson-Cook, Inc.: See—  
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- Anderson, David H. Intrusion indicating shield for consumer products. 4,678,083, Cl. 206-459.000.
- Anderson, J. Dale; McMillen, Kenneth R.; and Goertz, Arnold E., to Hesston Corporation. Quick attach apparatus for crop harvest header and the like. 4,677,814, Cl. 56-15.600.
- Anderson, Mark L.: See—  
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- Andersson, Bengt A., to Waco Jonsereds AB. Device in woodworking machines. 4,677,733, Cl. 29-563.000.
- Andrea, Johan; Lubchenko, Eugene; and Bradley, Ralph H., to NAP Consumer Electronics Corp.; and U.S. Philips Corporation. Color picture projection system with a wavelength-selective reflector for filtering out undesired light from a monochrome picture display source. 4,679,069, Cl. 358-60.000.
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- Anger, Bernd R.: See—  
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- Annegarn, Marcellinus J. J. C.: See—  
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- ANT Nachrichtentechnik GmbH: See—  
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- Antek Instruments, Inc.: See—  
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- Aoki, Ryoichi: See—  
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- Apotheloz, Robert, to Werkzeugmaschinenfabrik Oerlikon-Bührle AG. Safety device for a spinning projectile fuze. 4,677,914, Cl. 102-233.000.
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- Arai, Michio: See—  
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- Arai, Nobuhige, to Sharp Kabushiki Kaisha. Solar heat collector assembly. 4,677,966, Cl. 126-450.000.
- Arai, Osamu: See—  
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- Arendt, Ronald H.: See—  
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- Arioka, Hiroyuki: See—  
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- Ardit, Brian D.; Loeb, Jonathon T.; Miller, Joseph C.; Parsapour, Hossein B.; Rascoe, Fred H., III; and Woodward, Don W., to International Business Machines Corporation. Sheet money feeding machine with improved separation means. 4,678,175, Cl. 271-34.000.
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- Asagi, Yasuyoshi: See—  
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- Asahi Glass Company Ltd.: See—  
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- Asahi Kasei Kogyo Kabushiki Kaisha: See—  
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- Asakawa, Kenichi: See—  
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- Ashelin, Charles J.: See—  
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- Ashida, Kiyomi: See—  
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- Associated Press, The: See—  
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- AT&T Information Systems, Inc.: See—  
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- Atlantic Richfield Company: See—  
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- Mancinelli, Paul A., 4,678,837, Cl. 525-250.000.
- Mazurek, Harry, 4,678,862, Cl. 585-500.000.
- Aucher, Matthias J. Manual measuring tool for rolls of material. 4,677,752, Cl. 33-128.000.
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- Automotive Products plc: See—  
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- Autosense Corporation: See—  
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- Avery International: See—  
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- Avison, Malcolm J.; Hetherington, Hoby P.; Jue, Thomas H.; and Rothman, Douglas L., to Yale University. Apparatus and method for determining the presence of substances in a sample by NMR and producing an NMR image thereof. 4,678,995, Cl. 324-309.000.
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- Ayoub, Joseph; and Bourdet, Dominique, to Schlumberger Technology Corporation. Hydrocarbon well test method. 4,677,849, Cl. 73-155.000.
- Ayres, Walter D., Jr., to Surgeaco, Inc. Removable in-line self-cleaning strainer for piping systems. 4,678,589, Cl. 210-797.000.
- Ayukawa, Nobuhiro; and Konishi, Yasuhiko, to Nippon Dacro Shamrock Co., Ltd. Non-aqueous degreasing and chromating solution for metal treatment. 4,678,518, Cl. 148-6.200.
- Azaz, Emma: See—  
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- Kramer, James H., 4,677,721, Cl. 29-149.50S.
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- Babcock & Wilcox Company, The: See—  
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Tung, Chi F.; and Bacon, Chester A., Jr., 4,678,695, Cl. 428-120.000.
- Badger, Edward W.: See—  
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- Bagaglio, Giancarlo; Assche, Jan V.; and Watts, Arun, to Imperial Chemical Industries plc. Polyol compositions containing mould release agent. 4,678,513, Cl. 106-38.220.
- Baggiani, Giuseppe. Transformable low drawing-room table. 4,677,919, Cl. 108-63.000.
- Bahl, Inder J., to ITT Gallium Arsenide Technology Center, a division of ITT Corporation. Microwave circulator comprising a plurality of directional couplers connected together by isolation amplifiers. 4,679,010, Cl. 333-109.000.
- Bailey, Earl D. Portable machining turntable. 4,678,381, Cl. 409-221.000.
- Baker, Malcolm J.: See—  
Stiff, Rodney A.; Baker, Malcolm J.; and Lester, Leslie J., 4,677,813, Cl. 56-13.900.



- Baker, William R.; Marulic, Walter J.; and Robertson, James C., to Thrall Car Manufacturing Company. Railroad car with retractable closure track held down by bridge plate. 4,677,918, Cl. 105-378.000.
- Bakow, Leon: See—  
Sparling, Kenneth P.; Richardson, David G.; Incardona, Angelo; Wood, Ronald E.; Kikendall, Garth D.; and Bakow, Leon, 4,678,384, Cl. 411-43.000.
- Baldwin, John J.; Halcenko, Wasyl; Hartman, George; and Pitzenberger, Steven M., to Merck & Co., Inc. Prodrugs of antihypercholesterolemic compounds. 4,678,806, Cl. 514-539.000.
- Ball Corporation: See—  
Wood, Charles L., 4,679,148, Cl. 364-473.000.
- Ball, Robert J.; and Maycock, Ian C., to Automotive Products plc. Diaphragm spring clutch cover assembly. 4,678,071, Cl. 192-70.270.
- Ballhause, Helmut: See—  
Nickl, Josef; Muller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, 4,678,792, Cl. 514-307.000.
- Balsells, Joan C.: See—  
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- Balsells, Peter J., to Balsells, Peter J.; and Balsells, Joan C. Loading and locking mechanism. 4,678,210, Cl. 285-318.000.
- Ban, Katsuke; and Daimaru, Akimasa, to Honda Giken Kogyo Kabushiki Kaisha. Fiber-reinforced piston for internal combustion engines and associated method of construction. 4,677,901, Cl. 92-213.000.
- Ban, Thomas R.; Dusterhoft, Ernest E.; and Gilmore, John E., to Tricon Industries. Material spreader. 4,678,365, Cl. 404-118.000.
- Bando, Yoshiaki; Asano, Teruyoshi; Kato, Shigenobu; and Tanioka, Katsuhiko, to Seikisui Kagaku Kogyo Kabushiki Kaisha. Ball valve. 4,678,161, Cl. 251-171.000.
- Bania, Paul J., to Titanium Metals Corporation of America (TIMET). Production of titanium articles that are free from low density inclusions. 4,678,506, Cl. 75-10.250.
- Bankers Trust Co.: See—  
Bullock, Joseph J., 4,678,094, Cl. 215-256.000.
- Bantz, David F.; Malaby, Davey L.; and Sholtz, Paul N., to International Business Machines Corporation. Band buffer display system. 4,679,038, Cl. 340-721.000.
- Bar-on, Menachem: See—  
Alexander, Josef; and Bar-on, Menachem, 4,678,649, Cl. 423-308.000.
- Barabe, David J. Waist band adjustment for garment. 4,677,699, Cl. 2-221.000.
- Bard, Martin. Wall, ceiling and/or floor formation and a method for producing it. 4,677,801, Cl. 52-389.000.
- Bardsley, Ian R.: See—  
Lipski, Jerzy A.; and Bardsley, Ian R., 4,678,907, Cl. 250-231.05E.
- Barker, James M.: See—  
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- Barlet, Denis; and Alain, Dini, to Rhone-Poulenc Agrochimie. Concentrated aqueous suspensions based on neburon. 4,678,503, Cl. 71-93.000.
- Barmag AG: See—  
Wessolowski, Bernd; and Mink, Wilfried, 4,677,860, Cl. 73-862.480.
- Barnes, John R.; Diamond, John E.; and Griffin, Graham J., to Conoco Inc. Clamps for attaching pipelines together in parallel relationship. 4,678,147, Cl. 248-74.100.
- Barnett, Earl D.; and Mundstock, Robert W., to Chicago Show Printing Co. Collapsible container. 4,678,095, Cl. 220-4.00F.
- Barnett, Ronald E.: See—  
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- Barrett, Ronnie G. Anti-armor gun. 4,677,897, Cl. 89-166.000.
- Barron, Michael H.: See—  
Gutschick, Vincent P.; Barron, Michael H.; Waechter, David A.; and Wolf, Michael A., 4,678,330, Cl. 356-222.000.
- Barthelemy, Louis. Electric transformer with selectively energized modular circuits. 4,678,986, Cl. 323-343.000.
- Bartholomew, Donald D., to Proprietary Technology, Inc. Force recording seat belt assembly. 4,677,861, Cl. 73-862.540.
- Bartlett, Ian G.; and Lymer, Donald A., to Tybar Engineering Pty. Ltd. Apparatus for tufting yarn bits. 4,678,533, Cl. 156-435.000.
- Barton, James W.; and Allen, Hubert D., to Tamer Corporation. Method and apparatus for cutting an athletic field line. 4,678,042, Cl. 172-15.000.
- BASF Aktiengesellschaft: See—  
Rentze, Costin; Sauter, Hubert; Karbach, Stefan; Will, Wolfgang; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,678,798, Cl. 514-383.000.
- Schoettle, Klaus, 4,678,140, Cl. 242-199.000.
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- Bashford, Dennis J.; and Blackham, Geoffrey H., to Rediffusion Simulation Limited. Field blanking pulse modifier. 4,679,080, Cl. 358-150.000.
- Basinger, David M.; Hatley, Gary L.; Kiser, Billy J.; and Moser, James N., to Fieldcrest Cannon, Inc. Apparatus for automatically and continuously feeding and folding textile articles. 4,678,173, Cl. 270-45.000.
- Bass, Ronald M.: See—  
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- Batchelor, Robert B., to American Motors Corporation. Transfer case for multiple drive axle vehicle. 4,677,875, Cl. 74-695.000.
- Bateman, Andrew: See—  
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- Bateman, Terence; and Stevens, William W., to Stanton and Staveley Limited. Joints formed with welded flange pipes. 4,678,211, Cl. 285-368.000.
- Battin, Leland B., Jr.: See—  
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- Battu, Ramgopal: See—  
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- Bauk, Jerald L., to Motorola Inc. Feature extractor for quasi-periodic signals. 4,678,987, Cl. 324-77.00R.
- Bauer, Rainer. Circuit for the actuation of liquid crystal layers in mirrors. 4,678,281, Cl. 350-331.00R.
- Baxter Travenol Laboratories, Inc.: See—  
Cotter, Richard; Johnson, Robert C.; Rowe, W. Bruce; and Young, Susan K., 4,678,807, Cl. 514-552.000.
- Perry, Matthew J., 4,678,331, Cl. 356-246.000.
- Shafer, John C., 4,678,894, Cl. 235-375.000.
- Ward, Michael V.; and Cotter, Richard, 4,678,808, Cl. 514-560.000.
- Bayer Aktiengesellschaft: See—  
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- Kruger, Bernd-Wieland; Hoffmann, Hellmut; Roos, Ernst; and Behrenz, Wolfgang, 4,678,777, Cl. 514-110.000.
- Maurer, Fritz; Homeyer, Bernhard; and Stendel, Wilhelm, 4,678,776, Cl. 514-89.000.
- BBC Aktiengesellschaft Brown, Boveri & Cie.: See—  
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- BCIRA: See—  
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- Beach, David E., to Eastman Kodak Company. Apparatus and method for identifying a film cartridge used in a particular type camera. 4,678,300, Cl. 354-21.000.
- Bearden, Francis H.: See—  
Haacke, E. Mark; and Bearden, Francis H., 4,678,996, Cl. 324-309.000.
- Bearden, John L.: See—  
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- Beaulieu, Andre R., to RCA Corporation. Apparatus for aligning a fiber and a device. 4,678,271, Cl. 350-96.200.
- Beck, Ernst; Lenard, Peter; and Hutzler, Hans, to Vollmer Werke Maschinenfabrik GmbH. Feeding means for intermittently rotating a circular saw blade of great pitch. 4,677,882, Cl. 76-77.000.
- Becker, Benedikt: See—  
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- Becker, Michael: See—  
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- Beckman Instruments, Inc.: See—  
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- Becton, Dickinson and Company: See—  
Burns, James A., 4,677,979, Cl. 128-314.000.
- Thorne, Gale H.; Owen, Charles V.; Smith, Randall W.; Goldberg, Ruth D.; Miles, Scott D.; and Claus, Michael J., 4,678,752, Cl. 435-291.000.
- Beecham Group p.l.c.: See—  
Ponsford, Roger J.; Pearson, Michael J.; and Finch, Stephen C., 4,678,782, Cl. 514-210.000.
- Ryder, Geoffrey A., 4,678,102, Cl. 222-181.000.
- Beecher, John, III: See—  
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- Begeman, Robert H.: See—  
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- Behnke, Gunther: See—  
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- Behrenz, Wolfgang: See—  
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- BEI Electronics, Inc.: See—  
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- Beichel, Rudi: See—  
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- Beier, Helmut, to Siemens Aktiengesellschaft. Gas pressure circuit breaker. 4,678,878, Cl. 200-148.00A.
- Beitinger, Eberhard; and Glaser, Eberhard, to Ed. Zublin Aktiengesellschaft. Adsorption layer. 4,678,771, Cl. 502-402.000.
- Belart, Juan, to Alfred Teves GmbH. Hydraulic vehicle brake system with anti-locking. 4,678,242, Cl. 303-92.000.
- Belke, Robert E., Jr.; Shirk, Raymond A.; Lin, Hsiu H.; and Zakraysek, Louis, to General Electric Company. Metal core printed circuit board. 4,679,122, Cl. 361-414.000.
- Belliveau, Jean-Pierre; Bocard, Christian; Such, Christian; and Vaillant, Daniel, to Institut Francais du Pétrole; and Laboratoire Central des Ponts et Chaussées. Method usable in particular for washing and desorbing solid products containing hydrocarbons. 4,678,558, Cl. 208-390.000.
- Belmares-Sarabia, Armand; and Chayka, Stanley J., to Corporate Communications Consultants, Inc. Color correction system and method with localized color sampling. 4,679,067, Cl. 358-29.000.
- Benaroya, Henry. Multi-tandem free piston machine. 4,678,407, Cl. 417-341.000.
- Benn, Pauline: See—  
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- Benoit, Louis; Mabboux, Michel; Nerrinck, Bernard; and De Marchi, Jean-Louis, to Salomon S.A. Rear entry ski boot. 4,677,768, Cl. 36-117.000.
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Offiler, Stephen B.; Berg, Peter G.; and Kawate, Keith W., 4,678,982, Cl. 322-8.000.
- Berg, Ralph T., to Honeywell Inc. Ring laser gyro block stiffener. 4,678,335, Cl. 356-350.000.
- Berger, Heinz: See—  
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- Berger, Michael F.; and Sawyer, Sammy D., to Tandy Corporation. Co-processor combination. 4,679,166, Cl. 364-900.000.
- Bergman, Jan, to Hollandse Signaalapparaten B.V. Pulse radar apparatus. 4,679,050, Cl. 342-196.000.
- Bergner, Arndt, to Hilti Aktiengesellschaft. Expansion anchor assembly. 4,678,383, Cl. 411-32.000.
- Bergvall, Bengt A., to Husqvarna Aktiebolag. Electronic fancy sewing machine having means for adjusting the driving means of a cloth feeder during a feeding phase. 4,677,927, Cl. 112-455.000.
- Bernardi, Richard T.: See—  
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- Berndt, Klaus-Gunther: See—  
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- Bernier, Richard E.: See—  
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- Berova, Nikolina D.: See—  
Ivanov, Chavdar B.; Mondesha, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.
- Berrios, Luis H.: See—  
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- Berschauer, Friedrich: See—  
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- Bertelsen, John C., to Bertelsen, John C. Filtering system for paper handling machines. 4,678,489, Cl. 55-418.000.
- Bertolotti, Franco, to Montedison S.p.A. Die for hot die face cutting thermoplastic polymers. 4,678,423, Cl. 425-311.000.
- Bertorello, Mario, to Rotomors S.p.A. System for controlling the jaws of a self-centering platform (pallet) which can be moved between fittings (pallet supports) carried by the loading and unloading station and the working station of a machine tool. 4,678,077, Cl. 198-803.010.
- Bertot, Maurice: See—  
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- Bessey, Guy; and Bimbert, Claude, to CLECIM. Installation for preparing metal billets for extrusion. 4,677,838, Cl. 72-254.000.
- Beta Raven Inc.: See—  
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- Bethmann, Karl W.: See—  
Boecker, Juegen; Gersbach, Klaus; and Bethmann, Karl W., 4,677,915, Cl. 102-517.000.
- Betterton, Joseph T.; and Glover, Alfred H., to Chrysler Motors Corporation. Shaft retainer. 4,678,362, Cl. 403-373.000.
- Beyer, Harold H.: See—  
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- Bicknell, John; and O'Brien, Stephen, to Bonar Bray Limited. Motor monitor signal analysis system. 4,678,990, Cl. 324-158.0MG.
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- Biggs, Richard H.: See—  
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- Bimbert, Claude: See—  
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- Bind-O-Matic AB: See—  
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- Bingham, David; and Allen, Charles M., to Maxim Integrated Products, Inc. Integrated dual charge pump power supply and RS-232 transmitter/receiver. 4,679,134, Cl. 363-61.000.
- Bio-Medical Co., Ltd.: See—  
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- Bisajji, Takashi, to Ricoh Company, Ltd. Image forming apparatus. 4,678,318, Cl. 355-15.000.
- Bjorkman, Harry K., Jr.; and Carr, Peter, to Energy Development Associates, Inc. Formation of dense chlorine hydrate. 4,678,656, Cl. 423-500.000.
- Black, Charles E., III; and Halstead, Raymond T., to Indak Manufacturing Corp. Electrical switch having flexible printed circuit connector cable. 4,678,249, Cl. 439-77.000.
- Blackham, Geoffrey H.: See—  
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- Blanchard, Eugene J.: See—  
Vigo, Tyrone L.; and Blanchard, Eugene J., 4,678,473, Cl. 8-480.000.
- Blandford, David M.; and Easter, John H. Rotatable reciprocating collar for borehole casing. 4,678,031, Cl. 166-242.000.
- Blanford, Denis M., to NCR Corporation. Scanning control system for merchandise checkout. 4,679,154, Cl. 364-525.000.
- Blanken, Pieter G.; and van der Zee, Pieter, to U.S. Philips Corporation. Reduced distortion display circuit. 4,679,092, Cl. 358-242.000.
- Blaupunkt-Werke GmbH: See—  
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- Markovic, A.; Temerinac, M.; and Braegas, Peter, 4,679,238, Cl. 381-16.000.
- Blutschacher, Max: See—  
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- Bliznak, Bedrich V. Smoking apparatus having convoluted filtering-/heat-reduction passageway. 4,677,992, Cl. 131-209.000.
- Bloch, Joseph T.; and Cross, Dan A., to Boeing Company, The. Robotic wire harness assembly system. 4,677,734, Cl. 29-564.200.
- Blohm & Voss AG: See—  
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- Blom, C. James, to Roxor Corporation. Method of constructing a segmented mirror. 4,678,280, Cl. 350-320.000.
- Blood, Peter, to U.S. Philips Corporation. Optical absorption spectroscopy for semiconductors. 4,678,989, Cl. 324-158.00D.
- Bobrovniczky, Bert: See—  
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- Bock Products: See—  
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- Bode, Albert: See—  
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- Boecker, Juegen; Gersbach, Klaus; and Bethmann, Karl W., to Rheinmetall GmbH. Armor-piercing projectile. 4,677,915, Cl. 102-517.000.
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- Burlingame, Harry H., 4,678,977, Cl. 318-601.000.
- Butcher, William T.; Furlong, James J.; Howe, Dwayne E.; Snell, Gerald T.; and Yara, Calvin M., 4,679,117, Cl. 361-181.000.
- Jensen, Tom M.; Yoshimura, Frederick T.; and Jensen, Deborah P., 4,678,202, Cl. 280-642.000.
- Boer, Willem D.; and Kawasaki, Atsushi, to Energy Conversion Devices, Inc. Self-alignment process for thin film diode array fabrication. 4,678,542, Cl. 156-659.100.
- Boese, Roland, to Nicolet Instrument Corporation. Sample holder for powder x-ray diffractometer. 4,678,340, Cl. 366-111.000.
- Bohrer, Timothy H.; Pawlowski, Thomas D.; and Brown, Richard K., to James River-Norwalk. Packaging container for microwave popcorn popping. 4,678,882, Cl. 219-10.55E.
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- Boll, Wolf: See—  
Steinkemper, Reinhard; Boll, Wolf; and Peitsmeier, Karl, 4,678,361, Cl. 403-359.000.
- Bollin, Ernest, Jr.; and Fletcher, Mark G., to Du Pont de Nemours, E. I., and Company. Trehalose as stabilizer and tableting excipient. 4,678,812, Cl. 514-777.000.



- Bolton, Wilbur M.: See—  
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- Bolzan, Louis F.; and Weil, Edward D., to Stauffer Chemical Company. Process for the production of arylsulfonyl halides. 4,678,612, Cl. 260-543.00R.
- Bomed Medical Manufacturing, Ltd.: See—  
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- Bonar Bray Limited: See—  
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- Bonerb, Timothy C., to Bonerb, Vincent C. Freight vehicle with a convertible cargo space. 4,678,389, Cl. 414-267.000.
- Bonerb, Vincent C.: See—  
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- Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingeisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., to Eaton Corporation. Electrical device with protective shroud for flexible electrical cable extending therefrom. 4,678,867, Cl. 174-135.000.
- Bonk, Wernfried: See—  
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- Bonneton, Marc; and Janvier, Dominique, to Societe Anonyme RED-OUTE CATALOGUE. Automated self-powered material handling truck. 4,678,390, Cl. 414-282.000.
- Book, Marshall K.: See—  
Green, Carlos J.; Hirsius, John L.; and Book, Marshall K., 4,677,970, Cl. 128-82.100.
- Book, William J.; Scott, Julian C.; and Grace, James A., to Westinghouse Electric Corp. Electrical distribution apparatus having draw-out surge arrester. 4,679,113, Cl. 361-40.000.
- Boes, Margareta: See—  
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- Booth, David E.; Smith, Steven G.; and Adams, John L., to RCA Corporation. Kinescope funnel thumper and flush device. 4,678,448, Cl. 445-60.000.
- Booth, Inc.: See—  
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- Boots, Robert T., to Vermeulen-Hollandia Octrooien II B.V. Sliding roof for a vehicle. 4,678,228, Cl. 296-216.000.
- Bouchard, Andre C.; Thibault, Paul A.; and Lagushenko, Radomir I., to GTE Products Corporation. Electrical lead-ins for use for arc sustaining atmospheres. 4,678,520, Cl. 148-6.350.
- Bouchard, Antoine J. Dispenser for particulate matter. 4,678,377, Cl. 406-139.000.
- Bourassa, Ronald R.; and Butler, Douglas B., to Inmos Corporation. Resistor with low thermal activation energy. 4,679,170, Cl. 365-154.000.
- Bourdier, Dominique: See—  
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- Camet, Inc.: See—  
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- Campbell, Todd D.: See—  
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- Canadian Fram Limited: See—  
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- Canevari Timber Co., Inc.: See—  
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- Nagashima, Nao, 4,679,096, Cl. 358-287.000.
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- Charles Griener and Company, Inc.: See—  
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- Chen, Johnson C., to Pennwalt Corporation. Selective electrolytic stripping of metal coatings from base metal substrates. 4,678,552, Cl. 204-146.000.
- Chen, Wu-Nan: See—  
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- Chenevard, Alexis, to Sapal, Societe Anonyme des Plieuses Automatiques. Assembly for assorted packings with different products. 4,677,808, Cl. 53-238.000.
- Cheng, Eric K., to Reyloc Limited. Apparatus for supporting or erecting structures. 4,678,152, Cl. 248-225.100.
- Cheng, Tseng-Yng. Signalling device for indicating a nursed person in a bad sleeping condition. 4,679,036, Cl. 340-573.000.
- Cherry Semiconductor Corporation: See—  
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- Chevron Research Company: See—  
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- King, William F., 4,678,804, Cl. 514-493.000.
- Chiang, Robert L.; and Stanulis, Mark T., to Union Carbide Corporation. Catalytic cracking catalysts for high octane gasoline products. 4,678,765, Cl. 502-65.000.
- Chicago Metallic Corporation: See—  
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- Chicago Show Printing Co.: See—  
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- Chigira, Masayoshi: See—  
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- Chikamasa, Hiroshi: See—  
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- Chiyoma, Hitoshi; Watanabe, Zensaku; and Nakagawa, Masahiro, to Kabushiki Kaisha Toshiba. Image sensor with means to adjust capacitance of signal leads. 4,679,088, Cl. 358-213.180.
- Chizek, Michael, to Contour Chair-Lounge Co., Inc. Adjustable chair. 4,678,231, Cl. 297-329.000.
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- Chomerics, Inc.: See—  
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- Chonan, Katsuhiko: See—  
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- Christopoulos, John A., to United States of America, Army. Interconnector device. 4,678,728, Cl. 429-121.000.
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- Emmer, Eric D., 4,677,722, Cl. 29-156.50A.
- Filkins, Timothy J., 4,677,868, Cl. 74-359.000.

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- Pastor, Stephen D.; and Hessel, Edward T., 4,678,826, Cl. 524-104.000.
- Stanton, James L.; and Ksander, Gary M., 4,678,800, Cl. 514-412.000.
- Cincinnati Microwave, Inc.: See—  
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- Cincinnati Milacron Inc.: See—  
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- Clark, Robert. Bidirectional current time integration device. 4,679,000, Cl. 324-428.000.
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- Clucas, Robert A.: See—  
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- Coates, William J.: See—  
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- Coccoli, Joseph D.: See—  
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- Cohen, David J.: See—  
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- Cohen, Uri. Record member with metallic antifriction overcoat. 4,678,722, Cl. 428-642.000.
- Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, to Metropolitan Wire Corporation. Surgical case cart. 4,678,214, Cl. 292-213.000.
- Cole, William C.: See—  
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- Colgate, Gilbert W. P.: See—  
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- Colgate-Palmolive Company: See—  
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- Collin, William D., to Huddy Diamond Crown Setting Company (Proprietary) Limited. Cutter inserts for picks. 4,678,237, Cl. 299-79.000.
- Coison Castors (Europe) Limited: See—  
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- Combustion Electromagnetics, Inc.: See—  
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- Combustion Engineering, Inc.: See—  
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- Rankin, Arthur L., III, 4,678,131, Cl. 241-293.000.
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- Commonwealth Scientific & Industrial Organization: See—  
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- Conlon, Ralph D.: See—  
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- Connan, Jean-Louis; and Huiban, Jean-Yves. Electrical disturbance protective device between a terminal and a telephone line. 4,679,115, Cl. 361-119.000.
- Conoco Inc.: See—  
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- Cook, Donald A., to Coronet Industries, Inc. Suspended creel. 4,678,136, Cl. 242-131.000.
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- Cooper Industries, Inc.: See—  
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- Coopervision, Inc.: See—  
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- Cordis Corporation: See—  
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- Cordis Europa N.V.: See—  
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- Cornelius, Charles A.: See—  
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- Coronet Industries, Inc.: See—  
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- Cotter, Richard: See—  
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- Courvoisier, Guy: See—  
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- Cousty, Jean Pierre, to Technip Geoproduction. Raising method and device, in particular for an oil exploiting platform. 4,678,372, Cl. 405-196.000.
- Cox, Albert R., to Cooper Industries, Inc. Mass terminable flat cable assembly with readily separable ground plane. 4,678,864, Cl. 174-36.000.
- Cox, Michael W.; Levin, Richard I.; Cohen, David J.; and Frisbie, William R., to Q-Med, Inc. Cardiac signal real time monitor and method of analysis. 4,679,144, Cl. 364-417.000.
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- Craig, Gale M., to General Motors Corporation. Transistor protection circuit for automotive motor control applications. 4,679,112, Cl. 361-33.000.
- Craig, Preston S.; and Arendale, William F., to United Technologies Corporation. Non-optimum waveguide optical sensor. 4,678,328, Cl. 356-141.000.
- Crane, Russell M.: See—  
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- Crank, Ronald K.: See—  
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- Crocker, Robert L.: See—  
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- Crook, Paul: See—  
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- Crookshanks, Rex J., to Hughes Aircraft Company. Calibrated overlapping frequency sweep. 4,679,161, Cl. 364-571.000.
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- Crossley, Roger, to John Wyeth & Brother Limited. N-pyridyl-substituted pyridine-2-carboxamide-1-oxides. 4,678,794, Cl. 514-332.000.
- Crow, Robert W. Facial protector for batting helmet. 4,677,694, Cl. 2-9.000.
- Crownshaw, John C.: See—  
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- Csapody, Miklos, to Tungsum Rt. High pressure sodium vapor lamp with improved color reproduction index. 4,678,958, Cl. 313-15.000.
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- Culp, Gordon W.: See—  
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- Cumpston, Edward H. Pumped flow attrition disk zone. 4,678,127, Cl. 241-46.040.
- Cunningham, Howard W. Apparatus for separating honey and beeswax. 4,678,569, Cl. 210-187.000.
- Cunningham, William B., Jr.: See—  
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- Curtis, Stephen P.; and Jordan, Gary V., to Senelco Limited. Transponder systems. 4,679,046, Cl. 342-51.000.
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- CX/OXYTECH, Inc.: See—  
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- CXC Corporation: See—  
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- Dahan, Paul C., to Mobil Oil Corporation. Device for rescuing personnel from waters. 4,678,446, Cl. 441-80.000.
- Dahl, Erik Q.; Vatland, Arnfinn; and Vegge, Olaf T., to Elkem a/s. Baking furnace for electrodes. 4,678,434, Cl. 432-242.000.
- Dahlem, Wolfgang, to ZF-Herion-Systemtechnik GmbH. Progressively movable holding device. 4,677,936, Cl. 118-307.000.
- Dahlerud, Ole C., to Tandberg Data A/S. Method and arrangement for positioning a magnetic head to various tracks of a magnetic tape. 4,679,104, Cl. 360-78.000.
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- Daikoku, Takahiro: See—  
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- Daimaru, Akimasa: See—  
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- Kitamura, Hideaki; and Yamada, Mitsuhiko, 4,679,095, Cl. 358-280.000.
- Mitsuka, Ikuo, 4,679,155, Cl. 364-525.000.
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- Dallenbach-Toelke, Karin: See—  
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- Dallinger, James F., to New Holland Inc. Paddle wheel assembly for forage harvesters. 4,678,129, Cl. 241-101.700.
- Dalman, Austin L. Drum for mixing and dispensing feed material. 4,678,342, Cl. 366-186.000.
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- Danby Pty. Ltd.: See—  
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- Danree, Bernard, to Institut de Recherches Chimiques et Biologiques de Appliques (I.R.C.E.B.A.). Medical uses of halogenobenzenone-oxime derivatives. 4,678,810, Cl. 514-640.000.
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- Darby, H. Darrell. Shock absorbing surgical shoe. 4,677,767, Cl. 36-102.000.
- Darras, Robert L., to MD Associates. Method of reducing soft tissue swelling and pain. 4,678,668, Cl. 424-94.750.
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- Da Silva, Edouard: See—  
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- Data General Corporation: See—  
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- Davidson, John P.: See—  
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- Davies, Ronald C., to Digital Products Corporation. Methods and apparatus employing apparent resonant properties of thin conducting materials. 4,678,994, Cl. 324-236.000.
- Davis, Arthur A.: See—  
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- Davis, Arthur A.; and Eady, Robert W., to Standard Telephones and Cables plc. Optical repeaters. 4,679,250, Cl. 455-601.000.
- Davis, George B. Christmas tree lighting control. 4,678,926, Cl. 307-11.000.
- Davis, William M., to United Pharmaceuticals, Inc. Anti-spasmodic agents having a ring in the main chain. 4,678,780, Cl. 514-183.000.
- Dayco Products, Inc.: See—  
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- Maseth, David A., 4,677,751, Cl. 33-143.00M.
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- Deavenport, Joe E.: See—  
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- Decker, Paula: See—  
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- Deibler, Melvin E.: See—  
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- de Jong, Anno: See—  
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- Delaney, Michael J.: See—  
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- Delany, Edward B.: See—  
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- Dellapina, Marco: See—  
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- De Marchi, Jean-Louis; Mabboux, Michel; Paris, Jean; and Kopp, Norbert, to Salomon S.A. Alpine ski boot. 4,677,770, Cl. 36-120.000.
- De Marchi, Jean-Louis: See—  
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- DeNardo, Sally J.: See—  
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- Denier, Robert F.; Marshall, Robert H.; Jewell, John N.; and Litzinger, Elmer F., to Brown & Williamson Tobacco Corporation. Process for treating, drying and expanding tobacco. 4,677,994, Cl. 131-310.000.
- Denisard, Françoise: See—  
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- Depenbrock, Manfred, to Brown, Boveri & Cie AG. Direct self-control of the flux and rotary moment of a rotary-field machine. 4,678,248, Cl. 318-805.000.
- De Raymond, Peter G., to Victaulic Company of America. Gasket for segmented pipe couplings. 4,678,208, Cl. 285-112.000.
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- Dery, Yves. Set of dices for lottery. 4,678,190, Cl. 273-146.000.
- Deseret Medical, Inc.: See—  
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- Deters, Joseph C.: See—  
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- Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Harmonic interpolation for producing time variant tones in an electronic musical instrument. 4,677,889, Cl. 84-1.010.
- Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH: See—  
Lahr, Helfrid; and Pontani, Bernd, 4,678,624, Cl. 376-261.000.
- Devon County Council: See—  
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- Dewey, Loren G., to Amdahl Corporation. Error tracking apparatus in a data processing system. 4,679,195, Cl. 371-29.000.
- De Witt, Thomas. Range finding by diffraction. 4,678,324, Cl. 356-45.000.
- Deyhle, Henning; and Grisar, Alexander, to Dyckerhoff Engineering GmbH. Process for the disposal of combustible refuses. 4,678,514, Cl. 106-100.000.
- D'Hervilly, Guy: See—  
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- Dhuuyvetter, Timothy A.: See—  
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- Diamond, John E.: See—  
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- Dias, Daniel M.; Kumar, Manoj; Lien, Yeong-Chang L.; and Maruyama, Kiyoshi, to International Business Machines Corporation. Distributed voice-data switching on multi-stage interconnection networks. 4,679,190, Cl. 370-60.000.
- Dick, Heinz, to Ford Motor Company. Headlamp-indicator unit for motor vehicles. 4,679,125, Cl. 362-66.000.
- Dickmann, Thomas. Vehicle trailer hitch. 4,678,199, Cl. 280-491.00E.
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- Diener, Horst; Albrecht, Ernst; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Sewing machine housing construction. 4,677,924, Cl. 112-258.000.
- Diep, Daniel V., to Nalco Chemical Company. H<sub>2</sub>O<sub>2</sub> as a conditioning agent for electrostatic precipitators. 4,678,481, Cl. 55-4.000.
- Diesel Kiki Co., Ltd.: See—  
Kushida, Takeo, 4,678,000, Cl. 137-1.000.
- Oshizawa, Hidekazu; and Kondoh, Masami, 4,679,116, Cl. 361-154.000.
- Somikawa, Seiji; and Noguchi, Ichiro, 4,677,830, Cl. 62-126.000.
- Takemasa, Masami, 4,677,902, Cl. 98-2.110.
- Yamada, Keiichi; and Abe, Tatsuhiko, 4,678,160, Cl. 251-129.020.
- Digital Products Corporation: See—  
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- Dimmick, Vance E.: See—  
Nervig, Charles H.; and Dimmick, Vance E., 4,678,086, Cl. 211-47.000.
- Dirksing, Robert S., to Procter & Gamble Company. The Plural-chambered dispensing device exhibiting constant proportional co-dispensing and method for making same. 4,678,103, Cl. 222-130.000.
- Dischert, Robert A.: See—  
Topper, Robert J.; and Dischert, Robert A., 4,679,084, Cl. 358-160.000.
- Display-Design GmbH für moderne Verkaufsförderungsmittel und Raumausstattung: See—  
Lang, Franz J., 4,678,089, Cl. 211-133.000.
- Dissett, Walter L., to Tractech, Inc. Torque-proportioning differential with cylindrical spacer. 4,677,876, Cl. 74-715.000.
- Ditsch, John R.; Williams, Theodore G.; and Berrios, Luis H., to HDS, Inc. Hand development system. 4,678,181, Cl. 272-68.000.
- DiVincenzo, Gregory T.: See—  
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- Dixon, Fred W. Poultry delunger apparatus. 4,677,709, Cl. 17-11.000.
- Dlabac, Antonin: See—  
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- Dr. Ing. h.c.F. Porsche Aktiengesellschaft: See—  
Beck, Peter op de; Wuest, Rainer; and Stelter, Norbert, 4,679,145, Cl. 364-424.100.
- Kurz, Erich, 4,677,941, Cl. 123-41.120.
- Dr. Johannes Heidenhain GmbH: See—  
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- Dr. Karl Thomae GmbH: See—  
Nickl, Josef; Müller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, 4,678,792, Cl. 514-307.000.
- Dodd, Francis J., to Nuclear Energy Systems, Inc. Weld scanner guide and magnetically susceptible track. 4,677,916, Cl. 104-118.000.
- Dodd, Jack G., Jr.; and Dodd, Jeffrey J., to Walter C. McCrone Associates, Inc. Method and apparatus for analyzing the nature of a sample. 4,678,913, Cl. 250-341.000.
- Dodd, Jeffrey J.: See—  
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- Dodge, John L.; Bush, Duane B.; Pechuzal, Georges A.; and Ravindranath, Ambrish, to Garrett Corporation. The High efficiency transonic mixed-flow compressor method and apparatus. 4,678,398, Cl. 415-181.000.
- Doering, Robert R.; Duane, Michael P.; and Armstrong, Gregory J., to Texas Instruments Incorporated. High density CMOS integrated circuit manufacturing process. 4,677,739, Cl. 29-576.00B.
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- Dong, Michael W.; Yarbrow, Stanley K.; and Vandermark, Frank, to Perkin-Elmer Corporation. The Apparatus for periodically monitoring the composition of a plurality of samples. 4,678,639, Cl. 422-81.000.
- Dorn, Franz; Pfiffner, Albert; and Zehnder, Beat, to Hoffman-La Roche Inc. Certain  $\alpha$ -benzyl-3-pyridylmethanols, N-oxides thereof and their fungicidal use. 4,678,790, Cl. 514-277.000.
- Dornbracht, Helmut; and Grasse, Klaus-Peter, to Aloys F. Dornbracht GmbH & Co. Connector assembly for a water-dispensing fixture. 4,678,207, Cl. 285-39.000.



Douty, George H.; and Landis, John M., to AMP Incorporated. Multi-plane connector system. 4,678,121, Cl. 439-610.000.

Dover, B. Troy: See—  
Kamieniski, Conrad W.; and Dover, B. Troy, 4,678,614, Cl. 260-665.00R.

Dow Chemical Company, The: See—  
Alderman, Daniel A.; and Wolford, Troy D., 4,678,516, Cl. 106-197.100.

Elliott, Brian W., 4,678,712, Cl. 428-418.000.

Ham, George E.; Chen, Wu-Nan; and McIntyre, John M., 4,678,601, Cl. 252-500.000.

Johnston, Howard; and Troxell, Lillian H., 4,678,509, Cl. 71-94.000.

Lancaster, Gerald M.; and Allen, James A., 4,678,713, Cl. 428-421.000.

McCreedy, Kathleen M.; Keskkula, Henno; Pawloski, James C.; and Yonkers, Edward H., 4,678,833, Cl. 525-66.000.

McKinney, Osborne K.; Allen, James A.; and Flores, David P., 4,678,836, Cl. 525-221.000.

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Virkar, Anil; and Yuan, Thomas C., 4,678,761, Cl. 501-104.000.

Dow Corning Corporation: See—  
Gavin, John D., Jr.; and Meddaugh, Michael D., 4,678,376, Cl. 405-270.000.

Doyle, Ralph R., to Buehler Ltd. Abrasive slurry supply system for use in a metallographic sample preparation. 4,678,119, Cl. 239-9.000.

Draaisma, Henricus J. G.: See—  
den Broeder, Friedrich J. A.; Draaisma, Henricus J. G.; and Kahle, Alexander, 4,678,721, Cl. 428-607.000.

Drake, Cyril F.; and Brocklehurst, John R., to STC, plc. Therapeutic devices incorporating water soluble glass compositions. 4,678,659, Cl. 424-451.000.

Drake, Donald J.; Campanelli, Michael R.; and Ims, Dale R., to Xerox Corporation. Selective application of adhesive and bonding process for ink jet printheads. 4,678,529, Cl. 156-234.000.

Drapier, Albert: See—  
Henault, Jean-Paul; Drapier, Albert; Grochowski, Guy; and Meslif, Alain, 4,677,939, Cl. 122-17.000.

Dresser Industries, Inc.: See—  
James, Thomas A., 4,678,997, Cl. 324-341.000.

Dresti, Silvano; Buhler, Ernst; and Derighetti, Rene, to AG fur industrielle Elektronik AGIE Losone b. Locarno. Power supply circuit for spark erosion. 4,678,885, Cl. 219-69.00C.

DSPIE "D. Blagoev": See—  
Stambolov, Lyuben K.; Chaushev, Sotir Y.; and Simitchiev, Dilyan L., 4,678,615, Cl. 261-111.000.

Du Pont Canada Inc.: See—  
Boivin, Daniel W.; and Zelinka, Ronald A., 4,678,834, Cl. 525-74.000.

Duane, Michael P.: See—  
Doering, Robert R.; Duane, Michael P.; and Armstrong, Gregory J., 4,677,739, Cl. 29-576.00B.

Duerichen, Johann G. Wood or coal burning heater. 4,677,965, Cl. 126-76.000.

Duerschnabel, Wolfgang; Puckert, Franz; Steuer, Heinrich; and Bletschacher, Max, to Weiland-Werke AG. Copper-chromium-titanium-silicon alloy and application thereof. 4,678,637, Cl. 420-490.000.

Dufford, Edward L.: See—  
Chang, Wen-Hsuan; Dufford, Edward L.; Erikson, J. Alden; and Prucnal, Paul J., 4,678,835, Cl. 525-100.000.

Dugge, Richard H.; and Cordani, Eugene J., to ACF Industries, Incorporated. High volume covered hopper car with loading from below and automatic unloading. 4,677,917, Cl. 105-248.000.

Dugle, Thomas E. Rectilinearly traveling vehicle. 4,678,051, Cl. 180-9.100.

Dugliss, Charles H., to American Cyanamid Company. Chemiluminescent composition. 4,678,608, Cl. 252-700.000.

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Arnould, Emmanuel; and Dugre, Jean-Pierre, 4,679,163, Cl. 364-725.000.

Dunaway, Weyman H., to E.C.C. America Inc. Method for calcining kaolin. 4,678,517, Cl. 106-309.000.

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Dunromin Enterprises Unlimited, Inc.: See—  
Aveic, Katarina, 4,678,465, Cl. 604-397.000.

Dupier, Tim: See—  
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Du Pont de Nemours & Co., Inc.: See—  
Artz, Steven P., 4,678,498, Cl. 71-87.000.

Bollin, Ernest, Jr.; and Fletcher, Mark G., 4,678,812, Cl. 514-777.000.

Bushey, William R., 4,678,505, Cl. 75-0.50A.

Hanagan, Mary A.; and Thompson, Mark E., 4,678,502, Cl. 71-93.000.

Hay, James V.; and Levitt, George, 4,678,500, Cl. 71-92.000.

Huisman, Hendrikus F.; and Pigmans, Henricus J. M., 4,678,705, Cl. 428-315.900.

Logullo, Francis M., Sr.; Wu, Yun-Tai; and Zahr, George E., 4,678,821, Cl. 523-205.000.

Pasteris, Robert J.; and Muthukrishnan, Ramaurthi, 4,678,499, Cl. 71-90.000.

Petersen, Wallace C., 4,678,497, Cl. 71-86.000.

Reitz, Robert R., 4,678,607, Cl. 252-609.000.

Rudershausen, Charles G., 4,678,859, Cl. 570-163.000.

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Wilhite, Douglas L.; and Mickewich, Daniel J., 4,678,744, Cl. 430-569.000.

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Durbin, James W., to Canevari Timber Co., Inc. Method and system for determination of data record order based on keyfield values. 4,679,139, Cl. 364-200.000.

Dureanleau, Roger G.; and Knifton, John F., to Texaco Inc. Process for separation of product resulting from hydroformylation. 4,678,857, Cl. 568-454.000.

Durst Phototechnik GmbH: See—  
Reiterer, Walther, 4,678,319, Cl. 355-38.000.

Dusch, Albert; and Willenbacher, Erich, to Pfaff Industrie Maschinen GmbH. Positioning device for sewing machine main shaft. 4,677,926, Cl. 112-274.000.

Dusterhoft, Ernest E.: See—  
Ban, Thomas R.; Dusterhoft, Ernest E.; and Gilmore, John E., 4,678,365, Cl. 404-118.000.

Dutartre, Didier: See—  
Haond, Michel; Bensahel, Daniel; and Dutartre, Didier, 4,678,538, Cl. 156-643.000.

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Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., 4,678,076, Cl. 198-525.000.

Dyckerhoff Engineering GmbH: See—  
Deyhle, Henning; and Grisar, Alexander, 4,678,514, Cl. 106-100.000.

Dynapert-HTC Corporation: See—  
Derrico, Gerard G., 4,678,111, Cl. 228-37.000.

Dzus Fastener Co. Inc.: See—  
Wright, Andrew C. W., 4,677,714, Cl. 24-590.000.

E.C.C. America Inc.: See—  
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E. H. Wachs Company, The: See—  
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E.I. du Pont de Nemours and Company: See—  
Lee, Denny L. Y., 4,679,142, Cl. 364-406.000.

E-Z-EM, Inc.: See—  
Onik, Gary; and Ginsburg, Leonard, 4,678,459, Cl. 604-22.000.

Eady, Robert W.: See—  
Davis, Arthur A.; and Eady, Robert W., 4,679,250, Cl. 455-601.000.

Earwood, Donald E., Sr. Telephone cord twist restrainer. 4,679,234, Cl. 379-438.000.

Easter, John H.: See—  
Blandford, David M.; and Easter, John H., 4,678,031, Cl. 166-242.000.

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Eastman Kodak Company: See—  
Beach, David E., 4,678,300, Cl. 354-21.000.

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Malloy Desormeaux, Stephen G., 4,678,303, Cl. 354-173.110.

Eastman, Richard E.; and Williams, Randolph C., to Chrysler Motors Corporation. Transfer case with inter-axle dual-planetary differential. 4,677,873, Cl. 74-665.0GE.

Eaton Corporation: See—  
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Hicks, Loy A., Jr.; Sherwood, Edward P.; and Saks, Thomas J., 4,678,253, Cl. 439-210.000.

Kenway, Sidney, 4,678,879, Cl. 200-295.000.

Light, Gerard M., 4,678,070, Cl. 192-58.00B.

Mahon, Joseph J., 4,678,930, Cl. 307-141.000.

Schultz, Gary R., 4,678,017, Cl. 152-416.000.

Eberhardt, Horst: See—  
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Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, 4,677,845, Cl. 73-56.000.

Eccardt, Curtis J., to Emerson Electric Co. Adjustable side extensions for work table. 4,677,920, Cl. 108-69.000.

Eccles, Robert E.: See—  
Vasseghi, Nader; Goddard, Donald G.; and Eccles, Robert E., 4,678,940, Cl. 307-446.000.

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Eckle, Otto, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Machine tool spindle and tool holders suitable for use therewith. 4,678,382, Cl. 409-232.000.

Ecklund, Lawrence M., to Motorola, Inc. Correction control circuit for AM stereophonic receivers. 4,679,237, Cl. 381-15.000.

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Beitinger, Eberhard; and Glaser, Eberhard, 4,678,771, Cl. 502-402.000.

Glaser, Eberhard, 4,678,369, Cl. 405-129.000.

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Eder, Kenneth C.; and Krzyanowski, Robert V., to Honeywell Inc. Ultrasonic distance sensor with dual burst noise rejection. 4,679,175, Cl. 367-98.000.

Edgar, Brian W.; and Elliott, Robert B., to University of Auckland, The. Method of dispensing and/or a dispenser. 4,677,975, Cl. 128-200.140.

Edwards, David V.; and Newman, Michael A., to RFD Limited. Inflatable liferaft. 4,678,443, Cl. 441-38.000.

Edwards, Thomas P.: See—  
Beesley, Brian G.; Hurley, Clive; Brend, Ramon H. J.; Edwards, Thomas P.; Sherrell, Robert W. D.; and Vickery, Andrew J., 4,677,909, Cl. 100-229.000.

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EEE Corporation: See—  
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Egawa, Hideharu; and Okumura, Katsuya, to Kabushiki Kaisha Toshiba. Method of wire bonding with applied insulative coating. 4,678,114, Cl. 228-176.000.

Eggers, Mark L., to KW Battery Company. Tubular plate electrode slurry filling process and apparatus for lead-acid cells. 4,678,730, Cl. 429-140.000.

EIC Laboratories, Inc.: See—  
Robblee, Lois S., 4,677,989, Cl. 128-784.000.

Eichenberger, Hansulrich; Lacher, Ludwig; and Schmid, Titus, to Maschinenfabrik Rieter A.G. Arrangement for cleaning the pressing rollers of a combing machine. 4,677,710, Cl. 19-218.000.

Eidenschink, Rudolf: See—  
Kreuzer, Franz-Heinrich; Eidenschink, Rudolf; and Weber, Georg, 4,678,283, Cl. 350-340.000.

Einolf, Charles W., Jr.: See—  
Koch, Karl C.; and Einolf, Charles W., Jr., 4,679,111, Cl. 361-31.000.

Ekika Carbon Dioxide Co., Ltd.: See—  
Hamano, Masanori; Takeuchi, Siro; and Inoue, Ichiro, 4,678,640, Cl. 422-56.000.

Electric Power Research Institute, Inc.: See—  
Coffin, Louis F., Jr.; and Prater, Thomas A., 4,677,855, Cl. 73-799.000.

Electricity Council, The: See—  
Griffith, John T., 4,678,881, Cl. 219-10.510.

Electrohome Limited: See—  
Kurz, Walter, 4,679,211, Cl. 315-399.000.

Elevator GmbH: See—  
Roschier, Nils-Robert, 4,679,032, Cl. 340-562.000.

Elfine, Geraldine S., to CX/OXYTECH, Inc. Method of removing heavy metal from wastewater streams. 4,678,584, Cl. 210-719.000.

Elfman, Brian P.; and Zajac, Patricia L., to Autosense Corporation. Breath alcohol analyzer. 4,678,057, Cl. 180-272.000.

Elkem a/s: See—  
Dahl, Erik Q.; Vatland, Arnfinn; and Vegge, Olaf T., 4,678,434, Cl. 432-242.000.

Elliott, Brian W., to Dow Chemical Company, The. Curable coating composition and epoxy resin adduct useful therein. 4,678,712, Cl. 428-418.000.

Elliott, James O.; and Monahan, Michael B., to General Motors Corporation. Sensorless starting control for a brushless DC motor. 4,678,973, Cl. 318-254.000.

Elliott, Robert B.: See—  
Edgar, Brian W.; and Elliott, Robert B., 4,677,975, Cl. 128-200.140.

Ellison, John R., Jr.: See—  
Krohn, David A.; Maack, David R.; Vinarub, Edmond I.; and Ellison, John R., Jr., 4,679,029, Cl. 340-347.00P.

Ellison, Kenneth, to Hunter Engineering (Canada) Ltd. Oven system having a heated snout at its entrance end. 4,678,433, Cl. 432-59.000.

Ellison, Thomas M.: See—  
Palmer, Emery A.; Shimanski, Michael A.; Ellison, Thomas M.; and Everidge, Jack P., 4,678,690, Cl. 428-31.000.

Elm Company Ltd.: See—  
Hori, Keiichi, 4,679,058, Cl. 346-140.00R.

Elmore, Jimmy D.; and Goff, Elizabeth S., to Celanese Corporation. Process for the ammonium hydroxide hydrolysis of polymers of acetoxyethylene to polymers of vinylphenol. 4,678,843, Cl. 525-378.000.

Eloranta, Jarmo, to Rauma-Repol Oy. Mode of construction of lifting mechanisms for a jack-up platform and lifting mechanism for a jack-up platform. 4,678,165, Cl. 254-97.000.

Elston, Thomas P., to G S I Holdings (Proprietary) Limited. Nozzle. 4,678,125, Cl. 239-589.100.

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Oppitz, Hans, 4,678,554, Cl. 204-299.00R.

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Gluschenko, Nikolai N.; Golikov, Vladislav V.; and Emelyanov, Viktor A., 4,677,864, Cl. 73-863.510.

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Emhart Industries, Inc.: See—  
Foster, Thomas V., 4,678,492, Cl. 65-74.000.

Nebelung, Hermann H.; and Knoth, Werner-Dieter, 4,678,494, Cl. 65-261.000.

Shedigan, Vandos, 4,679,119, Cl. 361-315.000.

Williams, Reade; and Westlund, Kenneth P., 4,679,075, Cl. 358-106.000.

Emmer, Eric D., to Chrysler Motors Corporation. Tapered piston pin. 4,677,722, Cl. 29-156.50A.

Emmerich, Kenneth C., to Fansteel Inc. Coolant sleeve for mining tools. 4,678,238, Cl. 299-81.000.

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Tsujii, Fumio; Matsuoka, Yoji; Shibata, Takanori; Endo, Akira; and Shirai, Hiroshi, 4,679,147, Cl. 364-449.000.

Energy Conversion Devices, Inc.: See—  
Boer, Willem D.; and Kawasaki, Atsushi, 4,678,542, Cl. 156-659.100.

Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., 4,677,738, Cl. 29-572.000.

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Bjorkman, Harry K., Jr.; and Carr, Peter, 4,678,656, Cl. 423-500.000.

Engel, Gunter: See—  
Mang, Hermenegild; and Engel, Gunter, 4,678,535, Cl. 156-623.00R.

Engelhard Corporation: See—  
Wan, Chung-Zong; Dettling, Joseph C.; and Jagel, Kenneth I., 4,678,770, Cl. 502-304.000.

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Gummere, John B.; and Minney, Stephen C., 4,678,049, Cl. 177-229.000.

Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, to Voest-Alpine Aktiengesellschaft. Tilting channel arrangement for guiding a molten material. 4,678,168, Cl. 266-196.000.

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Ennis, James F., III, to Anderson, Mark L. Dripless dispenser for liquids and viscous fluids. 4,678,107, Cl. 222-386.500.

Enomoto, Takamichi: See—  
Ohta, Wasaburo; Enomoto, Takamichi; and Uehara, Kiyohiro, 4,678,285, Cl. 350-345.000.

Enron Corp.: See—  
Lisowyj, Bohdan; Hitchcock, David C.; and Epstein, Henry, 4,678,647, Cl. 423-96.000.

Environmental Tectonics Corporation: See—  
Melrose, Richard C.; and McIntosh, Lionel D., 4,678,914, Cl. 250-343.000.

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Niiranen, Tapani; Savolainen, Erkki; and Kohonen, Raimo, 4,678,574, Cl. 210-327.000.

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Krohn, David A.; Maack, David R.; Vinarub, Edmond I.; and Ellison, John R., Jr., 4,679,029, Cl. 340-347.00P.

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Schomers, Josef; Erbe, Kurt; and Bonk, Wernfried, 4,679,121, Cl. 361-413.000.

Erben, Ralf; and Walden, Michael F. M., to Lucas Industries Public Limited Company. Brake actuator. 4,678,065, Cl. 188-196.00D.

Erbes, Kurt: See—  
Schneller, Arnold; Herwig, Walter; and Erbes, Kurt, 4,678,737, Cl. 430-270.000.

ERCO Industries Limited: See—  
Twardowski, Zbigniew, 4,678,655, Cl. 423-478.000.

Erdelitsch, Herbert; and Hecht, Walter, to WSWF Auto-Electric GmbH. Steering column switch for motor vehicles. 4,678,875, Cl. 200-61.540.

Ergene, Serdar: See—  
Fetter, John L.; Evans, Jerald R.; and Ergene, Serdar, 4,679,041, Cl. 340-747.000.

Erhardt, Harry G., to RCA Corporation. CCD circuitry for line-sequential read out of a photosensor array. 4,679,090, Cl. 358-213.260.

Erhardt, Manfred: See—  
Loos, Herbert; and Erhardt, Manfred, 4,677,962, Cl. 125-11.00CD.

Erickson, Paul M.: See—  
Wilson, Timothy J.; and Erickson, Paul M., 4,679,028, Cl. 340-347.00C.

Erikson, J. Alden: See—  
Chang, Wen-Hsuan; Dufford, Edward L.; Erikson, J. Alden; and Prucnal, Paul J., 4,678,835, Cl. 525-100.000.

Ernst, Hans-Otto; and Jakobsmeier, Helmut, to Hella KG Hueck & Co. Headlight for motor vehicles. 4,679,127, Cl. 362-294.000.



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Bulst, Wolf-Eckhart; Erthel, Mira; and Zibis, Peter, 4,679,014, Cl. 333-195.000.

Escaravage, Gerard, to Aciens et Outillage Peugeot. Buckle, especially for a safety belt. 4,677,715, Cl. 24-637.000.

Eskandry, Ezra D.: See—  
Pfaff, Paul H.; Spagna, Richard N.; Clucas, Robert A.; Coulson, Paul; and Eskandry, Ezra D., 4,679,035, Cl. 340-572.000.

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Etablissements Poirier S.A.: See—  
Chabrol, Jean-Jacques; and Lambert, Jean-Pierre, 4,678,233, Cl. 297-429.000.

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Haond, Michel; Bensahel, Daniel; and Dutartre, Didier, 4,678,538, Cl. 156-643.000.

Eur-Control Kalle AB: See—  
Lundberg, Peter, 4,677,846, Cl. 73-63.000.

Evans, James D.: See—  
Nelson, Richard D.; and Evans, James D., 4,678,452, Cl. 464-38.000.

Evans, Jerald R.: See—  
Fetter, John L.; Evans, Jerald R.; and Ergene, Serdar, 4,679,041, Cl. 340-747.000.

Evans, Terence M.: See—  
Holmes, Robert T.; Evans, Terence M.; King, Keith; and Graiff, Leonard B., 4,678,479, Cl. 44-57.000.

Everidge, Jack P.: See—  
Palmer, Emery A.; Shinanski, Michael A.; Ellison, Thomas M.; and Everidge, Jack P., 4,678,690, Cl. 428-31.000.

Ewald, Henry J.: See—  
Vrabel, Robert J.; Vajgart, Jeffery L.; Staszal, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., 4,678,975, Cl. 318-266.000.

Ewing, Joseph. Handicap turn signal bar for an automobile. 4,677,932, Cl. 116-35.00R.

Extraversion, Inc.: See—  
Ytter, Willy, 4,678,246, Cl. 312-114.000.

Exxon Production Research Co.: See—  
Orloff, John E., 4,677,930, Cl. 114-230.000.

Exxon Research and Engineering Company: See—  
Wernick, David L., 4,678,555, Cl. 208-36.000.

Fahlbusch, Dieter: See—  
Knakowski, Rolf; and Fahlbusch, Dieter, 4,679,026, Cl. 340-63.000.

Fahnstock, E. Carl. Quick music notes slide rule. 4,677,893, Cl. 84-473.000.

Fairchild Filter Corporation: See—  
Moorehead, Jack F.; and Campbell, Richard S., Sr., 4,678,564, Cl. 210-108.000.

Fairchild Medical Systems, Inc.: See—  
Fairchild, Richard A., 4,679,217, Cl. 378-97.000.

Fairchild, Richard A., to Fairchild Medical Systems, Inc. X-ray cassette structure. 4,679,217, Cl. 378-97.000.

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Fansteel Inc.: See—  
Emmerich, Kenneth C., 4,678,238, Cl. 299-81.000.

Fanuc Ltd.: See—  
Yamazaki, Etuo; and Yamaguchi, Masashi, 4,679,159, Cl. 364-560.000.

Fanuc Ltd.: See—  
Obara, Haruki; Ito, Masaya; and Tonamura, Masashi, 4,678,884, Cl. 219-69.00P.

Farace, Louis P., to Motorola, Inc. Safe and arming device. 4,677,913, Cl. 102-215.000.

Farfor, James D.: See—  
Debenham, Michael; and Farfor, James D., 4,677,757, Cl. 34-4.000.

Farrar, John C.; Ney, Reuben E.; and Schroeder, James L., III, to AMP Incorporated. Filtered electrical connector. 4,679,013, Cl. 333-182.000.

Feijen, Jan; and Hennink, Wilhelmus E., to Cordis Europa N.V. Conjugates of anticoagulant and protein. 4,678,671, Cl. 424-443.000.

Fekkes, Wilhelmus F.: See—  
Schmitz, Herman J. R.; Annegarn, Marcellinus J. C.; and Fekkes, Wilhelmus F., 4,679,083, Cl. 358-147.000.

Feldmann, Joachim, to WABCO Westinghouse Fahrzeugbremsen GmbH. Fastener arrangement for deformation sensor. 4,677,857, Cl. 73-855.000.

Fellows, Adrian N., to Fibre Treatments (Holding) Limited. Impregnated substrate incorporating an indicator dye. 4,678,704, Cl. 428-289.000.

Fellows, Oscar L. Thermomotor. 4,677,825, Cl. 60-525.000.

Fender Musical Instruments Corporation: See—  
Gressett, Charles A., Jr.; Page, John F.; Smith, Daniel J.; and Carruthers, John, 4,677,891, Cl. 84-313.000.

Ferag AG: See—  
Reist, Walter, 4,678,174, Cl. 270-54.000.

Ferber, Alan C.; and Chamran, Morteza M., deceased (by Chamran, Delories M., executrix), to Perkin-Elmer Corp. Wide dynamic range

linear to log converter with microcomputer control. 4,679,162, Cl. 364-571.000.

Ferguson, Donald C.: See—  
Smith, Merrill M.; and Ferguson, Donald C., 4,678,528, Cl. 156-220.000.

Ferguson, Robert G.: See—  
Anderson, Andrew G.; Bullen, David A.; and Ferguson, Robert G., 4,677,877, Cl. 74-785.000.

Ferragamo, Mark: See—  
Jordan, Mark T.; and Ferragamo, Mark, 4,678,061, Cl. 182-206.000.

Ferrari, Harry M., to Westinghouse Electric Corp. Nuclear fuel assembly grid with predetermined grain orientation. 4,678,632, Cl. 376-462.000.

Fetter, John L.; Evans, Jerald R.; and Ergene, Serdar, to Sun Microsystems, Inc. High speed Z-buffer with dynamic random access memory. 4,679,041, Cl. 340-747.000.

Fetzer, Wolfgang, to Svenska Rotor Maskiner Aktiebolag. Apparatus for catalytic cleaning of exhaust gases from a furnace system. 4,678,643, Cl. 422-175.000.

F'Geppert, Erwin. Prevention of particulate accumulations on observation windows in military vehicles. 4,678,224, Cl. 296-91.000.

Fiat Auto S.p.A.: See—  
Castagno, Aldo, 4,678,227, Cl. 296-213.000.

Fibre Treatments (Holding) Limited: See—  
Fellows, Adrian N., 4,678,704, Cl. 428-289.000.

Fieldcrest Cannon, Inc.: See—  
Basinger, David M.; Hatley, Gary L.; Kiser, Billy J.; and Moser, James N., 4,678,173, Cl. 270-45.000.

Filkins, Timothy J., to Chrysler Motors Corporation. Transmission vibration viscous damper. 4,677,868, Cl. 74-359.000.

Fillman, Paul D., to RCA Corporation. Regulating power supply for video display apparatus. 4,679,131, Cl. 363-21.000.

Fillmore, William E., to Owens-Illinois, Inc. Vacuum indicating thermoplastic closure. 4,678,082, Cl. 206-459.000.

Finch, Stephen C.: See—  
Ponsford, Roger J.; Pearson, Michael J.; and Finch, Stephen C., 4,678,782, Cl. 514-210.000.

Finger, John F.; and Lawrenson, Glen A., to Sioux Steam Cleaner Corporation. Combination cleaner safety circuit. 4,678,892, Cl. 219-272.000.

Fink, Ludwig; and Toussaint, Hans-Norbert, to Siemens Aktiengesellschaft. Optical fiber plug device including fiber for monitoring a light source. 4,678,265, Cl. 350-96.200.

Finkel, Joel R.; Jacobs, Paul F.; Gustafson, Kenneth I.; and Green, William D., to Xerox Corporation. Method and apparatus for the prevention of unauthorized copying of documents. 4,678,322, Cl. 355-133.000.

Finley, Martha N.; and Spector, George. Vacuum cleaner exhaust dust collector. 4,678,485, Cl. 55-255.000.

Finn, Roger C.; and MacKenzie, Morley S., to Northern Telecom Limited. Optical fiber splice. 4,678,272, Cl. 350-96.210.

Finnell, James S., to Hewlett-Packard Company. Apparatus for locating a memory module within a memory space. 4,679,167, Cl. 364-900.000.

Fischer, Glenn N. Guided-bend test apparatus. 4,677,856, Cl. 73-850.000.

Fischer, Walter: See—  
Matthews, Thomas A.; Fischer, Walter; and Petzwinkler, Lucas, 4,678,068, Cl. 188-353.000.

Fisher, Robert J., to Magna International Inc. Memory positioning system for remote control rear-view mirror. 4,678,295, Cl. 350-634.000.

Fishman, Herbert; and Rogers, Alvin J., to Systems Engineering & Manufacturing Corp. Printed circuit board holder. 4,678,169, Cl. 269-46.000.

Fitzgerald, Thomas J.: See—  
Rudy, Richard M.; and Fitzgerald, Thomas J., 4,678,403, Cl. 417-12.000.

Flanders Filters, Inc.: See—  
Cadwell, George H., Jr.; Pittman, Clarence B.; and Bowers, Cecil W., 4,678,487, Cl. 55-385.00A.

Fletcher, Mark G.: See—  
Bollin, Ernest, Jr.; and Fletcher, Mark G., 4,678,812, Cl. 514-777.000.

Flitton, James F., to Photo-Me International PCL. Photographic camera. 4,678,305, Cl. 354-203.000.

Flores, David P.: See—  
McKinney, Osborne K.; Allen, James A.; and Flores, David P., 4,678,836, Cl. 525-221.000.

Flores, Robert J., to PMC Specialties Group, Inc. Process for the purification of triphenylmethane compounds. 4,678,613, Cl. 260-391.000.

Flory, Thomas A., to Monsanto Company. Multi-size tire chuck. 4,677,848, Cl. 73-146.000.

Flum, Paul, to Paul Flum Ideas, Inc. Collapsible display and storage container. 4,678,088, Cl. 211-73.000.

Fock, Jurgen; and Rott, Hans, to TH. Goldschmidt AG. Use of copolymers of polyoxyalkylene ethers of allyl and/or methallyl alcohol and vinyl esters as demulsifiers for water-containing crude oil. 4,678,599, Cl. 252-343.000.

Focke and Co.: See—  
Focke, Heinz; and Mutschall, Hugo, 4,678,074, Cl. 198-457.000.

Focke & Co., (GmbH & Co.): See—  
Focke, Heinz; and Mutschall, Hugo, 4,678,901, Cl. 250-223.00R.

Focke, Heinz; and Mutschall, Hugo, to Focke and Co. Apparatus for separating objects (packages) from a continuous row of objects. 4,678,074, Cl. 198-457.000.

Focke, Heinz; and Mutschall, Hugo, to Focke & Co., (GmbH & Co.). Optical sensor for monitoring cigarette groups. 4,678,901, Cl. 250-223.00R.

Fonda, Carlo L., to Videocolor. Shadow mask for a colored image tube and image tube comprising the same. 4,678,963, Cl. 313-405.000.

Fondiller, Robert. Apparatus for the construction of a low cost structure. 4,678,157, Cl. 249-65.000.

Fong, Dodd W.; and Kowalski, David J., to Nalco Chemical Company. Phosphonic acid-containing polymer. 4,678,840, Cl. 525-340.000.

Ford Motor Company: See—  
Cairns, Thomas M., 4,677,702, Cl. 7-107.000.

Dick, Heinz, 4,679,125, Cl. 362-66.000.

Hamburg, Douglas R., 4,677,956, Cl. 123-520.000.

Ransom, Keith C.; and Howitt, Henry G., 4,678,007, Cl. 137-625.660.

Tamagne, Henry J., 4,677,946, Cl. 123-146.50A.

Vrabel, Robert J.; Vajgart, Jeffery L.; Staszal, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., 4,678,975, Cl. 318-266.000.

Formation Damage Removal Corporation: See—  
Eastlund, Bernard J.; Schmitt, Kenneth J.; and Bass, Ronald M., 4,678,034, Cl. 166-248.000.

Foster, Thomas V., to Emhart Industries, Inc. Blowing process for expanding a molten glass parison. 4,678,492, Cl. 65-74.000.

Fouassier, Jean-Pierre. Modular device for storing compact discs or the like. 4,678,245, Cl. 312-15.000.

Four Season Solar Products Corporation: See—  
Esposito, Chris, 4,678,019, Cl. 160-272.000.

Fowler, George A.; Hamilton, James M.; and Whiteway, William J., to Canadian Patents and Development Limited. Traction device for line handling equipment. 4,678,132, Cl. 242-47.090.

Francescon, Paul K.: See—  
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,678,040, Cl. 166-370.000.

Frank, Dieter: See—  
Brady, Catherine D.; Metcalfe, Lincoln D.; Slaboszewski, Dale R.; and Frank, Dieter, 4,678,580, Cl. 210-490.000.

Frank, Marc. Small animal trap with multifingered bait holder. 4,677,786, Cl. 43-82.000.

Frank, Heinrich: See—  
Franke, Helga; Franke, Heinrich; Kruger, Hans-Rudolf; and Joppien, Hartmut, 4,678,811, Cl. 514-721.000.

Franke, Helga; Franke, Heinrich; Kruger, Hans-Rudolf; and Joppien, Hartmut, to Schering Aktiengesellschaft. Substituted benzylothers, pesticides containing these compounds and method for their preparation. 4,678,811, Cl. 514-721.000.

Frazer-Nash Ltd.: See—  
Griffin, Dennis, 4,678,143, Cl. 244-63.000.

Fredeking, Terry M. Method for avoiding mistakes during plasmapheresis. 4,678,458, Cl. 604-6.000.

Fredricks, Cheryl A.: See—  
Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., 4,678,867, Cl. 174-135.000.

Freeman, Thomas R., to Westinghouse Electric Corp. Nuclear reactor control rod cluster for enthalpy rise compensation. 4,678,628, Cl. 376-333.000.

Fremont Special Machine Co., Inc.: See—  
Simonton, R. D.; Cattano, John D.; and Mason, Robert K., 4,678,729, Cl. 429-129.000.

Frick Company: See—  
Pillis, Joseph W.; Murphy, David A.; Spellar, Peter C.; and Nemit, Paul, Jr., 4,678,406, Cl. 417-310.000.

Fried, Krupp GmbH: See—  
Heidenreich, Peter; Heinen, Karl-Heinz; Muller, Wolfgang; and Veuhoff, Heinz, 4,679,205, Cl. 373-84.000.

Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, 4,678,543, Cl. 202-154.000.

Friedrich, Karl, to Steyr-Daimler-Puch Aktiengesellschaft. Transmission, particularly for cross-country motor vehicles. 4,677,874, Cl. 74-665.00C.

Friesen, Albert D.; and Grassler, Walter F., to Winnipeg Rh Institute Inc., The. Sight tube for monitoring of fluids. 4,678,278, Cl. 350-319.000.

Frisbie, William R.: See—  
Cox, Michael W.; Levin, Richard I.; Cohen, David J.; and Frisbie, William R., 4,679,144, Cl. 364-417.000.

Fritzsch, Klaus, to Husky Injection Molding System Ltd. Automatic shut off nozzle for plastic extruder. 4,678,427, Cl. 425-562.000.

Frykhult, Rune H., to AB Celleco. Rotatable filter disc assembly. 4,678,575, Cl. 210-327.000.

Fuchizawa, Tetsuro: See—  
Tamagawa, Shigehisa; Fuchizawa, Tetsuro; and Abe, Hisamasa, 4,678,742, Cl. 430-523.000.

Fuji Electric Co., Ltd.: See—  
Kato, Toshiaki, 4,679,089, Cl. 358-213.190.

Fuji Photo Film Co., Ltd.: See—  
Asai, Takamitsu; Akashi, Goro; Kitamoto, Tatsuji; Chikamasa, Hiroshi; and Sato, Tsunehiko, 4,678,682, Cl. 427-48.000.

Kitaguchi, Hiroshi; Kato, Masatoshi; Sato, Kozo; Takeuchi, Masaji; and Tsukase, Masaaki, 4,678,735, Cl. 430-203.000.

Kitaguchi, Hiroshi; Takeuchi, Masashi; Sato, Kozo; Tsukase, Masaaki; and Kato, Masatoshi, 4,678,739, Cl. 430-353.000.

Kurokawa, Toshio, 4,678,409, Cl. 417-420.000.

Miyoshi, Takahito; Fujiyama, Masaaki; Okutu, Toshimitu; Masuyama, Kenichi; and Nasu, Norio, 4,678,697, Cl. 428-141.000.

Nakanishi, Haruo; Sakaki, Hirokazu; Yamazaki, Toru; and Okishi, Yoshio, 4,678,551, Cl. 204-129.750.

Shiozawa, Etuo; Harada, Shigeo; Ohtsuka, Shuichi; and Ohnishi, Masahiro, 4,678,312, Cl. 355-3.00R.

Tamagawa, Shigehisa; Fuchizawa, Tetsuro; and Abe, Hisamasa, 4,678,742, Cl. 430-523.000.

Tamura, Kaoru; Yasuhiro, Kawai; and Utsumi, Isao, 4,678,180, Cl. 271-296.000.

Tokunaga, Fumihiro; Asai, Takamitsu; and Fujiyama, Masaaki, 4,678,706, Cl. 428-323.000.

Yamada, Kohzaburo; Ichijima, Seiji; and Usui, Hideo, 4,678,743, Cl. 430-551.000.

Yamada, Sumito; and Okazaki, Masaki, 4,678,741, Cl. 430-445.000.

Yamada, Sumito; Mifune, Hiroyuki; and Urabe, Shigeharu, 4,678,745, Cl. 430-569.000.

Fuji Xerox Co., Ltd.: See—  
Inui, Toshiharu; and Moriguchi, Haruhiko, 4,679,055, Cl. 46-76.0PH.

Fujii, Yoshiharu, to Sharp Kabushiki Kaisha. Copying machine. 4,678,320, Cl. 355-49.000.

Fujimori, Fumio: See—  
Adachi, Yoshiharu; Fujimori, Fumio; Kondo, Toshio; Uemura, Hiroshi; and Shibata, Juichi, 4,678,064, Cl. 188-73.450.

Fujinuma, Katsumi; Takase, Tsuneyoshi; and Hayashi, Yoriyuki, to Toyo Cei Kabushiki Kaisha; and Fujinuma, Katsumi. Emergency mask. 4,677,976, Cl. 128-201.250.

Fujita, Kazuo: See—  
Sakimoto, Seiichiro; Fujita, Kazuo; Yamauchi, Yutaka; and Matsue, Hiroshi, 4,678,710, Cl. 428-407.000.

Fujita, Masahito; Miyazaki, Makoto; Kizaki, Masami; Nagashima, Yukio; and Shimbori, Yuichi, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of olefins. 4,678,768, Cl. 502-119.000.

Fujita, Tetsuya: See—  
Konno, Tetsuro; Kanai, Yutaka; and Fujita, Tetsuya, 4,678,313, Cl. 355-3.00R.

Fujitsu Limited: See—  
Fukuda, Misao; Tsuda, Toshitaka; Murano, Kazuo; and Awata, Yutaka, 4,679,188, Cl. 370-29.000.

Hattori, Toshihiro; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,677,880, Cl. 74-866.000.

Kanai, Yasunori; and Saitoh, Taichi, 4,678,942, Cl. 307-455.000.

Nawata, Kazumasa; and Kanai, Yasunori, 4,678,935, Cl. 307-297.000.

Sugishima, Kenji; and Nakagawa, Kenji, 4,678,919, Cl. 250-491.100.

Takemae, Yoshihiro, 4,679,214, Cl. 377-80.000.

Fujiwara, Akinori: See—  
Nishimura, Yuji; Fujiwara, Akinori; and Kanada, Shigeyasu, 4,678,928, Cl. 307-10.05B.

Fujiyama, Masaaki: See—  
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- Hsu, Shih C.; and Raman, Ramas V., 4,678,720, Cl. 428-606.000.
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- Grossman, Mark W.; and George, William A., 4,678,530, Cl. 204-105.00R.
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- Gudas, Charles J., to Scholl, Inc. Shoe inlay. 4,677,766, Cl. 36-43.000.
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Luke, Robert R.; Barker, James M.; Smith, Michael L.; Grigar, Larry L.; and Miller, Carl B., 4,678,044, Cl. 175-4.520.
- Halstead, Raymond T.: See—  
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- Hamburg, Douglas R., to Ford Motor Company. Solenoid duty cycle modulation for dynamic control of refueling vapor purge transient flow. 4,677,956, Cl. 123-520.000.
- Hametta, Allen W., to Hi-Tech Systems, Corp. Electronic metal detector. 4,678,992, Cl. 324-208.000.
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- Hamlin, Thomas J.: See—  
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- Hammill, Harry B., III: See—  
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- Hanagan, Mary A.; and Thompson, Mark E., to Du Pont de Nemours, E. I., and Company. Herbicidal ortho-alkyl- and ortho-alkenyl-substituted benzenesulfonamides. 4,678,502, Cl. 71-93.000.
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- Hara, Masato; and Kaneko, Atsumi, to Ashai Optical Co., Ltd. Reference position-detecting device for photoelectric encoder. 4,678,910, Cl. 250-237.00G.
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- Harris, Leland H.: See—  
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- Harris, William B. Desiccant cartridge for fuel tank vent line. 4,677,929, Cl. 114-211.000.
- Harry, Alan, to PA Consulting Services Limited. Ribbon cassettes and apparatus for receiving same. 4,678,139, Cl. 242-199.000.
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Saaski, Elric W.; and Hartl, James C., 4,678,904, Cl. 250-227.000.
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- Harvey, Donald M., to Eastman Kodak Company. Camera device for encoding conventional film cartridge. 4,678,299, Cl. 354-21.000.
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- Hatley, Gary L.: See—  
Basinger, David M.; Hatley, Gary L.; Kiser, Billy J.; and Moser, James N., 4,678,173, Cl. 270-45.000.
- Hatton, James H., Jr.: See—  
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- Hattori, Tadashi: See—  
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- Haunhorst, Greg A.: See—  
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Stole, Kjell A.; Lpvsland, Arnstien; and Havig, Egil, 4,678,560, Cl. 209-23.000.
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- Hay, Robert A.: See—  
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- Hayashi, Kimiyoshi, to Canon Kabushiki Kaisha. Color image reading apparatus with white balance system for controlling the intensity of a light source illuminating a color document. 4,679,073, Cl. 358-80.000.
- Hayashi, Masatake, to Sony Corporation. Image pickup tube. 4,678,962, Cl. 313-383.000.
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- Hayashi, Yukichi; Itako, Eiji; and Yasuhara, Masahiro, to Kabushiki Kaisha Nipponconco. Automatic vending machine with discount function. 4,679,150, Cl. 364-479.000.
- Hayes, Peter R., to BCIRA. Curing foundry moulds and cores. 4,678,020, Cl. 164-16.000.
- Hayes, Starr R. Clean up glove. 4,677,697, Cl. 2-159.000.
- Haygood, Norman M., Jr.: See—  
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- Heath Company: See—  
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- Hecht, Walter: See—  
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- Heck, Samuel C., to Sani-Fresh International, Inc. Safety lock mechanism for cleaning wand. 4,678,105, Cl. 222-153.000.
- Hehl, Karl. Vented cover assembly with filter insert for fluid reservoir. 4,678,572, Cl. 210-232.000.
- Heide, Jorgen, to Richards Medical Company. Touch sensitive hearing aid volume control circuit. 4,679,240, Cl. 381-68.600.
- Heidenreich, Peter; Heinen, Karl-Heinz; Muller, Wolfgang; and Veuhoff, Heinz, to Fried. Krupp GmbH. Tilttable metallurgical furnace vessel. 4,679,205, Cl. 373-84.000.
- Heinen, Karl-Heinz: See—  
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- Heinrich, Martin W.: See—  
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- Heinrich, Peter; Knop, Klaus; and Rube, Friedbert, to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG. Process for producing and using syngas and recovering methane enricher gas therefrom. 4,678,480, Cl. 48-197.00R.
- Heintz, Robert J. Vibration dampener. 4,678,066, Cl. 188-218.00A.
- Heist, Hans; Toepfer, Dieter; and Britzke, Sylvia, to Hoechst Aktiengesellschaft. Device for treating printing plates with a fluid. 4,678,310, Cl. 354-319.000.
- Helene Curtis, Inc.: See—  
Hoshowski, Myra A.; and Patel, Chaitanya, 4,678,475, Cl. 8-606.000.
- Hella KG Hueck & Co.: See—  
Ernst, Hans-Otto; and Jakobsmeier, Helmut, 4,679,127, Cl. 362-294.000.
- Hellekson, Ronald A.: See—  
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- Helms, Charles C.; Conlon, Ralph D.; and Delany, Edward B., to Perkin-Elmer Corporation, The. Instantaneous reading multichannel polychromatic spectrophotometer method and apparatus. 4,678,917, Cl. 250-373.000.
- Helversen, Frederick D. Canal covering system and method of installing same. 4,678,368, Cl. 405-118.000.
- Hempel, Hans D.; Horn, Jurgen; Rothermel, Wilfried; Sonneborn, Hans H.; Becker, Michael; and Muller, Ulrich, to Biotest-Serum-Institut GmbH. Blood-culture flask with integrated subculture. 4,678,753, Cl. 435-296.000.
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- Henkel Kommanditgesellschaft auf Aktien: See—  
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- Henning, John C., to Product Investment Incorporated. Container for hanger-supported garments. 4,678,079, Cl. 206-279.000.



- Hennink, Wilhelmus E.: See—  
Feijen, Jan; and Hennink, Wilhelmus E., 4,678,671, Cl. 424-443.000.
- Hennion, Claude: See—  
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- Henry Mann, Inc.: See—  
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- Henze, Christopher P., to Sperry Corporation. Digital power converter input current control circuit, 4,678,984, Cl. 323-285.000.
- Herbert Richter, Metallwaren-Apparatebau GmbH & Co.: See—  
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- Herbert, William G., Jr.; Grey, Henry G.; and Reynolds, Bruce C., to Xerox Corporation. Electroforming process and product, 4,678,691, Cl. 428-36.000.
- Hercules Incorporated: See—  
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- Sand, Michael L., 4,678,684, Cl. 427-213.360.
- Hergeth, Hubert A. Fiber-bale plucker, 4,678,128, Cl. 241-101.00A.
- Hermach, Carl J., to Publishers Equipment Corporation. Conversion of letterpress to offset printing, 4,677,911, Cl. 101-218.000.
- Hermens, Joannes L. G., to U.S. Philips Corporation. Integrated radiation detector, 4,678,918, Cl. 250-374.000.
- Herwig, Walter: See—  
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- Hessell, Edward T.: See—  
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- Hesston Corporation: See—  
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- Hetherington, Hoby P.: See—  
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- Hetherington, Todd G. Auxiliary shock absorber assembly, 4,678,204, Cl. 280-710.000.
- Heuga Holding b.v.: See—  
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- Hewlett-Packard Company: See—  
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- Jensen, Gordon A.; Reames, Stephen P.; Morris, Jerry D.; and Neal, Scott S., 4,679,193, Cl. 370-94.000.
- Neil, Robert B.; and Adleman, George L., 4,679,039, Cl. 340-728.000.
- Heymer, Gero: See—  
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- Hi-Tech Systems, Corp.: See—  
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- Hicks, Cecil B. Electro-mechanical security lock, 4,677,834, Cl. 70-279.000.
- Hicks, Loy A., Jr.; Sherwood, Edward P.; and Saks, Thomas J., to Eaton Corporation. Bus duct having improved bus bar clamping structure, 4,678,253, Cl. 439-210.000.
- Hicks, Michael S.; and Vannauker, David L., to Mobil Oil Corporation. Method of producing lube stocks from waxy crudes, 4,678,556, Cl. 208-96.000.
- Hida, Yoshinori: See—  
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- Hidaka, Hiroyoshi; and Sone, Takanori, to Asahi Kasei Kogyo Kabushiki Kaisha. Substituted isouinolinesulfonyl compounds, 4,678,783, Cl. 514-218.000.
- Hiestand, Karl: See—  
Schmid, Herbert; and Hiestand, Karl, 4,677,885, Cl. 82-40.00R.
- Higashiyama, Mitsuo, to Sony Corporation. Signal transmission apparatus for a multiple channel system and method for using the same, 4,679,225, Cl. 379-62.000.
- Higuchi, Keizo, to Mitsubishi Denki Kabushiki Kaisha. Video display control unit, 4,679,027, Cl. 340-723.000.
- Hilbert, Timothy L.: See—  
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- Hill, Warren D.: See—  
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- Hilti Aktiengesellschaft: See—  
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- Hinoto, Yuji: See—  
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- Hiramatsu, Kinuo: See—  
Honda, Kazuo; Horii, Yoshiaki; Hiramatsu, Kinuo; Nakamoto, Shuhei; and Kudo, Takashi, 4,678,054, Cl. 180-225.000.
- Hirano, Masao; Takaoka, Motoaki; and Shimura, Mikihiro, to Omron Tateisi Electronics Co. Temperature measuring apparatus, 4,679,157, Cl. 364-557.000.
- Hirano, Takahisa; and Hagimoto, Kiyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Rotary type fluid machine, 4,678,415, Cl. 418-50.000.
- Hirano, Takahisa; Fukami, Shoji; and Maeda, Mitsutosho, to Mitsubishi Jukogyo Kabushiki Kaisha. Rotary type fluid machine, 4,678,416, Cl. 418-55.000.
- Hiraoka & Co. Ltd.: See—  
Obayashi, Tsutomu; Watanabe, Shinobu; and Ino, Kazuhide, 4,678,681, Cl. 427-38.000.
- Hirayama, Akira: See—  
Kawabata, Juheiji; Sugie, Toshinori; Kobata, Fumihiko; and Hirayama, Akira, 4,678,831, Cl. 524-496.000.
- Hirose Denki Kabushiki Kaisha: See—  
Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, 4,678,256, Cl. 439-347.000.
- Hirose Electric Co., Ltd.: See—  
Mitani, Ikujiro; Kawanami, Norihide; and Kobayashi, Fumio, 4,678,261, Cl. 439-582.000.
- Hirose, Fumiyuki: See—  
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.
- Hirose, Naoya: See—  
Sugura, Susumu; Sugino, Takashi; and Hirose, Naoya, 4,679,074, Cl. 358-80.000.
- Hirota, Hajime: See—  
Ogino, Hidekazu; and Hirota, Hajime, 4,678,598, Cl. 252-174.170.
- Hiroyoshi, Toshiki, to Bio-Medical Co., Ltd. Cardiovascular prosthesis, 4,678,468, Cl. 623-1.000.
- Hirschfeld, Tomas B., to United States of America. Air Force. Precision guided antiaircraft munition, 4,678,142, Cl. 244-3.160.
- Hirsius, John L.: See—  
Green, Carlos J.; Hirsius, John L.; and Book, Marshall K., 4,677,970, Cl. 128-82.100.
- Hisano, Katsukuni: See—  
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.
- Hitachi Cable, Ltd.: See—  
Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeo; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.
- Hitachi, Ltd.: See—  
Gotou, Shizuo; Kagimasa, Toyohiko; Yoshizumi, Seiichi; and Shintani, Yooichi, 4,679,140, Cl. 364-200.000.
- Hosaka, Nobuyoshi; Shimizu, Tasuku; Mikada, Kenzo; Tamura, Kozo; and Tanabe, Masatoshi, 4,678,571, Cl. 210-202.000.
- Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.
- Kanazawa, Hiroshi; Yamashita, Seizi; and Miyashita, Kunio, 4,678,971, Cl. 318-135.000.
- Kawakami, Mitsuo; and Kawamoto, Hiroyuki, 4,678,727, Cl. 429-104.000.
- Murayama, Seiichi; Tsujii, Kanji; and Yajima, Yusuke, 4,678,536, Cl. 156-635.000.
- Ogawa, Toshio; Kondo, Shinichi; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,679,176, Cl. 367-119.000.
- Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeo; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.
- Tsujii, Fumio; Matsuoka, Yoji; Shibata, Takanori; Endo, Akira; and Shirai, Hiroshi, 4,679,147, Cl. 364-449.000.
- Uragami, Akira; Suzuki, Yukio; Kadono, Shinji; Iwamura, Masahiro; Masuda, Ikuro; and Yamauchi, Tatsumi, 4,678,943, Cl. 307-473.000.
- Yoshida, Toshimi; Maki, Hideo; Umemura, Hajime; Yasuda, Tetsuo; Masaoka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, 4,678,521, Cl. 148-11.50F.
- Hitachi Maxell, Ltd.: See—  
Kitta, Kenichi; Kanazawa, Yasunori; and Otomo, Yoshiro, 4,678,338, Cl. 356-402.000.
- Hitachi Medical Corporation: See—  
Ogawa, Toshio; Kondo, Shinichi; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,679,176, Cl. 367-119.000.
- Hitchcock, David C.: See—  
Lisowsky, Bohdan; Hitchcock, David C.; and Epstein, Henry, 4,678,647, Cl. 423-96.000.
- Hjorth-Hansen, Arne. Tire handling apparatus, 4,678,163, Cl. 254-50.200.
- Ho, Chih Y., to McNeilab, Inc. Method for the treatment of LHRH diseases and conditions, 4,678,784, Cl. 514-219.000.

- Ho, Victor: See—  
Liu, Marie W.; and Ho, Victor, 4,678,849, Cl. 526-259.000.
- Hochbein, David E., to Aluminum Company of America. Anode button facing machine, 4,677,727, Cl. 29-402.060.
- Hoechst Aktiengesellschaft: See—  
Engels, Joachim, 4,678,609, Cl. 260-397.450.
- Gradi, Reinhard; and Heymer, Gero, 4,678,650, Cl. 423-309.000.
- Heist, Hans; Toepfer, Dieter; and Britzke, Sylvia, 4,678,310, Cl. 354-319.000.
- Muller, Heinz; Lohmar, Elmar; and Scholz, Harald, 4,678,482, Cl. 55-71.000.
- Peiffer, Herbert; and Eberhardt, Horst, 4,678,339, Cl. 366-76.000.
- Pospich, Gunther; and Gutte, Richard, 4,678,832, Cl. 525-60.000.
- Schneller, Arnold; Herwig, Walter; and Erbes, Kurt, 4,678,737, Cl. 430-270.000.
- Hoffman, David; Verduin, Lee C.; and Ouwinga, Ross, to Rowe International, Inc. Price setting and display system for multiple unit merchandising machine, 4,677,777, Cl. 40-460.000.
- Hoffman-La Roche Inc.: See—  
Dorn, Franz; Pfiffner, Albert; and Zehnder, Beat, 4,678,790, Cl. 514-277.000.
- Hoffman, Michael J., to Stauffer-Wacker Silicones Corporation. Aqueous silicone emulsions as bladder lubricants, 4,678,815, Cl. 523-122.000.
- Hoffmann, Hellmut: See—  
Krugger, Bernd-Wieland; Hoffmann, Hellmut; Roos, Ernst; and Behrenz, Wolfgang, 4,678,777, Cl. 514-110.000.
- Hoffmann, Jürgen: See—  
Nodes, Rudolf; and Hoffmann, Jürgen, 4,678,578, Cl. 210-445.000.
- Hoffmann-La Roche Inc.: See—  
Klaus, Michael; and Loeliger, Peter, 4,678,793, Cl. 514-311.000.
- Hofmann, Constance J.: See—  
Marshall, Wayne E.; and Hofmann, Constance J., 4,678,673, Cl. 426-46.000.
- Hogeboom, John G.; and Thomas, Terence N., to Northern Telecom Limited. Digital line receiver, 4,679,209, Cl. 375-17.000.
- Hokari, Hiroshi: See—  
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,678,654, Cl. 71-76.000.
- Hole, David B.: See—  
Peterson, Thomas W.; Hole, David B.; and Mintz, S. Stanley, 4,678,952, Cl. 310-83.000.
- Holland, Charles J.: See—  
Epstein, David I.; and Holland, Charles J., 4,679,138, Cl. 364-200.000.
- Holland, John M., to Chevron Research Company. Fiber optic receiver having a method and an apparatus for data clock extraction, 4,679,252, Cl. 455-619.000.
- Hollandse Signaalapparaten B.V.: See—  
Bergman, Jan, 4,679,050, Cl. 342-196.000.
- Holloway, Gerald C., Jr., to Dayco Products, Inc. Method of making a fiber-loaded polymeric sheet, 4,678,455, Cl. 474-263.000.
- Holler, James M., to Bush Industries, Inc. Adjustable unitary hinge, 4,677,707, Cl. 16-239.000.
- Hollis, Richard G., to Mount Isa Mines Limited; and Commonwealth Scientific & Industrial Organization. Treatment of dross, 4,678,507, Cl. 75-24.000.
- Holloway, Peter R., to Analog Devices, Incorporated. MOS-cascoded bipolar current sources in non-epitaxial structure, 4,678,936, Cl. 307-303.000.
- Holmes, Robert T.; Evans, Terence M.; King, Keith; and Graiff, Leonard B. Diesel fuel composition, 4,678,479, Cl. 44-57.000.
- Holmstrom, Ulla-Kari M.; Sandgren, Lage M.; Norell, Maria G.; and Aexgård, Peter A., to KemaNord AB. Process for production of chlorine dioxide, 4,678,654, Cl. 423-478.000.
- Holt, Richard E. Demountable frames, 4,677,804, Cl. 52-648.000.
- Holtman, Dennis C., to Personal Products Company. Absorbent structure with reservoirs and a channel, 4,678,464, Cl. 604-385.00R.
- Holzman, James W.: See—  
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,678,214, Cl. 292-213.000.
- Homeyer, Bernard: See—  
Maurer, Fritz; Homeyer, Bernard; and Stendel, Wilhelm, 4,678,776, Cl. 514-89.000.
- Homeyer, Bernhard: See—  
Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hansler, Gerd; and Reinecke, Paul, 4,678,797, Cl. 514-378.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Ban, Keisuke; and Daimaru, Akimasa, 4,677,901, Cl. 92-213.000.
- Honda, Kazuo; Horii, Yoshiaki; Hiramatsu, Kinuo; Nakamoto, Shuhei; and Kudo, Takashi, 4,678,054, Cl. 180-225.000.
- Kishi, Toshiaki; and Kohama, Mitsuyoshi, 4,678,223, Cl. 296-78.100.
- Suzuki, Norio; Watabe, Akira; and Yamashita, Kazunari, 4,677,959, Cl. 123-587.000.
- Watanabe, Masaki; Yamamoto, Hitoshi; Matsuoka, Yoshinori; and Tanaka, Kunihiro, 4,678,053, Cl. 180-210.000.
- Honda, Kazuo; Horii, Yoshiaki; Hiramatsu, Kinuo; Nakamoto, Shuhei; and Kudo, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Body frames, 4,678,054, Cl. 180-225.000.
- Honda, Kenji, deceased (by Honda, Reiko, executor); and Sawafuji, Tadaaki, to Toho Beslon Co., Ltd.; and Tokyo Rope Manufacturing Co., Ltd. Composite rope and manufacture thereof, 4,677,818, Cl. 57-224.000.
- Honda, Reiko, executor: See—  
Honda, Kenji, deceased; and Sawafuji, Tadaaki, 4,677,818, Cl. 57-224.000.
- Honeywell Inc.: See—  
Berg, Ralph T., 4,678,335, Cl. 356-350.000.
- Eder, Kenneth C.; and Krzyanowski, Robert V., 4,679,175, Cl. 367-98.000.
- Nelson, Marvin D., 4,679,023, Cl. 337-140.000.
- Hoover, Charles D.: See—  
Bowen, Terry P.; Glover, Douglas W.; Hoover, Charles D.; Huber, John H.; and Schaffer, Ronald R., 4,678,264, Cl. 350-96.200.
- Hori, Hiroshi: See—  
Taniyama, Kiyoshi; and Hori, Hiroshi, 4,677,871, Cl. 74-467.000.
- Hori, Keiichi, to Elm Company Ltd. Cassette-type printing head with perforated film member, 4,679,058, Cl. 346-140.00R.
- Hori, Masaaki, to Brother Kogyo Kabushiki Kaisha. Apparatus for controlling the carriage of a printer, 4,678,979, Cl. 318-696.000.
- Horicke, Hans-Werner: See—  
Kotitschke, Gerhard; and Horicke, Hans-Werner, 4,677,763, Cl. 34-116.000.
- Horii, Yoshiaki: See—  
Honda, Kazuo; Horii, Yoshiaki; Hiramatsu, Kinuo; Nakamoto, Shuhei; and Kudo, Takashi, 4,678,054, Cl. 180-225.000.
- Horiike, Masanori: See—  
Izumi, Kouji; Horiike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, 4,677,845, Cl. 73-56.000.
- Hornel, Ronald F., to Chrysler Motors Corporation. Multiplexing of a bandpass filter circuit to work with a flux-gate sensor output, 4,677,754, Cl. 33-361.000.
- Horn, Jürgen: See—  
Hempel, Hans D.; Horn, Jürgen; Rothermel, Wilfried; Sonneborn, Hans H.; Becker, Michael; and Muller, Ulrich, 4,678,753, Cl. 435-296.000.
- Horrocks, Donald L.; and Kampf, Richard S., to Beckman Instruments, Inc. Apparatus for positioning an external radioactive standard in a liquid scintillation counter, 4,678,912, Cl. 250-328.000.
- Hosaka, Nobuyoshi; Shimizu, Tasuku; Mikada, Kenzo; Tamura, Kozo; and Tanabe, Masatoshi, to Hitachi, Ltd. Water purifier, 4,678,571, Cl. 210-202.000.
- Hoshowski, Myra A.; and Patel, Chaitanya, to Helene Curtis, Inc. Dye-conditioner composition that is non-staining to skin containing a certified violet dye and a quaternary ammonium compound, 4,678,475, Cl. 8-606.000.
- Hosiden Electronics Co., Ltd.: See—  
Okamoto, Kotaro, 4,679,062, Cl. 357-22.000.
- Hoskins, Michael K., to Ciba Corning Corp. Liquid clinical control standard, and reagent products, 4,678,754, Cl. 436-15.000.
- Hosoda, Bunichiro: See—  
Ishii, Hiroshi; and Hosoda, Bunichiro, 4,678,603, Cl. 252-522.00R.
- Hosokawa, Motoyuki: See—  
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Tsuji, Tomoji; and Wakui, Natsuko, 4,678,858, Cl. 568-902.000.
- Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, to Fried Krupp Gesellschaft mit beschränkter Haftung. Apparatus for producing ethanol, 4,678,543, Cl. 202-154.000.
- House Food Industrial Company Limited: See—  
Sugisawa, Ko; Matsumura, Yasushi; Sengoku, Koji; and Nagatome, Yoshiaki, 4,678,677, Cl. 426-634.000.
- Howard, Charles P.; and Stedman, Donald H., to Sensors, Inc. Liquid separator for gas analyzer, 4,678,488, Cl. 55-406.000.
- Howe, Dwayne E.: See—  
Butcher, William T.; Furlong, James J.; Howe, Dwayne E.; Snell, Gerald T.; and Yara, Calvin M., 4,679,117, Cl. 361-181.000.
- Howitt, Henry G.: See—  
Ransom, Keith C.; and Howitt, Henry G., 4,678,007, Cl. 137-625.660.
- Hoyt, John G. Circular linked rotating foil assembly for vessels, 4,677,928, Cl. 114-39.000.
- Hsu, Jang-Yu, to GA Technologies Inc. Gyro free electron laser, 4,679,197, Cl. 372-2.000.
- Hsu, Shih C.; and Raman, Ramas V., to GTE Laboratories Incorporated. Silver-copper-titanium brazing alloy, 4,678,720, Cl. 428-606.000.
- Huber, John H.: See—  
Bowen, Terry P.; Glover, Douglas W.; Hoover, Charles D.; Huber, John H.; and Schaffer, Ronald R., 4,678,264, Cl. 350-96.200.
- Hubner, Henry H., Jr.: See—  
Viola, Frank J.; and Hubner, Henry H., Jr., 4,678,217, Cl. 294-16.000.
- Huddy Diamond Crown Setting Company (Proprietary) Limited: See—  
Collin, William D., 4,678,237, Cl. 299-79.000.
- Huggins, Richard A. Cleaning system for static charged semiconductor wafer surface, 4,677,704, Cl. 15-1.50R.
- Hughes Aircraft Company: See—  
Crookshanks, Rex J., 4,679,161, Cl. 364-571.000.
- Shifrin, Gordon A.; and Hunsperger, Robert G., 4,677,740, Cl. 29-576.00B.
- Tsuda, George I., 4,679,207, Cl. 375-1.000.
- Hughes-Hartogs, Dirk, to Telebit Corporation. Ensemble modem structure for imperfect transmission media, 4,679,227, Cl. 379-98.000.
- Hughes Tool Company: See—  
Loret, Jerzy A.; and Vandevier, Joseph E., 4,678,404, Cl. 417-45.000.
- Vandevier, Joseph E.; Bearden, John L.; Pranger, William F.; and Miller, Harold L., 4,678,399, Cl. 415-199.200.



- Huiban, Jean-Yves: See—  
Connan, Jean-Louis; and Huiban, Jean-Yves, 4,679,115, Cl. 361-119.000.
- Huijsing, Johan H.; and Dhuyvetter, Timothy A., to Signetics Corporation. Simulated transistor/diode, 4,678,947, Cl. 307-490.000.
- Huisman, Hendrikus F.; and Pigmans, Henricus J. M., to Du Pont de Nemours, E. I., and Company. Composition and method for making magnetic recording elements, 4,678,705, Cl. 428-315.900.
- Hull, John R.; Lari, Robert J.; Praeg, Walter F.; and Turner, Larry R., to United States of America, Energy. Horizontal electromagnetic casting of thin metal sheets, 4,678,024, Cl. 164-503.000.
- Hunsperger, Robert G.: See—  
Shifrin, Gordon A.; and Hunsperger, Robert G., 4,677,740, Cl. 29-576.00B.
- Hunter Engineering (Canada) Ltd.: See—  
Ellison, Kenneth, 4,678,433, Cl. 432-59.000.
- Hurley, Clive: See—  
Beesley, Brian G.; Hurley, Clive; Brend, Ramon H. J.; Edwards, Thomas P.; Sherrell, Robert W. D.; and Vickery, Andrew J., 4,677,909, Cl. 100-229.000.
- Hurter, Rudolf, to Ciba-Geigy Corporation. Novel dyestuff intermediates and use thereof for the manufacture of novel azo dyes, 4,678,611, Cl. 260-510.000.
- Huse, Syozi: See—  
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.
- Husky Injection Molding System Ltd.: See—  
Fritzsche, Klaus, 4,678,427, Cl. 112-455.000.
- Husqvarna Aktiebolag: See—  
Bergvall, Bengt A., 4,677,927, Cl. 112-455.000.
- Hutchinson, Albert L.: See—  
Capasso, Federico; Cho, Alfred Y.; Hutchinson, Albert L.; and Mohammed, Khalid, 4,679,061, Cl. 357-4.000.
- Huttenes-Albertus Chemische Werke GmbH: See—  
Torbus, Marek, 4,678,816, Cl. 523-142.000.
- Hutzel, Hans: See—  
Beck, Ernst; Lenard, Peter; and Hutzel, Hans, 4,677,882, Cl. 76-77.000.
- Hwang, Shih-Ming. Device to facilitate the arming of an alarm system and to provide lock-out protection, 4,679,031, Cl. 340-501.000.
- Hwang, Shih-Ming. Structure of vibration sensor, 4,679,033, Cl. 340-566.000.
- Hydra-Tech, Inc.: See—  
Capers, Jerry W.; Capers, Donald L.; and Capers, Douglas W., 4,678,392, Cl. 414-563.000.
- Hyneczek, Jaroslav, to Texas Instruments Incorporated. Method and apparatus for using surface trap recombination in solid state imaging devices, 4,679,212, Cl. 377-58.000.
- Hyodo, Tohru: See—  
Murakami, Eiji; Sano, Yasuro; and Hyodo, Tohru, 4,677,925, Cl. 112-266.100.
- Iacoviello, John G., to Air Products and Chemicals, Inc. Metal container coating compositions comprising stable emulsions of water resistant polyvinyl alcohol-stabilized vinyl chloride-ethylene copolymers, 4,678,829, Cl. 524-459.000.
- Iadipalo, Rene M.; and Tkaczyk, Richard J., to General Motors Corporation. Machine vision method and apparatus, 4,678,920, Cl. 250-560.000.
- Ichihana, Hideyuki: See—  
Takamatsu, Masayoshi; Hashimoto, Kouji; Manabe, Akiyoshi; and Ichihana, Hideyuki, 4,678,845, Cl. 525-462.000.
- Ichijima, Seiji: See—  
Yamada, Kohzaburoh; Ichijima, Seiji; and Usui, Hideo, 4,678,743, Cl. 430-551.000.
- Ichimura, Kunihiro: See—  
Sakuragi, Masako; and Ichimura, Kunihiro, 4,678,844, Cl. 525-417.000.
- ICI Pharma: See—  
Jung, Frederic, 4,678,781, Cl. 514-200.000.
- Idemitsu Kosan Company Limited: See—  
Sonoda, Noboru, 4,677,844, Cl. 73-55.000.
- Ihara, Keiichi, to TDK Corporation. Apparatus for automatically mounting special-type chips on substrate, 4,677,745, Cl. 29-741.000.
- Iida, Tetsuya; and Ikarashi, Takayoshi, to Kabushiki Kaisha Toshiba. Synchronous binary counter, 4,679,216, Cl. 377-116.000.
- Iida, Yasuhiro: See—  
Imakoshi, Shigeyoshi; Soda, Yutaka; Suyama, Hideo; and Iida, Yasuhiro, 4,679,107, Cl. 360-113.000.
- Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, to Hitachi, Ltd. Gas turbine combustor, 4,677,822, Cl. 60-39.230.
- Ikarashi, Takayoshi: See—  
Iida, Tetsuya; and Ikarashi, Takayoshi, 4,679,216, Cl. 377-116.000.
- Ikariya, Takao; Itagaki, Masanori; Mizuguchi, Masatsugu; Sakai, Itaru; and Tajima, Osamu, to Nippon Kokan Kabushiki Kaisha. Method of manufacturing aromatic urethane and intermediate product thereof, 4,678,856, Cl. 560-24.000.
- Ikeda, Mitsuhiro: See—  
Tamamori, Hideo; and Ikeda, Mitsuhiro, 4,678,241, Cl. 303-33.000.
- Ikeda, Masaru; Watari, Masafumi; Hayashi, Yoshiaki; Yamamoto, Osamu; and Tsutsu, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Optical fiber for infrared transmission consisting essentially of high purity mixed crystal of thallium bromide and thallium iodide, 4,678,275, Cl. 350-96.340.
- Ikezue, Tatsuya: See—  
Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezue, Tatsuya, 4,678,731, Cl. 430-65.000.
- Illinois Tool Works Inc.: See—  
Ollivier, Jean; and Almeras, Roland, 4,678,385, Cl. 411-456.000.
- Imai, Chihiro: See—  
Tachikawa, Mamoru; Ueki, Satoshi; Sakuma, Masato; Imai, Chihiro; and Makishima, Tokuo, 4,678,767, Cl. 502-104.000.
- Imai, Kiyoshi: See—  
Itoh, Kunko; Imai, Kiyoshi; Yoshida, Takeo; and Fukushima, Motoo, 4,678,827, Cl. 524-188.000.
- Imai, Toshiaki: See—  
Shinohara, Hiroo; and Imai, Toshiaki, 4,678,755, Cl. 436-43.000.
- Imakoshi, Shigeyoshi; Soda, Yutaka; Suyama, Hideo; and Iida, Yasuhiro, to Sony Corporation. Magnetic transducer head utilizing magnetoresistance effect, 4,679,107, Cl. 360-113.000.
- Imanishi, Nobuyuki: See—  
Saeiki, Osamu; Mori, Kenji; Onoda, Mamoru; Watanabe, Ryo; Shinohara, Katsufumi; Ashie, Takehiko; and Imanishi, Nobuyuki, 4,678,508, Cl. 75-26.000.
- Imanishi, Shozo; and Sato, Mitsuo, to Aida Engineering, Ltd. Slide adjusting device for a press, 4,677,908, Cl. 100-53.000.
- Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, to General Research of Electronics, Inc. Radio receiver, 4,679,245, Cl. 455-155.000.
- Imperial Chemical Industries plc: See—  
Bagaglio, Giancarlo; Assche, Jan V.; and Watts, Arun, 4,678,513, Cl. 106-38.220.
- McAloon, Kevin T.; and Brew, Allan T., 4,678,700, Cl. 428-198.000.
- Smith, Anthony P., 4,677,821, Cl. 60-39.020.
- Ims, Dale R.: See—  
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- Inagaki, Masahisa: See—  
Yoshida, Toshimi; Maki, Hideo; Umehara, Hajime; Yasuda, Tetsuo; Masaoka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, 4,678,521, Cl. 148-11.50F.
- Inamura, Kazuhiko, to Oki Electric Industry Co., Ltd. Rotary drier apparatus for semiconductor wafers, 4,677,759, Cl. 34-58.000.
- Incardona, Angelo: See—  
Sparling, Kenneth P.; Richardson, David G.; Incardona, Angelo; Wood, Ronald E.; Kikendall, Garth D.; and Bakow, Leon, 4,678,384, Cl. 411-43.000.
- Indak Manufacturing Corp.: See—  
Black, Charles E., III; and Halstead, Raymond T., 4,678,249, Cl. 439-77.000.
- Index-Werke Komm.-Ges. Hahn & Tessky: See—  
Link, Helmut F., 4,677,719, Cl. 29-40.000.
- Ing, C. Olivetti & C., S.p.A.: See—  
Dagna, Giandomenico, 4,679,059, Cl. 346-140.00R.
- Ingendoh, Axel; Berschauer, Friedrich; Becker, Benedikt; Stendel, Wilhelm; Homeyer, Bernhard; Scheer, Martin; de Jong, Anno; Hansler, Gerd; and Reinecke, Paul, to Bayer Aktiengesellschaft. Biologically active agents containing substituted isoxazolidines, 4,678,797, Cl. 514-378.000.
- Inland Steel Company: See—  
Nickola, Richard A.; Sok, Brian A.; and Agarwal, Shashi B., 4,678,717, Cl. 428-553.000.
- Inman, Charles S. Golf ball carrier, 4,678,108, Cl. 224-274.000.
- Inmos Corporation: See—  
Bourassa, Ronald R.; and Butler, Douglas B., 4,679,170, Cl. 365-154.000.
- Ino, Kazuhide: See—  
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- Inokuchi, Toshiyuki, to Ricoh Company, Ltd. Anamorphic focusing system, 4,678,321, Cl. 355-52.000.
- Inose, Hiroshi: See—  
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.
- Inoue, Ichiro: See—  
Hamano, Masanori; Takeuchi, Siro; and Inoue, Ichiro, 4,678,640, Cl. 422-56.000.
- Inoue-Japax Research Incorporated: See—  
Inoue, Kiyoshi, 4,678,420, Cl. 425-144.000.
- Inoue, Kiyoshi, 4,678,976, Cl. 318-577.000.
- Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Injection molding machine with auxiliary packing means, 4,678,420, Cl. 425-144.000.
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- Installation Technology, Inc.: See—  
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- Institut de Recherches Chimiques et Biologiques de Appliques (I.R.-C.E.B.A.): See—  
Danree, Bernard, 4,678,810, Cl. 514-640.000.
- Institut Francais du Petrole: See—  
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- Intellex Incorporated: See—  
Peterson, Thomas W.; Hole, David B.; and Mintz, S. Stanley, 4,678,952, Cl. 310-83.000.
- International Business Machines Corporation: See—  
Arlid, Brian D.; Loeb, Jonathon T.; Miller, Joseph C.; Parsapour, Hossein B.; Rascoe, Fred H., III; and Woodward, Don W., 4,678,175, Cl. 271-34.000.
- Bantz, David F.; Malaby, Davey L.; and Sholtz, Paul N., 4,679,038, Cl. 340-721.000.
- Chao, Hu H.; and Chau-Chun, Nicky, 4,678,941, Cl. 307-449.000.
- de la Salle, Christian; and D'Hervilly, Guy, 4,679,169, Cl. 364-900.000.
- Dias, Daniel M.; Kumar, Manoj; Lien, Yeong-Chang L.; and Maruyama, Kiyoshi, 4,679,190, Cl. 370-60.000.
- Hatzakis, Michael; Liutkus, John J.; Paraszczak, Jurij R.; and Shaw, Jane M., 4,678,850, Cl. 370-17.000.
- Irvin, David R., 4,679,187, Cl. 370-17.000.
- Pennington, Keith S.; Afzali-Ardakani, Ali; and Sachdev, Krishna G., 4,678,701, Cl. 428-213.000.
- Pomerene, James H.; Puzak, Thomas R.; Rechtschaffen, Rudolph N.; Rosenfeld, Philip L.; and Sparacio, Frank J., 4,679,141, Cl. 364-200.000.
- West, Lynn P., 4,679,001, Cl. 328-167.000.
- Workman, Michael L., 4,679,103, Cl. 360-77.000.
- International Fuel Cells Corporation: See—  
Wertheim, Ronald J., 4,678,723, Cl. 429-17.000.
- International Standard Electric Corporation: See—  
Chown, David P. M., 4,679,251, Cl. 455-619.000.
- Intertec Associates Inc.: See—  
Conant, Louis A.; Bolton, Wilbur M.; and Wilson, James E., 4,678,028, Cl. 165-72.000.
- Intevp, S.A.: See—  
Rodriguez, Domingo; and Schemel, Roberto, 4,678,557, Cl. 208-112.000.
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- Inui, Toshiharu; and Moriguchi, Haruhiko, to Fuji Xerox, Co., Ltd. Method and apparatus for thermal half-tone printing, 4,679,055, Cl. 45-76.00P.
- Ionics, Incorporated: See—  
Mandle, Robert J.; and McRae, Wayne A., 4,678,553, Cl. 204-182.600.
- Iowa State University Research Foundation, Inc.: See—  
Ruble, Marshall V., 4,678,893, Cl. 235-70.00R.
- IRECO Incorporated: See—  
Cranney, Don H.; Gordon, David L.; and Hales, Richard H., 4,678,524, Cl. 149-21.000.
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- Irzinski, Edward P.; Krill, Jerry A.; and Zinger, William H., to Johns Hopkins University. The Sharp mode-transducer bend for over-moded waveguide, 4,679,008, Cl. 333-21.00R.
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- Ishihama, Hiroshi: See—  
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- Ishihama, Toshio: See—  
Ofusa, Masaatsu; and Ishihama, Toshio, 4,678,013, Cl. 139-384.00B.
- Ishihara, Hideo: See—  
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,678,371, Cl. 405-164.000.
- Ishii, Hiroshi; and Hosoda, Bunichiro, to Takasago Perfumery Co., Ltd. Cologne composition, 4,678,603, Cl. 252-522.00R.
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- Ishikawa, Yasuyuki; and Matsumura, Isao, to Canon Kabushiki Kaisha. Ophthalmic instrument, 4,678,297, Cl. 351-208.000.
- Ishizaka, Hideo: See—  
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- Ishizuka, Masashi; and Ogawara, Makoto, to Kawasaki Jukogyo Kabushiki Kaisha. Construction of vehicle body, 4,678,226, Cl. 296-203.000.
- Isotechnologies, Inc.: See—  
McIntyre, Donald R.; and Miles, James E., 4,678,186, Cl. 272-134.000.
- Isuzu Motors Limited: See—  
Hattori, Toshihiro; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,677,880, Cl. 74-866.000.
- Yoshimura, Hiroshi; and Hattori, Toshihiro, 4,678,069, Cl. 192-0.033.
- Itagaki, Masanori: See—  
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- Itako, Eiji: See—  
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- Ito, Masaya: See—  
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- Ito, Seigo: See—  
Murakami, Yoshikazu; Ito, Seigo; Okamoto, Hiromi; and Tanaka, Hideo, 4,679,015, Cl. 333-219.000.
- Ito, Toshihimitsu; and Okamoto, Akio, to Toyota Jidosha Kabushiki Kaisha. Method and system incorporating zero-correction for fuel supply control for internal combustion engine, 4,677,954, Cl. 123-478.000.
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Nakao, Shinroku; Itoh, Masao; Itoh, Akira; and Takano, Hiroshi, 4,678,182, Cl. 272-73.000.
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- ITT Gallium Arsenide Technology Center, a division of ITT Corporation: See—  
Bahl, Inder J., 4,679,010, Cl. 333-109.000.
- ITT Gilfillan, a division of ITT Corporation: See—  
Rathi, Devdas D., 4,679,210, Cl. 375-96.000.
- Ivanov, Chavdar B.; Mondesha, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabanova, Orhideya B., to T P O "Pharmachim". 1-(3,4-dimethylbenzyl)-2-(N-alkyl)-carbamoyl tetrahydroisoquinolines, 4,678,853, Cl. 546-146.000.
- Iwai, Tomio; and Matsushita, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor with turbo-charger, 4,677,826, Cl. 60-602.000.
- Iwami, Tomonori: See—  
Nogi, Tatsuo; Iwami, Tomonori; and Tanaka, Kazumi, 4,678,581, Cl. 210-500.230.
- Iwamoto, Yoshinao: See—  
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- Iwamura, Masahiro: See—  
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- Iwano, Hideo; and Shudo, Kazuo, to Mitutoyo Mfg. Co., Ltd. Coordinate measuring instrument, 4,677,755, Cl. 33-503.000.
- Iwasaki, Hirofumi: See—  
Shibasaki, Akio; and Iwasaki, Hirofumi, 4,678,703, Cl. 428-288.000.
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- Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, to Ricoh Company, Ltd. Device for detecting viscosity of liquid, 4,677,845, Cl. 73-56.000.
- J. E. Morgan Knitting Mills, Inc.: See—  
Kemp, Philip, 4,678,693, Cl. 428-91.000.
- J. M. Voith GmbH: See—  
Kotitschke, Gerhard; and Horicke, Hans-Werner, 4,677,763, Cl. 34-116.000.
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Weitemeyer, Christian; and Jachmann, Jurgen, 4,678,846, Cl. 525-477.000.



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- Jackson, Warren M., to Warren M. Jackson, Inc. Flat die thread roller. 4,677,837, Cl. 72-88.000.
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- Jakobsmeier, Helmut: See—
- Ernst, Hans-Otto; and Jakobsmeier, Helmut, 4,679,127, Cl. 362-294.000.
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- Bohrer, Timothy H.; Pawlowski, Thomas D.; and Brown, Richard K., 4,678,882, Cl. 219-10.55E.
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- Bonneton, Marc; and Janvier, Dominique, 4,678,390, Cl. 414-282.000.
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- Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, 4,678,256, Cl. 439-347.000.
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- Kato, Yukio; Komori, Mikio; and Yonai, Tadao, 4,677,993, Cl. 131-280.000.
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- Suzuki, Yoshio; and Yamaguchi, Seiji, 4,678,052, Cl. 180-143.000.
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- Irzinski, Edward P.; Krill, Jerry A.; and Zinger, William H., 4,679,008, Cl. 333-21.00R.
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- Noiles, Douglas G., 4,678,472, Cl. 623-1.800.
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- Jackson, David A.; Corke, Michael; Kersey, Alan D.; and Jones, Julian D. C., 4,678,909, Cl. 250-231.00P.
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- Sumihi, Noritaka, 4,677,867, Cl. 74-332.000.
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- Lemper, Herbert, 4,678,022, Cl. 164-416.000.
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- Hayashi, Yukichi; Itako, Eiji; and Yasuhara, Masahiro, 4,679,150, Cl. 364-479.000.
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- O'Brien, Thomas P.; and Bernardi, Richard T., 4,679,221, Cl. 378-148.000.
- Ono, Katsuhiko, 4,679,220, Cl. 378-132.000.
- Ozaki, Hidemichi, 4,679,219, Cl. 378-121.000.
- Sato, Kazuyuki, 4,679,173, Cl. 365-233.000.
- Shigemasa, Takashi, 4,679,136, Cl. 364-150.000.
- Shinohara, Hiroo; and Imai, Toshiaki, 4,678,755, Cl. 436-43.000.
- Takeda, Tamio; Gokyu, Toshio; Mizutani, Yuji; and Nakashima, Jun, 4,678,954, Cl. 310-156.000.
- Tsujimoto, Jun-ichi, 4,679,196, Cl. 371-51.000.
- Uchida, Kohachi; Shibuya, Kunihiro; and Nakamura, Hajime, 4,678,314, Cl. 355-5.000.
- Umezawa, Toshimitsu, 4,679,065, Cl. 358-29.000.
- Watanabe, Junji, 4,678,315, Cl. 355-7.000.
- Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezu, Tatsuya, 4,678,731, Cl. 430-65.000.
- Kabushiki Kaisha Toyota Chuo Kenkyusho: See—
- Kamigaito, Osami; Doi, Haruo; Noda, Shoji; Hioki, Tatsumi; Itoh, Akio; and Kakeno, Mitsutaka, 4,678,678, Cl. 427-38.000.
- Kabushiki Saisha Ishida Koki Seisakusho: See—
- Kataoka, Koichi; and Kabumoto, Takashi, 4,678,047, Cl. 177-1.000.
- Kaddis, George: See—
- Lewellin, Richard L., 4,678,822, Cl. 524-12.000.
- Kadin, Saul B., to Pfizer Inc. 1-acylcycloamoyloxindole-3-carboxamides as antiinflammatory agents. 4,678,802, Cl. 514-418.000.
- Kadono, Shinji: See—
- Uragami, Akira; Suzuki, Yukio; Kadono, Shinji; Iwamura, Masahiro; Masuda, Ikuro; and Yamauchi, Tatsumi, 4,678,943, Cl. 307-473.000.
- Kadota, Yoichi. Fluorescent display panel. 4,678,967, Cl. 313-497.000.
- Kagabu, Shinzo: See—
- Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,678,795, Cl. 514-341.000.
- Kageno, Kenji: See—
- Ueda, Toshio; Kageno, Kenji; and Harada, Susumu, 4,678,474, Cl. 8-543.000.
- Kagimasa, Toyohiko: See—
- Gotou, Shizuo; Kagimasa, Toyohiko; Yoshizumi, Seiichi; and Shintani, Yooichi, 4,679,140, Cl. 364-200.000.
- Kahle, Alexander: See—
- den Broeder, Friedrich J. A.; Draaisma, Henricus J. G.; and Kahle, Alexander, 4,678,721, Cl. 428-607.000.
- Kai, Toru; and Kato, Koichi, to Toyoda Gosei Co., Ltd. Resin molding apparatus. 4,678,421, Cl. 425-159.000.
- Kainer, Hartmut: See—
- Sommerer, Jurgen; Leipold, Michael; Kainer, Hartmut; and Stein, Hermann, 4,677,731, Cl. 29-526.00R.
- Kaiser, Roman, to Givaudan Corporation. 2-(1'-hydroxyimino-ethyl)-1,3,3,4,4-pentamethylcyclopentene and fragrance compositions containing same. 4,678,604, Cl. 252-522.00R.
- Kakeno, Mitsutaka: See—
- Kamigaito, Osami; Doi, Haruo; Noda, Shoji; Hioki, Tatsumi; Itoh, Akio; and Kakeno, Mitsutaka, 4,678,678, Cl. 427-38.000.
- Kakizaki, Kimio: See—
- Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeo; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.
- Kalista, Daniel J.: See—
- Bongard, James A.; Delaney, Michael J.; Duncan, Eugene F.; Fredricks, Cheryl A.; Groves, John P.; Kalista, Daniel J.; Klingseisen, Paul; Lazzaro, Joseph; and Nadolski, Gregory L., 4,678,867, Cl. 174-135.000.
- Kallianos, Andrew G.; Sprinkel, Francis M., Jr.; and Decker, Paula, to Philip Morris Incorporated. Filter cigarette. 4,677,995, Cl. 131-335.000.
- Kamada, Daikichi, to Kamada Signal Appliances Co., Ltd. Infrared intrusion sensor with preliminary and primary alarms. 4,679,034, Cl. 340-567.000.
- Kamada Signal Appliances Co., Ltd.: See—
- Kamada, Daikichi, 4,679,034, Cl. 340-567.000.
- Kamberg, Eduard, to New Super Laundry Machinery Co. Inc. Heated rotary flatwork ironer. 4,677,773, Cl. 38-44.000.
- Kamienski, Conrad W.; and Dover, B. Troy, to Lithium Corporation of America, Inc. Hydrocarbon-soluble organometallic complexes of magnesium and alkali metals and method of producing same. 4,678,614, Cl. 260-665.00R.
- Kamigaito, Osami; Doi, Haruo; Noda, Shoji; Hioki, Tatsumi; Itoh, Akio; and Kakeno, Mitsutaka, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method of strengthening ceramics. 4,678,678, Cl. 427-38.000.
- Kamiyama, Sumio: See—
- Yasuoka, Junichi; Kamiyama, Sumio; Ashida, Kiyomi; and Hata, Ryozi, 4,678,511, Cl. 75-251.000.
- Kamm, Eugen: See—
- Schoettle, Klaus; Schmidts, Kurt; Kamm, Eugen; and Berger, Heinz, 4,679,110, Cl. 360-132.000.
- Kamoshita, Yasuhiko; Tamaru, Takuya; Ogusu, Mikio; and Urata, Kazuo, to Nippon Gakki Seizo Kabushiki Kaisha. Disc playback device. 4,679,182, Cl. 369-77.200.
- Kampf, Richard S.: See—
- Horrocks, Donald L.; and Kampf, Richard S., 4,678,912, Cl. 250-328.000.
- Kampfer, Konrad; Rieger, Wolfhart; Gauckler, Ludwig; and Dellapina, Marco, to Swiss Aluminum Ltd. Porous ceramic filter body and manufacturing method therefor. 4,678,758, Cl. 501-80.000.
- Kanada, Shigeyasu: See—
- Nishimura, Yuji; Fujiwara, Akinori; and Kanada, Shigeyasu, 4,678,928, Cl. 307-10.05B.
- Kanai, Hiroyuki, to Kanai Juyo Kogyo Kabushiki Kaisha. Travellers for spinning machinery. 4,677,817, Cl. 57-125.000.
- Kanai Juyo Kogyo Kabushiki Kaisha: See—
- Kanai, Hiroyuki, 4,677,817, Cl. 57-125.000.
- Kanai, Masahiro: See—
- Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuzuki, Yoshio; and Ogawa, Kyosuke, 4,678,733, Cl. 430-57.000.
- Kanai, Yasunori; and Saitoh, Taichi, to Fujitsu Limited. Emitter coupled logic circuit with high drivability for capacitive load. 4,678,942, Cl. 307-455.000.
- Kanai, Yasunori: See—
- Nawata, Kazumasa; and Kanai, Yasunori, 4,678,935, Cl. 307-297.000.
- Kanai, Yutaka: See—
- Konno, Tetsuro; Kanai, Yutaka; and Fujita, Tetsuya, 4,678,313, Cl. 355-3.00R.
- Kanazawa, Hiroshi; Yamashita, Seizi; and Miyashita, Kunio, to Hitachi, Ltd. Linear motor and control method thereof. 4,678,971, Cl. 318-135.000.
- Kanazawa, Yasunori: See—
- Kitta, Kenichi; Kanazawa, Yasunori; and Otomo, Yoshiro, 4,678,338, Cl. 356-402.000.
- Kanehara, Kenji: See—
- Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,677,850, Cl. 73-204.000.
- Kaneishi, Shinji: See—
- Matsui, Sadayoshi; Taneya, Mototaka; Takiguchi, Haruhisa; and Kaneishi, Shinji, 4,679,200, Cl. 372-45.000.
- Kaneko, Atsumi: See—
- Hara, Masato; and Kaneko, Atsumi, 4,678,910, Cl. 250-237.00G.
- Kaneko, Takaoki: See—
- Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,678,644, Cl. 422-186.050.
- Kao Corporation: See—
- Ogino, Hidekazu; and Hirota, Hajime, 4,678,598, Cl. 252-174.170.
- Karbach, Stefan: See—
- Rentze, Costin; Sauter, Hubert; Karbach, Stefan; Will, Wolfgang; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,678,798, Cl. 514-383.000.
- Karhu Titan Canada Limitee: See—
- Angas, David J., 4,677,698, Cl. 2-161.00A.
- Karlsson, Karl-Anders: See—
- Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thuring, Jan; Anger, Bernd R.; and Oettgen, Herbert F., 4,678,747, Cl. 435-7.000.
- Karmon, Mordechai: See—
- Hasson, David; and Karmon, Mordechai, 4,678,685, Cl. 427-235.000.
- Karp, Joel A.: See—
- Logwood, Dennis J.; Haq, Mohammed E. U.; Reed, John A.; and Karp, Joel A., 4,679,171, Cl. 365-154.000.
- Kasai, Hitoshi: See—
- Hattori, Toshihiro; Urihara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,677,880, Cl. 74-866.000.
- Kassai, Kenzo, to Aprica Kassai Kabushikikaisha. Front cover for baby carriages. 4,678,222, Cl. 296-78.00A.
- Katakura, Kageyoshi: See—
- Ogawa, Toshio; Kondo, Shinichi; Umemura, Shinichi; and Katakura, Kageyoshi, 4,679,176, Cl. 367-119.000.
- Kataoka, Koichi; and Kabumoto, Takashi, to Kabushiki Saisha Ishida Koki Seisakusho. Article supply for a combinatorial weighing machine. 4,678,047, Cl. 177-1.000.
- Kato, Keiji: See—
- Usami, Hiroko; Yamamoto, Akihiro; Sugawara, Yutaka; Kotani, Shozo; and Kato, Keiji, 4,678,773, Cl. 514-25.000.
- Kato, Koichi: See—
- Kai, Toru; and Kato, Koichi, 4,678,421, Cl. 425-159.000.
- Kato, Masatoshi: See—
- Kitaguchi, Hiroshi; Kato, Masatoshi; Sato, Kozo; Takeuchi, Masasi; and Tsukase, Masaaki, 4,678,735, Cl. 430-203.000.
- Kitaguchi, Hiroshi; Takeuchi, Masashi; Sato, Kozo; Tsukase, Masaaki; and Kato, Masatoshi, 4,678,739, Cl. 430-353.000.
- Kato, Masayuki: See—
- Sugimoto, Shigeyuki; Kato, Masayuki; and Chonan, Katsuhiko, 4,678,980, Cl. 318-759.000.
- Kato, Minoru: See—
- Nakamura, Takehiro; Sato, Susumu; Hattori, Tadashi; Nabeta, Teiichi; and Kato, Minoru, 4,678,921, Cl. 250-574.000.
- Kato, Shigenobu: See—
- Bando, Yoshiaki; Asano, Teruyoshi; Kato, Shigenobu; and Tanioka, Katsuhiko, 4,678,161, Cl. 251-171.000.
- Kato, Toshiaki, to Fuji Electric Co., Ltd. Solid state image sensor having an anti-blooming isolation electrode. 4,679,089, Cl. 358-213.190.



- Kato, Yukio; Komori, Mikio; and Yonai, Tadao, to Japan Tobacco Inc. Method of and apparatus for inspecting cigarette paper. 4,677,993, Cl. 131-280.000.
- Katsurai, Junji; Monma, Masao; and Takaku, Tetsuo, to Konishiroku Photo Industry Co., Ltd. Thermal variable velocity printer system. 4,679,053, Cl. 346-1.100.
- Katsuyama, Shigeru: See—  
Kondo, Kenji; Katsuyama, Shigeru; Akahane, Shoji; and Tomioka, Kentaro, 4,678,436, Cl. 433-228.100.
- Katz, Maurice D. Anti-burglary device for automobile radios and cassettes. 4,678,874, Cl. 200-43.120.
- Kawabata, Juheiji; Sugie, Toshinori; Kobata, Fumihiro; and Hirayama, Akira, to Dainippon Ink and Chemicals, Inc. Block copolymers and resin compositions. 4,678,831, Cl. 524-496.000.
- Kawabata, Takashi: See—  
Sato, Yuichi; Tsunekawa, Tokuchi; and Kawabata, Takashi, 4,678,323, Cl. 365-4.000.
- Kawabuchi, Masami, to Matsushita Electric Industrial Co., Ltd. Ultrasonic probe. 4,677,853, Cl. 73-644.000.
- Kawado, Yasuhumi: See—  
Osaki, Sigemi; Yousina, Norio; Morishita, Tsuyoshi; and Kawado, Yasuhumi, 4,678,633, Cl. 419-8.000.
- Kawaguchi, Seiji. Automatic soldering device. 4,678,886, Cl. 219-85.00R.
- Kawai Musical Instrument Mfg. Co., Ltd.: See—  
Deutsch, Ralph, 4,677,889, Cl. 84-1.010.
- Kawakami, Mitsuo; and Kawamoto, Hiroyuki, to Hitachi, Ltd. Sodium-sulfur cell block. 4,678,727, Cl. 429-104.000.
- Kawamoto, Hiroyuki: See—  
Kawakami, Mitsuo; and Kawamoto, Hiroyuki, 4,678,727, Cl. 429-104.000.
- Kawamura, Kiyoshi: See—  
Shiratsuchi, Masami; Kawamura, Kiyoshi; Akashi, Toshihiro; Ishihama, Hiroshi; and Uchida, Yasumi, 4,678,803, Cl. 514-456.000.
- Kawamura, Toshiro; and Satow, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Superconducting solenoid and method of making same. 4,679,020, Cl. 335-216.000.
- Kawanami, Norihide: See—  
Mitani, Ikujiro; Kawanami, Norihide; and Kobayashi, Fumio, 4,678,261, Cl. 439-582.000.
- Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, to Nippon Steel Corporation. Cold rolled steel sheet having excellent press formability and method for producing the same. 4,678,522, Cl. 148-12.00C.
- Kawasaki, Atsushi: See—  
Boer, Willem D.; and Kawasaki, Atsushi, 4,678,542, Cl. 156-659.100.
- Kawasaki Jukogyo Kabushiki Kaisha: See—  
Ishizuka, Masashi; and Ogawara, Makoto, 4,678,226, Cl. 296-203.000.
- Murase, Masaaki, 4,678,441, Cl. 440-88.000.
- Nishida, Hiroshi; and Inoue, Takemi, 4,677,872, Cl. 74-551.900.
- Nishida, Hiroshi; and Yazaki, Mitsuhiro, 4,678,442, Cl. 440-89.000.
- Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, to Nippon Telegraph & Telephone Public Corporation; NEC Corporation; and Kabushiki Kaisha Toshiba. Method of transmitting terminating call signals within a restricted duration and a base station and a portable unit for use in the same. 4,679,244, Cl. 455-54.000.
- Kawasaki Steel Corporation: See—  
Shinozaki, Masatoshi; Matsumoto, Yoshihiro; Aoyagi, Yoshiki; and Kojima, Kazuhisa, 4,678,707, Cl. 428-323.000.
- Kawashima, Giichi, to Sumitomo Bakelite Company Limited. Method of producing permanent magnet. 4,678,616, Cl. 264-24.000.
- Kawate, Keith W.: See—  
Offiler, Stephen B.; Berg, Peter G.; and Kawate, Keith W., 4,678,982, Cl. 322-8.000.
- Kawazoe, Toshiji: See—  
Nozawa, Shigenori; Ohaya, Katsumi; and Kawazoe, Toshiji, 4,678,666, Cl. 424-81.000.
- Kaye, Gordon E.; and Agnello, Joseph A., Jr., to Univention Inc., a part interest. Position actuated illuminated gunsight. 4,677,782, Cl. 42-100.000.
- Kazumi, Jiro, to Canon Kabushiki Kaisha. Interval shooting device. 4,678,304, Cl. 354-173.110.
- Kearney, Thomas J. Treatment of wash water in paint spray booths. 4,678,586, Cl. 210-743.000.
- Keen, Egbert. Device comprising a frame of lengths of tube and coupling pieces and coupling piece for the same. 4,678,359, Cl. 403-170.000.
- Keenan, Andrea C.: See—  
Dupre, Jean; and Keenan, Andrea C., 4,678,596, Cl. 252-174.240.
- Keenan, Ronald M.: See—  
Korsky, Vincent V.; and Keenan, Ronald M., 4,679,228, Cl. 379-165.000.
- Kelland, David R., to Massachusetts Institute of Technology. Method for desulfurization of coal. 4,678,478, Cl. 44-1.0SR.
- Kellogg, Joseph A.; and Prather, James E., to Non Mar, Inc. Automotive body tool. 4,677,840, Cl. 72-465.000.
- Kelman, Charles D. Intraocular lens with glare-inhibiting closure, the method of inhibiting glare, and the closure for same. 4,678,469, Cl. 623-6.000.
- KemaNord AB: See—  
Holmstrom, Ulla-Kari M.; Sandgren, Lage M.; Norell, Maria G.; and Axegård, Peter A., 4,678,654, Cl. 423-478.000.
- Norell, Maria G.; and Wängård, Johan C., 4,678,653, Cl. 423-478.000.
- Kemeny, George A.: See—  
Carlson, Richard J.; and Kemeny, George A., 4,677,895, Cl. 89-8.000.
- Kemp, Philip, to J. E. Morgan Knitting Mills, Inc. Insulating fabric and method of manufacture thereof. 4,678,693, Cl. 428-91.000.
- Ken, Victor: See—  
Schapira, Joseph; Ken, Victor; Thery, Denis; and Jelodin, Stephanie, 4,678,519, Cl. 148-6.15Z.
- Kennecott Corporation: See—  
Thomas, Dwight J.; and Ashelin, Charles J., 4,678,577, Cl. 210-441.000.
- Kennedy, Lyn R., to Precision Measurement, Inc. Method and apparatus for measuring the relative density of gases. 4,677,841, Cl. 73-30.000.
- Kenner Parker Toys Inc.: See—  
Ventura, Frank D., 4,678,451, Cl. 446-471.000.
- Kent Scientific and Industrial Projects Limited: See—  
Jackson, David A.; Corke, Michael; Kersey, Alan D.; and Jones, Julian D. C., 4,678,909, Cl. 250-231.00P.
- Kenway, Sidney, to Eaton Corporation. Panel mounted apparatus with front operated clamping means. 4,678,879, Cl. 200-295.000.
- Keptel, Inc.: See—  
Lynch, Daniel; and Perry, Steven B., 4,679,224, Cl. 379-26.000.
- Kern, Mark T.; and Cinzori, Robert J., to Santa Barbara Research Center. Microprocessor-controlled fire sensor. 4,679,156, Cl. 364-551.000.
- Kernforschungszentrum Karlsruhe GmbH: See—  
Radkowsky, Alvin, 4,678,619, Cl. 376-173.000.
- Kersey, Alan D.: See—  
Jackson, David A.; Corke, Michael; Kersey, Alan D.; and Jones, Julian D. C., 4,678,909, Cl. 250-231.00P.
- Keskula, Henno: See—  
McCreedy, Kathleen M.; Keskula, Henno; Pawloski, James C.; and Yonkers, Edward H., 4,678,833, Cl. 525-66.000.
- Keys, Robert O., to Sherex Chemical Company, Inc. Promoters for froth flotation of coal. 4,678,561, Cl. 209-166.000.
- Keys, Robert O., to Sherex Chemical Company, Inc. Promoters for froth flotation of coal. 4,678,562, Cl. 209-166.000.
- Keys, Robert O., to Sherex Chemical Company, Inc. Modified alcohol frothers for froth flotation of sulfide ore. 4,678,563, Cl. 209-166.000.
- Kida, Otojuro; and Segawa, Yutaka, to Asahi Glass Company Ltd. ZrB<sub>2</sub> composite sintered material. 4,678,759, Cl. 501-92.000.
- Kidde, Inc. (Presto Lock Company Division): See—  
Remington, Richard C., 4,677,832, Cl. 70-67.000.
- Kiener, Michael A., to AM International, Inc. Chemical cleaning solution and method. 4,678,597, Cl. 252-100.000.
- Kikendall, Garth D.: See—  
Sparling, Kenneth P.; Richardson, David G.; Incardona, Angelo; Wood, Ronald E.; Kikendall, Garth D.; and Bakow, Leon, 4,678,384, Cl. 411-43.000.
- Kikuchi, Masafumi; Onodera, Toshio; Toyama, Sumio; and Sakamoto, Hiroshi, to Sony Corporation. Multiple scanning type television receiver. 4,679,091, Cl. 358-242.000.
- Kikuchi, Yoichi; and Kobayashi, Kenji, to Matsushita Electric Industrial Co., Inc. Hermetically sealed storage battery. 4,678,725, Cl. 429-53.000.
- Kikutani, Fumitaka: See—  
Tanaka, Eiichi; Furumai, Koro; and Kikutani, Fumitaka, 4,678,428, Cl. 431-76.000.
- Killop, James T.: See—  
Anderson, Carl E.; and Killop, James T., 4,677,836, Cl. 72-88.000.
- Killough, John E., to Atlantic Richfield Company. Hydrocarbon recovery process. 4,678,033, Cl. 166-246.000.
- Kimberly-Clark Corporation: See—  
Van Gompel, Paul T.; and Suprise, Jody D., 4,677,695, Cl. 2-79.000.
- Kincheloe, David W. Tape transport apparatus. 4,678,137, Cl. 242-192.000.
- Kind, Wilhelm: See—  
Hafner, Udo; Hans, Waldemar; Kind, Wilhelm; Krauss, Rudolf; and Sauer, Rudolf, 4,678,124, Cl. 239-585.000.
- King, Bonnie J., to Shell Oil Company. Apparatus for catalyst preparation by reactive sublimation. 4,678,769, Cl. 502-231.000.
- King, Keith: See—  
Holmes, Robert T.; Evans, Terence M.; King, Keith; and Graiff, Leonard B., 4,678,479, Cl. 44-57.000.
- King, Raymond A.; Larson, Jeffrey G.; and Walton, Lewis A., to Babcock & Wilcox Company, The. Spacer grid insert. 4,678,630, Cl. 376-438.000.
- King Taudevin & Gregson (Holdings) Limited: See—  
Roberts, David; and Johnson, Henry S., 4,678,493, Cl. 65-134.000.
- King, William F., to Chevron Research Company. Fungicidal benzylthiostannanes. 4,678,804, Cl. 514-493.000.
- Kirlick, John: See—  
Rutherford, David G.; Regnault, Alain; and Kirlick, John, 4,679,094, Cl. 358-261.000.
- Kirsch, Howard C.; and Procyk, Frank J., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Dynamic memory with increased data retention time. 4,679,172, Cl. 365-222.000.
- Kisanuki, Hisayuki: See—  
Maeo, Kunio; and Kisanuki, Hisayuki, 4,678,696, Cl. 428-122.000.
- Kiser, Billy J.: See—  
Basinger, David M.; Hatley, Gary L.; Kiser, Billy J.; and Moser, James N., 4,678,173, Cl. 270-45.000.

- Kishi, Toshiaki; and Kohama, Mitsuyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Cowling device for riding type vehicles. 4,678,223, Cl. 296-78.100.
- Kissel, Karl-Heinz; and Oevermann, Siegfried, to Robert Krause GmbH & Co. KG. Device for binding holed sheets. 4,678,357, Cl. 402-39.000.
- Kitagawa, Osamu, to Dainippon Screen Manufacturing Co., Ltd. Method of recording register marks. 4,679,071, Cl. 358-75.000.
- Kitaguchi, Hiroshi; Kato, Masatoshi; Sato, Kozo; Takeuchi, Masasi; and Tsukase, Masaaki, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material with development inhibitor releaser. 4,678,735, Cl. 430-203.000.
- Kitaguchi, Hiroshi; Takeuchi, Masashi; Sato, Kozo; Tsukase, Masaaki; and Kato, Masatoshi, to Fuji Photo Film Co., Ltd. Image forming method including heating step. 4,678,739, Cl. 430-353.000.
- Kitahara, Seizaburo: See—  
Maeda, Hironobu; Kitahara, Seizaburo; Yosimura, Haruo; Torawaki, Takao; Yaegasi, Takasi; and Yamaoka, Isao, 4,677,934, Cl. 118-58.000.
- Kitamoto, Tatsuji: See—  
Asai, Takamitsu; Akashi, Goro; Kitamoto, Tatsuji; Chikamasa, Hiroshi; and Sato, Tsunehiko, 4,678,682, Cl. 427-48.000.
- Kitamoto, Tomoyoshi: See—  
Kobayashi, Takeshi; Ishii, Ryouichi; and Kitamoto, Tomoyoshi, 4,679,135, Cl. 364-146.000.
- Kitamura, Hideaki; and Yamada, Mitsuhiro, to Dainippon Screen Mfg. Co., Ltd. Method and apparatus of scanning and recording image. 4,679,095, Cl. 358-280.000.
- Kitaka, Takashi; and Watanabe, Eiki, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling an elevator. 4,678,063, Cl. 187-119.000.
- Kitta, Kenichi; Kanazawa, Yasunori; and Otomo, Yoshiro, to Hitachi Maxell, Ltd. Color sensor. 4,678,338, Cl. 356-402.000.
- Kittel, Arthur; and Gerken, Heiner, to Olympia Werke AG. Receiving arrangement for a multiple type carrier for an impact printer. 4,678,352, Cl. 400-175.000.
- Kittleson, Karl A., to Northern Engineering, Inc. Potentiometer contact wiper. 4,679,024, Cl. 338-160.000.
- Kiuchi, Masayoshi, to Canon Kabushiki Kaisha. Film feeding indication device for camera. 4,678,306, Cl. 354-217.000.
- Kizaki, Masami: See—  
Fujita, Masahito; Miyazaki, Makoto; Kizaki, Masami; Nagashima, Yukio; and Shimbori, Yuichi, 4,678,768, Cl. 502-119.000.
- Kizawa, Horofumi, to Kabushiki Kaisha Komatsu Seisakusho. Fuel injection system for internal-combustion engines. 4,677,953, Cl. 123-450.000.
- Klaeger, Karlheinz. Spray nozzle for a liquid atomizer. 4,678,123, Cl. 239-464.000.
- Klaus, Michael; and Loeliger, Peter, to Hoffmann-La Roche Inc. Heterocyclic compounds. 4,678,793, Cl. 514-311.000.
- Kleinrahm, Rainer: See—  
Losch, Hans-Wilhelm; Kleurahrn, Rainer; Pieperbeck, Norbert; and Wagner, Wolfgang, 4,678,048, Cl. 177-212.000.
- Klingel, Hans. Folded CO<sub>2</sub> laser. 4,679,201, Cl. 372-61.000.
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- Kniepmann, Mark R.: See—  
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- Knifton, John F.: See—  
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- Kohler Co.: See—  
Bracht, Jeffrey L.; Heinrich, Martin W.; van Maaren, Richard D.; and Sleder, Richard L., 4,677,940, Cl. 123-2.000.
- Kohonen, Raimo: See—  
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- Koizumi, Haruyuki; and Omae, Koichi, to Omron Tateisi Electronics Co. Keyboard switch. 4,678,880, Cl. 200-340.000.
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- Kojima, Toshikuni: See—  
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- Kokusai Denshin Denwa Co., Ltd.: See—  
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,678,371, Cl. 405-164.000.
- Komai, Hiromichi: See—  
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- Koman, Ahmet: See—  
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- Komatsu, Kenji: See—  
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- Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH: See—  
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- Komori Printing Machinery Co., Ltd.: See—  
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- Kondoh, Masami: See—  
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- Koninger, Veit: See—  
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- Konishi, Yasuhiko: See—  
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- Konishiroku Photo Industry Co., Ltd.: See—  
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- Konno, Tetsuro; Kanai, Yutaka; and Fujita, Tetsuya, to Seikosha Co., Ltd. Electrophotographic recording apparatus, 4,678,313, Cl. 355-3.00R.
- Konrad Rosenbauer KG: See—  
Staudinger, Hermann, 4,678,041, Cl. 169-24.000.
- Konstant, Anthony N.; and Weider, John J., to Konstant Products, Inc. Beam to column connection, 4,678,091, Cl. 211-191.000.
- Konstant Products, Inc.: See—  
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- Kopp, Norbert: See—  
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- Kornrumpf, William P.: See—  
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- Korsky, Vincent V.; and Keenan, Ronald M., to Tie/Communications, Inc. Speakerphone sensing circuit, 4,679,228, Cl. 379-165.000.
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- Koss, Richard E. Basketball return device, 4,678,189, Cl. 273-1.50A.
- Kotai, Ferenc: See—  
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- Kotani, Shozo: See—  
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- Kotani, Toshihiro: See—  
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- Kotitschke, Gerhard; and Horicke, Hans-Werner, to J. M. Voith GmbH. Device for transferring a paper web from the press section to the drying section of a paper machine, 4,677,763, Cl. 34-116.000.
- Kowa Company, Ltd.: See—  
Shiratsuchi, Masami; Kawamura, Kiyoshi; Akashi, Toshihiro; Ishihama, Hiroshi; and Uchida, Yasumi, 4,678,803, Cl. 514-456.000.
- Kowalski, David J.: See—  
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- Kowalski, Edward F.: See—  
Malandra, Louis J.; Leduc, Robert J.; Hankinson, Michael F.; and Kowalski, Edward F., 4,678,623, Cl. 376-260.000.
- Kozakai, Shohet: See—  
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- Kraft, Inc.: See—  
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- Krage, Mark K.: See—  
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- Krajewski, Alexander A.: See—  
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- Kramer, James H., to B. F. Goodrich Company, The. Method for fabricating an elastomeric bearing assembly, 4,677,721, Cl. 29-149.50S.
- Kramer, Justin; and Peterson, Richard H. Electrical actuator for percussion instruments, 4,677,892, Cl. 84-405.000.
- Kraska, Robert E.; Wilary, Frank J.; and Lessar, Joseph F., to Medtronic, Inc. Hermetic electrical feedthrough assembly, 4,678,868, Cl. 174-152.0GM.
- Krause, James N.: See—  
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- Krauss, Rudolf: See—  
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- Kreuzer, Franz-Heinrich; Eidenschink, Rudolf; and Weber, Georg, to Merck Patent Gesellschaft mit beschränkter Haftung. Trialkanoyloxysilanes, 4,678,283, Cl. 350-340.000.
- Krieg, Larry M.: See—  
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- Krill, Jerry A.: See—  
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- Krishnakumar, C. K.; and Schafer, Clyde K., to Chamberlain Manufacturing Corporation. Water heater, 4,678,116, Cl. 236-25.00A.
- Kritchevsky, Gina R.; Gregor, John A.; Gruendig, Manfred W.; Sellers, Gregory J.; and Liss, Barbara, to Allied Corporation. Stampable polymeric composite containing an EMI/RFI shielding layer, 4,678,699, Cl. 428-175.000.
- Krohn, David A.; Maack, David R.; Vinarub, Edmond I.; and Ellison, John R., Jr., to Eotec Corporation. Optoelectronic rotational position sensor, 4,679,029, Cl. 340-347.00P.
- Kronogard, Hakan; and Selberg, Roberto. Golf swing training device, 4,678,193, Cl. 273-186.00C.
- Kroy Inc.: See—  
Richardson, Michael M.; and Schaffer, Douglas A., 4,678,353, Cl. 400-248.000.
- Krueger, Gerald G., to University of Utah Research Foundation. Methods of testing the reaction of various substances on living human skin, 4,677,968, Cl. 128-1.00R.
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- Kruger, Hans-Rudolf: See—  
Franke, Helga; Franke, Heinrich; Kruger, Hans-Rudolf; and Joppien, Hartmut, 4,678,811, Cl. 514-721.000.
- Kruse, Hubert: See—  
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- Kryder, Mark H.; and Shieh, Han-Ping D., to General Electric Company. Process for direct over-writing of digital data recorded on magneto-optical recording media, 4,679,180, Cl. 369-13.000.
- Krzyanowski, Robert V.: See—  
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- Ksander, Gary M.: See—  
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- Kubelbock, Alfred: See—  
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.
- Kubo, Jun, to Nissan Motor Company, Limited. Anti-skid brake control system and method featuring vehicle battery protection, 4,679,146, Cl. 364-426.000.
- Kubota Ltd.: See—  
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- Kubota, Yuichi: See—  
Shimada, Shigeru; Nishimatsu, Masaharu; Arioka, Hiroyuki; and Kubota, Yuichi, 4,678,708, Cl. 428-336.000.
- Kuboyama, Nobuyoshi. Rotary means for use as a heat source, 4,678,400, Cl. 415-199.400.
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- Kudoh, Yasuo: See—  
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- Kuester, James L., to Arizona Board of Regents. Process of producing liquid hydrocarbon fuels from biomass, 4,678,860, Cl. 585-14.000.
- Kuhfuss, Runwalt, to De La Rue Giori S.A. Process for processing security paper webs or security paper sheets to form bundles of security papers, 4,677,910, Cl. 101-93.010.
- Kuhl, Virgil: See—  
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- Kuhn, Reinhard: See—  
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- Kullen, Albrecht, to Braun Aktiengesellschaft. Hair dryer with axial blower, 4,678,410, Cl. 417-423.00R.
- Kumagai, Yoshihiro: See—  
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- Kumar, Manoj: See—  
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- Kumata, Kiyoshi: See—  
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- Kumiai Chemical Industry Co., Ltd.: See—  
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- Kunihiro, Masashi: See—  
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- Kuniya, Keiichi: See—  
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- Kuraray Company, Ltd.: See—  
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- Kurokawa, Toshio, to Fuji Photo Film Co., Ltd. Multiple magnetic pump system, 4,678,409, Cl. 417-420.000.

- Kuroki, Takanori. Heat exchanger structure and method of manufacturing same, 4,677,724, Cl. 29-157.30R.
- Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, to Sanwa Kagaku Kenkyusho Co., Ltd. Novel 2-oxopyrrolidine compounds, salts thereof process for the preparation thereof as well as pharmaceutical agent comprising the compound, 4,678,801, Cl. 514-413.000.
- Kurt Allert GmbH & Co. KG: See—  
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- Kurz, Erich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Electrical cooling fan, 4,677,941, Cl. 123-41.120.
- Kurz, Walter, to Electrohome Limited. Regulation of picture size with varying scan frequency, 4,679,211, Cl. 315-399.000.
- Kusano, Shoji: See—  
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- Kushida, Takeo, to Diesel Kiki Co., Ltd. High speed electromagnetic valve, 4,678,000, Cl. 137-1.000.
- Kuwata, Yutaka: See—  
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Eggers, Mark L., 4,678,730, Cl. 429-140.000.
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- LaBarge, Robert L.; and Maier, Frank E., to Aluminum Company of America. Integral rivet, 4,678,096, Cl. 220-273.000.
- Laboratoire Central des Ponts et Chaussées: See—  
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- Labrum, Joseph H.: See—  
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- Labystems Oy: See—  
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- Lacey, James J. Pump prime maintainer, 4,678,001, Cl. 137-194.000.
- Lacher, Ludwig: See—  
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- Lagushenko, Radomir I.: See—  
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- Lahr, Helfrid; and Pontani, Bernd, to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH. Method for loading fuel rods into a container, 4,678,624, Cl. 376-261.000.
- Laing, John R.; Zimmer, C. D.; Maniar, Deepak R.; and Williams, Meurig W., to Xerox Corporation. Process for developer compositions, 4,678,734, Cl. 430-137.000.
- L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—  
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- Lally, Thomas P., to Raychem Corporation. Sonar detection apparatus, 4,679,179, Cl. 367-162.000.
- Lambert, Jean-Pierre: See—  
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- Lambourn, Robert G. Aerated live bait bucket, 4,677,785, Cl. 43-55.000.
- Lancaster, Gerald M.; and Allen, James A., to Dow Chemical Company. The Co-extruded laminates containing carbon monoxide interpolymers, 4,678,713, Cl. 428-421.000.
- Lancaster, Robert L.; and Shaw, Raymond E., to Petro Products, Inc. Protective laminate, 4,678,702, Cl. 428-252.000.
- Landa, Ben Zion, to Savin Corporation. Registering method, 4,678,177, Cl. 271-238.000.
- Landheer, Dolf: See—  
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- Landis, John M.: See—  
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- Landoll, Leonard: See—  
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- Landoll, Patrick: See—  
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- Landrum, Clyde L.: See—  
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- Landry, Norman R.: See—  
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- Lane, Leslie A.; Lybeck, Lynn V.; Perloff, David S.; and Mallory, Chester L., to Prometrix Corporation. Process control interface system for designer and operator, 4,679,137, Cl. 364-188.000.
- Lane, Maxwell Victor: See—  
Lewellin, Richard L., 4,678,822, Cl. 524-12.000.
- Lang, Franz J., to Display-Design GmbH für moderne Verkaufsförderungsmittel und Raumausstattung. Display stand, 4,678,089, Cl. 211-133.000.
- Lange International S.A.: See—  
Arieh, Simon; and Courvoisier, Guy, 4,677,771, Cl. 36-120.000.
- Langenbach, George F., Jr., to Perma-Jack Company. Apparatus for and method of shoring a structure, 4,678,373, Cl. 405-230.000.
- Lanier, Jean-Pierre R.; and Marie, Georges P. Device for marking presence, reservation or information, 4,677,776, Cl. 40-15.00R.
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- Lapsker, Itzhak, to GBI International Industries, Inc. Method and apparatus for high tolerance polishing of a workpiece surface, 4,677,793, Cl. 51-251.000.
- Larck, William A.: See—  
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- Lari, Robert J.: See—  
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- Larribe, Lucien: See—  
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- Larson, Eric R.; and Siegel, Todd W., to Pfizer Inc. Ligands for affinity chromatographic purification of aldose reductase, 4,678,749, Cl. 435-183.000.
- Larson, Goran: See—  
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- Larson, Jeffrey G.: See—  
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- Laue, Hans-Bodo, to Nixdorf Computer A.G. Output circuit for signal transmission systems, 4,678,939, Cl. 307-445.000.
- Lauria, Vincent A., to National Starch and Chemical Corporation. Remoistenable adhesive compositions, 4,678,824, Cl. 524-48.000.
- Lavigne, Ronald L. Treatment system for landfill leachate, 4,678,582, Cl. 210-150.000.
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- Layher, Francis W., to National Semiconductor Corporation. Glass compression seals using low temperature glass, 4,678,358, Cl. 403-28.000.
- Lazzaro, Joseph: See—  
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- Lea, Chin-Tau A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Alternate self-routing packet switching node having fault detection capabilities, 4,679,186, Cl. 370-14.000.
- Leahan, Daniel P. Pen and note pad, 4,678,206, Cl. 281-15.00B.
- Lectron Products, Inc.: See—  
Northman, Bradley L.; Slavin, Michael; and West, Donald J., 4,678,006, Cl. 137-596.170.
- Leduc, Robert J.: See—  
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- Lee, Anthony: See—  
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- Lee, Denny L. Y., to E.I. du Pont de Nemours and Company. Radioactive material billing system and method, 4,679,142, Cl. 364-406.000.
- Lee, Donald M., to Ashland Oil, Inc. Ballistic separation of particles in a progressive flow reactor, 4,678,642, Cl. 422-144.000.
- Lee, Joseph L., to Mossberg & Sons, Inc. Retrofit firearm, 4,677,781, Cl. 42-70.010.
- Lee, Wen-Hsin. Cork screw, 4,677,883, Cl. 81-3.370.
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Tytgat, Daniel; and Lefevre, Pierre, 4,678,541, Cl. 156-664.000.
- Lehmann, Peter, to Mannesmann Aktiengesellschaft. Pipe pig with running gear, 4,677,865, Cl. 73-866.500.
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- Leiber, Heinz, to Robert Bosch GmbH. Method and apparatus for controlling brake pressure in vehicle brake systems, 4,678,243, Cl. 303-114.000.
- Leininger, Jon J. Air motor having integral generator, 4,678,922, Cl. 290-54.000.
- Leipold, Michael: See—  
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- Leja, Andrzej: See—  
Lohmeyer, Charles W.; Schlosser, Erich J.; Tucker, James E.; Stephen, James C.; Leja, Andrzej; and Beecher, John, III, 4,677,964, Cl. 126-41.00R.
- Le Magourou, Yves, to Societe d'Exploitation des Procédés Marechal (SEPM). High intensity power plug. 4,678,254, Cl. 439-139.000.
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- Lemper, Herbert, to Kabushiki Kaisha Kobe Seiko Sho. Tundish car in a continuous casting assembly. 4,678,167, Cl. 266-165.000.
- Lenard, Peter: See—  
Beck, Ernst; Lenard, Peter; and Hutzl, Hans, 4,677,882, Cl. 76-77.000.
- Lenz, Werner, and Most, Manfred, to Sueddeutsche Kuehlerfabrik Julius Fr Behr GmbH & Co. Cooler for a water cooled internal combustion engine. 4,678,026, Cl. 165-67.000.
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- Leoncavallo, Richard A., to Nalge Company. Reusable filter unit with recoverable filter membrane. 4,678,576, Cl. 210-433.200.
- Leopold, Kurt E.: See—  
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- Leroy, Yves: See—  
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- Lester, James N., to GTE Products Corporation. High intensity discharge lamp starting and operating apparatus. 4,678,968, Cl. 315-290.000.
- Lester, Leslie J.: See—  
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- Levin, Richard I.: See—  
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- Levine, Gerald B.: See—  
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- Levitt, George: See—  
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- Lewellin, Richard L., to Lane, Maxwell Victor; and Kaddis, George. Resin impregnated fibre batt. 4,678,822, Cl. 524-12.000.
- Lewiner, Jacques, and Hennion, Claude. Processes and devices for reading magnetic access control cards or similar. 4,678,897, Cl. 235-436.000.
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- Lien, Eldar: See—  
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- Lien, Shui-Chih A.: See—  
Yaniv, Zvi; Chapelle, Walter E.; Lien, Shui-Chih A.; and Yang, Mohshi, 4,678,282, Cl. 350-334.000.
- Lien, Yeong-Chang L.: See—  
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- Light, Gerard M., to Eaton Corporation. Fluid coupling device having improved heat dissipation. 4,678,070, Cl. 192-58.00B.
- Lillquist, Robert D.; Pimbley, Joseph M.; and Vogelsong, Thomas L., to General Electric Company. Composite visible/thermal-infrared imaging system. 4,679,068, Cl. 358-44.000.
- Lin, Hsiu H.: See—  
Belke, Robert E., Jr.; Shirk, Raymond A.; Lin, Hsiu H.; and Zak-raysek, Louis, 4,679,122, Cl. 361-414.000.
- Lin, Steve: See—  
Owen, Charles B.; Owen, Charles C.; and Lin, Steve, 4,678,014, Cl. 141-67.000.
- Lindemann, Peer, to Rolyan Manufacturing Co. Inc. Adjustable wrist splint. 4,677,971, Cl. 128-87.00R.
- Ling Electronics Inc.: See—  
Butts, Gary; Sydo, Lukas; and Rossi, Victor L., 4,678,347, Cl. 384-43.000.
- Link, Helmut F., to Index-Werke Komm.-Ges. Hahn & Tessky. Tool holding device for lathes. 4,677,719, Cl. 29-40.000.
- Lion Corporation: See—  
Nakamura, Kazuhito; Sasaki, Hisami; Chigira, Masayoshi; and Yokoi, Kenji, 4,678,590, Cl. 252-8.800.
- Lipski, Jerzy A.; and Bardsley, Ian R., to Microtel Limited. Optical scanner and sensor for monitoring power consumption. 4,678,907, Cl. 250-231.05E.
- Lisowsky, Bohdan; Hitchcock, David C.; and Epstein, Henry, to Enton Corp. Process for the recovery of gallium and germanium from coal fly ash. 4,678,647, Cl. 423-96.000.
- Liss, Barbara: See—  
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- Lithium Corporation of America, Inc.: See—  
Kamienki, Conrad W.; and Dover, B. Troy, 4,678,614, Cl. 260-665.00R.
- Litvinoff, Jerome S. Rescue vehicle. 4,677,896, Cl. 89-36.080.
- Litzinger, Elmer F.: See—  
Denier, Robert F.; Marshall, Robert H.; Jewell, John N.; and Litzinger, Elmer F., 4,677,994, Cl. 131-310.000.
- Liu, Marie W.; and Ho, Victor, to Ciba-Geigy Corporation. Heat-curable mixture containing substituted bicyclo(2.2.1)hept-5-ene-2,3-dicarboximide and polymaleimide. 4,678,849, Cl. 526-259.000.
- Liutkus, John J.: See—  
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- LJS Practice Management Limited: See—  
Simon, Lewis A.; and Scarffe, Michael F., 4,677,756, Cl. 33-514.000.
- Llinas, Rodolfo R.; Sugimori, Mutsuyuki; and Crank, Ronald K., to New York University. Infrared transcutaneous communicator and method of using same. 4,677,982, Cl. 128-664.000.
- Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thurin, Jan; Anger, Bernd R.; and Oettgen, Herbert F., to Sloan-Kettering Institute. Monoclonal antibodies for detection of an H (O) blood group antigen. 4,678,747, Cl. 435-7.000.
- Loce, Robert P.; and Deibler, Melvin E., to Xerox Corporation. Multi-magnification short focal length imaging system. 4,678,311, Cl. 355-1.000.
- Lockheed Corporation: See—  
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- Loctite Corporation: See—  
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- Loeb, Jonathon T.: See—  
Arlid, Brian D.; Loeb, Jonathon T.; Miller, Joseph C.; Parsapour, Hossein B.; Rascoe, Fred H., III; and Woodward, Don W., 4,678,175, Cl. 271-34.000.
- Loeliger, Peter: See—  
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- Log/E/Dunn Instruments, Inc.: See—  
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- Loggers, John J. Collision risk assessment system. 4,677,753, Cl. 33-264.000.
- Logie, Frank M., to Lucas Industries public limited company. Winding method. 4,677,743, Cl. 29-596.000.
- Logullo, Francis M., Sr.; Wu, Yun-Tai; and Zahr, George E., to Du Pont de Nemours, E. I., and Company. Composites. 4,678,821, Cl. 523-205.000.
- Logwood, Dennis J.; Haq, Mohammed E. U.; Reed, John A.; and Karp, Joel A., to Visic, Inc. MOS/CMOS memory cell. 4,679,171, Cl. 365-154.000.
- Lohmar, Elmar: See—  
Muller, Heinz; Lohmar, Elmar; and Scholz, Harald, 4,678,482, Cl. 55-71.000.
- Lohmeyer, Charles W.; Schlosser, Erich J.; Tucker, James E.; Stephen, James C.; Leja, Andrzej; and Beecher, John, III, to Weber-Stephen Products Co. Portable gas grill. 4,677,964, Cl. 126-41.00R.
- Lohr & Bromkamp GmbH: See—  
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- Loiacono, Gabriel M.: See—  
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- Long, Harry A. Temporary dental crown and method of forming the same. 4,678,435, Cl. 433-218.000.
- Long, Stuart G.; and Maciocia, Michael J., to General Dynamics, Pomona Division. Method of making packing material with anti-static coating. 4,677,809, Cl. 53-427.000.
- Lonsdale, Randall J.; and Hellekson, Ronald A., to Spectra-Physics, Inc. Trifocal lens for a laser instrument. 4,678,288, Cl. 350-432.000.
- Loos, Herbert; and Erhardt, Manfred, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Gearlike tool for dressing abrasive, gearlike, precision machining tools. 4,677,962, Cl. 125-11.00C.
- L'Oreal: See—  
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- Loret, Jerzy A.; and Vandevier, Joseph E., to Hughes Tool Company. Low volume variable rpm submersible well pump. 4,678,404, Cl. 417-45.000.
- Loriot, Pierre; Rendu, Michel; Rousseau, Jean; and Samoel, Alain, to Commissariat a l'Energie Atomique. Method of setting a stop means inside of a tubular element. 4,678,924, Cl. 29-407.000.
- Losch, Hans-Wilhelm; Kleinrahm, Rainer; Pieperbeck, Norbert; and Wagner, Wolfgang. Apparatus for the contactless coupling of a suspended part to force measuring device. 4,678,048, Cl. 177-212.000.
- Loss, Rolf D.: See—  
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- Lovsland, Arnstien: See—  
Stole, Kjell A.; Lovsland, Arnstien; and Havig, Egil, 4,678,560, Cl. 209-23.000.
- Lowe, Virginia L. Pan insert. 4,677,906, Cl. 99-450.000.
- Lu, Zhi-kang: See—  
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- Lubchenko, Eugene: See—  
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- Lubei, Carl; and Spector, George. Beachrunners. 4,677,765, Cl. 36-1.500.

- Lucas Industries Public Limited Company: See—  
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- Logie, Frank M., 4,677,743, Cl. 29-596.000.
- Morris, Clive A.; and Joby, Michael J., 4,679,151, Cl. 364-510.000.
- Thompson, Richard E., 4,678,067, Cl. 188-328.000.
- Luke, John A., to Brown & Williamson Tobacco Corporation. Smoking article mouthpieces. 4,677,996, Cl. 131-336.000.
- Luke, Robert R.; Barker, James M.; Smith, Michael L.; Grigar, Larry L.; and Miller, Carl B., to Halliburton Company. Tubing pressure operated initiator for perforating in a well borehole. 4,678,044, Cl. 175-4.520.
- Lukis, Lawrence J., to Moore Business Forms, Inc. Method and apparatus for correcting x-y position measurements. 4,679,241, Cl. 382-13.000.
- Lukowski, Frank J., Jr.; and Hammill, Harry B., III, to Calspan Corporation. Automatically guided vehicle control system. 4,678,329, Cl. 356-152.000.
- Luks Industrial Company Ltd.: See—  
Wong, Hoi W.; and Chai, Hung Y., 4,679,078, Cl. 380-15.000.
- Lundberg, Peter, to Eur-Control Kalle AB. Method of measuring and regulating the concentration of a fibre suspension and a device for carrying out the method. 4,677,846, Cl. 73-63.000.
- Lunk, Hans E.: See—  
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- Luxtron Corporation: See—  
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- Lybeck, Lynn V.: See—  
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- Lymer, Donald A.: See—  
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- Lynch, Daniel; and Perry, Steven B., to Keptel, Inc. Telephone line testing circuit. 4,679,224, Cl. 379-26.000.
- Lyon, George E.: See—  
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- Lyons, William C. Turbine tool. 4,678,045, Cl. 175-61.000.
- M/A-COM, Inc.: See—  
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- M.A.N. Maschinenfabrik Augsburg-Nurnberg AG: See—  
Heinrich, Peter; Knop, Klaus; and Rube, Friedbert, 4,678,480, Cl. 48-197.00R.
- Maack, David R.: See—  
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- Mabboux, Michel: See—  
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- De Marchi, Jean-Louis; Mabboux, Michel; Paris, Jean; and Kopp, Norbert, 4,677,770, Cl. 36-120.000.
- MacAvoy, David W.: See—  
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- Macchi, Ercole. Valve assembly structure for steam flatirons. 4,677,774, Cl. 38-77.830.
- Maciocia, Michael J.: See—  
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- Maciolek, Joseph R.: See—  
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- MacKenzie, Morley S.: See—  
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- Maddock, William H.; and Bobrovniczky, Bert, to Noma Inc. Trouble lamp and retainer. 4,678,153, Cl. 248-229.000.
- Maeda, Hironobu; Kitahara, Seizaburo; Yosimura, Haruo; Torawaki, Takao; Yaegashi, Takasi; and Yamaoka, Isao, to Sapporo Breweries, Ltd. Coating device for cold bottles or like containers. 4,677,934, Cl. 118-58.000.
- Maeda, Keini: See—  
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- Maeda, Mitsutosho: See—  
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- Maeda, Morio: See—  
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- Maeno, Kunio; and Kisanuki, Hisayuki, to Toyoda Gosei Co., Ltd. Weather strip. 4,678,696, Cl. 428-122.000.
- Mager, Eric L., to GTE Products Corporation. Fluorescent lamp having two phosphor layers. 4,678,966, Cl. 313-487.000.
- Magin, Berthold, to MTM Obermaier GmbH & Co. KG. Device for continuous and tension-free treatment of textile. 4,677,717, Cl. 26-18.500.
- Magna International Inc.: See—  
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- Magome, Koichi; Toda, Haruki; Koinuma, Hiroyuki; Sahara, Hiroshi; Suzuki, Kiminobu; Ohshima, Shigeo; and Komatsu, Kenji, to Kabushiki Kaisha Toshiba. Flip-flop circuit. 4,678,934, Cl. 307-279.000.
- Mahnke, Parker E., to Marcy Gymnasium Equipment Co. Exercise apparatus. 4,678,185, Cl. 272-134.000.
- MAHO Werkzeugmaschinenbau Babel & Co.: See—  
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- Mahon, Joseph J., to Eaton Corporation. Microwave oven timer. 4,678,930, Cl. 307-141.000.
- Maier, Frank E.: See—  
LaBarge, Robert L.; and Maier, Frank E., 4,678,096, Cl. 220-273.000.
- Maier, Peter; and Hansel, Gernot. Guide arrangement for a portable power saw. 4,677,750, Cl. 30-376.000.
- Maker, Lewis W.; and Nicholson, Horace, to United States Supply Company. Shipping container for packaging endless belts for transportation or storage. 4,678,084, Cl. 206-597.000.
- Maki, Hideo: See—  
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- Makimoto, Mitsuo: See—  
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- Malaby, Davey L.: See—  
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- Malafosse, Jean: See—  
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- Malandra, Louis J.; Leduc, Robert J.; Hankinson, Michael F.; and Kowalski, Edward F., to Westinghouse Electric Corp. Modular head assembly and method of retrofitting existing nuclear reactor facilities. 4,678,623, Cl. 376-260.000.
- Malhi, Satwinder D. S., to Texas Instruments Incorporated. Method of providing buried contacts for N and P channel devices in an SCL-CMOS process using a single N+ polycrystalline silicon layer. 4,677,735, Cl. 29-571.000.
- Malhotra, Satish K., to Steyr-Daimler-Puch AG. Hand firearm. 4,677,898, Cl. 89-187.010.
- Malhotra, Shadi L., to Xerox Corporation. Thermal transfer printing sheets containing certain coating compositions thereof. 4,678,687, Cl. 427-261.000.
- Malik, Arshad H.; Urfer, Allen D.; McDaniel, Robert S.; and Johnson, Donald L., to A. E. Staley Manufacturing Company. Carpet shampoo or upholstery cleaning composition. 4,678,595, Cl. 252-174.170.
- Mallory, Chester L.: See—  
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- Malloy Desormeaux, Stephen G., to Eastman Kodak Company. Film-on-spool sensor for determining mode of operation of film transport mechanism in camera. 4,678,303, Cl. 354-173.110.
- Maloney, Christopher E.; and Crane, Russell M. Gas laser tube apparatus. 4,679,202, Cl. 372-65.000.
- Manabe, Akiyoshi: See—  
Takamatsu, Masayoshi; Hashimoto, Kouji; Manabe, Akiyoshi; and Ichihana, Hideyuki, 4,678,845, Cl. 525-462.000.
- Mancinelli, Paul A., to Atlantic Richfield Company. Multilithium polymerization initiators. 4,678,837, Cl. 525-250.000.
- Mandle, Robert J.; and McRae, Wayne A., to Ionics, Incorporated. Renaturing reversibly denatured polypeptides and proteins by electroanalysis of solutions thereof in denaturants. 4,678,553, Cl. 204-182.600.
- Mang, Hermenegild; and Engel, Gunter, to Avi Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik mbH. Process for producing crystals. 4,678,535, Cl. 156-623.00R.
- Maniar, Deepak R.: See—  
Laing, John R.; Zimmer, C. D.; Maniar, Deepak R.; and Williams, Meurig W., 4,678,734, Cl. 430-137.000.
- Mannesmann Aktiengesellschaft: See—  
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- Mannesmann Rexroth G.m.b.H.: See—  
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Vrabel, Robert J.; Vajgart, Jeffery L.; Staszal, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., 4,678,975, Cl. 318-266.000.
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- Misra, Chanakya: See—  
The, Paul J.; and Misra, Chanakya, 4,678,477, Cl. 23-305.00A.
- Misumi, Teruo: See—  
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuzuki, Yoshio; and Ogawa, Kyosuke, 4,678,733, Cl. 430-57.000.
- Mita Industrial Co., Ltd.: See—  
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- Mitake, Kenjiro, to NEC Corporation. Output circuit having an improved protecting circuit. 4,678,950, Cl. 307-550.000.
- Mitani, Ikujiro; Kawanami, Norihide; and Kobayashi, Fumio, to Hirose Electric Co., Ltd. L-type coaxial plug connector. 4,678,261, Cl. 439-582.000.
- Mitani, Kazutami: See—  
Itoh, Hajime; and Mitani, Kazutami, 4,678,813, Cl. 521-61.000.
- Mitani, Wataru: See—  
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- Mitsubishi Denki Kabushiki Kaisha: See—  
Higuchi, Keizo, 4,679,027, Cl. 340-723.000.
- Kawamura, Toshimi; and Satow, Takashi, 4,679,020, Cl. 335-216.000.
- Kitaoaka, Takashi; and Watanabe, Eiki, 4,678,063, Cl. 187-119.000.
- Oshikiri, Keiichi; and Nakamura, Tooru, 4,678,949, Cl. 307-527.000.
- Sadamori, Yuichiro; and Maeda, Keini, 4,679,045, Cl. 340-825.070.
- Shibasaki, Takeshi, 4,679,082, Cl. 358-147.000.
- Sugimoto, Shigeyuki; Kato, Masayuki; and Chonan, Katsuhiko, 4,678,980, Cl. 318-759.000.
- Takahama, Shinobu, 4,677,741, Cl. 29-588.000.
- Tanaka, Minoru; and Yonehata, Yuzuru, 4,678,932, Cl. 307-633.000.
- Watakabe, Yaichiro, 4,678,714, Cl. 428-432.000.
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Hirano, Takahisa; and Hagimoto, Kiyoshi, 4,678,415, Cl. 418-50.000.
- Hirano, Takahisa; Fukami, Shoji; and Maeda, Mitsutosho, 4,678,416, Cl. 418-55.000.
- Okamoto, Arifumi, 4,678,388, Cl. 414-92.000.
- Suzuki, Tsutomu, 4,678,133, Cl. 242-56.00A.
- Mitsubishi Petrochemical Co., Ltd.: See—  
Hanamura, Eiichi; and Tokura, Yoshinori, 4,678,736, Cl. 430-270.000.
- Mitsubishi Rayon Co., Ltd.: See—  
Itoh, Hajime; and Mitani, Kazutami, 4,678,813, Cl. 521-61.000.
- Sasaki, Isao; and Mukai, Nobuhiro, 4,678,819, Cl. 523-171.000.
- Mitsui, Osamu; and Fukuoka, Yohei, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing a cycloolefin. 4,678,861, Cl. 585-266.000.
- Mitsuka, Ikuo, to Dainippon Screen Mfg. Co., Ltd. Method and system for processing image data in reproducing images. 4,679,155, Cl. 364-525.000.
- Mitutoyo Mfg. Co., Ltd.: See—  
Iwano, Hideo; and Shudo, Kazuo, 4,677,755, Cl. 33-503.000.
- Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, to Nippon Soken, Inc. Semiconductor-type flow rate detecting apparatus. 4,677,850, Cl. 73-204.000.
- Miura, Kenji: See—  
Kurono, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiro, 4,678,801, Cl. 514-413.000.
- Miwa, Gerald T.; and Walsh, John S., to Merck & Co., Inc. 1,2(1,4)-dimethyl-4(2)-(2-hydroxyethyl)-5-nitro-imidazole antiprotazoal agents with reduced mutagenicity. 4,678,799, Cl. 514-398.000.
- Miyake, Hideharu: See—  
Sugano, Takuo; Okabe, Yoichi; Miyake, Hideharu; and Fukaya, Naoki, 4,678,945, Cl. 307-476.000.
- Miyamoto, Keiichi: See—  
Kobari, Yuji; and Miyamoto, Keiichi, 4,678,056, Cl. 180-247.000.
- Miyamoto, Mitsuya; Oseki, Yasuyuki; and Nabae, Motohiro, to Furukawa Aluminum Co., Ltd. Anodized memory disk substrate and method of manufacturing the same. 4,678,547, Cl. 204-37.100.
- Miyamoto, Toshinobu; Hayashi, Hiroo; Sakurai, Hideo; Takabayashi, Hirofumi; and Ohnishi, Youichi, to Sumitomo Special Metal Co. Ltd. Magnetic field generating device for NMR-CT. 4,679,022, Cl. 335-296.000.
- Miyano, Seiji: See—  
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- Miyashita, Kunio: See—  
Kanazawa, Hiroshi; Yamashita, Seizi; and Miyashita, Kunio, 4,678,971, Cl. 318-135.000.
- Miyatani, Kazuo; and Sato, Isao, to RCA Corporation. Curved structure and method for making same. 4,678,292, Cl. 350-609.000.
- Miyazaki, Hiroshi; Arika, Junji; and Aimoto, Michiyuki, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of faujasite zeolite. 4,678,651, Cl. 423-329.000.
- Miyazaki, Makoto: See—  
Fujita, Masahito; Miyazaki, Makoto; Kizaki, Masami; Nagashima, Yukio; and Shimbori, Yuichi, 4,678,768, Cl. 502-119.000.
- Miyazawa, Takeshige: See—  
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,678,496, Cl. 71-76.000.
- Miyoshi, Takahito; Fujiyama, Masaaki; Okutu, Toshimitu; Masuyama, Kenichi; and Nasu, Norio, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,678,697, Cl. 428-141.000.
- Mizuguchi, Masatsugu: See—  
Ikariya, Takao; Itagaki, Masanori; Mizuguchi, Masatsugu; Sakai, Itaru; and Tajima, Osamu, 4,678,856, Cl. 560-24.000.
- Mizuhara, Howard, to GTE Products Corporation. Ductile brazing alloy containing reactive metals precious metals. 4,678,636, Cl. 420-456.000.
- Mizutani, Yuji: See—  
Takeda, Tamio; Gokyu, Toshio; Mizutani, Yuji; and Nakashima, Jun, 4,678,954, Cl. 310-156.000.
- Mobil Oil Corporation: See—  
Chang, Clarence D.; Penick, Joe E.; and Socha, Richard F., 4,678,645, Cl. 422-190.000.
- Chang, Clarence D.; and Miale, Joseph N., 4,678,763, Cl. 502-26.000.
- Dahan, Paul C., 4,678,446, Cl. 441-80.000.
- Dolan, Michael J.; Hilbert, Timothy L.; and Snyder, John D., 4,678,483, Cl. 55-97.000.
- Hartman, Kathy J.; and Shu, Winston R., 4,678,036, Cl. 166-273.000.
- Hicks, Michael S.; and Vannauker, David L., 4,678,556, Cl. 208-96.000.
- Le, Quang N.; Tsao, Ying-Yen P.; and Wong, Stephen S., 4,678,764, Cl. 502-26.000.
- Rosinski, Edward J., 4,678,766, Cl. 502-85.000.
- Shu, Paul, 4,678,032, Cl. 166-295.000.
- Modesitt, Phillip C.: See—  
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,678,040, Cl. 166-370.000.
- Mogensens, Vagn, to Dansk Industri Syndikat A/S. Method and an apparatus for replacing pattern plates in a moulding system. 4,678,021, Cl. 164-40.000.
- Mogi, Takao: See—  
Okada, Takashi; Mogi, Takao; Kobayashi, Hiroyuki; and Ohi, Katsuyuki, 4,679,235, Cl. 380-20.000.
- Mohammed, Khalid: See—  
Capasso, Federico; Cho, Alfred Y.; Hutchinson, Albert L.; and Mohammed, Khalid, 4,679,061, Cl. 357-4.000.
- Mol, Min K.: See—  
Meares, Claude F.; DeNardo, Sally J.; Cole, William C.; and Mol, Min K., 4,678,667, Cl. 424-85.000.
- Momose, Yutaka: See—  
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- Mon, George, to United States of America, Army. Fluidic complementary gain changing circuit. 4,678,009, Cl. 137-818.000.
- Monahan, Michael B.: See—  
Elliott, James O.; and Monahan, Michael B., 4,678,973, Cl. 318-254.000.
- Mondeshka, Donka M.: See—  
Ivanov, Chavdar B.; Mondeshka, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.
- Monet S.A.: See—  
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- Monma, Masao: See—  
Katsurai, Junji; Monma, Masao; and Takaku, Tetsuo, 4,679,053, Cl. 346-1.100.

- Monreal, F. Javier. Water gliding scooter board. 4,678,444, Cl. 441-65.000.
- Monreal, F. Javier. Water and snow wishbone shaped sled for one or two. 4,678,445, Cl. 441-72.000.
- Monsanto Company: See—  
Chan, Albert S. C., 4,678,662, Cl. 424-57.000.
- Flory, Thomas A., 4,677,848, Cl. 73-146.000.
- Ottot, Roger S.; and Runkle, Charles J., 4,678,573, Cl. 210-321.100.
- Monsigny, Jean, to Aciars et Outillage Peugeot. Buckle in particular for a safety belt. 4,677,716, Cl. 24-641.000.
- Montandon, Albert B.: See—  
Trahan, Wesley J.; and Montandon, Albert B., 4,678,117, Cl. 236-92.00A.
- Montanwerke Walter GmbH: See—  
Speidel, Hans, 4,677,792, Cl. 51-168.000.
- Montedison S.p.A.: See—  
Bertolotti, Franco, 4,678,423, Cl. 425-311.000.
- Mooney, Warren M. Apparatus for converting a transfer truck to a flatbed or the like. 4,678,391, Cl. 414-389.000.
- Moore Business Forms, Inc.: See—  
Lukis, Lawrence J., 4,679,241, Cl. 382-13.000.
- Moore, Larry V., to Rockwell International Corporation. Electrical connector for circuit boards. 4,678,252, Cl. 439-62.000.
- Moorehead, Jack F.; and Campbell, Richard S., Sr., to Fairchild Filter Corporation. Cast filter and automatic self-cleaning backflush control system therefor. 4,678,564, Cl. 210-108.000.
- Morelli, Aldo. Excavator with extensible boom. 4,677,772, Cl. 37-103.000.
- Mori, Kenji. Method of producing a photoradiator device. 4,678,279, Cl. 350-320.000.
- Mori, Kenji: See—  
Saeiki, Osamu; Mori, Kenji; Onoda, Mamoru; Watanabe, Ryo; Shinohara, Katsufumi; Ashie, Takehiko; and Imanishi, Nobuyuki, 4,678,508, Cl. 75-26.000.
- Mori, Kyoze: See—  
Tanaka, Kazunobu; and Mori, Kyoze, 4,678,602, Cl. 252-513.000.
- Mori, Yoshikazu: See—  
Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,679,003, Cl. 331-1.00A.
- Moriguchi, Haruhiko: See—  
Inui, Toshiharu; and Moriguchi, Haruhiko, 4,679,055, Cl. 46-76.0PH.
- Morishita, Tsuyoshi: See—  
Osaki, Sigemi; Yousina, Norio; Morishita, Tsuyoshi; and Kawado, Yasuhide, 4,678,633, Cl. 419-8.000.
- Moriya, Koichi: See—  
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,678,795, Cl. 514-341.000.
- Morland, Albert H.; and Phoenix, John T., to Coopervision, Inc. Method of mounting a partly formed lens blank. 4,677,729, Cl. 29-426.500.
- Morokawa, Shigeru, to Citizen Watch Company Limited. Method of driving liquid crystal matrix display. 4,679,043, Cl. 340-784.000.
- Morris, Clive A.; and Joby, Michael J., to Lucas Industries public limited company. Control for a limiting device. 4,679,151, Cl. 364-510.000.
- Morris, Jerry D.: See—  
Jensen, Gordon A.; Reames, Stephen P.; Morris, Jerry D.; and Neal, Scott S., 4,679,193, Cl. 370-94.000.
- Morris, Robert A.: See—  
Todaro, Frank A.; Castonguay, Roger N.; Krajewski, Alexander A.; and Morris, Robert A., 4,679,019, Cl. 335-172.000.
- Morton, Gerald H.: See—  
Gardner, John F.; and Morton, Gerald H., 4,678,159, Cl. 251-107.000.
- Moscovici, Poldi, to Superior Manufacturing & Instrument Corporation. Programmable power supply. 4,679,130, Cl. 363-17.000.
- Moscovici, Poldi, to Superior Manufacturing & Instrument Corporation. System for alleviating harmonic distortion. 4,679,133, Cl. 363-46.000.
- Moser, James N.: See—  
Basinger, David M.; Hatley, Gary L.; Kiser, Billy J.; and Moser, James N., 4,678,173, Cl. 270-45.000.
- Mosher, Oren A., to Package Machinery Company. Combination weighing apparatus for two combined products. 4,678,046, Cl. 177-1.000.
- Moskin, Jeffrey M., to Novitas, Inc. Two-terminal line-powered control circuit. 4,678,985, Cl. 323-324.000.
- Moss, Brian F.; Brent, Richard J.; and Pilkington, Ian B., to Ciba-Geigy AG. Device for processing exposed photographic film coiled on a spool. 4,678,307, Cl. 354-313.000.
- Moss, Brian F.; and Brent, Richard J., to Ciba-Geigy AG. Processing device. 4,678,308, Cl. 354-313.000.
- Moss, Brian F.; and Brent, Richard J., to Ciba-Geigy AG. Device for processing a role of exposed film coiled on a spool. 4,678,309, Cl. 354-313.000.
- Mossberg & Sons, Inc.: See—  
Lee, Joseph L., 4,677,781, Cl. 42-70.010.
- Most, Manfred: See—  
Lenz, Werner; and Most, Manfred, 4,678,026, Cl. 165-67.000.
- Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, to Kumiai Chemical Industry Co., Ltd. Cyclohexane derivatives having plant-growth regulating activities, and uses of these derivatives. 4,678,496, Cl. 71-76.000.
- Motorola Inc.: See—  
Bauck, Jerald L., 4,678,987, Cl. 324-77.00R.
- Ecklund, Lawrence M., 4,679,237, Cl. 381-15.000.
- Farace, Louis P., 4,677,913, Cl. 102-215.000.
- Peters, Tulley M.; and Bruce, William C., Jr., 4,679,194, Cl. 371-16.000.
- Rehbein, Clayton J.; and Battin, Leland B., Jr., 4,678,215, Cl. 292-247.000.
- Richardson, Charles P.; Kuhl, Virgil; Gasparaitis, Bernard; Staple, Bruce; and Krieg, Larry M., 4,679,233, Cl. 379-433.000.
- Wilson, Timothy J.; and Erickson, Paul M., 4,679,028, Cl. 340-347.00C.
- Moulinex, Societe Anonyme: See—  
Brison, Marc P., 4,677,749, Cl. 30-355.000.
- Mount Isa Mines Limited: See—  
Holliis, Richard G., 4,678,507, Cl. 75-24.000.
- Mowill, Rolf J., to A S Kongsberg Vapenfabrikk. Movable spike, variable entrance geometry pipe diffuser with vibration suppression. 4,678,396, Cl. 415-148.000.
- Mrowka, Joseph J.: See—  
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- MTM Obermaier GmbH & Co. KG: See—  
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- Mucheyer, Norbert: See—  
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- Muehleisen, Thomas C., to Alltel Corporation. Computer security guard circuit. 4,679,226, Cl. 379-95.000.
- Mukai, Nobuhiro: See—  
Sasaki, Isao; and Mukai, Nobuhiro, 4,678,819, Cl. 523-171.000.
- Mullen, John L.: See—  
Cannon, Stuart R.; Brazenor, William J.; Kneen, Peter W.; and Mullen, John L., 4,677,999, Cl. 135-117.000.
- Muller, Alexander, to General Electric Company. Apparatus for assembling a rotatable assembly. 4,677,744, Cl. 29-729.000.
- Muller, Erich: See—  
Nickl, Josef; Muller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, 4,678,792, Cl. 514-307.000.
- Muller, Heinz; Lohmar, Elmar; and Scholz, Harald, to Hoechst Aktiengesellschaft. Process for purifying hydrogen chloride gas. 4,678,482, Cl. 55-71.000.
- Muller, Ullrich: See—  
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- Muller, Walter: See—  
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- Muller, Wolfgang: See—  
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- Mundstock, Robert W.: See—  
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- Mundt, Peter; and Neuhold, Arnold, to Geimuplast Peter Mundt GmbH & Co. KG. Process of manufacturing slide frames. 4,678,525, Cl. 156-73.100.
- Murakami, Eiji; Sano, Yasuro; and Hyodo, Tohru, to Janome Sewing Machine Co. Ltd. Method of initially setting a stepping motor in a sewing machine. 4,677,925, Cl. 112-266.100.
- Murakami, Yoshikazu; Ito, Seigo; Okamoto, Hiromi; and Tanaka, Hideo, to Sony Corporation. Ferromagnetic resonator. 4,679,015, Cl. 333-219.000.
- Muramatsu, Kunihiro, to Nissan Motor Company, Limited. Battery condition monitor and monitoring method. 4,678,998, Cl. 324-427.000.
- Muramoto, Tomotaka: See—  
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- Murano, Kazuo: See—  
Fukuda, Misao; Tsuda, Toshitaka; Murano, Kazuo; and Awata, Yutaka, 4,679,188, Cl. 370-29.000.
- Murase, Masaaki, to Kawasaki Jukogyo Kabushiki Kaisha. System for discharging water from crank chamber. 4,678,441, Cl. 440-88.000.
- Murayama, Seiichi; Tsujii, Kanji; and Yajima, Yusuke, to Hitachi, Ltd. Method of photochemical surface treatment. 4,678,536, Cl. 156-635.000.
- Murphy, David A.: See—  
Pillis, Joseph W.; Murphy, David A.; Spellar, Peter C.; and Nemit, Paul, Jr., 4,678,406, Cl. 417-310.000.
- Murray, William P., to Spacesaver Corporation. Portable power source for mobile storage carriage. 4,678,981, Cl. 320-2.000.
- Musil, James C.: See—  
Zahuranec, Emery J.; and Musil, James C., 4,678,380, Cl. 408-211.000.
- Muthukrishnan, Ramaurthi: See—  
Pasteris, Robert J.; and Muthukrishnan, Ramaurthi, 4,678,499, Cl. 71-90.000.
- Mutschall, Hugo: See—  
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- Focke, Heinz; and Mutschall, Hugo, 4,678,901, Cl. 250-223.00R.
- Nabae, Motohiro: See—  
Miyamoto, Mitsuya; Oseki, Yasuyuki; and Nabae, Motohiro, 4,678,547, Cl. 204-37.100.
- Nabeta, Teiichi: See—  
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Thulin, Robert R., 4,678,418, Cl. 425-115.000.  
Nadolski, Gregory L.: See—  
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Nagano, Katsumi, to Kabushiki Kaisha Toshiba. Circuit in which output circuit and operational amplifier equipped input circuit are electrically isolated, 4,678,946, Cl. 307-490.000.  
Nagano, Syuji: See—  
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Nagasawa, Kenichi: See—  
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Nagatome, Yoshiaki: See—  
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Nagel, Gregory L.; Lee, Anthony; and Hill, Warren D., to General Motors Corporation. Method and apparatus for resistance welding, 4,678,887, Cl. 219-117.100.  
Nagy, Joseph G.: See—  
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Naito, Ryuchi, to Pioneer Electronic Corporation. Method for detecting an error in loading a recording disc, 4,679,181, Cl. 369-44.000.  
Naito, Yoshihiro: See—  
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Nakada, Takeshi: See—  
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Nakagawa, Kenji: See—  
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Nakagawa, Masahiro: See—  
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Nakagawa, Mitsuhiko; and Nitto, Fumiaki, to Sumitomo Electric Industries, Ltd. Friction material and method of making such material, 4,678,818, Cl. 523-157.000.  
Nakajima, Koe: See—  
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Nakamura, Hajime: See—  
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Nakamura, Junichi, to Olympus Optical Co., Ltd. Solid-state image sensing apparatus having an automatic control loop, 4,678,938, Cl. 307-311.000.  
Nakamura, Kazuhito; Sasaki, Hisami; Chigira, Masayoshi; and Yokoi, Kenji, to Lion Corporation. Softener composition, 4,678,590, Cl. 252-8.800.  
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Sawatari, Takeo; Nakamura, Mitsutaka; and Sugiura, Toshihiro, 4,677,847, Cl. 73-64.000.  
Nakamura, Takehiro; Sato, Susumu; Hattori, Tadashi; Nabeta, Teiichi; and Kato, Minoru, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Photo-electric smoke detector with light shielding electrode, 4,678,921, Cl. 250-574.000.  
Nakamura, Tooru: See—  
Oshikiri, Keiichi; and Nakamura, Tooru, 4,678,949, Cl. 307-527.000.  
Nakamura, Tsutomu; and Imai, Kiyoshi, to Shin-Etsu Chemical Co., Ltd. Vibration-damping rubber composition, 4,678,828, Cl. 524-265.000.  
Nakanishi, Haruo; Sakaki, Hirokazu; Yamazaki, Toru; and Okishi, Yoshio, to Fuji Photo Film Co., Ltd. Process for producing an aluminum support for a lithographic printing plate, 4,678,551, Cl. 204-129.750.  
Nakao, Shinroku; Itoh, Masao; Itoh, Akira; and Takano, Hiroshi, to Combi Co., Ltd. Bicycle ergometer and eddy current brake therefor, 4,678,182, Cl. 272-73.000.  
Nakashima, Jun: See—  
Takeda, Tamio; Gokyu, Toshio; Mizutani, Yuji; and Nakashima, Jun, 4,678,954, Cl. 310-156.000.  
Nakayama, Wataru: See—  
Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku,

Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.  
Nakayama, Yoshihiko: See—  
Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigeho; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, 4,678,029, Cl. 165-133.000.  
Nalco Chemical Company: See—  
Diep, Daniel V., 4,678,481, Cl. 55-4.000.  
Fong, Dodd W.; and Kowalski, David J., 4,678,840, Cl. 525-340.000.  
Giddings, David M.; and Williamson, Charles D., 4,678,591, Cl. 252-8.514.  
Nalepka, Paul: See—  
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.  
Nalge Company: See—  
Leoncavallo, Richard A., 4,678,576, Cl. 210-433.200.  
Namba, Satoshi: See—  
Shimizu, Tsutomu; Tarumoto, Kouji; and Namba, Satoshi, 4,678,738, Cl. 430-320.000.  
NAP Consumer Electronics Corp.: See—  
Andrea, Johan; Lubchenko, Eugene; and Bradley, Ralph H., 4,679,069, Cl. 358-60.000.  
Napier, James J.; and Griffith, Ronald C., to Penwalt Corporation. 6-phenyl-1,2,3,4,4a,5,6,10b-octahydrobenz(h)isoquinolines useful for treating depression, 4,678,791, Cl. 514-290.000.  
Narr, Benthold: See—  
Nickl, Josef; Muller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, 4,678,792, Cl. 514-307.000.  
Naruse, Osamu: See—  
Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, 4,677,845, Cl. 73-56.000.  
Nashef, Aws S.; and Campbell, Todd D., to American Hospital Supply Corporation. Bone-grafting material, 4,678,470, Cl. 623-16.000.  
Nason, Clyde K.; and Culp, Gordon W., to Pacesetter Infusion, Ltd. Solenoid drive apparatus for an external infusion pump, 4,678,408, Cl. 417-410.000.  
Nasu, Norio: See—  
Miyoshi, Takahito; Fujiyama, Masaaki; Okutu, Toshimitu; Masuyama, Kenichi; and Nasu, Norio, 4,678,697, Cl. 428-141.000.  
Nathanson, James A. Method of controlling pests, 4,678,775, Cl. 514-47.000.  
National Communications Research Center, Inc.: See—  
Jones, Ronald R., 4,679,239, Cl. 381-16.000.  
National Molding Corporation: See—  
Anscher, Joseph, 4,677,711, Cl. 24-200.000.  
National Research Development Corporation: See—  
McGeehan, Joseph P.; and Bateman, Andrew, 4,679,243, Cl. 455-47.000.  
National Semiconductor Corporation: See—  
Layher, Francis W., 4,678,358, Cl. 403-28.000.  
National Starch and Chemical Corporation: See—  
Lauria, Vincent A., 4,678,824, Cl. 524-48.000.  
Natsumeda, Takeshi; Nawa, Motoyuki; and Sugawara, Norio, to Matsushita Electric Industrial Co., Ltd. Fluid flow control assembly, 4,677,904, Cl. 98-38.100.  
Nauman, John D.: See—  
Johns, Robert H.; and Nauman, John D., 4,678,719, Cl. 428-593.000.  
Nawa, Motoyuki: See—  
Natsumeda, Takeshi; Nawa, Motoyuki; and Sugawara, Norio, 4,677,904, Cl. 98-38.100.  
Nawata, Kazumasa; and Kanai, Yasunori, to Fujitsu Limited. Inner bias circuit for generating ECL bias voltages from a single common bias voltage reference, 4,678,935, Cl. 307-297.000.  
NCR Corporation: See—  
Blanford, Denis M., 4,679,154, Cl. 364-525.000.  
Neal, Scott S.: See—  
Jensen, Gordon A.; Reames, Stephen P.; Morris, Jerry D.; and Neal, Scott S., 4,679,193, Cl. 370-94.000.  
Nebelung, Hermann H.; and Knoth, Werner-Dieter, to Emhart Industries, Inc. Blowhead arrangement for a glassware container manufacturing machine, 4,678,494, Cl. 65-261.000.  
NEC Corporation: See—  
Aoyagi, Masaru; and Saitoh, Makoto, 4,679,177, Cl. 367-132.000.  
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.  
Mitake, Kenjiro, 4,678,950, Cl. 307-550.000.  
Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, 4,678,256, Cl. 439-347.000.  
Takahara, Atsushi; Ishikawa, Tomoyoshi; Tanaka, Hiroyuki; and Okui, Tamio, 4,679,004, Cl. 331-14.000.  
Tsugane, Syuzo; and Nishiwaki, Mitsuo, 4,679,081, Cl. 358-138.000.  
Yamanaka, Hiroshi, 4,678,889, Cl. 219-121.0LJ.  
Negev Phosphates Ltd.: See—  
Alexander, Josef; and Bar-on, Menachem, 4,678,649, Cl. 423-308.000.  
Neiger, Henri J. C.; Genot, Claude M.; Prud'Hon, Gerard C.; and Schoens, Michel, to Merobel - Societe Anonyme Fracaise. Constant force exercise device, 4,678,184, Cl. 272-129.000.  
Neil, Robert B.; and Adelman, George L., to Hewlett-Packard Company. Smoothing discontinuities in the display of serial parallel line segments, 4,679,039, Cl. 340-728.000.

Nelson, Gary A.; Godding, Patrick N.; Schumaker, Richard E.; Walter, Keith D.; Marrone, Edward S.; Gates, Stillman E.; Rigsbee, Everett O., III; and Teener, Michael D., to CXC Corporation. Variable bandwidth switching system, 4,679,191, Cl. 370-84.000.  
Nelson, Marvin D., to Honeywell Inc. Over-temperature control for a thermostat, 4,679,023, Cl. 337-140.000.  
Nelson, Norman E., to Minnesota Mining and Manufacturing Company. Videocassette sleeve and cover, 4,678,080, Cl. 206-387.000.  
Nelson, Richard D.; and Evans, James D., to Performance Feeders, Inc. Overload release clutch, 4,678,452, Cl. 464-38.000.  
Nemit, Paul, Jr.: See—  
Piliis, Joseph W.; Murphy, David A.; Spellar, Peter C.; and Nemit, Paul, Jr., 4,678,406, Cl. 417-310.000.  
Nemoto, Tsuneo, to Sony Corporation. Magnetic tape cassette with reel brake mechanism, 4,678,138, Cl. 242-198.000.  
Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., to Vsesojuzny Institut Po Proektirovaniu Organizatsii Energeticheskogo Stroitelstva. Transfer assembly of belt conveyor, 4,678,076, Cl. 198-525.000.  
Nerrinck, Bernard: See—  
Benoit, Louis; Mabboux, Michel; Nerrinck, Bernard; and De Marchi, Jean-Louis, 4,677,768, Cl. 36-117.000.  
Nervig, Charles H.; and Dimmick, Vance E., to American Greeting Corporation. Page type display fixture with self return feature, 4,678,086, Cl. 211-47.000.  
Neu, Horst W., to Northrop Corporation. Honeycomb cutter and chip breaker/chaf remover, 4,677,886, Cl. 82-53.000.  
Neubauer, Heinz, to Siemens Aktiengesellschaft. Endocardial electrode controllable to form selected contours, 4,677,990, Cl. 128-786.000.  
Neuhold, Arnold: See—  
Mundt, Peter; and Neuhold, Arnold, 4,678,525, Cl. 156-73.100.  
New Holland Inc.: See—  
Dallinger, James F., 4,678,129, Cl. 241-101.700.  
Martenas, Wayne B., 4,678,130, Cl. 241-222.000.  
New Mexico State University Foundation: See—  
Zartman, David L., 4,677,967, Cl. 128-1.00R.  
New Super Laundry Machinery Co., Inc.: See—  
Kamberg, Eduard, 4,677,773, Cl. 38-44.000.  
New York University: See—  
Llinas, Rodolfo R.; Sugimori, Mutsuyuki; and Crank, Ronald K., 4,677,982, Cl. 128-664.000.  
Newell, Robert E.; Rand, Paul K.; and Osterweil, Carole A., to Glaxo Group Limited. Dispensing device, 4,678,106, Cl. 222-162.000.  
Newman, Lola; and Zelasko, Joseph. Detachable foam-borne mounting method, 4,678,150, Cl. 248-205.300.  
Newman, Michael A.: See—  
Edwards, David V.; and Newman, Michael A., 4,678,443, Cl. 441-38.000.  
Ney, Reuben E.: See—  
Farrar, John C.; Ney, Reuben E.; and Schroeder, James L., III, 4,679,013, Cl. 333-182.000.  
Nicholson, Horace: See—  
Maker, Lewis W.; and Nicholson, Horace, 4,678,084, Cl. 206-597.000.  
Nickl, Josef; Muller, Erich; Narr, Benthold; Ballhause, Helmut; and Haarmann, Walter, to Dr. Karl Thomae GmbH. Quaternary 3,4-dihydro-isouquinolinium salts, 4,678,792, Cl. 514-307.000.  
Nickola, Richard A.; Sok, Brian A.; and Agarwal, Shashi B., to Inland Steel Company. Powder metal and/or refractory coated ferrous metals, 4,678,717, Cl. 428-553.000.  
Nicolet Instrument Corporation: See—  
Anderson, Charles R., 4,678,333, Cl. 356-346.000.  
Boese, Roland, 4,678,340, Cl. 366-111.000.  
Nicoloso, Dante, to Alstom. Operating mechanism for a circuit-breaker, and a circuit-breaker fitted with the mechanism, 4,678,877, Cl. 200-148.00F.  
Nielsen, Max E.; Labrum, Joseph H.; and Grant, Patrick S., to Sperry Corporation. Exceedance counting integrating photo-diode array, 4,679,215, Cl. 377-95.000.  
Nigrelli, Biagio, Sr. Carton opening apparatus, 4,678,456, Cl. 493-309.000.  
Nihon Tokushu Noyaku Seizo K.K.: See—  
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,678,795, Cl. 514-341.000.  
Niiranen, Tapani; Savolainen, Erkki; and Kohonen, Raimo, to Enzo-Gutzeit OY. Disc filter, 4,678,574, Cl. 210-327.000.  
Nikaido, Akira, to Citizen Watch Co., Ltd. Linear motor, 4,678,951, Cl. 310-13.000.  
Nikitin, Vladimir V.: See—  
Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., 4,678,076, Cl. 198-525.000.  
Nippon Air Brake Co., Ltd.: See—  
Tamamori, Hideo; and Ikeda, Mitsuhiro, 4,678,241, Cl. 303-33.000.  
Nippon Coinco Kabushiki Kaisha: See—  
Kobayashi, Osamu; Akagawa, Masaki; and Hayashi, Hiroshi, 4,678,072, Cl. 194-206.000.  
Nippon Dacro Shamrock Co., Ltd.: See—  
Ayukawa, Nobuhiko; and Konishi, Yasuhiko, 4,678,518, Cl. 148-6.200.  
Nippon Gakki Seizo Kabushiki Kaisha: See—  
Kamoshita, Yasuhiko; Tamaru, Takuya; Ogusu, Mikio; and Urata, Kazuo, 4,679,182, Cl. 369-77.200.  
Nippon Kokan Kabushiki Kaisha: See—  
Ikariya, Takao; Itagaki, Masanori; Mizuguchi, Masatsugu; Sakai, Itaru; and Tajima, Osamu, 4,678,856, Cl. 560-24.000.

Nippon Sheet Glass Co., Ltd.: See—  
Tamenori, Hiroyuki; Hattori, Akihiko; and Yoshiyagawa, Mitsugi, 4,678,652, Cl. 423-339.000.  
Yoshizawa, Hideo, 4,678,495, Cl. 65-287.000.  
Nippon Soken, Inc.: See—  
Fukami, Akira; Oshiro, Takao; and Sasaya, Hideaki, 4,678,118, Cl. 237-12.30B.  
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,677,850, Cl. 73-204.000.  
Nakamura, Takehiro; Sato, Susumu; Hattori, Tadashi; Nabeta, Teiichi; and Kato, Minoru, 4,678,921, Cl. 250-574.000.  
Nippon Steel Corporation: See—  
Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, 4,678,522, Cl. 148-12.00C.  
Matsuo, Masataka, 4,678,120, Cl. 239-75.000.  
Nippon Telegraph and Telephone Corporation: See—  
Sakakibara, Kazuhiko; and Kuwata, Yutaka, 4,679,129, Cl. 363-17.000.  
Nippon Telegraph & Telephone Public Corporation: See—  
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.  
Nippondenso Co., Ltd.: See—  
Nakamura, Takehiro; Sato, Susumu; Hattori, Tadashi; Nabeta, Teiichi; and Kato, Minoru, 4,678,921, Cl. 250-574.000.  
Takao, Mitsunori, 4,677,955, Cl. 123-489.000.  
Nishida, Hiroshi; and Inoue, Takemi, to Kawasaki Jukogyo Kabushiki Kaisha. Method of fitting grip over handlebar and grip used in carrying the method into practice, 4,677,872, Cl. 74-551.900.  
Nishida, Hiroshi; and Yazaki, Mitsuhiro, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus responsive to shortage of coolant in an engine of a boat, 4,678,442, Cl. 440-89.000.  
Nishiguchi, Fumio: See—  
Komatsu, Hiroshi; and Nishiguchi, Fumio, 4,678,397, Cl. 415-151.000.  
Nishimatsu, Masaharu: See—  
Shimada, Shigeru; Nishimatsu, Masaharu; Arioka, Hiroyuki; and Kubota, Yuichi, 4,678,708, Cl. 428-336.000.  
Nishimura, Sanji: See—  
Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, 4,678,646, Cl. 422-245.000.  
Nishimura, Seiichi; and Takayasu, Hidekazu, to Sanshin Kogyo Kabushiki Kaisha. Fuel supplying device for internal combustion engine, 4,677,944, Cl. 123-73.00B.  
Nishimura, Yuji; Fujiwara, Akinori; and Kanada, Shigeyasu, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Controller for automatically effecting disengagement of buckle device, 4,678,928, Cl. 307-10.0SB.  
Nishimura, Yutaka: See—  
Yoshikawa, Yoshitaka; Tsukamoto, Masahide; Nishimura, Yutaka; Ono, Hitoshi; and Sano, Tetsuhiro, 4,679,054, Cl. 346-76.0PH.  
Nishino, Yoshimitsu; Tsuruda, Wataru; Koike, Kihachiro; and Matsuoka, Kensaku, to Japan Aviation Electronics Industry Limited; NEC Corporation; and Hirose Denki Kabushiki Kaisha. Connector, 4,678,256, Cl. 439-347.000.  
Nishioka, Kimihiko, to Olympus Optical Co., Ltd. Illuminating optical system for endoscopes, 4,678,900, Cl. 250-205.000.  
Nishiwaki, Mitsuo: See—  
Tsugane, Syuzo; and Nishiwaki, Mitsuo, 4,679,081, Cl. 358-138.000.  
Nissan Motor Co., Ltd.: See—  
Hayashi, Yoshimasa, 4,677,942, Cl. 123-41.210.  
Kobari, Yuji; and Miyamoto, Keiichi, 4,678,056, Cl. 180-247.000.  
Komatsu, Hiroshi; and Nishiguchi, Fumio, 4,678,397, Cl. 415-151.000.  
Kubo, Jun, 4,679,146, Cl. 364-426.000.  
Muramatsu, Kunihiro, 4,678,998, Cl. 324-427.000.  
Yamamori, Takahiro; Takagi, Yasuo; and Furukawa, Junichi, 4,677,878, Cl. 74-861.000.  
Nissinen, Martti: See—  
Lehtikoski, Olavi; and Nissinen, Martti, 4,678,325, Cl. 356-73.000.  
Nitchman, Harold L.; and Cunningham, William B., Jr. Dispensing container closure, 4,678,101, Cl. 222-82.000.  
Nitto Boseki Co., Ltd.: See—  
Ueda, Toshio; Kageno, Kenji; and Harada, Susumu, 4,678,474, Cl. 8-543.000.  
Nitto, Fumiaki: See—  
Nakagawa, Mitsuhiro; and Nitto, Fumiaki, 4,678,818, Cl. 523-157.000.  
Nixdorf Computer AG: See—  
Laue, Hans-Bodo, 4,678,939, Cl. 307-445.000.  
Noble, Philip C.; Tullos, Hugh S.; and Davidson, John P. Method and apparatus for preventing rotational failure of orthopedic endoprostheses, 4,678,471, Cl. 623-16.000.  
Noda, Shoji: See—  
Kamigaito, Osami; Doi, Haruo; Noda, Shoji; Hioki, Tatsumi; Itoh, Akio; and Kakeno, Mitsutaka, 4,678,678, Cl. 427-38.000.  
Nodes, Rudolf; and Hoffmann, Jurgen, to Sartorius GmbH. Flat filter element for the filtration of fluids, 4,678,578, Cl. 210-445.000.  
Nogi, Tatsuo; Iwami, Tomonori; and Tanaka, Kazumi, to Toray Industries, Inc. Polymethyl methacrylate hollow fiber type ultrafiltration membrane and process for preparation of the same, 4,678,581, Cl. 210-500.230.  
Noguchi, Ichiro: See—  
Sumikawa, Seiji; and Noguchi, Ichiro, 4,677,830, Cl. 62-126.000.  
Noiles, Douglas G., to Joint Medical Products Corporation. Ball and socket bearing for artificial joint, 4,678,472, Cl. 623-1.800.



- Noma Inc.: See—  
Maddock, William H.; and Bobrovniczky, Bert, 4,678,153, Cl. 248-229.000.
- Nomura, Kazuhiro, to Toyota Jidosha Kabushiki Kaisha. Construction of mudguard of movable fender portion in motor vehicle. 4,678,198, Cl. 280-153.00A.
- Non Mar, Inc.: See—  
Kellogg, Joseph A.; and Prather, James E., 4,677,840, Cl. 72-465.000.
- Noonan, Joseph F.: See—  
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,679,120, Cl. 361-358.000.
- Norell, Maria G.; and Wängård, Johan C., to KemaNord AB. Process for preparing chlorine dioxide. 4,678,633, Cl. 423-478.000.
- Norell, Maria G.: See—  
Holmstrom, Ulla-Kari M.; Sandgren, Lage M.; Norell, Maria G.; and Axegård, Peter A., 4,678,634, Cl. 423-478.000.
- North American Philips Corporation: See—  
Shone, Michael F.; and Loiacono, Gabriel M., 4,679,198, Cl. 372-41.000.
- Sorrow, Billy B., 4,678,890, Cl. 219-121.00L.
- North China Research Institute of Electro-Optics: See—  
Yu-Zhong, Liu, 4,678,546, Cl. 204-32.100.
- North States Industries, Inc.: See—  
Larson, Donald A.; and Runyon, Peter M., 4,677,791, Cl. 49-463.000.
- Northern Engineering, Inc.: See—  
Kittleson, Karl A., 4,679,024, Cl. 338-160.000.
- Northern Telecom Limited: See—  
Charlebois, Leonard J., 4,678,866, Cl. 174-88.00R.
- Finn, Roger C.; and MacKenzie, Morley S., 4,678,272, Cl. 350-96.210.
- Hogboom, John G.; and Thomas, Terence N., 4,679,209, Cl. 375-17.000.
- Northman, Bradley L.; Slavin, Michael; and West, Donald J., to Lectron Products, Inc. Electrically operated automatic transmission controller assembly. 4,678,006, Cl. 137-596.170.
- Northrop Corporation: See—  
Neu, Horst W., 4,677,886, Cl. 82-53.000.
- Norton Company: See—  
Agarwal, Anil K.; and Hay, Robert A., 4,678,762, Cl. 501-127.000.
- Stole, Kjell A.; Lovsland, Arntien; and Havig, Egil, 4,678,560, Cl. 209-23.000.
- Norton, William W., to Culligan International Company. Purified water storage system with accumulator tank and diaphragm responsive valves. 4,678,565, Cl. 210-110.000.
- Novitas, Inc.: See—  
Moskin, Jeffrey M., 4,678,985, Cl. 323-324.000.
- Nowotny, Georg: See—  
Visek, Tomas; Czaby, Gottfried; and Nowotny, Georg, 4,677,952, Cl. 123-372.000.
- Nozawa, Shigenori; Ohaya, Katsumi; and Kawazoe, Toshiji, to Pfizer Inc. Topical anti-inflammatory compositions. 4,678,666, Cl. 424-81.000.
- Nuclear Energy Systems, Inc.: See—  
Dodd, Francis J., 4,677,916, Cl. 104-118.000.
- Nuetrogena Corporation: See—  
Scott, Richard A.; Wortzman, Mitchell S.; and Jungermann, Eric, 4,678,663, Cl. 424-62.000.
- Nyiredy-Mikita, Klara: See—  
Meszaros, Sándor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno; Nyiredy, Szabolcs; Meier, Beat; Sticher, Otto; and Dallenbach-Toelke, Karin, 4,678,570, Cl. 210-198.200.
- Nyiredy, Szabolcs: See—  
Meszaros, Sándor; Verzar-Petri, Gisela; Nyiredy-Mikita, Klara; Tyihak, Erno; Nyiredy, Szabolcs; Meier, Beat; Sticher, Otto; and Dallenbach-Toelke, Karin, 4,678,570, Cl. 210-198.200.
- Nyman, Georg N.; Pauliny, Ferdinand; and Schindl, Klaus P., to C. Reichert Optische Werke AG. Optical arrangement for microscopes. 4,678,291, Cl. 350-510.000.
- Oba, Toshio: See—  
Itoh, Kunio; Kozakai, Shohei; Hida, Yoshinori; Okinoshima, Hiroshige; Okada, Fumio; Oba, Toshio; Shimizu, Hisashi; Hinoto, Yuji; and Yoshioka, Hiroshi, 4,678,688, Cl. 427-387.000.
- Obara, Haruki; Ito, Masaya; and Tonamura, Masashi, to Fanuc Ltd. Wire discharge machining power source. 4,678,884, Cl. 219-69.00P.
- Obata, Minoru: See—  
Ao, Hideki; Obata, Minoru; and Inui, Jun, 4,678,785, Cl. 514-222.000.
- Obayashi, Tsutomu; Watanabe, Shinobu; and Ino, Kazuhide, to Hiraoka & Co. Ltd. Process for preparation of water-proof sheets. 4,678,681, Cl. 427-38.000.
- Oberlander, George H.; and Stormo, Keith E. Heating/cooling/ventilation unit. 4,678,025, Cl. 165-12.000.
- O'Brien, Stephen: See—  
Bicknell, John; and O'Brien, Stephen, 4,678,990, Cl. 324-158.0MG.
- O'Brien, Thomas P.; and Bernardi, Richard T., to Kabushiki Kaisha Toshiba. CT X-ray collimator including a reinforced collimator blade assembly. 4,679,221, Cl. 378-148.000.
- Oettingen, Herbert F.: See—  
Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thurin, Jan; Anger, Bernd R.; and Oettingen, Herbert F., 4,678,747, Cl. 435-7.000.
- Oevermann, Siegfried: See—  
Kissel, Karl-Heinz; and Oevermann, Siegfried, 4,678,357, Cl. 402-39.000.
- Offiler, Stephen B.; Berg, Peter G.; and Kawate, Keith W. Supplemental automotive vehicular heater system and method of providing same. 4,678,982, Cl. 322-8.000.
- OFI Testing Equipment Inc.: See—  
Schroeder, Royce E., 4,677,843, Cl. 73-54.000.
- Ofusa, Masaatsu; and Ishihama, Toshio, to Yoshida Kogyo K. K. Woven slide fastener. 4,678,013, Cl. 139-384.00B.
- Ogawa, Kyosuke: See—  
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuzuki, Yoshio; and Ogawa, Kyosuke, 4,678,733, Cl. 430-57.000.
- Ogawa, Toshio; Kondo, Shinichi; Umemura, Shinichiro; and Katakura, Kageyoshi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Ultrasonic receiving apparatus. 4,679,176, Cl. 367-119.000.
- Ogawara, Makoto: See—  
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- Ohi, Katsuyuki: See—  
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- Okamoto, Keizo: See—  
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- Oki Electric Industry Co., Ltd.: See—  
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- Olson, Peter K.: See—  
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- Olympus Optical Co., Ltd.: See—  
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- Nishioka, Kimihiko, 4,678,900, Cl. 250-205.000.
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- Ontario Technologies Corporation: See—  
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- Ooseki, Yasuyuki: See—  
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- Owens-Illinois, Inc.: See—  
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- Penn Plax Plastics, Inc.: See—  
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- Sandler, Stanley R., 4,678,842, Cl. 525-359.100.
- Toukan, Sameeh S., 4,678,592, Cl. 252-25.000.
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- Performance Feeders, Inc.: See—  
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- Perry, David A.; and Stratton, Richard D., to Perkins Industries, Inc. Treatment of wood veneers in plywood manufacturing, 4,678,532, Cl. 156-314.000.
- Perry, Matthew J., to Baxter Travenol Laboratories, Inc. Multicuvette rotor assembly, 4,678,331, Cl. 356-246.000.
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- Reiterer, Walther, to Durst Phototechnik GmbH. Measuring device for selecting the filter in photographic enlarging or copying apparatuses. 4,678,319, Cl. 355-38.000.
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- Richardson, Charles P.; Kuhl, Virgil; Gasparaitis, Bernard; Staple, Bruce; and Krieg, Larry M., to Motorola, Inc. Microphone. 4,679,233, Cl. 379-433.000.
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- Richardson, Kenneth; and Whittle, Peter J., to Pfizer Inc. Triazole antifungal agents. 4,678,789, Cl. 514-262.000.
- Richardson, Michael M.; and Schaffer, Douglas A., to Kroy Inc. Tape supply cartridge. 4,678,353, Cl. 400-248.000.
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- Funato, Hiroyoshi, 4,678,263, Cl. 350-3.710.
- Inokuchi, Toshiyuki, 4,678,321, Cl. 355-52.000.
- Izumi, Kouji; Horike, Masanori; Furukawa, Tatsuya; Komai, Hiromichi; Naruse, Osamu; and Ebi, Yutaka, 4,677,845, Cl. 73-56.000.
- Ohta, Wasaburo; Enomoto, Takamichi; and Uehara, Kiyohiro, 4,678,285, Cl. 350-345.000.
- Tanaka, Shigetaka, 4,679,208, Cl. 375-13.000.
- Yamaguchi, Shingo, 4,679,229, Cl. 379-373.000.
- Ridley, Gordon, to Procter & Gamble Company. The. Transparent or translucent toilet bars containing a smectite-type clay. 4,678,593, Cl. 252-131.000.
- Rieger, Wolfhart: See—  
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- Ries, Edward. Variable displacement vane pump or motor. 4,678,413, Cl. 418-29.000.
- Riffiod, Michel M. R., to U.S. Philips Corporation. Delay simulator for FM-CW range measuring apparatus. 4,679,049, Cl. 342-172.000.
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- Riglietti, Antonio, to ALTA S.p.A. Hand operated liquid atomizer. 4,678,122, Cl. 239-333.000.
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- Rivas, Nelson; and Beichel, Rudi, to WorldTech Atlantis Inc. Method and apparatus for secondary and tertiary recovery of hydrocarbons. 4,678,039, Cl. 166-303.000.
- Robblee, Lois S., to EIC Laboratories, Inc. Iridium oxide coated electrodes for neural stimulation. 4,677,989, Cl. 128-784.000.
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Hafner, Udo; Hans, Waldemar; Kind, Wilhelm; Krauss, Rudolf; and Sauer, Rudolf, 4,678,124, Cl. 239-585.000.
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- Knoll, Peter, 4,679,044, Cl. 340-815.200.
- Leiber, Heinz, 4,678,243, Cl. 303-114.000.
- Pape, Werner, 4,677,951, Cl. 123-357.000.
- Robert Krause GmbH & Co. KG: See—  
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- Robertson, James C.: See—  
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- Robinson, David W.: See—  
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- Robinson, Edward A.: See—  
Raue, Glen F.; and Robinson, Edward A., 4,678,015, Cl. 141-131.000.
- Robinson, John S.; Ahlswede, Thomas E.; and Cornelius, Charles A., to R. R. Donnelley & Sons Company. Printing systems for typesetter emulation. 4,679,153, Cl. 364-523.000.
- Rock, Dan; Roth, Mark; and Sagan, Stephen F. Broadband spectrometer with fiber optic reformator. 4,678,332, Cl. 356-328.000.
- Rockwell International Corporation: See—  
Moore, Larry V., 4,678,252, Cl. 439-62.000.
- Rodal, David R.: See—  
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- Rodrigue, Roland; and Rodrigue, Ronnie. Boat and propulsion system. 4,678,440, Cl. 440-53.000.
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- Rodriguez, Anthony R. Elevator display system. 4,677,779, Cl. 40-514.000.
- Rodriguez, Domingo; and Schemel, Roberto, to Intevp, S.A. Process for the regeneration of spent catalyst used in the upgrading of heavy hydrocarbon feedstocks. 4,678,557, Cl. 208-112.000.
- Roe, Anthony M.; Coates, William J.; Slater, Robert A.; Breukelman, Stephen P.; and Meakins, George D., to Smith Kline & French Laboratories Limited. Pharmaceutical compositions having  $\beta$ -adrenoceptor antagonist activity employing pyridazinone derivatives. 4,678,786, Cl. 514-247.000.
- Roe, Homer D. Variable pitch propeller. 4,678,402, Cl. 416-157.00R.
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- Rohm and Haas Company: See—  
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- Rohner, Gerhard; Schweikert, Willi; and Ticks, Gerd-Heinz, to Carl Freudenberg, Firma. Air spring. 4,678,203, Cl. 280-707.000.
- Roller, George J., to Xerox Corporation. Front air knife top vacuum corrugation feeder. 4,678,176, Cl. 271-94.000.
- Rolls-Royce plc: See—  
Bridges, Stuart A.; and Goddard, John, 4,678,113, Cl. 228-160.000.
- Rolyan Manufacturing Co. Inc.: See—  
Lindemann, Peer, 4,677,971, Cl. 128-87.00R.
- Romine, Edward L.; and Byczek, Roger W., to Methode Electronics, Inc. Multi-pin electrical header. 4,678,250, Cl. 439-83.000.
- Roodvoets, David L., to Dow Chemical Company, The. Lightweight roofing system. 4,677,800, Cl. 52-309.120.
- Roos, Ernst: See—  
Kruger, Bernd-Wieland; Hoffmann, Hellmut; Roos, Ernst; and Behrenz, Wolfgang, 4,678,777, Cl. 514-110.000.
- Roschier, Nils-Robert, to Elevator GmbH. Procedure and means for producing a contrast image. 4,679,032, Cl. 340-562.000.
- Rosemount Engineering Company Limited: See—  
Price, Timothy D., 4,678,937, Cl. 307-311.000.
- Rosenberg, Peretz. Quick-action on/off valve. 4,678,004, Cl. 137-469.000.
- Rosenfeld, Jerold C., to Celanese Corporation. Stabilization of aromatic polyesters with dimercaptotriazole. 4,678,825, Cl. 524-83.000.
- Rosenfeld, Philip L.: See—  
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- Rosenthal, Michael R.: See—  
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- Rosenwald, Peter L. Internal medication delivery method and vehicle. 4,678,466, Cl. 604-891.000.
- Rosinski, Edward J., to Mobil Oil Corporation. Enhancement of shape selectivity of zeolites. 4,678,766, Cl. 502-85.000.
- Rosner, Mark S. Portable rapid massive parenteral fluid warming and infusion apparatus. 4,678,460, Cl. 604-113.000.
- Ross Bicycles Inc.: See—  
Ross, Sherwood B., 4,678,090, Cl. 211-150.000.



- Ross, Sherwood B., to Ross Bicycles Inc. Latch. 4,678,090, Cl. 211-130.000.
- Rossi, Victor L.: See—  
Butts, Gary; Sydo, Lukas; and Rossi, Victor L., 4,678,347, Cl. 384-43.000.
- Rostrup-Nielsen, Jens R.: See—  
Stahl, Henrik O.; and Rostrup-Nielsen, Jens R., 4,678,600, Cl. 252-373.000.
- Rotella, Thomas B. Stock price tracking apparatus. 4,677,933, Cl. 116-313.000.
- Roth, Herman. Knockdown housing structure. 4,677,797, Cl. 52-94.000.
- Roth, Mark. See—  
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- Rothermel, Wilfried. See—  
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- Rothman, Douglas L.: See—  
Avison, Malcolm J.; Hetherington, Hoby P.; Jue, Thomas H.; and Rothman, Douglas L., 4,678,995, Cl. 324-309.000.
- Rotomors S.p.A.: See—  
Bertorello, Mario, 4,678,077, Cl. 198-803.010.
- Rott, Hans. See—  
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- Rousseau, Jean. See—  
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- Rowe, David W.: See—  
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- Rowe International, Inc.: See—  
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- Rowe, W. Bruce. See—  
Cotter, Richard; Johnson, Robert C.; Rowe, W. Bruce; and Young, Susan K., 4,678,807, Cl. 514-552.000.
- Rowe, William S.; and Chao, Fred C., to General Electric Company. Transient monitor for nuclear reactor. 4,678,622, Cl. 376-259.000.
- Roxor Corporation. See—  
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- Roy, Glenn M.: See—  
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,678,674, Cl. 426-548.000.
- Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,678,675, Cl. 426-548.000.
- Rube, Friedbert. See—  
Heinrich, Peter; Knop, Klaus; and Rube, Friedbert, 4,678,480, Cl. 48-197.000.
- Rubio, Richard. Tailgate latch mechanism. 4,678,212, Cl. 292-7.000.
- Ruble, Marshall V., to Iowa State University Research Foundation, Inc. Method and means for determining the ease with which a cow may give birth to a calf. 4,678,893, Cl. 235-70.00R.
- Rudershausen, Charles G., to Du Pont de Nemours, E. I., and Company. Synthesis of fluorochloromethanes. 4,678,859, Cl. 570-163.000.
- Rudi, Alain; and Bertot, Maurice, to Aciens et Outillage Peugeot. Device for transmitting through an optical coupling device issuing from a steering wheel to an element mounted on a vehicle. 4,678,906, Cl. 250-227.000.
- Rudland, Peter E., to Time and Data Systems International Limited. Identification card with improved concealed coding and an optical swipe reader housing for use with it. 4,678,898, Cl. 235-468.000.
- Rudy, Richard M.; and Fitzgerald, Thomas J. Liquid level sensor for controlling pump operation. 4,678,403, Cl. 417-12.000.
- Ruegerswerke Aktiengesellschaft. See—  
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- Runkle, Charles J.: See—  
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- Runyon, Peter M.: See—  
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- Russo, Vera; Sottini, Stefano; Righini, Giancarlo; and Trigari, Silvana, to Consiglio Nazionale Delle Ricerche Roma. Method and apparatus for constructing microlens ends for optical fibers. 4,678,268, Cl. 350-96.180.
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- Rutzen, Horst. See—  
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- Ryan, James M.; Golden, Sanford S.; and Sliker, Larry, to Henry Dreyfuss Associates; and Golden Associates. Reclining chair. 4,678,229, Cl. 297-68.000.
- Ryder, Geoffrey A., to Beecham Group p.l.c. Container having a hooked-shaped member slidably attached thereto. 4,678,102, Cl. 222-181.000.
- Rylatt, John A., to Westinghouse Electric Corp. Debris-retaining trap for a fuel assembly. 4,678,627, Cl. 376-313.000.
- S. & M. Cannon Pty. Ltd.: See—  
Cannon, Stuart R.; Brazenor, William J.; Kneen, Peter W.; and Mullen, John L., 4,677,999, Cl. 135-117.000.
- Saaski, Elric W.; and Hartl, James C., to Technology Dynamics, Inc. Optical measuring device using a spectral modulation sensor having an optically resonant structure. 4,678,904, Cl. 250-227.000.
- Sachdev, Krishna G.: See—  
Pennington, Keith S.; Afzali-Ardakani, Ali; and Sachdev, Krishna G., 4,678,701, Cl. 428-213.000.
- Sadamori, Yuuichi; and Maeda, Keini, to Mitsubishi Denki Kabushiki Kaisha. Sequencing data transmission process. 4,679,045, Cl. 340-825.070.
- Saegusa, Noboru. See—  
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.
- Saeki, Osamu; Mori, Kenji; Onoda, Mamoru; Watanabe, Ryo; Shinohara, Katsufumi; Ashie, Takehiko; and Imanishi, Nobuyuki, to Kabushiki Kaisha Kobe Seiko Sho. Method for fluidized bed reduction of iron ore. 4,678,508, Cl. 75-26.000.
- Sagan, Stephen F.: See—  
Rock, Dan; Roth, Mark; and Sagan, Stephen F., 4,678,332, Cl. 356-328.000.
- Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Ltd. Frequency divider circuit and frequency synthesizer using the same. 4,679,003, Cl. 331-1.00A.
- Sahara, Hiroshi. See—  
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- Said, Ronald S. Apparatus for mounting application heads to an agricultural implement. 4,677,787, Cl. 47-1.500.
- St. Louis, Robert M., to Camco Inc. Drier storable rack. 4,677,760, Cl. 34-90.000.
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- Saitoh, Hajime; and Maeda, Morio, to Sumitomo Heavy Industries, Ltd. Electromagnetic-induction heater with magnetic field control. 4,678,883, Cl. 219-10.61R.
- Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuzuki, Yoshio; and Ogawa, Kyosuke, to Canon Kabushiki Kaisha. Member having light receiving layer of A-Si: Ge (C,N,O) A-Si/surface antireflection layer with non-parallel interfaces. 4,678,733, Cl. 430-57.000.
- Saitoh, Makoto. See—  
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- Saitoh, Taichi. See—  
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- Saka, Hiroshi. See—  
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- Sakai, Itaru. See—  
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- Sakaki, Hirokazu. See—  
Nakanishi, Haruo; Sakaki, Hirokazu; Yamazaki, Toru; and Okishi, Yoshio, 4,678,551, Cl. 204-129.750.
- Sakakibara, Kazuhiko; and Kuwata, Yutaka, to Nippon Telegraph and Telephone Corporation. Series resonant converter. 4,679,129, Cl. 363-17.000.
- Sakamoto, Hiroshi. See—  
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- Sakimoto, Seiichi; Fujita, Kazuo; Yamauchi, Yutaka; and Matsue, Hiroshi, to Showa Denko K. K. Coated particulate materials and method for manufacture thereof. 4,678,710, Cl. 428-407.000.
- Saks, Thomas J.: See—  
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- Sakuda, Osamu. See—  
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- Sakuma, Masato. See—  
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- Sakuragi, Masako; and Ichimura, Kunihiro, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Chelate, crosslinked polyethyleneimine resin having 2-hydroxy benzoyl group. 4,678,844, Cl. 525-417.000.
- Sakurai, Hideya. See—  
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- Salomon S.A.: See—  
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- De Marchi, Jean-Louis; Mabboux, Michel; Paris, Jean; and Kopp, Norbert, 4,677,770, Cl. 36-120.000.
- Samoel, Alain. See—  
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- Sampson, Robert L. Log holder device. 4,678,170, Cl. 269-296.000.
- Sanagi, Shiroh. See—  
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- Sand, Michael L., to Hercules Incorporated. Method for impregnating a thermoplastic polymer. 4,678,684, Cl. 427-213.360.
- Sanden Corporation. See—  
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- Sanders, Ward L.; and Robinson, David W., to American Sterilizer Company. Positioning lift for surgical table. 4,678,171, Cl. 269-325.000.
- Sandgren, Lage M.: See—  
Holmstrom, Ulla-Kari M.; Sandgren, Lage M.; Norell, Maria G.; and Asegård, Peter A., 4,678,654, Cl. 423-478.000.
- Sandler, Stanley R., to Pennwalt Corporation. Poly(fluoroacetylene) containing polymers. 4,678,842, Cl. 525-359.100.
- Sando, Daniel D. Apparatus for the display and storage of mattresses. 4,678,085, Cl. 211-28.000.
- Sandvik Kosta GmbH. See—  
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- Sani-Fresh International, Inc.: See—  
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- Sanjoh, Akira. See—  
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- Sano, Tetsuhiro. See—  
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- Sano, Yasuro. See—  
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- Sanshin Kogyo Kabushiki Kaisha. See—  
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- Santa Barbara Research Center. See—  
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- Santarelli, Paul. See—  
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,678,214, Cl. 292-213.000.
- Sanwa Kagaku Kenkyusho Co., Ltd.: See—  
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- Sapal, Societe Anonyme des Plieuses Automatiques. See—  
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- Sapporo Breweries, Ltd.: See—  
Maeda, Hironobu; Kitahara, Seizaburo; Yosimura, Haruo; Torawaki, Takao; Yaegashi, Takasi; and Yamaoka, Isao, 4,677,934, Cl. 118-58.000.
- Sarrantonio, August C., to Grumman Aerospace Corporation. Aircraft launcher and retriever. 4,678,141, Cl. 244-2.000.
- Sartorius GmbH. See—  
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- Sasaki, Hisami. See—  
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- Sasaki, Isao; and Mukai, Nobuhiro, to Mitsubishi Rayon Co., Ltd. Compositions for artificial marbles and process for producing artificial marbles therefrom. 4,678,819, Cl. 523-171.000.
- Sasaki, Toshi; Yoshida, Hiromichi; Fukuda, Shigehiko; Oizumi, Kiyoshi; Kakizaki, Kimio; Nakayama, Wataru; Daikoku, Takahiro; Nakajima, Tadakatsu; and Nakayama, Yoshihiko, to Hitachi Cable, Ltd.; and Hitachi, Ltd. Evaporating heat transfer wall. 4,678,029, Cl. 165-133.000.
- Sasaya, Hideaki. See—  
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- Sato, Isao. See—  
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- Miyatani, Kazuo; and Sato, Isao, 4,678,292, Cl. 350-609.000.
- Sato, Kazuyuki, to Kabushiki Kaisha Toshiba. Sequential access LSI memory circuit for pattern generator. 4,679,173, Cl. 365-233.000.
- Sato, Kozo. See—  
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- Kitaguchi, Hiroshi; Takeuchi, Masashi; Sato, Kozo; Tsukase, Masaaki; and Kato, Masatoshi, 4,678,739, Cl. 430-353.000.
- Sato, Mitsuo. See—  
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- Sato, Susumu; and Okamoto, Keizo, to Bridgestone Corporation. Tire tread rubber composition. 4,678,830, Cl. 524-495.000.
- Sato, Susumu. See—  
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- Sato, Tsunehiko. See—  
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- Sato, Yuichi; Tsunekawa, Tokuchi; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Distance measuring devices and light integrators therefor. 4,678,323, Cl. 365-4.000.
- Satow, Takashi. See—  
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- Sauer, Rudolf. See—  
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- Sauter, Hubert. See—  
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- Savage, Jack W.: See—  
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- Savin Corporation. See—  
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- Landa, Ben Zion, 4,678,177, Cl. 271-238.000.
- Savinykh, Vitaly V.: See—  
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- Savolainen, Erkki. See—  
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- Sawada, Shinichi. See—  
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- Sawafuji, Tadaaki. See—  
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- Sawatari, Takeo; Nakamura, Mitsutaka; and Sugiura, Toshihiro, to Aisin Seiki Kabushiki Kaisha. Automotive engine oil monitoring system. 4,677,847, Cl. 73-64.000.
- Sawyer, Sammy D.: See—  
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- Scalamandre, Fred. See—  
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- Scalamandre, Joseph; and Vigilante, John J., to Scalamandre, Fred; and Vigilante, Michael L., a part interest. Reusable concrete forms with spacer/tierods. 4,678,156, Cl. 249-34.000.
- Scarffe, Michael F.: See—  
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- Schafer, Clyde K.: See—  
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- Schaffer, Douglas A.: See—  
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- Schaffer, Ronald R.: See—  
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- Schapira, Joseph; Ken, Victor; Thery, Denis; and Jelodin, Stephane, to Compagnie Francaise de Produits Industriels. Method of zinc phosphatization, activation and refining bath used in said method and corresponding concentrate. 4,678,519, Cl. 148-6.15Z.
- Schatz, Douglas. See—  
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- Scheer, Martin. See—  
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- Schemel, Roberto. See—  
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- Schemm, Theodor. See—  
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- Schenten, James L., to Chrysler Motors Corporation. Rear spring actuated brake proportioner. 4,678,240, Cl. 303-6.00C.
- Scherbing, F. J., Jr., executor. See—  
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- Scherbing, Frank J., deceased; and by Scherbing, F. J., Jr., executor, to Warrior Corporation. Bag lock. 4,677,833, Cl. 70-68.000.
- Scherling Aktiengesellschaft. See—  
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- Schindl, Klaus P.: See—  
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- Schlesner, Uriel. Structural connector. 4,677,805, Cl. 52-648.000.
- Schlesinger, Ulrich. See—  
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- Schlichthorst, Norbert, to Blohm & Voss AG. Engine installation for use in a ship. 4,678,439, Cl. 440-11.000.
- Schlosser, Erich J.: See—  
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- Schlumberger Technology Corporation. See—  
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- Goldschild, Pierre, 4,678,035, Cl. 166-250.000.
- Schmid, Herbert; and Hiestand, Karl, to Sandvik Kosta GmbH; and SMW Schneider & Weisshaupt GmbH. Face driver for centering and driving workpieces chucked in a lathe. 4,677,885, Cl. 82-40.00R.
- Schmid, Titus. See—  
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- Schmidt, Samuel, to United Technologies Corporation. Inductive displacement transducer with unipolar output. 4,678,991. Cl. 324-207.000.
- Schmidt, Kurt: See—  
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- Schmitt, Kenneth J.: See—  
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- Schmitt, Walter, to Dr. Johannes Heidenhain GmbH. Measuring device error monitoring system. 4,678,948, Cl. 307-511.000.
- Schmitz, Herman J. R.; Annegarn, Marcellinus J. J. C.; and Fekkes, Wilhelmus F., to U.S. Philips Corporation. Teletext device with reduced page-access time. 4,679,083, Cl. 358-147.000.
- Schmolka, Irving R., to BASF Corporation. Mineral oil gels. 4,678,664, Cl. 424-65.000.
- Schneider, Josef F., to United States of America, Air Force. Charge depletion meter. 4,678,999, Cl. 324-427.000.
- Schneller, Arnold; Herwig, Walter; and Erbes, Kurt, to Hoechst Aktiengesellschaft. Radiation-sensitive composition and recording material based on compounds which can be split by acid. 4,678,737, Cl. 430-270.000.
- Schoengold, Ronald J.: See—  
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- Schoens, Michel: See—  
Neiger, Henri J. C.; Genot, Claude M.; Prud'Hon, Gerard C.; and Schoens, Michel, 4,678,184, Cl. 272-129.000.
- Schoettle, Klaus, to BASF Aktiengesellschaft. Tape cassette having a mounting for a leg spring for a reel brake spring. 4,678,140, Cl. 242-199.000.
- Schoettle, Klaus; Schmidts, Kurt; Kamm, Eugen; and Berger, Heinz, to BASF Aktiengesellschaft. Brake and tape tensioning means for tape cassettes having flanged reels, and a tape cassette, in particular a magnetic tape cassette, including these means. 4,679,110, Cl. 360-132.000.
- Scholl, Inc.: See—  
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- Scholz, Harald: See—  
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- Schomers, Josef; Erbele, Kurt; and Bonk, Wernfried, to ANT Nachrichtentechnik GmbH. Assembly system for communications device having plug-in circuit boards connected in multiple stages. 4,679,121, Cl. 361-413.000.
- Schroder, Johann: See—  
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- Schroeder, James L., III: See—  
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- Schroeder, Royce E., to OFI Testing Equipment Inc. Roller oven for testing fluids. 4,677,843, Cl. 73-54.000.
- Schropp, Leopold: See—  
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- Enkner, Bernhard; Stephani, Dietmar; Schropp, Leopold; and Stastny, Wilhelm, 4,678,419, Cl. 425-143.000.
- Schulte, Heinz; and Muehler, Norbert, to Mannesmann Rexroth GmbH. Apparatus for controlling an adjustable member. 4,677,899, Cl. 91-403.000.
- Schultz, Gary R., to Eaton Corporation. Wheel end valve for central tire inflation system. 4,678,017, Cl. 152-416.000.
- Schulz, Guenter; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. O-substituted 3-oxypyridinium salts, their preparation and their use as fungicides for crop protection. 4,678,504, Cl. 71-94.000.
- Schumaker, Richard E.: See—  
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- Schuster, Wilhelm, to Allstar Verbrauchsguter GmbH. Exhauster nozzle. 4,677,705, Cl. 15-398.000.
- Schutz, Hans U.: See—  
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- Schwaighofer, Helmut: See—  
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- Schwarz, Jakob: See—  
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- Schweikert, Willi: See—  
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- Schweinfurter, Friedrich. Regenerative pump with force equalization. 4,678,395, Cl. 415-53.007.
- Schwerdt, Kurt R.; and Levine, Gerald B., to Raytheon Company. Pseudo-raster weather display apparatus. 4,678,969, Cl. 315-382.000.
- SCM Corporation: See—  
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- Scolari, John E.; Warner, Robert T.; and Deavenport, Joe E., to Life Light Systems. Toy light sword. 4,678,450, Cl. 446-405.000.
- Scott, Bentley N.; Porter, Vernon R.; and Shortes, Samuel R., to Technology Network International, Inc. Cartridge and target device for marksmanship training. 4,678,437, Cl. 434-21.000.
- Scott, Julian C.: See—  
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- Scott, Richard A.; Wortzman, Mitchell S.; and Jungermann, Eric, to Nuetrogena Corporation. Hydroquinone composition having enhanced bio-availability and percutaneous adsorption. 4,678,663, Cl. 424-62.000.
- Screen, Stafford T., to Colson Castors (Europe) Limited. Castor brake. 4,677,706, Cl. 16-35.00R.
- Scriptel Corporation: See—  
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- Seagate Technology: See—  
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- Seaman, Gary G.: See—  
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- Sears, Roebuck & Co.: See—  
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- Seaton, David P.: See—  
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- Sebag, Henri: See—  
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- Segal, Ruth; Pisanty, Sara; and Azaz, Emma, to Yissum Research Development Company of the Hebrew University of Jerusalem. Compositions containing glycyrrhizin. 4,678,772, Cl. 514-25.000.
- Segawa, Yutaka: See—  
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- Seidon, Arnold: See—  
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- Seikisui Kagaku Kogyo Kabushiki Kaisha: See—  
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- Seiko Instruments & Electronics Ltd.: See—  
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- Seima Italiana S.p.A.: See—  
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- Sekimoto, Yoshihiro; Terashima, Shigeo; Kumata, Kiyoshi; and Tanaka, Toshiyuki, to Sharp Kabushiki Kaisha. Objective lens drive/support mechanism in an optical disc player. 4,678,276, Cl. 350-247.000.
- Sekiya, Tadashi; Tsuzuki, Akihiro; and Torii, Yasuyoshi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for manufacture of photo-semiconductor. 4,678,732, Cl. 430-136.000.
- Selberg, Roberto: See—  
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- Selenia Spazio SpA: See—  
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- Sellers, Gregory J.: See—  
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- Senelco Limited: See—  
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- Sengoku, Koji: See—  
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- Sensormatic Electronics Corporation: See—  
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- Sensors, Inc.: See—  
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- Sepulveda, Domingo: See—  
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- Settiner, Manfred: See—  
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- Shafer, John C., to Baxter Travenol Laboratories, Inc. Sample identification system. 4,678,894, Cl. 235-375.000.
- Shanghai Institute of Organic Chemistry, Academia Sinica: See—  
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- Shanghai Lamp Factory: See—  
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- Sharon Wire Mill Corporation (Proprietary) Limited: See—  
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- Sharp Kabushiki Kaisha: See—  
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- Fujii, Yoshiaki, 4,678,320, Cl. 355-49.000.

- Matsui, Sadayoshi; Taneya, Mototaka; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,679,200, Cl. 372-45.000.
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- Shaw, Jane M.: See—  
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- Shaw, Raymond E.: See—  
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- Shedgigan, Vandos, to Emhart Industries, Inc. Dielectric fluid for electrical capacitors. 4,679,119, Cl. 361-315.000.
- Shell Oil Company: See—  
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- Shenoy, Thirihalli A.; and Tao, John C., to Air Products and Chemicals, Inc. Natural gas depressurization power recovery and reheat. 4,677,827, Cl. 60-648.000.
- Shepard, Kenneth L., to Merck & Co., Inc. Substituted benzenesulfonamides. 4,678,855, Cl. 564-85.000.
- Shepard, Richard W.: See—  
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- Sherex Chemical Company, Inc.: See—  
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- Keys, Robert O., 4,678,562, Cl. 209-166.000.
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- Sherrell, Robert W. D.: See—  
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- Sherwin, Gary W., to Westinghouse Electric Corp. Low noise electroencephalographic probe wiring system. 4,678,865, Cl. 174-36.000.
- Sherwin, Gary W.; and Zomp, John M., to Westinghouse Electric Corp. Electromagnetically shielded narrow band electroencephalographic amplifier. 4,679,002, Cl. 330-66.000.
- Sherwood, Edward P.: See—  
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- Shiba, Haruo: See—  
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- Shibasaki, Akio; and Iwasaki, Hirofumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Nonwoven sheet having smooth filmy surface layer. 4,678,703, Cl. 428-288.000.
- Shibasaki, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Code transmission system character broadcasting receiver. 4,679,082, Cl. 358-147.000.
- Shibata, Takanori: See—  
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- Shibatani, Juichi: See—  
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- Shibuya, Kunihiro: See—  
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- Shieh, Han-Ping D.: See—  
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- Shifrin, Gordon A.; and Hunsperger, Robert G., to Hughes Aircraft Company. Forming monolithic planar opto-isolators by selective implantation and proton bombardment. 4,677,740, Cl. 29-576.00B.
- Shigemasa, Takashi, to Kabushiki Kaisha Toshiba. Dynamic error compensating process controller. 4,679,136, Cl. 364-150.000.
- Shimada, Shigeru; Nishimatsu, Masaharu; Arioka, Hiroyuki; and Kubota, Yuichi, to TDK Corporation. Magnetic recording medium. 4,678,708, Cl. 428-336.000.
- Shimanski, Michael A.: See—  
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- Shimbori, Yuichi: See—  
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- Shimizu, Tasuku: See—  
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- Shimizu, Tsutomu; Tarumoto, Kouji; and Namba, Satoshi, to Mazda Motor Corporation. Manufacture of a wear-resistant sliding surface. 4,678,738, Cl. 430-320.000.
- Shimozono, Shigeru, to Seikosha Co., Ltd. Stepping motor for a clock. 4,678,346, Cl. 368-157.000.
- Shimura, Mikihiro: See—  
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- Shin-Etsu Chemical Co., Ltd.: See—  
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- Itoh, Kunio; Imai, Kiyoshi; Yoshida, Takeo; and Fukushima, Motoo, 4,678,827, Cl. 524-188.000.
- Nakamura, Tsutomu; and Imai, Kiyoshi, 4,678,828, Cl. 524-265.000.
- Tawara, Yoshio; and Ohashi, Ken, 4,678,634, Cl. 419-30.000.
- Shinohara, Hiroo; and Imai, Toshiaki, to Kabushiki Kaisha Toshiba. Automatic chemical analyzer. 4,678,755, Cl. 436-43.000.
- Shinohara, Katsufumi: See—  
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- Shinohara, Yoshitsugu: See—  
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- Shinozaki, Masatoshi; Matsumoto, Yoshihiro; Aoyagi, Yoshiki; and Kojima, Kazuhisa, to Kawasaki Steel Corporation. Vibration damping composite laminate. 4,678,707, Cl. 428-323.000.
- Shintani, Yooichi: See—  
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- Shiohara, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, to Nihon Tokushu Noyaku Seizo K.K. 1-pyridylmethyl-2-nitromethylene-1,3-diazacyclohexane insecticides. 4,678,795, Cl. 514-341.000.
- Shiomi, Yasuhumi: See—  
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- Shiozawa, Etsuo; Harada, Shigeo; Ohtsuka, Shuichi; and Ohnishi, Masahiro, to Fuji Photo Film Co., Ltd. Rotatable head type electrophotographic apparatus, corona charging rotatable head and moveable electrophotographic liquid development processing unit therefor. 4,678,312, Cl. 355-3.00R.
- Shirai, Hiroshi: See—  
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- Shiratsuchi, Masami; Kawamura, Kiyoshi; Akashi, Toshihiro; Ishihama, Hiroshi; and Uchida, Yasumi, to Kowa Company, Ltd. Optical isomers, processes for production thereof and pharmaceutical composition thereof. 4,678,803, Cl. 514-456.000.
- Shirey, Phillip G.; Rowe, David W.; and Waynick, William R., to Paul Mueller Company. Dual-walled coiled plate heat exchanger with vented interface. 4,678,027, Cl. 165-70.000.
- Shirk, Raymond A.: See—  
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- Shockey, David R.: See—  
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- Sholtz, Paul N.: See—  
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- Shone, Michael F.; and Loiacono, Gabriel M., to North American Philips Corporation. Solid-state tunable laser. 4,679,198, Cl. 372-41.000.
- Shortes, Samuel R.: See—  
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- Shortt, Alexandra B.; and Haag, William G., to Stauffer Chemical Company. Trithiophosphonate insecticides. 4,678,778, Cl. 514-141.000.
- Shortt, William C. Continuous flow centrifugal separation. 4,678,588, Cl. 210-788.000.
- Showa Denko K. K.: See—  
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- Shrull, Dale; and Hendricks, Joe W. Single pass fracture planting system. 4,677,922, Cl. 111-52.000.
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- Shu, Winston R.: See—  
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- Shuman, Bernard E., to EEE Corporation. Magnetically secured display apparatus. 4,677,780, Cl. 40-600.000.
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- Brunn, Klaus, 4,679,218, Cl. 378-101.000.
- Brust, Hans-Detlef, 4,678,988, Cl. 324-158.00R.
- Bulst, Wolf-Eckhart; Erthel, Mira; and Zibis, Peter, 4,679,014, Cl. 333-195.000.
- Fink, Ludwig; and Toussaint, Hans-Norbert, 4,678,265, Cl. 350-96.200.
- Mattelin, Antoon; and Paquet, Bert, 4,678,289, Cl. 350-486.000.
- Merz, Arthur, 4,679,149, Cl. 364-478.000.
- Neubauer, Heinz, 4,677,990, Cl. 128-786.000.
- Preuss, Bernhard; and Berndt, Klaus-Gunther, 4,678,873, Cl. 200-18.000.
- Rainer, Alois, 4,679,165, Cl. 364-760.000.
- Siesta Corporation: See—  
Owen, Charles B.; Owen, Charles C.; and Lin, Steve, 4,678,014, Cl. 141-67.000.
- Sigma Enterprises, Inc.: See—  
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- Signetics Corporation: See—  
Huijsing, Johan H.; and Dhuyvetter, Timothy A., 4,678,947, Cl. 307-490.000.



- Simitchiev, Dilyan L.: See—  
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- Simmonds Precision: See—  
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Koch, Carl, 4,678,302, Cl. 354-107.000.
- Singer Company, The: See—  
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- Sioux Steam Cleaner Corporation: See—  
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- Sirasaki, Yuichi: See—  
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- Sjogren, Christer A.; and D'Amico, Carl, to Quipp Incorporated. Signature stacker. 4,678,387, Cl. 414-47.000.
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- Skil Corporation: See—  
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- Skinner, Alan A. Automotive non-pressure cooling system. 4,677,943, Cl. 123-41.270.
- Skoutas, James P., to Cherry Semiconductor Corporation. 50% duty cycle relaxation oscillator with latch-up prevention circuit. 4,679,006, Cl. 331-111.000.
- Skovajsa, Joseph. Device for ski training. 4,678,183, Cl. 272-97.000.
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- Slater, Robert A.: See—  
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- Slavin, Michael: See—  
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- Sleder, Richard L.: See—  
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- Sliker, Larry: See—  
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- Sloan-Kettering Institute: See—  
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- Slobodkin, Yefim, to Avery International. Apparatus for constant pressure in line-web crush-scoring. 4,678,457, Cl. 493-355.000.
- Slocum, Barclay. Proximal, tibial osteotomy for leveling a tibial plateau. 4,677,973, Cl. 128-92.0VW.
- Smith, Anthony P., to Imperial Chemical Industries PLC. Process start-up. 4,677,821, Cl. 60-39.020.
- Smith, Daniel J.: See—  
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- Smith, Donald E.; and Haunhorst, Greg A., to Aeroquip Corporation. Helicopter cargo hook. 4,678,219, Cl. 294-82.330.
- Smith Kline & French Laboratories Limited: See—  
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- Smith, Merrill M.; and Ferguson, Donald C., to American Biltrite, Inc. Method and apparatus for making a printed and embossed floor covering using a cast wear layer. 4,678,528, Cl. 156-220.000.
- Smith, Michael B., to Amoco Corporation. Method and apparatus for completing a plurality of zones in a wellbore. 4,678,037, Cl. 166-299.000.
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- Smith, Randall W.: See—  
Thorne, Gale H.; Owen, Charles V.; Smith, Randall W.; Goldberg, Ruth D.; Miles, Scott D.; and Claus, Michael J., 4,678,752, Cl. 435-291.000.
- Smith, Robert B. Night driving dazzle protection system. 4,678,296, Cl. 351-45.000.
- Smith, Steven G.: See—  
Booth, David E.; Smith, Steven G.; and Adams, John L., 4,678,448, Cl. 445-60.000.
- SmithKline Diagnostics, Inc.: See—  
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- SMW Schneider & Weisshaupt GmbH: See—  
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- Snell, Gerald T.: See—  
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- Snook, Clive: See—  
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- Snyder, John D.: See—  
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- Socha, Richard F.: See—  
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- Societe Anonyme REDOUTE CATALOGUE: See—  
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- Societe d'Exploitation des Procédés Marechal (SEPM): See—  
Le Magourou, Yves, 4,678,254, Cl. 439-139.000.
- Societe Industrielle Auer S.A.: See—  
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- Sok, Brian A.: See—  
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- Solomon, Donald D.: See—  
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- Sonoda, Noboru, to Idemitsu Kosan Company Limited. Apparent viscosity measuring apparatus. 4,677,844, Cl. 73-55.000.
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- Higashiyama, Mitsuo, 4,679,225, Cl. 379-62.000.
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- Nemoto, Tsuneo, 4,678,138, Cl. 242-198.000.
- Ohuchi, Norikazu, 4,678,537, Cl. 156-643.000.
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- Tatami, Mitsushige, 4,679,005, Cl. 331-16.000.
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- Sorrow, Billy B., to North American Philips Corporation. Hermetically sealed metal film resistor. 4,678,890, Cl. 219-121.00L.
- Sottini, Stefano: See—  
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- Spacesaver Corporation: See—  
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- Spano, John D., to Personal Products Company. Method and apparatus for placing flexible web pieces into concave shaped shells. 4,677,810, Cl. 53-428.000.
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- Sparling, Kenneth P.; Richardson, David G.; Incardona, Angelo; Wood, Ronald E.; Kikendall, Garth D.; and Bakow, Leon, to Lockheed Corporation. Controlled expansion blind fastener design. 4,678,384, Cl. 411-43.000.

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- Lubet, Carl; and Spector, George, 4,677,765, Cl. 36-1.500.
- Mills, Sean R.; and Spector, George, 4,678,191, Cl. 273-146.000.
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- Speidel, Hans, to Montanwerke Walter GmbH. Clamping or chucking system for a grinding wheel or disk. 4,677,792, Cl. 51-168.000.
- Spellar, Peter C.: See—  
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- Sperry Corporation: See—  
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- Henze, Christopher P., 4,678,984, Cl. 323-285.000.
- Nielsen, Max E.; Labrum, Joseph H.; and Grant, Patrick S., 4,679,215, Cl. 377-95.000.
- Spielmaker, Richard: See—  
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- Spofa, Spojene Podniky Pro Zdravotnickou Vyrobu: See—  
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- Spotzl, Markus: See—  
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- Sprinkel, Francis M., Jr.: See—  
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- Sramek, Bohumir, to Bomed Medical Manufacturing, Ltd. Calibrated arterial pressure measurement device. 4,677,984, Cl. 128-681.000.
- Sridhar, Narasi; and Crook, Paul, to Cabot Corporation. Corrosion- and wear-resistant duplex steel. 4,678,523, Cl. 148-325.000.
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- Stahl, Henrik O.; and Rostrup-Nielsen, Jens R. Heat exchange reforming process and reactor. 4,678,600, Cl. 252-373.000.
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- Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Method and apparatus for operating an open-end friction spinning machine. 4,677,819, Cl. 57-264.000.
- Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Suction control arrangement for open-end friction spinning. 4,677,820, Cl. 57-401.000.
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- Standard Telephones and Cables Public Limited Co.: See—  
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- Staniulis, Mark T.: See—  
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- Stant Inc.: See—  
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- Stanton, James L.; and Ksander, Gary M., to Ciba-Geigy Corporation. Gamma-r-glutamoyl derivatives. 4,678,800, Cl. 514-412.000.
- Stanton and Staveley Limited: See—  
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- Staple, Bruce: See—  
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- Stastny, Wilhelm: See—  
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- Staszal, Lawrence E.: See—  
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- Statz, Robert G. Bearing assembly. 4,678,350, Cl. 384-208.000.
- Stauber, Bernard. Transfer nozzle in a hot runner tool. 4,678,426, Cl. 425-549.000.
- Staudinger, Hermann, to Konrad Rosenbauer KG. Fire fighting service vehicle. 4,678,041, Cl. 169-24.000.
- Stauffer Chemical Company: See—  
Bolzan, Louis F.; and Weil, Edward D., 4,678,612, Cl. 260-543.00R.
- Olego, Diego J., 4,678,266, Cl. 350-96.120.
- Shortt, Alexandra B.; and Haag, William G., 4,678,778, Cl. 514-141.000.
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- Stein, Hermann: See—  
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- Stein, Willy, to Stein, Willy. Arrangement for influencing the keeping of a driving direction by a motor vehicle. 4,678,197, Cl. 280-80.00R.
- Steinkamper, Reinhard; Boll, Wolf; and Peitsmeier, Karl, to Daimler-Benz Aktiengesellschaft. Shaft connection arrangement. 4,678,361, Cl. 403-359.000.
- Stelter, Norbert: See—  
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- Stendel, Wilhelm: See—  
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- Maurer, Fritz; Homeyer, Bernard; and Stendel, Wilhelm, 4,678,776, Cl. 514-89.000.
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- Stephani, Dietmar: See—  
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- Stephen, James C.: See—  
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- Sterner, Carl L. Pothole patcher and road surfacing device. 4,678,363, Cl. 404-75.000.
- Stevens, William W.: See—  
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- Visek, Tomas; Czaby, Gottfried; and Nowotny, Georg, 4,677,952, Cl. 123-372.000.
- Steyr-Daimler-Puch Aktiengesellschaft: See—  
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- Sticher, Otto: See—  
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- Stiff, Rodney A.; Baker, Malcolm J.; and Lester, Leslie J., to Austoft Industries Limited. Cane harvester. 4,677,813, Cl. 56-13.900.
- Stocco, Peter J.: See—  
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- Stole, Kjell A.; Lovstrand, Arnstien; and Havig, Egil, to Norton Company. Screening device and process. 4,678,560, Cl. 209-23.000.
- Stormo, Keith E.: See—  
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- Stout, Daniel M.: See—  
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- Stratton, Richard D.: See—  
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- Straus, Albert E. Roll edge protector. 4,677,728, Cl. 29-415.000.
- Strauss, John W. High pressure revolving sewer cleaning nozzle. 4,677,997, Cl. 134-167.00C.
- Street Specialty Products Inc.: See—  
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- Streett, James T., to Street Specialty Products Inc. Replacement spring for a corvette door hinge. 4,677,708, Cl. 16-334.000.
- Striebel, Edmund E.: See—  
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- Stromberg, Nicklas: See—  
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- Stuckey, William C. Integrated liquid distribution apparatus. 4,678,341, Cl. 366-142.000.
- Stueer, Heinrich: See—  
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- Su, Cheng-Chung. Lavatory hospital bed. 4,677,700, Cl. 5-90.000.
- Such, Christian: See—  
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- Suda, Shigeyuki: See—  
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- Sueddeutsche Kuehlerfabrik Julius Fr Behr GmbH & Co.: See—  
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- Sueda, Tetsuo: See—  
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- Sugano, Takuo; Okabe, Yoichi; Miyake, Hideharu; and Fukaya, Naoki, to University of Tokyo. Unidirectional single-flux-quantum logic circuit. 4,678,945, Cl. 307-476.000.
- Sugawara, Norio: See—  
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- Sugawara, Yutaka: See—  
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- Sugie, Toshinori: See—  
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- Sugimori, Mutsuyuki: See—  
Llinas, Rodolfo R.; Sugimori, Mutsuyuki; and Crank, Ronald K., 4,677,982, Cl. 128-664.000.
- Sugimoto, Shigeyuki; Kato, Masayuki; and Chonan, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Power failure stop circuit for a converter. 4,678,980, Cl. 318-759.000.
- Sugino, Takashi: See—  
Sugiura, Susumu; Sugino, Takashi; and Hirose, Naoya, 4,679,074, Cl. 358-80.000.
- Sugisawa, Ko; Matsumura, Yasushi; Sengoku, Koji; and Nagatome, Yoshiaki, to House Food Industrial Company Limited. Process for preparing toluene charged into a container. 4,678,677, Cl. 426-634.000.
- Sugishima, Kenji; and Nakagawa, Kenji, to Fujitsu Limited. Electron beam exposure method and apparatus. 4,678,919, Cl. 250-491.100.
- Sugiura, Susumu; Sugino, Takashi; and Hirose, Naoya, to Canon Kabushiki Kaisha. Color image processing apparatus with a plurality of addressable characteristic conversion tables for compensating for differences in the spectral characteristics of different input devices. 4,679,074, Cl. 358-80.000.
- Sugiura, Toshihiro: See—  
Sawatari, Takeo; Nakamura, Mitsutaka; and Sugiura, Toshihiro, 4,677,847, Cl. 73-64.000.
- Sulzer Canada, Inc.: See—  
Wynn, Nicholas P., 4,678,648, Cl. 423-228.000.
- Sumi, Noriaki, to Kabushiki Kaisha Daikin Seisakusho. Power change-over mechanism of a vehicle for industrial machinery. 4,677,867, Cl. 74-332.000.
- Sumikawa, Seiji; and Noguchi, Ichiro, to Diesel Kiki Co., Ltd. Air conditioning system for automotive vehicles. 4,677,830, Cl. 62-126.000.
- Sumitomo Bakelite Company Limited: See—  
Kawashima, Giichi, 4,678,616, Cl. 264-24.000.
- Sumitomo Electric Industries, Ltd.: See—  
Nakagawa, Mitsuhiro; and Nitto, Fumiaki, 4,678,818, Cl. 523-157.000.
- Tada, Koji; Tatsumi, Masami; Kotani, Toshihiro; and Sawada, Shinichi, 4,678,534, Cl. 156-607.000.
- Yoshida, Noriyuki; and Takahashi, Kenichi, 4,678,327, Cl. 356-73.100.
- Sumitomo Heavy Industries, Ltd.: See—  
Saitoh, Hajime; and Maeda, Morio, 4,678,883, Cl. 219-10.61R.
- Sumitomo Special Metal Co. Ltd.: See—  
Miyamoto, Toshinobu; Hayashi, Hiroo; Sakurai, Hideya; Takabayashi, Hirofumi; and Ohnishi, Youichi, 4,679,022, Cl. 335-296.000.
- Sumka, Elmer H., to Westinghouse Electric Corp. Elevator car. 4,678,062, Cl. 187-1.00R.
- Sumoto, Kunihiko: See—  
Kuroko, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiko, 4,678,801, Cl. 514-413.000.
- Sun Industrial Coatings Private Ltd.: See—  
Tee, Sim Ah, 4,677,937, Cl. 118-500.000.
- Sun Microsystems, Inc.: See—  
Fetter, John L.; Evans, Jerald R.; and Ergene, Serdar, 4,679,041, Cl. 340-747.000.
- Sunday, Lester R., to Westinghouse Electric Corp. Apparatus for machining a valve's seat. 4,678,379, Cl. 408-83.500.
- Sundberg, Kenneth R.; and Patton, Keith H., to Phillips Petroleum. Method of collecting and processing spectral data for the earth's surface. 4,678,911, Cl. 250-253.000.
- Superior Manufacturing & Instrument Corporation: See—  
Moscovici, Poldi, 4,679,130, Cl. 363-17.000.
- Moscovici, Poldi, 4,679,133, Cl. 363-46.000.
- Suprise, Jody D.: See—  
Van Gompel, Paul T.; and Suprise, Jody D., 4,677,695, Cl. 2-79.000.
- Surface Systems, Inc.: See—  
Whitener, Miles B., 4,679,160, Cl. 364-563.000.
- Surgeco, Inc.: See—  
Ayres, Walter D., Jr., 4,678,589, Cl. 210-797.000.
- Surgical Dynamics, Incorporated: See—  
Onik, Gary; and Ginsburg, Leonard, 4,678,459, Cl. 604-22.000.
- Survival Technology, Inc.: See—  
Mesa, Clarence M., 4,678,461, Cl. 604-157.000.
- Sutherland, Ivan E. Asynchronous queue system. 4,679,213, Cl. 377-66.000.
- Sutka, Klara: See—  
Sutka, Pal; and Sutka, Klara, 4,678,748, Cl. 435-68.000.
- Sutka, Pal; and Sutka, Klara. Process for the production of immunobiological preparations applicable in the diagnosis, prevention and/or treatment of *Candida guilliermondii* infections. 4,678,748, Cl. 435-68.000.
- Suyama, Hideo: See—  
Imakoshi, Shigeyoshi; Soda, Yutaka; Suyama, Hideo; and Iida, Yasuhiro, 4,679,107, Cl. 360-113.000.
- Suzuki, Kiminobu: See—  
Magome, Koichi; Toda, Haruki; Koinuma, Hiroyuki; Sahara, Hiroshi; Suzuki, Kiminobu; Ohshima, Shigeo; and Komatsu, Kenji, 4,678,934, Cl. 307-279.000.
- Suzuki, Norio; Watabe, Akira; and Yamashita, Kazunari, to Honda Giken Kogyo Kabushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine. 4,677,959, Cl. 123-587.000.
- Suzuki, Shizuo: See—  
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,678,371, Cl. 405-164.000.
- Suzuki, Tsunemasa: See—  
Kuroko, Masayasu; Hayashi, Motohide; Suzuki, Tsunemasa; Miura, Kenji; Kumagai, Yoshihiro; Matsumoto, Yukiharu; Miyano, Seiji; and Sumoto, Kunihiko, 4,678,801, Cl. 514-413.000.
- Suzuki, Tsutomu, to Mitsubishi Jukogyo Kabushiki Kaisha. Automatic cutting and winding apparatus for a web-like material such as a film. 4,678,133, Cl. 242-56.00A.
- Suzuki, Yoshio; and Yamaguchi, Seiji, to Jidosha Kiki Co., Ltd. Power steering apparatus. 4,678,052, Cl. 180-143.000.
- Suzuki, Yukio: See—  
Uragami, Akira; Suzuki, Yukio; Kadono, Shinji; Iwamura, Masahiro; Masuda, Ikuro; and Yamauchi, Tatsumi, 4,678,943, Cl. 307-473.000.
- Svenska Rotor Maskiner Aktiebolag: See—  
Fetzer, Wolfgang, 4,678,643, Cl. 422-175.000.
- Swiss Aluminium Ltd.: See—  
Ritzl, Antal; and Zehnder, Jurg, 4,678,225, Cl. 296-181.000.
- Swiss Aluminium Ltd.: See—  
Kampfer, Konrad; Rieger, Wolfhart; Gauckler, Ludwig; and Delapina, Marco, 4,678,758, Cl. 501-80.000.
- Sydo, Lukas: See—  
Butts, Gary; Sydo, Lukas; and Rossi, Victor L., 4,678,347, Cl. 384-43.000.
- Sykes, Donald J., to Marpac Industries, Inc. Method for converting an expended thermoplastic article into a useful article. 4,678,617, Cl. 264-25.000.
- Synchro-Start Products, Inc.: See—  
Mishler, Ralph E.; and Stocco, Peter J., 4,679,017, Cl. 335-164.000.
- Syntax (U.S.A.) Inc.: See—  
Kluge, Arthur F.; and Wu, Helen Y., 4,678,805, Cl. 514-510.000.
- Systems Engineering & Manufacturing Corp.: See—  
Fishman, Herbert; and Rogers, Alvin J., 4,678,169, Cl. 269-46.000.
- Szabados, Andreas. Test specimen container for pasty specimen material. 4,678,559, Cl. 209-17.000.
- T-Bar Incorporated: See—  
Young, William K., 4,679,123, Cl. 361-428.000.
- T P O "Pharmachim": See—  
Ivanov, Chavdar B.; Mondesha, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.
- Tachikawa, Mamoru; Ueki, Satoshi; Sakuma, Masato; Imai, Chihiko; and Makishima, Tokuo, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for producing a catalyst component for polymerization of olefins. 4,678,767, Cl. 502-104.000.
- Tada, Koji; Tatsumi, Masami; Kotani, Toshihiro; and Sawada, Shinichi, to Sumitomo Electric Industries, Ltd. Method for growing a single crystal. 4,678,534, Cl. 156-607.000.
- Taguchi, Yoshinori; and Yamanami, Tsuguya, to Wacom Co., Ltd. Position detecting device. 4,678,870, Cl. 178-19.000.
- Taiyo Yushi K.K.: See—  
Ishizuka, Waichi; and Aoki, Ryoichi, 4,678,676, Cl. 426-573.000.
- Tajima, Osamu: See—  
Ikariya, Takao; Itagaki, Masanori; Mizuguchi, Masatsugu; Sakai, Itaru; and Tajima, Osamu, 4,678,856, Cl. 560-24.000.
- Takabayashi, Hirofumi: See—  
Miyamoto, Toshinobu; Hayashi, Hiroo; Sakurai, Hideya; Takabayashi, Hirofumi; and Ohnishi, Youichi, 4,679,022, Cl. 335-296.000.
- Takagi, Yasuo: See—  
Yamamoto, Takahiro; Takagi, Yasuo; and Furukawa, Junichi, 4,677,878, Cl. 74-861.000.
- Takahama, Shinobu, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing package for high power integrated circuit. 4,677,741, Cl. 29-588.000.
- Takahara, Atsushi; Ishikawa, Tomoyoshi; Tanaka, Hiroyuki; and Okui, Tamio, to NEC Corporation. Frequency synthesizer of a phase-locked type with a sampling circuit. 4,679,004, Cl. 331-14.000.
- Takahashi, Kenichi: See—  
Yoshida, Noriyuki; and Takahashi, Kenichi, 4,678,327, Cl. 356-73.100.
- Takahashi, Shohzoh: See—  
Yoshimura, Susumu; Kudoh, Yasuo; Tsuchiya, Soji; Kojima, Toshikuni; and Takahashi, Shohzoh, 4,679,124, Cl. 361-433.000.
- Takahashi, Yoshinobu: See—  
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,678,644, Cl. 422-186.050.
- Takaku, Tetsuo: See—  
Katsurai, Junji; Monma, Masao; and Takaku, Tetsuo, 4,679,053, Cl. 346-1.100.

- Takamatsu, Hideo: See—  
Yoshizawa, Tamae; Otsuka, Kiyoto; Nagata, Shiro; and Takamatsu, Hideo, 4,678,841, Cl. 525-353.000.
- Takamatsu, Masayoshi; Hashimoto, Kouji; Manabe, Akiyoshi; and Ichihara, Hideyuki, to Teijin Chemicals, Ltd. Mixed polycarbonate resin composition. 4,678,845, Cl. 525-462.000.
- Takano, Hiroshi: See—  
Nakao, Shinroku; Itoh, Masao; Itoh, Akira; and Takano, Hiroshi, 4,678,182, Cl. 272-73.000.
- Takao, Mitsunori, to Nippondenso Co., Ltd. Method and apparatus for discriminating operativeness/inoperativeness of an air-fuel ratio sensor. 4,677,955, Cl. 123-489.000.
- Takaoka, Motoaki: See—  
Hirano, Masao; Takaoka, Motoaki; and Shimura, Mikihiro, 4,679,157, Cl. 364-557.000.
- Takasago Perfumery Co., Ltd.: See—  
Ishii, Hiroshi; and Hosoda, Bunichiro, 4,678,603, Cl. 252-522.00R.
- Takase, Iwao: See—  
Yoshida, Toshimi; Maki, Hideo; Umehara, Hajime; Yasuda, Tetsuo; Masaka, Isao; Takase, Iwao; Inagaki, Masahisa; Jimbow, Ryutarou; and Kuniya, Keiichi, 4,678,521, Cl. 148-11.50F.
- Takase, Tsuneyoshi: See—  
Fujinuma, Katsumi; Takase, Tsuneyoshi; and Hayashi, Yoriyuki, 4,677,976, Cl. 128-201.250.
- Takayama, Makoto, to Canon Kabushiki Kaisha. Color adjusting device. 4,679,072, Cl. 358-80.000.
- Takayasu, Hidekazu: See—  
Nishimura, Seiichi; and Takayasu, Hidekazu, 4,677,944, Cl. 123-73.00B.
- Takeda, Tamio; Gokyo, Toshio; Mizutani, Yuji; and Nakashima, Jun, to Kabushiki Kaisha Toshiba. Rotor with permanent magnets having thermal expansion gaps. 4,678,954, Cl. 310-156.000.
- Takemae, Yoshihiro, to Fujitsu Limited. Shift register for refreshing a MIS dynamic memory. 4,679,214, Cl. 377-80.000.
- Takemasa, Masami, to Diesel Kiki Co., Ltd. Deodorizing device of an air conditioning system for automotive vehicles. 4,677,902, Cl. 98-2.110.
- Takeuchi, Kunihiko: See—  
Miller, Charles H.; Takeuchi, Kunihiko; and Goodridge, Paul A., 4,678,490, Cl. 65-14.000.
- Takeuchi, Masashi: See—  
Kitaguchi, Hiroshi; Takeuchi, Masashi; Sato, Kozo; Tsukase, Masaki; and Kato, Masatoshi, 4,678,739, Cl. 430-353.000.
- Takeuchi, Masao: See—  
Kitaguchi, Hiroshi; Kato, Masatoshi; Sato, Kozo; Takeuchi, Masao; and Tsukase, Masaki, 4,678,735, Cl. 430-203.000.
- Takeuchi, Siro: See—  
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- Takiguchi, Haruhisa: See—  
Matsui, Sadayoshi; Taneya, Mototaka; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,679,200, Cl. 372-45.000.
- Taleyarkhan, Rusi P., to Westinghouse Electric Corp. Boiling water nuclear reactor fuel assembly. 4,678,631, Cl. 376-444.000.
- Tamagawa, Shigehisa; Fuchizawa, Tetsuro; and Abe, Hisamasa, to Fuji Photo Film Co., Ltd. Photographic printing paper support. 4,678,742, Cl. 430-523.000.
- Tamagne, Henry J., to Ford Motor Company. Apparatus for positioning two sensor devices. 4,677,946, Cl. 123-146.50A.
- Tamamori, Hideo; and Ikeda, Mitsuhiro, to Nippon Air Brake Co., Ltd. Equalizer discharge valve for a railroad car air brake system. 4,678,241, Cl. 303-33.000.
- Tamari, Makoto: See—  
Sorimachi, Kanehiro; and Tamari, Makoto, 4,677,778, Cl. 40-476.000.
- Tamaru, Takuya: See—  
Kamoshita, Yasuhiko; Tamaru, Takuya; Ogusu, Mikio; and Urata, Kazuo, 4,679,182, Cl. 369-77.200.
- Tamenori, Hiroyuki; Hattori, Akihiko; and Yoshiyagawa, Mitsugi, to Nippon Sheet Glass Co., Ltd. Process for producing silica in fine powder form. 4,678,652, Cl. 423-339.000.
- Tamer Corporation: See—  
Barton, James W.; and Allen, Hubert D., 4,678,042, Cl. 172-15.000.
- Tamura, Kaoru; Yasuhiro, Kawai; and Utsumi, Isao, to Fuji Photo Film Co., Ltd. Selective sheet feeder. 4,678,180, Cl. 271-296.000.
- Tamura, Kozo: See—  
Hosaka, Nobuyoshi; Shimizu, Tasuku; Mikada, Kenzo; Tamura, Kozo; and Tanabe, Masatoshi, 4,678,571, Cl. 210-202.000.
- Tanabe, Masatoshi: See—  
Hosaka, Nobuyoshi; Shimizu, Tasuku; Mikada, Kenzo; Tamura, Kozo; and Tanabe, Masatoshi, 4,678,571, Cl. 210-202.000.
- Tanaka, Eiichi; Furumai, Koro; and Kikutani, Fumitaka, to Matsushita Electric Industrial Co., Ltd. Multistage fuel burner having a helically rising column of air-fuel mixture. 4,678,428, Cl. 431-76.000.
- Tanaka, Hideo: See—  
Murakami, Yoshikazu; Ito, Seigo; Okamoto, Hiromi; and Tanaka, Hideo, 4,679,015, Cl. 333-19.000.
- Tanaka, Hiroyuki: See—  
Takahara, Atsushi; Ishikawa, Tomoyoshi; Tanaka, Hiroyuki; and Okui, Tamio, 4,679,004, Cl. 331-14.000.
- Tanaka, Kazumi: See—  
Nogi, Tatsuo; Iwami, Tomonori; and Tanaka, Kazumi, 4,678,581, Cl. 210-500.230.
- Tanaka, Kazunobu; and Mori, Kyozo, to Daicel Chemical Industries, Ltd. Highly conductive styrenic resin composition. 4,678,602, Cl. 252-513.000.
- Tanaka, Kunihiko: See—  
Watanabe, Masaki; Yamamoto, Hitoshi; Matsuoka, Yoshinori; and Tanaka, Kunihiko, 4,678,053, Cl. 180-210.000.
- Tanaka, Minoru; and Yonehata, Yuzuru, to Mitsubishi Denki Kabushiki Kaisha. Snubber circuit for GTO thyristor. 4,678,932, Cl. 307-633.000.
- Tanaka, Norito, to Toyo Lint Free Co., Ltd. Dust-free garment for clean room. 4,677,696, Cl. 2-84.000.
- Tanaka, Satoshi: See—  
Akiyama, Kazunori; Tsunoda, Arihiro; and Tanaka, Satoshi, 4,678,178, Cl. 271-242.000.
- Tanaka, Shigetaka, to Ricoh Company, Ltd. Equalization system tuning device which updates equalizer coefficients based on selected decision regions. 4,679,208, Cl. 375-13.000.
- Tanaka, Toshihide; Saka, Hiroshi; Yoshimura, Yoshikazu; and Shiomi, Yasuhumi, to Matsushita Electric Industrial Co., Ltd. Waveguide-to-microstrip line coupling arrangement and a frequency converter having the coupling arrangement. 4,679,249, Cl. 455-328.000.
- Tanaka, Toshiyuki: See—  
Sekimoto, Yoshihiro; Terashima, Shigeo; Kumata, Kiyoshi; and Tanaka, Toshiyuki, 4,678,276, Cl. 350-247.000.
- Tandberg Data A/S: See—  
Dahlerud, Ole C., 4,679,104, Cl. 360-78.000.
- Tandy Corporation: See—  
Berger, Michael F.; and Sawyer, Sammy D., 4,679,166, Cl. 364-900.000.
- Taneya, Mototaka: See—  
Matsui, Sadayoshi; Taneya, Mototaka; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,679,200, Cl. 372-45.000.
- Tanioka, Katsuhiko: See—  
Bando, Yoshiaki; Asano, Teruyoshi; Kato, Shigenobu; and Tanioka, Katsuhiko, 4,678,161, Cl. 251-171.000.
- Taniyama, Kiyoshi; and Hori, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Lubrication mechanism in final drive and differential unit. 4,677,871, Cl. 74-467.000.
- Tanno, Masuo: See—  
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- Tao, John C.: See—  
Shenoy, Thirahalli A.; and Tao, John C., 4,677,827, Cl. 60-648.000.
- Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, to Cassella Aktiengesellschaft. Mixtures of blue mono-azo disperse dyestuffs and their use for dyeing polyester. 4,678,476, Cl. 8-639.000.
- Tarumoto, Kouji: See—  
Shimizu, Tsutomu; Tarumoto, Kouji; and Nanba, Satoshi, 4,678,738, Cl. 430-320.000.
- Tasch, Franz: See—  
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.
- Tashiro, Yoshizo, to Alps Electric Co., Ltd. Antiflocculating dyent for spacers in liquid crystal displays. 4,678,284, Cl. 350-344.000.
- Tatami, Mitsuhide, to Sony Corporation. Phase locked loop with frequency offset. 4,679,005, Cl. 331-16.000.
- Tate, William J. Automatic mirror rotating system. 4,679,158, Cl. 364-559.000.
- Tateisi, Kazuma; and Shinohara, Yoshitsugu, to Omron Tateisi Electronics Co. System for making payments for transactions. 4,678,895, Cl. 235-379.000.
- Tatsumi, Masami: See—  
Tada, Koji; Tatsumi, Masami; Kotani, Toshihiro; and Sawada, Shinichi, 4,678,534, Cl. 156-607.000.
- Taube, Bill: See—  
Grundstedt, Peter; and Taube, Bill, 4,678,018, Cl. 160-135.000.
- Tawara, Yoshio; and Ohashi, Ken, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of an anisotropic sintered permanent magnet. 4,678,634, Cl. 419-30.000.
- Tayebi, Amad, to Capsule Technology International, Ltd. Method for sealing tamper-evident capsules. 4,677,812, Cl. 53-477.000.
- Taylor, Michael D.; and Badger, Edward W., to Warner-Lambert Company. 2-alkylidene derivatives of 1,2,3,4-tetrahydropyridine-2,5-pyridine carboxylic acid dialkyl esters useful for treatment of cardiovascular disorders. 4,678,796, Cl. 514-356.000.
- Taylor, Roderick S.; and Leopold, Kurt E., to Canadian Patents and Development Limited. Magnetically induced pulser laser excitation system. 4,679,203, Cl. 372-86.000.
- TDK Corporation: See—  
Ihara, Keiichi, 4,677,745, Cl. 29-741.000.
- Kobayashi, Mikiya; Nakada, Takeshi; and Arai, Michio, 4,679,056, Cl. 346-76.0PH.
- Okamura, Masatoshi; and Shiba, Haruo, 4,679,109, Cl. 360-132.000.
- Shimada, Shigeru; Nishimatsu, Masaharu; Arioka, Hiroyuki; and Kubota, Yuichi, 4,678,708, Cl. 428-336.000.
- Technicon Instruments Corporation: See—  
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- Technion Research & Development Foundation, Ltd.: See—  
Hasson, David; and Karmon, Mordechai, 4,678,685, Cl. 427-235.000.
- Technip Geoproduction: See—  
Cousty, Jean Pierre, 4,678,372, Cl. 405-196.000.
- Technology Dynamics, Inc.: See—  
Saaski, Elric W.; and Hartl, James C., 4,678,904, Cl. 250-227.000.



- Technology Network International, Inc.: See—  
Scott, Bentley N.; Porter, Vernon R.; and Shortes, Samuel R., 4,678,437, Cl. 434-21.000.
- Tee, Sim Ah, to Sun Industrial Coatings Private Ltd. Apparatus for holding electrical or electronic components during the application of solder. 4,677,937, Cl. 118-500.000.
- Teener, Michael D.: See—  
Nelson, Gary A.; Godding, Patrick N.; Schumaker, Richard E.; Walter, Keith D.; Marrone, Edward S.; Gates, Stillman E.; Rigsbee, Everett O., III; and Teener, Michael D., 4,679,191, Cl. 370-84.000.
- Tegal Corporation: See—  
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- Teijin Chemicals, Ltd.: See—  
Takamatsu, Masayoshi; Hashimoto, Kouji; Manabe, Akiyoshi; and Ichihana, Hideyuki, 4,678,845, Cl. 525-462.000.
- Tektronix, Inc.: See—  
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Corrie, Brian L.; Benn, Pauline; and McElevey, Michael J., 4,677,737, Cl. 29-571.000.
- Telebit Corporation: See—  
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- Telecommunications Radioelectriques et Telephoniques T.R.T.: See—  
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- Telefonaktiebolaget L M Ericsson: See—  
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- Temerinac, M.: See—  
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- Terada, Takami: See—  
Ishida, Keichi; and Terada, Takami, 4,678,232, Cl. 297-408.000.
- Teraoka, Hideyuki, to Dainippon Screen Mfg. Co., Ltd. Heat treatment method. 4,678,432, Cl. 432-12.000.
- Terashima, Shigeo: See—  
Sekimoto, Yoshihiro; Terashima, Shigeo; Kumata, Kiyoshi; and Tanaka, Toshiyuki, 4,678,276, Cl. 350-247.000.
- Terragnoli, John. Self-contained machine for simultaneously slicing and perforating muffins prior to packaging. 4,677,888, Cl. 83-862.000.
- Terumo Corporation: See—  
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- Terumo Kabushiki Kaisha: See—  
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- Texaco Inc.: See—  
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- Texas Instruments Incorporated: See—  
Doering, Robert R.; Duane, Michael P.; and Armstrong, Gregory J., 4,677,739, Cl. 29-576.00B.  
Hyncek, Jaroslav, 4,679,212, Cl. 377-58.000.  
Malhi, Satwinder D. S., 4,677,735, Cl. 29-571.000.
- Tezuka, Nobuo, to Canon Kabushiki Kaisha. Information recording or erasing apparatus. 4,679,101, Cl. 360-60.000.
- TH. Goldschmidt AG: See—  
Fock, Jurgen; and Rott, Hans, 4,678,599, Cl. 252-343.000.  
Weitemeyer, Christian; and Jachmann, Jurgen, 4,678,846, Cl. 525-477.000.
- The, Paul J.; and Misra, Chanakya, to Aluminum Company of America. Process for lowering level of contaminants in Bayer liquor by membrane filtration. 4,678,477, Cl. 23-305.00A.
- Theeuwes, Felix: See—  
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,678,467, Cl. 604-892.000.
- Thery, Denis: See—  
Schapira, Joseph; Ken, Victor; Thery, Denis; and Jelodin, Stephane, 4,678,519, Cl. 148-6.15Z.
- Thibault, Paul A.: See—  
Bouchard, Andre C.; Thibault, Paul A.; and Lagushenko, Radomir L., 4,678,520, Cl. 148-6.350.
- Thomas, Dwight J.; and Ashelin, Charles J., to Kennecott Corporation. Seamless vessel for self contained filter assembly. 4,678,577, Cl. 210-441.000.
- Thomas, Glenn R.: See—  
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- Thomas, Keith E., to Capitol Records, Inc. Portable playback system with active tape drive tensioning feature. 4,679,108, Cl. 360-130.310.
- Thomas, Terence N.: See—  
Hogeboom, John G.; and Thomas, Terence N., 4,679,209, Cl. 375-17.000.
- Thompson, Mark E.: See—  
Hanagan, Mary A.; and Thompson, Mark E., 4,678,502, Cl. 71-93.000.
- Thompson, Richard E., to Lucas Industries Public Limited Company. Internal shoe-drum brake. 4,678,067, Cl. 188-328.000.
- Thomson, Ian, to Thomson & Nielsen Electronics Ltd. Dosimeter. 4,678,916, Cl. 250-370.000.
- Thomson & Nielsen Electronics Ltd.: See—  
Thomson, Ian, 4,678,916, Cl. 250-370.000.
- Thomson Video Equipment: See—  
Cattos, Jean-Yves; and Michler, Denis, 4,679,079, Cl. 358-135.000.
- Thorne, Gale H.; Owen, Charles V.; Smith, Randall W.; Goldberg, Ruth D.; Miles, Scott D.; and Claus, Michael J., to Becton, Dickinson and Company. Automatic random access analyzer. 4,678,752, Cl. 435-291.000.
- Thrall Car Manufacturing Company: See—  
Baker, William R.; Marulic, Walter J.; and Robertson, James C., 4,677,918, Cl. 105-378.000.
- Thulin, Robert R., to Nabisco Brands, Inc. Apparatus for continuously forming latticed pastry goods. 4,678,418, Cl. 425-115.000.
- Thurin, Jan: See—  
Lloyd, Kenneth O.; Old, Lloyd J.; Karlsson, Karl-Anders; Larson, Goran; Stromberg, Nicklas; Thurin, Jan; Anger, Bernd R.; and Oetgen, Herbert F., 4,678,747, Cl. 435-7.000.
- Tice, William A. Card feeding apparatus. 4,677,923, Cl. 112-104.000.
- Ticks, Gerd-Heinz: See—  
Rohner, Gerhard; Schweikert, Willi; and Ticks, Gerd-Heinz, 4,678,203, Cl. 280-707.000.
- Tie/Communications, Inc.: See—  
Korsky, Vincent V.; and Keenan, Ronald M., 4,679,228, Cl. 379-165.000.
- Tielemans, Leonardus P. M.; and Van Roemburg, Franciscus M. J., to U.S. Philips Corporation. Radial spiral-groove bearing. 4,678,348, Cl. 384-114.000.
- Tilles, Robert S.: See—  
Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., 4,678,076, Cl. 198-525.000.
- Time and Data Systems International Limited: See—  
Rudland, Peter E., 4,678,898, Cl. 235-468.000.
- Titanium Metals Corporation of America (TIMET): See—  
Bania, Paul J., 4,678,506, Cl. 75-10.250.
- Tkaczky, Richard J.: See—  
Iadipalo, Rene M.; and Tkaczky, Richard J., 4,678,920, Cl. 250-560.000.
- Toa Nenryo Kogyo Kabushiki Kaisha: See—  
Fujita, Masahito; Miyazaki, Makoto; Kizaki, Masami; Nagashima, Yukio; and Shimbori, Yuichi, 4,678,768, Cl. 502-119.000.
- Tachikawa, Mamoru; Ueki, Satoshi; Sakuma, Masato; Imai, Chihoro; and Makishima, Tokuo, 4,678,767, Cl. 502-104.000.
- Tobler, Paul: See—  
Punzar, Marianne; Marti, Franz; Mercier, Robert; Tobler, Paul; and Buttiker, Rudolf, 4,678,852, Cl. 544-194.000.
- Toda, Haruki: See—  
Magome, Koichi; Toda, Haruki; Koinuma, Hiroyuki; Sahara, Hiroshi; Suzuki, Kiminobu; Ohshima, Shigeo; and Komatsu, Kenji, 4,678,934, Cl. 307-279.000.
- Toda, Minoru, to RCA Corporation. Piezoelectric positioning device. 4,678,955, Cl. 310-328.000.
- Todaro, Frank A.; Castonguay, Roger N.; Krajewski, Alexander A.; and Morris, Robert A., to General Electric Company. Trip actuator for molded case circuit breakers. 4,679,019, Cl. 335-172.000.
- Toepfer, Dieter: See—  
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- Tofield, Robert H.: See—  
Alling, Richard L.; Shepard, Richard W.; Landrum, Clyde L.; Tofield, Robert H.; and Podhajec, Stephen T., 4,677,720, Cl. 29-148.40C.
- Toho Beslon Co., Ltd.: See—  
Honda, Kenji, deceased; and Sawafuji, Tadaaki, 4,677,818, Cl. 57-224.000.
- Tokunaga, Fumihiko; Asai, Takamitsu; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,678,706, Cl. 428-323.000.
- Tokura, Yoshinori: See—  
Hanamura, Eiichi; and Tokura, Yoshinori, 4,678,736, Cl. 430-270.000.
- Tokyo Rope Manufacturing Co., Ltd.: See—  
Honda, Kenji, deceased; and Sawafuji, Tadaaki, 4,677,818, Cl. 57-224.000.
- Tomasi, Jean-Pierre, to U.S. Philips Corporation. Terminal-guidance or position-adjustment system for aircraft using distance and angle measurements. 4,679,047, Cl. 342-52.000.
- Tomic, Dobrovoje. Pharmaceutical compositions for the treatment of diabetes and of hepatic diseases and malfunctions. 4,678,670, Cl. 424-127.000.
- Tominaga, Kazutoshi, to Kabushiki Kaisha Tominaga Jyushi Kogyo-sho. Gymnastic device for small pet animals. 4,677,938, Cl. 119-29.000.
- Tomioka, Kentaro: See—  
Kondo, Kenji; Katsuyama, Shigeru; Akahane, Shoji; and Tomioka, Kentaro, 4,678,436, Cl. 433-228.100.
- Tomita, Kazuyuki; and Tanno, Masuo, to Matsushita Electric Industrial Co., Ltd. Dry-etching method. 4,678,539, Cl. 156-643.000.
- Tomita, Masao, to Matsushita Electric Industrial Co., Ltd. Method of recording and reproducing video and audio signals on a magnetic tape. 4,679,097, Cl. 358-328.000.
- Tonamura, Masashi: See—  
Obara, Haruki; Ito, Masaya; and Tonamura, Masashi, 4,678,884, Cl. 219-69.00P.
- Tondre, Stephen L.; and Lunk, Hans E., to Raychem Corporation. Electrical insulation. 4,678,709, Cl. 428-380.000.
- Tone, Masatsugu, to Kubota Ltd. Coupling system and double shaft transmission structure for an agricultural tractor. 4,677,866, Cl. 74-15.860.
- Topper, Robert J.; and Dischert, Robert A., to RCA Corporation. Method and apparatus for freezing a television picture. 4,679,084, Cl. 358-160.000.
- Topura Co., Ltd.: See—  
Yamasaki, Katsuhisa, 4,677,703, Cl. 10-9.000.

- Torawaki, Takao: See—  
Maeda, Hironobu; Kitahara, Seizaburo; Yosimura, Haruo; Torawaki, Takao; Yaegashi, Takasi; and Yamaoka, Isao, 4,677,934, Cl. 118-58.000.
- Toray Industries, Inc.: See—  
Nogi, Tatsuo; Iwami, Tomonori; and Tanaka, Kazumi, 4,678,581, Cl. 210-500.230.
- Torbus, Marek, to Hüttenes-Albertus Chemische Werke GmbH. Mould material binding agent system which cold-hardens with formation of polyurethane. 4,678,816, Cl. 523-142.000.
- Torii, Yasuyoshi: See—  
Sekiya, Tadashi; Tsuzuki, Akihiro; and Torii, Yasuyoshi, 4,678,732, Cl. 430-136.000.
- Tornier, Alain. Coupling assembly for joining an implant tool to a bone implant. 4,677,972, Cl. 128-92.00V.
- Torrano, Michael A., Jr.; Lyon, George E.; and Haddick, David H., to LogE/Dunn Instruments, Inc. Method and apparatus for photographing video images of either polarity without CRT brightness or contrast readjustment. 4,679,087, Cl. 358-168.000.
- Torrington Company, The: See—  
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- Toukan, Sameeh S., to Pennwalt Corporation. Polymers and lubricant additives of alkylene dithioliadiazoles and alkylene cyanodithioliadiazoles. 4,678,592, Cl. 252-25.000.
- Toussaint, Hans-Norbert: See—  
Fink, Ludwig; and Toussaint, Hans-Norbert, 4,678,265, Cl. 350-96.200.
- Toyama, Sumio: See—  
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- Toyo Cci Kabushiki Kaisha: See—  
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- Toyo Lint Free Co., Ltd.: See—  
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- Toyo Soda Manufacturing Co., Ltd.: See—  
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- Toyoda Gosei Co., Ltd.: See—  
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- Maeno, Kunio; and Kisanuki, Hisayuki, 4,678,696, Cl. 428-122.000.
- Toyokawa, Yasufumi: See—  
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,678,496, Cl. 71-76.000.
- Toyota Jidosha Kabushiki Kaisha: See—  
Adachi, Yoshiharu; Fujimori, Fumio; Kondo, Toshio; Uemura, Hiroshi; and Shibata, Juichi, 4,678,064, Cl. 188-73.450.
- Fukuta, Kenji; Kaneko, Takao; and Takahashi, Yoshinobu, 4,678,644, Cl. 422-186.050.
- Futamura, Kazumasa, 4,677,945, Cl. 123-90.480.
- Ito, Toshimitsu; and Okamoto, Akio, 4,677,954, Cl. 123-478.000.
- Nomura, Kazuhiro, 4,678,198, Cl. 280-153.00A.
- Ohe, Junzo; and Kondo, Hiroshi, 4,679,052, Cl. 343-712.000.
- Taniyama, Kiyoshi; and Hori, Hiroshi, 4,677,871, Cl. 74-467.000.
- Yoshinaka, Toshio; and Nagano, Syuji, 4,678,055, Cl. 180-247.000.
- Tractech, Inc.: See—  
Dissett, Walter L., 4,677,876, Cl. 74-715.000.
- Trahan, Wesley J.; and Montandon, Albert B. Temperature responsive gas controller apparatus. 4,678,117, Cl. 236-92.00A.
- Transformatoren Union Aktiengesellschaft: See—  
Stein, Werner; and Muller, Walter, 4,678,927, Cl. 307-104.000.
- Traxler, Manfred: See—  
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.
- Trepanier, Fernand. Windmill. 4,678,923, Cl. 290-55.000.
- Trethewey, Paul M., to Grass Valley Group, Inc., The. Bar/dot level meter. 4,679,042, Cl. 340-754.000.
- Triangle Tool Corporation: See—  
Brock, Robert E., 4,678,158, Cl. 249-161.000.
- Tricon Industries: See—  
Ban, Thomas R.; Dusterhoft, Ernest E.; and Gilmore, John E., 4,678,365, Cl. 404-118.000.
- Trigari, Silvana: See—  
Russo, Vera; Sottini, Stefano; Righini, Giancarlo; and Trigari, Silvana, 4,678,268, Cl. 350-96.180.
- Trimmel, Wolfgang: See—  
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.
- Troxell, Lillian H.: See—  
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- Trubiano, Antoine, to Cari All Inc. Shopping cart apparel hanger. 4,678,195, Cl. 280-33.99A.
- True, Thomas T., to General Electric Company. Method and apparatus for enhancing magenta modulation of a light valve projector. 4,679,070, Cl. 358-62.000.
- Tsai, Yih-Wan, to PPG Industries, Inc. Reduction of material buildup by means of gas jet. 4,678,491, Cl. 65-27.000.
- Tsao, Ying-Yen P.: See—  
Le, Quang N.; Tsao, Ying-Yen P.; and Wong, Stephen S., 4,678,764, Cl. 502-26.000.
- Tsuboi, Shinichi: See—  
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- Tsuchiya, Soji: See—  
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- Tsuda, George I., to Hughes Aircraft Company. Single channel tracking for frequency hopping communication systems. 4,679,207, Cl. 375-1.000.
- Tsuda, Toshitaka: See—  
Fukuda, Misao; Tsuda, Toshitaka; Murano, Kazuo; and Awata, Yutaka, 4,679,188, Cl. 370-29.000.
- Tsuzuki, Yoshio: See—  
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- Tsugane, Syuzo; and Nishiwaki, Mitsuo, to NEC Corporation. System for coding video signal in block unit. 4,679,081, Cl. 358-138.000.
- Tsuji, Tomoji: See—  
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Tsuji, Tomoji; and Wakui, Natsuko, 4,678,858, Cl. 568-902.000.
- Tsuji, Fumio; Matsuo, Yoji; Shibata, Takanori; Endo, Akira; and Shirai, Hiroshi, to Hitachi, Ltd. Navigation system with capability of instructing running direction. 4,679,147, Cl. 364-449.000.
- Tsuji, Kanji: See—  
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- Tsujimoto, Jun-ichi, to Kabushiki Kaisha Toshiba. Semiconductor memory device with a bit error detecting function. 4,679,196, Cl. 371-51.000.
- Tsukamoto, Masahide: See—  
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- Tsukase, Masaaki: See—  
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- Kitaguchi, Hiroshi; Takeuchi, Masashi; Sato, Kozo; Tsukase, Masaaki; and Kato, Masatoshi, 4,678,739, Cl. 430-353.000.
- Tsukimoto, Takayuki: See—  
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- Tsuneoka, Masaru: See—  
Hasegawa, Masahiko; Naito, Yoshihiro; Tsuneoka, Masaru; and Momose, Yutaka, 4,677,824, Cl. 60-521.000.
- Tsuneoka, Tokuchi: See—  
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- Tsunoda, Arihiro: See—  
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- Tsunoda, Teruo, to Komori Printing Machinery Co., Ltd. Apparatus for detecting image area of thin plate. 4,678,336, Cl. 356-380.000.
- Tsuruda, Wataru: See—  
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- Tsutsu, Hiroshi: See—  
Ikeda, Masaru; Watari, Masafumi; Hayashi, Yoshiaki; Yamamoto, Osamu; and Tsutsu, Hiroshi, 4,678,275, Cl. 350-96.340.
- Tsuzuki, Akihiro: See—  
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- Tucker, James E.: See—  
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- Tullos, Hugh S.: See—  
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- Tung, Chi F.; and Bacon, Chester A., Jr., to Minnesota Mining and Manufacturing Company. Encapsulated flatop retroreflective sheeting and method for producing the same. 4,678,695, Cl. 428-120.000.
- Tunggram Rt.: See—  
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- Tuomi, Roger L., to United States of America, Agriculture. Wooden building system with flange interlock and beams for use in the system. 4,677,806, Cl. 52-656.000.
- Turbo's Investigacion Energetica: See—  
Valencia, Alvaro G., 4,677,957, Cl. 123-572.000.
- Turner, Larry R.: See—  
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- Tuse, Daniel: See—  
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- Twardowski, Zbigniew, to ERCO Industries Limited. Acid recovery in chlorine dioxide generation. 4,678,655, Cl. 423-478.000.
- Tybar Engineering Pty. Ltd.: See—  
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- Tyihak, Erno: See—  
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Tytgat, Daniel; and Lefevre, Pierre, to Solvay & Cie. (Societe Anonyme). Baths and process for chemical polishing of stainless steel surfaces. 4,678,541, Cl. 156-664.000.

Tzeng, Wen-Shian V., to Chomerics, Inc. Electromagnetic shielding. 4,678,716, Cl. 428-551.000.

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Ubermeier, Dieter: See—  
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Uchida, Yasumi: See—  
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Udagawa, Yoshio. Trackway toy assembly. 4,678,449, Cl. 446-136.000.

Ueda, Chie: See—  
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Ueda, Toshio; Kageno, Kenji; and Harada, Susumu, to Nitto Boseki Co., Ltd. Method for improving color fastness of reactive dyes on cellulose with allylamine copolymer. 4,678,474, Cl. 8-543.000.

Uehara, Kiyohiro: See—  
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Umehara, Shinichiro: See—  
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Burwell, William H., 4,679,206, Cl. 373-91.000.

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Manning, David T., 4,678,501, Cl. 71-92.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: See—  
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United Pharmaceuticals, Inc.: See—  
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United States of America: See—  
Agriculture: See—  
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Comberg, Albert A.; and Schroder, Johann, 4,678,961, Cl. 313-36.000.

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den Broeder, Friedrich J. A.; Draaisma, Henricus J. G.; and Kahle, Alexander, 4,678,721, Cl. 428-607.000.

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Mewissen, Jan A. C., 4,678,959, Cl. 313-17.000.

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Kaye, Gordon E.; and Agnello, Joseph A., Jr., 4,677,782, Cl. 42-100.000.

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Urabe, Shigeharu: See—  
Yamada, Sumito; Mifune, Hiroyuki; and Urabe, Shigeharu, 4,678,745, Cl. 430-569.000.

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Valmet-Dominion Inc.: See—  
Futcher, Ralph J., 4,677,762, Cl. 34-114.000.

Vanbrabant, Jean-Pierre C. R., to U.S. Philips Corporation. Arrangement for transmitting digital data. 4,679,192, Cl. 370-85.000.

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Vandermark, Frank: See—  
Dong, Michael W.; Yarbrow, Stanley K.; and Vandermark, Frank, 4,678,639, Cl. 422-81.000.

van der Zee, Pieter: See—  
Blanken, Pieter G.; and van der Zee, Pieter, 4,679,092, Cl. 358-242.000.

Van De Velde, Jean-Claude: See—  
Constant, Eugene; Leroy, Yves; and Van De Velde, Jean-Claude, 4,677,988, Cl. 128-736.000.

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Van Duyn, Paul D.; and Geddie, John D., to General Motors Corporation. Headlamp bulb retaining arrangement. 4,679,128, Cl. 362-306.000.

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van Weert, Michael J. C.; and van Limpt, Gerardus C. S. W., 4,678,965, Cl. 313-451.000.

van Maaren, Richard D.: See—  
Bracht, Jeffrey L.; Heinrich, Martin W.; van Maaren, Richard D.; and Sleder, Richard L., 4,677,940, Cl. 123-2.000.

Vannauker, David L.: See—  
Hicks, Michael S.; and Vannauker, David L., 4,678,556, Cl. 208-96.000.

Van Nostrand, Willard R. Mirror assembly for determining distance to passed vehicle. 4,678,294, Cl. 350-611.000.

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Tielemans, Leonardus P. M.; and Van Roemburg, Franciscus M. J., 4,678,348, Cl. 384-114.000.

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Rapkin, Myron C.; Schoengold, Ronald J.; Shockey, David R.; and Van Rysselberghe, Pierre C., 4,678,757, Cl. 436-169.000.

Van Sicker, Robert H., to General Electric Company. Miniature lamp arrays having improved lamp retention features. 4,679,126, Cl. 362-226.000.

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Buder, Eckart; Metz, Hans-Ulrich; and Ubermeier, Dieter, 4,678,726, Cl. 429-88.000.

Vasseggi, Nader; Goddard, Donald G.; and Eccles, Robert E., to Advanced Micro Devices, Inc. TTL compatible merged bipolar/CMOS output buffer circuits. 4,678,940, Cl. 307-446.000.

Vatland, Arnfinn: See—  
Dahl, Erik Q.; Vatland, Arnfinn; and Vegge, Olaf T., 4,678,434, Cl. 432-242.000.

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Ventura, Frank D., to Kenner Parker Toys Inc. Interfitting toy vehicle body and chassis. 4,678,451, Cl. 446-471.000.

Verduin, Lee C.: See—  
Hoffman, David; Verduin, Lee C.; and Ouwinga, Ross, 4,677,777, Cl. 40-460.000.

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Boots, Robert T., 4,678,228, Cl. 296-216.000.

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Vetco Offshore, Inc.: See—  
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Veuhoff, Heinz: See—  
Heidenreich, Peter; Heinen, Karl-Heinz; Muller, Wolfgang; and Veuhoff, Heinz, 4,679,205, Cl. 373-84.000.

VIAFRANCE and State of France as represented by the Ministry of Urban Planning, Housing and Transportation, Central Laboratory of Roads and Bridges: See—  
Charonnat, Yves; and Larrie, Lucien, 4,678,364, Cl. 404-105.000.

Vickery, Andrew J.: See—  
Beesley, Brian G.; Hurley, Clive; Brend, Ramon H. J.; Edwards, Thomas P.; Sherrell, Robert W. D.; and Vickery, Andrew J., 4,677,909, Cl. 100-229.000.

Victaulic Company of America: See—  
De Raymond, Peter G., 4,678,208, Cl. 285-112.000.

Vidaver, Anne K.: See—  
Vandenbergh, Peter A.; and Vidaver, Anne K., 4,678,750, Cl. 435-200.000.

Videocolor: See—  
Fonda, Carlo L., 4,678,963, Cl. 313-405.000.

Vigilante, John J.: See—  
Scalamandre, Joseph; and Vigilante, John J., 4,678,156, Cl. 249-34.000.

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Vilhelmsson, Kennet, to Radians AB. High power optical fiber with improved covering. 4,678,273, Cl. 350-96.300.

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Krohn, David A.; Maack, David R.; Vinarub, Edmond I.; and Ellison, John R., Jr., 4,679,029, Cl. 340-347.00P.

Vinnemann, Antonius; and Koninger, Veit, to Gebhard Balluff GmbH & Co. Distance measuring device operating with torsional ultrasonic waves detected without mode conversion. 4,678,993, Cl. 324-208.000.

Viola, Frank J.; and Hubner, Henry H., Jr., to Parker Hannifin Corporation. Carrier tool. 4,678,217, Cl. 294-16.000.

Viragat Limited: See—  
Bowyer, William H.; Crocker, Robert L.; Hansford, Christopher M.; Parker, Leslie K.; and Gray, Nigel, 4,678,194, Cl. 273-373.000.

Virkar, Anil; and Yuan, Thomas C., to Dow Chemical Company, The. Sinterable and strengthened magnesium oxide ceramic materials. 4,678,761, Cl. 501-104.000.

Visek, Tomas; Czaby, Gottfried; and Nowotny, Georg, to Steyr-Daimler-Puch AG. Unit for coupling a displaceable operating bar or shaft with a regulating member, in particular with an adjusting rod of a fuel injection aggregate in an internal combustion engine. 4,677,952, Cl. 123-372.000.

Visic, Inc.: See—  
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Voest-Alpine Aktiengesellschaft: See—  
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,678,168, Cl. 266-196.000.

Enkner, Bernhard; Stephani, Dietmar; Schropp, Leopold; and Stastny, Wilhelm, 4,678,419, Cl. 425-143.000.

Vogelsong, Thomas L.: See—  
Lillquist, Robert D.; Pimbley, Joseph M.; and Vogelsong, Thomas L., 4,679,068, Cl. 358-44.000.

Voinche, Jack L.; and Martien, James C. Water distillation method. 4,678,587, Cl. 210-748.000.

Volk, Joseph A., Jr.; and Kniemann, Mark R., to Beta Raven Inc. Controlled fat injection with steam in a pellet mill. 4,678,424, Cl. 425-331.000.

Vollmer Werke Maschinenfabrik GmbH: See—  
Beck, Ernst; Lenard, Peter; and Hutzel, Hans, 4,677,882, Cl. 76-77.000.

Volnák, William M. Chording keyboard for generating binary data. 4,679,030, Cl. 340-365.00A.

vom Braucke, Hans; vom Braucke, Manfred; and Westerwelle, Dieter, to Bielefelder Kuchenmaschinen-und Transportgeratefabrik vom Braucke GmbH. Hand tool for loosening soil. 4,678,043, Cl. 172-349.000.

vom Braucke, Manfred: See—  
vom Braucke, Hans; vom Braucke, Manfred; and Westerwelle, Dieter, 4,678,043, Cl. 172-349.000.

Vrabel, Robert J.; Vajgart, Jeffery L.; Stasz, Lawrence E.; Ewald, Henry J.; Haygood, Norman M., Jr.; and Misewicz, Leon M., to Ford Motor Company. Motor control circuit for motor driven power windows. 4,678,975, Cl. 318-266.000.

VS Remek Limited: See—  
Simon, Lewis A.; and Scarffe, Michael F., 4,677,756, Cl. 33-514.000.



- Vsesojuzny Institut Po Proektirovaniu Organizatsii Energeticheskogo Stroitelstva: See—  
Nenakhov, Sergei S.; Tilles, Robert S.; Savinykh, Vitaly V.; Dyakov, Vladimir A.; and Nikitin, Vladimir V., 4,678,076, Cl. 198-525.000.
- Vsesojuzny Nauchno-Issledovatel'skiy I Konstruktorskiy Institut Tsvetmetavtomatika: See—  
Gluschenko, Nikolai N.; Golikov, Vladislav V.; and Emelyanov, Viktor A., 4,677,864, Cl. 73-863.510.
- Vukmanic, Ronald W., to Chicago Metallic Corporation. Suspended ceiling system and runner. 4,677,802, Cl. 52-488.000.
- Vykukal, Hubert C., to United States of America, National Aeronautics and Space Administration. Weightlessness simulation system and process. 4,678,438, Cl. 434-34.000.
- WABCO Westinghouse Fahrzeugbremsen GmbH: See—  
Feldmann, Joachim, 4,677,857, Cl. 73-855.000.
- Waco Jonsereds AB: See—  
Andersson, Bengt A., 4,677,733, Cl. 29-563.000.
- Wacom Co., Ltd.: See—  
Taguchi, Yoshinori; and Yamanami, Tsuguya, 4,678,870, Cl. 178-19.000.
- Wada, Katsuo: See—  
Iizuka, Nobuyuki; Hisano, Katsukuni; Wada, Katsuo; Kunihiro, Masashi; Hirose, Fumiyuki; Ishibashi, Yoji; Sato, Isao; Arai, Osamu; Inose, Hiroshi; and Sakuda, Osamu, 4,677,822, Cl. 60-39.230.
- Waechter, David A.: See—  
Gutschick, Vincent P.; Barron, Michael H.; Waechter, David A.; and Wolf, Michael A., 4,678,330, Cl. 356-222.000.
- Wages, Dwight E.: See—  
Akhter, Lalarkh; Atkinson, Ronald E.; Wages, Dwight E.; and Beyer, Harold H., 4,678,606, Cl. 252-542.000.
- Wagner, Wolfgang: See—  
Losch, Hans-Wilhelm; Kleinrahm, Rainer; Pieperbeck, Norbert; and Wagner, Wolfgang, 4,678,048, Cl. 177-212.000.
- Wakui, Natsuko: See—  
Isogai, Nobuo; Okawa, Takashi; Hosokawa, Motoyuki; Tsuji, Tomoji; and Wakui, Natsuko, 4,678,858, Cl. 568-902.000.
- Walden, Michael F. M.: See—  
Erben, Ralf; and Walden, Michael F. M., 4,678,065, Cl. 188-196.000.
- Wall, Robert L.: See—  
Olsen, Dwight; and Wall, Robert L., 4,678,931, Cl. 310-201.000.
- Walsh, John S.: See—  
Miwa, Gerald T.; and Walsh, John S., 4,678,799, Cl. 514-398.000.
- Walter C. McCrone Associates, Inc.: See—  
Dodd, Jack G., Jr.; and Dodd, Jeffrey J., 4,678,913, Cl. 250-341.000.
- Walter, Henry C., to Du Pont de Nemours, E. I., and Company. Process for preparing sulfur-modified chloroprene polymers. 4,678,848, Cl. 526-220.000.
- Walter, Keith D.: See—  
Nelson, Gary A.; Godding, Patrick N.; Schumaker, Richard E.; Walter, Keith D.; Marrone, Edward S.; Gates, Stillman E.; Riggsbee, Everett O., III; and Teener, Michael D., 4,679,191, Cl. 370-84.000.
- Walton, Lewis A.: See—  
King, Raymond A.; Larson, Jeffrey G.; and Walton, Lewis A., 4,678,630, Cl. 376-438.000.
- Waltz, Marion D.: See—  
Knapp, David J.; and Waltz, Marion D., 4,678,023, Cl. 164-452.000.
- Wan, Chung-Zong; Dettling, Joseph C.; and Jagel, Kenneth I., to Engelhard Corporation. Three-way catalyst for lean exhaust systems. 4,678,770, Cl. 502-304.000.
- Wang, Ju-Zhen, to Shanghai Lamp Factory. Process and usage of ceriated tungsten electrode material. 4,678,718, Cl. 428-560.000.
- Wanngard, Johan C.: See—  
Norell, Maria G.; and Wanngard, Johan C., 4,678,653, Cl. 423-478.000.
- Ward, Michael A. V., to Combustion Electromagnetics, Inc. High efficiency voltage doubling ignition coil for CD system producing pulsed plasma type ignition. 4,677,960, Cl. 123-598.000.
- Ward, Michael V.; and Cotter, Richard, to Baxter Travenol Laboratories, Inc. Rapid acting intravenous emulsions of omega-3 fatty acid esters. 4,678,808, Cl. 514-560.000.
- Warner, James I. Riser assembly for a sub-surface irrigation and drainage system. 4,678,367, Cl. 405-39.000.
- Warner-Lambert Company: See—  
Jaen, Juan C.; and Wise, Lawrence D., 4,678,787, Cl. 514-253.000.
- Taylor, Michael D.; and Badger, Edward W., 4,678,796, Cl. 514-356.000.
- Warner, Robert T.: See—  
Scolari, John E.; Warner, Robert T.; and Deavenport, Joe E., 4,678,450, Cl. 446-405.000.
- Warren M. Jackson, Inc.: See—  
Jackson, Warren M., 4,677,837, Cl. 72-88.000.
- Warrior Corporation: See—  
Scherbing, Frank J., deceased; and Scherbing, F. J., Jr., executor, 4,677,833, Cl. 70-68.000.
- Washburn, Clyde, Jr., to Cincinnati Microwave, Inc. FM receiver. 4,679,247, Cl. 455-210.000.
- Watabe, Akira: See—  
Suzuki, Norio; Watabe, Akira; and Yamashita, Kazunari, 4,677,959, Cl. 123-587.000.
- Watakabe, Yaichiro, to Mitsubishi Denki Kabushiki Kaisha. Photomask material. 4,678,714, Cl. 428-432.000.
- Watanabe, Eiki: See—  
Kitaoka, Takashi; and Watanabe, Eiki, 4,678,063, Cl. 187-119.000.
- Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,678,315, Cl. 355-7.000.
- Watanabe, Masaharu; and Ohe, Hiroaki, to Terumo Kabushiki Kaisha. Apparatus for separating proteins from blood plasma. 4,678,566, Cl. 210-143.000.
- Watanabe, Masaki; Yamamoto, Hitoshi; Matsuoka, Yoshinori; and Tanaka, Kunihiko, to Honda Giken Kogyo Kabushiki Kaisha. Tilt-able tricycle. 4,678,053, Cl. 180-210.000.
- Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, to Solex Research Corporation of Japan. Crystallizer. 4,678,646, Cl. 422-245.000.
- Watanabe, Nobuatsu: See—  
Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, 4,678,646, Cl. 422-245.000.
- Watanabe, Ryo: See—  
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- Watanabe, Shinobu: See—  
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- Watanabe, Zensaku: See—  
Chiyoma, Hitoshi; Watanabe, Zensaku; and Nakagawa, Masahiro, 4,679,088, Cl. 358-213.180.
- Watari, Masafumi: See—  
Ikeda, Masaru; Watari, Masafumi; Hayashi, Yoshiaki; Yamamoto, Osamu; and Tsutsu, Hiroshi, 4,678,275, Cl. 350-96.340.
- Watts, Arun: See—  
Bagaglio, Giancarlo; Assche, Jan V.; and Watts, Arun, 4,678,513, Cl. 106-38.220.
- Waynick, William R.: See—  
Shirey, Phillip G.; Rowe, David W.; and Waynick, William R., 4,678,027, Cl. 165-70.000.
- Webasto-Werk W. Baier GmbH & Co.: See—  
Widemann, Friedrich; and Goerlich, Dieter, 4,678,431, Cl. 431-328.000.
- Weber, Charles A., to Bock Products. End cap for a tubular member. 4,678,011, Cl. 138-96.000.
- Weber, Georg: See—  
Kreuzer, Franz-Heinrich; Eidenschink, Rudolf; and Weber, Georg, 4,678,283, Cl. 350-340.000.
- Weber-Stephen Products Co.: See—  
Lohmeyer, Charles W.; Schlosser, Erich J.; Tucker, James E.; Stephen, James C.; Leja, Andrzej; and Beecher, John, III, 4,677,964, Cl. 126-41.000.
- Weibye, Bjorne, to Apothekernes Laboratorium A.S. Apparatus for preparing quick cooking rice and vegetables. 4,677,907, Cl. 99-483.000.
- Weider, John J.: See—  
Konstant, Anthony N.; and Weider, John J., 4,678,091, Cl. 211-191.000.
- Weil, Edward D.: See—  
Bolzan, Louis F.; and Weil, Edward D., 4,678,612, Cl. 260-543.000.
- Weiland-Werke AG: See—  
Duerschmabel, Wolfgang; Puckert, Franz; Stueer, Heinrich; and Bletschacher, Max, 4,678,637, Cl. 420-490.000.
- Weinstein, Morris: See—  
Green, Harold A.; and Weinstein, Morris, 4,678,515, Cl. 106-111.000.
- Weisert, Edward D., to Ontario Technologies Corporation. Method for making layered foil structure. 4,678,115, Cl. 228-183.000.
- Weitemeyer, Christian; and Jachmann, Jurgen, to Th. Goldschmidt AG. Acrylate or methacrylate-ester-modified organopolysiloxane mixtures, their preparation and use as adhesive coating compositions. 4,678,846, Cl. 525-477.000.
- Welker Engineering Company: See—  
Welker, Robert H., 4,678,290, Cl. 350-506.000.
- Welker, Robert H., to Welker Engineering Company. Apparatus for visual inspection of closed machinery. 4,678,290, Cl. 350-506.000.
- Wells Electronics, Inc.: See—  
Carter, Clyde T., 4,678,255, Cl. 439-267.000.
- Wennerberg, Gunnar: See—  
Dahlquist, John; Goss, John; and Wennerberg, Gunnar, 4,678,915, Cl. 250-358.100.
- Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: See—  
Apotheloz, Robert, 4,677,914, Cl. 102-233.000.
- Wernick, David L., to Exxon Research and Engineering Company. Preparation of cellulose acetate membrane and its use for polar solvent-oil separation. 4,678,555, Cl. 208-36.000.
- Wertheim, Ronald J., to International Fuel Cells Corporation. High pressure low heat rate phosphoric acid fuel cell stack. 4,678,723, Cl. 429-17.000.
- Wessolowski, Bernd; and Mink, Wilfried, to Barmag AG. Yarn tension sensor. 4,677,860, Cl. 73-862.480.
- West, Donald J.: See—  
Northman, Bradley L.; Slavin, Michael; and West, Donald J., 4,678,006, Cl. 137-596.170.
- West, Lynn P., to International Business Machines Corporation. Adaptive stop-notch filter. 4,679,001, Cl. 328-167.000.
- Westbrock, Paul; and Peitz, Theo, to BBC Aktiengesellschaft Brown, Boveri & Cie. Isolating switch apparatus for a high-voltage switching system which may be insulated with SF<sub>6</sub> gas. 4,678,876, Cl. 200-148.000.

- Western Geophysical Company of America: See—  
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Ao, Hideki; Obata, Minoru; and Inui, Jun, 4,678,785, Cl. 514-222.000.
- Yoshiyagawa, Mitsugi: See—  
Tamenori, Hiroyuki; Hattori, Akihiko; and Yoshiyagawa, Mitsugi, 4,678,652, Cl. 423-339.000.
- Yoshizawa, Hideo, to Nippon Sheet Glass Co., Ltd. Glass shaping mold. 4,678,495, Cl. 65-287.000.
- Yoshizawa, Kazuhiro: See—  
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.
- Yoshizawa, Shuji; Mitani, Wataru; Yamamoto, Mariko; Sanjoh, Akira; and Ikezue, Tatsuya, to Kabushiki Kaisha Toshiba. Electrophotographic photosensitive member having barrier layer comprising microcrystalline silicon containing hydrogen. 4,678,731, Cl. 430-65.000.
- Yoshizawa, Tamae; Otsuka, Kiyoto; Nagata, Shiro; and Takamatsu, Hideo, to Kuraray Company, Ltd. Method of producing a cyclized polydiene. 4,678,841, Cl. 525-353.000.
- Yoshizumi, Seiichi: See—  
Gotou, Shizuo; Kagimasa, Toyohiko; Yoshizumi, Seiichi; and Shintani, Yoichi, 4,679,140, Cl. 364-200.000.
- Yosimura, Haruo: See—  
Maeda, Hironobu; Kitahara, Seizaburo; Yosimura, Haruo; Torawaki, Takao; Yaegasi, Takasi; and Yamaoka, Isao, 4,677,934, Cl. 118-58.000.
- Yotsutani, Akio: See—  
Kawasaki, Ryoji; Yoshizawa, Kazuhiro; Yotsutani, Akio; Saegusa, Noboru; Ito, Koichi; and Huse, Syozi, 4,679,244, Cl. 455-54.000.
- Young, Susan K.: See—  
Cotter, Richard; Johnson, Robert C.; Rowe, W. Bruce; and Young, Susan K., 4,678,807, Cl. 514-552.000.
- Young, William K., to T-Bar Incorporated. Cable organizing and protection system and method. 4,679,123, Cl. 361-428.000.
- Yousina, Norio: See—  
Osaki, Sigemi; Yousina, Norio; Morishita, Tsuyoshi; and Kawado, Yasuhumi, 4,678,633, Cl. 419-8.000.
- Youtie, Robert K. Scroll type fluid displacement apparatus. 4,677,949, Cl. 123-235.000.
- Ytter, Willy, to Extraversion, Inc. Display device. 4,678,246, Cl. 312-114.000.
- Yu-Zhong, Liu, to North China Research Institute of Electro-Optics. Process for providing lithium tantalum oxide coated tantalum articles with improved wear resistance. 4,678,546, Cl. 204-32.100.
- Yuan, Thomas C.: See—  
Virkar, Anil; and Yuan, Thomas C., 4,678,761, Cl. 501-104.000.
- Yuasa, Hiroyoshi; Yasuda, Akira; and Omura, Koichi, to Matsushita Electric Works, Ltd. Visual image sensor system. 4,679,077, Cl. 358-108.000.
- Zabunova, Orhideya B.: See—  
Ivanov, Chavdar B.; Mondesha, Donka M.; Berova, Nikolina D.; Rakovska, Rossitza S.; Panova, Yordanka T.; Markov, Marko T.; Ovcharov, Radi G.; Usunov, Petko D.; and Zabunova, Orhideya B., 4,678,853, Cl. 546-146.000.
- Zahr, George E.: See—  
Logullo, Francis M., Sr.; Wu, Yun-Tai; and Zahr, George E., 4,678,821, Cl. 523-205.000.
- Zahuranec, Emery J.; and Musil, James C., to Crawford Fitting Co. Deburring tool. 4,678,380, Cl. 408-211.000.
- Zajac, Patricia L.: See—  
Elfman, Brian P.; and Zajac, Patricia L., 4,678,057, Cl. 180-272.000.
- Zakrasyk, Louis: See—  
Belke, Robert E., Jr.; Shirk, Raymond A.; Lin, Hsiu H.; and Zakrasyk, Louis, 4,679,122, Cl. 361-414.000.
- Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. Sweetening with L-aminodicarboxylic acid amides. 4,678,674, Cl. 426-548.000.
- Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. Sweetening with L-aminodicarboxylic acid alkenes. 4,678,675, Cl. 426-548.000.
- Zarembo, Peter J., to Minnesota Mining and Manufacturing Company. Multi-sectional raceway. 4,677,799, Cl. 52-220.000.
- Zartman, David L., to New Mexico State University Foundation. Intravaginal anchor. 4,677,967, Cl. 128-1.00R.
- Zecman, Kenneth P. Die casting torch. 4,678,429, Cl. 431-144.000.
- Zehnder, Beat: See—  
Dorn, Franz; Pfiffner, Albert; and Zehnder, Beat, 4,678,790, Cl. 514-277.000.
- Zehnder, Jurg: See—  
Ritzl, Antal; and Zehnder, Jurg, 4,678,225, Cl. 296-181.000.
- Zelasko, Joseph: See—  
Newman, Lola; and Zelasko, Joseph, 4,678,150, Cl. 248-205.300.
- Zelonka, Ronald A.: See—  
Boivin, Daniel W.; and Zelonka, Ronald A., 4,678,834, Cl. 525-74.000.
- Zeng, Sen: See—  
Zhang, Yun-xiang; Dai, Xing-yi; Lu, Zhi-kang; and Zeng, Sen, 4,678,847, Cl. 526-206.000.
- Zenith Electronics Corporation: See—  
Prazak, Charles J., III, 4,678,447, Cl. 445-45.000.
- ZF-Herion-Systemtechnik GmbH: See—  
Dahlem, Wolfgang, 4,677,936, Cl. 118-307.000.
- Zhang, Yun-xiang; Dai, Xing-yi; Lu, Zhi-kang; and Zeng, Sen, to Shanghai Institute of Organic Chemistry, Academia Sinica. Process for preparing a terpolymer of tetrafluoroethylene, ethylene and a third monomer. 4,678,847, Cl. 526-206.000.
- Zibis, Peter: See—  
Bulst, Wolf-Eckhart; Erthel, Mira; and Zibis, Peter, 4,679,014, Cl. 333-195.000.
- Zimmer, C. D.: See—  
Laing, John R.; Zimmer, C. D.; Maniar, Deepak R.; and Williams, Meurig W., 4,678,734, Cl. 430-137.000.
- Zinger, William H.: See—  
Irzinski, Edward P.; Krill, Jerry A.; and Zinger, William H., 4,679,008, Cl. 333-21.00R.
- Zinpro Corporation: See—  
Abdel-Monem, Mahmoud M., 4,678,854, Cl. 556-149.000.
- Zomp, John M.: See—  
Sherwin, Gary W.; and Zomp, John M., 4,679,002, Cl. 330-66.000.
- 501 Regents of the University of California: See—  
Meares, Claude F.; DeNardo, Sally J.; Cole, William C.; and Mol, Min K., 4,678,667, Cl. 424-85.000.



## LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF JULY, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Ag-Con Materials of Nevada, Inc.: See—  
Starbuck, Arthur E., Re. 32,454, Cl. 106-286.800.
- Eli Lilly and Company: See—  
Hamill, Robert L.; and Hoehn, Marvin M., Re. 32,455, Cl. 530-317.000.
- Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. A-21978 antibiotics and process for their production. Re. 32,455, Cl. 530-317.000.
- Hobbs, Arthur G., Jr.: See—  
Proctor, Robert H.; and Hobbs, Arthur G., Jr., Re. 32,451, Cl. 62-149.000.
- Hoehn, Marvin M.: See—  
Hamill, Robert L.; and Hoehn, Marvin M., Re. 32,455, Cl. 530-317.000.
- Ishii, Shiro, to M-S Corporation. Battery powered drawer opening device. Re. 32,456, Cl. 200-61.610.
- M-S Corporation: See—  
Ishii, Shiro, Re. 32,456, Cl. 200-61.610.
- Matey, James R., to RCA Corporation. Scanning capacitance microscope. Re. 32,457, Cl. 369-58.000.
- Murray Corporation: See—  
Proctor, Robert H.; and Hobbs, Arthur G., Jr., Re. 32,451, Cl. 62-149.000.
- Nikolich, Milovan, to Signode Corporation. Portable gas-powered tool with linear motor. Re. 32,452, Cl. 123-46.05C.
- Norman, Warren N.: See—  
Stover, Don A.; Upshaw, Clarence W.; and Norman, Warren N., Re. 32,453, Cl. 280-33.99B.
- Proctor, Robert H.; and Hobbs, Arthur G., Jr., to Murray Corporation. Weight-monitored air-conditioner charging station. Re. 32,451, Cl. 62-149.000.
- Pure Fuel of Nevada, Inc.: See—  
Starbuck, Arthur E., Re. 32,454, Cl. 106-286.800.
- RCA Corporation: See—  
Matey, James R., Re. 32,457, Cl. 369-58.000.
- Signode Corporation: See—  
Nikolich, Milovan, Re. 32,452, Cl. 123-46.05C.
- Starbuck, Arthur E., to Pure Fuel of Nevada, Inc.; and Ag-Con Materials of Nevada, Inc. Process for desulfurization of coal and ores. Re. 32,454, Cl. 106-286.800.
- Stover, Don A.; Upshaw, Clarence W.; and Norman, Warren N., to UNR Industries, Inc. Shopping cart with baby seat. Re. 32,453, Cl. 280-33.99B.
- UNR Industries, Inc.: See—  
Stover, Don A.; Upshaw, Clarence W.; and Norman, Warren N., Re. 32,453, Cl. 280-33.99B.
- Upshaw, Clarence W.: See—  
Stover, Don A.; Upshaw, Clarence W.; and Norman, Warren N., Re. 32,453, Cl. 280-33.99B.

## LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

- Auto Restraint Systems Limited: See—  
Giffin, William McAlpin; Pollitt, John Michael; and Clifford, Roy, B1 4,040,645, Cl. 280-803.000.
- Benasutti, John E.: See—  
Griffin, Wendell L.; Carlsen, John; and Benasutti, John E., B1 4,257,674, Cl. 350-96.210.
- Carlsen, John: See—  
Griffin, Wendell L.; Carlsen, John; and Benasutti, John E., B1 4,257,674, Cl. 350-96.210.
- Clifford, Roy: See—  
Giffin, William McAlpin; Pollitt, John Michael; and Clifford, Roy, B1 4,040,645, Cl. 280-803.000.
- Farmer, Diane B.: See—  
Farmer, M. Zane; and Farmer, Diane B., B1 4,572,253, Cl. 141-95.000.
- Farmer, M. Zane; and Farmer, Diane B. Automatic level sensing system. B1 4,572,253, 7-7-87, Cl. 141-95.000.
- Giffin, William McAlpin; Pollitt, John Michael; and Clifford, Roy, to Auto Restraint Systems Limited. Seat-belt apparatus. B1 4,040,645, 7-7-87, Cl. 280-803.000.
- Griffin, Wendell L.; Carlsen, John; and Benasutti, John E., to GTE Products Corporation. Elastomeric fiber optic splice. B1 4,257,674, 7-7-87, Cl. 350-96.210.
- GTE Products Corporation: See—  
Griffin, Wendell L.; Carlsen, John; and Benasutti, John E., B1 4,257,674, Cl. 350-96.210.
- Haglund, William A.; and Reiling, Theodore P. Perennial weed control by deep placement of volatile soil fumigants. B1 3,964,405, 7-7-87, Cl. 111-6.000.
- Kabushiki Kaisha Sunpak: See—  
Kamon, Akio; Nagashima, Sakyō; and Tsuruta, Yuzo, B1 4,329,624, Cl. 315-151.000.
- Kamon, Akio; Nagashima, Sakyō; and Tsuruta, Yuzo, to Kabushiki Kaisha Sunpak. Computer type electronic photoflash. B1 4,329,624, 7-7-87, Cl. 315-151.000.
- Mochlenpah Industries, Inc.: See—  
Mochlenpah, Walter G., B1 3,951,033, Cl. 411-468.000.
- Mochlenpah, Walter G., to Mochlenpah Industries, Inc. Connector plate. B1 3,951,033, 7-7-87, Cl. 411-468.000.
- Nagashima, Sakyō: See—  
Kamon, Akio; Nagashima, Sakyō; and Tsuruta, Yuzo, B1 4,329,624, Cl. 315-151.000.
- Pharmacia Aktiebolag: See—  
Sjoquist, John A., B1 3,995,018, Cl. 435-7.000.
- Pollitt, John Michael: See—  
Giffin, William McAlpin; Pollitt, John Michael; and Clifford, Roy, B1 4,040,645, Cl. 280-803.000.
- Reiling, Theodore P.: See—  
Haglund, William A.; and Reiling, Theodore P., B1 3,964,405, Cl. 111-6.000.
- S. C. Johnson & Son, Inc.: See—  
Schmidt, Ronald E.; Schultz, Harold H.; and Wilson, Dennis M., B1 4,529,787, Cl. 526-209.000.
- Schmidt, Ronald E.; Schultz, Harold H.; and Wilson, Dennis M., to S. C. Johnson & Son, Inc. Bulk polymerization process for preparing high solids and uniform copolymers. B1 4,529,787, 7-7-87, Cl. 526-209.000.
- Schultz, Harold H.: See—  
Schmidt, Ronald E.; Schultz, Harold H.; and Wilson, Dennis M., B1 4,529,787, Cl. 526-209.000.
- Sjoquist, John A., to Pharmacia Aktiebolag. Method of binding immunoglobulin employing a polypeptide from microorganisms. B1 3,995,018, 7-7-87, Cl. 435-7.000.
- Tsuruta, Yuzo: See—  
Kamon, Akio; Nagashima, Sakyō; and Tsuruta, Yuzo, B1 4,329,624, Cl. 315-151.000.
- Wilson, Dennis M.: See—  
Schmidt, Ronald E.; Schultz, Harold H.; and Wilson, Dennis M., B1 4,529,787, Cl. 526-209.000.

## LIST OF DESIGN PATENTEES

- A.R.A. Manufacturing Company of Delaware, Inc.: See—  
Tigner, Robert H.; and Richardson, Carl C., 290,747, Cl. D23-142.000.
- Abbott, Jane C.: See—  
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.
- Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.
- Aliberti, Alvino. Athletic goggles. 290,710, 7-7-87, Cl. D16-107.000.
- Allen, Robert S.; Freeman, Richard G.; and Seabury, Thomas W., to Multisonics, Inc. Keyboard and display panel for intersection controller. 290,707, 7-7-87, Cl. D14-115.000.
- Allflex International Limited: See—  
Scott, Michael J., 290,775, Cl. D30-43.000.
- American Telephone and Telegraph Company: See—  
Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., 290,703, Cl. D14-113.000.
- Amity Leather Products Company: See—  
Lund, Eric W.; and Young, Raymond W., 290,696, Cl. D19-11.000.
- Andreas Hettich, Firma: See—  
Eberle, Gunter, 290,749, Cl. D24-22.000.
- Appel, Mel; and Kress, George, to Mel Appel Company, The. Carrier for coloring books and crayons. 290,661, 7-7-87, Cl. D3-73.000.
- Apple Computer, Inc.: See—  
Pearl, Stephen; and Van-Dinh, Man, 290,706, Cl. D14-114.000.
- Pearl, Stephen; Willnauer, Sigmar; and Christensen, Terrence B., 290,716, Cl. D18-13.000.
- Aqua-Leisure Industries, Inc.: See—  
Berenon, Steven M., 290,764, Cl. D29-9.000.
- Arita, Toyomi, to Sanyo Electric Co., Ltd. Electric shaver. 290,758, 7-7-87, Cl. D28-49.000.
- AT&T Information Systems Inc.: See—  
Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., 290,703, Cl. D14-113.000.
- Attwood Corporation: See—  
Whitley, Warwick M., II, 290,744, Cl. D23-115.000.
- Whitley, Warwick M., II, 290,745, Cl. D23-115.000.
- Whitley, Warwick M., II, 290,746, Cl. D23-115.000.
- B.P. Electronics, Inc.: See—  
Rea, Arthur, 290,708, Cl. D16-14.000.
- Basil, Vicki L.; and Palacios, Roma. Mirror. 290,662, 7-7-87, Cl. D6-310.000.
- Berenon, Steven M., to Aqua-Leisure Industries, Inc. Aviator-style swim mask. 290,764, 7-7-87, Cl. D29-9.000.
- Bertrand, Vic, to Ritvik Group Inc., The. Toy construction block. 290,720, 7-7-87, Cl. D21-108.000.
- Bioelectron, Inc.: See—  
Montalbano, Anthony P.; and Conroy, David E., 290,751, Cl. D24-41.000.
- Board, John R., to Samuel Smith Old Brewery. Bottle. 290,686, 7-7-87, Cl. D9-355.000.
- Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., to Kenner Parker Toys Inc. Doll. 290,724, 7-7-87, Cl. D21-166.000.
- Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, to Kenner Parker Toys Inc. Doll. 290,725, 7-7-87, Cl. D21-166.000.
- Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, to Kenner Parker Toys Inc. Doll. 290,726, 7-7-87, Cl. D21-166.000.
- Broadbent, Michael C.: See—  
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.
- Buckhorn Material Handling Group Inc.: See—  
Tabler, Charles P., 290,778, Cl. D34-40.000.
- Burroughs Corporation: See—  
Stern, Timothy R.; and Selepouchin, Vladimir, 290,702, Cl. D14-113.000.
- Callahan, Anne E. Child restraint harness. 290,765, 7-7-87, Cl. D29-11.000.
- Canady, Albert E. Buoy marker launcher. 290,731, 7-7-87, Cl. D22-113.000.
- Cannon, Fleming V., Jr., to Dover Corporation. Hydraulic wrecker and boom housing. 290,692, 7-7-87, Cl. D12-14.000.
- Canon Kabushiki Kaisha: See—  
Omino, Seichi; and Shimoyama, Noboru, 290,715, Cl. D18-12.000.
- Yomo, Takashi, 290,705, Cl. D14-114.000.
- Cassidy, Edward K.: See—  
Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., 290,688, Cl. D9-398.000.
- Chernikoff, Nelson N.: See—  
Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., 290,688, Cl. D9-398.000.
- Choi, Jong S., to Gold Star Company, Ltd. Microwave oven. 290,675, 7-7-87, Cl. D7-351.000.
- Christensen, Terrence B.: See—  
Pearl, Stephen; Willnauer, Sigmar; and Christensen, Terrence B., 290,716, Cl. D18-13.000.
- Comptoir Nouveau de la Parfumerie: See—  
Llorente, Jacques, 290,687, Cl. D9-385.000.
- Conroy, David E.: See—  
Montalbano, Anthony P.; and Conroy, David E., 290,751, Cl. D24-41.000.
- Convergent Technologies, Inc.: See—  
Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., 290,703, Cl. D14-113.000.
- Coralline, William. Bingo chip bell. 290,691, 7-7-87, Cl. D10-116.000.
- Costan S.p.A.: See—  
De Zolt, Ivano, 290,667, Cl. D6-472.000.
- Cozad, Cheryl L.: See—  
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.
- Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.
- Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.
- Creative Devices Research, Ltd.: See—  
Holloway, Wynford, 290,719, Cl. D21-48.000.
- Curtis Manufacturing Company, Inc.: See—  
Judd, Thomas W., 290,717, Cl. D18-23.000.
- Dacor Corporation: See—  
Walsh, Mark L., 290,763, Cl. D29-9.000.
- Daiwa Seiko Inc.: See—  
Inumae, Kanji, 290,733, Cl. D22-141.000.
- Inoue, Kouji, 290,752, Cl. D25-73.000.
- Matsui, Yoshiyuki, 290,734, Cl. D22-142.000.
- Matsui, Yoshiyuki, 290,735, Cl. D22-142.000.
- Yamaguchi, Kaname, 290,732, Cl. D22-137.000.
- Dartnall, Adrian, to Gordon Ellis & Company. Grab bar. 290,683, 7-7-87, Cl. D8-319.000.
- Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., to American Telephone and Telegraph Company; AT&T Information Systems Inc.; and Convergent Technologies, Inc. Computer display terminal or similar article. 290,703, 7-7-87, Cl. D14-113.000.
- De Zolt, Ivano, to Costan S.p.A. Chest freezer. 290,667, 7-7-87, Cl. D6-472.000.
- DiCarlo, Paul; and Halt, John, to Xomed Inc. Surgical saw handpiece. 290,750, 7-7-87, Cl. D24-28.000.
- Doodson, Peter J., to U.S. Philips Corporation. Video cassette recorder. 290,695, 7-7-87, Cl. D14-2.000.
- Dover Corporation: See—  
Cannon, Fleming V., Jr., 290,692, Cl. D12-14.000.
- Duffek, Michael A. Combined cat house and platform. 290,767, 7-7-87, Cl. D30-1.000.
- Eberle, Gunter, to Andreas Hettich, Firma. Centrifuge. 290,749, 7-7-87, Cl. D24-22.000.
- Einhorn, Henry L. Inflatable club. 290,728, 7-7-87, Cl. D21-211.000.
- Einhorn, Henry L. Inflatable club. 290,729, 7-7-87, Cl. D21-211.000.
- Ekco Products, Inc.: See—  
Tabler, Charles P., 290,778, Cl. D34-40.000.
- Fairchild, Larry I., to Universal-Rundle Corporation. Sink sprayer. 290,741, 7-7-87, Cl. D23-35.000.
- Forbes, Hampton E., Jr., to Westvaco Corporation. Blank for hexagonal tray. 290,689, 7-7-87, Cl. D9-433.000.
- Freeman, Richard G.: See—  
Allen, Robert S.; Freeman, Richard G.; and Seabury, Thomas W., 290,707, Cl. D14-115.000.
- Freezinhot Bottle Co., Ltd.: See—  
Hung, Kung C., 290,755, Cl. D26-42.000.
- Fujitaki, Roy K.; and Fukushima, Hiroshi. Fluorescent light for recessed lighting or the like. 290,756, 7-7-87, Cl. D26-74.000.
- Fukuichi, Tokuo, to Toyota Jidosha Kabushiki Kaisha. Front bumper for an automobile. 290,693, 7-7-87, Cl. D12-169.000.
- Fukushima, Hiroshi: See—  
Fujitaki, Roy K.; and Fukushima, Hiroshi, 290,756, Cl. D26-74.000.
- Gillam, Paul A.: See—  
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.
- Goberman, Janis, to L'Oreal, S.A. Compact. 290,760, 7-7-87, Cl. D28-83.000.
- Goberman, Janis, to L'Oreal, S.A. Cosmetic compact. 290,761, 7-7-87, Cl. D28-83.000.
- Gold Star Company, Ltd.: See—  
Choi, Jong S., 290,675, Cl. D7-351.000.
- Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, to Penn Plax Plastics, Inc. Shelf unit for aquariums. 290,768, 7-7-87, Cl. D30-12.000.



Goldman, Marvin: See—  
Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, 290,768, Cl. D30-12.000.

Gompes, Simon: See—  
Rylands, Patrick, 290,727, Cl. D21-173.000.

Gordon Ellis & Company: See—  
Dartnall, Adrian, 290,683, Cl. D8-319.000.

Halt, John: See—  
DiCarlo, Paul; and Halt, John, 290,750, Cl. D24-28.000.

Hamada, Masanori; Okada, Takao; Uchida, Takako; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Radio tuner, 290,701, 7-7-87, Cl. D14-68.000.

Hedrick, John D. Shoulder-stock scope and camera mount, 290,709, 7-7-87, Cl. D16-44.000.

Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Handle for a faucet, 290,736, 7-7-87, Cl. D23-28.000.

Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet handle, 290,737, 7-7-87, Cl. D23-29.000.

Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet handle, 290,738, 7-7-87, Cl. D23-29.000.

Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Head for a faucet handle, 290,739, 7-7-87, Cl. D23-29.000.

Holloway, Thomas F., to Risdon Corporation. Lipstick dispenser, 290,762, 7-7-87, Cl. D28-89.000.

Holloway, Wynford, to Creative Devices Research, Ltd. Computer joystick, 290,719, 7-7-87, Cl. D21-48.000.

Holthaus, Susan M.: See—  
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.

Hostetler, Eldon, to Ziggity Systems, Inc. Stabilizing arm for poultry watering units, 290,770, 7-7-87, Cl. D30-13.000.

Hostetler, Eldon, to Ziggity Systems, Inc. Cage mounted poultry watering unit, 290,771, 7-7-87, Cl. D30-14.000.

Hostetler, Eldon, to Ziggity Systems, Inc. Support bracket for a cage mounted poultry watering device or similar article, 290,772, 7-7-87, Cl. D30-14.000.

Hostetler, Eldon, to Ziggity Systems, Inc. Combined support bracket and holder for a cage mounted watering unit, 290,774, 7-7-87, Cl. D30-14.000.

Houston, Herbert A. Shower curtain holder, 290,685, 7-7-87, Cl. D8-368.000.

Hung, Kung C., to Freezinhot Bottle Co., Ltd. Mini fluorescent lantern, 290,755, 7-7-87, Cl. D26-42.000.

Ideal Security Hardware Corporation: See—  
Wildgen, Leo F., 290,684, Cl. D8-331.000.

Iinuma, Kanji, to Daiwa Seiko Inc. Fishing reel, 290,733, 7-7-87, Cl. D22-141.000.

Imatt, Alex. Bottle drainer rack, 290,673, 7-7-87, Cl. D7-70.000.

Inoue, Kouji, to Daiwa Seiko, Inc. Synthetic resin tube, 290,752, 7-7-87, Cl. D25-73.000.

Interlego A.G.: See—  
Kushner, Philip M., 290,722, Cl. D21-108.000.

Ryaa, Jan; and Poulsen, Ole V., 290,721, Cl. D21-108.000.

International Business Machines Corporation: See—  
Schaum, David L.; and Taylor, Joseph P., 290,704, Cl. D14-113.000.

Janome Sewing Machine Co. Ltd.: See—  
Uchida, Koji, 290,711, Cl. D15-69.000.

Johnson, Edna M.: See—  
Johnson, James; and Johnson, Edna M., 290,678, Cl. D7-387.000.

Johnson, James; and Johnson, Edna M. Barbecue pit cover, 290,678, 7-7-87, Cl. D7-387.000.

Joseph, Jacob E. Support stand, 290,666, 7-7-87, Cl. D6-449.000.

Judd, Thomas W., to Curtis Manufacturing Company, Inc. Printer stand, 290,717, 7-7-87, Cl. D18-23.000.

Jung, Kwan S. Combined picnic table and barbecue grill, 290,663, 7-7-87, Cl. D6-337.000.

Kabushiki Kaisha Suiden: See—  
Kawai, Yuzo, 290,748, Cl. D23-158.000.

Kaminski, Stephen H.: See—  
Strousse, Babette L.; and Kaminski, Stephen H., 290,664, Cl. D6-361.000.

Katsuno, Akira: See—  
Tanaka, Akio; and Katsuno, Akira, 290,697, Cl. D14-30.000.

Kawai, Yuzo, to Kabushiki Kaisha Suiden. Combined ceiling fan and light, 290,748, 7-7-87, Cl. D23-158.000.

Kenner Parker Toys Inc.: See—  
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.

Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.

Kent Heating Limited: See—  
Ord, Graeme J.; and Lockhart, Robert N., 290,743, Cl. D23-97.000.

Kira, Hiroshi. Lighting fixture, 290,754, 7-7-87, Cl. D26-24.000.

Kitamura, Akio, to Takara Co., Ltd. Reconfigurable toy vehicle, 290,723, 7-7-87, Cl. D21-150.000.

Knochner, Michael: See—  
Stutzer, Franz A.; and Knochner, Michael, 290,676, Cl. D7-384.000.

Knochner, Michael: See—  
Stutzer, Franz A.; and Knochner, Michael, 290,677, Cl. D7-384.000.

Koyo Electronics Industries Co., Ltd.: See—  
Shimizu, Norio; and Watanabe, Yuichi, 290,694, Cl. D13-12.000.

Kreeger, Elmer W., to Pinckney Molded Plastics, Inc. Front panel for a bakery product container or similar article, 290,779, 7-7-87, Cl. D34-40.000.

Kress, George: See—  
Appel, Mel; and Kress, George, 290,661, Cl. D3-73.000.

Kushner, Philip M., to Interlego A.G. Simulative toy construction element, 290,722, 7-7-87, Cl. D21-108.000.

Lacoux, Peter. Table, 290,669, 7-7-87, Cl. D6-488.000.

Lee, Peter P. Polish applicator mitt, 290,777, 7-7-87, Cl. D32-40.000.

Liethen, Frederic J. Bird feeder or similar article, 290,773, 7-7-87, Cl. D30-15.000.

Lindahl, Richard, to Televerket. Telephone set, 290,700, 7-7-87, Cl. D14-53.000.

Llorente, Jacques, to Comptoir Nouveau de la Parfumerie. Perfume bottle, 290,687, 7-7-87, Cl. D9-385.000.

Lockhart, Robert N.: See—  
Ord, Graeme J.; and Lockhart, Robert N., 290,743, Cl. D23-97.000.

L'Oreal, S.A.: See—  
Goberman, Janis, 290,760, Cl. D28-83.000.

Goberman, Janis, 290,761, Cl. D28-83.000.

Lund, Eric W.; and Young, Raymond W., to Amity Leather Products Company. Combined checkbook holder with timepiece, 290,696, 7-7-87, Cl. D19-11.000.

Lundell, Rolf: See—  
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Lundy, Maureen E. Coffee table, 290,668, 7-7-87, Cl. D6-484.000.

M.T.D. Medical Technology and Development Ltd.: See—  
Nilsson, Lars A. H., 290,753, Cl. D25-80.000.

Mann, John M.: See—  
Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., 290,688, Cl. D9-398.000.

Masco Corporation of Indiana: See—  
Hill, Charles P.; and Spangler, Anthony G., 290,736, Cl. D23-28.000.

Hill, Charles P.; and Spangler, Anthony G., 290,737, Cl. D23-29.000.

Hill, Charles P.; and Spangler, Anthony G., 290,738, Cl. D23-29.000.

Hill, Charles P.; and Spangler, Anthony G., 290,739, Cl. D23-29.000.

Matsui, Yoshiyuki, to Daiwa Seiko, Inc. Fishing rod, 290,734, 7-7-87, Cl. D22-142.000.

Matsui, Yoshiyuki, to Daiwa Seiko, Inc. Fishing rod, 290,735, 7-7-87, Cl. D22-142.000.

Matsushita Electric Industrial Co., Ltd.: See—  
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Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,713, Cl. D18-1.000.

Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,714, Cl. D18-1.000.

McDowell, James W. Seed scale, 290,690, 7-7-87, Cl. D10-90.000.

McSweeney, Andrea: See—  
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.

Mel Appel Company, The: See—  
Appel, Mel; and Kress, George, 290,661, Cl. D3-73.000.

Miggels, Stephen G.: See—  
Day, Alvin D.; Miggels, Stephen G.; Nuttall, Michael J.; and Sylvester, Gordon E., 290,703, Cl. D14-113.000.

Miroyama, Toshiya: See—  
Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,713, Cl. D18-1.000.

Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,714, Cl. D18-1.000.

Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,713, Cl. D18-1.000.

Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,714, Cl. D18-1.000.

Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., to National Can Corporation. Can, 290,688, 7-7-87, Cl. D9-398.000.

Montalbano, Anthony P.; and Conroy, David E., to Bioelectron, Inc. Electrical body stimulator, 290,751, 7-7-87, Cl. D24-41.000.

Moran, Charles: See—  
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.

Moriyama, Toshiya: See—  
Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,714, Cl. D18-1.000.

Multisonics, Inc.: See—  
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Nagamatsu, Yasuo: See—  
Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,713, Cl. D18-1.000.

Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,714, Cl. D18-1.000.

Nakamura, Hitoshi; and Ohtsui, Tetsuo, to Pioneer Electronic Corporation. Loudspeaker, 290,699, 7-7-87, Cl. D14-34.000.

Nathan, Walter; and Zucker, Armand S., to RTC Industries, Inc. Slide track for a dispenser for cans or bottles, 290,670, 7-7-87, Cl. D6-511.000.

National Can Corporation: See—  
Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., 290,688, Cl. D9-398.000.

Nilsson, Lars A. H., to M.T.D. Medical Technology and Development Ltd. Panel, 290,753, 7-7-87, Cl. D25-80.000.

Nuttall, Michael J.: See—  
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Nyegaard, Kim D.; and Nyegaard, Ib. Vending machine, 290,718, 7-7-87, Cl. D20-1.000.

Ohta, Kikuo: See—  
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Hamada, Masanori; Okada, Takao; Uchida, Takako; and Ohta, Kikuo, 290,701, Cl. D14-68.000.

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Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.

Oliver, Yacoba C.: See—  
Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; McSweeney, Andrea; Cozad, Cheryl L.; and Oliver, Yacoba C., 290,724, Cl. D21-166.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.

Omino, Seiichi; and Shimoyama, Noboru, to Canon Kabushiki Kaisha. Ink ribbon cassette, 290,715, 7-7-87, Cl. D18-12.000.

Ord, Graeme J.; and Lockhart, Robert N., to Kent Heating Limited. Heating stove, 290,743, 7-7-87, Cl. D23-97.000.

Palacios, Roma: See—  
Basil, Vicki L.; and Palacios, Roma, 290,662, Cl. D6-310.000.

Pearson, Stanley W. Combined tray and dart and coin holder, 290,672, 7-7-87, Cl. D6-552.000.

Peart, Stephen; and Van-Dinh, Man, to Apple Computer, Inc. Monitor stand, 290,706, 7-7-87, Cl. D14-114.000.

Peart, Stephen; Willnauer, Sigmar; and Christensen, Terrence B., to Apple Computer, Inc. Laser printer, 290,716, 7-7-87, Cl. D18-13.000.

Penn Plax Plastics, Inc.: See—  
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PENSA, Inc.: See—  
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Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, 290,768, Cl. D30-12.000.

Philips, Gerald: See—  
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Poulsen, Ole V.: See—  
Ryaa, Jan; and Poulsen, Ole V., 290,721, Cl. D21-108.000.

Price Pfister, Inc.: See—  
Yost, Holly K., 290,740, Cl. D23-29.000.

Pudwill, Horst. Caulking gun, 290,681, 7-7-87, Cl. D8-14.100.

Rea, Arthur, to B.P. Electronics, Inc. Apparatus for converting movie films to video tape, 290,708, 7-7-87, Cl. D16-14.000.

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Tigner, Robert H.; and Richardson, Carl C., 290,747, Cl. D23-142.000.

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Rogers, Jay J. Cork retriever, 290,682, 7-7-87, Cl. D8-42.000.

Rowenta-Werke GmbH: See—  
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Stutzer, Franz A.; and Knochner, Michael, 290,677, Cl. D7-384.000.

Stutzer, Franz A., 290,757, Cl. D27-36.000.

RTC Industries, Inc.: See—  
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Rubbermaid Incorporated: See—  
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Ryaa, Jan; and Poulsen, Ole V., to Interlego A.G. Toy construction piece, 290,721, 7-7-87, Cl. D21-108.000.

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Miyamoto, Isshin; Nagamatsu, Yasuo; Miroyama, Toshiya; and Sakamoto, Masaharu, 290,714, Cl. D18-1.000.

Samsonite Corporation: See—  
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Scott, Michael J., to Allflex International Limited. Ear tag, 290,775, 7-7-87, Cl. D30-43.000.

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Siegel, Eric I. Holder for toothbrushes, toothpaste and other dental articles, 290,671, 7-7-87, Cl. D6-527.000.

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Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.

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Snodgrass, Warren H. Credenza, 290,665, 7-7-87, Cl. D6-446.000.

Solheim, Karsten. Golf club grip, 290,730, 7-7-87, Cl. D21-222.000.

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Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.

Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.

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Strousse, Babette L.; and Kaminski, Stephen H., to Samsonite Corporation. Chaise longue, 290,664, 7-7-87, Cl. D6-361.000.

Stutzer, Franz A.; and Knochner, Michael, to Rowenta-Werke GmbH. Food processor, 290,676, 7-7-87, Cl. D7-384.000.

Stutzer, Franz A.; and Knochner, Michael, to Rowenta-Werke GmbH. Food processor, 290,677, 7-7-87, Cl. D7-384.000.

- Stutzer, Franz A., to Rowenta-Werke GmbH. Lighter. 290,757, 7-7-87, Cl. D27-36.000.
- Sylvester, Gordon E.: See—  
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- Tabler, Charles P., to Buckhorn Material Handling Group Inc., and Ekco Products, Inc. Bakery basket. 290,778, 7-7-87, Cl. D34-40.000.
- Takagi, You, to Pioneer Electronic Corporation. Loudspeaker. 290,698, 7-7-87, Cl. D14-30.000.
- Takara Co., Ltd.: See—  
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- Tanaka, Akio; and Katsuno, Akira, to Pioneer Electronic Corporation. Speaker. 290,697, 7-7-87, Cl. D14-30.000.
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- Tigner, Robert H.; and Richardson, Carl G., to A.R.A. Manufacturing Company of Delaware, Inc. Housing for automotive air conditioner. 290,747, 7-7-87, Cl. D23-142.000.
- Toyota Jidosha Kabushiki Kaisha: See—  
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- Trabattoni, Roberto, to Trasi S.A. Case for cosmetic products. 290,759, 7-7-87, Cl. D28-83.000.
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- Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, to Valor Heating Limited. Gas fire. 290,742, 7-7-87, Cl. D23-97.000.
- Uchida, Koji, to Janome Sewing Machine Co. Ltd. Sewing machine. 290,711, 7-7-87, Cl. D15-69.000.
- Uchida, Takako: See—  
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- U.S. Philips Corporation: See—  
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- Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,725, Cl. D21-166.000.
- Bollinger, Howard N.; Holthaus, Susan M.; Veness, Cathy L.; Abbott, Jane C.; Spindle, Michael J.; Cozad, Cheryl L.; Oliver, Yacoba C.; Oliveira, Geraldine; and Slater, Jeanne, 290,726, Cl. D21-166.000.
- Wallin, Rolf, to Lundell, Rolf. Suction tool for removing tin during desoldering operation. 290,776, 7-7-87, Cl. D32-17.000.
- Walsh, Mark L., to Dacor Corporation. Diving mask. 290,763, 7-7-87, Cl. D29-9.000.
- Ware, R. Louis. Hydroponic wafer and wick therefor or similar article. 290,680, 7-7-87, Cl. D8-1.000.
- Watanabe, Yuichi: See—  
Shimizu, Norio; and Watanabe, Yuichi, 290,694, Cl. D13-12.000.
- Westvaco Corporation: See—  
Forbes, Hampton E., Jr., 290,689, Cl. D9-433.000.
- Whitehouse, Donald: See—  
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.
- Whitley, Warwick M., II, to Attwood Corporation. Venturi louvered vent. 290,744, 7-7-87, Cl. D23-115.000.
- Whitley, Warwick M., II, to Attwood Corporation. Louvered boat vent. 290,745, 7-7-87, Cl. D23-115.000.
- Whitley, Warwick M., II, to Attwood Corporation. Louvered vent for boats. 290,746, 7-7-87, Cl. D23-115.000.
- Wildgen, Leo F., to Ideal Security Hardware Corporation. Door latch. 290,684, 7-7-87, Cl. D8-331.000.
- Willnauer, Sigmar: See—  
Peart, Stephen; Willnauer, Sigmar; and Christensen, Terrence B., 290,716, Cl. D18-13.000.
- Wizen Industry Co., Ltd.: See—  
Shis, Tom Y., 290,712, Cl. D16-6.000.
- Wright, Peter: See—  
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 290,742, Cl. D23-97.000.
- Xomed Inc.: See—  
DiCarlo, Paul; and Halt, John, 290,750, Cl. D24-28.000.
- Yamaguchi, Kaname, to Daiwa Seiko, Inc. Fishing reel spool. 290,732, 7-7-87, Cl. D22-137.000.
- Yomo, Takashi, to Canon Kabushiki Kaisha. ROM cartridge for laser beam printer. 290,705, 7-7-87, Cl. D14-114.000.
- Yost, Holly K., to Price Pfister, Inc. Faucet handle. 290,740, 7-7-87, Cl. D23-29.000.
- Young, Raymond W.: See—  
Lund, Eric W.; and Young, Raymond W., 290,696, Cl. D19-11.000.
- Ziggity Systems, Inc.: See—  
Hostetler, Eldon, 290,770, Cl. D30-13.000.  
Hostetler, Eldon, 290,771, Cl. D30-14.000.  
Hostetler, Eldon, 290,772, Cl. D30-14.000.  
Hostetler, Eldon, 290,774, Cl. D30-14.000.
- Zucker, Armand S.: See—  
Nathan, Walter; and Zucker, Armand S., 290,670, Cl. D6-511.000.

## LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE  
7TH DAY OF JULY, 1987

- A. E. Staley Manufacturing Company: See—  
Malik, Arshad H.; and Cahn, Arno, H303, Cl. 514-85.000.
- Aldred, Anthony T.: See—  
Nevitt, Michael V.; Aldred, Anthony T.; and Chan, Sai-Kit, H302, Cl. 501-103.000.
- Arai, Hajime: See—  
Numazawa, Akio; Arai, Hajime; Haga, Shoji; and Nozaki, Tadashi, H295, Cl. 74-473.00R.
- Bothe, Gregory R.: See—  
Tutin, Michael B.; Pitman, Steven A.; and Bothe, Gregory R., H308, Cl. 342-4.000.
- Cahn, Arno: See—  
Malik, Arshad H.; and Cahn, Arno, H303, Cl. 514-85.000.
- Carver, James G.: See—  
Ducote, Marjorie E.; and Carver, James G., H306, Cl. 558-452.000.
- Chan, Sai-Kit: See—  
Nevitt, Michael V.; Aldred, Anthony T.; and Chan, Sai-Kit, H302, Cl. 501-103.000.
- Clark, Lee K.: See—  
Epure, Stefan T., deceased; Clark, Lee K.; and Haine, James P., H307, Cl. 174-52.0PE.
- Ducote, Marjorie E.; and Carver, James G., to United States of America, Army. Method for preparation of amine salt bonding agents. H306, 7-7-87, Cl. 558-452.000.
- Edlin, George R.: See—  
Jones, Robert W.; Edlin, George R.; Strickland, Brian R.; and Roberts, Thomas G., H311, Cl. 372-9.000.
- Epure, Gertrude M., executrix: See—  
Epure, Stefan T., deceased; Clark, Lee K.; and Haine, James P., H307, Cl. 174-52.0PE.
- Epure, Stefan T., deceased (by Epure, Gertrude M., executrix); Clark, Lee K.; and Haine, James P., to United States of America, Army. High "G" electronics system. H307, 7-7-87, Cl. 174-52.0PE.
- Haga, Shoji: See—  
Numazawa, Akio; Arai, Hajime; Haga, Shoji; and Nozaki, Tadashi, H295, Cl. 74-473.00R.
- Haine, James P.: See—  
Epure, Stefan T., deceased; Clark, Lee K.; and Haine, James P., H307, Cl. 174-52.0PE.
- Hearst, Peter J., to United States of America, Navy. Stripping agent for chemically resistant coatings. H300, 7-7-87, Cl. 134-22.190.
- Hiraizumi, Junichi; and Nagashima, Akira, to Kioritz Corporation. Saw chain guide device for chain saw. H294, 7-7-87, Cl. 30-383.000.
- Johnson, William V., to United States of America, Navy. Analog multiplexer. H310, 7-7-87, Cl. 370-114.000.
- Jones, Robert W.; Edlin, George R.; Strickland, Brian R.; and Roberts, Thomas G., to United States of America, Army. Compensated laser resonant fluorescence beam sensing device for neutral particle beams. H311, 7-7-87, Cl. 372-9.000.
- Kioritz Corporation: See—  
Hiraizumi, Junichi; and Nagashima, Akira, H294, Cl. 30-383.000.
- Liedl, Gerald L.: See—  
Staudenmann, Jean-Louis; and Liedl, Gerald L., H313, Cl. 378-81.000.
- Malik, Arshad H.; and Cahn, Arno, to A. E. Staley Manufacturing Company. Glycoside-containing agricultural treatment composition. H303, 7-7-87, Cl. 514-85.000.
- Melvin, William S.: See—  
Mitchell, Porter H.; and Melvin, William S., H305, Cl. 556-143.000.
- Milberger, Walter E., to United States of America, Army. Energy recoverable choke feed. H309, 7-7-87, Cl. 363-124.000.
- Miller, Walter E., Jr., to United States of America, Army. Covert beam projector. H299, 7-7-87, Cl. 244-3.130.
- Mitchell, Porter H.; and Melvin, William S., to United States of America, Army. Demilitarization of high burn rate propellants containing ferrocene or its derivatives. H305, 7-7-87, Cl. 556-143.000.
- Moorhead, Arthur J., to United States of America, Energy. Oxidation resistant filler metals for direct brazing of structural ceramics. H298, 7-7-87, Cl. 228-263.190.
- Moorhead, Arthur J., to United States of America, Energy. Oxidation resistant filler metals for direct brazing of structural ceramics. H301, 7-7-87, Cl. 428-627.000.
- Nagashima, Akira: See—  
Hiraizumi, Junichi; and Nagashima, Akira, H294, Cl. 30-383.000.
- Nevitt, Michael V.; Aldred, Anthony T.; and Chan, Sai-Kit, to United States of America, Energy. Ceramics containing dispersants for improved fracture toughness. H302, 7-7-87, Cl. 501-103.000.
- Niaura, Vitas: See—  
Vorrier, Robert J.; and Niaura, Vitas, H304, Cl. 522-92.000.
- Nozaki, Tadashi: See—  
Numazawa, Akio; Arai, Hajime; Haga, Shoji; and Nozaki, Tadashi, H295, Cl. 74-473.00R.
- Numazawa, Akio; Arai, Hajime; Haga, Shoji; and Nozaki, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Shift fork support structure in a manual transmission. H295, 7-7-87, Cl. 74-473.00R.
- Parker, Todd S. Rotating anode X-ray tube. H312, 7-7-87, Cl. 378-127.000.
- Pitman, Steven A.: See—  
Tutin, Michael B.; Pitman, Steven A.; and Bothe, Gregory R., H308, Cl. 342-4.000.
- Roberts, Thomas G.: See—  
Jones, Robert W.; Edlin, George R.; Strickland, Brian R.; and Roberts, Thomas G., H311, Cl. 372-9.000.
- Schultz, Edwin R., to United States of America, Air Force. Robotic refueling system for tactical and strategic aircraft. H297, 7-7-87, Cl. 141-232.000.
- Staudenmann, Jean-Louis; and Liedl, Gerald L., to United States of America, Energy. Monochromator for continuous spectrum x-ray radiation. H313, 7-7-87, Cl. 378-81.000.
- Strickland, Brian R.: See—  
Jones, Robert W.; Edlin, George R.; Strickland, Brian R.; and Roberts, Thomas G., H311, Cl. 372-9.000.
- Toyota Jidosha Kabushiki Kaisha: See—  
Numazawa, Akio; Arai, Hajime; Haga, Shoji; and Nozaki, Tadashi, H295, Cl. 74-473.00R.
- Tutin, Michael B.; Pitman, Steven A.; and Bothe, Gregory R., to United States of America, Air Force. Fabric visual/infrared/radar decoys. H308, 7-7-87, Cl. 342-4.000.
- United States of America, Air Force: See—  
Schultz, Edwin R., H297, Cl. 141-232.000.
- Tutin, Michael B.; Pitman, Steven A.; and Bothe, Gregory R., H308, Cl. 342-4.000.
- Army: See—  
Ducote, Marjorie E.; and Carver, James G., H306, Cl. 558-452.000.
- Epure, Stefan T., deceased; Clark, Lee K.; and Haine, James P., H307, Cl. 174-52.0PE.
- Jones, Robert W.; Edlin, George R.; Strickland, Brian R.; and Roberts, Thomas G., H311, Cl. 372-9.000.
- Milberger, Walter E., H309, Cl. 363-124.000.
- Miller, Walter E., Jr., H299, Cl. 244-3.130.
- Mitchell, Porter H.; and Melvin, William S., H305, Cl. 556-143.000.
- Staudenmann, Jean-Louis; and Liedl, Gerald L., H313, Cl. 378-81.000.
- Energy: See—  
Moorhead, Arthur J., H298, Cl. 228-263.190.
- Moorhead, Arthur J., H301, Cl. 428-627.000.
- Nevitt, Michael V.; Aldred, Anthony T.; and Chan, Sai-Kit, H302, Cl. 501-103.000.
- Staudenmann, Jean-Louis; and Liedl, Gerald L., H313, Cl. 378-81.000.
- Navy: See—  
Hearst, Peter J., H300, Cl. 134-22.190.
- Johnson, William V., H310, Cl. 370-114.000.
- Viskase Corporation: See—  
Vorrier, Robert J.; and Niaura, Vitas, H304, Cl. 522-92.000.
- Vorrier, Robert J.; and Niaura, Vitas, to Viskase Corporation. Printing ink for use on flexible films. H304, 7-7-87, Cl. 522-92.000.
- Zabel, Patrick H., to United States of America, Army. Elastic puller sabot for small caliber flechette. H296, 7-7-87, Cl. 102-521.000.



# CLASSIFICATION OF PATENTS

ISSUED JULY 7, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	361	4,677,754	CLASS 55	862.48	4,677,860	CLASS 104	163	4,677,974							
9	4,677,694	4,677,755	71	4,678,481	862.54	4,677,861	200.14	4,677,975							
79	4,677,695	4,677,756	71	4,678,482	862.65	4,677,862	201.25	4,677,976							
84	4,677,696	4,677,757	97	4,678,483	863.12	4,677,863	206.24	4,677,977							
159	4,677,697	4,677,758	112	4,678,484	863.51	4,677,864	207.14	4,677,978							
161 A	4,677,698	4,677,759	255	4,678,485	866.5	4,677,865	314	4,677,979							
221	4,677,699	4,677,760	374	4,678,486	CLASS 74	248	4,677,917	4,677,980							
CLASS 5	90	4,677,761	385 A	4,678,487	15.86	4,677,866	378	4,677,981							
90	4,677,700	4,677,762	406	4,678,488	332	4,677,867	18.32	4,678,512							
447	4,677,701	4,677,763	418	4,678,489	332.22	4,677,868	38.22	4,678,513							
CLASS 7	107	4,677,702	CLASS 56	13.9	4,677,813	359	4,677,869	4,678,514							
CLASS 8	1.5	4,677,765	15.6	4,677,814	424.8 R	4,677,870	111	4,678,515							
480	4,678,473	4,677,766	59	4,677,816	431	4,677,871	197.1	4,678,516							
543	4,678,474	4,677,767	125	4,677,817	467	4,677,872	286.8	Re. 32,454							
606	4,678,475	4,677,768	224	4,677,818	551.9	4,677,873	309	4,678,517							
639	4,678,476	4,677,769	264	4,677,819	665 GC	4,677,874	CLASS 106	4,678,518							
CLASS 10	9	4,677,703	401	4,677,820	665 GE	4,677,875	18.32	4,678,519							
CLASS 15	1.5 R	4,677,704	CLASS 60	39.02	4,677,821	695	4,677,876	4,678,520							
398	4,677,705	4,677,772	39.23	4,677,822	0.5 A	4,678,505	63	4,677,919							
CLASS 16	44	4,677,773	274	4,677,823	10.25	4,678,506	69	4,677,920							
35 R	4,677,706	4,677,774	521	4,677,824	24	4,678,507	CLASS 111	4,677,921							
239	4,677,707	4,677,775	525	4,677,825	26	4,678,508	6	4,677,922							
334	4,677,708	4,677,776	602	4,677,826	244	4,678,510	52	4,677,922							
CLASS 17	11	4,677,709	648	4,677,827	251	4,678,511	CLASS 112	4,677,923							
CLASS 19	218	4,677,710	751	4,677,828	CLASS 76	39	4,677,928	4,677,924							
CLASS 23	305 A	4,678,477	CLASS 62	126	4,677,830	25 A	4,677,881	258	4,677,925						
CLASS 24	200	4,677,711	149	Re. 32,451	CLASS 81	77	4,677,882	266.1	4,677,926						
274 R	4,677,712	4,677,781	CLASS 65	14	4,678,490	3.37	4,677,883	274	4,677,927						
590	4,677,713	4,677,782	27	4,678,491	CLASS 82	4 C	4,677,884	455	4,677,927						
637	4,677,714	4,677,783	74	4,678,492	40 R	4,677,885	CLASS 116	4,677,932							
641	4,677,715	4,677,784	134	4,678,493	53	4,677,886	313	4,677,933							
CLASS 26	18.5	4,677,717	261	4,678,494	CLASS 83	788	4,677,887	CLASS 118	4,677,934						
CLASS 29	33 P	4,677,718	287	4,678,495	862	4,677,888	58	4,677,935	596.17	4,678,006					
40	4,677,719	4,677,785	84 A	4,677,831	CLASS 84	1.01	4,677,889	108	4,677,936	625.66	4,678,007				
148.4 C	4,677,720	4,677,786	CLASS 70	67	4,677,832	1.19	4,677,890	307	4,677,937	630.12	4,678,008				
149.5 S	4,677,721	4,677,787	68	4,677,833	313	4,677,891	500	4,677,937	818	4,678,009					
156.5 A	4,677,722	4,677,788	279	4,677,834	405	4,677,892	CLASS 119	4,677,938	31	4,678,010					
157.1 R	4,677,723	4,677,789	456 R	4,677,835	473	4,677,893	29	4,677,939	96 R	4,678,011					
157.3 R	4,677,724	4,677,790	CLASS 71	76	4,678,496	CLASS 86	45	4,677,894	1 C	4,678,012					
280	4,677,725	4,677,791	86	4,678,497	87	4,678,498	41.12	4,677,940	384 B	4,678,013					
401.1	4,677,726	4,677,792	90	4,678,499	92	4,678,500	41.21	4,677,941	67	4,678,014					
402.06	4,677,727	4,677,793	92	4,678,501	93	4,678,502	41.27	4,677,942	95	4,678,015					
407	4,678,924	4,677,794	94	4,678,504	94	4,678,509	46 SC	Re. 32,452	131	4,678,016					
415	4,677,728	4,677,795	CLASS 49	56	4,677,789	CLASS 72	88	4,677,836	CLASS 147	48	4,678,016				
426.5	4,677,729	4,677,796	463	4,677,791	CLASS 51	168	4,677,792	CLASS 91	235	4,677,949	6.15 Z	4,678,519			
512	4,677,730	4,677,797	CLASS 52	36	4,677,794	251	4,677,793	CLASS 92	241	4,677,950	6.2	4,678,518			
526 R	4,677,731	4,677,798	63	4,677,795	CLASS 53	118	4,677,807	CLASS 98	357	4,677,951	6.35	4,678,520			
563	4,677,732	4,677,799	73	4,677,796	220	4,677,799	465	4,677,840	372	4,677,952	11.5 F	4,678,521			
572	4,677,733	4,677,800	94	4,677,797	309.12	4,677,800	CLASS 73	30	4,677,841	478	4,677,953	12 C	4,678,522		
576 B	4,677,734	4,677,801	106	4,677,798	488	4,677,802	32 A	4,677,842	2.11	4,677,902	489	4,677,954	CLASS 149	21	4,678,524
588	4,677,741	4,677,803	220	4,677,799	646	4,677,803	34	4,677,843	31	4,677,903	520	4,677,955	CLASS 152	416	4,678,017
591	4,677,742	4,677,804	309.12	4,677,800	648	4,677,804	55	4,677,844	38.1	4,677,904	572	4,677,956	CLASS 156	73.1	4,678,525
596	4,677,743	4,677,805	488	4,677,802	656	4,677,805	56	4,677,845	CLASS 99	413	4,677,905	585	4,677,957	195	4,678,526
729	4,677,744	4,677,806	646	4,677,803	CLASS 54	118	4,677,807	CLASS 100	53	4,677,908	41 R	4,677,964	213	4,678,527	
741	4,677,745	4,677,807	648	4,677,804	656	4,677,806	238	4,677,808	229	4,677,909	76	4,677,965	220	4,678,528	
CLASS 30	122	4,677,746	656	4,677,806	CLASS 55	118	4,677,807	CLASS 101	93.01	4,677,910	450	4,677,966	234	4,678,529	
124	4,677,747	4,677,808	656	4,677,806	CLASS 56	118	4,677,808	CLASS 102	218	4,677,911	75	4,677,967	245	4,678,530	
250	4,677,748	4,677,809	656	4,677,806	CLASS 57	118	4,677,809	CLASS 103	365	4,677,912	82.1	4,677,970	250	4,678,531	
355	4,677,749	4,677,810	656	4,677,806	CLASS 58	118	4,677,810	CLASS 104	215	4,677,913	87 R	4,677,971	314	4,678,532	
376	4,677,750	4,677,811	656	4,677,806	CLASS 59	118	4,677,811	CLASS 105	215	4,677,914	92 V	4,677,972	435	4,678,533	
128	4,677,752	4,677,812	656	4,677,806	CLASS 60	118	4,677,812	CLASS 106	215	4,677,915	92 VW	4,677,973	607	4,678,534	
143 M	4,677,753	4,677,813	656	4,677,806	CLASS 61	118	4,677,813	CLASS 107	215	4,677,916	92 VW	4,677,973	623 R	4,678,535	
264	4,677,753	4,677,814	656	4,677,806	CLASS 62	118	4,677,814	CLASS 108	215	4,677,917	92 VW	4,677,973	635	4,678,536	
		4,677,815	656	4,677,806	CLASS 63	118	4,677,815	CLASS 109	215	4,677,918	92 VW	4,677,973	643	4,678,537	
		4,677,816	656	4,677,806	CLASS 64	118	4,677,816	CLASS 110	215	4,677,919	92 VW	4,677,973	643	4,678,538	
		4,677,817	656	4,677,806	CLASS 65	118	4,677,817	CLASS 111	215	4,677,920	92 VW	4,677,973	643	4,678,539	
		4,677,818	656	4,677,806	CLASS 66	118	4,677,818	CLASS 112	215	4,677,921	92 VW	4,677,973	643	4,678,540	
		4,677,819	656	4,677,806	CLASS 67	118	4,677,819	CLASS 113	215	4,677,922	92 VW	4,677,973	643	4,678,540	
		4,677,820	656	4,677,806	CLASS 68	118	4,677,820	CLASS 114	215	4,677,923	92 VW	4,677,973	643	4,678,540	
		4,677,821	656	4,677,806	CLASS 69	118	4,677,821	CLASS 115	215	4,677,924	92 VW	4,677,973	643	4,678,540	
		4,677,822	656	4,677,806	CLASS 70	118	4,677,822	CLASS 116	215	4,677,925	92 VW	4,677,973	643	4,678,540	
		4,677,823	656	4,677,806	CLASS 71	118	4,677,823	CLASS 117	215	4,677,926	92 VW	4,677,973	643	4,678,540	
		4,677,824	656	4,677,806	CLASS 72	118	4,677,824	CLASS 118	215	4,677,927	92 VW	4,677,973	643	4,678,540	
		4,677,825	656	4,677,806	CLASS 73	118	4,677,825	CLASS 119	215	4,677,928	92 VW	4,677,973	643	4,678,540	
		4,677,826	656	4,677,806	CLASS 74	118	4,677,826	CLASS 120	215	4,677,929	92 VW	4,677,973	643	4,678,540	
		4,677,827	656	4,677,806	CLASS 75	118	4,677,827	CLASS 121	215	4,677,930	92 VW	4,677,973	643	4,678,540	
		4,677,828	656	4,677,806	CLASS 76	118	4,677,828	CLASS 122	215	4,677,931	92 VW	4,677,973	643	4,678,540	
		4,677,829	656	4,677,806	CLASS 77	118	4,677,829	CLASS 123	215	4,677,932	92 VW	4,677,973	643	4,678,540	
		4,677,830	656	4,677,806	CLASS 78	118	4,677,830	CLASS 124	215	4,677,933	92 VW	4,677,973	643	4,678,540	
		4,677,831	656	4,677,806	CLASS 79	118	4,677,831	CLASS 125	215	4,677,934	92 VW	4,677,973	643	4,678,540	
		4,677,832	656	4,677,806	CLASS 80	118	4,677,832	CLASS 126	215	4,677,935	92 VW	4,677,973	643	4,678,540	
		4,677,833	656	4,677,806	CLASS 81	118	4,677,833	CLASS 127	215	4,677,936	92 VW	4,677,973	643	4,678,540	
		4,677,834	656	4,677,806	CLASS 82	118	4,677,834	CLASS 128	215	4,677,937	92 VW	4,677,973	643	4,678,540	
		4,677,835	656	4,677,806	CLASS 83	118	4,677,835	CLASS 129	215	4,677,938	92 VW	4,677,973	643	4,678,540	
		4,677,836	656	4,677,806	CLASS 84	118	4,677,836	CLASS 130	215	4,677,939	92 VW	4,677,973	643	4,678,540	
		4,677,837	656	4,677,806	CLASS 85	118	4,677,837	CLASS 131	215	4,677,940	92 VW	4,677,973	643	4,678,540	
		4,677,838	656	4,677,806	CLASS 86	118	4,677,838	CLASS 132	215	4,677,941	92 VW	4,677,973	643	4,678,540	
		4,677,839	656	4,677,806	CLASS 87	118	4,677,839	CLASS 133	215	4,677,942	92 VW	4,677,973	643	4,6	

## CLASSIFICATION OF PATENTS

659.1	4,678,342	18	4,678,873	288	4,678,097	237 G	4,678,908	33.99 B	Re.32.433	156	4,678,954
664	4,678,341	43.12	4,678,874	289	4,678,098	253	4,678,910	47.41	4,678,196	201	4,678,931
CLASS 160		61.54	4,678,875			328	4,678,911	80 R	4,678,197	323	4,678,936
135	4,678,018	61.61	Re.32.456	48	4,678,099	341	4,678,913	153 A	4,678,198	328	4,678,953
272	4,678,019	148 A	4,678,878	CLASS 222		343	4,678,914	491 E	4,678,199	332	4,678,957
CLASS 164		148 F	4,678,877	52	4,678,100	358.1	4,678,915	607	4,678,200	CLASS 312	
16	4,678,020	295 R	4,678,876	82	4,678,101	370	4,678,916	620	4,678,201	13	4,678,243
40	4,678,021	340	4,678,879	130	4,678,103	373	4,678,917	642	4,678,202	114	4,678,246
416	4,678,022	CLASS 202	4,678,880	146.6	4,678,104	374	4,678,918	707	4,678,203	116	4,678,247
452	4,678,023	154	4,678,543	153	4,678,105	491.1	4,678,919	710	4,678,204	CLASS 313	
503	4,678,024	CLASS 203		162	4,678,106	560	4,678,920	803	BI 4,040.645	15	4,678,958
CLASS 165		95	4,678,544	181	4,678,107	574	4,678,921	808	4,678,205	17	4,678,959
12	4,678,025	CLASS 204		386.5	4,678,102	CLASS 251		15 B	4,678,206	25	4,678,960
67	4,678,026	15	4,678,545	274	4,678,108	107	4,678,159	36	4,678,961	36	4,678,962
70	4,678,027	32.1	4,678,546	CLASS 224		129.02	4,678,160	383	4,678,207	405	4,678,963
72	4,678,028	37.1	4,678,547	171	4,678,161	CLASS 252		112	4,678,208	414	4,678,964
133	4,678,029	67	4,678,548	74	4,678,109	8.514	4,678,591	144	4,678,209	451	4,678,965
166	4,678,030	105 R	4,678,549	CLASS 228		8.8	4,678,590	318	4,678,210	487	4,678,966
CLASS 166		74	4,678,550	4.1	4,678,110	23	4,678,592	368	4,678,211	497	4,678,967
242	4,678,031	129.75	4,678,551	37	4,678,111	100	4,678,593	CLASS 290		135	4,678,971
246	4,678,033	146	4,678,552	138	4,678,112	131	4,678,594	54	4,678,922	254	4,678,972
248	4,678,034	182.6	4,678,553	160	4,678,113	174.17	4,678,595	55	4,678,923	151	BI 4,329.624
250	4,678,035	299 R	4,678,554	176	4,678,114	174.24	4,678,596	CLASS 292		290	4,678,968
273	4,678,036	CLASS 206		183	4,678,115	186.31	4,678,597	7	4,678,212	382	4,678,969
295	4,678,037	279	4,678,079	201	4,678,899	343	4,678,598	37	4,678,213	397	4,678,970
299	4,678,038	387	4,678,080	CLASS 230		500	4,678,600	213	4,678,214	399	4,678,971
301	4,678,039	459	4,678,082	373	4,678,899	513	4,678,601	247	4,678,215	CLASS 318	
303	4,678,038	597	4,678,084	375	4,678,893	522 R	4,678,602	256.69	4,678,216	135	4,678,971
370	4,678,040	CLASS 169		379	4,678,894	542	4,678,603	CLASS 294		254	4,678,972
24	4,678,041	36	4,678,555	436	4,678,896	547	4,678,604	16	4,678,217	266	4,678,973
CLASS 172		112	4,678,556	468	4,678,898	609	4,678,605	82.33	4,678,218	577	4,678,974
15	4,678,042	390	4,678,557	CLASS 236		700	4,678,606	118	4,678,219	601	4,678,975
349	4,678,043	CLASS 208		25 A	4,678,116	CLASS 254		170	4,678,220	690	4,678,976
CLASS 174		33 GC	4,678,863	92 A	4,678,117	50.2	4,678,163	78 A	4,678,221	696	4,678,977
36	4,678,864	17	4,678,559	CLASS 237		93 H	4,678,164	78.1	4,678,222	759	4,678,978
88 R	4,678,866	166	4,678,561	12.3 B	4,678,118	97	4,678,165	91	4,678,223	805	4,678,248
135	4,678,867	CLASS 209		CLASS 256		203	4,678,226	181	4,678,224	CLASS 320	
152 GM	4,678,868	4.52	4,678,044	13.1	4,678,166	213	4,678,227	203	4,678,225	2	4,678,981
CLASS 175		61	4,678,045	CLASS 239		216	4,678,228	213	4,678,226	8	4,678,982
1	4,678,046	212	4,678,047	9	4,678,119	CLASS 259		216	4,678,227	CLASS 322	
229	4,678,048	108	4,678,049	75	4,678,120	8 B	4,678,162	68	4,678,229	CLASS 323	
4,678,050		110	4,678,050	333	4,678,121	CLASS 260		284	4,678,230	222	4,678,983
19	4,678,869	143	4,678,051	464	4,678,122	349	4,678,610	329	4,678,231	285	4,678,984
4,678,870		150	4,678,052	585	4,678,123	391	4,678,613	408	4,678,232	324	4,678,985
CLASS 178		169	4,678,053	589.1	4,678,124	397.45	4,678,609	429	4,678,233	343	4,678,986
9.1	4,678,051	187	4,678,054	4,678,582	4,678,125	510	4,678,611	439	4,678,234	CLASS 324	
143	4,678,052	198.2	4,678,055	4,678,583	4,678,126	543 R	4,678,612	CLASS 298		77 R	4,678,987
210	4,678,053	202	4,678,056	4,678,584	4,678,127	665 R	4,678,614	23 DF	4,678,235	158 D	4,678,988
225	4,678,054	232	4,678,057	4,678,585	4,678,128	CLASS 261		1	4,678,236	158 MG	4,678,989
247	4,678,055	321.1	4,678,058	4,678,586	4,678,129	111	4,678,615	1	4,678,237	158 R	4,678,990
272	4,678,056	433.2	4,678,059	4,678,587	4,678,130	CLASS 264		79	4,678,238	207	4,678,991
273	4,678,058	441	4,678,060	4,678,588	4,678,131	24	4,678,616	81	4,678,239	208	4,678,992
CLASS 182		445	4,678,061	4,678,589	4,678,132	25	4,678,617	CLASS 301		236	4,678,993
5	4,678,059	470	4,678,062	4,678,590	4,678,133	165	4,678,167	37 N	4,678,239	309	4,678,995
160	4,678,060	490	4,678,063	4,678,591	4,678,134	196	4,678,168	CLASS 303		341	4,678,997
206	4,678,061	497	4,678,064	4,678,592	4,678,135	CLASS 266		6 C	4,678,240	427	4,678,998
CLASS 187		500.23	4,678,065	4,678,593	4,678,136	CLASS 269		33	4,678,241	428	4,679,000
119	4,678,063	638	4,678,066	4,678,594	4,678,137	46	4,678,169	92	4,678,242	CLASS 328	
73.45	4,678,064	719	4,678,067	4,678,595	4,678,138	296	4,678,170	114	4,678,243	167	4,679,001
196 D	4,678,065	743	4,678,068	4,678,596	4,678,139	325	4,678,171	CLASS 305		CLASS 330	
218 A	4,678,066	788	4,678,069	4,678,597	4,678,140	CLASS 270		57	4,678,244	66	4,679,002
328	4,678,067	797	4,678,070	4,678,598	4,678,141	CLASS 271		10 LS	4,678,925	CLASS 331	
353	4,678,068	134 R	4,678,071	4,678,599	4,678,142	18	4,678,172	10 SB	4,678,926	1 A	4,679,003
CLASS 192		152	4,678,072	4,678,600	4,678,143	45	4,678,173	11	4,678,927	14	4,679,004
0.033	4,678,069	56	4,678,073	4,678,601	4,678,144	54	4,678,174	104	4,678,928	16	4,679,005
58 B	4,678,070	73	4,678,074	4,678,602	4,678,145	CLASS 248		112	4,678,929	111	4,679,006
70.27	4,678,071	133	4,678,075	4,678,603	4,678,146	34	4,678,175	112	4,678,930	141	4,679,007
CLASS 194		150	4,678,076	4,678,604	4,678,147	238	4,678,176	141	4,678,931	17 M	4,679,007
206	4,678,072	191	4,678,077	4,678,605	4,678,148	242	4,678,177	254	4,678,932	21 A	4,679,009
CLASS 198		328	4,678,078	4,678,606	4,678,149	295	4,678,178	279	4,678,933	21 R	4,679,008
396	4,678,073	353	4,678,079	4,678,607	4,678,150	296	4,678,180	297	4,678,934	109	4,679,010
457	4,678,074	11 E	4,678,080	4,678,608	4,678,151	CLASS 272		303	4,678,935	111	4,679,011
496	4,678,075	11 R	4,678,081	4,678,609	4,678,152	68	4,678,181	311	4,678,936	182	4,679,012
525	4,678,076	256	4,678,082	4,678,610	4,678,153	73	4,678,182	445	4,678,937	195	4,679,013
803.01	4,678,077	10.51	4,678,083	4,678,611	4,678,154	97	4,678,183	446	4,678,938	219	4,679,015
803.2	4,678,078	10.55 E	4,678,084	4,678,612	4,678,155	129	4,678,184	449	4,678,939	CLASS 333	
CLASS 200		10.61 R	4,678,085	4,678,613	4,678,156	134	4,678,185	455	4,678,940	132	4,679,016
1 V	4,678,871	69 C	4,678,086	4,678,614	4,678,157	144	4,678,186	476	4,678,941	164	4,679,017
5 R	4,678,872	85 R	4,678,087	4,678,615	4,678,158	CLASS 273		490	4,678,942	172	4,679,018
CLASS 220		117.1	4,678,088	4,678,616	4,678,159	1 R	4,678,188	511	4,678,943	197	4,679,019
4 F	4,678,093	121 L	4,678,089	4,678,617	4,678,160	1.5 A	4,678,189	527	4,678,944	216	4,679,020
273	4,678,096	121 LJ	4,678,090	4,678,618	4,678,161	146	4,678,190	550	4,678,945	295	4,679,021
CLASS 221		121 PW	4,678,091	4,678,619	4,678,162	157 R	4,678,191	633	4,678,946	296	4,679,022
231 P	4,678,093	272	4,678,092	4,678,620	4,678,163	CLASS 280		13	4,678,951	CLASS 337	
231 SE	4,678,097	CLASS 222		4,678,621	4,678,164	33.99 A	4,678,195	83	4,678,952	140	4,679,023
		231 SE		4,678,622	4,678,165			91	4,678,953		

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CLASS 338	7	4,678,313	21	4,679,131	13	4,679,208	270	4,678,375	93	4,678,669
160	4,679,024	14 C	4,678,316	46	4,679,132	17	4,679,209	94.75	4,678,668	
197	4,679,025	15	4,678,317	61	4,679,133	96	4,679,210	127	4,678,670	
CLASS 340	38	4,678,319	CLASS 364	156	4,678,618	CLASS 376	139	4,678,377	443	4,678,671
63	4,679,026	49	4,678,320	146	4,679,135	156	4,678,619	451	4,678,659	
347 CC	4,679,028	52	4,678,321	150	4,679,136	173	4,678,620	CLASS 408	CLASS 425	
347 P	4,679,029	133	4,678,322	188	4,679,137	203	4,678,621	46	4,678,378	72 R
365 A	4,679,030	CLASS 356	200	4,679,138	245	4,678,622	83.5	4,678,379	115	4,678,418
501	4,679,031	45	4,678,324	259	4,679,139	259	4,678,623	211	4,678,380	143
562	4,679,032	73	4,678,325	260	4,679,140	260	4,678,624	CLASS 409	144	4,678,420
566	4,679,033	73.1	4,678,326	261	4,679,141	261	4,678,625	221	4,678,381	159
567	4,679,034	141	4,678,327	298	4,679,142	298	4,678,626	232	4,678,382	174.4
572	4,679,035	152	4,678,328	313	4,679,143	313	4,678,627	CLASS 411	311	4,678,423
573	4,679,036	171	4,678,329	333	4,679,144	333	4,678,628	32	4,678,383	331
693	4,679,037	222	4,678,330	419	4,679,145	419	4,678,629	43	4,678,384	522
721	4,679,038	246	4,678,331	438	4,679,146	438	4,678,630	456	4,678,385	562
723	4,679,039	301	4,678,332	444	4,679,147	444	4,678,631	468	BI 3,951,033	CLASS 426
728	4,679,040	328	4,678,333	478	4,679,148	478	4,678,632	8	4,678,386	19
747	4,679,041	346	4,678,334	479	4,679,149	479	4,679,150	CLASS 412	46	4,678,672
754	4,679,042	350	4,678,335	510	4,679,151	510	4,679,152	CLASS 414	548	4,678,673
784	4,679,043	380	4,678,336	513	4,679,153	513	4,679,154	47	4,678,387	573
815.2	4,679,044	387	4,678,337	525	4,679,155	525	4,679,156	92	4,678,388	634
825.07	4,679,045	402	4,678,338	551	4,679,157	551	4,679,158	267	4,678,389	CLASS 427
CLASS 342	CLASS 357	557	4,679,159	559	4,679,160	559	4,679,161	282	4,678,390	38
51	4,679,046	2	4,679,061	560	4,679,162	560	4,679,163	389	4,678,391	4,678,678
52	4,679,047	44	4,679,062	563	4,679,164	563	4,679,165	563	4,678,392	4,678,679
61	4,679,048	30	4,679,063	571	4,679,165	571	4,679,166	731	4,678,393	4,678,680
172	4,679,049	CLASS 358	575	4,679,167	4,679,168	4,679,169	4,679,170	CLASS 415	48	4,678,682
196	4,679,050	24	4,679,064	725	4,679,169	725	4,679,170	2 R	123	4,678,683
CLASS 343	29	4,679,065	726	4,679,171	4,679,172	4,679,173	4,679,174	53 T	213.36	4,678,684
700 MS	4,679,051	44	4,679,066	780	4,679,175	780	4,679,176	148	4,678,394	4,678,685
712	4,679,052	60	4,679,067	900	4,679,177	900	4,679,178	151	4,678,395	254
CLASS 346	75	4,679,068	4,679,069	4,679,070	4,679,071	4,679,072	4,679,073	181	4,678,396	4,678,686
1.1	4,679,053	62	4,679,070	4,679,071	4,679,072	4,679,073	4,679,074	199.2	4,678,397	261
76 L	4,679,057	70	4,679,072	4,679,073	4,679,074	4,679,075	4,679,076	199.4	4,678,398	387
76 PH	4,679,054	85	4,679,077	4,679,078	4,679,079	4,679,080	4,679,081	CLASS 416	13	4,678,689
140 R	4,679,056	106	4,679,079	4,679,082	4,679,083	4,679,084	4,679,085	32	4,678,401	31
159	4,679,058	107	4,679,086	4,679,087	4,679,088	4,679,089	4,679,090	137 R	4,678,402	36
CLASS 350	108	4,679,091	4,679,092	4,679,093	4,679,094	4,679,095	4,679,096	CLASS 417	78	4,678,692
3.71	4,678,263	135	4,679,097	4,679,098	4,679,099	4,679,100	4,679,101	12	4,678,403	91
96.12	4,678,266	138	4,679,102	4,679,103	4,679,104	4,679,105	4,679,106	45	4,678,404	95
96.15	4,678,267	147	4,679,107	4,679,108	4,679,109	4,679,110	4,679,111	245	4,678,405	120
96.18	4,678,268	150	4,679,112	4,679,113	4,679,114	4,679,115	4,679,116	310	4,678,406	122
96.20	4,678,269	160	4,679,117	4,679,118	4,679,119	4,679,120	4,679,121	341	4,678,407	141
96.21	4,678,270	167	4,679,122	4,679,123	4,679,124	4,679,125	4,679,126	410	4,678,408	171
96.30	4,678,271	168	4,679,127	4,679,128	4,679,129	4,679,130	4,679,131	420	4,678,409	175
96.34	4,678,272	213.18	4,679,132	4,679,133	4,679,134	4,679,135	4,679,136	420 R	4,678,410	198
247	4,678,273	213.26	4,679,137	4,679,138	4,679,139	4,679,140	4,679,141	500	4,678,411	213
319	4,678,274	242	4,679,142	4,679,143	4,679,144	4,679,145	4,679,146	CLASS 418	252	4,678,702
320	4,678,275	257	4,679,147	4,679,148	4,679,149	4,679,150	4,679,151	26	4,678,412	288
331 R	4,678,276	261	4,679,152	4,679,153	4,679,154	4,679,155	4,679,156	29	4,678,413	289
334	4,678,277	287	4,679,157	4,679,158	4,679,159	4,679,160	4,679,161	43	4,678,414	315.9
340	4,678,278	280	4,679,162	4,679,163	4,679,164	4,679,165	4,679,166	50	4,678,415	323
344	4,678,279	287	4,679,167	4,679,168	4,679,169	4,679,170	4,679,171	55	4,678,416	336
345	4,678,280	287	4,679,172	4,679,173	4,679,174	4,679,175	4,679,176	CLASS 419	407	4,678,708
346	4,678,281	328	4,679,177	4,679,178	4,679,179	4,679,180	4,679,181	8	4,678,633	380
347	4,678,282	CLASS 360	4,679,182	4,679,183	4,679,184	4,679,185	4,679,186	30	4,678,634	414
348	4,678,283	10.1	4,679,187	4,679,188	4,679,189	4,679,190	4,679,191	CLASS 420	421	4,678,710
349	4,678,284	10.2	4,679,192	4,679,193	4,679,194	4,679,195	4,679,196	449	4,678,635	432
350	4,678,285	15	4,679,197	4,679,198	4,679,199	4,679,200	4,679,201	450	4,678,636	537.1
404	4,678,286	60	4,679,202	4,679,203	4,679,204	4,679,205	4,679,206	456	4,678,637	551
432	4,678,287	70	4,679,207	4,679,208	4,679,209	4,679,210	4,679,211	456	4,678,638	553
486	4,678,288	75	4,679,212	4,679,213	4,679,214	4,679,215	4,679,216	456	4,678,639	553
506	4,678,289	77	4,679,217	4,679,218	4,679,219	4,679,220	4,679,221	456	4,678,640	593
510	4,678,290	78	4,679,222	4,679,223	4,679,224	4,679,225	4,679,226	456	4,678,641	593
609	4,678,291	97	4,679,227	4,679,228	4,679,229	4,679,230	4,679,231	456	4,678,642	606
611	4,678,292	99	4,679,232	4,679,233	4,679,234	4,679,235	4,679,236	456	4,678,643	607
634	4,678,293	113	4,679,237	4,679,238	4,679,239	4,679,240	4,679,241	456	4,678,644	642
CLASS 351	130.31	132	4,679,242	4,679,243	4,679,244	4,679,245	4,679,246	456	4,678,645	CLASS 429
45	4,678,294	CLASS 361	4,679,247	4,679,248	4,679,249	4,679,250	4,679,251	456	4,678,646	17
208	4,678,295	31	4,679,252	4,679,253	4,679,254	4,679,255	4,679,256	456	4,678,647	34
CLASS 352	33	40	4,679,257	4,679,258	4,679,259	4,679,260	4,679,261	456	4,678,648	129
62	4,678,296	33	4,679,262	4,679,263	4,679,264	4,679,265	4,679,266	456	4,678,649	140
CLASS 354	117	119	4,679,267	4,679,268	4,679,269	4,679,270	4,679,271	456	4,678,650	CLASS 430
21	4,678,297	151	4,679,272	4,679,273	4,679,274	4,679,275	4,679,276	456	4,678,651	57
106	4,678,298	184	4,679,277	4,679,278	4,679,279	4,679,280	4,679,281	456	4,678,652	63
107	4,678,299	315	4,679,282	4,679,283	4,679,284	4,679,285	4,679,286	456	4,678,653	136
173.11	4,678,300	358	4,679,287	4,679,288	4,679,289	4,679,290	4,679,291	456	4,678,654	203
203	4,678,301	386	4,679,292	4,679,293	4,679,294	4,679,295	4,679,296	456	4,678,655	270
217	4,678,302	418	4,679,297	4,679,298	4,679,299	4,679,300	4,679,301	456	4,678,656	320
313	4,678,303	433	4,679,302	4,679,303	4,679,304	4,679,305	4,679,306	456	4,678,657	353
CLASS 355	4,678,304	CLASS 362	4,679,307	4,679,308	4,679,309	4,679,310	4,679,311	456	4,678,658	356
1	4,678,305	66	4,679,312	4,679,313	4,679,314	4,679,315	4,679,316	456	4,678,659	445
3	4,678,306	226	4,679,317	4,679,318	4,679,319	4,679,320	4,679,321	456	4,678,660	523
CLASS 356	294	294	4,679,322	4,679,323	4,679,324	4,679,325	4,679,326	456	4,678,661	531
3	4,678,307	306	4,679,327	4,679,328	4,679,329	4,679,330	4,679,331	456	4,678,662	569
CLASS 357	306	CLASS 363	4,679,332	4,679,333	4,679,334	4,679,335	4,679,336	456	4,678,663	4,678,745
CLASS 358	17	4,679,337	4,679,338	4,679,339	4,679,340	4,679,341	4,679,342	456	4,678,664	CLASS 431
CLASS 359	319	4,679,343	4,679,344	4,679,345	4,679,346	4,679,347	4,679,348	456	4,678,665	76
CLASS 360	3	4,679,349	4,679,350	4,679,351	4,679,352	4,679,353	4,679,354	456	4,678,666	4,678,428
CLASS 361	1	4,679,355	4,679,356	4,679,357	4,679,358	4,679,359	4,679,360	456	4,678,667	
CLASS 362	1	4,679,361	4,679,362	4,679,363	4,679,364	4,679,365	4,679,366	456	4,678,668	
CLASS 363	1	4,679,367	4,679,368	4,679,369	4,679,370	4,679,371	4,679,372	456	4,678,669	
CLASS 364	1	4,679,373	4,679,374	4,679,375	4,679,376	4,679,377	4,679,378	456	4,678,670	
CLASS 365	1	4,679,381	4,679,382	4,679,383	4,679,384	4,679,385	4,679,386	456	4,678,671	
CLASS 366										



## CLASSIFICATION OF PATENTS

202	4,678,430	582	4,678,261	CLASS 474	253	4,678,787	CLASS 524	194	4,678,852
328	4,678,431	607	4,678,260	101	4,678,454	254	4,678,788	CLASS 544	
		610	4,678,121	263	4,678,455	262	4,678,789	CLASS 546	
12	4,678,432		4,678,259	CLASS 493		277	4,678,790	146	4,678,853
59	4,678,433	857	4,678,262	309	4,678,456	290	4,678,791	CLASS 556	
242	4,678,434			355	4,678,457	307	4,678,792	149	4,678,854
		11	4,678,439	CLASS 501		311	4,678,793	CLASS 560	
218	4,678,435	53	4,678,440	80	4,678,758	332	4,678,794	24	4,678,856
228.1	4,678,436	88	4,678,441	92	4,678,759	341	4,678,795	CLASS 564	
		89	4,678,442	96	4,678,760	356	4,678,796	8*	4,678,855
21	4,678,437			104	4,678,761	378	4,678,797	CLASS 568	
34	4,678,438	38	4,678,443	127	4,678,762	383	4,678,798	454	4,678,857
		65	4,678,444	CLASS 502		398	4,678,799	902	4,678,858
5	4,678,746	72	4,678,445	26	4,678,763	412	4,678,800	CLASS 570	
7	4,678,747	80	4,678,446	456	4,678,764	413	4,678,801	163	4,678,859
				493	4,678,765	418	4,678,802	CLASS 585	
68	4,678,748	45	4,678,447	510	4,678,805	456	4,678,832	14	4,678,860
183	4,678,749	60	4,678,448	539	4,678,806	462	4,678,833	266	4,678,861
200	4,678,750			552	4,678,807	477	4,678,846	500	4,678,862
243	4,678,751			560	4,678,808	CLASS 525		CLASS 604	
291	4,678,752	136	4,678,449	599	4,678,809	60	4,678,832	6	4,678,458
296	4,678,753	405	4,678,450	640	4,678,810	66	4,678,833	22	4,678,459
		471	4,678,451	721	4,678,811	74	4,678,834	113	4,678,460
15	4,678,754			777	4,678,812	100	4,678,835	157	4,678,461
43	4,678,755			CLASS 521		221	4,678,836	180	4,678,462
123	4,678,756	47	4,679,243	61	4,678,813	250	4,678,837	285	4,678,463
169	4,678,757	54	4,679,244	CLASS 522		326.9	4,678,838	385 R	4,678,464
		155	4,679,245	175	4,678,814	340	4,678,841	891	4,678,465
61	4,678,758	183	4,679,246	CLASS 523		353	4,678,842	892	4,678,466
62	4,678,759	210	4,679,247	122	4,678,815	378	4,678,843	CLASS 623	
77	4,678,760	226	4,679,248	142	4,678,816	390	4,678,844	1	4,678,468
83	4,678,761	328	4,679,249	144	4,678,817	417	4,678,845	1.8	4,678,472
139	4,678,762	601	4,679,250	157	4,678,818	462	4,678,846	6	4,678,469
210	4,678,763	619	4,679,251	200	4,678,819	477	4,678,847	16	4,678,470
267	4,678,764			210	4,678,820	CLASS 526			4,678,471
347	4,678,765			218	4,678,821	206	4,678,847		
426	4,678,766	38	4,678,452	219	4,678,822	209	4,678,848		
571	4,678,767	144	4,678,453	222	4,678,823	220	4,678,849		
				247	4,678,824	259	4,678,850		

## CLASSIFICATION OF DESIGNS

D2—	320	290,660	D8—	1	290,680		68	290,701		108	290,720		35	290,741		290,760
D3—	73	290,661		14.1	290,681		113	290,702			290,721		89	290,761		
D6—	310	290,662		42	290,682			290,703			290,722		9	290,762		
	337	290,663		319	290,683			290,704		150	290,723			290,763		
	361	290,664		331	290,684		114	290,705		166	290,724		115	290,764		
	446	290,665		368	290,685			290,706			290,725		11	290,765		
	449	290,666	D9—	355	290,686		115	290,707			290,726		20	290,766		
	472	290,667		385	290,687	D15—	69	290,711		173	290,727		12	290,767		
	484	290,668		398	290,688	D16—	6	290,712		211	290,728		13	290,768		
	488	290,669		433	290,689		14	290,708			290,729		13	290,769		
	511	290,670	D10—	90	290,690		44	290,709		222	290,730		14	290,770		
	527	290,671		116	290,691		107	290,710	D22—	113	290,731		15	290,771		
	552	290,672	D12—	14	290,692	D18—	1	290,713		137	290,732		15	290,772		
D7—	70	290,673		169	290,693		12	290,714		141	290,733		17	290,773		
	71	290,674	D13—	12	290,694		13	290,715		142	290,734		43	290,775		
	351	290,675	D14—	2	290,695		23	290,716	D23—	28	290,735		40	290,776		
	384	290,676		30	290,697		11	290,696		29	290,736		40	290,777		
	387	290,677		34	290,698	D19—	1	290,717			290,737			290,778		
	397	290,679		53	290,700	D20—	1	290,718			290,738			290,779		
						D21—	48	290,719			290,739					

## STATUTORY INVENTION REGISTRATIONS

30—	383	H294	141—	232	H297	342—	4	H308	372—	9	H311	428—	627	H301	522—	92	H304
74—	473 R	H295	174—	52 PE	H307												
102—	521	H296	228—	263.19	H298	363—	124	H309	378—	81	H313	501—	103	H302	556—	143	H305
134—	22.19	H300	244—	3.13	H299	370—	114	H310		127	H312	514—	85	H303	558—	452	H306

GEOGRAPHICAL INDEX  
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Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
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Canal Zone	7	Minnesota	27	Tennessee	47
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Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
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Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

01 :	4,678,328	4,678,212	4,679,000	4,678,639	4,677,766	4,679,221
	4,678,362	4,678,213	4,679,030	4,678,723	4,677,773	4,679,232
	4,678,914	4,678,251	4,679,040	4,678,749	4,677,785	4,679,237
04 :	4,677,835	4,678,280	4,679,041	4,678,802	4,677,802	Re.32,455
	4,677,913	4,678,322	4,679,042	4,678,820	4,677,833	4,677,787
	4,677,985	4,678,347	4,679,087	4,678,917	4,677,837	4,678,011
	4,678,049	4,678,355	4,679,098	4,678,991	4,677,884	4,678,097
	4,678,150	4,678,358	4,679,102	4,678,995	4,677,912	4,678,523
	4,678,215	4,678,363	4,679,103	4,679,016	4,677,964	4,678,531
	4,678,294	4,678,365	4,679,105	4,679,019	4,678,014	4,678,577
	4,678,353	4,678,366	4,679,108	4,679,029	4,678,024	4,678,717
	4,678,398	4,678,368	4,679,114	4,679,120	4,678,040	4,678,864
	4,678,540	4,678,381	4,679,134	4,679,123	4,678,075	4,678,929
	4,678,780	4,678,384	4,679,137	4,679,228	4,678,091	4,679,112
	4,678,860	4,678,391	4,679,139	4,678,497	4,678,095	4,679,119
	4,678,970	4,678,408	4,679,156	4,678,499	4,678,116	4,679,128
	4,679,239	4,678,413	4,679,158	4,678,500	4,678,119	4,679,131
06 :	Re.32,456	4,678,414	4,679,161	4,678,505	4,678,151	4,679,148
	4,677,704	4,678,422	4,679,167	4,678,505	4,678,155	4,677,807
	4,677,740	4,678,438	4,679,171	4,678,684	4,678,181	4,678,247
	4,677,775	4,678,450	4,679,179	4,678,744	4,678,218	4,678,367
	4,677,796	4,678,459	4,679,191	4,678,812	4,678,235	4,678,893
	4,677,809	4,678,467	4,679,195	4,678,821	4,678,249	4,679,024
	4,677,823	4,678,470	4,679,197	4,678,823	4,678,250	4,679,222
	4,677,834	4,678,470	4,679,204	4,678,848	4,678,331	4,677,764
	4,677,840	4,678,475	4,679,207	4,677,794	4,678,354	4,677,814
	4,677,852	4,678,475	4,679,210	4,677,903	4,678,447	4,677,922
	4,677,886	4,678,472	4,679,227	4,677,906	4,678,454	4,677,994
	4,677,889	4,678,472	4,679,227	4,677,911	4,678,465	4,678,015
	4,677,891	4,678,472	4,677,769	4,677,921	4,678,475	4,678,238
	4,677,892	4,678,472	4,677,795	4,677,978	4,678,481	4,678,843
	4,677,895	4,678,472	4,677,798	4,677,986	4,678,565	4,677,789
	4,677,896	4,678,472	4,677,795	4,678,031	4,678,584	4,677,849
	4,677,916	4,678,472	4,678,031	4,678,068	4,678,584	4,677,970
	4,677,929	4,678,472	4,678,068	4,678,090	4,678,584	4,677,970
	4,677,963	4,678,472	4,678,189	4,678,206	4,678,589	4,678,085
	4,677,977	4,678,472	4,678,359	4,678,387	4,678,595	4,678,117
	4,677,984	4,678,472	4,678,576	4,678,403	4,678,673	4,678,440
	4,677,987	4,678,472	4,678,746	4,678,452	4,678,730	4,678,473
	4,678,002	4,678,472	4,679,170	4,678,512	4,678,779	4,678,532
	4,678,008	4,678,472	4,679,189	4,678,750	4,678,807	4,678,587
	4,678,046	4,678,472	4,679,193	4,679,035	4,678,808	Re.32,451
	4,678,057	4,678,472	4,679,215	4,679,086	4,678,809	3,951,033
	4,678,087	4,678,472	4,679,220	4,679,233	4,678,840	4,677,701
	4,678,092	4,678,472	4,678,576	4,677,694	4,678,871	4,677,932
	4,678,094	4,678,472	4,678,739	4,677,918	4,678,902	4,678,009
	4,678,115	4,678,472	4,678,848	4,678,136	4,678,930	4,678,406
	4,678,135	4,678,472	4,677,823	4,678,517	4,678,987	4,678,461
	4,678,142	4,678,472	4,677,895	4,678,702	4,678,992	4,678,926
	4,678,145	4,678,472	4,678,908	4,678,838	4,679,017	4,679,008
	4,678,185	4,678,472	4,678,938	4,679,164	4,679,028	4,679,012
	4,678,204	4,678,472	4,678,940	4,677,881	4,679,132	4,679,236
	4,678,210	4,678,472	4,678,985	Re.32,452	4,679,153	4,677,772
		4,678,472	4,678,621	4,677,723	4,679,162	4,677,812
		4,678,472	4,678,621	4,677,723	4,679,186	4,677,943

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,677,960	27 :	4,677,791	35 :	4,679,224	4,678,137	4,678,129	4,678,042
4,677,989		4,677,799		4,677,858	4,678,173	4,678,167	4,678,044
4,677,992		4,678,080		4,678,045	4,678,175	4,678,171	4,678,083
4,678,061		4,678,335		4,678,330	4,678,186	4,678,172	4,678,093
4,678,100		4,678,695		4,678,999	4,678,402	4,678,208	4,678,104
4,678,111		4,678,698	36 :	4,677,707	4,678,487	4,678,214	4,678,105
4,678,169		4,678,854		4,677,711	4,678,573	4,678,253	4,678,166
4,678,196		4,678,868		4,677,736	4,678,614	4,678,255	4,678,209
4,678,287		4,678,984		4,677,765	4,678,656	4,678,264	4,678,232
4,678,334		4,679,023		4,677,780	4,678,690	4,678,374	4,678,290
4,678,337		4,679,175		4,677,782	4,678,888	4,678,379	4,678,332
4,678,451		4,679,241		4,677,793	4,679,187	4,678,405	4,678,352
4,678,478	28 :	4,678,269		4,677,797	4,678,896	4,678,448	4,678,392
4,678,520	29 :	4,677,917		4,677,855	4,677,721	4,678,477	4,678,430
4,678,530		4,677,920		4,677,868	4,677,751	4,678,491	4,678,458
4,678,533		4,677,991		4,677,873	4,677,800	4,678,498	4,678,471
4,678,582		4,678,027		4,677,888	4,677,848	4,678,502	4,678,479
4,678,583		4,678,088		4,677,902	4,677,856	4,678,515	4,678,485
4,678,716		4,678,101		4,678,019	4,677,869	4,678,528	4,678,591
4,678,720		4,678,373		4,678,028	4,677,967	4,678,548	4,678,601
4,678,724		4,678,424		4,678,039	4,678,051	4,678,552	4,678,658
4,678,775		4,678,455		4,678,141	4,678,079	4,678,592	4,678,713
4,678,894		4,678,638		4,678,144	4,678,082	4,678,596	4,678,736
4,678,936		4,678,662		4,678,156	4,678,086	4,678,607	4,678,769
4,678,966		4,679,113		4,678,157	4,678,103	4,678,618	4,678,778
4,678,968		4,679,160		4,678,176	4,678,146	4,678,620	4,678,836
4,678,969		3,951,033		4,678,179	4,678,159	4,678,623	4,678,857
4,678,978	30 :	4,678,170		4,678,191	4,678,188	4,678,625	4,678,890
4,678,982	31 :	4,678,058		4,678,217	4,678,219	4,678,627	4,678,997
4,679,039		4,678,647		4,678,229	4,678,380	4,678,628	4,679,001
4,679,075	32 :	Re.32,454		4,678,260	4,678,425	4,678,629	4,679,166
4,679,138		4,677,974		4,678,266	4,678,457	4,678,631	4,679,174
4,679,142		4,678,306		4,678,296	4,678,490	4,678,632	4,679,194
4,679,199		4,678,059		4,678,299	4,678,530	4,678,657	4,679,212
4,679,217	33 :	4,678,891		4,678,300	4,678,544	4,678,719	4,677,968
4,572,253		4,679,009		4,678,301	4,678,561	4,678,760	4,678,524
4,677,702		4,679,118		4,678,303	4,678,562	4,678,784	4,678,752
4,677,722	34 :	Re.32,457		4,678,311	4,678,563	4,678,806	4,678,761
4,677,738		4,677,753		4,678,324	4,678,613	4,678,829	4,678,127
4,677,742		4,677,777		4,678,329	4,678,660	4,678,835	4,677,803
4,677,744		4,677,784		4,678,351	4,678,729	4,678,837	4,677,995
4,677,754		4,677,810		4,678,389	4,678,729	4,678,842	4,678,192
4,677,836		4,677,832		4,678,444	4,678,869	4,678,855	4,678,221
4,677,847		4,677,933		4,678,445	4,678,960	4,678,859	4,678,267
4,677,861		4,677,949		4,678,469	4,678,972	4,678,862	4,678,630
4,677,875		4,678,032		4,678,529	4,678,973	4,678,863	4,679,019
4,677,876		4,678,060		4,678,568	4,679,126	4,678,865	4,679,252
4,677,946		4,678,062		4,678,576	4,679,154	4,679,002	4,677,734
4,677,948		4,678,200		4,678,608	4,679,206	4,679,013	4,677,950
4,677,961		4,678,220		4,678,612	4,679,226	4,679,018	4,678,154
4,677,997		4,678,418		4,678,641	4,679,246	4,679,084	4,678,202
4,678,006		4,678,435		4,678,674	4,679,247	4,679,111	4,678,237
4,678,017		4,678,446		4,678,675	4,679,247	4,679,112	4,678,360
4,678,066		4,678,462		4,678,680	4,679,247	4,679,112	4,678,686
4,678,070		4,678,483		4,678,683	4,679,247	4,679,112	4,678,904
4,678,224		4,678,527		4,678,689	4,679,247	4,679,112	4,678,977
4,678,274		4,678,555		4,678,691	4,679,247	4,679,112	4,679,117
4,678,282		4,678,594		4,678,701	4,679,247	4,679,112	3,964,405
4,678,295		4,678,597		4,678,734	4,679,247	4,679,112	4,677,767
4,678,376		4,678,617		4,678,747	4,679,247	4,679,112	4,678,341
4,678,393		4,678,645		4,678,791	4,679,247	4,679,112	4,678,501
4,678,429		4,678,672		4,678,800	4,679,247	4,679,112	4,678,569
4,678,460		4,678,693		4,678,825	4,679,247	4,679,112	4,678,642
4,678,488		4,678,699		4,678,826	4,679,247	4,679,112	4,678,711
4,678,489		4,678,728		4,678,839	4,679,247	4,679,112	4,677,695
4,678,510		4,678,763		4,678,850	4,679,247	4,679,112	4,677,786
4,678,516		4,678,764		4,678,874	4,679,247	4,679,112	4,677,806
4,678,542		4,678,765		4,678,913	4,679,247	4,679,112	4,677,870
4,678,588		4,678,766		4,678,957	4,679,247	4,679,112	4,677,905
4,678,664		4,678,770		4,678,957	4,679,247	4,679,112	4,677,940
4,678,679		4,678,774		4,679,037	4,679,247	4,679,112	4,677,971
4,678,787		4,678,799		4,679,038	4,679,247	4,679,112	4,678,158
4,678,796		4,678,824		4,679,067	4,679,247	4,679,112	4,678,231
4,678,815		4,678,824		4,679,068	4,679,247	4,679,112	4,678,333
4,678,833		4,678,855		4,679,070	4,679,247	4,679,112	4,678,350
4,678,872		4,679,011		4,679,122	4,679,247	4,679,112	4,678,456
4,678,887		4,679,061		4,679,141	4,679,247	4,679,112	4,678,867
4,678,903		4,679,090		4,679,190	4,679,247	4,679,112	4,678,882
4,678,920		4,679,094		4,679,198	4,679,247	4,679,112	4,678,922
4,678,975		4,679,130		4,677,699	4,679,247	4,679,112	4,678,981
4,679,007		4,679,133	37 :	4,677,887	4,678,096	4,679,247	4,679,242
4,679,085		4,679,144		4,678,084	4,678,108	4,679,247	4,529,787
4,679,152					4,678,121	4,679,247	4,678,205
						4,679,247	4,678,394

## DESIGN PATENTS

04 :	290,730	290,740	290,765	290,739	34 :	290,661	290,725
06 :	290,662	290,754	290,671	290,770		290,669	290,726
	290,664	290,756	290,692	290,771		290,666	290,778
	290,665	290,777	290,670	290,772		290,667	290,660
	290,674	290,679	290,673	290,774		290,667	290,665
	290,703	290,762	290,680	290,774	36 :	290,704	290,741
	290,706	290,668	290,688	290,774		290,708	290,751
	290,707	290,689	290,763	290,774		290,708	290,751
	290,709	290,744	290,731	290,779		290,761	290,747
	290,716	290,745	290,736	290,779		290,761	290,678
	290,718	290,746	290,737	290,779		290,761	290,691
	290,728	290,750	290,738	290,779	37 :	290,672	290,696
	290,729			290,779	39 :	290,724	290,773

## STATUTORY INVENTION REGISTRATIONS

01 :	H299	06 :	H300	H303	24 :	H309	47 :	H298	48 :	H296
	H306		H307	H304	39 :	H297		H301		
	H311	17 :	H302	H313		H310		H305	49 :	H312

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PATENTS  
July 14, 1987

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee: . . . . .	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed: . . . . .	520.00
—Corresponding prior U.S. national application filed: . . . . .	350.00
—Supplemental search fee, per additional invention . . . . .	140.00
European Patent Office as Searching Authority . . . . .	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority . . . . .	370.00
—Additional examination fee, per additional invention . . . . .	125.00
—Searching Authority not the USPTO . . . . .	570.00
—Additional examination fee, per additional invention . . . . .	190.00
International fees	
Basic fee: . . . . .	485.00
Basic Supplemental fee (for each page over 30): . . . . .	10.00
Designation fee for the first 10 national or regional offices: . . . . .	120.00
Designation fee for 11th and subsequent designations: . . . . .	No Charge
Handling fee . . . . .	150.00
Supplement to the handling fee . . . . .	150.00

## U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA . . . . .	170.00	340.00
USPTO was neither ISA nor IPEA . . . . .	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4) . . . . .	25.00	50.00
—For each independent claim in excess of 3 . . . . .	17.00	34.00
—For each claim in excess of 20 . . . . .	6.00	12.00
—For each application containing a multiple dependent claim . . . . .	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1 . . . . .	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1 . . . . .	26.00	26.00

June 2, 1987.  
DONALD J. QUIGG,  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks.

## Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 10, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,458,363 through 4,459,702  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

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U.S. PATENT AND TRADEMARK OFFICE

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(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . \$ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:  
By a small entity (§1.9(f)) . . . . . \$ 225.00  
By other than a small entity . . . . . \$ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . \$ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:  
By a small entity (§1.9(f)) . . . . . \$ 55.00  
By other than a small entity . . . . . \$ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . \$ 500.00"

## Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

## PATENTS WHICH EXPIRED APRIL 26, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,380,833	06/297,778	4/26/83
4,380,835	06/251,961	4/26/83
4,380,842	06/288,272	4/26/83
4,380,848	06/244,720	4/26/83
4,380,850	06/259,951	4/26/83
4,380,867	06/281,668	4/26/83
4,380,874	06/257,657	4/26/83
4,380,877	06/286,397	4/26/83
4,380,884	06/228,175	4/26/83
4,380,885	06/223,929	4/26/83
4,380,888	06/238,990	4/26/83
4,380,889	06/323,718	4/26/83
4,380,895	06/274,285	4/26/83
4,380,902	06/270,892	4/26/83
4,380,926	06/227,564	4/26/83
4,380,931	06/256,750	4/26/83
4,380,936	06/271,638	4/26/83
4,380,951	06/264,449	4/26/83
4,380,953	06/230,240	4/26/83
4,380,958	06/217,349	4/26/83
4,380,962	06/223,614	4/26/83
4,380,969	06/310,737	4/26/83
4,380,970	06/248,499	4/26/83
4,380,973	06/290,598	4/26/83
4,380,987	06/241,585	4/26/83
4,381,002	06/217,881	4/26/83
4,381,009	06/228,937	4/26/83
4,381,024	06/334,646	4/26/83
4,381,028	06/248,796	4/26/83
4,381,030	06/220,506	4/26/83
4,381,040	06/303,188	4/26/83
4,381,041	06/208,699	4/26/83
4,381,055	06/242,673	4/26/83
4,381,068	06/233,039	4/26/83
4,381,071	06/279,733	4/26/83
4,381,075	06/331,722	4/26/83
4,381,078	06/220,501	4/26/83
4,381,083	06/231,067	4/26/83
4,381,097	06/226,003	4/26/83
4,381,100	06/222,147	4/26/83
4,381,101	06/236,947	4/26/83
4,381,109	06/288,219	4/26/83
4,381,110	06/306,657	4/26/83
4,381,112	06/283,439	4/26/83
4,381,113	06/236,720	4/26/83
4,381,116	06/220,304	4/26/83
4,381,122	06/233,621	4/26/83
4,381,123	06/223,828	4/26/83
4,381,125	06/231,393	4/26/83
4,381,150	06/248,376	4/26/83
4,381,156	06/279,032	4/26/83
4,381,174	06/238,786	4/26/83
4,381,183	06/314,007	4/26/83
4,381,185	06/271,912	4/26/83
4,381,191	06/277,019	4/26/83
4,381,205	06/365,531	4/26/83
4,381,206	06/285,163	4/26/83
4,381,228	06/274,084	4/26/83
4,381,240	06/260,681	4/26/83
4,381,242	06/391,597	4/26/83
4,381,243	06/322,871	4/26/83
4,381,266	06/219,201	4/26/83
4,381,281	06/215,161	4/26/83
4,381,285	06/223,755	4/26/83
4,381,287	06/363,367	4/26/83
4,381,298	06/310,390	4/26/83
4,381,304	06/295,179	4/26/83
4,381,310	06/295,276	4/26/83
4,381,317	06/297,620	4/26/83
4,381,367	06/328,009	4/26/83
4,381,370	06/246,102	4/26/83
4,381,374	06/320,983	4/26/83
4,381,412	06/289,854	4/26/83
4,381,413	06/288,501	4/26/83
4,381,422	06/280,670	4/26/83
4,381,423	06/249,703	4/26/83
4,381,425	06/231,430	4/26/83
4,381,428	06/262,362	4/26/83
4,381,434	06/217,605	4/26/83
4,381,435	06/222,183	4/26/83
4,381,440	06/228,511	4/26/83
4,381,442	06/277,027	4/26/83
4,381,443	06/322,084	4/26/83
4,381,448	06/297,795	4/26/83
4,381,457	06/286,278	4/26/83
4,381,466	06/244,080	4/26/83
4,381,486	06/237,846	4/26/83
4,381,501	06/248,820	4/26/83
4,381,504	06/229,942	4/26/83

Patent Number	Serial Number	Issue Date
4,381,509	06/237,020	4/26/83
4,381,511	06/259,053	4/26/83
4,381,537	06/337,074	4/26/83
4,381,558	06/267,037	4/26/83

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

**4,394,569**, Re. S.N. 050,275, Filed May 13, 1987, Cl. 250/204, FOCUS DETECTING METHOD AND APPARATUS, Kazuo Nakamura, Owner of Record: *Asahi Kogaku, Tokyo, Japan*, Attorney or Agent: John H. Mion, et al., Ex. Gp.: 255

**4,518,860**, Re. S.N. 053,091, Filed May 20, 1987, Cl. 250/253, COMPACT DETECTOR FOR RADON AND RADON DAUGHTER PRODUCTS, H. Ward Alter, et al., Owner of Record: *Terradex Corp., Walnut Creek, Calif.*, Attorney or Agent: Richard R. Trexler, et al., Ex. Gp.: 256

**4,525,417**, Re. S.N. 051,989, Filed May 19, 1987, Cl. 428/244, CARBON CONTAINING SLIDING LAYER, Heinz Dimigen, et al., Owner of Record: *U.S. Philips Corp., New York, N.Y.*, Attorney or Agent: Thomas A. Briody, et al., Ex. Gp.: 154

**4,615,895**, Re. S.N. 053,129, Filed May 22, 1987, Cl. 426/523, FORCED AIR/GAS BURNER AND BAKING OVEN INCORPORATING SAME, Amal C. Bhattacharjee, Owner of Record: *Nabisco Brand, Inc., Parsippany, N.J.*, Attorney or Agent: Richard Kornutik, Ex. Gp.: 132

## REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

## No Publications This Issue.

## Patent Term Extended Under 35 USC 156

A certificate extending the term of the following patent was issued on June 19, 1987.

Patent No. 4,243,775, granted Jan. 6, 1981, to Rosenshaft, et al., Owner of Record: *American Cyanamid Co.*, Title: *SYNTHETIC POLYESTER SURGICAL ARTICLES*, Classification: 525-415, Term Extended: 2 years

Patent and Trademark Office  
Board of Patent Appeals and Interferences Vacancies

The Board of Patent Appeals and Interferences will be filling a number of Examiner-in-Chief vacancies over the next several months. Positions are available in chemical, electrical, and mechanical technologies. Persons interested in being considered for these vacancies are invited to submit individual applications for each of the following vacancy announcements:

PTO-87-A6-chemical technology, PTO-87-A7-electrical technology, and PTO-87-A8-mechanical technology. There is no deadline for submitting applications. However, candidates are urged to apply as soon as possible since applications will be accepted only until the positions are filled.

Excerpts from the vacancy announcements describing the duties of the position, qualification requirements, factors to be used in evaluating candidates, and necessary application materials are listed below.

**Duties:** Serves as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office. As an Examiner-in-Chief, participates in the Board's appellate and administrative responsibilities and exercises independent judgment on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner, and may be responsible for conducting interlocutory proceedings in interference and for determining questions of priority of invention and patentability between interference parties. Appeals filed in accordance with 35 USC 134 and interferences declared in accordance with 35 USC 135 involve complex legal and technical questions. The Board of Patent Appeals and Interferences has the sole power to:

- (1) hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents, for reissue of patents, and for reexamination of patents;
- (2) to declare and to conduct proceedings in interferences; and
- (3) to determine priority of invention.

Final decisions of the Board, if unfavorable to an applicant, or to a party to an interference, may be appealed to the United States Court of Appeals for the Federal Circuit or civil action may be taken in accordance with 35 USC 145, or 35 USC 146.

**Qualification requirements:** In addition to a technical degree, candidates must possess:

- (1) A minimum of five years of comprehensive patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office;
- (2) A law degree and membership in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution;
- (3) A high degree of demonstrated competence in chemical, electrical, or mechanical technology;
- (4) A high degree of demonstrated competence and knowledge of interference law and practice;
- (5) Demonstrated ability to determine whether or not tests which are submitted in evidence are technically sufficient to prove the question at hand;
- (6) Demonstrated ability to write clearly, and to write logically developed opinions;
- (7) Demonstrated ability to use legal and technical background to evaluate testimony of witnesses;
- (8) Demonstrated ability to deal effectively with people within and outside the Patent and Trademark Office; and
- (9) Comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

**Factors which will be considered in evaluating qualified candidates:** Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals and questionnaire responses.

## Interested candidates should submit the following:

- (1) Personal Qualifications Statement, SF-171;
- (2) Merit Program Interest Statement, CD-261 (PTO employees only);
- (3) Current supervisory appraisal on your agency's form or on CD-362 (letters of reference for outside candidates);
- (4) Annual narrative performance rating, or equivalent;
- (5) Examiner-in-Chief Questionnaires; and
- (6) Samples which evidence your writing ability.

Questions concerning this notice and requests for application materials should be directed to Ms. Suzanne Waddill, Office of Personnel, One Crystal Park, Suite 700, Arlington, Va., telephone (703) 557-3631.

Feb. 3, 1987.  
**DONALD W. PETERSON,**  
*Deputy Assistant Secretary  
and Deputy Commissioner for  
Patents and Trademarks.*

Department of Commerce  
Patent and Trademark Office  
37 CFR Part 1  
[Docket No. 50103-7058]

## Arbitration of Patent Interference Cases

**Agency:** Patent and Trademark Office, Commerce.  
**Action:** Final rule.

**Summary:** The Patent and Trademark Office is amending its rules to implement the arbitration provisions of section 105 of the Patent Law Amendments Act of 1984, Pub. L. 98-622.

**Effective Date:** May 27, 1987.

**For Further Information Contact:** Ian A. Calvert or Michael Sofocleous by telephone at (703) 557-4000 or by mail marked to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

**Supplementary Information:** Section 105 of the Patent Law Amendments Act of 1984, enacted Nov. 8, 1984, provides for the arbitration of patent interference cases. Section 105, codified as 35 U.S.C. 135(d), provides:

Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.

The Patent and Trademark Office (PTO) conducts interference proceedings to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patent contain claims for the same patentable invention. Patent interference cases can be quite expensive. Arbitration may prove useful to minimize expenses in interference cases. The arbitration rule applies to all pending interferences.

The PTO published an advance notice of rulemaking in the Federal Register of Jan. 16, 1985 (50 FR 2294-2296). The notice was also published in the *Official Gazette* on Feb. 12, 1985 (1051 O.G. 9-10). The notice also appeared in the Bureau of National Affairs' Patent, Trademark and Copyright Journal, Vol. 29, p. 310 (Jan. 24, 1985), hereinafter "BNA." Five written comments were received in response to the advance notice.

A notice of proposed rulemaking was published in the Federal Register on Sept. 15, 1986 (51 FR 32756-32762), in the *Official Gazette* on Oct. 21, 1986 (1071 O.G. 25-31), and in BNA's Patent, Trademark and Copyright Journal, Vol. 32, pp. 552-558 (Sept. 18, 1986). In response to the notice, three comments, two in writing and one by telephone, were received. These comments are discussed herein.

All written comments are available for public inspection in Rm. 10C01, Crystal Gateway 2, 1225 Jefferson Davis Hwy., Arlington, Va.

## Discussion of the Rule

Under §1.690 the arbitrator can determine issues of patentability as between the parties but a determination by him or her that the subject matter is patentable would not be binding upon the PTO. If the arbitrator's award holds that a party's claims corresponding to the count are unpatentable over prior art or under 35 U.S.C. 112, that determination would be binding on that party vis-a-vis the party's opponent and would result in a judgment adverse to that party. The judgment, however, would not discharge the duty that each party has under 37 CFR 1.56 to bring to the attention of the examiner in charge of its respective application any prior art and/or reason relied upon by the arbitrator in the determination of unpatentability.

It is the longstanding practice of the PTO to favor the settlement of interferences and the PTO looks with favor on all proper efforts in that direction as being conducive to the termination of the proceeding. See 4 Revisé and Caesar, *Interference Law and Practice*, section 861, p. 2956 (Michie Co. 1948) and the Commissioner's Notice of Nov. 9, 1976, titled, "Extensions of Time and Filing of Papers in Interferences," 953 *Official Gazette* 2 (Dec. 7, 1976). In this regard, the notice states that:

... stipulation or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Consequently, the examiner-in-chief may give favorable consideration to a motion for an extension of time for purposes of settlement; however, a further motion for an extension for that purpose would not be granted unless it is accompanied by a schedule of specific dates showing that the parties will make a good faith effort to promptly terminate the proceeding. If preliminary motions under 37 CFR 1.633 have not been filed, the examiner-in-chief would not normally extend the time for their filing merely for purposes of settlement. In these circumstances, the examiner-in-chief would require that the preliminary motions be filed or that their filing be waived.

If the proceeding is in the testimony stage, the examiner-in-chief could grant the parties' motion to extend all the unexpired testimony times to close concurrently on the date the record is due provided they file a stipulation that any evidence to be submitted will be in one of the forms specified in 37 CFR 1.672(e) and (f), i.e., affidavit testimony or a stipulation either as to what a particular witness would testify to if called or the facts in the case of any party.



Analogously, the aforesaid practice would apply to arbitration. Section 1.690 requires that parties who intend to arbitrate an interference notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within 20 days of its execution. Pursuant to 35 U.S.C. 135(c) an agreement to arbitrate is considered to be one "made in connection with and in contemplation of the termination of the interference". The agreement must be in writing a copy filed in the PTO within 20 days after its execution. The notification of intention to arbitrate must be made in a separate paper. Merely incorporating the notification in the agreement is not sufficient to comply with §1.690(a). The parties also will be required to adhere to a time schedule approved by the examiner-in-chief such that the interference proceeding can be expeditiously resolved so as to prevent the unnecessary postponement of the beginning of the running of the term of any patent resulting from an application involved in the interference. *Pritchard v. Loughlin*, 361 F.2d 483, 149 USPQ 841 (CCPA 1966).

If the parties desire to arbitrate an interference prior to the close of the motion period, the examiner-in-chief will not normally grant an extension of time for the purpose. The parties will be required to file their preliminary motions under 37 CFR 1.633. After the motions are filed, the examiner-in-chief could grant an extension only upon compliance with 37 CFR 1.645 which requires a showing of "good cause." Such a "good cause" showing would normally include a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

Section 1.690(a) requires that an arbitration agreement include the following:

- (1) The name of the arbitrator or a date certain (not more than 30 days after the execution of the agreement) for his or her selection.
- (2) The issues to be decided by the arbitrator.
- (3) A provision that the arbitrator's award is binding on the parties and that the Board can enter a judgment based thereon.

Section 1.690(c) requires that a copy of the arbitration award be filed within 20 days from the date of the award or by a date set by the examiner-in-chief.

If the proceeding is in the testimony stage and the parties desire to arbitrate, the examiner-in-chief could grant a reasonable extension for that purpose. A motion for a further extension for that purpose would not be granted unless it were accompanied by a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority, and (3) terminating the interference. If the parties are to submit the required schedule, a motion for a further extension could be granted. If the parties file a copy of the arbitration agreement and they agree that any evidence submitted in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f), the examiner-in-chief could give favorable consideration to the parties' motion that all the unexpired times be extended to close concurrently on the date the record is due. By that date, the parties would be required to file the arbitrator's award and their records, if necessary for the resolution of any issue not decided by the arbitrator. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would set brief times so that parties could explain their evidence relating to any issues which the arbitrator did not, or was unable to decide. For example, the award might be dispositive of the issue of priority between the parties and leave for the Board's determination the question of substituting a new count raised in a preliminary motion under 37 CFR 1.633.

The arbitration award, filed by the parties, would be in the nature of a final decision and should include the following:

- (1) The style (e.g., *Jones v. Smith*), the number of the interference and the names of the real parties in interest.
  - (2) The subject matter in issue, i.e., the counts and a table of counts, if necessary, indicating the relationship of the parties' claims corresponding to each count and those claims not corresponding thereto.
  - (3) The issues for decision before the arbitrator.
  - (4) The arbitrator's decision. The decision may also include a statement of the grounds and reasoning in support thereof.
  - (5) A summary, if appropriate, indicating, *inter alia*, that judgment should be awarded to one of the parties.
- Any party to the arbitration can attack the award only in the manner provided by 9 U.S.C. 10 and 11. 9 U.S.C. 10 reads as follows:

In either of the following cases the United States court in and for the district wherein the award was made may make an order vacating the award upon the application of any party to the arbitration—

- (a) Where the award was procured by corruption, fraud, or undue means.
- (b) Where there was evident partiality or corruption in the arbitrators, or either of them.
- (c) Where the arbitrators were guilty of misconduct in refusing to postpone the hearing, upon sufficient cause shown, or in refusing to hear evidence pertinent and material to the controversy; or of any other misbehavior by which the rights of any party have been prejudiced.
- (d) Where the arbitrators exceeded their powers, or so imperfectly executed them that a mutual, final, and definite award upon the subject matter submitted was not made.
- (e) Where an award is vacated and the time within which the agreement required the award to be made has not expired the court may, in its discretion, direct a rehearing by the arbitrators.

9 U.S.C. 11 reads as follows:

In either of the following cases, the United States court in and for the district wherein the award was made may make an order modifying or correcting the award upon the application of any party to the arbitration—

- (a) Where there was an evident material miscalculation of figures or an evident material mistake in the description of any person, thing, or property referred to in the award.
  - (b) Where the arbitrators have awarded upon a matter not submitted to them, unless it is a matter not affecting the merits of the decision upon the matter submitted.
  - (c) Where the award is imperfect in matter of form not affecting the merits of the controversy.
- The order may modify and correct the award, so as to effect the intent thereof and promote justice between the parties.

See, for example, *Fairchild and Co., Inc. v. Richmond, F. and P. R. Co.*, 516 F.Supp. 1305 (D.D.C. 1981). If such an attack were to be made by one of the parties while the interference is pending before the Board, the Board would not stay the interference. Rather, the Board would issue its judgment in accordance with the award. So long as the award is in compliance with § 1.690, it would carry the presumption that the arbitrator acted correctly in making his decision and accordingly, the party designated by the award as the prevailing party would be entitled *prima facie* to a judgment in its favor. If the dissatisfied party brings an action in an appropriate United States district court and if the court vacates, modifies or corrects the award, the Board would take action consistent with the court's findings. No action would lie in the PTO to vacate or correct an arbitration award, unless all parties agreed in writing.

The following examples illustrate the practice of the PTO concerning arbitration.

#### Example 1

##### Arbitration Practice—Preliminary Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37

CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The parties decide to arbitrate the interference in accordance with §1.690 and file a motion for an extension of time so that they can "freely" arbitrate the interference, but do not file a waiver of their right to file motions.

The examiner-in-chief would deny the motion because the parties' intention to arbitrate, in and of itself, does not constitute a showing of "good cause" within the meaning of 37 CFR 1.645(a). Even if the parties file an agreement to arbitrate, the PTO would not grant any extension of time to permit the parties to "freely" arbitrate an interference prior to the expiration of the time for filing preliminary motions.

#### Example 2

##### Arbitration Practice—Testimony Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633. The parties file preliminary motions; the examiner-in-chief renders a decision thereon and sets the testimony times. The parties file a notice of intent to arbitrate the interference under §1.690(a) and a motion for a one month extension of the testimony times. The examiner-in-chief could grant the motion, but would indicate that if the parties file another motion for an extension for that purpose, the motion must be accompanied by a schedule, agreed to by the parties, setting forth the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

The parties file a motion for an additional one month extension of time to permit the parties to arbitrate the interference. Accompanying the motion is a proposed schedule of times and a copy of the arbitration agreement which provides, *inter alia*, (i) the name of the arbitrator or a date certain for his selection, (ii) that the arbitrator's award will be binding on the parties, (iii) the issues to be decided by the arbitrator and (iv) that the award will be filed by the date the record is due. The parties also indicate that the evidence to be filed in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f). The examiner-in-chief could grant the motion and indicate that he will give favorable consideration to a motion to extend all the unexpired times to close concurrently on the date the record is due should the parties request such.

On the date for filing the record, the parties file the arbitrator's award and their evidentiary records, if necessary. The award states (i) the style and number of the interference and the real parties in interest, (ii) the subject matter in issue and the parties' claims which correspond thereto and which do not correspond thereto, (iii) the issues for decision before the arbitrator, (iv) the arbitrator's decision (which may include a statement of the grounds and reasoning in support thereof) and (v) that judgment should be awarded to one of the parties. The examiner-in-chief examines the award to ensure that it complies with § 1.690 and is dispositive of the issues in the interference which can be decided by the arbitrator. If the award is otherwise acceptable, the Board would issue a judgment based on the award. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would determine how the interference will proceed.

#### Example 3

##### Arbitration Practice—Award Decides Interference-in-Fact Issue and Junior Party Takes No Testimony

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(b) on the ground that there is no interference-in-fact between his

claims corresponding to the count and his opponent's claims corresponding thereto. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. On the date for filing the record, the junior party files the award together with a motion requesting that the interference be terminated in view of the award. He does not file a record. In his award the arbitrator holds that no interference-in-fact exists between the parties' claims corresponding to the count.

The motion would be denied because the award decides a matter of patentability which would not result in a judgment adverse to one of the parties. Consequently, the junior party would be placed under an order to show cause why judgment under 37 CFR 1.652 should not be entered against him for his failure to file an evidentiary record by the time set therefore. In response to the order, the junior party requests final hearing to review the examiner-in-chief's denial of the motion for judgment and a testimony period to show no interference-in-fact. The examiner-in-chief would grant the junior party's request to the extent that final hearing is set and would deny the request for testimony because the junior party already had the opportunity to take testimony on the matter.

#### Example 4

##### Arbitration Practice—Cannot Decide Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to the count are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to the count. In response to the order, the senior party files a paper in accordance with 37 CFR 1.640(e) purportedly showing good cause why judgment should not be entered in accordance with the order and a motion requesting permission to arbitrate the patentability issue. The examiner-in-chief would deny the motion. The arbitrator is without authority to establish vis-a-vis the public that the subject matter of the court is patentable. Thus, the arbitration will serve no useful purpose. The Board would consider the senior party's paper and enter an appropriate order.

#### Example 5

##### Arbitration Practice—Award After Decision on Motions

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to counts 1 and 2 are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion with respect to count 1, denies the motion with respect to count 2 and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to count 1. The senior party files a paper in accordance with 37 CFR 1.640(e); the junior party, a response thereto. The Board considers the paper and the response thereto and based on the record enters judgment adverse to both parties as to count 1. Thereafter, the examiner-in-chief examines the preliminary statements and sets dates for taking testimony and filing the record.



During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator decides that judgment should be awarded to the junior party. On the date for filing the record, both parties file the award together with a motion requesting that the interference be terminated in view of the award. No record is filed.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to count 2.

#### Example 6

##### Arbitration Practice—Award Decides Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions for judgment under 37 CFR 1.633 are filed and after the examination of the preliminary statements, the examiner-in-chief sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator finds (1) that the evidence is insufficient to establish a prior public use bar under 35 U.S.C. 102(b) against the junior party, (2) that the claims of the junior party corresponding to the count are patentable under 35 U.S.C. 103 over the prior art cited by the senior party to the junior party, and (3) that judgment on priority should be awarded to junior party. On the date for filing together with a motion requesting that the interference be terminated in view of the award.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to the count. After the termination of the proceeding, each party has the duty under 37 CFR 1.56 to bring before the primary examiner the evidence concerning the purported public use bar and the prior art cited by the senior party and/or considered by the arbitrator.

#### Example 7

##### Arbitration Practice—Award Grants Priority to Junior Party Contingent Upon Granting of Preliminary Motion Under 1.633(C)

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion under 37 CFR 1.633(c)(1) to substitute another count. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and enter into an arbitration agreement which is approved by the examiner-in-chief. The agreement provides that any evidence to be submitted by the parties will be in the form of a stipulation under 37 CFR 1.672(e) and (f). The parties file a motion requesting that all the unexpired testimony times be extended to close concurrently on the date the record is due. The motion would be granted.

On the date for filing the record, the junior party files his record and the award. The award states, inter alia, that if the Board at final hearing should grant the junior party's motion under 37 CFR 1.633(c)(1) to substitute a new count, judgment should be awarded to the junior party based on the evidence. Otherwise, the award states that judgment should be awarded to the senior party.

The examiner-in-chief sets the brief times and after the filing thereof the interference would be set for final

hearing so that the Board can review the examiner-in-chief's denial of the junior party's motion under 37 CFR 1.633(c) and issue an appropriate judgment based on the award.

#### Example 8

##### Arbitration Practice—Award Attacked

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No preliminary motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief.

On the date for filing the record, both parties file their records. The junior party files the award which states that judgment should be awarded to him and a motion for judgment based on that award. The senior party files an opposition to the motion for judgment on the grounds (i) that the award contains errors of law, (ii) that the award was procured by "corruption, fraud or undue means" in violation of 9 U.S.C. 10(a), and (iii) that the arbitrator exhibited "evident partiality" in violation of 9 U.S.C. 10(b) and was "guilty of misconduct" in refusing to hear evidence pertinent and material" to the interference, citing 9 U.S.C. 10(c).

The Board would grant the judgment based on the award, holding that the senior party is not entitled to a patent containing his claims corresponding to the count. So long as the award is in compliance with the provisions of §1.690, it would carry a presumption that the arbitrator acted properly in all respects. Consequently, before the PTO the award is binding upon the parties and the junior party is *prima facie* entitled to a judgment in its favor. Thus, no action lies in the PTO as regards the matter raised by the senior party. The senior party's action lies in an appropriate United States district court and the PTO would take any action consistent with the court's decision.

#### Example 9

##### Arbitration Practice—Award Cannot Modify Board's Final Decision

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of their intent to arbitrate nor do they file a copy of the agreement in the interference. Both parties timely file their records and briefs. Both waive oral argument. The Board enters a final decision after consideration of the evidence in favor of the senior party.

The junior party requests reconsideration of the Board's final decision, submits a copy of the arbitration award and moves that the Board set aside its final decision and enter judgment in his favor based on the award. In support of its request, the junior party cites 9 U.S.C. 9, which provides that "any party to the arbitration may apply to the court so specified for an order confirming the award" and 35 U.S.C. 135(d) which provides that title 9 applies to interference arbitrations.

The Board would deny the motion to set aside. The parties did not comply with §1.690(a), i.e., notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within twenty (20) days of its execution. The denial of the motion is an appropriate sanction under 37 CFR 1.616.

Such action by the Board is considered consistent with long-standing interference practice. Cf. *Humphrey v. Fickert*, 1904 Dec. Comm'r. Pat. 447 (Comm'r. 1904) wherein the Board, after it had considered the evidence, refused to set aside its award of priority to Fickert and act upon the Fickert's concession of priority in favor of Humphrey, the losing party.

#### Example 10

##### Arbitration Award Filed With Record—No Notice to Examiner-In-Chief

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of the agreement. The junior party timely files its record together with a copy of the arbitration award and a motion for judgment based on the award.

The motion would be denied. Under the provisions of 37 CFR 1.616, the examiner-in-chief would place both parties under an order to show cause why judgment should not be rendered against them for their failure to comply with 1.690(a), i.e., failing to notify him of their intent to arbitrate and file a copy of the arbitration agreement.

#### Discussion of Comments

One commentator suggested that the expression "An interference or any aspect thereof shall be arbitrated" in part (b) of proposed §1.690 might be construed as going beyond the terms of the statute by authorizing an examiner-in-chief to require the parties to arbitrate an interference, and proposed that the quoted language be changed to "An arbitration proceeding under this section shall be conducted." To eliminate any possible misconstruction of the rule, this proposal has been adopted.

A second commentator suggested, by telephone, that a provision be added to proposed §1.690 requiring that the arbitrator be familiar with United States interference practice, and that United States law be applied by the arbitrator in making the determination. He expressed the fear that a foreign arbitrator might reach a result contrary to established domestic law.

This suggestion has not been adopted. It is incumbent upon the parties to select the arbitrator, and to satisfy themselves as to his or her qualifications. Presumably if the arbitrator's decision is contrary to established law, any resulting patent would be subject to attack on that ground by a third party in subsequent litigation.

Another commentator stated that, with the arbitration rule, the PTO was "attempting to apply a band-aid to a system which cannot be cured by application of a band-aid," and that the first-to-file system should be adopted in place of the first-to-invent system. This suggestion is obviously far beyond the scope of the rule change under consideration. The first-to-invent system is mandated by statute and could not be replaced merely by a change in the rules. The purpose of §1.690 is to establish a specific procedure governing the optional arbitration of interferences provided by section 105 of Pub. L. 98-622.

#### Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources.

The rule is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) because arbitration intended to minimize expenses in interference cases.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effects on the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

#### List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 135, Part 1 of Title 37 CFR is amended as follows:

#### PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. New §1.690 is added to Subpart E to read as follows:

#### §1.690 Arbitration of Interferences.

(a) Parties to a patent interference may determine the interference or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of Title 9, United States Code. The parties must notify the Board in writing of their intention to arbitrate. An agreement to arbitrate must be in writing, specify the issues to be arbitrated, the name of the arbitrator or a date not more than thirty (30) days after the execution of the agreement for the selection of the arbitrator, and provide that the arbitrator's award shall be binding on the parties and that judgment thereon can be entered by the Board. A copy of the agreement must be filed within twenty (20) days after its execution. The parties shall be solely responsible for the selection of the arbitrator and the rules for conducting proceedings before the arbitrator. Issues not disposed of by arbitration will be resolved in accordance with the procedures established in 37 CFR, Subpart E of Part 1, as determined by the examiner-in-chief.

(b) An arbitration proceeding under this section shall be conducted within such time as may be authorized on a case-by-case basis by an examiner-in-chief.

(c) An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner (1) the issue or issues arbitrated and (2) the disposition of each issue. The award may also include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an examiner-in-chief, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.



(d) An arbitration award shall not preclude the Office from determining patentability of any invention involved in the interference.

Mar. 16, 1987. **DONALD J. QUIGG,**  
*Assistant Secretary and  
Commissioner of Patents  
and Trademarks.*

[FR Doc. 87-9373 Filed 4-24-87; 8:45 am]  
BILLING CODE 3510-16-M

#### Registration to Practice

The results of the examination for registration to practice before the United States Patent and Trademark Office held on Apr. 7, 1987 were mailed to 89 candidates. The following list contains the names of persons who successfully passed the examination. Persons entitled at this time to receive provisional recognition pursuant to 37 CFR 10.9(a) have been given the same to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before Aug. 10, 1987.

Adams, William V., 4721 Playfield St., Annandale, Va. 22003  
Alexander, Daniel R., 5616 Bismach Dr., #03, Alexandria, Va. 22312  
Antler, Adriane M., 167 E. 77th St., #20, New York, N.Y. 10021  
Barclay, Michael, 3282 Granville Ave., Los Angeles, Calif. 90066  
Bauer, John A., 2401 Calvert St., N.W., Apt. 1017, Washington, D.C. 20008  
Bollinger, James M., 21 Peak St., Stamford, Conn. 06905  
Braden, Stanton C., 1201 S. Eads, Apt. 1810, Arlington, Va. 22202  
Byorick, Judith L., 604 Suburban Ct., #2, Rochester, N.Y. 14620  
Cairns, James A., 48 E. Rosemont Ave., Alexandria, Va. 22301  
Callahan, John T., 1300 Army Navy Dr., #405, Arlington, Va. 22202  
Catania, Richard L., 84-11 261st St., Floral Park, N.Y. 11001  
Clark, Teresa P., 2 Rainstar, Irvine, Calif. 92714  
Clemmons, William B., Jr., 9815 San Lea, Dallas, Tex. 75228  
Coleman, Henry D., 274 Clinton St., Brooklyn, N.Y. 11201  
Conard, Spencer D., 11539 Floyd, Apt. 3906, Overland Park, Kans. 66211  
Cook, Robert T., 2701 Revere 239, Houston, Tex. 77098  
Cornwall, Susan M., 1109 N. Shiawassee, Owosso, Mich. 48867  
Danckers, Andreas M., 600 S. Dearborn, #1011, Chicago, Ill. 60605  
Daniels, Scott M., 8503 Crossley Pl., Alexandria, Va. 22308  
Davidson, James P., 9215 Deercross Pkwy., #1D, Blue Ash, Ohio 45236  
Delleit, Stephen D., 2379 Briarwest, #89, Houston, Tex. 77077  
Drutchas, Grantland G., 1030 N. State Pkwy., #2B, Chicago, Ill. 60610  
Dunnam, Michael P., 418 Ritchie Pkwy., Rockville, Md. 20852  
Dussault, Kathleen G., 37 Burnett Terr., Maplewood, N.J. 07040  
Farber, Michael B., 1825 S. Glendon Ave., Los Angeles, Calif. 90025  
Farney, William B., 4718 Falcon St., Rockville, Md. 20853  
Fedus, Ronald C., P.O. Box 767, Fairview, N.J. 07022-0767  
Field, Sandra G., 137 Raab Ave., Bloomfield, N.J. 07003  
Frankfort, Howard M., 332 E. 73rd St., #5B, New York, N.Y. 10021  
Freed, Robert C., 1488 Holton St., St. Paul, Minn. 55108  
Genest, Allegra A., 11302 S.W. 133 Pl., Miami, Fla. 33186  
Giarratana, Mark, 19 Gray St., Hartford, Conn. 06105  
Hall, Jeffrey A., 212 Clinton St., Santa Cruz, Calif. 95062  
Haverstock, Thomas B., 437 Ruthven Ave., Palo Alto, Calif. 94301  
Hersko, Bart S., 2513D Walden Glen Cir., Cincinnati, Ohio 45231  
Hervey, William G., 603 Noble Forest Dr., Norcross, Ga. 30092  
Hunn, Melvin A., 1221 Vincent, Apt. 1025, Fort Worth, Tex. 76112  
Huscroft, Carey B., 4849 El Cemente Ave., #127, Davis, Calif. 95616  
Isaac, Christopher P., 6180 Edsall Rd., #104, Alexandria, Va. 22304  
Jarvis, Thomas L., 250 Hart Blvd., Staten Island, N.Y. 10301  
Kirkpatrick, Anita M., 3937 Tennyson St., San Diego, Calif. 92107  
Kotin, Sandra M., P.O. Box 30, Monticello, N.Y. 12701  
Krause, Joseph P., 5812 W. 101st St., Oak Lawn, Ill. 60453  
Lazar, Steven R., 110-55 72nd Rd., #506, Forest Hills, N.Y. 11375  
Leith, Debra K., 1012 N. 39th, Seattle, Wash. 98103  
Lemack, Kevin Scott, 25 Willis St., #27, Framingham, Mass. 01701  
Lipovsky, Peter A., 917B W. Perdew, Ridgecrest, Calif. 93555  
Lueders, Daniel J., 702 E. 63rd Pl., #2, Indianapolis, Ind. 46220  
Martin, Flory L., Rte. 3, Box 298 Steele Rd., Versailles, Ky. 40383  
Mellott, Deborah L., 42 Commonwealth Dr., Basking Ridge, N.J. 07920  
Nilsson, Nils E., 77 Fir Hill, Apt. 4-B-12, Akron, Ohio 44304  
Norton, Richard E., P.O. Box 2227, Corrales, N. Mex. 87048  
Olszewski, I. Monica, 2558 Euclid Hgts., Cleveland Hgts., Ohio 44106  
O'Neill, Michael K., 332 Forest Glen Ave., Franklin Lakes, N.J. 07417  
Oster, Jeffrey B., 55 Southern Slope Dr., Millburn, N.J. 07041  
Panian, Michael G., 812 Highview St., Pittsburgh, Pa. 15206  
Parr, Richard S., 35 Charles St., Metuchen, N.J. 08840  
Penn, Jonathan B., 344 E. 63rd St., Apt. 11B, New York, N.Y. 10021  
Pennington, Edward A., Rte. 2, Box 63, Warrenton, Va. 22186  
Pfrang, Douglas E., 2218 Allied Dr., Apt. 3, Madison, Wis. 53711  
Picard, Roberta A., 6100 Edsall Rd., Apt. 302, Alexandria, Va. 22304  
Powell, Kenneth J., 265 Woodstock, Gates Mills, Ohio 44040  
Prael, Eric L., 188 Chestnut Ave., Jamaica Plain, Mass. 02130  
Preston, Susan L., 3120 S.W. 302 Pl., Federal Way, Wash. 98023  
Radke, Terrance J., 50 Court La., Concord, Mass. 01742  
Randall, Tipton L., 3842 Woodland Ridge Rd., Wausau, Wis. 54401  
Rickman, Janine P., 1943 Selby, #201, Los Angeles, Calif. 90025

Ritchey, James M., 4420 New York Ave., Fair Oaks, Calif. 95628  
Ruhr, Paula S., 1300 Marriet Ct., Midland, Mich. 48640  
Rutkowski, Peter T., 459 Old Town Ct., Alexandria, Va. 22314  
Sako, Katie E., 2327 Boylston E., Apt. 2, Seattle, Wash. 98102  
Savage, Michael G., 1600 N. Oak St., #108, Arlington, Va. 22209  
Sharkey, Richard G., 2505 N.E. 137th St., Seattle, Wash. 98125  
Sias, Stacey R., 37 Carlson Ct., San Anselmo, Calif. 94950  
Sidor, Karl V., 714-G N. Sanders St., Ridgecrest, Calif. 93555  
Small, Jonathan A., 2208 Broderick St., San Francisco, Calif. 94115  
Sorrentino, Joseph M., 6101 Edsall Rd., Apt. 501, Alexandria, Va. 22304  
Stephens, Lawrence K., 12536 Arnsley Ct., Herndon, Va. 22071  
Tan, Steven Wheeler, 160 Bent Tree Dr., #3A, Fairfield, Ohio 45014  
Thomas, Dirk D., 2630 East-West Hwy., Chevy Chase, Md. 20815  
Tribble, Jack L., 110 Edgemont Rd., Montclair, N.J. 07043  
Trzyna, Peter K., Cadwalader, Wickersham & Taft, 1333 N. Hampshire Ave., N.W., Washington, D.C. 20036  
Walker, Paul M., Jr., 600 Haverford Rd., Ridley Park, Pa. 19078  
White, John M., 3153-B Anchorway Ct., Falls Church, Va. 22042  
Whitham, Michael E., 10858 Monticello Ct., Great Falls, Va. 22066  
Wiegand, Brian J., 20 Gilbert Ave., Paramus, N.J. 07652  
Wilson, Casey F., 2203-A 25th Ave. S., Nashville, Tenn. 37212  
Winter, Daryl B., 2145 Dexter Ave. N., #106, Seattle, Wash. 98109  
Wolin, Harry A., 2740 N. Tomahawk, Tucson, Ariz. 85749

June 16, 1987. **CAMERON WEIFFENBACH,**  
*Director, Office of  
Enrollment & Discipline.*

#### Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before Aug. 10, 1987.

Brown, Theresa A., 3180 S. Albion St., Denver, Colo. 80222  
Chapman, Terryence F., 3439 Fawn Cove, #5, Portage, Mich. 49002  
Ciarrante, Anthony V., 4310 Brinkley Rd., Temple Hills, Md. 10748  
Heaney, Brion P., 3329 Ardley Ct., Falls Church, Va. 22041  
Hirama, Tokuo, Smart & Biggar, P.O. Box 2999, Sta. D., Ottawa, Ont., Canada K1P 5Y6  
Ladd, Thomas A., 1804 17th Ave., Menominee, Mich. 49858

Malech, Panicia H., 4115 Davis Pl., N.W., #105, Washington, D.C. 20007  
McFarland, James D., 3485-C Reynard Way, San Diego, Calif. 92103  
Meyer, Dena, 1303 N. Scott St., Wilmington, Del. 19806  
Meyer, Richard S., 815 S. 18th St., #607, Arlington, Va. 22202  
Montes, Raul R., 12035 Arrowhead Glen, Houston, Tex. 77071  
Muccino, Richard R., RD 3, Box 539, Ringoes, N.J. 08551  
Murray, Michael M., 7436 Chummley Ct., Falls Church, Va. 22043  
Schad, Steven P., 2436 King Bridge Terr., Kentwood, Mich. 49506  
Smith, Randolph A., 4916 Rock Spring Rd., Arlington, Va. 22207  
Tucker, Albert M., 2729 Erlene Ave., #1070, Cincinnati, Ohio 45238

June 16, 1987. **CAMERON WEIFFENBACH,**  
*Director, Office of  
Enrollment and Discipline.*

#### Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Counsel Patent and Legal Operation, Corporate Research and Development, General Electric Co., P.O. Box 8, Bldg. K-1, Rm. 4A70, Schenectady, N.Y. 12301.

4,619,904. AGGLUTINATING IMMUNOASSAY USING PROTEIN-COATED LIQUID DROPLETS.  
4,664,808. METHOD FOR CONTINUOUS SEPARATION OF DISSOLVED MATERIALS.

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Group Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, AP2-226, Louisville, Ky. 402253.

3,824,805. COMBINATION ICE CUBE AND CRUSHED ICE DISPENSER SELECTOR MEANS.  
3,942,265. DRYER CONTROL ARRANGEMENT.  
4,329,630. SINGLE TRANSISTOR POWER CONTROL CIRCUIT FOR A DC MOTOR WASHING MACHINE DRIVE.  
4,330,924. METHOD OF FORMING CRIMPED TUBE JOINT.  
4,333,322. MOUNT FOR WASHING MACHINE.  
4,358,932. CONTROL SYSTEM FOR REFRIGERATOR WITH THROUGH-THE-DOOR QUICK-CHILLING SERVICE.  
4,409,532. START CONTROL ARRANGEMENT FOR SPLIT PHASE INDUCTION MOTOR.  
4,439,995. AN AIR CONDITIONING HEAT PUMP SYSTEM HAVING AN INITIAL FROST MONITORING CONTROL MEANS.  
4,445,344. REVERSIBLE ROTARY COMPRESSOR.  
4,592,785. PORTEINACEOUS SOIL REMOVAL PROCESS.

- 4,594,481. ELECTRIC TOUCH PAD KEY ASSEMBLY WITH STROKE AMPLIFIER.  
 4,595,855. SYNCHRONOUSLY OPERABLE ELECTRICAL CURRENT SWITCHING APPARATUS.  
 4,604,715. ROBOTIC INSPECTION SYSTEM.  
 4,620,078. POWER CONTROL CIRCUIT FOR MAGNETRON.

- 241,743. COMBINED PENCIL SHARPENER AND CLIP, *Mark Lemieux*, 131 Wilding Ave., Sault Ste. Marie, Ontario, Canada P6A-4V2; (705) 949-1802.  
 3,717,195. AUTOMATIC METAL LOUVERED SAFETY BLIND, *Gaston A. Larranaga*, Lokmaster Security System, 18761 W. North Frederick Ave., Gaithersburg, Md. 20879; (301) 963-4440.  
 3,878,539. PORTABLE ALARM DEVICE FOR HOME, OFFICE AND TRAVEL. ADJUSTABLE SLIDE-BRACKET HOOKS OVER DOOR TOPS IN SECONDS, *Chadyeane Gooding*, 3100-A Spring Hill Rd., Smyrna, Ga. 30080.  
 4,276,474. METHOD AND APPARATUS FOR CONTROLLING CURRENT IN INDUCTIVE

- LOADS, *C. Riverds*, P.O. Box 4757, Woodbridge, Va. 22194.  
 4,584,789. APPARATUS FOR ENHANCING THE DEVELOPMENT OF MICROORGANISMS NEEDED TO PROMOTE THE GROWTH AND DEVELOPMENT OF VEGETATION, *Gilbert and Maurice Jean*, c/o Neil F. Greenblum, Esq., Sandler & Greenblum, 2920 S. Glebe Rd., Arlington, Va. 22206; (703) 739-0333.  
 4,633,853. HOT WATER TANK CHECK VALVE, *Leonard Prill*, 28522 Hillview, Roseville, Mich. 48066.  
 4,649,676. SHELTER CONSTRUCTION, *C. Regina Davey*, c/o Frederick L. Bergert, Law Offices, Nies, Webner, Kurz & Bergert, Suite 700, 1911 Jefferson Davis Hwy., Arlington, Va. 22202.  
 4,662,549. CHILD'S BACKPACK, *Pat M. Dean*, 103 Springfield Pl., Goose Creek, S.C. 29445; (803) 572-7588.

- S.N. 690,888. ROTARY INTERNAL COMBUSTION ENGINE, *Joseph F. Frasca*, 5801 Yorktown Rd., Lorain, Ohio 44053.

## PATENT NOTICES

## Certificates of Correction for the Week of July 14, 1987

D. 288,242	4,618,370	4,636,814	4,648,699
D. 288,977	4,619,935	4,636,824	4,649,080
D. 288,978	4,620,636	4,636,877	4,649,342
4,416,762	4,621,287	4,636,942	4,650,280
4,435,307	4,622,214	4,637,204	4,650,576
4,446,226	4,625,704	4,637,850	4,651,256
4,462,089	4,626,535	4,638,444	4,651,577
4,482,784	4,626,570	4,639,036	4,651,890
4,493,983	4,626,923	4,639,746	4,652,049
4,504,610	4,627,049	4,640,438	4,652,149
4,505,778	4,627,219	4,640,600	4,652,199
4,554,945	4,628,402	4,640,669	4,652,403
4,573,994	4,628,916	4,640,774	4,652,953
4,578,293	4,628,970	4,640,776	4,653,111
4,583,605	4,629,228	4,640,798	4,653,156
4,584,361	4,630,039	4,640,960	4,653,431
4,585,211	4,630,343	4,641,174	4,654,008
4,588,433	4,631,379	4,641,229	4,654,391
4,588,876	4,632,500	4,641,386	4,654,839
4,589,468	4,632,517	4,641,644	4,655,587
4,591,632	4,632,932	4,641,980	4,655,973
4,593,016	4,633,274	4,642,311	4,656,111
4,593,891	4,633,861	4,642,673	4,656,718
4,595,956	4,634,220	4,643,048	4,656,861
4,606,408	4,634,350	4,643,068	4,657,262
4,610,385	4,634,713	4,643,849	4,657,727
4,611,079	4,634,855	4,644,072	4,659,452
4,613,385	4,635,928	4,644,532	4,659,503
4,614,156	4,636,253	4,644,965	4,659,580
4,615,100	4,636,410	4,645,004	4,659,936
4,615,631	4,636,510	4,647,194	4,660,913
4,616,011	4,636,805	4,647,358	4,661,108
4,616,976	4,636,806	4,647,665	4,663,046



# Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

\*Collection organized by subject matter.

## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner  
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 23, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-06-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-06-86
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	4-15-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-08-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-07-85
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-14-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	7-22-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	1-07-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-02-86

**Expiration of patents:** The patents within the range of numbers indicated below expire during May 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,599,579 to 3,514,783, inclusive  
Plant Patents . . . . . None

## REEXAMINATIONS

JULY 14, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

BI 3,464,799 (721st)

GAS DETECTOR

Charles L. Kimbell, P.O. Box 19035, Houston, Tex. 77055

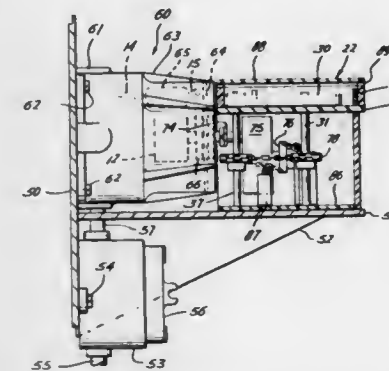
Reexamination Request No. 90/000,043, Aug. 3, 1981.

Reexamination Certificate for Patent No. 3,464,799, issued Sep.

2, 1969, Ser. No. 463,678, Jun. 14, 1965.

Int. Cl.<sup>4</sup> G01N 21/76

U.S. Cl. 422—91



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 7 and 8 is confirmed.

Claims 3, 5 and 6 are now disclaimed.

Claims 1, 2 and 4 were not reexamined.

7. The detector set forth in claim 3, wherein:

(a) said indicator is a strip; and

(b) said means for exposing said indicator strip includes a sealed container for housing said indicator strip and sealing it from the atmosphere except at a slotted portion through which the strip is successively fed externally of the sealed container for exposing to the gas the portion only of said strip moving across said slotted portion of said housing.

BI 3,536,881 (722nd)

CONSTANT CURRENT DENSITY EDM SYSTEM  
CAPABLE OF AUTOMATICALLY RESPONDING TO  
CHANGING MACHINING AREA

Kiyoshi Inoue, Tokyo, Japan, assignor to IJR Inc., Yokohama, Japan

Reexamination Request No. 90/001,001, May 1, 1986.

Reexamination Certificate for Patent No. 3,536,881, issued Oct. 27, 1970, Ser. No. 762,580, Sep. 25, 1968.

Continuation-in-part of Ser. No. 682,824, Nov. 14, 1967, which is a continuation-in-part of Ser. No. 493,473, Oct. 6, 1965, Pat. No. 3,360,683.

Claims priority, application Japan, Oct. 21, 1967, 42-67723; Nov. 27, 1967, 42-76040

Int. Cl.<sup>4</sup> B23P 1/04, 1/08

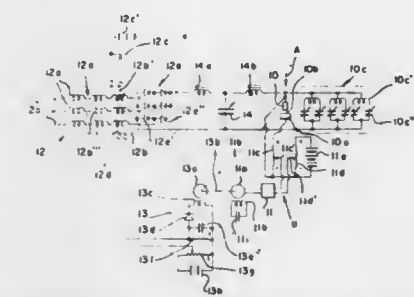
U.S. Cl. 219—69 G

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-20 is confirmed.

1. In a method of machining a workpiece constituting a workpiece electrode by advancing a tool electrode with re-

spect to the workpiece electrode and maintaining a machining gap therebetween flooded with a dielectric coolant, by applying electric pulses across the electrodes to effect electroerosive spark discharge along the workpiece surface juxtaposed with the tool electrode, whereby the surface area over which machining occurs varies during the process, the improvement which comprises the steps of continuously deriving an electri-



cal signal in response to the maintenance of said gap and representing variation in the surface area over which machining occurs; and automatically controlling the mean electric current supplied to said electrodes in the course of advance of said tool electrode to maintain the current density along said machining surface substantially constant while the area of the machining surface juxtaposed with the tool electrode is varied.

BI 4,062,981 (723rd)

HUMIDIFYING AND SHIRRING ARTIFICIAL SAUSAGE CASING

Douglas J. Bridgeford, Champaign, Ill., assignor to Teepak Investments, Inc., Chicago, Ill.

Reexamination Request Nos. 90/000,983, Apr. 9, 1986 and 90/001,070, Aug. 18, 1986.

Reexamination Certificate for Patent No. 4,062,981, issued Dec. 13, 1977, Ser. No. 662,669, Mar. 1, 1976.

Continuation-in-part of Ser. No. 488,646, Jul. 15, 1974, abandoned.

Int. Cl.<sup>4</sup> A22C 13/02; A23L 1/31

U.S. Cl. 426—278

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 4 and 5 are determined to be patentable as amended.

Claims 2 and 3, dependent on an amended claim, are determined to be patentable.

1. In a process for humidifying an artificial sausage casing on a shirring machine wherein a moisture-providing fluid is contacted with the inside wall of unshirred casing and the casing subsequently shirred, the improvement which comprises employing as said moisture-providing fluid a mixture comprising water and from about 0.5-5% of a water-dispersible surfactant having lubricating properties which is applied to said casing in a proportion to provide from about 0.015 to 0.15 mg. surfactant per square inch of casing.



B1 4,146,437 (724th)

## METHOD FOR EVALUATING A SYSTEM FOR ELECTRODEPOSITION OF METALS

Thomas J. O'Keefe, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.  
 Reexamination Request No. 90/000,671, Nov. 23, 1984.  
 Reexamination Certificate for Patent No. 4,146,437, issued Mar. 27, 1979, Ser. No. 831,811, Sep. 9, 1977.  
 Continuation of Ser. No. 645,609, Dec. 31, 1975, abandoned.  
 Int. Cl.<sup>4</sup> G01N 27/46  
 U.S. Cl. 204—1 T



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2-20 are cancelled.

Claim 1 is determined to be patentable as amended.

1. A method for evaluating an unknown electrolytic system comprising an acidic electrolytic solution and electrodes for electrodeposition of metals with respect to determining the performance characteristics of [the electrolytic solution, detection of impurities or additives in the electrolytic solution, estimation of the current efficiency characteristics of said system, or determining the performance characteristics of] an unknown working electrode, the method comprising the steps of:

- establishing an electrolytic circuit comprising a sample of the acidic electrolytic solution for said system, two electrodes immersed in said solution and spaced from one another therein, and a variable and reversible voltage source having its output terminals respectively connected to said electrodes;
- applying a predetermined initial voltage to one of said electrodes constituting [a] an unknown working electrode;
- varying the voltage in the negative direction until a predetermined cathodic current or predetermined maximum voltage sufficient to cause a cathodic reaction is attained at said working electrode thereby causing reduction of metal ions and deposition of metal at said electrode;
- reversing the direction of change of voltage and varying the voltage in the positive direction until a predetermined minimum voltage or a predetermined minimum current is attained at said working electrode thereby causing oxidation and redissolution of the metal which had been deposited by said cathodic reaction;
- repetitively varying the voltage in the negative direction, reversing it, and varying it in the positive direction through a plurality of cycles until a pseudoequilibrium is reached;
- recording the current obtained as a function of voltage for a cycle representative of the pseudoequilibrium, and determining the [performance characteristics of the sample solution, the presence of an impurity or additive, the current efficiency, or the] working electrode characteristics according to the recorded relationship between current and voltage at pseudoequilibrium by comparing the current versus voltage function for the unknown system with

the current versus voltage functions for known systems having the same electrolytic solution as the unknown system.

B1 4,200,703 (725th)

## PROCESS FOR THE MANUFACTURE OF HEAT-STABLE, NUCLEAR-BROMINATED POLYSTYRENES

Klaus Diebel; Horst-Dieter Wulf; Raban Grundmann, and Gunther Maahs, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls A.G., Marl, Fed. Rep. of Germany  
 Reexamination Request No. 90/001,036, Jun. 20, 1986.  
 Reexamination Certificate for Patent No. 4,200,703, issued Apr. 29, 1980, Ser. No. 617, Jan. 2, 1979.  
 Claims priority, application Fed. Rep. of Germany, Jan. 2, 1978, 2800012; Jan. 2, 1978, 2800013  
 Int. Cl.<sup>4</sup> C08F 8/20, 8/22  
 U.S. Cl. 525—340

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-7 is confirmed.

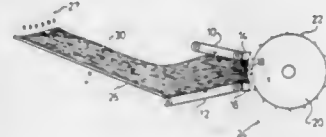
New claims 8-18 are added and determined to be patentable.

1. A process for the manufacture of a heatstable, nuclear-brominated polystyrene comprising brominating, at  $-20^{\circ}\text{C}$ . to  $+40^{\circ}\text{C}$ ., a polystyrene dissolved in a chlorinated hydrocarbon in the presence of a Lewis acid catalyst, and 0.02 to 2 moles, per mole of Lewis acid, of a nucleophilic substance which acts as a Lewis base for the Lewis acid, the amount of Lewis base being selected within this range such that the polystyrene is essentially not crosslinked during bromination.

B1 4,369,797 (726th)

## FEED MECHANISM FOR TOBACCO CUTTING MACHINES

Warren A. Brackmann, Cooksville, and Stanislaw M. Snidr, Mississauga, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Don Mills, Canada  
 Reexamination Request No. 90/000,433, Aug. 12, 1983.  
 Reexamination Certificate for Patent No. 4,369,797, issued Jan. 25, 1983, Ser. No. 215,006, Dec. 10, 1980.  
 Claims priority, application United Kingdom, Dec. 12, 1979, 7942887  
 Int. Cl.<sup>4</sup> A24B 7/04  
 U.S. Cl. 131—109.3



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2, 4-7 and 11 are determined to be patentable as amended.

Claims 3 and 8-10, dependent on an amended claim, are determined to be patentable.

New claims 12-23 are added and determined to be patentable.

1. A method of supplying tobacco is threshed tobacco lamina or whole leaf form to a cutting station in which cutting

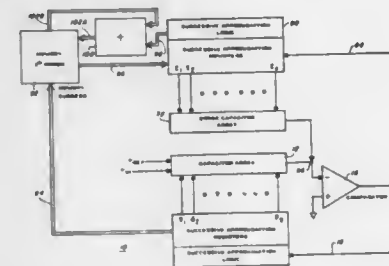
station [wherein] the tobacco is forwarded substantially horizontally from an upstream end thereof and is comminuted at a downstream end thereof at the rate at which the tobacco [it] enters the station, which comprises:

- forming a relatively thin layer of tobacco on [a] an elongate conveying surface at a location remote from said cutting station, [in which] the tobacco in said layer being [is] oriented substantially planarly of the layer and [is] substantially evenly distributed across the width thereof,
- subjecting said thin layer on said conveying surface to vibration whereby the tobacco in said layer densifies without the use of any force other than gravity while simultaneously [conveying said thin layer on said conveying surface towards said cutting station without substantially altering the orientation and juxtaposition of said tobacco in said layer,
- interleaving said tobacco in said thin layer with longitudinally-adjacent tobacco substantially without altering the orientation of the leaves in the said thin layer to form a relatively thick layer of interwoven compacted tobacco in which the tobacco is oriented planarly of the relatively-thick layer and containing the quantity of tobacco desired to be fed to said cutting station, and
- feeding said relatively thick layer to said cutting station without substantially altering the orientation of the tobacco in said layer.

B1 4,399,426 (727th)

## ON BOARD SELF-CALIBRATION OF ANALOG-TO-DIGITAL AND DIGITAL-TO-ANALOG CONVERTERS

Khen-Sang Tan, Plano, Tex., assignor to Texas Instruments, Inc., Dallas, Tex.  
 Reexamination Request No. 90/001,019, May 30, 1986.  
 Reexamination Certificate for Patent No. 4,399,426, issued Aug. 16, 1983, Ser. No. 260,435, May 4, 1981.  
 Int. Cl.<sup>4</sup> H03M 1/10  
 U.S. Cl. 340—347 CC



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 2 is cancelled.

Claims 1, 4 and 11 are determined to be patentable as amended.

Claims 3 and 5-10, dependent on an amended claim, are determined to be patentable.

New claim 12 is added and determined to be patentable.

1. A self-calibrating charge-redistribution analog-to-digital converter comprising:  
 a first binary weighted capacitor array having a plurality of capacitors, one plate of each of said capacitors being electrically connected to a node,  
 a comparator having one input electrically connected to said node,  
 first logic means connected to said comparator output and

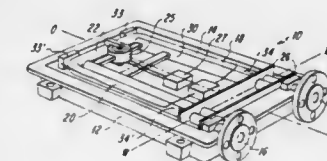
said array for selectively connecting said capacitors to preselected voltages, [and]

- at least one second binary weighted error capacitor array electrically connected to said node and having a plurality of capacitors for determining the error correcting signal required at said node to correct the binary mismatch of preselected capacitors in said first array, each of said capacitors in said error capacitor array [being] having one plate connected through a scaling capacitor to said node and an other plate connected to a reference potential [and]
- second logic means connected to said comparator output for selecting said capacitors in said second binary array to provide said error correcting signal.

B1 4,422,338 (728th)

## METHOD AND APPARATUS FOR MASS FLOW MEASUREMENT

James E. Smith, Boulder, Colo., assignor to Micro Motion, Inc., Boulder, Colo.  
 Reexamination Request Nos. 90/001,103, Oct. 1, 1986 and 90/001,115, Oct. 14, 1986 and 90/001,149, Jan. 13, 1987.  
 Reexamination Certificate for Patent No. 4,422,338, issued Dec. 27, 1983, Ser. No. 280,297, Jul. 6, 1981.  
 Continuation-in-part of Ser. No. 235,268, Feb. 17, 1981, abandoned.  
 Int. Cl.<sup>4</sup> G01F 1/84  
 U.S. Cl. 73—861.38



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-27 is confirmed.

1. In a Coriolis force mass flow rate meter including at least one continuous curved conduit solidly mounted at the open ends of leg portions thereof, which conduit is adapted to oscillate about an axis passing substantially through the mounting points of the legs, and further including mass flow rate readout means adapted to indicate mass flow rate as a function of the time delays in each direction of oscillation between the passage of one side leg of the curved conduit through a predetermined point of its oscillation and the passage of the other side leg of said conduit through a corresponding predetermined point of its oscillation, the improvement which comprises:

- at least one pair of sensors, one member of each pair being mounted on opposite side legs of the conduit, the sensors being adapted to generate an analog signal linearly representative of the actual oscillatory movement of the sides of the curved conduit at the location of the respective sensor; and
- means to electronically detect the time delay between the analog sensor signals corresponding to the time difference in the passage of the opposite sides of the curved conduit through points near the mid-plane of oscillation; whereby the magnitude of the time delay between the sensor outputs representing the time difference in passage through the mid-plane of oscillation is a measure of the mass flow rate through the curved conduit.

## JULY 14, 1987

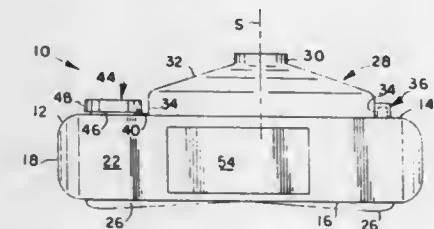
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Victor A. DeLay, Jr., 11886 70th St. No., Largo, Fla. 33543,  
assignor to Carl von dem Bussche; Victor A. DeLay, Jr. and  
Patrick T. Maguire, all of Pinellas County, Fla.  
Original No. 4,557,395, dated Dec. 10, 1985, Ser. No. 717,439,  
Mar. 28, 1985. Application for reissue May 5, 1986, Ser. No.  
859,507

U.S. Cl. 220—86 R Int. Cl. B65D 3/04

## 20 Claims

a fill spout formed in a top wall of said container body member and projecting upwardly therefrom,  
a vent means in the form of an aperture formed in said top wall,  
a funnel member having a rim, converging sidewalls, and a downspout,  
said fill spout and funnel downspout adapted for [releasable engagement] *operative association* with one another,  
a vent closure member secured to said funnel rim and projecting outwardly therefrom,  
said vent closure member closing said vent when brought into registration therewith.



1. A container of the type having a small fill spout and having increased utility when used in conjunction with a funnel, comprising:  
a container body member [of generally parallelepiped configuration],

**Donald N. Van Eenam, Des Peres, Mo., assignor to Akzo N.V., Arnhem, Netherlands**  
Original No. 4,433,090, dated Feb. 21, 1984, Ser. No. 502,830, Jun. 9, 1983. Continuation of Ser. No. 648,842, Sep. 6, 1984, abandoned. Application for reissue Aug. 5, 1985, Ser. No. 763,310

U.S. Cl. 524—295 Int. Cl.<sup>4</sup> C08F 2/38

U.S. Cl. 524—295

## 11 Claims

1. An acrylamide polymer comprising acrylamide and a sufficient amount of cinnamic acid material selected from the group consisting of cinnamic acids, cinnamyl alcohols, salts of cinnamic acids, and cinnamyl amines to substantially reduce the viscosity of the acrylamide polymer in solution.



## PATENTS

GRANTED JUL. 14, 1987

### ERRATA

For CLASS	See PATENT NO.
110-346 .....	4,679,268
439-495 .....	4,679,868
439-078 .....	4,679,869
439-493 .....	4,679,870
439-070 .....	4,679,871
439-061 .....	4,679,872
439-134 .....	4,679,873
439-595 .....	4,679,874
439-604 .....	4,679,875
439-426 .....	4,679,876
439-425 .....	4,679,877
439-425 .....	4,679,878
439-429 .....	4,679,879
439-404 .....	4,679,880
439-392 .....	4,679,881
439-569 .....	4,679,882
439-607 .....	4,679,883
439-106 .....	4,679,884
439-620 .....	4,679,885
439-816 .....	4,679,886
439-849 .....	4,679,887
439-883 .....	4,679,888
439-876 .....	4,679,889
439-884 .....	4,679,890
474-153 .....	4,679,999
493-159 .....	4,680,016
425-301 .....	4,680,269
503-214 .....	4,680,597
503-217 .....	4,680,598

# PATENTS

GRANTED JULY 14, 1987

## GENERAL AND MECHANICAL

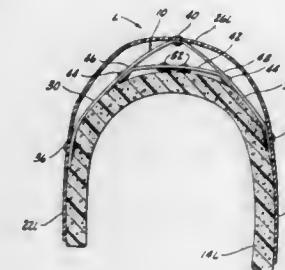
4,679,253

### SHOULDER PAD TRUSS ARCH SYSTEM

Hal D. Mitchell, and Donald R. Walker, both of Rolla, Mo.,  
assignors to Figgie International Inc., Willoughby, Ohio  
Filed Aug. 18, 1986, Ser. No. 897,082  
Int. Cl.<sup>4</sup> A41D 13/00

U.S. Cl. 2-2

14 Claims



1. A shoulder pad truss arch system for a shoulder pad having a arch member adapted to fit over a shoulder of a wearer, the arch member being of generally inverted U-shape as viewed from the side and having chestplate and backplate portions interconnected by a curved shoulder portion, the shoulder pad truss arch system comprising a first truss extending up from the chestplate portion of the arch member to the shoulder portion of the arch member, a second truss extending up from the backplate portion of the arch member to the shoulder portion of the arch member, and a truss bridge extending between the first and second trusses at a location spaced below the shoulder portion of the arch member, said truss bridge having one end attached to the first truss and the other end attached to the second truss so as to suspend the truss system and thus the shoulder pad on the shoulder of the wearer such that impact on the shoulder portion of the arch member causes the shoulder of the wearer to force at least a portion of the truss arch system generally upwardly to pull the chestplate and backplate portions toward one another.

4,679,254

### PROTECTIVE SHIELD FOR A WELDERS MASK

Hendrikus P. Wiegel, Karel Doormanstraat 6, 2631 AM Nootdorp, Netherlands

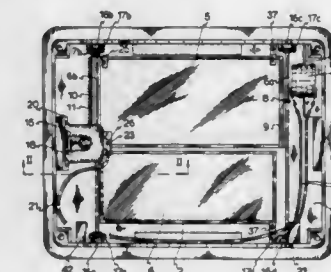
Filed Jan. 17, 1986, Ser. No. 819,680

Claims priority, application Netherlands, Jan. 18, 1985, 8500129; Nov. 29, 1985, 8503315

Int. Cl.<sup>4</sup> A61F 9/06

U.S. Cl. 2-8

16 Claims



1. A shield for protecting eyes, comprising:  
a body having an opening;  
an eye-protecting screen, slidable between first and second

positions in which the screen covers and uncovers the opening;  
a plurality of guide means in the shield for guiding the screen between the first and second positions, extending substantially parallel to the direction of screen movement;  
a reversible electric motor secured to the body, comprising a drive shaft and a toothed or friction pinion secured to the drive shaft, for moving said screen between the first and second positions, said screen comprising a toothed or friction rack in direct contact with the pinion; and means for activating the motor to move the screen between the first and second positions.

4,679,255

### WELDER'S MASK WITH REMOTE CONTROLLED EYE SHIELD

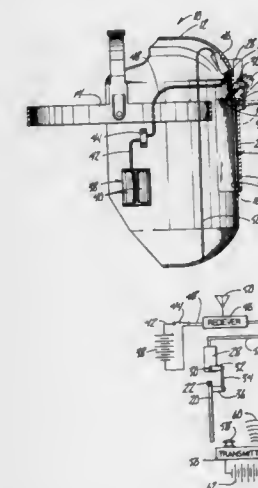
Thomas E. Kuhlman, R. R. 7748, Spirit Lake, Iowa 51360

Filed Mar. 6, 1986, Ser. No. 837,030

Int. Cl.<sup>4</sup> A61F 9/06

U.S. Cl. 2-8

8 Claims



1. A welder's mask having a remote controlled eye shield comprising:  
a mask housing having a viewing opening and means for mounting the mask housing upon the head of a user;  
a welder's eye shield having an upper edge portion hingedly secured to the mask housing and being hingebly movable between a closed position covering the viewing opening and an open position uncovering the viewing opening in the mask housing;  
motor means having a drive shaft and being mounted on the mask housing and being operably connectable to a first battery power source mounted on the mask housing, the motor means having connecting linkage means attached between the eye shield and the motor means, the drive shaft of the motor means being operable in first and second directions to move the connecting linkage means to correspondingly move the eye shield to any resting position between and including the open and the closed positions;  
the connecting means comprising a first arm rigidly secured at a first end to the drive shaft of the motor means, a second arm rigidly secured at a first end to and extending from the eye shield, and a linkage arm hingebly secured between the second ends of the first and second arms;  
remote control radio signal transmitter means operably connectable to a second battery power source and having



control switch means for transmitting a radio signal corresponding to moving the eye shield between the opened position and the closed position; and radio signal receiving means operably connectable to the first battery power means and the motor means for receiving and transferring the radio signal to the motor means.

4,679,256

## MULTI-SIZE JUMPER DRESS

Marcia Hischke, Chicago, Ill., assignor to Uniforms To You & Company, Chicago, Ill.

Filed Oct. 23, 1986, Ser. No. 922,455

Int. Cl.<sup>4</sup> A41D 1/22

U.S. Cl. 2—105

3 Claims



1. A wrap-around jumper dress adapted to fit a plurality of different female figures having height, waist, bust and hip measurements varying within predetermined ranges of these measurements between small and large, and comprising, in combination:

- a skirt, a wearer's back panel, a pair of chest panels, and a waistband;
- said skirt being formed by a middle panel and a pair of side panels joined at one side edge of each to opposite edges of said middle panel, said middle panel covering a wearer's rear side below the waist and at least a portion of the opposite sides of a wearer below the waist, and the unattached side portions of said side panels being adapted to overlap each other and at least cover the wearer's front side below the waist;
- said wearer's back panel having a generally horizontal bottom edge and a pair of spaced shoulder edges interconnected by a back-of-the-neck edge;
- each of said chest panels having an upper edge joined to one of said back panel's shoulder edges and a lower edge which extends down to adjacent the top edge of the adjacent side panel;
- said waistband being joined to the upper edges of said middle and side panels and to the bottom edge of said wearer's back panel and said lower edges of said chest panels, and said waistband having tab-like extensions on its opposite ends adapted to extend to behind a wearer's back side and be releasably secured to the back of the dress at the waist; and
- the act of drawing of said tab-like extensions snugly toward each other causing said dress to adjust itself to the shape, size and form of said wearer in respect to the wearer's particular height, waist, bust and hip measurements.

4,679,257

## WATERPROOF GLOVE

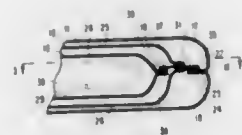
Allen W. Town, 415 W. John St., Alexandria, Ind. 46001

Filed Jun. 23, 1986, Ser. No. 877,459

Int. Cl.<sup>4</sup> A41D 19/00

U.S. Cl. 2—164

25 Claims



1. A covering for the hand comprising:
  - an outer shell closed on all sides except one which has an opening through which the hand may extend into said shell;
  - a membrane of material and being positioned within said outer shell and closed on all sides except one which is opened and aligned with said opening to allow the hand to extend into said membrane; and,
  - attachment means including an attachment tab sealingly secured to said membrane and extending outwardly therefrom to said outer shell whereat it is attached being operable to attach said membrane to said outer shell.

4,679,258

## HYDROTHERAPY MASSAGE METHOD AND APPARATUS

Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001

Continuation-in-part of Ser. No. 796,987, Nov. 12, 1985. This

application Mar. 24, 1986, Ser. No. 843,151

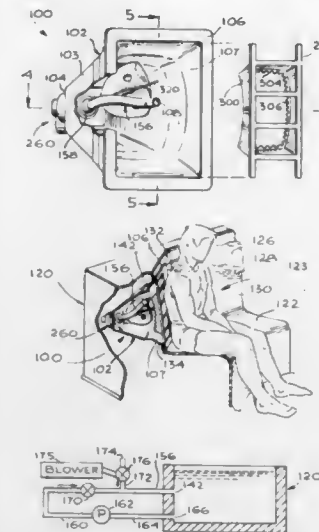
Int. Cl.<sup>4</sup> A61H 33/02

U.S. Cl. 4—542

39 Claims

1. Hydrotherapy apparatus for discharging a fluid stream substantially in a first direction for impacting against a user's body, said apparatus comprising:
  - fluid supply means;
  - elongated conduit means having a first end including a supply orifice and a second end including a nozzle having a discharge orifice;
  - means mounting said conduit means first end for coupling said supply orifice to said fluid supply means for supply fluid to said discharge orifice, said mounting means permitting said nozzle to randomly traverse a substantially planar area spaced from said first end;
  - said discharge orifice being oriented to discharge a first fluid

stream component in a direction extending along said conduit means elongation in said first direction; and



means applying a transverse thrust force to said nozzle for moving said nozzle across said area.

4,679,259

## RECLINABLE WHEELCHAIR APPARATUS

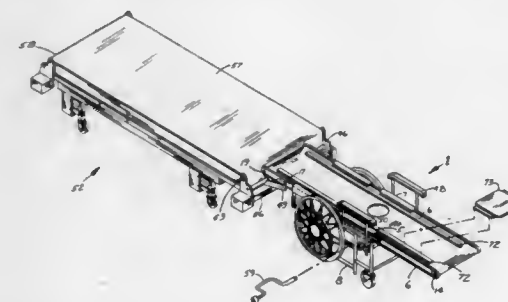
Paul DiMatteo, Huntington, and Charles F. Chubb, Brookville, both of N.Y., assignors to Nova Technologies, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 731,533, May 7, 1985. This application Jul. 1, 1985, Ser. No. 750,913

Int. Cl.<sup>4</sup> A61G 7/08

U.S. Cl. 5—81 R

31 Claims



1. A reclinable wheelchair comprising: a back rest section, a seat section, and a leg rest section; conversion means for converting the wheelchair surface between an upright chair position and a reclined wheelchair position having an extended horizontal surface; means for positioning said wheelchair in said reclined position end-to-end with a support on which a person lies; said wheelchair having a continuous belt of flexible material passing over rollers near head and foot ends of said wheelchair; said belt comprising top and bottom surfaces of said wheelchair; constraining means for supporting said belt in a selected position on the wheelchair; rotational means for propelling said belt in either direction; propelling power means for driving said rotational means; a roller at the head end of said wheelchair and comprising two flanged rollers, one flanged roller being located on each side of the wheelchair; a shaft for mounting each flanged roller, each flanged roller being rotatable freely on said shaft within a cylindrical cavity, said cavity and flanged roller forming together a guidance groove having a narrow outer slit and a wider inner groove, said guidance groove being shaped so that a belt with thick-

ened edges passes around the roller with a thickened edge of said belt passing through said wider inner groove, said belt having a relatively thinner center portion passing through said narrow outer slit.

4,679,260

## FLEXIBLE STRETCHER DEVICE

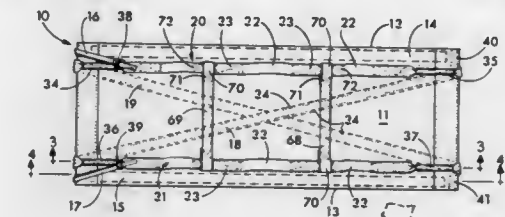
Peter O. Frettem, 514 W. State St., Cannon Falls, Minn. 55009

Filed Jul. 24, 1985, Ser. No. 758,334

Int. Cl.<sup>4</sup> A61G 1/00

U.S. Cl. 5—82 R

16 Claims



1. A flexible carrying device for flexibly and adjustably transporting a human body, said flexible stretcher device comprising:

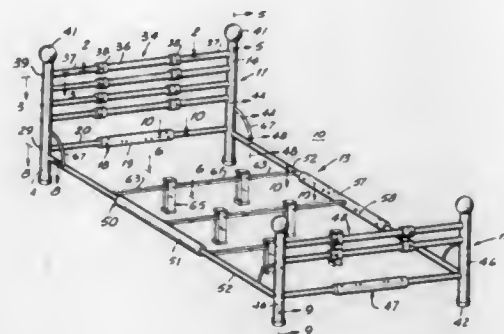
- a. a flexible, rectilinear and elongated body support member having a top surface, a bottom surface and folded side edges, each of said folded side edges forming elongated tubular envelope members, each of said elongated tubular envelope members having a predetermined diameter and having an open end and a closed secured end opposite said open end, each of said envelope members further having closing and tightening strap means fixed to said flexible body member in proximity to said open end,
- b. a pair of rigid tubular members for placement in said elongated tubular envelope members, each support member having a diametric dimension smaller than the predetermined diameter of said tubular envelope member and having a length that is less than the length of said body member, said closing and tightening strap means being folded over said open end of said tubular envelope member to securely hold said rigid support member within said tubular envelope member,
- c. a pair of diagonally disposed flexible reinforcement straps fastened to the bottom surface of said carrying body member and being generally disposed diagonally across said bottom surface in a generally central cross-over configuration and extending to the opposite ends of said rectilinear body support member, said diagonal flexible straps terminating interiorly proximate the respective ends of said tubular envelope members, said diagonally disposed straps being constructed and arranged to transfer the weight of the human body placed on said stretcher device to the ends of said flexible body member and on to the ends of said rigid support members to put said rigid support members in a state of compression, and
- d. a pair of oppositely disposed elongated flexible handle member straps fastened to said top surface of said body member and extending generally the length of said body support member, each of said handle member strap further being disposed parallel to and interiorly of each said elongated tubular envelope member, each of said handle member straps being connected to said diagonally disposed flexible reinforcement straps, whereby, the placement of a human body on said body support member causes compressive forces to be exerted on said rigid support members by means of said diagonally disposed reinforcement straps and said envelope members secured about the rigid support members.

# 4,679,261 TELESCOPIC BED

Smith B. Stanley, c/o Haze, New York, N.Y. 10003, and Yoram A. Alroy, 54 Morton St., New York, N.Y. 10014  
Continuation-in-part of Ser. No. 683,397, Dec. 17, 1984, abandoned. This application Aug. 21, 1985, Ser. No. 767,331  
Int. Cl.<sup>4</sup> A47C 19/04

U.S. Cl. 5-183

8 Claims



## 1. A bed structure comprising:

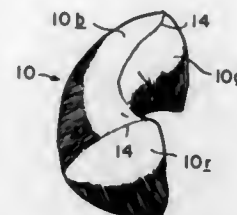
- a rear vertical head frame member of adjustable width including a pair of laterally spaced vertical tubular first posts and vertically spaced first cross pieces of adjustable lengths, each of said cross pieces above the lowermost cross piece including an intermediate tubular section and a pair of outer tubular sections telescoping opposite ends of said intermediate section and a soft compressible peripherally extending cushion member sandwiched between the confronting peripheral faces of said outer tubular sections and said intermediate section, and separable fastening means securing the opposite ends of said head frame cross pieces to respective head frame posts;
- a front vertical foot frame member of adjustable width including a pair of laterally spaced vertical tubular second posts and vertically spaced second cross pieces of adjustable lengths each of said second cross pieces above the lowermost second cross piece including an intermediate tubular section and a pair of outer tubular sections telescoping opposite ends of said tubular section and soft compressible peripherally extending cushion member sandwiched between the confronting peripheral faces of said second cross piece outer tubular sections and the intermediate tubular section, and separable fastening means securing the opposite ends of said second cross pieces to respective second posts;
- a pair of laterally spaced longitudinally extending parallel horizontal side beams of adjustable lengths extending between respective first posts and respective second posts substantially at the level of the lowermost cross pieces of said head and foot frame members and defining therewith a bottom frame and separable fastening means securing the opposite ends of said beams to respective pairs of said first and second posts;
- mattress support means carried by said bottom frame and including longitudinally spaced parallel horizontal stringers of adjustable lengths extending between said beams; and
- a gusset member located proximate the corner of the end portion of each beam and the portion of the post connected to and projecting above the respective beam and separable fastening means securing said gusset member at their ends to respective posts and beams at points spaced from said corners.

# 4,679,262 HEAD SUPPORT CUSHION

James R. Davis, 18 Denbow Rd., and Michael P. McConnell, 25 Faculty Rd., both of Durham, N.H. 03824  
Filed Jun. 10, 1985, Ser. No. 742,761  
Int. Cl.<sup>4</sup> A47G 9/00

U.S. Cl. 5-434

14 Claims



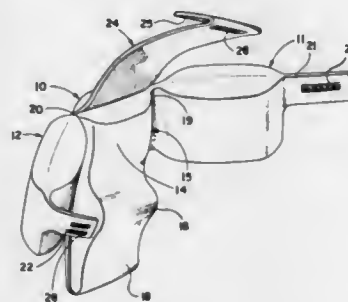
1. A cushion for supporting simultaneously the front and side of the head of a user reposing in a sitting or semi-reclining position, said cushion comprising a naturally curved relatively stiff body, the length and curvature of the body being such that when the body is positioned on the user's shoulder at one side of the midsagittal plane, the body extends from a location adjacent to the mastoid process behind the user's ear forwardly under the chin to a point beyond the midsagittal plane to the mental terminus of the user's mandible so that said body provides positive anatomically correct support for the user's head no matter which direction the head nods or tilts to said one side of the midsagittal plane.

# 4,679,263 HEAD SUPPORTED PILLOW

William A. Honer, Rt. 1, Box 202, Flowery Branch, Ga. 30542  
Filed Oct. 2, 1985, Ser. No. 782,870  
Int. Cl.<sup>4</sup> A47C 20/02

U.S. Cl. 5-437

4 Claims



1. A pillow for supporting the head of a person, said pillow including a plurality of cushions, and means for hinging said plurality of cushions with respect to one another, said pillow including a back cushion engageable with the back of said person's head, a lefthand cushion engageable with the left side of said person's head, said lefthand cushion being hinged to said back cushion, a righthand cushion engageable with the right side of said person's head, said righthand cushion being hinged to said back cushion, said back cushion being of a size and shape to receive the back of said person's head and extend laterally substantially to the sides of said person's head and including a left edge and a right edge, said lefthand cushion having a rear end generally contiguous with said left edge of said back cushion and a front end lying generally at the edge of said person's face, said lefthand cushion having a height sufficient to cover the left side of said person's head above the neck of said person, said righthand cushion having a rear end generally contiguous with said right edge of said back cushion and a

front end lying generally at the edge of said person's face, said righthand cushion having a height sufficient to cover the right side of said person's head above the neck of said person, said means for hinging said plurality of cushions with respect to one another including a first hinge means for hinging said rear end of said lefthand cushion to said left edge of said back cushion, and second hinge means for hinging said rear end of said righthand cushion to said right edge of said back cushion, the arrangement being such that said back cushion holds the rear end of said right- and lefthand cushions with respect to each other, said back cushion, said righthand cushion and said lefthand cushion having a thickness such that the head of said person is held in a substantially natural position when said person is reclining, said pillow further including strap means extendable along the forehead of said person for holding the front ends of said right- and lefthand cushions with respect to each other with said cushions against said person's head, said strap means including releasable fastening means.

end spaced from the outer free end of said first leg and forming an opening between said outer free ends of said first leg and said second leg, with the second leg tightly engaging the underside of the mattress, and with said opening of the hook

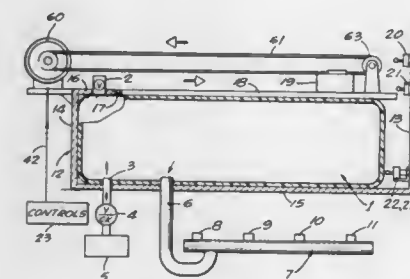


# 4,679,264 AIRBED MATTRESS INCLUDING A REGULATED, CONTROLLABLE AIR RESERVOIR THEREFOR

Carlos A. Mollura, 2824 Del Oro La., Fullerton, Calif. 92635  
Continuation-in-part of Ser. No. 731,450, May 6, 1985, abandoned. This application Apr. 1, 1986, Ser. No. 846,857  
Int. Cl.<sup>4</sup> A47C 27/10

U.S. Cl. 5-453

14 Claims



1. A system comprising an air mattress or an air cushion linked in direct air communication with an air reservoir means comprising a flexible container that includes air inlet means and air outlet means; means for propelling air through said air inlet means; means for exerting controllable pressure on said air reservoir means; means for starting said propelling means, and means for stopping said propelling means, said pressure exerting means being adapted to activate said starting means when the air volume in said reservoir falls below a predetermined minimum and to activate said stopping means when the air volume in said reservoir means rises above a first predetermined maximum.

# 4,679,265 LIFT DEVICE FOR AN INCUMBENT PERSON

Jack W. Wicks, 9425 Blind Pass Rd., #1007, St. Petersburg Beach, Fla. 33706  
Filed Sep. 27, 1985, Ser. No. 781,405  
Int. Cl.<sup>4</sup> A61G 7/06

U.S. Cl. 5-445

7 Claims

1. A lift device for an incumbent person for use with a mattress having an upper surface, an end, and an underside, with the end having a thickness dimension, comprising, in combination: means for grippingly engaging the mattress comprising a substantially rigid hook for connection with the thickness dimension of the mattress independent of any means associated with the mattress including a central portion having a length substantially equal to the thickness dimension of the mattress, a first leg extending from a first end of the central portion and having an outer free end, with the first leg tightly engaging the upper surface of the mattress, a second leg extending from an opposite end of the central portion and having an outer free

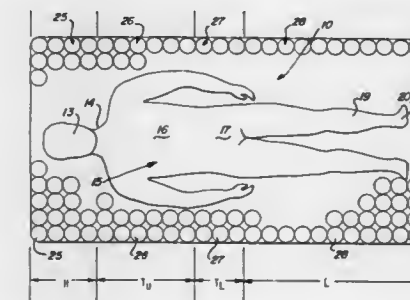
formed by the outer free ends of said first and second legs being of a dimension substantially equal to the thickness dimension of the mattress; and an elongated tether connected to said first leg adjacent the outer free end thereof, with the tether being of a flexible nature throughout its length.

# 4,679,266 VARYING FIRMNESS MATTRESS

Eugene Kraft, 2760 W. Warren Ave., Detroit, Mich. 48208  
Filed Feb. 18, 1986, Ser. No. 830,091  
Int. Cl.<sup>4</sup> A47C 27/00

U.S. Cl. 5-464

7 Claims



1. A standard type mattress formed with varying firmnesses for supporting a predetermined, generally average height and weight person comfortably and substantial level, comprising: the mattress being divided into four major body support regions along its length, namely, a head support region, an upper torso support region, a lower torso support region, and a leg support region; the head support region extends from the mattress upper end towards the lower end a distance equal to roughly the height of an average head and neck beginning about at the juncture of the neck to the shoulders to the top of the head; the upper torso support region extends a distance roughly equal to the average distance between about the neck and shoulder juncture to the waist, and the lower torso support region extends a distance roughly equal to the average distance between about the waist to the crotch so that the upper torso region is roughly two-thirds and the lower torso region is roughly one-third the length of an average person's torso; and the leg support region extends from the lower torso support region to the lower end of the mattress a distance roughly equal to between about the height of the legs of an average person from the crotch to the bottom of feet; and with each of the head and leg support regions and the upper and lower torso regions being constructed so that it



has its own uniform springy firmness, with the upper torso region being the most firm, the head region being of lesser firmness than the upper torso region, the leg region being of considerably lesser firmness than the head region, and the lower torso region being of the firmness of roughly about that of the head region;

and with the several firmnesses being pre-selected to provide a substantially level body support lengthwise upon the mattress.

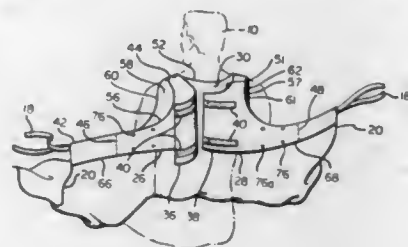
#### 4,679,267 RESTRAINING SAFETY HARNESS

Edith A. Thiele, 405 W. Haven, New Lenox, Ill. 60451  
Filed Mar. 31, 1986, Ser. No. 846,204

Int. Cl.<sup>4</sup> A47G 9/02; A61F 13/00

U.S. Cl. 5—494

20 Claims



1. For use with a person lying on a bed having a frame, an improved safety blanket comprising the combination of a main generally rectangular panel sized to fit over the bed and substantially cover the person lying thereon, one outer and two inner harness panels sized to fit substantially around the chest of the person, and over the shoulders of the person, the inner and outer panels having edges defining openings to receive the person's head and arms, the outer harness panel being formed as part of and continuous with the main blanket panel, near the top edge and mid-point thereof, each inner harness panel being formed as part of and continuous with the outer harness panel, near spaced regions thereof that overlie the shoulders of the person, each inner harness panel further being secured to the outer harness panel and the main blanket panel near spaced regions laterally and outwardly beyond the person, the inner panels having ends designed to overlap with one another, means to removably secure the lapped ends of the inner panels together, enclosing the harness panels as a continuous loop around the person, operable to hold the person relative to the blanket, the securing means being in the form of cooperating hook-loop fasteners, allowing the lapped ends of the inner panels to be secured together at adjustable locations, to set the looseness of the harness panels circumferentially when secured on the person, the lapped ends of the inner panels, when secured together, normally being in the back region and underlying the person lying on the bed and thereby being beyond the reach of the person's hands, for the person separating the lapped panels, by himself/herself, for the unsupervised removal from the restraintment of the blanket, the regions of securement between each inner harness panel and the outer harness panel and the main blanket panel being spaced apart, when the adjacent panels are flat and extended tightly, between 15 and 25 inches, additional releasable securing means secured onto the inner and outer harness panels, being laterally spaced inwardly from the adjacent region of securement of each inner harness panel to the outer harness panel and the main blanket panel, and when selectively secured together providing additional sizing adjustment of the harness, and means at the corners of the main panel operable to secure the

blanket to the bed frame and over the person lying on the bed.

#### 4,679,268 METHOD AND APPARATUS FOR BURNING SOLID WASTE PRODUCTS USING A PLURALITY OF MULTIPLE HEARTH FURNACES

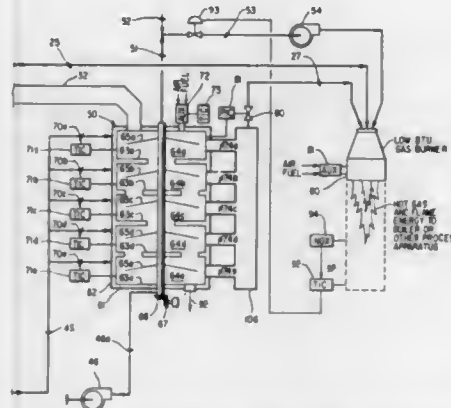
Richard M. Gurries, Saratoga; Jay K. Johnson, La Honda, and Eric A. Nering, Moss Beach, all of Calif., assignors to Gurries & Okamoto, Inc., Cupertino, Calif. and Associated Mechanical Contractors, Inc., Greensboro, N.C.

Filed Sep. 11, 1986, Ser. No. 906,287

Int. Cl.<sup>4</sup> F23G 7/06

U.S. Cl. 110—346

26 Claims



1. A process for continuously burning solids comprising the steps:

- partially burning said solid in a first multiple hearth furnace which is operated under reducing conditions and forming a carbon-containing char and a low Btu gas in said first multiple hearth furnace;
- recovering said char from said first multiple hearth furnace and conveying said char to a second multiple hearth furnace which is operated under oxidizing conditions;
- substantially completely burning the char recovered from said first multiple hearth furnace in said second multiple hearth furnace;
- transporting said low Btu gas from said first multiple hearth furnace to a burner where substantially complete burning of said low Btu gas takes place; and
- recovering oxygen containing gas from from said second multiple hearth furnace and utilizing said gas in said first multiple hearth furnace.

#### 4,679,269 HEEL LASTING MACHINE

Michael M. Becka, Nashua, N.H., and Walter Vornberger, Tewksbury, Mass., assignors to International Shoe Machine Corporation, Nashua, N.H.

Filed Mar. 27, 1986, Ser. No. 845,089

Int. Cl.<sup>4</sup> A43D 21/16, 21/00

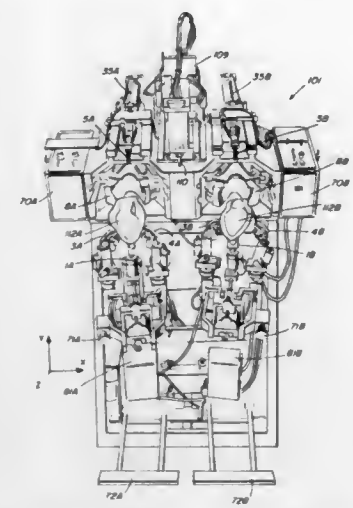
U.S. Cl. 12—10.5

19 Claims

19. In a heel lasting machine having two stations to receive two footwear upper assemblies, each footwear upper assembly including a last, an insole on the last bottom and an upper draped about the last, said last having a spindle hole whose longitudinal position varies from last to last, said lasting machine being operable to apply a precisely positioned ribbon of adhesive onto the heel region of each of the two footwear upper assemblies, despite the variation in position of the spindle hole, said heel lasting machine comprising:

a single adhesive applying unit having a nozzle to deliver the

ribbon of adhesive to each of the two footwear upper assemblies at the heel region of each footwear upper assembly of the two footwear upper assemblies; and



positioning means to establish spatial positioning between the nozzle and the heel region of said each footwear upper assembly of the two footwear upper assemblies to assure proper positioning of the ribbon pattern with respect to each of the footwear assemblies.

#### 4,679,270 WASH BRUSH OPERATED BY THE WASH WATER

Giorgio Gatti, Correggio Emilia, and Loris Ferrari, Carpi, both of Italy, assignors to G.F. S.r.l., Correggio Emilia, Italy

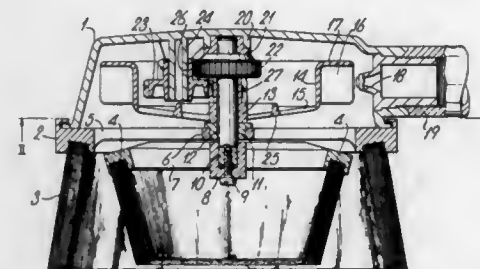
Filed Jan. 22, 1986, Ser. No. 821,338

Claims priority, application Italy, Mar. 1, 1985, 46818 A/85

Int. Cl.<sup>4</sup> A46B 13/06

U.S. Cl. 15—29

4 Claims



1. Apparatus for washing surfaces comprising, a pan-shaped casing having a closed top and an open bottom, a bladed impeller mounted for rotation within and generally coaxially of said casing, nozzle means converging into said casing for directing water generally tangentially of the bladed impeller to drive the impeller in rotation, said open bottom of the casing defining an outlet for the water from said nozzle so that the water flows along a flow path from the nozzle to the impeller and then through said outlet, said impeller having a body of cup shape which opens toward the closed top of the casing and defines with the top of the casing a region out of the flow path of the water flowing through the casing, a rotary brush adjacent said open bottom of the casing, a fixed brush connected to said casing and surrounding said rotary brush, reduction gear means connecting said impeller to said rotary brush for driving said brush in rotation at a speed less than the speed of rotation of the impeller, said reduction gear means being within said impeller body of cup shape in said region out of the flow path

#### 4,679,271 AUTOMATIC TOOL FORCE COMPENSATOR FOR A SURFACE MAINTENANCE MACHINE

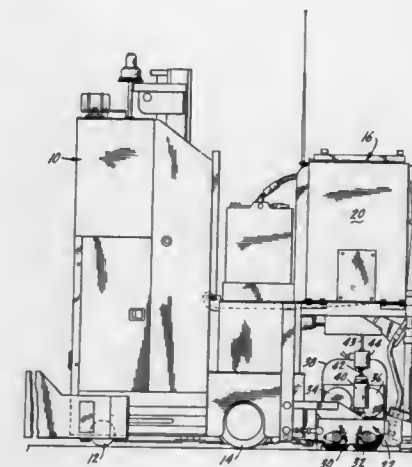
Bruce F. Field, Minneapolis, and Joseph G. Kasper, Gold Valley, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Mar. 14, 1986, Ser. No. 839,877

Int. Cl.<sup>4</sup> A47L 11/18, 11/20

U.S. Cl. 15—49 C

9 Claims



1. An automatic tool force compensator for a surface maintenance machine including, means for raising and lowering surface maintenance tools, means for setting a degree of tool application force that it is desired to apply to a surface and for providing an electrical signal representative thereof, means for measuring the actual degree of tool application force applied to the surface and for providing an electrical signal representative thereof, means for comparing said electrical signals and for operating said means for raising and lowering the surface maintenance tools in accordance therewith to provide the desired degree of tool application force tool drive means, means for sensing load on the tool drive means and for providing an electrical signal representative thereof, and means for comparing the tool drive means load signal with a reference, with the output of said means for comparing the tool drive means signal with a reference being connected to and providing an operating signal for said means for raising and lowering the surface maintenance tools.

#### 4,679,272 TOOTHBRUSH

Max Florence, Toronto, Canada, assignor to Sulcabrush Inc., Toronto, Canada

Filed Feb. 5, 1986, Ser. No. 826,446

Int. Cl.<sup>4</sup> A46B 9/04

U.S. Cl. 15—106

11 Claims

1. A toothbrush comprising an elongate, generally straight handle means, having first and second ends, and first and second brushing heads which have respective first and second axes and are generally identical, and each of which comprises a plurality of bristle elements forming a single rounded tuft which tuft has a height greater than its diameter and extends outwards about the respective first or second axis, with the

first brushing head extending at an acute angle to the handle means on one side thereof and the second brushing head extending at an obtuse angle to the handle means on the other side thereof.



tending at an obtuse angle to the handle means on the other side thereof.

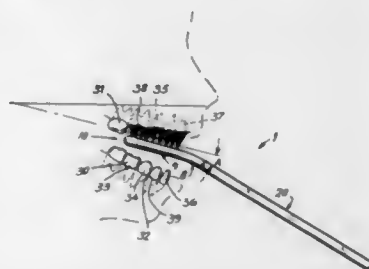
4,679,273

# DENTAL APPLIANCE FOR CLEANSING THE GINGIVAL ONE THIRD AREAS OF THE TEETH AS WELL AS THE SULCULAR AND THE EMBRASURE REGIONS THEREOF

Seth Okin, 6 Tuddington Rd., Great Neck, N.Y. 11023  
Continuation-in-part of Ser. No. 766,508, Aug. 19, 1985,  
abandoned. This application Oct. 17, 1986, Ser. No. 919,598  
Int. Cl.<sup>4</sup> A46B 9/04

U.S. Cl. 15—167 R

11 Claims



1. A dental appliance for cleansing the gingival one third areas of the teeth of a user as well as the sulcular and the embrasure regions thereof, said dental appliance comprising:
  - a brush head portion of elongate configuration having:
    - a proximal end,
    - a distal end, and
    - a length as measured from the said distal end to the said proximal end;
  - a plurality of tufts of bristles disposed along the said length of said brush head portion in a single phase, with each of said tufts of bristles being connected at one end to said brush head portion, said tufts of bristles being sized so as to define an undulating brushing surface formed from the other of the ends of said tufts of bristles, said brushing surface including:
    - a plurality of convex regions, each of which is configured to coincide with a portion of the free gingival margin adjacent to the facial surface of a selected, adult tooth, said convex regions of said tufts of bristles including at least one located at the said distal end of said brush head portion which is configured to coincide with a portion of the said free gingival margin adjacent to the facial surfaces of an average, adult molar,
    - a plurality of concave regions located adjacent to and alternating with the said convex regions of said tufts of bristles, said concave regions of said tufts of bristles being configured to coincide with the average of the interproximal margins that are located between the said selected teeth used in configuring the said convex regions of said tufts of bristles situated on either side thereof, said concave regions located adjacent to the said one convex region at the said distal end of said brush head portion having the configuration of the average interproximal margin that is located between adult molar teeth, and
    - a mean height, as measured in a direction normal to said

brush head portion, that increases from the said distal end of said brush head portion to the said proximal end of said brush head portion;

a handle portion of elongate configuration connected to said brush head portion at the said proximal end thereof; and

a neck portion connecting said handle portion to said brush head portion.

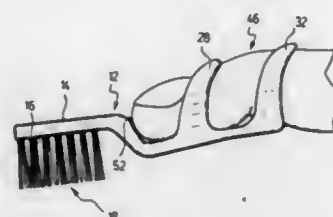
4,679,274

# FINGER MANIPULATED ORAL HYGIENE DEVICE

Jack C. Friedman, 750 W. Broadway #809, Vancouver, British Columbia, Canada V5Z 1H7  
Filed Jul. 24, 1985, Ser. No. 758,652  
Int. Cl.<sup>4</sup> A46B 9/04

U.S. Cl. 15—167 R

11 Claims



1. An oral hygiene device for mounting on and manipulated by a user's finger, said device comprising a stem, an oral hygiene working head provided on said stem, and means for mounting said stem on a user's finger, said stem having upper and lower surfaces, said working head being provided on said stem lower surface and said mounting means being provided on said stem and extending upwardly relative to said stem, said working head being offset from said mounting means along said stem, said stem having a stepped portion between said working head and said mounting means to elevate thereby a portion of said stem provided with said mounting means, wherein said mounting means comprises two pairs of lugs, said lugs of each pair opposing one another across said stem and said pairs of lugs being spaced apart along said stem a sufficient distance to position said pairs of lugs to each side of a first knuckle of a user's finger when said device is in use, said lugs extending upwardly from said stem upper surface and being curved towards one another to conform to a contour of a user's finger, said lugs overlying an upper portion of a user's finger, said lugs engaging a corresponding portion of a user's finger to clamp a user's finger between opposing lugs of said pairs of lugs to mount securely thereby said oral device on a user's finger, said stepped portion of said stem provides a stop for an end of a user's finger when clamped by said pairs of lugs.

4,679,275

# PAINT SCRAPER

Timothy L. Shannon, 1901 Sackett Ave., Cuyahoga Falls, Ohio 44223

Filed Mar. 7, 1986, Ser. No. 837,298  
Int. Cl.<sup>4</sup> B44D 3/16

U.S. Cl. 15—236 R

15 Claims



1. A paint scraper, comprising: an elongated member having a handle portion at a first end thereof and a scraper head por-

tion at a second end thereof, said head portion defined by angled edges of said elongated member joining at a point, said angled edges being normal to top and bottom flat planar surfaces of said elongated member, said elongated member being received by a sheath at a pivot point between said handle and head portion.

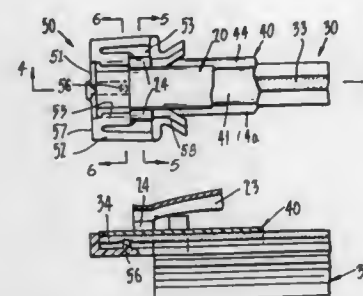
4,679,276

# RETAINING MEANS

Frederick J. Tomkin, 4 Queensway, London W2, England  
Filed Jan. 29, 1985, Ser. No. 760,311  
Int. Cl.<sup>4</sup> B60S 1/38, 1/02

U.S. Cl. 15—250.42

11 Claims



1. A releasable retaining means for restraining a squeegee element against longitudinal movement relative to a flexible resilient squeegee element backing strip and for limiting longitudinal movement of the backing strip relative to a harness of a windscreen wiper blade assembly, the retaining means comprising a clip having a body portion and at least one leg resiliently connected thereto having an inwardly directed tab portion, wherein the tab portion of the or each leg and the body portion together with the backing strip form a receiving means for engaging a claw of the harness, whereby to limit longitudinal movement of the backing strip relative to the harness, and, wherein the body portion includes an anchoring means adapted to penetrate into the backing strip and compress a portion of the squeegee element into frictional engagement with the backing strip, whereby to restrain the squeegee element against longitudinal movement relative to the backing strip.

4,679,277

# FULL LENGTH INTERLOCKING HINGE FOR A FOLDING DOOR

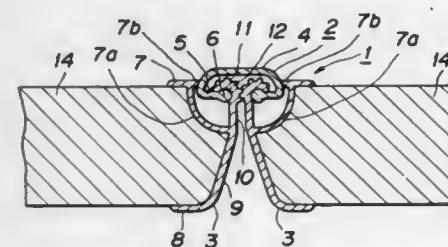
Yoji Shibata, Tokyo, Japan, assignor to Shin Nibon Koku Seibi Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1985, Ser. No. 806,862  
Claims priority, application Japan, Dec. 10, 1984, 59-187157[U]

U.S. Cl. 16—354

Int. Cl.<sup>4</sup> E05D 7/00

3 Claims



1. A hinge for use in a folding door, comprising:
  - A basic frame extending longitudinally and having a generally C-shape in cross-section, said basic frame having

support shafts extending longitudinally and disposed one on each edge of said basic frame to form a longitudinal opening therebetween;

a pair of moving frames each having opposed longitudinal flanges supporting the longitudinal edge of a door therebetween;

supporting pieces extending from the moving frame, through said longitudinal opening into the center of said basic frame, the tips of said supporting pieces from each of the moving frames contacting and co-acting with one another, the interior surface of each of said tips being formed in a generally semicircular shape to cooperatively engage one of said support shafts for rotation therearound; and

a longitudinal edge extending from one of the longitudinal flanges of each moving frame such that said longitudinal edge is in constant contact with the outside surface of said basic frame, to form a light and odor seal.

4,679,278

# METHOD OF MAKING A HYDROPHILIC COTTON FLEECE

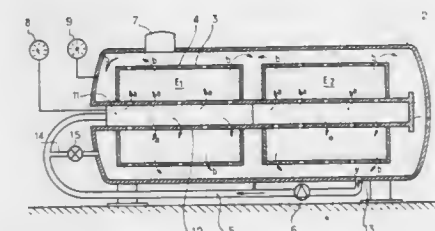
Jean-Francois Caumont, Brionne, France, assignor to Tempo Sany, Paris, France

Division of Ser. No. 634,720, Jul. 26, 1984. This application Nov. 1, 1985, Ser. No. 793,814

Claims priority, application France, Sep. 21, 1983, 83 15026  
Int. Cl.<sup>4</sup> D01B 9/00

U.S. Cl. 19—66 CC

9 Claims



1. Hydrophilic cotton fleece made in accordance with the following method: subjecting raw cotton on carding machines successively to preliminary beating and opening to obtain cotton and flocks which are opened and physically cleaned, placing flocks so treated on perforated cylinders on which they deposit themselves fairly uniformly to form a fleece which is fluffy and has practically no cohesion; placing this fleece in a wetting bath consisting of warm water to which a wetting agent is added to obtain a fleece which is more compact and has a certain firmness by physical cohesion; removing the fleece from the wetting bath and drying it between calender rollers; winding the fleece on a cylinder to obtain a coil which is then introduced into an autoclave to undergo boiling and bleaching operations, which operations are characterized in that during boiling and bleaching, treatment liquids are made to circulate radially through the turns of the coil in such a way that a differential pressure is established between the liquid entering the coil and the liquid leaving it, by reason of the losses of load due to the difficulty which the liquid experiences in passing through the coil, and this differential pressure brings about displacement and tangling of the cotton fibres because of the effect of hydraulic tufting on the whole of the volume of cotton distributed over the coil, thus considerably increasing the cohesion of the fleece obtained after unwinding.



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## SLIVER COILER

Jürgen Klüttermann, Mönchengladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

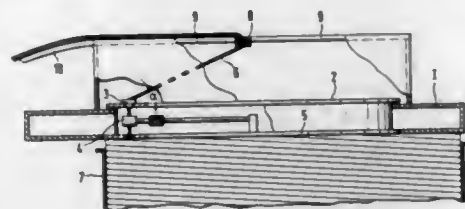
Filed May 12, 1986, Ser. No. 862,245

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517060

Int. Cl.<sup>4</sup> B65H 54/80

U.S. Cl. 19—159 R

12 Claims



1. In a sliver coiler including a unidirectionally rotating rotary head assembly having a radius and a generally horizontal plane of rotation; a sliver trumpet eccentrically mounted in the rotary head assembly and a sliver supporting means including a fixedly held, immovable sliver guide element situated centrally above said rotary head assembly at a distance therefrom; the sliver having an unsupported running portion extending through a free space linearly from said sliver guide element to said sliver trumpet; the improvement wherein the angle formed between said plane of rotation and a line connecting said sliver guide element with said sliver trumpet is 30° at the most, permitting high running speeds of the sliver.

4,679,280

## FASTENERS FOR CHAINS, NECKLACES, BANGLES, AND SIMILAR PIECES OF JEWELRY

Roland Krahenbuhl, 30 route de Nogent-sur-Seine, Soucy, 89100 Sens, France

Continuation of Ser. No. 672,589, Nov. 19, 1984, abandoned.

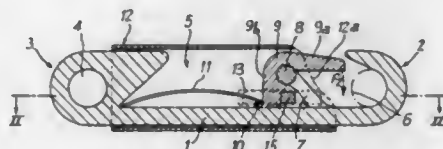
This application Jun. 4, 1986, Ser. No. 873,431

Claims priority, application France, Nov. 21, 1983, 83 18471; Nov. 12, 1984, 84 17203

Int. Cl.<sup>4</sup> A44B 13/02

U.S. Cl. 24—233

9 Claims



1. In a fastener comprising a main elongated body having two ends, with one end of said elongated body being provided to be fixedly connected to one end of a two-end piece of jewelry and an other end of said elongated body being hook-shaped; said elongated body further having a central recessed part supporting a heel including a spindle; an angle shaped rocker being pivotally mounted on said spindle and having two arms; spring means cooperating with one of the two arms of said angle shaped rocker and urging a second one of said two arms towards the hook shaped end of said elongated body to close said hook shaped end; and a casing at least partially enclosing said elongated body;

the improvement wherein said casing has two side walls each provided with an opening; and wherein the central recessed part is provided with a substantially H-shaped sliding part having a central portion and two wings, with said central portion being mounted between said heel and said one of the two arms of said angle shaped rocker, and

said two wings being each provided to extend through said opening of the casing; the central portion of the sliding part adapted to push said one arm of the angle shaped rocker against the bias of said spring means; whereby slidably pushing the wings of the substantially H-shaped sliding part causes the central portion thereof to pivot the angle-shaped rocker against biasing of said spring means and to open the hook shaped end of the elongated body for enabling the introduction therein of an end of said piece of jewelry, and whereby the wings of the H-shaped sliding part substantially cover the openings and prevent dirt and the like from entering the fastener.

4,679,281

## AUTOMATIC LOCKING SLIDER WITH A PAIR OF PULL TABS

Susumu Ishii, Kurobe, and Kiyoshi Oda, Namerikawa, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

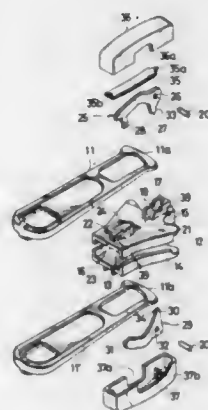
Filed May 7, 1986, Ser. No. 860,579

Claims priority, application Japan, May 24, 1985, 60-76408[U]

Int. Cl.<sup>4</sup> A44B 19/30

U.S. Cl. 24—422

1 Claim



1. An automatic locking slider for a slide fastener having a pair of rows of coupling elements, said slider comprising:
  - (a) a slider body including a pair of upper and lower flanged wings joined at one end by a neck to define therebetween a substantially Y-shaped guide channel for the passage therethrough of the pair of rows of coupling elements, each of said wings having a support post at one end adjoining said neck, each support post having a recess, said slider body having a through opening extending through said neck and said two support posts;
  - (b) a pair of first and second locking members supported on said upper and lower wings, respectively, and each mounted on a pivot pin rockably received in said recess of a respective one of said support posts, said upper locking member having at one end a locking prong projectable into and retractable from said guide channel in response to pivotal movement of said upper locking member, and at the other end a first link arm projecting into said through opening, said lower locking member having at one end a second link arm projecting into said through opening and engageable with said first link arm in response to pivotal movement of said second locking member;
  - (c) a pair of first and second housings mounted on said upper and lower wings, respectively, and each having a pin retainer projecting from an inner wall of each of said first and second housings for retaining said pivot pin of each of said first and second locking members in the respective recess;

- (d) a leaf spring acting between said first housing and said first locking member for normally urging the latter to pivotally move in such a direction that said locking prong projects into said guide channel; and
- (e) a pair of pull tabs operatively connected to said first and second locking members, respectively, for pulling the respective locking members so as to pivotally move the same against the bias of said leaf spring in such direction that said locking prong is retracted from said guide channel.

4,679,282

## PRESS FASTENER

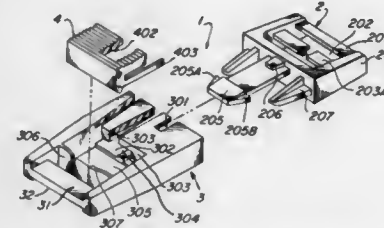
Lung S. Feng, 7F, No. 180, Lane 415, Kuang Fu S. Rd., Taipei, Taiwan

Filed Jun. 4, 1986, Ser. No. 870,541

Int. Cl.<sup>4</sup> A44B 11/25

U.S. Cl. 24—614

3 Claims



1. A press fastener, including the combination of:
  - a plug body including outwardly extending elastic tongue part positioned at one end of said plug body, said tongue part containing a climbing angle peak along a front portion thereof;
  - a slotted body including an angled receiving groove extending interiorly from one end of said slotted body to a press groove creating a gap in a central portion thereof for allowing said elastic tongue part to extend through said receiving groove such that said climbing angle peak of the tongue part extends into said press groove to fasten said plug body to said slotted body; and
  - an elastic press body positioned in the press groove of said slotted body supported thereby for allowing downward pressure exerted upon said elastic press body to be transmitted to said climbing angle of the elastic tongue part to thereby unfasten said plug body from said slotted body.

4,679,283

## DEVICE FOR BIAXIALLY STRETCHING FILM

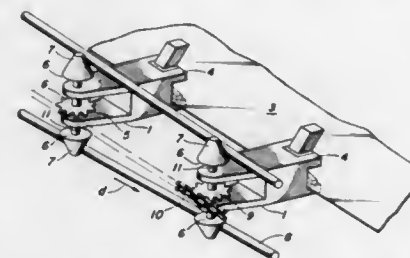
Albert W. Forrest, Jr., Chillicothe, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1985, Ser. No. 728,880

Int. Cl.<sup>4</sup> D06C 3/04; B29C 55/16

U.S. Cl. 26—73

4 Claims



1. In a device for stretching film simultaneously in two directions composed of a tenter frame with film clips to grip the edges of a continuous web of film, wherein the film clips are affixed to varying velocity carriers, and wherein the sides of the tenter frame diverge to stretch said web of film transversely in the direction of film travel and simultaneously

stretching the film longitudinally in the direction of film travel by acceleration of the film between said carriers, said varying velocity carriers each comprising a movable carrier body and a stationary support therefor composed of track means in which the carrier body can move and rail means out of parallel with said track means, the improvement comprising at least one conical driver within said carrier body adapted to contact said rail means and means for rotating said driver, said conical driver adapted to move said carrier body along said track means at a velocity dependent upon the point of contact of the face of said driver with said rail means.

4,679,284

## YARN ENTANGLING AIR JET

Geoffrey Naylor, and Christopher J. Lawrence, both of Macclesfield, United Kingdom, assignors to Rieter-Scragg Limited, Cheshire, United Kingdom

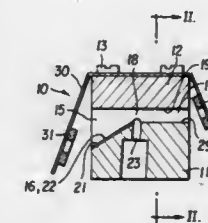
Filed May 21, 1986, Ser. No. 865,340

Claims priority, application United Kingdom, Jul. 20, 1985, 8518390

Int. Cl.<sup>4</sup> D02G 1/16; D02J 1/08

U.S. Cl. 28—272

20 Claims



1. An entangling jet having a yarn passageway extending therethrough with an air inlet passageway and a yarn threading slot each communicating with said yarn passageway, said yarn passageway having a base surface, an inlet portion and an outlet portion and being defined in said outlet portion by said base surface and by side surfaces defining an apex opposed to said base surface and providing a reducing width of passageway away from said base surface towards said apex, said yarn passageway being defined in said inlet portion by said base surface and by an inlet surface opposed to and converging towards said base surface in a direction towards outlet portion, said air inlet passageway communicating with said apex of said outlet portion, one side surface of said yarn passageway having an opening therein which is substantially parallel with said base surface and spaced therefrom towards said apex and with which said yarn threading slot communicates, said jet being formed by two parts separably secured to each other, said two parts having at said one side of said yarn passageway two mutually spaced surfaces defining between them said opening and said yarn threading slot, and at the other side of said yarn passageway two mutually contacting surfaces.

15. An entangling jet comprising:

- (a) a lower part having an upper surface, a lower surface, a front surface, a rear surface, and two side surfaces, said upper surface of said lower part comprising, beginning at a first one of said two side surfaces of said lower part, a first planar surface extending from said front surface of said lower part to said rear surface of said lower part, a wall extending from said front surface of said lower part to said rear surface of said lower part and forming the bottom of a yarn passageway, a second planar surface parallel to but spaced downwardly from said first planar surface of said lower part, and a downwardly extending guide surface extending from said second planar surface of said lower part to the second one of said two side surfaces of said lower part and from said front surface of said lower part to said rear surface of said lower part, said yarn passageway comprising an inlet portion and an outlet

portion, the height of said inlet portion being at a maximum at said front surface of said lower portion and sloping to a minimum where said inlet portion meets said outlet portion, an air inlet passageway being formed in said lower part and extending from said lower surface of said lower part to said yarn passageway where said inlet portion meets said outlet portion;

- (b) an upper part having an upper surface, a lower surface, a front surface, a rear surface, and two side surfaces, said lower surface of said upper part comprising, beginning at a first one of said two side surfaces of said upper part, a first planar surface extending from said front surface of said upper part to said rear surface of said upper part, said first planar surface of said upper part being sized, shaped, and positioned to make surface abutting contact with said first planar surface of said lower part, a base wall extending from said front surface of said upper part to said rear surface of said upper part and forming the top of said yarn passageway, said base wall being coplanar with said first planar surface of said upper part, a second planar surface parallel to but spaced downwardly from said first planar surface of said upper part, said second planar surface of said upper part being sized, shaped, and positioned to be parallel to but spaced from said second planar surface of said lower part to define a yarn threading slot therebetween, and an upwardly extending guide surface extending from said second planar surface of said upper part to the second one of said two side surfaces of said upper part and from said front surface of said upper part to said rear surface of said upper part; and
- (c) means for releasably connecting said upper and lower parts together.

4,679,285

**METHOD OF MAKING A LUBRICATED HINGE PIN**  
David B. Ballantyne, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1985, Ser. No. 797,957

Int. Cl.<sup>4</sup> B21D 53/40; E05D 5/10

U.S. Cl. 29—11

2 Claims



1. A method of making a lubricated hinge pin that fits in axially aligned barrel sections of a pair of hinge plates to pivotally connect same to form a hinge comprising the steps of:
- forming the hinge pin as a hollow cylindrical body with an outer diameter that is receivable with a close fit in the barrel sections,
  - forming a radially expandable portion terminating with an internal stop shoulder on one end of the cylindrical body,
  - forming a preformed head and lubricant entrance on the other end of the cylindrical body,
  - forming lubricant delivery holes in the cylindrical body intermediate said ends,
  - forming a mandrel having an extruding head and a shank connected to the extruded head by a breakaway portion,
  - assembling the mandrel in the cylindrical body so that the extruding head is located in said one end and the shank

extends through the cylindrical body and outward past said other end,

inserting the cylindrical body with the mandrel in the barrel sections with the preformed head abutting one side of the hinge and the stop shoulder aligned with the opposite side of the hinge,

pulling the extending portion of the shank so as to radially expand the expansion portion of the cylindrical body with the extruding head to abut said other side of the hinge and until the extruding head is stopped by the stop shoulder and retained by such forming action to close and seal said one end of the cylindrical body,

continuing to effect such pulling until the breakaway portion breaks with the extruding head stopped by the stop shoulder to thereby release the shank for removal from the cylindrical body and leave the extruding head in place to permanently close and seal said one end,

inserting lubricant in the cylindrical body through said entrance, and

sealingly closing said entrance.

4,679,286

**MULTIFACE MACHINING MACHINE TOOL**

Shoji Momoi, Kagamihara, and Sumiaki Inami, Aichi, both of Japan, assignors to Yamazaki Machinery Works, Ltd., Aichi, Japan

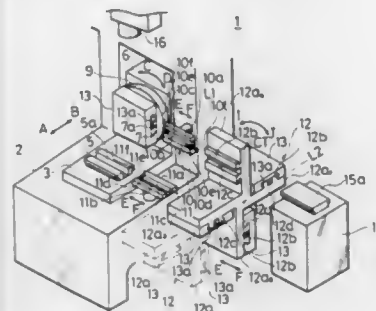
Filed Feb. 12, 1986, Ser. No. 828,746

Claims priority, application Japan, Feb. 25, 1985, 60-35912

Int. Cl.<sup>4</sup> B23Q 41/02; B65G 47/00

U.S. Cl. 29—33 P

2 Claims



1. A multiface machining machine tool including a spindle for mounting a tool thereon and being capable of machining at least two faces of a workpiece loaded on a pallet by means of said tool, whereby said multiface machining machine tool comprises:

- a workpiece rotatably holding means for rotatably holding said pallet at a position opposite to said spindle;
- a workpiece holding means for holding a face of the workpiece other than the face machined by the tool of the spindle when said workpiece rotatably holding means is holding the workpiece opposite to the spindle;
- a pallet changer provided with a main body rotatably held by a driving means and formed with a plurality of wings arranged in a windmill shape, and workpiece supporting means for loading a pallet on each one of said wings; and
- an intermediate station having transfer means for transferring the workpiece between said workpiece rotatably holding means, workpiece holding means, and said pallet changer.

4,679,287

**HEATED VARIABLE CROWN ROLL**

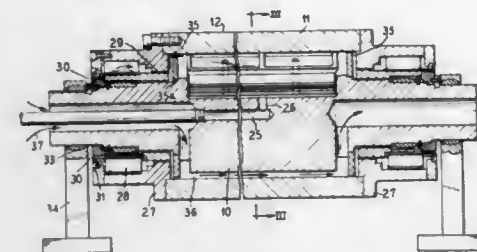
Andre Allard, Kalamazoo, Mich., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 4, 1984, Ser. No. 657,738

Int. Cl.<sup>4</sup> B21B 13/02

U.S. Cl. 29—116 AD

6 Claims



1. A roll for operating at a predetermined temperature comprising, in combination:
- a rotatable roll having a cylindrical working face and a longitudinal axis;
  - a stationary shaft means for supporting the rotatable roll;
  - bearing means at each end of the roll between the shaft means and the roll, whereby an imaginary line which is perpendicular to the longitudinal axis and passes through a bearing does not pass through the working face;
  - an annular insulating fluid chamber adjacent each end of the roll shell between a respective bearing means and each respective end of the roll for reducing thermal transmission between the roll and bearing means,
  - means for delivering a heated fluid to the roll to maintain the roll at a working temperature, and
  - means for delivering an insulating fluid separate from the heated fluid to each of said chambers for absorbing heat from the roll and preventing said heat from the heated fluid from reaching the bearing means.

4,679,288

**SURFACE TREATMENT OF A ROLLING MILL ROLL**  
Guy Monfort, Braives; Jean Crahay, Francorchamps, and Adolphe Bragard, Esneux, all of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

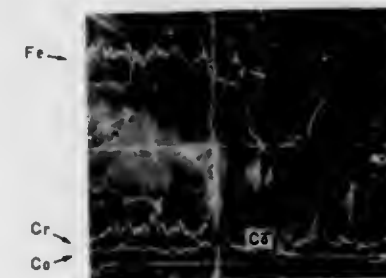
Continuation of Ser. No. 797,439, Nov. 13, 1985. This application Nov. 24, 1986, Ser. No. 935,094

Claims priority, application Belgium, Nov. 14, 1984, 6/48029

Int. Cl.<sup>4</sup> B21B 1/00, 3/00

U.S. Cl. 29—121.8

7 Claims



1. In a method for the surface treatment of a rolling mill roll, including depositing on the roll surface a layer of a material which is at least partly metallic, directing an intermittent laser beam at the surface of said layer while rotating said roll about its longitudinal axis, melting the layer surface in each successive impact zone of the laser beam, forming in said impact zone a microcrater surrounded by a rim and solidifying the rim, the successive microcraters being distributed according to a determined pattern in order to impart a controlled roughness to said

surface, the improvement comprising providing the material of said layer with at least one hardening component or at least one component which can react with at least one constituent of the material of said roll to form said hardening component, melting also the material of said roll surface in the successive impact areas of the laser beam, alloying said molten roll material with said molten layer material in said impact areas, and forming an alloyed rim around each of said microcraters.

4,679,289

**METHOD AND APPARATUS FOR FORMING INTRUDED BRANCH ATTACHMENT STRUCTURES IN TUBING**

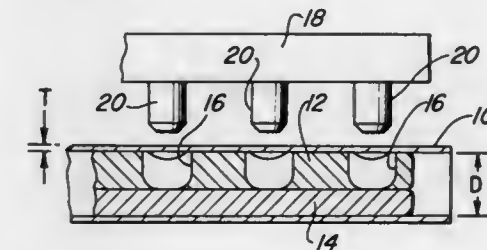
Donald E. Miller, Adrian, Mich., assignor to Brazeway, Inc., Adrian, Mich.

Filed Aug. 15, 1986, Ser. No. 896,979

Int. Cl.<sup>4</sup> B21D 53/00; B23D 21/14

U.S. Cl. 29—157 R

2 Claims



1. Apparatus for forming intruding branch attachment structure in tubing comprising:

- a mandrel locatable within a length of extrudable metal tubing, said tubing having an inner diameter D and a wall thickness T, said mandrel having an upper section and a lower section, the upper and lower sections being disposed in mutually slidable, stacked relationship to occupy essentially the entire interior diameter D of the tubing, the upper section having formed therein one or more pockets of interior dimension less than D and opening to the interior wall surface of the tubing; and
- a punch having at least one punch head portion aligned with a pocket in the upper section of said mandrel, the punch head portion being of a lateral dimension which is less than the interior dimension of the pocket with which it is aligned, said punch being driveable through the wall of said tubing and into said pocket thereby to displace the wall material of said tubing into the gap between the punch head portion and the pocket to form an intruded sleeve in said tubing.

4,679,290

**METHOD OF DE-EMPHASIZING THE GAP BETWEEN A DOOR EDGE AND ADJACENT STRUCTURE**

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Division of Ser. No. 604,186, Apr. 26, 1984, Pat. No. 4,587,761.

This application Mar. 13, 1986, Ser. No. 839,745

Int. Cl.<sup>4</sup> B23Q 17/00

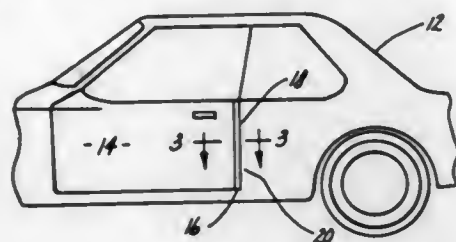
U.S. Cl. 29—407

5 Claims

1. The method of concealing the gap between the trailing edge of a vehicle swinging closure and adjacent body structure against which the trailing edge closes and for concurrently protecting the trailing edge by means of an edge guard applied over said edge, said method comprising providing an elongated edge guard having a base connecting inner and outer spaced legs when viewed in cross section of such a length to provide a range of adjustment fits of the edge guard on the edge whereby the edge guard may be more or less fully inserted onto the edge, installing the edge guard legs on the edge with there being an initially pliable, but subsequently harden-



able filler material between the spaced legs at the base of the edge guard and the edge, adjusting the edge guard on the edge so that the edge guard substantially fills said gap and allowing



the filler material to harden and provide a substantially permanent locator between the adjusted position of the base of the edge guard and the edge.

4,679,291

# ROBOTIC STAPLING SYSTEM FOR FIBER PLACEMENT FOR COMPOSITE PARTS

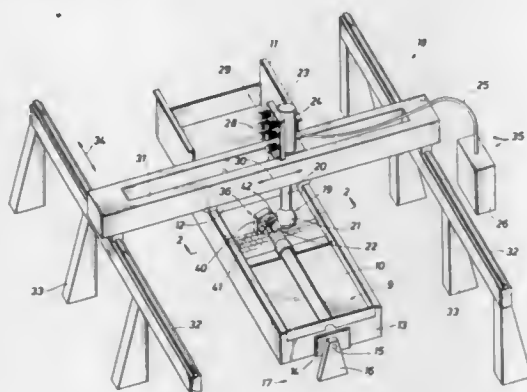
Walter R. Schmeal; Nazim S. Nathoo, both of Houston, Tex., and John A. Neate, Miles, Mich., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 26, 1986, Ser. No. 832,949

Int. Cl.<sup>4</sup> B23P 11/00, 19/00; B32B 31/00

U.S. Cl. 29—432

8 Claims



1. A method for fabricating a filament-reinforced part using a core member having recesses defined in the surface thereof, said method comprising:  
mounting the core member;  
placing filament matrix means against said recesses formed in the surface of said core member; and  
fastening the filament matrix means in place in said recesses of said core member.

4,679,292

# METHOD FOR SECURING A PANEL TO A STRUCTURAL MEMBER

Albert R. Mead, Setauket, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 24, 1985, Ser. No. 779,766

Int. Cl.<sup>4</sup> B29C 27/00

U.S. Cl. 29—447

8 Claims

1. A method for securing a panel to a structural member comprising the steps:  
integrally forming an enlarged edge of the panel;  
integrally forming a bifurcated edge on a connector made of memory metal alloy;  
inserting the enlarged edge of the panel into the bifurcated

edge of the connector during a first temperature condition;



subjecting the connector to a second temperature condition causing contraction of the bifurcated edge thus clamping the enlarged panel edge thereto; and  
fastening the structural member to the connector.

4,679,293

# METHOD OF MAKING A RAILROAD TRACK INSULATOR UNIT

James S. Bryan, Clyde, and Roger D. Meadows, Waynesville, both of N.C., assignors to Dayco Products, Inc., Dayton, Ohio Division of Ser. No. 531,120, Sep. 9, 1983, Pat. No. 4,569,477.

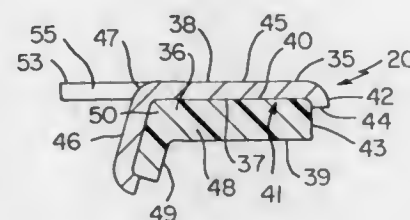
This application Dec. 5, 1985, Ser. No. 804,726

The term of this patent subsequent to Feb. 11, 2003, has been disclaimed

Int. Cl.<sup>4</sup> B23P 11/02

U.S. Cl. 29—450

7 Claims



1. In a method of making a railroad track insulator for holding a railroad rail against its foundation means and comprising the steps of securing a generally L-shaped configuration metallic part and a generally L-shaped configuration polymeric part together so that the polymeric part is adapted to engage said rail, forming said metallic part to have an open side recess means in one of the opposite sides thereof with said recess means being defined by a peripheral flange means on each edge thereof, and disposing and securing said polymeric part in said recess means so as to have a peripheral edge means thereof supported by said peripheral flange means of said metallic part, the improvement wherein said step of forming said metallic part comprises the step of stamping a sheet of metallic material to bend same into such a configuration.

4,679,294

# METHOD FOR MAKING A TRIMETALLIC CYLINDER

Donald P. Lomax, 649 Stourbridge Pl., P.O. Box 232, Wales, Wis. 53183, and Ronald M. Boggs, P.O. Box 253, Genesee, Wis. 53127

Division of Ser. No. 396,623, Jul. 9, 1982, abandoned. This application Nov. 25, 1985, Ser. No. 801,296

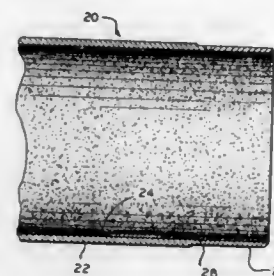
Int. Cl.<sup>4</sup> B23P 19/04

U.S. Cl. 29—460

3 Claims

1. A method for making a trimetallic cylinder comprising the steps of:  
providing a metal cylinder;  
welding an end ring onto each end of said metal cylinder, said end rings being of a material which is more corrosion resistant than said metal cylinder, said welding step providing a cylinder having a common bore;  
placing in said cylinder a quantity of a lining alloy having a melting point less than said metal cylinder and said end rings;

placing end caps on said cylinder and heating said cylinder above the melting point of said lining alloy;  
spinning said cylinder about its axis to centrifugally coat the bore of said cylinder with said lining alloy and to form a



metallurgical bond between said lining alloy and said bore of both the cylinder and rings, and,  
cooling said cylinder, removing said end caps and finishing the inner surface of said cylinder.

4,679,295

# MODULAR MACHINE TOOL FOR SERIES MACHINING OF PARTS IN A BAR

Angel Lopez, Les Geneveys-sur-Coffrane, Switzerland, assignor to Jean Greub S.A., La Chaux-de-Fonds, Switzerland

PCT No. PCT/CH85/00153, § 371 Date May 30, 1986, § 102(e) Date May 30, 1986, PCT Pub. No. WO86/02305, PCT Pub. Date Apr. 24, 1986

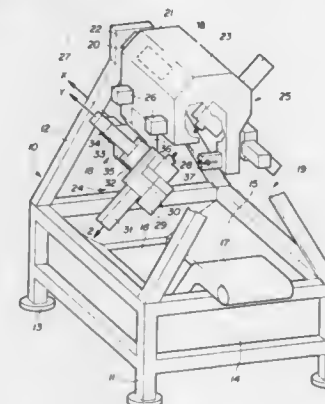
PCT Filed Oct. 11, 1985, Ser. No. 879,102

Claims priority, application Switzerland, Oct. 16, 1984, 4942/84

Int. Cl.<sup>4</sup> B23P 23/00; B23Q 7/04

U.S. Cl. 29—564.8

12 Claims



1. A modular machine tool for machining series of parts from a bar of raw material, said machine tool comprising at least one module equipped with at least one machining station, means for transporting a bar of raw material in position and maintaining said bar in position, an indexing device for forming indexing marks on said bar, said machining station comprising at least one machining unit having independent drive means adapted to displace said machining unit with respect to said bar of raw material, each said module being provided with a rigid chassis comprising a rectilinear connecting beam disposed parallel to said bar of raw material, said machining station forming a part of said module being swingably mounted on said connecting beam, and said chassis comprising a lower frame forming a case and an upper prism-shaped frame, said lower frame being configured to contain at least one of a lubricating unit and means for the removal of chips, said upper frame comprising said connecting beam and end elements connecting said beam to said lower frame.

4,679,296

# MACHINE TOOL

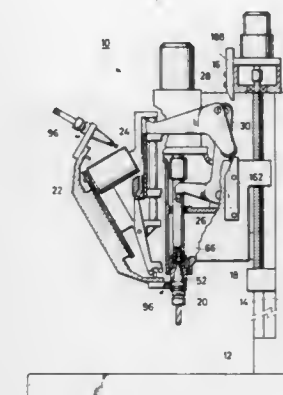
Kikuo Watanabe, Aichi; Mitsuo Kobayashi, Mie; Noboru Hirose, and Keiichi Sato, both of Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 23, 1985, Ser. No. 768,750

Int. Cl.<sup>4</sup> B23Q 3/157

U.S. Cl. 29—568

3 Claims



1. A machine tool for machining a work piece, the machine tool of the type having as main spindle head rotatably supporting a main spindle with a tool mount at one end, the spindle head being reciprocable relative to the machine tool frame in the axial direction of the main spindle, the machine tool further comprising:

- a tool holding member installed in the tool mount of said main spindle;
- automatic means for changing a tool held in said tool holding member during "double action" reciprocal tool-changing movement of said spindle head, said automatic means including:
  - a. a tool support carried on said frame and movable in the axial direction of said main spindle independently of said main spindle;
  - b. a tool magazine rotatably supported on, and axially movable with, said tool support and having a plurality of tool holders each capable of detachably holding said tool, and spaced about the magazine periphery, said magazine for indexing a selected tool holder into and out of axial alignment with said main spindle;
  - c. first cam-and-crank means interconnecting said main spindle head, said frame, and said tool support for moving said tool support together with said spindle head a predetermined distance during the "double action" movement of said main spindle head relative to said frame, the tool being held in said main spindle also being engaged to be held by one of said plurality of tool holders of the tool magazine during movement in said predetermined distance;
  - d. second cam-and-crank means interconnecting said main spindle head and said frame for causing said tool holding member to release the tool from the tool holding member during a preselected portion of said "double action" movement; and
  - e. means for preventing movement of said tool support below a fixed axial location, the spindle head being axially movable below said fixed location for performing machining operations.

4,679,297

# METHOD FOR CHANGING THE TOOLING IN A ROBOT-BASED SYSTEM AND SYSTEM UTILIZING SAME

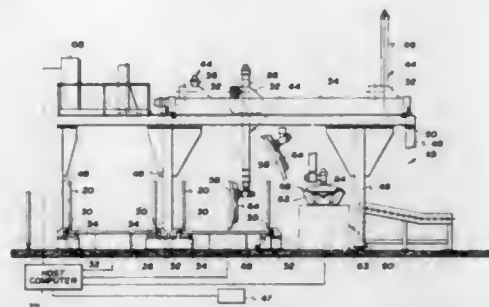
Robert E. Hansen, Jr., New Baltimore; James R. Murray, and Roberta L. Zaid, both of Troy, all of Mich., assignors to GMF Robotics Corporation, Troy, Mich.

Filed May 15, 1986, Ser. No. 863,333

Int. Cl.<sup>4</sup> B23Q 3/155

U.S. Cl. 29—568

20 Claims



1. A method for automatically changing tooling of a robot-based system, the method comprising: indexing a first container into a work envelope of a robot having a first end effector connected to a distal end of an arm; conveying at least one fixture adapted to support a first part in a desired position and orientation into the work envelope; controlling the robot so that the robot removes the fixture from an operative position and places the fixture in the first container; moving the first container out of the work envelope; indexing a second container having a second fixture adapted to support a second part in a desired position and orientation into the work envelope; controlling the robot so that the robot picks up and places the second fixture in an operative position in preparation for conveyance of the second part; and moving the second container out of the work envelope.

4,679,298

# METHOD OF FABRICATION OF GAAS COMPLEMENTARY ENHANCEMENT MODE JUNCTION FIELD EFFECT TRANSISTOR

Rainer Zuleeg, San Juan Capistrano; Johannes K. Nottboff, Lomita, and Gary L. Troeger, Fountain Valley, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 570,951, Jan. 16, 1984, Pat. No. 4,568,957.

This application Aug. 30, 1985, Ser. No. 771,524

Int. Cl.<sup>4</sup> H01L 21/00

U.S. Cl. 29—571

4 Claims



1. A process for forming a GaAs integrated circuit structure containing complementary enhancement mode junction field effect transistors (JFET) comprising: forming at least one n channel JFET structure in a first main surface of a semi-insulating GaAs substrate, the process for forming the n channel JFET comprising: forming source and drain regions by a first ion implantation of n type impurity ions into two regions of the substrate separated by an intermediate region; forming a channel region by exposing a portion of the

intermediate region to a second ion implantation of further n type impurity ions, the second implantation also implanting into the source and drain regions; and forming a gate region by exposing a portion of the channel region to a third ion implantation of p type impurity ions; then emplacing electrical contacts atop the source, drain and gate regions; and

forming at least one p channel JFET structure in said first main surface of the substrate, the process for forming the p channel structure comprising: forming a p channel region by a channel ion implantation of p type impurity ions into the substrate; forming source and drain regions by ion implantation of p type impurity ions into respective spaced-apart areas of the p channel region while protecting the remainder of the p channel region from this ion implantation; and forming a gate region by exposing a portion of the channel region intermediate the source and drain regions to an ion implantation of n type impurity ions; then forming electrical contacts atop the source, drain and gate regions wherein the ion implantations into the substrate pass through a protective layer of silicon-nitride sufficient to provide a consistent and fixed depth reference for the ion implantations, the protective layer being removed beneath at least the electric contacts.

4,679,299

# FORMATION OF SELF-ALIGNED STACKED CMOS STRUCTURES BY LIFT-OFF

Nicholas J. Szluk, Albuquerque, N. Mex., and Gayle W. Miller, Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 11, 1986, Ser. No. 895,407

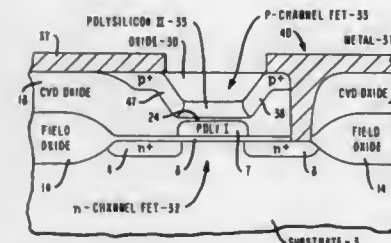
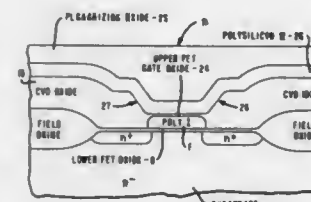
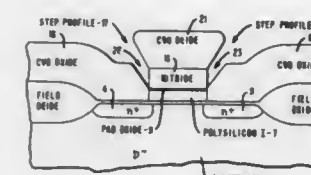
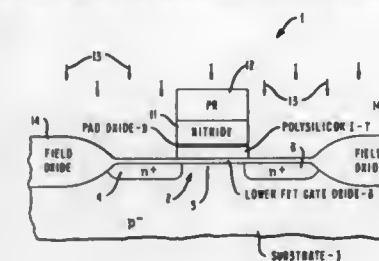
Int. Cl.<sup>4</sup> H01L 29/78, 29/04, 27/02

U.S. Cl. 29—571

18 Claims

1. A process for fabricating in an active region of a substrate an aligned, three-dimensionally integrated circuit structure having two channel regions responsive to a common gate electrode, comprising the steps of: forming in the active region of a semiconductor substrate over a first channel defined between first source/drain regions a relatively thick lift-off material layer coextensive with an underlining gate electrode layer, together forming sidewalls at the channel ends; forming a first dielectrical layer, over the integrated circuit structure, characterized by the presence of an accentuated etchability of the first dielectric layer in the regions covering the sidewalls of the lift-off material layer; selectively etching first dielectric layer material covering the sidewalls of the lift-off material layer to expose the lift-off material; selectively removing the lift-off material and first dielectric formed thereover to form a recess in correspondence with the gate electrode layer; forming a conformal layer of a semiconductor material over the structure to retain a recess in correspondence with the gate electrode layer; forming a region of dopant masking material in the recess in correspondence with the gate electrode layer; and doping the semiconductor material in the presence of the

region of dopant masking material to form in the semiconductor material layer a second channel under the dopant



masking region and second source/drain regions outside the dopant masking region.

4,679,300

# METHOD OF MAKING A TRENCH CAPACITOR AND DRAM MEMORY CELL

Tsu C. Chan, Carrollton, and Yu-Pin Han, Dallas, both of Tex., assignors to Thomson Components-Mostek Corp., Carrollton, Tex.

Filed Oct. 7, 1985, Ser. No. 785,195

Int. Cl.<sup>4</sup> H01L 27/10; H01C 11/24

U.S. Cl. 29—571

6 Claims



1. A method of fabricating a trench capacitor in an integrated circuit containing a plurality of circuit elements formed in a semiconductor substrate having a substrate conductivity type, comprising the steps of:

forming a protective layer on said substrate; cutting an implant aperture having first and second aperture dimensions along first and second axes in said substrate, in a predetermined location in said substrate dimensions along said first and second axes, through said protective layer to said substrate; implanting a predetermined dose of ions of conductivity type opposite to said substrate conductivity type; diffusing said dose of ions into said substrate by heating said substrate to a predetermined temperature for a predetermined time such that a substantial concentration of said ions of said opposite conductivity type extends a predetermined distance from said implant aperture, whereby that portion of said dose of ions extending in said substrate below said predetermined capacitor plate location forms a plate conductive region extending downwardly into said substrate along a third axis and having first, second and third plate dimensions along said first, second and third axes; cutting a trench into said substrate through said implant aperture, thereby forming a trench wall on that surface of said trench extending into said substrate through said plate conductive region with a wall area having a wall length greater than said first plate dimension along said first axis and a wall depth greater than said third plate dimension along said third axis; growing a wall layer of silicon dioxide on said trench wall adjacent said plate conductive region and extending along said trench wall beyond said plate conductive region; filling said trench with polycrystalline silicon filler heavily doped with a trench dopant material of the same conductivity type as said substrate conductivity type and having the capacity of diffusing through thin layers of silicon dioxide; and heating said substrate to a predetermined temperature for a predetermined time sufficient to diffuse a predetermined quantity of said trench dopant material through said wall layer of silicon dioxide to form a diffused channel stop region disposed about said plate conductive region in that portion of said silicon substrate abutting said trench wall and outside said first and third plate dimensions, whereby a parallel-plate capacitor is formed, one plate of which consists of said conductive plate region and the other plate of which is formed by said heavily doped polycrystalline filler, which capacitor has improved resistance to discharge through the effect of said diffused channel stop region.

4,679,301

# PROCESS FOR PRODUCING SILICIDE OR SILICON GATES FOR AN INTEGRATED CIRCUIT HAVING ELEMENTS OF THE GATE-INSULATOR-SEMICONDUCTOR TYPE

Pierre Blanchard, Echirolles, and Jean P. Cortot, Grenoble, both of France, assignors to Thomson-Csf, Paris, France

Filed Sep. 30, 1985, Ser. No. 782,140

Claims priority, application France, Oct. 2, 1984, 84 15125 Int. Cl.<sup>4</sup> H01L 21/283

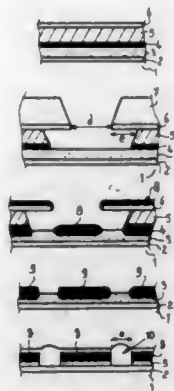
U.S. Cl. 29—571

11 Claims

1. A process for producing closely spaced gate electrodes on a silicon semiconductive substrate for an integrated circuit comprising: depositing on the top surface of the substrate successively, layers of silicon oxide, polycrystalline silicon, a metal which can be converted to a silicide, an oxide and a masking material, patterning the masking layer to provide openings where there is exposed the underlying oxide layer, etching the oxide layer isotropically to undercut the masking layer to obtain overhang, thereby exposing portions of the metal layer larger than the openings in the masking layer, etching the exposed portions of the metal layer, for exposing the underlying polycrystalline silicon, depositing through the openings in the masking layer a layer

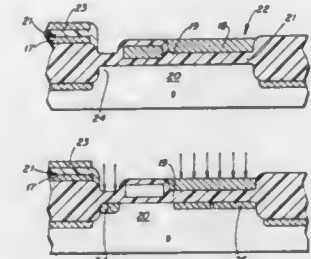
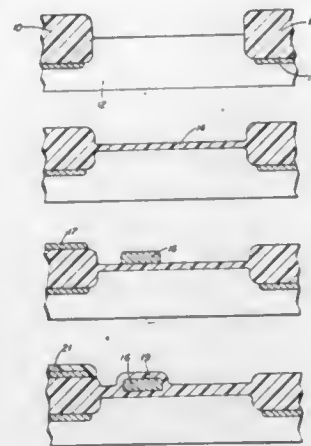


of a metal which can be converted into a silicide on only the central portion of the exposed polycrystalline layer, corresponding essentially to the opening in the masking layer,



annealing the substrate for converting the metal in the portions contacting the polycrystalline layer to silicide, and removing both the layers the silicide portions and the unconverted polycrystalline silicon portions between the silicide portions to define the silicide gates.

ing as a capacitor dielectric, the junction depth and concentration of ions in the capacitor area being less than the



junction depth and concentration of ions in the source area.

4,679,302

### DOUBLE POLYSILICON INTEGRATED CIRCUIT PROCESS

Robert E. Theriault, Ottawa, and John G. Hogeboom, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 12, 1986, Ser. No. 861,887

Int. Cl.<sup>4</sup> H01L 27/04, 29/78

U.S. Cl. 29—571

7 Claims

1. A double polysilicon integrated circuit processing method comprising:

- taking a silicon wafer;
- forming field oxide regions therein;
- forming a gate oxide layer over a device well region, said device well region having source, gate and capacitor areas;
- depositing a first polysilicon layer over the gate oxide layer;
- etching the polysilicon to form a transistor gate over said gate area;
- forming a second oxide layer over the gate and the surrounding device region;
- depositing a second polysilicon layer over the second oxide layer;
- etching the second polysilicon layer to leave polysilicon over said capacitor area; and
- in a single implantation step, implanting ions through said second oxide layer into said source area to form a transistor source and through said oxide and second polysilicon layers to define one side of a capacitor at said capacitor area, said second level polysilicon at the capacitor area functioning as an opposed side of the capacitor, and the second oxide layer at the capacitor area function-

4,679,303

### METHOD OF FABRICATING HIGH DENSITY MOSFETS WITH FIELD ALIGNED CHANNEL STOPS

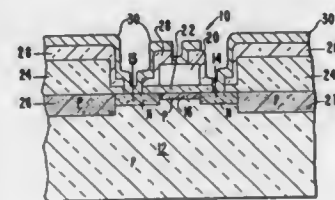
John Y. Chen, Los Angeles, and Richard C. Henderson, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 537,920, Sep. 30, 1983, abandoned. This application May 16, 1985, Ser. No. 734,806

Int. Cl.<sup>4</sup> H01L 21/425

U.S. Cl. 29—571

10 Claims



1. A method of fabricating a MOSFET device, comprising a sequence of the following steps:

- providing a substrate;
- providing a field oxide layer on the surface of said substrate;
- forming a patterned first mask over said field oxide layer defining the boundary of an active device area in said substrate;
- removing that portion of said oxide layer exposed by said first mask so as to expose said active device area of said

- substrate, a resulting edge of said field oxide layer being aligned with a boundary point of said active device area;
- doping said exposed active device area to form an active channel region;
- providing a second mask layer overlying the surface of said substrate and removing said first mask so as to lift-off the overlying portion of said second mask layer to provide a second mask overlying said active area;
- implanting ions into said substrate and masked field oxide at an energy level insufficient for said ions to penetrate said second mask, but with sufficient energy to pass through said field oxide layer to form a channel stop self aligned to said field oxide layer and correspondingly aligned with said active device area; and
- removing said second mask.

4,679,304

### PROCESS FOR PRODUCING ZONES FOR THE ELECTRICAL ISOLATION OF THE COMPONENTS OF AN INTEGRATED CIRCUIT

Daniel Bois, Chet BD 98, 38263 Neylam, France

PCT No. PCT/FR85/00066, § 371 Date Nov. 15, 1985, § 102(e)

Date Nov. 15, 1985, PCT Pub. No. WO85/04516, PCT Pub.

Date Oct. 10, 1985

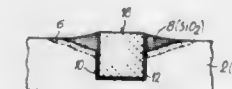
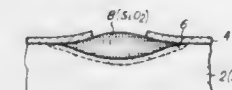
PCT Filed Mar. 29, 1985, Ser. No. 800,617

Claims priority, application France, Mar. 30, 1984, 84 05051

Int. Cl.<sup>4</sup> H01L 21/82, 21/306

U.S. Cl. 29—576 W

7 Claims



1. A process for the production of isolation zones for bringing about electrical isolation between the components of an integrated circuit formed on a silicon substrate, comprising the successive stages of:

- forming a mask on said substrate in order to define the locations of the isolation zones to be produced;
- doping the unmasked substrate regions;
- oxidizing thermally said doped substrate regions in order to form a surface isolation;
- forming a trench in each oxidized region of the substrate and in the substrate regions positioned below said oxidized regions by etching successively said oxidized regions and the substrate;
- oxidizing thermally the edges of said trenches in order to form on said edges an insulating film;
- filling said trenches by depositing an isolating dielectric in said trenches in order to form a deep isolation; and
- eliminating said mask.

4,679,305

### METHOD OF MANUFACTURING A HETEROJUNCTION BIPOLAR TRANSISTOR HAVING SELF-ALIGNED EMITTER AND BASE AND SELECTIVE ISOLATION REGIONS

Kouhei Morizuka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

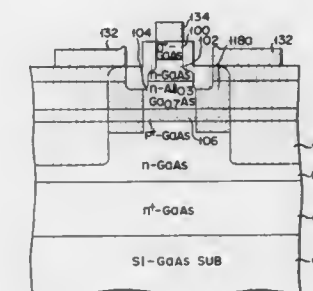
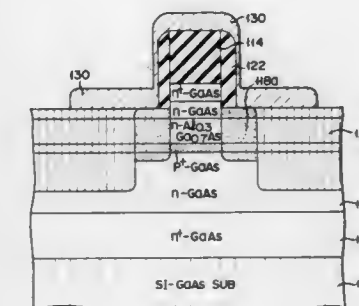
Filed Dec. 18, 1985, Ser. No. 810,300

Claims priority, application Japan, Dec. 21, 1984, 59-268383

Int. Cl.<sup>4</sup> H01L 21/265

U.S. Cl. 29—576.3

11 Claims



1. A method of manufacturing a heterojunction bipolar transistor comprising the steps of:

- forming a first semiconductor layer of a first conductivity type as a collector on a semiconductor substrate;
- forming a second semiconductor layer of a second conductivity type as a base on said first semiconductor layer;
- forming a third semiconductor layer of the first conductivity type as an emitter on said second semiconductor layer, said third and second semiconductor layers constituting a heterojunction;
- selectively forming a first mask on said third semiconductor layer;
- ion-implanting ions of an impurity of the second conductivity type into the resultant structure using a first mask, thereby forming an emitter region and an external base region of the second conductivity type extending to said second semiconductor layer;
- forming a second mask on a side wall of said first mask; and
- ion-implanting a predetermined first material into the resultant structure using said first and second masks, thereby forming a high-resistance layer for isolating said external base region, wherein a width of a remaining external base region is defined by a width of said second mask.

4,679,306

**SELF-ALIGNED PROCESS FOR FORMING DIELECTRICALLY ISOLATING REGIONS FORMED IN SEMICONDUCTOR DEVICE**

Janzoh Shimizu, Tokyo, Japan, assignor to NEC Corporation, Japan

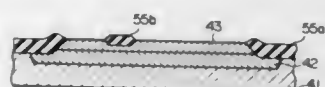
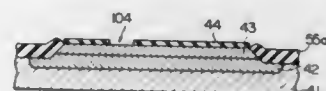
Filed Sep. 24, 1985, Ser. No. 779,496

Claims priority, application Japan, Sep. 28, 1984, 59-203201

Int. Cl.<sup>4</sup> H01L 21/385

U.S. Cl. 29—576 W

30 Claims



1. A method of manufacturing a semiconductor device comprising the steps of:

- forming a first mask film on a semiconductor substrate;
- forming a first polycrystalline silicon layer on said first mask film, said first polycrystalline silicon layer being doped with p type impurity atoms;
- forming a second mask film on said first polycrystalline silicon layer, said second mask film being formed of the same material as said first mask film and having a different etching nature from that of polycrystalline silicon;
- patterning said second mask film and said first polycrystalline silicon layer successively, thereby retaining first and second portions composed of the second mask film and the first polycrystalline silicon layer;
- forming a second polycrystalline silicon layer on exposed parts of said first mask film and said first and second portions, said second polycrystalline silicon layer being undoped or lightly doped with p type impurity atoms;
- applying heat treatment to diffuse said p type impurity atoms from said first polycrystalline silicon layer to said second polycrystalline silicon layer, thereby increasing the concentration of the p type impurity atoms in a part of the second polycrystalline silicon layer extending on said first mask film between said first and second portions;
- selectively removing a portion of said second polycrystalline silicon layer where said p type impurity atoms are not diffused during said step (f);
- selectively removing exposed portions of said first mask film, thereby exposing a portion of said semiconductor substrate;
- selectively removing part of the exposed portion of said semiconductor substrate;
- removing said remaining second polycrystalline silicon layer and said first mask film between said first and second portions, thereby exposing a portion of said semiconductor substrate between the first and second portions; and
- removing the exposed portions of said semiconductor substrate, thereby causing the exposed portions to have different depths from each other.

4,679,307

**METHOD OF MANUFACTURING A RECESSED GATE OF A SEMICONDUCTOR DEVICE**

István Bársony, Hamamatsu, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,536

Claims priority, application Japan, Oct. 29, 1984, 59-225885

Int. Cl.<sup>4</sup> H01L 21/22, 21/265, 21/302

U.S. Cl. 29—576 B

5 Claims



1. A method of manufacturing a semiconductor device with a recessed gate structure, the method comprises the steps of: forming a thin film pattern of a predetermined material on a semiconductor substrate having a predetermined configuration; selectively etching said semiconductor substrate using said film pattern as an etching mask to form a concave portion in said semiconductor substrate, said concave portion being wider than windows of said film pattern; implanting ions of an appropriate impurity into a surface area of the bottom of said concave portion to form a recessed gate region, the implantation of said ions uses at least one part of said thin film pattern as a mask.

4,679,308

**PROCESS FOR CONTROLLING MOBILE ION CONTAMINATION IN SEMICONDUCTOR DEVICES**

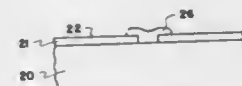
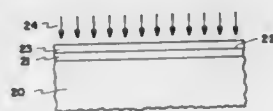
Chris J. Finn, and Daniel W. Youngner, both of Maple Grove, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 14, 1984, Ser. No. 681,768

Int. Cl.<sup>4</sup> H01L 21/20; B01J 17/00

U.S. Cl. 29—576 B

18 Claims



1. A process for controlling mobile ion contamination in semiconductor devices comprising the steps of: forming a layer of a dielectric material on a major surface of a semiconductor body; forming a layer of an organic material overlying said dielectric material; implanting a mobile ion gettering agent into said layer of organic material using an implantation energy in a range such that a substantial amount of said gettering agent remains in said layer of organic material; ashing said layer of organic material in an oxygen based plasma; and performing subsequent processing steps.

4,679,309

**PROCESS FOR MANUFACTURING ISOLATED SEMI CONDUCTOR COMPONENTS IN A SEMI CONDUCTOR WAFER**

Joseph Borel, St. Egreve, France, assignor to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux E.F.-C.I.S., Grenoble, France

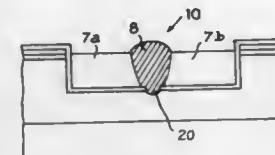
Filed Jun. 18, 1984, Ser. No. 621,733

Claims priority, application France, Jun. 21, 1983, 83 10243

Int. Cl.<sup>4</sup> H01L 21/76

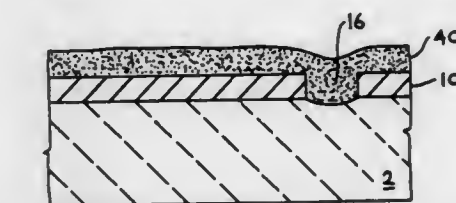
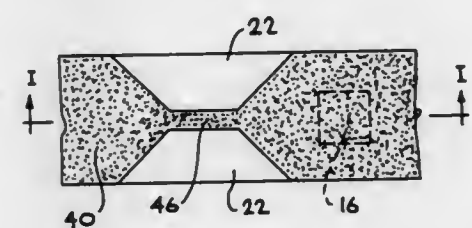
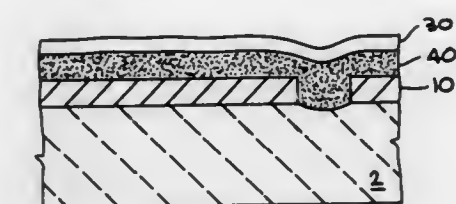
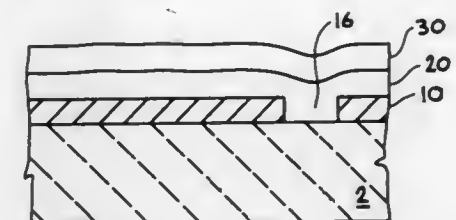
U.S. Cl. 29—576 W

3 Claims



3. The process as claimed in claim 2, further comprising, after the epitaxying step, the following step; locally oxidizing said epitaxied polycrystalline silicon layer over the whole of its thickness opposite said windows.

(c) patterning said silicon layer to form the desired fuse width and length prior to formation of the silicide; and



(d) heating said structure to a temperature sufficient to cause said metal and said patterned silicon to react to form the desired metal silicide.

4,679,311

**METHOD OF FABRICATING SELF-ALIGNED FIELD-EFFECT TRANSISTOR HAVING T-SHAPED GATE ELECTRODE, SUB-MICRON GATE LENGTH AND VARIABLE DRAIN TO GATE SPACING**

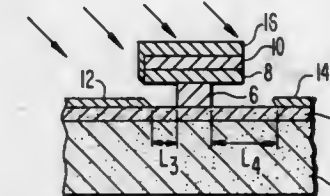
Amir A. Lakhani, and Laurence C. Olver, both of Columbia, Md., assignors to Allied Corporation, Morristown, N.J.

Filed Dec. 12, 1985, Ser. No. 808,597

Int. Cl.<sup>4</sup> H01L 21/283, 21/308

U.S. Cl. 29—579

13 Claims



4,679,310

**METHOD OF MAKING IMPROVED METAL SILICIDE FUSE FOR INTEGRATED CIRCUIT STRUCTURE**

Govardhan Ramachandra, Sunnyvale, and Kiran M. Bhatt, Milpitas, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 31, 1985, Ser. No. 794,216

Int. Cl.<sup>4</sup> H01L 21/90

U.S. Cl. 29—577 R

15 Claims

1. A method of forming an improved metal silicide fuse of controlled thickness on an integrated circuit structure comprising a silicon substrate which comprises:

- forming on said underlying silicon substrate a layer of a predetermined amount of a metal capable of reacting with silicon to form a silicide;
- forming over said metal a layer of silicon in excess of the amount needed to react with all of said underlying metal;

1. A method of fabricating a self-aligned semiconductor device on a substrate having an active region formed therein, comprising the steps of:

- forming a multi-layer gate structure on the active region, said gate structure having an aluminum layer contacting said active region, a titanium layer disposed on said alumi-



num layer and a platinum layer disposed on said titanium layer;

(b) selectively etching said aluminum layer to form a gate electrode having a T-shaped cross-section; and

(c) forming source and drain electrodes on the active region using the T-shaped gate electrode as a shadow mask so that the source and drain electrodes are aligned with the gate electrode.

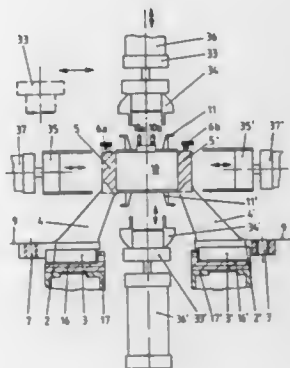
4,679,312

**METHODS AND APPARATUS FOR THE AUTOMATIC PRODUCTION OF STATORS FOR ELECTRIC MOTORS**  
Manfred Nussbaumer, and Bruno Fischer, both of Dietikon, Switzerland, assignors to Micafil AG, Zurich, Switzerland  
Filed Feb. 4, 1986, Ser. No. 825,908  
Claims priority, application Switzerland, Feb. 15, 1985, 0717/85

Int. Cl.<sup>4</sup> H02K 15/06

U.S. Cl. 29—596

7 Claims



1. In an apparatus for the production of stators for electric motors, said apparatus being of the type comprising a production line having a plurality of work stations, including a winding station, and conveyor means for advancing stator workpiece holders successively to said stations, the improvement wherein:

said conveyor means comprises a pair of parallel, horizontally spaced belts driven synchronously in horizontally spaced relationship,

each said holder comprising:

jaws for securing a stator workpiece therebetween, and legs extending generally vertically from said jaws and including bearing surfaces engageable with respective ones of said belts to form a horizontal space between said legs,

said winding station comprising:

upper and lower winding forms arranged to move generally vertically to approach a stator workpiece from above and below, with one of said winding forms arranged to travel between said belts and said legs as it approaches said stator workpiece, and

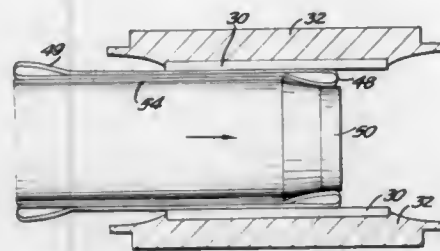
a pair of winding form holders arranged to move generally horizontally to approach said winding forms from opposite horizontal sides of said workpiece holder, and retaining means for retaining said stator holders at said stations while continuing to drive said belts so that said stator holders can be advanced independently of one another.

# 4,679,313 METHOD OF MAKING A SERVO MOTOR WITH HIGH ENERGY PRODUCT MAGNETS

Roy D. Schultz, Radford; Thomas R. England, Blacksburg, and C. Clark Altizer, Radford, all of Va., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.  
Filed Mar. 8, 1985, Ser. No. 709,763  
Int. Cl.<sup>4</sup> H02K 15/06

U.S. Cl. 29—596

8 Claims



1. A method of making an electric motor with the stator winding inside a slotless cylindrical stator shell comprising the steps of:

forming a slotless cylindrical stator shell of magnetic material;

creating a generally cylindrical support with a reduced diameter portion at one end;

forming the winding around said support from preformed coils such that the coil and turns at one end of said support flare inwardly and extend adjacent said reduced diameter portion, and the coil end turns at the other end of said support flare outwardly;

inserting said winding into said cylindrical stator shell starting with the inwardly flared end coils while the winding is supported by said support;

impregnating said winding with a resin to secure said winding inside said stator shell; and

removing said support from the winding through said end having said outwardly flared end coils.

4,679,314

# METHOD FOR MAKING A FLUID COOLED ACYCLIC GENERATOR ROTOR

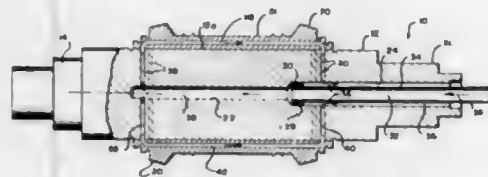
Henry G. Lenz, Scotia; Leonard Coffman, Schenectady, and Adrian M. Beltran, Ballston Spa, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 23, 1985, Ser. No. 812,033

Int. Cl.<sup>4</sup> H02K 15/14

U.S. Cl. 29—598

14 Claims



1. A method for manufacturing a fluid cooled rotor for an acyclic electromagnetic machine comprising the steps of:

A. providing a rotor core of a ferromagnetic steel having a peripheral surface;

B. machining internal passages in said core opening into said core peripheral surface for accommodating the circulation of a coolant;

C. providing a plurality of coolant tubes;

D. fixedly supporting said coolant tubes in spaced relation to said peripheral surface, said tubes being distributed about the periphery of said core;

E. coupling inlet and outlet ends of said tubes in coolant flow connection with said passages at said peripheral surface; and

F. forming a current conductor enveloping said tubes and diffusion bonded to said core peripheral surface from a metallic powder by hot isostatic pressure, said passages being vented to the isostatic pressure to prevent collapse of said tubes.

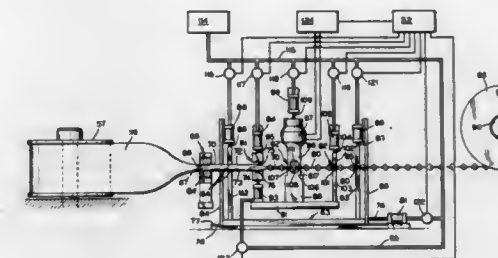
4,679,316

# APPARATUS FOR FORMING AND INSERTING CELL SEPARATOR BASKETS

Robert D. Simonton, Fremont; John D. Cattano, Castalia, and Robert K. Mason, Gibsonburg, all of Ohio, assignors to Fremont Special Machine Co., Inc., Fremont, Ohio  
Division of Ser. No. 707,887, Mar. 4, 1985, Pat. No. 4,618,546.  
This application May 5, 1986, Ser. No. 859,691  
Int. Cl.<sup>4</sup> H01M 2/00; B23P 19/00

U.S. Cl. 29—731

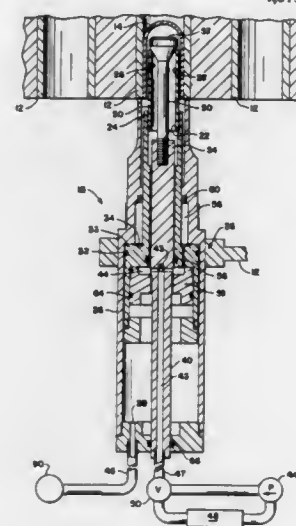
20 Claims



4,679,315  
**HYDRAULIC TUBE PLUG REMOVER**  
Mark A. Overbay, East Ridge, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.  
Filed Jan. 6, 1986, Ser. No. 816,601  
Int. Cl.<sup>4</sup> B23P 15/26

U.S. Cl. 29—726

3 Claims



1. In combination, a tube, a plug in the end of the tube, plug removal means including a shaft having an enlarged first end extending up into the plug, expandable means surrounding the enlarged end, such that when the shaft is removed axially outwardly of the plug and the expandable means, it forces the expandable means radially outwardly into tight engagement with plug, a plug removal means actuator including a first member having a first end attached to the shaft, and second end attached to a first piston, a second member having a first end attached to the expandable means and a second end attached to a second piston, a first chamber having one wall thereof, formed by the first piston, a second chamber having one wall thereof formed by the second piston, a source of pressurized fluid, a first passage connecting the source of pressurized fluid with the first chamber, a restricted second passage connecting the first chamber to the second chamber, such that when the source of pressurized fluid is initially connected to the first chamber, the enlarged first end of the shaft is immediately moved axially outwardly of the plug and the expandable means, causing the expandable means move radially outwardly into right engagement with the plug, and as more pressurized fluid enters the first chamber and the second chamber, both and the first and second pistons move to pull the plug removal means and the plug out of the tube.

# 4,679,317 SCREENED CABLE INSULATED BY MEANS OF MINERAL INSULATION MATERIAL AND METHOD OF MANUFACTURING SUCH A CABLE

Gilles Bailleul, Montesson, France, and Tjerk Sannes, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 670,514, Nov. 13, 1984, abandoned.

This application Mar. 28, 1986, Ser. No. 846,506

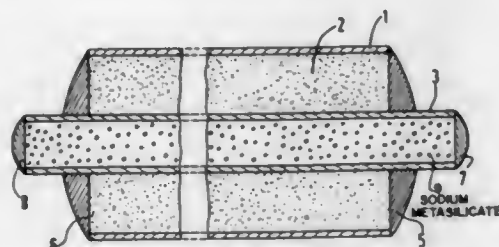
Claims priority, application France, Nov. 21, 1983, 83 18487  
Int. Cl.<sup>4</sup> H01B 13/00

U.S. Cl. 29—828

6 Claims

1. A method of manufacturing a cable insulated with mineral

insulation material and comprising a central electrical conductor unfilled hollow throughout its length, said mineral insulation material provided around said central conductor, a metal sheath surrounding said central electrical conductor and said insulation material, said central conductor extending along the length of said cable, and the ends of said cable being sealed in a moisture-tight manner by means of plugs through which said central conductor passes, said method comprising subjecting a hollow central conductor having a reducible diameter exceeding that of the desired conductor to a mechanical treatment for



increasing the length of, and thereby reducing the diameter of said conductor having said reducible diameter while being periodically subjected to an annealing treatment characterized in that prior to commencement of said mechanical treatment said hollow conductor having said reducible diameter is filled with a material capable of withstanding the pressure of said mechanical treatment and the temperature of said annealing treatment and said material is removed from said conductor having said reducible diameter when said treatments are terminated and the diameter of said conductor having said reducible diameter has been reduced to the desired value.

4,679,318

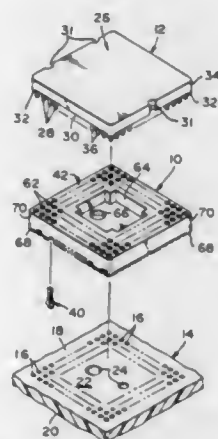
#### APPLICATION TOOL AND METHOD FOR POSITIONING ELECTRICAL SOCKETS ON CIRCUIT BOARDS FOR SURFACE SOLDERING

Edward J. Bright, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 6, 1986, Ser. No. 826,932  
Int. Cl.<sup>4</sup> H05K 3/34; B23P 19/00

U.S. Cl. 79-840

8 Claims



1. A method of positioning an electrical socket on a printed circuit board for subsequent soldering thereto, said socket including a plurality of conductive contact elements disposed in cavities in a dielectric housing with openings to said cavities on opposing surfaces thereof, said contact elements having converging spring arms at one end and positioned adjacent one of said openings and a solder foot at another end and extending outwardly through another of said openings, said method comprising the steps of:

placing said electrical socket on said circuit board with said

solder feet resting on or being above solder paste previously deposited on conductive pads on said circuit board; positioning application tool means on said socket with pins, depending from said tool means, entering said cavities and being received between said spring arms for frictional engagement therewith; and pushing on said application tool means to move said contact elements towards said circuit board to seat said solder feet in said solder paste.

6. An application tool for use in positioning an electrical socket on a printed circuit board for subsequent soldering thereto, said socket being of the type having contact elements with converging spring arms at one end and a solder foot at another end, said spring arms being accessible through openings on one surface of the socket and said solder foot extending outwardly from another surface of the socket, said application tool comprising:

body means having a spatial area substantially equal to that of said electrical socket and further having post means for engaging a surface of said electrical socket; and depending pin means on one surface of said body means, said pin means adapted for being frictionally received between said spring arms on said contact elements so that upon pushing on said body means, said contact elements are moved towards said circuit board to seat said solder feet in solder paste deposited on conductive pads on said circuit board with said post means on said body means into said spring arms.

4,679,319

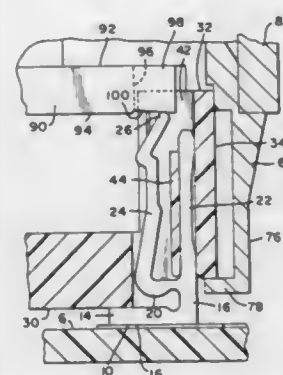
#### TOOL AND METHOD FOR REMOVING CONNECTOR HOUSINGS FROM TERMINALS MOUNTED ON A SUBSTRATE

Dimitry G. Grabbe, Middletown, and Iosif Korsunsky, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 14, 1986, Ser. No. 885,121  
Int. Cl.<sup>4</sup> H05K 13/04

U.S. Cl. 29-843

18 Claims



1. A pulling tool of the type comprising a yoke having a central axis, a plurality of pulling arms pivoted to the yoke at spaced angular intervals around the central axis, the arms extending from the yoke beside, and along, the central axis in a first axial direction and being arcuately movable towards and away from the central axis, a reaction member and actuating means for moving the yoke relative to the reaction member in a second axial direction which is the opposite direction of the first axial direction, the tool being intended to remove a housing from a group of terminals which are mounted on a substrate, the terminals being arranged in at least two parallel rows and having terminal end portions which are spaced from the substrate, the housing having a lower face which is parallel to, and opposed to, the substrate and having an upper face which is spaced from the substrate, a recess extending in-

wardly from the upper face towards the lower face, the recess having recess sidewalls which surround the recess and which extend inwardly from the upper face, the housing having terminal receiving cavities which extend inwardly from the recess sidewalls and which extend from the lower face towards the upper face, the terminals being in the cavities, the tool being characterized in that:

the reaction member comprises a reaction plate having parallel major surfaces and circumferential side surfaces which extend normally of the major surfaces, the reaction plate being dimensioned to fit between the rows of terminals,

the pulling arms have free ends, the free ends having housing engaging portions for engagement with the housing, whereby,

upon placing the tool above the housing with the reaction plate between the rows of terminals, thereafter arcuately moving the pulling arms towards the central axis until the housing engaging portions are engaged with the housing, and thereafter moving the yoke relative to the reaction plate in the second axial direction, the housing will be pulled from the terminals.

4,679,321

#### METHOD FOR MAKING COAXIAL INTERCONNECTION BOARDS

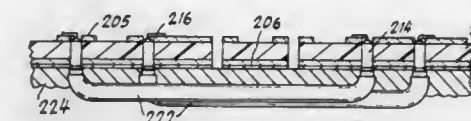
J. Philip Plonski, Huntington, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Oct. 18, 1985, Ser. No. 788,962

Int. Cl.<sup>4</sup> H01K 3/10

U.S. Cl. 29-850

7 Claims



1. A method of making a coaxial conductor interconnection board having a plurality of coaxial conductors, each conductor of said plurality of coaxial conductors including a signal conductor surrounded by a dielectric in turn surrounded by a conductive shield, comprising the steps of:

drilling holes through the substrate of the board at selected terminal points;

placing a plurality of preformed coaxial conductors on one surface of the substrate;

stripping the end of each conductor of said plurality of preformed coaxial conductors to provide exposed signal conductor sections and exposed dielectric sections;

inserting the stripped ends of the coaxial conductors through said holes at the terminal points so that the exposed dielectric sections substantially reside in said holes,

the conductive shields are on one side of the board, and the exposed signal conductor sections are on the other side of the board, and

scribing the coaxial conductors on one surface of the substrate by placing an adhesive coating on the substrate and activating the adhesive upon contact with each coaxial conductor being scribed.

4,679,320

#### PROCESS FOR PRODUCING MULTILAYER CERAMIC CIRCUIT BOARD WITH COPPER

Yoshihiko Imanaka, Atsugi; Hiromi Ogawa, Yokohama; Mineharu Tsukada, Atsugi; Etsuro Udagawa, Atsugi; Kazuaki Kurihara, Atsugi; Hiromitsu Yokoyama, Sagami-hara, and Nobuo Kamehara, Isehara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

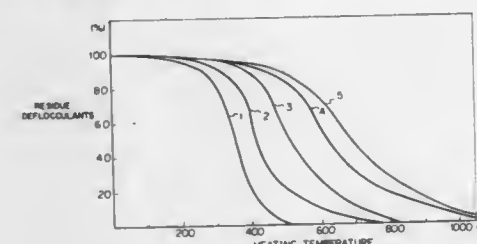
Filed Nov. 26, 1985, Ser. No. 801,783

Claims priority, application Japan, Dec. 28, 1984, 59-274534

Int. Cl.<sup>4</sup> H01K 3/22

U.S. Cl. 29-848

7 Claims



1. A process for producing a multilayer ceramic circuit board with copper comprising the steps of:

forming green sheets by doctoring a slurry which comprises 100 parts by weight of glass ceramic particles, 5 to 20 parts by weight of a thermally depolymerizable resin binder, 2 to 10 parts by weight of a plasticizer, and up to 2 parts by weight of a fatty acid ethylene oxide adduct type deflocculant, said glass ceramic comprising 20 to 70% by weight of alumina; and 30 to 80% by weight of SiO<sub>2</sub>-B<sub>2</sub>O<sub>3</sub> type glass;

forming via holes through said green sheets; screen-printing a copper paste on said green sheets; laminating said green sheets, thereby forming a multilayer structure; and

firing said multilayer structure in a non-oxidizable atmosphere.

4,679,322

#### HAIR CLIPPER

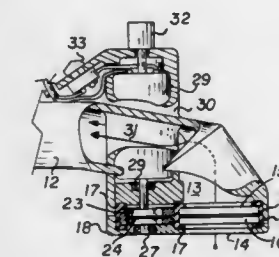
Rick E. Hunts, 885 Barsby, Vista, Calif. 92083

Filed Jul. 7, 1986, Ser. No. 882,825

Int. Cl.<sup>4</sup> B26B 19/44

U.S. Cl. 30-133

12 Claims



1. A precision hair clipper for cutting the hair of a subject to a uniform length at a selectable spacing from the subject's scalp which comprises:

a housing defining a flow chamber having an inlet and an outlet connectable to a vacuum source; a pair of balanced plates, each having a plurality of openings; said plates being slidably mounted against each other across the inlet;

means for oscillating said plates in opposite phases within their own planes;

wherein the edges of the openings of one plate cooperate with the edges of the opening in the other plate to shear hair drawn into the housing by said vacuum source; and wherein said openings are shaped and positioned in relation



to one another to maintain a generally constant aperture area therethrough, throughout a complete oscillating cycle of the plates; and wherein said means for oscillating comprises: means for maintaining the plate in a linear direction throughout said oscillating cycle; and said openings in each one of said plates comprise a plurality of parallel and symmetrical slots oriented obliquely in relation to said linear direction of the plates.

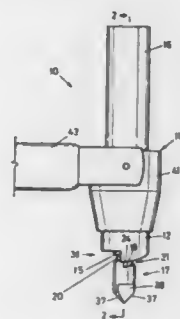
4,679,323

## ROTARY NIBBLER

Brian A. Bennett, 53 Morphett Road, Camden Park, South Australia, Australia  
Continuation of Ser. No. 669,454, Nov. 7, 1984, Pat. No. 4,593,465. This application Mar. 7, 1986, Ser. No. 837,498  
The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.  
Int. Cl.<sup>4</sup> B23D 27/02

U.S. Cl. 30—240

11 Claims



1. A rotary nibbler comprising a body, said body having an interior bore defining a generally cylindrical bearing surface having a central axis, a spindle carried in said bore for rotation within said bearing surface of the body about said central axis, a first end of the spindle having a drive engagement surface adjacent one end of the body, a second end of the spindle projecting from the other end of the body and having surfaces defining a helical groove in the side wall of the spindle, one of said groove surfaces defining, with that side wall, a helical cutting edge, said body also having a flat workpiece engagement face which defines, with the axis of rotation, an angle which approximates the helix angle of the groove, said cylindrical bearing surface having an end portion opening to the workpiece engagement face and defining therewith a cutting edge unitary with said body and cooperable with said helical cutting edge upon rotation of the spindle.

4,679,324

## SAFETY RAZOR BLADES

Bryan R. Kirk, Basingstoke, England, assignor to The Gillette Company, Boston, Mass.  
Filed Nov. 7, 1985, Ser. No. 795,969  
Claims priority, application United Kingdom, Nov. 15, 1984, 8428921

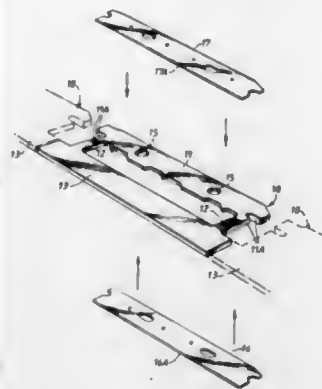
Int. Cl.<sup>4</sup> B26B 21/54, 21/06

U.S. Cl. 30—346.58

6 Claims

1. A razor blade unit, for use on the head of a safety razor comprising a razor blade having a sharpened blade edge, and a carrier for said razor blade, said carrier comprising:  
a base portion substantially along the entire length of said sharpened blade edge and permanently secured to a surface of said blade;  
an edge-protecting bar positioned in front of said sharpened blade edge; and  
frangible connecting means including a first narrow finger

projecting from said base portion integrally connecting said bar to said base portion, whereby said edge-protect-



ing bar is separated from said base portion prior to use of said sharpened blade edge.

4,679,325

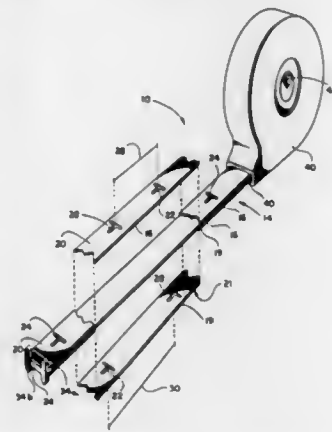
## CHALK LINE MARKING DEVICE

Bobby Sweatman, Rte. 12, Box 737 Crow Rd., Cumming, Ga. 30130

Filed Apr. 16, 1986, Ser. No. 852,814  
Int. Cl.<sup>4</sup> G01B 3/10

U.S. Cl. 33—138

12 Claims



1. An extensible tape for placing chalk marks on a workpiece at regularly spaced intervals, comprising:  
a first layer of porous material receptive to chalk; and  
a second layer having a smooth surface substantially non-receptive to chalk, said second layer overlying one face of said first layer, said second layer having holes therein at regularly spaced intervals through which the underlying portions of said first layer are exposed;  
whereby when said tape is brought into contact with a body of chalk, said portions of said first layer exposed through said holes receive particles of said chalk, and said smooth second layer is non-receptive to said chalk, such that when said chalked tape is extended across a surface of said workpiece with said second layer imposed against said workpiece surface, chalk is transferred from said portions of said chalk-receptive first layer exposed through said holes in said second layer onto said workpiece to provide chalk marks at said regularly spaced intervals.

4,679,326

## HEIGHT GAUGE

Kinji Takizawa; Ichiro Mizuno, and Iwao Sugizaki, all of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

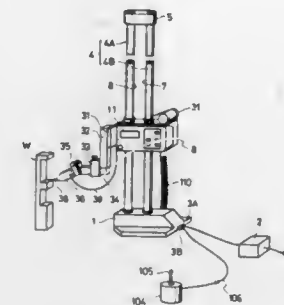
Filed Nov. 15, 1985, Ser. No. 798,523

Claims priority, application Japan, Nov. 21, 1984, 59-246552; Nov. 21, 1984, 59-177050[U]

Int. Cl.<sup>4</sup> G01B 5/02

U.S. Cl. 33—170

12 Claims



1. In a height gauge having a slider vertically movably mounted on a support provided on a base, measuring means for detecting the amount of relative movement between said slider and said support, and a digital indicator for digitally indicating a measured value obtained on the basis of an output from said measuring means,

the improvement comprising:

a driving system engaged with both said slider and said support for automatically and vertically moving said slider along said support, said driving system including a transmission mechanism which comprises a driving shaft rotatably mounted in said slider and having a pinion which engages with a rack formed on said support, said driving shaft being formed thereon with a hollow portion along the central axis thereof and a groove formed in parallel with said hollow portion, a pulley rotatably mounted on said driving shaft, a motor provided on said slider which rotates said pulley by way of a belt, a control wheel rotatably mounted on said driving shaft, and a shifting member which is axially movably provided on said driving shaft between said pulley and said control wheel, said shifting member being rotatable synchronously with said driving shaft;

means for changing said shifting member in its position on said driving shaft so that said shifting member is selectively engaged with said pulley or said control wheel, said means for changing including a changeover knob having a movable element axially movably provided within said hollow portion and a pin extending through said groove so as to interconnect said movable element and said shifting member;

a detector provided on said slider, said detector including a measuring element tiltable in the longitudinal direction of said support, and said detector generating a signal when said measuring element comes into registration with an object to be measured; and

a control circuit which stops the operation of said driving system on the basis of the signal generated by said detector and holds the indication of a measured value being displayed by said digital indicator at that time.

4,679,327

## FRONT WHEEL DRIVE VEHICLE, AUTOMATIC TOE SET ALIGNMENT SYSTEM, THEREFOR

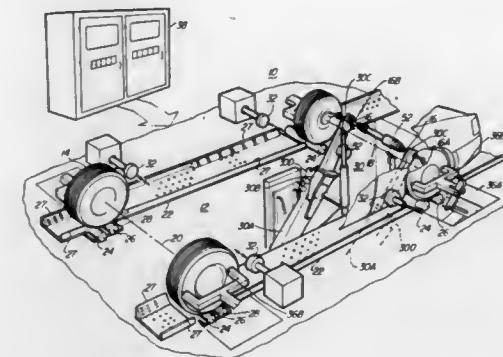
John W. Fouchey, Sterling Heights, and Thomas E. Chamberlain, Garden City, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jul. 7, 1986, Ser. No. 882,565

Int. Cl.<sup>4</sup> G01B 5/255

U.S. Cl. 33—203.13

3 Claims



1. A method of measuring an adjusting in and automatic toe set alignment system, toe angles of a left front wheel and a right front wheel associated with a steerable front axle of a motor vehicle, said steerable front axle being steered by a steering wheel within the vehicle, said system being of the type wherein said alignment system has a reference center line oriented in a chosen direction, wherein said right front wheel has a first tie rod for aligning the toe angle of said right front wheel and a second tie rod for aligning the toe angle of said left front wheel, and wherein a right rear wheel and a left rear wheel are mounted to a non-steerable rear axle, which method comprises:

- orienting the direction of a center line of said vehicle to be in alignment with said reference line of said system;
- positioning said steering wheel of said vehicle so that a pair of spokes of said steering wheel are oriented to be perpendicular to said reference center line of said system;
- obtaining acceptable camber angle values;
- rotating said front and rear wheels about said front and rear axles, respectively, over a predetermined angular path to obtain a run-out compensation value for each of said wheels, the run-out compensation values providing data indicative of high points and depressions of a side wall surface of said wheels;
- storing said run-out compensation values;
- measuring to obtain values of a static toe angle of each of said wheels;
- storing each of said static toe angle values;
- by using static toe angle measurements of said rear wheels, obtaining a thrust angle value of said rear axle with respect to said reference center line of said system;
- storing said thrust angle;
- utilizing said stored run-out compensation values and said thrust angle value to modify said static toe angle value of said front wheels to obtain a corrected toe angle of each of said front wheels;
- positioning a pair of programmable tie rod adjustment heads about said tie rods so as to be in alignment to adjust said first and said second tie rods;
- programming said tie rod adjustment heads so as to adjust said tie rods of said front wheel to bring said front wheel toe angles in conformance with said corrected toe angle of each of said front wheels;
- retracting said tie rod adjustment heads from said tie rods;
- positioning a pair of programmable nut runners so as to be in alignment for adjusting a jam nut for said first and another jam nut for said second tie rods; and

o. programming said nut runners so as to torque said jam nuts a predetermined torque value so as to fix said front wheels in toe angle planes that conform to said corrected toe angle values.

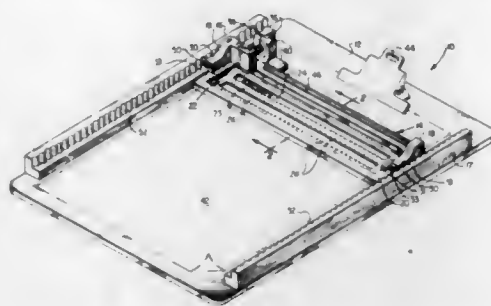
# 4,679,328 LETTERING TEMPLATE

Michael Saad, 1600 Windermere Dr., Arlington, Tex. 76014  
Filed Jan. 11, 1986, Ser. No. 872,811

Int. Cl.<sup>4</sup> B43L 13/02

U.S. Cl. 33—447

9 Claims



1. A writing template for facilitating a generation of upper-case and lowercase letters by a user holding a writing member upon writing material with both primary and secondary rectilinear motion of said template, said template comprising:

- a planar substrate adapted for receiving said writing material thereupon;
- a slotted member disposed upon said substrate, having at least one slot and borders formed therearound for defining the area of writing with said writing member and adapted for rectilinear movement above said writing material;
- means for mounting said slotted member upon said substrate, above said writing material and permitting a primary rectilinear movement thereof in a plurality of parallel spaced steps along said substrate; and
- means associated with said slotted member for moving said slotted member in a secondary rectilinear movement a select, incremental distance upon said writing material for permitting the formation of lowercase letters;

said moving means for said secondary rectilinear movement comprising a depression arm coupled to said slotted member; and

said depression arm constructed with an area for receiving engagement of and pressure from a hand of the user to impart said secondary rectilinear movement said incremental distance and define said borders of said slot for said writing member in the generation of said lowercase letters.

4,679,329

COMBINED PRIMARY AND SECONDARY SINE BARS  
Wesley R. Goldsmith, 3383 Moore St., Mar Vista, Calif. 90066,  
and Joel E. Di Marco, 4288 Revere Pl., Culver City, Calif. 90230

Filed Aug. 4, 1986, Ser. No. 892,259

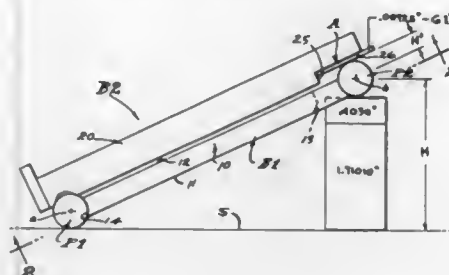
Int. Cl.<sup>4</sup> G01B 3/56

U.S. Cl. 33—538

26 Claims

1. In combination;
- a primary sine-bar comprised of a base plug for support upon a true surface and an altitude plug for support offset from said true surface, the plugs being held on spaced parallel axes by a bar member extending therebetween;
  - a secondary sine-bar comprised of a bar member coextensively overlying the primary sine-bar with one end having direct supported engagement upon the base plug of the primary sine-bar and its other end overlying the altitude plug of the primary sine-bar;

and adjustment means disposed between the altitude plug and the overlying end of the secondary sine-bar to adjust



a height established by support of the altitude plug offset from said true surface.

# 4,679,330 CONCENTRICITY GAUGE

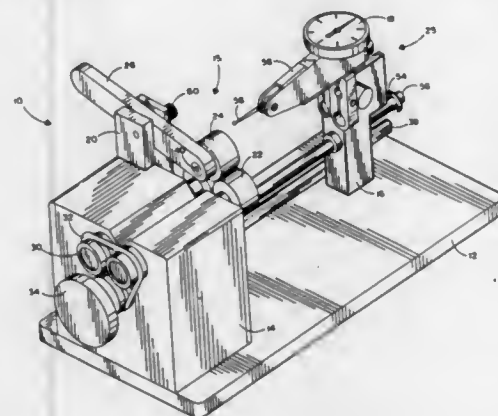
Kenneth L. Williams, 3060 Country Club Dr., Costa Mesa, Calif. 92626

Filed Dec. 12, 1985, Ser. No. 808,037

Int. Cl.<sup>4</sup> G01B 5/20

U.S. Cl. 33—550

7 Claims



1. An apparatus for measuring the concentricity of a workpiece, the apparatus of the type having a workpiece support portion for rotationally supporting a workpiece and having a gauge support portion for positioning a probe and gauge relative to the workpiece, the apparatus comprising:

- a workpiece support portion having at least one driven roller and at least one idler roller for retaining and rotating said workpiece;
- a gauge support portion having means for adjustment of said probe in at least two directions relative to said workpiece for contacting said probe to said workpiece, and having means for positioning said probe away from said workpiece for gaining access to said workpiece without disturbing said adjustment of said probe for the next workpiece; and
- a pair of parallel shafts extending from said workpiece support portion, one of said shafts extending into said gauge support portion for controlling the path of travel between said probe and said workpiece, the other of said shafts being adapted for selective engagement with said gauge support portion for holding said probe at a selected position relative to said workpiece, said gauge support portion being rotatable about the axis of said one of said shafts.

# 4,679,331 APPARATUS AND METHOD FOR DETERMINING CONTOUR CHARACTERISTICS OF A CONTOURED ARTICLE

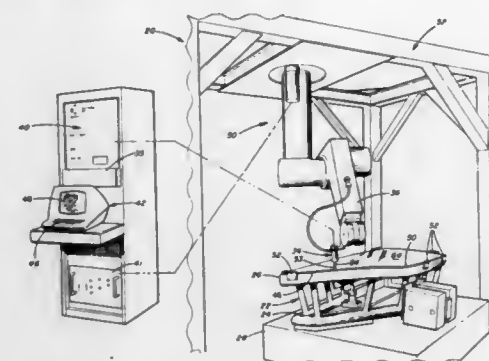
Harry S. Koontz, Penn Hill, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 26, 1985, Ser. No. 768,384

Int. Cl.<sup>4</sup> G01B 7/28

U.S. Cl. 33—551

14 Claims



1. An apparatus for determining contour characteristics of a shaped article, comprising:

- a supporting surface;
- first means for determining contour of said supporting surface;
- first means responsive to said first determining means for generating position reference points and reference values;
- second means for determining contour of an article while supported on said supporting surface;
- second means responsive to said second determining means and said first generating means for generating a thickness value for each position reference point; and
- third means responsive to said first and second generating means for determining contour characteristics of the shaped article.

4,679,332

# SENSOR DEVICE FOR A MACHINE FOR MEASURING CONDUCTIVE PARTS MOUNTED ON A MEASUREMENT TABLE

Walter Lüthi, Ebnet-Kappel, Switzerland, assignor to Tesa S.A., Renens, Switzerland

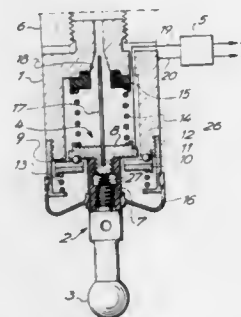
Filed Sep. 22, 1986, Ser. No. 910,131

Claims priority, application Switzerland, Oct. 14, 1985, 04415/85

Int. Cl.<sup>4</sup> G01B 7/28

U.S. Cl. 33—559

5 Claims



1. A sensor device for a machine for measuring conductive parts mounted on a measurement table and comprising a housing intended to be fastened to a movable support of the machine, a measurement tip sensor integral with the housing and

intended to sense a part to be measured by displacement of the movable support, a mechanism for the three-dimensional linking of the sensor to the housing and capable of being deformed elastically when a given pressure of the tip of the sensor against the part to be measured is exceeded and an electric circuit influenced by contact of the tip of the sensor against the part to be measured so as to produce an electric pulse, characterized by the fact that the electric circuit (5) comprises a capacitive amplifier (25) which is connected to the tip (3) of the sensor (2) in order to precharge the latter to a given voltage and has electronic means (28, 29) sensitive to a displacement of charge between the tip of the sensor and the part to be measured so as to produce an electric measurement pulse which is indicative of the entrance into contact of the tip of the sensor with the part to be measured, an insulation of the part to be measured with respect to the measurement table, and a safety arrangement (17, 18) which is sensitive to the elastic deformation of the linkage mechanism so as to produce an electric safety pulse indicating a possible elastic deformation of said mechanism.

4,679,333

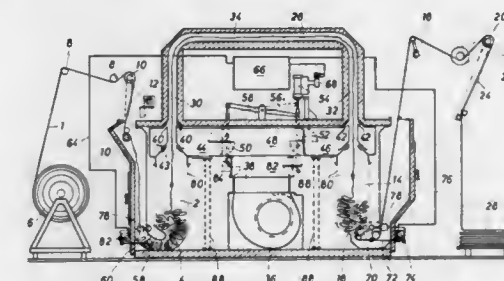
# APPARATUS FOR THE DRY TREATMENT OF A FABRIC Jaime A. Vinas, Barcelona 23, La Llagosta (Prov. of Barcelona), Spain

Filed Nov. 8, 1985, Ser. No. 796,605

Int. Cl.<sup>4</sup> F26B 13/12

U.S. Cl. 34—155

7 Claims



1. An apparatus for the dry treatment of a fabric, comprising first and second chambers adapted to contain respective piles of open width fabric, said first chamber being for an inlet pile and said second chamber for an outlet pile; means for providing gradual supply of the fabric into said first chamber; means for providing a gradual removal of the fabric from said second chamber; a flattened section duct for containing the open width fabric and having ends which connect said first and second chambers; movable means situated at least partly in each chamber, adapted to be moved by the fabric on exhaustion of the respective pile; blower means for blowing air into said duct and transporting the fabric contained therein; heating elements disposed downstream of said blower means in the direction of said air to heat said air; slot means in each of the ends of said duct for allowing the ingress of air into the duct; gate means adapted to regulate alternately the direction of air flow towards one or the other slot means; drive means for said gate means, closing one of said gate means while opening the other of said gate means; and connecting means associating the movement of said movable means with said drive means so that upon the movable means sensing the exhaustion of a pile of fabric the drive means reverses the flow of air so as to reverse the direction of transport of the fabric.



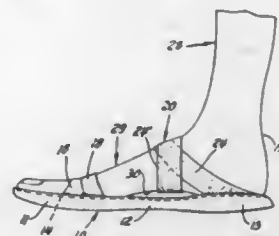
4,679,334

## FOOTWEAR HEEL-LOCK SUPPORT STRAPPING SYSTEM

Frank McBride, 631 Chicago Blvd., Detroit, Mich. 48202  
Continuation-in-part of Ser. No. 820,806, Jan. 20, 1986,  
abandoned. This application Dec. 4, 1986, Ser. No. 938,232  
Int. Cl.<sup>4</sup> A43B 3/12, 5/06

U.S. Cl. 36—114

5 Claims



1. In an article of footwear, adapted for application to the foot of a wearer, and having a heel end portion, a heel-lock support strapping system comprising:

- (a) a heel support strap disposed at the heel end portion of the footwear and having a first end portion extended upwardly and forwardly at an acute angle from the longitudinal plane of the footwear from one side of the heel end portion of the footwear, and having a second end portion extended upwardly and forwardly at an acute angle from the longitudinal plane of the footwear from the other side of the heel end portion of the footwear;
- (b) means for anchoring the heel support strap to the article of footwear at the heel end portion of the footwear;
- (c) said second end portion of the heel support strap being longer than said first end portion, and being adapted to be wound over the base of the instep of the foot of a wearer of the article of footwear, and thence directly downward and under the arch of said foot and back upwardly over said base of the instep, and thence rearwardly and downwardly at an acute angle from the longitudinal plane of the footwear to a fastening position with said first end portion of the heel support strap to form a figure eight to create a force to pull the rear portion of the foot of said wearer downward and backward into a steadfast engagement with the footwear to provide a positive rear-foot control, while allowing the achilles tendon to function freely from any restrictive strap pressure; and,
- (d) fastening means for securing said second end portion of the heel support strap to said first end portion.

4,679,335

## VENTED BICYCLE SHOE

Remo Berlese, 31036 Ospedaletto di Istrana, Treviso, Italy  
Filed Oct. 22, 1985, Ser. No. 790,109

Int. Cl.<sup>4</sup> A43B 5/14

U.S. Cl. 36—131

8 Claims

- 1. A bicycle shoe, comprising:
  - a base section having an exterior portion for engaging a bicycle pedal and an interior portion bearing the underside of the wearer's foot,
  - an upper section attached to the base section and enclosing the wearer's foot,
  - a plurality of spaced air scoops at the front of the shoe aligned with the base section, the air scoops being adapted to receive an intake of air in response to forward motion of the shoe, and
  - a plurality of spaced channels extending along the interior portion of the base section from respective air scoops at the front of the shoe toward the rear of the shoe, said channels venting to the interior of the shoe, the air scoops comprising the forward ends of respective channels, and

the depths of the channels being increased at their forward ends to provide the air scoops with greater intake areas



than the channels, and thereby increase the flow rate of air through the channels.

4,679,336

## EARTH MOVING MACHINE

Norman Brocklebank, Beverley, and Alan Cooper, Stoke on Trent, both of United Kingdom, assignors to J. C. Bamford Excavators Limited, Rocester, United Kingdom  
Filed Nov. 27, 1985, Ser. No. 802,719

Claims priority, application United Kingdom, Dec. 1, 1984, 8430389

Int. Cl.<sup>4</sup> E02F 5/02

U.S. Cl. 37—103

14 Claims



- 1. A machine comprising a body having a ground engaging propulsion means, a base frame, means mounting the base frame on the ground engaging propulsion means for movement relative to the ground engaging propulsion means about a first generally vertical axis, a boom extending outwardly of the body, means mounting the boom on the base frame for movement about a second axis transverse to the first axis, a dipper arm, means mounting the dipper arm at an outer end of the boom for movement about a third axis also transverse to the first vertical axis, an implement, means mounting the implement at an outer end of the dipper arm for movement about a fourth axis, also generally transverse relative to the first vertical axis, a cable, means securing the cable to the dipper arm, a winch means, means connecting the cable to the winch means to enable movement of the dipper arm relative to the boom and hence to effect movement of the implement towards the body, a hydraulic ram, means mounting the hydraulic ram between the dipper arm and the boom to effect movement of the dipper arm relative to the boom and hence to effect movement of the implement at least away from the body, a counterweight, means mounting the counterweight on the base frame, and means for moving the counterweight towards and away from the first vertical axis in response to movement of the centre of gravity of the machine.

4,679,337

## MATERIAL WORKING MACHINE WITH VIBRATING TOOL CARRIER

Frederick A. Cartercock, Seabrook Hythe, and Jack S. Knackstedt, London, both of England, assignors to Jaromir Vaclav Drazil, Buckinghamshire, England  
PCT No. PCT/GB84/00391, § 371 Date Jul. 29, 1985, § 102(e)  
Date Jul. 29, 1985, PCT Pub. No. WO85/02427, PCT Pub. Date Jun. 6, 1985

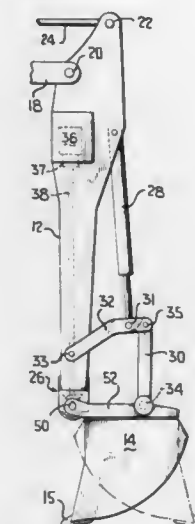
PCT Filed Nov. 12, 1984, Ser. No. 761,110

Claims priority, application South Africa, Nov. 29, 1983, 83/8903

Int. Cl.<sup>4</sup> E02F 3/42, 3/84

U.S. Cl. 37—118 R

14 Claims



- 1. A material working machine comprising vibratory means driven by driving means, and non-vibratory means, and including vibratory tool carrier means including attachment means for removable attachment, to the tool carrier means, of a working tool or working tool unit, the tool carrier means incorporating first mounting means for its connection to the vibratory means, and second mounting means for its connection to the non-vibratory means, the second mounting means enabling reciprocation of the tool carrier means at the point of its attachment to the second mounting means when the vibratory means is in operation, the first and second mounting means being spaced from each other in, or substantially in, the direction of said reciprocation, and said tool carrier means incorporates at least one oil reservoir means fluidically connected between the first and second mounting means for supplying oil to both said first and second mounting means.

4,679,338

## SNOW REMOVAL SYSTEM WITH ADJUSTABLE SNOW IMPELLER GATE

Carlisle A. Middleton, 38 Dunganrie Rd., Baltimore, Md. 21228  
Continuation-in-part of Ser. No. 764,712, Aug. 12, 1985, Pat. No. 4,597,203. This application Jun. 27, 1986, Ser. No. 879,254  
Int. Cl.<sup>4</sup> E01H 5/00

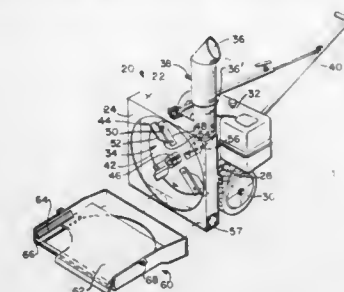
U.S. Cl. 37—244

9 Claims

- 1. In a system for removing material such as snow accumulated to a height on a surface, the system including:

- a frame,
- a means for powering said system attached at said frame,
- a plurality of wheels supporting the frame,
- a housing supported at the frame and defining an intake opening therein and defining a discharge opening, and
- means at the housing for intaking said material through the intake opening and discharging said material through the discharge opening, the improvement comprising: means for maximizing efficiency of said removal of material,

including: the intake opening extending substantially upward from a lower portion thereof adjacent a said surface, means for adjusting the upward extent of said intake opening to coincide with said height of material on a surface,



the means for adjusting comprising: a transition member, means for detachably attaching the transition member to the housing at said intake opening, means on the transition member for guiding, and a plate vertically movable on said means for guiding.

4,679,339

## PRICE CASSETTE

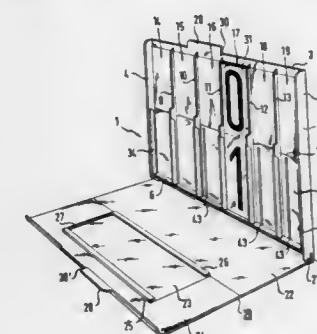
Norbert Hetzer, Lobbach, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.  
Filed May 9, 1985, Ser. No. 732,262

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421505

Int. Cl.<sup>4</sup> G09F 3/18

U.S. Cl. 40—10 R

5 Claims



- 1. Price cassette comprising a moulding in which a plurality of parallel wells at least partially open towards the cassette front side and separated from each other by webs are disposed for receiving price and/or information tags, and a cover which is connected to the moulding and adapted to be placed against the cassette front side for covering the wells, the cover having transparent window areas through which the price and/or information tags can be read, characterized in that the wells (14, 15, 16, 17, 18, 19) at the moulding (2) are open over their entire length towards the cassette front side and that the webs (9, 10, 11, 12, 13) between the wells (14, 15, 16, 17, 18, 19) each include an arrowhead shaped edge along at least a portion of their front faces (32) facing the cassette front side so that (a) said price and/or information tags can be inserted from the cassette front side into the parallel wells, the insertion being facilitated by the inclined faces of the arrow shaped head whereby the tags buckle along their length as they are inserted and (b) the tags once inserted are held in place in the wells by the arrow shaped edges.

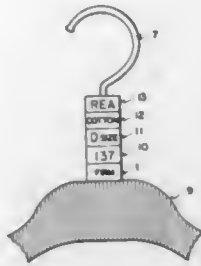
4,679,340

## CLOTHING DATA MARKER

Gert A. Johansson, P.O. Box 158, 443 01 Lerum, Sweden  
 Filed Mar. 8, 1985, Ser. No. 709,733  
 Int. Cl.<sup>4</sup> G09F 3/00

U.S. Cl. 40—322

5 Claims



1. A marker adapted to fit onto a hook of a clothes hanger to convey information concerning a garment hung from the clothes hanger, said marker comprising a thin cylindrical ring wall extending longitudinally in the direction of the hook and defining a central traversing hole adapted to receive said clothes hanger hook, the outer surface of said ring wall bearing said information, a radial slot opening within said wall extending over the entire longitudinal length thereof, said slot having a width allowing passage laterally of said hook through said slot for mounting of said marker to said clothes hanger hook, a pair of barbs extending radially inwardly from the inner periphery of said ring wall and positioned to respective sides of said slot and having pointed, wedged ends directed inwardly towards the center of the ring, and having opposed surfaces converging towards each other to form a converging passage having at its inner end a width less than the diameter of said clothes hanger hook, and wherein at least said pair of barbs is formed of a resilient material, such that the clothes hanger hook in pushing through said slot and said passage, deflects the barbs away from each other to permit entry of the hook into the center of the cylindrical ring but said barbs prevent said hanger hook from exiting the slot absent deformation or destruction of at least one of said barbs, and wherein said marker further comprises a plurality of hook locating lugs extending from the inner periphery of the ring wall towards the center of the cylindrical ring wall, at circumferentially spaced positions and to respective sides of said pair of barbs, such that said lugs act jointly with said pair of barbs to center said cylindrical ring wall on said clothes hanger hook.

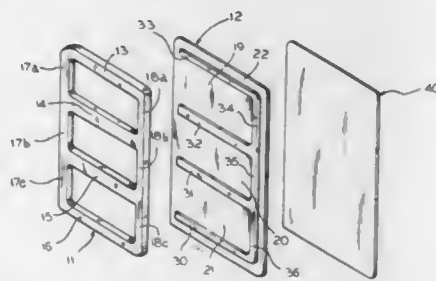
4,679,341

## MODULAR DISPLAY APPARATUS FOR SIGN PANELS

John G. Goldman, Northbrook, Ill., assignor to Mercury Plastics, Inc., Chicago, Ill.  
 Filed Feb. 6, 1985, Ser. No. 698,570  
 Int. Cl.<sup>4</sup> G09F 7/02

U.S. Cl. 40—611

15 Claims



1. A modular display apparatus for slidably receiving, supporting, maintaining and, displaying from a front side thereof,

one or more substantially flat multi-sided signage panels in a desired orientation, said apparatus comprising:

one or more substantially flat panel support means for positioning behind corresponding ones of said one or more substantially flat signage panels,

each of said one or more substantially flat panel support means being of a size substantially equivalent to that of said respective flat signage panel positioned in front thereof,

a plurality of elevated panel ridge means operably emanating from said substantially flat panel support means so as to emanate forwardly therefrom,

said plurality of elevated panel ridge means positioned to closely follow the outer peripheral shape of said respective signage panel so as to substantially abut and surround all but one of said multitude of signage panel sides,

said forwardly emanating portions of said plurality of elevated panel ridge means supporting said respective signage panel along a bottom portion of said signage panel and serving to restrain the position of said respective signage panel positioned therewithin, in a position juxtaposed to said respective panel support means, about all but said one non-abutted side through which slidable reciprocating movement of said signage panel into and out of abutment with said plurality of elevated panel ridge means, is accommodated so as to substantially encircle said signage panel except along said non-abutted side,

overlay frame means operably affixable over said substantially flat panel support means, said plurality of elevated panel ridge means, and a peripheral portion of said signage panel, to further restrainably affix and border each one of said one or more signage panels in place against respective ones of said flat panel support means and within respective ones of said abutting elevated panel ridge means, said overlay frame means describing a series of panel aperture means, each aperture means being operably aligned with a respective one of said one or more signage panels so as to operably display indicia borne thereby, through said panel aperture means,

said overlay frame means further comprising a series of overlay struts framing each said panel aperture means, each of said overlay struts being of a substantially inverted U-shaped construction having inner and outer peripheral edges and having a front face at the top of said inverted U-shaped construction,

each of said overlay struts being in respective operable alignment with each of said plurality of elevated panel ridges so as to telescopically nest thereover, while respectively framing all peripheral sides of each signage panel positioned therewithin and recessing each said signage panel back from the front face of said struts and against said panel support means;

said overlay frame means further creating, at the location of said non-abutted side at which position no elevated panel ridge means occurs, slot insert means formed between said substantially flat panel support means at said location and said corresponding overlay strut positioned thereover, to accommodate insertion, removal and restraint of said signage panel into and from said desired orientation for display, said slot insert means providing access to said signage panel at said non-abutted side between said overlay frame means and said flat panel support means without removal of said overlay frame means in front of said signage panel and without removal or penetration of said flat panel support means behind said signage panel, with said signage panel restrainably interposed between said panel support means along its rear surface, the inner peripheral edges of said overlay struts of said overlay frame means about its periphery at its front surface, and said elevated panel ridge means abutting all but one of said signage panel peripheral sides; and

said overlay frame means being restrainably affixed to one or more of said elevated panel ridge means and said panel support means by overlay attachment means.

4,679,342

## MEANS FOR RENDERING CONTROLS TACTUALLY-SENSITIVE

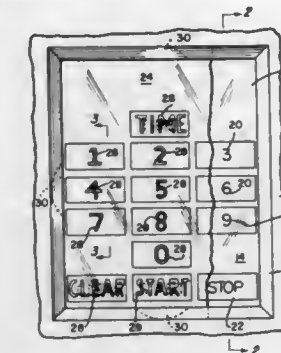
Donna Wilson, Village Green, Building 15, Apt. 89, Hazlet, N.J.  
 07730

Filed Dec. 2, 1985, Ser. No. 803,236

Int. Cl.<sup>4</sup> G09F 18/00

U.S. Cl. 40—616

6 Claims



1. For a control panel of a given configuration comprising a given area, and having discrete, and only visually-sensitive or visually-discriminatory controls set out thereon in a prescribed pattern of lettered words and Arabic numerals, means for rendering said words and numerals tactly-sensitive or tactly-discriminatory, comprising:

a sheet having a configuration substantially identical to said given configuration, and encompassing at least an area equal to said given area;

said sheet having discrete, tactly-sensitive or tactly-discriminatory indicia thereon in said same prescribed pattern; and

said sheet further having means for emplacement thereof upon said control panel and surmountingly over said visually-sensitive controls; wherein said indicia literally correspond to said words and said numerals.

4,679,343

## 4 PLUS DOUBLE LOADER

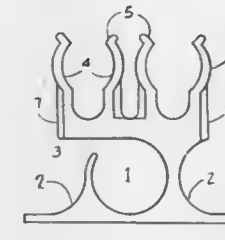
James B. Gomez Harlow, 7560 E. Juniper Dr., Tucson, Ariz.  
 85730

Filed Feb. 14, 1986, Ser. No. 830,322

Int. Cl.<sup>4</sup> F41C 27/00; F42B 39/00

U.S. Cl. 42—87

1 Claim



1. An integral one-piece molded plastic loading device for double barreled firearms comprising: a universal ring member, a plurality of shell holders, and a stabilizer bar; said ring member having an open segment therein for adjustably fitting about the back side of a user's hand and having guide lips for the acceptance and guiding of shells therein, and said stabilizer bar extending across the inside of said user's hand to prevent tilting of said device during loading of the firearm.

4,679,344

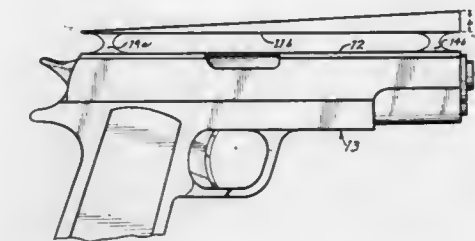
## GUN SIGHT

Thomas A. Jolly, 352 Loma Vista, El Segundo, Calif. 90245  
 Continuation-in-part of Ser. No. 664,611, Oct. 25, 1984, Pat. No. 4,601,121. This application Jul. 21, 1986, Ser. No. 888,589  
 The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> F41G 1/00

U.S. Cl. 42—100

4 Claims



1. A gun sight for mounting on a gun having a muzzle, barrel and top surface, said sight comprising:

a base portion attached to the top surface of said gun; a top portion in the form of an elongated ellipse, said top portion rising linearly towards the muzzle of the gun; said top portion rising a distance substantially equal to the minor axis of said ellipse; whereby when a target is sighted along said top portion of the sight, the gun is properly aimed when a circle centered on the target appears in the sight.

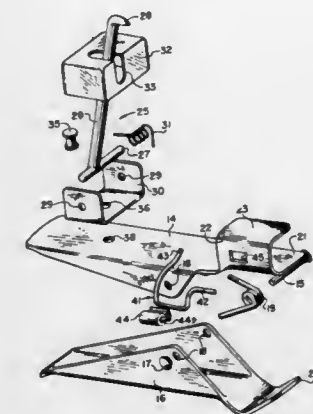
4,679,345

## FISHING LINE STRIKE INDICATOR

Dwayne A. Hall, 918 Cherry Dr., Schaumburg, Ill. 60194  
 Filed Apr. 16, 1986, Ser. No. 852,747  
 Int. Cl.<sup>4</sup> A01K 97/12

U.S. Cl. 43—17

5 Claims



1. An improved fishing line signalling device providing strike indication, comprising in combination: clamping means including in assembly a pair of elongated bar members pivotably connected off-center of and along the length dimensions thereof, and being biased to move together along an aligned end portion thereof to provide a clamping end portion for attachment of the signalling device, pivotable spring-biased signalling arm means to be pivotably connected to a selected bar member for movement about a vertical axis to provide horizontal displacement of the signalling arm means, and to be pivotably connected for movement about a horizontal axis to provide vertical displacement of the signalling arm means in the direction of the spring-bias, the spring-bias moving the signalling arm means responsive thereto to a released signalling



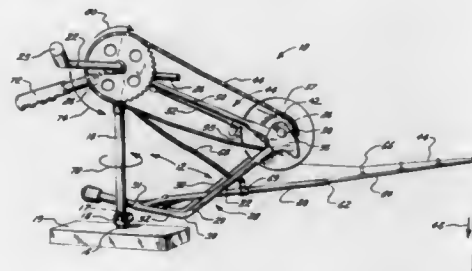
position thereof, said signalling arm means having a free-end portion thereof movable against said spring-bias and into engagement with a perpendicularly extended fishing line with movement thereof to a set non-signalling position thereof, and having the free-end portion thereof movable horizontally by the engaging fishing line about the vertical axis of the signalling arm means with forward line movements of the fishing line, to provide release of the signalling arm means to the released signalling position thereof, and secondary clamping means movable into engagement with the fishing line for providing restraint against free line movement while allowing forward line movement thereof, and being moved by the signalling arm means from engagement with the fishing line with movement of the signalling arm means to the released signalling position thereof.

#### 4,679,346 FISHING APPARATUS

Albert Angelety, Sr., 2512½ Pauger St., New Orleans, La. 70116  
Filed Aug. 12, 1985, Ser. No. 764,548  
Int. Cl.<sup>4</sup> A01K 89/00

U.S. Cl. 43—20

10 Claims



1. An improved fishing apparatus, comprising:
  - a. a frame;
  - b. a primary sprocket rotatably on the frame, the primary sprocket further including a pair of handle members for manually imparting rotation to the primary sprocket;
  - c. a spool containing fishing line rotatably mounted on the frame;
  - d. means for interconnecting the sprocket and the spool so that rotation of the sprocket imparts rotation to the spool;
  - e. a flexible pole member mounted on the frame for housing a length of fishing line from the rotatably mounted spool; and
  - f. braking actuating means, housed within one of the handle members so that positioning of the handle within a certain arc around its rotational axis provides frictional non-rotation of the spool and the spool member when a pull is exerted at the end of the length of fishing line.

#### 4,679,347 FISHING FLASHER

Ronald H. Stirtz, 1660 Lorane Hwy., Eugene, Oreg. 97405  
Filed Jun. 24, 1985, Ser. No. 747,862  
Int. Cl.<sup>4</sup> A01K 85/00

U.S. Cl. 43—43.1

11 Claims



1. A fishing flasher comprising:
  - a. an elongate, resilient blade having a transverse fold-line intermediate the ends of the blade defining a pair of sub-

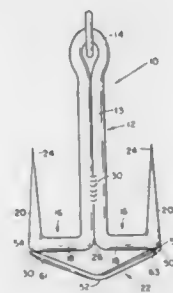
stantially equal length blade segments extending divergently outwardly from and to either side of said fold-line, each of said blade segments extending from said fold-line to a free end and the blade segments with the flasher in a relaxed state having flat inner faces and extending in divergent planes thus to form a V-shape with the open end of the V-shape disposed rearwardly in the flasher; an aperture extending through said blade adjacent said fold-line which aperture receives line mounting the flasher with the line extending through the aperture; said blade segments outwardly of said fold-line being unsupported and being constructed and arranged to resiliently deform with the flasher drawn through the water at trolling speed whereby the blade segments are shaped to have concave inner faces facing each other of decreasing curvature extending from said fold-line and with the free ends of the blade segments substantially paralleling each other, said deforming of the blade segments reducing the drag produced by the flasher on such being drawn through the water.

#### 4,679,348 TRAP DRAG

Eddie L. Wimberley, P.O. Box 266, Camp Wood, Tex. 78833  
Filed Sep. 29, 1986, Ser. No. 912,326  
Int. Cl.<sup>4</sup> A01M 23/24

U.S. Cl. 43—96

3 Claims



1. A game trap drag for attachment to a game trap comprising:
  - a. a shank;
  - b. means for attaching said trap to said shank near a first end of said shank;
  - c. first and second arms extending generally perpendicularly outward from a second end of said shank and forming a crown at said second end;
  - d. first and second flukes attached on each of said first and second arm members, respectively, and radially extending outward therefrom to terminate in a point; and
  - e. an antihitching member consisting of a bar bent to define an apex between a first and second end of said antihitching member, said antihitching member attached at the junction of said first fluke and said first arm, and further attached at the junction of said second fluke and said second arm, said apex thereby extending outwardly beyond said crown.

#### 4,679,349 FISH LINE SINKER

Conny Birchfield, 3509 NE. 53rd St., #30, Vancouver, Wash. 98661

Filed Feb. 10, 1986, Ser. No. 827,942  
Int. Cl.<sup>4</sup> A01K 95/00

U.S. Cl. 43—44.97

6 Claims

1. In combination a fish line, and sinker comprising: an elongated coil spring body member forming the outer configuration of the sinker having the properties of being resiliently

bendable and resiliently stretchable whereby regardless of orientation, upon getting wedged between objects it can be resiliently deformed by a pulling action to generate a snap back



reaction, said body member being laterally rigid and thereby crush resistant, and attachment means attaching the body member to said fish line.

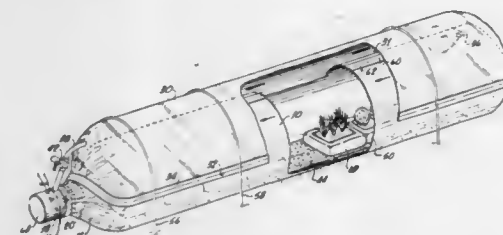
#### 4,679,350 PLANT GROWING SHELTER

Maynard A. Banta, 11291 Weatherby Rd., Los Alamitos, Calif. 90720

Filed Oct. 14, 1986, Ser. No. 918,716  
Int. Cl.<sup>4</sup> A01G 13/04

U.S. Cl. 47—29

21 Claims



1. A plant shelter comprising
  - a. an at least partially sealed enclosure formed of thin, flexible, transparent material, and having top, bottom, side and end portions,
  - b. a shade sheet formed of a material having a decreased light transmissivity, said shade sheet being secured and sealed to side and end portions of said enclosure and having at least an intermediate portion spaced above the top portion of said enclosure, said shade sheet and said enclosure forming therebetween a return air duct extending along at least the top portion of said enclosure,
  - c. a blower means for forcing air into said enclosure, said enclosure having a return passage at one end thereof providing fluid communication between said enclosure at said one end and the interior of said return air duct, and
  - d. a conduit means connecting the interior of said return air duct at a portion thereof remote from said return passage to said blower means, whereby air forced into said enclosure by said blower means is recirculated through said return air duct from said return passage and returned to said blower by said conduit means.

4,679,351

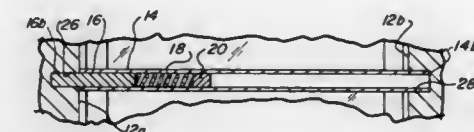
#### SECURITY BAR FOR WINDOW OPENING

Dominic A. Zarlengo, 3025 W. Scott Pl., Denver, Colo. 80211, and Phillip C. Zarlengo, 1379 S. Drexel Way, Lakewood, Colo. 80226

Filed Jun. 16, 1986, Ser. No. 874,409  
Int. Cl.<sup>4</sup> E06B 3/68

U.S. Cl. 49—57

1 Claim



1. A security bar for restricting passage through a window type opening having a pair of opposed frame members on opposite sides thereof and with a hole in each frame member comprising in combination:

a cylindrical tube of rigid material having a length approximating the distance between said opposite frame members of the opening, one end of said tube adapted to be received in the hole in one of said frame members, the opposite end of said tube having an axially slidable cylindrical insert adapted to project into the other of said holes, a coil spring member positioned internally of said tube and adapted to bias said insert axially outwardly of the tube, and a stop fixed internally of the tube against which the coil spring member can react, said stop being made of a malleable material and being frictionally retained in place by axial compression of the malleable material which causes radial expansion into a tight friction fit with the interior of the tube.

4,679,352

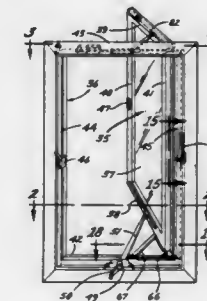
#### HARDWARE FOR MOUNTING A WINDOW SASH

Wayne C. Bates, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed May 22, 1986, Ser. No. 866,237  
Int. Cl.<sup>4</sup> E05D 15/52

U.S. Cl. 49—192

11 Claims



1. Hardware for mounting an upright window sash in a window frame, said hardware comprising pivot means supporting said sash to swing between closed and open positions about an upright axis located near one upright side of said sash, and means selectively operable (a) to hold said axis near the adjacent upright side of said frame as said window is swung from said closed position to said open position or (b) to cause said axis to travel toward the other upright side of said frame automatically as an incident to swinging of said sash from said closed position to said open position.

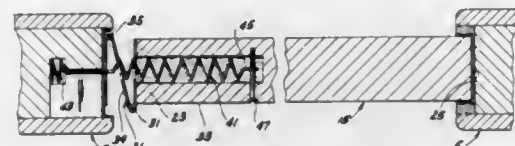
4,679,353

## SECURITY DOOR

George Langenbach, 9127 Pardee Spur, and John F. Langenbach, 9017 Firewood Trail, both of St. Louis, Mo. 63126  
Filed Sep. 29, 1986, Ser. No. 912,259  
Int. Cl.<sup>4</sup> E05D 15/58

U.S. Cl. 49—257

15 Claims



## 1. A security door comprising:

first and second vertical door jambs spaced from one another to define a doorway therebetween, the second door jamb having a generally channel-shaped recess therein extending generally vertically from adjacent the bottom of the jamb to adjacent the top of the jamb;  
a door for closing said doorway;  
hinge means on the first door jamb for supporting the door adjacent one vertical edge of the door, constituting its inner edge, and enabling it to swing on a generally vertical axis between an open position wherein the door is swung out of the doorway and a closed position wherein the door closes the doorway and the opposite vertical edge of the door, constituting its outer edge, is spaced inwardly from said recess in the second door jamb;  
said door being movable outwardly in the plane of the doorway from its closed position to a secured position wherein said outer vertical edge is received in said vertical recess thereby to prevent the door from swinging out of its secured position;  
spring means for urging said door away from its secured position; and  
locking means operable to pull the outer vertical edge of the door into said vertical recess and to maintain the door in its secured position against the urging of said spring means, said locking means comprising cooperable locking components in the door and said second door jamb.

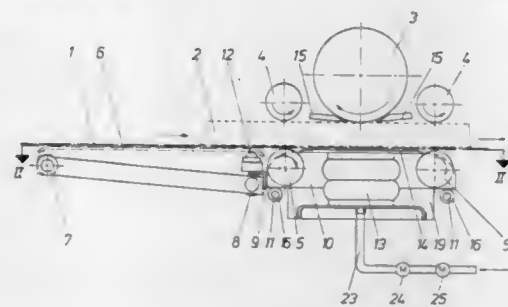
4,679,354

## GRINDING MACHINE FOR GRINDING OR RASPING OF RUBBER ITEMS

Svend Holst, Tarm; Niels Jensen, Hemmet, and Georg Jensen, Skjern, all of Denmark, assignors to B & J Rocket Rasp A/S, Tarm, Denmark  
Continuation of Ser. No. 747,056, Jun. 20, 1985, abandoned.  
This application Jul. 22, 1986, Ser. No. 888,275  
Int. Cl.<sup>4</sup> B24B 7/00

U.S. Cl. 51—76 R

6 Claims



1. A grinding machine for surface roughening a rubber workpiece for retreading of rubber tires comprising:  
support means for holding the workpiece, and grinding element, said support means including,

- (a) a flat support surface,  
(b) means for supporting said support surface in a manner which makes it free to tilt in all directions, including:  
(1) a pair of transverse bearing arms floatably supporting said support surface within predetermined limits so that said surface is relatively free to yield in response to variations in thickness of the workpiece,  
(2) upward bias means including a bellows engaging said support surface and generally centered between said arms and having its central axis generally in line with the center of the support surface, said bias means being independently controllable to urge the workpiece into engagement with said grinding element, said arms include journals and said support surface includes apertures sized substantially larger than said journals to receive said journals in loose engagement to accommodate the free tilting of the surface, and  
(c) a conveyor belt situated atop said support surface for conveying the workpiece into engagement with said grinding element, said bellows having a top surface in contact with said support surface and wherein the periphery of said top surface is distant from the peripheral edges of said support surface, so that said support surface is free to tilt in all directions in response to variations in the workpiece.

4,679,355

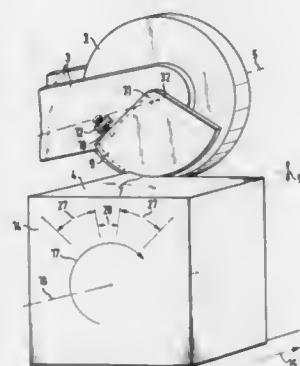
## APPARATUS FOR GRINDING A SEMIFINISHED STEEL PRODUCT

Egon Evertz, Vorlander Strasse 23, D-5650 Solingen, and Rolf Seybold, Solingen, both of Fed. Rep. of Germany, assignors to Egon Evertz, Solingen, Fed. Rep. of Germany  
Filed May 13, 1986, Ser. No. 862,653

Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517302  
Int. Cl.<sup>4</sup> B24B 19/00

U.S. Cl. 51—99

13 Claims



1. An apparatus for grinding a semifinished steel product which requires removal of material up to the penetration depth of cracks near the surface thereof and which is advanced in the direction of the longitudinal axis thereof whilst being rotated about said longitudinal axis, said apparatus comprising a support member movably mounted on the apparatus, a bearing provided in said support member, a grinding wheel mounted in said bearing with its axis parallel to the longitudinal axis of the semifinished product and arranged so that its axis is movable relative to the semifinished product, a stop member in the form of a segment of a circle pivotally mounted on the support member with its pivotal axis coaxial with the axis of the grinding wheel but spaced from the center of the circle so that the circle is eccentric relative to the axis of the grinding wheel, and means for pivotally adjusting and locking the stop member in position, said stop member resting on the unabraded surface of the semifinished product at a position which is spaced from the point of engagement of the grinding wheel by a distance which

corresponds to the penetration depth of the grinding wheel and said stop member controlling the position of the grinding wheel relative to the surface of the semifinished product so that material is removed uniformly around the entire periphery of the semifinished product.

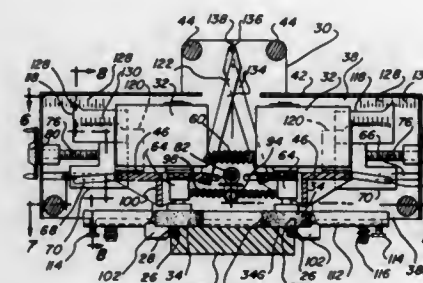
4,679,356

## AUTOMATIC SKI TUNING DEVICE

Jacques B. Thomas, P.O. Box 3111, Winter Park, Colo. 80482  
Filed May 9, 1986, Ser. No. 861,604  
Int. Cl.<sup>4</sup> B24B 9/00

U.S. Cl. 51—205 WG

15 Claims



1. A device for filing the bottom edge of a ski wherein the ski varies in width along its length comprising in combination, frame means adapted to be moved along the length of the ski, motor means mounted on said frame means, grinding means operably connected to said motor means and adapted to engage the bottom edge of said ski as the frame means is moved along the length of the ski, and operative mechanism means on said frame means adapted to adjust the angle of said grinding means relative to the bottom of the ski whereby the edge can be ground at an angle relative to the bottom of the ski.

4,679,357

## METHOD AND APPARATUS FOR DISPLACING A HONING TOOL

Günter Richter, Kirchheim-Nabern, and Reinhard Fröschle, Ostfildern, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Gehring Gesellschaft mit beschränkter Haftung & Co., Ostfildern, Fed. Rep. of Germany  
Filed Jun. 7, 1985, Ser. No. 742,610

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421193  
Int. Cl.<sup>4</sup> B24B 33/02, 33/08

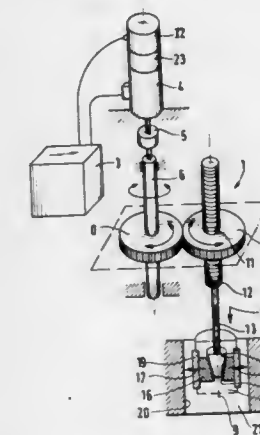
U.S. Cl. 51—281 P

1 Claim

1. A method of displacing a honing tool having stones for stock removal in workpiece bores, including the steps of initially rapidly feeding said tool until the latter contacts the workpiece, and then changing over to a slower stock removal feed step; the improvement therewith which comprises in combination the steps of:

effecting said rapid feeding and said stock removal feed by means of a single motor employed during said rapid feeding and said stock removal feed;  
presetting the rapid feeding speed, the stock removal feed speed, and a respective torque limit of said motor; introducing said honing tool into said workpiece bore, thereupon rapidly feeding the honing stones of said tool with feeding means, and in so doing operating said single motor of a continuing feed at high speed and low torque limit in conformity with said preset values; turning said single motor off when said honing stones come to rest against the wall of said workpiece bore, and when said preset torque limit of said single motor is reached; after said honing stones come to rest against said bore wall and said single motor is shut off, temporarily changing the direction of

rotation of said single motor and slightly backing-off said honing stones from said bore wall; after the conclusion of said backing-off step, automatically initiating a stroke motion of said honing tool, tool rotation and stock removal feeding, which pursuant to said presetting operates at a low stock removal feed speed and high torque limit; after achieving a predetermined finished size value, stopping said stock removal feeding, and briefly rotating said single motor in the opposite direction in order to back-off said stock removal feeding by a predetermined amount; inputting into a first input element a stock removal feeding value which in conformity with the stock removal task is necessary for the first of a series of workpieces which are to be machined; upon achieving this feeding value stop-



ping said stock removal feeding; and storing the thus-obtained position in a feed control mechanism as the finished size value; inputting, into a second input element of said feed control mechanism, a previously determined honing stone wearvalue which is related to a machined workpiece; and adding this value, in said feed control mechanism, to said finished size value to form a new finished size value, which is then stored;  
operating said feed control mechanism via pulses; successively inputting into a position cycle regulator, for said stock removal feeding, one pulse at a time; and utilizing said pulse in such a way that with each pulse, said single motor is rotated further by a specific angular step, thus operating said single motor also as a quasi stepping motor particularly during said stock removal feeding.

4,679,358

## GRINDING WHEEL ADVANCING APPARATUS

Christopher Z. Sieradzki, Homewood, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Mar. 20, 1986, Ser. No. 842,111  
Int. Cl.<sup>4</sup> B24B 49/00

U.S. Cl. 51—165.72

1 Claim

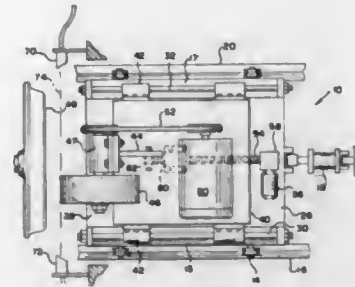
1. A grinding apparatus comprising  
a first carriage means mounted on a track assembly, a first drive means adapted to move said first carriage means laterally along said track assembly to an operating position and a fully retracted position,  
a second carriage means mounted on said first carriage means, a second drive means mounted on said first carriage means and adapted to move said second carriage means laterally along said first carriage means,  
a grinding wheel assembly mounted on said second carriage means, said grinding wheel assembly including a grinding wheel and a drive mechanism,  
a sensing mechanism comprising a light source emitting a light beam and a light receiver so positioned such that



when said first carriage means is at said fully retracted position, and said grinding wheel is within acceptable wear condition, said light beam when activated will be blocked from entering said light receiver by said grinding wheel,

and when said first carriage means is at said fully retracted position and said grinding wheel is worn beyond preselected wear conditions, said light beam when activated will be able to enter said light receiver and thereby activate said second drive means to laterally move said second carriage means until said grinding wheel blocks said light beam thereby deactivating said second drive means,

and wherein said second drive means comprises a screw mechanism connected at one end to a motor mounted on said first carriage, an engaging gear mounted on said second carriage means with said screw mechanism passing through said engaging gear, such that upon rotation of said screw mechanism, said second carriage means is moved in relation to said first carriage means.



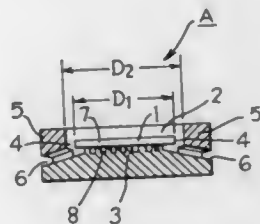
**4,679,359**  
**METHOD FOR PREPARATION OF SILICON WAFER**  
Akira Suzuki, Gottemba, Japan, assignor to Fuji Seiki Machine Works, Ltd., Shizuoka, Japan

Filed Dec. 20, 1985, Ser. No. 811,611

Claims priority, application Japan, Dec. 28, 1984, 59-274949  
Int. Cl.<sup>4</sup> B24C 1/06

U.S. Cl. 51—321

6 Claims



1. A process for finishing a silicon wafer, comprising the steps of:

- providing a mono-crystal silicon block;
- cutting said block to form a thin waferlike disc;
- rough grinding a surface of the disc to effect partial finishing thereof and to provide the disc with the approximate desired thickness;
- reducing the roughness of the ground surface by blasting the ground surface of the disc with a slurry composed of silicon carbide particles and water so as to effect removal of a majority of the metamorphosed layer formed on the surface during the cutting and grinding steps and to provide the surface with a satinlike matte finish; and then
- polishing the surface of the disc to provide a mirrorlike finish.

**4,679,360**  
**LAMELLAR END GRINDING WHEEL**  
Gerd Eisenblätter, Jägerweg 10, 8192 Geretsried 2, Fed. Rep. of Germany

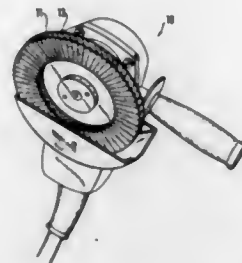
Filed May 22, 1986, Ser. No. 865,973

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541347

Int. Cl.<sup>4</sup> B24D 13/14

U.S. Cl. 51—337

19 Claims



1. Lamellar end grinding wheel comprising a circular disc-shaped flexible back plate, grinding flaps arranged along a circumferential zone of said back plate so as to overlap one another in tile-like manner and being fixed there, said grinding flaps being passed through radial slots formed in said circumferential zone, said back plate being constructed as a sheet metal plate, a supporting plate arranged on the side of said back plate remote from a working surface, said supporting plate being firmly connected to said back plate at least on the outer circumference of said back plate, rear ends of said grinding flaps being fixed between said back plate and said supporting plate, and a circumferential edge of said back plate being bent over towards a side remote from said working surface to form a hook-like circumferential flange in radial section and said supporting plate being fixed under said hook-like circumferential flange.

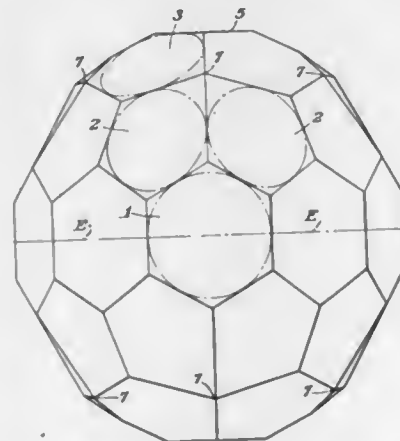
**4,679,361**  
**POLYHEDRAL STRUCTURES THAT APPROXIMATE A SPHERE**  
J. Craig Yacoe, 108 Harvey Ln., Chadds Ford, Pa. 19317

Filed Jan. 13, 1986, Ser. No. 817,927

Int. Cl.<sup>4</sup> E04B 1/32, 7/08

U.S. Cl. 52—81

8 Claims



1. A polyhedron that approximates a sphere, the sphere having an equator and two poles, the polyhedron having a plurality of polygonal faces, in which each vertex of the poly-

hedron is a junction of three or four polygonal edges, wherein each edge of each polygon is tangent to the approximated sphere at one point, each polygonal face being defined in a manner such that a circle can be inscribed therein that is tangent to each edge of the polygon at one point, wherein the polyhedron comprises two substantially parallel faces that are regular polygons said two parallel faces located at the poles to form polar caps and at least half of the remaining faces are selected from non-equilateral hexagons and pentagons, wherein the irregular polygonal faces are positioned in rings, including a first ring in a substantially equatorial position with respect to the approximated sphere and the centers of the inscribed circles of the polygons of more polar rings being at substantially the same latitude in each ring, and wherein successively more polar rings of polygons contain faces which are either equal in number or one-half the number of faces in the next most equatorial ring adjacent to each polar cap contains no more than one half the number of faces in the first ring.

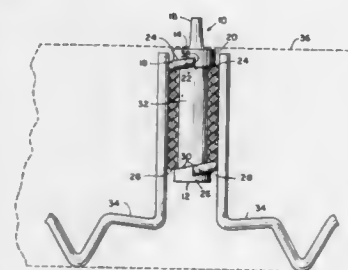
**4,679,362**  
**VOID PLUG LIFT INSERT ASSEMBLY FOR A CAST CONCRETE PRODUCT**  
Richard C. Mess, Stone Mountain, Ga., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jun. 12, 1980, Ser. No. 158,986

Int. Cl.<sup>4</sup> E04B 1/41, 1/38

U.S. Cl. 52—125.5

7 Claims



1. A lift insert assembly for imbedment in a concrete product comprising:

- (a) a substantially cylindrical insert for receiving a lifting device;
- (b) means secured to said insert for supporting said insert in perpendicular spaced relation with the upper surface of said concrete product;
- (c) a void plug filling said insert, said void plug being comprised of an elastomeric tubular body member closed at one end and open at the other end;
- (d) an integral annular collar extending radially from said closed end and having a longitudinally inwardly facing shoulder means overlying and shaped conformably to the shape of the upper end of said insert;
- (e) integral abutment means extending radially from said open end and overlying and residing against the lower end of said insert;
- (f) the longitudinal distance between said shoulder means of said collar and said abutment means being less than the corresponding length of said insert, such that, upon insertion, said void plug is stretched to place said shoulder means and abutment means in overlying intimate contact with the respective ends of said insert; and
- (g) the intermediate surface of said body member, between said shoulder means and said abutment means, being free of threads.

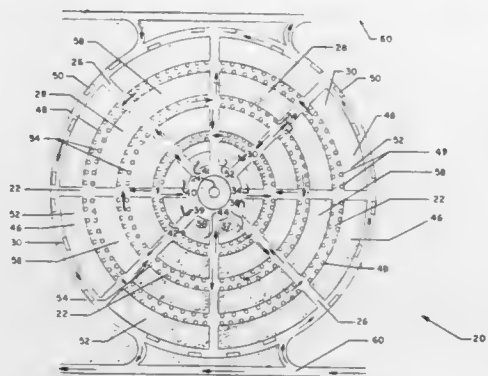
**4,679,363**  
**TOWNSHIP, CITY AND REGIONAL LAND ARRANGEMENT**  
George W. Adams, 425 Muddy Branch Rd. #101, Gaithersburg, Md. 20877

Filed Jan. 28, 1986, Ser. No. 823,276

Int. Cl.<sup>4</sup> E04H 3/04

U.S. Cl. 52—169.3

41 Claims



1. A township land arrangement comprising:

- a first plurality of concentric circular roadways, and a common center area defined at the center of said roadways;
- a second plurality of roadways radially extending outwardly from said center area and intersecting said first plurality of roadways;
- a first plurality of segment areas, each of said first plurality of segment areas defined by adjacent ones of said radially extending roadways and innermost and outermost ones of said concentric roadways;
- each of said first plurality of segment areas defining a plurality of substantially curved-shaped adjacent land areas, each of said curved-shaped adjacent land areas bounded by adjacent ones of said concentric roadways and by adjacent ones of said radially extending roadways; and
- said center area being substantially circular in shape and including a council house and a civic center.

**4,679,364**  
**DOCK SEAL**  
Robert P. Fettig, Waterford; Matthew J. Bushman, and Glenn M. Miller, both of Milwaukee, all of Wis., assignors to Kelley Company Inc., Milwaukee, Wis.

Filed Jan. 6, 1986, Ser. No. 816,347

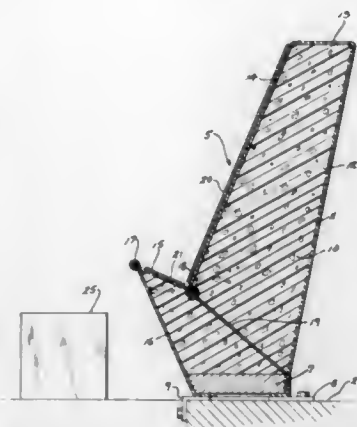
Int. Cl.<sup>4</sup> E04H 14/00

U.S. Cl. 52—173 DS

21 Claims

1. In combination, a loading dock having a wall with a doorway therein, a dock seal mounted on the outer surface of said wall and bordering said doorway, said dock seal including a pad of resilient material mounted along the side of said doorway, said pad having an outer end and having an inner end mounted on said wall, said pad including a first vertical surface extending inwardly toward the dock from said outer end, said pad also having a second vertical surface extending laterally in a direction toward the center of said doorway and disposed generally normal to said first surface, said first and second surfaces being joined at an inside vertically extending corner, and a sheet of impact resistant flexible material disposed on said first surface, said first and second surfaces being constructed and arranged so that engagement of said pad by a truck body

backing toward the dock will compress and deform said pad to urge said first surface into engagement with the outer side of



the truck body and move said second surface into engagement with the rear end of the truck body.

4,679,365

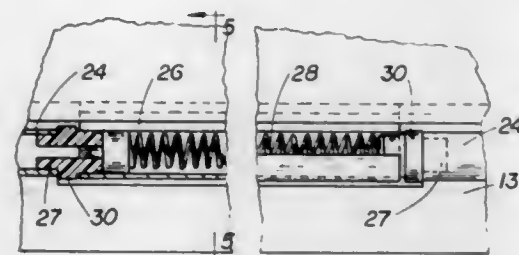
**EMERGENCY EXIT FOR A PERSONNEL CHAMBER**

Charles Herring, Rte. 3, Greenville, Ill. 62246

Filed Sep. 25, 1985, Ser. No. 779,961

Int. Cl.<sup>4</sup> E05B 65/10; E06B 1/04

U.S. Cl. 52-204



1. In combination with a vertical peripheral wall of a mobile home having an interior horizontal floor and vertical peripheral side walls extending therefrom, said side walls having inner and outer faces and upper and lower portions, an exit opening in at least one of the lower portions of one of said vertical peripheral side walls adjacent said interior floor of said mobile home to permit exit from a crawling position, said exit opening being sized and positioned relative said interior floor of said mobile home to permit personnel to exit therethrough from a crawling position on the floor of said mobile home in an emergency; an inner wall frame member including joined vertical and horizontal leg members, said frame member being sized to conform with said exit opening with one of said leg members extending horizontally into said opening to provide a peripheral border therefor and the other of said leg members extending vertically to be fastened to said inner face of said vertical side wall; a door assembly including an outer wall frame member of spaced upper and lower horizontal leg members joined at their extremities by spaced vertical leg members, said leg members being generally staggered seat shaped right angle cross-section having two oppositely extending vertical leg portions joined by connecting intermediate leg portions which nest in one of the legs of said inner wall frame members, one of said outer wall vertical leg portions of said door assembly being fastened to said outer face of said vertical wall and the other oppositely extending vertical leg portion of said door assembly providing a door panel seat; said door assembly having a door panel comprised of a border frame including joined vertical and upper and lower horizontal legs nestingly

receiving peripheral edges of spaced inner and outer wall sheets with insulation material sandwiched therebetween, said border frame of said door panel having a butt hinge connecting with said outer wall frame member along the lower horizontal leg thereof, said hinge connection including dovetailing tubular segments integral with said outer wall frame member and said door panel respectively to form a butt hinge when dovetailed, said dovetail segments being pivotally connected about the longitudinal axis thereof by spring load pin members disposed within said integral tubular segments for gravitational pivotal movement of said door panel outside said mobile home when pushed out of closed position; and an actuatable locking member including a bolt housing mounted on the inner wall sheet and upper horizontal leg of said border frame of said door panel on the upper side thereof and an arcuate spring loaded bolt slidably disposed within said housing to hold said door panel in closed position against said outer door frame, said bolt member being hand actuatable by personnel when in the crawling position on the floor of said mobile home.

4,679,366

**MODULAR BUILDING COMPONENT**

William G. Hitchins, "Fiddawn", New Cascade Road, Norfolk Island, Australia (2899)

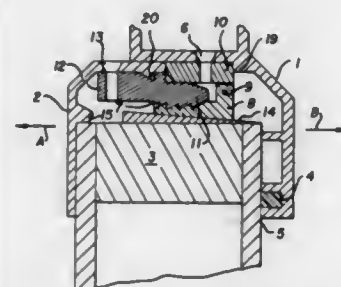
Filed Jul. 23, 1985, Ser. No. 758,085

Claims priority, application Australia, Jul. 23, 1984, PG6168

Int. Cl.<sup>4</sup> E06B 1/04

U.S. Cl. 52-217

3 Claims



1. A device for attaching first and second frame parts about opposite sides of the periphery of an aperture in a wall of a building; said device comprising a U-shaped female member having first and second limbs pivotally attached one to the other and each having one inwardly-facing side forming a bight therebetween, a cooperating male member insertable into said bight of said U-shaped female member; means attaching said female member to said frame first part, said female member having a plurality of teeth on said inwardly-facing side of one said limb thereof; means attaching said male member to said second frame part, said male member having a plurality of co-acting teeth on a side thereof; whereby, with said female and male members attached to said first and second frame parts respectively and the said two frame parts fitted together, said male member is received within said bight of said female member so as to be locked therein by means of the mutual engagement of said teeth and co-acting teeth; and a portion of the periphery of the wall aperture having a ramp along which one said limb of said female member is adapted to slide when said frame parts are fitted together to thereby urge the said two members into locking relationship.

4,679,367

**INTERCONNECTING OF WOODEN MEMBERS**

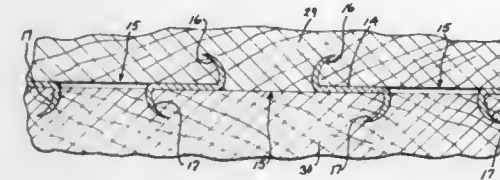
Alan C. Gelsthardt, North Fond du Lac, Wis., assignor to Jack Walters &amp; Sons, Corp., Allenton, Wis.

Filed Aug. 29, 1985, Ser. No. 770,691

Int. Cl.<sup>4</sup> B24B 47/02; B27F 7/00

U.S. Cl. 52-233

17 Claims



1. A method of making a wooden composite assembly such as a beam, post or the like, said method comprising:
  - (a) positioning a plurality of elongated wooden boards of varying lengths in spaced face-to-face relationship to thereby form a plurality of parallel layers and so that at least one of said layers is formed of a plurality of boards having a total length about equal to the length of an adjacent layer,
  - (b) abutting the inner ends of the plurality of boards in said at least one of said layers to form a generally planular joint between said abutting ends,
  - (c) providing a connector device having a base plate with a plurality of spaced openings therein, and with said openings having a plurality of wood engaging prongs extending outwardly therefrom and initially generally normal to said base plate, the prongs of alternate adjacent openings extending in opposite directions from said base plate,
  - (d) positioning said connector device between said parallel layers so that said base plate bridges the inner portion of said joint and so that oppositely extending prongs engage the opposing faces of boards in adjacent layers and form an assemblage,
  - (e) and compressing said assemblage to form a rigid composite assembly so that said prongs deform and clinchingly engage the wood surrounding said joint and splice the boards forming said joint together as well as holding facing boards in adjacent layers together.
11. A rigid wooden composite assembly such as a beam, post or the like, said assembly comprising, in combination:
  - (a) a plurality of elongated wooden boards of varying lengths disposed in face-to-face relationship and forming a plurality of parallel layers with at least one of said layers being formed of a plurality of boards having a total length about equal to the length of an adjacent layer,
  - (b) the inner ends of said last-named plurality of boards being disposed in abutting relationship and thereby forming a generally planular joint therebetween,
  - (c) and a connector device having a base plate with a plurality of spaced openings therein, and with said openings having a plurality of prongs extending outwardly therefrom and initially in a direction generally normal to said base plate,
  - (d) the prongs of alternate adjacent openings extending in opposite directions from said base plate,
  - (e) said connector device being disposed between said parallel layers so that said base plate bridges the inner portion of said joint with said oppositely extending prongs penetrating the opposing faces of boards in adjacent layers,
  - (f) said assembly being compressed together into a unified structure with said prongs being deformed and clinchingly engaging the wood surrounding said joint and splicing the boards forming said joint together as well as holding facing boards in adjacent layers together.

184-022 O.G.-87-3

4,679,368

**RAIL PANEL MOUNTING LATCH**

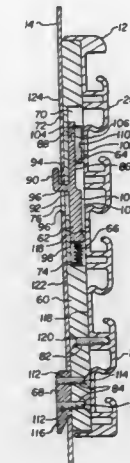
Frederic R. Pettinga, Grand Rapids, and Steve F. Goodman, Wyoming, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Nov. 13, 1985, Ser. No. 797,446

Int. Cl.<sup>4</sup> A47H 27/00

U.S. Cl. 52-36

22 Claims



1. A wall panel having a front and a back and adapted to be removably mounted to a vertical slotted standard having a plurality of vertically spaced slots, a front face and a rear face, said panel comprising:
  - a support means secured to said panel and registrable with a first slot of said standard to at least partially support said panel on said standard;
  - a latch means mounted to said panel, vertically movable between locked and unlocked positions, registrable with a second slot of said standard, when said latch means is in said unlocked position and said support means extends through said first slot, and engageable with said rear face of said standard adjacent said second slot, when said latch means is in said locked position and said support means engages said rear face adjacent said first slot, to securely mount said panel to said standard; and
  - an actuating means movably mounted to said panel and for actuating movement of said latch means between said locked and unlocked positions.

4,679,369

**ANCHORING SYSTEM**

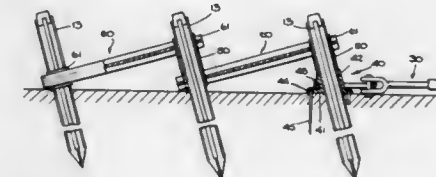
Ann M. Kinsley, Havertown, and William A. Mansi, Yeadon, both of Pa., assignors to Wickes Manufacturing Company, Southfield, Mich.

Filed Mar. 15, 1985, Ser. No. 712,581

Int. Cl.<sup>4</sup> B64F 1/16, 1/02

U.S. Cl. 52-155

7 Claims



1. A multiple stake ground anchoring system comprising:
  - a stake guide having a base section and an elongated hollow sleeve section which is inclined to the base section and which extends therethrough;



a first stake extending through said hollow sleeve of the stake guide;

a hollow spacer collar mounted on said sleeve section of the stake guide and in coaxial alignment therewith, said spacer collar being sized to permit the passage of said stake closely through its hollow interior;

a rigid elongated stake tie having two passages extending through it, said passages having parallel axes and being sized to permit the passage of said stake closely there-through, said stake tie being mounted on said spacer collar with one of its passages in coaxial alignment with said hollow spacer collar; and

a second stake extending through the passage in said stake tie which is distal to that mounted on said spacer collar, whereby said second stake is rigidly connected to said first stake and both said stakes are at the same angle of inclination with respect to the base section of said stake guide.

4,679,370

## SURFACE-FORMING PANEL

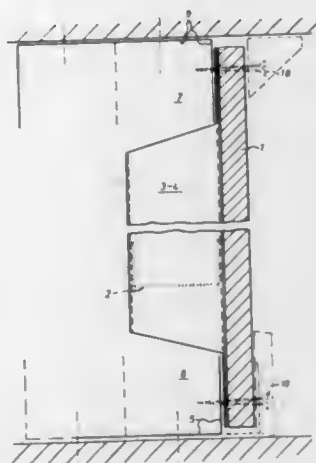
Björn Samuelsson, 93, Ryttnästarrvägen, Vällingby, Sweden (S-162 24)

Continuation of Ser. No. 548,159, Nov. 2, 1983, abandoned. This application Apr. 14, 1986, Ser. No. 852,087

Claims priority, application Sweden, Nov. 5, 1982, 8206293 Int. Cl.<sup>4</sup> E04B 2/00

U.S. Cl. 52-407

12 Claims



1. In a wall structure of a building, a surface-forming panel comprising a planar rectangular facing element of building material, a collapsible sheet metal reinforcing framework on a rear surface of the element, the element having a first pair of opposite edges and a second pair of opposite edges perpendicular to the first pair of edges, and attachment means between the panel and the wall structure independent of the reinforcing framework comprising plural foldable profiled elements each having a flange portion secured to the rear surface of the facing element and a body portion with bend lines for unfolding the element from a transport position, the framework including a pair of of the profiled elements positioned in parallel along the first pair of opposite edges of the facing element, the wall structure including parallel panel supports substantially aligned with the second pair of opposite edges, the attachment means consisting entirely of fasteners connected between the panel and said supports, the profiled elements extending lengthwise between the supports in substantially continuous engagement with a rear surface of the panel thereby providing reinforcement for the panel between said supports and the profiled elements being adapted for folding in a direction perpendicular to their length.

4,679,371  
PROFILE

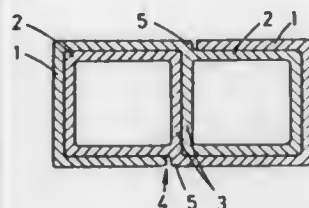
Ann-Christin Jilken, Sundsvall, Sweden, assignor to Adenco Engineering AB, Lidings, Sweden  
PCT No. PCT/SE83/00217, § 371 Date Feb. 2, 1984, § 102(e)  
Date Feb. 2, 1984, PCT Pub. No. WO83/04294, PCT Pub. Date Dec. 8, 1983

PCT Filed Jun. 1, 1983, Ser. No. 589,080

Claims priority, application Sweden, Jan. 4, 1982, 8203465 Int. Cl.<sup>4</sup> E04C 1/04

U.S. Cl. 52-574

4 Claims



1. A combination including a first and a second profile, wherein each said profile consists of first and second sections (1, 2) rigidly joined together, each first section (1) being an open-walled hollow section with an inner contour and each second section (2) being a closed hollow section with an outer contour, the inner contour being uniform with and somewhat bigger than the outer contour wherein each first section has an opening (4) arranged so that said first and second profiles can be telescoped into one another, each opening (4) having a width which is substantially no wider than the thickness of the wall of the open-walled hollow section (1) disposed in that opening (4) when the profiles are so telescoped, whereby the first section of the first of the telescoped profiles substantially, completely surrounds and rigidly interlocks with the second section (2) of the second of the telescoped profiles without recourse to additional members.

4,679,372

## SPACE FRAME APPARATUS AND A SPACE FRAME EMPLOYING SUCH APPARATUS

Alfred H. Noble, 310 Highland Road, Kensington, Johannesburg, Transvaal, South Africa

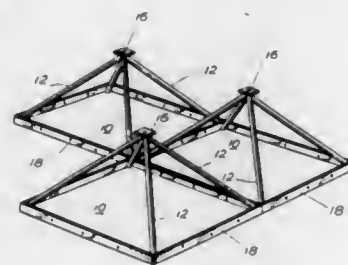
Filed May 23, 1985, Ser. No. 737,189

Claims priority, application South Africa, May 24, 1984, 84/3943

Int. Cl.<sup>4</sup> E04H 12/00

U.S. Cl. 52-648

4 Claims



1. A space frame unit and a hollow box connector combination.

the space frame unit comprising

a substantially rectangular integral frame having edges provided with upstanding lips, said edges being connected to adjacent edges of frames of similar space frame units placed side-by-side with the space frame unit thereby connecting the frames together in side-by-side relationship; at least four elongated structural members fixedly attached to the frame at the corners of the

4,679,374

## BUILDING CONSTRUCTION METHOD

Robert Boehmig, 850 Glenair Dr., NE., Atlanta, Ga. 30328

Filed Dec. 3, 1984, Ser. No. 677,345

Int. Cl.<sup>4</sup> E04G 21/14

U.S. Cl. 52-745

10 Claims

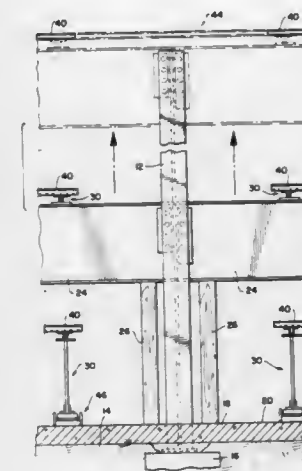
frame and converging towards one another to form an apex of the space frame unit being substantially remote from the frame thereof;

a fixing plate arrangement at the apex permanently receiving ends of the structural members remote from the frame;

the hollow box connector comprising

a lid spaced from the fixing plate arrangement, an open-ended tubular member located between the lid and the fixing plate arrangement at the apex of the space frame unit having a plurality of holes in its walls; and

bolt means serving to draw the lid and the fixing plate arrangement towards one another, said bolt means passing through the tubular member, thereby holding the tubular member between the lid and the fixing plate arrangement; the holes in the tubular member permitting connection to the tubular member of cross-members and connecting the apex of the space frame unit to the apices of the other space frame units placed side-by-side therewith.



4,679,373

## METHOD AND DEVICE FOR THE ALIGNING OF AN ELEMENT, E.G. FRAME, TO BE INSERTED INTO A WALL OPENING

Bernd Ludwig, Heylstrasse 33, D-6460 Gelnhausen, Fed. Rep. of Germany

PCT No. PCT/EP84/00395, § 371 Date Aug. 5, 1985, § 102(e)  
Date Aug. 5, 1985, PCT Pub. No. WO85/02648, PCT Pub. Date Jun. 20, 1985

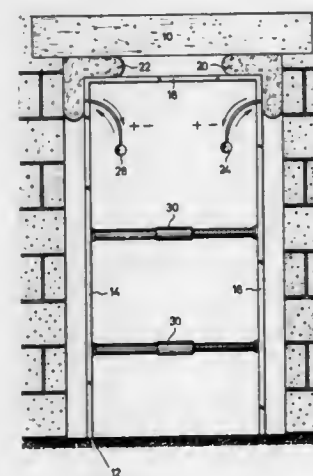
PCT Filed Dec. 10, 1984, Ser. No. 767,199

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 8335189[U]; Mar. 7, 1984, 8406973[U]

Int. Cl.<sup>4</sup> E06B 1/58; E04F 21/00

U.S. Cl. 52-745

21 Claims



1. A method for aligning elements such as frames, door frames, window frames or the like in, for example, a wall opening, wherein the space between the two may have to be filled with foam and a compensating element has to be arranged in each of at least two corner areas to adjust the element inside of the opening, wherein inflatable air bags, as removable compensating elements, are placed between the upper corner areas of the element and the wall opening, said air bags exerting controlled pressure on the longitudinal jambs and the crosspiece running between said jambs.

1. A method for constructing an entire roof system for single story building structures comprising:

installing an array of upstanding columns upon a prepared ground surface in spaced parallel lines and transverse rows to define bays between adjacent column lines with groups of columns in said adjacent lines defining therebetween the corners of panel areas within said bays;

assembling large primary and smaller secondary panels at a convenient working height near said surface, said primary panels to form the roof structure over alternate bays and said secondary panels to form the roof structure over bays intermediate to said alternate bays, assembling said primary panels including placing beams of a length to extend between adjacent columns in a line of columns at each end of each said primary panel, securing spaced joists perpendicularly to and extending between said beams with the end most joists secured inwardly of the ends of said beams, assembling said secondary panels including temporarily securing to the beams spaced parallel secondary panel joists which extend between the beams of the primary panels located in adjacent ones of said alternate bays with the end most joists of said secondary panels being temporarily secured inwardly of the ends of said beams, and securing joist bridging perpendicular to said primary and secondary panel joists;

temporarily storing selected ones of said secondary panels in underlying relationship to selected ones of said primary panels to thereby clear said surface in at least a portion of said intermediate bays;

utilizing said portion of said intermediate bays to accommodate lifting equipment; and

successively raising and connecting said primary and secondary panels to the upper ends of said columns that are disposed at the corners of each said panel area.

4,679,375

**SUSPENSION CEILING GRID SYSTEM WITH NARROW-FACED GRID**

Richard Shirey, Avon Lake, Ohio, assignor to Doan Incorporated, Westlake, Ohio

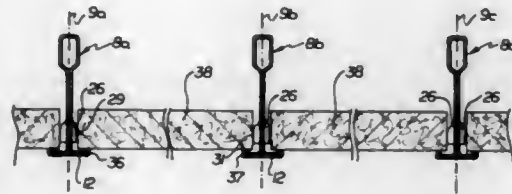
Filed Sep. 23, 1983, Ser. No. 535,382

The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.

Int. Cl.<sup>4</sup> E04B 5/52

U.S. Cl. 52-777

22 Claims



1. A narrow-faced suspension ceiling grid system comprising a plurality of grid tees interconnected to form a grid providing a plurality of panel openings, said grid tees providing a bulb a planar central web and a pair of opposed flanges extending from the side of said web opposite said bulb, the lower surface of said flanges being exposed and providing said grid tees with a face having a fixed face width equal to the distance between the edge extremities of said opposed flanges, said edge extremities being spaced apart about 9/16 inch, a plurality of unrabbed panels positioned in said panel openings each providing a lower planar surface extending to lateral edges thereof, said lower surface of said panels overlying associated flanges of said grid tees and being supported thereby, said panels being undersized with respect to said grid to provide a predetermined maximum clearance of about 5/16 inch with respect to said webs of said grid tees, said web providing centering means operable to center said panels and provide a substantially uniform spacing of at least about 1/4 inch between said edges of said panels and the plane of said webs.

4,679,376

**ARRANGEMENT IN A ROLL WRAPPING APPARATUS FOR THE APPLICATION OF HEADERS**

Karl-Erik Ekblom, Mäntsälä, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

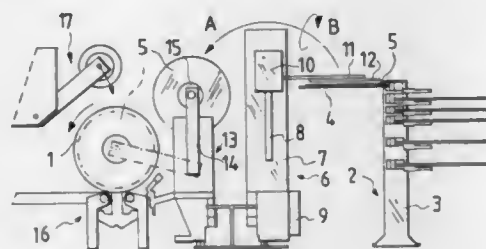
Filed Dec. 31, 1985, Ser. No. 815,006

Claims priority, application Finland, Dec. 31, 1984, 845174

Int. Cl.<sup>4</sup> B65B 61/22

U.S. Cl. 53-137

6 Claims



1. An arrangement in a roll wrapping apparatus for the application of soft inner headers to the ends of paper rolls which comprises  
a storage unit,  
storage members located in said storage unit for carrying different size headers,  
a transfer unit having a frame,  
an application unit having a frame,  
first gripping means supported on said transfer unit frame for

shifting a header from said storage unit to said application unit,  
second gripping means carried by said application unit frame for shifting the header to a position against the end of the roll,  
said second gripping means receiving the header from said first gripping means and holding the header over its center area, and  
means for rotating said second gripping means so as to keep the header aligned by the effect of centrifugal force while said second gripping means shifts the header onto the end of the roll.

4,679,377

**APPARATUS FOR APPLYING AN END PLUG TO AN END OF A FUEL ROD TUBE**

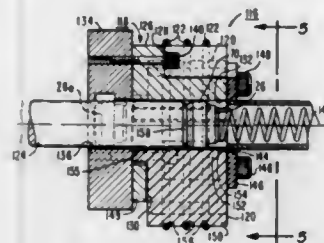
Stuart L. Rieben, and Mark E. Wylle, both of Mt. Lebanon Twp., Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 678,519, Dec. 5, 1984. This application Jun. 12, 1986, Ser. No. 873,642

Int. Cl.<sup>4</sup> G21C 3/10

U.S. Cl. 53-327

5 Claims



1. An end plug applying apparatus for applying an end plug to a hollow tube end of a nuclear fuel rod such that a frictional interfitting engagement will be established between the end plug and the tube end facilitating the formation of a connection therebetween which hermetically seals the fuel rod, said apparatus comprising:

- a housing having spaced inlet and outlet ends, said inlet end adapted to receive the end plug and said outlet end adapted to receive the tube end to which the plug is to be applied;
- guide means disposed in said housing and having internal surface portions which define an internal guide channel aligned in tandem with said inlet and outlet ends of said housing along a common axis and being of a cross-sectional size smaller than that of an outer external surface of the end plug, said guide means being yieldably expandable radially with respect to said common axis;
- means defining an infeed opening adjacent said inlet end of said housing and displaced laterally of said common axis through which the end plug is fed in a direction extending toward said common axis to a loading position in front of said inlet end of said housing; and
- means disposed adjacent said inlet end of said housing and movable along said common axis for engaging and moving the end plug from said loading position in front of said inlet end, through said inlet end and through said guide channel, to said outlet end, said movement of said plug through said guide channel causing yieldable expansion of the cross-sectional size of said guide means such that said surface portions of said guide means conform to the outer external surface of the end plug and maintain guiding contact therewith as the end plug is moved through said guide channel;
- said housing has a series of elongated guideways spaced from one another about said common axis, and the elongated axis of each guideway extending generally radially from said common axis;
- said guide means includes

a plurality of elongated guide members mounted in said respective guideways for radial movement relative to said common axis and having inner portions facing toward one another so as to define said guide channel therebetween and the elongated axis of each guide member extending generally radially from said common axis, and  
a plurality of flexible resilient expandable endless members surrounding said plurality of guide members so as to bias said guide members toward one another, said endless members yieldably allowing movement of said guide members away from one another upon contact of said inner portions thereof with the end plug for establishing and maintaining guiding contact with the end plug as the same is moved through said guide channel.

4,679,378

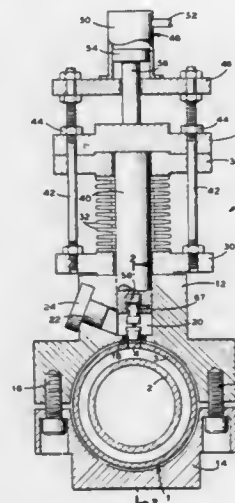
**VACUUM SEALING DEVICE FOR INSULATED STEAM INJECTION TUBING**

Paul T. Anderson; Lawrence Irwin; John C. Matthews, all of Lancaster; Charles E. Paugh, Winchester, all of Ohio, assignors to The Babcock &amp; Wilcox Company, New Orleans, La. Division of Ser. No. 776,254, Sep. 16, 1985. This application Aug. 15, 1986, Ser. No. 897,181

Int. Cl.<sup>4</sup> B65B 31/02

U.S. Cl. 53-405

4 Claims



1. A method of plugging a vacuum port in a tube with a plug having a sealing pin comprising holding clamping means around the tube and over the port, the clamping means having a space with an opening communicating with the port, drawing a vacuum from the space to draw a vacuum from the port, moving the plug of the sealing pin into the port for sealing the port and breaking the plug away from a remainder of the sealing pin to leave the plug in the port.

4,679,379

**AUTOMATIC BUNDLING MACHINE**

Paolo Cassoli, Casalecchio Di Reno, Italy, assignor to Cassoli s.r.l. Macchine Automatiche Confezionatrici, Bologna, Italy

Filed Sep. 13, 1983, Ser. No. 531,740

Int. Cl.<sup>4</sup> B65B 63/02

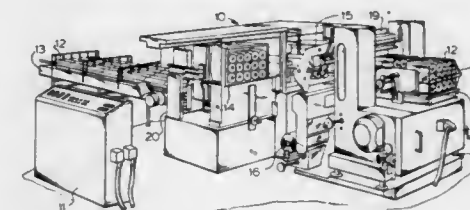
U.S. Cl. 53-438

18 Claims

1. An automatic bundling apparatus for bundling selected number of articles in bundles with sheet material for use in combination with a conveyer means for feeding horizontally disposed rows of articles to said apparatus, said apparatus comprising:

a wrapping stage having a sheet material supply reel, a hollow mandril having an entrance at one end and an exit at the opposite end, and a means for folding said sheet

material around the outside of said mandril for forming a tubular first wrapper having one open end generally aligned with said entrance and one sealed end adjacently beyond said exit;  
a main ram disposed in front of said entrance of said mandril and adjacent said open end of said wrapper;  
a collating stage for receiving a selected plurality of stacked rows of said articles from said conveyer means;  
a compressing stage for receiving said articles from said collating stage, said compressing stage having means for, in sequence, transporting said stack of rows to a position between said main ram and said mandril entrance and for simultaneously compressing the height and the width of said stack of rows;  
a control means for actuating said ram for pushing said stack of rows through said entrance and the inside of said man-



dril such that said stack of rows advances through said mandril and out of said exit and pushes against said sealed end of said wrapper and moves on beyond said exit and advances said wrapper off of said mandril and simultaneously advances a discrete amount of sheet material from said supply reel around the outside of said mandril for forming a next wrapper for a next stack of rows; and  
a cutting and sealing stage disposed adjacently beyond said exit for receiving thereby said first wrapper with said stacks of rows in said first wrapper from said wrapping stage, said cutting and sealing stage having means for simultaneously sealing the open end of said first wrapper, between said exit and the trailing end of the advanced stack of rows in said first wrapper, and forming the sealed end of said next wrapper, and separating said first wrapper from said next wrapper.

4,679,380

**TREATMENT OF POROUS STRUCTURES**

Norman Rudd, 110 London Rd., Aston, Clinton, Aylesbury, Buckinghamshire, United Kingdom

PCT No. PCT/GB84/00412, § 371 Date Aug. 1, 1985, § 102(e) Date Aug. 1, 1985, PCT Pub. No. WO85/02429, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 30, 1984, Ser. No. 767,294

Claims priority, application United Kingdom, Dec. 2, 1983, 8332209

Int. Cl.<sup>4</sup> B65B 3/00, 63/00

U.S. Cl. 53-440

9 Claims

1. A method for the treatment of a porous structure with a treating solution, comprising the steps of:  
forming a tube from plastics material, the tube having a diameter;  
seaming the tube with a first transverse seam to form a first end of a jacket;  
filling the jacket with the treating solution through a second end of the jacket which is open;  
sealing the jacket with a second transverse seam to close the second end;  
bundling the jacket in the region of the first and second ends of the jacket to form a substantially cylindrical rod;  
freezing the jacket and the enclosed treating solution to form a rod;  
removing the jacket from the rod of treating solution; and



inserting the rod of the treating solution into a cylindrical opening in the porous structure wherein the diameter of



the cylindrical opening is greater than the diameter of the tube.

4,679,381

# APPARATUS FOR AND METHOD OF LOADING ELONGATED ARTICLES

Paul Truninger, Industriest. 9, CH-Langendorf/Solothurn, Switzerland

Filed Jul. 19, 1984, Ser. No. 632,410

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326152; Mar. 16, 1984, 3409780

Int. Cl.<sup>4</sup> B65B 35/50, 35/30, 35/44, 5/10

U.S. Cl. 53—447

40 Claims



1. Apparatus for loading elongated articles between first and second stations, comprising:
  - first transport means for simultaneously lifting the elongated articles from said first station and conveying them along a predetermined path to an intermediate station;
  - adjusting means cooperating with said first transport means for aligning the elongated articles and forming a layer of contacting articles of predetermined width at said intermediate station;
  - second transport means for lifting said formed layer of elongated articles from said intermediate station, said second transport means defining a support surface upon which said layer of elongated articles is arranged when being lifted from said intermediate station and conveyed to said second station; and
  - means for depositing at least one intermediate layer onto said support surface before said second transport means picks up said formed layer of elongated articles to transfer the latter from said intermediate station to said second station.

4,679,382

# RIDING TYPE MOWER

Kazuo Saruhashi, Saitama; Masato Ara, Chiba; Takanori Suzuki, Saitama; Ganji Saito, Saitama, and Atsushi Kojima, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

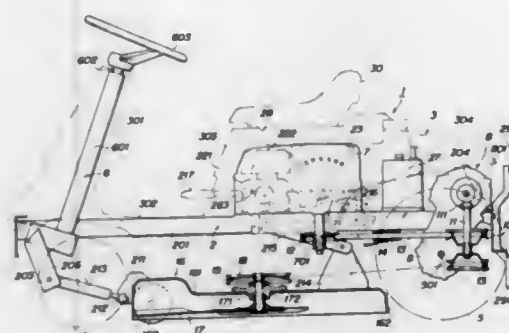
Filed Aug. 26, 1985, Ser. No. 769,117

Claims priority, application Japan, Aug. 27, 1984, 59-179135; Aug. 27, 1984, 59-179136; Aug. 27, 1984, 59-179137; Jan. 22, 1985, 60-9544

Int. Cl.<sup>4</sup> A01D 55/18, 35/24

U.S. Cl. 56—10.1

12 Claims



1. A riding type mover comprising:
  - a vehicle body;
  - a front wheel steerably arranged in the front part of the vehicle body;
  - a rear wheel drivably arranged in the rear part of the vehicle body;
  - a mower cutting means including a housing disposed under vehicle body;
  - a driver seat disposed on said vehicle body;
  - an engine operatively interconnected with, to drive, said rear wheel and said mower cutting means;
  - an engine output shaft downwardly extending from said engine, said engine output shaft having a drive pulley fixed thereon;
  - a transmission gearing for said rear wheel, said transmission gearing being disposed behind an axle of said rear wheel, said transmission gearing having a downwardly extending input shaft provided with an upper pulley and a lower pulley being fixed thereon, said upper pulley and said lower pulley being both disposed behind said axle of said rear wheel;
  - a cutter drive pulley for driving said mower cutting means, said mower cutting means being disposed substantially at the center part of said vehicle body;
  - a drive belt for interconnecting said drive pulley on said engine output shaft with said upper pulley on said input shaft of said transmission gearing;
  - a drive belt for interconnecting said lower pulley on said input shaft and said transmission gearing on said cutter drive pulley, wherein said mower cutting means is to be level-adjustable;
  - a fuel supply system consisting of a fuel feed equipment and a fuel tank; and
  - an exhaust system consisting of an exhaust pipe and a muffler, wherein said driver seat is disposed substantially at the longitudinal central part of said vehicle body, said engine being disposed directly below said driver seat, said fuel supply system being disposed at one side of said engine, said exhaust system being disposed at the other side of said engine and said cutter means and housing, said engine and said driver seat being disposed substantially at the longitudinal central part of the vehicle body, and within the contour of the cutter housing as viewed from above.

4,679,383

# LAWN EDGER

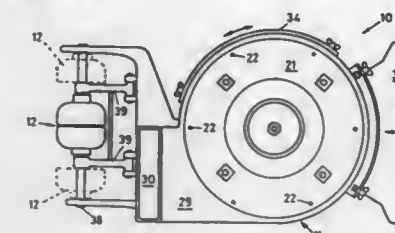
Francis W. Quintel, Allenby Gardens, Australia, assignor to Robert Douglas Sheehan, South Australia, Australia  
PCT No. PCT/AU85/00031, § 371 Date Oct. 21, 1985, § 102(e)  
Date Oct. 21, 1985, PCT Pub. No. WO85/03620, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 22, 1985, Ser. No. 797,679

Claims priority, application Australia, Feb. 24, 1984, PG3784  
Int. Cl.<sup>4</sup> A01D 34/84

U.S. Cl. 56—13.4

10 Claims



1. A lawn edger comprising a hollow frame, ground engaging wheels supporting the frame, a motor carried by the frame having a rotor with a vertical axis of rotation, an axle extending transversely of the frame rearwardly of said axis of rotation, a pair of half-wheels rotatable and slidable on the axle, spacer means co-operable with the half wheels to retain them contiguous with one another in a central longitudinal plane of the frame, or spaced from one another adjacent the lateral sides of the frame, fan and cutter assembly within the hollow frame said fan and cutter assembly comprising a plurality of fan blades which extend outwardly from the axis of rotation in generally radial planes, and a plurality of cutting blades beneath the fan blades and which extend axially downwardly and radially outwardly from the axis of rotation, one of said ground engaging wheels being rotatably mounted with respect to said frame at a central location with respect to said axis of rotation, and means coupling the rotor to the fan and cutter assembly for driving the latter.

4,679,384

# MOWING MACHINE

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

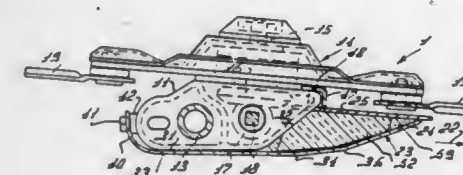
Continuation of Ser. No. 489,000, Apr. 27, 1983, abandoned.

This application Dec. 31, 1984, Ser. No. 687,494

Int. Cl.<sup>4</sup> A01D 34/44

U.S. Cl. 56—13.6

42 Claims



1. A mowing machine comprising:
  - a cutting member;
  - a supporting member for said cutting member, said supporting member comprising on its lowest side a flat part;
  - a supporting skid for bearing on the ground to support at least part of the weight of the machine during operation, a rear portion of said supporting skid bearing against said flat part over substantially the latter's entire area for carrying

rying said supporting member, a forward portion of said supporting skid extending forward of said supporting member, said forward portion diverging rearwardly; a space defined at least in part by the supporting skid between the forward portion of said supporting skid and said supporting member; and a body of lightweight filling material occupying a substantial portion of said space and establishing an effective connection between said supporting skid and said supporting member.

4,679,385

# ATTACHMENT FOR LAWN TRIMMER

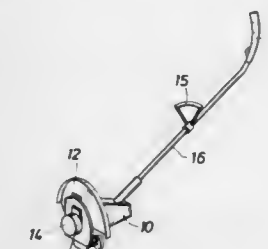
Benjamin C. Carmine, 415 Shadow Creek Dr., Seabrook, Tex. 77586

Filed Dec. 23, 1985, Ser. No. 812,757

Int. Cl.<sup>4</sup> A01D 34/84

U.S. Cl. 56—16.9

9 Claims



1. An attachment for converting a lawn trimmer into a lawn edger trimmer, the lawn trimmer including a housing enclosing a motor, a shield plate integrally formed with the motor housing and a spool and line housing projecting outwardly from the motor housing substantially perpendicular to the shield plate, the attachment comprising:
  - (a) a base plate detachably mounted to the motor housing in substantial planar contact with the motor housing shield plate, said base plate including a hole for receiving the spool and line housing therethrough;
  - (b) a deflection shield extending along an arcuate edge of said base plate, said deflection shield being integrally formed with said base plate and protruding outwardly therefrom, said deflection shield defining a curved surface projecting from said base plate for deflecting grass clippings and debris outwardly from said base plate;
  - (c) an edge guide depending downwardly from a bottom edge of said base plate for guiding the lawn trimmer along the path;
  - (d) bracket means mounted to said base plate for receiving a nose portion of the lawn trimmer housing therein;
  - (e) wheel means mounted to said bracket means and said base plate for rolling the lawn trimmer along the path; and
  - (f) means for mounting said base plate to the lawn trimmer housing.

4,679,386

# HARVESTER FOR THE IMPACT-STRIPPING OF SEED FROM A STANDING CROP

E. Cordell Luodahl, Logan, Utah; Neil L. West, Bettendorf, Iowa, and Homer D. Witzel, Englewood, Fla., assignors to Deere & Company, Moline, Ill.

Filed May 7, 1982, Ser. No. 375,838

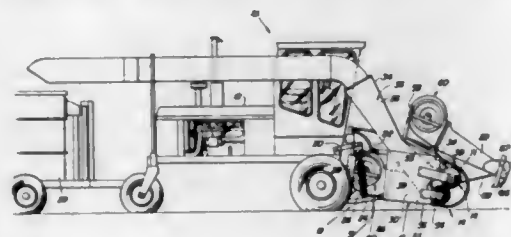
Int. Cl.<sup>4</sup> A01D 45/00, 41/00

U.S. Cl. 56—126

12 Claims

1. A harvesting machine for stripping seeds from seed-bearing heads in a standing crop while essentially leaving the stems of the crop attached to the soil and comprising:

- a mobile main frame adapted to advance over a field of the standing crop;
- a vertically adjustable harvesting header carried by the main frame;
- a first axially transverse rotor mounted on the header with its axis generally below the level of substantially all the seed-bearing heads on the standing crop and including a hub and outwardly projecting stripper means whose outer ends define the rotor periphery whereby the rotor generates a cylinder as it rotates, the stripper means defining longitudinally spaced openings on the rotor periphery of a width greater than upper seed-bearing heads into the rotor interior as the machine advances so that the heads are impacted of angulated sides of the stripper means interiorly of the outer end thereof;
- a second axially transverse rotor disposed parallel to, above



and forwardly of the first rotor and having a generally cylindrical outer periphery adjacent the periphery of the first rotor, the axis of the second rotor being generally above the level of substantially all the seed-bearing heads on the standing crop;

means for driving the rotor in opposite directions at peripheral speeds greater than 18 m/sec with the front side of the first rotor moving upwardly and the front side of the second rotor moving downwardly, the first rotor being driven so that the angulated sides of the stripper means impact the seed-bearing heads disposed within the openings in the rotor in a generally stem-wise direction to knock the seeds from the heads and to propel them rearwardly from the rotor; and

crop collection means mounted on the header behind the rotors and adapted to receive the seeds propelled rearwardly from the rotors.

4,679,387

**REINFORCING CORD WITH WRAPPING WIRE**

Wolfgang Weidenhaupt, Erkelenz, and Peter Dismon, Heinsberg-Proselen, both of Fed. Rep. of Germany, assignors to AKZO NV, Arnhem, Netherlands

Continuation of Ser. No. 610,877, May 16, 1984, abandoned.

This application Dec. 9, 1985, Ser. No. 807,767

Claims priority, application Fed. Rep. of Germany, May 16, 1983, 3317744

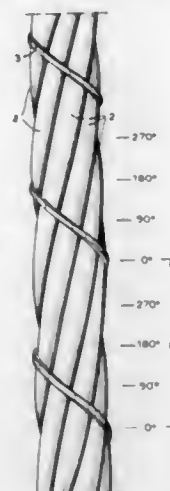
Int. Cl.<sup>4</sup> D02G 3/48; B60C 9/00; D07B 1/06

U.S. Cl. 57-212

5 Claims

1. A reinforcing cord made of at least one strand of steel wires for reinforcing the elastomeric carcass of a cord tire, comprising at least one flat wrapping wire of metal wound helically on the strand and forming the outermost layer of the reinforcing cord, the hardness of the flat wrapping wire being between 30% to 60% of the hardness of the steel wires, the flat wrapping wire having a rectangular cross-section whereby the

longer side of the cross-section of the flat wrapping wire is in contact with the steel wires, and the ratio of the shorter side to



the longer side of the cross-section of the flat wrapping wire is between 0.4 and 0.7.

4,679,388

**PROCESS AND APPARATUS FOR FRICTION SPINNING**

Peter Artzt; Hans Rottmayr, and Wolfgang Bauer, all of Reutlingen, German Democratic Rep., assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

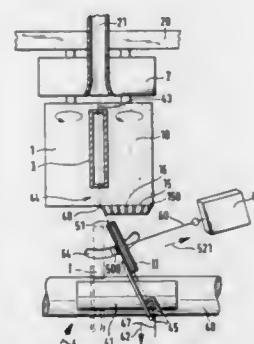
Filed Nov. 14, 1985, Ser. No. 797,816

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441678

Int. Cl.<sup>4</sup> D01H 7/882, 15/02

U.S. Cl. 57-263

15 Claims



1. A process for friction spinning, in which fibers are twisted together to form a thread in a V-shaped nip formed by rotation of two frictional elements driven in the same direction, comprising:

piecing such thread by returning formed thread to the vicinity of the rotating frictional elements, but deflected from a straight thread formation line parallel with the V-shaped nip; and then placing said thread into said thread formation line; and

commencing spinning thread from fibers by feeding such fibers to the rotational frictional elements and drawing off said thread along said thread formation line, thereby deflecting said thread from a plane defined through such thread formation line and perpendicular to the plane of the rotation axes of the frictional elements, wherein such deflection includes directing the thread with controllable force into at least one peripheral edge of the frictional elements having enhanced frictional engagement characteristics, whereby improved twisting take-up results.

4,679,389

**SPINNING OR TWISTING MACHINE**

Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Überbach-Fils, Fed. Rep. of Germany

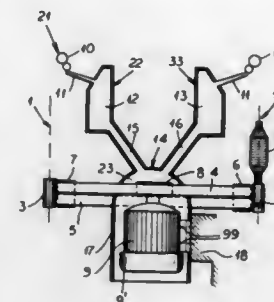
Filed Feb. 12, 1986, Ser. No. 828,838

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504976

Int. Cl.<sup>4</sup> D01H 5/66, 3/16

U.S. Cl. 57-304

4 Claims



1. A spinning machine comprising:

a spinning frame provided with:

- a plurality of groups of upright spinning spindles having respective whorls and disposed in at least one row, respective drive belts tangentially engaging the whorls of each group for driving the respective spindles, and
- a respective electric motor having a vertical motor shaft for each of said groups drivingly coupled to the respective drive belt thereof;
- a drafting frame above said spindles and provided with drafting rolls defining a drafting station at each spindle for drafting respective rovings to be fed to said spindles for spinning thereby, said drafting stations being arrayed along said row;
- a suction duct extending all along said row above said spindles and formed with suction pipe fittings reaching from said duct toward each of said stations for sucking roving fragments into said duct;
- a suction source connected with said duct for generating suction therein;
- respective downwardly open bell shaped housings extending over each of said motors; and
- means connecting each of said housings to said duct at locations spaced therealong for drawing heat from said motors and preventing spinning variations at spindles of each group dependent upon the proximity of the respective spindles to the respective motor.

4,679,390

**OPENING ROLLER ASSEMBLIES FOR OPEN END SPINNING MACHINES**

William R. Stewart, Strathmartine, Scotland, assignor to Wm. R. Stewart & Sons (Hacklemakers) Limited, Scotland

Filed Feb. 20, 1986, Ser. No. 831,437

Claims priority, application United Kingdom, Feb. 22, 1985, 8504595

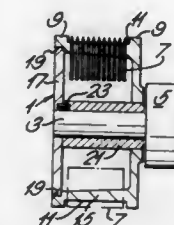
Int. Cl.<sup>4</sup> D01H 7/895

U.S. Cl. 57-408

13 Claims

1. An opening roller assembly for an open end spinning machine comprising a drive shaft mounted for rotation in a bearing forming part of or fitted to the machine and an opening roller having a circumferential surface which may be pinned or wrapped with flexible saw-toothed wire, said roller forming a close sliding fit on the drive shaft, and including a non-mechanical force means restraining at least part of said roller in the axial direction of said drive shaft in an operating position

on said shaft to allow easy removal of at least part of said roller from said shaft and further including mechanical drive means



to impart rotation of said shaft to said roller when said roller is in said operative position.

4,679,391

**METHOD OF MANUFACTURING JEWELRY CHAINS FROM DECORATED HELICOID MEMBERS AND/OR LINKS**

Valterio Tizzi, Via Clementini 2, 47037 Rimini (Forlì), Italy

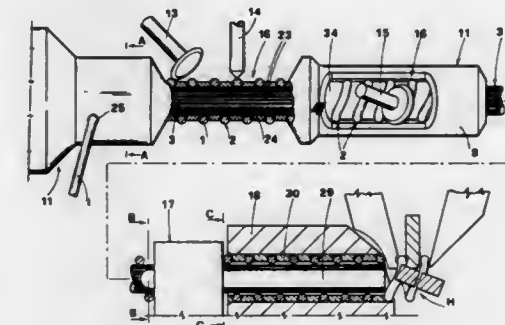
Filed Sep. 30, 1985, Ser. No. 782,040

Claims priority, application Italy, Nov. 14, 1984, 3623 A/84

Int. Cl.<sup>4</sup> B21L 7/00; B21F 3/04

U.S. Cl. 59-20

5 Claims



1. Method for the automatic decoration of helicoid members and/or links from which to fashion chain-type articles of jewelry in precious metal, and of costume jewelry, comprising the following steps:

- a—feeding a wire uncoiled from an interchangeable clutch-driven supply reel;
  - b—straightening the wire;
  - c—forming at least one guide groove on and along at least one straight line generator of the wire;
  - d—milling the wire transverse to its axis and along one of its straight line generators to avoid subsequent twisting, guiding the wire by way of the grooves before and after such milling;
  - e—winding the wire into a helicoid around a small diameter former having a splined profile and interlocking the milled surface formed in the wire with the splined profile; supporting the former bilaterally to bear strains from the decoration tools;
  - f—crafting and decorating the wire while still wound helicoidally around the former;
  - g—shaping of each turn of the helicoid to the cross-sectional shape of the former;
- wherein said guiding is introduced immediately before said winding in order to avoid twisting the wire, and said milling produces single cuts forming the milled surface produced on the wire which are angled in relation to the axis of the wire to a degree  $\beta$  which is equal to the lead angle of the helicoid in relation to the former; and the further step of:



h—forming a link from the end-most turn of the helicoid, and connecting the link thus formed with the supervening end-most turn of the helicoid;  
wherein the feeding of the wire is regulated to follow the lead of the helicoid, and advancing and retracting the former at each such operation through a distance equal to the pitch of the helicoid takes place, the advancing of the former being accompanied by a spin movement, the retracting of the former being a straight line translation with no rotation of the former.

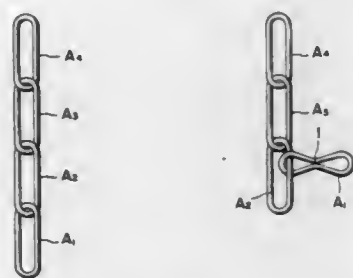
4,679,392

**PROCESS FOR PRODUCING A GARLAND CHAIN**  
Shigesaburo Nakagawa, Ichikawa, Japan, assignor to Nakagawa Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 774,844, Sep. 11, 1985, abandoned. This application Jun. 13, 1986, Ser. No. 873,917  
Claims priority, application Japan, Jul. 1, 1985, 60-144146  
Int. Cl.<sup>4</sup> B21L 11/00

U.S. Cl. 59—35.1

14 Claims



1. A process for producing a garland chain comprising the steps of:

- forming a chain comprising a plurality of connected links, including a plurality of long links, said long links having a length at least twice their width;
- moving a first link attached to a long link of said chain to an end of said long link to be adjacent to a second link attached to said long link at said end;
- deforming said long link at a medial portion thereof so as to prevent movement of said first and second links away from said end of said long link; and
- repeating said moving and deforming steps with respect to additional long links of said chain.

4,679,393

**PRESSURE WAVE MACHINE OPERATING AS PRESSURE EXCHANGER, IN PARTICULAR FOR USE AS THE HIGH-PRESSURE COMPRESSOR FOR GAS TURBINES**

Jaen Hellat, Rütihof-Baden, and Jakob Keller, Dottikon, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 26, 1985, Ser. No. 780,202

Claims priority, application Switzerland, Sep. 28, 1984, 4670/84

Int. Cl.<sup>4</sup> F02C 3/02

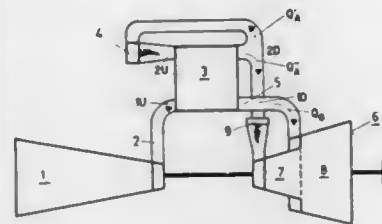
U.S. Cl. 60—39.45

3 Claims

1. In a pressure wave machine operating as a pressure exchanger, in particular for use as a high pressure compressor for gas turbines, comprising a rotor casing, at least one cell rotor located within the rotor casing, a control casing flanged onto each of the two end faces of the rotor casing, which control casings close off the rotor casing at its two end surfaces, each control casing at the end surfaces of the rotor casing having at least one high pressure driving gas inlet port and one low pressure air inlet port and one low pressure driving gas outlet port and one high pressure air outlet port, respectively, a pressure exchanger combustion chamber for generating high pressure driving gas and connected to the high pressure driv-

ing gas port, the pressure exchanger combustion chamber connected to the high pressure air port to which is branched off a part of the high pressure air in the pressure exchanger combustion chamber for burning fuel intended for the pressure exchanger combustion chamber, with the rest of the high pressure air being available for combustion in another combustion chamber, the improvement wherein:

a closing edge of the low pressure air port, as viewed in the direction of rotation of the cell rotor, is located ahead of a closing edge of the low pressure driving gas port, the condition  $A-D > B$  applies to the casing geometry, where A is the distance between an opening edge of the low pressure driving gas port and the closing edge of the low pressure driving gas port, D is the distance between the opening edge of the low pressure driving gas port and an opening edge of the low pressure air port, and B is the length of the low pressure air port, the lengths A, B and D being measured in a cylindrical section situated at half the height of the cells, the opening edge of the low pressure driving gas port, as viewed in the direction of the peripheral velocity of the



cell rotor, being located ahead of an opening edge of the low pressure air port, the inlet ports for the high pressure driving gas and the low pressure air are located in one of the two control casings, and the outlet ports for the high pressure air and the low pressure driving gas are located in the other casing, the following relationships exist between the length (L) of the cells of the cell rotor, the distance (d) between the opening edge of the high pressure driving gas port and the opening edge of the high pressure air port, the length (a) of the high pressure driving gas port, the length (b) of the high pressure air port, the distance (A) between the opening edge of the low pressure driving gas port and the closing edge of the low pressure driving gas port, the distance (D) between the opening edge of the low pressure driving gas port and the opening edge of the low pressure driving gas port, the length (B) of the low pressure air port and the velocity parameters determining the pressure wave process, said quantities d, a, b, A, D and B being measured in a cylindrical section located at half the height of the cells:

$$\frac{V}{u_1} = \frac{d}{L}$$

$$\frac{V}{u_2} = \frac{b+d}{L}$$

$$\frac{2V}{c_2 u_1 + u_2 + 21} = \frac{b+d-a}{L}$$

$$\frac{2V}{c_2 l + c_1 D - u_1} = \frac{D}{L}$$

$$\frac{V}{u_1} = \frac{A-D}{L}, \text{ and}$$

$$\frac{2V}{c_1 u_1 + u_1 + c_1 l} = \frac{A-B-D}{L}$$

where

v is the velocity of the rotor cells relative to the casing,  
 $u_s$  is the propagation velocity of the shock wave,  
u is the flow velocity of the media, relative to the cells, at the ends of the charging zone and the scavenging zone, and  
c is the sonic velocity,  
where the indices 2U and 1D refer to the high pressure driving gas and the low pressure driving gas, respectively, and the index 1U refers to the low pressure air; furthermore, the indices 1 and 2 refer to low pressure and high pressure, respectively, the index 21 refers to the expansion range of the driving gas and the index 12 refers to the compression range of the air.

4,679,394

**GAS TURBINE ENGINE POWER PLANT**  
Maurice I. Taylor, Allestree, England, assignor to Rolls-Royce plc, London, England

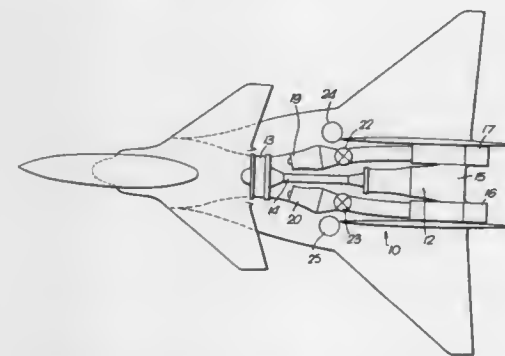
Filed Apr. 24, 1979, Ser. No. 33,093

Claims priority, application United Kingdom, May 30, 1978, 24115

Int. Cl.<sup>4</sup> F02K 3/12

U.S. Cl. 60—224

7 Claims



1. A gas turbine power plant for a V.T.O.L. or S.T.O.L. aircraft comprising:

- a main gas turbine engine for the aircraft;
- a main engine exhaust nozzle assembly for receiving and discharging a portion of exhaust gases from said main gas turbine engine rearwardly of the aircraft;
- at least one auxiliary gas turbine engine;
- at least one auxiliary exhaust nozzle assembly, said auxiliary exhaust nozzle assembly including an innermost nozzle portion for discharging exhaust gases from said at least one auxiliary gas turbine engine rearwardly of the aircraft and an outermost nozzle portion for discharging a remaining portion of exhaust gases from said main gas turbine engine rearwardly of the aircraft;
- at least one vertically arranged exhaust nozzle operatively connected to said at least one auxiliary gas turbine engine for discharging exhaust gases therefrom vertically downward; and
- means selectively operable to discharge exhaust gases from said at least one auxiliary turbine engine to said innermost nozzle portion of said at least one auxiliary exhaust nozzle assembly in a first mode of operation and to said vertically arranged exhaust nozzle in a second mode of operation.

4,679,395

**CLEANING MEANS FOR VEHICLE EXHAUSTING PIPE**  
A-Lin Ou, No. 27, Wen Hue Road, Chung Yan Li, Chung Li City, Taiwan

Filed Oct. 25, 1984, Ser. No. 664,606

Int. Cl.<sup>4</sup> F01N 1/14, 3/30

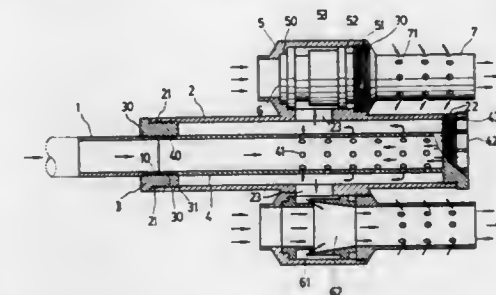
U.S. Cl. 60—319

13 Claims

1. In a multi-component exhaust assembly adapted to be connected at the exhausting pipe of a vehicle, including an acceleration cylinder with an air inlet terminus and an outlet

terminus remote from said air inlet terminus, said acceleration cylinder comprising:

- a walled housing defining a passage in said acceleration cylinder between said air inlet terminus and said outlet terminus thereof;
- a hollow cylindrical body, with said hollow cylindrical body having two spaced cylindrical circumferential flanges for seating it in said housing at the walls thereof thereby forming a chamber for receiving exhaust gases from said



exhausting pipe; said hollow cylindrical body defining an interior nozzle formation tapering in the direction of the outlet terminus of said acceleration cylinder and said nozzle formation being connected to said air inlet terminus for receiving atmospheric air during operation of the respective vehicle; and  
walled passage means for connecting said chamber for receiving exhaust gases and said interior nozzle with concomitant admixture of air during operation of the respective vehicle.

4,679,396

**ENGINE CONTROL SYSTEMS**

William S. Heggie, 74 Woodfield Drive, Ottawa, Ontario, Canada

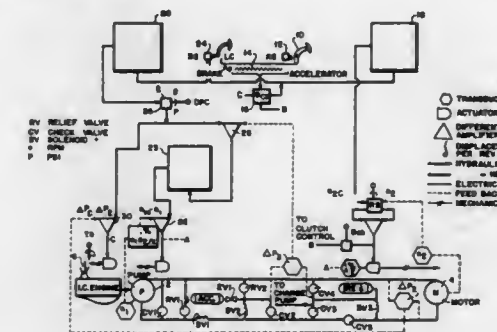
Continuation-in-part of Ser. No. 385,438, Jun. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 099,984, Dec. 3, 1979, abandoned. This application Jan. 9, 1984, Ser. No. 569,157

Claims priority, application Canada, Dec. 8, 1978, 317645

Int. Cl.<sup>4</sup> F16D 31/02

U.S. Cl. 60—414

3 Claims



1. A system for transmitting the output of an engine to a load in response to a driver's pressure on an accelerator pedal or on a brake pedal including

- a first swash plate device mechanically coupled to said engine and operable in accordance with a first algebraic expression,
- a second swash plate device having a controllable swash plate and operable in accordance with a second algebraic expression,

- (c) the first and second swash plate devices being each capable of independent control and each capable of operating as either a hydraulic pump or a hydraulic motor, a hydraulic system having a first and second line interconnecting said first and second swash plate devices to thereby control the engine speed in accordance with a function of at least one of said algebraic expressions,
- (d) a parallel by-pass hydraulic line across said first swash plate device between said first and second hydraulic lines,
- (e) a check valve connected in said parallel by-pass hydraulic line,
- (f) another check valve connected in said second hydraulic line,
- (g) a high pressure accumulator unit,
- (h) a first solenoid valve arranged when open to connect the output of said accumulator unit to the junction of said first swash plate device and said by-pass hydraulic line in said second hydraulic line, said junction being on one side of said other check valve remote from said second swash plate device, whereby in operation, said accumulator unit discharges to the input side of said first swash plate device,
- (i) a second solenoid valve connected between said accumulator unit and said second hydraulic line,
- (j) control circuits for activating said first solenoid valve and said second solenoid valve,
- (k) a reservoir unit connected to said second hydraulic line on the other side of said other check valve,
- (l) where the first algebraic expression is

$$\Delta P_c - \Delta P_3$$

and the second algebraic expression is  $A_p$  where

$\Delta P_c$  = Pressure command function,  
 $\Delta P_3$  = Accumulator pressure difference ( $P_4 - P_3$ ),  
 $A_p$  = Throttle potentiometer setting,  
 $P_3$  = Motor outlet pressure  
 $P_4$  = Inlet pressure,

- (m) wherein in operation with said accumulator charged up, said driver's pressure activates said control circuits to cause said first and second solenoid valves to open and permit accumulator pressure to be applied through them to said first-mentioned check valve to cause it to open to apply said accumulator pressure through it to the first hydraulic line and to the second swash plate device, said other check valve being automatically closed by said accumulator pressure to prevent fluid-flow therethrough, the accumulator fluid flow being in parallel with the fluid flow from the first swash plate device,
- (n) wherein, in operation with said accumulator pressure depleted and said driver's pressure requiring a greater pressure than said accumulator pressure can provide, said first-mentioned check valve is automatically closed by the pressure from said first swash plate device to said first hydraulic line to prevent fluid flow therethrough, whereby said accumulator fluid flow is automatically placed in series with the fluid flow from said first swash plate device,
- (o) wherein, in operation in a braking action of said load, the driver's pressure on said brake pedal activates said control circuits to close said first solenoid valve and open said second solenoid valve to permit fluid pressure from said second swash plate device to automatically charge up said accumulator and store surplus pressure representing kinetic energy of deceleration in said accumulator unit.

4,679,397

## HYDRAULIC POWER BRAKE APPARATUS

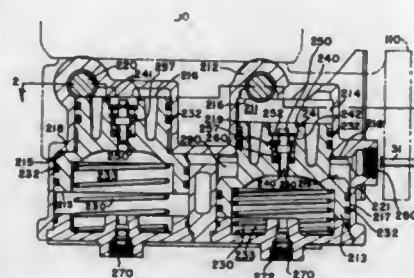
Raymond Kosarski, Jr., Niles, Mich., and Robert W. Jackson, South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Oct. 15, 1985, Ser. No. 787,817

Int. Cl.<sup>4</sup> B60T 11/20, 13/58, 17/00; F15B 3/00

U.S. Cl. 60—562

5 Claims



1. A power braking apparatus for a vehicle, comprising: a single master cylinder and a reservoir, the master cylinder having two pressure chambers with respective fluid pressure outlets;
- a fluid power apparatus connected with the master cylinder and comprising a housing, an input rod, a first chamber and a work chamber divided by a power piston, a spring biasing said power piston, a fluid power inlet communicating with said work chamber, a fluid power outlet communicating with said first chamber, passage means through said power piston, valve means connected to said input rod and controlling fluid flow through said passage means, and a fluid pressure outlet line from said working chamber; and
- a pair of fluid displacement multipliers each of which comprises at least one stepped housing chamber connected directly to a respective fluid pressure outlet of the single master cylinder, the housing chamber having a stepped portion between small and large diameter sections, a differential area piston having a shoulder between small and large diameter portions of the piston, poppet valve means associated with said differential area piston, an outlet to an associated brake circuit and for communicating fluid pressure received from the large diameter section of said housing chamber, and the fluid pressure outlet line of the fluid power apparatus providing fluid pressure to each multiplier which has a variable volume chamber defined by the shoulder and small diameter portion of the differential area piston and stepped portion of said housing chamber.

4,679,398

## VARIABLE CAPACITY TURBOCHARGER CONTROL DEVICE

Fumio Nishiguchi; Masato Noguchi, both of Yokohama, and Keiji Hatanaka, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 27, 1985, Ser. No. 706,278

Claims priority, application Japan, Feb. 29, 1984, 59-36105

Int. Cl.<sup>4</sup> F02B 37/12

U.S. Cl. 60—602

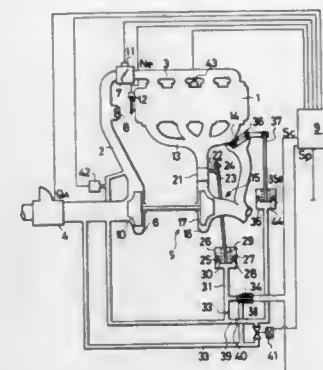
10 Claims

1. A device for controlling a turbocharger having a compressor and a turbine coupled to the compressor, said device comprising: means for determining the supercharge pressure of air from said compressor;
- variable capacity means for varying the flow rate of exhaust gas introduced into the turbine in a low speed state of an engine connected to the turbocharger, said variable capacity means responsive to a first control signal;
- exhaust gas bypass means for controlling the flow rate of the

exhaust gas bypassing said variable capacity means and said turbine in a high speed state of the engine, said bypass means responsive to a second control signal;

a control means, responsive to operating parameters of said engine, for generating said first and second control signals; and

said control means including means for detecting an acceleration state of the engine and responsive to said determined supercharge pressure and generating said second control signal for controlling the operation of the exhaust gas bypass means such that the exhaust gas bypass means reduces the flow rate of the exhaust gas introduced into the turbine only when the determined supercharge pressure has reached a predetermined pressure in an acceleration state of the engine.



## PROTECTION SYSTEM FOR STEAM TURBINES INCLUDING A SUPERHEAT MONITOR

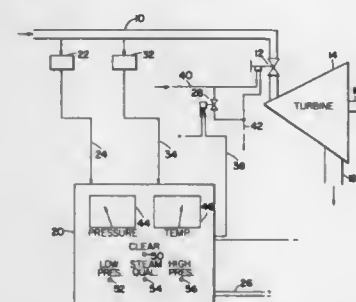
Roger D. Strickler, Mt. Pleasant, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Sep. 13, 1985, Ser. No. 775,875

Int. Cl.<sup>4</sup> F01K 13/02

U.S. Cl. 60—646

8 Claims



1. A protection system for a steam-driven turbine for assuring operation of the turbine only when the driving steam is superheated, said turbine including trip means for interrupting the supply of steam to the turbine, which comprises: pressure sensing means mounted to sense the pressure of the driving steam and to generate a pressure signal indicative of said pressure;
- temperature sensing means mounted to sense the temperature of the driving steam and to generate a temperature signal indicative of said temperature;
- logic means connected to receive the pressure signal and the temperature signal, said logic means including signal conditioning means for adjusting the value of the temperature and pressure signals;
- comparator means connected to receive the temperature signal and the pressure signal after they have been conditioned and for generating an output fault signal when the absolute value of the conditioned pressure signal exceeds the absolute value of the conditioned temperature signal; and
- energization means connected to receive the fault signal and in response thereto to energize the trip means to interrupt the flow of steam to the turbine.

4,679,400

## VARIABLE TURBINE VANE SUPPORT

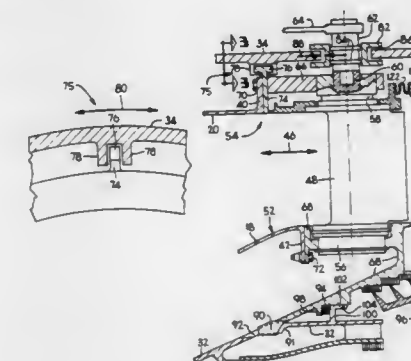
James S. Kelm, Milford; Harvey M. MacLin; Edward C. Vickers, both of Cincinnati, and Thomas G. Wakeman, West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 561,756, Dec. 15, 1983, abandoned. This application Jul. 12, 1985, Ser. No. 754,678

Int. Cl.<sup>4</sup> F02C 1/00

U.S. Cl. 60—722

8 Claims



1. In a gas turbine engine including an annular combustor with inner and outer combustor walls, an annular casing with inner and outer casing walls bounding said combustor, and a variable vane array with a plurality of vanes located aft of said combustor, the improvement comprising: support means for supporting said variable turbine vane array including axial attachment means for attaching said array to said combustor wall so that substantially all of the axial load on said array is transmitted through said combustor walls.

4,679,401

## TEMPERATURE CONTROL OF CRYOGENIC SYSTEMS

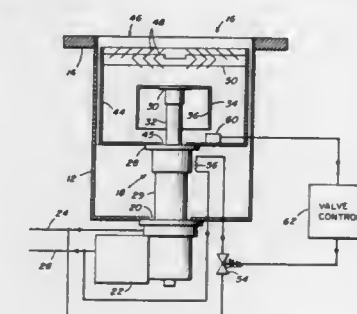
Philip A. Lessard, Acton; Allen J. Bartlett, Milford, and John F. Peterson, Lynnfield, all of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Filed Jul. 3, 1985, Ser. No. 752,354

Int. Cl.<sup>4</sup> B01D 8/00

U.S. Cl. 62—55.5

30 Claims



1. A cryogenic refrigerator comprising:



a refrigerator heat sink;  
a source of refrigerant gas under pressure;  
gas expansion means including a reciprocating piston in a cylinder for expanding the refrigerant gas in a gas expansion space within the cylinder to cool the gas and the refrigerator heat sink to cryogenic temperatures;  
means for selectively diverting refrigerant gas away from the gas expansion means; and  
a heat exchanger in thermal communication with the refrigerator heat sink for receiving diverted refrigerant gas and conducting heat from the refrigerant gas into the refrigerator heat sink to warm the heat sink while keeping the diverted gas out of fluid communication with the gas expansion space.

4,679,402

## COOLING HEAT EXCHANGER

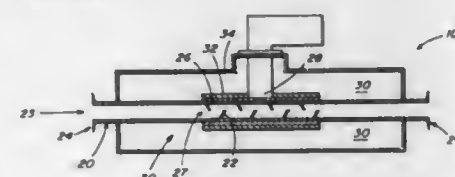
Bruce R. Andeen, Acton, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Aug. 11, 1986, Ser. No. 895,268

Int. Cl.<sup>4</sup> B01D 8/00

U.S. Cl. 62-55.5

20 Claims



1. A cooling heat exchanger assembly, comprising:
  - a flow through conduit of low thermal conductivity material;
  - an optically dense center portion of the conduit;
  - a container surrounding the conduit such that an insulating volume filled with solid insulation is created between the conduit and the container; and
  - a cryogenic refrigerator having a piston which reciprocates in a cylinder to expand and thus cool gas in an expansion space at the end of the cylinder, the cylinder extending through the container such that its cold end is in thermal contact with the conduit.

4,679,403

## HEAT PUMP APPARATUS

Yuji Yoshida, Itami; Shigeo Suzuki, Hirakata; Kazuo Nakatani, Moriguchi; Yuji Mukai, Kadoma; Akira Nakazawa, and Takumi Imoto, both of Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

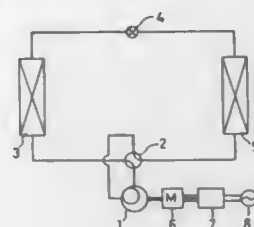
Filed Sep. 5, 1985, Ser. No. 772,887

Claims priority, application Japan, Sep. 6, 1984, 59-186707; May 14, 1985, 60-103472

Int. Cl.<sup>4</sup> F25B 13/00

U.S. Cl. 62-114

6 Claims



1. A method for operating a heat pump that includes:
  - a refrigeration circuit comprising and operatively connecting:
    - (a) a variable-r.p.m. compressor;

- (b) a primary heat exchanger for a heat sink;
- (c) a capillary tube or expansion valve; and
- (d) a secondary heat exchanger for a heat source, so as to lower the discharge temperature of the compressor at times when the compressor is being operated at speeds in excess of that at which said compressor would be operated by an electric motor powered directly by alternating electric current of supplied hertz, in comparison with the discharge temperature of the compressor if said heat pump were using a single constituent refrigerant as the refrigeration circuit working fluid,

said method comprising:

operating said compressor at said speeds in excess, while using a constant-composition multiple-constituent refrigerant as the refrigeration circuit working fluid, said constant composition multiple-constituent refrigerant being one selected from the group consisting of:

- (i) at least 50 percent by weight of R22, and at least one minor constituent refrigerant selected from the group consisting of R23, R13, R116, SF6, R13 B1, R125, R12, R152a, R124, R142b, RC318, R12B1, R14, R133a and R11; and
- (ii) at least 50 percent by weight of R12, and at least one minor constituent refrigerant selected from the group consisting of R13, R116, SF6, R13 B1, R125, R115, R218, R124, R142b, RC 318, R114 and R133a.

4,679,404

## TEMPERATURE RESPONSIVE COMPRESSOR PRESSURE CONTROL APPARATUS AND METHOD

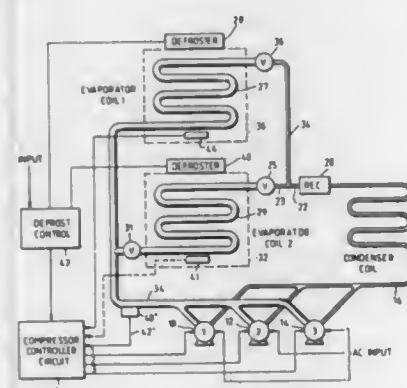
Richard H. Alsenz, 1545 Industrial Rd., Missouri City, Tex. 77489

Continuation of Ser. No. 742,985, Jun. 10, 1985, abandoned, and a continuation-in-part of Ser. No. 706,403, Feb. 27, 1985, Pat. No. 4,628,700, which is a continuation of Ser. No. 458,914, Jan. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 257,113, Apr. 24, 1981, Pat. No. 4,612,776, which is a continuation of Ser. No. 62,525, Jul. 31, 1979, abandoned. This application Feb. 28, 1986, Ser. No. 835,449

Int. Cl.<sup>4</sup> F25B 7/00

U.S. Cl. 62-175

34 Claims



1. A compressor controller circuit for use in a multiple compressor cooling system, said controller circuit having a control means including a means adapted to select either the operating suction line pressure or to the temperature of an area to be cooled as a system parameter for controlling the cycling of said compressors on and off in a sequence to select a combination of said compressors to provide the minimum compressor capacity sufficient to obtain an average operating system parameter in the range defined from an upper to a lower operating limit, said controller further including a means responsive to the temperature of an area to be cooled by a system evaporator coil for dynamically adjusting said upper and lower operat-

ing limits to obtain a combination of said compressors having the minimum system compressor capacity required to maintain said area temperature at a desired level.

4,679,405

## MOLDED DRAIN CONNECTION WITH INSERT

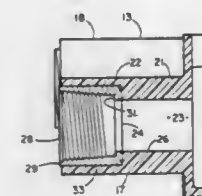
Charles A. Mitchell, Indianapolis, Ind.; Thaddeus J. Wawro, Auburn, N.Y.; Charles E. Whipple, Brewerton, N.Y., and William E. Wright, Sr., East Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 3, 1986, Ser. No. 881,991

Int. Cl.<sup>4</sup> F25D 21/14; F16L 33/00

U.S. Cl. 62-285

10 Claims



1. In a plastic condensate collection pan for use with an air conditioning system of the type having an evaporator coil which tends to form condensation on its outer surface, a discharge conduit and an associated coupling device for threadably connecting to a drainage pipe comprising:
  - a plastic cylindrical conduit extending from a wall of the condensate pan and defining an axial opening therefrom;
  - a cylindrical metal insert disposed in said axial opening and secured to said discharge conduit to prevent rotation of said insert when a torque is applied about its axes; and
  - said insert having a threaded portion to which a discharge pipe can be connected.

4,679,406

## HEAT-INSULATING WINDOW

Rolf-Diether Weiblen, Eltener Strasse 1, D-4330 Mülheim/Ruhr, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 669,841

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341485; European Pat. Off., Feb. 22, 1984, 84101824.5; Jul. 28, 1984, 84108985.7

Int. Cl.<sup>4</sup> F25D 23/12

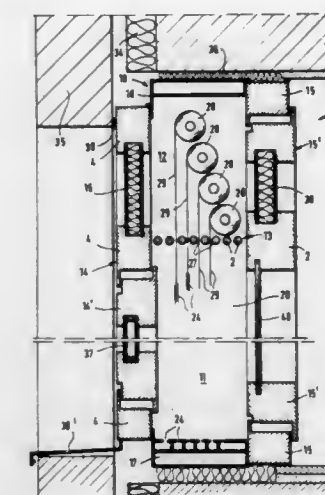
U.S. Cl. 62-262

12 Claims

1. A heat-insulating window for closing window openings in buildings which comprises

an installation frame adapted to be incorporated into a wall structure of a building, said installation frame containing means for mounting profiles containing lateral guide slots which extend vertically for engaging the borders of curtain webs, said profiles being mounted so that the curtain webs laterally extend beyond the window opening, an outer facing frame adapted to be secured to the outer side of the installation frame and defining a window opening, an inner facing frame adapted to be secured to the inner side of the installation frame and containing a removable auxiliary frame, said outer facing frame and said inner facing frame defining a first auxiliary chamber and a window chamber disposed therebetween, said auxiliary chamber being disposed above said window chamber and separated therefrom by an intermediate wall which contains slots for the passage of curtain webs therethrough, at least one glass pane disposed in said window opening in front of said window chamber, and

roller means containing curtain webs disposed in said auxiliary chamber, said curtain webs being extendable across



said auxiliary chamber, through the slots in said intermediate wall and across said window chamber.

4,679,407

## BEVERAGE CONTAINER WITH ENCLOSED COOLING MEANS

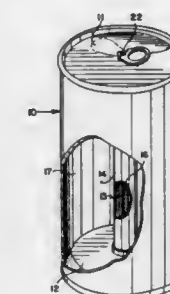
Ho K. Kim, 162-1, Hongjae 1-dong, Sudaemun-ku, Seoul, and Seung E. Choi, Samho Garden Mansion Apartment, Block 8, Rm 808, 444-1, Banpo 1-dong, Kangnam-ku, Seoul, both of Rep. of Korea

Filed Dec. 10, 1985, Ser. No. 807,444

Int. Cl.<sup>4</sup> F25D 3/10

U.S. Cl. 62-294

4 Claims



1. A beverage container with an enclosed cooling system which comprises:

a beverage container provided with a container top and containing a cooling system disposed within said container, said cooling systems comprising,  
a cooling tank adapted to contain a pressurized liquid cooling agent and disposed within said container in the lower portion thereof,  
a conduit means extending through the container from the cooling tank to the top of the container, and defining a chamber therein, and  
pipe means disposed within the conduit means and having a serpentine configuration, said pipe means communicating at one end with the cooling tank and at the other end with the chamber of the conduit means, said other end having a reduced-size portion, said container top being provided with a removable panel portion having an opener attached to the outside surface thereof, whereby, upon the initial opening of the removable panel, the chamber of the con-

duit means is exposed to the environment and the pressurized liquid cooling agent immediately expands from the reduced-size end portion disposed at the lower end portion of the conduit means to cool the contents of the container.

4,679,408

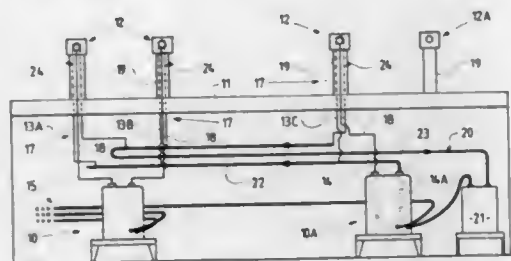
## DISPENSING AND COOLING APPARATUS

James L. Nelson, P.O. Box 821, Gold Coast, Queensland, Australia (4220)

Filed Feb. 11, 1986, Ser. No. 828,426  
Int. Cl.<sup>4</sup> B67D 5/62

U.S. Cl. 62—390

11 Claims



1. A cooling apparatus for cooling a beverage to be dispensed from a dispensing apparatus having an inlet for the beverage and outlet means for dispensing the beverage, said cooling apparatus including:

primary instantaneous cooling means locatable between the inlet and the outlet means and having a heat exchanger for cooling the beverage, said primary cooling means comprising at least one cooling assembly having an expansion chamber into which liquid refrigerant may be introduced and at least two flow paths through said chamber, a first said flow path being for the beverage and a second said flow path forming part of a secondary cooling means, said secondary cooling means being in heat exchange relationship with the beverage contained in the outlet means for ensuring that the temperature of the beverage contained in the outlet means is maintained at a desired value prior to dispensing the beverage from the outlet means; said secondary cooling means further including refrigerant circulating means having a supply line coupled to one end of said second flow path, a heat exchanger adapted to be located in heat exchange relationship with the beverage that may be contained in the outlet means and coupled to the other end of said second flow path and a return line between the heat exchanger of the secondary cooling means and the circulating means for returning refrigerant to the circulating means.

4,679,409

## ABSORPTION REFRIGERATION CYCLE

Peter W. Fitt, Somerset, England, assignor to I C Gas International Limited, Somerset, England

Filed Sep. 16, 1986, Ser. No. 907,894

Claims priority, application United Kingdom, Sep. 17, 1985, 8522932

Int. Cl.<sup>4</sup> F25B 15/00

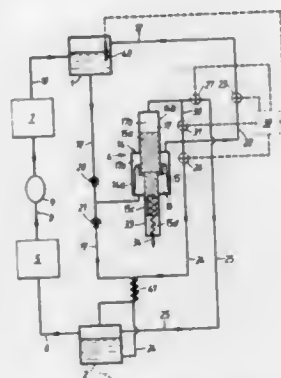
U.S. Cl. 62—476

18 Claims

1. A system for using an absorption refrigeration cycle and comprising:

absorber means;  
generator means having a liquid space and a vapour space;  
condenser means;  
evaporator means; and  
a pump assembly for pumping liquid from the absorber means to the generator means, said pump assembly comprising a cylinder, piston means separating said cylinder into a first chamber connected by first valve means to said absorber means and said generator means for pumping

liquid from said absorber means to said generator means and a second chamber connected by second valve means to said generator means and said absorber means for receiving fluid from said generator means and passing it to said absorber means, wherein said second chamber of said pump assembly comprises first and second parts, said first part of said second chamber being connected by said second valve means to said liquid space of said generator



means and said second part of said second chamber being connectable by said second valve means to said vapour space and to said liquid space of said generator means, means being provided for detecting the level of liquid in one of said generator means and said absorber means and for controlling said second valve means to permit either liquid or vapour to flow into said second part of said second chamber in dependence on the level of liquid in said generator means or said absorber means respectively.

4,679,410

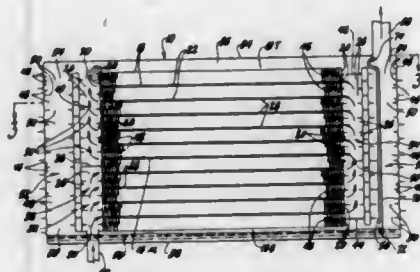
## INTEGRAL EVAPORATOR AND ACCUMULATOR FOR AIR CONDITIONING SYSTEM

William Drayer, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1986, Ser. No. 924,798  
Int. Cl.<sup>4</sup> F25B 43/00, 39/02

U.S. Cl. 62—503

2 Claims



2. An integral accumulator and evaporator for an air conditioning system comprising a plurality of plates stacked one on another with one plate on top and another plate on the bottom of the stack, said plates having an elongated shape with longitudinally spaced evaporator manifold defining cavities interconnected by an elongated evaporator tube pass defining cavity formed in one face thereof, said plates arranged so that their said cavities cooperate with the corresponding ones in an adjoining and oppositely facing plate so as to define a pair of longitudinally spaced evaporator manifold chambers interconnected by a tube pass between each such pair of oppositely facing plates whereby there is formed a plurality of adjoining evaporator chambers adjacent remote ends of the stacked

plates, those plates except for said top and bottom plates and at least one intermediately located plate having an opening connecting the adjoining evaporator chambers at each end so as to define a vertically oriented evaporator manifold with an upper end and a lower end adjacent each end of said stacked plates, said one intermediate plate having an opening connecting the chambers between the two adjoining pairs of said plates adjacent only one of said ends and blocking connection between the corresponding chambers adjacent the other end whereby the manifold adjacent said one end is partitioned into a lower manifold section and an upper manifold section so as to form a flow path from said lower manifold section through the associated tube passes to the other manifold and back through the remaining associated tube passes to said upper manifold section, said top plate having an opening therethrough to said upper manifold section and closing the upper end of the other evaporator manifold, said bottom plate having an opening therethrough to said lower manifold section and closing the other end of said other evaporator manifold, said plates also having accumulator defining cavities in their said face located outboard of said evaporator manifold defining cavities that cooperate with the corresponding ones in the adjoining and oppositely facing plate so as to define a plurality of adjoining accumulator chambers at the remote ends of the stacked plates, said plates having an opening therethrough connecting the adjoining accumulator chambers whereby there is formed a vertically oriented side accumulator chamber with an open top and an open bottom at each said remote end of said stacked plates, a bottom tank sealingly connected to the periphery of said bottom plate so as to cooperate therewith to form a bottom accumulator chamber open to both said side accumulator chambers at their bottom end, an inlet pipe extending through said bottom tank to the opening to said lower manifold section, a top tank sealingly connected to the periphery of said top plate so as to cooperate therewith to form a top accumulator chamber open to the opening to said upper manifold section and also to both said side accumulator chambers at their top, an outlet pipe in said top tank open to the interior thereof and aligned with the top of the side accumulator chamber adjacent said other manifold, and an aspirator tube extending through the last mentioned side accumulator chamber having an inlet end located near the bottom of said bottom tank and an outlet end located in said outlet tube.

4,679,411

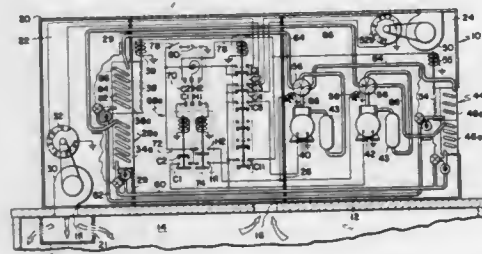
## STEPPED CAPACITY CONSTANT VOLUME BUILDING AIR CONDITIONING SYSTEM

Richard H. Pearce, Jr., La Crosse, Wis., assignor to American Standard Inc., New York, N.Y.

Continuation-in-part of Ser. No. 934,156, Aug. 16, 1978, Pat. No. 4,259,847, which is a continuation-in-part of Ser. No. 789,480, Apr. 21, 1977, abandoned. This application Apr. 6, 1981, Ser. No. 251,620  
Int. Cl.<sup>4</sup> F25B 39/02

U.S. Cl. 62—519

7 Claims



1. A vapor compression refrigeration system comprising: evaporator means for evaporating refrigerant; compressor means for compressing vaporous refrigerant; low pressure refrigerant line means for passing refrigerant from the evaporator means to the compressor means; a condenser including a plurality of generally parallel heat exchange fins and a plurality

of refrigeration circuits running through the condenser generally transverse to the heat exchange fins, wherein groups of the refrigerant circuits cover in overlapping fashion the area of the condenser transverse to the direction of the flow of an external heat exchange medium moving thereover; condenser-evaporator refrigerant line means for conveying condensed refrigerant from the condenser to the evaporator means; expansion means located in the condenser-evaporator line means for reducing the temperature and pressure of refrigerant passing there-through; a plurality of high pressure refrigerant lines for passing refrigerant from the compressor means to the condenser; refrigerant distribution means in each of the high pressure refrigerant lines, wherein each group of refrigerant circuits is connected to a different distribution means; means for selectively preventing the flow of refrigerant through at least a selected one of the high pressure refrigerant lines, wherein the group of circuits connected to the distribution means in the selected refrigerant line is removable from service without appreciably reducing the effective heat exchange area of the condenser; said plurality of the refrigerant circuits being intertwined; said compressor means including a plurality of vapor compressors; and said preventing means including switch means to shut down at least one and less than all of said compressors thereby leaving another of said compressors in operation.

4,679,412

## METHOD FOR DETERMINING AND CORRECTING THE LENGTH OF A PIECE OF KNITTING PRODUCED ON A FLAT KNITTING MACHINE

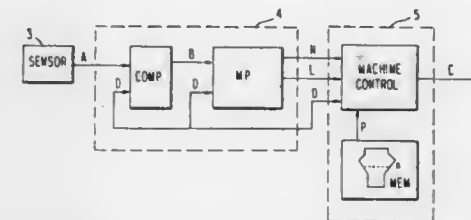
Hans Schieber, and Otto Geitner, both of Bopfingen, Fed. Rep. of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Fed. Rep. of Germany  
Continuation of Ser. No. 568,469, Jan. 5, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 848,897

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1983, 3300240

Int. Cl.<sup>4</sup> D04B 7/00, 15/80

U.S. Cl. 66—71

4 Claims



1. A method of determining and correcting the length of a piece of knitting being produced on an electronically controlled flat knitting machine, comprising the steps of:

- continuously determining the real length of the piece of knitting being produced by means of a sensor between a needle bed and a knitted piece withdrawal means;
- comparing in a comparator of a digital control circuit the determined real length value with an instantaneous desired length value stored in a programmed memory of a machine control system;
- processing resulting comparison value and said desired length value in a microprocessor of said digital control circuit;
- feeding an overruling stitch length signal and an overruling course number signal from said microprocessor to a machine control circuit in said machine control system; whereby the stitch length and the number of subsequent courses as well as the shape and the type of knitting and pattern of the remainder of the piece being knitted are controlled by said resulting comparison value and said desired length value.



4,679,413

# FLAT-BED KNITTING MACHINE HAVING A SPOOL TABLE PROVIDED WITH MOVABLE YARN SPOOL HOLDERS

Adam Müller, and Ernst Goller, both of Reutlingen, Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

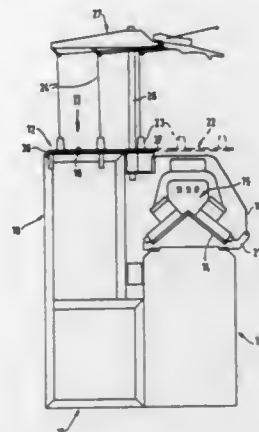
Filed Jul. 29, 1986, Ser. No. 890,266

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528693

Int. Cl.<sup>4</sup> D04B 3/06

U.S. Cl. 66—125 R

16 Claims



1. A flat-bed knitting machine, comprising:
  - a needle bed apparatus;
  - a carriage apparatus;
  - a spool table disposed in the rear area of the machine above the needle bed apparatus and the carriage apparatus;
  - at least one pull-out apparatus mounted to the spool table, each pull-out apparatus including a guide rail, a pull-out rail movable relative to the guide rail and at least one yarn spool holder mounted to the pull-out rail; and
  - a yarn supply device for each yarn spool holder.

4,679,414

# APPARATUS FOR CONTROLLING A DEWATERING PROCESS

Kazutoshi Takimoto, Yao; Takatomo Matsumi, Fujidaira, and Koji Kikuchi, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

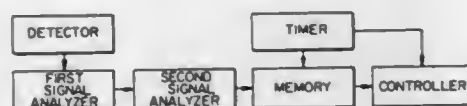
Filed Oct. 23, 1985, Ser. No. 790,347

Claims priority, application Japan, Jan. 18, 1985, 60-7861; Feb. 6, 1985, 60-22199

Int. Cl.<sup>4</sup> D06F 33/02

U.S. Cl. 68—12 R

1 Claim



1. An apparatus for dewatering control comprising
  - a detector serving to output a signal corresponding to the rate of water ejected from a dewatering tank;
  - a first signal-analyzing means for determining whether an output signal from said detector is of a specified kind or not;
  - a second signal-analyzing means for repeatedly determining, when said output signal is determined to be of said specific kind by said first signal-analyzing means, whether a signal of said specified kind has continued for a fixed time duration or not;

- a timer serving to count time from the beginning of a dewatering operation;
- a memory means serving to read and store a time datum from said timer when said second signal-analyzing means determines that signal of said specified kind has continued for said fixed time duration and to update said time datum every time it is determined that a signal of said specified type has continued for said specified time duration; and
- a controlling means for controlling the termination of dewatering operation on the basis of time datum stored in said memory means a specified time interval after the beginning of said dewatering operation.

4,679,415

# LOCKING MECHANISM FOR LIGHTWEIGHT SECURITY CABINET

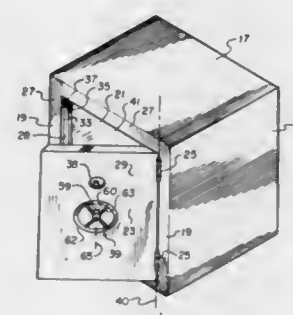
Kenneth Spratt, Provo, Utah, assignor to Thomas A. James, Mapleton, Utah

Filed Dec. 10, 1985, Ser. No. 806,826

Int. Cl.<sup>4</sup> E05B 63/14

U.S. Cl. 70—118

3 Claims



1. A lightweight security cabinet presenting a box-like structure having a full back panel in association with vertical side panels and top and bottom panels positioned perpendicular to said back panel and joined thereto to form an open box-like structure, said security cabinet having a door, having edges, pivotally mounted within an outlining frame assembly by means of at least one hinge, said door and attendant frame assembly being mounted on said open box-like structure to form a sealable enclosure, said cabinet having a locking mechanism for use on an interior surface of a security cabinet door, said mechanism comprising:
  - a driven gear mounted rotatably on said interior surface of said cabinet door, said driven gear being driven by an actuation means made manipulatable from the exterior surface of said door;
  - a rack-type gear mounted slidably along the interior surface of said door, said rack-type gear being mechanically cooperable with said driven gear whereby a rotation of said driven gear displaces said rack-type gear along the interior surface of said door;
  - a first shaft fixedly mounted on said rack-type gear, said first shaft being slidably supported on said interior door surface by a plurality of first support means whereby a displacement of said rack-type gear effects a linear displacement of said first shaft;
  - a pair of restraining members spacedly positioned apart on said first shaft and defining a channel therebetween;
  - a second shaft pivotally mounted on the interior surface of said cabinet door by a first pivot mounting upstanding from said cabinet door, a portion of said second shaft being positioned within said channel defined by said restraining members whereby a displacement of said first shaft effects a pivoting action of said second shaft about its pivot point;
  - a third shaft positioned slidably on said interior door surface by a plurality of third support means, said third shaft being pivotally mounted to a distal end of said second shaft

- whereby a rotation of said second shaft about its pivot point effects a substantially linear displacement of said third shaft along said interior door surface; and
- first retaining means mounted on said third shaft and made slidable along the interior door surface of said cabinet, said first retaining means being slidable between two conditions, said conditions being a first condition wherein a portion of said first retaining means does not extend beyond an edge of said door surface and a second condition wherein a portion of said first retaining means is extended beyond the surface of said door whereby the extension of said first retaining means beyond said door edge when the door is in a closed position results in an abutment of said first retaining means against said frame assembly of said security cabinet resulting in said door being made substantially unmovable absent a retraction of said first retaining means;
- a fourth shaft, mounted slidably on said interior door surface of said cabinet;
- a fifth elongate shaft having a distal end and a proximal end; said fifth shaft member being floatingly mounted to said cabinet solely by mounting said distal end pivotally on said second shaft member; wherein said entire fifth shaft is free to be displaced about said door surface by the motion of said second and fourth shaft members.

which engagement will retract said trigger bolt a predetermined amount prior to engagement of the latch bolt, with said strike plate; and means operatively coupling said trigger bolt and said latch bolt such that initial retraction of the trigger bolt will effect partial and preliminary retraction of the latch bolt, which preliminary retraction of the latch bolt positions said beveled surface thereon to engage the strike plate.

4,679,417

# TRANSMISSION SELECTOR ASSEMBLY AND LATCHING MECHANISM

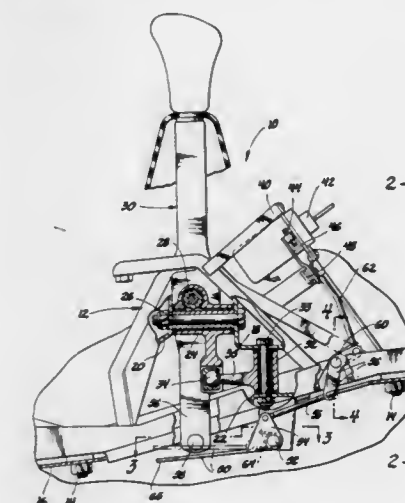
Kenneth L. Van Cise, Jr., Bay City, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 27, 1986, Ser. No. 866,699

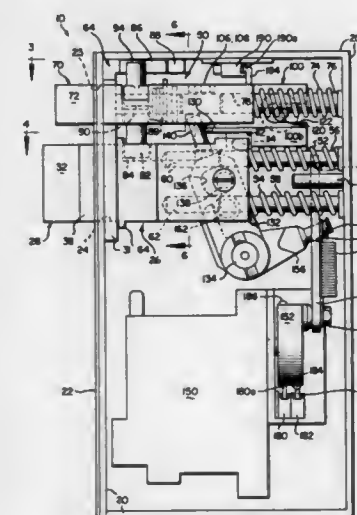
Int. Cl.<sup>4</sup> B60R 25/06

U.S. Cl. 70—247

2 Claims



1. A lock mechanism including: a casing structure adapted to be mounted to one of a door and a door frame for cooperation with an apertured strike plate mounted to the other of said door and door frame, said lock mechanism further comprising: a pair of apertures formed in said casing structure; a latch bolt retractably mounted with respect to said casing structure and biased to an extended, first position wherein a latching portion thereof extends from one of said casing apertures for engagement with said strike plate aperture, and said latch bolt being movable to a second retracted position; said latching portion of said latch bolt including a beveled leading surface located proximate the distal end of said latch bolt for engagement with said strike plate to move said latch bolt to the retracted position, and an unbeveled portion adjacent said beveled portion; a biased trigger bolt mounted to said casing structure and extending from a second one of said apertures, said trigger bolt including a camming surface and being positioned to have its camming surface engage the strike plate prior to said latch bolt,



2. A console mounted transmission selector mechanism including a latching mechanism comprising: a housing secured to a vehicle body member; a shift lever pivotally mounted in said housing and being pivotally manipulated to a plurality of transmission selector positions including a vehicle parking position; a vehicle key operated mechanism secured in said housing and being manipulable to LOCK, RUN and OFF positions; a latching plate pivotally mounted in said housing and including a latch opening; and linkage means disposed between said key operated mechanism and said latching plate for pivoting said latching plate when said key operated mechanism is manipulated to the LOCK position, including a first bellcrank operatively connected to said vehicle key operated mechanism, a crank arm secured to said latching plate, a second bellcrank pivotally disposed on said housing, a first link connected between said first and second bellcranks and a second link connected between said second bellcrank and said crank arm, said shift lever having an extension alignable with said latch opening when said shift lever is manipulated to said vehicle parking position, said extension preventing pivoting of said latching plate by said key operated mechanism prior to said shift lever being positioned in said vehicle parking position and said latching plate preventing manipulation of said shift lever from said vehicle parking position if said key operated mechanism is in said LOCK position.

4,679,418

**HIGH SECURITY CYLINDER LOCK**

Mark L. Allen, 1776 E. 13th St., Brooklyn, N.Y. 11229

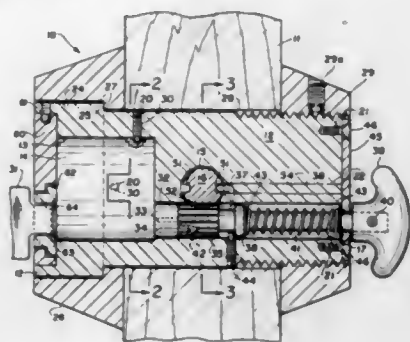
Continuation-in-part of Ser. No. 685,222, Dec. 26, 1984, Pat. No.

4,593,546. This application Apr. 2, 1986, Ser. No. 847,183

Int. Cl.<sup>4</sup> E05B 9/10

U.S. Cl. 70—380

4 Claims



1. A high security door lock comprising: a lock housing comprising a solid cylindrical member having an outwardly projecting rim at one end thereof, said rim providing an external shoulder spaced from said one end, the other end of said cylindrical member being threaded so that a flange means can be threaded onto said cylindrical member, said cylindrical member being provided at said one end with an axial bore having a depth greater than the longitudinal length of a lock cylinder, a second longitudinal bore extending from the bottom of said axial bore to said other end of said cylindrical member, a bolt receiving bore intersecting at least a portion of said second bore and extending transversely through said cylindrical member so that a bolt can be inserted therein from either side of said cylindrical member; lock cylinder means including a key operated plug positioned at the bottom of said first bore so as to leave a space in said bore at said one end of said housing in front of said lock cylinder, said lock cylinder means being provided with a bolt moving member extending into said second bore; bolt driving means mounted in said second bore in position to be actuated by said bolt moving member of said lock cylinder to drive a bolt into and out of a locking position; a solid bolt slidably positioned in said bolt receiving bore so that a portion thereof engages said bolt driving means, said bolt when driven to a locking position remaining in engagement with said bolt driving means and in said bolt receiving bore so as to prevent said cylindrical member being rotated in a door in which it is installed; an annular collar member having an internal shoulder and adapted to slide over said cylindrical member so that when the shoulder of said collar member abuts the shoulder of said cylindrical member the end of said collar member is flush with said one end of said cylindrical member and can rotate freely thereon; flange means threaded onto the threaded end of said cylindrical member to engage the inner side of a door in which the lock is installed; second bolt moving means mounted in said second bore and extending to said other end of said cylindrical member, said second bolt moving means being adapted to disengage said bolt driving means from said bolt moving member of said lock cylinder and to actuate said bolt driving means when the latter is so disengaged; a guard plate positioned in and substantially filling the space in said bore in front of said lock cylinder, said guard plate having an aperture aligned with said cylinder plug whereby a key may be inserted through said aperture and into said plug so as to actuate said bolt moving member; and means extending from the sidewall of said housing into the peripheral edge of said guard plate to secure said guard plate in said housing.

**4,679,419  
FRONT-PROGRAMMABLE COMBINATION LOCK  
WITH MOVABLE FACEPLATE**

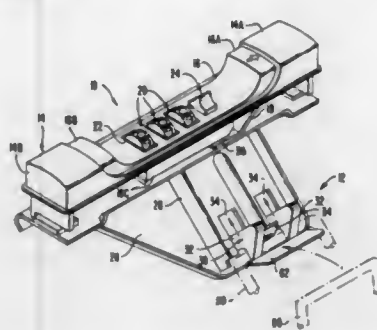
Stephen S. Seelba, Clifton, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Apr. 25, 1986, Ser. No. 855,639

Int. Cl.<sup>4</sup> E05B 37/02

U.S. Cl. 70—312

15 Claims



1. A combination lock comprising a casing including a fixed portion and a movable faceplate, a plurality of combination members supported for movement with the faceplate, and also for combination setting movement relative to the faceplate, means for preventing movement of the faceplate in a predetermined direction until the combination members have been set to an opening combination of the lock and for thereupon permitting such movement, and manually shiftable means movable with the faceplate, and also shiftable relative to the faceplate for enabling the combination members to select another opening combination of the lock.

4,679,420

**FORCE IMMUNE DOOR LATCH**

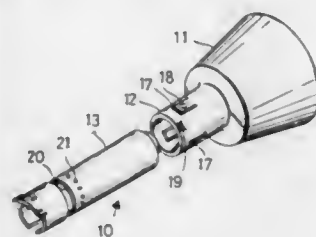
Tal-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Jan. 2, 1985, Ser. No. 688,338

Int. Cl.<sup>4</sup> E05B 13/10

U.S. Cl. 70—422

4 Claims



1. A force immune door latch, in combination, comprising: a handle, a sleeve extending rearwardly of the handle, said sleeve having a forward reduced end and a rearward enlarged end, said ends defining a shoulder therebetween, an inner annular collar having at least one aperture formed therein, said collar being positioned abutting the shoulder, nested within the rearward enlarged end of the sleeve on a substantially common longitudinal axis therewith, a cylinder having a locked position and an unlocked position and further having a plurality of depressions formed annularly therein, said cylinder being nested with respect to the sleeve, the collar and the handle such that the handle, sleeve, and the collar having a substantially common longitudinal axis, means cooperating between the collar and the rearward enlarged end to preclude substantial axial separation and rotational movement therebetween, means cooperating between the cylinder and the forward reduced end of the sleeve to preclude substantial axial separation therebetween, a spring-loaded ball detent being positioned within the aperture of the collar with its biasing force being

oriented inwardly in a direction substantially perpendicular to the common longitudinal axis, wherein said detent is received within the depressions on the cylinder to accommodate rotation of the cylinder and the handle substantially in unison with each other in the unlocked position of the cylinder, but providing relative rotation therebetween in the locked position of the cylinder, whereby in the locked position of the cylinder excessive torque applied to the handle normally sufficient to break the latch will not result in breakage thereof, thereby precluding an undesired destruction of the lock by a burglar or others.

4,679,421

**AUTOMATED GAS-LIQUID RELATIVE  
PERMEAMETER**

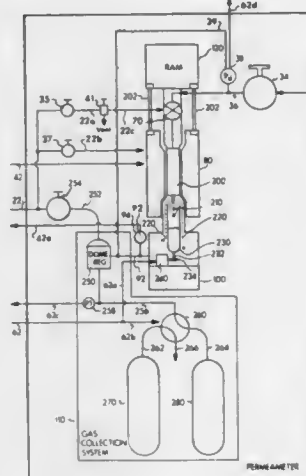
Robert D. Barree, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 10, 1986, Ser. No. 884,252

Int. Cl.<sup>4</sup> G01N 15/08

U.S. Cl. 73—38

34 Claims



1. An automated gas-liquid relative permeameter for determining the relative permeability of a core sample, said permeameter comprising:  
means (40) for providing a vacuum,  
means (30) for providing a supply of helium gas,  
means (20) for providing a supply of nitrogen gas,  
means (80) connected to said vacuum and nitrogen providing means for holding said core at a predetermined pressure,  
means (120) engaging the top of said core and connected to said holding means for applying said predetermined pressure to said top of said core,  
means (70) cooperative with said applying means and connected to said helium providing means and said nitrogen providing means for supplying said helium gas to said top of said core under control of said nitrogen gas,  
means (100) engaging the bottom of said core and removably connected to said holding means for delivering said predetermined pressure to said bottom of said core,  
means (90) cooperative with said delivering means for collecting produced liquid from said core sample when said helium gas is supplied to said top of said core by said supply means,  
means (240) engaging said produced liquid collecting means for instantaneously weighing said collected fluid,  
means (110) cooperative with said delivering means for collecting produced helium gas from said core sample when said helium gas is supplied to said top of said core by said supplying means,  
means (258) connected to said produced helium collecting means for instantaneously measuring the pressure of said collected helium gas, and  
means (60) connected to said weighing means and to said

measuring means for automatically determining said gas-liquid relative permeability of said core sample.

4,679,422

**METHOD AND APPARATUS FOR STEADY-STATE  
MEASUREMENT OF LIQUID CONDUCTIVITY IN  
POROUS MEDIA**

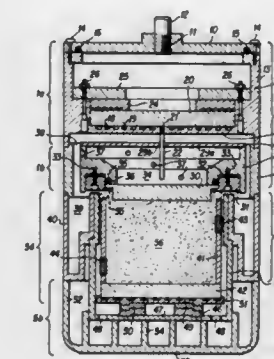
Jacob Rabin, Palo Alto, Calif.; Dale P. Hammermeister, Las Vegas, Nev., and John R. Nimmo, Mountain View, Calif., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 28, 1986, Ser. No. 901,360

Int. Cl.<sup>4</sup> G01N 15/08

U.S. Cl. 73—38

13 Claims



1. A method for establishing and measuring the steady-state flow of a liquid through an unsaturated porous medium and determining the medium's liquid conductivity comprising the steps of:

- placing a compacted sample of the porous medium on which the measurements are to be made on a liquid conducting surface;
- providing for the passing of a continuous supply of a liquid with constant pressures maintained at the liquid inflow and outflow sides of said sample;
- subjecting said sample to a constant centrifugal force;
- collecting the liquid passing through said sample;
- measuring the flow rate of said liquid through said medium and the liquid content of said medium until these measurements are substantially constant over a predetermined time interval; and
- computing the liquid conductivity of said medium from the measurement of said flow rate and the distribution of liquid within said medium.

4,679,423

**METHOD AND APPARATUS FOR MEASURING THE  
PORE SIZE OF ENHANCED TUBES**

Paul H. Ballentine, Cazenovia, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 16, 1985, Ser. No. 809,619

Int. Cl.<sup>4</sup> G01B 13/08

U.S. Cl. 73—37.5

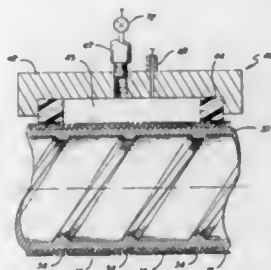
3 Claims

1. A pore measuring system for accurately measuring during production the average pore size on the surface of an enhanced evaporator tube having subsurface channels connected by pores on the surface, the average pore size measuring system comprising:

- a fluid pressure source;
- two separate fluid pressure flow path means in fluid flow communication with said fluid pressure source, a first fluid pressure flow path including at least two parallel fluid pressure flow circuit means, a first fluid pressure flow circuit means having an adjustable flow control valve and



a movable test housing downstream of said adjustable flow control valve for matingly engaging a portion of the surface of the enhanced evaporator tube, said movable test housing defining a passage for the flow of said fluid pressure source through the pores on the enhanced evaporator tube to the surroundings to reduce the fluid pressure downstream of said first fluid pressure flow path adjustable flow control valve, and a second fluid pressure flow circuit means having a second adjustable flow control valve and a reference orifice downstream of said second adjustable flow control valve, said reference orifice having a predetermined area, a second fluid pressure flow path means including a clamp means for moving said movable test housing by fluid pressure from said fluid



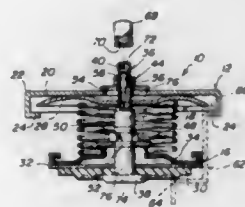
pressure source into mating engagement with a portion of the surface of the enhanced evaporator tube; and a differential pressure transducer means for measuring the difference in pressure between said at least two parallel fluid pressure flow circuit means whereby one side of said differential pressure transducer means is connected in fluid communication downstream of said adjustable flow control valve and another side of said differential pressure transducer means is connected in fluid communication downstream of said second adjustable flow control valve thereby measuring the difference in pressure drop across the subsurface channels between pores on the enhanced evaporator tube and the pressure across said reference orifice.

#### 4,679,424 PRESSURE TESTER CAP

Iosif Tubman, 1480 E. 17th St., Brooklyn, N.Y. 11230  
Filed Sep. 8, 1986, Ser. No. 906,280  
Int. Cl.<sup>4</sup> G01M 3/32

U.S. Cl. 73-45.8

4 Claims



1. A pressure tester cap as of the type having a cover assembly removably mounted on a neck of a radiator of a motor vehicle, a valve assembly of a smaller diameter of said cover assembly and said valve assembly urging said valve assembly away from said cover assembly, the improvement comprising: (a) an air valve sleeve having one end supporting said valve

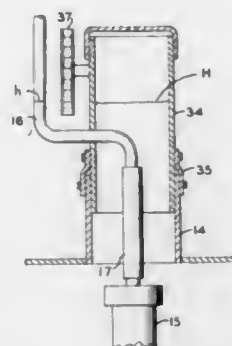
assembly and having its other end extending through said cover assembly;  
(b) means for holding said valve assembly on said air valve sleeve, wherein said holding means comprises:  
(i) a lower washer to fit over said air valve stem and onto top of said valve assembly; and  
(ii) a nut which threadably engages lower portion of said air valve sleeve to make contact of with said lower washer for holding said valve assembly in place; and  
(c) means for securing said air valve sleeve on said cover assembly so that air under pressure can be discharged into said radiator from an air hose chuck to check said radiator for leaks and still permit fluid to escape from said radiator when pressure in said radiator rises above a predetermined level.

#### 4,679,425 LIQUID STORAGE TANK LEAK DETECTION SYSTEM

Daniel B. Bolland, Convent Station, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.  
Filed Dec. 5, 1985, Ser. No. 804,861  
Int. Cl.<sup>4</sup> G01F 23/02

U.S. Cl. 73-49.2

12 Claims



1. An apparatus for determining whether fluid is leaking from a fluid storage tank having a fill pipe, said apparatus comprising:  
a first vertical tube adapted to be inserted into the tank being tested via the fill pipe and having a length substantially equal to the diameter of said tank, said tube being sealed at the bottom;  
a second tube adapted to be vertically positioned under conditions of use of said apparatus, said second tube having a predetermined diameter;  
means for connecting said second tube to the top of said first tube whereby said first and second tube define a fluid container;  
means for filling said first and second tube with fluid to a predetermined level in said second tube;  
said second tube having a diameter relative to the diameter of the fill pipe such that any change in the level of fluid in said second tube and said fill pipe resulting from a change in temperature of the fluids therein are proportional; and  
means for determining any deviation from a proportional change in the fluid level in the second tube and fill pipe whereby any such deviation is indicative of a leak of fluid from said tank.

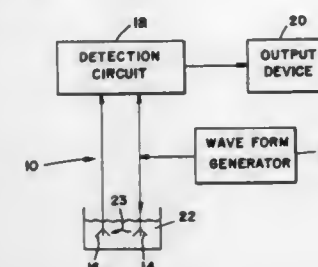
#### 4,679,426 WAVE SHAPE CHEMICAL ANALYSIS APPARATUS AND METHOD

Milto E. Fuller, 301 Bartlett St., Reno, Nev. 89512, and Gary S. Fletcher, Jr., 8123 Sunrise Blvd., No. 224, Citrus Heights, Calif. 95610

Filed Sep. 9, 1985, Ser. No. 774,150  
Int. Cl.<sup>4</sup> G01N 29/02

U.S. Cl. 73-53

21 Claims



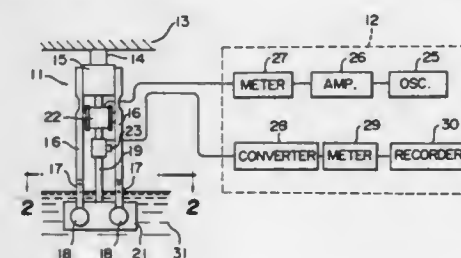
1. An apparatus for measuring the concentration of a chemical in a test sample, said apparatus comprising:  
electromagnetic waveform generation means for generating an electromagnetic signal having a periodic waveform of known shape;  
antenna means coupled to said waveform generation means for transmitting said electromagnetic signal into the test sample and for receiving a corresponding periodic electromagnetic signal having a waveform with a shape changed from said known shape as a result of propagation of said electromagnetic signal through the test sample; and  
detection means coupled to said antenna means and responsive to the transmitted and received electromagnetic signals for quantifying the change in shape of said received electromagnetic signal with respect to said known shape of said transmitted electromagnetic signal, said detection means further being formed to determine the concentration of the chemical in the test sample by correlation of the magnitude of the change in shape relative to a known concentration of the chemical from calibration test samples.

#### 4,679,427 APPARATUS FOR MEASURING VISCOSITY

Mamoru Kanda, Tokyo; Osamu Suzuki, Kumagaya; Shousuke Ishiwata, Saitama, and Mitsuro Hayashi, Kumagaya, all of Japan, assignors to Chichibu Cement Kabushiki Kaisha, Tokyo, Japan  
Division of Ser. No. 559,948, Dec. 9, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 854,755  
Claims priority, application Japan, Dec. 13, 1982, 57-218054  
Int. Cl.<sup>4</sup> G01N 11/16

U.S. Cl. 73-54

12 Claims



1. An apparatus for measuring the viscosity of a viscous substance, comprising: two thin spaced-apart plates of similar size and shape and having opposed major, parallel surfaces, the two plates being immersible during use of the apparatus in a

viscous substance whose viscosity is to be measured; driving means for vibrationally driving the two plates while immersed in the viscous substance such that the two plates undergo vibration in a plane parallel to the major surfaces of the two plates and at the same vibrational frequency but in opposite phase relation whereby the amplitude of vibration of the two plates is proportional to the viscosity of the viscous substance; detecting means for detecting the amplitude of vibration of at least one of the two plates and producing a corresponding electrical output signal representative of the viscosity of the viscous substance; and two similar static plates stationarily disposed relative to and on opposite sides of the two plates, each static plate having a surface extending parallel to and spaced from confronting major surfaces of the two plates.

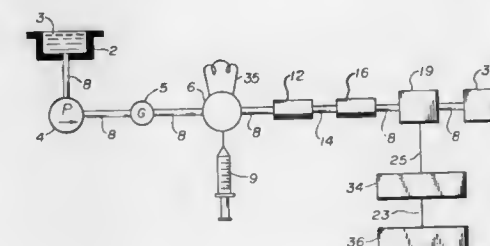
#### 4,679,428 INDEPENDENT ANALYSIS OF ANIONS AND CATIONS USING INDIRECT PHOTOMETRIC CHROMATOGRAPHY

Theodore E. Miller, Jr., and Ziad Iskandarani, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 682,032, Dec. 12, 1984, Pat. No. 4,567,753. This application Jan. 24, 1986, Ser. No. 822,188  
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.  
Int. Cl.<sup>4</sup> G01N 31/04

U.S. Cl. 73-61.1 C

6 Claims



1. An ion chromatography method for simultaneous and fully independent analysis of sample cations and anions, the method comprising:

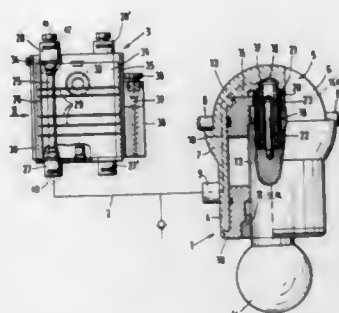
- eluting a sample containing transparent cations and anions through an ion exchange chromatography column means comprising a cation ion exchange-performing stationary phase and an anion ion exchange-performing phase,
- using as the eluent an electrolyte solution of effective displacing ions consisting essentially of a single salt of a photometrically detectable cation and anion having constant absorptivity ratios, relative to two wavelengths, distinctive of the cation and anion,
- monitoring the absorbance of the effluent of the chromatography column means at different wavelengths at which the cation and anion have said constant absorptivity ratios distinctive of each, and
- quantitatively analyzing the sample independently for sample cations and sample anions.

# 4,679,429 HYDRAULIC RAM STROKE MONITORING APPARATUS

Gerhard Merten; Werner Rafael, both of Lunen, and Horst Schlüsener, Werne, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen, Lunen, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,404  
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 3502806

Int. Cl.<sup>4</sup> F15B 21/04; G01M 19/00  
U.S. Cl. 73—168 11 Claims



1. In a hydraulic arrangement comprising a hydraulic ram (1) and apparatus (3) for monitoring the working stroke of the hydraulic ram, such as for adjusting the cutting horizon of a mineral winning machine in the form of a coal plough or the like, the monitoring apparatus including an indicator having a housing (24) containing a tubular measuring chamber (25) connected to the hydraulic ram by a hydraulic line (2), the improvements comprising: the tubular measuring chamber being transparent on at least one side for the observation of the level of hydraulic fluid contained therein, means connecting the lower end of the tubular measuring chamber to the hydraulic line leading to the hydraulic ram, and an air-permeable but dust-impermeable plug (28) closing the upper end of the tubular measuring chamber, said plug thus establishing atmospheric communication with the upper interior of the measuring chamber while shielding the interior of the chamber from contaminating dust particles, and said plug being removable from the chamber to enable the insertion therein of a calibrating device.

4,679,430

## ULTRASONIC LIQUID INTERFACE DETECTOR

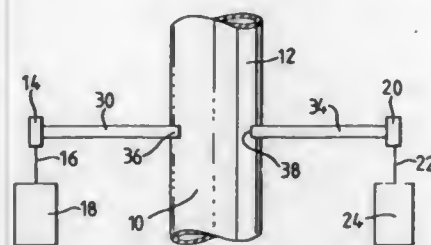
Colin B. Scott-Kestin, Stoke-sub-Hamdon; Roger B. Pike, Newbury; Roger D. Watkins, Wantage; Arthur B. Gillespie, Abingdon, and Michael O. Deighton, Reading, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 26, 1984, Ser. No. 593,277  
Claims priority, application United Kingdom, Mar. 30, 1983, 8308813

Int. Cl.<sup>4</sup> G01F 23/22  
U.S. Cl. 73—290 V 8 Claims

1. A method for detecting an interface of a liquid in a container comprising, causing Lamb waves to propagate through a portion of a wall of the container, receiving the Lamb waves after they have propagated through the portion of the wall, and detecting the liquid interface in response to the amplitude of the received Lamb waves, wherein the Lamb waves are transmitted to and from the portion of the wall as Lamb waves

propagating along respective strip waveguides, only an end of each waveguide contacting the wall thereby separating trans-



mitting and receiving transducers of the propagated lamb waves from the wall of the container.

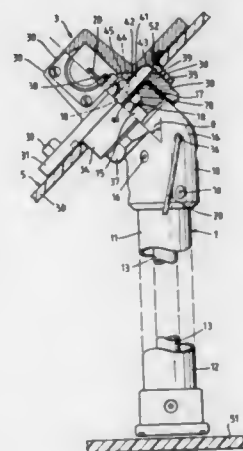
4,679,431

## PROBE ASSEMBLIES INCLUDING SUCH MOUNTS

Neil R. Jacob, and John R. Sulter, both of Basingstoke, England, assignors to Smiths Industries Public Limited Company, London, England

Filed Mar. 5, 1986, Ser. No. 836,670  
Claims priority, application United Kingdom, Mar. 15, 1985, 8506716

Int. Cl.<sup>4</sup> G01F 23/00, 23/26  
U.S. Cl. 73—290 R 9 Claims



1. A stress-relieving mount for supporting an elongate fluid-gauging probe in a fluid reservoir, said mount comprising: a plurality of discs, each disc having an aperture therethrough in a central region of the disc, and an outer edge; means securing said discs to one another centrally around said apertures; means securing said discs to one another around their respective outer edges; means securing the mount at the joined central regions of said discs solely with one end of said probe; and means securing the joined outer edges of the discs solely with a wall of the reservoir such that vibrational stresses of the probe are accommodated by deflection of the joined central regions of the discs relative to the outer edges of the discs.

4,679,432

## PROBE FOR MEASURING THE LEVEL OF A LIQUID

Erich Draeger, Asnières, France, assignor to Veglia, Paris, France

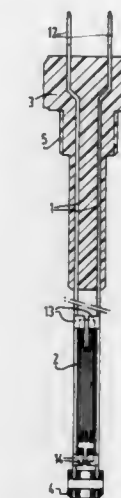
Filed Nov. 26, 1985, Ser. No. 801,860  
Claims priority, application France, Nov. 27, 1984, 84 18025

Int. Cl.<sup>4</sup> G01F 23/24  
U.S. Cl. 73—295 5 Claims

1. A probe for measuring the level of a liquid in a reservoir

which is at least partially filled with said liquid, said probe comprising:

- a first insulating support member;
- a conductor of given length made from a material whose resistance depends on its temperature, said conductor being supported on said first insulating support member;
- a second insulating support member spaced apart from said first insulating support member;
- a pair of elongated metal pieces supported on said second insulating support member, said metal pieces having first ends and second ends, said first ends forming output elec-



trodes of said probe, said second ends being electrically connected to said conductor and supporting said conductor, said first ends being adapted to be connected to a constant current source such that said conductor can be heated by said constant current source; means for mounting said metal pieces on said reservoir so that said conductor is in said liquid over a first part of its length and in a gaseous medium over a non-immersed second remaining part of its length; and measuring means connected to said conductor for measuring a voltage drop at said conductor as an indication of said level of said liquid.

4,679,433

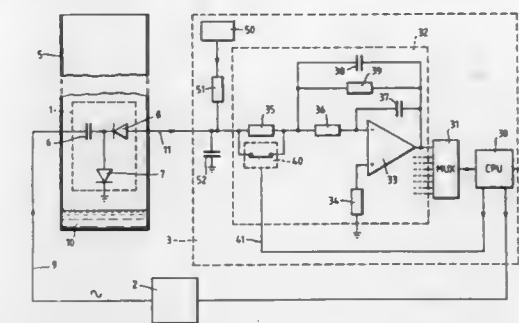
## FLUID-GAUGING SYSTEMS

Peter Clinton, Crewe, Cheshire; Ronald V. Myers, Basingstoke, Hampshire, and David Sinclair, Camberley, Surrey, all of England, assignors to Smiths Industries Public Limited Company, London, England

Filed Apr. 3, 1986, Ser. No. 847,461  
Claims priority, application United Kingdom, Apr. 3, 1985, 8508741; Aug. 3, 1985, 8519581

Int. Cl.<sup>4</sup> G01F 23/26  
U.S. Cl. 73—304 C 10 Claims

1. A fluid-gauging system of the kind including a capacitive sensor unit comprising a capacitor and at least one unidirectional current device connected to the output of the capacitor, the capacitor being mounted for immersion within the fluid, a first electrical supply that supplies an alternating electric signal to the sensor unit such that the output of the sensor unit varies in accordance with change in fluid quantity, and a measuring unit connected to receive the output of the sensor unit, the improvement wherein the system includes means for causing the said first electrical supply periodically to interrupt the supply of alternating signal to the unidirectional current device, and a second supply of steady current, that supplies



across the unidirectional current device when the supply of alternating signal is interrupted.

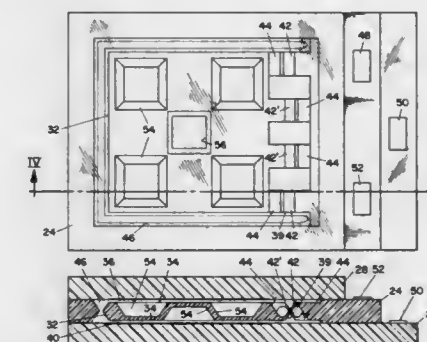
4,679,434

## INTEGRATED FORCE BALANCED ACCELEROMETER

Robert E. Stewart, Woodland Hills, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 25, 1985, Ser. No. 758,692  
Int. Cl.<sup>4</sup> G01P 15/02

U.S. Cl. 73—517 B 13 Claims



1. An integrated, force balanced accelerometer, comprising: capacitance forming means having substantially parallel electrodes; acceleration sensitive means flexibly mounted between said parallel electrodes in a neutral position; said acceleration sensitive means formed within a substrate of semiconductor material by forming an opening therein that defines the periphery of said acceleration sensitive means in said substrate to define an inertial mass attached to said substrate by hinge means; said hinge means, include crossed beam flexure blades formed within said semiconductor substrate; means for applying a D.C. electrical potential across said parallel electrodes of said capacitance forming means to establish a bias field; a means for generating A.C. electrical potentials between said acceleration sensitive means and said parallel electrodes, which potential change as said acceleration sensitive means undergoes a displacement from said neutral position; and electronic means connected between said parallel electrodes of said capacitance forming means and said acceleration sensitive means to close an electrical servo loop therebetween, wherein motion of said acceleration sensitive means causes an output from said electronic means to return said acceleration sensitive means to said neutral position and represent the acceleration of said accelerometer.



4,679,435

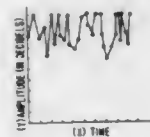
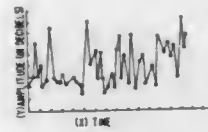
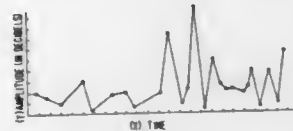
# GAS CONTENT DETERMINATION OF EVAPORITE FORMATIONS USING ACOUSTIC EMISSIONS DURING DISSOLUTION

Gerald L. Finfinger, West Mifflin; Roger L. King, and Thomas E. Marshall, both of Pittsburgh, all of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 11, 1986, Ser. No. 838,490  
Int. Cl.<sup>4</sup> G01N 29/00

U.S. Cl. 73—594

5 Claims



5. A method for determining the presence and magnitude of the gas content of an evaporite formation comprising the steps of:

- obtaining a small sample from the formation to be mined;
- placing said sample into a container of water, which container with sample and water is then placed into a sound-proof chamber;
- sensing the acoustic emissions from said sample as it dissolves in the water;
- recording the level of acoustic emissions produced as the sample dissolves during a time period of predetermined duration; and
- predicting the volume of gas contained in the evaporite formation to be mined.

4,679,436

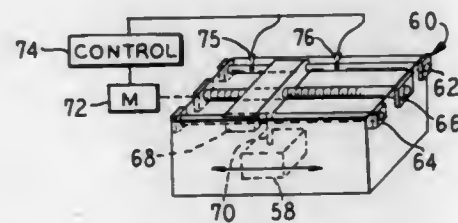
# RECIPROCATING METHOD AND APPARATUS FOR PRODUCING UNIFORM ULTRASONIC FIELD FOR USE IN LIQUID CRYSTAL BASED ACOUSTICAL IMAGING

Jaswinder S. Sandhu, Buffalo Grove, Ill., assignor to Raj Technology, Inc., Morton Grove, Ill.

Filed Aug. 5, 1986, Ser. No. 893,253  
Int. Cl.<sup>4</sup> G01N 29/00

U.S. Cl. 73—603

25 Claims



1. An apparatus for producing a substantially uniform acoustic field for use in producing an image on a liquid crystal display cell, where the display cell includes a layer of liquid

crystal material disposed and encapsulated between a pair of cover members, said apparatus comprising: transducer means for producing acoustic energy and for radiating the acoustic energy therefrom in a direction toward an object, and means for moving said transducer means toward and away from said object at a rate so as to produce said substantially uniform acoustic field.

4,679,437

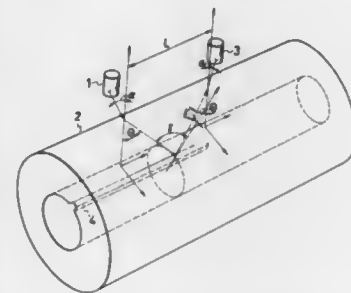
# METHOD OF DETECTING FLAWS IN THICK WALL STEEL PIPE WITH ULTRASONIC ANGLE BEAM TECHNIQUE

Mitsuhiko Koike, and Nobuaki Yakoh, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 4, 1985, Ser. No. 784,081  
Claims priority, application Japan, Oct. 4, 1984, 59-208806  
Int. Cl.<sup>4</sup> G01N 29/04

U.S. Cl. 73—622

6 Claims



1. In a method of detecting longitudinal flaws in a thick wall steel pipe with an ultrasonic beam in which the flaw on an inner surface of a thick wall steel pipe being tested is detected by a shear wave of the ultrasonic beam using a transmitting probe (1) and a receiving probe (3), the improvement wherein said transmitting probe is disposed slantingly relative to longitudinal and transverse directions of said pipe so that the shear wave of an ultrasonic beam transmitted therefrom is incident onto said pipe at an oblique refraction angle and said transmitted wave impinges onto a longitudinal flaw on said inner surface of said pipe at an oblique incidence angle, and said receiving probe is disposed geometrically so as to receive ultrasonic waves reflected from said flaw of said inner surface; and wherein a transverse incidence angle  $\gamma$  of said ultrasonic beam is determined in accordance with:

$$\tan \gamma = \sqrt{\tan^2 \theta_L + \frac{(\sin^2 \theta_i)/(1 - 2t/D)^2}{1 - (\sin^2 \theta_i)/(1 - 2t/D)^2}}$$

where  $\theta_L$  is an angular component of said refraction angle,  $\theta_i$  is a transverse component of said refraction angle in said pipe,  $t$  is a wall thickness of said pipe, and  $D$  is an outer diameter of said pipe.

4,679,438

# HIGH PRESSURE TRANSDUCER

William Wareham, Marion, Mass., assignor to Dynisco, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 689,385, Jan. 7, 1985. This application Nov. 14, 1985, Ser. No. 798,169  
Int. Cl.<sup>4</sup> G01L 7/08, 9/04

U.S. Cl. 73—726

12 Claims

1. In a liquid-filled pressure transducer having a frame, a capillary tube extending through the frame and a sensing element having a bore for receiving the capillary tube, a method of securing the sensing element to the capillary tube in a liquid-

4,679,440

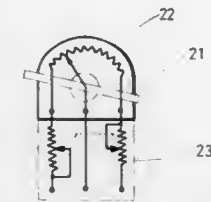
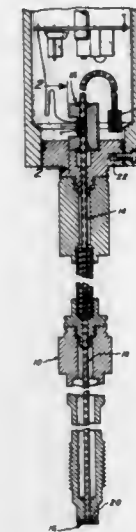
# THROTTLE SENSOR FOR ENGINE

Masayuki Okamura, Aichi, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Ichi, Japan

Filed Dec. 18, 1984, Ser. No. 683,188  
Claims priority, application Japan, Jan. 20, 1984, 59-9202  
Int. Cl.<sup>4</sup> G01M 15/00

U.S. Cl. 73—118.1

1 Claim



grip the capillary tube with at least a small gripping force, and welding the area about the capillary tube where the weld prep indentation is disposed to form a liquid-tight weld between the capillary tube and sensing element.

1. A throttle sensor for an engine comprising a first variable resistor having an operating element fixed with a movable portion of a throttle valve of the engine and adapted to output an electrical signal having a magnitude corresponding to the degree of opening of the throttle valve, and means to automatically adjust the correlative value of said electrical signal to the opening degree of the throttle valve, said means comprising a composite circuit variable resistor means connected electrically to said first variable resistor and adapted to correct a correlative value between the opening degree of the throttle valve and the magnitude of the electrical signal output from said first variable resistance, said composite circuit variable resistor means including a second and third variable resistor, said second and third resistors each having slide adjustment means interlocked with each other, an output terminal on said first variable resistor, and said slide adjustment means being separately adjustable with respect to each other, so as to set an output voltage from said output terminal to a target value of an output voltage corresponding to the opening degree of said throttle valve.

4,679,439

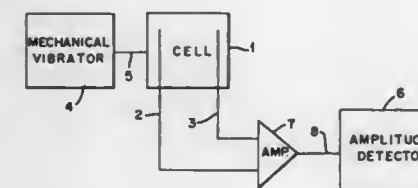
# METHOD AND APPARATUS FOR MEASURING THE UNSTEADY SEDIMENTATION POTENTIAL OF COLLOIDAL PARTICLES

Joseph B. Culkin, Wilton, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Sep. 17, 1985, Ser. No. 777,101  
Int. Cl.<sup>4</sup> G01N 27/00

U.S. Cl. 73—61.4

25 Claims



1. A method for measuring the unsteady sedimentation potential of particles in suspension comprising: inserting at least a portion of said suspension of particles in a cell, said cell having a first electrode and a second electrode; vibrating the entire cells at a frequency in the range between 0.001-50 khz to accelerate said particles in suspension contained therein to cause an unsteady sedimentation of said particles in suspension; and measuring the unsteady sedimentation potential of the accelerated particles across said first and second electrodes.

4,679,441

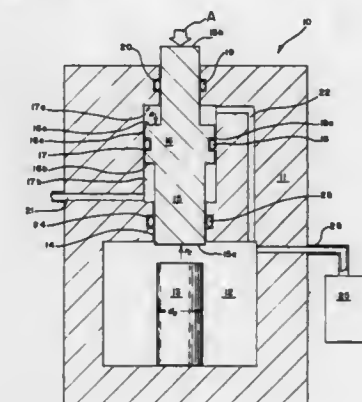
# PRESSURE BALANCED LOADING PISTON FOR TRIAXIAL TEST CELLS

Christopher F. Johnson, Bountiful, and Sidney J. Green, Salt Lake City, both of Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Filed Mar. 27, 1986, Ser. No. 845,249  
Int. Cl.<sup>4</sup> G01N 3/10

U.S. Cl. 73—798

9 Claims



1. A triaxial test cell and piston therefor comprising a triaxial test cell housing containing a vessel arranged to provide for receipt and removal of a specimen of material to be tested and to maintain a confining fluid therein, the housing including a

cylindrical opening into said vessel that receives a piston slidably fitted therein, said cylindrical opening to include an intermediate enlarged annular portion; a piston for sliding installation within said cylindrical opening, said piston including, intermediate therealong, a collar formed to extend outwardly from the piston longitudinal surface that includes upper and lower faces; fluid passage means connecting said vessel to the cylindrical opening annular portion above said collar upper face for freely passing confining fluid therethrough; means for venting to atmosphere the cylindrical opening annular portion below said collar lower face; and seal means arranged to prohibit passage of confining fluid into said cylindrical opening annular portion below said piston collar lower face and from said cylindrical opening annular portion above said piston collar upper face to without the test cell.

4,679,442

**ELECTROMAGNETIC FLOW METER**

Yousuke Kubota, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 24, 1985, Ser. No. 813,136

Claims priority, application Japan, Dec. 26, 1984, 59-273491; Aug. 21, 1985, 60-181881

Int. Cl.<sup>4</sup> G01F 1/58

U.S. Cl. 73—861.12

11 Claims



1. An electromagnetic flow meter is interposable between the flanged ends of upstream and downstream pipes conveying a fluid whose flow rate is to be measured, said flow meter comprising:

- a detector body including
  - a measuring pipe made of a non-magnetic material having longitudinal end faces contacting said flanged ends of said conveying pipes and having a pair of diametrically opposed reinforcing portions parallel to the axis of said measuring pipe, said fluid flowing through said measuring pipe along said axis of said measuring pipe;
  - a pair of electrodes mounted in said measuring pipe and positioned on a first imaginary straight line orthogonal to said axis of said measuring pipe and passing through said reinforcing portions of said measuring pipe, said electrodes contacting said fluid flowing through said measuring pipe; and
  - a pair of magnetic flux generating units mounted on the outer surface of said measuring pipe, each of said magnetic flux generating units including a magnet core having coils wound thereon, each of said magnet cores having an axis positioned on a second imaginary straight line that intersects, at right angles, both said first imaginary line connecting said electrodes and said axis of said measuring pipe at a common point of intersection, said magnetic flux generating units generating magnetic field lines orthogonal to said first imaginary line and said axis of said measuring pipe; and
- an outer casing enclosing the radial portion of said detector body, said outer casing having longitudinal end faces substantially aligned with said longitudinal end faces of said measuring pipe.

4,679,443

**BELT TESTING DEVICE**

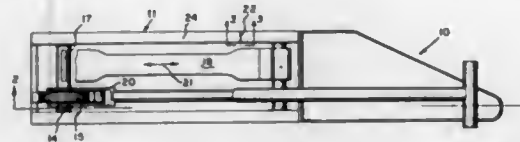
Don S. Strader, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 24, 1986, Ser. No. 888,678

Int. Cl.<sup>4</sup> G01N 3/08

U.S. Cl. 73—826

5 Claims



1. A belt testing apparatus for indirect measurement of tensile strength of a belt sample by direct measurement of the compressive strain on the apparatus, said apparatus comprising:

- a frame having a pair of spaced apart rails, one of said pair of rails having a gap therein separating said one rail into a first portion and a second portion;
- a stationary shaft rigidly fixed within said frame between said pair of spaced apart rails;
- a rotatable shaft rotatably positioned within said frame at a predetermined distance from and generally parallel to said stationary shaft, said rotatable shaft being rigidly fixed at said predetermined distance from said stationary shaft and positioned on the opposite side of said gap from said stationary shaft;
- means for attaching said belt sample to said stationary shaft and said rotatable shaft;
- means for rotating said rotatable shaft; and
- a strain sensing means positioned across said gap in said frame, said strain sensing means being adapted to sense the amount of compressive strain being exerted on said one of said pair of rails of said frame, said compressive strain being proportional to said tensile strength of said belt sample.

4,679,444

**INSTRUMENT FOR MEASURING THE COHESION FORCE IN DENTAL CROWN**

Silvan Kiefer, Pforzheim, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

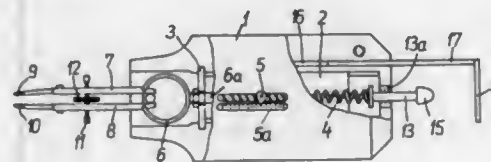
Filed May 15, 1985, Ser. No. 734,170

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418503

Int. Cl.<sup>4</sup> G01L 5/00

U.S. Cl. 73—827

5 Claims



1. An instrument for measuring the cohesion force between a dental outer crown and a dental inner crown connected to one another, comprising:

- (a) a housing adapted to be manually grasped;
- (b) scale means including a linearly extending helical spring means accommodated in said housing and indicator means for displaying the extent of compression or expansion of said spring;
- (c) a divider-like gripping means attached to one end of said spring means and arranged for displacement relative to said housing; said gripping means including means for clamping the gripping means to one of the interconnected

crowns, whereby upon pulling apart the two components, said indicator means shows the extent of expansion of said helical spring means for determining the pulling force exerted on the inner and outer crowns at the moment of separation thereof; and

- (d) pressing means for forcing the inner and outer crowns into engagement with one another; said pressing means being attached to one end of said spring means and being arranged for displacement relative to said housing, whereby upon pressing together the inner and outer crowns, said indicator means shows the extent of compression of said helical spring means for determining the pressing force exerted on the inner and outer crowns.

4,679,445

**ON-LINE REPLACEMENT SENSOR ASSEMBLY FOR A VORTEX SHEDDING FLOWMETER**

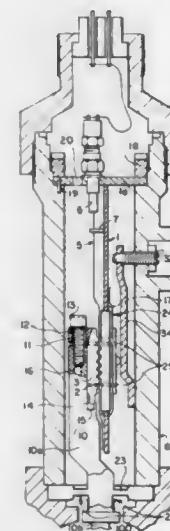
James K. Knudsen, East Greenwich, R.I.; Jane E. Smith, Mentor, Ohio; Victor J. Budan, Eastlake, Ohio; David J. Wroblewski, Willoughby, Ohio, and Eugene Skuratovsky, Mayfield Hts, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 3, 1986, Ser. No. 825,413

Int. Cl.<sup>4</sup> G01F 1/32

U.S. Cl. 73—861.24

10 Claims



1. A fiber optic sensor arrangement for easy removal from a vortex shedding flowmeter having a flowmeter housing which is exposed to a flowing fluid in a fluid space on one side of the flowmeter housing and the sensor on another side of the housing, comprising:

- a sensor housing defining a sensor space on the other side of said flowmeter housing;
- a sensor beam connected for movement to said sensor housing and having a first portion extending into said sensor space and a second portion extending through the flowmeter housing into the fluid space;
- pressure boundary means connected to said beam for isolating said sensor space from the fluid space;
- a mounting bracket detachably connected to said sensor housing; and
- a fiber optic sensor element operatively connected to said first portion of said sensor beam and connected to said mounting bracket said sensor element being disposed in said sensor space between a pair of jaws independently mounted on said sensor beam and said mounting bracket and being operatively engaged for sensing movement of said beam with passage of vortices past said second portion of said beam in the fluid space, said fiber optic sensor element being removable from said housing with one of said pair of jaws and said mounting bracket without dis-

turbing the flowing fluid in the fluid space on the one side of the flowmeter housing, said pressure beam, or said pressure boundary means.

4,679,446

**MULTI-VOLUME DISPLACEMENT PIPETTE**

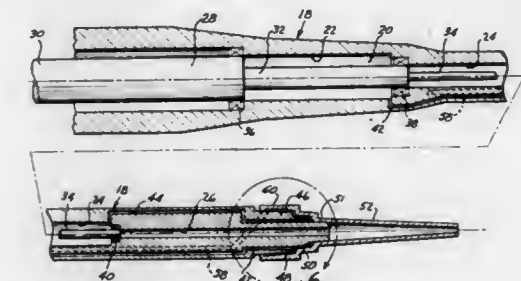
Neil J. Sheehan, Berkeley; Jon E. Oppenlander, Lafayette, and Richard P. Fleenor, Monte Sereno, all of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 9, 1985, Ser. No. 773,954

Int. Cl.<sup>4</sup> G01N 1/14

U.S. Cl. 73—864.13

6 Claims



1. A multi-volume displacement pipette assembly comprising:

- a tubular body having a first end for receiving a plunger and a second end including tip mounting means for receiving a removable dispensing tip;
- a first generally cylindrical chamber in the tubular body for holding a first volume of fluid, which first cylindrical chamber opens through the second end of the tubular body;
- at least one second generally cylindrical chamber in the tubular body for holding a second volume of fluid and which is coaxially aligned with the first chamber, which second cylindrical chamber opens through the second end of the tubular body through a fluid pathway extending through the tubular body and interconnecting such at least one second cylindrical chamber with the second end of the tubular body;
- a plunger assembly coaxial with the tubular body and operatively mounted therein for reciprocal, longitudinal movement through the first cylindrical chamber and such at least one second cylindrical chamber in the tubular body to displace or draw in fluid to such first cylindrical chamber and at least one second cylindrical chamber, the plunger assembly comprising a first portion having an external diameter substantially equal to the internal diameter of the first cylindrical chamber and at least one second portion coaxially aligned with the first portion and having an external diameter substantially equal to the internal diameter of such at least one second cylindrical chamber;
- fluid sealing means between the first cylindrical chamber and such at least one second cylindrical chamber for preventing fluid communication between chambers but permitting reciprocal, longitudinal movement of the plunger assembly; and
- a removable dispensing tip means for mounting to the mounting means on the second end of the tubular body and which removable dispensing tip means selectively provides fluid flow through such fluid pathway extending through the tubular body and interconnecting such at least one second cylindrical chamber with the second end wherein said removable dispensing tip means comprises a generally conically shaped tubular body having a lumen extending therethrough, which lumen is coaxially aligned and in fluid communication with the first chamber, and a shoulder on the removable dispensing tip means forming



a greater diameter portion of the lumen through the removable dispensing tip means, which greater diameter portion forms a seal with the second end of the tubular body to prevent liquid flow through the fluid pathway from such at least one second cylindrical chamber.

4,679,447

# METHOD AND APPARATUS FOR POSITIONING AND TESTING RAILROAD WHEELS

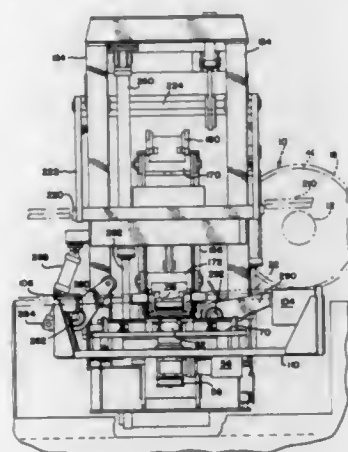
Christopher Sieradzki, Homewood, and Lyman W. Jeffreys, Barrington, both of Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Jan. 13, 1986, Ser. No. 817,921

Int. Cl. G01M 19/00; G01N 11/00, 11/30, 11/24

U.S. Cl. 73-865.8

20 Claims



1. An improved method for positioning and testing railroad wheels, said method comprising:  
moving a wheel to a first position with the wheel positioned upright in a vertical posture;  
gripping the wheel about its rim and flange;  
swinging the wheel about a spaced axis from said vertical posture to a substantially horizontal posture at a second position;  
receiving said wheel in said horizontal posture upon a horizontal receiving means at said second position;  
lowering said wheel and receiving means to a third position below said second position with said wheel resting upon a plurality of support means defining a horizontal plane;  
rotating said support means and wheel about a vertical axis substantially central of said wheel; and gauging at least one of the upper surface and the rim surface of said wheel for warpage and rotundity respectively while being rotated.

4,679,448

# SYSTEM FOR THE INTERNAL INSPECTION OF PIPELINES

Svend Lund, Birkerød, Denmark, assignor to Akademiet for de Tekniske Videnskaber, Svejsecentralen, Glostrup, Denmark

Filed Apr. 10, 1985, Ser. No. 721,678

Int. Cl. G01M 19/00

U.S. Cl. 73-866.5

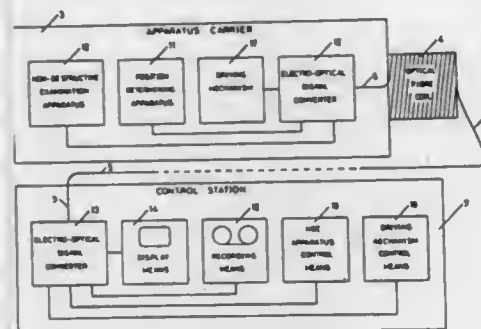
4 Claims

1. A system for the internal inspection of a pipeline for carrying fluids, such as oil or gas, comprising:  
an apparatus carrier to be inserted in the pipeline and travel inside the pipeline from point to point over considerable distances of several kilometers;  
non-destructive examination apparatus mounted in said apparatus carrier to generate electronic measurement signals representative of at least one of the conditions of the pipeline wall material and surfaces;  
position determining apparatus mounted in said apparatus

carrier to generate electronic position representative of the successive positions of said apparatus carrier during said travel;

at least one first electro-optical signal converter installed in said apparatus carrier, said first electro-optical signal converter being connected to convert said electronic measurement signals and said electronic position signals into corresponding optical signals;

at least one second electro-optical signal converter situated outside a carrier launching end of the pipeline, said second electro-optical signal converter being connected to convert said optical signals into equivalent electronic signals; at least one coil of expendable, thin optical fiber consisting of a single naked strand without supporting mantle having a length of several kilometers to be at least the same length



as the pipeline section to be examined, said coil being mounted on said apparatus carrier to gradually deposit said optical fiber inside said pipeline during said travel of said apparatus carrier, said optical fiber to remain in said pipeline after the internal inspection, said optical fiber being connected to transmit optical signals between said first electro-optical signal converter and said second electro-optical signal converter situated outside said carrier launching end of the pipeline; and display and recording means situated outside said carrier launching end of the pipeline, said display and recording means being connected with said second electro-optical signal converter to receive said electronic signals and thereby generate displays and permanent recordings of the results of the inspection of the pipeline.

4,679,449

# SPEED METER DRIVE DEVICE FOR AUTOMOBILE

Shuji Nagano; Shuichi Ida, both of Toyota, and Toshio Yoshinaka, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 28, 1985, Ser. No. 738,227

Claims priority, application Japan, Feb. 12, 1985, 60-18738[U]

Int. Cl. F16H 37/00, 1/16

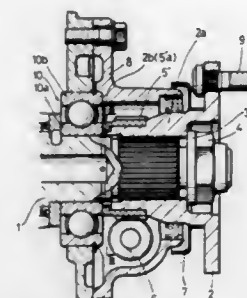
U.S. Cl. 74-12

1 Claim

1. A speed meter drive device for use with a vehicle comprising:  
an output shaft projecting from a housing of a transmission or a transfer;  
a connecting member mounted to a projected portion of said output shaft for transmitting a torque generated by said output shaft to another member;  
a speed meter driven gear adapted to be rotated in cooperation with rotation of said output shaft to drive a speed meter; and  
a speed meter drive gear for rotating said speed meter driven gear;  
wherein said speed meter drive gear is substantially cylindrical and is detachably mounted to an outer circumference of said connecting member, one end of said speed meter drive gear closest to said housing of said transmission or

said transfer is in abutment against an inner race of a bearing installed between said housing and said output shaft, and the other end of said speed meter drive gear is in abutment against a stepped portion formed on said connecting member;

further wherein said speed meter drive gear is keyed to an outer circumference of said connecting member only at



said one end of said speed meter drive gear, said speed meter drive gear including at least one projection which is keyed to at least one groove on said connecting member; and

further wherein end surfaces of said projection and said groove, farthest from said bearing, are separated from one another.

4,679,450

# CONTROL SYSTEM FOR SELECTIVELY SWITCHABLE TWO/FOUR WHEEL DRIVE AUTOMATIC TRANSMISSION SYSTEM SHIFTING TRANSFER TRANSMISSION SPEED STAGE

Yoichi Hayakawa; Masao Kawai, both of Anjo; Yutaka Taga, Toyota; Kazuaki Watanabe, Toyota, and Yoshiharu Harada, Toyota, all of Japan, assignors to Aisin-Warner Limited, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

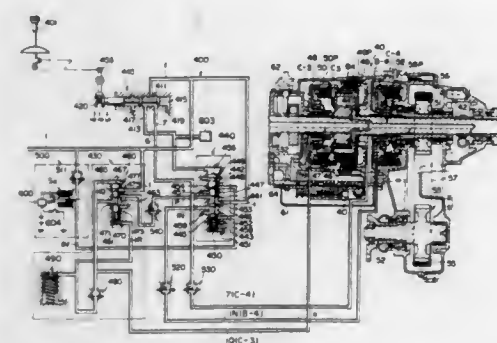
Filed Jul. 24, 1985, Ser. No. 758,442

Claims priority, application Japan, Jul. 28, 1984, 59-157905

Int. Cl. B60K 41/04

U.S. Cl. 74-752 A

4 Claims



1. For an automatic transmission system for a vehicle, comprising a main transmission unit which can be set to any one of a plurality of speed stages, an auxiliary transmission unit which is connected in series with said main transmission unit and can be selectively set to either a first speed reduction ratio or a second speed reduction ratio substantially larger than said first speed reduction ratio, and a means for manually controlling said auxiliary transmission unit to select either said first speed reduction ratio or said second speed reduction ratio,

a transmission control system comprising:

(a) a means for controlling said main transmission unit automatically to provide each selected one of said plu-

ality of speed stages according to operational conditions of the vehicle; and

(b) a means for controlling said auxiliary transmission unit to override said manual control means in a manner only to prevent shifting of said auxiliary transmission unit to said second speed reduction ratio according to vehicle speed, throttle opening and according to which of said plurality of speed stages said main transmission unit is set,

wherein said override means includes means responsive to a specific combined range of vehicle speeds and throttle openings for each of said speed stages.

4,679,451

# CASE FOR DRIVING SECTION OF LINEAR ACTUATOR

Kenichiro Nakamura, Moriyama, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

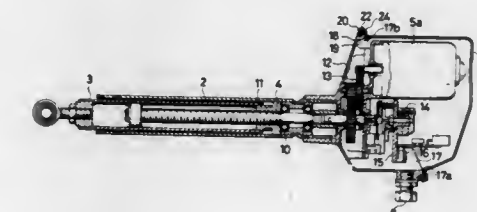
Filed Apr. 21, 1986, Ser. No. 853,947

Claims priority, application Japan, Jul. 2, 1985, 60-100072[U]

Int. Cl. F16H 57/02

U.S. Cl. 74-606 R

4 Claims



1. A linear actuator comprising: a body having a front portion and a rear portion, the front portion having an outer cylinder protruding therefrom, a screw shaft supported at its rear end in the outer cylinder, a nut threaded on the screw shaft, an inner cylinder secured to the nut and guided and slidable in the outer cylinder while being kept from rotating, and a motor within the body connected to drive the screw shaft, whereby the inner cylinder is movable back and forth into and out of the front end of the outer cylinder by rotation of the screw shaft, the rear portion of the body having an opening providing access to the interior of the body; and a cover closing said opening; the opening having a bottom edge, a top edge, and side edges, the top edge being located forward in relation to the bottom edge, and the side edges being inclined, whereby the opening faces both upwardly and rearwardly; the body having an outer surface surrounding the opening, said outer surface extending both downwardly and forwardly from the location of the opening; and the cover having a flange extending entirely around its periphery and overlying at least the part of said outer surface immediately adjacent to the opening; in which the bottom, top and side edges of the opening lie in a plane; in which the body has a face surrounding said edges, said face also lying in said plane; in which said outer surface is perpendicular to said plane, and in which said flange of the cover comprises a first portion parallel to and overlying said face, and a second portion parallel to and overlying said outer surface.

4,679,452

# LIMIT SENSING DEVICE

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Continuation of Ser. No. 609,295, May 11, 1984, abandoned.

This application Jul. 29, 1986, Ser. No. 892,732

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317888

Int. Cl. F01B 25/26; F16H 21/44

U.S. Cl. 74-110

7 Claims

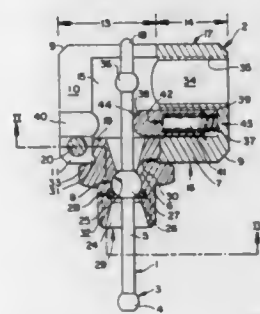
1. A mechanical limit sensing device for a piston and cylinder actuator, comprising:

a housing consisting essentially of a bearing sleeve adapted to be fixed to a cylinder of a piston and cylinder actuator, and a clamping body fixed at a variable rotational position to said bearing sleeve;

said bearing sleeve having an outer annular bearing collar engaged with said clamping body, an inner ball socket, an axial opening extending through said sleeve and through said ball socket having opposite truncated conical portions widening outwardly away from said ball socket, said bearing sleeve further including an outer end with an outer male thread adapted to be fixed to a cylinder of a piston and cylinder actuator, spaced away from said collar and away from said clamping body, said outer male thread being coaxial with said axial opening;

said clamping body having a slot therein with a cylindrical opening for receiving said collar, said slot dividing one end of said clamping body into two clamping jaws, said collar being disposed between said clamping jaws;

a clamping member connected between said clamping jaws for urging said clamping jaws together for fixing said clamping body to said bearing sleeve; and



a rocking lever extending through said sleeve and having a ball pivotally mounted to said ball socket of said sleeve for pivoting of said lever on said sleeve, said rocking lever having a first end extending outwardly from said sleeve in a direction away from said clamping jaw and an opposite end extending outwardly from said sleeve and through said slot, said slot being shaped to guide a pivotal movement of said opposite end of said lever, said one end of said lever being adapted to be engaged and pushed by movement of part of a piston and cylinder actuator and said opposite end of said lever being adapted to influence a switching element with pivoting said lever;

said clamping body including a portion from which said slot and said jaws extend, said portion of said clamping body including a bore therein lying in a plane of said slot and extending perpendicularly to said axial opening of said bearing sleeve, said slot including an enlarged opening communicating with said bore and into which said opposite end of said lever extends and is movable, said bore of said clamping body having a female thread therein for receiving a switching element.

4,679,453

# APPARATUS FOR PRODUCING STEPWISE MOVEMENT

Masayuki Morita, and Masaichi Hattori, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed May 31, 1984, Ser. No. 615,823

Claims priority, application Japan, Jun. 1, 1983, 58-98203

Int. Cl.<sup>4</sup> F16H 27/02, 31/00

U.S. Cl. 74—128

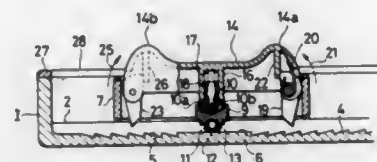
10 Claims

1. An apparatus for providing stepwise movement of a holder along an elongated, stepped member, said apparatus comprising:

an elongated stepped member;

a holder disposed to move along said stepped member, said holder having at least one opening therethrough, with said

opening being substantially normal to a surface of said stepped member along which said holder moves; and at least one button mounted in said opening, said button including at least one claw pivotally affixed to said button, wherein depression of said button within said holder engages said claw in said stepped member such that further depression of said button causes said claw to pivot and move said button and said holder laterally stepwise along said stepped member and means for biasing said at least one button to a central position where each claw is out of engagement with said stepped member.



gages said claw in said stepped member such that further depression of said button causes said claw to pivot and move said button and said holder laterally stepwise along said stepped member and means for biasing said at least one button to a central position where each claw is out of engagement with said stepped member.

4,679,454

# MULTI-RATIO TRANSMISSION

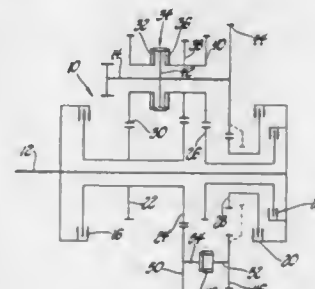
James C. Polak, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1985, Ser. No. 808,645

Int. Cl.<sup>4</sup> F16H 3/08

U.S. Cl. 74—330

3 Claims



2. A preselected multi-ratio power transmission comprising: input means for transmitting drive forces; output means; first, second and third friction clutch means each selectively engageable with said input means for accepting drive forces therefrom, first input gear means drivingly connected with said first friction clutch means; second input gear means drivingly connected with said second friction clutch means; third input gear means drivingly connected with said third clutch means; first output gear means drivingly connected with said first input gear means; second output gear means drivingly connected with said first and second input gear means; third output means drivingly connected between said third input gear means and said output means; and one double-acting synchronizer clutch for selectively engaging said first output gear means with said output means and alternately said second output gear means with said output means, said first friction clutch means and said one double-acting synchronizer clutch cooperating during engagement to establish two forward drive ratios between said input and output means, said second friction clutch means and said one double-acting synchronizer clutch cooperating during engagement to establish two other forward drive ratios between said input and output means, said third friction clutch means being engageable to provide another forward drive ratio between said input means and said output means; and said one double-acting synchronizer clutch being relieved of transmitting drive forces during the engagement of said third friction clutch means and being manipulable for alternate connection with either said first output gear or

said second output gear while said third friction clutch means is engaged.

4,679,455

# MULTIRATIO POWER TRANSMISSION

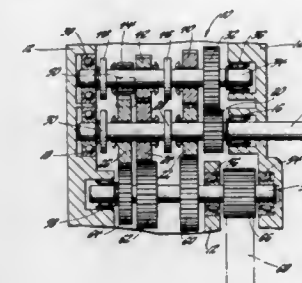
Laszlo Nagy, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 24, 1985, Ser. No. 747,793

Int. Cl.<sup>4</sup> F16H 3/08

U.S. Cl. 74—359

2 Claims



1. A plural step multiratio transmission comprising: an input shaft; an output shaft disposed parallel to and noncoaxial with said input shaft; a countershaft disposed parallel to and noncoaxial with both said input shaft and said output shaft; intermeshing head set gear means including gear means drivingly connected to said input shaft and countershaft respectively; output cluster gear means drivingly connected with said output shaft; three ratio gear means rotatably disposed on said input shaft and meshing with said output cluster gear means; three ratio gear means rotatably disposed on said countershaft and operatively connected through meshing relation with respective ones of said ratio gear means on said input shaft; and selectively engageable clutch means on said input shaft and said countershaft for selectively individually connecting said gear ratio means to the respective shafts for rotation therewith for providing a plurality of distinct gear ratios between said input shaft and said output shaft, said ratio gear means on said input shaft being idler gear means for the respective gear means on said countershaft.

4,679,456

# AUXILIARY DEVICE DRIVING UNIT DRIVEN BY A VEHICLE ENGINE

Kazutoshi Kaneyuki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

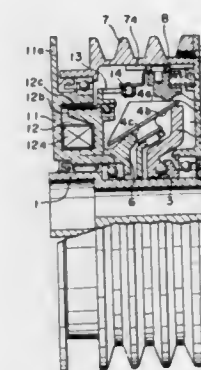
Filed Dec. 17, 1985, Ser. No. 809,786

Claims priority, application Japan, Dec. 17, 1984, 59-267968

Int. Cl.<sup>4</sup> F16H 15/16

U.S. Cl. 74—752 D

7 Claims



1. An auxiliary device driving unit connectable to an engine

of a vehicle, which has an input shaft connected to a crank shaft of the engine, a pulley connected to auxiliary devices through belts and a transmission system for transmitting a rotational force from said input shaft to said pulley, characterized by comprising:

- a frictional transmission type stepless speed-change gear which is provided with an input-transmission member mounted on said input shaft, a plurality of conical planet cones which are rotated around their own axes by receiving a rotational force from said input-transmission member, an orbit ring as a stationary element having frictional engagement with said planet cones to guide the revolution of said planet cones, a speed-change ring which is in frictional contact with the frictional transmission surface including the cone generatrix of each of said planet cones and is shiftable in the direction of the axis of said input shaft, means for transmitting a rotational force of said speed-change ring to said pulley,
- a non-contact type electromagnetic brake attached to a fixed plate for supporting said orbit ring as a stationary element of said speed-change gear,
- a cam connected to a rotating element of said electromagnetic brake,
- a cam follower fixed to said speed change ring and being in contact with said cam, and
- an electric circuit for controlling said electromagnetic brake depending on the condition of operations of said auxiliary devices of the engine.

4,679,457

# BACK-LASH ELIMINATING MECHANISM IN SCREW-TYPE DRIVING DEVICE

Masumi Nishikawa, Toyoake, and Masanobu Ishikawa, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

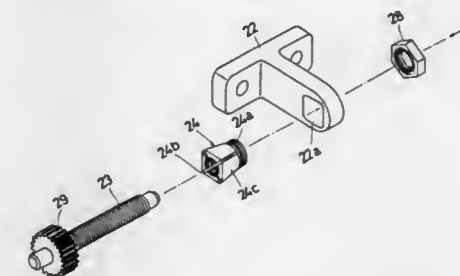
Filed Mar. 19, 1985, Ser. No. 713,754

Claims priority, application Japan, Mar. 21, 1984, 59-54762

Int. Cl.<sup>4</sup> F16H 25/24, 57/12

U.S. Cl. 74—441

5 Claims



1. A back-lash eliminating screw-type driving device comprising:

- a first bracket;
- a second bracket movable relative to said first bracket, said second bracket having a generally prismoidal tapered hole therethrough, said hole being rectangular in cross section;
- a screw member rotatably disposed on said first bracket;
- a first nut member threadable engaging said screw member and disposed in said hole of said second bracket, said first nut member having an outer surface including a generally prismoidal tapered portion being rectangular in cross section and corresponding to the configuration of said generally prismoidal tapered hole and an integral threaded portion extending from the narrower end of said tapered portion, said first nut member also having axially and radially extending slits, one of said slits intersecting each corner of said outer surface of said prismoidal portion, said tapered portion and said tapered hole being dimensioned such that said tapered portion of said first nut



member slidably fits in said tapered hole and said threaded portion extends out of said tapered hole beyond the narrower end of said hole; and

a second nut member threadably engaging said threaded portion of said first nut member for drawing said first nut member axially within said tapered hole to urge opposing sides of said outer surface toward one another to cause said nut member to threadably engage said screw member more firmly.

4,679,458

## WORM GEAR

Manfred Brandenstein, Eussenheim; Norbert Klüpfel, Hambach; Gebhard Pape, Schweinfurt; Roland Haas, Hofheim, and Rolf Schmiedchen, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

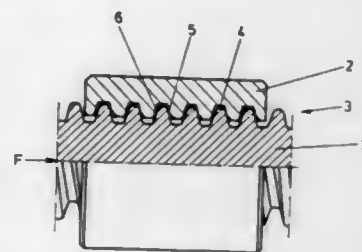
Filed Feb. 13, 1986, Ser. No. 829,427

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505467

Int. Cl.<sup>4</sup> F16H 1/18, 55/08

U.S. Cl. 74-458

5 Claims



1. In a worm gear having an outwardly directed thread on a spindle having first and second ends and a nut having a bore with an inwardly directed thread, said spindle being positioned inside said nut such that said outwardly directed and inwardly directed threads are intermeshed with both axial and radial play, the improvement wherein said spindle and nut have a first relative position in a state in which said first and second ends of said spindle are both subject to loading in a first radial direction with respect to the axis of the spindle and a second relative position different from said first relative position in a state in which said first and second ends of said spindle are subject to loading in opposite radial directions with respect to the axis of said spindle, thereby creating a torque, said spindle and nut having a relatively small axial play therebetween in said first state, said spindle having surface portions on said outwardly directed thread which transmit said torque between said spindle and nut, said torque transmitting surface portions being located only on a crown surface of said outwardly directed thread in respective thread areas in said second state, whereby said torque-transmitting portions are in contact with corresponding portions of a groove bottom arranged between said inwardly directed thread.

4,679,459

## CONCAVE-CONVEX GEAR PAIR HAVING STAGGERED TEETH

Erwin F'Geppert, Oakland County, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 22, 1986, Ser. No. 855,869

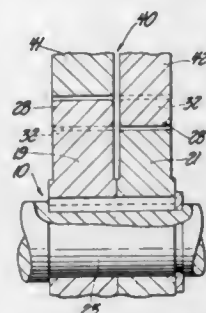
Int. Cl.<sup>4</sup> F16K 55/17

U.S. Cl. 74-460

1 Claim

1. In a speed change spur gear system, a pair of external spur gears having their teeth in meshed engagement; one spur gear having a relatively small diameter, and the other spur gear having a relatively large diameter; each spur gear being comprised of two axially aligned gear sections arranged so that the teeth on one gear section are circumferentially staggered from

the teeth on the other gear section by a one half tooth spacing; the teeth on each one gear section having pressure faces that are convex in the radial plane; the teeth on each other gear section having pressure faces that are concave in the radial plane; the two spur gears being oriented so that the concave tooth surfaces on one gear are engaged with the convex tooth surfaces on the other gear, and the convex tooth surfaces on said one gear are engaged with the concave tooth surfaces on the other gear; the concave pressure faces being designed to



serve as drive surfaces or driven surfaces, the convex pressure faces being designed to serve as driven surfaces or drive surfaces; the curvatures on the gear teeth pressure faces being such that a unidirectional wiping action is produced as the pressure faces move against one another; the gear sections in each spur gear having substantially the same width in the axial dimension; each gear section being formed separately from its companion gear section; each spur gear comprising a mounting shaft and a pair of separately-formed gear sections keyed onto said shaft.

4,679,460

## BRAKE LEVER DEVICE

Toshiharu Yoshigai, Higashi-Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Kabushiki Kaisha, Higashi-Osaka, Japan

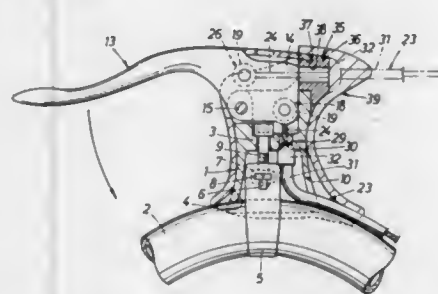
Filed Dec. 5, 1985, Ser. No. 804,784

Claims priority, application Japan, Feb. 2, 1985, 60-14483[U]

Int. Cl.<sup>4</sup> B62K 23/04; F16C 1/10

U.S. Cl. 74-489

7 Claims



1. A brake lever device comprising a cylindrical housing which is attached to project from a handle bar with a base opening of the housing removably held against the handle bar by a fastening band; a brake lever pivotally mounted on the housing for movement in a top of the housing; a Bowden cable connected for being operated by rotational operation of the brake lever;

wherein a first inner connector is provided on a lever base as a means for removably clamping an inner wire of the Bowden cable so as to draw the inner wire upwardly into the housing, upon rotation of the brake lever, and a second inner connector is provided on the lever base as a means for removably clamping the inner wire so as to draw the inner wire sidewardly into the housing, the inner wire

being selectively connectable to either of both said connectors;

wherein a port through which the Bowden cable is insertable is notched at a base edge of the housing close to the handle bar and a first outer receiver is provided in the housing at a position closer toward the handle bar than the first inner connector for receiving an outer sheath of the Bowden cable and through which the inner wire is introducible to the first connector, and a second outer receiver is provided on the top of the housing, at a position at an opposite side of the pivotal mounting of the lever from a hand manipulable portion of the lever, for receiving a terminal end of the outer sheath of the Bowden cable and through which the inner wire is introducible to the second wire connector; and

wherein the first inner connector comprises a freely rotatable roll connector having means for removably clamping a terminal end of the inner wire so that, upon pivoting of the lever, the inner wire, when introduced from said port will be pulled relative to the outer sheath, and the second inner connector comprises a freely rotatable roll connector having means for removably clamping said terminal end of the inner wire so that, upon rotation of the lever, the inner wire, when introduced at the housing top will be pulled relative to the outer sheath, and wherein a removable rubber cover is provided for mounting over said outer surface of said housing when the Bowden cable is introduced through said port and said cover being removed when the Bowden cable is introduced at the top of the housing.

4,679,461

## DRIVE DEVICE FOR TWO-SHAFT EXTRUDING MACHINE

Hideki Mizuguchi; Haruo Yamaguchi; Seigo Hanada, and Nobuo Mukuda, all of Hiroshima, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

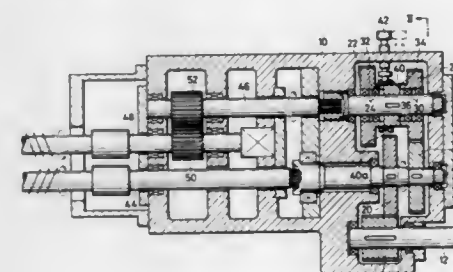
Filed Sep. 27, 1985, Ser. No. 780,755

Claims priority, application Japan, Oct. 17, 1984, 59-155743[U]

Int. Cl.<sup>4</sup> F16H 37/06, 3/14

U.S. Cl. 74-665 GA

7 Claims



1. In a two-shaft extruding machine, a drive device for driving a first (44) of two screw shafts of said machine directly and driving a second (48) of said screw shafts through an intermediate shaft (46) and a pair of meshed gears (50, 52), the improvement wherein said drive device comprises: a first shaft (12); a second shaft (14) disposed coaxially with said first screw shaft and rotatable integrally therewith; a third shaft (16) disposed coaxially with said intermediate shaft and rotatable integrally therewith; a first gear (18) rotatable integrally with said first shaft; a second gear (20) rotatable integrally with said second shaft and meshed with said first gear; a third gear (22) rotatably supported on said third shaft and meshed with said first gear; a fourth gear (26) rotatable integrally with said second shaft; a fifth gear (28) rotatably support on said third shaft and meshed with said fourth gear; a claw clutch (32, 34, 30, 40) for coupling a selected one of said third and fifth gears to rotate integrally with said third shaft, whereby said

second screw shaft can be selectively driven in one of the same and the opposite directions as said first screw shaft is driven; a casing (10) inside of which portions of said first, second and third shafts which respectively support said first, second and fourth, and third and fifth gears, are rotatably disposed; means for rotatably supporting said first, second and third shafts inside said casing and an operating mechanism (42) for operating said claw clutch from outside said casing.

4,679,462

## DIFFERENTIAL TRANSMISSION MECHANISM FOR A CONSTANT SPEED DRIVE

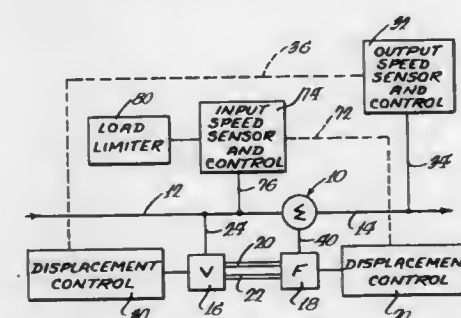
Stephen S. Baits, and Richard W. Reynolds, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 24, 1984, Ser. No. 685,474

Int. Cl.<sup>4</sup> F16H 47/04

U.S. Cl. 74-687

11 Claims



6. A hydraulic differential transmission comprising, a planetary gear differential having plural relatively movable elements with one element connected to a drive input, a second element connected to a drive output and a third element, a hydrostatic transmission having a pair of hydraulically interconnected hydraulic units, one of said hydraulic units being of variable overcenter displacement and connected to said drive input, the other of said hydraulic units being of variable displacement and connected to said third element of the planetary gear differential, means for controlling said variable overcenter displacement hydraulic unit to control the speed and direction of operation of the other hydraulic unit to maintain a constant speed of the drive output with a varying speed of the drive input between a first range of drive input speeds while said other hydraulic unit is set at maximum displacement, said other hydraulic unit operating between a maximum speed in one direction of operation and less than maximum speed in the other direction of operation as said first range of drive input speeds varies between a maximum and a minimum respectively, and means for selectively setting the displacement of said other hydraulic unit at any one of a plurality of different predetermined values whereby the displacement of said other hydraulic displacement unit may be reduced when the drive input is operating within a second range of drive input speeds lower than said first range to provide for operation of said other hydraulic unit at increased speed up to a maximum in said other direction of operation.

4,679,463

## LIMITED SLIP DIFFERENTIAL

Kiyotaka Ozaki, Yokosuka City; Shuujl Torii; Tomio Jiado, both of Yokosuka City, and Takashi Imaseki, Yokosuka City, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

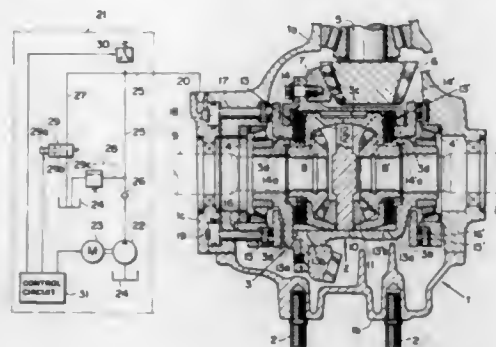
Filed Aug. 29, 1985, Ser. No. 770,567

Claims priority, application Japan, Aug. 31, 1984, 59-181797; Oct. 23, 1984, 59-223487

Int. Cl.<sup>4</sup> F16H 1/45.5

U.S. Cl. 74-711

5 Claims



1. A limited slip differential for a vehicle comprising: a casing adapted to be driven; a pair of side gears retained within said casing; a pinion gear retained within said casing and engaging said side gears to form a differential gear mechanism; a pinion mate shaft supporting thereon said pinion gear and having a cam portion; a pair of pressure rings retained within said casing having grooves engaged with said cam portion; a pair of friction clutches interposed between said pressure rings and said casing; and means for selectively applying a preload to said friction clutches through control of fluid pressure; a housing within which said casing is retained; a pair of roller bearings rotatably supporting said casing on said housing; and a pair of reaction plates having annular body portions mounted on said casing for movement axially of said casing but against rotation relative to same and each having a portion disposed outside of said casing and a portion projecting inside of same to engage corresponding one of said friction clutches, one of said reaction plates being rotatably supported on said housing and the other being operatively connected to said means to receive a fluid pressure therefrom.

4,679,464

## SHAFT-MOUNTED PLANETARY SPEED-REDUCING GEAR UNIT FEATURING A BALANCED, SELF-ALIGNING AND SELF-DISTANCING RING GEAR

Giovanni Castellani, 9, Via E. Orlandi, 41100 Modena, Italy

Filed Jan. 2, 1985, Ser. No. 688,829

Claims priority, application Italy, Jan. 24, 1984, 40007 A/84

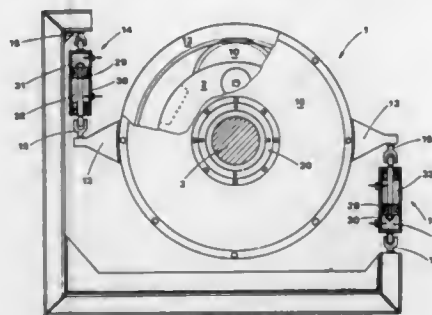
Int. Cl.<sup>4</sup> F16H 57/08

U.S. Cl. 74-788

2 Claims

1. A shaft-mounted planetary speed-reducing gear unit incorporating a balanced, self-aligning and self-distancing ring gear, and comprising a planet carrier (2) and an output shaft (3), with integral shafts (11) carrying planet pinions (10) which are turned by a sun gear (9) integral with a gear unit input shaft (8) and mesh with the internal teeth of a gear ring (12) fixed to a gear case wherein the gear ring (12) is connected by a pair of generally horizontal diametrically opposed appendages (13) to a pair of generally vertically-disposed hydraulic cylinders (14) located substantially parallel with each other at opposite sides

of the gear unit and suspended by way of ball-and-socket joints (15 and 16) between the gear ring and a rigid structure; a piston (29) stroking with a barrel (30) of each hydraulic cylinder (14) separates a low pressure oil chamber (31) connected to a low pressure hydropneumatic accumulator (33) by a relative throttle valve (35) and a ball check valve (37), from a high pressure oil chamber (32) connected to a high pressure hydropneumatic accumulator (34) by a relative throttle valve (36) and ball check valve (38); the planet carrier (2), cantilevered at the end



of the output shaft (3) of a driven machine (4) and equipped with a hub (24), joins with the gear unit input shaft (8) by way of a self-aligning roller bearing (17); the gear ring (12), whose internal teeth mesh with planet pinions (10) turning on the integral shafts (11) by way of self-aligning roller bearings, is fixed to the gear case embodied in two halves: a first half (18) at the driven machine side joined to the periphery of the hub (24) of the planet carrier (2) by way of a rotary oil seal (20) and a second half (19) joining with the gear unit input shaft (8) by way of a rotary oil seal (21).

4,679,465

## ECCENTRIC SWING GEAR TRANSMISSION

Yasuo Goto, 10-7, Minami-Ohi 4-chome, Shinagawa-ku, Tokyo, and Masao Adachi, 1598-68, Nogaya-cho, Machida-City, Tokyo, both of Japan

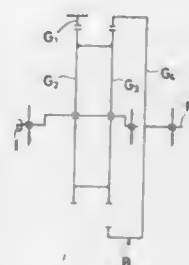
Filed Sep. 18, 1985, Ser. No. 777,427

Claims priority, application Japan, Sep. 20, 1984, 59-197256

Int. Cl.<sup>4</sup> F16H 1/28

U.S. Cl. 74-805

2 Claims



1. A transmission which comprises eccentric swing gears composed of a speed change internal gear and a speed change external gear each having a pressure angle of a tooth form within 30° to 45° and an addendum h satisfying the relation of  $m/2 > h > 0$  (m=module), said speed change external gear engaging with the speed change internal gear therein, and coupling gears composed of a coupling internal gear having a trapezoidal or a substantially trapezoidal tooth form and a coupling external gear similarly having a trapezoidal or a substantially trapezoidal tooth form and having the same number of teeth as said coupling internal gear, the coupling external gear engaging with the coupling internal gear therein, the tooth forms of said coupling internal and external gears being

molded so that the following relation may be satisfied between  $\theta_1$  and  $\theta_2$ :

$$\theta_2 = (360^\circ/Z \times \frac{1}{2}) + \theta_1$$

wherein Z represents the teeth number of said coupling internal gear and said coupling external gear, and  $\theta_1$  and  $\theta_2$  represent pressure angles of said coupling external gear and said coupling internal gear, respectively, said eccentric swing gears being connected to said coupling gears.

4,679,466

## LINE PRESSURE CONTROL DEVICE FOR HYDRAULIC CONTROL SYSTEM OF AUTOMATIC TRANSMISSION

Haruyoshi Kumura, Yokohama; Keiju Abo, Yokosuka; Hiroyuki Hirano, Yokohama; Sigeaki Yamamuro, Zushi, and Masaki Nakano, Kawasaki, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

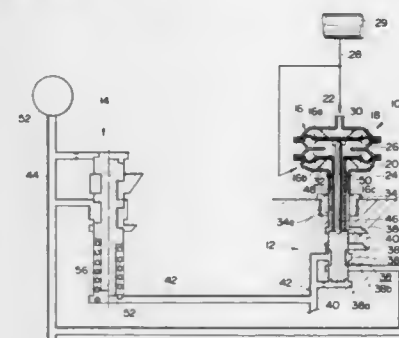
Filed Feb. 28, 1986, Ser. No. 835,060

Claims priority, application Japan, Mar. 8, 1985, 60-44581; Apr. 1, 1985, 60-66567

Int. Cl.<sup>4</sup> B60K 41/04; F01B 19/02

U.S. Cl. 74-863

12 Claims



1. A line pressure control device for a hydraulic control system of an automatic transmission, comprising: a fluid pump for producing a line pressure; line pressure passage means connected to said fluid pump for distributing said line pressure; a source of intake manifold vacuum; a vacuum diaphragm unit connected to said source of intake manifold vacuum for producing a variable force depending upon variations of said intake manifold vacuum; and a control valve connected to said line pressure passage means and having a valve spool movable to regulate said line pressure based upon said force applied thereto from said vacuum diaphragm unit; said vacuum diaphragm unit including a casing having an inner wall, parallel first and second diaphragms disposed within said casing, vacuum chamber means defined within said casing by one side of said first diaphragm and by one side of said second diaphragm, atmospheric pressure chamber means defined within said casing by other sides of both said first and said second diaphragms in such a manner that said first diaphragm is subject to a differential pressure by which it is urged away from said valve spool while said second diaphragm is subject to a differential pressure by which it is urged toward said valve spool, spring means for urging said first diaphragm toward said valve spool while said second diaphragm moves away from said valve spool, and rod means for connecting said first and second diaphragms to said valve spool, in which said first and second diaphragms, said spring means and said rod means are constructed and arranged so that said force reduces as said intake manifold vacuum increases and is supplied from said first diaphragm to said valve spool through said rod means when said intake manifold vacuum is lower than a first predetermined value and so

that said force increases as said intake manifold vacuum increases and is supplied from said second diaphragm to said valve spool through said rod means when said intake manifold vacuum is higher than a second predetermined value.

4,679,467

## BROKEN CORK REMOVER

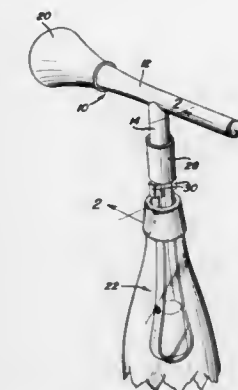
Thomas V. Delnero, 423 49th St., Apt. #1, West Palm Beach, Fla. 33407

Filed Mar. 20, 1986, Ser. No. 841,824

Int. Cl.<sup>4</sup> B67B 7/10

U.S. Cl. 81-3.07

2 Claims



1. A tool for use in removing corks from bottles, said tool comprising an elongated handle including an elongated laterally projecting stem outwardly from said handle intermediate its opposite ends, opposite sides of said stem defining outwardly opening recesses formed therein, a flexible loop-forming band having generally parallel closely laterally spaced apart opposite ends between which said stem is receivable, the opposite ends of said band including inward projections receivable within said recesses, a sleeve mounted on said stem and shiftable therealong between an inactive position spaced along said stem toward said handle from said recesses exposing the latter for receiving said projections therein and allowing withdrawal of said projections therefrom and an active position shifted along said stem away from said handle with said sleeve registered with and extending lengthwise across said recesses closely outward of the corresponding ends of said band to prevent withdrawal of said projections from said recesses, and outward projections carried by said band ends spaced from the corresponding inward projections and engageable by the end of said sleeve remote from said handle to define a limit of movement of said sleeve along said stem to said active position.

4,679,468

## POWER DRIVEN TRACK SHOE SPIKE SOCKET WRENCH

Barbara J. Gray, 14014 Goldenwood, San Antonio, Tex. 78249

Filed Jan. 15, 1982, Ser. No. 339,295

Int. Cl.<sup>4</sup> B25B 13/06, 21/00

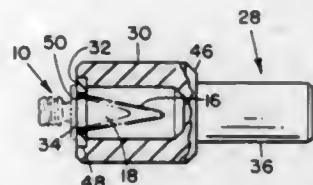
U.S. Cl. 81-121.1

6 Claims

1. A socket wrench particularly adapted for changing track shoe spikes wherein said track-shoe spikes have engaging surfaces formed thereon and have a threaded portion for mating with threaded socket members disposed in track-shoe soles, and wherein said socket wrench is specially adapted for use in combination with an electric drill, comprising: a first body member having an axial aperture formed therein of substantially circular shape adapted for insertion of the spike portion of a track-shoe spike; engaging means adapted to mate with the engaging surfaces of the track-shoe spikes and disposed in said axial aperture



for engaging the engaging surfaces of the track-shoe spikes and wherein said engaging means is formed in a circular insert fixedly attached to the interior surface of said axial aperture; and  
a second body member fixedly attached to said first body member and specially adapted for releasable engagement by the chuck of an electric drill, whereby a track-shoe spike may be changed by disposing said second body



member in the chuck of said electric drill, and disposing said first body member over the spike portion of a track-shoe spike until said engaging means engages the engaging surface of said track-shoe spike in such manner as to mate with the engaging surface about the circumference of the spike, and thereafter operating said electric drill so as to insert or remove said track-shoe spike from said socket member disposed in said track-shoe sole.

4,679,469

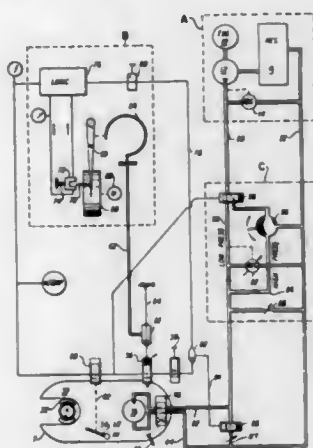
#### POWER TONGS CONTROLLER WITH PERSISTING TORQUE

William E. Coyle, Sr., 3300 Sharon St., Houma, La. 70360  
Continuation-in-part of Ser. No. 629,421, Jul. 10, 1984, Pat. No. 4,579,024, and Ser. No. 526,611, Aug. 26, 1983, which is a continuation-in-part of Ser. No. 487,048, Apr. 21, 1983, Pat. No. 4,552,041. This application Mar. 28, 1986, Ser. No. 845,521 The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> B25B 23/151

U.S. Cl. 81—470

3 Claims



1. A pipe make-up system comprising fluid-driven power tongs having an inlet for driving fluid and an outlet for exhaust fluid, means for supplying fluid under pressure to said inlet, a normally closed valve disposed in a shunt between said inlet and said outlet, a transducer connected to said tongs for generating a signal as a function of tongs torque, means responsive to said transducer for opening said valve at a predetermined maximum tongs torque, thereby relieving the pressure differential between said inlet and said outlet, and

means for choking flow through said shunt so as to maintain residual tongs torque even after said valve is opened.

4,679,470

#### GUIDE-BAR DEVICE FOR MULTI-SPINDLE LATHE

Markus Geiser, Pery, and Claude Vandevor, La Neuveville, both of Switzerland, assignors to Sameca SA, Lambolig, Switzerland

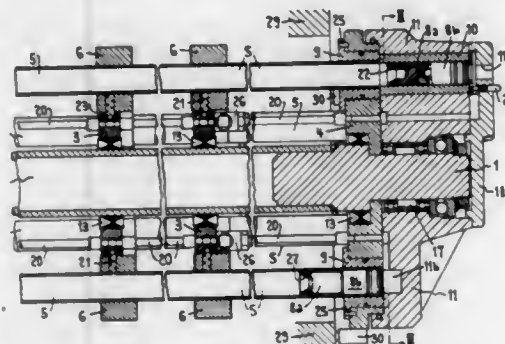
Filed Oct. 11, 1983, Ser. No. 540,383

Claims priority, application European Pat. Off., Nov. 5, 1982, 82810472.9

Int. Cl.<sup>4</sup> B23B 13/04

U.S. Cl. 82—2.7

17 Claims



1. A guide-bar device for a multi-spindle lathe operable to simultaneously machine a plurality of bar of stock, said guide bar device including a rotatable barrel carried by and operable to be indexed by the multi-spindle lathe so as to progressively perform various machining operations on said bar stock as said barrel rotates, said guide-bar device further comprising:

- a central shaft;
- front disk means coaxially disposed about and supporting said shaft and adapted to be supported by said lathe;
- a rear disk coaxially disposed about and supporting said shaft and adapted to be supported by said lathe;
- at least one intermediate disk coaxially disposed about said central shaft;
- a plurality of guiding tubes removably supported about said central shaft by means of said intermediate disk, said guiding tubes enclosing a bar stock to be machined;
- hydraulic means, for simultaneously supporting and advancing the bar stock in each of said guiding tubes, said hydraulic means including means for introducing hydraulic fluid into said guiding tubes and means for rotatingly supporting a rear part of the bar stock in each of said guiding tubes and for progressively advancing the bar stock in each of said guiding tubes during said machining;
- at least one source of hydraulic fluid;
- a hydraulic fluid distributor connected to said source of hydraulic fluid; said hydraulic fluid distributor including means for distributing the hydraulic fluid to said hydraulic fluid introducing means and to said means for rotatingly supporting and advancing the bar stock.

4,679,471

#### LATHE FOR GENERATING ASPHERICAL SURFACES

Stirling G. Wauchope, and Malcolm J. McLean, both of Oxford, England, assignors to Robertson Engineering (Thame) Limited, Oxford, England

PCT No. PCT/GB84/00317, § 371 Date May 14, 1985, § 102(e) Date May 14, 1985, PCT Pub. No. WO85/01237, PCT Pub. Date Mar. 28, 1985

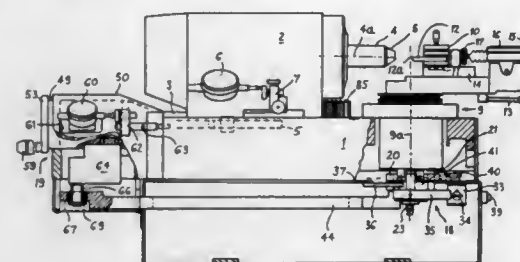
PCT Filed Sep. 19, 1984, Ser. No. 740,271

Claims priority, application United Kingdom, Sep. 19, 1983, 8325027

Int. Cl.<sup>4</sup> B23B 5/40

U.S. Cl. 82—12

12 Claims



1. A lathe for cutting an aspherical surface on a workpiece, comprising in combination:  
headstock means having rotatable spindle means adapted to mount a workpiece for rotation about the axis of said spindle means,  
radius cartridge means including tool posts means and pivot means for said radius cartridge means, whereby said radius cartridge means is swingable on said pivot means and is adapted to move a cutting tool mounted in said tool post means in contact with said workpiece and along an arc of predetermined radius transversely to said spindle axis of said headstock means,  
said headstock means and said radius cartridge means being mounted for linear movement relatively to one another substantially parallel to said spindle axis of said headstock means, and  
coupling means coupled to said pivot means and operated in response to turning of said pivot means upon swinging of said radius cartridge means to produce and control linear displacement of said headstock means and said radius cartridge means relatively to one another, whereby said cutting tool mounted in said tool post means is arranged to cut a predetermined aspherical surface on said workpiece.

4,679,472

#### METHOD AND APPARATUS FOR MACHINING THE CIRCUMFERENCE OF OUT-OF-ROUND WORKPIECES, PARTICULARLY PISTON RINGS

Otto Feller, Leichlingen; Manfred Brocksieper, Hückeswagen, and Rolf Lückger, Cologne, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Dec. 17, 1985, Ser. No. 809,871

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447234; Dec. 7, 1985, 3543407

Int. Cl.<sup>4</sup> B23B 5/26, 5/24

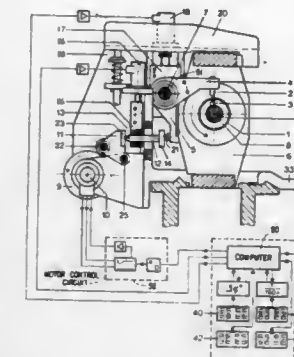
U.S. Cl. 82—19

21 Claims

1. In an apparatus for machining the circumference of a workpiece to provide the workpiece with a predetermined out-of-round contour, the apparatus including a copying disc having a basic out-of-round contour, a first motor to rotationally drive the copying disc, a tool handler which is mounted to be radially displaceable relative to the workpiece axis, transfer means including a double lever for transferring the basic out-of-round contour to the tool holder, and a second motor running synchronously with the first motor to rotationally drive the workpiece, the improvement wherein:

the predetermined out-of-round contour deviates from the basic out-of-round contour of the copying disc by prede-

termined lead or lag difference angle values, wherein the stator or one of the motors is rotatably mounted, and wherein the apparatus further comprises means for con-



trolling the rotary position of said stator of said one of the motors by the respective lead or lag difference angle values.

4,679,473

#### SHEARING MACHINE

Tadashi Hirata, Yamato; Hidekatsu Ikeda, Hatano; Yoshitaka Arima, and Yoshihiko Kashiwara, both of Isehara, all of Japan, assignors to Amada Company, Limited, Japan

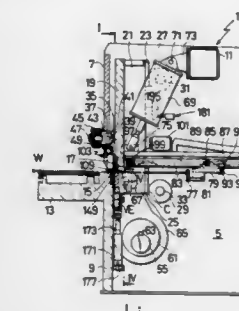
Filed Nov. 6, 1984, Ser. No. 668,837

Claims priority, application Japan, Nov. 9, 1983, 58-172285

Int. Cl.<sup>4</sup> B23D 33/08, 33/10, 15/06

U.S. Cl. 83—157

20 Claims



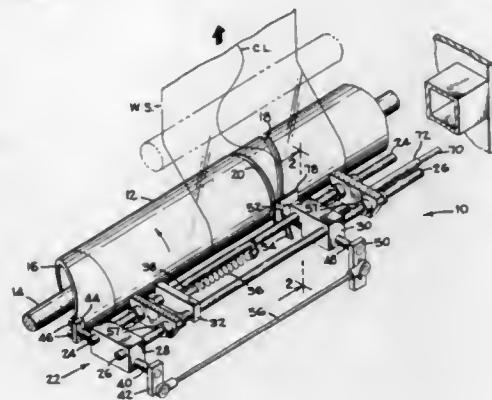
1. A shearing machine, comprising:

- a frame;
- a work-table provided integrally on the frame;
- a lower blade detachably fixed to the work-table at the level of the work-table;
- an upper blade;
- a ram supported on said frame for vertical movement with respect to said lower blade, said ram holding the upper blade for performing shearing operations in cooperation with the said lower blade;
- upper and lower rear guide means provided on the frame to guide the upper and lower rear portions of the ram;
- front guide means supported on the frame above the work-table to guide the front portion of the ram;
- a driving means for driving the ram supported on the frame beneath the ram but slightly more rearward than the plane of the vertical movement of the ram; and
- connecting rod means connecting the driving means to the ram at a position which is higher than the lower guide means and lower than the front guide means.

4,679,474  
**CUTTING THERMOPLASTIC WEBS**  
 Emiel Lambrecht, Gijzegem-Aalst, Belgium, assignor to FMC  
 Corporation, Chicago, Ill.  
 Filed Dec. 6, 1985, Ser. No. 806,234  
 Int. Cl.<sup>4</sup> B26D 7/10

U.S. Cl. 83-171

## 2 Claims



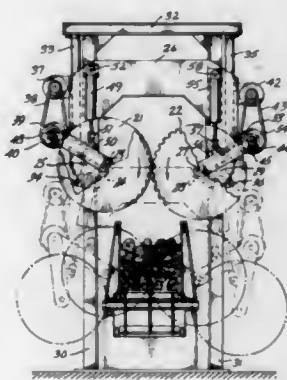
1. In a thermoplastic web slitting machine having a rotatable drum supporting a web passing thereover and a knife having its cutting edge received in a continuous groove formed in the surface of the drum and a knife holder for mounting said knife so that its cutting edge is maintained in the circumferential groove, the improvement comprising:

a source of heated fluid including a heater, a pressure regulator and a flow regulator;  
 conduit for receiving and delivering said heated fluid, said conduit having a portion thereof slidably mounted in an L-shaped pipe;  
 a discharge hood secured to the end of said L-shaped pipe whereby heated fluid flowing thereto is directed to said knife holder.

4,679,475  
LOG-BUNDLING AND CUTOFF APPARATUS  
Luis F. Antezana, Mercer Island, Wash., assignor to Nicholson  
Manufacturing Corporation, Seattle, Wash.  
Continuation of Ser. No. 705,954, Feb. 27, 1985, abandoned.  
This application Oct. 31, 1986, Ser. No. 924,103  
Int. Cl.<sup>4</sup> B27B 1/00, 5/02

U.S. Cl. 83-420

### 8 Claims



1. Cutoff mechanism for cutting bundled logs into bolts comprising a deep trough conveyor having a generally flat bottom and opposite upright sides with a rise at least approximately as great as the horizontal width of said conveyor for receiving a plurality of logs with their lengths generally in registration to form a log bundle in said trough conveyor

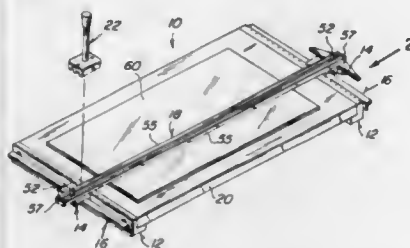
composed of several superposed layers of logs, and log bundle cutoff means adjacent to and beyond the discharge end of said deep trough conveyor and including a frame having two guide columns spaced apart horizontally a distance greater than the width of said deep trough conveyor, support means guided for elevational movement by said guide columns, two circular cutoff saws mounted on said support means in side by side substantially coplanar relationship with adjacent portions of their peripheries in overlapping relationship substantially centrally over said trough conveyor, and actuating means for moving said support means downward relative to said frame to effect descent of said cutoff saws from an upper position in which the overlapping portions of said saws are higher than the logs in said trough conveyor, for cutting bolts as the support means descend first from the logs in the upper outer corners of the bundle of logs in said deep trough conveyor and then from logs inward and downward from such upper outer corners to enable outer bolts to fall away from the log bundle before inner bolts for freeing inner bolts from laterally outward restraint on being severed, to a lower position in which the overlapping portions of said cutoff saws are lower than the bottom of said trough conveyor for cutting bolts from the logs in the lowest layer of the log bundle in said deep trough conveyor from its outer edges toward its central portion.

4,679,476  
**SCORING GUIDE AND GLASS CUTTER SYSTEM**  
 Edward Abreu, 5707 13th Ave. - 2nd Floor, Brooklyn, N.Y.  
 11219

Filed Apr. 3, 1986, Ser. No. 847,771  
Int. Cl.<sup>4</sup> B26D 3/08

U.S. Cl. 83-886

## 2 Claims



1. A scoring guide and glass cutter system comprising:

- (a) a pair of base members with an L-shaped cross section of predetermined length;
- (b) a cutting board disposed in said base members;
- (c) a guide mechanism carried by said base members;
- (d) a guide bar mounted on said guide mechanism; and
- (e) a holder containing a glass cutter for disposition in said guide bar for coaction with a plate of glass, wherein said holder is comprised of:
  - (i) a handle tubular in form within which is positioned the glass cutter; and
  - (ii) a base fixedly attached to said handle with a pair of slots perpendicular to said handle, which coact with said guide bar and through which the glass cutter extends to coact with the glass plate when plate is positioned on said cutting board.

4,679,477  
PERCUSSIVE ACTION SILENT ELECTRONIC  
KEYBOARD

Charles Monte, 901 E. Walnut Ave., Burbank, Calif. 91501  
Filed Jun. 20, 1985, Ser. No. 746,844  
Int. Cl.<sup>4</sup> G10H 1/34, 1/46

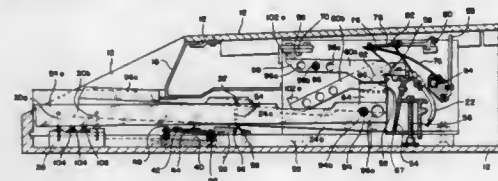
U.S. Cl. 84-1.1

### 6 Claims

1. A percussive action silent electronic keyboard for play as a musical instrument and providing electrical input signals for electronic music synthesis equipment which generates music

electronically in response to play action of the keyboard, said keyboard comprising:

a keyboard array of a plurality of depressable pivoted playing keys adjacently arranged as a musical keyboard, each said key communicating with a pivoted, freely moveable silent hammer in a cam and follower arrangement, each said hammer comprising a butt portion and a flexible bridal strap attached at one end to said butt portion, and further including a leaf spring having one end secured to said housing and the other end free, another end of said

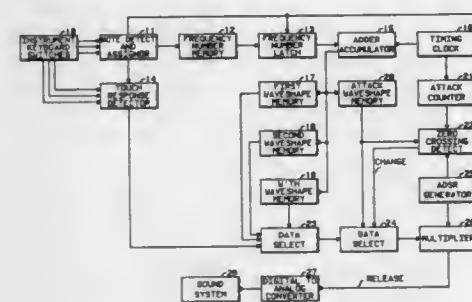


stop means for stopping the momentum of each silent hammer which is caused to move freely about its pivot in a limited arc from a rest position to an impact position by following a camming surface of its corresponding key resulting from depressing of the key during playing action, electrical switch means responsive to the playing action of said key for generating and supplying electrical signals indicative of said action to said electronic music synthesis equipment with which said keyboard may be used to generate music.

**4,679,478**  
**TOUCH RESPONSIVE MUSICAL TONE GENERATOR**  
 Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan  
 Filed Jan. 6, 1986, Ser. No. 816,466  
 Int. Cl.<sup>4</sup> G10H 1/057, 1/46, 7/00

U.S. Cl. 84-1.1

## 23 Claims



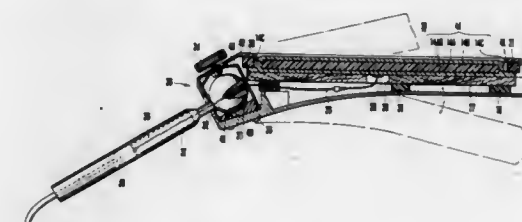
1. In combination with a keyboard operated musical instrument having an array of keyswitches, apparatus for producing a musical tone having a spectrum which is responsive to the manner in which the keyswitches are actuated comprising;

- a keyswitch state detect means wherein a detect signal is generated in response to each actuated keyswitch in said array of keyswitches;
- an encoding means for encoding each said detect signal to generate a detect data word which identifies each said actuated keyswitch corresponding to a generated detect signal;
- a touch response means whereby a touch response signal is generated in response to the manner in which a keyswitch is actuated;
- an assignor means responsive to each said detect data word whereby one of a plurality of tone generators is assigned to generate a musical tone associated with a corresponding keyswitch contained in said array of keyswitches and

whereby said touch response signal and said detect data word are furnished to the tone generator assigned to the corresponding keyswitch; and

- a plurality of tone generators each of which comprises, an attack and decay waveshape memory means for storing sample values of a musical waveshape including the attack and decay phases of said musical waveshape,
- a plurality of waveshape memory means each storing a plurality of sample values for a period of a musical waveshape having a preselected spectrum,
- a memory addressing means responsive to said furnished detect data word whereby data values are read out from .. said attack and decay waveshape memory means and from said plurality of waveshape memory means at a memory address advance rate corresponding to the associated actuated keyswitch in said array of keyswitches,
- a first data select means responsive to said furnished touch response signal whereby the plurality of sample values read out from a corresponding one of said plurality of waveshape memory means is selected,
- a transition means whereby a change signal is generated in response to data values read out of said attack and decay waveshape memory means,
- a second data select means whereby if said change signal is generated said plurality of sample values selected by said first data select means are selected and whereby if said change signal is not generated said data values read out from said attack and decay waveshape memory means are selected,
- a conversion means for producing a musical tone responsive to the data selected by said second data select means thereby producing a musical tone having a spectrum which is responsive to the manner in which the keyswitch associated with an assigned tone generator is actuated.

4,679,479  
ELECTRONIC DRUM  
Hisakazu Koyamato, Hamamatsu, Japan, assignor to Nippon  
Gakki Seizo Kabushiki Kaisha, Hamatsu, Japan  
Filed Apr. 29, 1986, Ser. No. 857,165  
Claims priority, application Japan, May 1, 1985, 60-92352  
Int. Cl.<sup>4</sup> G10H 3/14  
U.S. Cl. 84—1.04 11 Claims



1. An electronic drum comprising:
  - a surface layer having a predetermined hardness for generating a vibration by a performer's strike thereto;
  - a base layer having a predetermined hardness formed to be spaced apart from said surface layer by a predetermined distance;
  - a coupling portion having a predetermined hardness for transmitting said vibration to said base layer so that said base layer is vibrated by said performer's strike;
  - an impact absorbing layer which fills the space defined by said surface layer, said coupling portion and said base layer for absorbing an impact of said performer's strike; and
  - a detection element mounted under said base layer for detecting the transmitted vibration via said coupling portion and for generating a detection signal responsive to said



transmitted vibration so that said detection signal is responsive to said performer's strike.

4,679,480

# **TONE SIGNAL GENERATION DEVICE FOR CHANGING THE TONE COLOR OF A STORED TONE WAVESHAPE IN AN ELECTRONIC MUSICAL INSTRUMENT**

Hideo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

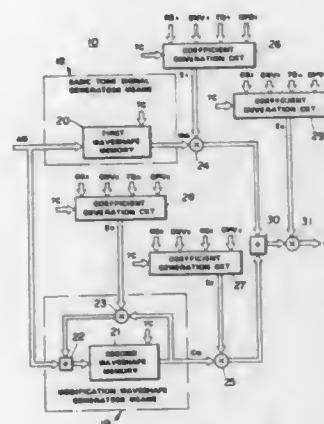
Filed Aug. 27, 1985, Ser. No. 770,308

Claims priority, application Japan, Aug. 31, 1984, 59-180429

Int. Cl.<sup>4</sup> G10H 1/12, 7/00

U.S. Cl. 84-1.22

9 Claims



1. A tone signal device comprising: basic tone signal generation means comprising a first waveshape memory for storing basic waveshape data representing a basic waveshape having plural periods and tone color which varies with time, said basic waveshape being formed from a part or plural parts of a full tone waveshape representing a musical tone from the start of sounding of the tone to the end thereof, and for generating a basic tone signal in accordance with said basic waveshape data read out from said first waveshape memory; modification signal generation means comprising a second waveshape memory for storing modification waveshape data representing a modification waveshape having plural periods and tone color which varies with time, and for generating a modification signal in accordance with said modification waveshape data read out from said second waveshape memory; weighting means for weighting said basic tone signal and said modification signal by individually using separate weighting coefficients; weighting coefficient generation means for generating said separate weighting coefficients in response to tone color change parameters; and combining means for combining said weighted basic tone signal and weighted modification signal to produce a modified tone signal.

4,679,481

# **SOUND ENHANCING DEVICE**

Richard Lozon, 14952 Stoneham, Riverview, Mich. 48192

Filed Apr. 18, 1986, Ser. No. 853,664

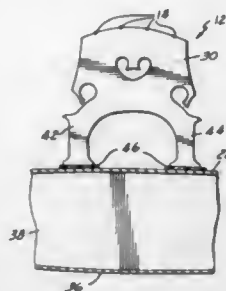
Int. Cl.<sup>4</sup> G10D 3/04

U.S. Cl. 84-309

10 Claims

1. A sound enhancing device for a stringed musical instrument having a body portion and a plurality of strings running transversely to the axis of the stringed musical instrument along its top under tension, comprising: a bridge being located between the strings and body portion of the stringed musical instrument; and a bridge pad of a cold flowable material being situated be-

tween the bridge and the body portion of the stringed musical instrument for enhancing the mating relationship of the bridge to the body portion of the stringed musical instrument, whereby when the strings are under tension the bridge pad, as a result of the tension, cold flows to



conform and distort to the contacting surfaces of the body portion of the stringed musical instrument and the bridge so that the string vibrations will be transmitted through the bridge to the body portion of the stringed musical instrument with clarity, tone and richness of the sound of the stringed musical instrument.

4,679,482

# **PIANO KEYBOARD SHIELD**

Edward G. Simanski, 3005 Spruce Ave., Altoona, Pa. 16601

Continuation-in-part of Ser. No. 521,066, Aug. 8, 1983, which is

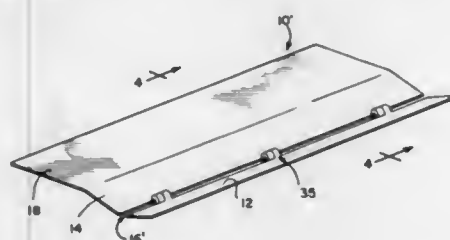
a division of Ser. No. 385,509, Jun. 7, 1982, Pat. No. 4,419,921.

This application Jul. 23, 1985, Ser. No. 757,883

Int. Cl.<sup>4</sup> G09B 15/06

U.S. Cl. 84-467

12 Claims



1. A keyboard shield adapted to be attached to a piano of the type having a laterally extending gap or slot in a vertical section located at the rear of the keyboard, said shield, when attached to the piano, including a cover section interrupting a player's line of vision to at least a portion of said keyboard, the improvement wherein said shield includes a rear section engageable within said slot for attaching the shield to the piano, said rear section being continuous laterally and connected to said cover section by a hinge.

4,679,483

# **DISPENSER AND DISPENSING CASSETTE**

Josef B. V. Wrana, Spånga, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1986, Ser. No. 827,120

Int. Cl.<sup>4</sup> B64D 1/02; F41F 5/00; H01Q 17/00

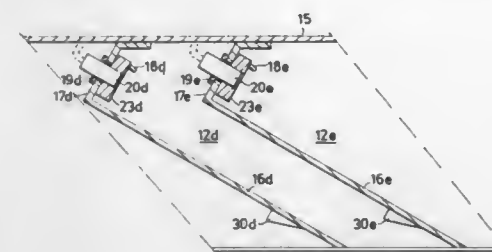
U.S. Cl. 89-1.51

4 Claims

1. An improved dispenser adapted for mounting on an air-plane wing for launching radar deflecting elements, such dispenser comprising a plurality of cells containing such deflecting elements and an electronic fire control unit for supplying firing signals to such cells to cause such deflecting elements to

be dispensed therefrom, such improvement being characterized in that each of said cells comprises:

- a dispensing cassette detachably supported therein and containing at least two cartridges which respectively contain such deflecting elements, each cartridge having an electrical contact at one end thereof for receiving a firing signal for launching the deflecting elements therein;
- electrical coupling means connected to said electronic fire control unit;



guide means in said cell adapted to engage corresponding guide means on said cassette when said cassette is substantially fully inserted into said cell, such cell guide means and cassette guide means cooperating to ensure that when inserted in said cell said cassette is positioned therein so that the electrical contacts of the cartridges in the cassette engage said electrical coupling means to receive said firing signals from said fire control unit; and locking means for detachably securing said cassette within said cell.

4,679,484

# **ELECTROMAGNETIC LAUNCHER RAIL TEMPERATURE REDUCTION THROUGH CONTROLLED BREECH CURRENT INJECTION**

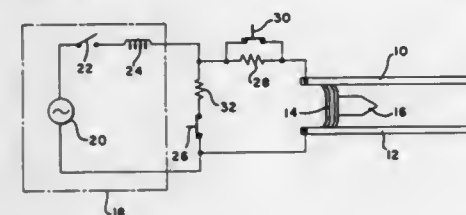
George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 6, 1984, Ser. No. 638,329

Int. Cl.<sup>4</sup> F41F 1/02

U.S. Cl. 89-8

4 Claims



1. An electromagnetic projectile launching system comprising:

- a pair of conductive rails;
- means for conducting current between said rails and for propelling a projectile along said rails;
- a source of electric current; and
- a resistor connected electrically in parallel with a switch to form a circuit which is electrically connected between said rails such that the opening of said switch commutates current from said current source to said rails, wherein said resistor is composed of temperature dependent resistive material which increases in resistance as its temperature rises, thereby increasing the current injected into said rails.

4,679,485

# **BALLISTIC TOLERANT DUAL LOAD PATH BALLSCREW AND BALLSCREW ACTUATOR**

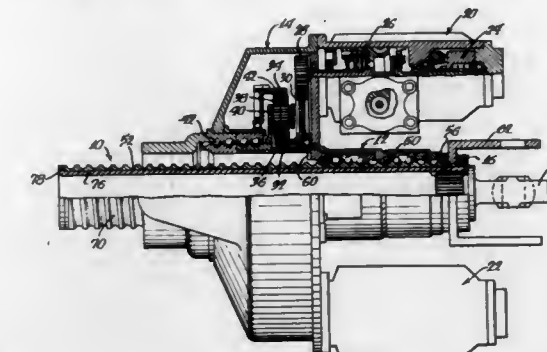
Jeffrey D. Nelson, Rockford, and John F. Scanlon, Roscoe, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 27, 1984, Ser. No. 686,983

Int. Cl.<sup>4</sup> F41H 5/04; F16H 1/18

U.S. Cl. 89-36.02

38 Claims



1. A ballistic tolerant dual load path ballscrew actuator comprising, a selectively driven ballnut and a ballscrew drivingly connected to said ballnut, said ballscrew having an outer tubular member of a hardened metal material to withstand high contact loads and having an external helical ball groove providing a primary load path and an inner tubular member closely fitting within and fixed to the outer tubular member to provide a secondary load path upon cracking of the outer tubular member by a projectile passing through the outer tubular member, said inner tubular member being formed of a rigid ballistic tolerant composite nonmetallic material to maintain its structural integrity when contacted by said projectile which has passed through and caused cracking of the outer tubular member and which, by being fixed to the outer tubular member, maintains the overall length of the outer tubular member and prevents propagation of said crack.

4,679,486

# **COMBINATION GUN WITH REPEATER MECHANISM**

Viggo Landaas, 3740 Lunde, Norway

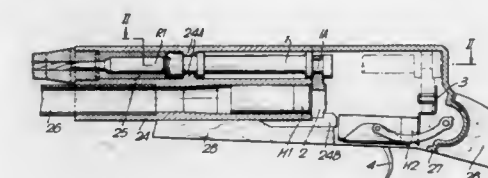
Filed Mar. 4, 1985, Ser. No. 708,050

Claims priority, application Norway, Mar. 7, 1984, 840857

Int. Cl.<sup>4</sup> F41F 11/04, 13/04

U.S. Cl. 89-126

4 Claims



1. A gun having a first barrel and a second barrel of different caliber, each barrel having a chamber end, a receiver having sections for guiding and latching first and second interconnected breech blocks, a repeater mechanism, a barrel selector mechanism which brings one barrel into an inoperative state while simultaneously putting the other barrel into an operative state, characterized in that the chamber end of said first barrel is located forward relative to the chamber end of the second barrel by a distance at least corresponding to the overall length of the longest cartridge to be used by one of the barrels, and that the length of the breech block of the second barrel and the corresponding receiver section is reduced at least by the same

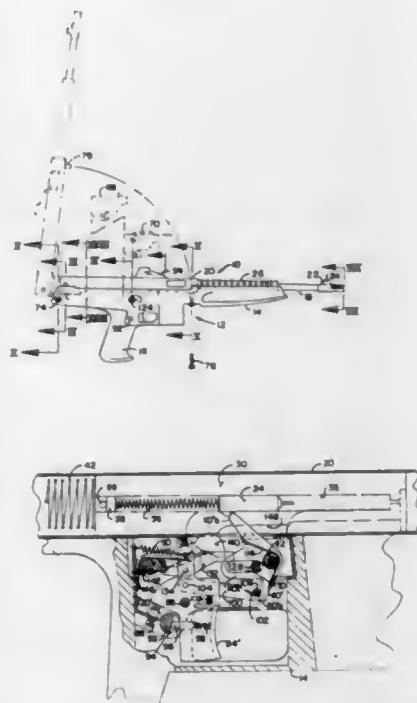
distance, thereby achieving weight savings and overall length reduction.

**4,679,487**  
**PROJECTILE FIRING WEAPON WITH A**  
**REPLACEABLE FIRING MECHANISM ACTUATOR**  
**CASSETTE**

Walter R. Houseman, League City, Tex., assignor to Custom Technical Enterprises, League City, Tex.  
Filed Jan. 12, 1984, Ser. No. 619,926  
Int. Cl. F41D 11/02

U.S. Cl. 89-140

3 Claims



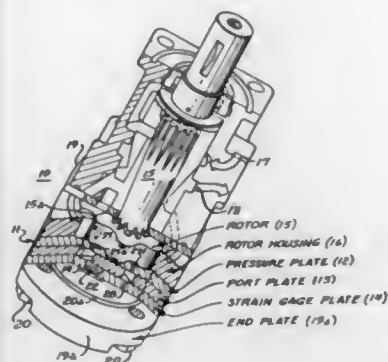
1. A replaceable firing mechanism actuator cassette for a projectile firing weapon having a barrel, grip means and a firing pin comprising:

- a cassette body defining an interior space;
- a trigger pivotally attached to the cassette body;
- a sear pivotally attached to the cassette body, a portion of the sear projecting from the cassette body so as to engage a firing pin of the weapon;
- a pawl attached to the trigger and engaging the sear such that, as the trigger is pivoted about its attachment, the pawl causes the sear to pivot about its attachment to thereby disengage it from the firing pin;
- first spring means biasing the sear toward a first position in which it engages the firing pin;
- a pawl cam surface defined by the pawl;
- a pawl actuator pin attached to the cassette body such that it bears against the pawl cam surface, the interengagement of the pin and the pawl cam surface causing the pawl to disengage from the sear after a predetermined amount of travel;
- a trip actuator lever pivotally attached to the cassette body and defining a trip lever cam surface;
- a sear actuator link pivotally attached to the trigger and bearing against the trip lever cam surface; and,
- selector means to engage and disengage the sear actuator link and the sear, such that the weapon operates in a fully automatic mode when the sear actuator link and the sear are engaged, and a semi-automatic mode when the sear actuator link and the sear are disengaged.

**4,679,488**  
**INTEGRAL ROTATIONAL DISPLACEMENT SENSOR**  
**FOR AN HYDRAULIC MOTOR**  
Gary Krutz, 605 Northridge Dr., West Lafayette, Ind. 47906,  
and David L. Hansen, 909 E. 24th St., Apt. C, Hutchinson,  
Kans. 67502

Filed Dec. 4, 1985, Ser. No. 805,119  
Int. Cl. F01B 31/12

22 Claims



1. Apparatus for determining a variety of operating parameters, including incremental rotational movement, speed and torque, of a fluid motor having a rotating assembly including a rotor and a rotor housing comprising: pressure sensing means and pressure coupling means interposed between said rotating assembly and said pressure sensing means for communicating to said pressure sensing means variations in pressure produced in a plurality of areas within the motor in response to rotation of the rotor within the rotor housing, said pressure sensing means producing a pressure signal indicative of the pressure variations, and said pressure coupling means including a plurality of apertures for selectively coupling pressure variations from at least two of said areas at a time to said pressure sensing means whereby the pressure signal produced by said pressure sensing means is defined by at least three states, permitting at least incremental movement of the rotor to be determined from the pressure signal.

**4,679,489**  
**AUTOMATIC LEVELING SYSTEM FOR BLAST HOLE**  
**DRILLS AND THE LIKE**

Richard A. Jasinski, Oak Creek, and Donald M. Mains, Greendale, both of Wis., assignors to Becor Western Inc., South Milwaukee, Wis.

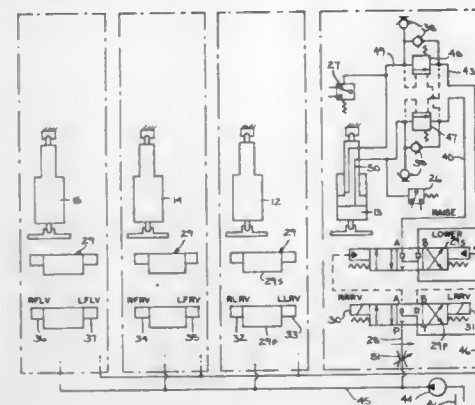
Filed Nov. 4, 1985, Ser. No. 794,778  
Int. Cl. F15B 21/02, 11/22

U.S. Cl. 91-36

13 Claims

1. A leveling system for a blast hole drill or the like having a base plane comprising:  
jack means spaced from one another defining first and second axes in the base plane which are generally transverse to each other;  
fluid supply means operatively connected to said jack means;  
valve means connected to said fluid supply means and said jack means;  
sensor means adapted to continuously detect the attitude of the base plane along the first and second axes;  
said sensor means including a first sensor device to detect an attitude within a fine level range and a second sensor device to detect an attitude outside a coarse level range; and  
control means operatively connected to said sensor means and said valve means to provide a raising or lowering mode of operation of said jack means in conjunction with

said first sensor device and a constant releveling mode of operation in conjunction with said second sensor device



wherein said constant releveling is defined by an interruption of said raising or lowering mode.

**4,679,490**  
**OSCILLATOR RECIPROCATION CONTROL SYSTEM**  
**FOR PISTON MOTOR**

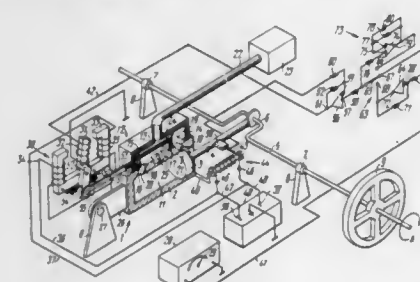
Leonid P. Russin, ulitsa Nelidovskaya, 22, kv. 18, Moscow, U.S.S.R.

Division of Ser. No. 318,569, Nov. 5, 1981, Pat. No. 4,487,107, which is a continuation of Ser. No. 45,674, Jun. 5, 1979, abandoned. This application Sep. 12, 1984, Ser. No. 649,668

Int. Cl. F01L 15/00, 33/00; F15B 13/16

U.S. Cl. 91-189 R

4 Claims



1. Apparatus for controlling the revolution of the drive shaft of an engine comprising:

- an actuating cylinder;
- a piston with rod, serving as an actuating member, mounted for reciprocation inside said actuating cylinder and dividing the cavity of said cylinder into a rodless cavity and a rod cavity;
- a source of working fluid;
- a valve distributor serving as a switching member and communicating each one of said cavities, namely, the rod cavity and the rodless cavity, with said source of working fluid;
- a valve in said valve distributor;
- a crank member serving as a converter of reciprocation of said piston to revolution of a drive shaft and effecting the kinematic coupling of said rod with said drive shaft;
- an electric oscillator whose frequency is variable in accordance with a preset r.p.m. of said drive shaft;
- a converter in the form of a linear dynamic link coupled electrically with said oscillator and mechanically with said valve of said valve distributor;
- a transducer of the current value of the piston position relative to its neutral position, said transducer being coupled by means of negative electric feedback to said converter; said negative electric feedback being formed by a first operational amplifier having a non-inverting input connected to

said oscillator, an inverting input connected to said transducer, and an output connected to said converter;  
a three-way switch for stopping the engine in the neutral position of said piston and for changing the direction of said drive shaft rotation, said switch being connected to a circuit formed by said electric oscillator and said first operational amplifier; and  
a second operational amplifier, said three-way switch in one of its positions acting to break said circuit formed by said oscillator and said first operational amplifier, in a second position acting to directly connect said oscillator and said amplifier, and in a third position being connected with an output of said second operational amplifier whose inverting input is connected to said electric oscillator.

**4,679,491**  
**REACTION MECHANISM FOR TANDEM BRAKE**  
**BOOSTER**

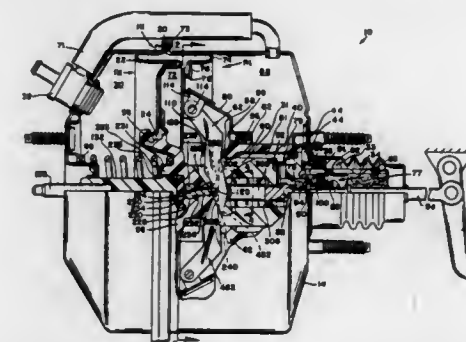
Robert K. Wilson, Granger, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 4, 1985, Ser. No. 795,304

Int. Cl. F15B 9/10

U.S. Cl. 91-369 A

8 Claims



1. A reaction mechanism for a tandem brake booster having first and second walls that move in opposite directions within a cavity to produce first and second output forces in response to an input force applied to a control member and a force transmitting lever arrangement through which said second output force is presented to an output member and combined therein with said first output force to create a joint output force, said force transmitting lever arrangement having first and second arm means each of which has a first end connected to said second wall, a fulcrum, and a second end connected to said output member, each of said arm means having a first cam surface that engages said fulcrum and a second cam surface that engages said output member, said first and second cam surfaces directing said second output force along a force vector substantially parallel to said output member to prevent the introduction of forces that may rotate said first wall, the improvement comprising:

- a first plunger carried by said first wall and having a projection that extends therethrough, said projection having a slot extending from the end thereof for a set distance;
- a second plunger carried by said control member; and  
reaction lever means having third and fourth arm means each of which has a first end connected to said second wall and a second end located in said slot in said projection on said first plunger, said first plunger responding to said joint output force by moving to provide said second end of said third and fourth arm means with a reaction force, said reaction force being transmitted into said second plunger to balance said input force; said slot providing a guide for the second ends of the third and fourth arm means to assure that the reaction force is transmitted to the second plunger without the introduction of moments.



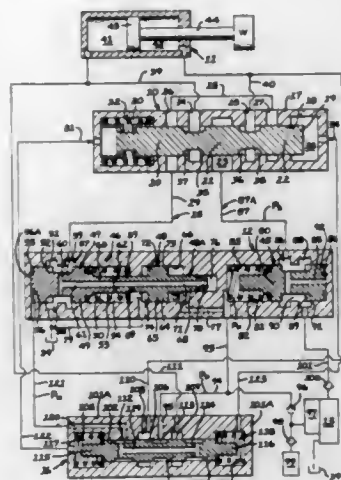
4,679,492

**COMPENSATED FLUID FLOW CONTROL VALVE**  
Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Inc., Peoria, Ill.

Filed Jul. 21, 1986, Ser. No. 887,590  
Int. Cl.<sup>4</sup> F15B 13/08

U.S. Cl. 91—420

38 Claims



1. A valve assembly interposed between a fluid motor operable to control positive and negative loads and subjected to positive and negative load pressure, fluid exhaust means, including reservoir means and a source of pressure connected to a pump, first valve means operable to selectively interconnect said fluid motor with said exhaust means and said source of pressure, positive load pressure control means between said fluid motor and said pump, negative load pressure compensating control means between said fluid motor and said exhaust means, said negative load pressure compensating control means including fluid outflow metering orifice means, first regulating means of the throttling action of throttling member means operable to control the flow of fluid through any specific flow area of said fluid outflow metering orifice means at a relatively constant control pressure differential independent of the magnitude of said negative load pressure, and second regulating means operable to increase said control pressure differential acting across said fluid outflow metering orifice means with increase in pressure at said positive load pressure control means whereby fluid flow through said fluid outflow metering orifice means becomes independent of the magnitude of said negative load pressure and can be increased with the increase in pressure at said positive load pressure control means during control of said negative load.

4,679,493

**REINFORCED PISTONS**

Robert Munro, and Roger A. Day, both of Lymington, England, assignors to AE PLC, Warwickshire, England

Filed Apr. 25, 1985, Ser. No. 727,336

Claims priority, application United Kingdom, May 1, 1984, 8411074

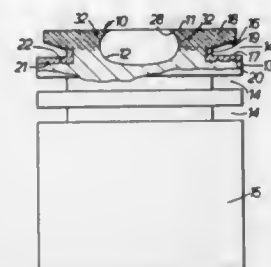
Int. Cl.<sup>4</sup> F16J 1/01

U.S. Cl. 92—212

18 Claims

1. A piston for an internal combustion engine formed of a light metal or metal alloy and comprising:  
a crown having an upper surface,  
a ring band extending around the crown and including at least two piston ring grooves,

each of said at least two piston ring grooves having upper and lower generally radially extending surfaces,  
one of said piston ring grooves being closely adjacent said crown and having at least the lower radially extending surface thereof formed by a wear-resistant insert which is cast into the piston,



at least a portion of the crown including a fibre reinforcement which contacts the insert and which is between the insert and an upper surface of the crown said at least a portion of the crown being of minimum axial thickness, to prevent the separation of said insert from the crown in an axial direction while allowing the upper piston ring groove to be close to the upper surface of the crown.

4,679,494

**DAMPER DEVICE FOR AN AIR CONDITIONING APPARATUS**

Kaneo Katayama, Yalzu, and Yasuhiko Hashimoto, Fujieda, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

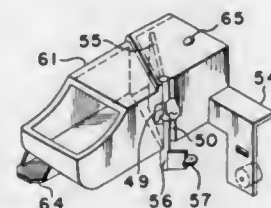
Filed Nov. 18, 1985, Ser. No. 799,103

Claims priority, application Japan, Nov. 27, 1984, 59-179615[U]; Jun. 5, 1985, 60-84787[U]

Int. Cl.<sup>4</sup> F24F 1/02

U.S. Cl. 98—38.6

6 Claims



1. A damper device for an air conditioning apparatus provided with an internal air circulating part adapted to suck room air to pass it in a heat exchanger thereby effecting heat exchanging and to discharge the heatexchanged air into a room, characterized by comprising

- (a) a duct for communicating said air circulating part with the exterior of said air circulating part, said duct being provided in its side wall with a slit having a predetermined length and a recess adapted to receive a pivotal shaft, and
- (b) a damper placed in said duct to adjust an air flow rate between said air circulating part and the outside of the air conditioning apparatus, said damper comprising an opening and closing part extending in said duct through said slit so as to open and close said duct, a shaft member which is formed at one end of said opening and closing part and which is pivotally supported in said recess, and a cable connecting part to which a cable to operate said shaft member is connected.

4,679,495

**AIR DIFFUSER**

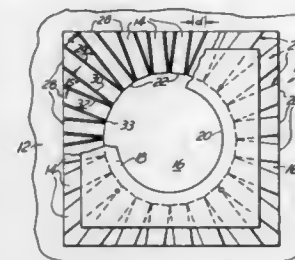
Howard W. Locker, 820 N. Ocean Blvd., Delray Beach, Fla. 33444

Continuation of Ser. No. 17,412, Mar. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 817,222, Jul. 20, 1977, Pat. No. 4,142,456. This application May 1, 1981, Ser. No. 259,667

Int. Cl.<sup>4</sup> F24F 7/00

U.S. Cl. 98—40.12

8 Claims



1. An air diffuser for an air outlet, said air diffuser comprising a plurality of regularly disposed stationary rigid diverging nozzles dividing the flow of air from said outlet into separate diverging air streams, said nozzles each having substantially parallel opposite stationary sidewalls and being substantially square in section, and said nozzles having longitudinal axes mutually disposed at a predetermined constant angle in the range of about 15° to 30°, wherein said nozzles are formed by a pair of substantially parallel flat baffle plates and by a plurality of stationary wedge members disposed between said baffle plates, each of said wedge members has a leading edge formed by a pair of flat walls converging at said predetermined constant angle in the range of about 15° to 30° and is arranged such that opposite walls of consecutive wedge members are substantially parallel and form with said baffle plates said nozzles having substantially square cross-section, and each of said nozzles has an outlet separated from the outlet of an adjacent nozzle by a distance which is at least one-half the width of each of said nozzles.

4,679,496

**APPARATUS FOR PRODUCING LAMINATED PRODUCTS**

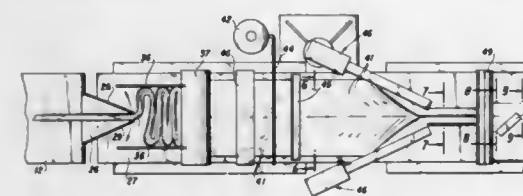
William J. Simelunas, Glen Rock, and Nicholas R. Polifroni, Cliffside Park, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed May 18, 1984, Ser. No. 611,671

Int. Cl.<sup>4</sup> A23G 3/00

U.S. Cl. 99—450.2

20 Claims



1. Apparatus for producing a laminated sheet product having thin layers of a semifluid first material interleaved with thin layers of a semifluid second material, comprising:  
longitudinally extending first conveyor means;  
longitudinally extending second conveyor means, aligned with said first conveyor means and moving at a velocity slower than same;  
means for continuously forming a first sheet of the first material on said first conveyor means;  
means for folding said sheet from an edge thereof over itself

to form a rope having a width substantially less than the width of said sheet;  
means for transferring said rope from said first conveyor means to said second conveyor means in alternate first and second directions substantially transverse to said second conveyor means;  
means for continuously forming a second sheet of the first material on said second conveyor means;  
means for continuously depositing the second material on said second sheet to form a layered sheet of said first and second materials;  
means for continuously rolling said layered sheet from the edges thereof inwardly to form a double roll extending longitudinally along said second conveyor means; and  
means for flattening said roll into a laminated sheet product.

4,679,497

**CHEESE HARDENING MACHINE FOR PASTA FILATA CHEESE**

Stefano Tomatis, via Provinciale 141, 12010 San Lorenzo di Peveragno (Cuneo), Italy

Filed Sep. 18, 1985, Ser. No. 777,348

Claims priority, application Italy, Sep. 25, 1984, 67953 A/84

Int. Cl.<sup>4</sup> A01J 25/00

U.S. Cl. 99—455

8 Claims



1. A cheese hardening machine for pasta filata cheese such as ball-shaped mozzarella, comprising:

- (a) an elongated vat having a loading end and a delivery end and a flat, substantially horizontal bottom, said vat being fillable with water to a predetermined level thereby to provide, in use, a filling of water for said machine;
- (b) tube means connecting said delivery end of said vat to said loading end of said vat, said tube means extending outside the vat below said predetermined level as an outside circulation loop;
- (c) a motor-driven axial turbine interposed in said tube means, said turbine being adapted to withdraw water from said vat at said delivery end, propel, during use, at least some of said withdrawn water, at a high speed from said delivery end to said loading end and to reintroduce thereby recirculated water therefrom into said vat at said loading end, whereby a highly turbulent flow of water is generated in said vat from said loading end to said delivery end;
- (d) shovel means comprising a set of blades extending transversely to said vat near said vat bottom and extending upwardly short of said predetermined level, said shovel means being movable in the direction of net water flow in said vat towards said delivery end of said vat;
- (e) loading means for loading cheese into said vat at said loading end of said vat; and
- (f) extractor means for continuously extracting cheese from said vat at said delivery end of said vat.

4,679,498

## INSTALLATION FOR PREPARING A CHOCOLATE PASTE

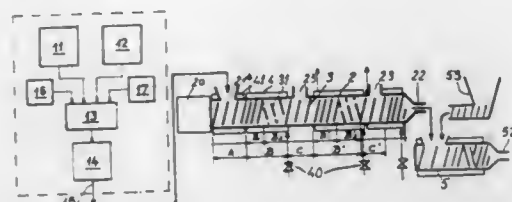
Henri Chaveroa, Paris; Jean Pontillon, Meulan; Michel Billon, Unieux; Hervé Adenier, Comptegne, all of France, and Ahmed Kamoun, Sfax, South Africa, assignors to Clextal, Paris, France

Division of Ser. No. 731,622, Apr. 26, 1985. This application Jan. 30, 1986, Ser. No. 824,333

Claims priority, application France, Aug. 26, 1983, 83 13769 Int. Cl.<sup>4</sup> A23G 1/10

U.S. Cl. 99—483

7 Claims



1. Installation for continuously preparing a chocolate paste comprising means for grinding (11, 12, 13, 14), mixing and refining ingredients comprising at least particles of cocoa and sugar, means for fluidification by dispersion of said particles of cocoa and sugar in a continuous fatty phase and means for degasifying, by evaporation of water and of undesirable volatile compounds, a portion of said installation being constituted by a screw conveyor comprising a long sleeve (2) surrounding at least two screws (3) with parallel axes, means (20) for driving said screws in rotation at an adjustable speed about their axes and means (4) for regulating the temperature of the material entrained in said screws, wherein said screw conveyor (2) constitutes means for dry-conching the refined paste placed, in a continuous production circuit, downstream of refining means (14) and upstream of means (5) for liquefaction by incorporation of additives whose nature and proportions correspond to a predetermined recipe, said screw conveyor (2) being fed continuously a predetermined flow rate of paste refined to the degree of particle size necessary for the finished product and comprising, upstream to downstream, a zone (A) of supply and preliminary kneading provided with means (41) for heating the paste and at least one treatment zone (B) provided with means (31) for rolling and shearing whose effectiveness increases progressively, and means (4) for regulating the temperature, each treatment zone (B) being followed by a degasifying zone (C), said liquefaction means being constituted by a final treatment zone (50) of said screw conveyor placed downstream of the last degasifying zone (C) and at the entrance of which said sleeve (2) is provided with at least one orifice (28) for the introduction of liquefaction additives.

4,679,499

## APPARATUS FOR SIZING AND PEELING LONGATED CYLINDRICAL BODIES OF VEGETABLE MATTER

Joaquin Gutierrez-Rubio, Seville, Spain, assignor to Sociedad Anonima de Racionalizacion y Mecanizacion (Sadrym), Seville, Spain

Filed Jul. 11, 1985, Ser. No. 753,901

Claims priority, application Spain, Sep. 21, 1984, 536.171 Int. Cl.<sup>4</sup> A23N 7/04

U.S. Cl. 99—591

9 Claims

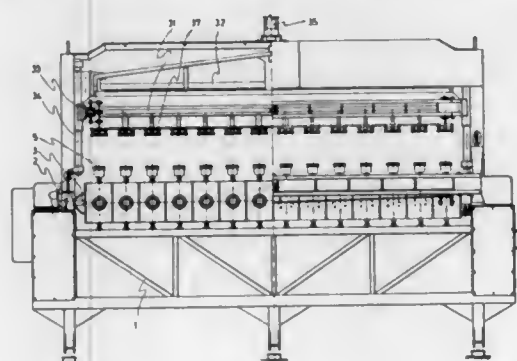
1. Apparatus for sizing and peeling elongated, generally cylindrical bodies of vegetable matter such as spears of asparagus, comprising:

a drum mounted for stepwise rotation about a horizontal axis through a loading station, a peeling station and an unloading station which are disposed peripherally of the drum with substantially 90 degrees spacing between each said station respectively at a substantially horizontal position, a

substantially vertical position and a substantially horizontal position;

a plurality of longitudinally extending rows of radially outwardly opening mouthpieces provided on said drum, each row extending substantially in alignment with said horizontal axis and arranged to be brought serially into each of said stations as said drum is rotated in a stepwise manner, each of said mouthpieces being adapted to telescopically receive an end portion of a respective cylindrical body of vegetable matter when that mouthpiece is in said loading station and to grip and maintain a grip on said end portion as said drum is rotated in a stepwise manner, until after the respective cylindrical body of vegetable matter has been peeled in said peeling station and has arrived at said unloading station;

said loading station being juxtaposed with said drum and including conveyor means arranged for individually serving each said mouthpiece in a respective row of said mouthpieces by accepting a respective generally cylindrical body of vegetable matter deposited thereon and guiding that body radially inwardly towards said drum until a



respective said end portion of that body is telescopically inserted thereby into the respective said mouthpiece; said peeling station being juxtaposed with said drum and including cutting means arranged for individually serving each said mouthpiece in a respective row of said mouthpieces by engaging and mechanically cutting an outer peripheral layer from a main portion of the respective generally cylindrical body of vegetable matter gripped in each respective mouthpiece in the respective said row, excepting said end portion of such body; and said unloading station being juxtaposed with said drum and including means for individually extracting each peeled, generally cylindrical body of vegetable matter from a respective said mouthpiece in a respective said row of said mouthpieces, as that mouthpiece releases its grip on the respective said end portion of the respective said body; and

a take-away conveyor means on which each said extracting means deposits each respective said peeled, generally cylindrical body of vegetable matter extracted from a respective said mouthpiece thereby.

4,679,500

## PRINTER WITH PLURAL ENDLESS BANDS AND STOP MEANS THEREFOR

Heinrich Volk, Beerfelden-Gammelsbach, Fed. Rep. of Germany, assignor to Esselte Meto International GmbH, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,432

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3427858

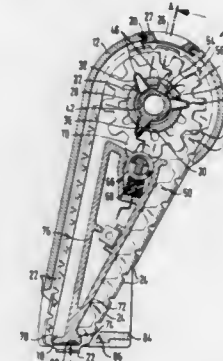
Int. Cl.<sup>4</sup> B41J 1/20; B41K 1/10

U.S. Cl. 101—111

4 Claims

1. Printing mechanism comprising a plurality of setting

wheels which are mounted rotatably about a common axis and with which endless printing bands are in a drive connection which carry printing types in a region of their length at the outer surface and indicating types in another region of their length at the outer surfaces and which are led about the setting wheels and about a deflection edge arranged spaced therefrom and which are adjustable by turning the setting wheels, the printing bands being provided with a plurality of teeth in said another region of their length at the inner surface thereof for engagement in corresponding recesses in the setting wheels, said mechanism further comprising a setting shaft adapted to be brought into a drive connection with each of the setting wheels, said setting shaft carrying an actuating knob, and said mechanism further comprising stop means for limiting the



turning angle of the setting wheels, said stop means comprising stop shoulders disposed in the path of movement of the tooth lying in front of the plurality of the teeth when regarded in the respective adjustment direction of the printing bands, characterized in that the stop shoulders are disposed directly adjacent the deflection edge and the height of at least the teeth lying in front of the plurality of the teeth in each adjustment direction of the printing bands is greater than the printing band deflection possible due to the elasticity of the printing band in the region of the stop shoulder, and a web is disposed at least in the region of the stop shoulder in the association with the outer surface of the printing bands, said web being spaced from the stop shoulder a distance which is smaller than the height of at least the tooth lying in front in each adjustment direction of the printing band plus the printing band thickness.

4,679,501

## REGISTRATION DEVICE FOR USE IN SILK SCREEN PRINTING

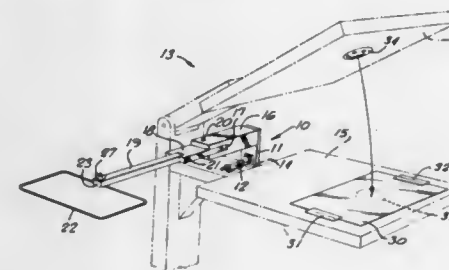
Alan L. Hanosh, 4025 Bohannon Dr., Menlo Park, Calif. 94025

Filed Feb. 10, 1986, Ser. No. 827,641

Int. Cl.<sup>4</sup> B41F 15/00; B41M 1/18

U.S. Cl. 101—114

5 Claims



1. A registration device for use in silk screen printing of articles to facilitate the accurate positioning of the article to be printed, said registration device comprising:

a silk screen printing apparatus supported by a printer frame and including a platen supported by said printer frame; a support arm affixed to said printer frame in a fixed position with respect to the platen of said silk screen printing apparatus;

a frame holding arm support block and frame holding arm assembly including a frame holding arm, said assembly being affixed to said support arm, said frame holding arm having a first end where it is attached to said frame holding arm support block and a second end, said support block horizontally, pivotally holding a frame holding arm in a manner to permit said frame holding arm to move in a generally horizontal plane, said frame holding arm having two sections pivoted together so that the frame means may move upwardly, said support block having stop means to position said frame holding arm in a specific home position;

frame means affixed to the free end of said frame holding arm, the frame means being movable to contact the platen of the silk screening apparatus when said frame holding arm is in its home position; and

a transparent sheet having the indicia to be printed on its upper surface affixed to said frame means whereby an object to be silk screened may be placed on said platen and moved so that the exact location to be printed may be moved under the indicia on the transparent sheet on the frame, and the frame and transparent sheet may then by swung out of the way and the object printed in the desired location.

4,679,502

## REGISTER SYSTEM FOR IN-REGISTER ALIGNMENT OR ORIENTATION OF A FLEXIBLE PRINTING PLATE

Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

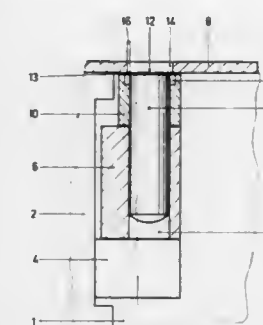
Continuation of Ser. No. 392,803, Jun. 28, 1982, abandoned, which is a continuation of Ser. No. 59,024, Jul. 19, 1979, abandoned. This application Dec. 9, 1985, Ser. No. 807,193

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831921

Int. Cl.<sup>4</sup> B41F 27/06

U.S. Cl. 101—415.1

14 Claims



1. Register system of in-register alignment of a flexible printing plate on a plate cylinder of a rotary printing machine comprising means defining at least two register punch-holes formed in the printing plate and register markings corresponding thereto formed in the plate cylinder, the printing plate having a lower surface facing towards the plate cylinder and the plate cylinder having a rotary axis, said register markings being at a radial distance from the axis of the plate cylinder at most equal to the radial distance of the lower surface of the printing plate therefrom, said register markings comprising respective surface areas slightly smaller than and geometrically similar to a cross-sectional area of said register punch-holes and having an appearance contrasting with the surroundings thereof, said means defining said register punch-holes



being respective edges of the printing plate and, in clamped condition of the printing plate on the printing cylinder, being spaced from and being adjustable in relation to the contours of said register markings in the printing cylinder, said printing plate remaining contact-free in relation to said register markings during adjustment of said means defining said register punch-holes in relation to the contours of said register markings.

4,679,503

## DETONATOR SECURING DEVICE

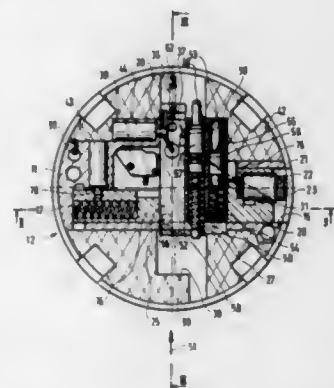
Werner Rüdenauer, Roth; Wilhelm Fürst, Buchberg, and Norbert Liebl, Ruckersdorf, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany  
Filed May 3, 1985, Ser. No. 730,333

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418759

Int. Cl.<sup>4</sup> F42C 15/40, 15/34

U.S. Cl. 102—208

7 Claims



1. Safe and arm unit for an ignition device for a projectile, including a detonator latching slider, an impeller-generator extendable laterally on a carriage outwardly of the projectile; a slider guidance for guiding said impeller-generator laterally of the longitudinal axis of the projectile, a securing means for the detonator latching slider being releasable by the electrical energy of the impeller-generator; a blocking element projecting into the slider guidance as long as the projectile remains in an unlaunched condition; a locking pin extending into the slider guidance for the carriage of the impeller-generator as long as the projectile is not yet launched; and a tension spring engaging the latching slider in opposition to the armed position of the forward displacement of said slider.

4,679,504

## HELICOPTER ROTOR FOULING

Richard H. Carpenter, Alexandria, Va., assignor to Commonwealth Technology Incorporated, Alexandria, Va.  
Filed Dec. 3, 1984, Ser. No. 677,484

Int. Cl.<sup>4</sup> F42B 4/12

U.S. Cl. 102—348

9 Claims

6. An apparatus for fouling a rotor system of a helicopter positioned in a localized space comprising:  
a carrier located initially at a launch point;  
a propelling means for said carrier for propelling said carrier so as to overfly the localized space;  
a long flexible line including a means for playing out said line located at the launch point, said line including a proximal

end attached to said carrier and a distal end which trails on the ground;



a terminating means for terminating the playing out of said line by said carrier after overflying the localized space and before said distal end of said line leaves the ground.

4,679,505

## 00 BUCKSHOT SHOTSHELL

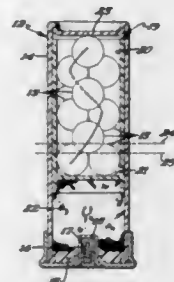
Hugh B. Reed, Wayzata, Minn., assignor to Federal Cartridge Corporation, Minneapolis, Minn.

Filed Nov. 30, 1984, Ser. No. 676,588

Int. Cl.<sup>4</sup> F42B 7/06, 7/10

U.S. Cl. 102—449

22 Claims



1. A 12 Gauge 00 lead buckshot shell comprising:
  - (a) a shotshell casing having elongated tubular sidewalls and having a basewad with a centrally disposed primer opening extending therethrough longitudinally of said casing;
  - (b) a shotshell primer disposed within said primer opening;
  - (c) a propellant superimposed with respect to said primer within said casing;
  - (d) obturator wad means superimposed upon and covering said propellant;
  - (e) a sleeve member disposed within said casing in superimposed relation to said wad means and having a constant internal diameter greater than 00 buckshot but less than 2.154 times the diameter of 00 lead buckshot;
  - (f) a plurality of 00 lead buckshot pellets superimposed upon each other within the sleeve member, each of said pellets intersecting a nesting zone with an adjacent pellet and having load-bearing points of contact relative to the adjacent pellets the total of which numbers greater than zero but less than six;
  - (g) closure means closing the end of said casing and holding said buckshot within said casing until the shotshell is fired; and
  - (h) the center of each of said pellets being located outside the nesting zones of said pellet

4,679,506

## RAILWAY TRUCK WITH IMPROVED STEERING LINKAGE, DETACHABLE SUSPENSION AND TRACTION MOTOR MOUNTED BRAKE

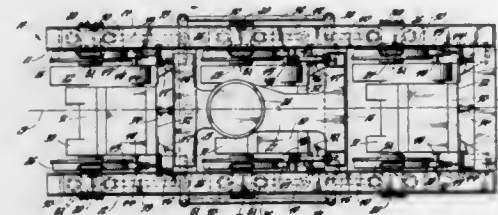
David J. Goding, Palos Park, and Remigio R. Ramos, Bolingbrook, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1985, Ser. No. 800,321

Int. Cl.<sup>4</sup> B61C 9/50; B61F 5/38, 5/30

U.S. Cl. 105—136

15 Claims



12. A combination in a powered steering railway truck of a pair of longitudinally spaced rail engaging wheel and axle members each including a pair of wheels laterally connected by an axle, frame means carried by said axles, yieldable suspension means supporting the frame on the axles and permitting limited yawing of said wheel and axle members, a traction motor drivingly connected with at least one of said axles, said motor having a housing supported along one side by axle bearings carried by its respective axle and restrained from rotation about said axle by torque means reacting against said frame, said motor housing moving together with said axle during yawing of the wheel and axle members, and a tread brake including a wheel engagable shoe and actuating means including a force developing device connected with and operative to move said shoe into and out of engagement with said wheel to apply and release the brake, said actuating means being carried on said traction motor housing to establish fixed dimensional relations between the brake and its associated wheel and to completely separate the brake application forces from having any effect upon the axle steering forces.

4,679,507

## THREE-AXLE RAILWAY TRUCK STEERING LINKAGE

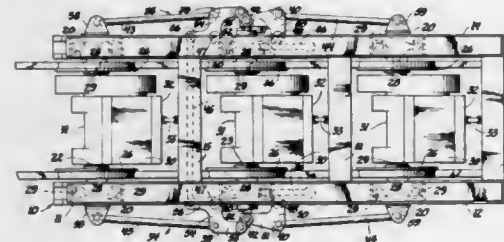
Mostafa Rassaian, Lisle, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1985, Ser. No. 803,439

Int. Cl.<sup>4</sup> B61B 3/06, 5/38

U.S. Cl. 105—136

7 Claims



1. Steering and restraining mechanism in combination with a three-axle steering railway truck including a frame support by front, center and rear sequentially longitudinally spaced axles, each having a pair of flanged wheels secured near its opposite ends, and yieldable suspension means between the axles and the frame, and nominally urging the axles into centered positions for motion along straight paths but permitting limited yawing and lateral movement of said axles, said steering and restrain-

ing mechanism carrying all traction and braking forces between the axles and the frame, and comprising restraining means establishing an essentially fixed longitudinal relation between the frame and said center axle and transmitting all its traction and braking forces to the frame but permitting relative vertical and lateral motion therebetween,

a pair of linkages, one on each side of the truck and interrelating the ends of the axles on its respective side, the linkages being interconnected laterally across the frame for equal and opposite motion, each linkage including first and second levers operatively laterally engaging one end of the center axle and pivoted at points of the frame longitudinally spaced toward the front and rear axles, respectively, from said one end of the center axle, a front traction rod longitudinally connecting a point of said first lever laterally outboard of its pivot with one end of the front axle, and a rear traction rod longitudinally connecting a point of said second lever laterally outboard of its pivot with one end of the rear axle, said front and rear traction rods exclusively carrying all traction and braking forces from their respective axles to the frame, said levers, rods and points being related in a manner to require equal and opposite yawing movements of the front and rear axles to correspond with predetermined lateral movements of the center axles to provide substantially radial positioning of the axles during negotiation of a constant curve.

4,679,508

## TRANSIT VEHICLE DOOR CONTROL APPARATUS

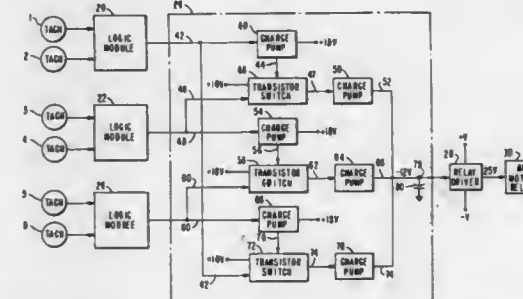
Mark T. Fruehan, West Mifflin; Jeffrey A. Fennig, Library, and Jayant K. Kapadia, Pleasant Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 21, 1986, Ser. No. 832,497

Int. Cl.<sup>4</sup> B60N 5/00

U.S. Cl. 105—341

5 Claims



1. In door control apparatus for a vehicle having at least one door and a plurality of trucks each having two axles, the combination of:
  - first means for providing at least two speed signals for each of said trucks;
  - second means responsive to the two speed signals for each truck to provide a first output signal for each truck when each of the speed signals for said truck indicate a vehicle speed less than a predetermined speed condition;
  - third means responsive to the first output signal for a first truck and the first output signal for a second truck to provide a second output signal;
  - fourth means responsive to the first output signal for said second truck and the first output signal for a third truck to provide a third output signal; and
  - fifth means responsive to one of said second output signal and said third output signal to control the operation of said door.

4,679,509

## WHEEL CHAIR TABLE SYSTEM

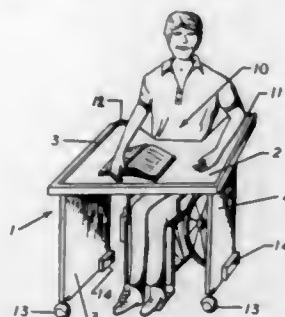
Samuel O. Sampson, Jr., 4732 Southshore Dr., Metairie, La. 70002

Filed Jun. 18, 1985, Ser. No. 745,923

Int. Cl.<sup>4</sup> A47B 39/00

U.S. Cl. 108—27

1 Claim



## 1. A wheel chair table system, comprising:

- a horizontal planar surface disposed generally above a pair of horizontally parallel arms of a wheelchair, said planar surface having a generally straight rear edge, a pair of generally parallel side edges extending laterally forward from the ends of said rear edge and separated by a distance generally wider than said arms of said wheelchair, and a front edge extending laterally between the forward ends of said side edges and generally parallel to said rear edge;
- a notch in said front edge extending rearward into said planar surface, said notch having a straight rear edge portion disposed generally parallel to said rear edge and a pair of straight side edges extending angularly outward from said rear edge to define a cut out having a narrower rear portion and a wider front portion;
- a pair of generally opposed planar side members extending laterally downward from a lower surface of said planar surface;

means for retaining said planar side members and said planar surface in a rigidified configuration;

- a pair of opposed rollers formed by attaching a roller to a rear, lower portion of each of said side members to provide for movement of said planar surface, said opposed rollers further being disposed in a vertical plane generally parallel to said rear edge of said planar member to provide a means for rotating said planar surface to a tilted configuration with its front edge raised to a position higher than its rear edge;

- a footing extending downward from a front, lower portion of each of said side members having a lower surface suitable for engaging a floor surface to prevent lateral motion thereon, said footings forming a pair of opposed footings for restraining lateral motion of said planar surface;

- a handle attached to a portion of said front edge on both sides of said cut out for use by an invalid in a wheel chair to rotate and lift said planar surface about said opposed rollers upward from a first configuration in which said footing engages said floor surface and a configuration in which said cut out in part, surrounds a forward body portion of said invalid, to a second configuration in which said cut out rotates with said planar surface and moves upward along a frontal periphery of said invalid to allow said planar surface to rotate to its tilted configuration with its front edge in a higher position than its rear edge while remaining in a configuration in which said cut out in part, still surrounds a forward body portion of said invalid, to further allow a separation between said footing and said flooring so that said planar surface may be moved about by said invalid from a first location to a second location with said wheel chair; and

- a lip extending around at least three edges of said planar surface, said lip having a portion extending upward from

said rear edge and including generally parallel portions extending upward from said side edges to provide a means when said planar surface is in its tilted configuration for retaining articles on said planar surface.

4,679,510

## OFFICE DESK, IN PARTICULAR FOR PERIPHERAL COMPUTER EQUIPMENT

Wolf Veyhl, and Erwin Kübler, both of Neuweiler, Fed. Rep. of Germany, assignors to Veyhl Produktion KG, Fed. Rep. of Germany

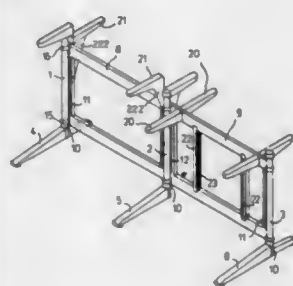
Filed May 24, 1985, Ser. No. 738,050

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1984, 3420648

Int. Cl.<sup>4</sup> B60C 17/00

U.S. Cl. 108—152

24 Claims



- 1. Office desk, in particular for peripheral computer equipment, comprising a table frame consisting of two side parts and a longitudinal beam connecting the two side parts, and a table top arranged between the side parts, characterized in that the side parts are formed by columns provided with feet, that the columns comprise connection elements which are positively engaged by matching connection elements provided on the longitudinal beam which is detachably connected with the columns, and that carrying arms for at least one table top are fastened on the longitudinal beam.

4,679,511

## FLUIDIZED BED REACTOR HAVING INTEGRAL SOLIDS SEPARATOR

Myron L. Holmes, Simsbury, and Leo A. Smolensky, Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

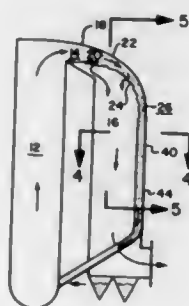
Continuation-in-part of Ser. No. 858,138, Apr. 30, 1986, Pat. No. 4,640,201. This application Oct. 30, 1986, Ser. No. 925,770

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> F23J 3/00

U.S. Cl. 110—216

7 Claims



- 1. A fluidized bed reactor system for treatment of a particulate material in a fluidized state in a gas comprising:

- a. a reactor enclosure defining a treatment chamber for

4,679,513

## THREAD-TENSIONING DEVICE FOR A BOBBIN HOUSING

Erich Druffel, Bielefeld, Fed. Rep. of Germany, assignor to Durkoppwerke GmbH, Fed. Rep. of Germany

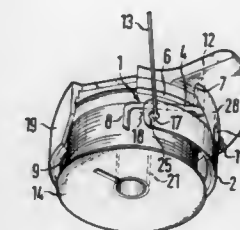
Filed Oct. 21, 1986, Ser. No. 921,783

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1985, 3537391.1

Int. Cl.<sup>4</sup> D05B 57/14

U.S. Cl. 112—229

5 Claims



- 1. A thread-tensioning device for a bobbin housing, the bobbin housing having an upper part and a lower part defining a space for a bobbin, and having jacket means for substantially surrounding a bobbin received therein, the thread-tensioning device comprising:

- a thread-tensioning member having a first end supported on the housing, a second end of the thread-tensioning member comprising finger means for bearing upon a thread package accommodated on the bobbin.

4,679,512

## METHOD OF AND APPARATUS FOR BURNING LIQUID AND/OR SOLID FUELS IN PULVERIZED FORM

Kurt Skoog, Väddö, Sweden, assignor to Stubinen Utveckling AB, Väddö, Sweden

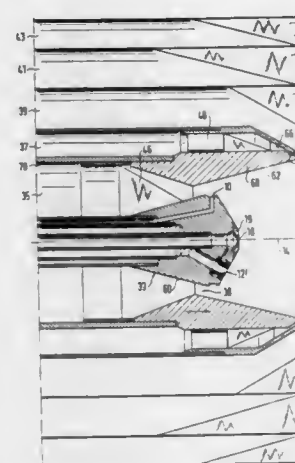
Filed Apr. 23, 1986, Ser. No. 855,134

Claims priority, application Fed. Rep. of Germany, May 20, 1985, 3518080

Int. Cl.<sup>4</sup> F23D 1/00

U.S. Cl. 110—347

28 Claims



- 1. A method of burning liquid fuels such as oil or the like and/or solid fuels, especially coal, peat or the like, in pulverized form, the latter either in dry condition or mixed with a carrier liquid such as water and/or oil to form an emulsion being introduced together with the liquid fuel into a combustion chamber while creating a recirculating flow profile, said flow profile being confined by a rotating outer flow of air, characterized in that the solid and liquid fuels are introduced into the combustion chamber separately and—in case of plural fuel inlets alternately—at a predetermined angular distance from each other along a circumference, especially along an imaginary circle.

4,679,514

## PRESSER FOOT WITH SLIDABLE PLUNGER

Konstantin Schwaab, Aichwald, Fed. Rep. of Germany, assignor to Union Special Corporation, Chicago, Ill.

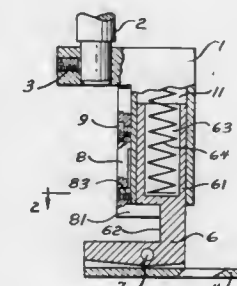
Filed Mar. 18, 1986, Ser. No. 841,124

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1985, 3511935

Int. Cl.<sup>4</sup> D05B 29/02

U.S. Cl. 112—235

21 Claims



- 1. A presser foot, comprising:

- a hub having a hollow guide;
- a plunger having a guide member slidably received in the guide, said plunger having a lower portion carrying a sole which contacts the material being sewn;
- means for biasing the guide member outwardly in the guide;
- a guide part secured to the guide of the hub and having a lower leg directed toward the plunger; and
- means cooperating between the leg and plunger to prevent rotation of the plunger, including means for adjusting the play between the hub guide and guide member.



4,679,515

**PROCESS AND APPARATUS FOR STITCHING EXCESS  
THREAD CHAIN ON A SEWING MACHINE**

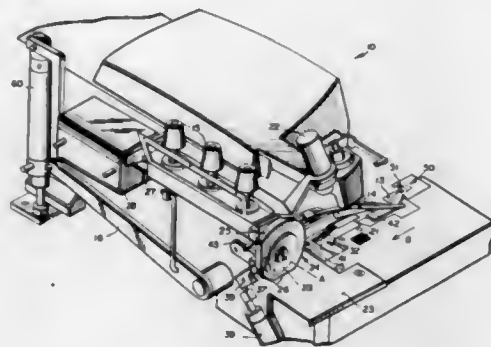
J. Herbert Keeton, 747 Meader St., P.O. Box 296, Campbellsville, Ky. 42718

Filed May 23, 1986, Ser. No. 866,561

Int. Cl.<sup>4</sup> D05B 65/06

U.S. Cl. 112—262.1

19 Claims



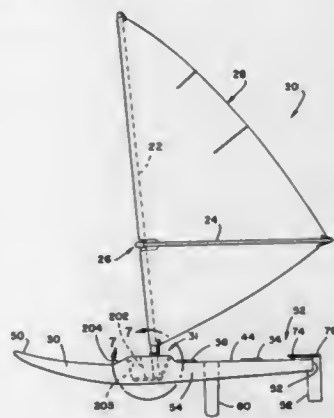
1. An attachment for a semi-automatic sewing machine, having a stitching needle for stitching a thread chain, a presser foot, and a power source, comprising:
- means for automatically sensing the completion of stitching, by the semi-automatic sewing machine, of a first garment, by sensing a trailing portion of the first garment;
  - means for automatically engaging the first garment in response to said sensing and moving the first garment away from the stitching needle more quickly than the sewing machine stitches the thread chain, to pull excess thread chain extending past the trailing portion of the first garment relatively taut;
  - means for automatically severing the excess thread chain from the trailing portion of the first garment when the excess thread chain is relatively taut; and
  - means for automatically positioning the excess thread chain with respect to a second garment so that the excess thread chain is stitched to the second garment by the sewing machine.

4,679,516

**SAILBOARD ASSEMBLY HAVING A LIMITED  
DISPLACEMENT MAST**Terry V. Friesen, 636 Santana Rd., Novato, Calif. 94947-1531  
Continuation-in-part of Ser. No. 656,707, Oct. 1, 1984,  
abandoned. This application Mar. 7, 1986, Ser. No. 837,606Int. Cl.<sup>4</sup> B63H 9/04

U.S. Cl. 114—39

7 Claims



1. In a wind-propelled sailboard assembly including a board-

like body on which a sailor may stand, a mast movably mounted to said body for angular displacement about an enlarged end thereof, manually engageable boom means carried by said mast and extending away therefrom, sail means mounted to said mast and coupled to said boom means, and mounting means removably mounting said mast to said body and including retainer means engaging said enlarged end of said mast and mounting said enlarged end for limited angular displacement of said mast about a normal orientation to said body, said mounting means further including a rigid collar mounted to said body in spaced apart generally concentric relation to said mast, said collar having a height dimension along said mast proximate said enlarged end, and a resilient member positioned between said mast and said collar and supporting said mast in an upright orientation with respect to said body when said boom means is released by said sailor and said mast moves to a released position, and said mounting means permitting sufficient manual angular displacement of said mast relative to said body by manipulation of said boom means by said sailor to enable balancing of the helm of said sailboard by tilting of said mast, wherein the improvement in said sailboard assembly comprises:

- said resiliently displaceable member substantially filling the volume between said mast and said collar over said height of said collar and biasing said mast toward said released position upon any angular displacement of said mast from said released position in any direction toward said collar; and
- said retainer means being provided by a member mounted to said body and having an opening therein dimensioned for and slidably receiving said enlarged end of said mast therethrough.

4,679,517

**FENDER PROTECTIVE STRUCTURES**

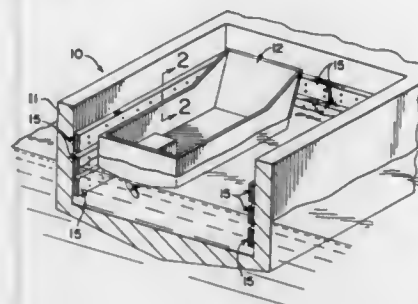
James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 27, 1986, Ser. No. 844,638

Int. Cl.<sup>4</sup> B63C 1/02

U.S. Cl. 114—45

13 Claims



1. In a fender system for inside the hull of a ship comprising an elongated longitudinally extending fender, said fender having a first layer of ultra-high molecular weight material, a second resilient layer bonded to said first layer, said second layer having a plurality of openings in laterally spaced and longitudinally spaced relationship, a third layer of rigid non-resilient material bonded to said second layer, said third layer having a plurality of openings in laterally and longitudinally spaced alignment with said openings in said second layer, vent holes in said fender that communicate said aligned openings with the interior of said hull for venting fluids, and means for attaching said third layer to said hull of said ship.

4,679,518

**FORKED THILL HEAD ATTACHMENT**

Dieter Frank, Stangergasse 8, D-8242 Bischofswiesen, Fed. Rep. of Germany

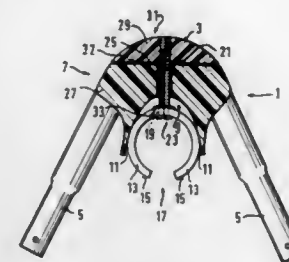
Filed May 14, 1986, Ser. No. 863,032

Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517740

Int. Cl.<sup>4</sup> B63B 15/00

U.S. Cl. 114—98

13 Claims



1. A forked thill head attachment for installing a forked thill to a mast of a rigging, with a V-shaped forked thill head, clamping jaws for gripping about the mast and forming a rearward vertical gap, said clamping jaws being constructed as a separate component from the forked thill head for detachable mounting to the mast together with a forward lying adjustment section of the forked thill head by a longitudinally alterable screw contrivance provided in the forked thill head in the region of the vertical longitudinal plane of symmetry of the clamping jaws, rotation of the adjustment section displacing the clamping jaws in the forward direction and pressing them toward one another, characterized in that said screw contrivance includes a longitudinal bolt running through the forked thill head in the longitudinal direction and joining the clamping jaws with respect to said adjustment section, said bolt being threaded such that rotating said screw contrivance presses said adjustment section and the clamping jaws toward one another, with said jaws contacting forwardly tapered inner contacting surfaces of an accommodating space of the forked thill head, said clamping jaws pivoted over a tilting axis lying perpendicularly to the vertical longitudinal plane of symmetry of the forked thill, wherein said clamping jaws are provided, substantially in the vertical plane of longitudinal symmetry, with a boring that is penetrated by the longitudinal bolt, with the clamping jaws being held by a bolt head integral with said bolt and having a larger diameter as compared to the inner diameter of the boring in the clamping jaws.

4,679,519

**LAMINATED CLOTH CONSTRUCTION**

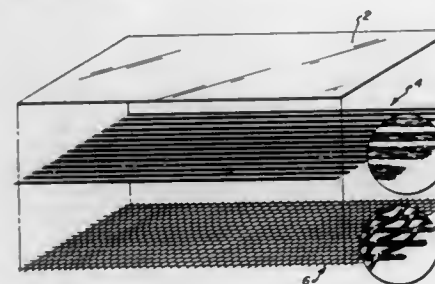
James C. Linville, 2 Golden Ct., Rowayton, Conn. 06853

Filed Nov. 26, 1984, Ser. No. 674,764

Int. Cl.<sup>4</sup> B63H 9/04

U.S. Cl. 114—103

13 Claims



1. A sailcloth comprising at least three coextensive layers bonded together at their interfaces by a synthetic adhesive

resin wherein one outer layer is a film of dimensionally stable synthetic polyester resin, the second outer layer is selected from the group consisting of a warp-knit fabric, a scrim fabric, taffeta and a film of dimensionally stable synthetic polyester resin, and wherein there are one or more inner layers one of which comprises a weft-free warp of strands of a stretch resistant polymer having a denier in the range of about 20 to about 1000.

4,679,520

**MAINSAIL REEFING AND FURLING DEVICE AND  
METHOD**

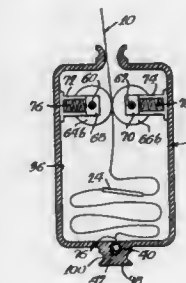
Olaf T. Harken, 1251 Wisconsin Ave., Pewaukee, Wis. 53072

Filed Jun. 10, 1985, Ser. No. 742,917

Int. Cl.<sup>4</sup> B63H 9/04

U.S. Cl. 114—104

22 Claims



1. A device for furling a mainsail supported between a mast and a boom, said device comprising an opening for said sail along the top of the boom, a cavity within the boom for receiving the furling portion of the sail, and tractive means in frictional engagement with opposite sides of the sail along said boom for pulling said sail through said opening and into said cavity.

4,679,521

**SHIP WITH STABILIZING DEVICE**

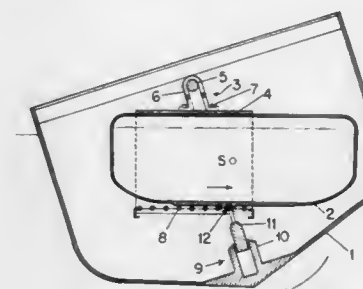
Kemal Butka, 372 Central Park West, New York, N.Y. 10025

Filed Oct. 25, 1985, Ser. No. 792,831

Int. Cl.<sup>4</sup> B63B 39/02, 39/06

U.S. Cl. 114—124

7 Claims



1. A ship comprising a hull having an inner hollow and a longitudinal axis; a body located in said inner hollow of said hull and movable in a direction substantially transverse to said longitudinal axis so that when said hull turns about said longitudinal axis in a first lateral direction under the action of waves, wind and the like said body urges to turn said hull back in a second lateral direction which is opposite to said first lateral direction so as to stabilize the ship; and guiding means arranged in said inner hollow of said hull and formed so that when said hull is turned about said longitudinal axis in said first lateral direction, said body is turned in said second lateral direction so as to stabilize the ship, said guiding means includ-

ing a supporting element arranged for supporting said body and mounted turnably about an axis extending substantially parallel to said longitudinal axis, and a guiding element arranged to guide said body in said supporting element, said supporting element being formed as a sleeve having an inner opening in which said body is slidingly located, said guiding element including a holding member connected with said body and movable in a substantially upright direction while being restrained from movement in a direction transverse to said lateral directions.

4,679,522

## FLOAT DEVICE FOR SMALL SIZE BOAT

Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 686,678, Dec. 27, 1984, abandoned.

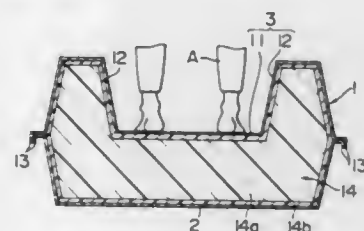
This application Jan. 23, 1986, Ser. No. 878,505

Claims priority, application Japan, Dec. 28, 1983, 58-202323

Int. Cl.<sup>4</sup> B63B 35/00

U.S. Cl. 114—357

2 Claims



1. A small size boat comprising a boat body made of hard material having an inside surface defining a cavity and a float which has been inserted in said cavity, said float having a central portion of buoyant hard foamed plastic of high density which comprises a larger portion of said float and has a shape substantially geometrically similar to, but smaller than, the cavity, and an outer portion of buoyant soft foamed plastic of low density which forms an outer layer around said central portion and comprises a smaller portion of said float, said outer layer being formed such that said central portion and said outer layer, together, have a shape substantially geometrically similar to, but larger than, the cavity when said outer layer is not compressed so that, when said float is confined within the cavity, said soft outer layer is compressed within the cavity and conforms with the inside surface of the body of the boat.

4,679,523

## FLAG HAVING A SUPPORT PEDESTAL

Francisco O. Orero, and Augusto M. Garcia, both of Avda. Blasco Ibáñez, 75-Paterna (Valencia), Spain

Filed Jul. 31, 1985, Ser. No. 761,088

Claims priority, application Spain, Nov. 28, 1984, 282991

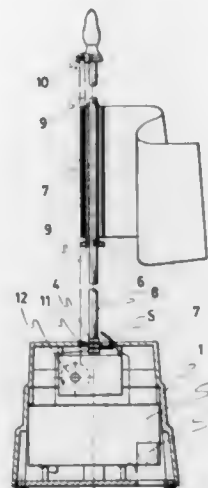
Int. Cl.<sup>4</sup> G09F 17/00

U.S. Cl. 116—173

1 Claim

1. A flag assembly comprising a pedestal frame (1) defining a space therein and having an upper rope receiving opening (11), a staff (8) connected to said frame and extending upwardly therefrom, said staff having a conductive base (4) adjacent said frame, a flexible conductive flap (5) connected to said frame and having a free end extending upwardly from said frame near said base, a miniature battery operated phonograph recorder (2) in said pedestal frame and having a pair of contacts which are closable with each other to activate said recorder, one of said contacts being electrically connected to said flap and the other of said contacts being electrically connected to said base so that said recorder is activated when said flap is engaged with said base, a pulley (10) rotatably mounted near a top end of said staff, a shuttle (6) having a sleeve telescopically slidable over said staff for upward and downward movement along said staff, said shuttle having a lower flange

which is engageable against said flap to move said flap against said base when said shuttle is near a bottom of said staff to activate said recorder, a rope having one end connected to said shuttle and being entrained over said pulley, said rope having an opposite end extending through said opening (11) in said frame and into said frame, a spring-loaded winding spool (12) rotatably mounted in said frame and connected to said opposite



end of said rope, said opposite end of said rope being windable on said spool for raising said shuttle and unwindable from said spool for lowering said shuttle and loading said spring-loaded winding spool, said spool being rotatable by a spring when said shuttle is in its lowered position to rotate said spool to raise said shuttle, and a flag (7) having a portion engaged around said sleeve of said shuttle for being raised and lowered with said shuttle.

4,679,524

## ARRANGEMENT FOR WEB COATING

Dan Eklund, Viberlaaksonie, Finland, assignor to Oy Wartsila Ab, Helsinki, Finland

Continuation of Ser. No. 537,734, Sep. 30, 1983, abandoned,

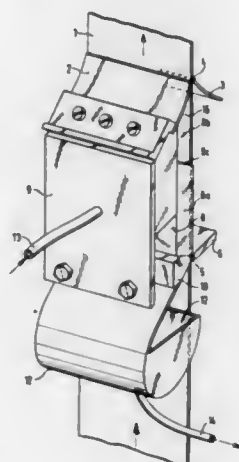
which is a continuation-in-part of Ser. No. 307,868, Oct. 2, 1981, abandoned. This application Apr. 2, 1985, Ser. No. 718,826

Claims priority, application Finland, Oct. 8, 1980, 803184; May 5, 1983, 831672

Int. Cl.<sup>4</sup> B05C 11/04, 3/15, 3/18

U.S. Cl. 118—122

17 Claims



1. Apparatus for non-pressurized coating a vertically up-

wardly travelling web moving at a given speed comprising, in combination:

- a vertical coating chamber open to atmospheric pressure and free of any seal against atmospheric pressure and provided with means for substantially closing said coating chamber to use said coating chamber as a substantially closed case while being under said atmospheric pressure and being defined by said web, a pair of side walls, a back wall spaced from said web, and a flexible blade applied against said web, said side walls of said coating chamber being vertically adjustable thereby providing said means for said closed case;
- a back-up rotating roll at the opposite side of said web and forming a coating nip together with said flexible blade, through which nip said web passes above said coating chamber;
- a horizontally oriented slot at the bottom of said coating chamber forming a web entrance to said coating chamber such that the web moves in a substantially vertical direction upwardly through said horizontal slot and enters said slot in a substantially vertical direction;
- said slot comprising rotatable screw means forming a slot width regulator for an infinitely regulator adjustment of the width of said slot, said slot width being regulated up to 5 cm, said screw means increasing or decreasing said width of said slot upon rotating said screw means;
- means for supplying a coating substance of a given viscosity to said coating chamber;
- the coating substance supply to said coating chamber and the width of said slot being so adapted to said speed of said web and said viscosity of said coating substance, that only a small amount of or substantially none of said coating substance flows vertically downwardly in a direction opposite to the direction of said upwardly travelling web through said slot during normal operation of said apparatus;
- said side walls including an upper edge forming overflow means determining the level of said coating substance above said slot, and said upper edge of said side walls being below said blade; and
- a collecting tank below said slot and separate from said coating chamber and open against said web mounted below said horizontally oriented slot to collect therein the coating substance which flows over said vertically adjustable side walls.

4,679,525

## ARTICLE SUPPORTING FIXTURE

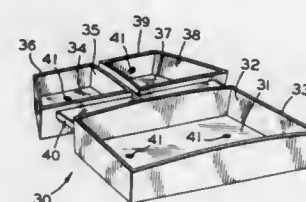
Edward W. Curtze, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Mar. 27, 1986, Ser. No. 844,577

Int. Cl.<sup>4</sup> B05C 13/00, 13/02

U.S. Cl. 118—500

17 Claims



1. A fixture for supporting a window assembly, the window assembly including at least one glass sheet having a predetermined portion thereof encapsulated by a gasket, the glass sheet and the gasket each having inner and outer surfaces, the fixture comprising:

- a floor;
- an upstanding wall extending from said floor and having an upper edge defining a window assembly supporting sur-

face, said wall having a flange formed at said upper edge to define a window assembly supporting surface; and at least one reference means formed in the fixture.

4,679,526

## WORKPIECE HOLDER FOR COATING PROCESSES

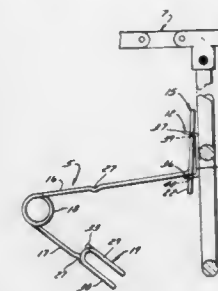
Jerome J. Dziedzic, Greenfield, Wis., assignor to Flur Wire & Metal Inc., Oak Creek, Wis.

Filed Jul. 31, 1986, Ser. No. 891,163

Int. Cl.<sup>4</sup> B05C 13/02

U.S. Cl. 118—503

5 Claims



1. A workpiece holder which is detachably securable to a carrier and to which a workpiece to be coated is quickly and readily removably securable for transport by the carrier along a path that carries the workpiece through a coating station, said workpiece holder comprising:

a single piece of substantially stiff but springy wire having a pair of opposite ends, characterized in that:

- A. a medial portion of said piece of wire is bent to define a pair of clamping arms connected by a spring coil,
  - (1) said clamping arms and spring coil being substantially contained in a single plane,
  - (2) each of said clamping arms having a front end adjacent to said spring coil and a rear end spaced, rearwardly from the spring coil and spaced from the rear end of the other clamping arm, and
  - (3) each of said clamping arms having an undulation intermediate its said ends, said undulations defining opposing concavities in which opposite edge portions of a workpiece are receivable for confinement of the workpiece under clamping bias imposed upon the clamping arms by the spring coil;

B. one end portion of said piece of wire is bent to define a loop connected to one of said clamping arms at the rear end thereof and substantially all portions of which are coplanar, said loop providing for attachment of the workpiece holder to a carrier with said one clamping arm projecting in a predetermined direction from the carrier; and

C. the other end portion of said piece of wire is bent to define a pair of stabilizing wings each of which has an inner end and an outer end, the inner end of each stabilizing wing being adjacent to the rear end of the other of said clamping arms and the outer ends of the stabilizing wings being spaced to opposite sides of said plane and in forwardly offset relation to said rear end of said other clamping arm for engagement against rearwardly facing surface portions of a workpiece confined by said clamping arms,

- (1) one of said stabilizing wings being substantially U-shaped with a bight portion at its outer end and a pair of elongated legs which are connected by said bight portion, one of said legs being connected at its inner end to the rear end of said other clamping arm, and
- (2) the other of said stabilizing wings being connected at its inner end to the inner end of the other of said legs.



4,679,527

**MAGNETIC BRUSH DEVELOPER**

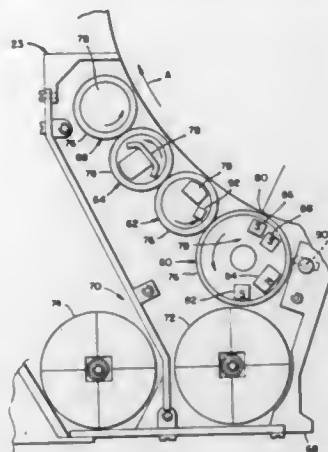
Phillip Chang, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1985, Ser. No. 813,783

Int. Cl.<sup>4</sup> G03G 15/09

U.S. Cl. 118—658

15 Claims



1. Magnetic brush development apparatus including a housing, a magnetic brush roll mounted in said housing and adapted to be arranged in closely spaced relation to a photoconductor surface to define a nip therebetween, said roll comprising a cylinder surrounding a magnet assembly, a developer supply source arranged to supply developer mix to said magnetic brush roll, for causing relative rotary movement between said cylinder and its associated magnet assembly to cause developer mix to be carried from said supply source to be brushed on to said photoconductor surface in a development zone at the nip between said magnetic brush roll and said photoconductor surface, and a mix barrier for limiting the flow of developer mix from said supply source to said photoconductor surface, said magnetic assembly including:

- a development magnet positioned in use in the development zone at the nip between said magnetic brush roll and said photoconductor surface, at least one transport magnet for transporting said developer mix from said developer supply source to said nip, and
- a pre-nip magnet, having the same polarity as said development magnet, arranged ahead of the development zone between said development magnet and said at least one transport magnet, adjacent said development magnet, and so spaced from the transport magnet as to create a tangential field therebetween, said mix barrier being arranged between said transport magnet and said pre-nip magnet.

4,679,528

**HEATING BOILER HAVING A VERTICAL BURNER TUBE**

Peter Krans, Ughelen, and Hermanus J. Meuleman, Apeldoorn, both of Netherlands, assignors to Remeha Fabrieken B.V., Apeldoorn, Netherlands

Continuation of Ser. No. 672,625, Nov. 19, 1984, abandoned.

This application Feb. 27, 1986, Ser. No. 834,156

Claims priority, application Netherlands, Nov. 24, 1983, 8304041

Int. Cl.<sup>4</sup> F22B 21/00, 9/02

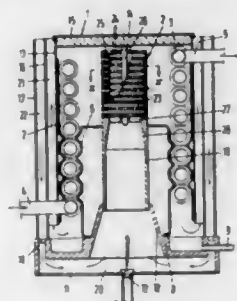
U.S. Cl. 122—367 C

5 Claims

1. A heating boiler having a vertical axis and including, arranged concentrically with said axis, a completely premixing gas burner tube having a lower circumferentially closed premixing portion, with an upper end and a lower end, and an upper portion provided with a plurality of burner ports extending through the tube wall with inlets on the inside circumferential surface of the tube and outlets on the outside circumferential

tial surface of the tube, the outside circumferential surface serving as a flame supporting surface; means for delivering a mixture of gaseous fuel and sufficient combustion air to burn the fuel completely to the lower portion of the burner tube; a helical water tube surrounding the burner tube; an enclosure surrounding the water tube and having a closed upper end; a flue gas discharge jacket surrounding and radially spaced from the enclosure; an annular bottom closure member mounted underneath the helical water tube and sealingly connected to both the flue gas discharge jacket and the lower portion of the burner tube; and means for guiding combusted fuel and air from the burner ports to the space between the enclosure and the flue gas discharge jacket, wherein the improvement comprises:

- the lower circumferentially closed premixing portion having a length and a diameter such that complete premixing of fuel and combustion air is assured;
- the upper portion of the burner tube being an assembly of stacked alternately flat and radially corrugated annular discs forming said plurality of burner ports such that the inlet areas of said ports are smaller than the outlet areas,



the discs having substantially equal inner and outer diameters, and the upper portion of the burner tube further including means for holding the stacked discs together and for attaching the stacked discs to the lower portion of the burner tube;

- the annular bottom closure member comprising a condensate trough having a drain outlet;
- a fuel nozzle mounted below said annular bottom closure member;

the connection between the annular bottom closure member and the lower portion of the burner tube comprising an upwardly extending passage coaxial with the vertical axis and tapering inwardly toward the lower end of the lower portion of the burner tube; and the interior surface of the burner tube tapers inwardly toward the upper end of the lower portion, and wherein the means for holding the stacked disc together comprises a flat plate placed on top of the stack of discs, a cross piece disposed in the tapered region of the lower portion of the burner tube, the cross piece having angled ends which matingly fit against the tapered interior surface of the burner tube, and a tension bolt connecting the flat plate to the cross piece.

4,679,529

**STEAM GENERATOR FEED WATER HEATER**

Gérard Mancel, Houilles, France, assignor to Electricité de France Service National, Paris, France

Filed Apr. 21, 1986, Ser. No. 853,951

Claims priority, application France, Apr. 24, 1985, 85 06219

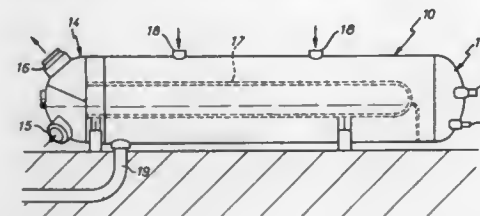
Int. Cl.<sup>4</sup> F22D 1/30, 1/34

U.S. Cl. 122—441

7 Claims

1. Steam generator feed water heater comprising a pressurized enclosure, a heat exchanger through which the feed water is caused to flow, at least one horizontal condensate inlet tube, at least one condensate outlet tube at a low point on said enclosure, and a double screen device associated with said at least

one condensate inlet tube and comprising an inner screen with a cylindrical sidewall and, surrounding said inner screen an outer screen having one end linked to said inner screen, a bottom wall common to both screens constituting an impact wall facing said inner screen, and passage areas in which there



are provided perforations in said screens not facing each other over most of the perimeter of their transverse cross-sections, said outer screen comprising a barrel that is perforated except in a stop area extending over a major part of its perimeter facing the passage area of said inner screen.

4,679,530

**COOLING SYSTEM FOR AN AUTOMOBILE ENGINE**

Yoshikazu Kuze, 31-3, Higashimagome 1-chome, Ohta-ku, Tokyo, Japan

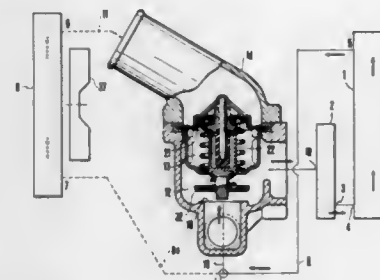
Filed Feb. 18, 1986, Ser. No. 830,093

Claims priority, application Japan, Feb. 19, 1985, 60-029388; Apr. 26, 1985, 60-088771; Apr. 26, 1985, 60-088772

Int. Cl.<sup>4</sup> F01P 7/16

U.S. Cl. 123—41.1

3 Claims



1. A cooling system for an automobile engine having a water jacket, a radiator, a water pump, and a thermostat housing, comprising:

- a first passage communicating an upper outlet of the water jacket with an inlet of the radiator provided at a lower portion thereof;
- a second passage communicating an upper outlet of the radiator with an inlet of the water pump and having the thermostat housing at the upstream of the pump;
- an outlet of the pump being communicated with a lower inlet of the water jacket;
- a bypass connected between the first passage and the thermostat housing;
- a thermostat comprising a thermo-sensitive device, a first valve and a second valve disposed in the thermostat housing, both the valves being operatively connected to the thermo-sensitive device, so that the first valve closes the second passage and the second valve opens the bypass;
- the thermo-sensitive device being disposed in the bypass and the first and second valves being operated by the operation of the thermo-sensitive device.

4,679,531

**INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINE**

Mitsuo Hitomi, Fumio Hinata, and Yasuhiro Yuzuriha, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

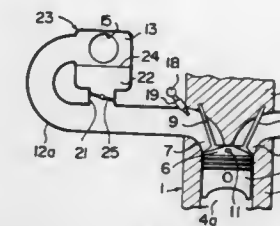
Filed Nov. 6, 1985, Ser. No. 795,443

Claims priority, application Japan, Nov. 8, 1984, 59-235440; Dec. 29, 1984, 59-275487

Int. Cl.<sup>4</sup> F02M 31/00

U.S. Cl. 123—52 MB

32 Claims



1. An intake system for an internal combustion engine having a plurality of cylinders arranged along a first direction comprising:

- an intake passage including a common passage portion opening toward atmosphere and having a downstream end, a surge tank extending along said first direction and connected to the downstream end of the common passage portion, and a plurality of discrete passage portions, each of which branches from the surge tank via an opening and is respectively connected to one of the cylinders, the respective openings of the discrete passage portions being aligned in said first direction;

at least one interconnecting passage provided to connect each of the discrete passage portions only with each other at a portion of each of the discrete passage portions downstream of the surge tank, said at least one interconnecting passage comprising a main interconnecting portion and discrete connecting portions connected at opposite ends to the main interconnecting portion and the respective discrete passage portions said main interconnecting portion being disposed adjacent to and below the surge tank;

an on-off valve disposed at each junction of the at least one interconnecting passage with the discrete passage portions and in the respective discrete connecting portion, said on-off valve being adapted to move between an open position and a closing position, said junction being substantially spaced from where the discrete passage portions connect with the respective cylinders; and an actuator which moves the on-off valves to the open position as the engine speed increases at least during heavy load operation of the engine.

4,679,532

**VALVE ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE**

Kazuo Aoi, Hamamatsu, and Naoki Tsuchida, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 12, 1985, Ser. No. 764,880

Claims priority, application Japan, Aug. 15, 1984, 59-169375

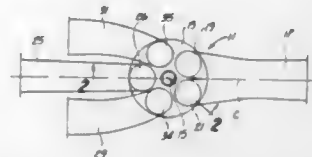
Int. Cl.<sup>4</sup> F01L 1/26

U.S. Cl. 123—90.22

7 Claims

1. In a valve arrangement for an internal combustion engine having a combustion chamber having a peripheral edge in plan view defining a closed curve, at least three intake valves serving said chamber, and at least two exhaust valves serving said chamber, the improvement comprising said valves being located so that their outer edges all lie adjacent said closed curve

so that said valves lie on a closed curve spaced inwardly from the peripheral edge of said combustion chamber in plan view, the pilot valve, the pneumatic actuator and the relief valve, on the other side, being between 3:1 and 15:1.



no two of said exhaust valves being adjacent to each other around the closed curve upon which they lie.

4,679,533

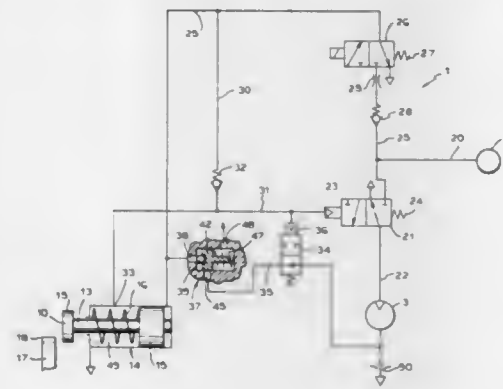
## PNEUMATIC STARTER

Juergen Klie, and Hans-Wilhelm Weiss, both of Sprockhoevel, Fed. Rep. of Germany, assignors to G. Duesterlob GmbH, Sprockhoevel, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 644,128, Aug. 23, 1984, abandoned. This application Feb. 18, 1986, Ser. No. 830,683  
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1983, 3330314

Int. Cl.<sup>4</sup> F02N 7/08

U.S. Cl. 123—179 F

18 Claims



1. In a pneumatic starter arrangement for use in connection with an internal combustion engine having a flywheel gear (17), comprising a pneumatic starter motor (3), an axially retrievable pinion (19) engageable with the flywheel gear, a pneumatic actuator (14) having a spring-biased piston (15) coupled to the pinion (19) for imparting the axial motion to the latter, a supply branch conduit (25) connecting a pressure supply source (2) to the actuator, a main supply conduit (22) connecting the pressure supply source to the starter motor, a main control valve (21) provided in the main supply conduit, a pilot valve (26) provided in the supply branch conduit between the pressure supply source and the actuator (14), means for controlling the position of the main control valve in response to the position of the piston of the pneumatic actuator, and a bypass conduit (35) connecting the starter motor to the supply branch conduit, the improvement comprising a relief valve (37) positioned in said bypass conduit and being designed such that its opening pressure is substantially greater than its closing pressure, and resistance-to-flow means (90) connected to said bypass conduit and arranged at an exhaust side of the starter motor, the ratio of combined air volumes of all pressure air conduits between the starter motor, the main control valve and the relief valve and between the starter motor and the resistance-means and the pressure-relief valve on the one side, and

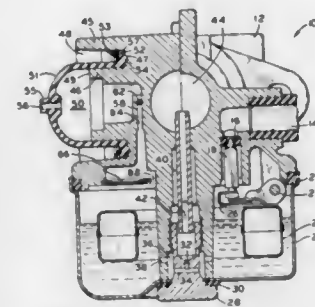
4,679,534  
PRIMER FOR FLOAT-TYPE CARBURETORS  
Thomas G. Guntly, Hartford, and Curtis L. Schultz, Grafton, both of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Feb. 25, 1986, Ser. No. 833,350

Int. Cl.<sup>4</sup> F02M 1/16

U.S. Cl. 123—187.5 R

11 Claims



1. A primer for a carburetor, said carburetor adapted to provide a combustible fuel/air mixture to a combustion engine and including a carburetor body, a fuel/air mixture passage, a fuel supply bowl, and a fuel nozzle means for conducting fuel from the fuel supply bowl to the mixture passage, said primer comprising:

- a primer chamber in said carburetor body;
- an operator actuatable displacing means for abruptly displacing a discrete volume of air from said chamber, said displacing means including a vent aperture for admitting air from outside said carburetor body into said chamber;
- a generally downwardly sloping surface in said chamber, said surface being oriented parallel to the direction of flow of air through said vent aperture, said surface including a priming aperture therein, said priming aperture being located intermediate the upper and bottom surfaces of said primer chamber;
- a generally vertical surface in said chamber perpendicularly adjoining surface in said chamber perpendicularly adjoining said downwardly sloping surface; and
- a passageway extending from said priming aperture into said fuel supply bowl.

4,679,535  
DUAL ACTION GENEVA CAM AND ROTARY  
INTERNAL COMBUSTION ENGINE AND PUMP  
UTILIZING SAME

Richard S. Stadden, P.O. Box 6053, Atascadero, Calif. 93423

Filed Jan. 6, 1986, Ser. No. 816,356

Int. Cl.<sup>4</sup> F02B 53/00

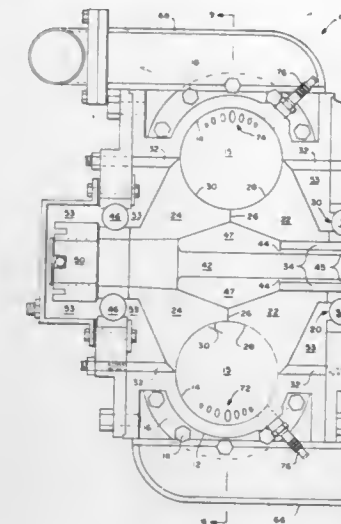
U.S. Cl. 123—245

13 Claims

1. A dual action Geneva cam comprising:

- (a) a driven member rigidly connected to a drive shaft, said driven member comprising two diametrically opposed driving pins, two diametrically opposed locking cams and two diametrically opposed relief sections, and
- (b) at least first and second driving members rotatively disposed in adjacent quadrants about said driven member, each of said driving members comprising four cam-locking surfaces to engage and disengage said locking cams of said driven member and four slots to engage and disen-

gage said driving pins of said driven member whereby said driven member continuously rotates when alternatively



said first driving member is held stationary while said second driving member rotates.

4,679,536

ENGINE COMBUSTION CONDITION DETECTING  
SYSTEM AND METHOD

Tatsun Morita, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

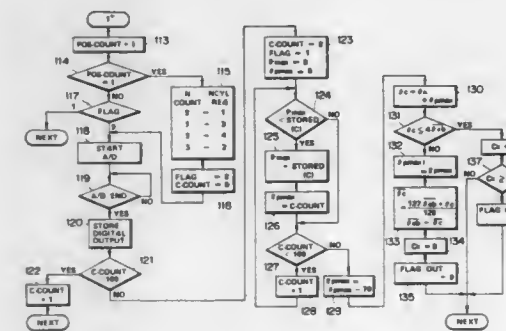
Filed Sep. 30, 1985, Ser. No. 781,665

Claims priority, application Japan, Nov. 28, 1984, 59-249468

Int. Cl.<sup>4</sup> F02P 5/04

U.S. Cl. 123—425

12 Claims



1. A system for an engine including a combustion chamber in which combustion is induced periodically by generating a spark, the system comprising:

- (a) means for sensing pressure within the combustion chamber;
- (b) means for detecting a timing at which the sensed pressure peaks;
- (c) means for measuring an interval between an occurrence of a spark generation and the timing of the pressure peak;
- (d) a memory;
- (e) means for, in accordance with a length of the presently measured interval, selectively storing the presently detected timing of the peak pressure in the memory in place of data held previously in the memory or ignoring the presently detected timing of the pressure peak so as to allow the memory to continue to hold the previously detected timing of the pressure peak, comprising:

- (1) means for deriving a mean value of the periodically measured intervals;
- (2) means for comparing the presently measured interval to a reference value which is related to the mean value of the intervals;
- (3) means for, when the presently measured interval is greater than the reference value, storing the presently detected timing of the pressure peak in the memory; and
- (4) means for, when the presently measured interval is not greater than the reference value, ignoring the presently detected timing of the pressure peak;
- (f) means for outputting a signal representing the detected timing currently held in the memory.

4,679,537

## DAMPING DEVICE

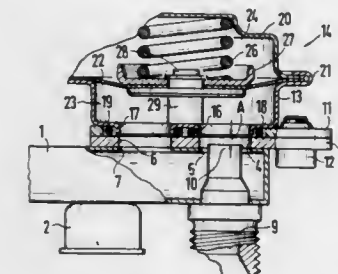
Siegfried Fehrenbach, Markgröningen; Kurt Herbst, Burgstetten; Wolfgang Schulz, Bietigheim-Bissingen, and Eberhard Utz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Nov. 21, 1985, Ser. No. 800,568

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446324

Int. Cl.<sup>4</sup> F16L 55/04

U.S. Cl. 123—447

13 Claims



1. A damping device comprising a damper element, a rigid fuel distributor line which distributes fuel to fuel injection valves of a fuel injection system for internal combustion engines, said damper element disposed on said rigid fuel distributor line and comprises at least one damper diaphragm fastened in a damper housing, said damper diaphragm further adapted to define a fuel chamber in said damper housing below said diaphragm and a damping chamber above said damper diaphragm, at least two flow openings extending from said fuel chamber to said fuel distributor line, a flow tube extending into said fuel distributor line in spaced relation with at least one flow opening in axial alignment therewith, said flow tube communicates with a fuel supply line connected to supply an outlet of a fuel feed pump and with said fuelchamber of said damper element via said at least one flow opening for supplying fuel to said rigid fuel distributor line.

4,679,538

## DUAL FUEL ENGINES

Joseph S. Foster, West Vancouver, Canada, assignor to Pro-Staff Fuels Ltd., West Vancouver, Canada

Filed Dec. 1, 1986, Ser. No. 936,712

Int. Cl.<sup>4</sup> F02M 21/02

U.S. Cl. 123—525

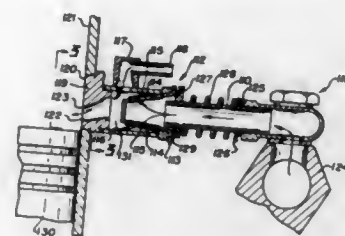
4 Claims

1. An improved gas injection system for uniflow dual fuel engines having a plurality of cylinders, a piston in each cylinder, inlet ports arranged around each cylinder to be uncovered by downward movement of the piston in the cylinder, comprising:

- a seal located in one inlet port;
- a reed valve assembly connected to said inlet port via said seal;
- an inlet pipe connected to said reed valve assembly and



adapted to be connected at its distal end to a gas source; and  
an air inlet pipe connected between said port seal and said



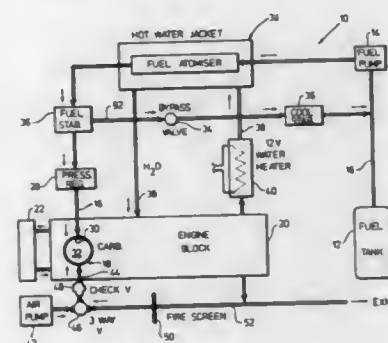
reed valve assembly for feeding air therebetween such that when said piston closes said one inlet port, air from said air inlet pipe will close said reed valve to prevent further flow of gas.

4,679,539

**VAPOR LOCK CONTROL AND FUEL ECONOMIZER**  
George D. Storbakken, 10677 Ogden Ave., Boise, Id. 83709  
Filed Dec. 10, 1985, Ser. No. 807,464  
Int. Cl.<sup>4</sup> F02M 31/00

U.S. Cl. 123—557

4 Claims



1. A fuel economizer system operably attachable to an existing fuel supply system associated with an internal combustion engine, wherein said existing fuel supply system includes a fuel pump means for drawing fuel from a fuel supply means and delivering said fuel through a fuel supply conduit to a carburetor means attached to said internal combustion engine, said fuel economizer system comprising:
  - a. fuel heating means serving to heat said fuel prior to delivery to said carburetor means;
  - b. a fuel stabilizer means liquidly interconnected with said fuel supply conduit, consisting of a chamber for receiving heated fuel from said fuel heating means, and serving to direct excess liquid and vaporized fuel to a bypass metering valve means for redelivery to an inlet side of said fuel pump means while also serving to direct a smooth flow of heated liquid fuel to said carburetor means;
  - c. a fuel pressure regulator for operably controlling flow rate and pressurization of said fuel to said carburetor means;
  - d. said fuel heating means, said fuel stabilizer means, and said fuel regulator so configured that said fuel passes through said fuel heating means first, through said fuel stabilizer means second, and lastly through said fuel pressure regulator before delivery to said carburetor means; and,
  - e. fuel cooling stabilizer means for cooling excess fuel delivered to said fuel stabilizer means wherein said excess fuel is redelivered to said fuel pump means.

4,679,540

**IGNITION SYSTEM**

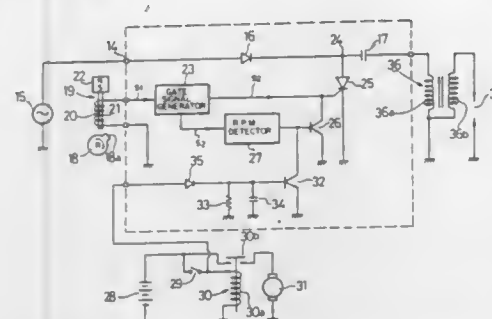
Masao Abe, Asaka, and Nobuo Miura, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 775,877, Sep. 13, 1985, abandoned. This application Oct. 27, 1986, Ser. No. 924,190

Claims priority, application Japan, Sep. 13, 1984, 59-193414  
Int. Cl.<sup>4</sup> F02P 3/06

U.S. Cl. 123—602

1 Claim



1. An ignition circuit for an internal combustion engine comprising
  - (a) an ignition circuit generating an ignition timing signal,
  - (b) an inhibition circuit comprising an r.p.m. detector circuit and a first gating circuit shunting said first gating circuit in response to output from said r.p.m. detector circuit, for inhibiting generation of said ignition timing signal when the r.p.m. of said engine is below a predetermined value;
  - (c) an interruption circuit comprising series connection of a second gating circuit to said inhibition circuit and a time-constant-discharge-circuit comprising a parallel connection of a resistor and a capacitor, and a diode preventing rapid discharge of said capacitor;
  - (d) said time constant discharge circuit shunting said second gating circuit and preventing operation for said inhibition circuit in response to charged voltage in said capacitor when a starter switch is in "ON" position, and continuing to shunt said second gating circuit and to prevent operation of said inhibition circuit in the "ON" position of said starter switch and for a constant time period, just after said starter switch is turned to "OFF" position in response to still charged voltage in said capacitor.

4,679,541

**BELT-CONFIGURED SAW FOR CUTTING SLOTS INTO STONE**

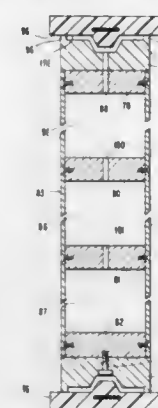
Donald D. Fish, Bedford, Ind., assignor to W. F. Meyers Company, Inc., Bedford, Ind.  
Continuation-in-part of Ser. No. 657,833, Oct. 5, 1984, Pat. No. 4,603,678. This application Jul. 12, 1985, Ser. No. 754,675  
Int. Cl.<sup>4</sup> B28D 1/08

U.S. Cl. 125—21

5 Claims

1. A device for cutting a slot in stone comprising:
  - a main frame;
  - a jib movably mounted to said frame, said jib having a groove surface defining a groove and including water outlet means opening in said groove, said jib including a pair of spaced apart extensions on opposite sides of said groove extending the length of said groove;
  - a pair of spaced apart and aligned sheaves being rotatably mounted and with at least one of said sheaves having lateral width and being mounted to said jib;
  - means on said frame and operably associated with said sheaves being operable to rotate same;
  - a flexible belt extending through said groove with a top and opposite sides and extending around and in driven engagement by said sheaves, said sides defining the width of said belt which is sized at least equal to said lateral width

allowing said one sheave to pass through a slot cut by said belt as said jib moves said belt through said slot, said belt having a continuous bottom projection facing inwardly into said groove being spaced from said groove surface along the length of said groove by water flowing outwardly from said water outlet means, said groove is complementary in shape to said projection positioned therein, said belt further having a pair of inwardly facing edge surfaces spaced apart by said projection; and,



water means on said jib and in communication with said water outlet means and being operable to emit water between said groove and said projection on said belt to provide lubrication therebetween,  
said extensions forming limit means mounted on said jib and extending adjacent said belt at said inwardly facing edge surfaces allowing water to be maintained in said groove as said extensions support said belt on said inwardly facing edge surfaces limiting flow of water outwardly between said extensions and said belt.

4,679,542

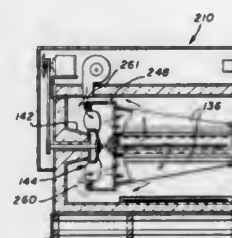
**FAN-PLENUM CONFIGURATION**

Donald P. Smith, 4530 Woodfin Dr., Dallas, Tex. 75220, and Virgil L. Archer, Dallas, Tex., assignors to Donald P. Smith, Dallas, Tex.

Continuation of Ser. No. 359,921, Mar. 19, 1982, abandoned. This application Dec. 31, 1985, Ser. No. 815,666  
Int. Cl.<sup>4</sup> A21B 1/00

U.S. Cl. 126—21 A

18 Claims



1. An impingement device for processing food products comprising:
  - an enclosure defining a chamber for receiving a food product therein,
  - means for supporting said food product within the chamber,
  - a plurality of duct means mounted in said chamber, nozzles in each of said duct means shaped and spaced to form a plurality of discrete streams of gas each stream vertically impinging upon a discrete area of said food product and diffusing upon contact with said food product, at least one duct means positioned above and one duct means positioned below said food product supporting means for

directing gas through said nozzles in said duct means to impinge upon the food product on said supporting means, a plenum in said chamber for enclosing a reservoir of gas, said plenum being positioned adjacent an edge of said supporting means and having said duct means connected thereto, said plenum having one side with outlet openings in communication with said duct means and having another side with an inlet opening therein, said plenum being of a size and shape to extend above and below said supporting means and being spaced inwardly from said enclosure whereby a flow path for gas in said chamber is formed both above and below said plenum to allow gas to return to said inlet opening after contacting said food product,  
impeller means positioned in said chamber at said inlet opening for providing a supply of pressurized gas to said plenum from said chamber,  
deflector means in said plenum, said deflector means being shaped and positioned relative to said impeller means to direct gas from said impeller means into said duct means whereby gas is caused to flow through said nozzles in said ducts to impinge vertically upon said food product and once contacting said food product to return around said plenum and to said impeller means by paths which extend above and below said plenum, and means for moving said food product within said chamber relative to said duct means whereby the impingement jets formed by the nozzles of said duct means are moved across the surface of said food product.

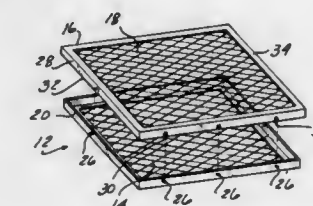
4,679,543

**HOLDER FOR RETAINING REFRACTORY MATERIALS**  
John H. Waltman; Wesley J. Stewart, both of Pontiac, and Gerald E. Leroux, Clarkston, all of Mich., assignors to JWJ Enterprises, Pontiac, Mich.

Filed Feb. 18, 1986, Ser. No. 830,219  
Int. Cl.<sup>4</sup> A47J 37/00

U.S. Cl. 126—25 R

1 Claim



1. In an outdoor gas-fired grill including refractory materials for cooking food with radiant heat, the improvement of an adjustable-refractory-material-retaining holder comprising:
  - a pair of refractory-material-retaining trays, each member of said pair comprising at least one side wall, a flange integral with and projecting horizontally from an edge of at least one side wall, and a flat refractory-material-retaining open mesh supported by the flange and fastened thereto, wherein one member of said pair of refractory-material-retaining trays may be telescopically received by the other member so that the flat, refractory-material-retaining open meshes thereof are in substantially parallel, spaced-apart relation with respect to each other;
  - a plurality of vertically disposed slots formed in the at least one side wall of one member of the pair of refractory-material-retaining trays; and
  - a plurality of screws extending horizontally from the at least one side wall of the other member of the pair of refractory-material-retaining trays at locations thereon corresponding to the locations of the plurality of slots, each of said plurality of screws being capable of being passed through its corresponding slot and tightened down at a selected position along the vertical length of the corre-

sponding slot for adjustably fastening the pair of refractory-material-retaining trays together to accommodate refractory material of varying sizes, the selected position chosen at a distance apart sufficient to retain a selected refractory material of particular size between the pair of refractory-material-retaining trays.

4,679,544

**THREADED ADJUSTABLE GAS INTAKE ASSEMBLY**  
Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.

Continuation-in-part of Ser. No. 768,853, Aug. 23, 1985, which is a continuation-in-part of Ser. No. 617,949, Jun. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 548,723, Nov. 4, 1983, Pat. No. 4,478,205, which is a continuation-in-part of Ser. No. 548,724, Nov. 4, 1983, Pat. No. 4,488,534. This application Oct. 25, 1985, Ser. No. 791,315

Int. Cl.<sup>4</sup> F24B 3/00

U.S. Cl. 126—41 R

14 Claims



1. A multi-adjustable gas intake assembly for a gas burner element which can provide connection between varying position of gas controls and gas burners including both vertical and horizontal adjustment comprising:

- a first tubular gas conveying member defining a combined flexible and threaded portion;
- a second tubular gas conveying member defining a combined flexible and threaded portion, said flexible and threaded portions of said first and second tubular members constructed and arranged to threadably engage each other, at least one of said first and second tubular members being freely movable in a threaded manner with respect to the other and vertically and horizontally adjustable;
- air regulator and gas supply inlet means on one of said tubular members
- said air regulator and gas supply inlet means including an opening into said tubular member to effect mixing of gas and air;
- and
- means operatively associated with the other of said tubular members for connection with a gas burner element.

4,679,545

**GAS-FIRED OUTDOOR SPA AND HOT TUB HEATER**  
Adrian V. Cavestany, Moorpark, Calif., assignor to Raypak, Inc., Westlake Village, Calif.

Continuation-in-part of Ser. No. 778,436, Sep. 20, 1985, abandoned. This application Jun. 16, 1986, Ser. No. 874,465

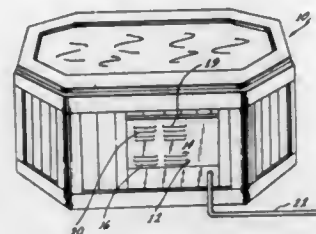
Int. Cl.<sup>4</sup> F24H 1/00

U.S. Cl. 126—350 R

6 Claims

1. A portable spa unit having peripheral walls and adapted for outdoor use containing heated water, the said spa unit having one side wall adapted to receive a heater, the said heater having a panel exposed to the outside of the spa unit and

positioned substantially flush with the outside wall of the spa, a self-contained, gas fired water heater constructed to be contained within said one side wall of the spa unit, the heater having connections to the interior of the spa unit for the water to be passed through the heater to be heated, the heater including a gas burner and means including connections for supplying gas to the burner, the panel having openings for the admis-



sion of combustion air from outside the spa unit and having openings for the discharge of gases of combustion to outside of the spa unit, and circulating means for circulating combustion gases from the burner and discharging the said gases from the heater through said discharge openings in said panel, and said circulating means having means for limiting the temperature of the gases being discharged whereby to limit the temperature of said exposed panel of the heater unit.

4,679,546

**IMPLANTABLE SHUT-OFF DEVICE**

Ernst S. C. van Waalwijk van Doorn, Wijchen; Joseph D. M. de Vries, Malden, and Franciscus J. M. de Vries, Wassenaar, all of Netherlands, assignors to Applied Medical Technics B.V., Wijchen, Netherlands

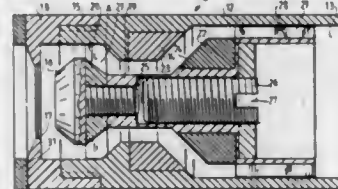
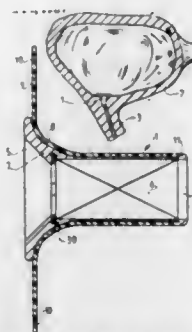
Filed Oct. 16, 1985, Ser. No. 788,155

Claims priority, application Netherlands, Oct. 17, 1984, 8403174

Int. Cl.<sup>4</sup> A61F 1/00; A61M 25/00

U.S. Cl. 128—1 R

10 Claims



1. Shut off device particularly suitable for implantation in a urethra comprising a tubular housing having attachment means for permanent fitting on the wall tissue of said urethra, a valve system located in said tubular housing for respectively closing off and leaving clear the passage in said housing, means for disconnectably coupling said valve system to said housing, and said valve system consists of a cylindrical body having a valve

seat, a valve co-operating therewith and means for pressing said valve and said seat against one another.

4,679,547

**FLUID SUBMERSIBLE LARYNGOSCOPE**

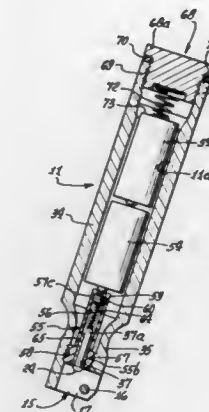
Jack Bauman, 1677 San Onofre Dr., Pacific Palisades, Calif. 90272

Filed Feb. 19, 1986, Ser. No. 830,738

Int. Cl.<sup>4</sup> A61B 1/26

U.S. Cl. 128—10

10 Claims



1. In a fluid submersible laryngoscope including a hollow handle to contain power supply means, a blade to be inserted into a patient's mouth, and means to removably attach the blade to an end portion of the handle in a substantially L shaped configuration, the improvement comprising:

- (a) a terminal pin carried by the handle at said end portion of the handle,
- (b) means to place the terminal pin in electrical energy transmitting relation with light bulb carried by the blade, when the blade is attached to the handle,
- (c) and first fluid sealing means between the terminal pin and handle to block access of external fluid into the hollow handle, whether or not the blade is attached to the handle, and when the handle is submerged in fluid,
- (d) said fluid sealing means comprising a tubular elastomeric body carrying said terminal pin, the pin having an enclosed shank in fluid sealing and retained relation with a bore defined by said elastomeric body whereby center extent of the elastomeric body is resiliently yieldable axially of the handle to allow the pin and said center extent of the body to deflect axially when the blade is fully attached to the handle and said electrical energy transmitting relation is established to energize the bulb, the pin having ahead on the shank projecting endwise outwardly of said elastomeric body, said body having an exterior generally annular surface in fluid sealing engagement with a bore defined by the handle.

4,679,548

**RE-EDUCATION APPARATUS FOR THE ARTICULATED SEGMENTS OF THE HAND**

Jean-Claude R. Pecheux, Charleville Mezieres, France, assignor to Compagnie Generale de Material Orthopedique, France

Filed Jan. 25, 1985, Ser. No. 695,162

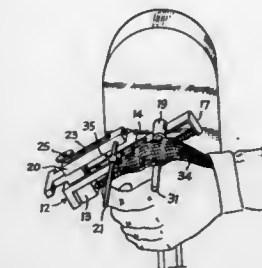
Int. Cl.<sup>4</sup> A61H 1/02

U.S. Cl. 128—26

15 Claims

1. An apparatus for restoring mobility to the articulated segments of the hand, comprising:  
a driving member with at least one driving shaft, on which is fixed only one radial slide-guide;  
a sliding block guided by said slide-guide and operationally

coupled to a return member urging said sliding block in centrifugal movement with respect to the shaft;  
a support for resting the hand, which support extends in parallel to the axis of the shaft;  
at least one bar carried by the sliding block and extending in parallel to the support;  
means of joining said bar to at least one articulated segment of the hand; and  
means of driving said sliding block in centripetal movement, in relation to the angular displacement in one direction of



the slide-guide driven by the shaft, wherein the driving means is comprised of at least one wire or cable which is flexible but non-stretchable and extends sideways of the slide-guide between the sliding block and substantially the center of angular rotation of said slide-guide, and by a fixed cam carried by the structure of the driving member and offering, inside the plane in which the wire or cable moves when said slide-guide is angularly displaced, an evolutive bending profile for driving the sliding block centripetally in relation with the angular movement of the slide-guide.

4,679,549

**INTEGRAL FOOT MASSAGE AND SUPPORT APPARATUS**

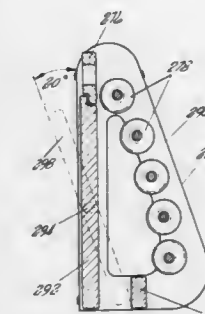
William M. Quam, and Dorothy M. Quam, both of 241 Conejo Rd., Santa Barbara, Calif. 93103

Division of Ser. No. 516,700, Jul. 22, 1983, which is a continuation-in-part of Ser. No. 445,196, Nov. 29, 1982. This application Nov. 21, 1984, Ser. No. 656,265

Int. Cl.<sup>4</sup> A61H 15/00; A63B 23/04

U.S. Cl. 128—57

6 Claims



3. An integral foot massage and support comprising a base plate having a substantially planar surface for defining a support when the base plate is placed on a support surface and defining a foot receiving surface when the base plate is positioned in a spaced opposed position to the support surface;  
housing means operatively coupled to said base plate and including means for defining side members; and  
a plurality of massage assemblies each of which includes an axially extending center support member and a plurality of annular shaped massage elements mounted



axially on and rotatable about said center support members, said center support members being mounted between said side members at an angle which approximates the ergonomic design angle which is at least 10° to about 20°, said ergonomic design angle being selected so as to reduce fatigue, stress and discomfort of the thigh, lower leg and foot of a human user in a sitting position, said base plate being pivotable relative to said housing to change the angle thereof independent of said ergonomic design angle enabling the feet of a human user to be exercised.

4,679,550

# INTEGRAL FOOT MASSAGE AND SUPPORT APPARATUS

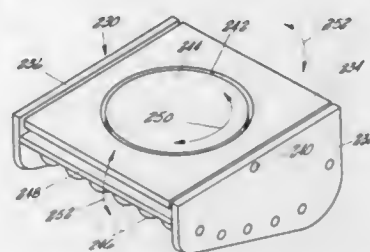
William M. Quam, and Dorothy M. Quam, both of 241 Conejo Rd., Santa Barbara, Calif. 93101

Continuation-in-part of Ser. No. 445,196, Nov. 29, 1983. This

application Jul. 22, 1983, Ser. No. 516,700

Int. Cl. A61H 15/00; A63B 23/04

U.S. Cl. 128—57



1. A combined foot massage and support comprising:
  - a base support including a base plate having a substantially planar surface and a second opposite surface, said base plate having a circular shaped opening located centrally therein;
  - a pair of substantially planar side support members each of which terminate in a first support end and a second support end, said first support end of each of said side support members including means defining a substantially planar support surface and said second support end of each of said side support members being located opposite said first support end and including means defining a ramp support surface having a slope which approximates the ergonomic design angle which is adapted to reduce fatigue, stress and discomfort of the thigh, lower leg and foot of a human user in a sitting position, said substantially planar side support members being operatively coupled to and extending from said base support and base plate and in a spaced parallel relationship to each other with the substantially planar support surface of each of said side support members positioned adjacent said base support and with the ramp support surface of each of said side support members positioned with the slope of the ramp support surface extending in the same direction;
  - a plurality of massage assemblies each of which includes an axially extending center support member and a plurality of annular shaped massage elements mounted axially on and rotatable about said center support members, said center support members being mounted in an arcuate, spaced parallel alignment between said spaced parallel planar side support members above said base support and above said opposite side of the base plate, said plurality of massage elements being mounted on said center support members and having a radius which extends therefrom to below said ramp support surfaces to form a convex shaped, angularly disposed treating surface which extends substantially between said substantially parallel side support members; and

means including a rotatable disc positioned in said circular

opening in said base plate which is adapted to be engaged and rotated by at least one foot of a user; said foot massage and support being adapted to have a massage position wherein the base support, the substantially planar surface of the base plate and the substantially planar surface of the side support members are positioned on a supporting surface placing the convex shaped, angularly disposed treating surface in a massage position which is adapted to receive the feet of a user which may be massaged by movement of the feet relative to the rotatably mounted massage elements and a support position wherein the ramp support surfaces of the second support end of each side support members are positioned on a supporting surface placing the base support including the substantially planar surface of the base plate at an angle to receive and support the feet of a user.

4,679,551

# DEVICE FOR PERFORMING THERAPEUTIC TREATMENTS

Jean M. Anthony, Antwerpen, Belgium, assignor to Tomtec, N.V., Antwerpen, Belgium

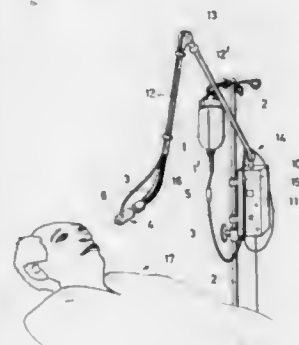
Filed Feb. 22, 1985, Ser. No. 704,631

Claims priority, application Belgium, Feb. 23, 1984, 2/60347; Mar. 26, 1984, 2/60374; Apr. 25, 1984, 2/60398; Oct. 23, 1984, 0/213872

Int. Cl. A61B 19/00; A61M 35/00

U.S. Cl. 128—67

6 Claims



1. Apparatus for moistening a body area of a patient, comprising:
  - holding means to hold a supply of a liquid;
  - ultrasonic spray means having an activated state to spray the liquid onto the body area, and a deactivated state wherein the spray means does not spray the liquid onto the body area;
  - liquid conducting means connected to the holding means and to the ultrasonic spray means, and having an open position to conduct liquid from the holding means to the ultrasonic spray means, and a closed position to prevent the liquid from passing from the holding means to the ultrasonic spray means; and
  - control means connected to the liquid conducting means to regularly move the liquid conducting means between the open and closed positions a plurality of times during a pre-determined interval, and further connected to the ultrasonic spray means to regularly change said ultrasonic spray means between the activated and deactivated states a plurality of times during the predetermined interval, the control means maintaining the ultrasonic spray means in the activated state for a brief period each time after the liquid conducting means is moved from the open position to the closed position during the predetermined interval, to inhibit the accumulation of fluid in the ultrasonic spray means when said ultrasonic spray means is in the deactivated state.

4,679,552

# DRAPE FOR ARTHROSCOPIC SURGERY

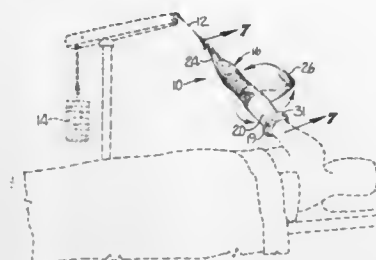
Richard B. Caspari, Maidens, Va., assignor to Chattanooga Corporation, Chattanooga, Tenn.

Filed Oct. 18, 1985, Ser. No. 788,784

Int. Cl. A61F 5/04, 13/00

U.S. Cl. 128—132 D

9 Claims



1. A surgical drape adapted for protectively covering a limb of a patient during arthroscopic surgery or the like and while applying traction to the limb, and comprising:
  - a tubular sleeve of flexible sheet material, with said sleeve having a length adapted to receive at least a substantial portion of the length of the limb of the patient, traction pad means mounted within a portion of said tubular sleeve, with said pad means having a length dimension sufficient to extend along a substantial portion of the length of the limb, and having portions thereof which are adapted to lie along opposite sides of the limb of the patient which is received in the sleeve,
  - strap means positioned on the outside of said tubular sleeve and having opposite ends attached through said sleeve to said traction pad means, and
  - wrap means for encircling the sleeve when the limb of a patient is received therein to circumferentially bind the tubular sleeve upon the limb, and such that a traction force may be applied to said strap means which results in the traction force being applied to the limb which is distributed along the elongate contact area between said traction pad means and the intermediate limb.

4,679,553

# VENIPUNCTURE SITE PROTECTOR

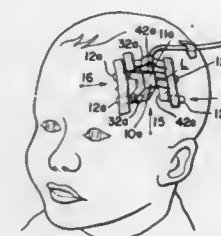
Raymond E. Proulx, 5837 Cameo, Alta Loma, Calif. 91701, and Frank J. Rauscher, 5908 Mt. View Ave., San Bernardino, Calif. 92407

Continuation-in-part of Ser. No. 554,768, Nov. 23, 1983, abandoned. This application May 17, 1985, Ser. No. 735,331

Int. Cl. A61M 5/00

U.S. Cl. 128—133

5 Claims



1. A venipuncture site protector, comprising:
  - a body constructed of relatively non-elastic thin and stiff but readily bendable material and including a cup-like shield mounting tabs extending from said shield,
  - said shield having an open end, an opposite closed end, four side walls, a rectangular end wall closing said closed end and joined along its edges to said side walls, and a gener-

ally rectangular cross section in planes parallel to said end wall, said mounting tabs including a pair of laterally spaced tabs extending outwardly from each of two opposite sides of said shield and joined to the corresponding opposite side walls of said two opposite sides along junctures disposed substantially in the plane of said open shield end, said two corresponding opposite side walls and the two remaining opposite shield side walls having end edges at said open end of said shield and notches entering said side wall edges, the notches in each pair of said opposite walls being aligned for receiving through one of said notches of each pair of said opposite side walls a holder mounting an intravenous needle entering the venipuncture site with the holder positioned within said one notch and needle extending subcutaneously toward the other notch of the respective pair of said opposite side walls, and said one notch of each pair of said opposite side walls being larger than said other notch of said opposite side wall of said pair and occupying a major portion of the respective side wall for receiving the needle holder, and said other notch of the other respective pair of said opposite side walls providing clearance for the patient's skin above the needle.

4,679,554

# ATHLETIC SUPPORTER

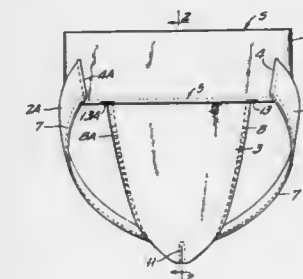
Daniel S. Markham, 124 Irving St., Laurel, Md. 20707

Filed Apr. 23, 1985, Ser. No. 726,159

Int. Cl. A61F 5/40

U.S. Cl. 128—158

15 Claims



1. In an athletic supporter having in combination as elements of construction a waistband, leg straps and a genital-supporting pouch, the improvement, wherein at least the waistband and the pouch consist essentially of a knitted or woven fabric of elasticized polypropylene fiber formed of polypropylene and spandex fibers with the polypropylene fiber constituting the major portion of the fabric, said fabric having a coefficient of stretch in all directions of at least 50% per linear inch and a recovery to the unstretched state in excess of about 95%, said polypropylene fabric being characterized by a substantial degree of moisture transfer, with the fibers thereof substantially non-absorbant to moisture, said polypropylene fiber having a specific gravity of approximately 0.9.

4,679,555

# METHOD AND APPARATUS FOR INTRAPULMONARY DELIVERY OF HEPARIN

Marvin A. Sackner, Miami Beach, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Aug. 7, 1984, Ser. No. 638,587

Int. Cl. A61M 15/00

U.S. Cl. 128—203.15

9 Claims

6. A method of intrapulmonary administration of heparin, comprising the steps of:
  - releasing a metered dose of aerosolized powdered heparin

from a pressurized canister containing powdered heparin and a low boiling point propellant;  
inhaling the metered dose of aerosolized powdered heparin into the lungs of a patient;  
repeating the releasing and inhaling steps until a pharmaceutically effective amount of the heparin has been delivered to the patient.

4,679,556

# RELEASABLE HOLDER AND METHOD OF USE

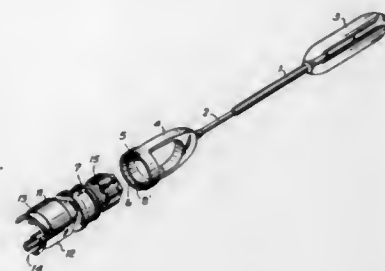
Paul Lubock, Laguna Hills, and Mike Sullivan, San Clemente, both of Calif., assignors to Shiley Inc., Irvine, Calif.

Filed Apr. 16, 1986, Ser. No. 852,699

Int. Cl.<sup>4</sup> A61B 17/00

U.S. Cl. 128—303 R

7 Claims



1. A device for releasably holding an object which comprises:  
an elongated rod having a proximal end and a distal end, said rod being attached at its proximal end to a handle and at its distal end to a bifurcated member terminating in a ring enclosing a circular key member,  
a holder member readily attachable and detachable to said ring,  
said holder member terminating in at least two cooperating fingers and having a resilient cylindrical head with an axial screw thread, said fingers being adapted to engage with and grip an object to be held and said cylindrical head being adapted to be locked through a snapping engagement, within said circular key member, and  
an engaging screw located in said screw thread and adapted to interact with said holder member so as to control and limit the movement of said fingers and thereby, upon turning, to engage and disengage said fingers with respect to a desired object.

4,679,557

# ELECTRODYNAMIC TRANSLUMINAL ANGIOPLASTY SYSTEM

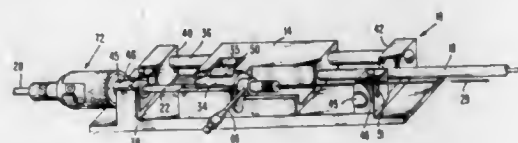
Eric A. Ople, and Thomas J. Clement, both of Seattle, Wash., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 10, 1984, Ser. No. 649,101

Int. Cl.<sup>4</sup> A61B 17/32

U.S. Cl. 128—305

14 Claims



1. An electrodynamic transluminal angioplasty system comprising:  
(a) a prime mover having a drive shaft;  
(b) an advancer assembly comprising a body having a saddle formed therein and a carriage which is adapted to move within said saddle;

(c) means for connecting a drive wheel in said carriage to said drive shaft of said prime mover;  
(d) catheter engagement coupling means including a driven wheel for connecting a rotatable catheter to said drive wheel, whereby said driven wheel in said catheter engagement coupling means can be driven by said drive wheel in said carriage thereby rotating said catheter.

4,679,558

# CATHETER BASED SURGICAL METHODS AND APPARATUS THEREFOR

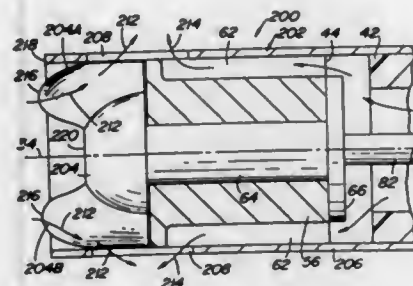
Kenneth Kensey, Hinsdale, Ill., and John Nash, Downingtown, Pa., assignors to Intravascular Surgical Instruments, Inc., Telford, Pa.

Division of Ser. No. 765,034, Aug. 12, 1985. This application Sep. 22, 1986, Ser. No. 909,802

Int. Cl.<sup>4</sup> A61B 17/00

U.S. Cl. 128—328

23 Claims



1. The method of disintegrating a stone within the body of a living being by utilizing an elongated, small diameter, flexible catheter having a longitudinal axis and a distal end at which a working head is located, said working head being arranged for high speed movement with respect to said axis by associated drive means, said drive means arranged to freely effect the movement of said working head even if said catheter is bent through any arc up to a minimum radius of curvature and without resulting in excessive vibration which could interfere with the stone disintegration process, said method comprising inserting said catheter into said body from a remote location, causing said drive means to move said working head at a high rate of speed and advancing said catheter into contact with said stone along said axis as said working head is moving, whereupon the mechanical action of said moving working head causes the disintegration of said stone.

4,679,559

# METHOD AND DEVICE FOR TAGGING A MACRO-ORGANISM

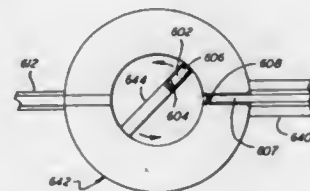
Keith B. Jefferts, Shaw Island, Wash., assignor to Northwest Marine Technology Inc., Shaw Island, Wash.

Filed Oct. 7, 1986, Ser. No. 916,165

Int. Cl.<sup>4</sup> A61B 17/00

U.S. Cl. 128—330

16 Claims



12. A device for tagging a macro-organism, comprising:  
a hollow injection needle at least partially insertable into body tissues of the macro-organism;

a wire at least partially disposable in said needle for pushing a tag through said needle, said needle having an inner diameter larger than an outer dimension of said tag and said wire, said needle and said wire defining an injection path;  
means located along said path for severing an end portion from a leading end of said wire;  
means located along said path for magnetizing said end portion, the magnetized and severed end portion constituting said tag, said tag having a magnetic field with a first orientation, said leading end of said wire having, upon formation of said tag, a magnetic field with a second orientation;  
means engageable with said wire for moving said wire through said needle to thereby push said tag into body tissues of the macro-organism upon a partial insertion of said needle into said body tissues; and  
means, operatively connected to at least one of said means for magnetizing and said means for severing, for setting said first orientation and said second orientation to be opposite to one another at least in a region about a rear end of said tag and said leading end of said wire immediately prior to and immediately after injection of said tag into the macro-organism, whereby said leading end of said wire repels said tag and thereby prevents said tag from being withdrawn from the body tissues of the macro-organism together with said wire.

4,679,560

# WIDE BAND INDUCTIVE TRANSFERAL POWER AND DATA LINK

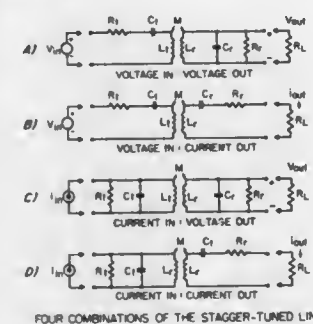
Douglas C. Galbraith, Stanford, Calif., assignor to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 2, 1985, Ser. No. 719,232

Int. Cl.<sup>4</sup> A61N 1/00

U.S. Cl. 128—419 R

14 Claims



1. An inductive link for conveying power and/or data through the skin of a user comprising a first external coil, a second medically implantable coil, the coils being movable relative to one another, the mutual inductive coupling of said coils changing with their position relative to one another, and a means for stagger tuning said first and second coils to maintain a gain which is relatively independent of the coil's mutual coupling at a selected frequency or frequency band of interest.

4,679,561

# IMPLANTABLE APPARATUS FOR LOCALIZED HEATING OF TISSUE

James D. Doss, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 20, 1985, Ser. No. 736,021

Int. Cl.<sup>4</sup> A61N 1/32

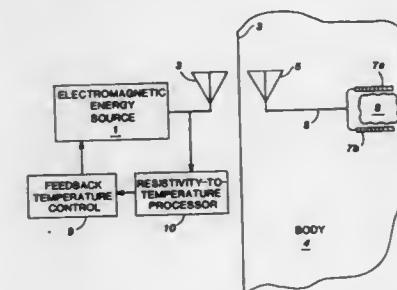
U.S. Cl. 128—422

6 Claims

1. An apparatus for locally increasing the temperature of

living tissue located inside of a body, said apparatus comprising in combination:

- means disposed externally to the body for generating radio-frequency electromagnetic energy having a chosen intensity;
- first antenna means for receiving and for radiating the radio-frequency electromagnetic energy from said means for generating radio-frequency electromagnetic energy, said first antenna means being adapted for placement at substantially the closest location external to the body to the tissue to be heated;
- second antenna means closely coupled to said first antenna means for receiving the radiated electromagnetic energy and for generating an alternating voltage therefrom having a first electrical connection and a second electrical connection, said second antenna means being adapted for location within the body near an accessible outer surface thereof in order to facilitate receiving the radiated electromagnetic energy, whereby the alternating voltage appears between said first electrical connection and said second electrical connection;



- at least one first electrode means being in electrical contact with said first electrical connection and at least one second electrode means being in electrical contact with said second electrical connection for receiving the alternating voltage appearing between said first electrical connection and said second electrical connection of said second antenna means, said at least one first electrode means and said at least one second electrode means being adapted for location within the tissue to be heated in the vicinity of at least one of said first electrode means and said second electrode means causing thereby an increase in temperature therein; and
- means for externally measuring the voltage current characteristics of said first antenna means for determining the increase in temperature within the tissue to be heated, said means for externally measuring the voltage current characteristics of said first antenna means having parametric dependence on the change in electrical resistance within the tissue to be heated resulting from the increase in temperature therein.

4,679,562

# GLUCOSE SENSOR

Eugene Luksha, Golden Valley, Minn., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Continuation of Ser. No. 466,881, Feb. 16, 1983, abandoned.

This application May 9, 1986, Ser. No. 861,347

Int. Cl.<sup>4</sup> A61B 5/00

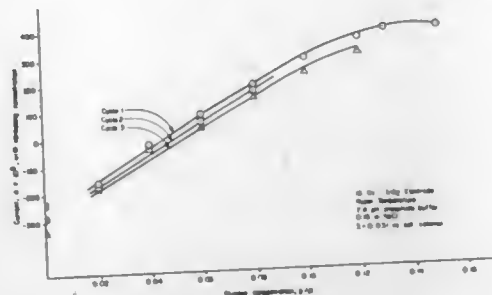
U.S. Cl. 128—635

6 Claims

1. Glucose sensor means for in-vivo generation of an electrical signal in response to the presence of glucose in the bloodstream and thereby electrically determining blood glucose concentrations, said sensor means comprising an iridium substrate with an in-situ oxidized outer surface of iridium oxide to which are bonded first and second superposed films, said first



film being bonded to said iridium oxide surface and consisting essentially of silanized gamma aminopropyltriethoxysilane.



and with said second film consisting essentially of glucose oxidase and being covalently bonded in-situ onto said first film.

4,679,563

## BIOMEDICAL ELECTRODE

Shintaro Wada; Hisanori Takahashi, and Yoichi Nomura, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 761,723, Aug. 2, 1985. This application Jan. 28, 1986, Ser. No. 823,175  
Claims priority, application Japan, Oct. 8, 1984, 59-152182[U]; Oct. 8, 1984, 59-152183[U]; Dec. 27, 1984, 59-201623[U]; Dec. 27, 1984, 59-201624[U]

Int. Cl.<sup>4</sup> A61B 5/04

U.S. Cl. 128—640

9 Claims



1. A biomedical electrode comprising a flexible electrode plate capable of conforming to a skin surface of a living body, an electrically conductive adhesive layer adhered to a first portion of said electrode plate and to a non-tacky member not adhered to said electrode plate interpositioned between a second portion of said electrode plate and said conductive adhesive layer, wherein the second portion of said electrode plate has a cut therein which provides a tongue adapted to be connected to a terminal of a biomedical diagnostic device.

4,679,564

## MONITORING ELECTRODE ATTACHABLE TO A PATIENT

Robert W. Sessions, German Church Rd., Hinsdale, Ill. 60521  
Filed Oct. 4, 1984, Ser. No. 657,588

Int. Cl.<sup>4</sup> A61B 5/04

U.S. Cl. 128—640

9 Claims



1. An electrode attachable to a patient for use with electronic medical monitoring or diagnostic equipment, said electrode comprising:  
a foam pad;  
a non-conductive carrier attached to one side of said

foam pad having a conductive metallized strip thereon at a side of said carrier facing away from said foam pad;  
a conductive film strip overlying at least said conductive metallized strip, said conductive film strip extending beyond said conductive metallized strip on each side thereof and covering said carrier and a portion of said foam pad;  
an adhesive layer covering said side of said foam pad on which said non-conductive carrier is attached and also covering said conductive film strip; and  
a means for electrically connecting said conductive metallized strip to a lead of said diagnostic or monitoring equipment.

4,679,565

## ULTRASONIC DIAGNOSTIC APPARATUS USING NON-LINEAR PARAMETERS OF AN ORGAN

Hiroshi Sasaki, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

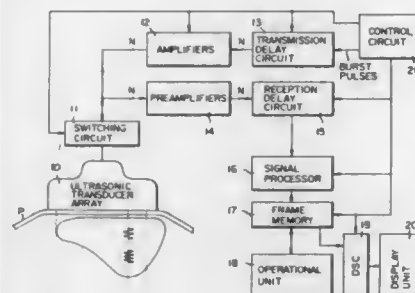
Filed Oct. 23, 1985, Ser. No. 790,471

Claims priority, application Japan, Oct. 23, 1984, 59-222715

Int. Cl.<sup>4</sup> A61B 10/00

U.S. Cl. 128—660

10 Claims



3. An apparatus for obtaining a non-linear parameter of an object comprising:  
ultrasonic transducer means for directing ultrasonic waves into an object and receiving echoes reflected from the object;  
scanning means coupled with said transducer means for activating said transducer means to sequentially send two ultrasonic burst waves of respective first and second frequencies into the object, the two ultrasonic bursts being separated by a predetermined time interval so that echoes of the first ultrasonic burst wave of the first frequency reflected from the object are mixed within the object with the second ultrasonic burst wave of the second frequency reflected from the object;  
means coupled with said transducer means for activating said transducer means to detect echoes of the reflected waves from the object having the first frequency as a function of time;  
means coupled with said transducer means for activating said transducer means to detect echoes of the reflected waves from the object having the differential frequency between the first and second frequency created by the mixing of the two ultrasonic burst and the reflection of those mixed waves from the object;  
storing means coupled with said transducer means for storing the echoes of the first frequency and the echoes of the differential frequency; and  
calculating means coupled with said storing means for obtaining the non-linear parameter of the object by comparing the stored echoes of the differential frequency with the stored echoes of the first frequency.

4,679,566

## APPARATUS FOR MEASURING PULSE RATE, VITAL CAPACITY AND PULMONARY PEAK FLOW

Ulf S. Tamm, 124 S. Compo Rd., Westport, Conn. 06880

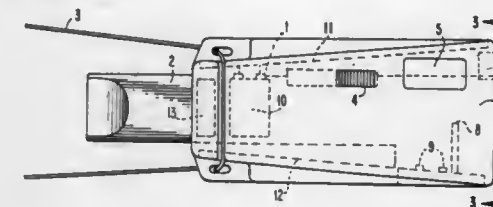
Continuation-in-part of Ser. No. 699,232, Feb. 8, 1985, Pat. No. 4,598,700, which is a continuation of Ser. No. 475,217, Mar. 14, 1983, abandoned. This application Mar. 24, 1986, Ser. No. 842,837

The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> A61B 5/08

U.S. Cl. 128—671

18 Claims



1. A portable apparatus for measuring pulse rate and pulmonary peak flow of a person comprising:  
a case having means formed therein for transmitting expired air therethrough and for receiving a portion of a person's body to measure pulse rate;  
means for measuring pulmonary peak flow disposed within said means for transmitting expired air and for receiving a portion of a person's body;  
means for measuring pulse rate disposed within said means for transmitting expired air and for receiving a portion of a person's body; and  
a source of electrical power disposed within said case and connected to said means for measuring pulmonary peak flow and said means for measuring pulse rate and for operating said means for measuring pulse rate.

4,679,567

## PRESSURE TRANSDUCER

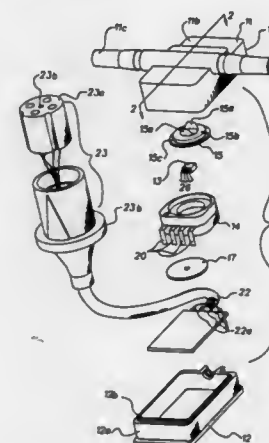
Stephen P. Hanlon; Walter L. Kerby, both of Sandy; Edmund R. Purdy, Fruitheights, and James Strom, Salt Lake City, all of Utah, assignors to Deseret Medical, Inc., Sandy, Utah

Filed Feb. 4, 1986, Ser. No. 826,056

Int. Cl.<sup>4</sup> A61B 5/02

U.S. Cl. 128—675

15 Claims



1. A pressure transducer assembly for monitoring pressure in a fluid comprising:  
a hollow body having an open chamber and a uniformly dimensioned passage defining a flow path with an inlet and outlet port in fluid flow communication with said

flow path and an opening in said flow path extending to said chamber,  
a mounting means being an electrical insulator and having a centrally opened web with a receiving well extending outwardly therefrom and a transducer supporting portion in communication therewith,  
a lid means having a first area shaped to close a part of said opening and maintain a section of said uniformly dimensioned passage and a second area configured to fit within said mounting means receiving well and said first and second areas having a passageway extending there-through to connect said flow path to the area of said opened web,  
a pressure transducer means secured in said supporting portion and exposed to said central opening of said web and said lid means passageway for determining and converting fluid pressure in said flow path into electrical signals,  
a fluid pressure responsive media which is electrically non-conductive said media closing the rest of said opening and filling said passageway between said flow path and said transducer,  
an electrical conducting means connected to said pressure transducer means and extending through said web and out of said mounted means as electrical connection lugs; and  
integrated circuit means mounted to said lugs and connected to an output cable for modifying the signal from said transducer means to permit the signal to be read directly on a measuring instrument.

4,679,568

## PHYSIOLOGICAL POTENTIAL PREAMPLIFIER

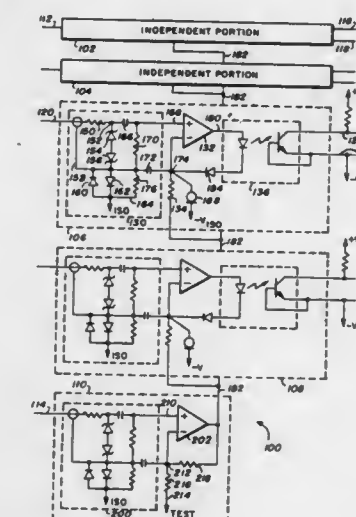
David A. Blau, Los Altos, and William R. Fish, San Jose, both of Calif., assignors to Siegen Corporation, Sunnyvale, Calif.

Filed Sep. 19, 1985, Ser. No. 777,773

Int. Cl.<sup>4</sup> A61B 5/04

U.S. Cl. 128—696

7 Claims



1. A preamplifier responsive to a potential developed between a first input line and a common line and operative to develop an isolated potential between a first pair of output lines, the preamplifier comprising in combination:  
first operational amplifier means including a non-inverting input, an inverting input, and an output;  
first coupling means coupling said first operational amplifier means non-inverting input to the common line;  
first resistor means including a first end coupled to said first operational amplifier means and a second end;  
second coupling means coupling said first operational amplifier means inverting input to said first operational amplifier means output;

second operational amplifier means including a non-inverting input, an inverting input coupled to said first resistor means second end, and an output;  
third coupling means coupling said second operational amplifier means non-inverting input to the first input line;  
first optical isolator means including an input portion and an output connected between the first pair of output lines; and  
fourth coupling means coupling said first optical isolator means input portion between said second operational amplifier means inverting input and said operational amplifier means output.

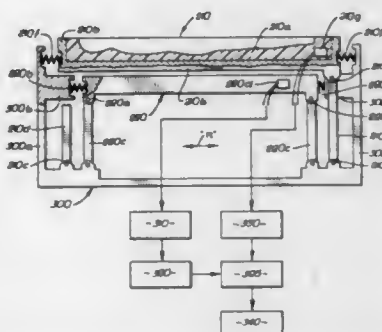
4,679,569

## BALLISTOCARDIOGRAPH

Arnold S. J. Lee, 2008 Cotner Ave., Los Angeles, Calif. 90025  
Continuation-in-part of Ser. No. 786,746, Oct. 11, 1985. This application Nov. 7, 1985, Ser. No. 795,894  
Int. Cl.<sup>4</sup> A61B 5/02

U.S. Cl. 128—714

25 Claims



1. A ballistocardiograph system for accurately and reproducibly preparing a ballistocardiograph of a subject, the system comprising:  
steady means for stationing, and thereby reproducibly positioning, a body of the subject by close-fitting confinement and constraint of a large area of skin of the body;  
motion limiting means for limiting movement of the steady means to a particular linear direction of movement;  
a motion transducer connected to the steady means for producing a ballistocardiograph of body motion caused by blood output through the heart by sensing motion of the steady means within which the body is stationed; and  
transfer means for transferring the body into and out of contact with the steady means;  
wherein the steady means includes a first rigid body having a negative impression of a portion of the dorsal half of the body of the subject.

4,679,570

## PHONOCARDIOSCOPE WITH A LIQUID CRYSTAL DISPLAY

Walter Lund, Berlin; Lou Berman, Bridgeport, both of Conn., and Felix Dothan, Jerusalem, Israel, assignors to Phonocardi-scope Partners, New Haven, Conn.

Filed Nov. 13, 1984, Ser. No. 670,854  
Int. Cl.<sup>4</sup> A61B 5/02

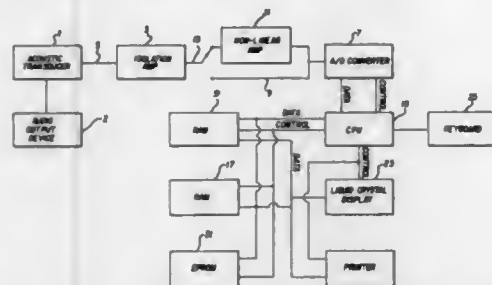
U.S. Cl. 128—715

6 Claims

1. A phonocardiograph apparatus for monitoring heart functions said apparatus comprising:  
(a) acoustical transducer means for detecting the sound of heartbeats and producing an analog electrical signal in response thereto;  
(b) an analog-to-digital converter for converting said analog heartbeat signal to a digital heartbeat signal;  
(c) coupling means for coupling said transducer means to said analog-to-digital converter said coupling means including an isolation means for electrically isolating said

transducer means from the other elements of said apparatus, non-linear amplifier means coupled to said isolation means for non-linearly amplifying the acoustic heartbeat signal, shunt means connected to said analog-to-digital converter in parallel with said non-linear amplifier means, and switch means for selectively applying the output of said isolation means to said non-linear amplifier means or said shunt means;

(d) memory means coupled to said analog-to-digital converter for storing the digital heartbeat signal;



(e) CPU means coupled to said analog-to-digital converter and to said memory means for controlling the operation thereof;

(f) liquid crystal display means coupled to said memory means and said CPU means, wherein at least a predetermined portion of the digital heartbeat signal data stored in said memory means is displayed by said liquid crystal display means and wherein the display of the digital heartbeat signal data is controlled by said CPU means.

4,679,571

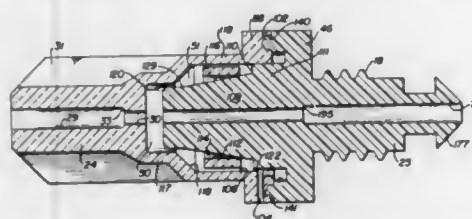
## BLOOD SAMPLE NEEDLE ASSEMBLY WITH VEIN INDICATOR

Eric Frankel, New York, N.Y., and Andrzej J. Plucinski, Norwood, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 31, 1984, Ser. No. 645,893  
Int. Cl.<sup>4</sup> A61B 5/14

U.S. Cl. 128—764

13 Claims



1. A needle assembly for collecting one or more liquid samples from a source for subsequent discharge into evacuated containers, comprising

- (a) a housing having a forward end and a rearward end;
- (b) a sample collection chamber in said housing;
- (c) a first access opening in said forward end in liquid flow communication with said chamber;
- (d) a first cannula extending outwardly from said first access opening for insertion into said source;
- (e) a second access opening in said rearward end in flow communication with said chamber;
- (f) a second cannula positioned in said second access opening and in flow communication with said chamber;
- (g) valve means on said second cannula for controlling discharge of liquid samples from said chamber into evacuated containers attached to said second cannula;
- (h) cooperating means on said forward end and said rear-

ward end of said housing providing an annular fluid bleed passage means therebetween;

- (i) said fluid bleed passage means being separate from said second access opening and said second cannula;
- (j) vent means in said housing providing flow communication with said fluid bleed passage and ambient;
- (k) said cooperating means including a tapered hub post on said rearward end, said hub post extending into said chamber;
- (l) said hub post having a gradually increasing cross section from said forward end to said rearward end;
- (m) an annular compressed tablet forming a central bore positioned on said hub post and comprised of a material responsive to aqueous containing materials adapted to be introduced into said chamber for swelling and closing said fluid bleed passage upon contact with an aqueous containing material passing therethrough; and
- (n) whereby when said first cannula engages said source, aqueous containing liquid enters said chamber, forcing any gas therein through said fluid bleed passage and said vent means, and causing said liquid to come into contact with said tablet which swells and closes said fluid bleed passage.

4,679,572

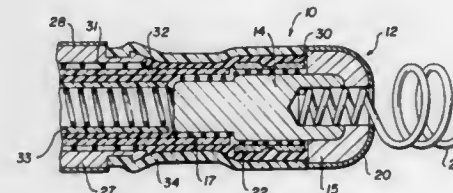
## LOW THRESHOLD CARDIAC PACING ELECTRODES

Ross G. Baker, Jr., Houston, Tex., assignor to Intermedics, Inc., Angleton, Tex.

Filed Mar. 11, 1986, Ser. No. 838,607  
Int. Cl.<sup>4</sup> A61N 1/05

U.S. Cl. 128—786

11 Claims



1. A cardiac pacing lead assembly, comprising an electrode means having a tip portion provided with an exposed surface layer of iridium oxide situated to be in electrically coupled relationship with excitable cardiac tissue of the heart when said lead assembly is implanted in a human patient, for alternatively stimulating said cardiac tissue when said electrode means is electrically energized and sensing electrical activity of the heart in response to said stimulation when said electrode means is de-energized, and an electrical conductor means electrically connected at one end thereof to said tip portion for delivering electrical energization thereto and for conducting signals representing said electrical activity therefrom, and having terminal means at the other end for connection to a pulse generator of a cardiac pacemaker.

4,679,573

## ADAPTOR ASSEMBLY FOR AIRWAY TUBE

George K. Parnoff, Walnut Creek, and Steven L. Sultan, Berkeley, both of Calif., assignors to Andros Analyzers Incorporated, Berkeley, Calif.

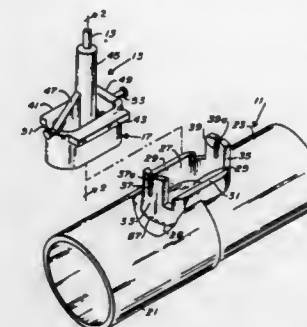
Continuation of Ser. No. 670,308, Nov. 8, 1984, abandoned. This application Aug. 11, 1986, Ser. No. 895,056  
Int. Cl.<sup>4</sup> A61B 5/08

U.S. Cl. 128—716

8 Claims

1. An adaptor assembly for sampling gas in an airway tube attached to a patient, said adaptor assembly comprising, a tubular section adapted for securing in series with the airway tube, said tubular section having an opening between the oppo-

site ends thereof, sample tube connecting means for securing a sample tube in communication with the interior of said tubular section intermediate the ends thereof, said connecting means being secured to said tubular section at said opening therein and including a filter probe extending a predetermined distance across the interior of said tubular section to provide filtered communication between the interior of said tubular section and



said sample tube, said filter probe having a filter at the end thereof inside said tubular section, said filter having a first filter surface area exposed to the interior of said tubular section and a second surface area opposite said first surface area, means defining a void volume contiguous with said second surface area, said first surface area having a ratio of surface area to void volume in excess of 10 to 1 square centimeters to cubic centimeters.

4,679,574

## CIGARETTE

Paul W. Lang, and Franklin C. Gribshaw, both of Orange, Calif., assignors to C. Allen Jensen, Pasadena, Calif.

Filed Feb. 20, 1986, Ser. No. 832,168  
Int. Cl.<sup>4</sup> A24D 1/02, 1/12

U.S. Cl. 131—365

12 Claims



1. A smoking device comprising:  
a measure of cut tobacco;  
a cigarette paper;  
said measure of cut tobacco being rolled in said cigarette paper to form a cigarette;  
said cigarette paper having an interior surface in direct contact with said measure of cut tobacco; and  
a thin layer of refractory material bonded to said paper interior surface;  
wherein said thin layer is applied in a pattern, and said pattern is formed by spaced holes in said thin layer.

4,679,575

## CIGARETTE

Katsunori Yamaguchi, Kawasaki, and Nagaaki Takemoto, Tokyo, both of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

PCT No. PCT/JP84/00420, § 371 Date Jul. 8, 1985, § 102(e) Date Jul. 8, 1985, PCT Pub. No. WO86/01377, PCT Pub. Date Mar. 13, 1986

PCT Filed Sep. 3, 1984, Ser. No. 758,641  
Int. Cl.<sup>4</sup> A24D 1/02; A24F 1/00

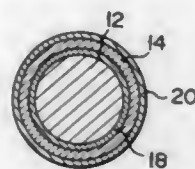
U.S. Cl. 131—365

8 Claims

1. A cigarette comprising:  
shredded tobacco;



a rolling material wrapping said shredded tobacco;  
a fire-retarding agent contained in said rolling material or coated on the outer surface of said rolling material; and



a combustion promoter coated on the inner surface of said rolling material.

#### 4,679,576 VANITY CASE

Yukitomo Yuhara, Abiko; Sumio Okojima, Yachiyo, and Tatsuo Ishikawa, Chiba, all of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

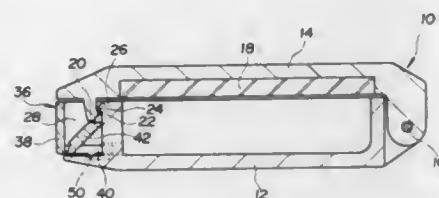
Filed Jun. 12, 1985, Ser. No. 743,963

Claims priority, application Japan, Mar. 15, 1985, 60-36093[U]; Mar. 25, 1985, 60-41521[U]; Mar. 28, 1985, 60-43956[U]; Mar. 28, 1985, 60-43955[U]; Mar. 28, 1985, 60-43954[U]; Apr. 5, 1985, 60-49989[U]

Int. Cl.<sup>4</sup> A45D 33/00

U.S. Cl. 132—82 R

20 Claims



#### 1. A vanity case comprising:

a receptacle member molded of plastic material for containing cosmetic material;  
a cover member molded of plastic material;  
said receptacle and cover members being hinged together at respective rear ends thereof;  
a recess formed in a front end of said receptacle member and defined by an inner wall, a bottom surface and side walls;  
a first latch tongue formed on said cover member;  
a second latch tongue formed on said inner wall of said recess;

said first and second latch tongues being engaged with each other by snap action when said receptacle member is closed by said cover member, thereby maintaining said cover member in a closed position with respect to said receptacle member; and

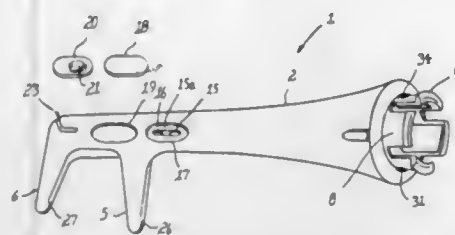
a push piece disposed within said recess and being movable therein rearwardly and forwardly, said push piece having a front wall and an arm integrally formed with said front wall through a thin flexible section, said flexible section permitting said arm to tilt with respect to said front wall, an upper surface of said arm being positioned closely adjacent a lower surface of said cover member in said closed position of said cover member, and a rear end of said arm being in contact with said inner wall of said recess and, upon rearward movement of said push piece, sliding upwardly on said inner wall to tilt said arm whereby said upper surface of said arm forces said lower surface of said cover member in upward and forward directions to release engagement between said first second latch tongues.

4,679,577  
DEVICE FOR CLEANING TEETH  
Phillippus J. Fourie, 34 Park Plaza, 21 Gregory Avenue, Melrose North, Johannesburg, Transvaal, South Africa  
Filed Jun. 14, 1985, Ser. No. 744,855  
Claims priority, application South Africa, Jun. 15, 1984, 84/4529

Int. Cl.<sup>4</sup> A61C 15/00

U.S. Cl. 132—92 R

5 Claims



1. A flossing device, comprising: an elongate floss carrying member (2) having a hollow interior and an open first end, an elongate locking member (3) inserted into the hollow interior of the floss carrying member through said open first end and coaxially rotatable therein, a second, opposite end of the floss carrying member defining two spaced, laterally extending tines (5, 6) supporting a span (25) of dental floss between outer ends thereof, the locking member having a first open ended slot (22) extending transversely through and across an inner end thereof and through which the dental floss passes in an operative position of the locking member, the floss carrying member having a second open ended slot (23) extending transversely through and across said opposite end thereof, wherein the first and second slots are in aligned registry in a threading position of the locking member relative to the floss carrying member such that an advanced length of floss may be introduced from the exterior of the device into inner, bottom portions of the slots by laying the floss crosswise in said open slot ends and advancing the floss deeper into the slots, whereafter the locking member may be rotated within the floss carrying member to wind the floss around the locking member and thereby tension the span between the tines.

#### 4,679,578 VEHICLE CLEANING SYSTEM INCORPORATING NOVEL NOZZLE APPARATUS

Richard M. Miller, 2442 Harvest Dr., Conyers, Ga. 30208  
Continuation-in-part of Ser. No. 594,934, Mar. 29, 1984, abandoned. This application Oct. 16, 1985, Ser. No. 788,098  
Int. Cl.<sup>4</sup> B60S 3/04

U.S. Cl. 134—123

16 Claims

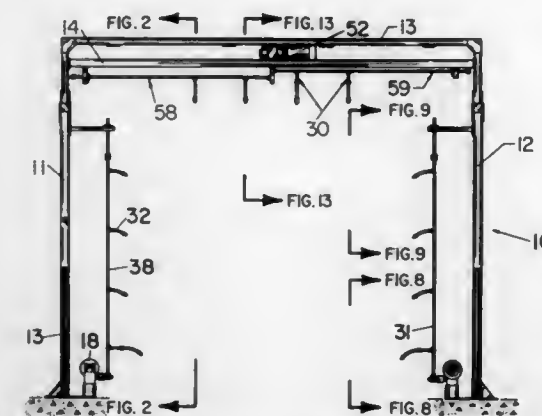
#### 14. Vehicle washing apparatus comprising:

(a) water spray means comprising:

(1) a plurality of water spray nozzles arranged in spaced, overlapping vertical deployment;  
(2) drive means for repetitively exciting said nozzles in a repetitive synchronous spray pattern without spray interference; and

(b) each of said water spray nozzles including a weighted

nozzle means for causing said nozzle, upon excitation by the drive means, to describe a uniform and substantially



planar pattern of orbital movement relative to the surface of the vehicle.

#### 4,679,579 METHOD AND APPARATUS FOR CONTROLLING THE PRESSURE OF GASES FLOWING THROUGH A CONDUIT

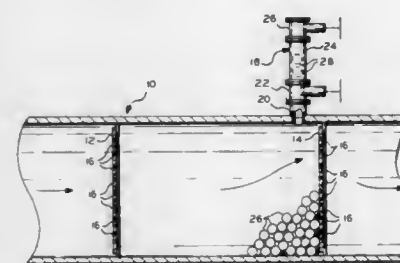
Bryan A. Megee, and James D. Whiteside, II, both of Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 12, 1986, Ser. No. 828,482

Int. Cl.<sup>4</sup> G05D 7/00

U.S. Cl. 137—13

8 Claims



1. A method of controlling the flow of a stream of gas flowing through a conduit during the flow of said gas stream through said conduit comprising disposing a plurality of pairs of generally spherically shaped objects within said conduit during the flow of said gas stream until the pressure of said gas stream downstream of said plurality of pairs of said objects is reduced to a desired value, each pair of objects being mutually secured together by a length of flexible connecting means.

4,679,580  
VAPOR VENT CONTROL VALVE  
Jeffrey E. Devall, Mt. Zion, and Ronald E. Reinke, Decatur, both of Ill., assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Jun. 23, 1986, Ser. No. 877,603

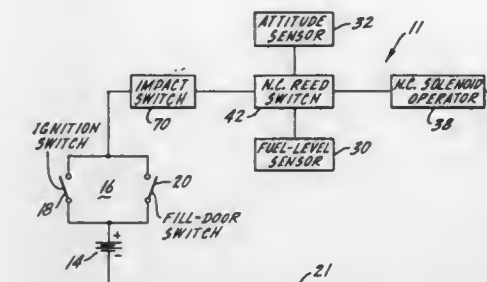
Int. Cl.<sup>4</sup> F16K 17/36

U.S. Cl. 137—39

11 Claims

1. A vapor vent control valve arrangement positioned between a fluid tank and a vapor recovery means comprising: a housing defining a fluid passage including an entry port and an exhaust port providing a fluid flow path between said tank and vapor recovery means;  
a solenoid valve means positioned to seal said exhaust port;

a relief valve means in said solenoid valve means to relieve a back pressure downstream of said solenoid valve;  
a series circuit, including means for receiving electrical energy, a first switch means, a second switch means and said solenoid valve means;  
a buoyant float in said fluid passage, operable to open said second switch means;



an attitude-responsive means, operable to move said buoyant float and thus open said second switch means;  
wherein actuation of said first switch means completes said series circuit and opens said solenoid valve means, thus providing fluid communication between said fluid tank and said vapor recovery means.

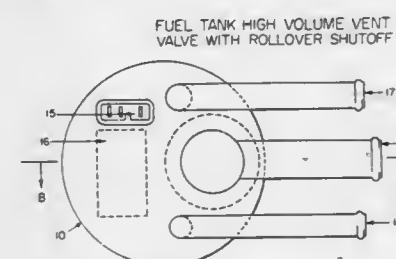
4,679,581  
FUEL TANK VENT VALVE  
William G. Mears, Kennett Square, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 18, 1986, Ser. No. 853,513

Int. Cl.<sup>4</sup> F16K 17/36

U.S. Cl. 137—43

4 Claims



#### 1. A fuel tank vent valve comprising:

(a) a hollow, elongated housing adapted to be positioned at a vertical or near vertical position within a liquid fuel tank, said housing having at its upper end a valve seat communicating with the exterior of said tank and having at least one port communicating with the interior of said tank;  
(b) a float slidably mounted within said housing and adapted to form a liquid-tight seal when seated against said valve seat of said hollow, elongated housing, and having an interior hollow channel communicating with the exterior of said tank when said float is seated against said valve seat and communicating with the port in said housing;  
(c) a ball positioned within said interior hollow channel adapted to seal said interior channel when said float is positioned against said valve seat of (c), said ball having a density greater than that of the liquid fuel present or to be present in the fuel tank; and  
(d) means for urging said float, upwardly against said valve seat.

4,679,582

## GAS PRESSURE REDUCING REGULATOR

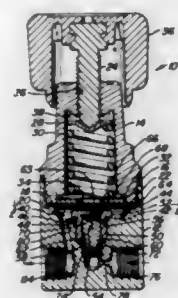
Roger D. Zwicker, Arlington, Tex., assignor to Victor Equipment Company, Denton, Tex.

Filed May 9, 1986, Ser. No. 861,504

Int. Cl.<sup>4</sup> F16K 17/14

U.S. Cl. 137—71

7 Claims



1. A gas pressure regulator for reducing high inlet gas pressure from a source to low outlet gas pressure comprising:

- a. a body having an inlet for communication with a high pressure gas source and an outlet for communication with a low pressure application;
- b. a cap on said body defining an ambient air chamber therein;
- c. a diaphragm intermediate said cap and body and sealed therebetween;
- d. a low pressure chamber defining a lateral wall in said body communicating with said diaphragm;
- e. a high pressure chamber in said body communicating with said inlet;
- f. a valve assembly disposed between said high pressure chamber and an outlet passage communicating with said outlet, said valve assembly being operable from a closed position to cut off flow from said inlet and from an open position wherein such flow is allowed from said inlet to said outlet; and
- g. a diaphragm plate located intermediate said diaphragm and said valve assembly, said diaphragm plate being in contacting relation with said diaphragm and movable therewith but being otherwise free of attachment to said diaphragm, said diaphragm plate being dimensioned so as to substantially extend between said lateral wall,
- h. means defining at least one opening in said diaphragm plate whereby pressure on the side of said diaphragm plate opposite said valve assembly is communicated to the opposite side of said diaphragm plate and thence to said diaphragm,
- i. means defining grooves in said diaphragm plate extending from the center of said plate to a point adjacent to the periphery thereof, said grooves being adapted for directing gas from said valve assembly to said outlet,
- j. a spring plate located intermediate said ambient chamber and said diaphragm, said spring plate being in contracting relation with said diaphragm and having a centrally disposed aperture therein so as to permit said diaphragm to expand into said ambient chamber through said aperture to burst when a very large overpressure condition occurs in said high pressure chamber.

4,679,583

## PNEUMATIC CONTROL SYSTEM, CONTROL MEANS THEREFOR AND METHOD OF MAKING THE SAME

William L. Lucas, Henrico County; Clarence M. Asbill, III, Richmond; Gerald L. Frank, and David M. Miller, both of Henrico County, all of Va., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 602,018, Apr. 19, 1984, Pat. No. 4,576,194.

This application Dec. 23, 1985, Ser. No. 812,367

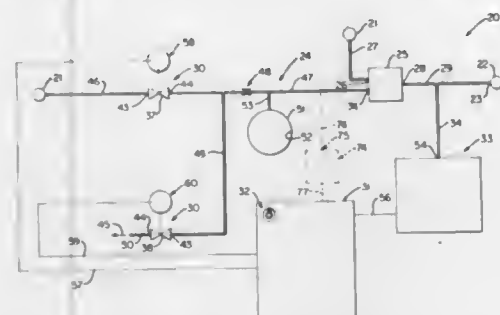
The portion of the term of this patent subsequent to Mar. 18,

2003, has been disclaimed.

Int. Cl.<sup>4</sup> G05D 16/00

U.S. Cl. 137—84

10 Claims



1. In a pneumatic control system comprising a pneumatic source, a pneumatically operated device that produces an output, and a control means for interconnecting said source to said device, said control means having an input means interconnected to said source and an output means interconnected to said device, said control means having set point means for selecting a desired output of said device, said control means having valve means for controlling the interconnection between said input means and said output means so as to regulate the pressure value in said output means, said control means having regulating means for operating said valve means to tend to produce an output of said device that corresponds to said selected output of said set point means, the improvement wherein said regulating means has a silicon transverse voltage strain gauge means that senses said pressure value in said output means and operates said valve means so as to produce a pressure value in said output means that is substantially equal to a pressure value that will cause said device to produce said selected output, said control means comprising a relay means having said input means and said output means, said relay means having a pilot input and a valve unit for interconnecting said input means to said output means in relation to the pressure value in said pilot input at said valve unit, said valve means being interconnected to said source and to said pilot input whereby said regulating means operates said valve means to create said pressure value in said pilot input at said valve unit in relation to the sensed pressure value in said output means, said regulating means also having another silicon transverse voltage strain gauge means that senses the pressure value in said pilot input at said valve unit thereof.

4,679,584

## SOFT SEAT Y-PATTERN CHECK VALVE

Harold E. Wolff, Alexandria, La., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 11, 1986, Ser. No. 895,075

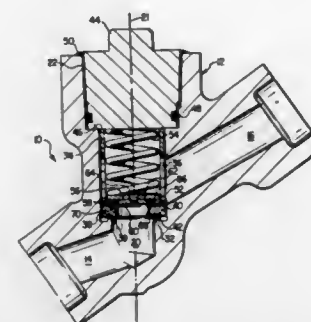
Int. Cl.<sup>4</sup> F16K 15/02

U.S. Cl. 137—269

10 Claims

1. A check valve formed with a valve body having a flow passage, the valve body being an on-off Y-pattern valve body having a narrow annular seal seat to cooperate with a valve stem, the narrow annular seal seat unsuitable for use with a soft seal, said check valve comprising:  
means for forming a permanent seal against the narrow annular seal seat, said means further forming a continuous

tion of the walls of the flow passage from the permanent seal along one direction of flow and defining an annular soft seal surface of surface area sufficiently greater than the narrow annular seal seat for sealing engagement with an annular soft seal;  
means for mounting a portion of the annular soft seal thereto



and for blocking fluid flow through the center of the soft seal; and  
said mounting means responding to fluid flow in a first direction through the passage to move the soft seal away from the soft seal surface and responding to reverse flow through the passage to force the soft seal into sealing engagement with the soft seal surface to check reverse flow.

4,679,585

## FLOWMETER-CONTROLLED VALVING

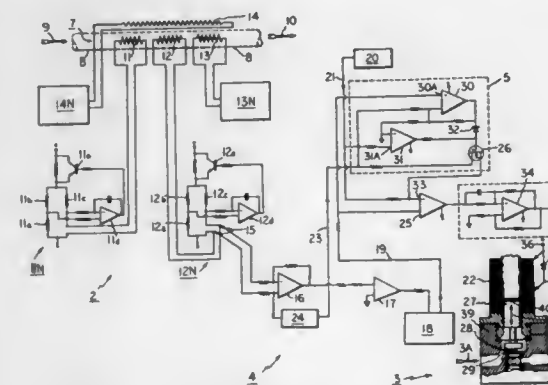
James H. Ewing, Brockton, Mass., assignor to MKS Instruments, Inc., Andover, Mass.

Filed Jan. 10, 1986, Ser. No. 818,216

Int. Cl.<sup>4</sup> F16K 31/02

U.S. Cl. 137—486

11 Claims



1. Apparatus for controlling fluid flow, comprising a fluid-control valve having electrical winding means operable to regulate flow of fluid in a path by moving a valving member, means producing electrical flow signals characterizing actual amounts of fluid flow in said path, means producing electrical setpoint signals characterizing desired amounts of fluid flow in said path, controller means for energizing said winding means to regulate said fluid flow to agree with said desired amounts of said fluid flow responsive to electrical flow signals and setpoint signals applied thereto, a fast wake-up network having electrical switching means which may be turned on to apply to said controller means an artificial electrical setpoint signal which is larger than a predetermined relatively small threshold setpoint signal and which will cause said controller means to energize said winding means strongly and thereby open said valve to commence or increase said fluid flow quickly, said network including means evaluating both said flow signals and

said setpoint signals and turning on said switching means when said flow signals are smaller than a relatively small threshold level and said setpoint signals are also in excess of said predetermined relatively small threshold setpoint signal, and said controller means including means applying to said electrical winding means in control of said valving member electrical pulses having a predetermined relatively low-frequency repetition rate and having duty cycles which vary as required to move said valving member to regulate said flow of fluid, whereby rapid and free movement of said valving member are promoted by its being vibrated slightly at said rate and energized strongly by said fast wake-up network.

4,679,586

## PILOT OPERATED RELIEF VALVE

Hans-Peter Riedel, Steinhausen; Josef Zürcher, Edlibach, and Hubert Häussler, Neuheim, all of Switzerland, assignors to Beringer-Hydraulik GmbH, Neuheim, Switzerland

Continuation of Ser. No. 573,965, Jan. 26, 1984, Pat. No.

4,625,756. This application Apr. 4, 1986, Ser. No. 848,153

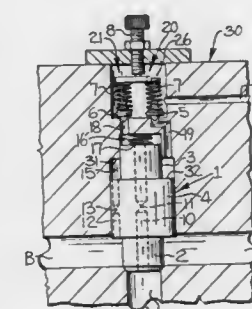
Claims priority, application Fed. Rep. of Germany, Jan. 26,

1983, 3302434; May 17, 1983, 3317879; Aug. 11, 1983, 3328988

Int. Cl.<sup>4</sup> G05D 16/00; F16K 17/10

U.S. Cl. 137—491

11 Claims



1. A pilot operated relief valve comprising  
a housing having a bore therein, said bore having inner and outer ends and an outwardly facing annular shoulder intermediate its ends to define an inner cylindrical bore portion and an outer cylindrical bore portion which has a diameter greater than that of said inner bore portion,  
a first fluid channel coaxially communicating with said outer end of said bore, and a second fluid channel radially communicating with said outer end of said bore,  
a piston slideably mounted in said bore and comprising a cylindrical central portion which is closely received in said outer bore portion, and a cylindrical inner end portion which is coaxially fixed to said central portion so as to define an inwardly facing annular shoulder at the juncture thereof and which faces said annular shoulder of said bore, said inner end portion being closely received in said inner bore portion and having an inner end which faces said inner end of said bore, said piston further comprising a cylindrical outer end portion coaxially fixed to said central portion and having a diameter which generally corresponds to that of said inner end portion, said piston being slideably mounted in said bore for movement between a closed position wherein said outer end portion closes said first fluid channel, and an open position which permits communication between said first and second fluid channels, and wherein the space between the inner end of said bore and the inner end of said inner end portion of said piston defines a first control space, and the space between the outwardly facing shoulder of said bore and the oppositely facing shoulder of said piston defines a second control space,  
first fluid canal means communicating between said first fluid channel and said first control space,



second fluid canal means communicating between said second channel and said second control space, and pressure release means operatively communicating with each of said first and second control spaces for releasing the pressure in each of said spaces upon the pressure therein exceeding a predetermined absolute amount, said pressure release means comprising a pressure relief outlet maintained at essentially zero pressure, a first relief duct communicating between said first control space and said pressure relief outlet, a second relief duct communicating between said second control space and said pressure relief outlet, adjustable pressure operated relief valve means operatively connected to each of said first and second relief ducts, a passageway extending between said first control space and said second fluid channel, and one way valve means disposed in said passageway for limiting flow to the direction from said first control space to said second channel upon a predetermined pressure difference being present therebetween.

4,679,587

### LEAK DETECTOR WITH TWO STAGE PISTON CHAMBER

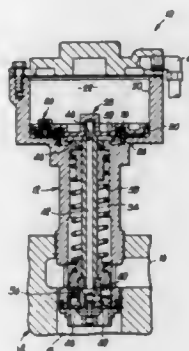
Klaus D. Jarr, Overland Park, Kans., assignor to The Marley-Wylain Company, Mission Woods, Kans.

Filed Oct. 14, 1986, Ser. No. 917,858

Int. Cl.<sup>4</sup> B67D 5/34

U.S. Cl. 137—509

8 Claims



1. For use with a fluid conduit, a detector for sensing leakage of fluid from said conduit and for restricting the flow of fluid through said conduit whenever said leakage exceeds a certain, predetermined rate of flow, said detector comprising:

- a housing defining a chamber;
- a piston received in said chamber presenting a fluid pressure-receiving face and movable in said chamber in response to the pressure of fluid directed to said piston face;
- means connected to said housing for communicating said fluid conduit to said housing chamber to enable movement of the piston in said chamber in accordance to the fluid pressure in said conduit;
- valve means coupled to said piston for movement therewith and adapted for interposition in said fluid conduit,
- said valve means being shiftable between a first position enabling a first volumetric rate of flow through said fluid conduit and a second position enabling a second volumetric rate of flow through said conduit which is greater than said first volumetric rate of flow; and
- means for increasing the area of said fluid pressure-receiving face of said piston when said valve means is moved from said first position to said second position to enable greater compensation for thermal expansion and contraction of fluid in said fluid conduit by said piston when said valve means is in said second position.

4,679,588

### COMBINATION ROTARY ELECTRICAL SWITCH AND VACUUM SELECTOR VALVE

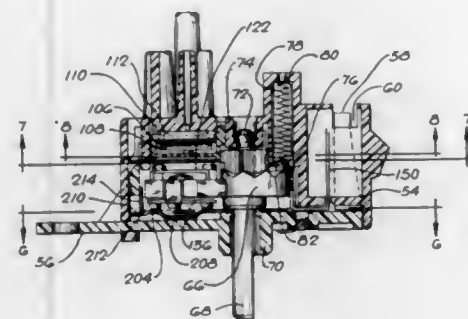
Andrew F. Raab, Morton Grove, and Albert R. Cobb, III, Glenview, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Filed Nov. 21, 1985, Ser. No. 800,558

Int. Cl.<sup>4</sup> F16K 33/44; H01H 9/06

U.S. Cl. 137—560

14 Claims



1. A combination electrical switch and vacuum selector valve, comprising
  - a casing,
  - rotary carriage means including shaft means rotatable in the casing,
  - such casing having bearing means for rotatably supporting such shaft means,
  - a vacuum valve carriage including a vacuum valve member movable along a linear path in the casing,
  - such casing having means forming a flat valve surface with valve ports extending out of the casing from such valve surface,
  - such casing including a linear guide channel for receiving and guiding the valve carriage for linear sliding movement with the valve member in sliding engagement with such surface,
  - the valve member including means for selectively affording communication between certain of the ports as the valve carriage is moved along the guide channel in the casing,
  - the valve carriage having a gear rack thereon,
  - the rotary carriage means including a pinion gear member meshing with the gear rack whereby rotary movement of the rotary carriage means produces linear movement of the valve carriage,
  - a plurality of switch contact means mounted in the casing,
  - and a switch contactor mounted on the rotary carriage means for movement therewith along a curved path,
  - the contactor being slidably engageable with the switch contact means for selectively affording electrical connections therebetween,
  - such switch contact means including at least one switch contact plate,
  - such casing and such switch contact plate having means for holding such switch contact plate in a stable position in such casing with such valve carriage slidably engaging such switch contact plate,
  - such switch contact plate comprising means for slidably retaining the valve carriage in the guide channel with the valve member in operative sliding engagement with the valve surface.

4,679,589

### FLUID PRESSURE CONTROLLING SOLENOID VALVE

Masahiro Inden, Toyooka; Kazutaka Kuwana, Toyota; Nobuyasu Nakanishi, Toyota, and Noboru Noguchi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

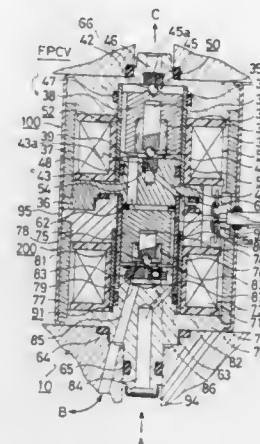
Filed Sep. 19, 1986, Ser. No. 909,389

Claims priority, application Japan, Sep. 19, 1985, 60-207421

Int. Cl.<sup>4</sup> F15B 13/044

U.S. Cl. 137—596.17

6 Claims



1. A fluid pressure controlling solenoid valve comprising an intermediate member of a magnetic material having a cylindrical outer side surface and including a first valve seat disposed in its upper end face and located at the center of the cylindrical configuration, a first fluid path disposed adjacent to the first valve seat and extending therethrough from the upper to the lower end face thereof, and a second fluid path communicating with the fluid passage of the first valve seat and extending in a direction away from the center;
- a first end member of a magnetic material having a cylindrical outer side surface and including a second valve seat disposed at the center of the cylindrical configuration and a first port communicating with the fluid passage of the second valve seat;
- a second port communicating with the second fluid path;
- a first cylindrical plunger enclosure member having its one end fastened to the upper end face of the intermediate member and its other end fastened to the first end member and having a plunger receiving space which communicates with the first and the second valve seat and the first fluid path, with the center axis of the space passing through the first and the second valve seat;
- a first plunger of a magnetic material disposed within the first plunger enclosure member to divide its interior into a pair of spaces and including a first valve member disposed opposite to the first valve seat to close the opening thereof, a second valve member disposed opposite to the second valve seat to close the opening thereof and a bypass path which provides a communication between the pair of divided spaces;
- first spring means for urging the first plunger in a direction along the center axis of the first plunger enclosure member;
- a first electrical coil disposed around the first plunger enclosure member;
- a first yoke of a magnetic material disposed laterally outside the first electrical coil and having its one end fastened to the intermediate member and its other end fastened to the first end member;
- a second end member of a magnetic material having a cylindrical outer side surface and including a third valve seat disposed at the center of the cylindrical configuration in opposing relationship with the other surface of the inter-

mediate member and a third port communicating with the fluid passage of the third valve seat;

a second, cylindrical plunger enclosure member having its one end fastened to the lower end face of the intermediate member and its other end fastened to the second end member and having a plunger receiving space which communicates with the first fluid path and the third valve seat, with a center axis of the space passing through the third valve seat;

a second plunger of a magnetic material disposed within the second plunger enclosure member to divide its interior into a pair of spaces and including a third valve member disposed opposite to the third valve seat to close the opening thereof and a bypass path which provides a communication between the pair of divided spaces;

second spring means for urging the second plunger in a direction along the center axis of the second plunger enclosure member;

a second electrical coil disposed around the second plunger enclosure member;

and a second yoke of a magnetic material disposed laterally outside the second electrical coil and having its one end fastened to the intermediate member and its other end to the second end member.

4,679,590

### RECEPTACLE FOR COLLECTING FLUIDS

Patrick T. Hergenroeder, 48 W. Orange Street, Chagrin Falls, Ohio 44022

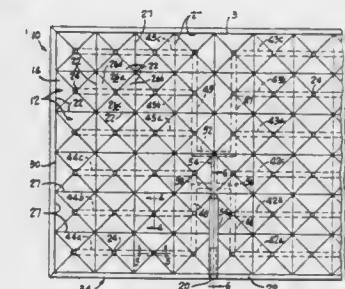
Continuation of Ser. No. 645,864, Aug. 31, 1984, abandoned.

This application May 27, 1986, Ser. No. 869,441

Int. Cl.<sup>4</sup> A61M 1/00

U.S. Cl. 137—602

13 Claims



8. A receptacle for collecting fluid comprised of a body of small thickness relative to its length and width and having an upper and lower surface, a plurality of shallow basins formed by the upper surface and channels in the lower surface communicating directly with an edge of the receptacle to constrain fluid to an area beneath the basins, and a discharge port communicating with a plurality of said channels.

4,679,591

### SERVOVALVE DRIVE ELECTRONICS IMPROVEMENTS

Dale N. Maue, Minnetonka, and Richard A. Land, Chaska, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Mar. 17, 1986, Ser. No. 840,402

Int. Cl.<sup>4</sup> F15B 13/044

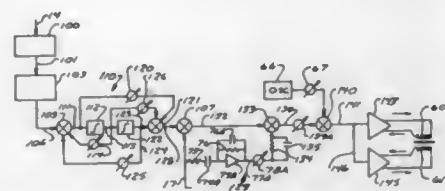
U.S. Cl. 137—624.13

12 Claims

1. A circuit for compensating an input signal to a servovalve having a spool, which servovalve spool has a response roll off characteristic with frequency, wherein the servovalve spool is driven in displacement by electric current signals acting through drive coils with an input error signal that is a dynamic signal, at a frequency (f) including:

first circuit means for providing a correction factor signal to

the error signal which is a function of the square of the frequency of the error signal; means for summing the correction factor signal and the error



signal with a stabilization signal that is a function of rate of displacement of the servovalve spool; and means for driving coils of a servovalve in proportion to the output of the means to sum.

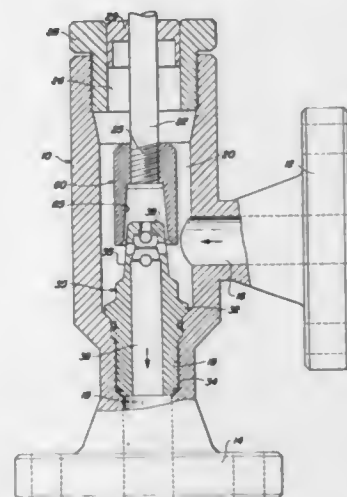
4,679,592

**VALVE SEAT DESIGN TO REDUCE CAVITATION**  
C. Paul Lamb, Dallas, Tex., assignor to Teledyne Industries, Inc., Calif.

Filed Oct. 7, 1985, Ser. No. 785,067  
Int. Cl.<sup>4</sup> F16K 47/16, 47/02

U.S. Cl. 137—625.33

15 Claims



1. In a valve, a valve body having a valve chamber and inlet and outlet passages; a valve seat element in said chamber between said inlet passage and said outlet passage, said seat element having a bore formed therein; an end portion on said seat element closing said bore; a truncated conical seat surface on said seat element, said seat surface having a plurality of orifices extending therethrough and communicating with said bore; a valve element having a skirt portion and a pocket formed therein, said pocket having a truncated conical wall; and means movably securing said valve element in said valve chamber such that a portion of said seat element extends into said pocket in said valve element and said skirt portion of said valve element covers a portion of said plurality of orifices to form a plurality of tortuous flow paths.

4,679,593

**SOLENOID VALVE**

Robert K. Sanders, Lebanon, Ind., assignor to General Motors Corporation, Detroit, Mich.

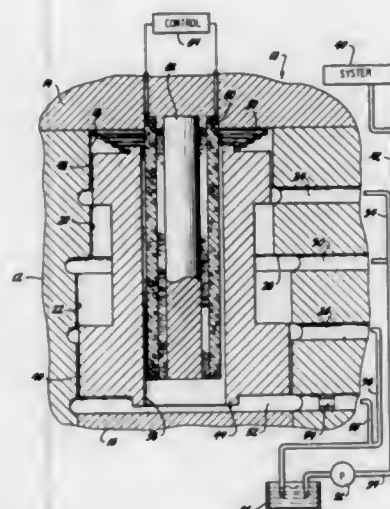
Filed Sep. 18, 1986, Ser. No. 908,737  
Int. Cl.<sup>4</sup> F15B 13/044

U.S. Cl. 137—625.65

2 Claims

1. A solenoid valve comprising: a valve body having a valve bore therein; a valve spool slidably disposed in said valve body

and including two spaced valve lands formed on the outer circumference thereof, a fluid flow channel between said valve lands and a longitudinally extending central bore; a magnetic core member secured in said valve body and extending into said central bore of said valve spool; a solenoid coil disposed circumjacent said core member for substantially the entire length thereof; spring means disposed between a portion of said valve body and one end of said valve spool for urging said valve spool in one longitudinal direction; pressure passage means formed in said valve body and communicating with said valve bore adjacent one of said valve lands; exhaust passage means formed in said valve body and communicating with said



valve bore adjacent the other of said valve lands; and control passage means formed in said valve body in fluid communication with said valve bore adjacent said fluid flow channel, said spring means being operable to urge the valve spool in said one longitudinal direction to selectively permit fluid communication between said control passage means and one of said pressure passage means and exhaust passage means, and said solenoid coil being selectively energized to cause a magnetic field urging said valve spool in the other longitudinal direction to selectively permit fluid communication between said control passage means and the other of said pressure passage means and said exhaust passage means.

4,679,594

**TWO-CIRCUIT FLUID PRESSURE CONTROL VALVE**  
Stephen W. Fogg, Bath, England, assignor to Becton Limited, Bristol

Filed Feb. 28, 1986, Ser. No. 834,684

Claims priority, application United Kingdom, Mar. 21, 1985, 8507330

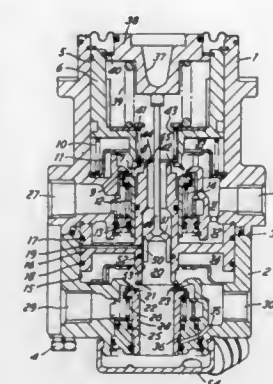
Int. Cl.<sup>4</sup> B60T 15/02

U.S. Cl. 137—627.5

4 Claims

1. A two-circuit fluid pressure control valve having a housing containing an input member acting via resilient coupling means upon a first fluid pressure responsive member, a first double valve operable dependent upon the position of said first pressure responsive member to alternatively connect a first output port to an input port or to a vent, the pressure at said first output port acting on said first pressure responsive member in a sense to oppose the action of the resilient coupling means and also acting on a second pressure responsive member, a second double valve operable dependent upon the position of said second pressure responsive member to alternatively connect a second output port to an input port or to a vent, the pressure responsive member being subject to pressure at the second output port in a sense to oppose the action thereon of the pressure at the first output port and a reaction

linkage interconnecting said input member and the second pressure responsive member for reducing hysteresis thereof in the housing, said reaction linkage being movable by said input



member relative to and independent of the movement of both said first fluid pressure responsive means and said first double valve.

4,679,595

**DEVICE FOR CONTROLLING THE FLOW IN A PIPE SYSTEM**

Jorgen M. Johannessen, Koge, Denmark, assignor to Jorgen Mosbaek Johannessen ApS, Denmark

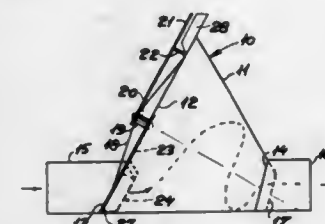
PCT No. PCT/DK84/00063, § 371 Date Feb. 28, 1985, § 102(e)  
Date Feb. 28, 1985, PCT Pub. No. WO85/00446, PCT Pub. Date Jan. 31, 1985

PCT Filed Jun. 29, 1984, Ser. No. 711,503

Claims priority, application Denmark, Jun. 30, 1983, 3011/83  
Int. Cl.<sup>4</sup> F15C 1/16

U.S. Cl. 137—813

12 Claims



1. A device for controlling the flow of a liquid in a pipe system, comprising:

a housing having a curved side wall to form a vortex chamber therein, said housing having an inlet opening and an outlet opening oriented to allow free, unobstructed and substantially linear flow of said liquid through said housing from said inlet opening to said outlet opening in the absence of an angular velocity component in an inflowing liquid toward the housing side wall,

an adjustable guide vane mounted within said housing and adjacent said inlet opening, said guide vane being movable between the first position in which it is positioned substantially away from said inlet opening so as to impart no angular velocity component to the inflowing liquid toward such side wall, and operative positions in which it extends at least partially across said inlet opening to give said inflowing liquid controlled amounts of a velocity component having a direction which forms an angle with the direction of the inflowing liquid to move said inflowing liquid to said side wall to create a vortex flow of liquid in said chamber which creates a braking effect.

4,679,596

**PRESSURE RELIEF VALVE**

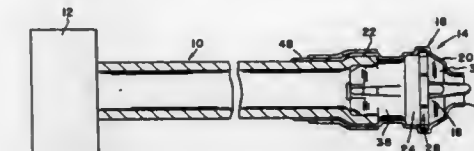
Daniel H. Olson, Louisville, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio

Filed Feb. 3, 1986, Ser. No. 825,167

Int. Cl.<sup>4</sup> F16K 15/14

U.S. Cl. 137—853

7 Claims



1. A pressure relief valve cooperating with a tube which receives pressurized fluid, comprising a body coupled to an end of the tube, the body cooperating with the tube to define a fluid passage communicating with fluid pressure in the tube, a resilient sleeve engageable with the tube and the body to normally close the fluid passage, the resilient sleeve being responsive to fluid pressure above a predetermined level to open the fluid passage and permit fluid flow outwardly from the tube, the body defining a first surface cooperating with the resilient sleeve to initially open the fluid passage when the fluid pressure in the tube approaches the predetermined level, the body defining a second surface cooperating with the resilient sleeve to control further opening of the fluid passage in response to fluid pressure in the tube above the predetermined level, and the second surface defining a plurality of flanges defining a larger diameter than a diameter defined by the first surface.

4,679,597

**LIQUID PULSATION DAMPENING DEVICE**

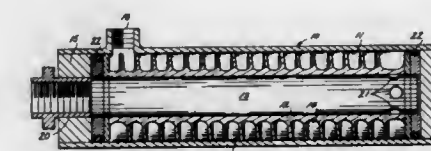
John Stein, Spokane, Wash., assignor to Kim Hotstart Mfg. Co., Inc., Spokane, Wash.

Filed Dec. 20, 1985, Ser. No. 811,646

Int. Cl.<sup>4</sup> F16L 55/02

U.S. Cl. 138—26

14 Claims



1. A liquid pulsation dampening device, comprising:

a housing having a continuous cylindrical inner wall surface formed about a central longitudinal axis;

two end walls respectively sealed across the cylindrical inner wall surface of the housing at positions spaced longitudinally apart from one another along the axis;

a coaxial hollow longitudinal tube located within the housing, the tube having continuous inner and outer surfaces extending between the two end walls, the outer surface defining a space separating it from the cylindrical inner wall surface of the housing;

a continuous helical fin formed integrally about the outer surface of the tube with the fin being extended radially outward to the cylindrical inner wall surface of the housing;

first port means leading between the inner wall surface of the housing and the outer surface of the tube for connection to a conduit adapted to lead to a source of liquid pulsations, passage means for transferring liquid between the space separating the inner wall surface of the housing and the outer surface of the tube and the interior of the tube, the passage means being positioned at a single general location along the central longitudinal axis, the passage means



being longitudinally spaced from the location of the first port means;  
second port means leading into the interior of the tube for connection to a conduit adapted to lead away from the source of liquid pulsations; and  
the first port means, passage means, and second port means defining a flow path through which substantially all of the liquid entering and exiting the dampening device is caused to flow whereby liquid pulsations are dampened as a result of such flow.

4,679,598

## SUBSEA PIPELINE BUNDLE

Trevor P. Jee, Seven Kings, England, assignor to The British Petroleum Company p.l.c., London, England  
Filed Mar. 17, 1986, Ser. No. 839,961  
Claims priority, application United Kingdom, Mar. 20, 1985, 8507192

Int. Cl.<sup>4</sup> G05D 7/00

U.S. Cl. 138—103

4 Claims



1. A tube bundle, suitable for the transportation of gas from a subsea wellhead, which tube bundle comprises (a) an insulated external casing, (b) at least one internal production line, and (c) an internal heating tube for carrying a heating medium through the bundle to its wellhead end for discharge into the casing and return therethrough, the heating tube having a tapered or stepped layer of insulating material with the insulation increasing in thickness in the direction away from the wellhead.

4,679,599

## SAFETY HOSE

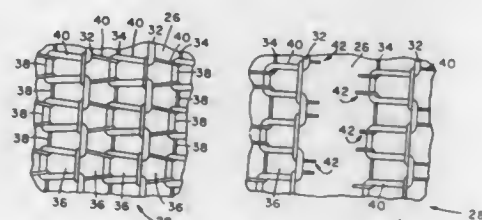
Mark A. Newberry, Lakewood, and Dennis C. Kemper, Aurora, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Feb. 8, 1985, Ser. No. 700,144

Int. Cl.<sup>4</sup> F16L 55/00

U.S. Cl. 138—104

6 Claims



1. In a hose of the type having an elastomeric tube, a twined reinforcement encircling the tube and an elastomeric cover encircling the tube and reinforcement, the improvement comprising:

a knit reinforcement comprising intermittent leads of a first yarn and a second, tensionally weaker yarn alternatively knitted together with knit stitched loops that each have a helically oriented component and a longitudinally oriented component in relation to the tube and wherein a cumulative tensile strength of the longitudinally oriented loop components is substantially less than a cumulative tensile strength of the helically oriented loop components such that some of the loops of the second yarn define a

means to break and permit substantial elongation of the hose without tube rupture.

4,679,600

## HIGH TENSILE STRENGTH REMOVABLE HOSE COVERING

Robert C. Dougherty, Tucson, Ariz., assignor to Durodyne, Inc., Tucson, Ariz.

Filed Sep. 9, 1985, Ser. No. 774,019

Int. Cl.<sup>4</sup> F16L 11/08

U.S. Cl. 138—128

19 Claims



1. A high tensile strength removable hose covering for surrounding and protecting an inner hose and to impart high tensile strength in the longitudinal direction to the combined inner hose and removable hose covering for the full length of the hose covering between hose couplings or stationary standards, the removable hose covering comprising:

a separable closure mechanism having a lockable first part and second part;  
means connecting between said closure mechanism first part and second part; and  
a high tensile strength longitudinal member adapted to be attached to associated hose couplings or stationary standards, said high tensile strength longitudinal member operably connected to said means connecting between said first part and second part of said closure mechanism.

4,679,601

## METHOD AND AN APPARATUS FOR ACCELERATING AIR OR GAS EXCHANGE

Alfred Schmid, Schöfflisdorf, Switzerland, assignor to Bucher-Guyer AG, Niederweningen, Switzerland

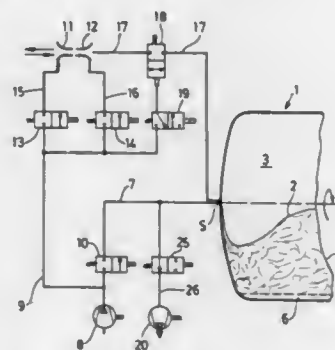
Continuation of Ser. No. 575,823, Feb. 1, 1984, abandoned. This application Apr. 2, 1986, Ser. No. 847,164

Claims priority, application Switzerland, Mar. 31, 1983, 1803/83

Int. Cl.<sup>4</sup> B30B 9/22; B65B 3/00

U.S. Cl. 141—4

17 Claims



1. A cyclical method for accelerating air or gas exchange in a press container having a pressure chamber separated from a pressing space by a membrane with the aid of compression means, discharge means, and pressure and vacuum pumping means, comprising  
operating said compression means to produce compressed air or gas,  
operating said pressure pumping means to mix air or gas from an external source with said compressed air or gas from said compression means,

introducing said mixed air or gas through a pump conduit into said pressure chamber to move said membrane against solid material in said pressing space,  
closing off said pump conduit from said pressure chamber, introducing compressed air or gas from said compression means through a main conduit into said pressure chamber thereby to exert pressure on said solid material and to separate liquid from said solid material,  
closing off said main conduit from said pressure chamber, opening said pump conduit, and  
operating said compression means and said vacuum pumping means in conjunction with each other to discharge air or gas from said pressure chamber thereby to move said membrane away from said solid material.

4,679,602

## REMOVABLE DEVICE FOR REPEATEDLY PRESSURIZING A CONTAINER

Glenn E. Hollis, 3621 Belcher Dr., Tampa, Fla. 33609, and Craig E. Hollis, 3520 Cleveland Heights Blvd., Lakeland, Fla. 33903

Filed Jul. 27, 1982, Ser. No. 402,347

Int. Cl.<sup>4</sup> B65B 3/04

U.S. Cl. 141—19

1 Claim



1. A filling device for filling a container with a pressurized gas from a cartridge having a face portion, comprising in combination:

a base for connection to the container,  
a housing including a first cavity operatively connected to said base for housing the cartridge containing the pressurized gas;  
a fluid passageway extending from said housing through said base for fluid communication with the interior of the container;  
means for puncturing the face of the cartridge to permit the gas contained therein to flow through said fluid passageway into the container; and  
valve means for controlling the flow of gas through said fluid passageway;  
wherein said valve includes a shaft which extends through said base to engage said fluid passageway;  
wherein said shaft includes a hole which is aligned with said fluid passageway when said valve is in the "on" position and is misaligned with said fluid passageway when the valve is in the "off" position;  
further including a pressure gauge for sensing the pressure on the gas contained within the container;  
wherein said pressure gauge includes an indicator rod to provide a visual indication of the pressure of the interior of the container;  
wherein said indicator rod of said pressure gauge is color coded to indicate over-charging, under-charging, and the desired pressure of the container.

4,679,603

## FILLING MACHINE FOR FILLING LIQUID UNDER COUNTERPRESSURE

Friedrich Rademacher, Kamen-Südkaemen; Siegmund Sindermann, Kamen-Heeren, and Rolf Süshardt, Waltrop, all of Fed. Rep. of Germany, assignors to Holstein und Kappert GmbH, Fed. Rep. of Germany

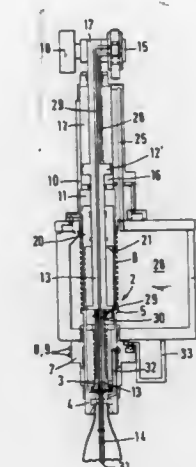
Filed Dec. 20, 1985, Ser. No. 811,518

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446501

Int. Cl.<sup>4</sup> B67C 3/06

U.S. Cl. 141—39

8 Claims



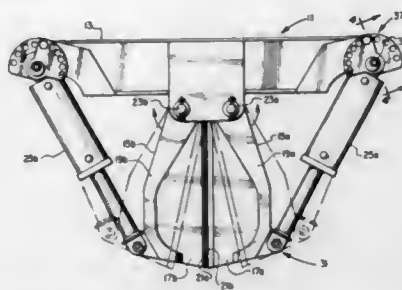
1. Filling machine for filling liquid into a container under counterpressure comprising a filling machine vessel, a filling valve in communication with said vessel, said filling valve including a support body, an upwardly extending return gas tube located in and extending through said support body and having a lower end, valve means in said support body, an upwardly extending piston-cylinder unit for operating said filling valve and with said unit extending through said support body, wherein the improvement comprises a generally vertically movable container centering member displaceable between an upper release position spaced from the container to be filled and a lower centering position engaging the container to be filled with said filling valve extending from said vessel to said centering member, means for moving said centering member between the release position and the centering position and for moving the lower end of said return gas tube into the container to be filled downwardly from said centering member, a piston member in said piston-cylinder unit enclosing said return gas tube and displaceable relative to said return gas tube in the centering position of said centering member for opening said filling valve for supplying liquid from said filling machine vessel, said means for moving said centering member arranged to close said filling valve by lifting said piston member when the liquid introduced from said pressure vessel through said filling valve into the container reaches the level of the lower end of said return gas tube while said centering member remains in the centering position, so that by lifting said piston member an increased volume communicating with the container is established and the return gas tube empties the liquid therein into the container and, with the shutoff of the return gas connection to said vessel, a pressure release of the space within the container to atmospheric pressure takes place.

**4,679,604**  
**SHEAR BLADE CUTTING DEVICE WITH ADJUSTING**  
**BLADE ALIGNMENT COMPENSATOR**  
 D. Franklin Howeth, 2901 St. Louis Ave., Fort Worth, Tex.  
 76110

Filed May 6, 1986, Ser. No. 860,136  
 Int. Cl.<sup>4</sup> A01G 23/08

U.S. Cl. 144—34 E

13 Claims



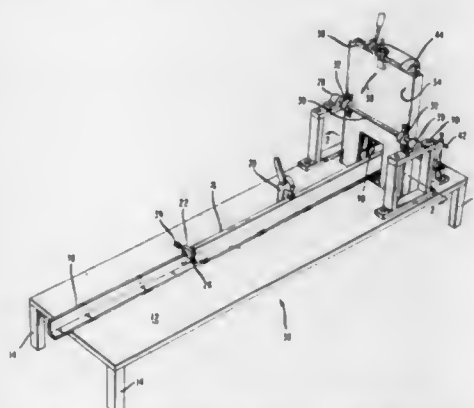
1. A cutting apparatus, which comprises:
  - a frame assembly;
  - a pair of shear blades mounted to said frame assembly, with at least one of said shear blades being pivotally mounted to said frame assembly and movable with respect to the other of said shear blades in pincer-like fashion;
  - actuator means connected between said frame assembly and said pivotally mounted blade for moving said pivotally mounted shear blade with respect to said other shear blade;
  - and means for adjusting the connection of said actuator means to one of said frame assembly or said pivotally mounted shear blade to adjust the movement of said pivotally mounted shear blade with respect to said other shear blade.

**4,679,605**  
**FENCE MACHINING DEVICE**  
 Salvatore Picciuto, Piscataway, N.J., assignor to Mar-Sal Machine Co., Inc., Greenbrook, N.J.

Filed Jun. 26, 1986, Ser. No. 878,618  
 Int. Cl.<sup>4</sup> B27C 5/00

U.S. Cl. 144—117 R

6 Claims



1. A fence post machining device comprising a workpiece supporting table, a plate, said plate hingably secured to said table, a carriage, means to slidably engage said carriage to said plate, said means to slidably engage including a rack, said rack being secured to said plate, a pinion, said pinion being mounted for rotation on said carriage, an operating lever, one end of said operating lever being coupled to said pinion, whereby manually manipulating said operating lever causes the rotation of said pinion and alternately and selectively displaces the longitudinal axis of said pinion along the length of said rack, a

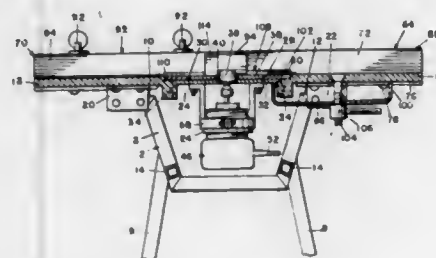
cutter, said cutter mounted for rotation on said carriage, means to selectively alternately slidably displace said carriage relative to said plate and to pivot said carriage about a line extending parallel to the plane defined by said work supporting surface, means to limit the amount of pivoting of said plate relative to said work surface, means to limit the amount of slidable translation of said plate to said carriage, means to removably secure a workpiece to said workpiece supporting surface.

**4,679,606**  
**ROUTER TABLE**  
 Alvin L. Bassett, 10410 SE. Raymond Ave., Portland, Oreg.  
 97266

Filed Jul. 7, 1986, Ser. No. 882,254  
 Int. Cl.<sup>4</sup> B27C 9/00, 5/00

U.S. Cl. 144—134 A

8 Claims

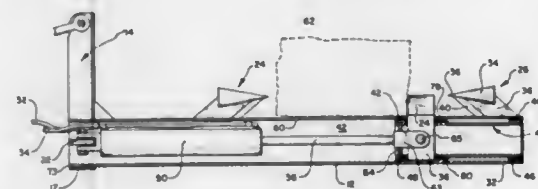


1. A router table comprising:
  - a. a table having a planar top surface and comprising a pair of coplanar slabs spaced apart to present a parallel-sided gap therebetween,
  - b. a fence disposed along one edge of said table and rising above the top surface thereof whereby a work piece may be guided thereby in a straight line across said table top, the gap between said slabs being disposed at right angles to said fence,
  - c. a carriage having its upper surface coplanar with said slabs mounted slidably between said slabs for movement in said gap at right angles to said fence, and
  - d. a router including a drive unit and a router bit rotatable on a vertical axis, said router drive unit being mounted beneath said carriage and said router bit projecting upwardly through an aperture of said carriage not larger than required to permit free rotation of the bit, the top surface of said carriage extending substantial distances in all directions from said bit aperture to provide solid support for the work piece in the area surrounding said bit.

**4,679,607**  
**LOG SPLITTER**  
 Terry Bradley, Box 12, Howell, Utah 84316  
 Filed Apr. 4, 1986, Ser. No. 848,743  
 Int. Cl.<sup>4</sup> B27L 7/00

U.S. Cl. 144—193 A

43 Claims



43. A double-action hydraulic log splitter, comprising:
  - a hollow, cylindrical support frame having formed therein an elongated slot parallel the axis of the support frame;
  - first and second cleaving blades mounted at fixed positions in a confronting relationship on the exterior of the support

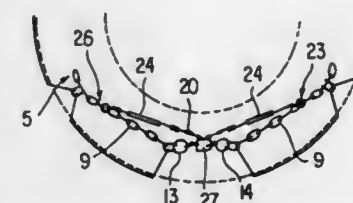
frame at opposite ends of the elongated slot, the first and second cleaving blades each comprising:  
 an elongated conical body portion having a vertex directed toward the other of the cleaving blades and a longitudinal axis parallel the axis of the support frame; and  
 a generally planar footing having a tapered, knife-like edge oriented toward the other of the cleaving blades, said footing being attached to the body portion and defining a plane containing all points on longitudinal axis thereof;  
 a hollow, cylindrical carriage slideably mounted within the support frame for reciprocating motion substantially therewithin, said carriage being provided on opposite sides thereof with means defining a primary and a supplementary coupling slot;  
 a log-impelling block on the exterior of the support frame having a depending coupling tongue for insertion through the elongated enclosure in the support frame and through the primary and supplementary coupling apertures in the carriage, said log-impelling block releasably secured to the carriage and movable therewith between the first and second cleaving blades; and  
 two-way hydraulic cylinder means mounted within the support frame at one end of the carriage and having a clevis releasably secured to the coupling tongue between the primary and supplementary apertures in the carriage for propelling the carriage and driving the log-impelling block between the first and second cleaving blades, whereby a log placed against the support frame between the log-impelling block and either of the cleaving means is split by being forced onto that cleaving means.

**4,679,608**  
**VEHICLE TIRE CHAIN**  
 Ferdinand Jeindl, Graz, Austria, assignor to Steirische Kettenfabriken Pengg-Walenta KG, Graz, Austria  
 Filed Jan. 22, 1985, Ser. No. 693,685

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401971

U.S. Cl. 152—213 A

16 Claims



1. In a vehicle tire chain having an openable and closable inner and outer support engaging, in a mounted state of the chain, respective inner and outer sides of a vehicle tire, a plurality of runner chains each secured to the inner and outer supports and straddling, in the mounted state of the chain, a running face of the tire, the improvement wherein said outer support comprises

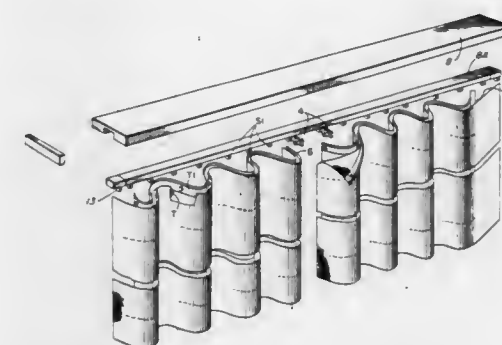
- (a) a first part supporting said runner chains jointly with said inner support; said first part having first and second ends situated adjacent one another in the mounted state of the chain;
- (b) first and second deflecting members secured to said first and second ends, respectively of said first part; and
- (c) a second part comprising a closing linkage means for closing said first part under tension in the mounted state of the chain and during normal operation thereof; said closing linkage means including
  - (1) opposite first and second ends;
  - (2) first and second hooks secured to said first and second ends, respectively, of said closing linkage means and releasably attached to said first part of said outer support in the mounted state of said chain; said closing linkage means being passed glidingly over said first and

second deflecting members and being deflected by more than 90° by each of said deflecting members and said closing linkage means having two end portions crossing one another in said mounted state; and  
 (3) separate elastic tensioning members situated adjacent said first and second ends of said closing linkage means; each elastic tensioning member exerting a resilient force on both said first and second deflecting members from different directions to expose each deflecting member to two resilient forces from two directions by means of said closing linkage means.

**4,679,609**  
**THERMALLY PROTECTIVE DRAPERY**  
**CONSTRUCTION FOR WINDOWS, SLIDING GLASS**  
**DOORS, GLASS WALL PANELS AND THE LIKE**  
 Frank E. Bateman, 42 George St., Littleton, Mass. 01460  
 Continuation-in-part of Ser. No. 539,033, Oct. 5, 1983, which is a continuation-in-part of Ser. No. 318,666, Nov. 5, 1981. This application Jun. 24, 1986, Ser. No. 880,331  
 Int. Cl.<sup>4</sup> A47H 5/032, 13/12, 23/01

U.S. Cl. 160—124

17 Claims



1. A thermal drapery construction, comprising:
  - (a) a retaining rod for locating drapery material adjacent to a wall surface;
  - (b) an inner panel of heat shielding fabric and an outer panel of drapery material spaced apart from each other;
  - (c) carrier members having opposing fasteners on their opposite sides and having a depth of at least 0.25 inch, the carrier members being interconnected by cords and mounted on the rod in sliding contact slidably supporting the panels in reversely folded relationship below the rod;
  - (d) fasteners secured in spaced apart relationship along the upper edge of each panel for fastening each panel to the carrier members, the fasteners along the upper edge of one panel being spaced a predetermined equal distance and the fasteners along the upper edge of the other panel being spaced alternating distances longer and shorter than the equal distance to compensate for different arcuate lengths of folds of the panels and thereby maintain a distance between panels at least 0.25 inch thereby providing an airspace between panels for insulation; and
  - (e) separator means the same thickness as the airspace, located between the inner and outer panels, for maintaining the critical airspace at lower portions of the two panels.



# 4,679,610 MODULAR WINDOW INSERT WITH COLLAPSIBLE SHADE

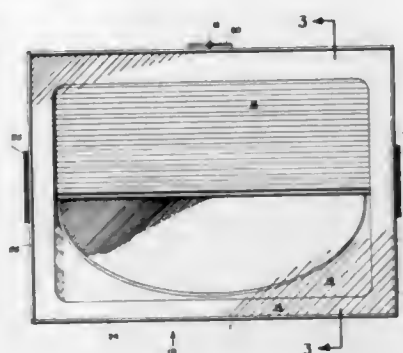
Mike Spraggins, 13201 Stairrock, San Antonio, Tex. 78248

Filed Jan. 31, 1986, Ser. No. 824,679

Int. Cl.<sup>4</sup> E06B 3/32

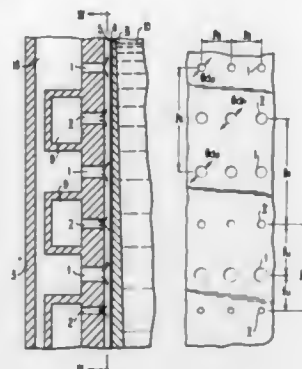
U.S. Cl. 160—107

8 Claims



1. A modular window insert unit comprising: means defining a curved inner window pane formed of impact resistant plastic; means defining a curved outer window pane formed of impact resistant plastic; a curved frame assembly securing said inner and outer window panes in spaced, generally parallel relation; collapsible shade means comprising a plurality of collapsible tubes formed from a compressed polymer material, said tubes being attached along complementary edges, each of said tubes being substantially collapsed when said shade is in a first position, and each of said tubes having a substantially hexagonal cross-section when said shade is in a second position, said shade being secured in said frame assembly between said inner and said outer panes; actuator means for moving said collapsible shade from said first position to said second position.

cooling water into the water film portion therethrough and wherein at least one of diameters of the inlet and



outlet ports and a vertical distance between each inlet port and the outlet ports adjacent thereto is varied.

# 4,679,612 GUIDE ASSEMBLY FOR A TWIN-BELT CONTINUOUS CASTING MOLD

Gerd Artz, Ratingen; Dieter Figge, Essen, and Clemens Philipp, Meerbusch, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

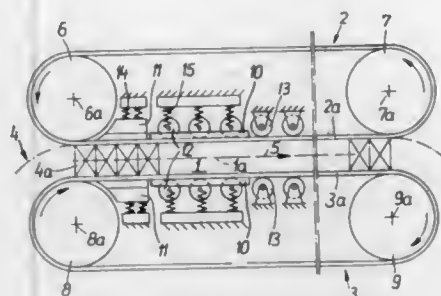
Filed Dec. 6, 1985, Ser. No. 805,706

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1984, 3444689

Int. Cl.<sup>4</sup> B22D 11/06

U.S. Cl. 164—431

5 Claims



1. In a twin-belt continuous casting mold including an elongated mold chamber defined by top, bottom and opposite lateral chamber walls travelling codirectionally in a casting direction; said mold chamber having a width dimension oriented perpendicularly to said casting direction; said top and bottom walls being constituted by a length portion of respective upper and lower endless casting belts supported by respective upper and lower upstream and downstream end drums as viewed in the casting direction; said mold chamber having an entrance adjacent the upstream end drums and an outlet adjacent the downstream end drums; said opposite lateral chamber walls being constituted by a length portion of respective segmented side dams; a guide assembly for the casting belts; said guide assembly including a plurality of support rollers arranged serially parallel to the casting direction and engaging each casting belt along said mold chamber; additional ribbed supports engaging each casting belt in a zone between a respective said upstream end drum and a respective first said support roller as viewed in the casting direction from said upstream end drums; said additional ribbed supports engaging each casting belt in a direction transverse to said casting direction for supporting said casting belts in a zone of said mold chamber

# 4,679,611 COOLING APPARATUS FOR BELT TYPE CONTINUOUS CASTING MACHINE

Takashi Yoshida; Tomoaki Kimura; Tadashi Nishino, all of Hitachi, and Sadayuki Saito, Chiba, all of Japan, assignors to Hitachi, Ltd. and Kawasaki Steel Corporation, both of Tokyo, Japan

Filed Nov. 29, 1985, Ser. No. 802,722

Claims priority, application Japan, Nov. 28, 1984, 59-251380

Int. Cl.<sup>4</sup> B22D 11/124

U.S. Cl. 164—431

14 Claims

1. A cooling apparatus for a belt type continuous casting machine comprising: a belt mold having a pair of movable belts and a pair of side members, a cooling pad disposed adjacent to the movable belt for forming a water film portion therebetween and having a plurality of inlet and outlet ports for running

and said side dams; the improvement wherein said support assembly comprises a first resilient holding means for positioning each said additional support and resiliently urging it into engagement with a respective said casting belt; each said additional ribbed support being constituted by a support carrier; said support rollers forming a first and a second group of support rollers; said first group of support rollers being situated in a zone of said entrance adjacent the respective said support carrier downstream thereof; a second resilient holding means for positioning each said support roller of said first group in a zone between said side dams for resiliently urging each said support roller of said first group into engagement with a respective said casting belt; said first and second resilient holding means comprising a plurality of rockers; a separate one of said rockers carrying said support carriers and the support rollers of said first group; each rocker having a stationarily supported horizontal pivot means for providing a swinging motion for each said rocker in a vertical plane; said second group of support rollers being situated downstream of said first group of support rollers and being rigidly held; each said roller of said first and second groups having a supporting portion provided with an arcuate outer contour being convex towards said mold chamber and being oriented parallel to said width dimensions; each said supporting portion being shorter than said width dimension; further comprising side dam support means extending parallel to said casting direction and flanking said support rollers of said first group and engaging a respective said casting belt in alignment with said side dams.

# 4,679,613 METHOD OF AND APPARATUS FOR CASTING A COMPOUND METAL BAR

E. Henry Chia, and Ronald D. Adams, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

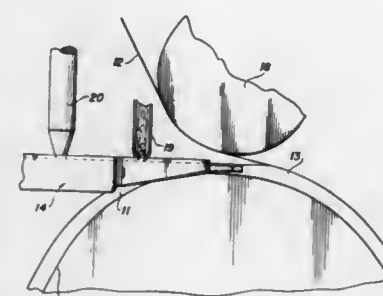
Continuation of Ser. No. 446,128, Dec. 2, 1982, Pat. No. 4,566,524. This application Jan. 8, 1986, Ser. No. 817,197

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> B22D 11/06, 11/18, 19/08

U.S. Cl. 164—453

12 Claims



1. Apparatus for continuously casting a compound metal bar, having a core metal encased by a clad metal comprising: a continuous casting machine having a continuously advancing mold; means for continuously substantially horizontally pouring a first molten metal into the mold of the continuous casting machine from the side wall of a tundish; and means for continuously substantially horizontally discharging a second molten metal into said mold at a point submerged beneath the surface of the first molten metal, whereby said second metal solidifies to form the core metal and the first metal solidifies to form the clad metal of the compound metal bar with substantially no oxidation at the interface between the two molten metals.
8. A method of continuously casting a compound metal bar having a core metal encased in a clad metal comprising the steps of: continuously advancing a metal casting mold;

continuously pouring a first molten metal into said mold; continuously discharging a second molten metal into the mold at a point submerged beneath the surface level of the first molten metal; providing means for preventing metal turbulence in said metal casting mold as said first and second molten metals are continuously poured into said mold so that substantially no mixing of said metals occurs at a transition zone between the two and a unitary metal matrix is formed and said first and second metals remain substantially distinct metallurgical entities with substantially no oxidation at the interface between the two metals, and continuously solidifying said first and second metals to form said compound metal bar.

# 4,679,614 APPARATUS FOR SIGNIFICANTLY DECREASING UNDESIRABLE VARIATION IN THE ALIGNMENT OF ADJUSTABLE CONTINUOUS CASTER MOLD WALLS

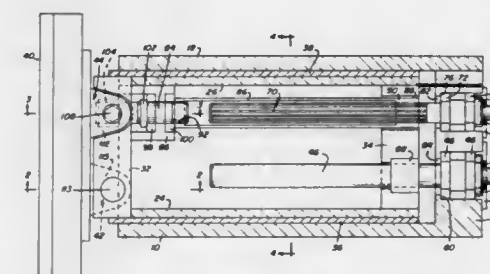
John A. Grove, Sugarcreek Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 25, 1985, Ser. No. 791,636

Int. Cl.<sup>4</sup> B22D 11/04, 11/10

U.S. Cl. 164—436

6 Claims



1. In a continuous caster mold, said mold having broad and narrow mold walls, means for adjustment of the spacing and angular alignment of the narrow walls with respect to a casting direction, and a pair of means pivotally connecting each narrow wall to the adjustment means at spaced locations adjacent opposed ends of said wall in the casting direction, the improvement in said mold for increasing the rigidity of said adjustment means which is characterized by: said adjustment means including an elongated housing having an opening in one narrow end thereof, an elongated member slidably mounted in the housing and extending outwardly through said opening in the housing, said pair of pivotal connections connecting the mold wall to said member, means for moving said slidable member longitudinally back and forth in the housing, and means extending longitudinally through the housing and said slidable member and connected to the rotatable member of one of said pair of pivotal connections for adjusting the angular alignment of said mold wall by tilting said wall about the axis of the other of the pivotal connections in said pair.

# 4,679,615 METHOD AND APPARATUS FOR HEATING AND/OR COOLING OBJECTS SIMULTANEOUSLY AT DIFFERENT PRESELECTED TEMPERATURES

Avinoam Livne, Beersheva, Israel, assignor to Advanced Products Ltd., Beersheva, Israel

Filed Mar. 1, 1985, Ser. No. 707,152

Claims priority, application Israel, Mar. 2, 1985, 71131

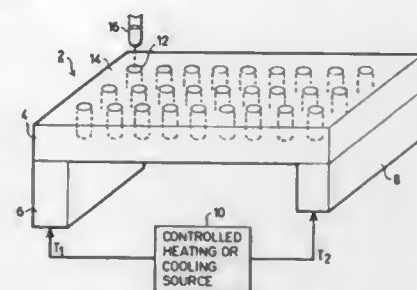
Int. Cl.<sup>4</sup> F28F 13/00

U.S. Cl. 165—1

10 Claims

1. A method of heating and/or cooling a plurality of objects simultaneously at a plurality of different preselected temperatures, comprising: establishing a constant temperature gradient over a length of a heat-conductive member by producing a

predetermined temperature difference between two spaced points of said heat-conductive member; bringing said plurality of objects into heat-exchange relationship with predetermined locations of said temperature gradient according to the pre-



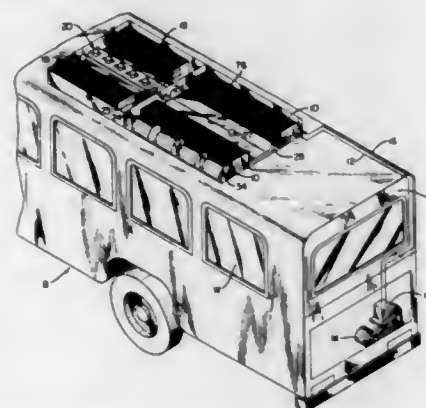
lected temperatures to which the respective object is to be heated or cooled; and maintaining said predetermined temperature difference at said two spaced points of the heat-conductive member during the heating or cooling of said objects.

**4,679,616**  
**ROOF-MOUNTED AIR CONDITIONER SYSTEM**  
**HAVING MODULAR EVAPORATOR AND CONDENSOR**  
**UNITS**

Houshang Ferdows, Boulder, Colo.; Martin Krug, Möglingen, and Paul R. Bihl, Ditzingen, both of Fed. Rep. of Germany, assignors to Suetrak U.S.A., Inc., Lamar, Colo.  
Continuation of Ser. No. 565,026, Dec. 20, 1983, Pat. No. 4,607,497. This application Apr. 28, 1986, Ser. No. 832,971  
Int. Cl.<sup>4</sup> B60H 3/00

U.S. Cl. 165—43

4 Claims



1. In an air conditioner system mounted on the roof of a bus wherein said bus has an upper relatively flat roof, a ceiling spaced beneath said roof with a return air inlet disposed in said roof intermediately between air circulating ducts which extend between said roof and ceiling for directing conditioned air into the interior of said bus, there being compressor means to draw refrigerant from evaporator coils and to discharge said refrigerant under pressure, the improvement comprising:

- a modular condensor unit having a first shallow, generally rectangular housing including a base panel conforming to the contour of said roof, mutually opposed sidewalls and end walls and a cover, elongated condensor coils extending horizontally within said housing to receive the refrigerant under pressure from said compressor means, and air circulating means for directing air across said condensor coils between said condensor coils and discharging the air through an air outlet in said cover;
- a modular evaporator unit having a second outer shallow, generally rectangular housing including a base panel conforming to the contour of said roof, mutually opposed sidewalls and front and rear end walls and a cover, means

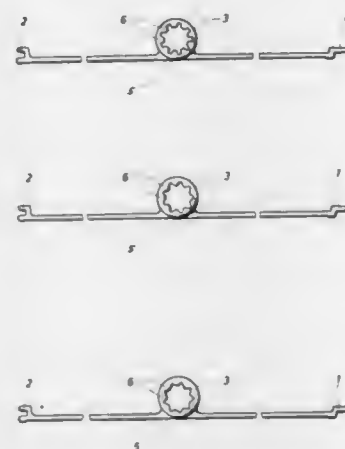
for attaching said base panel to said roof whereby said return air inlet and said air circulating ducts are in communication with the interior of said evaporator housing, said evaporator coils mounted on opposite sides of said return air inlet, and elongated heater coils between each of said evaporator coils and opposite sidewalls of said housing, a fresh air inlet in one said end wall of said evaporator housing, and evaporator air blower means in said evaporator housing for directing air through said return air inlet and fresh air inlet simultaneously across said evaporator coils and heater coils preliminary to discharge through said air circulating ducts into the interior of said bus; and said modular condensor unit and said modular evaporator unit mounted independently of one another on the roof of the bus, and refrigerant lines extending between said condensor unit and said evaporator unit including means for conducting the refrigerant from said condensor coils to said evaporator coils.

**4,679,617**  
**CEILING OR WALL UNIT**

Erick C. V. Keldmann, Bellinge, Denmark, assignor to Elpan, Aps, Odense M., Denmark  
Filed Feb. 6, 1985, Ser. No. 698,807  
Claims priority, application Denmark, Feb. 6, 1984, 516/84  
Int. Cl.<sup>4</sup> F28F 1/32

U.S. Cl. 165—56

1 Claim



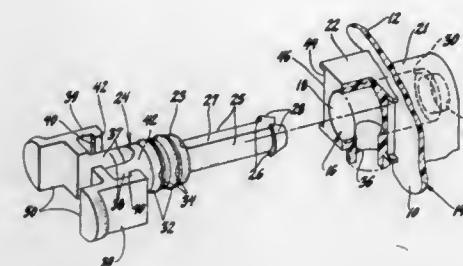
1. Heat transfer apparatus comprising:
- a plurality of integral extruded metal modules, each said module comprising an elongated, substantially circular pipe and an elongated, generally planar and rectangular plate;
  - a pair of elongated manifolds extending transversely of said modules at respective opposite ends thereof;
  - a plurality of pipe stubs interconnecting said manifolds with the pipes of said modules; and
  - means disposed on said manifolds for supporting said apparatus;
  - each said substantially circular pipe having a predetermined outer diameter and having an inner diameter of the order of 8 mm, and being provided with longitudinal inner ribs;
  - each said plate having first and second elongated, parallel edges having means formed thereon for structural connection of adjacent plates to one another;
  - each said plate having its associated pipe attached to one side thereof and having on its opposite side a surface comprising a pair of elongated, substantially planar portions extending the length of the plate, and a plurality of longitudinally-oriented ribs disposed therebetween.

**4,679,618**  
**DRAINCOCK AND DRAIN HOLE FOR A LIQUID**  
**VESSEL**

Frank J. Farkas, Getzville, N.Y., assignor to General Motors Corporation, Detroit, Mich.  
Filed Nov. 13, 1986, Ser. No. 930,110  
Int. Cl.<sup>4</sup> F16F 1/34

U.S. Cl. 165—71

2 Claims



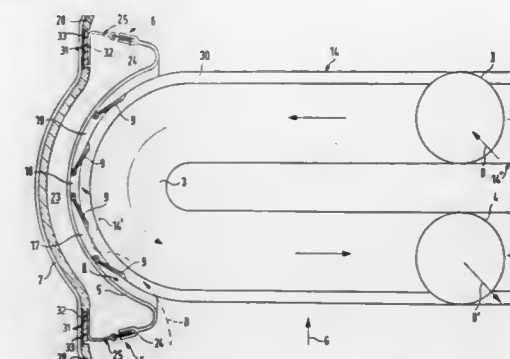
1. A draincock and drain hole for a liquid vessel such as a motor vehicle radiator characterized by the hole including a stepped cylindrical bore with a large diameter portion that opens to the exterior of the vessel and a small diameter portion that opens to the interior of the vessel, the draincock having a cylindrical body that is receivable with a slip fit in the large diameter bore portion, at least one cantilever retaining arm extending from one end of the cylindrical body having a hook and a ramp at the end thereof, the ramp arranged to contact with a radial step between the bore portions on inwardly forced movement of the draincock to deflect the respective arm inward to allow the hook and thereby the arm to pass through the small diameter bore portion and whereafter the hook upon clearing the small diameter bore portion allows the arm to resume its normal state while extending through but not blocking the small diameter bore portion and positioning the hook for contact with the vessel about the hole to prevent removal of the draincock from the hole, seal means mounted on the cylindrical body for preventing leakage therepast in the large diameter bore portion, the vessel having a hole intersecting with the large diameter bore portion for connecting same with the exterior of the vessel, the length of the retaining arm measured from the cylindrical body to the hook being determined so that the draincock while remaining retained by the hook is movable between an open position uncovering the hole to the large diameter bore portion and through the small bore portion past the retaining arm to the interior of the vessel and a closed position blocking the hole with the cylindrical body and positioning the seal means between the radial hole and the small diameter bore portion to sealingly close the drain hole, and at least one cantilever locking arm extending from the other end of the cylindrical body having a locking hook and a lock engaging ramp, a detent formed on the exterior of the vessel, the lock engaging ramp being arranged to contact with the detent on inwardly forced draincock movement to deflect the locking arm outward so that the locking hook clears the detent and whereafter the locking arm resumes its normal state to position the locking hood to contact the detent to lock the draincock in its closed position and whereafter the locking arm is manually deflectable outward to release from the detent to allow movement of the draincock to its open position while remaining retained in the stepped bore by the retaining arm.

**4,679,619**  
**HEAT EXCHANGERS HAVING A TUBE MATRIX IN A**  
**HOUSING**

Bernhard Wöhr, Gauting, and Alfred Jabs, Gröbenzell, both of Fed. Rep. of Germany, assignors to MT Motoren-und Turbinen Union München GmbH, Fed. Rep. of Germany  
Filed Apr. 18, 1986, Ser. No. 853,468  
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514377

U.S. Cl. 165—81

15 Claims



1. In a heat exchanger having a plurality of spaced U-shaped tubes arranged in a matrix and disposed in a housing for the flow of hot gases around the tubes for heat exchange with a fluid conveyed in said tubes, said housing having a wall surrounding the curved U-portions of the tubes of the matrix in spaced relation, the improvement comprising a shell disposed between the wall and the curved U-portions of the tubes of the matrix, means including a flexible seal between the wall and the shell for preventing flow of hot gases therebetween, and means including at least one brush seal between the shell and the curved U-portions of the tubes of the matrix for blocking passage therebetween of hot gases.

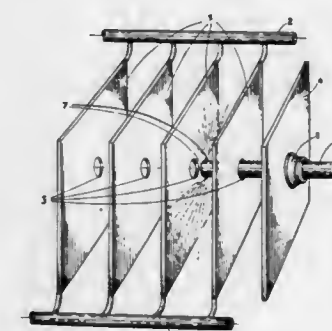
**4,679,620**  
**METHOD AND APPARATUS FOR CLEANING PLATE**  
**HEAT EXCHANGERS USED FOR RECOVERING HEAT**  
**FROM EXHAUST GASES**

Klaus-Dieter Daun, Am Sonnenhang 33, D 4300 Essen 17, Fed. Rep. of Germany  
Filed Feb. 28, 1986, Ser. No. 834,882  
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507203

U.S. Cl. 165—95

Int. Cl.<sup>4</sup> F28G 9/00

7 Claims



2. A device for cleaning plate heat exchangers of a type used for recovering heat from contaminated exhaust gases and comprising hollow heat exchanger plates arranged in spaced parallel relationship through which a heat exchange medium is



directed in an arrangement in which the exhaust gases are passed through the spaces between the plates, a plurality of through holes defined in each of said plates in aligned relationships, a soot blower mounting on said heat exchanger, a lance carried by said mounting and being rotatable and axially movable relative thereto in alignment with the holes of the plates, said lance being hollowed for carrying a cleaning medium having at least one radially discharging nozzle for discharging the cleaning fluid therefrom adjacent an end thereof, said lance being rotatable and axially movable for discharging the fluid over each of the plates.

4,679,621

## SPIRAL HEAT EXCHANGER

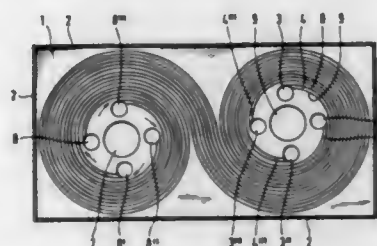
Jurgen Michele, Schortens, Fed. Rep. of Germany, assignor to Paul Grote, Friedrichsfehn, Fed. Rep. of Germany  
Filed Feb. 20, 1986, Ser. No. 831,927

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1985, 3505789

Int. Cl.<sup>4</sup> F28D 7/02

U.S. Cl. 165—145

3 Claims



1. A recuperative spiral heat exchanger, comprising: two interconnected multi-channel spirals having opposed directions of spirals and composed of a multiplicity of spirally-extending, spaced-apart separating walls, each adjacent pair of which define a flow duct therebetween used in an alternate fashion for one of two oppositely flowing streams of medium, said two spirals together forming substantially S-shaped flow ducts lying substantially in the same plane, a closed housing in which said two spirals are arranged, and inflow and outflow openings for said flow ducts, said inflow openings being disposed in said housing approximately at the center of one of said spirals and said outflow openings being disposed in said housing approximately at the center of said other spiral.

4,679,622

## TAKE-APART FITTING FOR MULTI-TUBE HEAT EXCHANGER

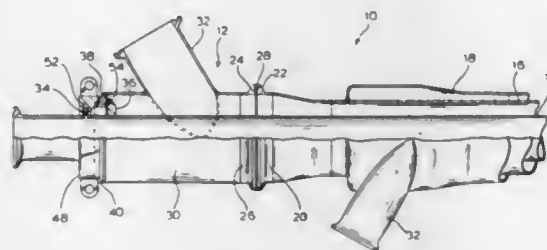
Robert B. Cannon, Gulf Shores, Ala., assignor to Robert B. Cannon, Inc., Gulf Shores, Ala.

Filed Apr. 25, 1985, Ser. No. 727,294

Int. Cl.<sup>4</sup> F28D 7/10

U.S. Cl. 165—154

9 Claims



1. A multi-tube heat exchanger comprising: a first tube;

a second tube disposed about and concentric with said first tube;  
an end of said second tube;  
a fitting disposed about said first tube and coupled to said end of said second tube;  
a cap ring disposed about and secured to the outer surface of said first tube;  
an end cap secured to an end of said fitting, said end cap having a bore of sufficient diameter to receive said first tube extending therethrough;  
clamp means for securing said end cap in position and to urge said end cap into sealing engagement with said cap ring, said end cap and said clamp means having mating surfaces machined to complementary, inverted, chamfered surfaces, whereby, as said clamp is tightened said surfaces are urged against each other;  
said clamp means comprising a split clamp, said first tube includes as clamp ring disposed about the outer surface thereof; and said clamp further includes a groove extending about the inner surface thereof for capturing said clamp ring.

4,679,623

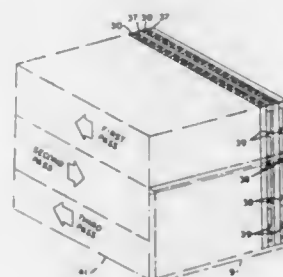
## TRIPLE PASS CERAMIC CROSS-FLOW HEAT RECUPERATOR

Richard E. Landry, and Joel G. Reed, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.  
Continuation of Ser. No. 705,256, Feb. 25, 1985, abandoned, which is a division of Ser. No. 536,030, Sep. 26, 1983. This application Aug. 11, 1986, Ser. No. 895,531

Int. Cl.<sup>4</sup> F28F 3/00

U.S. Cl. 165—166

5 Claims



1. A heat recuperator comprising a cross flow ceramic core within a housing, the core comprising ribbed layers for the flow therethrough of combustion air to be heated, the core also comprising other ribbed layers for the flow therethrough of hot exhaust gas, the combustion air ribbed layers being stacked alternatively with the hot gas ribbed layers, the air flow through the combustion air ribbed layers being orthogonal to the gas flow through the hot gas ribbed layers, the air flow through the combustion air ribbed layers being triple pass, the passes being separated from each other by divider ribs, each pass having supporting ribs therein providing channels for the air flow, the construction of the divider ribs being such as to reduce the number of said supporting ribs required for support of all the layers in the core, the divider ribs being thicker than the ribs in the hot gas ribbed layers, the divider ribs being sealed to prevent air in one pass from leaking to an adjoining pass, and metal inserts in the housing that face with the divider ribs so as to cause the air flow to be triple pass.

4,679,624

## HYDRAULIC SETTING TOOL

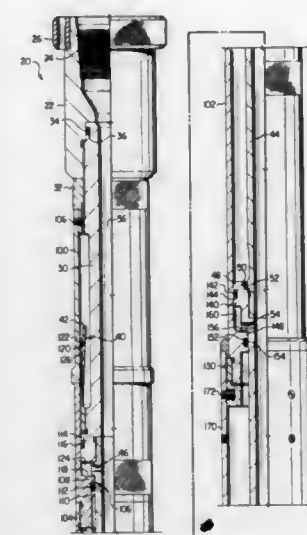
Monty E. Harris, Azle, and Richard A. Sukup, Burleson, both of Tex., assignors to The Western Company of North America, Fort Worth, Tex.

Filed Sep. 9, 1985, Ser. No. 774,023

Int. Cl.<sup>4</sup> E21B 23/04

U.S. Cl. 166—120

32 Claims



1. An oil or gas well retainer setting and fluid pumping tool comprising:  
means responsive to a first pressure to the interior bore of the tool for moving an actuation means into engagement with the retainer for setting said retainer;  
means responsive to a second pressure in the bore of the tool for disengaging a plug means in the tool to open a passageway in said tool to permit fluid flow through said tool, and  
means within the tool for capturing said plug means in its disengaged position wherein said means for capturing said plug means comprises a fitting having a bore therein and expandable fingers receiving said disengageable plug means therein, said fingers serving to lock said plug means in said fitting when engaged therein.

4,679,625

## OIL RECOVERY PROCESS USING A VISCOSITY ADJUSTED GELATION SYSTEM

David L. Gibbons, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Feb. 11, 1986, Ser. No. 828,464

Int. Cl.<sup>4</sup> E21B 33/13

U.S. Cl. 166—270

21 Claims

1. A process for recovering oil from a subterranean oil-bearing formation penetrated by a wellbore and having a high permeability region bounded by at least one lower permeability region comprising the steps of:  
preparing a crosslinkable polymer solution having a predetermined viscosity such that said solution is capable of penetrating said high permeability region at a predetermined rate to a predetermined depth;  
providing a crosslinking agent in a solution capable of crosslinking said polymer, said crosslinking agent solution having a viscosity substantially less than said predetermined viscosity of said polymer solution;  
adjusting the viscosity of said crosslinking agent solution by the addition of a viscosifying agent in an amount sufficient to raise the viscosity of said crosslinking agent solution substantially equal to that of said polymer solution such that said crosslinking agent solution is capable of penetrating said high permeability region at a rate and to a depth substantially equal to said predetermined rate and depth of

said polymer solution and wherein said viscosifying agent is substantially unreactive with said crosslinking agent; sequentially injecting a slug of said polymer solution and a slug of said crosslinking agent solution into said wellbore in fluid communication with said high permeability region;  
displacing said sequentially injected slugs into said high permeability region such that said slugs penetrate said high permeability region at said predetermined rate; substantially mixing said slugs at said predetermined depth in said high permeability region;  
crosslinking said polymer with said crosslinking agents to form a crosslinked polymer gel which substantially reduces the permeability of said high permeability region; and  
recovering oil from said formation.

4,679,626

## ENERGY EFFICIENT PROCESS FOR VISCOUS OIL RECOVERY

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

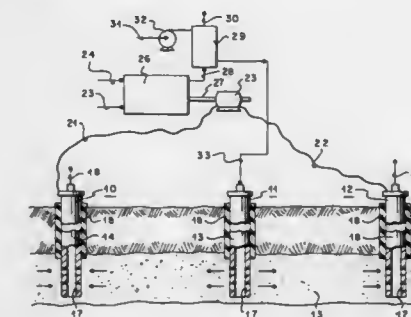
Continuation of Ser. No. 560,696, Dec. 12, 1983, abandoned.

This application Mar. 11, 1986, Ser. No. 839,459

Int. Cl.<sup>4</sup> E21B 43/24

U.S. Cl. 166—248

3 Claims



1. A method of producing viscous hydrocarbons from a subterranean formation in which plural spaced apart wellbores have been drilled, said method comprising:  
providing means for burning a combustible material to generate hot gases and for using said hot gases to continuously generate electrical power and to continuously heat a well injection liquid, said means including first and second heat exchangers each having means providing separate flow paths for combustion air, working gas and injection liquid, a gas compressor and a gas expander operably connected for operation with a working gas, said gas expander being drivingly connected to generator means and responsive to working gas being expanded through said gas expander for generating said electrical power;  
providing electrode means in at least two of said wellbores; simultaneously generating electrical power and heating said injection liquid by passing combustion air, working gas and injection liquid through said first heat exchanger to heat said combustion air and said injection liquid, burning said combustible material with said combustion air, passing said injection liquid, working gas and heated flue gas produced from said burning through said second heat exchanger to heat said working gas and said injection liquid;  
using said electrical power to cause electrical current to pass between said electrode means in a manner such that said viscous hydrocarbons are heated; and  
simultaneously, while heating said viscous hydrocarbons with said current, injecting heated injection liquid into said formation through one of said wellbores to cause said

viscous hydrocarbons to flow through said formation to one of said at least two wellbores.

4,679,627

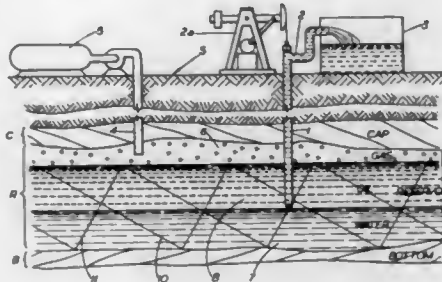
## METHOD OF OIL RECOVERY

William M. Harrison, 6666 Chimney Rock, #14, Houston, Tex. 77081

Continuation-in-part of Ser. No. 764,718, Aug. 12, 1985, Pat. No. 4,648,449. This application Dec. 26, 1985, Ser. No. 813,472 Int. Cl.<sup>4</sup> E21B 43/25

U.S. Cl. 166—249

19 Claims



1. A method of recovering petroleum from an underground reservoir comprising the steps of:

- injecting into said reservoir a substantially water insoluble gas to form a gas cap forcing oil and water toward the bottom of said reservoir;
  - generating one or more pressure waves and directing said pressure waves into said reservoir to release petroleum fluids retained by said reservoir; and
  - producing said petroleum fluids through a well communicating with said reservoir;
- said method being further characterized by performing additional fluid injection steps during step (a).

4,679,628

## DILUTION APPARATUS AND METHOD

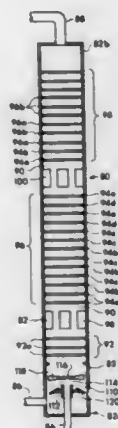
Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation of Ser. No. 470,258, Feb. 28, 1983, abandoned, Division of Ser. No. 279,027, Jun. 30, 1981, Pat. No. 4,402,916. This application Nov. 13, 1985, Ser. No. 797,609

Int. Cl.<sup>4</sup> E21B 43/22

U.S. Cl. 166—252

8 Claims



1. In a process for the secondary and tertiary recovery of oil from an oil-bearing subterranean formation having at least one input well and at least one output well which process includes the preparation of an aqueous solution of a polymer consisting essentially of a partially hydrolyzed polyacrylamide capable of meeting the performance demands of an oil-bearing subterra-

nean formation into which the polymer solution is introduced, the step of diluting the aqueous polymer solution having a polymer concentration such that the solution has a gel-like consistency to provide an aqueous polymer solution having a polymer concentration such that the solution has a substantially non-gel-like consistency while at the same time minimizing polymer degradation as the aqueous polymer solution is undergoing a physical change from a gel-like consistency to a substantially non-gel-like consistency thereby enabling the partially hydrolyzed polyacrylamide to retain its capability for meeting the performance demands of an oil-bearing formation into which an aqueous solution containing said polymer is introduced, said dilution being carried out by continuously dispersing an aqueous solution of said polymer of known concentration having a gel-like consistency into a chamber, having an inlet and an outlet, by passing the polymer solution through distributor means at the inlet of the chamber to increase the surface area of the gel-like polymer solution; continuously introducing into the chamber an aqueous diluent for said aqueous polymer solution in an amount such that the concentration of the aqueous polymer solution in the chamber will be altered to a preselected lower concentration, said aqueous diluent being of a character such that it will be absorbed by the gel-like polymer solution; continuously and successively moving the aqueous polymer solution and said diluent through a series of flow control and polymer solution dispersing stations positioned in said chamber in spaced relation to one another between the inlet and the outlet of the chamber, each of the flow control stations comprising static mixers positioned between at least two of said polymer solution dispersing stations for regulating the flow pattern of the polymer solution as it passes from one dispersing station to the next and to impart uniformity to the flow of the aqueous polymer solution, each of the polymer solution dispersing stations comprising screens, the perforations of which act to disperse and progressively increase the surface area of said polymer solution whereby greater amounts of the aqueous diluent will be absorbed by said polymer as it passes through each of said dispersing stations until the aqueous polymer solution has a substantially non-gel-like consistency and said preselected lower concentration is attained when the polymer solution reaches the outlet of the chamber; discharging the diluted aqueous polymer solution from the outlet of the chamber at said preselected lower concentration; and further diluting said discharged solution with an aqueous diluent to a preselected still lower concentration of said polymer prior to injection into an input well of an oil-bearing subterranean formation.

4,679,629

## METHOD FOR MODIFYING INJECTIVITY PROFILE WITH BALL SEALERS AND CHEMICAL BLOCKING AGENTS

Milton K. Abdo, Dallas, and Alfred R. Jennings, Jr., Plano, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 1, 1985, Ser. No. 707,271

Int. Cl.<sup>4</sup> E21B 33/138

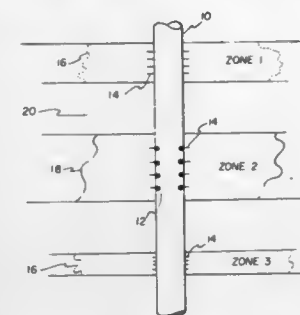
U.S. Cl. 166—281

11 Claims

1. A method for selectively closing off zones in a hydrocarbonaceous fluid producing formation or reservoir which contains at least one zone of greater permeability and at least one zone of lesser permeability which method is effective in producing increased amounts of hydrocarbonaceous fluids and where said zones are in fluid communication with at least one injection well and at least one production well comprising:

- determining the permeability profile of said formation or reservoir and ascertaining the existence of at least one zone of greater permeability and at least one zone of lesser permeability;
- introducing into the wellbore having perforations therein fluidly connected to said zones, an injection fluid with ball sealers therein which are sufficient to seal off said zone of greater permeability when seated in said perforations;
- injecting a temporary blocking agent into said zone of

- less permeability which agent is sufficient to close pores in said zone of lesser permeability;
- removing said sealers from said zone of greater permeability;
- injecting a permanent blocking agent into said zone of greater permeability after removal of said ball sealers;



- causing a reaction to take place in said zone of lesser permeability which reaction is sufficient to remove said temporary blocking agent; and
- injecting a fluid sufficient to remove hydrocarbonaceous fluids from said zone of lesser permeability via said production well.

4,679,630

## METHOD OF COMPLETING PRODUCTION WELLS FOR THE RECOVERY OF GAS FROM COAL SEAMS

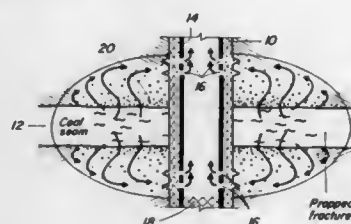
Richard E. Wyman, Calgary, Canada, assignor to Canadian Hunter Exploration Ltd., Calgary, Canada

Filed Dec. 23, 1985, Ser. No. 812,639

Int. Cl.<sup>4</sup> E21B 43/26

U.S. Cl. 166—305.1

4 Claims



1. A method of completing production wells for the recovery of gas from a coal seam and having a casing cemented in the well, comprising the steps of:

- providing perforations in the casing opposite earth formations located above and/or below the coal seam; and
- hydraulically fracturing the coal seam through the perforations in the casing, said fracturing of the coal seam propagating initially through the earth formations located above and/or below the coal seam and providing a filter for the coal fines to prevent their migration toward said perforations and plugging or impairment of the perforations during withdrawal of gas from the coal seam through the perforations.

4,679,631

## COMPOSITION AND METHOD OF STIMULATING SUBTERRANEAN FORMATIONS

Walter R. Dill; Michael L. Walker, and William G. F. Ford, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 3, 1986, Ser. No. 882,127

Int. Cl.<sup>4</sup> E21B 43/26, 43/27

U.S. Cl. 166—307

20 Claims

1. A method of treating a subterranean formation containing iron comprising contacting a subterranean formation with an

aqueous fluid containing a compound consisting essentially of at least one member selected from the group consisting of dihydroxymaleic acid, salts of dihydroxymaleic acid, gluconodeltalactone present in an amount sufficient to substantially prevent the precipitation of ferric iron in said aqueous fluid during said contacting with said subterranean formation.

4,679,632

## REMOTELY CONTROLLED RISER CONNECTION

Lars Bengtsson, Torslanda, and Johan Sjölander, Gothenburg, both of Sweden, assignors to Gotaverken Arendal AB, Sweden

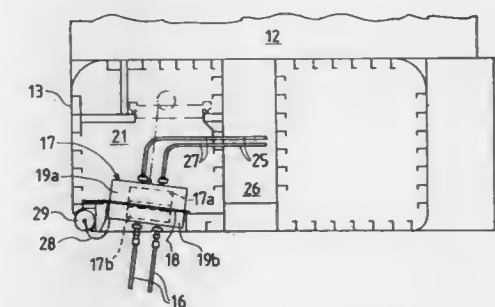
Filed Apr. 22, 1986, Ser. No. 854,539

Claims priority, application Sweden, May 15, 1985, 8502419

Int. Cl.<sup>4</sup> E21B 43/01

U.S. Cl. 166—345

4 Claims



1. A vessel for processing crude oil and/or gas and including a watertight compartment adjacent to its bottom plating, said compartment communicating by way of at least one product transfer pipe with a processing plant or with storage means within the vessel and connectable to at least one riser conduit extending from a well at the sea floor, a recessed sealing collar within said bottom plating,

a two part connection piece having a first part connected to said product transfer pipe and a second part connected to said riser conduit, means for watertightly mounting said first part in said collar, and remotely releasable means for holding said second part to said first part.

4,679,633

## METHOD FOR DEPTH ADJUSTMENT OF A TILLING MACHINE

Wolfgang Kauss, Lohr-Wombach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

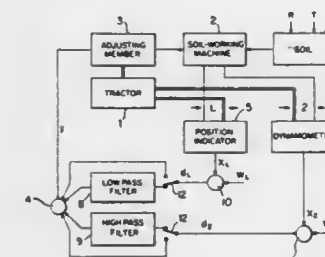
Filed Sep. 13, 1984, Ser. No. 650,010

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337317

Int. Cl.<sup>4</sup> A01B 63/112, 79/00

U.S. Cl. 172—1

14 Claims



1. A method for adjusting the working depth of a soil-tilling



machine that is carried by a tractor, the position of the soil-tilling machine being adjusted in relation to the tractor, said method comprising

extracting by a first control loop a high frequency component of a traction signal equal to, at the least, a predetermined cut-off frequency, said traction signal representing the traction as produced on the soil-tilling machine in the soil,

extracting by a second control loop a low frequency component of a position signal equal to, at the most, said predetermined cut-off frequency, said position signal representing the position of the soil-tilling machine in relation to the tractor,

mixing said extracted components only of said traction and position signals to generate an adjusting signal for controlling the elevation of the soil-tilling machine with respect to the tractor by keeping said first control loop and said second control loop separate so that the elevation adjustments caused by said traction signal and said position signal, respectively, are mutually independent.

4,679,634

# APPARATUS FOR EXTENDING THE FRAME OF A TRACTOR

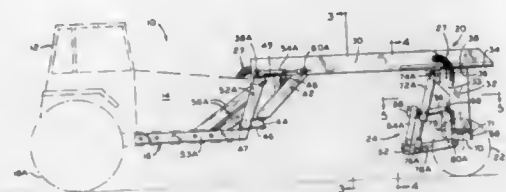
Gerald L. Bulmahn, Rural Rte. 8, P.O. Box 173, Decatur, Ind. 46733

Filed Feb. 11, 1986, Ser. No. 828,287

Int. Cl.<sup>4</sup> A01B 59/044, 63/104

U.S. Cl. 172-250

12 Claims



1. An apparatus for extending the frame of an agricultural tractor adapted for pulling farm implements for adapting said tractor to ridge or no till farming, said tractor including a set of rear wheels, a frame, a set of front wheels, and an engine mounted between said front and rear wheels, the apparatus comprising:

- a longitudinal extension frame;
- extension frame attaching means connected to said extension frame for attaching said extension frame to said tractor frame along with removal of said tractor front wheels;
- pivoting means secured to said extension frame to enable pivoting of at least a portion of said extension frame relative to said tractor frame about a substantially vertical axis;
- front wheel attaching means connected to said extension frame for attaching at least two front wheels to said extension frame;
- a hydraulically operated steering apparatus operably secured to said front wheels and to said extension frame pivoting means;
- hydraulic fluid hose extension means for connecting the tractor hydraulic steering control means to said hydraulic steering apparatus; and
- a three point hitch connected to said extension frame for attaching an agricultural implement to said extension frame at a position intermediate said front wheel attaching means and said extension frame attaching means.

4,679,635

# SELF-TRIPPING RIPPERS

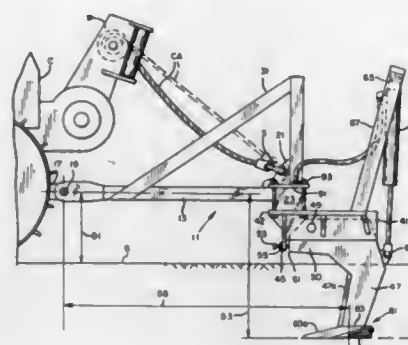
Eddie L. Fields, 26979 Dawson Rd., Monroe, Oreg. 97456

Filed Oct. 28, 1985, Ser. No. 790,665

Int. Cl.<sup>4</sup> A01B 13/08; E02F 5/32

U.S. Cl. 172-260.5

2 Claims



1. Apparatus comprising a crawler tractor equipped at its rear with a winch operated cable, said crawler tractor having a rearwardly extending drawbar, a ground ripping attachment comprising a main frame having a forward portion pivotally connected to said drawbar for pivotal movement about a horizontal axis, said attachment having ground engaging ripping means disposed rearwardly of said axis, cable attaching means on said main frame spaced rearwardly of said axis to facilitate connection of said cable and elevation of said attachment where said ripping means is clear of the ground to provide for travel of the tractor from one place to the other, said cable when unwound sufficiently completely releasing said attachment to facilitate unrestrained contact of said ripping means with the ground, and means independent of said cable and said tractor for varying the depth at which said ripping means rips the ground, wherein the horizontal spacing of said ripping means rearwardly of said axis is a multiple of the vertical distance from said tractor drawbar from the ground surface, and wherein the vertical spacing of the bottom portions of said ripping means from a horizontal plane containing said axis, in the ripping position of said ground ripping means, is substantially greater than said vertical distance, but substantially less than said horizontal spacing, said ripping means comprising a series of laterally related ground ripping members, each being pivotally mounted on the main frame for pivotal movement about a horizontal axis upwardly and rearwardly from a down operative position for automatic tripping upon engagement with an immovable object, accumulator means for releasably biasing said ground ripping members to remain in their operative positions, the sole ripping means for said attachment comprising a flyte on the lower end of each ground ripping member, each said flyte having a central portion having a relatively flat bottom surface and an inclined upper surface, each said flyte having a pair of wing portions flanking the central portion and having upper faces inclined forwardly and downwardly to define front edges which in plan angle rearwardly, said flytes together with the above recited spatial relationship enabling said ground ripping means to seek its own depth of penetration in the soil while being freely released from said cable.

4,679,636

# METHOD AND APPARATUS FOR CORING ROCK

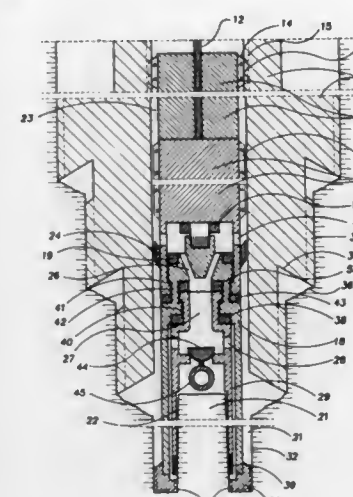
James L. Rühle, 2535 E. Balfour Ave., Fullerton, Calif. 92634

Filed Oct. 16, 1986, Ser. No. 919,650

Int. Cl.<sup>4</sup> E21B 10/02, 25/04

U.S. Cl. 175-58

4 Claims



1. The invention of a wire-line conveyed assembly of down-hole reversible electrically-driven high-speed thin-kerf core-sampling apparatus comprising:

- a suitable wire-line conveyance system with connecting means suitable for the support and conveyance of said coresampling assembly through suitable cylindrical conduit to and from the bottom of a hole excavated in rock, and with electrical-connecting means suitable for the transmission of electric power to said core-sampling assembly,
- a suitable weighted unit, or sinker bar, through which passes said suitable wire-line conveyance system, and to which is rigidly affixed a plurality of guide fins arranged in a longitudinal manner on the exterior surface of said suitable weighted unit, or sinker bar,
- a suitable reversible direct-current electric motor rigidly affixed to the bottom of said suitable weighted unit, or sinker bar, to which is rigidly affixed a plurality of centralizing heat-sink fins, arranged in a longitudinal manner on the exterior surface of said suitable direct-current electric motor, with suitable electrical-connecting means between said suitable wire-line conveyance system and said suitable direct-current electric motor, and with a motor-case extension and a suitable splined rotational output shaft extending downward from the bottom of said suitable direct-current electric motor, said suitable splined rotational output shaft enveloped at the bottom of said suitable direct-current electric motor by suitable pressure-actuated sealing means so as to exclude outside fluid entry into said suitable direct-current electric motor,
- a suitable pressure-actuated annular cup seal enveloping said motor-case extension with its sealing lip facing up, and a plurality of side ports through said motorcase extension, said side ports situated above said suitable up-facing pressure-actuated annular cup seal, and a circumferential inward-facing shoulder rigidly affixed to the bottom of said motor-case extension, below which is situated a suitable bearing support, or circumferential thrust bearing,
- a suitable rotating outer cylindrical core barrel with suitable splined connecting means to said suitable splined rotational output shaft, containing a circumferential out-facing shoulder around its topmost perimeter, above which is situated suitable pressure-actuated sealing means, said suitable rotating outer cylindrical core barrel also containing a plurality of inclined fluid passageways at its top, below which is situated, at the lowermost extremity of

said suitable cylindrical core barrel, a suitable core bit containing suitable water courses, a suitable nonrotating inner cylindrical core barrel containing at its topmost extremity suitable pressure-actuated sealing means, below which is situated a central and axial fluid passageway, said suitable nonrotating inner cylindrical core barrel also containing near its top a circumferential out-facing shoulder upon which is situated a suitable swivel bearing, and below which is situated a plurality of side ports and a suitable oneway check valve that allows fluid passage in an upward direction only, whereas near the lower extremity of said suitable nonrotating inner cylindrical core barrel is situated circumferentially near its bottom interior a suitable core-restraining device, or core catcher, a suitable hole-enlarging means, or hole opener, operating in either the linear-motion or rotational excavation mode, with said suitable hole enlarging means, or hole opener, containing a central and axial bore of sufficient diameter to allow the passage of said reversible electrically-driven core-sampling assembly, with said central and axial bore containing in its wall a plurality of longitudinally-arranged guide slots.

4,679,637

# APPARATUS AND METHOD FOR FORMING AN ENLARGED UNDERGROUND ARCuate BORE AND INSTALLING A CONDUIT THEREIN

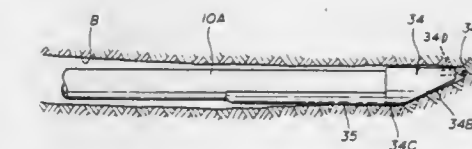
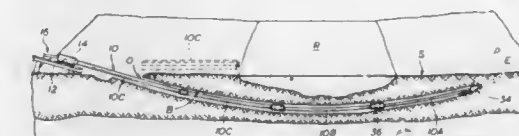
Martin D. Cherrington, and William D. Cherrington, both of Cherrington Corp., 7398 San Joaquin, Sacramento, Calif. 95820

Continuation-in-part of Ser. No. 733,723, May 14, 1985, abandoned. This application Apr. 17, 1986, Ser. No. 853,344

Int. Cl.<sup>4</sup> E21B 7/04, 7/08

U.S. Cl. 175-61

50 Claims



1. A method for drilling an arcuate underground pilot bore hole along a predetermined arcuate path in one direction of travel between two surface locations, and then enlarging the pilot bore hole in an opposite direction of travel between the surface locations to receive a production conduit therein, the bore hole being drilled by a drill pipe string of connected pipe sections including a leading drill pipe section of a smaller diameter than the diameter of at least the majority of the remaining pipe sections, said method comprising the steps of: advancing the small diameter leading drill pipe section with a drill bit thereon in one direction of travel along the arcuate path from a surface entry location to a surface exit location; removing the small diameter leading drill pipe section from the drill pipe string after exit from the exit location; attaching a reamer and production conduit connected thereto to the drill string at the exit location after the small diameter leading pipe section has been removed; pulling the drill string, reamer, and production conduit along the pilot bore hole from the exit location to the earth

entry location in an opposite direction of travel with the reamer forming an enlarged opening to receive the production conduit;

rotating said drill string and reamer during pulling thereof; and circulating drilling fluid through said drill string during the drilling and reaming operations.

11. Apparatus for drilling an arcuate underground pilot bore hole along a predetermined inverted arcuate path between two spaced earth surface locations; said apparatus comprising:

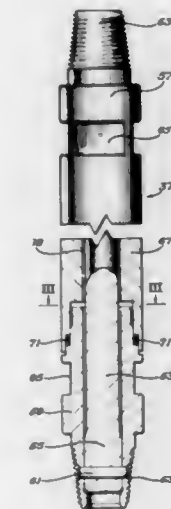
a drill pipe string including a plurality of connected pipe sections extending from one surface location into a bore entrance opening of the pilot bore hole;

means at said one surface location to apply a thrust on said pipe string;

said drill pipe string having a leading pipe section with a drill bit thereon and being of a flexibility greater than the other pipe sections; and,

means to circulate drilling fluid during the drilling operation.

a cylindrical overload sub, located concentrically around the rod; and



4,679,638

# DOWNHOLE PROGRESSIVE CAVITY TYPE DRILLING MOTOR WITH FLEXIBLE CONNECTING ROD

Jay M. Eppink, Spring, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 711,322, Mar. 13, 1985, Pat. No. 4,636,151. This application Dec. 27, 1985, Ser. No. 814,335. The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> E21B 4/02; F03C 2/00; F16D 3/04

U.S. Cl. 175-107

10 Claims

1. A downhole drilling motor, comprising:
  - a stator of the progressive cavity type;
  - a rotor, within the stator, wherein the rotor rotates and gyrates in response to fluid flow through the stator;
  - a housing, connected to the stator;
  - a bearing shaft, concentrically located within the housing, and rotatable about the longitudinal axis of the bearing shaft and the housing;
  - a bearing between the housing and the bearing shaft;
  - a flexible rod, extending between the rotor and the bearing shaft, for translating the rotation and gyration of the rotor to the true rotation of the bearing shaft;
  - an upper threaded connection, nonintegral to, but connected to one end of the rod, for connecting the rod to the rotor;
  - a lower threaded connection, nonintegral to, but connected to the other end of the rod, for connecting the rod to the bearing shaft;

means for engaging the sub and the selected connection in a manner so as to allow the connections to rotate axially a limited amount in relation to one another.

4,679,639

# ROTARY DRILL BITS AND CUTTING ELEMENTS FOR SUCH BITS

John D. Barr, Cheltenham, and Michael T. Wardley, Hardwicke, both of England, assignors to NL Petroleum Products Limited, Cheltenham, England

Filed Nov. 30, 1984, Ser. No. 676,696

Claims priority, application United Kingdom, Dec. 3, 1983, 8332343; Feb. 28, 1984, 8405181

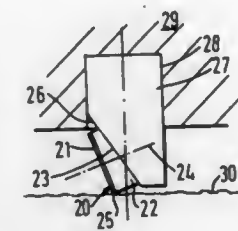
Int. Cl.<sup>4</sup> E21B 10/46

U.S. Cl. 175-329

26 Claims

1. A cutting element for a rotary drill bit comprising a thin hard facing layer, defining a front cutting face, bonded to a less hard backing layer, defining a rear face and lateral surfaces, the backing layer being fabricated of non-uniform thickness, thicker adjacent the cutting edge of the facing layer than it is over the rest of the area of the facing layer, wherein the general plane of the facing layer is disposed generally at right

angles to the central axis of the cutting element, and the general plane of the rear surface of the backing layer is inclined at



an angle of less than 90° to the central axis so as to provide the required variation in thickness.

4,679,640

# METHOD FOR CASE HARDENING ROCK BITS AND ROCK BITS FORMED THEREBY

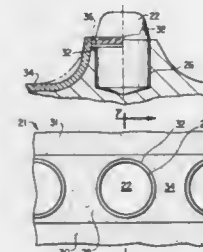
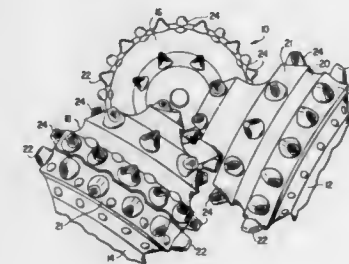
Michael B. Crawford, Duncanville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 21, 1986, Ser. No. 832,490

Int. Cl.<sup>4</sup> E21B 10/52

U.S. Cl. 175-374

15 Claims



1. In the method of manufacturing rock bits for earth boring, the steps comprising:

- (a) profiling a cutter blank to define at least one circumferential row on which cutter inserts are to be supported in an interference fit in cavities formed in said circumferential row;
- (b) carburizing the cutter blank;
- (c) machining a plurality of preselected surface areas of said circumferential row at the locations at which said cavities are to be formed while substantially retaining the carburizing in the remaining areas of said circumferential row, said machining exposing an uncarburized area of said blank slightly greater than the inserts when supported in their respective cavities;
- (d) metallurgically hardening the carburized areas of said blank;
- (e) forming insert cavities in said circumferential row at locations within said preselected surface areas of trans-

verse dimension less than the corresponding dimension of said inserts; and

(f) pressing cutter inserts into said cavities to effect an interference fit spaced from said hardened surface to maintain the surface of said circumferential row substantially free of stress cracking in the areas surrounding said inserts.

7. In a rotary rock bit having at least one rolling cutter member for forming a borehole in the earth, said rolling cutter member having at least one annular surface containing an annular row of cutter inserts mounted in an interference fit in socket cavities in said annular surface for cutting the inner portions of a borehole, the improvement comprising said annular surface being case hardened to include the land area substantially between adjacent cutter inserts thereon and a narrow substantially concentric band of land area contiguously surrounding each of said insert cavities, said band area being larger than the corresponding dimension of the insert thereat and substantially devoid of case hardening whereby the surface areas of said annular surface surrounding said inserts are substantially free of stress cracking induced by said interference fit.

4,679,641

# APPARATUS FOR FEEDING SPROUTING BEANS OR THE LIKE IN FIXED QUANTITIES

Sanji Kawakami, Kodaira, Japan, assignor to Kabushiki Kaisha Daisel Kikai, Tokyo, Japan

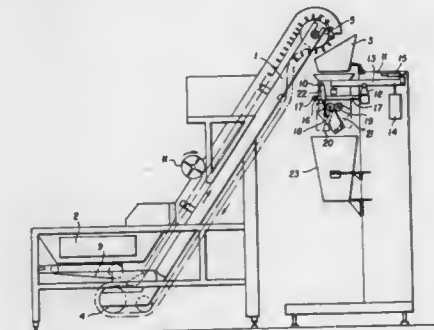
Filed Aug. 2, 1985, Ser. No. 761,700

Claims priority, application Japan, Aug. 16, 1984, 59-170930

Int. Cl.<sup>4</sup> G01G 13/24, 13/04

U.S. Cl. 177-114

4 Claims



1. An apparatus for feeding sprouting beans or the like in fixed quantities, which comprises:
  - a framework having a first arm extending therefrom and a second arm extending therefrom and having a plurality of rollers mounted thereon;
  - a weighing bucket having a discharging mechanism at the bottom, said weighing bucket being received by said rollers of said second arm so as not to be pivoted from side to side;
  - a load cell connected to said first arm for detecting the weight of said weighing bucket;
  - a raking-up conveyor comprising a conveying belt arranged standingly slantwise from a lower sprouting beans reservoir to said weighing bucket, with a plurality of needlelike projections extending therefrom, which conveys continuously the sprouting beans from said reservoir to said weighing bucket while holding the sprouting beans by means of said needlelike projections;
  - conveyor control means for decreasing the conveying speed of said raking-up conveyor when said load cell detects a predetermined primary weight of the weighing bucket; and
  - means for intermittently actuating the discharging mechanism of said weighing bucket to discharge the sprouting beans in its interior when said load cell detects a predetermined secondary weight of the weighing bucket.



4,679,642

# SPRING-TYPE ADJUSTABLE MOUNTING FOR WEIGHING SCALE FLEXURES

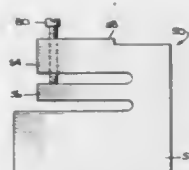
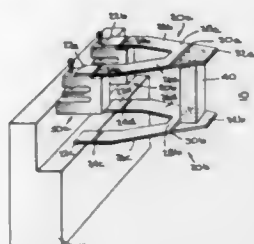
Marilyn A. Brock, Morris Plains, and Daniel G. Scheffer, Rockaway Township, Morris County, both of N.J., assignors to Ohaus Scale Corporation, Florham Park, N.J.

Filed Aug. 4, 1986, Ser. No. 892,326

Int. Cl.<sup>4</sup> G01G 23/14, 3/08

U.S. Cl. 177-164

7 Claims



1. Apparatus for adjusting the position of a flexure mounting in a weighing scale having a base and at least one flexure mounting comprising:

- first spring means for resiliently connecting the flexure mounting to the base, said first spring means having a relatively high spring constant;
- second spring means having a relatively low spring constant; and
- control means movable relative to said base and operatively connected to said first and second spring means so that most of the motion of said control means results in deflection of the second spring means and only a minor portion of said motion results in deflection of the first spring means and the flexure mounting.

4,679,643

# CAPACITIVE WEIGHING DEVICE

Bertrand Bové, Wichelen, Belgium, assignor to Advanced Micro Electronic Components and Systems, Belgium

Filed Jan. 17, 1986, Ser. No. 820,548

Claims priority, application Netherlands, Jan. 21, 1985, 8500139

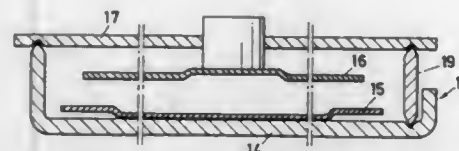
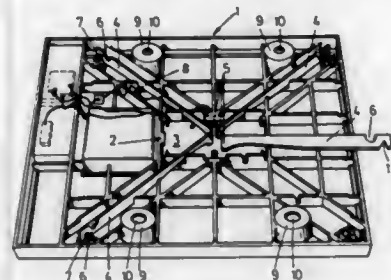
Int. Cl.<sup>4</sup> G01G 3/14; H01G 7/00, 5/01

U.S. Cl. 177-210 C

7 Claims

1. Capacitive weighing device, comprised of a frame or substructure, four arms arranged in cross shape or substantially in cross shape and hingedly supported on knife-edges in said frame, a weighing plate vertically movable relative to said frame, bearing through knife-edges on said arms, in notches provided therefor in the arms, in which said arms bear with the mutually-facing ends thereof on a spring plate, wherewith an armature or upmost capacitive plate is insulatedly connected, said spring plate bearing with the one end thereof on one upstanding side from a box-like holder with a bottom whereon a metal film which acts as a lowermost capacitive plate is insulatedly fixed, and bearing with the opposite end thereof on an upstanding knife-edge, said knife-edge being supported in

two slots provided in the bottom, in such a way that during a weighing operation, said knife-edge may slightly swing and



always form substantially the same angle with the spring plate bearing on said knife-edge.

4,679,644

# CHIN ACTUATED CONTROLLER SYSTEM FOR CONTROLLING POWERED APPARATUS

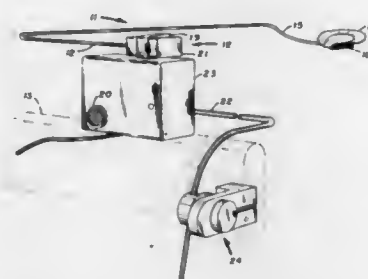
John H. Loveless, Westminster, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Nov. 19, 1985, Ser. No. 799,712

Int. Cl.<sup>4</sup> B62D 11/04

U.S. Cl. 180-6.5

47 Claims



1. A chin actuated controller system for enabling a person to control, by chin movements, the operation of a powered apparatus responsive to proportional control signals, said chin actuated controller system comprising, in combination:

- a control arm having a first end mounted for pivotal movement in a horizontal plane about a vertical axis in proportion to sideways movements of the chin of the person and in a vertical plane about a horizontal axis in proportion to vertical movements of the chin of the person and a distal end extending to a location adjacent the chin of the person controlling the powered apparatus;
- a chin pad supported at the distal end of said control arm engageable by the person's chin, enabling the person to depress said control arm vertically and simultaneously swing said control arm horizontally by turning the person's head;

controller electrical circuit means including first and second power control means for controlling the supply of power from a power source to said powered apparatus, said first and second power control means each having an operating member movable to adjust the power supplied to the powered apparatus; and

cam mechanism means operatively connecting said control arm to each operating member of said first and second power control means for transmitting movement thereto in response to the chin activated pivotal movements of said control arm, thereby producing proportional control signals to said powered apparatus in proportion to the vertical depression of said control arm about said horizontal axis and sideways left or right movement of said control arm about said vertical axis.

4,679,645

# MECHANICAL DEVICE FOR TRANSMITTING SIGNALS THROUGH A SWIVEL CONNECTION

James J. Galloway, 2309 Via Anacapa, Palos Verdes Estates, Calif. 90274, and Anthony Madrigal, 655 N. Acacia, Reedley, Calif. 93654

Filed Feb. 27, 1985, Ser. No. 706,146

Int. Cl.<sup>4</sup> B60K 1/00

U.S. Cl. 180-65.8

8 Claims



1. In a rotatable mechanical coupling including a hollow shaft having an axis of rotation and extending along the axis of rotation through a barrier and mounting lockable rotatable mechanical apparatus for rotation with respect to said barrier on one side thereof about said axis of rotation of said hollow shaft, the improvement comprising:

- transducer means positioned on the opposite side of said barrier from said mechanical apparatus for indicating the locked or unlocked condition of the mechanical apparatus to be actuated via said hollow shaft;
- a plurality of displaceable members within said hollow shaft; means confining said plurality of displaceable members within said hollow shaft whereby said displaceable members are displaceable to actuate said transducer means;
- flexible means having one end portion coupled to the mechanical apparatus mounted for rotation therewith and movable to the different positions dependent upon two different conditions of said mechanical apparatus, namely locked and unlocked positions;
- said confining means including an opening therein positioned to allow a second end of said flexible means to enter said hollow shaft and displace said displaceable means dependent upon the position of said flexible means to cause actuation of said transducer at one of said conditions.

4,679,646

# DRIVELINE FOR REGENERATIVE BRAKING

Christopher J. Greenwood, Leyland, United Kingdom, assignor to Leyland Vehicles Limited, Leyland, United Kingdom

Filed Mar. 12, 1984, Ser. No. 588,656

Claims priority, application United Kingdom, Mar. 15, 1983, 8307059

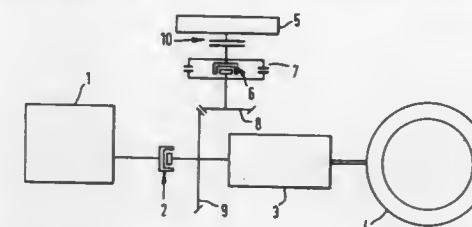
Int. Cl.<sup>4</sup> B60K 9/00

U.S. Cl. 180-165

3 Claims

3. A driveline for a vehicle, comprising a continuously-variable-ratio transmission, an engine for driving the transmission, a flywheel system for the regenerative braking of the vehicle, an engine clutch for coupling the engine to an input of the transmission only when its speed on the engine side would

exceed that on the transmission side, a first flywheel clutch coupling the flywheel system to the transmission input only when its speed on the flywheel side would exceed that on the transmission side, and a second flywheel clutch parallel to the first, and operable to couple the flywheel to the transmission



input for regenerative braking; wherein control means responds to the speeds on the flywheel side and on the transmission side to engage a multiplate clutch only when those speeds are equal and to disengage the clutch when the flywheel is to be disengaged.

4,679,647

# REAR SEAT COVER FOR VEHICLES HAVING A SADDLE-SHAPED SEAT

Katsusuke Komuro, Chofu, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

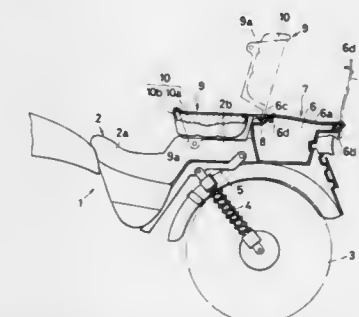
Filed May 28, 1986, Ser. No. 867,838

Claims priority, application Japan, May 29, 1985, 60-80712[U]

Int. Cl.<sup>4</sup> B62J 1/08

U.S. Cl. 180-219

3 Claims



1. A seat assembly for a motorcycle comprising: a tandem seat having a front and rear seat and positioned upon a frame between a front and rear wheel; an accommodating box positioned at the rear end of said tandem seat and having a height taller than said tandem seat; and a rear seat cover positioned between said tandem seat and accommodating box and being swingable between an upright and level position, wherein when said rear seat cover takes said level position, said rear seat cover substantially covers the whole surface of said rear seat and a top surface of said rear seat cover and said accommodating box form a substantially continuous even plane.

4,679,648

**ALARM DEVICE FOR AUTOMOBILES AND SIMILAR VEHICLES**

Kim L. Johansen, No. 12 Oldenvej, DK-3490 Kvistgaard, Denmark

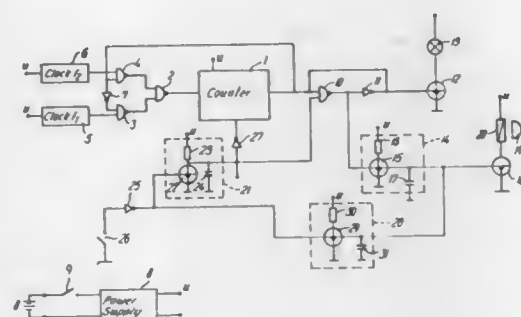
PCT No. PCT/DK85/00084, § 371 Date Apr. 21, 1986, § 102(e) Date Apr. 21, 1986, PCT Pub. No. WO86/01468, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 23, 1985, Ser. No. 857,759

Claims priority, application Denmark, Aug. 23, 1984, 4036/84 Int. Cl. G08B 21/00

U.S. Cl. 180—272

4 Claims



1. An alarm device for automobiles and similar vehicles, comprising a pulse timer (1) connected to the battery (B) of the vehicle through a contact (9) activated upon forward driving in a high gear, said pulse timer being further connected to a warning lamp (13) and through a first timing circuit (14) to an acoustic alarm generator (19) for operation of the latter after a first predetermined time interval following activation of the warning lamp (13), a switch (10) being connected between the pulse timer (1) on one hand and the warning lamp (13) and said timing circuit (14), respectively, on the other hand, and being controlled by a contact (26) selectively operable by the driver to interrupt the signal connection between the pulse timer (1) and the warning lamp (13) and the first timing circuit (14), respectively, characterized in that the pulse timer is a counter (1) which in a closed condition of said switch (10) supplies its activation signal in a predetermined final counting position, that said counter (1) from a first clock generator (5) or from a second clock generator (6), respectively, which are connected to the counter (1) over a logic switching circuit (2 to 4) either with a first counting pulse sequence in a first counting condition lasting until occupying said final counting condition or with a second counting pulse sequence in a second counting condition initiated by activation of the logic switching circuit in response to the counter (1) generating said activation signal, said second counting pulse sequence having substantially higher frequency ( $f_2$ ) than said first sequence ( $f_1$ ), a second timing circuit (21) being connected to said selectively operable contact (26) for supplying a stop signal to the counter (1) during a predetermined second time interval following the driver's activation of said contact (26) and supplying at the expiry of said second time interval a control signal to said switch (10) for re-establishing the signal connection between the counter (1) and the warning lamp (13) and the first timing circuit (14), respectively.

**MOTOR VEHICLE ENGINE MOUNTING ARRANGEMENT**

Klaus Hoerig, Gross-Gerau, and Hans-Joachim Gora, Bischofsheim, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

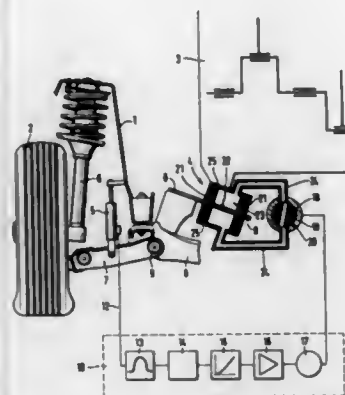
Filed Oct. 28, 1985, Ser. No. 791,754

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444297

Int. Cl. B60K 5/00

U.S. Cl. 180—291

3 Claims



1. Mounting of an engine with at least one hydraulically damped spring element on a body of a motor vehicle having a wheel which is spring mounted with respect to the body characterized by a displacement transducer between the body and the wheel, and the hydraulically damped spring element including two chambers in fluid connection through a throttle valve operatively connected to the displacement transducer so that as the signal from the displacement transducer increases as a result of a variation in distance between the body and the wheel hydraulic damping of the spring element increases.

4,679,650

**HEARING AID EAR MOLD END PIECE FOR THE AUDITORY CANAL AND HEARING AID EAR MOLD**

Ludwig M. Moser, Estenfeld, and Anton Kammermeier, Welden, both of Fed. Rep. of Germany, assignors to Westra Electronic GmbH, Fed. Rep. of Germany

PCT No. PCT/EP85/00132, § 371 Date Dec. 5, 1985, § 102(e) Date Dec. 5, 1985, PCT Pub. No. WO85/04779, PCT Pub. Date Oct. 24, 1985

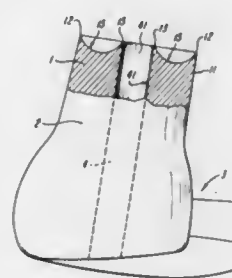
PCT Filed Mar. 28, 1985, Ser. No. 809,885

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413067

Int. Cl. A61B 7/02

U.S. Cl. 181—130

15 Claims



1. An end piece for use with a hearing aid mold for an auditory canal, the end piece comprising:  
a body having an end face and an outer circumference which substantially matches the contours of the auditory canal;

a sound discharge opening passing through said body; said end face forming a concave annular channel extending at least partially around said sound discharge opening such that a first edge is defined which lies adjacent said outer circumference and a second edge is defined which lies adjacent said sound discharge opening; and said first and second edges being relatively sharp edges.

4,679,651

**LOUDSPEAKER ENCLOSURE**

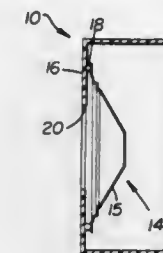
Robert D. Peeters, 712 McDuff Ave., Fremont, Calif. 94538

Filed Dec. 2, 1982, Ser. No. 446,425

Int. Cl. G05K 5/00

U.S. Cl. 181—155

16 Claims



1. A loudspeaker and enclosure comprising: a housing having an opening therein, said opening defined by an aperture in a front wall of said housing;  
a loudspeaker with a diaphragm, said diaphragm including a peripheral mounting portion at the mouth thereof;  
means attached to said front wall and said peripheral mounting portion of said diaphragm, said means mounting said loudspeaker inside said housing with the mouth of said diaphragm facing said front wall, and said means spacing the peripheral mounting portion of said diaphragm from said front wall in the range of one-sixteenth to one-eighth inch.

4,679,652

**AUTOMATICALLY ADJUSTABLE LADDER SUPPORT**

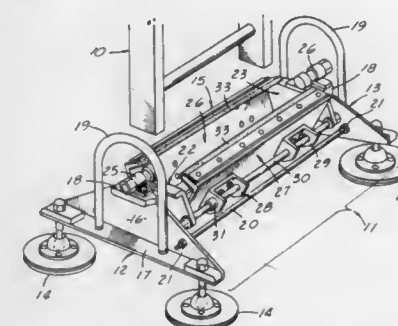
Ramiro E. Cervantes, Sr., 3127 Dorchester Ave., Los Angeles, Calif. 90032

Filed Mar. 17, 1986, Ser. No. 840,098

Int. Cl. E06C 5/36; E04G 1/14

U.S. Cl. 182—200

5 Claims



5. A self-adjusting support for a ladder, comprising:  
first and second end plates mounted in fixed predetermined spaced apart relation exceeding the width of the lower end portion of the ladder;  
a pair of jaw means pivotally mounted to said first and second end plates for pivoting from a first position with the jaw means closed on each other to a second position where the jaw means are spaced apart a sufficient amount

to enable receipt of the ladder lower end portion therebetween;

each jaw means includes an elongated manner with a longitudinally extending clamping surface and a longitudinally extending actuating surface spaced from said clamping surface, and each said jaw means being mounted for pivoting about a longitudinal axes from the first position where the clamping surfaces are in contact and the actuating surfaces are separated to the second position where the clamping surfaces are separated and the actuating surfaces are in contact;

coil spring means interconnecting the jaw means to each other for urging the jaw means toward the second position; and

a pair of end wall assemblies supporting the first and second end plates on a ground plane.

4,679,653

**HIGHLY MANEUVERABLE INSULATED MAN LIFTING AERIAL CRANE FOR USE IN SERVICING OVERHEAD HIGH-VOLTAGE ELECTRICAL TRANSMISSION LINES**

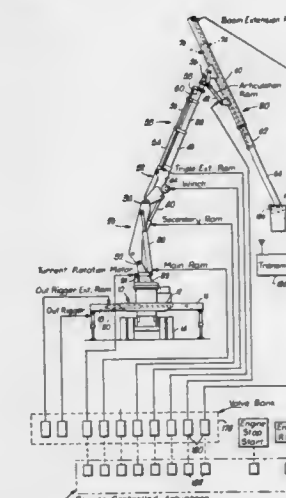
Ernest R. Pasquarette, Jr., Lee's Summit; Stanley G. Crouse, Greenwood, both of Mo.; Ermen Campanella, and Franco Boiti, both of Bergamo, Italy, assignors to Ruco Equipment Company, Inc., Kansas City, Mo.

Filed Jan. 7, 1986, Ser. No. 816,851

Claims priority, application Italy, Sep. 30, 1985, 67829 A/85 Int. Cl. B66F 11/04

U.S. Cl. 182—2

27 Claims



1. An electrically insulated, articulated, man-lifting aerial crane for use in servicing overhead high-voltage electrical transmission lines and the like comprising:

a vehicle providing an elevated, mobile base;  
selectively operable, ground-engageable outrigger means associated with the vehicle for stabilizing the base during use;

a turret mounted on said base for selective rotary movement about a generally upright axis;

a first boom section pivotally coupled with said turret for up-and-down swinging movement;

a second boom section pivotally coupled with the first section adjacent the outer end of the latter for up-and-down swinging movement;

a third boom section pivotally coupled with said second boom section adjacent an outer end of the latter for up-and-down swinging movement, said third section including:

a first tubular boom;  
a second tubular boom telescopically housed within said first boom;



a third boom telescopically housed within said second boom,  
 said third boom being constructed of a dielectric material capable of avoiding the transmission of electrical energy along the length thereof;  
 power means operably coupled with said booms of the third section for telescopically extending and retracting the same; and  
 a man-carrier coupled with said third boom adjacent said outer end of the latter for transporting a workman to and from an overhead electrical transmission line during operation of the crane and maintaining the workman electrically insulated from ground potential,  
 said power means being provided with control structure operable to always cause extension of said third boom to a fully extended position thereof before extension of said second boom whereby to place an outer end of the third boom at a remote location relative to the first and second booms prior to allowing extension of the second boom, said control structure further being operable to always cause retraction of the second boom into the first boom before retraction of the third boom into the second boom whereby to maintain said outer end of the third boom at said remote location until the second boom is first fully retracted.

4,679,654

# DESCENDING LIFE-ESCAPING DEVICE SPECIALLY FOR A HIGH BUILDING USE

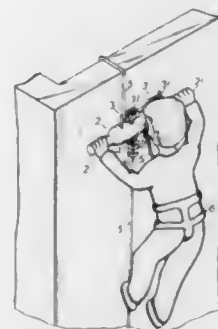
Li-Hsing Lu, 7, Ping-Taan Road, Ta-Cheng Hsiang, Changhua Hsien, Taiwan

Filed Feb. 12, 1986, Ser. No. 828,507

Int. Cl.<sup>4</sup> B60T 3/00

U.S. Cl. 182—5

5 Claims



1. A descending life-escaping device for enabling a person to escape from a life-threatening situation from a high place mainly having

- a sausage-shaped and transversely-disposed weight-supporting member which is equipped with two grip handles on right and left sides thereof,
- a pair of transversely positioned coil-like parts on a top side of said weight-supporting member, and
- a vertically placed coil-like part on a bottom side of said weight supporting member,

wherein said coil-like parts each include a spiral through which a vertically-hung cable to be descended by the person is wound from an open end of each spiral, said coil-like parts being provided on said weight-supporting member so that said cable passes through said device in a winding manner and frictionally contacts with all of said coil-like parts and a front side of said weight-supporting member, so that the descending speed of a person can be reduced by control of the descending person to bring said person to ground safely.

4,679,655

# CONVERTIBLE STAND

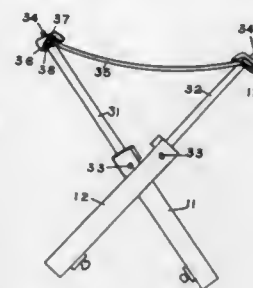
Daniel F. Behring, 2519 Tenth St., Monroe, Wis. 53566

Filed Oct. 14, 1986, Ser. No. 918,146

Int. Cl.<sup>4</sup> A47C 9/10; A01M 31/02

U.S. Cl. 182—33

6 Claims



1. Portable, pivotally cross toggled grate means for use as tool or table legs or tree platform, comprising,

- (a) furcated grate means embodying a plurality of rigid elongated parallel finger portions having integrally incorporated therein first hinge structure component means disposed axially perpendicular to said finger portions,
- (b) means embodying a rigid elongated portion interspaced between at least two said finger portions having integrally incorporated therein second hinge structure component means complementary to that of said first hinge structure component means wherein said first component means and said second component means are selectively engaged to provide pivotal connection between said grate means and said member means at any of multiple linearly separated locations.

4,679,656

# SKY-RIDE VERTICAL MOBILITY DEVICE

Hyok S. Lew, Hyon S. Lew, and Yon K. Lew, all of 7890 Oak St., Arvada, Colo. 80005

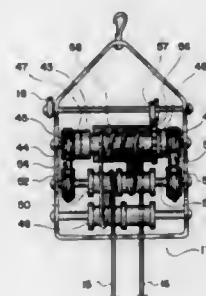
Continuation-in-part of Ser. No. 711,318, Mar. 13, 1985, which is a continuation-in-part of Ser. No. 682,673, Dec. 17, 1984, Pat. No. 4,598,792, which is a continuation-in-part of Ser. No. 676,400, Nov. 29, 1984, Pat. No. 4,598,793. This application

Nov. 12, 1985, Ser. No. 797,411

Int. Cl.<sup>4</sup> A62B 1/08

U.S. Cl. 182—42

14 Claims



8. A vertical mobility device for transporting a person or object in vertical directions comprising in combination:

- (a) a first cylindrical member rotatably and nonshiftably secured to a supporting structure including a means for securing said supporting structure to an elevated structure;
- (b) a second cylindrical member rotatably and nonshiftably secured to said supporting structure in a substantially parallel configuration with respect to said first cylindrical member;

- (c) a third cylindrical member rotatably and shiftably secured to said supporting structure intermediate said first and second cylindrical members in a substantially parallel configuration with respect to said first cylindrical member;
- (d) a cord member wound on said first cylindrical member over at least one complete lap, wherein one portion of said cord member extending from one side of the cylindrical surface of said first cylindrical member loops over the combination of said third and first cylindrical members over at least one complete loop, and the other portion of said cord member extending from the other side of the cylindrical surface of said first cylindrical member loops over the combination of said second and third cylindrical members over at least one complete loop;
- (f) cord guide means for guiding said cord member wound on said first cylindrical member wherein said cord guide means enhances smooth looping movements of said cord member;
- (g) a ratchet mechanism linked to said cylindrical member, said ratchet mechanism preventing said cylindrical member from rotating in a direction resulting in looping motion of said cord member releasing said one portion of said cord member and taking up said the other portion of said cord member when said ratchet mechanism is activated;
- (h) means for activating and deactivating said ratchet mechanism, said means operable by a manual shifting mechanism; and
- (i) at least one securing means affixed to said one portion of said cord member for securing a harness; whereby, a person or persons wearing a harness secured to said at least one securing means affixed to said one portion of said cord member can remain suspended in midair or lower oneself at a safe speed by exerting a small amount of pull on said the other portion of said cord member as said braking plus said small amount of pull on said the other portion of said cord member substantially counter balances pull on said one portion of said cord member created by the weight of said person or persons secured to said one portion of said cord member when said ratchet mechanism is deactivated.

4,679,657

# MOBILE TANK VEHICLE ACCESS SYSTEM

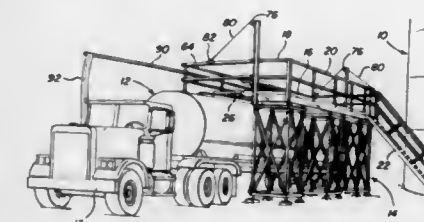
Ronald W. Bennett, Florence, and Ellie H. MacDonald, Timmonsville, both of S.C., assignors to Aluminum Ladder Company, Florence, S.C.

Filed Jan. 23, 1986, Ser. No. 821,805

Int. Cl.<sup>4</sup> E04G 1/26, 1/28

U.S. Cl. 182—113

11 Claims



1. A mobile tank vehicle access system including an elevated platform defining one elongated marginal portion, a generally planar extension panel including a base marginal edge pivotally mounted from said marginal portion for angular displacement relative thereto about an axis extending along said marginal portion and base marginal edge between a raised upstanding inoperative position and a lowered position extending at least generally horizontally outwardly of said marginal portion, said extension panel including a free marginal edge opposite said base marginal edge for engaging, resing against and extending along the near side of the top of an elongated tank body disposed outward of an generally paralleling said one marginal

portion and including central tank interior access means spaced along the tank body disposed at least slightly outward of said free marginal edge, an elongated upstanding railing structure swingably mounted from said platform for movement between a raised upwardly and inwardly retracted position and lowered outwardly extended position relative to said one marginal portion, said railing structure generally paralleling said free marginal edge when said railing structure and a panel are in the lowered positions thereof and being spaced a distance outward from said free marginal edge sufficient to receive said tank interior access means between said free marginal edge and said railing structure, first means connected between said platform and railing structure for raising and lowering said railing structure independent of raising and lowering said extension panel, a second extension panel corresponding to the first mentioned extension panel and spaced along said one elongated marginal portion from the first mentioned panel, elongated access ramp means including a base end, means pivotally mounting said base end from said one elongated marginal portion between the first mentioned extension panel and said second extension panel for swinging about an axis extending along said one elongated marginal portion and angular displacement of said access ramp means between a raised inoperative position and an outward and downwardly inclined operative position with the free and thereof engaged with and supported from said near side of the top of said tank body, said one elongated marginal portion including a lower upstanding fence projecting upwardly therefrom immediately inwardly of each of said extension panels, each fence terminating upwardly in a horizontally outwardly projecting safety panel.

4,679,658

# GAFF

Harlan Demers, Dalton, Ohio, assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 5, 1985, Ser. No. 751,872

Int. Cl.<sup>4</sup> A63B 27/00

U.S. Cl. 182—221

11 Claims



1. A gaff for use in a climbing iron for climbing a wooden pole or tree, said gaff having at least one groove on the part of the gaff that is inserted into the pole or tree wherein the gaff has a plurality of grooves and the gaff is prismatic in shape and has two top sides and a line formed by the intersection of the planes of said two top sides and grooves along a line parallel to the line formed by said intersection.

4,679,659

## METHOD AND APPARATUS FOR LUBRICATING A MOVING CHAIN

Manfred Jendick, Recklinghausen, Fed. Rep. of Germany, assignor to GerroKaiser Dosenwerk GmbH & Co KG, Fed. Rep. of Germany

Continuation of Ser. No. 671,696, Nov. 15, 1984, abandoned.

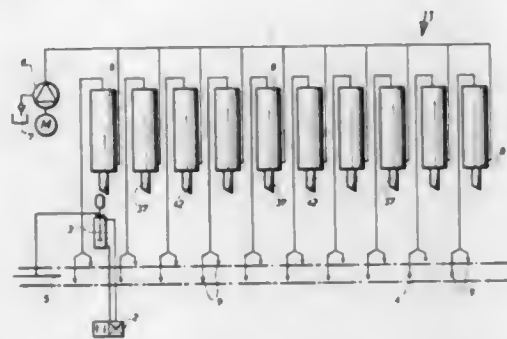
This application Jun. 18, 1986, Ser. No. 875,503

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1983, 3341658

Int. Cl.<sup>4</sup> F16N 13/02

U.S. Cl. 184—15.2

10 Claims



1. Apparatus for periodically applying a selected amount of a liquid lubricant onto a rapidly moving chain having a number of spaced lubrication points thereon, a driving chain wheel, said chain being guided by said driving chain wheel, a plurality of spaced apart lubricant applicator nozzle units each arranged to direct lubricant on to different said lubrication points on said chain, a plurality of cam-actuated piston pumps each arranged for supplying a lubricant to a different one of said units, an axially extending driving shaft having at least one governing cam thereon arranged for operating said lubricant pumps, wherein the improvement comprises:

- means for interengaging said driving shaft and said driving chain wheel so that the torque from said driving chain wheel is transmitted to said driving shaft whereby said driving shaft is driven by said chain wheel at the same speed as said chain,
- said piston pumps are arranged stationary and disposed in a semi-circular arrangement in angularly spaced relation in a single radial plane extending transversely of the axial direction of said driving shaft, and said at least one governing cam projects radially outwardly from said driving shaft and rotates in a circle moving past the stationary said piston pumps, said piston pumps comprising a first said piston pump, a last said piston pump and a number of intermediate said piston pumps located between the first and the last said piston pumps,
- an oil distributor,
- each said piston pump has a pump head, a pressure chamber within said pump head, said pressure chamber has a first end and a second end with an inlet intermediate the ends thereof for receiving the lubricant from said oil distributor and an outlet at the first end thereof for directing the lubricant to the associated said nozzle unit, an axially extending piston extending into the second end of said pressure chamber and being axially displaceable therein, said piston having one end located outside said pressure chamber and a deflecting cam located on said one end of said piston, means for displacing said piston away from the first end of said pressure chamber, said governing cam arranged to contact said deflecting cam on said piston and to displace said piston toward the first end of said pressure chamber to open said first check valve for discharging lubricant and when said governing cam releases said deflecting cam said displacing means returns said piston toward the second end of said chamber establishing a suction within said chamber for opening said second

pressure valve and filling the pressure chamber with the selected amount of liquid lubricant whereby said second check valve closes when the filling operation is completed for maintaining the selected quantity of lubricant within said pressure chamber until said piston is again displaced by the cooperating action of said governing cam and deflecting cam, and

- said at least one governing cam comprises a first said governing cam and a second said governing cam angularly offset relative to one another around said driving shaft with the spacing therebetween corresponding to the spacing between the first and the last said piston pumps, so that during rotation of said driving shaft the first said governing cam contacts said deflecting cam of the first said piston pump and the second said governing cam contacts the deflecting cam of the last said piston pump.

4,679,660

## MECHANISM FOR AUTOMATICALLY STORING SWING ARMS USED FOR APPARATUS FOR LIFTING AUTOMOBILES FOR REPAIR

Koichi Suzuki, Aichi, Japan, assignor to Sugiyasu Industries Co., Ltd., Aichi, Japan

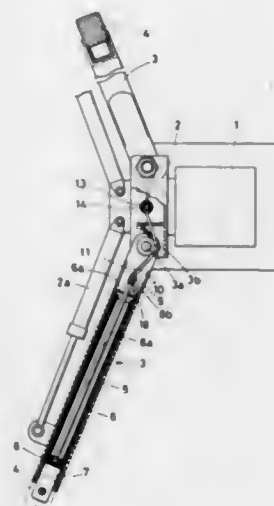
Filed Jul. 18, 1986, Ser. No. 887,991

Claims priority, application Japan, Aug. 3, 1985, 60-133829[U]

Int. Cl.<sup>4</sup> B60S 13/00

U.S. Cl. 187—8.41

2 Claims



1. In an apparatus for lifting automobile for repair thereof, comprising a pair of spaced apart posts each having a carriage which is connected thereto for vertical movement and each carriage includes a pair of horizontal swing arms pivotally connected thereto for swinging movement in a horizontal plane, each of said swing arms having a car body support means at its one end, and comprising at least two arm elements, wherein one of said arm elements comprises a substantially horizontal hollow support arm element connected to a pivot pin of said carriage and the other of said arm elements comprises a substantially horizontal telescopic arm element supported by said support arm element and slidable therein so as to extend therefrom or retract thereinto in a horizontal plane, an improvement characterized in that:

- said slidable or telescopic arm element is a hollow element closed at the end thereof nearer to said carriage and having a hollow cylinder therein;
- a hollow piston rod passes through said closed end of said slidable arm element, a portion of said piston rod extending in said hollow cylinder and the other portion thereof extending in said hollow support arm element;
- said hollow piston rod is opened at its both ends;

- a piston is connected to the open end of said hollow piston rod in said cylinder, said piston being slidable in said cylinder;
- said piston and said closed end of said slidable arm element defines an air chamber between them in said cylinder;
- a pressurized-air supply means is connected, through an air hose, to the open end of said hollow piston rod in said support arm element, so that the air under pressure may be supplied from said supply means through said hollow piston rod into said air chamber, thereby moving slidable arm element and said piston relative to each other;
- said piston rod is also connected to said carriage by means of an interconnection means which is fixed, at its one end, to the end of said piston rod in said support arm element and is engaged, at a portion of its middle section, with a portion of said pivotal pin of said carriage and is secured to another portion, excepting said pivotal pin, of said carriage; and
- said support arm element is provided, on its inner surface, with a means for preventing said slidable arm element from moving or sliding, in said support arm element, toward the carriage beyond a given point.

4,679,661

## MODULAR GEARLESS ELEVATOR DRIVE

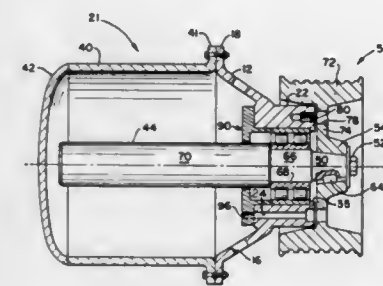
William H. Gibson, Aurora, Colo., assignor to Otis Elevator Company

Filed Feb. 24, 1986, Ser. No. 832,198

Int. Cl.<sup>4</sup> B66B 11/04

U.S. Cl. 187—20

3 Claims



1. A drive arrangement including a motor and a sheave wherein:

- the front endcap (10) of the motor comprises a concave disc-like portion (12) that is centered about the motor axis and a tubular boss (22) extending axially outwardly from the center of the disc-like portion (12); wherein the boss (22) has a cylindrical bore portion (36), a front surface (25), and threaded holes (80) extending axially inwardly from the front surface (25) into the boss (22);
- the sheave (56) comprises an outer rim portion (72) connected via an intermediate disc portion (74) to an inner hub portion (54); wherein holes (78) are provided axially through the intermediate disc portion (74) in ultimate alignment with the threaded holes (80) when the sheave (56) is assembled to the boss (22) and wherein the outer rim portion (72) extends over the boss (22) with a tight running clearance therebetween so that the sheave (56) and the front endcap (10) are held in close axial alignment when the sheave (56) is bolted to the front endcap (10) via bolts through the holes (78) in the sheave (56) and the threaded holes (80) in the boss (22);
- the motor (21) comprises a tubular housing (40) and a shaft (44) extending axially out the front of the housing (40); wherein a first portion (50) of the shaft (44) is disposed to extend past the boss (22) for receiving the hub portion (54) of the sheave, and wherein a second portion (66) of the shaft (44) is disposed substantially within the boss (22) in correspondence with the cylindrical bore portion (36) of the boss (22) for receiving a bearing (68) between the

second shaft portion (66) and the cylindrical bore portion (36).

4,679,662

## LIGHTWEIGHT AIRCRAFT FURNITURE CASTER ASSEMBLY HAVING A NOTCHED BRAKING PLATE ENGAGED BY A BRAKE

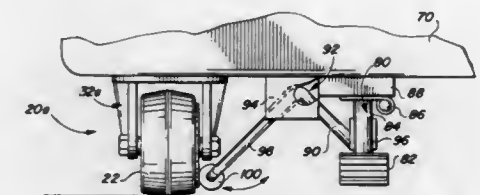
Robert A. Nordskog, 18135 Karen Dr., Tarzana, Calif. 91356

Filed Nov. 8, 1985, Ser. No. 796,066

Int. Cl.<sup>4</sup> B60B 33/00

U.S. Cl. 188—1.12

5 Claims



1. An improved lightweight aircraft furniture caster assembly, said assembly comprising, in combination:

- a lightweight aircraft furniture caster wheel consisting essentially of lightweight material, said wheel having transverse cut-away portions to reduce the overall weight of said wheel; and,
- a generally inverted U-shaped lightweight caster wheel support bracket releasably connected to said wheel for free rotation of said wheel, said bracket consisting essentially of lightweight material wherein said wheel includes a plurality of spaced passageways symmetrically disposed around a central hub of said wheel, and extending transversely and completely through said wheel, said passageways having reinforcing rods releasably secured therein to dimensionally stabilize and strengthen said wheel;
- wherein said assembly includes braking means and a lightweight braking plate releasably connected to said wheel wherein said braking plate is metallic, is generally circular, has two side surfaces and an outer periphery and includes semicircular notches at said outer periphery, said wheel having two sides, said braking plate being secured by said reinforcing rods to one of the sides of the wheel, a separate braking mechanism releasably bears against one of the side surfaces of the braking plate, wherein said one of the side surfaces faces in the same direction as said one of said sides, said braking mechanism comprising an element which frictionally engages said one of said side surfaces to slow the rotation of said wheel, said element fits within one of the notches to lock the wheel in a stopped position.

4,679,663

## TRANSMISSION ANTI-CLASH AND ANTI-RATTLE BRAKE

Mark J. Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 584,567, Feb. 29, 1984, Pat. No. 4,584,894.

This application Nov. 25, 1985, Ser. No. 802,104

Int. Cl.<sup>4</sup> F16D 63/00; F16M 57/10; B60K 41/26

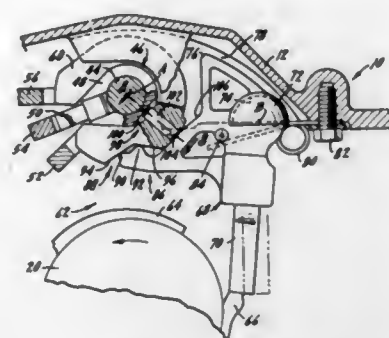
U.S. Cl. 188—82.1

6 Claims

1. A brake comprising friction means adapted for movement with an element to be braked, an arm movable into the path of said friction means to prevent movement thereof with said element such that it applies a frictional braking force to said element, said arm being movable out of said path to allow movement of said friction means with said element such that it does not apply a frictional braking force thereto, means for moving said arm into said path, control means movable in one plane to a plurality of positions and movable in another plane



from each of said positions, said brake being constructed and arranged such that said arm is in said path and said brake is applied when said control means is in one of said positions, and



means for moving said arm out of said path in response to movement of said control means in either plane from said one of said positions.

4,679,664

**BLANKING IMPACT ABSORBER**

Carsten Rosendal, 1 Ostergade, 2. sal, DK-7400 Herning, Denmark

Continuation of Ser. No. 685,892, Dec. 24, 1984, abandoned.

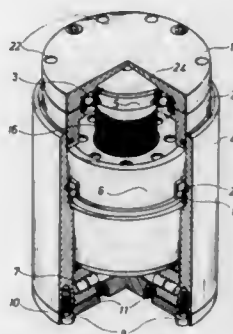
This application Sep. 29, 1986, Ser. No. 912,656

Claims priority, application Denmark, Dec. 27, 1983, 5986-83

Int. Cl.<sup>4</sup> B60T 7/12

U.S. Cl. 188-134

5 Claims



1. A blanking impact absorber for a press like machine tool having a stationary member and a movable member between which a workpiece may be positioned, said impact absorber comprising:

a housing fixed to one of said stationary and movable members of said machine tool;

a flywheel mounted in said housing by means for permitting only rotation of said flywheel about a rotational axis;

a spindle extending coaxially with said rotational axis and mounted by means for permitting rotation about said axis and movement along said axis;

means for rotating said flywheel in response to movement of said spindle along said rotational axis and for movement of said spindle along said rotational axis in response to rotation of said flywheel, whereby energy of movement is transformed from said machine tool to said flywheel and back again;

a cover fixed to the other of said stationary and movable members of said machine tool and being connectable with said spindle for transferring pressing and tensile forces between said cover and said spindle;

clutch means for preventing rotation of said spindle about said rotational axis in response to a pressing force on said cover along said axis and for allowing rotation of the spindle about said rotational axis in response to a tensile

force provided from said rotating flywheel, said tensile force provided from said rotating flywheel being greater than tensile forces arising during idling of said press-like machine tool; and

means for braking rotation of said spindle about said axis, whereby energy of rotation of said flywheel is dissipated.

4,679,665

**BRAKE DISC DESIGN FOR WHEEL MOUNTED DISCS**

Roy E. Smith, Kingston, Canada, assignor to Urban Transportation Development Corporation Ltd., Canada

Continuation of Ser. No. 615,646, May 31, 1984, abandoned.

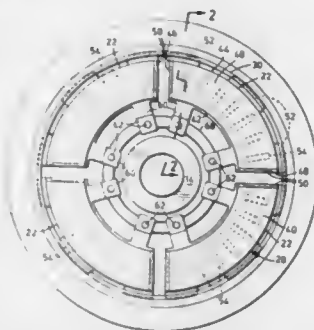
This application Feb. 21, 1986, Ser. No. 831,740

Claims priority, application Canada, Mar. 12, 1984, 449348

Int. Cl.<sup>4</sup> F16D 65/12

U.S. Cl. 188-218 XL

15 Claims



1. A disc brake assembly, comprising:  
a wheel having a hub for mounting said wheel for rotation about an axis, a rim, and a web,  
a disc to be engaged by a brake pad, said disc comprising a plurality of annular disc segments, each of said disc segments having a leading edge, a trailing edge, a radially inner edge and a radially outer edge,  
each of said disc segments having at least two spaced apart mounting tangs adjacent said radially inner edge,  
said mounting tangs adapted to restrain substantially all centrifugal force applied to said segment when said assembly rotates about said axis,  
at least one retention tang adjacent said radially outer edge of each of said disc segments,  
each of said disc segments having abutment means adjacent said leading and trailing edges, said abutment means contacting said web of said wheel,  
said wheel having a flange adjacent said rim spaced from said web and projecting radially toward said hub for engaging said at least one retention tang of each of said disc segments, and  
fastening means for fixing each of said disc segments to said wheel,

wherein said retention tangs project between said web and said flange of said wheel when said disc segments are fastened in place, said retention tangs are radially spaced from said rim and engage said flange so that said disc segments can freely expand radially away from said hub under the effect of heat generated during braking but may not move axially with respect to said web, and said retention tangs are radially movable relative to said flange when said disc segments expand radially outward under the effect of heat generated during braking.

4,679,666

**WEIGHT RESPONSIVE ROTARY RETARDATION DEVICE**

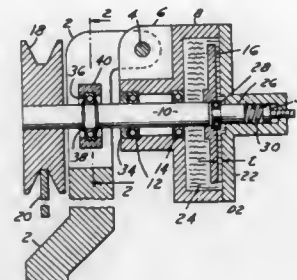
John H. Brems, Apt. 11-G, 2800 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Dec. 4, 1981, Ser. No. 327,516

Int. Cl.<sup>4</sup> F16D 57/00

U.S. Cl. 188-290

14 Claims



1. In a system in which a carrier or pallet for a weight to be supported is moved by gravity down an inclined track whereby the velocity of movement is retarded by a rotary device for angular velocity control in which the retarding torque is substantially proportional to the angular velocity, and which utilizes the shearing of a viscous fluid to create said retarding torque, that improvement which includes weight responsive means to increase said retarding torque in response to the increase in a weight supported by said carrier, comprising:

- a first torque means,
- a second torque means mounted for rotation relative to, and with variable proximity to, said first torque means,
- viscous fluid means positioned between said first and second torque means,
- elastic means acting between said first and second torque means biased to separate said first and second torque means, and
- connecting means operating between said first and second torque means and responsive to said supported weight to increase the proximity of said torque means in response to an increased supported weight,

whereby a relative rotational movement between said torque means causes an internal shearing of said viscous fluid means creating a retarding torque substantially proportional to the angular velocity of said relative rotational movement, and said internal shearing of said viscous fluid means is increased by an increase of proximity of said torque means in response to an increase of said supported weight creating an increase in said retarding torque in response to an increase in said supported weight.

4,679,667

**ANCHOR PIN RETAINER**

Frank W. Zawodni, Ft. Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Oct. 28, 1985, Ser. No. 792,074

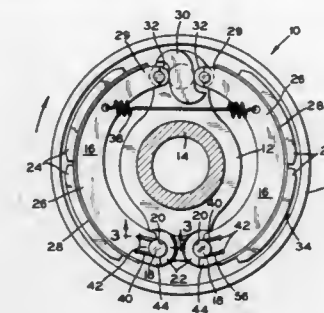
Int. Cl.<sup>4</sup> F16D 65/04

U.S. Cl. 188-341

10 Claims

1. In a brake assembly of the type including a brake drum, a pair of brake shoes including a pair of webs supporting each of said shoes, said webs having adjacent ends pivotally mounted to a pair of anchor pins, and actuating means disposed between the opposite ends of said shoes to pivot said shoes into frictional contact with said drum; an improvement comprising a pair of unitary retainers engaging each of said anchor pins, a first retainer of each pair of retainers being located adjacent one web of each said pair of webs and a second retainer of each pair of retainers being located adjacent the other web of each said pair of webs, each retainer including an arcuate portion partially encircling a respective one end of one of said anchor pins, each retainer comprising a pair of spaced legs, each leg

having an integral hook on the end thereof in engagement with one of said webs, said spaced legs being substantially parallel, said legs extending in the same direction from opposed sides of



4,679,668

**BRAKE CONTROL APPARATUS FOR A VEHICLE**

Shoichi Washizu; Takeshi Morijiri; Kazuo Kogure, all of Gunma, and Satoshi Arimitsu, Kanagawa, all of Japan, assignors to Fuji Heavy Industries Ltd., Tokyo and Nippon Air Brake Co., Ltd., Kobe, both of Japan

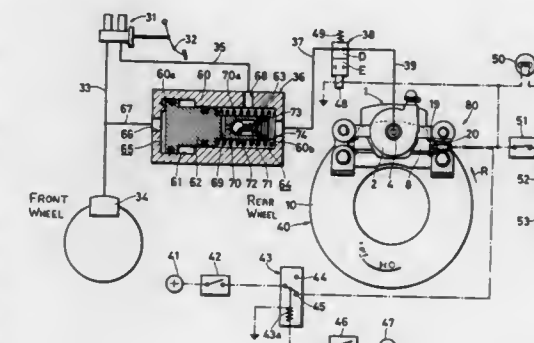
Filed Apr. 22, 1986, Ser. No. 855,082

Claims priority, application Japan, Apr. 25, 1985, 60-90494

Int. Cl.<sup>4</sup> B60T 11/28

U.S. Cl. 188-353

10 Claims



1. A brake control apparatus for a vehicle comprising:  
(A) brake apparatus for the respective wheels which are operated by pressurized fluid from a master cylinder;  
(B) an electro-magnetic valve arranged in a conduit connecting said master cylinder with at least one of said brake apparatus, said electro-magnetic valve being normally in the communicating state and being changed over into an intercepting state by an external instruction;  
(C) at least one of said brake apparatus being of the disc brake type, said one comprising:  
(a) a disc rotor;  
(b) first and second friction pad assemblies for engagement with opposite sides of said disc rotor, said assemblies being guided for movement towards said disc rotor;  
(c) a caliper body straddling the peripheral edge of said disc rotor and said first and second friction pad assemblies;  
(d) actuating means arranged in said caliper body for urging said first and second friction pad assemblies into engagement with said disc rotor; and  
(e) elastically deformable retainers for supporting said first

and second friction pad assemblies in the peripheral direction:

(D) at least one of said first and second friction pad assemblies being displaceable within a predetermined range in the peripheral direction in accordance with the change of the direction of the frictional force with said disc rotor; and

(E) a switch movable by said peripheral displacement of said one friction pad assembly for generating said external instruction for said electro-magnetic valve.

#### 4,679,669 SHOCK ABSORBER

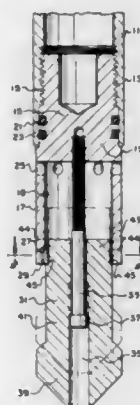
Gerald F. Kaib, North Richland Hills, and David M. Brown, Fort Worth, both of Tex., assignors to S.I.E., Inc., Fort Worth, Tex.

Filed Sep. 3, 1985, Ser. No. 771,902

Int. Cl.<sup>4</sup> F16F 7/12

U.S. Cl. 188—375

12 Claims



1. A shock absorber for a wireline instrument for use in a liquid containing well to reduce sock if the instrument impacts on an object while being lowered, said shock absorber comprising:

- a sleeve, having an inner surface;
- a mandrel, telescopically movable within the sleeve from an outward extended position to an inward retracted position if a sufficient impact of the instrument occurs, the mandrel having an outward portion with a smooth cylindrical surface and an inward portion located inward of the outward portion, which has a polygonal cross section with a plurality of flat sides defining an annular shoulder between the inward and outward portions;
- means for connecting the sleeve and mandrel to the wireline instrument; and
- a plurality of separate cutting elements, each mounted on the inner surface of the sleeve, each cutting element having a flat cutting edge in contact with one of the flat sides of the inward portion of the mandrel and bearing against the shoulder, each cutting element being mounted at a rake angle which is negative with a cutting edge inclined outwardly toward the outward portion of the mandrel and into the material being cut for cutting chips of material off of the outward portion of the mandrel as the mandrel is moved inward into the sleeve due to an impact.

#### 4,679,670 WHEELED SUITCASE AND HANDLE

John A. Wickman, Swansea, Mass., assignor to American Tourister, Inc., Warren, R.I.

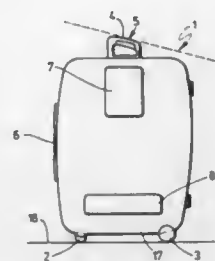
Continuation of Ser. No. 705,956, Feb. 27, 1985, abandoned.

This application Jul. 15, 1986, Ser. No. 885,811

Int. Cl.<sup>4</sup> A45C 5/14, 13/26

U.S. Cl. 190—18 A

11 Claims



1. An improved suitcase of the shape of a hollow, generally rectangular solid which comprises:

- (a) two generally vertical parallel side panels having two generally vertical edges and two generally horizontal edges;
- (b) two generally vertical parallel end panels having two generally vertical edges and two generally horizontal edges and being attached along the generally vertical edges thereof to the vertical edges of said side panels;
- (c) a generally horizontal top panel having a generally rectangular shape and being attached along its edges to the upper generally horizontal edges of said side panels and said end panels;
- (d) a generally horizontal bottom panel having a generally rectangular shape and being attached along its edges to the lower generally horizontal edges of said side panels and said end panels;
- (e) at least two spaced apart rear wheels movably mounted to said bottom panel at one end thereof and in a direction generally parallel to said side panels, said rear wheels protruding at least partially below the said bottom panel;
- (f) at least one front wheel movably mounted to said bottom panel at the other end thereof in a direction generally parallel to said side panels, said at least one front wheel protruding at least partially below the said bottom panel, the diameters of said at least two rear wheels being greater than the diameter of said at least one front wheel, and said at least one front wheel being on the leading position of said bottom panel during transport of said suitcase upon said wheels;
- (g) a first handle means attached to one of said end panels, said first handle means being adapted to allow carrying of said suitcase without the use of said front and rear wheels; and
- (h) a second handle means attached to said top panel and being adapted for movement of said suitcase on said front and rear wheels, said second handle means comprising a front riser section at the leading portion thereof, a rear riser section at the following portion thereof, and a gripping section intermediate and connected to said front and rear riser sections, said front riser section being of a length greater than the length of said rear riser section, with the distance between said gripping section and said top panel of said suitcase increasing in the direction of movement of said suitcase when transported upon said wheels by means of a manual force applied to the gripping section of said suitcase through said handle, the angle of inclination of said gripping section being away from the normal direction of travel of said suitcase and toward said rear wheels.

#### 4,679,671 BAND CLAMPING DEVICE FOR LUGGAGE TRANSPORTATION

Hiroshi Kobayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Sankodo, Tokyo, Japan

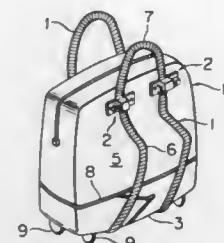
Filed Apr. 15, 1985, Ser. No. 723,460

Claims priority, application Japan, Jul. 5, 1984, 59-100698[U]; Aug. 31, 1984, 59-131483[U]; Dec. 28, 1984, 59-196865[U]

Int. Cl.<sup>4</sup> A45C 13/30

U.S. Cl. 190—115

12 Claims



1. An assembly of a pair of band clamping devices for being mounted horizontally spaced from each other on at least one side of luggage to be carried to clamp a luggage carrying band in an inverted U-shaped configuration to form handle portions on an upper side of the clamping devices and parallel carrying portions on the lower side of the clamping devices, each clamping device comprising:

- a base through which the band may pass orthogonally, said base having a horizontally elongated base plate fixed on the side of the luggage, and
- an elongated frame integral with and perpendicular with respect to said elongated base plate,
- said elongated frame having upper and lower elongated openings respectively adjacent to said base plate, and
- an elongated main opening communicating with said pair of elongated openings and laterally opening with respect to said base,
- said elongated main opening and said elongated lower and upper openings having a length longer than the width of the band to form an internal passage to allow the band to orthogonally pass through said base portion,
- a fitting for mounting on the base,
- said fitting having a central bracket portion engaging and retaining a portion of the band in said elongated main opening at a position nonaligned with respect to said lower and upper openings, and
- having a pair of leg portions formed integral with said bracket portion and horizontally slidable along the outside of said elongated frame of said base portion,
- said elongated openings being sufficiently longer than the width of the band and the fitting such that the band is laterally adjustable with respect to the other band clamping device,
- whereby the length of the handle portions of the inverted U-shaped band and the length of the parallel portions of the band and the distance between the parallel portions of the band may be manually adjusted to facilitate insertion of the arms and shoulders of a carrier of the luggage, and after the manual adjustment the carrying band may be clamped by pulling the parallel portions of the band.

#### 4,679,672 OVERHEAD ELECTRIC TRACTION SYSTEM FOR RAILWAYS

Alan E. Seddon, Rainford, and John Doughty, Wigan, both of England, assignors to BICC Public Limited Company, London, England

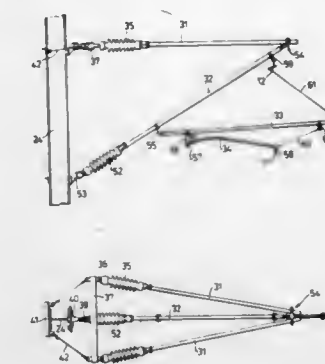
Filed Jan. 30, 1986, Ser. No. 824,076

Claims priority, application United Kingdom, Jan. 30, 1985, 8502336

Int. Cl.<sup>4</sup> B60M 1/22; E04C 3/02; H02G 7/20

U.S. Cl. 191—41

5 Claims



1. In an overhead electric traction system in which at least one overhead conductor at longitudinally spaced positions along its length is suspended from cantilever structural assemblies and in which sections of one flexible member of the system, selected from the group of flexible members consisting of said overhead conductor of the system and a catenary, twin catenaries, and a main catenary by which the conductor is supported, are each maintained under tension by balance weights supported by upstanding supports of cantilever structural assemblies at the ends of said section, a mid-point anchor which is positioned at approximately the mid-point of at least one section of the system and which comprises an upstanding support positioned alongside the route of the system and, mounted on an upper part of the upstanding support, a cantilever structure comprising a pair of substantially rigid elongate members which lie in a substantially common plane and extend transversely with respect to and are spaced apart in a direction lengthwise of the route, which at their ends nearer the route are connected to said upstanding support by a third transversely extending elongate member inclined at an acute angle to said common plane, and which at their ends remote from the route are connected to opposite ends of a fourth substantially rigid elongate member which extends lengthwise of the route and which, at each of its end portions, is connected to said upstanding support by an elongate element, the arrangement being such that, in the event of an unbalanced load on said flexible member pivotal movement of the cantilever structure about a substantially vertical axis is prevented by one of the elongate elements and the unbalanced load is transferred to the upstanding support as a torsional load.

#### 4,679,673 MARINE REVERSING CLUTCH ASSEMBLY

Kojiro Yamaoka, Nishinomiya; Kazuhiko Yano, Toyonaka, and Kazuhiko Ohtsuki, Takarazuka, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Dec. 6, 1985, Ser. No. 805,609

Claims priority, application Japan, Jan. 14, 1985, 59-4710

Int. Cl.<sup>4</sup> F16D 21/04, 11/06; F16H 3/14; B63H 23/08

U.S. Cl. 192—21

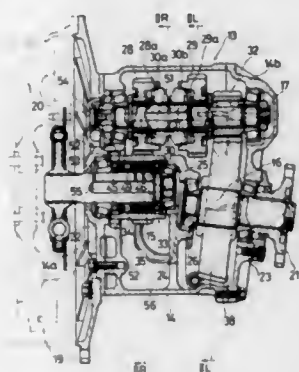
5 Claims

1. A marine reversing clutch assembly for use in boats between an engine, mounted in a stern portion of the hull of a boat with the output end of the engine directed towards the stern, and a propeller shaft extending backwardly and down-



wardly from the hull, the reversing clutch assembly comprising:

a clutch casing in which are journaled an output shaft having a fore end positioned within said casing, and an aft end extending backwardly and downwardly from said casing, an input shaft having a fore end, and an aft end, said input shaft aft end extending into said casing, and a clutch shaft and an intermediate shaft located within the casing; the input/clutch and intermediate shafts being substantially parallel and the aft end of said input shaft and the fore end of said output shaft facing each other with a small gap therebetween, said output shaft being inclined with respect to said input shaft, said clutch shaft being arranged above said input and output shafts and said intermediate shaft being arranged at a level between those of said clutch shaft and said input shaft; and



the clutch shaft having thereon rotatable forward and reverse drive gears, a clutch means disposed between said forward and reverse drive gears and being operative to couple selectively one of said gears to said clutch shaft, and an output gear fixedly mounted on an aft end portion of said clutch shaft, said forward drive gear meshing with a driving gear drivably mounted on said input shaft, and said driving gear meshing with one of two gears on said intermediate shaft the other of said two gears meshing with said reverse drive gear, and said output shaft having thereon an output gear meshing with said output gear of said clutch shaft the output gear of said clutch shaft being smaller than said output gear of said output shaft and one of said output gear being formed as a conical gear.

4,679,674

#### SYSTEM FOR ENGAGING AN ELECTROMAGNETIC CLUTCH UPON ACCELERATION OF AN ENGINE

Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan and Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Dec. 18, 1984, Ser. No. 682,976

Claims priority, application Japan, Dec. 22, 1983, 58-243452  
Int. Cl.<sup>4</sup> B60K 41/02

U.S. Cl. 192-0.052

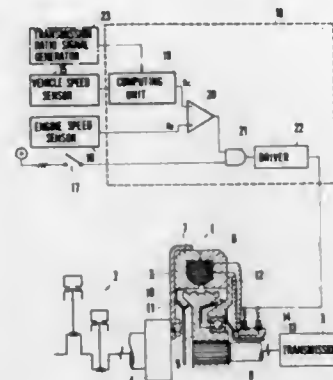
11 Claims

1. In a system for controlling clutch torque for a vehicle having an engine, a transmission, and an electromagnetic clutch between the engine and the transmission, the clutch having a drive member and a driven member driven by said drive member when the clutch is engaged, the clutch being automatically completely disengaged when vehicle speed decreases below a predetermined value, the improvement comprising:

means for controlling the clutch when accelerating the vehicle, after deceleration, from a low speed driving condition where the vehicle speed is below the predetermined value where the clutch is completely disengaged, so that the clutch remains completely disengaged until said controlling means completely engages the clutch when en-

gine speed substantially equals speed of the driven member of the clutch, comprising:

first means for determining engine speed;  
second means for determining the speed of the driven member of said electromagnetic clutch of a completely disengaged condition of the clutch;  
third means for detecting acceleration of said vehicle and producing an acceleration signal when said acceleration is detected;



fourth means for comparing said engine speed with said speed of said driven member and producing an output when both the speeds substantially coincide with each other; and

fifth means responsive to occurrence simultaneously of said acceleration signal and said output for completely engaging said electromagnetic clutch which heretofore was completely disengaged.

4,679,675

#### COUPLING CLUTCH

James V. Hanks, Robbinsdale; Charles D. Raines, Blaine, and Leonid Dayen, Plymouth, all of Minn., assignors to Horton Manufacturing Co., Inc., Minneapolis, Minn.

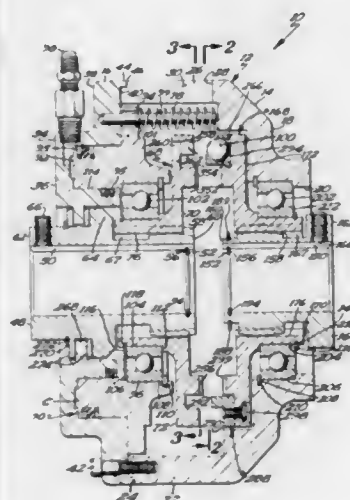
Continuation-in-part of Ser. No. 761,196, Jul. 31, 1985, Pat. No. 4,633,991, and a continuation-in-part of Ser. No. 715,736, Mar. 25, 1985, Pat. No. 4,624,356, and a continuation-in-part of Ser. No. 630,374, Jul. 12, 1984, Pat. No. 4,606,447. This application

Dec. 9, 1985, Ser. No. 806,661

Int. Cl.<sup>4</sup> F16D 11/04

U.S. Cl. 192-67 R

16 Claims



1. A coupling clutch comprising, in combination: a first hub

for receipt of a first shaft in a non-rotatable condition; a second hub for receipt of a second shaft in a non-rotatable condition; a first disc; means for slideably mounting the first disc on the first hub; means for biasing the first disc in a first axial direction towards a first axial position on the first hub; means for moving the first disc in the opposite axial direction towards a second axial position; a second disc, with the second disc being selectively engageable with the first disc to rotatably relate the first disc and the second disc; means for slideably mounting the second disc on the second hub; and means for substantially preventing slideable movement of the second disc with respect to the second hub and for allowing canting of the second disc with respect to the second hub to take up angular misalignment of the first and second shafts; with the means for slideably mounting the first disc on the first hub comprising, in combination: crown splines formed on the first hub; and splines formed in the first disc complementary to and for slideable receipt on the crown splines of the first hub; with the means for slideably mounting the second disc on the second hub comprising, in combination: crown splines formed on the second hub; and splines formed in the second disc complementary to and for slideable receipt on the crown splines of the second hub, wherein the crown splines on the hubs allow further canting of the discs with respect to the hubs to take up considerable more angular misalignment of the first and second shafts with the substantially equal rotational backlash.

4,679,676

#### OVERRUNNING CLUTCH CAGE WITH SIMPLIFIED MANUFACTURE

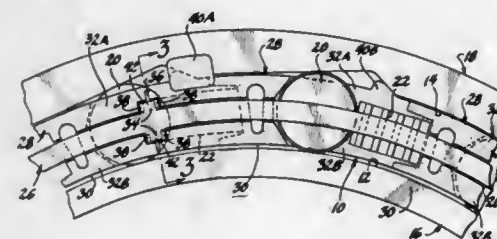
Donald J. King, Huron, and Frederick E. Lederman, Sandusky, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 11, 1986, Ser. No. 872,854

Int. Cl.<sup>4</sup> F16D 41/06; F16C 33/46

U.S. Cl. 192-45

3 Claims



1. An overrunning clutch cage assembly of the type that retains metal wedging elements and is adapted to be installed in an annular space between confronting surfaces of a pair of rotatable members, said clutch cage providing for ease of manufacture, comprising,

a cage body including a plurality of circumferentially spaced support portions adapted to fit closely within said annular space and to slidably engage one of said confronting surfaces when said clutch overruns so as to maintain said rotatable members in coaxial relation to one another, said cage body being formed of a moldable plastic material so as to provide support portions with desirable frictional properties,

said cage body also including a plurality of connector portions circumferentially interconnecting said support portions and also formed of said moldable plastic material, so that said cage body may be molded as an easily handled unitary structure, with each connector portion being just sufficiently strong to temporarily maintain said support portions interconnected, and,

a pair of metal end rings adapted to be joined to said unitary cage body in axially spaced relation, thereby forming a plurality of armored wedging element retention pockets in cooperation with said support portions, said jointer of said end rings acting to fracture said connector portions while maintaining the support portions in substantially

their original circumferentially spaced relation, thereby allowing said support portions of the completed cage assembly to operate independently after said cage assembly is installed.

4,679,677

#### HYDRAULIC TYPE STARTING CLUTCH

Kohel Ohzono, Fujimi; Kiyotaka Hayashi, Urawa; Mitsuru Saito, Koganei; Masaie Kato, Musashino, and Yoshihiro Yoshida, Itabashi, all of Japan, assignors to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English), Tokyo, Japan

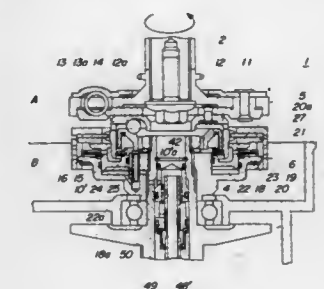
Filed Jul. 15, 1985, Ser. No. 755,066

Claims priority, application Japan, Jul. 16, 1984, 59-147341; May 9, 1985, 60-96682

Int. Cl.<sup>4</sup> F16D 25/02, 25/063; B60K 41/28, 41/02

U.S. Cl. 192-85 AA

9 Claims



1. A hydraulic type starting clutch comprising:

an input shaft;

an input rotating member arranged for rotation in unison with said input shaft;

an output shaft;

an output rotating member arranged for rotation in unison with said output shaft;

friction plates interposed between said input rotating member and said output rotating member for engagement therewith to transmit torque from said input rotating member to said output rotating member;

urging means interposed between said friction plates and said output rotating member for urging said friction plates to cause said transmission of torque from said input rotating member to said output rotating member;

a hydraulic pressure chamber defined between said urging means and said output rotating member and disposed to be supplied with a hydraulic fluid for acting upon said urging means to urge said friction plates;

a hydraulic fluid source for supplying said hydraulic fluid to said hydraulic pressure chamber;

pressure regulating valve means for regulating the pressure of said hydraulic fluid in said hydraulic pressure chamber; and

control means for controlling said pressure regulating valve means to regulate the pressure of said hydraulic fluid in said hydraulic pressure chamber so as to increase with an increase in the rotational speed of said input shaft, said control means comprising:

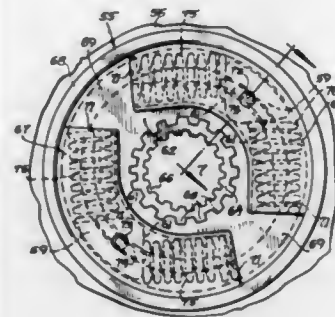
a governor housing secured to said input rotating member, and

actuating means operable in response to the rotational speed of said input shaft to actuate said pressure regulating valve means, said actuating means being arranged within said governor housing and directly engaging said pressure regulating valve means for urgingly displacing the same;

said urging means being responsive to the hydraulic fluid pressure increased by said control means to urge said friction plates to cause transmission of torque from said input rotating member to said output rotating member

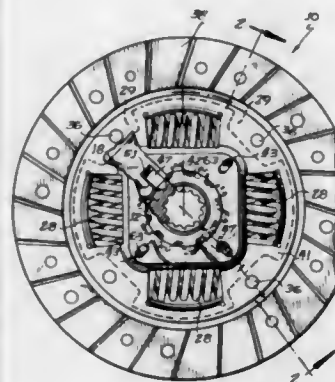
when the rotational speed of said input shaft reaches a predetermined low speed value.

9. A hydraulic type starting clutch comprising:
- an input shaft;
  - an input rotating member arranged for rotation in unison with said input shaft;
  - an output shaft;
  - an output rotating member arranged for rotation in unison with said output shaft;
  - friction plates interposed between said input rotating member and said output rotating member for engagement therewith to transmit torque from said input rotating member to said output rotating member, said friction plates including at least a first clutch plate and a second clutch plate, said first clutch plate being mounted on said output rotating member in a manner circumferentially immovable and axially movable relative to said output rotating member;
  - urging means interposed between said friction plates and said output rotating member for urging said friction plates to cause said transmission of torque from said input rotating member to said output rotating member;
  - a hydraulic pressure chamber defined between said urging means and said output rotating member and disposed to be supplied with a hydraulic fluid for acting upon said urging means to urge said friction plates;
  - a hydraulic fluid source for supplying said hydraulic fluid to said hydraulic pressure chamber;
  - pressure regulating valve means for regulating the pressure of said hydraulic fluid in said hydraulic pressure chamber; and
  - control means for controlling said pressure regulating valve means to regulate the pressure of said hydraulic fluid in said hydraulic pressure chamber so as to increase with an increase in the rotational speed of said input shaft, said urging means being responsive to the hydraulic fluid pressure increased by said control means to urge said friction plates to cause transmission of torque from said input rotating member to said output rotating member when the rotational speed of said input shaft reaches a predetermined low speed value, said control means comprising:
  - a governor housing secured to said input rotating member, and
  - means operable in response to the rotational speed of said input shaft to actuate said pressure regulating valve means;
  - said second clutch plate being mounted on said governor housing at an outer periphery thereof in a manner circumferentially immovable and axially movable relative to said governor housing.



said drive straps and spring abutments providing reaction surfaces contacting the ends of the springs.

**4,679,679**  
**CLUTCH DRIVEN PLATE ASSEMBLY WITH ANTI-BACKLASH DAMPING**  
 Thaddeus Lech, Jr., Sterling Heights, and Bruce A. Mullard, Mt. Clemens, both of Mich., assignors to Borg-Warner Automotive, Inc., Troy, Mich.  
 Filed Jul. 11, 1985, Ser. No. 754,040  
 Int. Cl.<sup>4</sup> F16D 3/14, 3/66  
 U.S. Cl. 192-106.2 9 Claims



1. A clutch driven plate assembly for an automotive vehicle clutch driving a transmission input shaft, including a hub assembly having an inner hub with a barrel splined onto the input shaft and an outer hub having a radial flange, a clutch plate carrying friction facings at the outer periphery thereof, a spring retainer plate secured to the clutch plate to sandwich said outer hub flange therebetween, said plates and outer hub flange having axially aligned sets of circumferentially spaced windows therein, and damper springs received in each set of windows, the improvement comprising intermeshing backlash splines on said inner and outer hubs allowing limited relative rotation therebetween, means yieldable resisting relative rotation between said hubs including at least two radially-biased plungers in one hub and a plurality of camming recesses in said other hub corresponding to the number of plungers, so that rotation of said plates, damper springs and outer hub relative to said inner hub causes said plungers to cam out of said recesses, a first spacer located between said clutch plate and said inner hub and piloting said inner hub central to said outer hub, and anti-rotation tabs on the periphery of said spacer received in notches in said outer hub.

**4,679,678**  
**MINIMUM COMPLEXITY VIBRATION DAMPER**  
 Paul A. Habel, Jr., and Elaine S. Kulczycki, both of Troy, Mich., assignors to Borg-Warner Corporation, Chicago, Ill.  
 Division of Ser. No. 564,151, Dec. 22, 1983, Pat. No. 4,555,009.  
 This application Sep. 9, 1985, Ser. No. 773,691  
 Int. Cl.<sup>4</sup> F16D 3/14, 3/66  
 U.S. Cl. 192-106.2 3 Claims

1. A vibration damper assembly for a torque converter lock-up clutch, friction clutch or torsional coupling, comprising a pressure plate, a reactor plate, a generally cylindrical hub barrel operatively connected to a transmission input shaft, said reactor plate being directly connected to said hub barrel and having a pair of outwardly curved arcuate channels extending for approximately 180° acting as spring pockets and separated by a pair of diametrically opposed inwardly offset drive straps, said pressure plate being generally flat and provided with a pair of diametrically opposed inwardly offset substantially triangular spring abutments 90° removed from said drive straps and projecting into said channels, and two pairs of oppositely disposed damper springs, said pressure plate and reactor plate

forming the spring pockets enclosing said damper springs positioned between said spring abutments and drive straps, and

**4,679,680**  
**CLUTCH MASTER CYLINDER WITH INTERNAL RESERVOIR**

Dennis J. Komatz, Birmingham, Mich., assignor to Lucas Industries Public Limited Company, Birmingham, England  
 Continuation-in-part of Ser. No. 549,508, Nov. 7, 1983, abandoned. This application Jul. 23, 1984, Ser. No. 633,869  
 Int. Cl.<sup>4</sup> B60T 11/16; F16D 65/32  
 U.S. Cl. 192-85 R 4 Claims



1. An actuating master cylinder for providing a hydraulic pressure signal in response to an operator input for actuating a hydraulic device through a hydraulic circuit, said master cylinder comprising an integral cylindrical housing having a first, open end and an opposing second, generally closed end, a first large diameter cylinder bore extending from said open end toward said closed end, a second smaller diameter cylinder bore extending from the inner termination of said first cylinder bore and terminating adjacent said closed end, said first and said second cylinder bores being coaxial and defining a shoulder at their junction, a reservoir plunger having a diameter complimentary to said second cylinder bore and inserted therein through said open end, biasing means interposed between said closed end and said reservoir plunger for urging said reservoir plunger toward said first cylinder bore and inserted through said open end and fixed in engagement with said shoulder, said plug, said reservoir plunger and said second cylinder bore defining a reservoir, an actuating plunger having a diameter complimentary to said first cylinder bore and slidably received therein through said open end for pressurizing fluid in said second cylinder bore, said actuating plunger and said plug defining with said first cylinder bore a working chamber, means for actuating said plunger in response to an operator input for pressurizing said working chamber, an outlet port in said housing communicating said first cylinder bore with the associated hydraulic circuit, passage means extending through said plunger for communicating said reservoir chamber with said working chamber and check valve means for controlling the flow through said passage means for precluding flow from said working chamber into said reservoir chamber when said actuating plunger is actuated by an operator for pressurizing said working chamber and for permitting fluid to flow from said reservoir into said working chamber when said actuating plunger has not been actuated by an operator.

**4,679,681**  
**SYNCHRONIZING RING AND PROCESS OF MANUFACTURING THE SAME**  
 Martin Creydt, Wiesloch; Wolfgang Bickel, Reilingen, and Harald Pfestorf, Untereisesheim, all of Fed. Rep. of Germany, assignors to Kolbenschmidt AG, Neckarsulm, Fed. Rep. of Germany  
 Filed Mar. 29, 1985, Ser. No. 717,633  
 Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3412779  
 Int. Cl.<sup>4</sup> F16D 23/02, 13/66  
 U.S. Cl. 192-107 M 2 Claims

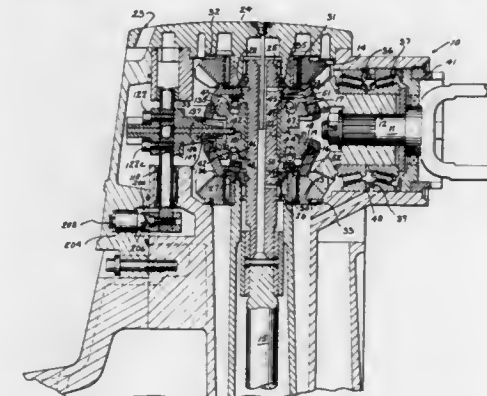
1. A synchronizing ring comprising a metal formed blank composed of a composite material, comprising a metallic layer consisting of an aluminum alloy of the type selected from the

group of Al Si 12 Cu Ni Mg, Al Si 18 Cu Ni Mg and Al Zn 4.5 Si Pb Cu Mg and having a thickness of 0.1 to 1.0 mm forming



a friction cone and a steel backing layer having a thickness of 0.5 to 3.5 mm clad to the metallic layer.

**4,679,682**  
**MARINE DRIVE SHIFT MECHANISM WITH DETENT CANISTER CENTERED NEUTRAL**  
 Charles F. Gray, Jr.; Gary L. Meisenburg, both of Fond du Lac, and Alvin Zemlicka, Sheboygan, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.  
 Filed Aug. 18, 1986, Ser. No. 897,627  
 Int. Cl.<sup>4</sup> F16D 21/04, 23/14; F16H 3/14  
 U.S. Cl. 192-21 14 Claims



1. In a marine drive having a housing with forward and reverse gear means and shift means having a forward position engaging said forward gear means and having a reverse position engaging said reverse gear means and having a neutral position disengaging said forward and reverse gear means, a detent canister assembly comprising a single modular unit mounted in said housing, said assembly comprising a cylindrical canister containing a ball and means biasing said ball into engagement with said shift means to center the latter in said neutral position.

**4,679,683**  
**CLUTCH COVER ASSEMBLY**  
 Tamio Nagano, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan  
 Filed Jul. 8, 1985, Ser. No. 752,425  
 Claims priority, application Japan, Jul. 9, 1984, 59-104268[U]  
 Int. Cl.<sup>4</sup> F16D 13/50 5 Claims

1. A clutch cover assembly comprising a clutch cover body



and a diaphragm spring therein, said clutch cover body having an inner peripheral part, a plurality of diaphragm spring tabs on said clutch cover body at said inner peripheral part of said clutch cover body and having spaces therebetween in the circumferential direction of said inner peripheral part, said diaphragm spring tabs being bent inward of said clutch cover body and extending through tab openings in said diaphragm spring and extending radially outwardly at their inner end and a pair of wire rings disposed on said diaphragm spring tabs, one of said wire rings of said pair of wire rings being disposed on said diaphragm spring tabs between said clutch cover body and said diaphragm spring and the other of said wire rings of said pair of wire rings being disposed on the other side of said diaphragm spring between said diaphragm spring and said



radially outwardly extending inner end of said diaphragm spring tabs, said diaphragm spring being between said wire rings, said diaphragm spring and said wire rings being supported by said diaphragm spring tabs; characterized by that pin opening are provided on the diaphragm spring adjacent the inner peripheral part of said clutch cover, said diaphragm spring tabs and said pair of wire rings, pins are fitted in said pin openings and extend through said diaphragm spring in such a manner that said diaphragm spring is slidable axially of said pins and without play in the circumferential direction of said diaphragm spring, and base portions of said pins are fixed to pin tabs at the inner peripheral part of said clutch cover body intermediate adjacent pairs of said diaphragm spring tabs and extending radially inwardly therebetween.

4,679,684

# **MULTIPLE CHAMBER AUTOMATED VENDING MACHINE**

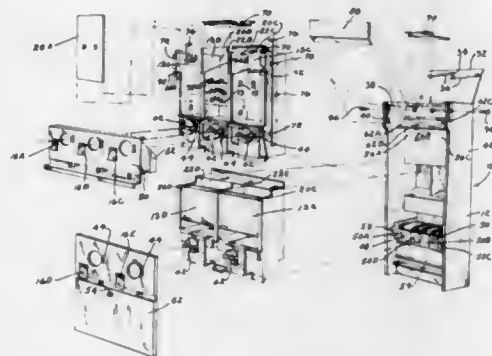
Robert L. Glaser, Deerfield, Ill., assignor to L. M. Becker & Co., Inc., Appleton, Wis.

Filed Mar. 3, 1986, Ser. No. 835,388

Int. Cl.<sup>4</sup> G07F 11/44

U.S. Cl. 194—350

2 Claims



1. A multi-chamber automated vending machine comprising:

an outer housing;  
an upper chamber and a lower chamber inside the housing, each of said chambers being adapted to hold a flowable body of merchandise items, each of said chambers having a filling port for introducing the merchandise items into the chamber and a dispensing port for dispensing the respective items to the outside of the chamber;  
said upper chamber having a bottom wall and a plurality of vertically extending walls;  
said lower chamber surrounding a portion of the bottom wall of the upper chamber and a portion of a vertically extending wall of the upper chamber;  
automated vending means responsive to payment positioned in each of the chambers in the lower portion thereof which are separately operable;  
door means connected to the housing providing an entry into the interior of the housing, whereby the filling ports for both chambers may be accessed by opening the door means;  
wherein both of the chambers have associated therewith coin operated triggering means for controlling the vending of the merchandise in response to coin payment, each of said triggering means having a coin receptacle for receiving coins from outside the chamber and a coin pathway which directs coins to a coin storage area which is below both of the chambers; and  
the coin pathway for the triggering means for the upper chamber communicates between the coin receptacle for the upper chamber and the storage area, and extends downward past at least the upper portion of said bottom chamber to the coin storage area.

4,679,685

# **ACCUMULATING COMMODITY CONVEYOR**

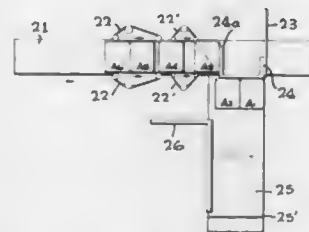
Kenji Inoko, Shiga, Japan, assignor to AB Tetra Pak, Lund, Sweden

Filed Nov. 30, 1983, Ser. No. 556,647

Int. Cl.<sup>4</sup> B65G 47/31

U.S. Cl. 198—461

1 Claim



1. A commodity conveying device incorporated into an accumulating device comprising:  
a first conveyor forwarding commodities at a constant speed;  
a second conveyor contiguous and perpendicular to said first conveyor, said second conveyor comprising a plurality of rotatable circular cylinders arranged in parallel to be connected at each end to one of a pair of identical endless chains;  
a pusher in reciprocating motion which pushes said commodities off said first conveyor in a perpendicular direction onto said second conveyor; and  
means for synchronizing the motions of said commodities, second conveyor, and said pusher so as to provide a constant flow rate of commodities whereby each commodity is separated from each other by a constant distance on said second conveyor, and for further controlling the push off speed of said pusher to be equal to the speed of said second conveyor thereby avoiding any tumbling or damage to said commodities and eliminating problems during subsequent accumulation, said synchronizing means comprising sets of pairs of endless vertical belts disposed on either side

of said first conveyor with adjustable inter-belt distance and capable of gripping said commodities, with one of said belt pair set travelling at a speed lower than that of said first conveyor, and the other of said belt pair set travelling at a speed equal to that of said first conveyor, the combined effect providing desired constant commodity flow rate and constant distance of separation.

4,679,686

# **BEARING SYSTEM FOR RECIPROCATING FLOOR CONVEYOR**

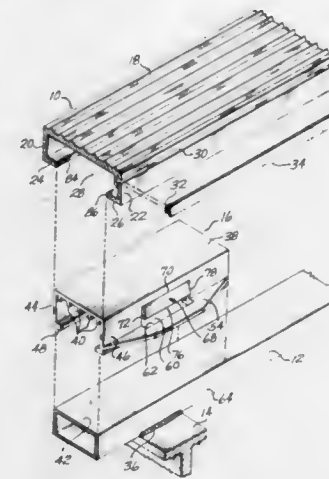
Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Continuation-in-part of Ser. No. 346,865, Feb. 8, 1982, Pat. No. 4,492,303. This application Dec. 10, 1984, Ser. No. 680,069

Int. Cl.<sup>4</sup> B65G 25/00

U.S. Cl. 198—750

7 Claims



1. In a reciprocating floor conveyor of a type comprising a plurality of elongated floor members, each of which is a metal extrusion of channel form comprising a top panel, a pair of opposite side panels extending downwardly from the top panel, and a pair of bottom flanges projecting inwardly from the side panels and defining a space between them, and each of which is supported on and guided by an elongated metal guide beam and a plurality of spaced apart plastic slide bearings on the guide beam, and further comprising drive means for moving the floor members in one direction along the guide beams and bearings, for advancing a load, and for retracting them in the opposite direction, an improved bearing system for the floor members characterized by:

each said plastic slide bearing having a top positioned above the guide beam, a side part on each side of the bearing depending from the top outwardly adjacent the sides of the guide beam, and a bottom lock flange projecting inwardly from each side part below the guide beam, and a wing on each side of the bearing, extending laterally outwardly from the bearing, said wings being in coplanar parallelism with each other and being spaced below and in parallelism with the top of the bearing, each said wing having an outer edge which makes mutually bracing contact with the outer edge of an adjacent wing on an adjacent plastic slide bearing, said bearing top being of a width smaller than the space between the two bottom flanges of the floor member, and each side part of each bearing including a sidewall which slopes downwardly and outwardly to a lower edge, said bearing having a width at the level of the lower edges of said sidewalls which is wider than the width of the space between the two bottom flanges of the floor member, each said sidewall lower edge being spaced above the upper surface of the wing on its side of the bearing, to define with the wing a space in which an inner edge portion of the bottom flange of the floor member on its side of the bearing is

received, said sidewall being resiliently connected to the bearing such that the floor member can be set down on top of the bearing, with the top of the bearing positioned in the space between the two bottom flanges of the floor member, and the floor member can then be pushed downwardly, and the downward force applied by the flanges of the floor member on said sidewalls of the bearing will cause the sidewalls to spring inwardly to allow the floor member to move downwardly until the bottom flanges are in the slots defined between the bottom edges of the sidewalls and the top surfaces of the wings, at which time the sidewalls will spring outwardly into positions placing their lower edges above the bottom flanges of the floor member;

wherein said downwardly and outwardly sloping sidewalls are located generally at the longitudinal center of the bearing, and each is in the nature of a flap which is connected at its top to the bearing and has free ends and a free lower edge, each said sidewall functioning like a cantilever beam and bending at its edge of connection to the bearing in response to the downward force exerted on it by the flange of the floor member.

4,679,687

# **APPARATUS TO EFFECT STRESS-FREE TRANSPORTATION OF A RIBBON ON A CONVEYOR CAPABLE OF NEGOTIATING TURNS**

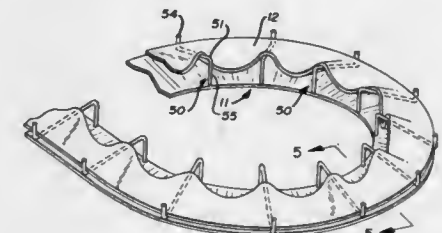
Roger P. Rehm, Orrville, Ohio, assignor to Singer Products Corporation, Smithville, Ohio

Filed Oct. 2, 1985, Ser. No. 782,874

Int. Cl.<sup>4</sup> B65G 21/18

U.S. Cl. 198—778

8 Claims



1. A conveyor system having a plurality of transverse belt members with inner and outer ends, picket means secured to the inner and outer ends of said belt members, said picket means being nestable and telescopic with the picket means on successive belt members and inter-engaging successive belt members to permit said belt members to move effectively along a straightaway as well as through right- or left-hand turns, support members to permit a flat ribbon of material to negotiate turns without deleteriously deforming the ribbon being presented from said belt members at selected longitudinal intervals along said conveyor system, said support members being inclined upwardly relative to the belt members each support member being inclined upwardly from an outer edge of the turn towards an inner edge of the turn.

4,679,688

# **PACKAGE FOR RISK SAMPLES**

Jan Söderholm, Luntmakargatan 71, 1 tr, Stockholm, Sweden S-113 51, and Hugo Cedraeus, Grönviksvägen 187, Bromma, Sweden S-161 42

Continuation of Ser. No. 734,274, filed as PCT/SE 84/00295, Sep. 12, 1984, published as WO 85/01272, Mar. 25, 1985, abandoned.

This application Sep. 10, 1986, Ser. No. 906,616

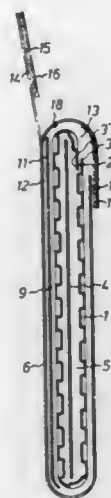
Int. Cl.<sup>4</sup> B65D 81/26

U.S. Cl. 206—204

10 Claims

1. A package useful for shipment of risk samples (8) con-

tained in a primary package (7), including a first casing (1) and a second casing (6) containing the first casing, and characterized in that the first casing (1) is formed with translucent shock absorbent material and defines an internal compartment (5) for receiving a sample (8), said second casing is at least partly translucent and defines together with said first casing a compartment (9) intermediate the respective casings for insertion of a document therein, said first casing and said second casing are arranged such that said internal compartment is visually checkable by viewing through translucent portions of the respective casings, means are provided for preventing reading of the inserted document from outside said second casing, said



first casing has a pair of edges (3,3') defining a slit-shaped opening (2) to said internal compartment, said second casing has a slit-shaped opening (13) in communication with the opening of said first casing and with said intermediate compartment, and said second casing further has an adhesive cover flap (14) with a removable protective tape (15), said cover flap being foldable over both the slit-shaped opening of said first casing and the slit-shaped opening of said second casing in such a manner that, with said protective tape removed, said cover flap adhesively seals to said edges (3,3') and effects a liquid and gas-tight seal of said edges, thereby sealing the slit-shaped opening of said first casing, and adhesively seals to said second casing to seal the slit-shaped opening of said second casing.

4,679,689

#### PROCESSING, SHIPPING AND/OR STORAGE CONTAINER FOR PHOTOMASKS AND/OR WAFERS

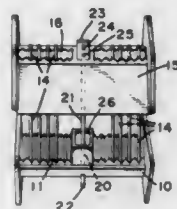
Eugene R. Blome, San Jose, Calif., assignor to General Signal Corporation, Stamford, Conn.

Filed Sep. 3, 1985, Ser. No. 771,871

Int. Cl.<sup>4</sup> B65D 85/48

U.S. Cl. 206—334

14 Claims



1. A system for holding photomasks and/or wafers in a clean environment during processing, shipment and/or storage of said photomasks and/or wafers said system comprises:  
a first processing tray having grooves in which a lower portion of the edges of said photomasks and/or wafers are

inserted, said first tray has an opening along its bottom surface permitting the escape of chemicals that are used in the processing of said photomasks and/or wafers;  
a second processing tray having grooves, said second tray positioned above said first tray so that the grooves of said second tray will hold an upper portion of the edges of said photomasks and/or wafers, said second tray has an opening along its top surface so that said second tray may be used to permit the escape of chemicals that are used in the processing of said photomasks and/or wafers;  
means for connecting said first tray to said second tray, so that said photomasks and/or wafers will be held firmly in place; and  
a container which contains one or more inflatable diaphragms connected to the inside surface of said container, in which said first and second trays and said means are inserted, whereby when said container is closed, said one or more diaphragms inflate causing said wafers and/or photomasks to be securely held within said first and second trays.

4,679,690

#### FASTENER ORIENTING, TAPPING AND COLLECTION SYSTEM

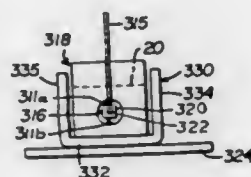
John H. Steward, Bloomfield Hills, and Harold A. Ladouceur, Livonia, both of Mich., assignors to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 395,410, Jul. 6, 1982, Pat. No. 4,476,599, which is a division of Ser. No. 151,549, May 20, 1980, Pat. No. 4,338,694. This application Oct. 15, 1984, Ser. No. 660,774

Int. Cl.<sup>4</sup> B65D 85/24

U.S. Cl. 206—345

4 Claims



1. A stack of nuts removeably retained in serial alignment for delivery to a nut installation means, each nut having a body portion with generally polygonal top and bottom faces, and a central threaded bore extending through each nut body portion and through said top and bottom faces, and generally perpendicular thereto, the stack of nuts comprising in combination:

a plurality of said nuts in the form of a stack with the top face engaging the bottom face of the next adjacent nut, and said nut bores in general co-axial alignment; and  
a removeable flexible linear connector wire loop extending through said generally co-axially aligned nut bores having a bight portion and a pair of return portions substantially parallel to the axis of said aligned nut bores, said connector loop releasably interconnecting said nuts in stacked relation for delivery to said nut installation means without fixedly retaining any two adjacent nuts.

4,679,691

#### THREE-SIDED TIP TRAY

Kevin J. Halloran, 25200 Carlos Bee Blvd., Button Bash Plaza, SE. 380, Hayward, Calif. 94542

Filed Aug. 12, 1985, Ser. No. 764,728

Int. Cl.<sup>4</sup> B65D 1/34

U.S. Cl. 206—557

5 Claims

1. A tip tray comprising:  
a rectangular, planar, transparent plate having a top and

bottom surface, first and second lateral end edges, and first and second longitudinal side edges;  
narrow upturned walls formed on the top surface of said plate and along only three edges thereof;  
a pair of narrow, elongated, substantially parallel support bars formed on the bottom surface of said plate and along the first and second longitudinal side edges thereof, each of said support bars extending along at least a portion of the first lateral end edge of said plate to form a stop member;



at least two tabs formed along the sides of each of said support bars, said tabs extending laterally inward from said support bars, the top surface of said tabs being spaced from the bottom surface of said transparent plate to form a thin holding track between said bottom surface and said tabs for removably securing cardstock visible through said transparent plate.

4,679,692

#### CONTAINERS FOR COSMETICS

Brian Davey, North Shields, England, assignor to Lion Brush Works Limited, Newcastle-upon-Tyne, England

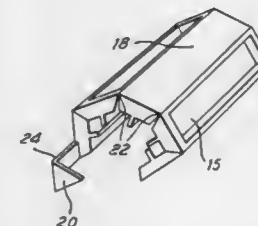
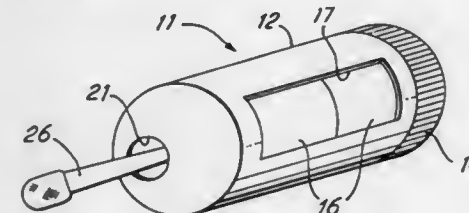
Filed Jan. 18, 1985, Ser. No. 692,587

Claims priority, application United Kingdom, Jan. 20, 1984, 8401504

Int. Cl.<sup>4</sup> A45D 40/24

U.S. Cl. 206—581

7 Claims



1. A cosmetic container comprising:  
support means having a plurality of mutually inclined surfaces, said support means comprising a plurality of trays, and hinge means connecting each tray to an adjacent one of said trays, said trays being folded about said hinge means so that each tray forms one of said mutually-inclined surfaces;  
a plurality of cosmetics, a respective one of said cosmetics being located in each of said trays; and  
a housing having a substantially cylindrical sidewall disposed in surrounding relationship to said support means and being rotatable relative thereto, said support means when disposed in said housing being oriented such that the trays project radially outwardly toward the sleeve-like

sidewall of the housing relative to the cylindrical axis thereof, said cylindrical sidewall having an elongated aperture formed through the cylindrical sidewall thereof for providing access to at least one of the trays when the latter is radially aligned with the aperture.

2. A cosmetic container comprising:  
a housing having a cylindrical wall;  
an elongate aperture in said cylindrical wall of said housing, said aperture having its major dimension extending generally parallel to the axis of the cylindrical wall;  
support means mounted within said housing, said support means being generally cylindrical and being mounted for rotation about the cylindrical axis of the housing;  
a plurality of cosmetics carried by said support means, said cosmetics being disposed around said axis and disposed on said support means so as to face radially outwardly of said axis;  
knob means connected to said support means and projecting from said housing so that rotation of said knob about said axis causes rotation of said support means within said housing to present a different one or group of said cosmetics, in turn, at said elongate aperture; and  
said housing having a generally flat end wall, a second aperture in said flat end wall, said second aperture being radially offset relative to said axis, said support means including at least one recess, at least one cosmetic applicator accommodated in said recess, and said support means being rotatable to bring said recess into alignment with said second aperture whereby said applicator can be removed from said recess.

4,679,693

#### LABEL RESEALING CONTAINER

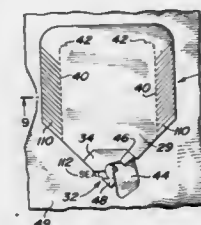
Harold Forman, P.O. Box 363, Conshohocken, Pa. 19428

Filed May 14, 1986, Ser. No. 863,073

Int. Cl.<sup>4</sup> B65D 81/24

U.S. Cl. 206—610

5 Claims



1. A resealable container comprising:  
(a) a container with at least one face capable of being torn, said tearable face including a preformed, generally U-shaped slit, said slit forming a tongue flap in said tearable face;  
(b) a releasable label having one dry side and one adhesive side, said adhesive side coated with releasable, pressure sensitive adhesive and including an uncoated section at one label end to form a pull tab, said label adhesive side facing and adhering to said container's tearable face so that said label completely surrounds and overfits said container's U-shaped slit; and  
(c) a pull tab extension adjoining said pull tab with perforations defining said pull tab edge, said extension having generally two dry sides but with one area on one side of said extension including permanent adhesive to hold said tab and extension to said container until opening so that when said extension is pulled, it releases said tab to allow opening of said container and leaves said adhesive extension area fastened to said container as evidence of unsealing.



4,679,694

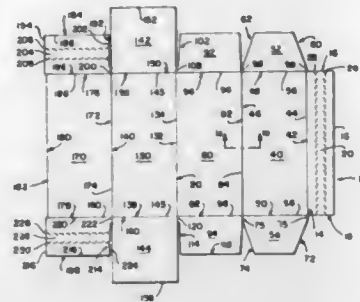
**CARTON AND BLANK FOR PACKAGING ICE CREAM OR THE LIKE**

Paul J. Donohie, Pittsford; Gary L. Gray, Fairport, and Frank G. Capuano, Rochester, all of N.Y., assignors to Rendell Paper Company, Rochester, N.Y.

Filed Apr. 15, 1986, Ser. No. 852,293  
Int. Cl.<sup>4</sup> B65D 5/54

U.S. Cl. 206—611

16 Claims



1. A carton for packaging ice cream or the like, comprising:
  - (a) connected cover, front, bottom and rear panels,
  - (b) said panels being substantially rectangular in shape,
  - (c) each of said panels having left, right, top and bottom edges,
  - (d) said cover panel having a closure flap hingedly connected to said cover panel at said cover panels top edge,
  - (e) said rear panel hingedly connected at its top edge to said bottom edge of said cover panel,
  - (f) said bottom panel hingedly connected at its top edge to said bottom edge of said rear panel,
  - (g) said front panel hingedly connected at its top edge to said bottom edge of said bottom panel,
  - (h) each of said panels having a left end flap hingedly connected to said left edge and a right end flap hingedly connected to said right edge,
  - (i) said end flaps each having inner, outer, upper and lower edges,
  - (j) said left and right rear panel end flaps extending from said left and right edges of said rear panel a distance sufficient to overlap said corresponding left and right front panel end flaps,
  - (k) the length of said inner edges of said left and right bottom panel end flaps being substantially equal to the length of said left and right edges of said bottom panel respectively,
  - (l) said closure flap having at least one weakness line running substantially parallel to said cover panel's top edge,
  - (m) said left and right front panel end flaps comprising a first pair of end flaps and said left and right rear panel end flaps comprising a second pair of end flaps and one of said pair of flaps having a weakness line formed in each flap of said pair,
  - (n) means for securing said closure flap to said front panel, and
  - (o) means for securing said left and right front panel end flaps to said left and right rear panel end flaps respectively.

4,679,695

**CONTAINER RACK**

Thomas E. Leff, 10302 Viacha Dr., San Diego, Calif. 92124  
Filed Sep. 17, 1984, Ser. No. 650,729

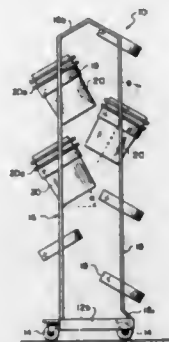
Int. Cl.<sup>4</sup> A47G 29/00

U.S. Cl. 211—71

8 Claims

1. An apparatus for supporting a plurality of containers comprising:
  - a horizontal rectangular open frame base defined by a pair of parallel side beams connected together at the ends thereof by means of a pair of parallel end beams;
  - a plurality of vertically extending support members secured

to and extending upward at least from the ends of the side beams of the base and defined by a pair of spaced apart elongated legs connected at the lower end thereof to the base and connected together at top thereof by a cross member extending generally parallel to the end beams; holding means defined by encircling open frame means connected in horizontal rows between the legs of adjacent support members above and at each side of the base and encircling the outer wall of cylindrical containers and



removably holding a plurality of cylindrical containers in vertically spaced rows extending horizontally parallel to the side beams of the base, and the holding means and, hence, the containers of each row being disposed above and at least partially within the dimensions of said base and inclined from their normal freestanding position away from the containers in an adjacent row, wherein the rows of holding means on opposite sides are offset vertically and the containers at least partially overlap at the center of the base.

4,679,696

**CONTAINER AND SEALING ASSEMBLY**

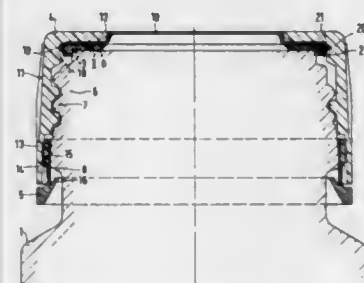
Yvon Bonnenfant, Vittel; Philippe Odet, St. Georges; Raymond Perne, Anse, all of France, and Claude Thevenot, D.Om Joao, Portugal, assignors to Societe Generale des Eaux Minerales de Vittel, Vittel and Astra Plastique, St. Georges de Renelns, both of, France

Filed Apr. 26, 1985, Ser. No. 727,534

Claims priority, application France, Apr. 26, 1984, 84 06765  
Int. Cl.<sup>4</sup> B65D 41/04

U.S. Cl. 215—252

17 Claims



1. A disposable container having an opening and a sealing assembly having means for indicating that the container has not been opened, said sealing assembly comprising:
  - a sealing member having a disc for enclosing the opening of said container and a seal positioned between said disc and said opening; and
  - a collar having means for engaging the opening of said container, for retaining said sealing member to the opening of said container; wherein said disc has a central projection which is con-

nected to the remainder of said disc by a sloping surface, and wherein said collar has a recess for receiving the central projection of said disc and a chamfer for receiving the sloping surface of said disc.

4,679,697

**BOTTLE TOP**

Eugene J. Allaire, 310-225 East 13th, North Vancouver, British Columbia, Canada V7L 2L6

Filed Feb. 18, 1986, Ser. No. 799,894

Int. Cl.<sup>4</sup> B65D 41/42

U.S. Cl. 215—295

8 Claims



1. A bottle cap comprising a generally flat portion with a skirt extending downwardly from the flat portion and adapted to be crimped onto a bottle;
  - a plurality of depressions arranged on the interior of the flat portion of the cap, extending about one third through the thickness of the cap and providing lines of weakness in the cap to facilitate bending, and thus release, of the cap when the cap is installed on a bottle.

4,679,698

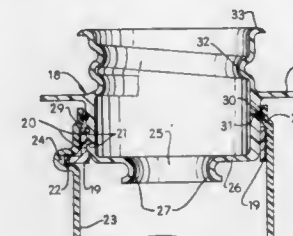
**FUEL TANK FILLER TUBE RESTRICTOR ASSEMBLY**  
John E. Thorn, Sylvania, Ohio, and William W. Burns, Iowa City, Iowa, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 335,015

Int. Cl.<sup>4</sup> B65B 3/00

U.S. Cl. 220—86 R

30 Claims



1. A restrictor assembly for the end of a filler tube, which comprises:
  - A. a flexible band adapted to be inserted into the end of the filler tube to form a locking ring lying against the inside surface of the filler tube and having a V-shaped gap between the ends of the locking ring more narrow in a direction axially inward said filler tube, the inner surface of the flexible band comprising first engagement means;
  - B. a wedge adapted to be inserted into said V-shaped gap to expand the locking ring against the inside surface of the filler tube; and
  - C. a restrictor cup comprising a tubular side wall and a restrictor wall with an opening through it, adapted to be inserted, restrictor wall first, into the filler tube to engage said locking ring, which restrictor cup comprises second engagement means adapted to engage said first engagement means.

4,679,699

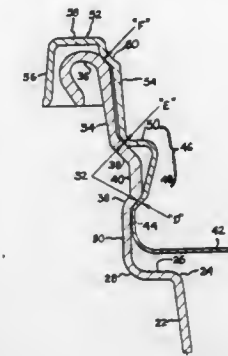
**SEALING LID AND CONTAINER**

Charles R. Malsbury, Palmer, and Richard R. Lawrence, Wilbraham, both of Mass., assignors to Rexcel, Inc., Ludlow, Mass.

Filed May 22, 1986, Ser. No. 865,860  
Int. Cl.<sup>4</sup> B65D 39/00

U.S. Cl. 220—307

36 Claims



1. A sealing lid for use with a cup, formed of an enclosure member having an outwardly extending rim defining an opening and a first sealing means disposed below said opening and extending inwardly of said rim, comprising when said lid is snapped onto the cup over the rim:
  - a. a panel member having a periphery;
  - b. an outer wall member secured to said panel member along its periphery, said outer wall member having a second sealing means disposed for cooperative sealing engagement with said first sealing means of said cup so as to provide a first sealing of said cup;
  - c. an annular hollow rib secured to said outer wall member and extending over said cup rim, said rib having a third sealing means disposed for cooperative sealing engagement with said cup rim so as to provide a second sealing of said cup; and
  - d. said panel member, outer wall member and rib being configured and dimensioned for snap-fitting sealing engagement with said cup over said opening.

4,679,700

**SELF-CLOSING CONTAINER TOP**

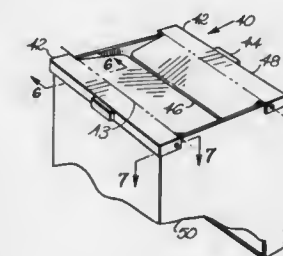
G. Robert Tharrington, 3901 Sawyer Wood Rd., Sarasota, Fla. 33583, and Isabella A. Hodge, 2931 Coral Shores Dr., Ft. Lauderdale, Fla. 33306

Filed Oct. 10, 1986, Ser. No. 917,708

Int. Cl.<sup>4</sup> B65D 43/14

U.S. Cl. 220—337

8 Claims



1. A self-closing container top adapted to be supportively received over a container having an upper rim defining an opening, said container top comprising:
  - two generally horizontal top panels each supportively disposed for rotation about opposing coaxial mounting shafts having a generally horizontal axis;

each said top panel having a center margin and an outer margin;  
 said top panels in opposing side-by-side arrangement one to another forming a common parting line between one said center margin to another;  
 each said axis disposed from said center margin but not to said outer margin;  
 stop means for preventing each said top panel from rotating about said axis beyond a position wherein said center margins become upwardly divergent;  
 counterweight means disposed on each said top panel between each said axis and said outer margin for self-righting said top panels to a closed position wherein each said top panel is against said stop means and generally horizontal;  
 said container top substantially covering the container opening when said top panels are in said closed position.

#### 4,679,701 RESEALABLE PACK

Horst W. Ackermann, Orbe; Petr Masek, Yverdon, and Jean Servaux, Savigny, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Jan. 17, 1985, Ser. No. 745,590

Claims priority, application Switzerland, Jul. 5, 1984, 3248/84

Int. Cl.<sup>4</sup> B65D 43/24, 90/04

U.S. Cl. 220-404

6 Claims



1. A resealable pack comprising:
  - a gusseted bag, having an open end at its top, within a relatively rigid outer envelope in the form of a box having a bottom and at least two sets of opposing sidewalls having bottom edges affixed to the box bottom;
  - a first movable part having a top edge, two side edges and a bottom edge, and an inner and an outer face surface, the bottom edge being affixed to a top edge of a first of said sidewalls of the box;
  - a second movable part having a top edge, two side edges and a bottom edge, and an inner and an outer face surface, the bottom edge being affixed to a top edge of a second of said sidewalls of the box which opposes the first sidewall;
  - a first and a second moveable member each having two outer faces and two edges, one edge of the first and second moveable members being affixed to the first and second movable parts, respectively, the other edge of the first and second movable members being affixed to the first and second sidewalls, respectively, such that when each moveable member is in a closed position, the outer faces, sidewall and moveable part define a deformable parallelogram, one face of each moveable member being bonded to an outer face of the open end of the gusseted bag at a distance below the top of the bag, the faces of each moveable member being of a length such that said one face of each closes and seals the bag when in a closed position; and
  - a moveable flap having a top edge and a bottom edge, the bottom edge being affixed to and extending from the top edge of the first movable part, the flap being of a length

such that when in a closed position and folded over it extends to the bottom edge of the second movable part.

#### 4,679,702 SANITARY DRINKING ACCESSORY FOR A METAL BEVERAGE CAN

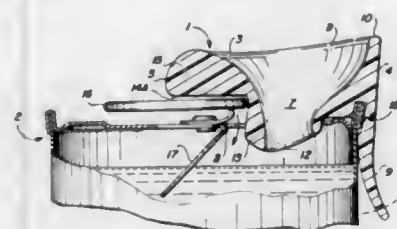
Anthony J. Maccarone, Glendale, Ariz., and Stephen M. Orr, San Luis Obispo, Calif., assignors to By Macaroni, Inc., Glendale, Ariz.

Filed Oct. 6, 1986, Ser. No. 915,426

Int. Cl.<sup>4</sup> A47G 19/22; B65D 25/48, 39/00

U.S. Cl. 220-90.2

3 Claims



1. A sanitary drinking accessory adapted to be detachably coupled to the top of a metal beverage can of the type which is provided with an integral manually-operable feature for effecting an opening in the can lid in order that the beverage may be consumed directly from the can, the can being further characterized by a can lid which has been fixed to the can body in such a manner that the junction between the can lid and the can body includes a circumferential raised edge and terminates in a circumferential, downwardly facing shoulder extending about the can body proximate its top edge, said drinking accessory comprising:
  - (A) a unitary body fabricated from a resilient plastic material which is not inherently potentially toxic when brought into contact with a human mouth; and
  - (B) said unitary body having:
    1. a top surface;
    2. a bottom surface;
    3. an intermediate zone between said top surface and said bottom surface and defining the thickness of said unitary body at each position across said top surface and said bottom surface;
    4. a periphery, said periphery including:
      - a rear section, and
      - a front section, said front section having:
        - i. a top;
        - ii. a bottom; and
        - iii. a shape, in horizontal cross section, in the form of a circular section generally conforming to the curve of the circumference of the top of the beverage can with which said drinking accessory is to be used;

5. an aperture extending completely through said intermediate zone, said aperture having an upper section and a lower section:
  - a. said aperture flaring outwardly at its upper section such that its side walls merge with and comprise at least a portion of said top surface;
6. a drinking lip defined by contiguous portions of said top surface and said top of said front section of said periphery;
7. integral attachment means for detachably fixing said unitary body to a beverage can, of which the manually-operable feature has been actuated to obtain an opening in the can lid, such that:
  - a. said front section of said periphery encompasses at least a portion of the circumference of the can top
  - b. said rear section of said periphery extends beyond the opening in the can lid; and

- said lower section of said aperture is aligned with the opening in the can lid; and
8. said integral attachment means further comprising:
    1. a recess disposed between said bottom surface and said front section of said periphery, said recess being dimensioned and configured to snugly receive the can raised edge when said drinking accessory has been operably affixed to a can; and
    2. a tab depending downwardly from said front section of said periphery;
- whereby, when said drinking accessory has been attached to the beverage can, a consumer may drink the can contents from said drinking lip without touching the can directly with his mouth and removal of said drinking accessory from the can may be facilitated by manually pulling the tab outwardly away from the can body to thereby increase the clearance between said recess and the can raised edge such that said drinking accessory may be peeled away from the can.

#### 4,679,703 DEVICE FOR PREVENTING NAPKINS FROM BUNCHING AT THE DISPENSING OPENING IN A PAPER NAPKIN DISPENSER

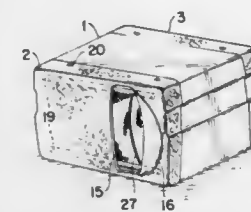
Raymond F. De Luca, Samford, Conn., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Mar. 2, 1984, Ser. No. 585,538

Int. Cl.<sup>4</sup> A47K 10/24; B65H 1/00

U.S. Cl. 221-52

13 Claims



1. In a napkin dispenser having at least one face plate with a generally elongated dispensing opening and pressure exerting means for urging a napkin stack with two opposed edges and a further edge perpendicular to said two opposed edges toward said face plate, said further edge disposed adjacent said dispensing opening, a device for substantially preventing napkins from bunching at said dispensing opening when napkins are successively withdrawn from said dispenser, said device comprising pressure relief means mounted adjacent said face plate to engage said napkin stack only along a substantial length of said two opposed edges thereof for reducing the level of pressure exerted by said face plate on the center portion of said napkin stack, wherein said pressure relief means is positioned with respect to said face plate, said napkin stack and said discharge opening such that when further edge of a napkin is pulled from said discharge opening the edges of the napkin which form said two opposed edges of said napkin stack are progressively stripped from said pressure relief means simultaneously.

#### 4,679,704 GRAVITY PIPE TRANSPORT SYSTEM

Raymond B. Dunlop, 411 Chitek Crescent, Saskatoon, Saskatchewan, Canada S7K 5C1, and William E. G. Taylor, 810 Gordon Street, Moosomin, Saskatchewan, Canada (S0G 3N0)

Filed Oct. 28, 1985, Ser. No. 792,030

Claims priority, application Canada, Oct. 31, 1984, 466689

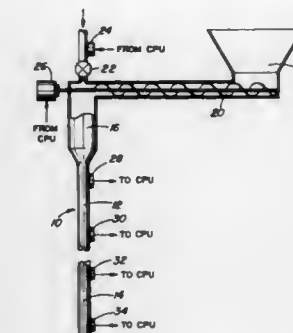
Int. Cl.<sup>4</sup> B65G 11/20, 53/66

U.S. Cl. 222-56

13 Claims

1. A gravity flow pipe transport system for material comprising non-slurried solids particles, said system comprising:

a pipe of which at least a major portion is generally upright, said pipe having an upper section and a lower section; controllable supply means to supply said material to the upper section of said pipe; controllable air flow means to provide a flow of naturally aspirated air into said pipe; monitoring means to provide signals indicative of the pres-



ures and the location of flow regimes and a flow regime interface therebetween at a plurality of locations along the length of said pipe; control means responsive to the signals provided by said monitoring means to vary the rate at which said material is supplied to said pipe and the rate of air flow into said pipe whereby plugging of said pipe by said materials is substantially eliminated.

#### 4,679,705 FLUID SUPPLY SYSTEM, A CONNECTOR AND A VALVE

Malcolm F. Hamilton, Southminster, England, assignor to Hoze-lock-ASL Ltd., Buckinghamshire, England

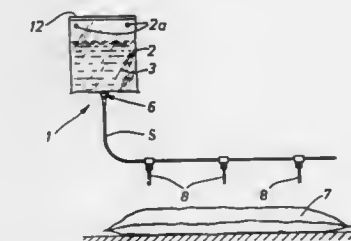
Filed Aug. 3, 1982, Ser. No. 404,790

Claims priority, application United Kingdom, Jan. 14, 1982, 8201041

Int. Cl.<sup>4</sup> B67B 7/26

U.S. Cl. 222-90

17 Claims



4. A two-part progressive flow valve for a fluid supply system, said valve comprising:
  - (a) a first part snap-engageable into a second part and being relatively rotatable therein between first and second angular positions,
  - (b) in said first angular position said valve is closed and in said second angular position said valve is fully open,
  - (c) said second part having a circular seating portion corresponding in diameter to a first circular portion of said first part so that in use said first portion is seated in said seating portion and rotatable about the axis of said seating portion,
  - (d) each of said first and second parts including a further circular portion and these further portions being arranged eccentrically to one another,
  - (e) said further portion of said first part including a bore extending generally radially thereof,
  - (f) the bore is blocked off by said further portion of said



second part in said first angular position with said two further portions in engagement with a gap remote from a region surrounding said bore between said further portions, and

(g) in said second angular position, said bore is not blocked off and said valve is fully open and there is a gap near the region surrounding said bore between said further portions.

16. A connector suitable for connecting two regions together separated by a wall or partition, said connector comprising:

- at least a first piece and a second piece releasably snap-lockable together with said wall or partition gripped therebetween and with said connector surrounding a hole in said wall or partition,
- said first piece being provided with a male portion, which in use passes through said hole in said wall and is snap-locked in the female portion of said second piece,
- said second piece being generally tubular,
- said female portion comprising a bore having a first portion flared in a direction towards said first piece when said first and second pieces are releasably locked together and in locking said female portion said flared first portion of said bore is engaged by a head of said male portion which resiliently deforms said second piece and/or is itself resiliently deformed until head snap engages a locking abutment on said female portion, at which location an annular gap is defined between said female portion and said male portion between the head and the remainder of said first piece,
- said first piece being separable from said second piece first by closing the gap to thereby move said locking abutment in relation to said head so that said head and male portion may then be retracted from said female portion.

4,679,706

#### DISPENSING SYSTEM WITH INFLATABLE BAG PROPELLING MECHANISM AND SEPARATE PRODUCT GAS PHASE

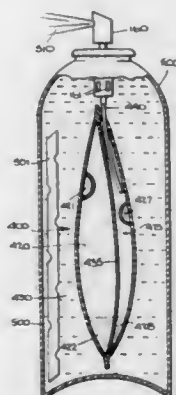
David J. Magid, Doylestown; Barbara Svitila, Wayne, and William Kalriess, Quakertown, all of Pa., assignors to Enviro-Spray Systems, Inc., Hoboken, N.J.

Filed Oct. 29, 1984, Ser. No. 666,202

Int. Cl.<sup>4</sup> B65D 83/14

U.S. Cl. 222—130

8 Claims



1. An apparatus for developing an internal pressure within a dispensing system adapted to dispense a flowable product and for introducing a gas into the product to be dispensed which comprises:

an inflatable bag with at least two chambers being substantially impervious to the flowable product to be dispensed which includes a pressurizing gas phase chamber and an integral product gas phase chamber separate and isolated therefrom, said pressurizing gas phase chamber including

therein gas generating components which upon admixing generate gas and increase the number of moles of gas present in said pressurizing gas phase, said gas pressurizing phase chamber walls being non-gas permeable, said product gas phase chamber including therein gas generating components which upon admixing generate gas and increase the number of moles present in said product gas phase, and

means for transferring said product gas phase from said separate compartment into the flowable product to be dispensed from the dispensing system.

4,679,707

#### POST-MIX BEVERAGE DISPENSER APPARATUS HAVING FRONT ACCESS FOR LOADING SYRUP, CO<sub>2</sub> AND WATER

Jason K. Sedam, Dunwoody, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

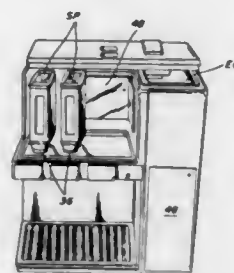
Division of Ser. No. 634,044, Jul. 24, 1984, Pat. No. 4,497,348, which is a continuation of Ser. No. 320,476, Nov. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 277,806, Jun. 26, 1981, Pat. No. 4,357,284. This application Feb. 4, 1985, Ser. No. 697,899

The portion of the term of this patent subsequent to Jan. 15, 2001, has been disclaimed.

Int. Cl.<sup>4</sup> B67D 5/56

U.S. Cl. 222—129.1

8 Claims



1. A self-contained, portable post-mix, carbonated beverage dispenser apparatus for use on a counter top comprising:

- a cabinet having front, side, back, top and bottom walls and a base for supporting the cabinet on a counter top;
- a self-contained refrigeration means disposed within said cabinet;
- a carbonator including a carbonator tank for holding a supply of water to be carbonated;
- a manually refillable water reservoir, separate from, but coupled in fluid communication with said carbonator tank, said reservoir being disposed within the cabinet in a substantially non-removable manner for supplying water to said carbonator tank, said water reservoir having an upwardly facing entrance opening means contiguous to said front and side walls and accessible through said top wall for receiving a manually introduced water supply so that water can be manually poured into said reservoir without removing said reservoir from said cabinet and without repositioning said cabinet on said counter top;
- at least one replaceable flavor concentrate container disposed contiguous to said front wall;
- at least one replaceable CO<sub>2</sub> cylinder disposed contiguous to said front wall for supplying CO<sub>2</sub> gas to said carbonator tank;
- access means for the water entrance opening means, flavor concentrate container, and CO<sub>2</sub> cylinder, permitting water, flavor concentrate containers and CO<sub>2</sub> cylinders to be introduced into said cabinet at positions contiguous to the front wall thereof; and
- a dispensing station at said front wall for delivering a post-mix, carbonated beverage formed from a mixture of flavor concentrate and carbonated water.

4,679,708

#### UNIFORM MATERIAL DISCHARGE APPARATUS

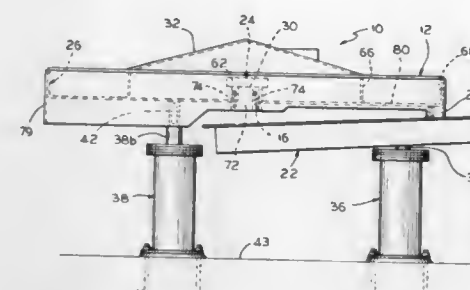
James F. Spence, Elgin, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Jan. 15, 1986, Ser. No. 818,973

Int. Cl.<sup>4</sup> B67D 5/64

U.S. Cl. 222—161

10 Claims



- A material discharge apparatus, comprising: a hopper having a material supporting surface and defining an opening; means for vibrating said hopper to move material in a substantially horizontal flow path along said supporting surface toward said opening; means for discharging material through said opening at a preselected uniform rate, said means for discharging material limiting material discharge to no more than said preselected uniform rate independent of the rate at which material actually reaches said opening, said discharging means having recirculating means with an upwardly facing surface situated over said opening and an edge which intercepts material moving in said horizontal flow path; and means are provided for changing the vertical location of said edge, whereby material moving in said hopper in said flow path below said edge flows into the opening and material moving in said hopper in said flow path above said edge is directed by the surface on the recirculating means over the opening and back into the horizontal flow path.

4,679,709

#### DISPENSER MOUNTING SYSTEM

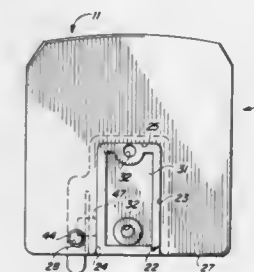
James W. Poitras, Holliston, and Edwin W. Wlodyka, Ashland, both of Mass., assignors to Highland Laboratories, Ashland, Mass.

Filed Jun. 12, 1985, Ser. No. 743,941

Int. Cl.<sup>4</sup> B67D 5/06

U.S. Cl. 222—180

19 Claims



- A liquid dispenser comprising: container means comprising a bowl for retaining a liquid to be dispensed and a mounting plate portion demountably retaining said bowl and having a downwardly, forwardly and rearwardly opening slot defined by a slot edge means,

a front surface bounding said slot, and a rear surface adapted to be juxtaposed to a support surface; and bracket means comprising a body portion with a back surface for engaging the support surface and defining openings for fasteners for securing said bracket means to the support surface, wall means extending transversely to the support surface, and skirt means projecting from said wall means and spaced from and substantially parallel to the support surface; said wall means engaging said slot edge means so as to provide vertical support for said plate portion, and said skirt means and the support surface engaging said front surface and said rear surface, respectively, so as to provide horizontal support for said plate portion, and wherein said openings are juxtaposed to and accessible via said slot.

4,679,710

#### HOT MELT FOAM ADHESIVE SYSTEM

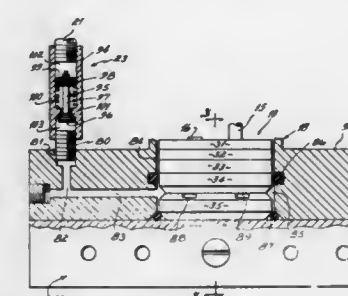
Calvin R. Jameson, and Dario J. Ramazzotti, both of Atlanta, Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Jun. 22, 1981, Ser. No. 276,044

Int. Cl.<sup>4</sup> F01C 1/14; F04C 15/04

U.S. Cl. 222—190

8 Claims



- Apparatus for dispensing a foamed adhesive or sealant material, said apparatus comprising, a pump, means for supplying said material in a liquid state to said pump; a source of gas, means for supplying gas from said source to said pump such that said pump is operable to agitate said liquid material in the presence of the gas so as to distribute said gas throughout said liquid material and to pressurize said liquid material and gas to place said gas into solution with the liquid material, and means for dispensing said liquid material and gas solution at a pressure below the solution maintenance pressure of said gas and liquid material solution whereby the gas is released from solution as said liquid forms a foam, said means for supplying gas to the pump including a check valve for preventing the back flow of liquid material from said pump to the source of said gas, and said check valve being located above the horizontal plane of said pump such that liquid material cannot flow by gravity from said pump into said check valve.

4,679,711

#### MULTI-ORIFICE ZERO CAVITY NOZZLE DISPENSER

Larry C. Trevathan, Westlake, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sep. 11, 1985, Ser. No. 774,656

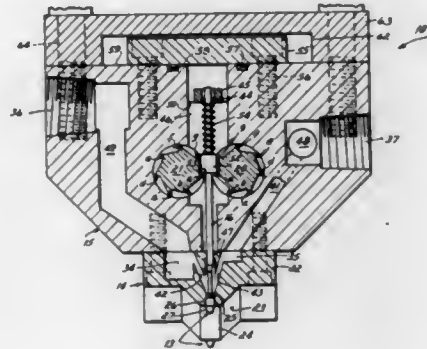
Int. Cl.<sup>4</sup> B67D 5/34

U.S. Cl. 222—330

6 Claims

- A device for dispensing multiple closely spaced streams of liquid comprising a nozzle having a plurality of parallel axial bores therein, each of said axial bores having a valve seat located therein,

each of said axial bores terminating in an outlet orifice located downstream of said valve seat, a plurality of axially movable valve needles, one of said axially movable valve needles being located within each of said bores, each of said valve needles having a valve section formed thereon, said valve section of each of said valve needles being engageable with the valve seat of the bore within which said valve needle is located, a cam surface on each of said valve needles,



oscillatable actuator means engageable with said cam surface of each of said valve needles to control opening and closing movement of said valve needles relative to said valve seats of the bores within which said valve needles are located, adjusting means for selectively adjusting the number and location of said axially movable needle valves simultaneously engaged and actuated by said actuator means, said adjusting means comprising a rotatable cam, and said actuator means comprising a motor for effecting oscillation of said rotatable cam.

4,679,712

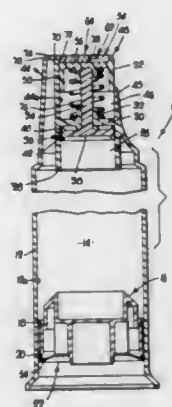
## ORIFICE COVER SLIDE ACTUATOR LOCK FOR VISCOUS PRODUCT DISPENSER

Donald D. Foster, and David G. Moore, both of Lee's Summit, Mo., assignors to Realex Corporation, Kansas City, Mo.  
Filed Feb. 25, 1985, Ser. No. 705,240

Int. Cl. B67D 5/40

U.S. Cl. 222-384

5 Claims



1. In a dispensing pump having a discharge spout and a depressible actuator adjacent the spout for operating the pump, the improvement comprising:  
a locking cover shiftably carried by said actuator for movement relative to the latter between an open position opening the spout and a closed position closing the spout, said cover being disposed when in said open position to clear

the spout for unimpeded depression of the actuator and when in said closed position to overlie the spout and lock the actuator against depression, said actuator being provided with means adjacent the upper extremity thereof defining a transverse guide track with respect to the path of travel of the actuator during depression thereof, said cover being slidably received in said track for movement between said open and closed positions thereof, the pump including a tubular body having a primary product chamber and a secondary pumping chamber for communication with the primary chamber, said spout being disposed for communication with the primary chamber, and said secondary chamber having a reciprocable pumping piston therein coupled with the actuator for movement therewith during depression of the actuator.

4,679,713

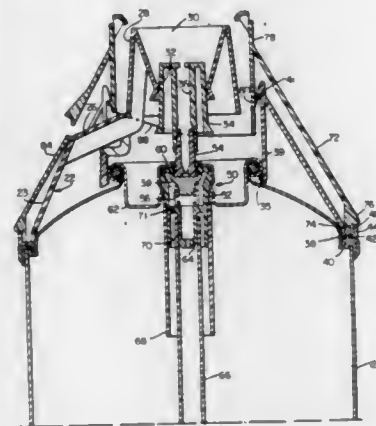
## VALVE ACTUATOR

James R. Crapser, and Edward J. Malek, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.  
Filed Apr. 18, 1985, Ser. No. 724,390

Int. Cl. B65D 83/14

U.S. Cl. 222-402.13

14 Claims



1. A valve actuator for use with an aerosol container and comprising:  
a cap mountable on the discharge end of the container and having a movable operating member adapted to shift a valve member carried by the container from normal valve closed position to open position to allow discharge of the container contents; and  
actuator means supported exterior of said cap for movement relative thereto and having a surface for engaging and operating said operating member as said actuator means is moved from a first to a second position, wherein said surface on said actuator means is inclined relative to a surface of said operating member to cam the same into valve opening position when said actuator means is moved from said first position to said second position and to release said operating member when said actuator means is moved from said second position to said first position, whereby said operating member can be manually shifted into said valve opening position when said actuator means is in said first position and whereby said operating member remains in said valve opening position so long as said actuator means is in said second position.

4,679,714

## UNIT DOSE LIQUID DISPENSER

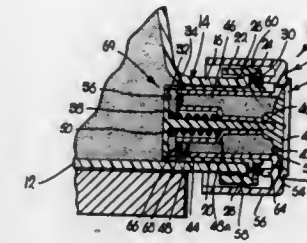
William S. Blake, Linwood, N.J., assignor to Realex Corporation, Kansas City, Mo.

Filed Nov. 13, 1984, Ser. No. 670,313

Int. Cl. G01F 11/38

U.S. Cl. 222-449

1 Claim U.S. Cl. 222-517



1. A metering device for use in dispensing successive, equal-size doses of liquid product from the neck of a container on which the device is mounted, said device comprising:  
a first body adapted to be immovably received within the neck of the container;  
a second body telescopically coupled with said first body for alternate disposition in a filling position and an axially shifted discharge position, said bodies cooperating to define a dosage accumulation chamber fillable during disposition of the second body in said filling position and dischargeable during placement of the second body in said discharge position, said bodies having an inlet valve at a normally inner end thereof adapted to open when said second body is in said filling position and close when the second body is in said discharge position, said bodies further having an outlet valve at a normally outer end thereof adapted to open when said second body is in said discharge position and close when the second body is in said filling position, said second body having an externally disposed, manually actuatable skirt spaced radially outwardly from said chamber for manipulation by a user in moving the second body between said filling and discharge positions thereof; and  
means for yieldably biasing said second body toward one of said positions thereof, said outlet valve including an annular seat on one of said bodies and a stopper on the other of said bodies having an annular surface sealingly engaging said seat when the second body is in said filling position and axially spaced from said seat when the second body is in said discharging position, said stopper being on said first body and said seat being on the second body, said first body being provided with a normally inner end having a centrally disposed stem projecting axially therefrom in the direction of said outlet valve, said stopper being carried by said stem at a termination thereof remote from said inner end of the first body, said second body being provided with a normally inner end having a centrally disposed sleeve projecting axially therefrom in reciprocable, surrounding relationship to said stem, said stem having a coil spring encircling the same within said sleeve and trapped between a shoulder on said sleeve and means on said first body for yieldably biasing the second body toward said filling position.

4,679,715

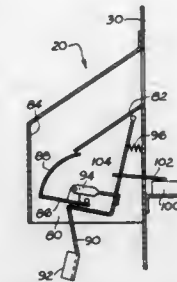
## ICE CUBE DISPENSING OUTLET

Donald G. Hovinga, Mason City, Iowa, assignor to Schneider Metal Manufacturing Co., Mason City, Iowa

Filed Sep. 6, 1985, Ser. No. 773,479

Int. Cl. B67D 3/00, 5/62

5 Claims



1. An ice cube dispensing apparatus comprising:  
(a) a dispensing chute having a pair of opposed side walls, a floor, a front panel, and an outlet defined between the floor and front panel;  
(b) a segment shaped outlet door having an outer surface which normally closes the outlet, said door being pivotally mounted to the side walls at a radial centerpoint of the door;  
(c) a manual door opener having a pivotal mounting to the dispensing apparatus and a cup receptive abutment thereon below the door enabling the door opener to be pushed in a first direction away from the front panel and pivotally about the pivotal mounting;  
(d) means connecting the door opener to the door for opening the door when the abutment is pushed in said first direction;  
(e) a spring biasing the door opener in a second direction opposite to said first direction and the door to its closed position;  
(f) an ice cube dispensing switch means for operating a motor in the dispensing apparatus; and  
(g) means on the door for operating the switch means when the door is open.

4,679,716

## NEEDLE ORGNIZER

Marilyn Layton, 2320 SW. 46th Ter., Fort Lauderdale, Fla. 33317

Continuation of Ser. No. 617,661, Jan. 4, 1984, abandoned. This application Oct. 28, 1985, Ser. No. 792,179

Int. Cl. A41H 31/00

U.S. Cl. 223-109 R

7 Claims



1. An organizer for selective use of a plurality of needles threaded with floss or threads of different colors comprising:  
(a) frame means acutely angular in cross section and fixed in a rigid position, thereby providing an angular space, said frame means being formed by first and second planar sections, said planar sections connected together along one edge to form said acute angle, said first planar section being an organizer supporting segment which lies in a horizontal position upon a support surface, said second planar section being a means for displaying indicia, said



means for displaying readily visible to a user when said organizer is placed upon a support surface;

(b) an elongate solid pin cushion of substantially uniform cross section throughout substantially its entire length, constructed of a material capable of manually receiving needles in the external surface thereof,

said cushion being confined within said acutely angular frame in the rear of said organizer, said cushion being generally hidden from sight of a user behind said second planar section when said organizer is placed upon a support surface.

4,679,717

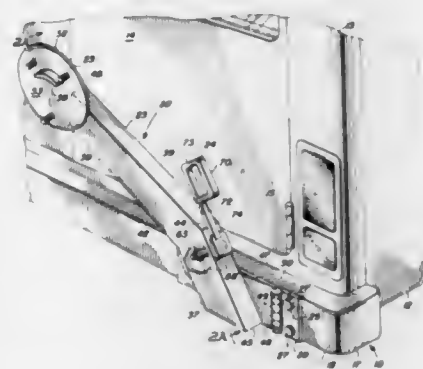
## SPARE TIRE CARRIER

Dale G. Hansen, HC Box 14B, Star Valley, Ariz. 85541  
Filed Mar. 16, 1984, Ser. No. 590,470

Int. Cl.<sup>4</sup> B62D 43/00

U.S. Cl. 224—42.06

7 Claims



1. A spare tire carrier for use in combination with a vehicle, which vehicle includes
  - a. an upright body panel, and
  - a frame member extending along said body panel and having a face surface,
  - and for detachably supporting a spare tire, which spare tire includes
    - a central hub opening, and
    - a plurality of attachment openings spaced about said hub opening,
  - and for supporting said tire for movement about an upright axis with the stress therefrom borne by said frame member, said spare tire carrier comprising:
    - a. a mounting bracket securable to said frame member;
    - b. a support arm having
      - i. a first end hingedly coupled to said mounting bracket for rotation of said support arm about an upright axis, and
      - ii. a free end having attachment means for detachable securement of said spare tire;
    - c. latch means for selectively retaining said support arm in a normal position in which said spare tire is substantially parallel with said body panel, said latch means comprising
      - i. a latch plate carried by said frame member and having an opening therein; and
      - ii. a bolt carried by said support arm and receivable within the opening of said latch plate when said spare tire is in said normal position;
    - d. biasing means normally urging said bolt in a first direction to penetrate the opening within said latch plate;
    - e. release means for selectively moving said bolt in a second direction to withdraw said bolt from the opening within said latch plate, said release means comprising

- i. a lever having a fixed end coupled with said bolt and a free end defining a handle, and
- ii. a fulcrum carried by said support arm intermediate the ends of said lever, said lever being rotatable about said fulcrum in response to pressure applied to said handle for moving said bolt in said second direction.

4,679,718

## CUTTER FOR DISPENSING CONTAINER AND DISPENSING CONTAINER PROVIDED WITH SAID CUTTER

Hisao Kai, Chiba; Kensuke Ochiai, Tokyo, and Takeshi Niisato, Saitama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

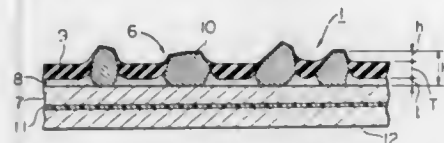
Filed Mar. 24, 1986, Ser. No. 843,471

Claims priority, application Japan, Mar. 25, 1985, 60-58279; Mar. 25, 1985, 60-58280

Int. Cl.<sup>4</sup> B65D 85/672

U.S. Cl. 225—48

16 Claims



1. A cutter for dispensing container, characterized by having a file-like coarse surface formed on the surface of a foldable substrate by fast adhesion of irregular granules to the surface of said substrate with a soft adhesive agent covering said irregular granules, said soft adhesive agent having an elongation of 130 to 700%, as measured in accordance with ASTM D-882.

4,679,719

## ELECTRONIC CONTROL FOR A PNEUMATIC FASTENER DRIVING TOOL

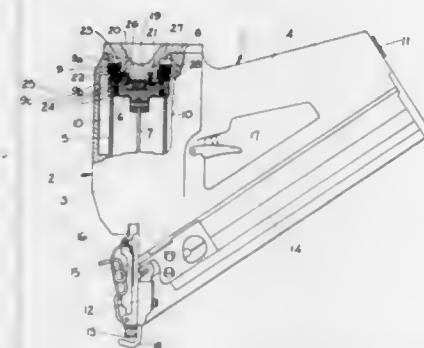
Francis J. Kramer, Edgewood, Ky., assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Dec. 27, 1985, Ser. No. 814,189

Int. Cl.<sup>4</sup> B25C 1/06

U.S. Cl. 227—5

36 Claims



1. A pneumatic fastener driving tool and an electronic control system therefor, said tool comprising a body containing a cylinder and a piston, a driver mounted on said piston, a firing valve above and normally closing the upper end of said cylinder, a reservoir connected to a source of air under pressure, a volume above said firing valve, said volume being connectable to said reservoir such that air under pressure from said reservoir maintains said firing valve closed, said volume being connectable to exhaust to open said firing valve and permit air under pressure to enter said cylinder above said piston and to cycle said tool, said volume normally being connected to said reservoir, a manual trigger, a workpiece responsive trip, a

magazine and a plurality of fasteners within said magazine, said electronic control system comprising a solenoid actuated valve and a solenoid therefor, said solenoid actuated valve being ported to connect said volume above said firing valve to exhaust when said solenoid is actuated, control circuit means having an output connected to said solenoid to actuate said solenoid, said control circuit having inputs at least from said manual trigger and said workpiece responsive trip, said control circuit means being operative to determine the mode of operation of said tool, to interpret said inputs and to generate an output to said solenoid when said inputs satisfy said mode of operation.

4,679,720

## MASS SOLDERING SYSTEM PROVIDING A SWEEPING FLUID BLAST

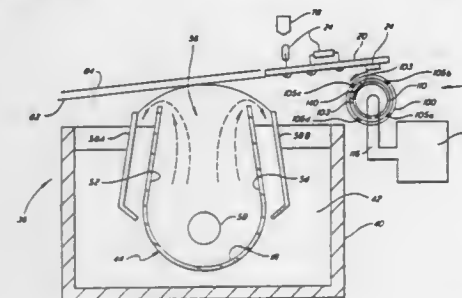
A. Victor Sedrick, Jr., Goffstown, N.H., and Charles R. Lowell, Concord, Mass., assignors to Hollis Automation, Inc., Nashua, N.H.

Filed Oct. 23, 1986, Ser. No. 922,184

Int. Cl.<sup>4</sup> H05K 3/34

U.S. Cl. 228—20

14 Claims



1. An apparatus for mass joining with solder electrical and electronic components assembled on a circuit board wherein said components have leads which protrude therefrom, and comprising in combination: a wave soldering station adapted to provide a wave of molten solder; means for transporting said circuit board across said solder whereby a quantity of molten solder may be deposited onto said circuit board underside and said protruding leads; and an excess solder removal station adjacent said wave soldering station, said excess solder removal station adapted to impinge a sweeping fluid blast of continuously varying angle of impingement directed towards the solder wave onto the bottom surface of the board sufficiently soon after it leaves the solder wave so that the solder is still molten, the sweeping fluid blast having sufficient velocity to remove essentially all bridges and shorts but not sufficient velocity to adversely affect properly wetted joints, whereby each portion of the bottom surface of the board may be subjected to a sweeping fluid blast from a plurality of different angles, said excess solder removal station comprising a first fixedly positioned inner tubular shell having at least one inlet and having an open slot directed toward the point where said boards exit said wave, and a second rotatably mounted outer tubular shell having a plurality of elongate spaced slots formed therein, means for rotating said outer tubular shell and fluid supply means for connection to said inlet, said outer tubular shell encompassing and rotating about said inner tubular shell such that fluid emanating from said inner tubular shell will be directed by the open portion of the inner tubular shell through the slot of the outer shell to form a sweeping fluid blast.

4,679,721

## APPARATUS FOR FUSE-BONDING ARTICLES

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Tokyo, Japan

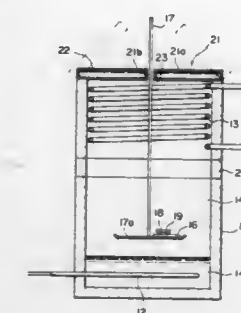
Filed Sep. 16, 1986, Ser. No. 908,025

Claims priority, application Japan, Sep. 17, 1985, 60-203343; Sep. 17, 1985, 60-203344

Int. Cl.<sup>4</sup> B23K 1/08

U.S. Cl. 228—40

8 Claims



1. An apparatus for bonding first and second articles maintained in a predetermined relative position with a fusible bonding agent provided therebetween, comprising:
  - a closed vessel for containing a heat transfer liquid such that a space is defined above the liquid level of said heat transfer liquid, said heat transfer liquid having a boiling point higher than the melting point of said bonding agent;
  - heating means provided in said vessel for heating said heat transfer liquid within said vessel to a temperature higher than the boiling point of said heat transfer liquid so that vapors of said heat transfer liquid fill said space in said vessel;
  - a cooler provided in an upper portion of said space for condensing vapors of said heat transfer liquid;
  - entrance and exit port means provided in said vessel for communication with said space and designed to permit the passage of said first and second articles together there-through;
  - means for conveying said first and second articles along a predetermined path through said space via said entrance and exit port means; and
  - closure means provided adjacent to said entrance and exit port means and moveable for opening and closing said entrance and exit port means, said closure means being provided with cooling means therein for condensing the vapors of said heat transfer liquid.

4,679,722

## METHOD AND APPARATUS FOR WELDING TWO PIPES ALONG THEIR LINE OF PENETRATION

Werner Fliedt, Geesthacht, and Hans Noll, Leverkusen, both of Fed. Rep. of Germany, assignors to Klöckner Wilhelmsburger GmbH, Geesthacht, Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 806,633

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444820

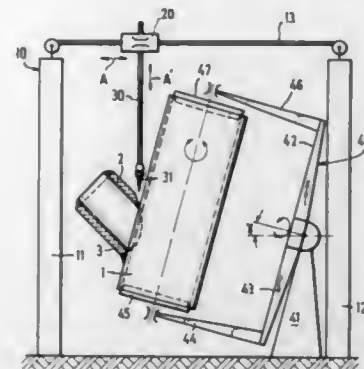
Int. Cl.<sup>4</sup> B23K 31/00

U.S. Cl. 228—168

3 Claims

1. A method of welding a secondary pipe to a primary pipe using a vertically-downwardly extending electric welding burner, the secondary pipe being welded to the primary pipe at an attachment point located between opposite ends of the primary pipe and such that the secondary pipe will extend at an angle  $\alpha$  relative to an imaginary central axis which extends through the primary pipe, the method comprising the steps of (1) cutting an attachment end of said secondary pipe such that the contour thereof generally conforms to the contour of the outer surface of said primary pipe along a line of penetration of said secondary pipe in the outer surface of said primary pipe at

said attachment point, (2) beveling the attachment end of said secondary pipe so that when the attachment end of said secondary pipe is positioned against the outer surface of said primary pipe at said attachment point, a continuous welding space will be provided therebetween, (3) positioning said secondary pipe relative to said primary pipe such that the attachment end of said secondary pipe abuts the outer surface of said primary pipe at said attachment point, (4) positioning both said primary pipe and said secondary pipe such that the downwardly-extending electric welding burner will be aimed at the weld-



ing space therebetween, (5) initiating operation of said welding burner, and (6) rotating said primary pipe about its imaginary axis, rotating said primary pipe end over end and moving said primary pipe about a horizontal axis spaced therefrom, while simultaneously moving said welding burner vertically upwardly and downwardly and horizontally, so that said welding burner will continuously aim into said weld space as said primary pipe is rotated and will operate at a constant current strength, thus providing a continuous and optimum weld in said weld space.

4,679,723

#### METHOD OF SOLDERING THE OUTER SLEEVE OF A COAXIAL CABLE CONNECTOR TO A HOUSING

Ernst-Ludwig Velt, Solms, and Jürgen Klee, Braunsfels, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 828,117, Feb. 10, 1986, abandoned.

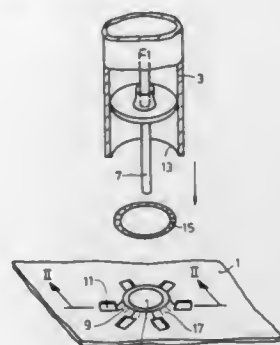
This application Oct. 22, 1986, Ser. No. 922,823

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1985, 3505616

Int. Cl.<sup>4</sup> B23K 31/02

U.S. Cl. 228—168

9 Claims



1. A method of soldering a metallic sleeve to a metal plate, around an opening in the plate, comprising forming a raised wall portion around the opening in the plate, so as to form a raised edge of the opening, placing a ring of wire solder around said wall portion, placing a sleeve, having a mounting surface at an end of the sleeve, with said mounting surface abutting the plate, such

that the sleeve surrounds said ring of solder and the solder is disposed in a trough defined by the sleeve, the plate, and the raised wall portion, and then melting said solder by heating it, and then permitting it to cool and solidify, thereby soldering said sleeve to said plate.

4,679,724

#### WATER-PROOF CONTAINER

Hiromichi Inagaki, 1-143, Aza Maedaomote Inuyama-shi, Aichi, Japan

Division of Ser. No. 745,875, Jun. 18, 1985, which is a division of Ser. No. 543,319, Oct. 19, 1983, Pat. No. 4,551,123. This application Oct. 4, 1985, Ser. No. 784,517

Int. Cl.<sup>4</sup> B65D 90/04

U.S. Cl. 229—4.5

7 Claims



1. A container comprising: a paper base member; a double-wall heat shrinkable plastic film covering the paper base member and having at least one portion heat sealed to close the paper base member entirely within the plastic film; and a lid connected to the base member for closing at least one open end of a container shape formed by the paper base member; the container being made by a method comprising: covering the paper base member with said heat-shrinkable plastic film having a pair of walls with a space therebetween, the paper base member being positioned between the walls and in the space; removing all air from the space between the walls to pull the walls of plastic film against the paper base member; sealing said at least one portion of the plastic film to close the space in an air tight manner after removing air from the space; forming the base member into the container shape having at least one open end; and covering the at least one open end with said lid to close the at least one open end of the container shape.

4,679,725

#### END CLOSURE LOCK

Jerry F. Wilson, West Monroe, La., assignor to Manville Sales Corporation, Denver, Colo.

Continuation of Ser. No. 577,108, Feb. 6, 1984, abandoned. This application Mar. 13, 1986, Ser. No. 846,826

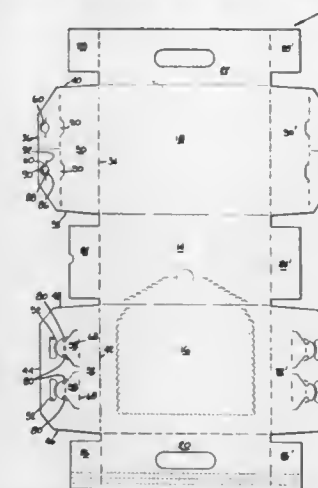
Int. Cl.<sup>4</sup> B65D 75/52

U.S. Cl. 229—40

4 Claims

1. A wrap-around sleeve style carrier comprising: a bottom panel, two side panels, and a top panel; two pairs of end panels hingedly joined to opposite ends of said side panels along fold lines to close the ends of said carrier, each pair of end panels comprising a first end panel and a second end panel, said first end panel having a primary locking means comprising two spaced apart locking tabs and a secondary locking means comprising two spaced apart locking openings, said first end panel further having slits extending outwardly from opposite sides of each locking opening at the widest part thereof, the slits extending in the general direction of said fold lines, said second end panel having a primary locking means comprising two spaced apart locking openings adapted to receive said primary locking tabs and a secondary locking means comprising two spaced apart punch locking tabs, each of said punch locking tabs having a head portion adapted to be punched through one of said secondary locking openings

and a tapered body portion hingedly joined at a base to said second end panel along a fold line and connected to said head portion through a neck portion, the width of the neck portion being less than the width of a secondary locking opening at the widest part thereof and the width of the head portion being less than the combined width of a secondary locking opening at the widest part thereof and the lengths of the slits extending therefrom, said tapered body portion having edges converging from adjacent the base of said tapered body portion to said neck portion, said head portion having edges extending outwardly from said neck portion which are adapted to engage the inside of the first end panel adjacent said secondary openings to prevent said punch tabs from pulling out of said secondary



openings, and said second end panel having two relief tabs on either side of each of said neck portions to facilitate the insertion of said punch tabs into said secondary openings, said relief tabs extending between said converging edges of said body portion and said edges of said head portion, said relief tabs being hingedly joined to said second end panel along fold lines extending from said converging edges of said body portion toward said edges of said head portion, and said first end panel at least partially overlapping said second end panel with said primary locking tabs engaged in said primary openings and said secondary male punch tabs extending over said first end panel and engaged in said secondary openings to lock the end panels together.

4,679,726

#### END CLOSURE STRUCTURE FOR AN END LOADING CARTON

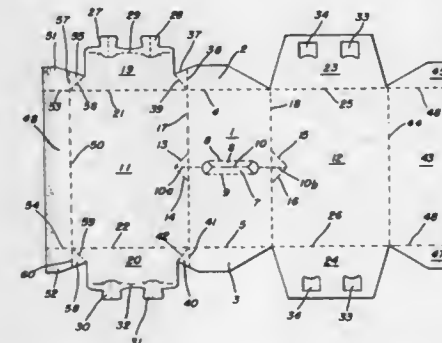
James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 17, 1986, Ser. No. 820,524

Int. Cl.<sup>4</sup> B65D 5/08

U.S. Cl. 229—138

8 Claims



1. End closure means for an end loading carton having

foldably joined top bottom and side walls forming a tubular structure, said closure means comprising a pair of closure flaps foldably joined to an end edge of said bottom and said top walls respectively, a pair of closure panels foldably joined to corresponding end edges of said side walls respectively, foldable web structure foldably joined to a side edge of each of said closure flaps and to the adjacent side edge of one of said closure panels to form interconnections therebetween, the other of said closure panels being folded inwardly to its end closing position and said one of said closure panels being folded outwardly so as to impart a closing force inwardly to said closure flaps through said webs to move said closure flaps toward closed positions overlapping said other closure panel following which said one closure panel is closed into overlying relation with said web structures and into overlapping relation with said closure flaps and said other closure panel, and adjoining means securing said closure panels and said closure flaps together.

4,679,727

#### THERMOSTATIC STEAM TRAP WITH SELF-CENTERING VALVE

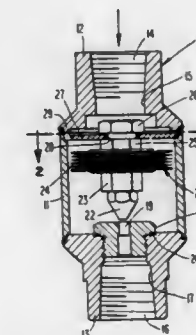
Thomas Aleson, Plains, Pa., assignor to Nicholson Division, Datron Systems, Inc., Wilkes-Barre, Pa.

Filed Aug. 13, 1986, Ser. No. 896,054

Int. Cl.<sup>4</sup> F16T 1/10

U.S. Cl. 236—56

2 Claims



1. A thermostatic steam trap comprising a hollow body having an inlet opening, an outlet opening, a valve seat formed in the outlet opening, a valve adapted to seal the outlet opening in cooperation with the valve seat, thermostatic actuating means adapted to move the valve into and out of sealing contact with the valve seat, and a baffle contained within the hollow body and adapted to intercept the flow of steam entering the inlet opening and to prevent said steam flow from taking a direct course between inlet and outlet openings, characterized by a cylindrical portion forming part of said hollow body, said cylindrical portion and remaining portions of said hollow body being so configured as to support a baffle in the form of a solid circular plate transversely of the cylindrical portion proximate to said inlet opening and so as to permit slight transverse and axial movement of said plate, said plate having formed therein a central opening so configured as to engage and retain said thermostatic actuating means in a position permitting said actuating means to axially move towards and away from said outlet opening, and also permitting said actuating means slight transverse and axial movement with respect to said plate, said thermostatic actuating means having said valve rigidly attached thereto, whereby upon operation of said actuating means to effect sealing contact of the valve with the valve seat, the valve is concentrically aligned with the valve seat by the relative motion between the hollow body, circular plate and thermostatic actuating means, said circular plate having additionally formed upon its peripheral edge a plurality of nonarcuate segments, thereby forming spaces between said segments and the adjacent inner surface of the



cylindrical portion, whereby steam entering said inlet portion is diverted from directly impinging upon said thermostatic actuating means and indirectly passed to said outlet opening.

4,679,728

## ELECTRICAL CONTROL UNIT

Mark Gregory, Coventry, England, assignor to Potterton International Limited, London, England

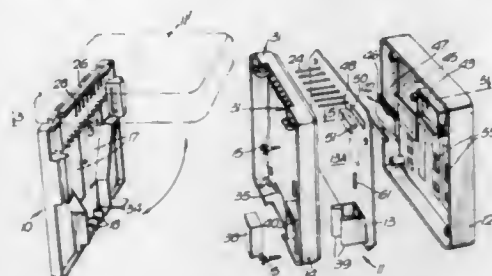
Filed Aug. 24, 1983, Ser. No. 525,990

Claims priority, application United Kingdom, Aug. 31, 1982, 8224857

Int. Cl.<sup>4</sup> H01H 9/26; H05K 1/14

U.S. Cl. 237-1 R

14 Claims



1. An electrical control unit comprising a backplate for mounting on a surface such as a wall, and a housing for electrically operated control circuits, the backplate having means for terminating external electrical connections at a plurality of positions, the housing being removably secured on the backplate and having means for electrically connecting the control circuits with at least some of the terminations on the backplate upon mounting the housing on the backplate, and the terminations on the backplate having a cover and means for selectively moving said cover member when said housing is removed from said backplate between positions in which, in a first position, even with the housing mounted on the backplate, the terminations are accessible externally of the unit, and in a second, operative position the terminations are covered by said cover plate and inaccessible externally of the assembled backplate housing.

4,679,729

## APPARATUS AND METHOD FOR REGULATING FLOW AND TEMPERATURE IN A CENTRAL HEATING INSTALLATION

Robert Petitjean, Limal, Belgium, and Bo G. Eriksson, Borås, Sweden, assignors to Tour & Andersson AB, Johanneshov, Sweden

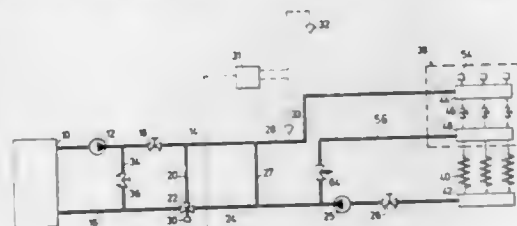
Filed Apr. 18, 1986, Ser. No. 853,470

Claims priority, application Sweden, Apr. 29, 1985, 8502062-6

Int. Cl.<sup>4</sup> F24D 3/00

U.S. Cl. 237-8 R

10 Claims



1. A method of regulating the flow and the temperature in a central heating installation, including a feed water pipe (14, 28) from a heat source (10), a heating circuit comprising a control and distributing unit (38) having an inlet chamber (44) connected to the feed pipe and provided with a plurality of outlets, a plurality of heating coils (40, 40', 40'') issuing from said inlet

chamber by way of said outlets, a collecting unit (42) for said coils, a return water pipe (24, 16) for returning water from the coils to the heat source (10), water circulating means (12, 25), water transfer means (27) for transferring part of the return water flow to the inlet side of the heating coils (40, 40', 40''), flow volume in the separate coils being limited by means of valves (54, 54', 54'', 62, 62', 62''), the improvement being that a portion of the return water is returned to a mixing chamber (48) positioned between the inlet chamber and the coils and the feed water flow for each individual coil (40, 40', 40'') from each of said outlets (52, 52', 52'') passes through said mixing chamber (48) where a portion of the return water mixes with the feed water for each individual coil, thus separately adjusting the inlet temperature for each individual coil (40, 40', 40'') and maintaining at least an approximately constant flow through each coil.

4,679,730

## HEATER FOR WARMING AN OPERATOR OF A VEHICLE

Goroh Uchida, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

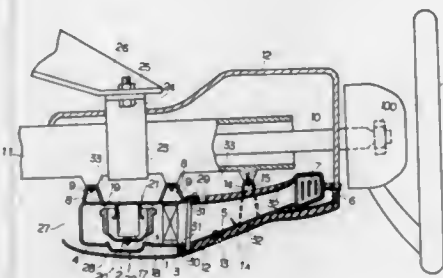
Filed Jan. 31, 1985, Ser. No. 697,023

Claims priority, application Japan, Apr. 10, 1984, 59-71427

Int. Cl.<sup>4</sup> B60H 1/02

U.S. Cl. 237-12.3 R

17 Claims



1. A heating apparatus for warming an operator of a vehicle comprising:  
 a steering wheel;  
 a steering shaft connected to said steering wheel and rotating with angular displacements of the steering wheel;  
 a steering column supported by a vehicle body and substantially enclosing the steering shaft therein;  
 a steering column cover enclosing the steering shaft and a portion of the steering column therein, an interval being defined between the steering column and the steering column cover, the steering column cover including at least one opening;  
 a casing mounted on the steering column and located within said interval without contacting the steering column cover, and including an inlet and an outlet, a space being defined between said casing and said steering column cover;  
 a blowing means located within said casing;  
 a heating means located within said casing such that said blowing means and said heating means are enclosed by the casing as one unit, said unit being easily attached to the steering column, while transmitting no vibration or heat to the steering column cover; and  
 a duct having an inlet, an outlet and an intermediate portion, said duct being located within said interval, said inlet of said duct being in communication with said outlet of said casing, said outlet of said duct being in communication with said at least one opening of said steering column cover, said intermediate portion of said duct being cov-

ered by insulation material, whereby vibration and heat are not transmitted to the steering column cover.

4,679,731

## RAILWAY TRACK STRUCTURE AND A METHOD OF BUILDING SUCH STRUCTURE AND BAGS FILLED WITH BALLAST MATERIAL

Karl Klugar, Graz, Austria, and Gerardus P. T. M. Van Santvoort, Elst, Netherlands, assignors to Akzo nv, Arnhem, Netherlands

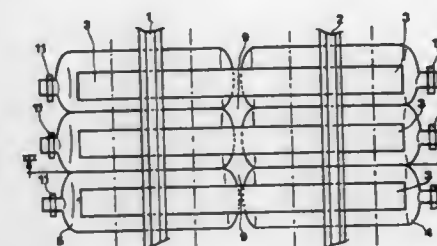
Continuation of Ser. No. 539,383, Oct. 6, 1983, abandoned. This application Jan. 23, 1986, Ser. No. 824,921

Claims priority, application Netherlands, Oct. 6, 1982, 8203871

Int. Cl.<sup>4</sup> E01B 1/00

U.S. Cl. 238-2

22 Claims



1. A railway track structure formed of at least a pair of rails which are fastened to a plurality of mutually separated sleepers extending in transverse direction of the rails, which are via the sleepers supported on a bed of ballast material, characterized in that each sleeper is supported by and fastened to at least one supporting element comprising a closed bag at least substantially filled with hard ballast material such as pebbles, broken stone and/or sand, which bags mainly form the load-bearing portion of said bed of ballast material.

4,679,732

## VECTORABLE EXHAUST NOZZLE FOR A GAS TURBINE ENGINE

Clifford S. Woodward, Bristol, England, assignor to Rolls-Royce plc, London, England

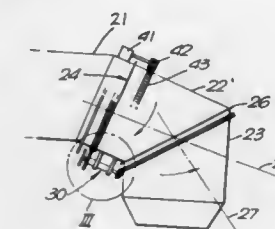
Filed Jul. 31, 1985, Ser. No. 760,767

Claims priority, application United Kingdom, Aug. 16, 1984, 8420799

Int. Cl.<sup>4</sup> B64C 15/00

U.S. Cl. 239-265.35

8 Claims



1. A vectorable exhaust nozzle for a gas turbine engine comprising:  
 a first duct;  
 a rotatable second duct having an upstream end substantially parallel with a downstream end of the first duct;  
 a first bearing means for attaching the downstream end of the first duct to the upstream end of the second duct to allow the second duct to be rotatable about a longitudinal axis perpendicular to the plane of the first bearing means, the second duct terminating at a downstream end in a

plane which lies at an acute angle  $\alpha$  to the longitudinal axis;

a rotatable third duct having an upstream end substantially parallel with the downstream end of the second duct and terminating in an orifice from which an exhaust gas stream issues;

a second bearing means for attaching the downstream end of the second duct to the upstream end of the third duct to allow the third duct to be rotated about an axis perpendicular to the plane of the second bearing means;

actuating means for rotating the second duct;

and epicyclic transmission means mounted on and rotatable with the second duct comprising: a first input member operable to drive the epicyclic gear train when the second duct is rotated, a first co-operating means, including a member fixed to the first duct, adapted to drive the first input member, an output member operable to be driven by the epicyclic gear train, a second co-operating means including a member fixed to the third duct adapted to be driven by the output member and thereby rotate the third duct in an opposite direction to rotation of the second duct and simultaneously therewith, and a third co-operating means operable on a second input member adapted to also drive the epicyclic gear train and thereby vary the velocity ratio between the first input member and the output member as a function of an angle  $\theta$  through which the second duct is rotated by the actuating means.

4,679,733

## TWO-FLUID NOZZLE FOR ATOMIZING A LIQUID-SOLID SLURRY

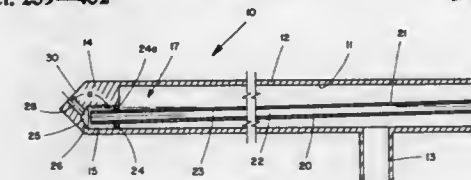
Charles W. Lipp, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1986, Ser. No. 839,254

Int. Cl.<sup>4</sup> B05B 7/00, 7/14

U.S. Cl. 239-432

8 Claims



1. A two-fluid mixing nozzle which comprises:  
 (a) an elongated first conduit for the flow of a gas through said nozzle, said gas being introduced into the distal end or portion of said first conduit and discharged from the proximate end of said first conduit into a dispersion chamber, said first conduit including a reduced portion, said reduced portion (1) having a cross-sectional area for flow which is less than the cross-sectional area for flow provided by that portion of said first conduit which is adjacent said reduced portion, (2) having a longitudinal axis which is angularly offset from the longitudinal axis of at least a portion of the remainder of said first conduit, and (3) terminating at its downstream end at said dispersion chamber;  
 (b) an elongated second conduit which has a portion thereof located within and substantially coaxial with the longitudinal axis of said reduced portion of said first conduit, said second conduit being for the flow, concurrently with the flow of said gas, of a liquid-solid slurry through said nozzle, said liquid-solid slurry being introduced into the distal end or portion of said second conduit and being discharged from the proximate end of said second conduit, said liquid-solid slurry discharge being into said dispersion chamber; and  
 (c) a third conduit in fluid communication with said dispersion chamber through which the dispersion formed in said dispersion chamber is discharged from said nozzle, said

third conduit being in oblique relationship with the longitudinal axis of said at least a portion of the remainder of said first conduit.

4,679,734

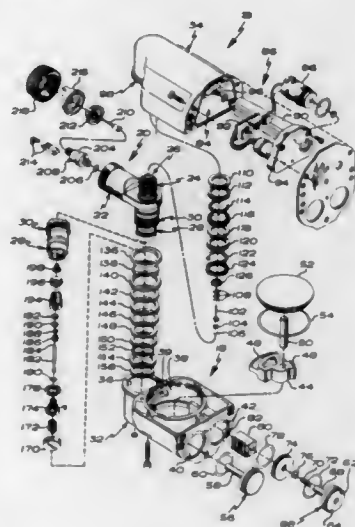
## ROBOT SPRAY GUN

Gordon V. Mommsen, Brooklyn Center, Minn.; Norman N. Fender, Monroe, Mich.; Stanley G. Karwowski, St. Paul, Minn.; William C. Scherer, Minneapolis, Minn., and Robert J. Lind, Robbinsdale, Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed Oct. 30, 1985, Ser. No. 792,907  
Int. Cl.<sup>4</sup> B05B 5/02, 15/08

U.S. Cl. 239—692

5 Claims



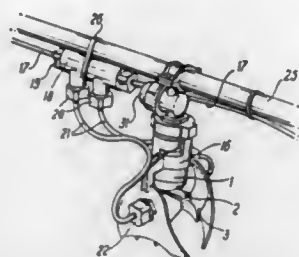
1. A spray gun for mounting on a robot, said spray gun comprising:
  - main housing comprising a fluid passage and a compressed air passage;
  - a spray head pivotably mounted to said main housing, said spray head being pivotable between at least first and second positions, said spray head comprising:
    - a shaft comprising first and second ends;
    - a compressed air passage in said first end;
    - a fluid passage in said second end; and
    - a nozzle assembly attached to said shaft intermediate said ends, said shaft ends rotatably pivoting in said main housing;
  - means for transferring fluid from said housing to said spray head through said shaft second end and comprising means sealing said main housing fluid passage and said spray head fluid passage in sliding communication with one another and in isolation from the atmosphere;
  - means for transferring compressed air from said housing to said spray head through said shaft first end and comprising means sealing said main housing air passage and said spray head air passage in sliding communication with one another and in isolation from the atmosphere;
  - an electrostatic power supply; and
  - means for transferring electrostatic potential from said power supply to said spray head through said shaft first end.

4,679,735  
ELECTROSTATIC SPRAYING APPARATUS  
Christopher C. Pay, Woodhall Spa, England, assignor to Crop Control Products Limited, Lincoln, England  
Filed Apr. 2, 1986, Ser. No. 847,238  
Claims priority, application United Kingdom, Apr. 3, 1985, 8508670

U.S. Cl. 239—708

Int. Cl.<sup>4</sup> B05B 5/02

11 Claims



3. A spraying apparatus for spraying a liquid, comprising:
  - spray nozzle means for directing a spray of a liquid,
  - at least one electrode disposed adjacent to a path of said liquid emerging from said nozzle said at least one electrode having an elongate configuration perpendicular to said path of liquid emerging from said nozzle,
  - barrier means disposed generally adjacent to each of said electrodes for minimizing contact of said spray with said electrodes said barrier means further comprising a plurality of pointed protuberances extending outwardly therefrom, and
  - housing means, having a plurality of pointed protuberances depending therefrom, for containing said electrodes therein, said housing means being removably secured to said barrier means by a support member having a plurality of radial baffles extending therefrom, said support member extending from a recess within said housing means.

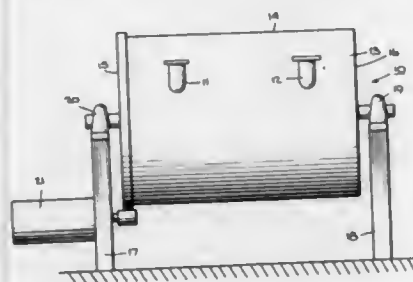
4,679,736  
ROTARY MILL AND A METHOD OF CHARGING THE MILL

John J. Orlando, Rivervale, N.J., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Mar. 15, 1985, Ser. No. 712,570  
Int. Cl.<sup>4</sup> B02L 23/02, 17/18

U.S. Cl. 241—25

12 Claims



1. A method for charging material under seal from the atmosphere to a batch-type grinding mill, said mill comprising a rotatably mounted shell having a peripheral wall, means to rotate the shell, a plurality of grinding media within the shell, said mill being operable under a predetermined environment and under seal from the atmosphere, the method comprising:
  - a. providing the mill with a charging system comprising: at least one charging orifice located in said shell and loading means sealably secured on the peripheral wall of the shell over each charging orifice respectively, each of said load-

- ing means comprising a loading conduit with a port of entry at one end and an exit port at the other end, the exit port being aligned and forming a passageway with each orifice respectively for charging material into the shell, and each of said loading means being disposed on the shell to have a substantially vertical loading position when located at the side of the mill with the port of entry essentially above the exit port, thereby providing substantially unencumbered charging path for charge material through the loading means into the shell, and each of said loading means being part of a loading assembly comprising in addition to said loading means a removable sealable plug member for insertion into the loading means in a sealed relationship therewith relative to the atmosphere, a removable, sealable charge tube assembly for insertion into the loading means in sealed relationship therewith relative to the atmosphere, and a loading conduit valve means for sealing the loading means from the atmosphere in the absence of sealing by the plug member and charge tube assembly, thereby permitting interchange of the removable plug and removable charge tube assembly without breaking the seal in the loading means with respect to the atmosphere; and
- b. charging material to the mill using at least one of said loading assemblies;
- c. sealing the plug member in the loading means;
- d. with the plug member sealed in the loading means, establishing the predetermined environment in the mill;
- e. positioning the shell so that the port of entry of the loading conduit is essentially above the exit port;
- f. opening the loading conduit valve;
- g. retracting the removable, sealable plug member to a sealed position in a retaining section above the loading conduit valve means;
- h. closing the loading conduit valve;
- i. replacing the removable, sealable plug member in the retaining section with the removable sealable charge tube assembly, the charge tube assembly containing the charge material under seal and now being in sealed relationship with the retaining section of the loading means;
- j. opening the loading conduit valve and releasing the seal in the charge tube assembly to flow from the charge tube assembly into the shell; and
- k. replacing the charge tube assembly with the plug member.

4,679,737  
GRINDING SUB-SAMPLING MILL AND METHOD FOR PREPARATION OF TEST SAMPLE  
Thomas R. Romer, Washington, Mo., assignor to Romer Labs, Inc., Washington, Mo.

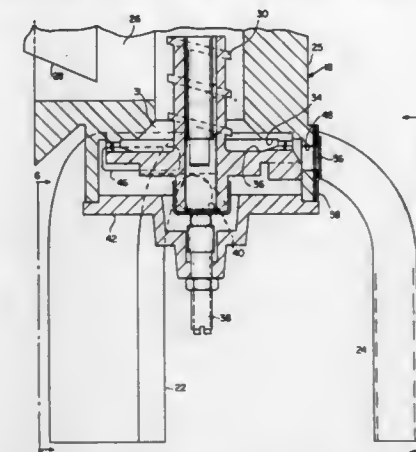
Filed Jun. 12, 1986, Ser. No. 873,678  
Int. Cl.<sup>4</sup> B02C 7/11

U.S. Cl. 241—29

10 Claims

1. Apparatus for uniformly grinding a solid foodstuff and obtaining a small representative sample thereof, said apparatus comprising hopper means for delivering discrete particles of said foodstuff to a planetary grinder, said grinder being comprised of a housing supporting a stationary grinder head and a rotary grinder head therein and means for introducing said foodstuff therebetween, said grinder heads being supported within a housing having a multiplicity of separate discharge outlets spaced about the periphery of the grinder heads, said outlets collectively forming a minor portion of the periphery, a major portion of the periphery being closed, one of said outlets having adjustment means for restricting the size of the outlet to provide discharge of a selected small percentage of uniformly ground and uniform composition foodstuff to a sample test collection receptacle, said grinder heads being in a horizontal plane to deliver ground foodstuff horizontally to

said discharge outlets, the entire grinder heads lying in a horizontal plane, said outlets being equidistantly spaced peripher-



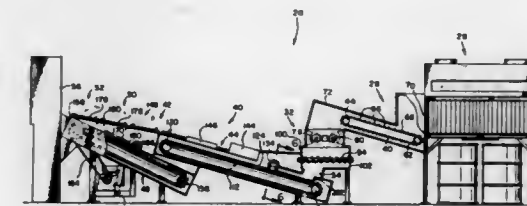
ally around said housing and aligned to bridge outside edges of said heads.

4,679,738  
CONVEYOR FOR SORTING RADIOACTIVE WASTE  
Anthony J. Prisco, Beverly, and Alfred N. Johnson, Voorhees, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1984, Ser. No. 648,833  
Int. Cl.<sup>4</sup> B02C 23/08

U.S. Cl. 241—101.2

17 Claims



1. An apparatus for detecting radioactive components in dry active waste, said apparatus comprising,
  - means for reducing the waste to pieces of substantially uniform size,
  - first and second conveyors and a housing for said conveyors, means for conveying said pieces from said means for reducing the waste to said first and second conveyors,
  - each of said first and second conveyors including a receiving portion and a discharge portion, said discharge portion of said first conveyor being spaced above and upstream from said receiving portion of said second conveyor to disperse said pieces as they are transferred from said first conveyor to said second conveyor so that said pieces which are in clusters are separated from each other to increase the likelihood of detecting radiation emanating therefrom,
  - a plurality of radiation detector means for detecting radioactive radiation emanating from said pieces, at least one of said plurality of radiation detector means being located on each of said conveyors, each of said radiation detector means being disposed in close overlying relation to its respective conveyor so that low levels of radiation emanating from said pieces can be detected,
  - each of said conveyors including means for flattening said pieces of waste before said pieces pass under said radiation detector means, and
  - said means for flattening being disposed between said receiv-



ing portion of each conveyor and said radiation detector means on each of said conveyors, said housing being generally closed, and means for providing a generally closed connection between said housing and said means for reducing the waste so that air that is in said housing and in said means for reducing the waste can be controlled.

4,679,739

## VERTICAL ROLLER MILL

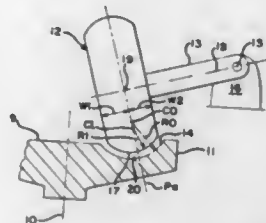
Isao Hashimoto, Akashi; Tosuke Kinoshita; Masahiro Uchida, both of Kobe, and Susuma Uchiyama, Nishinomiya, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jun. 14, 1985, Ser. No. 745,287

Claims priority, application Japan, Jun. 16, 1984, 59-124166  
Int. Cl.<sup>4</sup> B02C 15/00

U.S. Cl. 241—121

9 Claims



1. A roller mill comprising a base, a table supported on said base and adapted to be rotated on a substantially vertical axis, said table having an annular groove formed in the top surface thereof, a roller arm means connected to said roller for supporting said roller on said base for rotation on an axis which intersects said vertical axis, said roller having an outer peripheral portion which forms part of a circle of curvature in cross section on the outer side which is radially outward of said table, said roller being adapted when in use to rotate in said groove and to compress material against said groove and rotate with said table, whereby a clearance is formed between said peripheral portion and said groove and said clearance is filled with the material, said roller having a radial plane which passes through the center of said circle of curvature and is fixed circumferentially of said table relative to said base, said roller being axially wider on the radially inward side of said plane than on the radially outward side of said plane and, at least partially on said radially outward side of said table, said annular groove forming part of a circle of curvature and said circle of curvature of said groove being substantially concentric with said peripheral portion of the roller in cross section.

4,679,740

## WEDGE-CLAMP ASSEMBLY FOR AN IMPACT CRUSHER

Axel W. Orphall, McMurray, Pa., assignor to Stedman Machine Co., Anrora, Ind.

Filed Jan. 6, 1986, Ser. No. 816,181

Int. Cl.<sup>4</sup> B02C 13/28

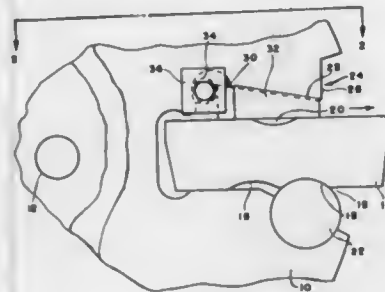
U.S. Cl. 241—189 R

12 Claims

1. A rotor assembly for use in a crushing machine for reducing material, such as limestone, grain, and ore comprising: a rotatably mounted shaft, at least one disc fixedly mounted on said rotatable shaft for rotation therewith, having an outer peripheral surface with opposed outer faces extending radially outwardly from said shaft, in which surface there is located at least one slot, breaker bar means arranged parallel to the axis of said shaft received in said slot in said disc, and extending radially outwardly from said slot for contacting and impacting against said material, a wedge member arranged in said slot of said disc between

an associated surface of said disc and said breaker bar means for engagement therebetween, said surface of said disc cooperating with an engaging surface of said wedge member so that any movement of the wedge member outwardly from said slot in a radial direction increases the holding force between said wedge member and said breaker bar means,

said slot having an enlargement located inwardly from where said wedge member is arranged, and clamping means for said wedge member associated with said enlargement in said slot, said clamping means comprising: elongated means having opposed ends and which is insertable longitudinally in said enlargement of said slot for engagement with said wedge member, and



a restraining member mounted at each said opposed end of said elongated means and constructed and arranged to abut said adjacent surfaces of said disc and to overlap a portion of said wedge member for limiting the movement of said wedge member in a direction perpendicular to said radial direction but allowing relative movement between said clamping means and said wedge member, said elongated means including restricting means extending through said restraining members associated with said slot in said enlargement for contact by said wedge member in said slot in an initial positioning in a manner that upon operation of said rotor assembly the centrifugal force causes said wedge member to slide out of said initial positioning in said radial direction away from said enlargement of said slot for increasing the holding force of said wedge member against said breaker bar means.

4,679,741

## CRUSHER WITH ROTARY PLATES

Kolbjorn Hansen, Hvalstad, Norway, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

PCT No. PCT/NO83/00013, § 371 Date Dec. 21, 1983, § 102(e) Date Dec. 21, 1983, PCT Pub. No. WO83/03779, PCT Pub. Date Nov. 10, 1983

Continuation of Ser. No. 567,852, Dec. 21, 1983, abandoned.

This PCT application Apr. 22, 1983, Ser. No. 799,196

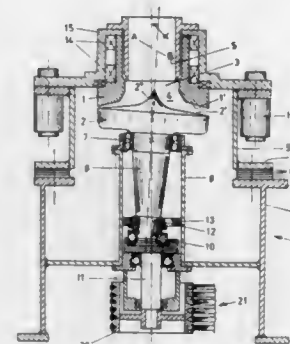
Claims priority, application Norway, Apr. 22, 1982, 821312  
Int. Cl.<sup>4</sup> B02C 2/06

U.S. Cl. 241—206

16 Claims

1. A crusher supported by a frame and having a vertical main axis, the crusher including crusher plates (1,2) disposed one above the other with the plates being spaced apart to form therebetween an annular crushing slot (4) with radial outwardly converging crushing surfaces (1',2'), the plates being rotatable about respective axes (A,B) which are non-parallel, the one plate (1) being provided with a central feed opening (3) having a feed funnel (5) projecting downwardly into the opening (3), and the other plate (2) being driven in rotation during operation while simultaneously executing a gyrating movement in a direction opposite to its direction of rotation, characterized in that

the other plate has a center of gravity and includes a downwardly projecting shaft having an upper end, said upper end and a lower end being adjacent said center of gravity and being rotatably and pivotally supported in a first spherical bearing (7), said first bearing having an axis which is coaxial with the axis of rotation of said other plate and being disposed within an upper region of a bearing housing (8) that is rigidly connected to said crusher frame, a lower region of said bearing housing rotatably supporting a rotary driven shaft (11), the lower end of said downwardly projecting shaft being supported in a second spherical bearing (10) that is eccentrically



arranged on an upper end of said driven shaft, the axis of rotation of said driven shaft being coaxial with the axis of rotation (A) of said one plate, and said downwardly projecting shaft being provided, at said lower end closely adjacent to, and above, said second spherical bearing (10), with a gear wheel (12), said bearing housing (8) including therein an internal rim gear (13), said gear wheel (12) being engaged with said rim gear (13), said gear wheel and said rim gear spacing said downwardly projecting shaft apart from said bearing housing, so that when the gear wheel (12) rolls on the rim gear (13), said other plate rotates in a direction opposite its direction of gyrating movement.

4,679,742

## CRUSHER HAVING OPPOSED AND BALANCED DRIVER JAWS

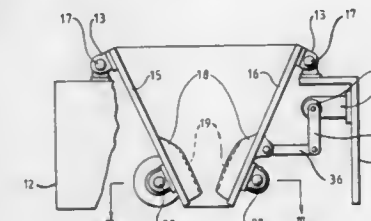
Leslie G. Ellis, Christchurch, New Zealand, assignor to Ian Gordon Rodger, Christchurch, New Zealand

Filed Nov. 18, 1985, Ser. No. 799,301

Int. Cl.<sup>4</sup> B02C 1/06

U.S. Cl. 241—266

17 Claims



1. A crusher including: a pair of opposed crushing jaws, a pivotal mounting of each jaw for pivotal movement towards and away from the other jaw, means for driving the jaws to pivot towards each other simultaneously and away from each other simultaneously, the pivotal mounting of each jaw being

adjacent one end of the jaw, the said one ends of the jaws being located opposite each other, the other ends of the jaws being located opposite each other, a drive shaft rotatably mounted on one of the jaws and having eccentric portions, a cross shaft rotatably mounted on the other of the jaws and having eccentric portions, a pair of connecting rods each pivoted at one end on a respective eccentric portion of the drive shaft and pivoted at the opposite end on a respective eccentric portion of the cross shaft, and means for adjusting the distance between the pivots at the ends of the connecting rods.

4,679,743

## APPARATUS FOR WINDING CABLE ON CABLE DRUMS

Gunter Dallmaier, Hanover, Fed. Rep. of Germany, assignor to Paul Troester Maschinenfabrik, Hanover, Fed. Rep. of Germany

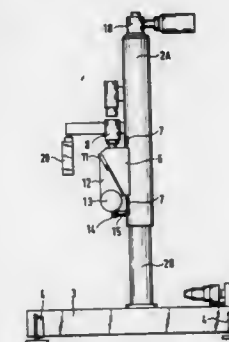
Filed May 16, 1986, Ser. No. 864,589

Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517696

Int. Cl.<sup>4</sup> B21C 47/24; B65H 49/24, 54/553

U.S. Cl. 242—54 R

11 Claims



1. Apparatus for winding cable on a cable drum comprising: two telescopic vertical stands each comprising an upper part and a lower part movable vertically relatively to one another, motor means for raising and lowering said upper part relative to said lower part, undercarriage means supporting said lower part vertically and a vertical guideway on said upper part, a horizontal telescopic traverse connecting said upper parts of said stands with one another with said stands spaced to accommodate a cable drum between them and means for varying the effective length of said traverse to vary the spacing between said stands, a first slide slidable on said vertical guideway of each of said stands, motor means for moving each of said first slides vertically of the respective guideway and an inclined guideway on each of said first slides, said inclined guideway being at an acute angle to the vertical and to the horizontal, a second slide slidable on each of said inclined guideways and a spindle on each of said second slides, said spindles being of a size and shape to be received in central holes in opposite sides of a cable drum, support means on each of said stands below said second slide for engagement by said second slide, and abutments on said inclined guideways of said first slides for engagement by said second slide to limit the movement of said second slides relative to said first slides.

4,679,744

**MAGNETIC TAPE WINDING METHOD AND SYSTEM**

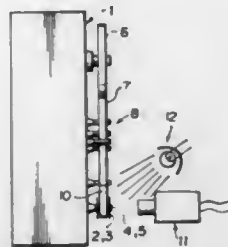
Hiroshi Chikamasa, and Masaki Sakaguchi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 13, 1986, Ser. No. 895,937

Claims priority, application Japan, Aug. 19, 1985, 60-181258  
Int. Cl.<sup>4</sup> G06K 9/00

U.S. Cl. 242—67.3 R

4 Claims



2. A magnetic tape winding system for winding a predetermined length of magnetic tape around a small winding frame from a magnetic tape feed roll, which comprises:

- (i) a winding apparatus for rotating said small winding frame and winding said magnetic tape around said small winding frame at a predetermined speed;
- (ii) a camera device for optically imaging a winding surface condition of said magnetic tape wound around said small winding frame;
- (iii) a winding appearance judgment device for judging the quality of the winding surface condition of said magnetic tape wound around said small winding frame by a calculation processing of image signals generated by said camera device;
- (iv) a winding speed command device for sending a command to said winding apparatus based on results of judgment of said winding appearance judgment device to make said winding apparatus change the speed of magnetic tape winding around said small winding frame; and
- (v) a judgment timing generator for detecting the quantity of said magnetic tape wound around said small winding frame, and activating said winding appearance judgment device when a predetermined quantity of tape is detected.

4,679,745

**REEL BRAKE DEVICE OF A VIDEOCASSETTE RECORDER**

Kyo S. Kim, Kwachon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul

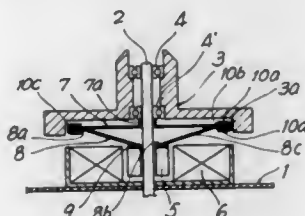
Filed Jul. 3, 1986, Ser. No. 881,672

Claims priority, application Rep. of Korea, Jul. 3, 1985, 8220/1985[U]

Int. Cl.<sup>4</sup> B65H 23/06

U.S. Cl. 242—75.4

1 Claim



1. A reel brake device of a videocassette recorder, comprising a solenoid mounted on a base plate of a deck of the recorder and arranged around a reel shaft erected on said base plate to be radially spaced from said reel shaft, and a moveable core wire disposed between said solenoid and said reel shaft and below a reel table rotatably supported to an upper portion

of said reel shaft, said core wire being actuated by said solenoid, the device being characterized by further comprising:

- a disc-shaped supporting plate, fixedly fitted at the opened center portion thereof, to a middle portion of said reel shaft and spaced from a lower surface and inner side surface of said reel table;
- a funnel-shaped elastic member disposed just below said supporting plate and slideably fitted, at the opened center portion thereof, to said reel shaft, said elastic member having at outer and inner peripheral edges thereof flat portions one contacting with the lower surface of said supporting plate and the other supporting said moveable core wire, respectively, said elastic member also having a slit radially extended between said outer and inner peripheral edges thereof, so as to be radially expanded in the widening of said slit caused by the upward movement of said moveable core wire; and
- a brake ring disposed between the inner side surface of said reel table and said supporting plate and radially spaced from the inner side surface of said reel table, said brake ring having an annular recess receiving each outer peripheral edge of said supporting plate and elastic member, said brake ring also having a slit radially extending throughout the width thereof, so as to be radially expanded by the expansion of said elastic member, whereby the outer surface of said brake ring can be contacted with the inner side surface of the reel table, in order to brake the rotation of the reel.

4,679,746

**REEL TO WIND PACKAGES OF WIRE**

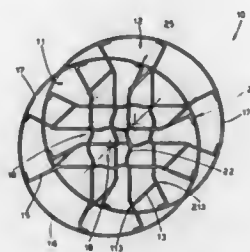
Rossano Compagnucci, Osimo, and Ercole Masera, Roveredo in Piano, both of Italy, assignors to Ferriere Nord SpA, Osoppo and Siro SpA, Santa Maria Nuova, both of Italy

Filed Feb. 19, 1986, Ser. No. 830,950

Claims priority, application Italy, Feb. 19, 1985, 83328 A/85  
Int. Cl.<sup>4</sup> B65H 75/20

U.S. Cl. 242—77.2

15 Claims



1. A reel for winding coilable material comprising two opposed reel heads joined by cross members, each head comprising a plurality of bent filiform elements disposed essentially in a single plane, each element comprising:

- (a) a substantially U-shaped member having a base and first and second legs, one of said legs forming a substantially planar angular portion with said base and the other leg forming an axially bent angular portion with said base; and
- (b) a substantially arcuate circumferential member extending from said first leg that includes a seating means in the same plane as said circumferential member adjacent to said first leg;

the end of said circumferential member welded to the seating means of an adjacent circumferential member in the same reel head to form a substantially circular continuous periphery for said reel head, said planar angular portion being superposed on, and welded to, an adjacent axially bent angular portion in the same reel head to form a continuous hub for said reel head, the cross members being joined to legs of the opposed reel heads.

4,679,747

**APPARATUS FOR LOADING AND UNLOADING THE LEADER BLOCK OF A TAPE CARTRIDGE**

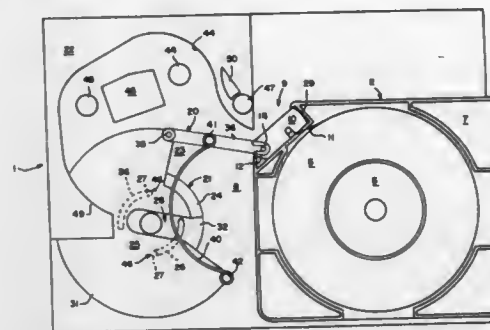
Jay A. Smith, Harleysville, Pa., assignor to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Filed Mar. 21, 1986, Ser. No. 842,446

Int. Cl.<sup>4</sup> G11B 15/32, 23/04

U.S. Cl. 242—195

12 Claims



1. In a transport apparatus for receiving and operating upon a tape cartridge including a web of tape disposed on a supply reel and having a free end engaged by a leader block, said leader block having an engagement slot and said transport apparatus including a take-up reel for receiving said leader block, an improved leader block loading means comprising a linkage for engaging the slot of said leader block and for delivering said engaged leader block to the take-up reel of said transport apparatus, and means responsive to rotation of said take-up reel for operating said linkage.

4,679,748

**CANNON-LAUNCHED PROJECTILE SCANNER**

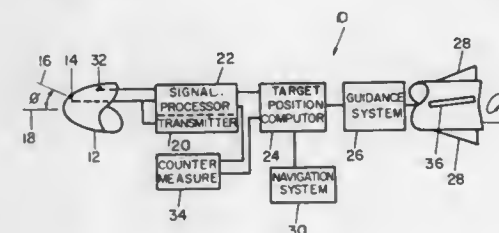
Ake Blomqvist, Hedgatan 21, 691 35 Karlskoga, Sweden, and James Linick, 99 rue de La Faisanderie, 75 116 Paris, France

Filed Jun. 25, 1984, Ser. No. 624,631

Claims priority, application Sweden, Jul. 5, 1983, 8303830  
Int. Cl.<sup>4</sup> F41G 7/00

U.S. Cl. 244—3.19

11 Claims



1. A cannon-launched projectile, comprising in combination: radar means including an antenna fixed at a predetermined angle with respect to the axis of the projectile; said radar means including means for processing information received by said antenna to detect and select a potential target; said radar means also comprising several range gate means to obtain a good signal to clutter ratio; said radar means further comprising target position computer means for computing the location of the target selected by said processor means; and guidance system means including one or more guidable fins to alter the direction of flight of the projectile based upon directional information received from said target position computer means.

4,679,749

**AUXILIARY AIRPLANE SEATS**

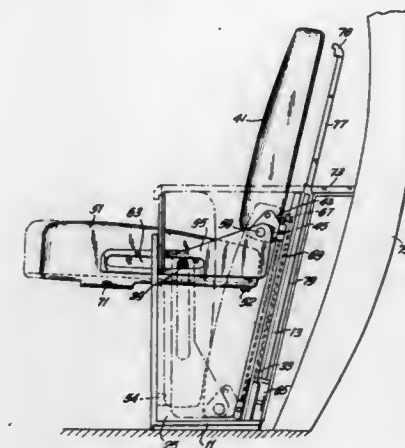
James M. Ryan, and Arthur H. Gilmore, both of New York, N.Y., assignors to Falcon Jet Corporation, Teterboro, N.J.

Filed Sep. 28, 1984, Ser. No. 655,526

Int. Cl.<sup>4</sup> B64D 11/06

U.S. Cl. 244—122 R

12 Claims



1. An auxiliary airplane seat comprising in combination a containment unit including a bottom member, a substantially vertical, upwardly extending rear panel, at least two vertical, upwardly extending side panels and a vertical, upwardly extending front panel attached to said bottom member and forming a housing, a pair of spaced, parallel guide means located on said rear panel, guiding means disposed on each of said side panels, a substantially vertically movable seat back member provided with linking means including guide pins adapted to cooperate with the guide means located on said rear panel disposed in said containment unit adjacent said rear panel, a substantially vertically upwardly and horizontally movable seat bottom member disposed in said containment unit in front of said seat back member including a pair of slotted track means located along the sides thereof which are pivotally connected to the linking means of said seat back member and the guiding means on said side panels disposed in the slots of said track means, whereby said seat back moves substantially vertically upwardly in said containment unit when said seat bottom is moved substantially vertically upwardly and horizontally and the track means located along the sides of said seat bottom member, slide past and pivot about said guiding means on said side panels which are disposed in the slots of said track means.

4,679,750

**LATCH SYSTEM**

Frank M. Burhans, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 20, 1984, Ser. No. 622,580

Int. Cl.<sup>4</sup> B64D 29/06

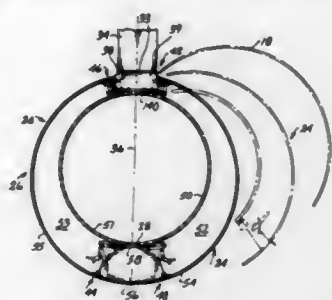
U.S. Cl. 244—129.4

34 Claims

1. A latch system for an aircraft nacelle, the nacelle comprising first and second cowls, each cowl being hingedly mounted to the nacelle for pivotal movement between a closed position adapted for aircraft operation and one or more open positions wherein access is provided to interior portions of the nacelle, the first and second cowls being positioned adjacent and in side-to-side relationship with one another, the first cowl including a first edge along which the first cowl is hingedly mounted to the nacelle, the latch system comprising latch means movable to and from a latched position in which the latch means is connected to the first cowl at the first edge and holds the first cowl in its closed position and prevents the first cowl from moving to an open position, the latch means includ-



ing locking means associated with a second cowl for holding the latch means in its latched position when the second cowl is



in its closed position, whereby the first cowl is held in its closed position when the second cowl is in its closed position.

4,679,751

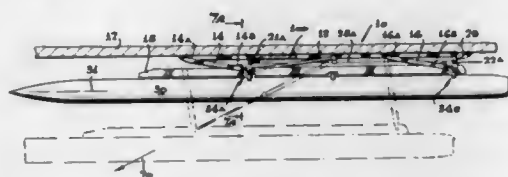
**WEAPON DISPENSING SYSTEM FOR AN AIRCRAFT**  
Paul F. Peterson, Rancho Palos Verdes, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Apr. 29, 1986, Ser. No. 857,004

Int. Cl.<sup>4</sup> B64D 1/06

U.S. Cl. 244—137.4

9 Claims



1. A weapon dispensing system for ejecting a weapon from an aircraft comprising:  
a weapon positioning means for positioning the weapon in a stored position and a release position comprising:  
a weapon support rack; and  
fore and aft links having first and second ends, said first ends of said fore and aft links pivotally coupled to the aircraft and said second ends of said fore and aft links pivotally coupled to said rack;  
an actuator means having a first end coupled to the aircraft and a second end coupled to said weapon positioning means, said actuator means for moving said weapon positioning means from the stored position to the release position; and  
fore and aft weapon attaching means for releasably locking the weapon to said rack comprising: the weapon having fore and aft mounting lugs; fore and aft hook means rotatably mounted to said rack moveable from a first position in engagement with said fore and aft mounting lugs, respectively, to a second position disengaged therefrom;  
fore and aft wedge members mounted to said positioning means for engaging with and locking said fore and aft hook means in said first position when said positioning means is in said stored position and disengaging from and unlocking said fore and aft hook means when said positioning means is in said release position allowing said fore and aft hook means to move from said first position to said second position disengaged from said lug means.

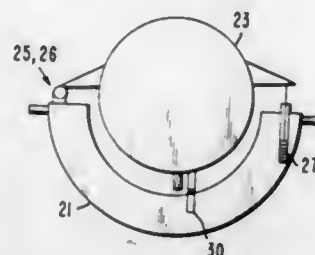
4,679,752  
**PAYLOAD DEPOLYMENT FROM SHUTTLE EMPLOYING AN EJECTION RESTRAINT DEVICE**  
Alois Wittmann, Palos Verdes; Theodore M. Isaacs, and John R. Murphy, both of Fountain Valley, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 28, 1985, Ser. No. 695,156

Int. Cl.<sup>4</sup> B64G 1/22

U.S. Cl. 244—158 R

10 Claims



1. Apparatus for use in the gyroscopic ejection of a spacecraft from a support structure, said support structure comprising a spacecraft supporting cradle having an open end, said spacecraft straddling said open end, said apparatus further comprising an ejecting mechanism for applying a tangential thrust force to one side of said spacecraft, said apparatus comprising:

a separable ejection restraint mechanism having one end attached to said cradle and the other end attached to said spacecraft for restraining said thrust force applied to said spacecraft for a predetermined time period in order to dissipate undetermined forces acting upon said spacecraft prior to the ejection thereof.

4,679,753  
**SURVEYING SATELLITE INCORPORATING STAR-SENSING ATTITUDE DETERMINATION SUBSYSTEM**

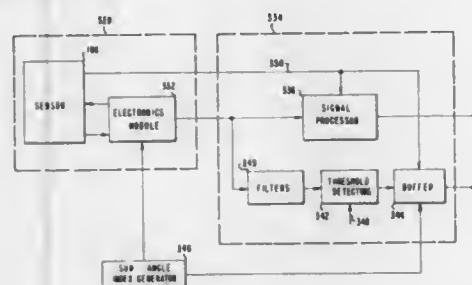
Peter B. Landecker, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 21, 1984, Ser. No. 643,130

Int. Cl.<sup>4</sup> B64G 1/36

U.S. Cl. 244—171

8 Claims



1. A system for surveying features of a planet, said system comprising:  
a spacecraft;  
a sensor for producing a signal in response to radiation from a source, the amplitude of said signal corresponding to the radiation flux at the sensor produced by the source, said sensor being located onboard said spacecraft;  
means for alternately directing said sensor toward said planet and toward a predetermined star field;  
means for analyzing said sensor signal when said sensor is directed toward said planet to provide surveying information concerning said features of said planet;  
a buffer for storing star field data signals from said sensor;

star field data compression means for selecting signals from said sensor when said sensor is directed toward said star field, said signal selection being performed to optimize the number of star detections and avoid saturation of said buffer; and  
means for analyzing said selected signals to provide sensor attitude information.

4,679,754

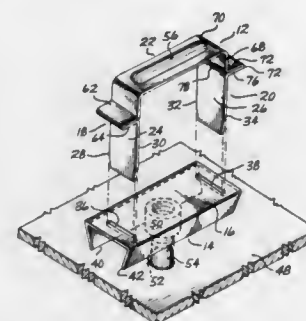
**CONNECTOR ASSEMBLY FOR SECURING CABLES, PIPES, OR THE LIKE TO A SUPPORT STRUCTURE**  
Peter S. Richards, 100 Mt. St. Pl. NW., Issaquah, Wash. 98027

Filed Jul. 28, 1986, Ser. No. 889,929

Int. Cl.<sup>4</sup> F16L 3/22

U.S. Cl. 248—68.1

12 Claims



1. A connector assembly for securing cables, pipes, or the like, to a support structure, comprising:

a U-shaped retainer comprising a pair of spaced apart sidearms, and a cross member, each said sidearm having opposite edges; and

a base member comprising a support portion, a pair of slots in said support portion, spaced apart a distance corresponding to the spacing of the sidearms, each said slot being sized to receive a related one of said sidearms, and a pair of laterally spaced apart grip jaws offset from the support portion, and positioned to receive between them the sidearms after the sidearms have passed through said slots, said grip jaws being spaced apart a distance less than the width dimension of the sidearms, so that the sidearms have to be forcibly moved through the space between the grip jaws,

whereby an object or objects to be supported may be positioned on the support portion of the base member, between said slots, and then the U-shaped retainer can be moved toward the base member, to place the sidearms of the retainer in said slots, and then the U-shaped retainer can be pushed upon to move the sidearms through the slots until the cross member is generally against said object or objects, and the grip jaws of the base member will dig into and grip the edges of the sidearms, to in that manner securely connect the U-shaped retainer to the base member, and hold the object or objects secure between the U-shaped retainer and the base member.

4,679,755

**SUPPORT DEVICE FOR THIN-WALLED TUBING**  
Jean-Jacques Marsault, Saint Arnoult en Yvelines; Jean-Pierre Peyrelongue, Pontchartrain; Jean-Claude Semedard, Paris, and Gérard Vallee, Viroflay, all of France, assignors to Stein Industrie, France

Filed Jun. 5, 1985, Ser. No. 741,408

Claims priority, application France, Jun. 5, 1984, 84 08788

Int. Cl.<sup>4</sup> F16L 3/08

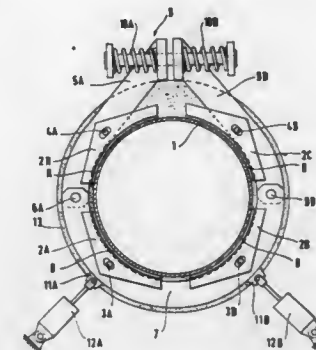
U.S. Cl. 248—74.1

6 Claims

1. A fixing device for a pipework (1) having a cylindrical wall which is thin relative to its diameter and subjected to large

temperature variations and to radial forces in arbitrary directions, said device comprising:

a. sectional support cradles (2A, 2B, 2C, 2D) having pipe-work contacting faces;  
b. a rigid half-collar (7) for disposal around the periphery of the pipework, and having some of the cradles mounted thereto;



c. two arms (5A, 5B) hinged at their ends to respective ends of the half-collar and having others of the cradles mounted thereto; and  
d. a flexible arm clamping device (9) resiliently mounted to said two arms for drawing said arms together to apply the cradles against the pipework, independently of expansions and radial forces applied to the pipework.

4,679,756

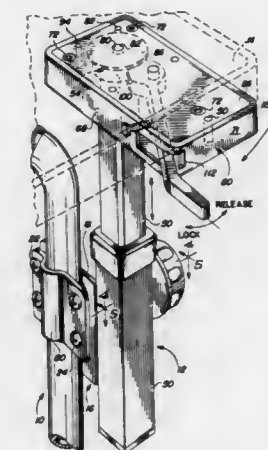
**MOUNTING FOR A WHEELCHAIR SERVICE TRAY**  
Charles F. Wood, 8341 W. Foothill Dr., Peoria, Ariz. 85345

Filed May 14, 1986, Ser. No. 863,048

Int. Cl.<sup>4</sup> E04G 3/00

U.S. Cl. 248—285

7 Claims



1. Apparatus for supporting a tray upon a piece of furniture, said apparatus comprising in combination:

(a) a mounting for supporting the tray with respect to a piece of furniture;  
(b) means for attaching said mounting to a segment of the piece of furniture;  
(c) a stanchion vertically positionable with respect to and in engagement with said mounting to permit vertical positioning of the tray, said stanchion being non-rotatable about its longitudinal axis during and after vertical positioning, said stanchion including a head having a cylindrical surface;  
(d) a cam unit for supporting the tray upon said stanchion

and for regulating pivotal movement of the tray about the longitudinal axis of said stanchion;

- (e) means for capturing said head within said cam unit to support said cam unit upon said head; and
- (f) said cam unit including a cam for interacting with any circumferential part of said cylindrical surface to restrict rotation of said cam unit and the attached tray in one direction and an arm responsive to manipulation for disengaging said cam with said cylindrical surface to permit rotation on a selective basis of said cam unit and the attached tray in the other direction;

whereby, the tray is vertically and pivotally positionable with respect to the piece of furniture.

4,679,757

## ADJUSTABLE BOOKHOLDER

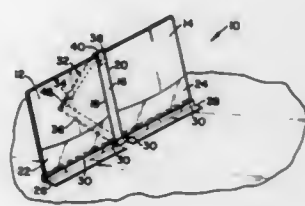
Fred P. Mussari, 14456 Portland Ave. S., Burnsville, Minn. 55337

Filed May 16, 1986, Ser. No. 864,296

Int. Cl.<sup>4</sup> A47B 97/08

U.S. Cl. 248—463

3 Claims



1. An adjustable bookholder, which comprises:
  - a pair of covers secured to opposite edges of an intermediate spine for relative pivotal movement between opened and closed positions;
  - said spine and covers each having inside and outside surfaces and upper and lower edges;
  - ledge means secured to the lower edges of said covers for supporting bound or unbound materials thereon;
  - a rigid first member pivotally secured at one end to the upper edge of said spine for pivotal movement between extended and retracted positions;
  - a flexible but substantially inextensible second member secured at one end to the other end of said first member;
  - a releasable first connector secured to the lower inside surface of said spine for releasable engagement with said cross member for adjusting the desired angle of inclination of the bookholder; and
  - releasable second and third connectors secured to opposite ends of said first member for releasable engagement with the said other ends of said first and second members, respectively to retain said members in retracted position.

4,679,758

## EXTERIOR REARVIEW MIRRORS FOR VEHICLES

Ian Boddý, Bognor Regis, and Shaun Gurteen, Chichester, both of England, assignors to Britax Wingard Limited, Chichester, England

Filed Jul. 23, 1985, Ser. No. 758,475

Claims priority, application United Kingdom, Aug. 18, 1984, 8421050; May 29, 1985, 8513552

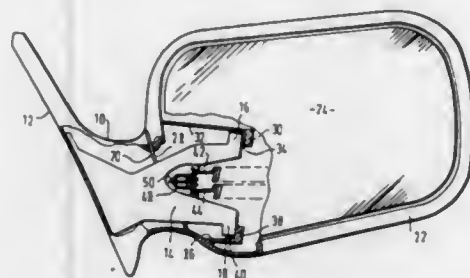
Int. Cl.<sup>4</sup> A47G 1/24

U.S. Cl. 248—479

9 Claims

1. An exterior mirror for a vehicle comprising a base member having a mounting face adapted to engage with the vehicle body, first pivotal engagement means mounted on an arm secured to the base member so as to project laterally in the opposite direction to the mounting face, a housing for a reflective member having second pivotal engagement means, a first

link pivotally attached to the base member at a point which is nearer to the mounting face than the first pivot axis, a stop on the first link a stop arranged to engage with a formation on the base member to limit pivotal movement of the link, a second link pivotally attached to the first link, and resilient means for urging the first and second pivotal engagement means into engagement with one another so that the housing is pivotally movable relative to the base member about a pivot axis formed by said first and second pivotal engagement means, the resilient



means extending between the second link and a point in the interior of the housing which is further from the mounting face than said pivot axis when the housing is in its position of normal use, and the links being movable between a first position in which the line of action of the spring pulls the housing towards its position of normal use and the second link engages with a formation on the base member to limit pivotal movement of the links, and a second position in which the spring pulls the housing towards the mounting face and the stop on the first link engages with the base member.

4,679,759

## ASSEMBLY FOR MOUNTING A VIBRATING BODY

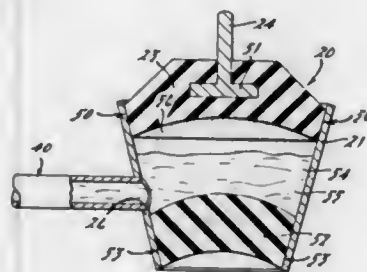
David M. Ford, Northville Township, Wayne County, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1984, Ser. No. 685,690

Int. Cl.<sup>4</sup> F16M 7/00; F16F 5/00

U.S. Cl. 248—562

17 Claims



15. An engine mounting system mounting an internal combustion engine to a support structure of a motor vehicle, said engine having a primary torsional displacement axis, said engine mounting system comprising a plurality of engine mounts, each of at least two of said engine mounts comprising:

- (A) a substantially rigid housing forming a frusto-conical sleeve open at a first, larger diameter end and open at a second, smaller diameter end, said housing having an inside surface and an outside surface and having a fluid flow port therethrough, said housing being rigidly attached to said support structure;
- (B) a first deformable elastomeric body sealingly bonded to the inside surface of said housing at said first open end of said housing, forming a fluid-tight closure of said first open end;
- (C) rigid attachment means fixedly coupled to said first

elastomeric body and rigidly engaging an engine member which is rigidly integral with said engine;

- (D) a second deformable elastomeric body sealingly bonded to the inside surface of said housing at said second opening end of said housing, forming a fluid-tight closure of said second open end, said second elastomeric body being of higher hysteretic damping value than said first elastomeric body, wherein, in each of said at least two engine mounts, said housing, said first elastomeric body and said second elastomeric body together define an elastically expandable chamber; and
- (E) a conduit sealingly attached at one end to the fluid flow port of one said engine mount and sealingly attached at another end to the fluid flow port of at least one other said engine mount, said conduit and said fluid flow ports permitting flow of fluid between the chamber of said one engine mount and said other engine mount, which two chambers together with said conduit form a continuous, fluid-tight enclosure, said one engine mount and said other engine mount being oriented in a plane substantially orthogonal to said primary torsional displacement axis of said engine.

4,679,760

## SPRING ARRANGEMENT

Josef Dotzler, Amberg, and Johann Meier, Fensterbach/Wolfring, both of Fed. Rep. of Germany, assignors to Grammer Sitzsysteme GmbH, Amberg, Fed. Rep. of Germany

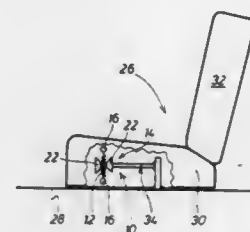
Filed Apr. 18, 1986, Ser. No. 853,767

Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517345

Int. Cl.<sup>4</sup> F16M 13/00

U.S. Cl. 248—602

5 Claims



1. A spring arrangement comprising a resilient coil spring having first and second ends fixed relative to each other, and a spring-engaging member adapted to act on the spring between said first and second ends of the spring in an actuating direction which differs from the longitudinal direction of the spring, said engaging member comprising first and second interconnected elements which are disposed in mutually opposite relationship at substantially the same level on respective sides of said spring, each said element having a surface of a curved configuration which is adapted to bear against said spring and which extends over a plurality of turns of said coil spring, thereby to provide non-linear dependency of the spring force on the relative distance covered as between said engaging member and said spring.

4,679,761

## VIBRATION DISSIPATION MOUNT FOR MOTORS OR THE LIKE

Thomas R. Smail, Brookerville, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Oct. 21, 1981, Ser. No. 313,246

Int. Cl.<sup>4</sup> F16M 13/00

U.S. Cl. 248—609

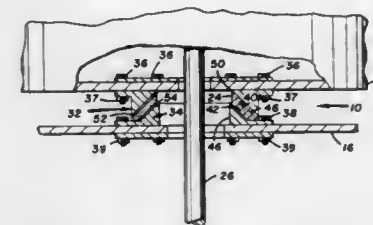
8 Claims

1. A vibration dissipation mount for a flywheel assembly comprising:
  - a flywheel;
  - a rotating shaft connected at a first end to said flywheel;

a flywheel chamber which encloses said flywheel and into which said rotating shaft passes;

a motor connected to a second end of said rotating shaft for driving said flywheel;

a pair of complementary plates, one of said plates having a convex surface, the other of said plates having a complementary concave surface, each of said plates having an



aperture extending through said complementary surfaces thereof, said apertures being dimensioned to accommodate there through and to permit free rotation of said rotating shaft when said plates are disposed in complementary relationship, one of said plates being affixed to said motor, the other of said plates being affixed to said flywheel chamber; and

a cushioning means being disposed between said plates.

4,679,762

## FORM SET-UP

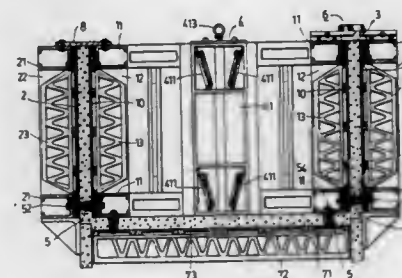
Yuan-Ho Lee, No. 851, Chung-San Road, Nan-Pao Tsun, Kuei-Jen Hsian, Tainan Hsiang, Taiwan

Filed Dec. 14, 1984, Ser. No. 681,778

Int. Cl.<sup>4</sup> B28B 7/30; E04B 1/16; E04G 11/06

U.S. Cl. 249—26

4 Claims



1. An inner form set-up for molding the inner surfaces of a closed multi-sided concrete wall structure comprising:
  - vertical form walls connected to each other, each of said form walls acting to mold one side of the concrete wall structure, each form wall comprising two portions;
  - wedge means provided between said two portions of each of said form walls and extending vertically along the full length of said form wall, said wedge means including two first wedge members each having a first vertical panel fixedly abutting one of said portions, a second vertical panel connected to said first panel and flush with a molding surface of said portions of said form wall, and a third vertical panel connected to said second panel and inclined to said first and second panels, and a second wedge member for insertion horizontally between said first wedge members to place said form walls in a molding position and for retraction outward to contract said form walls, said second wedge member having two opposite first panels which are inclined at the same inclination to that of said third panels of said first wedge members and a second panel interconnecting said first panels of said second wedge member;
  - a rack-and-gear mechanism interengaging said first and second wedge members for moving said second wedge

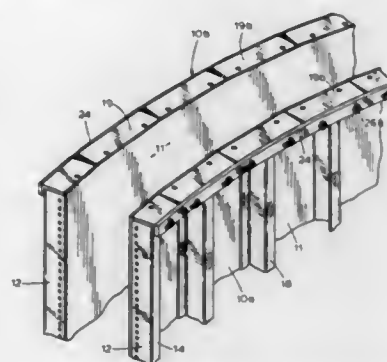


member horizontally relative to said first wedge members; and  
guide means for causing said two portions of each of said form walls to approach each other or to move away from each other when said second wedge member moves.

**4,679,763**  
**CONCRETE FORM HAVING ADJUSTABLE CURVATURE AND METHOD FOR PRODUCING SAME**  
Thomas W. Brotherton, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa  
Filed Aug. 22, 1985, Ser. No. 768,201  
Int. Cl.<sup>4</sup> E04G 9/02

U.S. Cl. 249—189

6 Claims



1. A concrete form having a flexible panel member with an upstanding perimetral flange projected laterally from one side thereof and wherein said flange has a pair of transversely opposite side sections disposed on opposite ends of said form each of which side sections has a flat terminal surface portion extended inwardly in a direction parallel to said one side of the form, the improvement wherein:

- each of said opposite flange side sections is divided into a plurality of segments by a plurality of notches longitudinally spaced over the length thereof, with each notch terminating in a V-shape portion having the apex thereof adjacent said one side of the panel member whereby said panel member is laterally flexibly movable to a preselected generally curve shape; and
- means secured to the terminal surface portions of said flange segments to maintain the pre-selected curved shape of said panel.

**4,679,764**  
**AUTOMATIC VALVE ACTUATOR AND CONTROL SYSTEM**  
Gordon M. Smith, La Habra Heights; Fred G. Chase, Sr., La Habra, and Gerard E. Ducharme, Fullerton, all of Calif., assignors to Johnston Pump/General Valve, Inc., Glendora, Calif.

Continuation-in-part of Ser. No. 477,084, Mar. 21, 1983, abandoned. This application Aug. 6, 1984, Ser. No. 638,194  
Int. Cl.<sup>4</sup> F16K 31/124, 31/14

U.S. Cl. 251—14

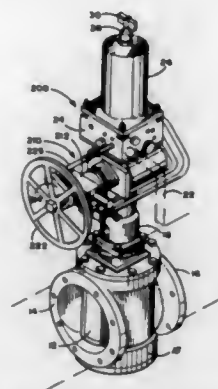
8 Claims

1. An improved valve actuator control system adapted for use with a plug-type valve and an operator for opening and closing the valve, the actuator of the type having a motor, a power source for activating the motor for motor shaft rotation in either direction, and means for sensing whether the valve is opened or closed for stopping the motor when the selected flow configuration of the valve is achieved, the improvement comprising:

manual motor override means having means for manually engaging said motor shaft for opening and closing said valve when said power source is not available for activating said motor, and

power source bypass means connected to said motor over-

ride means for automatically disengaging said power source from said motor for preventing injury when said power source becomes available for activating said motor while said motor shaft is manually engaged, said manual motor override means comprising a splined receptacle moveable axially with respect to said motor



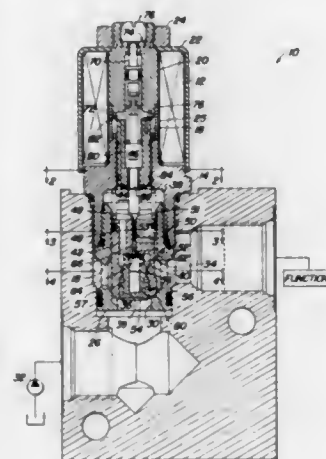
shaft and wherein said motor shaft is splined for selective engagement and disengagement with said receptacle, said override means comprising a rotatable cam pin having cam roll pins, and a guide having cam slots for receiving said roll pins, said guide being mechanically connected to said splined receptacle.

**4,679,765**  
**LOW LEAKAGE ORIFICE-CONTROLLED POPPET VALVE**  
Kenneth D. Kramer, Waterloo, Iowa, and Rohn L. Olson, North Richland Hills, Tex., assignors to Deere & Company, Moline, Ill.

Filed Apr. 14, 1986, Ser. No. 853,312  
Int. Cl.<sup>4</sup> F16K 31/122

U.S. Cl. 251—38

11 Claims

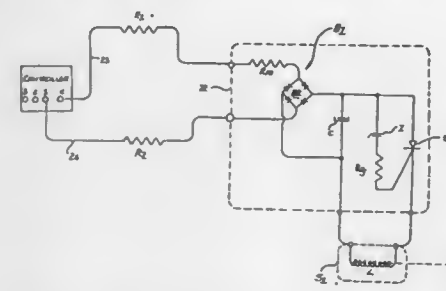


1. In a pilot-operated control valve having a housing defining a fluid inlet and a fluid outlet, a main valve member movable in the housing to control fluid communication between the inlet and the outlet, the main valve member having a pilot passage therein extending between the inlet and outlet and having a pilot valve seat surrounding a portion of the pilot passage, the control valve also having a pilot poppet engageable with the pilot valve seat and movable in relation thereto to control fluid communication through the pilot passage to thereby control movement of the main valve member, and

having means for hydrodynamically balancing the pilot poppet, characterized by:  
the pilot poppet being a solid member; and  
the balancing means being completely received by the main valve member.

**4,679,766**  
**SOLENOID BOOSTER**  
Kenneth J. Cuming, 68 Robinson Road, Hawthorn, Victoria, Australia  
Filed Apr. 29, 1985, Ser. No. 728,567  
Claims priority, application Australia, May 1, 1984, PG4778  
Int. Cl.<sup>4</sup> F16K 31/06; H01H 47/04  
U.S. Cl. 251—129.04

9 Claims



- A water supply control system comprising:  
at least one valve means adapted to be arranged within a water supply line to control the flow of water in the supply line;  
a solenoid operatively connected to and controlling operation of each of said valve means;  
a controller means, including an alternating current power supply, electrically connected to each said solenoid; and  
a solenoid control device electrically interposed between said controller means and at least one said solenoid, said solenoid control device being arranged to receive power from said power supply and to be located electrically adjacent to or integral with its associated solenoid, said solenoid control device comprising a circuit means for electrically connecting said device to the solenoid, a direct current charge storage means connected in said circuit in parallel to the solenoid, a rectifier means connected in said circuit for providing a direct current supply to said direct current charge storage means from said alternating current power supply, monitoring means for determining when the storage means has reached a desired charge sufficient to energize the solenoid, and switching means connected in said circuit for automatically passing current stored by said storage means to the solenoid in response to said monitoring means determining that said storage means has reached a desired charge to thereby energize the solenoid.

**4,679,767**  
**SOLENOID ARRANGEMENT INCLUDING YOKE-ENCLOSED COIL AND DOUBLE ENCAPSULATION**  
David J. Vollmer, Ironia, and James E. Greame, Long Valley, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

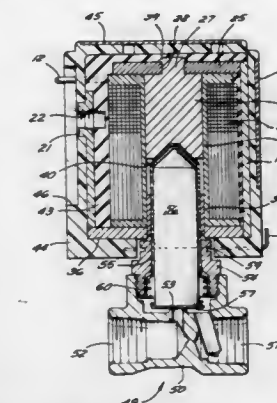
Filed Nov. 12, 1985, Ser. No. 796,757  
Int. Cl.<sup>4</sup> F16K 31/06; H01F 5/06, 7/16

U.S. Cl. 251—129.15

14 Claims

- A solenoid arrangement comprising:  
a coil of electrically conductive wire,  
a yoke of magnetic material surrounding the coil, the coil being completely encapsulated by a thermosetting resin, the resin being located between the coil and the yoke, and

the yoke being substantially completely encapsulated on all sides by a thermoplastic resin, so that none of the thermo-



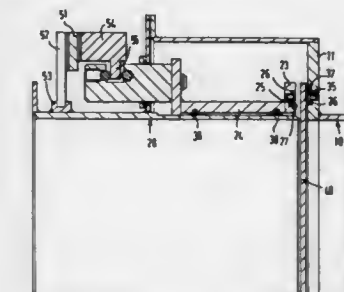
setting resin is exposed on the exterior of the solenoid arrangement.

**4,679,768**  
**VALVE**  
Derrick Hardy, Lowdham, England, assignor to Bercorit & Herweg Limited, Arnold, England  
Filed Jul. 18, 1985, Ser. No. 756,232  
Claims priority, application United Kingdom, Jul. 18, 1984, 8418349

Int. Cl.<sup>4</sup> F16K 25/00

U.S. Cl. 251—159

7 Claims



1. A valve for controlling passage of a fluent medium, comprising:

- a first duct section having an axis and an end;
- a second duct section having an axis and an end, said second duct section being disposed so that its axis substantially coincides with said axis of said first duct section and so that its end is spaced apart from said end of said first duct section to provide a gap between said ends;
- a rotatable shaft having an axis, said shaft being disposed outside said duct sections with its axis parallel to said axes of said duct sections;
- a valve plate mounted on said shaft and perpendicular to said axis thereof, said plate being positioned to engage said gap;
- a first annular flange affixed to said first duct section;
- a sleeve slidably mounted around said second duct section, said sleeve having a second annular flange that faces said first annular flange;
- an annular element rotatably disposed around said second duct section;
- selectively operable means for rotating said annular element and said shaft in concert;
- cam means operatively connecting said annular element and said sleeve for sliding said sleeve in a predetermined cycle when said annular element is rotated, said cycle including a first stage wherein said second flange is withdrawn from said gap as said valve plate rotates and a second state wherein said second flange is forced against said valve plate as said valve plate rests in said gap; and

annular sealing means for resiliently sealing said valve plate to at least one of said flanges during said second stage of said predetermined cycle.

4,679,769

# STEAM TURBINE CONTROL VALVE FOR CYCLIC DUTY

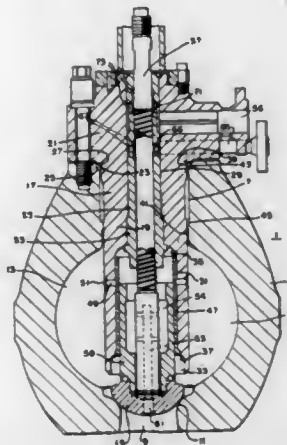
Suryakant K. Dawawala, Casselberry, Fla., and Bernard L. LaCoste, Wilmington, Del., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 770,379, Aug. 29, 1985, abandoned, which is a continuation of Ser. No. 635,376, Jul. 27, 1984, abandoned. This application Nov. 28, 1986, Ser. No. 936,926

Int. Cl.<sup>4</sup> F16K 1/32

U.S. Cl. 251-282

6 Claims



## 1. A turbine control valve comprising:

a body having a cavity disposed therein, the cavity having an elongated generally round first opening on one side of the cavity, the first opening having a circumferential sealing surface adjacent thereto, a generally round second opening with a valve seat disposed therein on a side opposite the first opening, and a third opening for admitting steam to the cavity;

a valve plug which mates with the valve seat to close off the second opening;

a bonnet having a generally cylindrical portion with an integral flange on one end of the cylindrical portion, the flange having a circumferential seal surface which mates with the circumferential sealing surface adjacent the first opening, the bonnet having a centrally disposed bore extending therethrough with two counter bores extending inwardly from the end without the flange, the first counter bore being long and terminating with a large fillet radius, the second counter bore being sufficiently deep to receive the plug and also terminating with a fillet radius, the cylindrical portion having a first raised land on the outer surface adjacent the flange and a second raised land on the outer surface and spaced from the first land and the first raised land being larger in diameter than the second raised land;

the first opening in the body also having raised first and second lands which respectively mate with the first and second lands on the cylindrical portion of the bonnet in such a manner that there is a low clearance between the mating lands;

a hardened sleeve tightly fit into the first counter bore in the bonnet;

a stem guide bushing fastened in the bore of the bonnet;

a valve stem slidably disposed in the stem guide bushing;

a plug guide slidably disposed in the hardened sleeve and on the valve stem and affixed to the valve plug so that the sliding motion between the valve stem and the plug guide is small;

the valve plug having a centrally disposed port extending therethrough which cooperates with the valve stem to provide means for reducing the force required to remove

the plug from the seat to form a control valve operable for cyclic duty where large temperature changes occur at the plug.

4,679,770

# GATE VALVE FOR TWO WAY FLOW

Richard Liberman, Montreal, Canada, assignor to Crane Canada Inc., Montreal, Canada

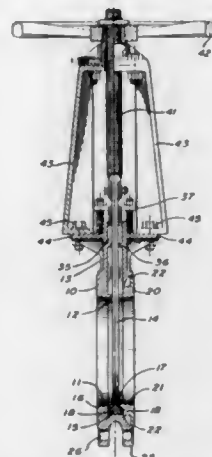
Filed Feb. 10, 1986, Ser. No. 827,878

Claims priority, application Canada, May 9, 1985, 481186

Int. Cl.<sup>4</sup> F16K 3/02

U.S. Cl. 251-328

5 Claims



1. A gate valve for two way flow comprising, a rigid valve body having a flow passage with smooth curved walls there-through, the body having a gate blade slot in the approximate center of the flow passage, a flexible resilient seat flush with the smooth curved walls, the seat being in the form of a strip extending through one end of the gate blade slot, around the flow passage and through the other end of the gate blade slot, a body port insert ring attached and sealed to the valve body, the body port insert ring holding said resilient seat in place, a gate blade with a semicircular end, the gate blade adapted to fit in the gate blade slot to seal against the resilient seat, the strip forming the resilient seat extending on both sides through the gate blade slot and providing edge seals for edges of the gate blade, the strip at the location of the edge seals having an aperture extending down the strip on each side in line with the edges of the gate blade and elongated members for insertion into the apertures to expand the edge seals and provide a seal between the edges of the gate blade and the edge seals.

4,679,771

# CABLE TENSION SENSING APPARATUS

Bruce S. Johnson, Dallastown, Pa., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Jan. 11, 1985, Ser. No. 690,532

Int. Cl.<sup>4</sup> B66D 1/50

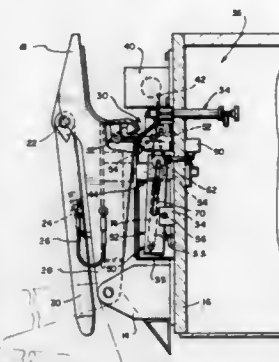
U.S. Cl. 254-273

22 Claims

1. Apparatus for maintaining the tension in a winch-controlled cable between minimum and maximum tension limits comprising a housing pivotally supported on a member for movement between first and second rotational positions, the housing having entrance and exit openings therein for the cable; first biasing means for biasing the housing to the first rotational position; a slidable pulley rotatably disposed within the housing with respect to the entrance and exit openings so as to enable the cable to be passed around the pulley and so as to cause the housing to pivot away from said first rotational position in accordance with the tension on the cable, second biasing means within the housing for biasing the pulley away from the entrance and exit openings for the cable, the first biasing means being selected such that the first rotational position of the housing corresponds to the minimum cable tension limit and such that the second rotational position of the

housing corresponds to the maximum cable tension limit; first means for detecting the housing being at the first rotational position and for preventing operation of the winch to unwind

tions of said posts each being anchored thereto by being passed about the corresponding tubular body above the corresponding fence rail end and also being looped over said corresponding fence rail end.



the cable therefrom; and second means for detecting the housing being at the second rotational position and for preventing operation of the winch to wind up cable.

4,679,772

# WIRE FENCE POST BRACING SYSTEM

Duane G. Peterson, Box #22, Dutton, Mont. 59433

Filed Jul. 17, 1986, Ser. No. 886,335

Int. Cl.<sup>4</sup> B21F 27/00

U.S. Cl. 256-36

5 Claims



1. In combination with a fence including first and second adjacent fence posts having upper and lower end portions, a fence bracing system including first and second brace anchors removably supported from the upper end portions of said first and second posts, respectively, and including fence rail support members projecting toward each other, a rigid fence rail having opposite ends, said opposite ends and support members being telescopically engaged for support of said fence rail ends from said support members, a tension wire anchor member engaged with the lower end portion of each of said posts, two pairs of at least two-strand sections of wire, each pair of wire strand sections having a first pair of corresponding end portions anchored relative to a corresponding anchor member and a second pair of end portions anchored relative to the upper end portion of the other post, a pair of elongated lever members each passing between the longitudinal mid-portions of a corresponding pair of wire strand sections and manually displaceable about an axis extending along said corresponding pair of wire strand sections and disposed transverse to the lever for twisting said corresponding pair of wire strand sections about each other and thereby adjustably shortening the effective length thereof to form an inclined tensioned connection between upper and lower end portions of said posts and with said pairs of twisted wire strand sections crossed and oppositely inclined relative to each other, said brace anchors each comprising an upstanding tubular member including an at least partially closed upper end, said tubular members each being downwardly telescoped over and abutted against the upper end portion of the corresponding post, those pairs of strand section end portions anchored relative to the upper end por-

4,679,773

# HORIZONTAL TAPPING FURNACE AND METHOD OF OPERATION

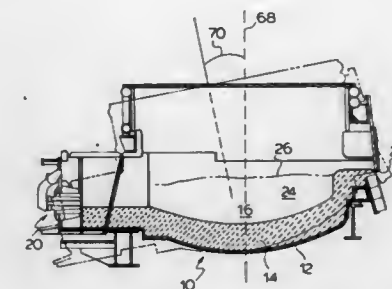
Edgar R. Wunsche, 682 Bermuda, Oshawa, Ontario, Canada (L1J 6A8)

Filed Sep. 30, 1985, Ser. No. 782,136

Int. Cl.<sup>4</sup> C21B 11/00

U.S. Cl. 266-45

13 Claims



## 6. A metallurgical furnace including:

a furnace floor and a furnace wall means extending generally upwardly about said floor, said furnace having a vertical axis and a horizontal axis, means mounting the furnace for pivotal tilting movement about said horizontal axis between a non-tilted, normal upright position, and a tilted discharge position with said furnace tilted less than 15° to said vertical axis,

a hearth zone defined between said floor and wall means adapted to house a bath of liquid metal of predetermined volume, said hearth zone having an upper end defining a predetermined upper level for said bath and for a layer of liquid slag floating on said upper level, when said furnace is in a non-tilted, normal upright position,

said hearth zone having a lower end adjacent said floor,

a tapping passage extending through said wall means from a liquid metal discharge outlet at an outer end into said lower end of said hearth zone, at an inner end, said discharge outlet being defined by an outwardly facing passage wall and said passage at said outer end,

said tapping passage being disposed generally parallel to said horizontal axis and vertically below said predetermined upper level, when said furnace is in said non-tilted, normal, upright position,

a discharge outlet closure having a closure surface and being pivotally mounted externally of said passage for pivotal to and fro movement towards and away from said furnace wall means between a first position in which said closure surface engages said passage wall at said outer end to fully close said discharge outlet, and a second position spaced apart from said passage wall.

4,679,774

# FLUID CONDUIT COUPLING FOR A METALLURGICAL CONVERTER TRUNNION

Craig J. Lawrence, Nazareth, and John J. Ferriola, Fogelsville, both of Pa., assignors to Bethlehem Steel Corp.

Filed Nov. 13, 1985, Ser. No. 797,567

Int. Cl.<sup>4</sup> C21C 5/50

U.S. Cl. 266-246

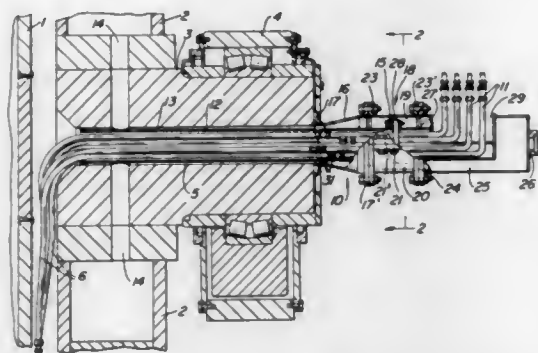
6 Claims

1. In a tiltable metallurgical converter having a hollow trunnion pin, a coupling assembly to convert fluid supply



conduits to fluid distribution conduits located within such hollow trunnion pin, said coupling assembly comprising:

- (a) an outer water jacket member having a flanged tubular extension on one end,
- (b) an inner water jacket member flanged at both ends and secured to said trunnion pin,
- (c) a tubular sleeve member flanged at one end and spaced within said inner water jacket member and said hollow trunnion pin,



- (d) a water jacket spacer member flanged at both ends and secured to said inner water jacket member and said outer water jacket member, said water jacket spacer member split longitudinally into two flanged sections secured to each other, and
- (e) a plurality of individual eccentric flexible fluid conduits within said tubular sleeve member.

4,679,775

## VIBRATION DAMPING EQUIPMENT

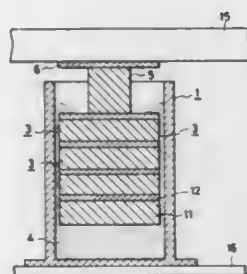
Takashi Funaki, Tokyo, and Katsuo Nakatsuka, Sendai, both of Japan, assignors to Yakumo Industrial Corporation, Tokyo, Japan, a part interest

Filed Sep. 20, 1984, Ser. No. 652,633

Int. Cl.<sup>4</sup> F16F 9/04

U.S. Cl. 267—64.27

17 Claims



1. A vibration damping apparatus for damping vibration between a first member and a second member, comprising:
  - a cylinder for connection to the first member, having a closed end having a closed end surface, an open end opposite said closed end surface, and an internal surface extending in a longitudinal direction from said open end to said closed end surface;
  - a piston, longitudinally movable in said cylinder in spaced noncontacting relation thereto, having a side surface opposing said internal surface and an inner end surface opposite said closed end surface, and defining a continuous space completely surrounding said piston, and a piston rod connected to said piston and extending through said open end in spaced noncontacting relation to said cylinder, for connection to a second member; and
  - a magnetic fluid filling said space in contact with said inter-

nal surface, said side surface, said closed end surface, and said inner end surface;

one of said cylinder and said piston comprising a magnetic member and the other of said cylinder and said piston comprising a nonmagnetic member, said magnetic member including a plurality of magnetic bodies arranged so as to define means for forming a magnetic field in said cylinder of maximum intensity opposite the one of said side surface and said internal surface of said one of said cylinder and said piston and so as to thereby generate an apparent increase in the viscosity of said magnetic fluid proportionally to the magnetic field intensity therein, such that longitudinal movement of said piston in said cylinder displaces said magnetic fluid therein so as to force said magnetic fluid to flow longitudinally through the portion of said space between said side surface and said internal surface at a velocity gradient relative to said magnetic member resisted by a viscous force proportional to an average velocity of said magnetic fluid relative to said magnetic member defined by said velocity gradient, and such that said magnetic fluid resists movement of said piston perpendicular to said longitudinal direction sufficiently to maintain said cylinder and said piston in said spaced noncontacting relation.

4,679,776

## ELASTIC RUBBER BEARING WITH HYDRAULIC DAMPING

Jochen Remmel, and Robert Büchlinger, both of Remscheid, Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

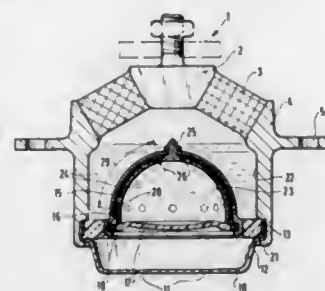
Filed May 9, 1985, Ser. No. 732,452

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418123

Int. Cl.<sup>4</sup> F16F 15/04; F16M 13/00; B60G 15/04

U.S. Cl. 267—140.1

6 Claims



1. In an elastic rubber bearing with integrated hydraulic damping, including a bearing core, a ring-shaped spring element, and a base plate enclosing a work chamber filled with hydraulic liquid; a liquid-filled volumetrically-variable expansion chamber, a separating wall constituted of an elastic material having at least one opening therein, and a superimposed rigid separating support wall having cutouts extending intermediate said chambers; the improvement comprising: the separating wall constituted of elastic material forming an elastic membrane and said rigid separating support wall being generally hemispherical shaped, a flow throttling arrangement between the elastic membrane and the rigid separating support wall, said flow throttling arrangement including elongate passageways between said elastic membrane and said rigid separating wall communicating between said at least one opening in the elastic material and cutouts on the rigid separating wall to provide throttled flow opening means between said work chamber and expansion chamber, the elastic and the rigid separating support wall extending into the work chamber, and elastic ring means for elastically fastening said separating wall to a housing.

4,679,777

## HYDRAULIC-ELASTOMERIC MOUNT DISPLACEMENT DECOUPLER

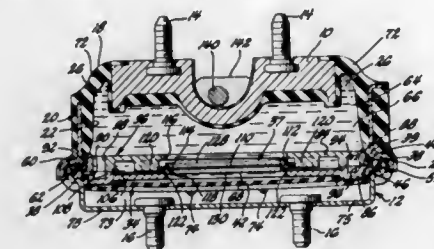
Thomas P. Gold, Westchester, Ohio, and John E. Vogel, Ann Arbor, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1985, Ser. No. 785,245

Int. Cl.<sup>4</sup> F16F 9/34

U.S. Cl. 267—140.1

4 Claims



1. A hydraulic-elastomeric mount comprising a pair of mounting members, a hollow elastomeric body interconnecting said mounting members, an elastomeric diaphragm closing said elastomeric body and forming therewith a closed cavity that is filled with liquid, a rigid partition dividing said cavity into a chamber enclosed by said elastomeric body and a chamber enclosed by said diaphragm, an orifice connecting said chambers to effect damping, and a rigid nondeformable hydraulic damping decoupler mounted for free reciprocal movement between oppositely facing rigid sides in said partition in response to alternating pressure buildup in said chambers so as to effect cyclic volume change in said chambers without deformation of said decoupler to thereby permit vibratory amplitudes below a prescribed level without forcing liquid through said orifice and thus without hydraulic damping thereby, characterized by tapered elastomeric cushion means on said decoupler for both cushioning and forcibly causing rocking of said decoupler against said partition as said decoupler reciprocates between said partition sides to prevent noise generation thereby.

4,679,778

## FLUID-CONTAINING POWER UNIT MOUNTING DEVICE

Toshikazu Tabata, Sagami-hara; Yoshinari Fujiwara, Yachiyo; Norio Yoda, Yotsukaido, and Hiroshi Aikawa, Atsugi, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa and Kinugawa Rubber Ind. Co. Ltd., Chiba, both of Japan

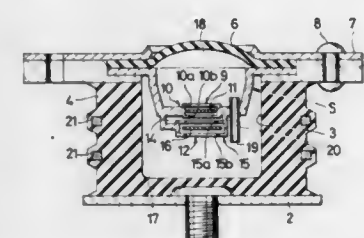
Continuation of Ser. No. 696,386, Jan. 30, 1985, abandoned. This application Oct. 15, 1986, Ser. No. 919,624

Claims priority, application Japan, Jan. 30, 1984, 59-13414

Int. Cl.<sup>4</sup> F16M 5/00; B60G 15/04; G05D 11/00; F16K 51/00

U.S. Cl. 267—140.1

6 Claims



1. A fluid-containing power unit mounting device comprising:
  - a first base plate for attachment to a power unit;
  - a second base plate for attachment to a chassis;
  - a mounting rubber interposed between said first and second base plates to form an internal chamber therein;
  - a diaphragm and a partition plate means, each having a perimeter, provided on one of said first and second base

plates to form a secondary chamber therebetween wherein said internal and secondary chambers are partitioned by said partition plate means;

first and second serially connected valve means each for restricting communication in at least two directions between the internal and secondary chambers and for reducing a total spring constant of the mounting device provided on the partition plate means, each of said first and second valve means having a compartment disposed in the partition plate means and a movable plate freely movable within the compartment, said partition plate means having orifices for communicating the internal chamber with the secondary chamber through the compartment of each of the first and second valve means; and

a fluid channel means communicating the internal chamber with the secondary chamber to reduce high frequency vibration of the mounting device, said chambers and said channel being filled with a working fluid.

4. A fluid-containing power unit mounting device comprising:

- a first base plate for attachment to a power unit;
- a second base plate for attachment to a chassis;
- a mounting rubber interposed between said first and second base plate to form an internal chamber therein;
- a diaphragm and a partition plate means provided on one of said first and second base plates to form a secondary chamber therebetween wherein said internal and secondary chambers are partitioned by said partition plate means;
- first and second serially connected valve means each of restricting communication in at least two directions between the internal and secondary chambers and for reducing a total spring constant of the mounting device provided on the partition plate means, said first and second valve means respectively having plate members connected to the partition plate means through elastic members for absorbing the vibration of the mounting device, said plate members forming therebetween a central chamber filled with a working liquid; and
- orifice means disposed in the partition plate means to communicate the internal and secondary chambers with each other.

4,679,779

## HYDRAULIC MOUNT

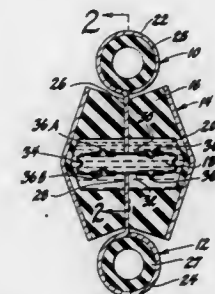
Joseph W. Hodonsky, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 17, 1986, Ser. No. 875,187

Int. Cl.<sup>4</sup> F16F 9/22

U.S. Cl. 267—140.1

4 Claims



1. A hydraulic mount comprising a shell, a pair of mounting members extending into the interior of said shell from opposite directions, elastomeric means joining said mounting members to the interior of said shell and defining a first chamber that expands and contracts with relative reciprocal movement of said mounting members, expansible means within said first chamber defining a second chamber that expands and contracts with relative reciprocal movement of said mounting members

in unison with and at a faster rate than said first chamber, liquid filling said chambers, first variable size orifice means for connecting said first chamber to said second chamber with an orifice that decreases in size with increasing pressure differential between said chambers above a prescribed pressure range when the pressure in said first chamber is greater, and second variable size orifice means for connecting said second chamber to said first chamber with an orifice that decreases in size with increasing pressure differential between said chambers above said prescribed pressure range when the pressure in said second chamber is greater.

4,679,780

# SPRING COMPRESSOR WITH LATCHABLE LOCKING DEVICE

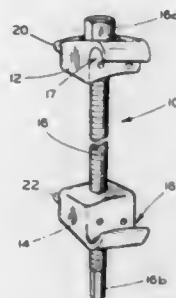
Kenneth D. Kloster, 6649 Millridge, Maumee, Ohio 43537

Continuation-in-part of Ser. No. 565,137, Dec. 27, 1983, abandoned, which is a continuation of Ser. No. 473,720, Mar. 16, 1983, abandoned, which is a continuation of Ser. No. 242,283, Mar. 10, 1981, abandoned. This application Aug. 31, 1984, Ser. No. 646,622

Int. Cl.<sup>4</sup> F16F 1/10

U.S. Cl. 267-177

3 Claims



1. A spring compressor for compressing a helical coil spring comprising:

a pair of spaced apart shoes each having a groove formed therein for receiving a portion of the helical coil of the spring;

at least one of said shoes having said groove formed of a helical configuration, and said groove defining a spring engaging bottom wall located in a plane formed at a predetermined, non-perpendicular angle with respect to a compression axis;

an elongate threaded shank parallel to said compression axis for mounting said shoes in spaced apart relationship with said grooves in facing relationship to one another, said shank having one end thereof rotatably supported by one of said shoes and having an opposite threaded end for threaded engagement with the other one of said shoes whereby rotation of said shank in one direction relative to said other one of said shoes causes said pair of spaced apart shoes to move toward one another; and

a latchable locking means carried by at least one of said shoes, said locking means including a U-shaped member having a pair of spaced apart, generally parallel legs extending through apertures formed in said shoe on opposite sides of said elongate shank, said legs having first ends connected by a connecting member and having second ends adapted to extend over said groove, said legs being located in a plane substantially parallel to said angled spring engaging bottom wall such that each of said second ends is spaced from said bottom wall by substantially the same distance, said U-shaped member being movable between a retracted position wherein said outer ends of said legs are positioned within said shoe and said portion of the helical coil spring can be inserted into said groove and a locked position wherein said second ends of said legs extend over said groove and over said portion of the helical coil, said groove and said legs cooperating to

substantially surround said portion of the helical coil for maintaining said portion of the helical coil within said groove, and detent means carried by one of said shoes and positioned to engage one of said legs for maintaining said U-shaped member in either the locked position or the retracted position.

4,679,781

# ADJUSTABLE JIG

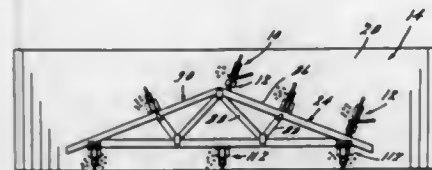
Robert A. LePoire, 2200 Barritt, Lansing, Mich. 48912

Division of Ser. No. 507,300, Jun. 24, 1983, Pat. No. 4,524,960, which is a continuation-in-part of Ser. No. 245,970, Mar. 20, 1981, abandoned. This application Feb. 25, 1985, Ser. No. 705,318

Int. Cl.<sup>4</sup> B25B 1/10

U.S. Cl. 269-45

3 Claims



1. An adjustable jig for use with a support formed of magnetic material and defining a plurality of spaced passageways opening upon a surface of said support, said adjustable jig comprising, in combination, a body, a permanent magnet carried by said body and magnetically attractable to said support, pin means carried by said body and adapted to be received selectively in the passageways defined by said support to mechanically connect said body to said support, said jig including a stop member pivotally connected to said body and having a curved abutment surface adapted to engage a workpiece.

4,679,782

# MECHANICAL TOGGLE CLAMP WITH MEANS FOR APPLYING UNIFORM CLAMPING FORCE

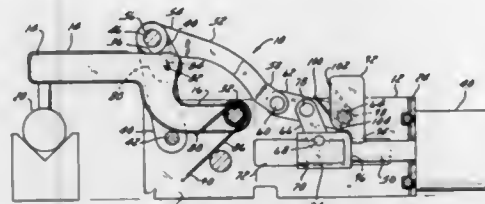
Edward R. Horn, Nasbotah, and Norbert J. Kot, II, Milwaukee, both of Wis., assignors to Aladdin Engineering &amp; Mfg, Brookfield, Wis.

Continuation of Ser. No. 688,314, Jan. 2, 1985, abandoned. This application Nov. 27, 1985, Ser. No. 802,306

Int. Cl.<sup>4</sup> B25B 1/14

U.S. Cl. 269-228

19 Claims



1. A mechanical clamp for use in clampingly engaging a workpiece, the mechanical clamp comprising:

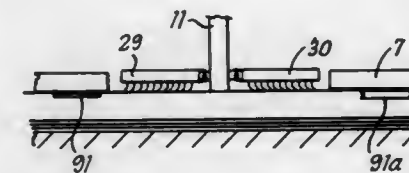
a frame,

a clamp member having an end portion supported for movement toward and away from a supporting surface and adapted to clampingly engage a workpiece against the supporting surface, said clamp member including a cam surface,

means for pivotally connecting said clamp member to the frame such that the clamp member is pivotally movable between a clamping position wherein said end portion of the clamp member clampingly engages the workpiece

against the supporting surface and a retracted position wherein said end portion releases the workpiece, and means for forcing said end portion of said clamp member into clamping engagement with the workpiece, said means for forcing including a force applying member engageable with said cam surface, said cam surface having opposite ends and a configuration such that said end portion of said clamp member is spaced from the supporting surface by a first dimension when the force applying member engages said one of said opposite ends of said cam surface and said end portion of said clamp member is spaced from the supporting surface by a second dimension when the force applying member engages the other of the opposite ends of said cam surface and such that the force applied by said end portion on said workpiece when said force applying member engages one of said opposite ends of said cam surface is substantially equal to the force applied by said end portion on said workpiece when said force applying member engages the other of said opposite ends of said cam surface.

pivotal movement of the plates in opposite senses about parallel, substantially horizontal axes; a plurality of needles carried on the lower surface of each plate; the tips of all the needles on a plate being substantially parallel, lying at an acute angle to the lower surface of the respective plate and pointing towards the outer edge of the respective plate, and the points of all the needles on a plate being substantially coplanar and adapted to engage a fabric layer; a nozzle located on the carrier between the two plates for directing an air blast downwardly between the plates; and means for pivoting the plates between a



4,679,783

# APPARATUS FOR OPENING SIGNATURES TO BE SUPPLIED TO BINDING MACHINES

Antonio Masuri, Via G. Mameli, 11, 20129 Milano, Italy

Filed Jun. 23, 1986, Ser. No. 877,299

Claims priority, application Italy, Jul. 26, 1985, 21726 A/85

Int. Cl.<sup>4</sup> B65H 39/02

U.S. Cl. 270-54

9 Claims



1. Apparatus for opening signatures comprising: a closed loop conveyor means, said closed loop conveyor means having a concavely curved section, means for depositing signatures to be opened onto said concavely curved section of said closed loop conveyor means in use of said apparatus, a plurality of rotatable sucker members disposed above said concave curved section of said closed loop conveyor means, a support frame carrying said plurality of rotatable sucker members, and drive means connected to said support frame, said drive means operating to cause said support frame to perform reciprocating arcuate movements which follow the curve of said concave section of said closed loop conveyor means.

standby position wherein the tips of the needles on one plate lie at a downwardly acute angle to the tips of the needles on the other plate and below the level of the nozzle, a fabric pickup position wherein the plates are pivoted upwardly from the standby position while in engagement with the fabric layer, said downwardly acute angle is increased and the needle points on both plates lie not below the level of the nozzle and tension the fabric layer across the nozzle, and a release position wherein the tips of the needles on each plate lie substantially vertically and below the level of the nozzle.

4,679,785

# PROCESS AND INSTALLATION FOR TRANSFER AND POSITIONING

Bernard Helffer, St Andres les Vergers, and Jacques Scheydecker, Avallon, both of France, assignors to Institut Textile de France, Boulogne Billancourt, France

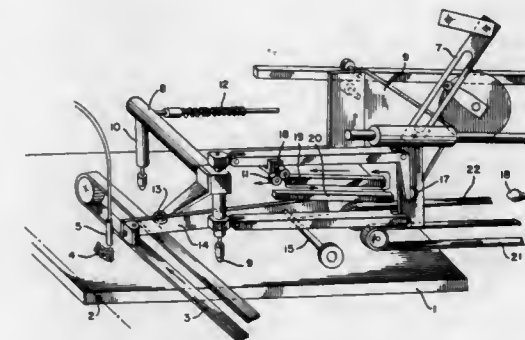
Filed Apr. 20, 1984, Ser. No. 602,398

Claims priority, application France, May 4, 1983, 83 07461

Int. Cl.<sup>4</sup> B65H 7/02

U.S. Cl. 271-227

14 Claims



1. A system for the transferring and positioning of a workpiece upon movement thereof from a first station to a second station, said system comprising a vertically adjustable surface having first and second locations thereon, first transfer means for slidably introducing a workpiece onto said surface at said first location, repositioning means overlying said surface for selective engagement with a workpiece at said first location and a transfer and repositioning of the workpiece to the second location, and second transfer means for engaging said workpiece at said second location and slidably removing the workpiece from said surface toward the second station, said repositioning means including vertically adjustable elements, means responsive to the presence of a workpiece at the first surface location for effecting a downward movement of said elements

4,679,784

# FABRIC PICKUP DEVICE

Itzhak Porat; Percy Grosberg, and Magid N. Moghaddassi, all of Leeds, England, assignors to Univ. of Leeds Industrial Services Limited, Leeds, England

Filed Jun. 6, 1985, Ser. No. 742,217

Claims priority, application United Kingdom, Jun. 8, 1984, 8414636

Int. Cl.<sup>4</sup> B65H 3/22

U.S. Cl. 271-18.3

10 Claims

1. A fabric pickup device comprising a carrier; two pickup plates lying one to each side of the carrier, each pickup plate having a lower surface with an inner edge adjacent to the carrier and an outer edge; means mounting each plate on the carrier adjacent to the inner edge of the respective plate for



against the workpiece and the underlying surface, support means for said surface responsive to engagement of said elements against a workpiece and underlying surface to allow a vertical downward movement of said surface and a downward retraction thereof from the first transfer means, means for laterally shifting said elements, means for rotating said elements during a lateral shifting thereof, and means, at the second surface location, for retracting said elements, allowing a vertically upward return of said surface and an engagement of a repositioned workpiece with said second transfer means remote from said first location and said first transfer means.

4,679,786

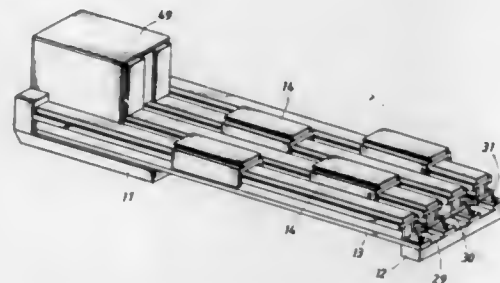
## UNIVERSAL EXERCISE MACHINE

Robert E. Rodgers, 8011 Meadow Croft, Houston, Tex. 77063  
Filed Feb. 25, 1986, Ser. No. 832,640

Int. Cl.<sup>4</sup> A63B 21/00, 1/00

U.S. Cl. 272-70

18 Claims



8. An exercise apparatus comprising:

- (a) a supportive frame;
- (b) a pair of slides mounted on said frame for reciprocating motion driven by the user during limb exercise on the exercise apparatus;
- (c) endless chain means deployed in loops;
- (d) said slides including selectively releasable chain connector means for connecting to said endless chain means to provide a power stroke in a first direction;
- (e) said slides being deployed on said frame to be powered by the user in providing reciprocating motion thereto;
- (f) rotative power consuming means; and
- (g) first means connecting said endless chain means to said power consuming means for delivery of rotation thereto to deliver power to be consumed in the operation of the apparatus to thereby provide a load to the user, wherein said first means includes means powered by said endless chain means on power strokes provided by the user thereto and enabling reciprocation of said endless chain means.

4,679,787

## COMBINED EXERCISE STATION AND SLEEPING BED

Joseph D. Guilbault, Solon, Ohio, assignor to The Stouffer Corporation, Solon, Ohio

Filed Feb. 14, 1985, Ser. No. 701,618

Int. Cl.<sup>4</sup> A63B 21/00; A47C 19/06

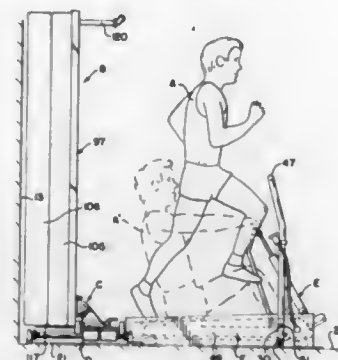
U.S. Cl. 272-93

10 Claims

1. A combined bed and exercise apparatus comprising, in combination:

- a frame means adapted to be firmly fixed in place to a floor;
- a bed having a head portion, a foot portion, two side edges and an upper surface;
- a hinge fixed to said frame means and pivotally supporting one end of said bed above said frame means such that said bed is pivotable between a vertical position and a horizontal position, said bed being positioned over a bed space in said horizontal position; and,
- exercise equipment immovably fixed in place on said frame means and immovably secured on said floor within said bed space and collapsible for accommodation and con-

cealment thereof beneath said bed when in its horizontal position, said exercise equipment being exposed in its fixed



position on the said fixed frame means, when said bed is in said vertical position, to thereby enable normal usage of the so exposed said exercise equipment.

4,679,788

## EXERCISE DEVICE

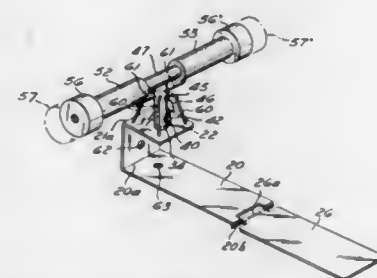
David M. Adler, 1301 N.E. 191 St., North Miami Beach, Fla. 33141

Filed Dec. 2, 1985, Ser. No. 803,420

Int. Cl.<sup>4</sup> A63B 21/00

U.S. Cl. 272-93

16 Claims



1. An exercise device comprising:

- a substantially rigid base having an elongated flat bottom segment adapted to extend beneath a bed mattress,
- a front segment attached to and extending transverse to said bottom segment at one end thereof,
- and a top segment attached to said front segment in spaced relation to said bottom segment and extending from said front segment substantially parallel to said bottom segment,
- said bottom, front and top segments together forming a channel-shaped structure dimensioned to fit snugly on the end of a bed mattress;
- a post structure extending transverse to said top segment of the base in a direction away from said bottom segment of the base; and
- a cross arm structure coupled to said post structure in spaced relation to said top segment of the base, said cross arm structure extending substantially parallel to said top segment of the base and substantially parallel to said front segment of the base and spaced from said top segment enough to permit a user's legs adjacent the ankles to fit between said cross arm structure and said top segment;
- said base also having a flat back segment hingedly connected to said bottom segment at the opposite end of the latter from said front segment.

4,679,789

## VIDEO GAME APPARATUS WITH AUTOMATIC SKILL LEVEL ADJUSTMENT

Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Continuation of Ser. No. 686,483, Dec. 26, 1984, abandoned.

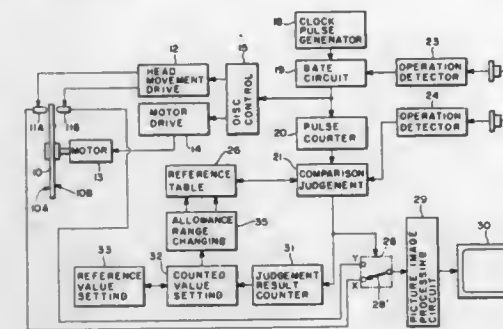
This application Jul. 28, 1986, Ser. No. 890,897

Claims priority, application Japan, Dec. 26, 1983, 58-198413[U]; Dec. 26, 1983, 58-198414[U]

Int. Cl.<sup>4</sup> A63F 9/22

U.S. Cl. 273-1 E

6 Claims



1. In a video game apparatus of the type in which a player actuates an operation section while looking at a game picture image displayed and a success or failure of the game is determined by an operating timing of the operation section; the improvement comprising:

- a reference table for setting a permissible range of said operating timing indicative of the success of the game;
- timing detection means for detecting a timing of the operation section operated by a player, said timing detection means comprising a clock pulse generator and a pulse counter for counting the number of pulses generated by said generator;
- judgment means for emitting a first type of signal when the timing detected by said timing detection means is within the permissible range set by said reference table, and emitting a second type of signal when the timing detected by said timing detection means is outside the permissible range set by said reference table;
- judgment result counting means for counting at least one of said first and second types of signals output from said judgment means;
- counted value detection means for outputting an adjustment signal when it is detected that the counted value in said judgment result counting means has reached a preset value; and
- permissible range changing means for changing the permissible range set in said reference table in accordance with said adjustment signal.

4,679,790

## BASEBALL EXERCISING DEVICE

Yong S. Ham, Jangmi APT 12-1105, 7-Shinchun-Dong, Kangnam-ku, Seoul, Rep. of Korea

Filed Mar. 12, 1986, Ser. No. 838,829

Int. Cl.<sup>4</sup> A63B 69/40

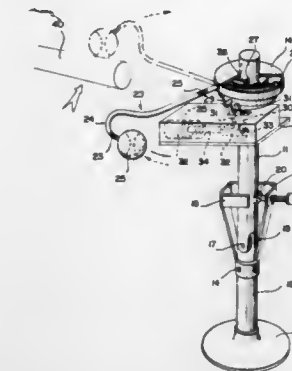
U.S. Cl. 273-26 E

11 Claims

- 1. A portable baseball hitting device comprising
- a column member adapted to extend in a substantially vertical direction,
- a housing rotatably disposed at one end of said column member,
- an arm member connected at one end to said housing to rotate therewith, said housing being provided at the surface thereof with a pin, said arm member extending radially from said housing in a substantially horizontal direc-

tion with the other end thereof being attached to a base-ball,

a hydraulic cylinder mounted on the column member, said hydraulic cylinder being provided with a means for engaging said pin to retard the initial counter-clockwise rotation of the housing and arm member attached thereto, spring bias means disposed within said housing with one end



thereof connected to the housing and the other end thereof connected to the column member whereby when a batter hits the ball, the arm member is caused to rotate in a clockwise direction around said column member, against the bias of the spring means and when the arm member stops its clockwise rotation, the spring means causes the arm member to rotate counter-clockwise to return to its initial hitting position.

4,679,791

## SET OF GOLF CLUBS

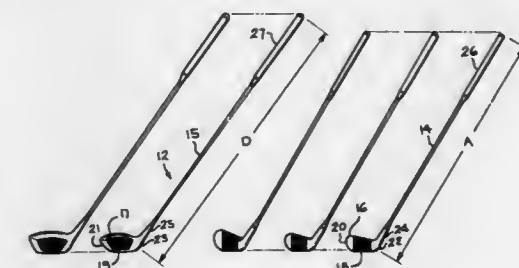
Donald R. Hull, 501 1/2 Hickory St., Perrysburg, Ohio 43551

Filed Nov. 29, 1984, Ser. No. 676,517

Int. Cl.<sup>4</sup> A63B 53/00

U.S. Cl. 273-77 A

10 Claims



10. An improved set of golf clubs including a plurality of irons and a plurality of woods, each of said clubs including a shaft having a first and second end, a grip positioned about said first end of said shaft, a club head attached to said second end of said shaft by a hosel, said club head having a toe, a heel, and a striking face, said grip having a substantially rectangular cross-section with opposed flat parallel sides and a rounded top and bottom, said sides being substantially parallel to the leading edge of the club head and the score lines on the striking face of said club head, said grip being constructed of a substantially non-compressible core covered by a wear-resistant compressible outer cover, said irons having a first common club length, first common club weight and first common club lie, said woods having a second common club length, a second common club weight and a second common club lie, said second common club length of said woods being longer than said first common club length of said irons, said second common club weight of said woods being lighter than said first

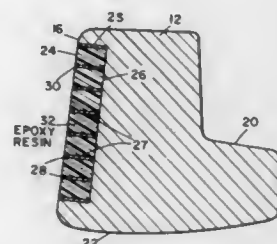
common club weight of said irons, said second common club lie of said woods being flatter than said first common club lie of said irons, one-half of said first and second common club weights lying in said toe of said club heads and the remaining one-half of said club weights lying in said grip, shaft, hosel and heel of said clubs, whereby the center of gravity of said clubs lie at the approximate center of said club faces.

#### 4,679,792 GOLF PUTTER

George T. Straza, and George C. P. Straza, both of P.O. Box 1292, Rancho Santa Fe, Calif. 92067  
Continuation of Ser. No. 632,373, Jul. 19, 1984, abandoned. This application Jan. 30, 1986, Ser. No. 824,166  
Int. Cl.<sup>4</sup> A63B 53/04

U.S. Cl. 273—78

11 Claims



11. An insert member for forming the ball striking face of a golf putter head, the member comprising:

a cellular structure having an outer periphery of the same general shape as the elongate outer periphery of a golf putter head, a generally flat front face, and a thickness substantially less than the thickness of a putter head, for mounting in a correspondingly shaped cavity in the front face of a golf putter head with the front face of the structure coplanar with the front face of the putter head;

the cellular structure comprising a honeycomb-like array of adjoining open ended cells with their central axes perpendicular to the front face of the array, adjacent cells being separated by common cell walls, and a resilient material filling each of the cells to the level of the front face so as to leave the outer ends of the cell walls exposed.

#### 4,679,793 TABLE GAME

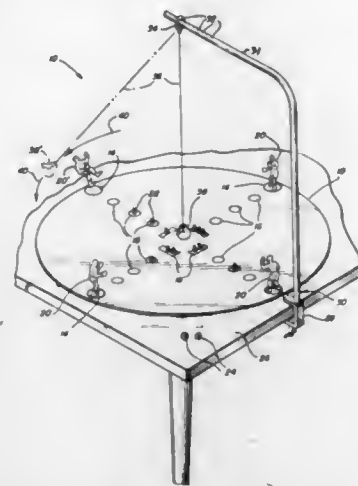
Ramon Gonzalez, 2721 W. Wellington, Chicago, Ill. 60618  
Filed Mar. 10, 1986, Ser. No. 838,308  
Int. Cl.<sup>4</sup> A63F 7/24

U.S. Cl. 273—85 R

4 Claims

1. a table game for simulating the sport of boxing, or the like, including a horizontal playing surface adapted to be placed on a table, an overhead support means attachable to said table and having a horizontal beam member in substantial overlaying relationship to said playing surface, a pendulum dependent from said horizontal beam, means for centering said pendulum above said playing surface wherein said centering means comprises a plurality of notches defined in said beam with said pendulum suspended from a ring encircling said beam and

placable in any of said notches, a plurality of playing figures positionable on said playing surface to be vulnerable to said



pendulum when said pendulum is swung in a circular motion above said playing surface.

#### 4,679,794 GOLF BALL

Mikio Yamada, Kobe, and Akibiko Hamada, Kakogawa, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

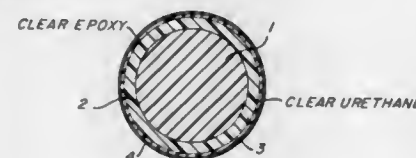
Filed Nov. 5, 1985, Ser. No. 795,129

Claims priority, application Japan, Nov. 5, 1984, 59-233498

Int. Cl.<sup>4</sup> A63B 37/12, 43/06

U.S. Cl. 273—235 R

7 Claims



1. A golf ball having an excellent white appearance without any white paint layers disposed on the cover, which comprises a core with a cover thereon, said cover containing 100 parts by weight of an ionomer resin, 1 to 10 parts by weight of an inorganic white pigment containing barium sulfate having a particle size of 1 to 10 micrometers said barium sulfate being present in an amount of not less than 60% by weight, based on the total amount of the inorganic white pigment, 0.0001 to 0.05 parts by weight of a blue coloring agent and 0.01 to 0.4 parts by weight of a fluorescent whitening agent, the weight of said blue coloring agent and said fluorescent whitening agent being based on 100 parts by weight of the ionomer resin.

#### 4,679,795

OPTICAL BRIGHTENERS IN GOLF BALL COVERS  
Terence Melvin, Somers, Conn., and R. Dennis Nesbitt, Westfield, Mass., assignors to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 519,351, Aug. 1, 1983, abandoned. This application Apr. 18, 1986, Ser. No. 861,532

Int. Cl.<sup>4</sup> A63B 37/00, 37/12

U.S. Cl. 273—235 R

28 Claims

1. A golf ball which incorporates a polymeric material which contains from about one percent 1% to about ten percent 10% of a white pigment wherein said pigmented poly-

meric material incorporates from about 0.01 to about 0.50 percent of a compatible optical brightener which increases the whiteness of the surface of said golf ball all percentages to total 100 percent.

5. A golf ball having a core and a cover wherein said cover comprises from about 99 to about 89.50 percent of a natural or synthetic polymer, from about one to about ten percent of a white pigment and from about 0.05 to about 0.25 percent of a compatible optical brightener which increases the whiteness of the cover all percentages to total 100 percent.

#### 4,679,796

##### PROBLEM SOLVING GAME

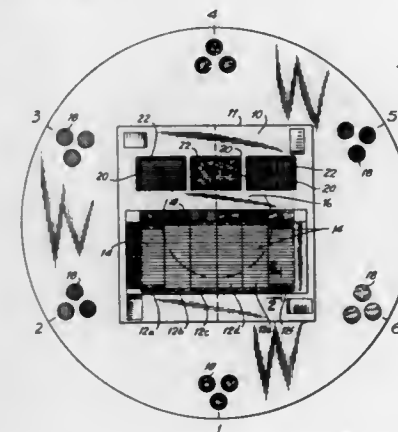
Harold Rein, 33 Fifth Ave., New York, N.Y. 10003, assignor to Harold Rein et al, New York, N.Y.

Filed Nov. 7, 1985, Ser. No. 795,855

Int. Cl.<sup>4</sup> A63F 3/00; A63B 71/00

U.S. Cl. 273—236

5 Claims



1. A game in which players gain points by correctly solving problems, the game comprising:

scoring means comprising:

- a plurality of vertical columns, each vertical column being defined by a plurality of slots;
- a plurality of chips, each chip shaped and dimensioned to removably fit into said slots; and
- a plurality of challenge cards, each challenge card having a problem to be solved by a player and the correct solution to the problem thereon, players gaining points by correctly solving the problem, said points being indicated during play by chips retained in slots, wherein each vertical column is divided into three areas and wherein the challenge cards are divided into three sets, each set of challenge cards being associated with a different one of said three column areas, the first challenge card set including cards with easier to solve problems thereon, the second set including cards with problems more difficult to solve than those on the first set, and the third set including cards with problems more difficult to solve than those on the second set.

#### 4,679,797

BOARD GAME SIMULATING TRAVEL THROUGH TIME  
Alan Sherin, 12330 Osborne St., #28, Hanson Hills, Calif. 91331; Bradley Geagley, 1411 N. Hayworth, #18, West Hollywood, Calif. 90039, and Glenn Benest, 953 11th St., #1, Santa Monica, Calif. 90403

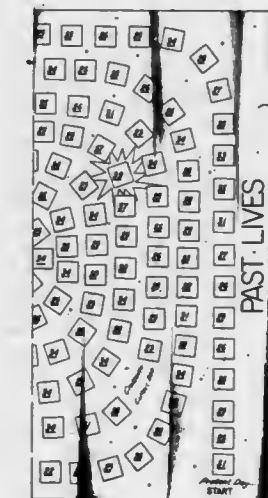
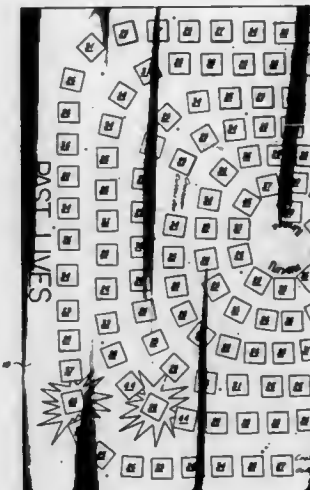
Filed Jul. 22, 1985, Ser. No. 757,152

Int. Cl.<sup>4</sup> A63F 3/00

U.S. Cl. 273—251

4 Claims

1. A game board combination including: a game board having marked squares thereon constituting a path from a beginning location to an end location and simulating a journey backward in time through a number of distinct past ages, each



ages and wherein at least one square on the game board for each of the different ages directs a player to select one of the instruction cards in that particular age each player accumulating points, as different treasure cards are selected; and a book containing descriptions of past lives indexed to different point totals so that a player may determine his past life as indicated to the total number of points accumulated when the game ends.

#### 4,679,798

##### BOARD GAME APPARATUS REPRESENTING TRANSPORTATION

Robert E. Dvorak, 7021 Date Palm Ave., S., St. Petersburg, Fla. 33707, and Frank D. Fattedad, 302-5411 Arcadia Road, Richmond, B.C., Canada (V6X 2H1)

Filed Mar. 15, 1985, Ser. No. 712,359

Int. Cl.<sup>4</sup> A63F 3/00

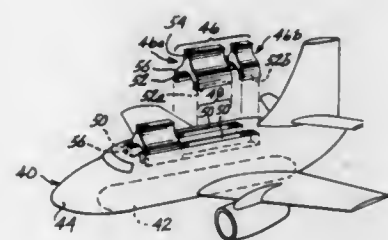
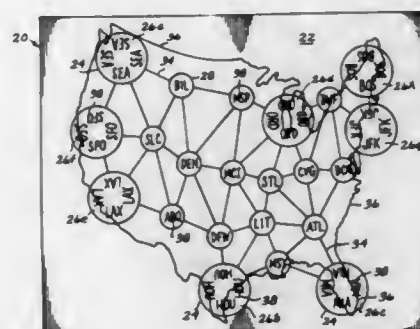
U.S. Cl. 273—254

12 Claims

3. A game apparatus comprising in combination: (a) a game board with a playing surface displaying a plurality of interconnected first symbols representing destinations, the first symbols being distinguishable by coded first indicia displayed thereon;



- (b) second symbols representing destinations displayed on the playing surface, said second symbols not displaying any of the first indicia;
- (c) third symbols representing transportation routes located and displayed on the playing surface so as to extend between and connect various of the first and second symbols;
- (d) a plurality of distinguishable first playing pieces that do not display any of the first indicia, each first playing piece having upper and lower surfaces, the lower surfaces of each first playing piece being adapted for placement on the playing surface at selected first symbols, the upper



- surface of each playing piece being adapted for selectively receiving and carrying at least one second playing piece;
- (e) a plurality of second playing pieces of at least one size, each second playing piece being adapted to be received and carried by any one of the first playing pieces, with each second playing piece correspondingly displaying at least a portion of one of the first indicia; and,
- (f) said first playing pieces having the configuration to transport vehicles that correspond with the nature of the destinations represented by the first and second symbols and with the transportation routes represented by the third symbols.

4,679,799

# APPARATUS AND METHOD FOR PROPELLING AN OBJECT

Don A. Coletti, P.O. Box 171, Troy, N.Y. 12182  
Filed Aug. 30, 1985, Ser. No. 771,347  
Int. Cl.<sup>4</sup> A63B 67/00

U.S. Cl. 273-318

10 Claims

1. A game apparatus comprising:
- a flaccid, essentially planar base having finite bounds of predetermined dimension, within said bounds the surface of said base being homogeneous; and
- at least three attachment means, each attachment means located toward the periphery of the base a predetermined distance from each other, each of said attachment means being adapted to secure a portion of the base to a human finger, and support the base in a spaced apart relationship to the palm of the hand when the fingers are moved away from each other, whereby the contraction of the fingers and the associated attachment means toward each other

move the base to a relaxed state wherein said base forms a pocket for holding an object, and the expansion of the



fingers and associated attachment means away from each other, moves the base to its taut position wherein said base is substantially planar.

4,679,800

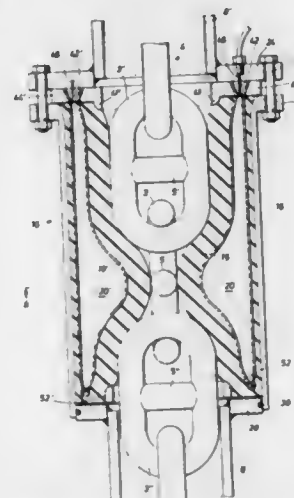
# HAWSER CHAIN SEAL ASSEMBLY

James A. Burton, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Oct. 15, 1984, Ser. No. 660,710  
Int. Cl.<sup>4</sup> B63B 21/18; F16J 15/00

U.S. Cl. 277-34

7 Claims



1. A hawser chain seal assembly adapted for sealing about a hawser chain, said chain extending through two axially aligned sections of hawser pipe, said assembly comprising,
- a housing means adapted for connecting said hawser pipe sections, said housing means movable to and from an open position for exposing said hawser chain extending through said hawser pipe sections and a closed position for longitudinally surrounding said hawser chain,
- a sealing element having at least two semi-cylindrical parts, each of said parts adapted for placement partially about said hawser chain when said housing means is in said open position, said sealing element being longitudinally disposed between said hawser chain and said housing means when said housing means is in said closed position, said semi-cylindrical parts of said sealing element each having at least one inflatable bladder,
- means for receiving pressurized fluid for application to said bladders of said sealing elements for causing said sealing elements to sealingly engage said hawser chain, and
- said housing means is connected between ends of the two axially aligned sections of hawser pipe and comprises,
- a first outward flange fastened to an end of a first section of hawser pipe,

- a second outward flange fastened to an end of a second section of hawser pipe,
- a sealing means disposed peripherally about an outwardly facing surface of said second flange, and
- a cylindrical housing structure for sealingly engaging said sealing means of said second flange and for fastening to said first outward flange, said housing structure being movable in one direction to an open position for providing external access to said hawser chain and being movable in the other direction to a closed position for fastening to said first outward flange.

4. A hawser chain seal assembly adapted for sealing about a hawser chain, said chain extending through two axially aligned sections of hawser pipe, said assembly comprising,
- a housing means adapted for connecting said hawser pipe sections, said housing means movable to and from an open position for exposing said hawser chain extending through said hawser pipe sections and a closed position for longitudinally surrounding said hawser chain,
- a sealing element having at least two semi-cylindrical parts, each of said parts adapted for placement partially about said hawser chain when said housing means is in said open position, said sealing element being longitudinally disposed between said hawser chain and said housing means when said housing means is in said closed position, said semi-cylindrical parts of said sealing element each having a plurality of inflatable bladders molded therein,
- means for receiving pressurized fluid for application to said bladders of said sealing elements for causing said sealing elements to sealingly engage said hawser chain,
- said semi-cylindrical sealing parts are each formed of elastomeric material in the shape of one-half of a cylinder cut by a plane through its longitudinal axis and when placed about said hawser chain cooperate to form a cylindrical packing element for sealing about said hawser chain

4,679,801

# LABYRINTH SEAL WITH PRESSURIZED SEALING PACKING

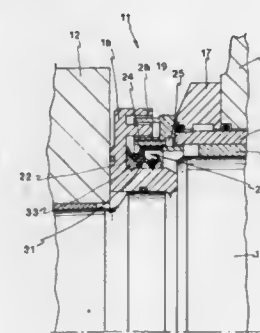
Alfredo Poloni, Ronchi Del Legionari, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Feb. 28, 1986, Ser. No. 834,598

Claims priority, application Italy, Feb. 28, 1985, 83334 A/85  
Int. Cl.<sup>4</sup> F16J 15/32, 15/447

U.S. Cl. 277-53

4 Claims



1. A labyrinth seal for providing a seal between elements in relative motion, comprising:
- a stationary collar
- rotary collar
- a labyrinth defined by said stationary collar and said rotary collar;
- a sealing packing of a flexible material located in the innermost portion of said labyrinth and facing said labyrinth, said sealing packing comprising at least one inner lip and at least one frontal lip, each of said lips contacting said rotary collar, said packing and said rotary collar defining

a toric space, the rotary collar being rotatable with respect to the inner lip and the frontal lip; and

means to deliver fluid under pressure to a portion of the labyrinth next to said sealing packing.

4,679,802

# CLAMP CHUCK

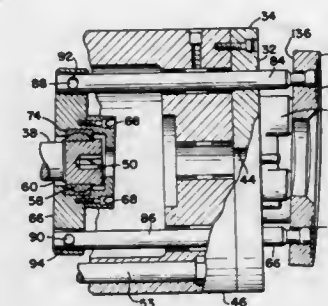
Loren D. Beal, 754 Penarth Ave., Walnut, Calif. 91789

Filed Mar. 14, 1986, Ser. No. 839,736

Int. Cl.<sup>4</sup> B23B 31/10

U.S. Cl. 279-106

21 Claims



1. A chuck assembly for retaining a workpiece in a machine tool during a machining operation including:
- a tool surface;
- a clamp member having a clamp surface thereon facing said tool surface, said tool and clamp surfaces being adapted for retaining a workpiece therebetween; and
- means for moving said clamp surface with respect to said tool surface, said means for moving including:
- a connection member adapted for connection to a source of linear movement;
- a lever member having:
- a first edge portion;
- a second edge portion; and
- a central portion;
- first pivot means connecting said central portion of said lever member to said connection member;
- at least two tension members, each having:
- a first end; and
- a second end;
- second pivot means connecting said first ends of said at least two tension members to said first and second edge portions of said lever member; and
- third pivot means operatively connecting said second ends of said at least two tension members to said clamp surface.

4,679,803

# APPARATUS FOR MAINTAINING STABILITY OF MOBILE LAND VEHICLES ON SLOPING TERRAIN

Cleveland J. Biller, Morgantown, and David D. Johnson, Booth, both of W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 27, 1986, Ser. No. 822,574

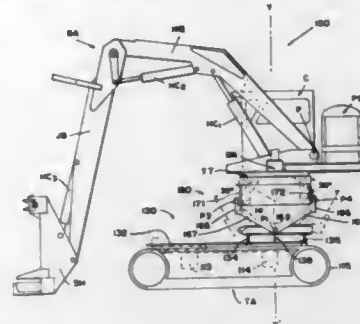
Int. Cl.<sup>4</sup> B60P 1/18; B60G 17/00

U.S. Cl. 280-6 H

20 Claims

1. In a vehicle including a base platform supporting a swing-house assembly for rotation about a first axis generally normal to said platform and a driver tread assembly for propelling said vehicle the swing-house assembly having an operator's cab, an engine and a boom assembly, and the tread assembly having longitudinal and transverse axes normal to said first axis, an apparatus disposed between said platform and said tread assembly for changing the center of gravity of said vehicle to stabilize the vehicle during its movement over terrain of varying slope said apparatus comprising:

means for translating said base platform relative to said tread assembly along said longitudinal axis, and

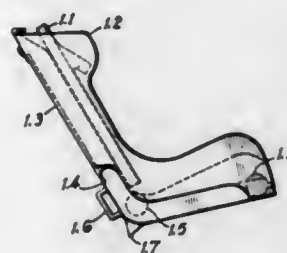


said translating means including means for pivoting said base platform relative to said tread assembly about said transverse axis.

**4,679,804**  
**CONVERTIBLE AUTO RESTRAINER SEAT (CAR SET)**  
Conner Johnson, 3317-B Pepper Tree Cir., Decatur, Ga. 30034  
Filed Sep. 30, 1985, Ser. No. 781,798  
Int. Cl.<sup>4</sup> B62B 7/12

U.S. Cl. 280—30

8 Claims



1. A seat for children comprising a seat portion with a back portion extending generally vertically from one edge thereof, said seat portion having separately pivotable front and rear sets of leg members secured thereto, said members having an operative position for supporting the seat, and a folded position for storage thereof, said back portion having a recess formed in the rear face thereof with a panel releasably secured therein, said back portion also having upper and lower retaining means, said lower retaining means for holding said panel in said recess, and said upper retaining means for supporting said panel in a position above and generally parallel to said seat portion.

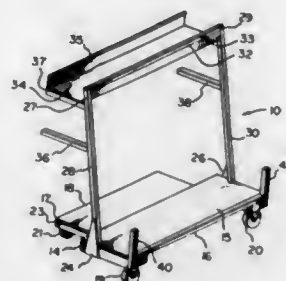
**4,679,805**  
**SPACE SAVER CART**  
Michael J. Cunningham, 6004 5th Avenue, S.E., Calgary, Alberta, Canada T2A 4E4  
Filed Aug. 11, 1986, Ser. No. 895,215  
Claims priority, application Canada, Sep. 17, 1985, 490910  
Int. Cl.<sup>4</sup> B62B 3/00

U.S. Cl. 280—33.99 R

12 Claims

1. A movable cart comprising:  
(a) a base frame provided with means for rollably moving said cart, said base frame including a longitudinally extending beam member and two deck support members, each of generally rectangular outline, attached to said beam member and extending horizontally outwardly in mutually opposed directions from the points of attachment to said beam member, the first said member being positioned at a level slightly below that of the second said member;

(b) elongated support means vertically extending from and connected to said base frame; and  
(c) an open-ended rectangular tray member secured to and projecting outwardly from said vertically extending support means at its upper end, said tray member being parallel to and vertically spaced apart from said first deck support member of said base frame;

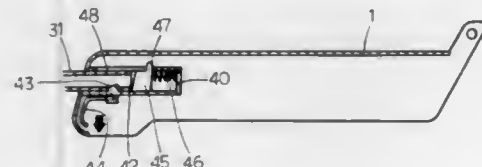


said cart being constructed and arranged such that when the first said cart is brought into juxtaposition with a second said cart the first deck support member of said base support means of said first cart will nest beneath the second deck support member of said second cart.

**4,679,806**  
**ARM REST AND HANDRAIL ASSEMBLY FOR BABY CARRIAGE**  
Lin Gingline, Tainan Hsien, Taiwan, assignor to Te-Chin Handicraft Enterprise Co., Ltd., Tainan Hsien, Taiwan  
Filed Feb. 19, 1986, Ser. No. 830,810  
Int. Cl.<sup>4</sup> B62B 7/14

U.S. Cl. 280—47.38

1 Claim



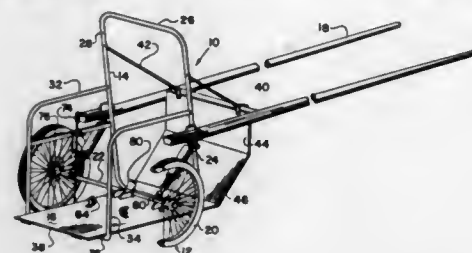
1. An improved banister for a baby carriage comprising left-hand and right-hand side banisters and a front banister, said left-hand and right-hand side banisters having open front ends, said front banister having locking projections at its opposite ends for insertion into the open front ends of said left-hand and right-hand banisters, respectively, said locking projections each having an aperture in the underside of each such projection, each of said left-hand and right-hand banisters having in said open front ends a locking chamber for receiving such projection, a plate in each said locking chamber slidable from the front to the back of each said chamber and resilient means in each said chamber for urging said plate in each said open end to the front end thereof, a protrusion at the upper side of each said slidable plate extending in a groove in the upper wall of said chamber for receiving said slidable plate protrusion and for guiding said plate and a stopper in the bottom wall of each said chamber, said stopper having a sloping front wall, a vertical back stopping wall, a spring for urging said stopper into said chamber and a trigger for extracting said stopper from said chamber, the forward end of the protrusions on said front banister contacting the sloping front wall of said stopper to depress said stopper against the tension of said spring as said front banister protrusions are inserted, said stopper being urged upward by said spring into the aperture when said stopper and aperture are aligned, said stopper being withdrawn from said

banister when said trigger is actuated, said aperture being located in an underside of said front banister projection.

**4,679,807**  
**WHEELCHAIR CART**  
Johnny D. Raybon, 509 Lubbock Rd., Brownfield, Tex. 79316  
Filed Aug. 14, 1986, Ser. No. 896,758  
Int. Cl.<sup>4</sup> B62C 1/02

U.S. Cl. 280—65

10 Claims



1. A sulky having:  
a "U" shaped frame having a bight and two distal ends, a stub axle, connected to each distal end of the "U" shaped frame,  
a wheel journaled to each of the stub axles,  
two horizontal shafts for a horse extending forward of the wheels,

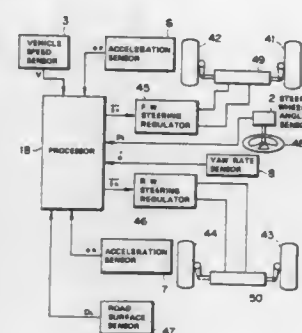
WHEREIN THE IMPROVEMENT COMPRISES:

a floor having a rear and front portion,  
said front portion of the floor connected to the bight of the "U" shaped frame,  
a roll bar frame connected to the shafts and connected to the front portion of the floor and extending upward therefrom,  
a horizontal roll bar at the top of the roll bar frame,  
a horizontal handrail on each side of the sulky,  
each handrail attached to and extending rearward of the roll bar,  
the rear of each handrail connected to the rear of the floor, and  
lock means on the floor for locking at least one wheelchair to the floor.

**4,679,808**  
**VEHICLE MOTION ESTIMATING SYSTEM**  
Ken Ito, Yokohama, and Taketoshi Kawabe, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Japan  
Filed Mar. 7, 1986, Ser. No. 837,170  
Claims priority, application Japan, Mar. 15, 1985, 60-50553  
Int. Cl.<sup>4</sup> B62D 6/00

U.S. Cl. 280—91

13 Claims



1. A vehicle motion estimating system comprising:  
means for sensing a steering wheel angle of a controlled vehicle, determining an actual value of said steering wheel

angle, and producing a signal indicative of said steering wheel angle,

means for sensing a vehicle speed of said controlled vehicle, determining an actual value of said vehicle speed, and producing a signal indicative of said speed,  
means for sensing a first motion variable of said controlled vehicle, determining an actual value of said first motion variable, and producing a signal indicative of said first motion variable,

means for sensing a second motion variable of said controlled vehicle, determining an actual value of said second motion variable, and producing a signal indicative of said second motion variable, and

processing means, with inputs receiving the signals produced by said steering wheel angle sensing means, vehicle speed sensing means and first and second motion variable sensing means, for estimating from said signals at least a third variable defining a motion of said controlled vehicle, said processing means comprising state discriminating means for producing a condition signal which is in a first signal state when said controlled vehicle is in a steady state turning motion and in a second signal state when said controlled vehicle is in transient state turning motion, motion estimating means for determining estimated values of said first, second and third variables corresponding to the signals indicative of said actual values of said steering wheel angle and vehicle speed by solving at least a first mathematical vehicle model which is determined by equations of vehicle motion and values of a group of vehicle characterizing parameters comprising a first vehicle characterizing parameter, and parameter adjusting means for adjusting the value of said first vehicle characterizing parameter used in determining said estimated value of said third variable in accordance with a result of a comparison between said actual and estimated values of said first motion variable when said condition signal is in said first signal state, and in accordance with a result of a comparison between said actual and estimated values of said second motion variable when said condition signal is in said second signal state.

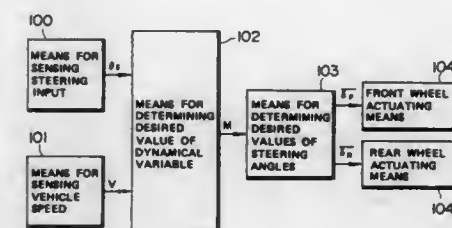
**4,679,809**  
**STEERING CONTROL SYSTEM FOR WHEELED VEHICLE**

Ken Ito, Naohiko Inoue, both of Yokohama, and Taketoshi Kawabe, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 9, 1985, Ser. No. 773,650  
Claims priority, application Japan, Sep. 10, 1984, 59-188153;  
Jan. 28, 1985, 60-13925; Jan. 31, 1985, 60-15512  
Int. Cl.<sup>4</sup> B62D 6/02

U.S. Cl. 280—91

17 Claims



1. A steering control system for a controlled vehicle having a pair of front wheels and a pair of rear wheels, comprising:  
steering input sensing means for sensing a steering input quantity representing a driver's steering command of said controlled vehicle and determining a sensed value of said steering input quantity,  
vehicle speed sensing means for sensing a vehicle speed of



said controlled vehicle and determining a sensed value of said vehicle speed,

target determining means connected with said steering input and vehicle speed sensing means for determining a desired value of at least one dynamic variable corresponding to a response of a desired vehicle to said sensed values of said steering input quantity and said vehicle speed by solving a group of equations of vehicle motion characteristics of said desired vehicle for said desired value of said at least one dynamic variable using a set of vehicle parameters representative of said desired vehicle,

steering angle determining means connected with said target determining means for determining desired values of front and rear steering angles of said front wheels and said rear wheels required to achieve said desired value of said dynamic variable by solving equations of motion characteristic of said controlled vehicle using said desired value of said dynamic variable and a set of vehicle parameters representative of said controlled vehicle,

front wheel steering actuating means for steering said front wheels of said controlled vehicle so that the actual front steering angle of said front wheels remains equal to said desired value of said front steering angle,

rear wheel steering actuating means for steering said rear wheels of said controlled vehicle so that the actual rear steering angle of said rear wheels remains equal to said desired value of said rear steering angle.

4,679,810

## POWERED STEP ASSEMBLY FOR VEHICLES

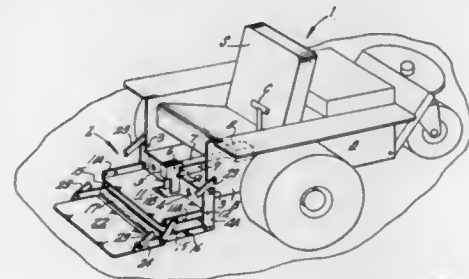
James F. Kimball, 83617 Rattlesnake Rd., Dexter, Oreg. 97431

Filed Jun. 30, 1986, Ser. No. 879,968

Int. Cl.<sup>4</sup> B60R 3/02

U.S. Cl. 280—166

7 Claims



1. A step assembly for a vehicle having a forwardly disposed seat, said assembly comprising,

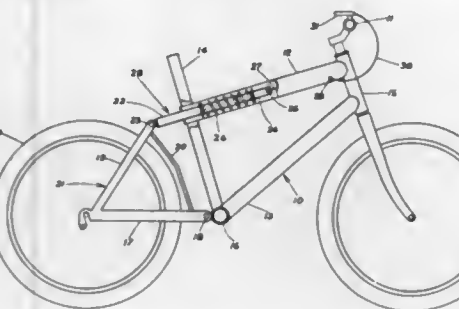
a control plate pivotally attached to said vehicle for movement about a horizontal axis,

step means pivotally secured to said control plate and located forwardly of said vehicle seat and including a step member,

linkage means pivotally coupling said control plate to said step means,

control bars releasably attached at one of their ends to said step means and at their opposite ends to the body of said vehicle, and

powered actuator means carried by said vehicle and coupled to said control plate for positioning said plate about said horizontal axis, wherein control plate movement by said actuator means will position said step means between a lowermost, generally horizontal ground engaging position to function as a step and an inclined elevated position for permitting said step means to function as a footrest for an occupant in said vehicle seat, and wherein said step means may be pivoted from said inclined elevated position to a generally vertical, fully elevated position after said control bars have been disconnected from said step means.



U.S. Cl. 280—284

4 Claims

1. A rear suspension system for a bicycle, said bicycle having a main frame including a top tube, a seat tube, a bottom bracket shell, and a swing arm pivot and a rear frame assembly which includes a swing arm, a pair of seat stays, a swing arm front support and a rear wheel all pivotally mounted to said main frame at the junction of said swing arm pivot and said swing arm, comprising:

a tubular shock absorber assembly employing linear reciprocating motion mounted coaxially inside said top tube, said tubular shock absorber assembly having a front anchor point attached to said top tube and a rear anchor point extending through and beyond an open rearward end of said top tube and being pivotally connected to a junction point of said seat stays, said tubular shock absorber assembly including an inner tube having a reduced diameter portion at one end thereof, an outer tube slidably mounted about said inner tube, and a compression spring mounted around and operatively connected between said inner and outer tubes;

a means for remotely adjusting the dampening characteristics of said tubular shock absorber assembly including an elastomer cylinder slidably mounted on said reduced diameter portion, a sliding compression tube mounted on said reduced diameter portion concentric to said elastomer cylinder and a sliding piston mounted between said elastomer cylinder and said sliding compression tube, said sliding compression tube being connected to an operator actuated control lever by means of a cable such that when actuated, said control lever, through said cable, moves said sliding compression tube and said sliding piston relative to said reduced diameter portion against said elastomer cylinder, compressing said elastomer cylinder in the longitudinal direction of said tubular shock absorber assembly, the longitudinal compression of said elastomer cylinder resulting in a diametric increase of said elastomer cylinder which acts between the outer surface of the reduced diameter portion of said inner tube and an inner surface of said outer tube such that the damping characteristics of the tubular shock absorber assembly is adjusted.

4,679,812

## APPARATUS FOR SIMPLIFYING THE LAUNCHING AND RETRIEVAL OF A BOAT FROM ITS TRAILER

Donn A. Byrnes, 94 High Mesa Rd., Los Lunas, N. Mex. 87031

Filed Dec. 19, 1985, Ser. No. 810,997

Int. Cl.<sup>4</sup> B60D 1/06

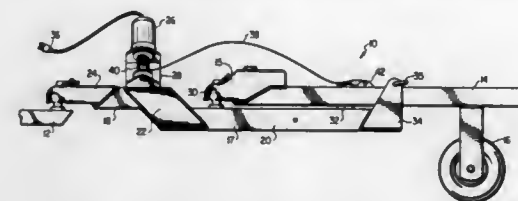
U.S. Cl. 280—406 A

5 Claims

1. A boat launching and retrieving apparatus comprising:

a longitudinal body adapted to serve as an intermediate coupling apparatus between a tow vehicle and a boat trailer; a winch mounted to said longitudinal body for

lowering the boat trailer down a boat ramp for launching and pulling the boat trailer up the boat ramp for retrieval; means for limiting relative motion of said apparatus and the boat trailer to fore and aft axial motion; said longitudinal body including a front member, a rear member attached



below and extending rearwardly from said front member, first coupling means associated with said front member, said coupling means associated with said rear member; and said first coupling means, second coupling means and means for limiting relative motion being substantially colinear.

4,679,813

## SKI STIFF IN TORSION

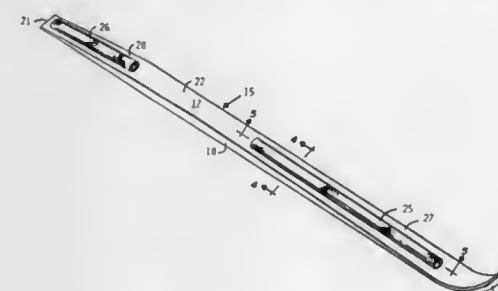
Donald A. Girard, P.O. Box 172, Rancho Cordova, Calif. 95670

Filed Apr. 10, 1986, Ser. No. 850,280

Int. Cl.<sup>4</sup> A63C 5/07

U.S. Cl. 280—602

11 Claims



1. A ski that is stiff in torsion and is flexible in the vertical direction, comprising

a ski body that is compliant both in beam and in torsion, having a bottom surface and a top surface, a curved-up front end, a rear end, and a ski binding area in between its ends for affixation of a user's ski boot, providing a forward top surface portion and a rear top surface portion, at least one hollow elastomeric tubular hose supporting and reinforced by tightly helically wound braiding of high-tensile-strength filaments, rigidly secured to an upper surface portion said ski body, said hose extending lengthwise.

4,679,814

## RANDOMLY ORIENTED REINFORCING FIBERS IN A SNOW SKI

Franklin D. Meatto, Cromwell, and Edward D. Pilpel, Manchester, both of Conn., assignors to TriStar Sports Inc., Middletown, Conn.

Continuation of Ser. No. 574,443, Jan. 27, 1984, abandoned. This application Dec. 3, 1985, Ser. No. 804,320

Int. Cl.<sup>4</sup> A63C 5/12

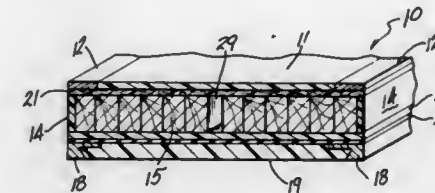
U.S. Cl. 280—610

18 Claims

1. In a snow ski of predetermined length having a core formed from a predetermined material, a top surface, a bottom running surface bounded on its opposing sides by metal edges, and a first side and a second opposing side positioned generally perpendicularly to the top and bottom surfaces and intermediate thereof, the improvement comprising:

at least one isotropic torsional reinforcing precured planar

laminate layer intermediate the top surface and bottom running surface and generally parallel thereto extending laterally at least partially between the first side and the second opposing side and longitudinally extending substantially over the predetermined length of the ski, the at



least one isotropic torsional reinforcing precured planar laminate layer being independent of the core and formed from fibers of high elastic modulus suspended in a matrix of predetermined material, the fibers being oriented randomly therein to thereby permit the torsional stiffness of the structure to be selectively predetermined.

4,679,815

## SAFETY SKI BINDING

Roger Pascal, Annecy-Le-Vieux, and Jean P. Dimier, Rumilly, both of France, assignors to Salomon S.A., Annecy, France

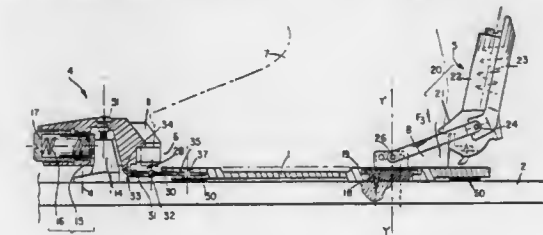
Filed Jun. 18, 1984, Ser. No. 621,734

Claims priority, application France, Jun. 20, 1983, 83 10819

Int. Cl.<sup>4</sup> A63C 9/081

U.S. Cl. 280—618

27 Claims



1. A ski binding for releasably securing a boot to a ski, said binding comprising:

(a) a pivotable plate adapted to be pivotably secured to said ski whereby said plate is pivotable on said ski around an axis substantially perpendicular to the upper surface of said ski, said plate pivoting to an unaligned position relative to said binding during release of said boot;

(b) first and second means for securing the front and rear of said boot onto said ski, said first means being elastically pivotable to allow for release of said boot with pivoting of said first means, wherein said second means is mounted on said plate;

(c) means for linking said first means with said plate whereby realignment of said first means relative to said binding is accompanied by automatic realignment of said plate, wherein said linkage means further comprises a linkage rod secured to said first means by a clip, said linkage rod being pivotable relative to said clip around an axis transverse to the axis around which said plate pivots relative to said ski, and wherein said clip is pivotable relative to said first means around an axis transverse to the axis around which said plate pivots relative to said ski to allow for height adjustment of said first means relative to said plate.

# 4,679,816 WHEELCHAIR

Heikki Riikonen, Forssa, Finland, assignor to Tunturipyörä Oy, Finland

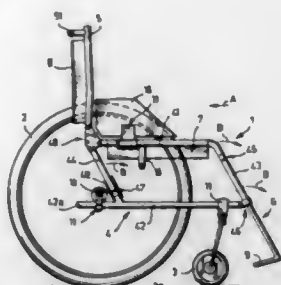
Filed May 30, 1986, Ser. No. 868,578

Claims priority, application Finland, Jun. 7, 1985, 852297; Feb. 14, 1986, 860693

Int. Cl.<sup>4</sup> B62M 1/14

U.S. Cl. 280—650

9 Claims



1. A wheelchair comprising a body portion (1), back wheels (2), and front wheels (3), which wheels (2, 3) are fastened to the body portion (1) and which body portion comprises side supports (4), upper supports (5), and lower supports (6), a seat portion (7) being positioned between said side supports (4), a back (8) in connection with the upper supports, and a foot support (9) in connection with the lower supports (6), and in which wheelchair the back wheels (2) are detachable and the body portion (1) is foldable when the wheelchair is changed from the using position into the transporting position, characterized in that the side supports (4) are formed by two elongated members: an upper and lower part (41) and (42) respectively which extend roughly horizontally in the transporting position, and a front and back part (43) and (44) respectively which are pivoted to and interconnect said horizontal parts and are shorter than said horizontal parts; said lower supports (6) being fixed to said front parts (43) respectively while extending below said lower parts (42) respectively such that the lower supports (6) are movable in a rearward direction to extend generally horizontally adjacent the lower parts (42) when the wheelchair is moved into the transporting position.

# 4,679,817 FOLDING HAND TRUCK

Dieter Schüfer, Nassau/Lahn, Fed. Rep. of Germany, assignor to Leifhelt AG, Nassau/Lahn, Fed. Rep. of Germany  
Continuation of Ser. No. 606,448, May 3, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 838,900

Claims priority, application European Pat. Off., May 11, 1983, 83104657.8

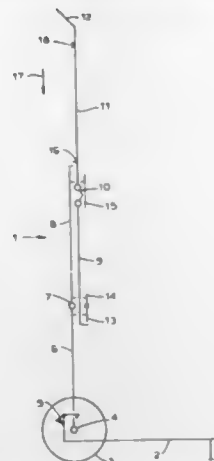
Int. Cl.<sup>4</sup> B62B 1/12

U.S. Cl. 280—655

9 Claims

1. A simplified hand truck having a wheeled horizontal carrier part (2) foldably connected to a collapsible upright handle portion (1) wherein, in accordance with the invention, said upright handle portion (1) comprises two pairs of interarticulated, generally rectangular, planar frame sections, one (6, 8) of said pairs being stationary with respect to the wheels and the other (9, 11) of said pairs being slidable, within guide means (13, 14) provided on the stationary one (6, 8) of said pairs, between a retracted position and an extended position; each of said pairs being internally hinged along adjacent edges of said frame sections by a respective hinge means (7, 10) to permit the frame sections defining a pair to rotate with respect to each other, with the four frame sections being so dimensioned that said two hinge means (7, 10) are aligned with each other when said slidable pair (9, 11) is in

said retracted position, thereby permitting collapse of said upright handle portion (1) by a single folding operation; said slidable pair (9, 11), when in its extended position, locking the hinge means (7) of said stationary pair against relative rotation of the frame sections (6, 8) thereof, said



two hinge means (7, 10) then being out of alignment with each other; and the overall length of said upright handle portion (1) being less when said slidable (9, 11) section pair is retracted than when said slidable pair is extended and serving as a locking element.

# 4,679,818 DISPLAY TABLE ATTACHMENT FOR SHOPPING CARTS

Dorothy A. Kakavas, Moline, Ill., assignor to Adams Merchandising, Inc., Moline, Ill.

Filed Feb. 10, 1986, Ser. No. 827,580

Int. Cl.<sup>4</sup> A47B 23/00

U.S. Cl. 280—33.99 A

6 Claims



1. A display table attachment for use with a shopping cart having a top-opening basket including front and rear transverse rails and left and right fore-and-aft side rails that together define a peripheral top rail structure that has a configuration such that the rear rail is higher than the front rail and the side rails slope downwardly and forwardly and also converge from front to rear: said display table attachment adapted to overlie and be supported by the rail structure and having a top flat surface of substantially rectangular shape dimensioned to extend from front to rear and side to side of the rail structure, front engagement means depending from the front part of the table for engagement with the front portion of the rail structure to hold the table against lateral and at least forward shifting relative to the basket, the rear part of the table being configured to adapt to the configuration of, and to be supported by, the rear portion of the rail structure, said rear table part configuration having notches converging on the order of the converging side rails and enabling the rear part of the table to

descend below the level of the high rail portion and thus to enable the overall level position of the table top surface and to stabilize the table against shifting laterally and rearwardly relative to the basket, and said front engagement means on the table being so dimensioned in cooperation with the configuration of the rear part of the table as to elevate the front part so that the table top surface as a whole is substantially level.

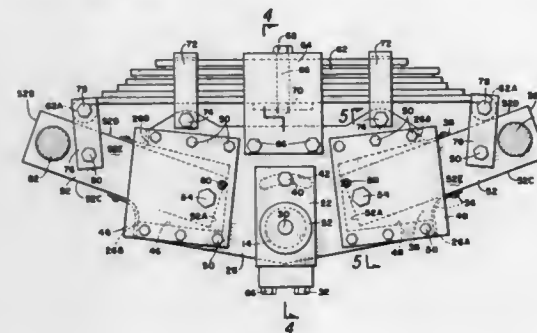
# 4,679,819 TRAILER SUSPENSION SYSTEM

Clyde O. Box, 3898 N. Memorial, Tulsa, Okla. 74115  
Filed Jan. 31, 1986, Ser. No. 824,607

Int. Cl.<sup>4</sup> B60G 5/00

U.S. Cl. 280—680

1 Claim



1. A tandem suspension system for a trailer in which the trailer has a structural member running along each opposed side thereof, the suspension system of each side comprising: a shaft rotatably supported to the trailer structural member and extending perpendicularly and outwardly therefrom; a rocker plate affixed to said shaft in a vertical plane parallel to and spaced from the trailer structural member, the rocker plate having a recess in each end; a pair of rocker arms, each having an inner and an outer end, and having opposed parallel sides and top and bottom edges, the inner end of each rocker arm being pivotally received in a said recess in said rocker plate whereby the rocker arms extend away from each other and in a common plane with said rocker plate; an elongated leaf spring having opposed ends, the spring being supported above said rocker plate; shackles pivotally connecting each end of said spring to said rocker arm at a point spaced from the outer end thereof; a pair of retainer plates secured to said each end of said rocker plate, each pair of retainer plates being secured to opposite sides of said retainer plate at a said recess therein in opposed parallel relationship, the inner end of each of said rocker arms being received between a pair of retainer plates, the inner end of each rocker arm and each pair of retainer plates having aligned openings therein; a bolt received in said aligned opening in each pair of retainer plates and said rocker arm received therebetween whereby each rocker arm is pivoted to a said pair of retainer plates, and wherein each of said rocker arms is formed of an elongated member having opposed parallel side walls spaced apart a distance slightly less than the spacing between said retainer plates whereby said retainer plates guide the pivotal movement of said rocker arms in the plane of said rocker plate; a grease retainer member affixed to the top and bottom edge of each of said rocker arms, each grease retainer slideably and sealably engaging said rocker plate, the said recess in each end of said plate being thereby closed and forming a grease receiving cavity; and an axle affixed to each rocker arm adjacent the outer end thereof, each axle extending perpendicular to the plane of said rocker arms, each axle providing means to receive a wheel thereon.

# 4,679,820 REINFORCING UNIT FOR A LONGITUDINAL BEARER

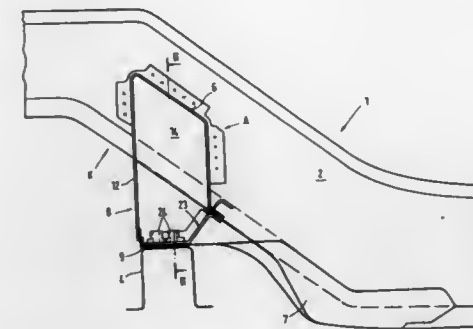
Rainer Srock, Leonberg; Ursula Herrmann, Weissach-Flacht, and Bernhard v. Rotberg, Hemmingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany  
Filed Sep. 19, 1985, Ser. No. 777,531

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1984, 3434452

Int. Cl.<sup>4</sup> B62D 21/02

U.S. Cl. 280—781

11 Claims



1. A reinforcing unit in combination with a U-profile-shaped longitudinal extending bearer and a transversely arranged auxiliary bearer of a body structure of a passenger motor vehicle said transversely arranged auxiliary bearer providing for the support thereon of a lower wheel guide member and for the fastening of a steering mechanism and for the mounting of drive aggregates or parts of the force transmission, said reinforcing unit comprising form rigid-body means connected to the U-shaped longitudinal bearer and composed of several shell shaped elements and of closure panel means connected together within a vertical offset area of each longitudinal bearer, the form-rigid body means being constructed at least partly as box profile and forming together with the U-profile-shaped longitudinal bearer a fixedly connected structural unit having an abutment surface means for fastening the transversely extending auxiliary bearer to the longitudinal extending bearer at the vertical offset area, the shell shaped elements including a first shaped element connected, with a vertical web on the inside of the longitudinal bearer, the first shaped element having a transversely extending wall leading vertically away from the longitudinal bearer and being connected with a second shaped element for forming the abutment surface means within the vertical offset area of the longitudinal bearer and wherein the first shaped element extends in sloping and straight vertical planes defining a trapezoidal column and the second shaped element extends from the offset area obliquely to the vehicle longitudinal center axis in a horizontal plane matched substantially to the configuration of the longitudinal bearer.

# 4,679,821 SEAT BELT APPARATUS

Kazuo Yamamoto, Fujisawa, and Shuichi Asano, Kawasaki, both of Japan, assignors to NSK-Warner Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,272

Claims priority, application Japan, Apr. 23, 1984, 59-80317

Int. Cl.<sup>4</sup> B60R 22/00

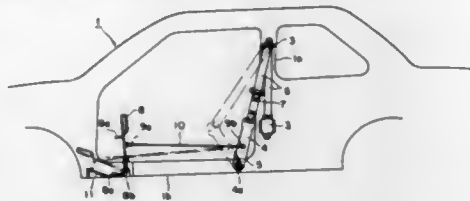
U.S. Cl. 280—808

12 Claims

1. A seat belt apparatus comprising: operating means operable by the foot of a person seated in position in a vehicle so as to move between either a first position or a second position which is separated away from said first position, said operating means including a pedal which is pivotally mounted on said vehicle so as to be pushed by a foot of said person seated in position;



restraining means which is normally located at a retracted position defined in said vehicle and which is moved out of said retracted position to be placed around said person to keep said person in a restrained condition wherein said restraining means includes a three point seat belt having a webbing to be placed around said person in position for establishing said restrained condition; and

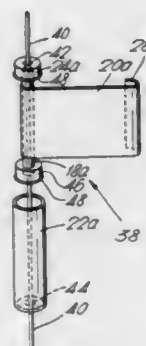


connecting means for connecting said means operable by the foot of a person to said restraining means for moving said restraining means from said retracted position to an advanced position easily accessible by said person seated in position when said operating means is operated from said first position to said second position thereby allowing said person seated in position to grab said restraining means located at said advanced position without taking an uncomfortable posture.

4,679,822

## INFORMATION DEVICES

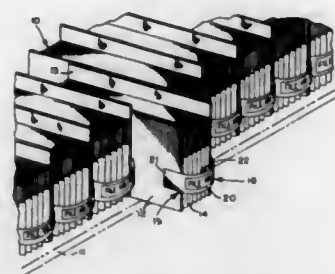
Maynard F. Wolfe, c/o Woodcraft Investments Limited, 1501  
Hitchinson House, Central, Hong Kong  
Filed Oct. 25, 1985, Ser. No. 791,549  
Claims priority, application United Kingdom, Oct. 26, 1984,  
8427086  
Int. Cl.<sup>4</sup> B42D 19/00; B65D 71/00; A45C 11/26; G09F 11/02  
U.S. Cl. 281-5 13 Claims



1. An information device comprising:
  - a relatively rigid support portion suitable for attachment to an object,
  - a relatively flexible information label capable of being secured to said relatively rigid support portion, said label when secured being extendable in use into an open state and also storable into a closed state relative said support portion,
  - a separate cover member attachable to said support portion to contain said label after said label is stored in said closed state, and detachable from said support portion to allow said label to be extended into said open state, and
  - sealing means for providing a water and air tight seal of an area containing said label when in said closed state.

4,679,823  
SHELF FILING SYSTEM WITH IDENTIFICATION  
HANDLE FOR FILE POCKETS

Francis J. Nagy, 33325 Rockford Dr., Solon, Ohio 44139  
Filed Oct. 18, 1984, Ser. No. 662,372  
Int. Cl.<sup>4</sup> B42F 21/00; B42D 17/00, 9/00; B15D 25/22  
U.S. Cl. 281-15 A 7 Claims

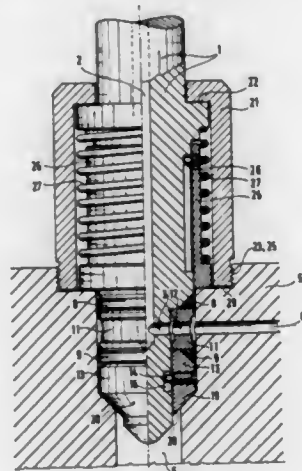


1. In combination with a file pocket or other file holder for shelf filing systems adapted to be supported at a bottom edge thereof on a shelf and including front and back walls joined together at least along their bottom edges for retaining therebetween file materials, a strap having a central portion upon which identifying indicia may be applied, said strap further having respective ends joined to said front and back walls adjacent a side edge thereof with the central portion forming an open loop projecting outwardly beyond such side edge of the file pocket.

4,679,824

## FLUID-TIGHT COUPLING FOR TWO SECTIONS OF A FLUID LINE

Francis Rodriguez, Vertou, and Jean-Paul Roblin, Nantes, both  
of France, assignors to Alsthom, Paris, France  
Filed Mar. 24, 1986, Ser. No. 843,413  
Claims priority, application France, Mar. 22, 1985, 85 04303  
Int. Cl.<sup>4</sup> F16L 35/00 3 Claims



1. A fluid-tight coupling for two sections of a fluid line, comprising a cylindrical male fitting containing an axial channel, a radial opening in said cylindrical male fitting connecting said axial channel to the outside, said channel constituting a first section of said fluid line, said male fitting being sized to fit slidably into a bore machined into a mating part thereof, a second section of said fluid line being formed in said mating part and opening into said bore, the issuing orifice of said second line section being aligned with said radial opening in said male fitting when the male fitting has been driven home, said male fitting being provided with two axially spaced, upper

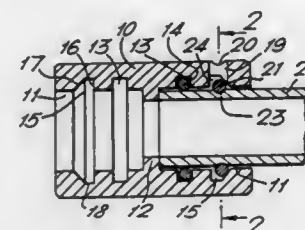
and lower ring seals located one on each side of said radial opening, said upper seal being furthest from the end of the male fitting and axially secured between a shoulder on the male fitting and a sliding ring on the male fitting, said sliding ring having a radial through-hole alignable with said radial opening of said male fitting and said issuing orifice of said second line section, said lower seal being axially secured between said sliding ring and a sliding bushing fitted over the end of the male fitting, said bore comprising a shoulder blocking said sliding bushing in the course of the male fitting penetrating the bore, said sliding ring having walls at opposite ends respectively in contact with the upper seal and the lower seal and wherein said seals have an outside diameter when uncompressed which is slightly smaller than that of said bore in the mating part such that the seals are compressed by the axially sliding bushing being stopped by said bore shoulder as the male fitting penetrates the bore and said seals are expanded radially to apply firmly against the wall of said bore.

4,679,825

## PIPE CONNECTOR

Clive N. Taylor, 12 Fern Close, Burton, Christchurch, Dorset,  
England  
PCT No. PCT/GB83/00280, § 371 Date Jul. 16, 1984, § 102(e)  
Date Jul. 16, 1984, PCT Pub. No. WO84/01990, PCT Pub.  
Date May 24, 1984  
PCT Filed Nov. 1, 1983, Ser. No. 626,786  
Claims priority, application United Kingdom, Nov. 16, 1982,  
8232690  
Int. Cl.<sup>4</sup> F16L 35/00 2 Claims

U.S. Cl. 285-93



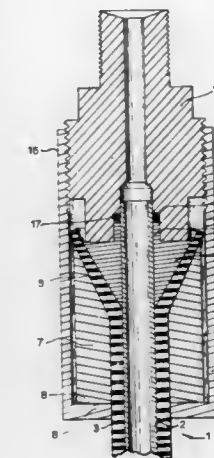
1. A pipe connector comprising a body having a bore for receiving an end portion of a pipe, said bore being provided with a first circumferentially extending groove arranged to co-operate with a circumferentially extending groove provided on the exterior of said end portion of the pipe, a passage-way provided in said body and extending from said first groove to the exterior of said body, a second circumferentially extending groove provided in said bore, a sealing ring disposed in said second groove for sealing engagement therewith and with the exterior of said end portion of the pipe, said first groove when co-operating with the groove on said end portion of the pipe forming therewith a channel in which a retaining rod or wire is inserted by being passed through said passage-way, and said first groove having side wall means which is inclined relative to the axis of the bore to hold the rod or wire in the co-operating groove thereby to provide an axial interference preventing withdrawal of said end portion of the pipe from the connector; in combination with a template for determining the length of the retaining rod or wire, said template comprising a plate having a plurality of grooves, the length of each groove corresponding to the length of a retaining wire or rod required for use with a pipe of a particular diameter.

4,679,826

## HIGH PRESSURE HOSE FITTING

John H. Olsen, Vashon, Wash., assignor to Flow Industries,  
Inc., Kent, Wash.  
Filed May 6, 1985, Ser. No. 731,113  
Int. Cl.<sup>4</sup> F16L 39/00 6 Claims

U.S. Cl. 285-149



1. A high pressure hose fitting for use in combination with a hose having an inner lining which is encircled by a layer of reinforcing cords and which defines the internal passageway of the hose, said hose fitting comprising:

- an end portion of said hose, said end portion including an end segment of said inner lining and a corresponding end segment of said layer of reinforcement cords which has a lengthwise end section thereof separated from a lengthwise end section of said lining end segment, the latter being disposed in direct communication with said hose passageway along its entire extent and being constructed of a material such that high pressure within said passageway will cause it to swell outwardly to a limited extent;
- a cylindrical housing having an opening for admission of said hose end portion at one end and a threaded opening at the other end for receiving an outlet fitting in a thread connected manner;
- an outlet fitting threadably connected to said housing, said outlet fitting having a hollow interior for admission of and sealing to the liner end segment of said hose and a recess extending around the outside of said liner end segment;
- a crimped sleeve disposed within said housing in intimate contact with the outside surface of the end segment of said cords layer, one end of said sleeve being disposed adjacent to the one end of said housing and defining a conical recess at its other end for gripping to and receiving the end segment of said cords layer;
- a conical, barbless ferrule having a hollow interior for receiving and sealing to the exterior of said inner liner end section of said liner end segment and a conical outer surface for clamping the separated end section of said cords layer of said hose end portion to the conical recess of said sleeve, said ferrule also including a projection which is expandable to a limited extent and which is located adjacent to the recess of said outlet fitting for sealing to said outlet fitting; and
- an O-ring between said projection of said ferrule and said outlet fitting for sealing said outlet fitting to said ferrule.

4,679,827

# RAINTIGHT AND OILTIGHT CONNECTOR FOR FLEXIBLE CONDUIT

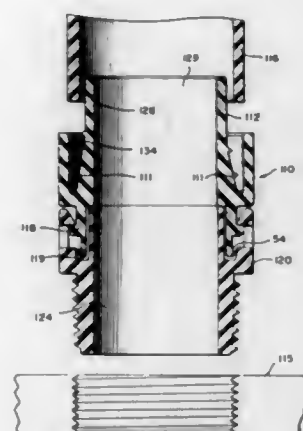
Joseph P. Law, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 687,107, Dec. 28, 1984, abandoned. This application Aug. 30, 1985, Ser. No. 770,899

Int. Cl.<sup>4</sup> F16L 41/00

U.S. Cl. 285—158

9 Claims



1. A connector for coupling an electrical conduit to an electrical enclosure having an opening comprising: a first elongate housing for receiving said conduit, said first elongate housing having a first passage therethrough; and a second elongate housing engageable with said first housing for rotatable movement therebetween said second housing including a second passage therethrough in communication and axially aligned with said first passage, said second elongate housing including means for engagement with said electrical enclosure adjacent said opening; said second elongate housing further including an open ended axially extending annular channel for receipt of a portion of said first housing; said channel being defined by a pair of substantially parallel circumferentially continuous walls, one wall of said pair being interior the other wall and defines a portion of said second passage, said one wall of said channel having a greater axial extent than the other said wall; and said first housing including a circumferential annular projection extending outwardly therefrom, and said second housing including plural spaced deflectable locking elements extending upwardly from said other wall for deflectable engagement with said projection for rotatably securing said first housing to said second housing, wherein said portion of said first housing received in said channel includes an annular protuberance extending outwardly therefrom engaging the interior surface of said other wall of said channel, whereby an oiltight seal is formed therebetween.

# CONNECTING DEVICE FOR PIPINGS, PIPES AND CONDUITS

Christian Bernardot, Plaisir, France, assignor to Permaswage S.A., Les Clayes-Sous-Bois, France

PCT No. PCT/FR82/00026, § 371 Date Sep. 28, 1982, § 102(e) Date Sep. 28, 1982, PCT Pub. No. WO82/02755, PCT Pub. Date Aug. 19, 1982

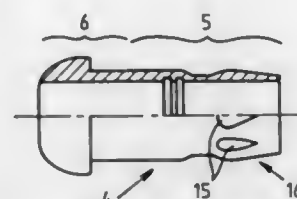
Continuation of Ser. No. 433,128, Sep. 28, 1982, abandoned. This PCT application Feb. 10, 1982, Ser. No. 817,776

Claims priority, application France, Feb. 11, 1981, 81 02694

Int. Cl.<sup>4</sup> F16L 55/00

U.S. Cl. 285—175

7 Claims



1. A crimping connecting accessory for connecting rigid pipings, comprising an unthreaded sleeve having: a tail section including a first malleable portion for a first connection of the radial crimping type onto the outer periphery of an end of a first pipe; and a head section including a second portion of higher hardness than said first malleable portion for a second connection of the dismountable type into a female member attached to an outer periphery of an end of a second pipe, said head section being of a larger diameter than said tail section, said tail section and said head section being joined to one another to form a single metal piece, wherein: said first malleable portion comprises at least one zone for radial crimping onto an end piping and means for preventing said malleable portion from rotating with respect to said pipe on which it is crimped.

4,679,829

# PORTING MEMBER WITH A UNIVERSAL COUPLING MECHANISM

Masahiro Yanagisawa, Isesaki, Japan, assignor to Sanden Corporation, Guama, Japan

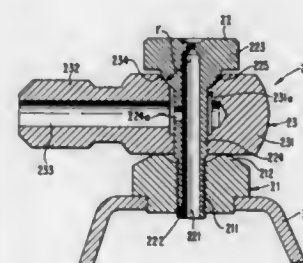
Filed Jan. 23, 1986, Ser. No. 824,369

Claims priority, application Japan, Jan. 28, 1985, 60-9030[U]

Int. Cl.<sup>4</sup> F16L 41/00

U.S. Cl. 285—190

4 Claims



1. In a porting member with a universal coupling mechanism including a connector means fixedly mounted on a container provided with a central hollow portion and radial hole to form a fluid passageway from the interior of said container to external equipment, and a port means rotatably supported on said connector means provided with a connecting hollow portion to complete the fluid passageway together with said central hollow portion and said radial hole whereby the desired position of one end opening of said connecting hollow portion can

be easily selected by rotation of said port means, the improvement comprising: said connector means having two surfaces which are opposite to one another with a gap between said surfaces, said surfaces contacting with the opposite side surfaces of said port means to form a sealing structure, a semi-spherical portion and an edge portion are formed on said surfaces of said connector means, respectively, said port means having a pair of oppositely facing surface portions, one of said surface portions having a bevelled configuration disposed to engage with said semi-spherical portion and the other of said surface portions being generally planar disposed to engage with said edge portion.

4,679,830

# TUBE COUPLING

Frans J. J. A. Kok, AB Helden, Netherlands, assignor to Dresser Europe S.A., Belgium

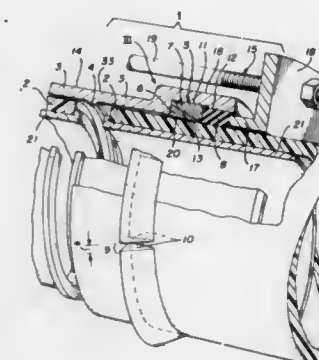
Filed May 16, 1985, Ser. No. 735,224

Claims priority, application Netherlands, May 17, 1984, 8401586

Int. Cl.<sup>4</sup> F16L 21/06

U.S. Cl. 285—323

3 Claims



1. A tube coupling (1) for connecting a tube portion (2) of synthetic resin with another conduit element, comprising: a socket portion (3) surrounding the tube end of said tube portion (2) and having an abutment should therein; at least one grip rim (6) disposed within the socket portion (3) and engaging the tube portion (2) and having a diverging clamping surface (13) diverging in the direction towards said other conduit element; at least one sealing ring (8) disposed within the socket portion (3) adjacent the grip rim (6) of elastic material; at least one clamping rim (7) disposed within the socket portion (3) and having a diverging clamping surface (13) diverging in the direction towards the tube portion (2) for contacting in a self disengaging and self engaging ramping relation with the diverging clamping surface (13) of said grip rim (6); loading means (15) for loading said clamping rim (7) and said sealing ring (8) with axial compression in the direction towards said other conduit element; said loading means (15) comprising at least one pressing ring (17) penetrating into the socket portion (3) for engaging said clamping rim (7) through said sealing ring (8) and further including a plurality of tension bolts (19) engaging a flange (18) integrally formed with the pressing ring (17) for drawing the pressing ring (17) towards said other conduit element as said pressing ring (17) penetrates into the socket portion (3); said grip rim (6) having a saw toothed longitudinal section at its inner side, including teeth (24) having teeth surfaces (25) of said saw toothed longitudinal section converging in the direction towards the free end of said tube portion (2);

at least one support sleeve (21) internally supporting said tube portion (2) of synthetic resin: said grip rim (6) having at least one gap (9) at its circumference; said gap (9) having a width (w) equal to the product of  $\pi$  and the inner diameter (D) of the grip ring (6) diminished by the product of  $\pi$  and the outer diameter (D') of the tube portion (2) diminished by the product of  $2\pi$  and the height (h) of said teeth (24); said grip rim (6) having such total circumferential length, that during operation of compressing the grip rim (6) by causing the pressing ring (17) to engage the sealing ring (8) along its circumference which causes the sealing ring (8) to engage the clamping rim (7) along its circumference thereby axially compressing the sealing ring (8) and increasing the frictional force between the sealing ring (8) and the tube portion (2) and further causing the clamping rim (7) to engage the grip rim (6) along their contacting diverging surfaces (13), thereby simultaneously causing the free ends (41) of the grip rim (6) bounding said gap (9) to interabut to prevent excessive constriction of the tube portion (2) while the teeth surfaces (25) of the saw toothed longitudinal section engage the tube portion (2) to thereby prevent movement of the tube portion (2) and; said sealing ring (8) being further compressed between said clamp rim (7) and said pressure ring (17) when a force is exerted on the tube portion (2) in the direction towards the free end of tube portion (2) to thereby exert an increased force on said clamp rim (7) to thereby prevent movement of the tube portion (2).

4,679,831

# PIPE COUPLING CONNECTION SEALING APPARATUS

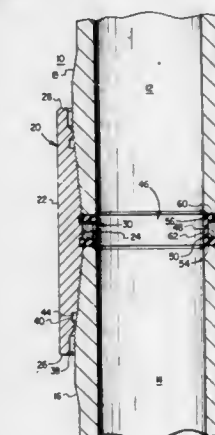
William P. Kielminski, 601 Cypress Station Dr., #203, Houston, Tex. 77090

Filed Jun. 13, 1986, Ser. No. 874,011

Int. Cl.<sup>4</sup> F16L 21/02

U.S. Cl. 285—332.2

6 Claims



1. A pipe coupler for use with either lined or unlined pipes comprising: (a) a pipe coupling connector means including a pipe connector member having a centrally disposed bore having a body portion with first and second ends and first and second recesses integral with the first and second body end portions; and (b) a floating seal means operatively connected to the pipe connector member, said floating seal means responsive to the pipe being joined for floating to a final position thereby allowing torque to equalize on the ends of the joined pipes, said floating seal means being operatively mounted in said bore and including a cylindrically shaped metal ring operatively connected to the pipe connector member, said metal ring having first and second opposing



sides and ends, the opposing ends having recesses, and said first side and said first and second opposing ends of the metal ring being encased in a flexible sealing material whereby the ends of pipes being joined force the sealing material into the metal rings first and second recesses and into the bores first and second recesses to seal the ends of the pipes against leakage.

4,679,832

## FLANGE RING FOR PIPES

Manfred Meinig, Seiting Strasse 186, D-7201 Rietheim-Weilheim 2, Fed. Rep. of Germany

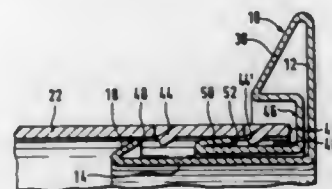
Filed Apr. 24, 1986, Ser. No. 855,322

Claims priority, application Fed. Rep. of Germany, May 2, 1985, 3515737

Int. Cl.<sup>4</sup> F16L 23/00

U.S. Cl. 285-414

13 Claims



1. A flange ring for mounting in an open pipe, said flange ring comprising:
  - flange means,
  - outer and inner leg means projecting from said flange means, said outer leg means closer to the inner wall of the pipe than said inner leg means when installed in the pipe, said outer and inner leg means being substantially parallel to one another and capable of being flexed under stress with respect to said flange means by the inner wall of the pipe when said leg means are driven into the open pipe,
  - outer and inner pipe engaging means inserted inside the pipe, said outer pipe engaging means projecting from said outer leg means toward the inner wall of the pipe when installed in the pipe, said inner pipe engaging means projecting from said inner leg means toward the inner wall of the pipe when installed in the pipe.

4,679,833

## CLOSURE MECHANISM FOR SUITCASES OR THE LIKE

Rudi Dueringer, Wuppertal, Fed. Rep. of Germany, assignor to S. Franzen Sohne GmbH & Co., Solingen, Fed. Rep. of Germany

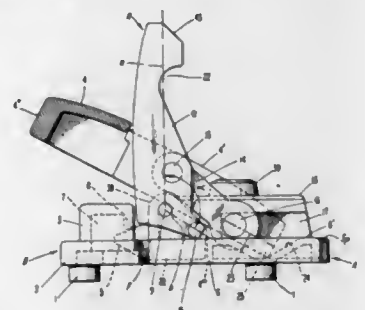
Filed Dec. 31, 1985, Ser. No. 815,078

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1985, 3500862

Int. Cl.<sup>4</sup> E05C 5/02

U.S. Cl. 292-113

12 Claims



1. A closure mechanism for suitcases or the like, comprising:

- a counter-closure part, and
- a closure part securable to said counter-closure part, said closure part comprising
  - a base plate,
  - a hasp of generally U-shaped configuration including a pair of legs interconnected by a bight, said bight arranged to engage said counter-closure part, said legs each carrying a connector arranged for linear displacement relative to said base plate and defining a first pivot axis about which said hasp is pivotable to move said bight toward and away from said base plate, at least one of said legs including a contact surface,
  - a handle pivotably mounted on said base plate for rotation toward said base plate about a second pivot axis to a closing position, and away from said base plate toward an opening position,
  - said handle including first and second mutually inclined lever arm means, said first lever arm means being longer than said second lever arm means and being manually engageable for pivoting said handle, said second lever arm means carrying lift pin means located below at least one of said legs extending into underlying relationship with said contact surface of said hasp, and
  - a pair of coupling links each pivotably connected to said handle and one of said connectors such that rotation of said handle toward said opening position causes said connectors of said hasp to be linearly displaced by said links, and causes said hasp to be rotated about said first axis by engagement of said lift pins with said contact surface.

4,679,834

## DOOR UNLOCKING DEVICE

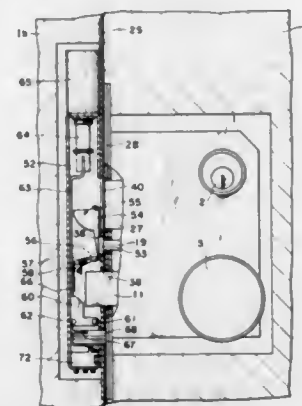
Motobiro Gotanda, 1802-10, Nakabyo, Abiko-shi, Chiba-ken, Japan

Filed Dec. 3, 1985, Ser. No. 804,085

Int. Cl.<sup>4</sup> E05C 1/06

U.S. Cl. 292-169.13

7 Claims



1. In combination with a door supported at one edge by a door frame, said door being locked with a lock apparatus which includes a front plate adapted to be fixed to one side edge of the door; outer and inner door knobs adapted to be secured to outside and inside surfaces of the door, respectively; a latch bolt which is adapted to be displaced between a first position where one end portion of the latch bolt is protruded from the front plate and a second position where the latch bolt is retracted therefrom, which is normally urged toward the first position and which is cooperable with the inner door knob so that the latch bolt may be displaced to the second position by rotation of the inner door knob; and a trigger bolt which is adapted to be displaced between an extended position where one end portion of the trigger bolt is protruded from the front plate and a retracted position where the trigger bolt is retracted therefrom, which is normally urged

to be displaced toward the extended position, which is engageable with the latch bolt so that the movement of the latch bolt from the first to second position necessarily causes the movement of the trigger bolt from the extended to retracted position, and which is capable of acting on the latch bolt when the trigger and latch bolts are in the retracted and first positions, respectively, so that the latch bolt is locked and prevented from being displaced from the first to second position, the locking of the latch bolt with the trigger bolt being released by displacing the trigger bolt to the extended position; a device for unlocking said door comprising:

- a casing having a strike and adapted to be mounted on the door frame with the strike being flush with the surface of the door frame adjacent to the door;
- a first opening provided in said strike at a position so that when the door is closed the latch bolt can enter said first opening and can be positioned in said first, protruded position;
- a second opening provided in said strike at a position so that when the door is closed the trigger bolt can enter said second opening and can be positioned in said extended position;
- stopper means provided within said casing and adapted to be displaced between a service position where the trigger bolt is engaged by said stopper means and is prevented from entering said second opening and from being positioned in said extended position when the door is closed, and a non-service position where the trigger bolt is permitted to be positioned in said extended position;
- pushing means provided within said casing, adapted to be displaced between a first location and a second location and capable of displacing the latch bolt which is positioned in said first position to said second position by its movement from said first location to said second location when the door is closed;
- means for moving said stopper means between said service and non-service positions; and
- means for moving said pushing means between said first and second locations.

4,679,835

## HALF TURN CABINET LATCH WITH THREE-PART PRIMARY OPERATING ELEMENT

Lee S. Weinerman, Medina, and Joel T. Vargus, Middleburg Hts., both of Ohio, assignors to The Eastern Company, Strongsville, Ohio

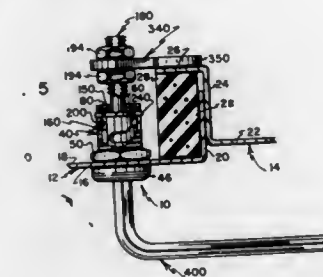
Continuation-in-part of Ser. No. 761,038, Jul. 31, 1985. This application Sep. 30, 1985, Ser. No. 781,662

The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> E05C 3/06

U.S. Cl. 292-197

22 Claims



1. A clamping type cabinet latch, comprising:
  - (a) body means having a generally cylindrical body for mounting the latch on a closure or the like, the body having a passage extending therethrough along an imaginary center axis;
  - (b) pawl means that is rotatable and translatable relative to the body along the center axis for movement among unlatched, latched, and latched-clamped positions for selectively releas-

ing, retaining, and securely clamping the closure in a closed position relative to an associated cabinet door frame or the like;

- (c) operating element means for rotation relative to the body through a limited range of movement in clockwise and counterclockwise directions about the center axis for operating the latch;
- (d) operating component means including an assembly of operating components that are protectively nested within the body for drivingly interconnecting the operating element means with the pawl means for effecting movement of the pawl means relative to the body among said unlatched, latched, and latched-clamped positions in response to clockwise and counterclockwise rotations of the operating element means about the center axis, with the assembly of operating components being nestable one within another and being insertable as an assembly into the body;
- (e) retainer means for cooperating with the body for releasably retaining the assembly of operating components within the body but being removable with ease to provide access to the operating components for lubrication, service and repair;
- (f) the assembly of operating components including:
  - (i) an elongate, generally cylindrical shank having a forward end region, a rearward end region, and an outer surface that interconnects the forward and rearward end regions, the shank being oriented to extend substantially concentrically along the central axis with its forward end region positioned within the body passage, with its outer surface extending from within the confines of the body passage and rearwardly out of the body passage, and with its rearward end region located rearwardly with respect to the body, the shank having a generally radially extending hole formed therethrough with opposed ends of the hole opening through the outer surface of the shank at a location within the confines of the passage;
  - (ii) a pin having a central portion that is received by the hole formed in the shank, and having opposed end regions that project radially outwardly from the outer surface of the shank into close proximity with diametrically opposed portions of the inner surface of the body passage;
  - (iii) inner plug means formed as a one-piece member that extends along the center axis and has forward and rearward ends, the inner plug means having:
    - (A) a generally cylindrical sleeve portion having a substantially uniform outer diameter that extends concentrically about and axially along the center axis from the forward end of the inner plug means toward the rearward end thereof;
    - (B) interconnection means for interconnecting the inner plug means and the body to prevent relative rotation therebetween;
    - (C) a hole formed through the sleeve portion and through the washer-like portion and having a substantially uniform inner diameter that extends along the center axis, with the inner diameter being operable to journal the outer surface of the shank for rotation therein relative to the inner plug means; and,
    - (D) a pair of generally L-shaped slots formed in the sleeve portion and opening through the inner diameter and the outer diameter of the sleeve portion, with each of the slots having first and second leg portions that extend substantially orthogonally relative to each other, with the first leg portions extending substantially axially with respect to the center axis, and with the second leg portions extending substantially circumferentially about the sleeve portion, and with the opposed end regions of the pin extending through the generally L-shaped slots;
  - (iv) outer plug means formed as a three-piece assembly of interfitting parts that extends along the center axis and has forward and rearward ends, the outer plug means having a pair of semi-circular sleeve halves and a generally cylindrical core, with the sleeve halves being arranged to form a tubular structure with portions thereof surrounding and



interfitting with portions of the core to establish driving connections among the sleeve halves and the core, and with the sleeve halves and the core cooperating to define:

(A) a generally cylindrical sleeve portion having a substantially uniform outer diameter that extends concentrically about and axially along the central axis from the rearward end of the outer plug means toward the forward end thereof, the uniform outer diameter of the outer plug means being of a size that enables it to be journaled for smooth rotation about the center axis by the inner diameter of the body;

(B) a relatively reduced diameter portion that defines the forward end of the outer plug means, the reduced diameter portion being formed integrally with the sleeve portion and extending along the center axis into the reduced diameter forward end region of the passage formed in the body;

(C) a hole formed in the sleeve portion and opening through the rearward end of the outer plug means, the hole having a substantially uniform inner diameter that extends along the center axis, the inner diameter being operable to journal the outer diameter of the inner plug means for rotation therein relative to the outer plug means; and,

(D) a pair of generally curved cam slots formed in the sleeve portion and opening through the inner diameter and the outer diameter and the sleeve portion, with each of the slots defining cam surfaces that receive end regions of the pin.

4,679,836

## CLOSURE LATCH

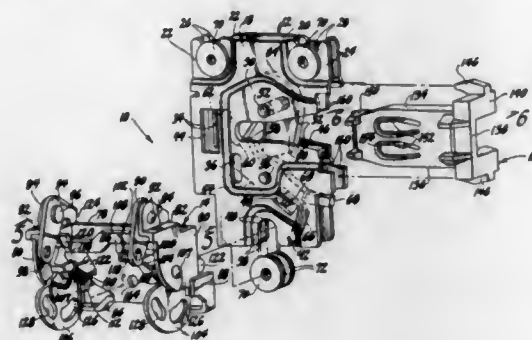
Dominic S. Pupillo, Sterling Heights, and Luben Scheff, Rochester Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1986, Ser. No. 842,151

Int. Cl.<sup>4</sup> E05C 3/26

U.S. Cl. 292-216

8 Claims



1. A vehicle body closure latch formed of the same units assembled in either a right hand or a left hand configuration, comprising, in combination,

a latch unit having a vertical center line about which the latch unit is rotatable 180° between a right hand position and a left hand position and including:

a frame having right hand and left hand sides, a latch bolt mounted on the frame for movement between latched and unlatched positions, a detent mounted on the frame and engageable with the latch bolt for maintaining the latch bolt in latched position,

a latch actuating unit mounted to the right hand side of the frame in a right hand latch configuration and mounted to the left hand side of the frame in a left hand latch configuration, the actuating unit including:

a spaced pair of detent release levers movable between operating and bypass positions,

means interconnecting the detent release levers for concurrent movement between the positions thereof, one detent release lever being connectable with the detent to release the detent and the other detent release lever concurrently moving with the one detent release lever when the detent release levers are in operating position and the actuating unit is mounted to the right hand side of the frame in a right hand configuration,

the other detent release lever being connectable with the detent to release the detent and the one detent release lever concurrently moving with the other detent release lever when the detent release levers are in operating position and the actuating unit is mounted to the left hand side of the frame in a left hand configuration,

a pair of operating levers, each engageable with one detent release lever to concurrently move the one and the other detent release levers when the release levers are in operating position and release the detent,

latch actuating means operatively connected to at least one of the detent release levers for concurrently moving the one and the other detent release levers between the operating position and the bypass position, the operating levers bypassing the detent release levers when the detent release levers are in the bypass position,

a bumper unit mounted to the same side of the frame of the latch unit as the actuating unit for guiding relative movement of the latch bolt and a striker, and cooperating means on each of the units for assembling the units in the right hand and left hand configurations.

4,679,837

## HARD BAR BUMPER FOR VEHICLES

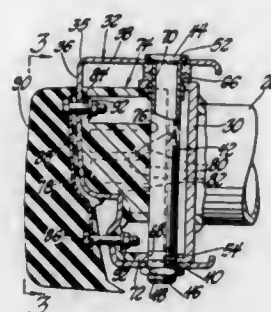
Dean M. Bayer; Larry J. McCoy, both of Anderson, Ind.; Chris A. Thomason, Sterling Heights, Mich.; Thomas P. Tranbarger, Pendleton, and Marco E. Rodriguez, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 4, 1986, Ser. No. 848,202

Int. Cl.<sup>4</sup> B60R 19/04

U.S. Cl. 293-102

4 Claims



1. A bumper assembly for operative connection to a vehicle having a body comprising a bumper beam of selected wall thicknesses having an outer generally vertical face and upper and lower generally horizontal flanges extended toward the body of the vehicle, each of said flanges having an opening therethrough, tie bolt means extending through said holes for mechanically interconnecting said flanges to one another, said tie bolt means having a head at one end mounted adjacent to said outer surface of one of said flanges, fastener means received by the other end of said tie bolt means adjacent to the outer surface of the other of said flanges for directly mechanically connecting said flanges to one another, an energy absorbing bulk head extending from seating engagement on the tie bolt means to a terminal position engaging the inner surface of the outer face of the bumper beam, and means for attaching said bulk head to said bumper beam so that impact loads imparted to said generally vertical face are transmitted by said bulk head to said tie bolt means and along the length thereof to

said upper and lower flanges to thereby inhibit dishing of said outer face of said bumper beam.

4,679,838

## VEHICLE COLLISION BUMPER

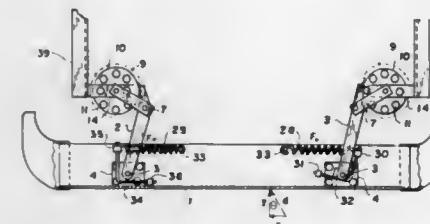
Stanley J. Mikina, 4782 Coquina Key Dr., SE., St. Petersburg, Fla. 33705

Filed Apr. 14, 1986, Ser. No. 851,208

Int. Cl.<sup>4</sup> E05C 1/02

U.S. Cl. 293-137

5 Claims



1. In a vehicle collision bumper, the combination of a stacked assembly of frictionally engaged discs on each side of a toothed ring, a ratchet member engaging said toothed ring, with said ratchet member guided by a pair of radius arms pivoted on the disc axis, links connecting the radius arms with the bumper, with said links pivoted at the ratchet pivot at one end and at a parallel pivot on the bumper at the other end, the link connection at the bumper including means for automatically engaging or disengaging the links from centering springs that are adapted for biasing said links with said set-up forces, with aforesaid set-up springs establishing a link centering moment due to the set-up spring force acting in conjunction with the reaction on the link pivot at the bumper, a similar set-up spring system at each end of the bumper, a reset spring on the disc axis also biasing the ratchet member into engagement with the toothed ring, with said reset spring also biasing the radius arms and connected bumper links for return to their initial position after a collision.

4,679,839

## GRAPPLE SNUBBER

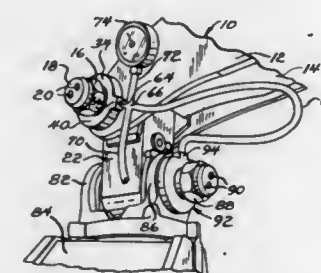
Tony R. Damron, 8301 Bell Fountain Dr., Ocean Springs, Miss. 39564-9049

Filed May 7, 1986, Ser. No. 860,554

Int. Cl.<sup>4</sup> B66C 1/00; F16F 9/00

U.S. Cl. 294-119.4

4 Claims



1. The combination in a log skidder comprising a lifting arm, a grapple and means suspending said grapple from said arm comprising a body, a first pivot member suspending said body from said arm and pivotable about a first substantially horizontal axis, a second pivot member substantially perpendicular to said first pivot member suspending said grapple from said body and pivotable about a second substantially horizontal axis substantially perpendicular to said first substantially horizontal axis, first hydraulic snubber means acting between said arm and said body to inhibit movement between said arm and said body, second hydraulic snubber means acting between said

body and said grapple to inhibit movement between said grapple and said body, and hydraulic means for operating said first hydraulic snubber means and said second hydraulic snubber means to inhibit such movement, each said hydraulic snubber means comprising a block having a central bore receiving the respective pivot member, said block having a face-opening recess concentric with and spaced radially outwardly from said bore and defining a ring-shaped cylinder, and a ring-shaped piston in said cylinder.

4,679,840

## SEAT FOR A TRUCK BED

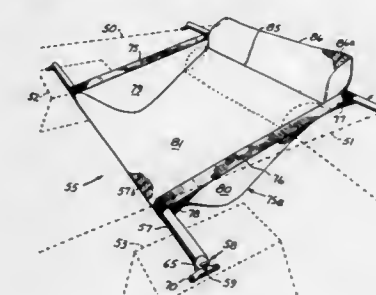
Steven A. Fry, 30052 Running Deer La., Laguna Niguel, Calif. 92677, and Rodney L. Stafford, 100 S. Seranada, #44, Orange, Calif. 92669

Continuation of Ser. No. 829,453, Feb. 10, 1986, abandoned, which is a continuation of Ser. No. 622,136, Jun. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 567,269, Dec. 30, 1983, abandoned. This application Sep. 22, 1986, Ser. No. 910,329

Int. Cl.<sup>4</sup> B60N 1/00, 1/12; A47C 7/36

U.S. Cl. 296-64

15 Claims



1. A seat for a truck bed, which truck bed has an axis of forward movement, and a lateral dimension of a substantial width, said seat comprising:

a forwardly located, and a rearwardly located runner, each extending laterally across the truck bed, and each having a pair of ends, each said runner comprising a pair of telescopically engaged and overlapping tubular sections which enable the length of said runners to be lengthened or shortened;

four attachment means, each adapted to attach a respective end of a runner to said truck bed, the two attachment means respective to one of said runners being adapted to be attached to said truck bed higher than the two attachment means respective to the other said runner, whereby one runner is higher than the other, the runners being parallel to one another; and

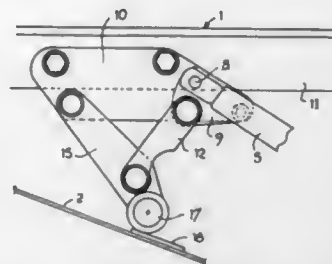
a seat member supported by and extending between both of said runners, said seat member comprising a flexible inelastic central sheet of substantial width to accommodate an occupant, having a slack length greater than a straight-line distance between the runners in order to form a concave cavity to receive and seat the occupant, a pair of flexible, inelastic side panels conforming in edge shape to a slack contour of said cavity, each attached continuously to a respective edge of the central sheet and extending generally upwardly and, a pair of side bands of flexible inelastic material having a substantial width and being supported by and extending between said runners, and having a length shorter than the slack length of said edges of the central sheet, whereby to form side restraints and arm rests, and to make the side panels taut; the upper edges of the side panels being continuously attached to a respective side band so each side panel forms a respective closure of the seat cavity at the edge; whereby to provide lateral stability and support for an occupant.



**4,679,841**  
**COUNTERBALANCING DEVICE FOR HATCHBACK LID**  
**ON A ROAD VEHICLE**

Claude Tannay, Velizy, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly sur-Seine, both of, France

Filed Sep. 19, 1986, Ser. No. 909,185  
Claims priority, application France, Sep. 23, 1985, 8514075  
Int. Cl.<sup>4</sup> B62D 25/12; E05F 11/00, 1/12  
U.S. Cl. 296—76 4 Claims

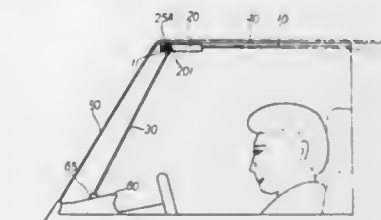


1. A counterbalance device for a rear hatchback lid on a road vehicle, said lid being hinged at a top on superstructure of the vehicle about a horizontal axis and comprising at least one counterbalance unit one end of which is pivoted on the superstructure and the other end to the lid, characterized in that said counterbalance unit is pivoted to one of said lid and said superstructure by means of an input lever and a camming lever both pivoted at a first end portion to said one of said lid and said superstructure, said counterbalance unit being pivoted to said input lever, a link pivoted at opposite end portions to said input lever and camming levers, a second end portion of said camming lever having a roller bearing against the other of said lid and said superstructure during initial movement of said lid from a closed position.

**4,679,842**  
**RETRACTABLE GLARE SHIELD DEVICE FOR**  
**AUTOMOBILES**

Tsai Hwang-Change, No. 139, 6 Ling, Nan Jing Sugar Factory, Shui Shang Hsiang, Chiayi City, Taiwan  
Filed Jul. 8, 1986, Ser. No. 883,526  
Int. Cl.<sup>4</sup> B60J 3/00

U.S. Cl. 296—97 G 1 Claim



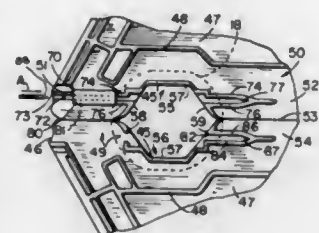
1. An extractable glare shield device for automobiles mainly comprising:  
a track bar inclinedly disposed on the ceiling of a vehicle, and an L-shaped hook being attached to the front end thereof and a stop means to the opposite end thereof;  
a slider member slidably mounted on said track bar having a pair of shaft bars disposed respectively on both sides thereof with the center line of said shaft bars always parallel to the windscreen of the vehicle;  
a stiff transparent filter plate which is tinted for the purpose of filtering sunlight and configured with one of its corners removed and a slot-like opening positioned near the front side thereof for ready operation;  
a pair of C-shaped clips rotatably mounted on said shaft bars

respectively being used to detachably affix said filter plate to said slider member;  
and the above said components being assembled in such a manner that the filter plate can be pulled down from the ceiling of said vehicle and positioned behind said windscreen for shielding glare sun beam, and be horizontally received under the ceiling thereof for space-saving purpose.

**4,679,843**  
**VISOR MOUNTING CLIP**

Scott A. Spykerman, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Dec. 26, 1984, Ser. No. 686,158  
Int. Cl.<sup>4</sup> B60J 3/02  
U.S. Cl. 296—97 K 5 Claims



1. A visor having a mounting clip assembly for one end of the visor for detachably securing said one end to a linearly extending, cylindrical socket mounted to a vehicle, said visor formed of at least one core means constructed of plastic material comprising:

said visor core means including a pin guide and support channel, said channel formed by parallel ribs extending inwardly from one end of said core corresponding to said one end of said visor, said channel having an opening at one edge of said visor for receiving a pin therein, said ribs forming said channel extending adjacent and parallel to a longitudinal edge of said visor, said core including a recess formed therein and extending from said longitudinal edge of said visor in orthogonal relationship to and intersecting said channel;

a collar means positioned within said channel adjacent said opening;

cylindrical solid pin means extending within said channel through said collar means and between said ribs, said ribs being tapered at the innermost ends of said channel remote from said opening, whereby said pin means is wedged into said collar means and tapered ends of said ribs which secure said pin means in place against rotation or other movement in said channel; and

a cylindrical sleeve coaxially surrounding said pin in the area extending substantially entirely across said recess, said sleeve having an inner diameter greater than the outer diameter of said pin to permit rotation of said sleeve around said pin with said pin extending through the entire length of said sleeve.

**4,679,844**  
**FASTENING ARRANGEMENT FOR A CONVERTIBLE**  
**BOOT**

Gerald T. Wolford, Frazer; Dwight R. Kleinlein, Washington, and Hubert F. Stewart, Rochester, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

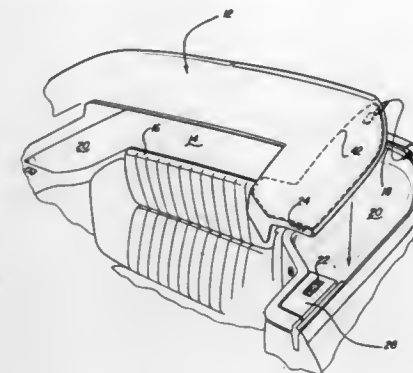
Filed Mar. 10, 1986, Ser. No. 837,937  
Int. Cl.<sup>4</sup> B60J 7/20

U.S. Cl. 296—136 6 Claims

1. In a motor vehicle having a convertible top, a storage well for receiving a foldable top of the vehicle, said well having top linkage receiving areas at forward extensions of the well laterally flanking the rear seat area of the vehicle, and a boot for

overlying the storage well when the top is stored therein, a fastening arrangement for securing the boot to the vehicle comprising:

a trim panel member disposed forward of each well area adjacent the side of the vehicle and laterally flanking the rear seat;  
a housing member in each trim panel;

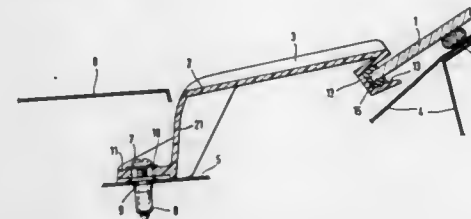


a bolt slidably disposed on said housing; and  
a keeper carried at each side of said boot so as to be in overlying relationship to said housing, said keeper extending into said housing and in locking engagement relationship with said bolt when the boot is positioned over the well.

**4,679,845**  
**MOTOR VEHICLE WINDSHIELD COWL PLATE**  
Heinz Detampel, Russelsheim; Frank Hillemann, Ginsheim; Wolfgang Jobst, Naubheim, and Manfred Prien, Enkenbach, all of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 31, 1985, Ser. No. 760,898  
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428293

Int. Cl.<sup>4</sup> B62D 25/10, 27/00; B60J 1/02  
U.S. Cl. 296—192 3 Claims



1. In a motor vehicle body, a structure adapted to close the space between the hood, a windshield fixed on the vehicle body structure and the fenders, comprising:

said windshield being adhesively secured to the vehicle body and having an exposed cantilevered lower edge extending freely forwardly and downwardly relative the vehicle body structure to which the windshield is adhesively attached;

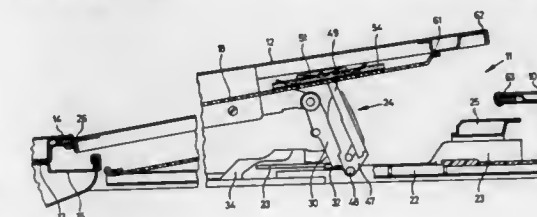
and a molded plastic windshield plate adapted to substantially close the space between the hood, fenders and the windshield, said windshield plate having a rearward edge and an integral channel member disposed on the rearward edge defining a groove receiving the cantilevered lower edge of the windshield to provide a substantially flush adjoining relationship between the windshield plate and the windshield and function to mount the rearward edge of the windshield plate on the vehicle body and yet enable lateral movement of the windshield plate relative to the

windshield whereby the plastic windshield plate adjustably closes the space between the hood, the fenders and the fixed windshield.

**4,679,846**  
**SLIDING AND LIFTING ROOF WITH TILTABLE**  
**SLIDING LINER PANEL CONTROLLED BY A**  
**GUIDANCE ARRANGEMENT**

Horst Lux, Herrenberg, and Walter Schätzler, Stockdorf/Gauting, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gauting and Daimler-Benz Aktiengesellschaft, Stuttgart, both of, Fed. Rep. of Germany

Filed Nov. 21, 1985, Ser. No. 800,410  
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1984, 3442615  
Int. Cl.<sup>4</sup> B60R 13/02; B60J 7/047, 7/05, 7/057  
U.S. Cl. 296—214 20 Claims



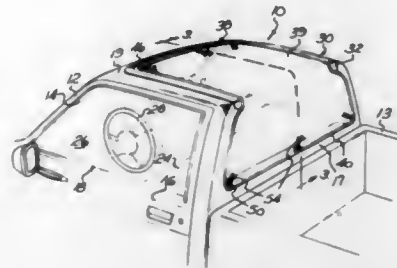
1. Sliding and lifting roof construction for vehicles having a rigid cover, which in a closed position closes a roof opening in a fixed roof surface, said cover being mounted on guide tracks that extend along each side of the roof opening and connected to lifting mechanisms disposed at opposite sides thereof in a manner enabling the cover to be selectively pivotally lifted so as to raise a rear end of the cover above the fixed roof surface, and slidably displaced after lowering of its rear end below the fixed roof surface, and a tiltable, sliding roof liner panel, which is slidably together with the cover and which, upon raising the cover, is induced into a raising movement that, starting from said closed position, is faster than the raising movement of the cover; wherein the tiltable sliding roof liner panel, at least on one of its sides, is coupled with a pivotable lifting arm whose axis of pivot is positioned below said liner panel for substantially all raised positions of said liner panel, said pivotable lifting arm being coupled to a lifting lever of a respective one of said lifting mechanisms located at said one side of the cover by a means for positively guiding the pivotal movement of the lifting arm in response to movement of said lifting lever in a manner producing said pivotal movement of the liner panel which is faster than said pivotal movement of the cover.

**4,679,847**  
**REMOVABLE CAB TOP FOR VEHICLES**  
Ronald L. Dirck, P.O. Box 196, Warsaw, Ind. 46580  
Filed Jul. 1, 1986, Ser. No. 880,698  
Int. Cl.<sup>4</sup> B60J 7/00

U.S. Cl. 296—218 6 Claims

1. A removable top in combination with a vehicle, wherein said vehicle includes a cab having a roof and adjoining rear wall, said cab further including corner located support posts connected by upper side rails, an opening means formed in said cab roof between said side rails and extending into said cab rear wall between said support posts, said removable top being

formed of transparent sheet material covering said cab opening means between said support posts and side rails and forming a



continuation of said cab roof, fastening means associated with said top and cab for detachably connecting the top to the cab.

4,679,848

## BACK SUPPORT MECHANISM AND METHOD

Petrus A. M. Splierings, 85 E. India Row, Apt. 24C, Boston, Mass. 02110

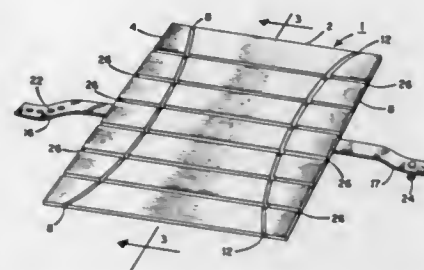
Continuation of Ser. No. 700,736, Feb. 11, 1985, abandoned.

This application Aug. 14, 1986, Ser. No. 895,590

Int. Cl.<sup>4</sup> A47C 7/46

U.S. Cl. 297-284

45 Claims



34. A spinal appliance for directly controlling the posture of a human lower back of a human spine of a nominal human subject by so contacting the lower back as to consistently force lower back vertebrae repeatedly into their appropriate lumbar curvature in response to sitting in a chair in which the appliance is positioned at the back of the chair in position to confront the lower back vertebrae of the nominal human subject, comprising:

- a posture-controlling support sheet having a front and a back and defining a plane, said sheet formed of a resilient material having a thickness and rigidity sufficient to support the lower back, said sheet having a posture-correcting two-dimensional lower-back-contacting surface having a longitudinal length as long as the lower back of the nominal human subject is long and a transverse width at least as wide as the spine thereof is wide;
- a strength and form imparting lever defining a major plane, said lever formed of a resilient material having a length no longer than the length of the posture-controlling support sheet and having a width;
- a substantially arcuate articulation coupling said posture-controlling support sheet and said strength and form imparting lever along an arcuate joint defining a preselected slope, said joint being generally centrally located with respect to said back of said sheet;
- said two-dimensional surface of said sheet is selectively formable into a posture-correcting shape in response to angular motion of said lever about said arcuate joint from an initial condition in which the planes of the lever and sheet are generally parallel to an operative condition in

which the lever is generally transverse the posture-controlling sheet at a selected angular orientation thereto; one of the dimensions of the two-dimensional surface of the posture-controlling sheet in the posture-correcting shape is curvilinearly extending with a preselected curvature, the other dimension of the two-dimensional surface of the posture-controlling sheet in the back supporting shape is generally linearly extending;

the lever having a thickness, width and rigidity sufficient to prevent buckling of the lever along its width in response to the contacting of the lower-back-contacting surface and the lower back of a human subject;

said preselected slope of the arcuate joint is selected such that said preselected curvature of the two-dimensional surface of the posture-controlling support sheet in the posture-correcting shape everywhere locally conforms to the lumbar curve of the vertebrae of the lower back of the nominal human subject; and

adjustable means coupled to said lever for maintaining said lever fixed against angular motion in its operative condition at any selected angular orientation of said lever.

4,679,849

## METHOD AND AN INVALID CHAIR FOR CONVEYING A PERSON HAVING LIMITED ABILITY TO MOVE WITHOUT HEAVY LIFTING FROM A SITTING TO A LYING POSITION

Jan Torgny, Örebro, Sweden, assignor to JATAB, Jan Torgny AB, Sweden

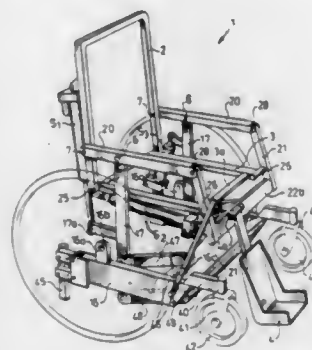
PCT No. PCT/SE85/00180, § 371 Date Dec. 10, 1985, § 102(e) Date Dec. 10, 1985, PCT Pub. No. WO85/04799, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 18, 1985, Ser. No. 834,276

Claims priority, application Sweden, Apr. 19, 1984, 8402222 Int. Cl.<sup>4</sup> A61G 5/00

U.S. Cl. 297-330

8 Claims



3. A wheelchair for moving a person of limited mobility from an upright sitting position to a recumbent position, said wheelchair (1) comprising:

- a wheeled frame structure comprising at least a fixed horizontal frame structure (16) and a vertical frame structure (17, 17a, 47, 48);
- a seat structure (3) having a front portion, a rear portion and an arm rest structure (20, 21);
- a back rest (2);
- a leg rest (4);
- first and second journals (25, 26) respectively arranged in the regions of the front portion and rear portion of the seat structure, said first journal (25) connecting said back rest to said rear portion of said seat structure, and said second journal (26) connecting said leg rest to said front portion of said seat structure;
- a third journal (7) connecting said arm rest structure (20) to said back rest;
- a fourth journal (6) connecting said arm rest structure of the

seat structure (3) and a member (17) of the vertical frame structure, said fourth journal being located close the center of gravity of a person sitting in the wheelchair and about which the back rest and seat structure (3) can be swung;

a first drive means connecting said back rest (2) to said vertical frame structure (17a), said first drive means enabling the back rest and said seat structure to be swung about the fourth journal, while retaining the mutual relative positions of the back rest and seat structure unchanged, to a first position in which the major part of the pivotal movement of the back rest (2) towards its horizontal position has been completed;

a second drive means (S2) connected between said rear position of said seat structure and said leg rest, said second drive means operable when said back rest and seat structure are in said first chair position for movement of the seat structure (3) and back rest (2) in mutually opposite directions to a second position in which the back rest and the seat structure lie substantially in register with each other in a horizontal plane.

4,679,851

## CUSHION AND METHOD

O. B. Solie, Rockford, Ill., and Godfrey J. Pyle, Shoreview, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 31, 1985, Ser. No. 761,000

Int. Cl.<sup>4</sup> A47C 31/02; B68G 7/05

U.S. Cl. 297-452

14 Claims



1. A cushion comprising a resiliently compressible pad having major front and rear surfaces and at least one opening through and disposed at about a right angle to the front and rear surfaces, an enclosure assembly having an inner surface surrounding and comprising the pad comprising a rear cover overlying the rear surface of the pad and a front cover overlying the front surface of the pad and having a part extending into said opening, and fastener means for retaining said part of the front cover in the opening to compress the pad comprising a first fastener portion including a backing, stems projecting from the backing, and heads at the ends of the stems opposite the backing with hook like parts projecting along the stems toward said backing, and a second fastener portion having a backing with a front surface and a multiplicity of loops projecting from said front surface engaged around the hook like parts of said first fastener portion, one of said fastener portions being attached to a part of said rear cover at said opening and the other of said fastener portions being attached to the part of said front cover in said opening.

4,679,850

## DEVICE FOR FIXING A HEADREST ON A VEHICLE SEAT STRUCTURE

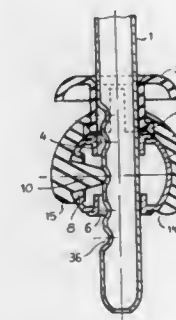
Francois Bianchi, Valentigney; Denis Busa, Audincourt, and Francois Fourrey, Montbéliard, all of France, assignors to Cycles Peugeot, Valentigney, France

Filed Jun. 13, 1986, Ser. No. 873,928

Claims priority, application France, Feb. 11, 1986, 86 01845 Int. Cl.<sup>4</sup> A47C 1/10

U.S. Cl. 297-410

9 Claims



1. A device for slidably mounting on a seat structure a headrest extended by at least one support bar having at least one notch, said device comprising a framework tube of the seat structure, the tube having a lower side portion, an upper side portion and an intermediate lateral side portion, a lower orifice and an upper orifice which are respectively provided in said lower side portion and said upper side portion of said tube for slidably receiving said support bar, said orifices being suitably spaced apart for guidingly maintaining said support bar, in a given orientation in a transverse plane intersecting said tube, and a third orifice provided in said lateral side portion of said tube between said upper and lower orifices, a split collar engaged on and locally covering said tube and a lug resiliently carried by the split collar and extending through said third orifice for cooperation with said notch in the support bar and immobilizing said bar relative to said tube.

4,679,852

## REMOTE HARNESS WEB ADJUSTER

James R. Anthony, and Allan R. Lortz, both of Carmel, Ind., assignors to Indiana Mills & Manufacturing, Inc., Carmel, Ind.

Continuation-in-part of Ser. No. 810,340, Dec. 17, 1985. This application Jun. 30, 1986, Ser. No. 880,128

Int. Cl.<sup>4</sup> A43C 11/00, 31/00

U.S. Cl. 297-464

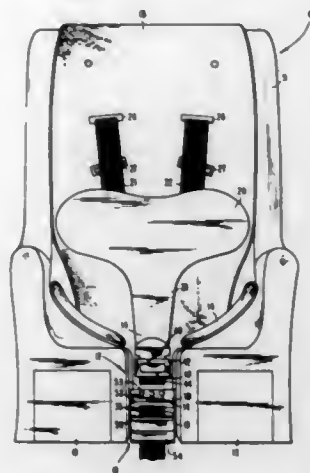
18 Claims

1. A child restraining device for mounting in a vehicle comprising:

- a child seat having a seat support upon which the child may sit and back support against which the child may rest against;
- a harness movably mounted to said child seat and including a front restraining portion positionable in front of the child with first lock means mounted on said front restraining portion, said harness including a belt affixed thereto being located beneath said seat support with said belt extending forwardly through said seat to and in front of said seat support;
- second lock means mounted to said seat in front of said seat support and engageable with said first lock means to removably secure said harness to said seat;
- a belt adjuster mounted to said seat in front of said seat support with said adjuster including adjusting means frictionally receiving said belt being operable to hold said belt once said belt is pulled manually through said adjuster to tighten said harness and also being operable to release



said belt to loosen said harness upon manual operation of said adjuster; and  
said adjusting means including a cam member pivotally mounted to said belt adjuster and frictionally engageable



with said belt to hold said belt and further including at least one manually operable pivot rod connected to said cam member for pivoting said cam member about the pivot axis.

4,679,853

## SEAT BELT ANCHORAGE

Bjorn Emanuelson, Vargarda, Sweden, assignor to Autoliv Development AB, Vargarda, Sweden

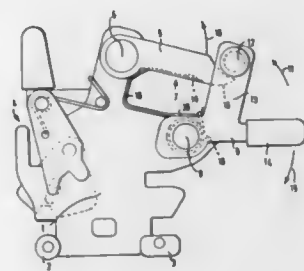
Filed Dec. 2, 1985, Ser. No. 803,805

Claims priority, application United Kingdom, Dec. 3, 1984, 8430468

Int. Cl.<sup>4</sup> B60R 21/02

U.S. Cl. 297-468

21 Claims



1. A seat belt anchorage installed in a motor vehicle, comprising a support member mounted adjacent a door of the vehicle, a first member, means for connecting the first member to the support member, the said first member being adapted to have part of the seat belt secured thereto or retained thereby, and a second member movably connected to the support member, having an initial position in which it engages the first member to retain the first member in a latched position in which it is secured to the support member, thus effectively connecting said part of the seat belt secured thereto or retained thereby to the support member, the second member being movable to a second position in which it releases the first member, thus permitting the said part of the seat belt to be disengaged from the support member.

4,679,854

## VEHICLE SEAT

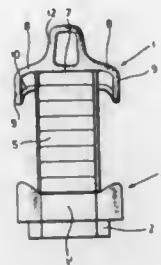
Peter-Ulrich Putsch, Rockenhausen, and Heinz P. Cremer, Kaiserslautern, both of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany  
Filed Mar. 28, 1986, Ser. No. 845,629

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 3511216

Int. Cl.<sup>4</sup> B60R 21/00

U.S. Cl. 297-486

12 Claims



1. A vehicle seat having a back rest including an upholstery support comprising two arms provided on said upholstery support and extending from said upholstery support so as to be positioned over the right and left shoulder, respectively of a vehicle seat user from behind the vehicle user when said user is seated in said vehicle seat wherein each of said arms is connected to a side restraint member that laterally overlaps the shoulder of the vehicle user, wherein each of said arms is formed together with the associated side restraint as a structural unit, and wherein said arms are positioned only above the shoulders of the vehicle user when said user is seated in said vehicle seat.

4,679,855

## SIDE SUPPORT ASSEMBLY

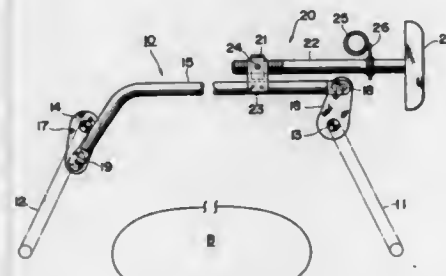
Takemi Hattori, Kariya, and Reiki Kawamura, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan  
Filed Dec. 27, 1985, Ser. No. 813,821

Claims priority, application Japan, Dec. 27, 1984, 59-196197

Int. Cl.<sup>4</sup> B60R 21/10; A47C 31/00

U.S. Cl. 297-486

9 Claims



1. An occupant side support assembly for a seat having a backrest, comprising:  
left and right frames horizontally swingable and provided on the left and right sides of the backrest, each frame constituting a side support framework;  
connecting rod means provided on the backrest and extending transversely thereof for swinging said left and right frames toward and away from each other; and  
a locking mechanism provided on said connecting rod for simultaneously locking said left and right frames at a position to which they have been set.

4,679,856

## MINE SELF-ADVANCING ROOF SUPPORT AND METHOD OF RELOCATING A MINE WINNING FACE EQUIPPED WITH SELF-ADVANCING ROOF SUPPORT

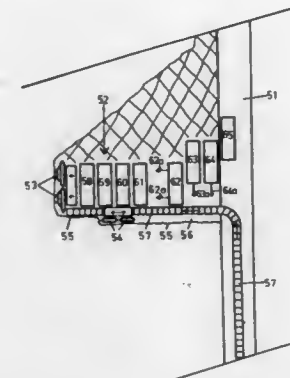
Walter Lubojatsky, Recklinghausen; Hans Lachner, Herne, and Gerald Seebacher, Recklinghausen, all of Fed. Rep. of Germany, assignors to Klöckner-Becorit GmbH, Castrop-Rauxel, Fed. Rep. of Germany  
Filed Sep. 21, 1984, Ser. No. 653,872

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334004; Aug. 4, 1984, 3428854

Int. Cl.<sup>4</sup> E21D 15/44, 23/00

U.S. Cl. 299-11

15 Claims



1. A method of relocating a winning face by means of a self-advancing roof support system by installing a new winning face at the head side of the roof support system and which includes a plurality of self-advancing roof support frames having a defined configuration, a plurality of advancing means acting perpendicular to the breast of the working for advancing said plurality of self-advancing roof support frames in the direction of the breast of the working, each of which is associated with one of said roof support frames, a plurality of additional advancing means each of which is associated with one of said roof support frames, acting parallel to the breast of the working, which means cooperate to successively advance the self-advancing roof support frames sideways parallel to the breast of the working, comprising the steps of:

extending a cut for installing the new winning face in the longitudinal direction of the winning face at the head side of the face equipment and widening the cut by the width of a support frame; and  
advancing the self-advancing roof support into said cut by migrating said supports sideways parallel to the breast of the working while maintaining their configuration.

4,679,857

## MOUNTING FRAME FOR LINEAR IMPACT RIPPER ASSEMBLY

Michael A. Roussin, Peoria; Jerry D. Fidler, East Peoria, and Brian D. Jensen, Dunlap, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 765,732, Aug. 13, 1985, abandoned. This application Sep. 11, 1986, Ser. No. 906,681

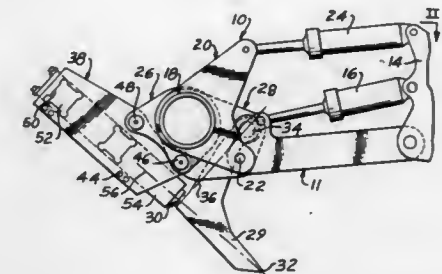
Int. Cl.<sup>4</sup> E21C 37/20

U.S. Cl. 299-37

10 Claims

1. A mounting frame adapted for supporting an impact ripper on a vehicle providing an elevationally adjustable support frame having a pair of rearwardly extended transversely spaced legs, said impact ripper including a ripper shank for engaging the ground and an impactor, comprising:  
a main crossbeam having laterally spaced opposite ends;  
a pair of end plates mounted on each end of the crossbeam and forwardly extended therefrom for pivotal connection to said legs of the support frame;  
a pair of impactor mounting plates mounted on said cross-

beam in inwardly spaced relation from each of said pairs of end plates and rearwardly downwardly extended from the crossbeam in trailing relation thereto;  
a pair of ripper shank mounting plates mounted on said crossbeam between said pair of impactor mounting plates



in forwardly extended relation from the crossbeam between said legs of the support frame; and  
a shank pivot mounting on said shank mounting plates and adapted for supporting the ripper shank in depending relation therefrom.

4,679,858

## MINING MACHINE CUTTER PICK INSERT

Klaus Tank, Essexwold, South Africa, assignor to DeBeers Industrial Diamond Division (Proprietary), Johannesburg, South Africa

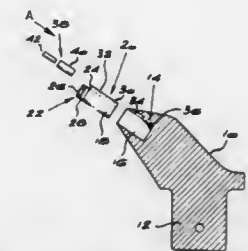
Filed Jan. 29, 1985, Ser. No. 696,050

Claims priority, application South Africa, Jan. 31, 1984, 84/0716

Int. Cl.<sup>4</sup> E21C 35/18; E21B 10/46

U.S. Cl. 299-91

7 Claims



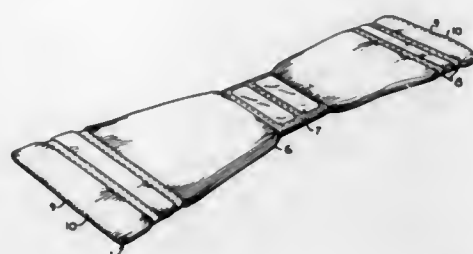
1. A cutting tool for a mining machine, comprising:  
a holding lug including a socket, and a first groove a communication with and extending outward from the socket;  
a cylindrical pin located in the socket, and including an outside cutting surface, and a second groove aligned with the first groove and extending inward from a side of the pin, said first and second grooves being located opposite each other and forming a locking bore; and  
means securing the pin in the socket, and including  
(i) a low temperature non-metallic adhesive or soft solder, applied at a low temperature to the pin and to the surfaces of the lug forming the socket to bond the pin to the lug, and  
(ii) insert means extending into the locking bore in contact with the holding lug and the pin, to restrain the pin against rotational movement in the socket, the insert means having (a) an axially extending locking sleeve including an axial through bore, and (b) an expansion pin driven into the axial through bore of the locking sleeve, and expanding the sleeve radially outward into a tight pressure engagement with the holding lug and the cylindrical pin.

4,679,859  
**METHOD OF MAKING MOPS AND MATS  
 IMPREGNATED WITH ANTIMICROBIAL COMPOUNDS**  
 Charles G. Wilson, Kearney, Mo., assignor to Golden Star, Inc.,  
 North Kansas City, Mo.

Filed Oct. 28, 1985, Ser. No. 791,938  
 Int. Cl.<sup>4</sup> A47L 13/20

U.S. Cl. 300—21

8 Claims



1. A mop swab having antimicrobial activity and comprising:

- (a) an assemblage of yarns of cellulosic fibers;
- (b) said yarns being formed into a mop swab; and
- (c) said mop swab being impregnated with an organic copper salt bonded to said cellulosic fibers and having an antimicrobial activity.

4,679,860  
**WHEEL ASSEMBLY FOR VEHICLE**  
 Masaru Koishi, Niiza; Haruo Shinohara, Kawagoe, and Shinji Takayanagi, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

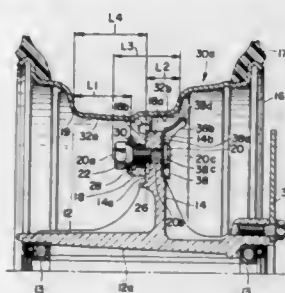
Filed Dec. 3, 1985, Ser. No. 804,272

Claims priority, application Japan, Dec. 21, 1984, 59-194030[U]

Int. Cl.<sup>4</sup> B60B 3/16, 23/10

U.S. Cl. 301—9 DN

1 Claim



1. A wheel assembly for a vehicle comprising:
- (a) a hub including a tubular body and a radial flange formed around an outer peripheral surface of said hub body and having opposite radial faces;
  - (b) a separate rim including an annular body disposed coaxially with said hub body and a radial flange formed around an inner peripheral surface of said rim body and having opposite radial faces, said hub flange and said rim flange being mated together at their one radial faces;
  - (c) fastening means releasably connecting said hub flange and said rim flange together to fix said rim with respect to said hub, said fastening means comprising a plurality of bolts each passing through said mated rim and hub flanges in circumferentially spaced relation, and a plurality of nuts each threaded on a distal end of a respective one of said bolts, there being provided a plurality of washers each mated with and fixedly secured to the other radial face of said hub flange by said bolts passing through said washers, each washer including a base and a projection extending

generally radially outwardly from said base so as to serve as said projection means; and

(d) projection means provided on said hub flange and extending generally radially outwardly of that portion of the inner peripheral surface of said rim body disposed adjacent to the other radial face of said rim flange, the distance between a radial outer end of said projection means and the one radial face of said hub flange being less than the distance between the other radial face of said rim flange and an axial outer end of said that portion remote from the other radial face of said rim flange, said projection means comprising a plurality of projections spaced circumferentially of said hub flange.

4,679,861  
**WHEEL COVER MOUNTING**  
 Yasuhide Narita, 4-16, Kitauchi-cho, Minami-ku, Nagoya-shi, Aichi-ken; Noboru Shirai, 104, Niho, Miya-cho, Gamagori-shi, Aichi-ken; Chihaya Kobro, Kopo Sugira 105, 2-31, Takayashiro, Meito-ku, Nagoya-shi, Aichi-ken, and Masami Hosono, 2-53, Kounomi-cho, Nishi-ku, Nagoya-shi, Aichi-ken, all of Japan

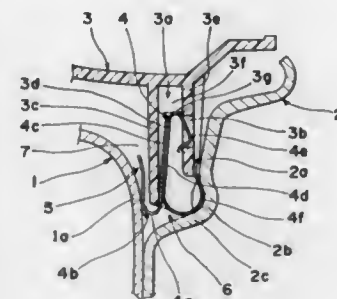
Filed Sep. 12, 1985, Ser. No. 775,312

Claims priority, application Japan, Sep. 12, 1984, 59-138203[U]

Int. Cl.<sup>4</sup> B60B 7/00, 7/02

U.S. Cl. 301—37 P

3 Claims



1. In a wheel cover mounting which comprises a wheel cover having its back face formed with a plurality of receptacles positioned adjacent the periphery thereof, and a resilient retaining member for each receptacle inserted at one end thereof into the respective receptacle in a direction axially of the wheel, the other end of said resilient retaining member protruding outwards from the receptacle and being adapted to be press-fitted into a space which is defined between a lateral wall of a wheel disc lying generally axially of the wheel and a lateral wall of a wheel rim lying generally axially of the wheel for detachably fitting the wheel cover to the wheel, the improvement wherein said resilient retaining member is constituted by a metallic leaf spring and said outwardly protruding end has a pair of curved upturned spring catches extending in the opposite directions away from each other so as to represent a generally W-shaped configuration, one of said spring catches being adapted to resiliently engage the lateral wall of the wheel disc whereas the other of the spring catches is adapted to be inserted into and resiliently engage a hump area formed in the lateral wall of the wheel rim.

4,679,862  
**QUICK-RELEASE WHEELCHAIR AXLE**  
 Chung-I Luo, No. 40, Sec. 1, Nan Ya S. Road, Pan Chiao City, Taiwan

Filed Jan. 30, 1986, Ser. No. 824,195

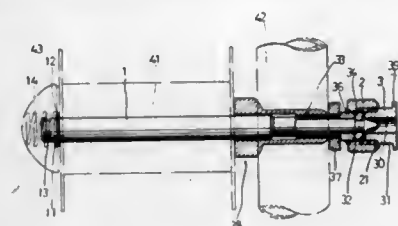
Int. Cl.<sup>4</sup> B60B 27/02

U.S. Cl. 301—112

2 Claims

1. A quick-release wheelchair axle comprising a coupling device which is directly incorporated into said axle of the

wheelchair wherein the male member of the coupling extends forth from one end of said axle along the axis of said axle a female member of said coupling with a receptacle running completely through it, threads forming the outer surface of the end of said female coupling oriented towards the male connector, a release ring maintained in a normally closed position by



a release ring spring on the end of said female member opposite said threads, ball bearings within ball bearing slots on said female member which, in close position, are retained by said release ring, a lock ring to restrain the release ring on the end of said female coupling closest to said threads, a sleeve adjustment nut and a sleeve which may be adjusted along said sleeve adjustment threads.

4,679,863  
**EMERGENCY BRAKE COMMAND READ-CONVERT  
 DEVICE FOR RAILWAY TRAIN HAVING CARS WITH  
 PNEUMATIC AND CARS WITH ELECTRICAL BRAKE  
 CONTROL**

Mitsuhiko Ikeda, Amagasaki, and Yasuo Nakao, Kobe, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

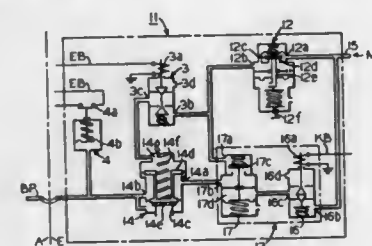
Filed Apr. 29, 1986, Ser. No. 857,693

Claims priority, application Japan, Apr. 30, 1985, 60-94090

Int. Cl.<sup>4</sup> B60T 13/74, 15/14

U.S. Cl. 303—3

12 Claims



1. In a railway train having at least one electric brake-controlled car with an emergency brake command wire extending therethrough, at least one pneumatic brake-controlled car with a brake pipe extending therethrough, and a source of fluid under pressure, there is provided on said at least one electric brake-controlled car a read-convert device comprising:

- (a) a fluid delivery path having first and second segments;
- (b) pressure-regulating valve means for connecting fluid under pressure from said source to said first and second segments of said delivery path at a certain chosen value;
- (c) a discharge valve having an outlet to which said brake pipe is connected, an inlet, an exhaust port, a pilot chamber, and a piston valve, said piston valve having a first position in which fluid pressure communication is established between said inlet and said outlet and is interrupted between said outlet and said exhaust port, and a second position in which fluid pressure communication is interrupted between said inlet and said outlet and is established between said outlet and said exhaust port to vent said brake pipe below said certain chosen value and accordingly produce an emergency brake application on said at least one pneumatic brake-controlled car;
- (d) pilot valve means operable in response to energization of said emergency brake command wire for establishing fluid pressure communication between said first segment of said

delivery path and said pilot chamber to establish said first position of said piston valve and operable in response to deenergization of said emergency brake command wire for venting said pilot chamber to establish said second position of said piston valve; and

(e) cut-off means selectively operable for connecting fluid under pressure from said second segment of said delivery path to said inlet of said discharge valve in order to re-charge said brake pipe to said certain chosen value when said piston valve is in said first position, and thereby effect a release of said emergency brake application on said at least one pneumatic brake-controlled car.

4,679,864  
**DECELERATION AND PRESSURE SENSITIVE  
 PROPORTIONING VALVE WITH LOW DECELERATION  
 RESPONSIVENESS**

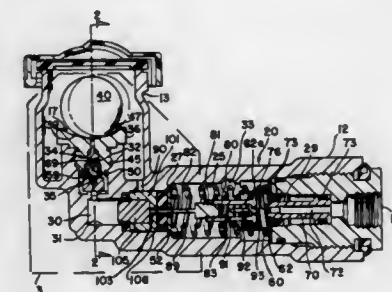
Lawrence R. Myers, Lloyd G. Bach, both of South Bend, Ind., and Robert F. Gaiser, Stevensville, Mich., assignors to Allied Corporation, Morristown, N.J.

Filed Apr. 11, 1986, Ser. No. 850,463

Int. Cl.<sup>4</sup> B60T 8/28

U.S. Cl. 303—6 C

26 Claims



1. In a proportioning valve assembly for a vehicle having an inlet communicating with a fluid pressure source and an outlet communicating with a brake assembly, a pressure responsive assembly cooperating with the inlet and the outlet to vary fluid communication therebetween in response to pressurized fluid communicated to the inlet, an inertia sensing mass responsive to deceleration of the vehicle and cooperating with the pressure responsive assembly to assist in the variation of fluid communication between the inlet and the outlet, a fluid-containing chamber communicating by means of a channel with the pressure responsive assembly, and first valve means disposed in said channel and engaged by said inertia sensing mass, the improvement comprising second valve means disposed in the channel and initially closed by means of said inertia sensing mass, an opening between said fluid-containing chamber and a portion of said channel, and the pressure responsive assembly having a reduced diameter end part engaging piston means of larger diameter disposed in said channel, the second valve means remaining closed and preventing communication of increased fluid pressure to the outlet until initial deceleration displaces said inertia sensing mass to effect opening of said second valve means.



4,679,865

## RELAY VALVE DEVICE

Helmut Ulrich, Springe; Peter Bartscher, Hanover, both of Fed. Rep. of Germany, and Brian Shilton, Leicestershire, England, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

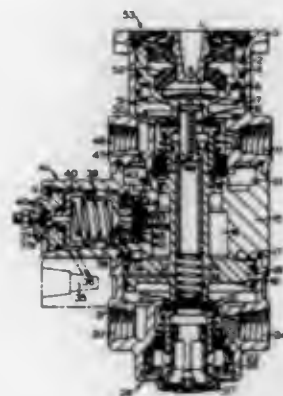
Filed Apr. 9, 1986, Ser. No. 849,661

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513292

Int. Cl.<sup>4</sup> B60T 15/06, 15/18; F15B 11/02

U.S. Cl. 303—52

14 Claims



1. A relay valve device for a pressure system which releases a pressure dependent on a control pressure from a supply source into a load circuit comprising, an intake valve linking the supply source to the load circuit, a discharge valve linking the load circuit to atmosphere, a relay piston for the actuation of the intake and discharge valves, the relay piston has a first control surface which is open to the control pressure and a second control surface, the relay piston has a reaction surface which is open to the pressure of the load circuit, the relay piston is located in such a way that it is open to the control pressure in opening direction of the intake valve and in closing direction of the discharge valve and in closing direction of the intake valve, the second control surface is open to the control pressure, a line feeding the control pressure into the second control surface and a shut-off device are controlled by the condition of a signal pressure and which is used throughout the period in which the signal pressure is present, the shut-off device includes a pressure relief valve and a switch-off device, the pressure relief valve is constructed in such a way that during a malfunction of the signal pressure, it shuts OFF the lines feeding control pressure into the second control surface when the control pressure reaches the value of the relief pressure, and the switch-off device is constructed in such a way that it switches OFF the pressure relief function of the pressure relief valve while the signal pressure is present.

4,679,866

## METHOD FOR ASCERTAINING THE SET-POINT BRAKING MOMENT FOR THE VARIOUS WHEELS OF A VEHICLE

Anton van Zanten, Ditzingen; Gerhard Heess, Tamm, both of Fed. Rep. of Germany, and Hans P. Geering, Winterthur, Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP84/00403, § 371 Date Aug. 16, 1985, § 102(e) Date Aug. 16, 1985, PCT Pub. No. WO85/02590, PCT Pub. Date Jun. 20, 1985

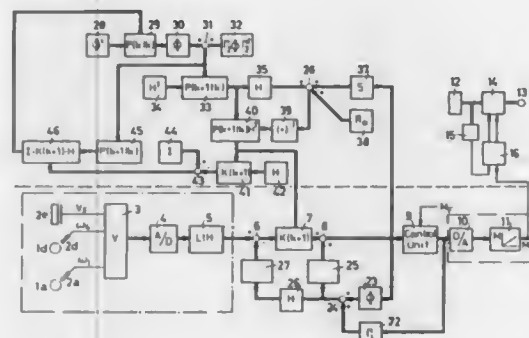
PCT Filed Dec. 15, 1984, Ser. No. 768,096

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345545

Int. Cl.<sup>4</sup> B60T 8/60

U.S. Cl. 303—104

10 Claims



1. A method for ascertaining a set-point braking moment for various wheels of a vehicle, using input variables  $Z(K+1)_i$ , which are dependent on wheel speeds  $V_R$  of these wheels and on a vehicle speed  $V_F$  wherein  $i$  is  $2-n$  for the variable dependent on the wheel speeds and  $Z(K+1)_i$  for the variable dependent on the vehicle speed, characterized in that a Kalman filter is used in such a manner comprising the steps of

- forming at predetermined time intervals  $T$ , a difference between input signals  $Z(K+1)_i$  and simulation values  $\hat{Z}(K+1)_i$  ascertained in the Kalman filter based on previous measurements;
- converting these differences  $\hat{Z}(K+1)_i$  by multiplication with a Kalman amplification factor  $K$  that forms a matrix, into  $2n+1$  difference values  $\hat{X}(k+1/k+1)_i$ ;
- forming respective sums of these difference values  $\hat{X}(K+1/K+1)_i$  and corresponding simulation values  $\hat{X}(k+1/K)_i$ ;
- delivering these summed values  $\hat{X}(K+1/K+1)_i$  to a regulator, which compares the summed values corresponding to the wheel speeds and the vehicle speed to ascertain signals  $MB_i$  corresponding to braking moments for the wheel brakes;
- storing in a memory the summed values, after multiplication by a transition matrix  $\phi$  and after addition to the signals  $MB_i$  multiplied by a matrix  $\Gamma_1$ , as simulation values  $\hat{X}(k+2/k+1)$  for the next sum formation;
- and storing the simulation values  $\hat{X}(k+2/k+1)$ , after multiplication by a measurement matrix  $H$ , in a second memory as a simulation value  $\hat{Z}(k+2)$  for the next measurement,

wherein the terms  $(k+m)$  and  $(k+m/k+n)$  are corresponding variables used in the evaluation of different cycles wherein  $m$  and  $n$  denote the cycle number, and wherein  $T$  is the cycle time.

4,679,867

## CABINET FOR AN ELECTRONIC APPARATUS

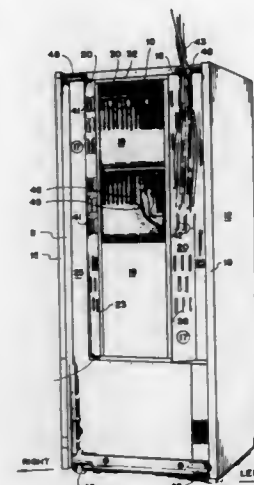
Stanley W. Heldenbrand, and Clyde L. Chappuis, both of San Jose, Calif., assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 13, 1985, Ser. No. 701,285

Int. Cl.<sup>4</sup> A47B 81/00

U.S. Cl. 312—287

5 Claims



4. A cabinet for housing a telecommunication apparatus, the cabinet including left and right side walls and front and rear doors for permitting physical access to the apparatus, the apparatus including a back plane structure within the cabinet, said back plane structure being positionable in a plane normal to said side walls and intermediate said front and rear doors, the cabinet being characterized by:

- left and right cable channels being defined at left and right interior corners of the cabinet by said rear door when in a closed position, said left and right side walls, respectively, and a left connector panel being angled diagonally between said left side wall and said rear door, and a right connector panel being angled diagonally between said right side wall and said rear door;
- an interconnect cavity being defined by a floor member spanning an area bounded by a plane of said back plane structure, lower edges of said right and left connector panels and said rear door when in a closed position, and a ceiling member spanning an area bounded by a plane of said back plane structure, upper edges of said connector panels and said rear door when in the closed position; wherein, when said rear door is in an open position, a periphery of a port is defined by the rearmost edges of said floor, said ceiling, and said left and right connector panels, said port being for physical access to an interior of said interconnect cavity and said back plane structure.

4,679,868

## MULTICONDUCTOR ELECTRICAL CABLE TERMINATIONS AND METHODS AND APPARATUS FOR MAKING SAME

Alexander W. Hasircoglu, Lancaster, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 27, 1985, Ser. No. 769,724

Int. Cl.<sup>4</sup> H01R 4/66

U.S. Cl. 439—495

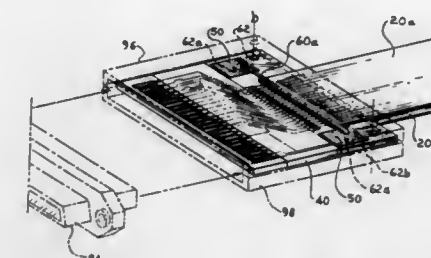
14 Claims

1. A termination for an electrical cable having a plurality of interspersed co-planar signal and ground wires embedded in a substantially planar insulating sheath, each wire having an uninsulated end portion extending from an end portion of the insulation, comprising:

- a planar circuit board substantially parallel to the plane of the cable and having a plurality of signal wire termination sites disposed in a longitudinal array on a first major sur-

face of the circuit board, the lateral spacing between the signal wire termination sites corresponding to the lateral spacing between the signal wires in the cable, and the uninsulated end portion of each signal wire being mechanically and electrically connected to a respective one of the signal wire termination sites;

- a bus member having a longitudinal mid-portion which overlies and spans the entire width of the end portion of the insulation, the uninsulated end portion of each ground



wire being mechanically and electrically connected to the bus member;

- a cover overlying the first major surface of the circuit board, the signal wire termination sites, the bus member and a portion of the cable upstream from the bus member; and means for securing the bus member to the circuit board adjacent each end of the bus member so that the bus member clamps the end portion of the insulation against the first major surface of the circuit board with the plane of the cable parallel to the plane of the circuit board.

4,679,869

## CABLE CONNECTOR HOLDER

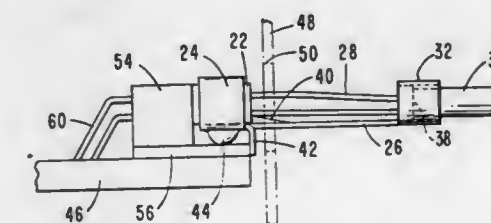
David A. Watson, New Concord, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 18, 1986, Ser. No. 830,424

Int. Cl.<sup>4</sup> H01R 13/658

U.S. Cl. 439—78

6 Claims



1. In combination with an electrical connector having mating first and second housing members in which the first housing member is mounted on a supporting surface and includes a plurality of pin members and a second housing member which includes corresponding apertures for connection to the ends of a plurality of wires extending from a cable having a metallic sleeve surrounding the wires within the cable, a support member for the second housing member comprising:

- an elongated body portion having opposed flange portions located at one end of the body portion for receiving and holding the housing member in a mounted position on the body portion;
- a stop portion on the body portion for engaging one end of the housing member to hold the housing member in said mounted position;
- means extending from the body portion for engaging a ground member located on the supporting surface upon

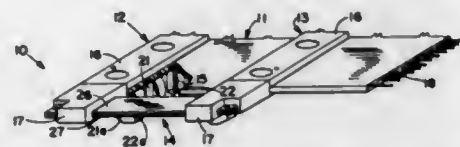
mounting of the second housing member to the first housing member;  
and a pair of opposed finger portions located at one end of the body portion opposite the flange portion end and extending outwardly from said body portion to engage the cable and the metallic sleeve, said finger portions being squeezed around the cable and to ground the metallic sleeve upon mounting of the second housing member to the first housing member.

4,679,870

**MANUFACTURE OF LOW PROFILE CLIP CONNECTOR**  
David A. Pretzel, Moreland Hills, Ohio, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Filed Dec. 13, 1984, Ser. No. 681,362  
Int. Cl.<sup>4</sup> H01R 9/11, 13/50A

U.S. Cl. 439-493

12 Claims



8. In an electrical connector for an electrical device that has plural rows of electrically conductive leads, the connector including an electrical cable having plural electrical conductors, a pair of connector bodies of electrically non-conductive material molded to said cable to respective locations along its length, each connector body including therein plural electrical contacts having an exposed contact portion for engaging a lead of the electrical device and a mounting portion about which the connector body is molded and which is electrically connected to a function to a respective conductor of said cable, and resilient means for coupling said connector bodies for relative pivoting-like movement to permit attachment of said connector to the electrical device with respective ones of said electrical contacts engaged with respective leads of such device; and the improvement comprising as a part of each said connector body a respective separately molded support means of electrically non-conductive material engageable with a surface of a mold cavity for supporting said cable and said electrical contacts connected thereto in proper position with respect to the mold cavity during molding of the balance of the connector body therein, and locking means for locking said support means in the connector body upon such molding of the balance of the connector body to at least a part of each of said support means, cable and contacts to form an integral structure therewith.

4,679,871

**IC PACKAGE CONNECTOR**

Yoshinori Egawa, Hachioji, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan  
Filed Mar. 19, 1986, Ser. No. 841,457  
Claims priority, application Japan, Mar. 22, 1985, 60-41858[U]

Int. Cl.<sup>4</sup> H01R 23/72

U.S. Cl. 439-70

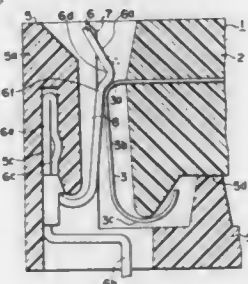
4 Claims

1. A connector for an IC package, the IC package having a body provided with a plurality of IC leads each of which has an arcuate shoulder part extending from a side of the body and a respective bent part extending from the shoulder part toward the bottom of the body, said connector comprising:

a connector body having a bottom wall and a peripheral sidewall extending upward from the bottom wall and around the periphery thereof to bound a compartment in which the IC package is inserted with the shoulder part of each of the IC leads projecting toward said peripheral side wall and the bent part of each of the IC leads extending

from the shoulder part toward the bottom wall of said connector body, and a plurality of partition walls spaced at regular intervals along the inner periphery of said sidewall and projecting therefrom into the compartment, each of said partition walls extending between the upper end of the peripheral sidewall and said bottom wall thereby defining a plurality of contact accommodation grooves between said plurality of partition walls; and a plurality of electrical contacts each of which extends in a respective one of said accommodation grooves, each of said contacts comprising a planted part fixed to said connector body having an end in said respective accommodation groove that is adjacent said bottom wall and said peripheral sidewall of said connector body and having a terminal portion that is outside of said connector body and,

a flat resilient contact piece extending at one end thereof from said end of said planted part into said compartment toward the center thereof and at an angle relative to said peripheral sidewall,



said contact piece having at the other end thereof an engaging part for engaging the shoulder part of the IC lead at one location thereon when the IC package is inserted in said compartment, and another engaging part extending from said first mentioned engaging part at an angle therefrom toward the center of said compartment for engaging the shoulder part at another location spaced from said first-mentioned location when said IC package is inserted in said compartment,

said resilient contact piece being urged by the bent part of an IC lead of the IC package to deflect about said end of said planted part toward the peripheral side wall as the IC package is inserted into said compartment and to deflect under its own resiliency toward the center of said compartment after the IC package is inserted in the compartment such that said engaging parts engage the shoulder part of the IC lead at the two respective said locations thereon.

4,679,872

**CYLINDRICAL BACK PLANE STRUCTURE FOR RECEIVING PRINTED CIRCUIT BOARDS**

Larry D. Coe, 1957 E. Oxford, Tempe, Ariz. 85283  
Filed Jan. 27, 1986, Ser. No. 822,655  
Int. Cl.<sup>4</sup> H01R 23/70, 25/00

U.S. Cl. 439-61

15 Claims

1. A back plane apparatus for receiving a plurality of electrical connectors, each having a plurality of connector connectors, the back plane apparatus comprising in combination:

- (a) a plurality of conductive spider members each having a conductive hub and a plurality of narrow, elongated conductive legs extending radially outwardly therefrom;
- (b) a plurality of insulative disks disposed between the respective conductive spider members and insulating each conductive spider member from the adjacent ones, the conductive spider members and insulative disks forming a vertical stack;
- (c) a plurality of printed circuit boards each having an electrical connector attached along an edge thereof, each

electrical connector having a plurality of connector conductors for electrically contacting a conductive leg of a respective one of the conductive spider members, the connector conductors of each electrical connector being arranged in pairs, the connector conductors of each pair being located side-by-side, outer portions of conductive legs of alternate conductive spider members being offset downward and sideways in one direction and outer portions of the conductive legs of the other conductive spider members being offset upward and sideways in the opposite direction, adjacent outer conductive leg portions being located side-by-side and respectively electrically

member whereby the removal of said electrical plug is prevented.

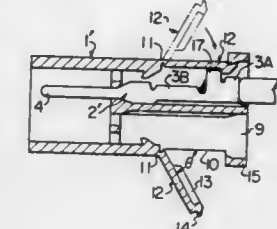
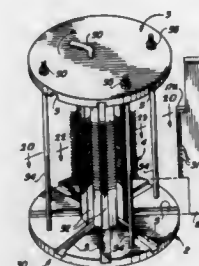
4,679,874

**CONNECTOR HOUSING**

Elji Saijo, and Shigekazu Wakata, both of Yokkaichi, Japan, assignors to Tokai Electric Wire Company Limited, Japan  
Continuation of Ser. No. 573,405, Jan. 24, 1984, abandoned. This application Oct. 3, 1985, Ser. No. 783,796  
Claims priority, application Japan, Jan. 27, 1983, 58-10428[U]  
Int. Cl.<sup>4</sup> H01R 11/00

U.S. Cl. 439-595

10 Claims



- (d) means for clamping the conductive spider members and the insulative disks together in interleaved relationship to each other and maintaining the conductive legs in predetermined aligned relationship with each other; and
- (e) a plurality of guide means for precisely guiding each of the electrical connectors as it is plugged into the back plane apparatus so that the conductive legs are precisely aligned with and make reliable electrical contact with corresponding connector conductors of respective plugged-in electrical connectors.

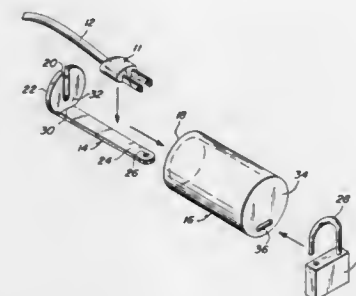
4,679,873

**ELECTRICAL PLUG LOCK**

John R. Brackett, Jr., 181 Dearborn Rd., Greenland, N.H. 03840  
Filed Sep. 8, 1986, Ser. No. 906,219  
Int. Cl.<sup>4</sup> H01R 13/44

U.S. Cl. 439-134

3 Claims



- 1. An electrical plug lock for security purposes which comprises:
- (a) a housing for containing an electrical plug having a first open end and a second closed end with a through bore in said second closed end;
- (b) a closure member which cooperatively fits together with said housing for capturing said electrical plug therein, wherein said closure member has a back portion having an elongated slot for receiving the cord of an electric plug and a tongue attached at a first end projecting from said back portion and having a hole at a second end; and
- (c) means for locking said housing together with said closure

4,679,875

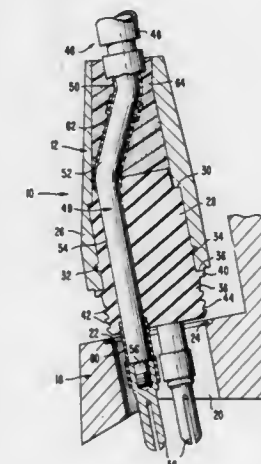
**ATTACHMENT OF ELECTRIC CABLE TO SUBMERSIBLE PUMP MOTOR HEADS**

Wayne H. Ramsey, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 9, 1985, Ser. No. 806,487  
Int. Cl.<sup>4</sup> H01R 11/00

U.S. Cl. 439-604

15 Claims



- 1. A device for attaching an end of an electric cable to the head of a motor or the like having an opening for receiving the



device, said device comprising a rigid shell with a body of elastomeric material filling an end portion of the shell and projecting therefrom to form an insert to be received in said opening, said cable having conductor means extending through said body and provided with terminal means at an end of said conductor means, said body being sealed within said shell and said conductor means being sealed within said body, said insert having an integral external peripheral bead abutting an end of said shell and having external peripheral ridge means for sealing said insert in said opening with said bead against a portion of said motor head surrounding said opening and with said terminal means positioned to engage cooperable terminal means of the motor head via said opening.

4,679,876

## ELECTRICAL CONNECTOR AND AN ELECTRICAL TERMINAL

Juan Regla, and Jose Lazaro, both of Barcelona, Spain, assignors to AMP Incorporated, Harrisburg, Pa.

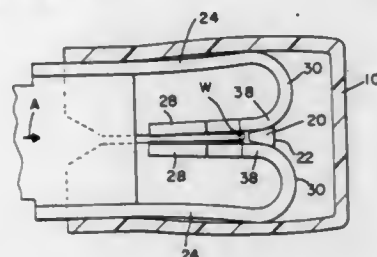
Filed Sep. 24, 1986, Ser. No. 910,912

Claims priority, application United Kingdom, Sep. 30, 1985, 8524065

Int. Cl.<sup>4</sup> H01R 4/24

U.S. Cl. 439-426

10 Claims



1. An electrical connector comprising: an electrically insulating housing having walls defining a terminal receiving cavity, the housing having an open end and an opposite end, two opposed walls of the housing each being formed with a wire receiving slot extending from said open end towards said opposite end; an electrical terminal provided with a pair of interconnected, superposed wire gripping plates having aligned openings therein, the terminal being insertable into the cavity through said open end to make electrical connection with a wire extending through said wire receiving slots; means biasing said wire gripping plates resiliently against one another with opposed faces thereof in contiguous face to face relationship; and wedge means projecting from the housing into the cavity for forcing the plates apart from each other to receive the wire between said opposed faces of the plates as the terminal is being inserted into the cavity, the wedge means and the openings in the plates being so relatively arranged that when the terminal has been inserted into the housing, the wedge means enter said openings to permit the plates to resile against the wire to grip it.

4,679,877

## ELECTRIC PLUG WITH SNAP-FITTED HOUSING COMPONENTS

Joseph M. Ahroni, 2701 W. Manor Pl., #204, Seattle, Wash. 98199

Filed Jul. 17, 1985, Ser. No. 755,230

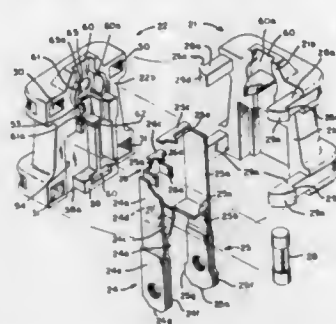
Int. Cl.<sup>4</sup> H01R 11/20, 13/58, 13/68

U.S. Cl. 439-425

10 Claims

1. An electrical plug and cord assembly comprising: an insulated electrical cord having two separated conductors; a plug housing which is longitudinally divided into two mating non-conductive half-shells and a wireway for an

end portion of the cord having an expanded intermediate portion defined by upstanding side walls, said wireway having an entrance between the shells; one of said shells having a non-conductive prong projecting completely through said cord between said conductors



and within said expanded portion of the wireway to resist pulling of the cord out of the wireway by pressing said conductors against said side walls; conductive contact members in the plug housing engaging said conductors; and means for holding said shells together.

4,679,878

## INSULATION-PIERCING ELECTRICAL CONTACT AND CONNECTOR INCORPORATING THE SAME

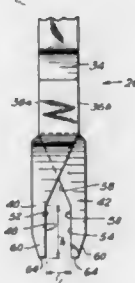
Claus Volk, Yorktown Heights, N.Y., assignor to Stewart Stamping Corporation, Yonkers, N.Y.

Filed Aug. 1, 1985, Ser. No. 761,477

Int. Cl.<sup>4</sup> H01R 4/24

U.S. Cl. 439-425

4 Claims



4. A modular plug connector, such as of the type insertable into modular jacks for telephone use, for terminating a multi-conductor cable comprising a plurality of elongated insulated conductors comprising:

- a unipartite housing formed of dielectric material and having a forward end, a rearward end at which the cable is received and a contact-receiving side, a plurality of channels formed in said housing for receiving respective insulated conductors, each pair of adjacent channels being separated from each other by a partition wall so that the width of said channels is defined by the distance between adjacent partition walls, and a plurality of contact-receiving slots, each slot opening onto said contact-receiving side of said housing and communicating with a respective one of said conductor-receiving channels; and
- a plurality of electrical contacts formed of metallic conductive material for terminating the elongated insulated conductors, each contact being received in a respective one of said contact-receiving slots and including a thin, substantially planar body portion having a pair of opposed substantially planar side surfaces defining a thickness of said body portion and a longitudinally extending top edge surface, first and second insulation-piercing tines integral

with said body portion, said tines being longitudinally spaced from each other and transversely offset with respect to each other and adapted to pierce the insulation of the elongated insulated conductor to be received in the respective one of said channels communicating with the respective one of said slots in which said contact is received, each of said tines having an inner surface adapted to electrically engage the elongated conductor of the elongated insulated conductor to be received in said respective channel, said inner surfaces of said tines lying within the thickness of said body portion and being transversely spaced from each other a distance less than the maximum transverse dimension of the elongated conductor to be received in said respective channel, said tines terminating in bottom edges at least portions of which lie within the thickness of said body portion both before and after engagement with the elongated conductor and wherein the transverse distance between the inner surface of each tine and an opposed partition wall is less than the sum of the diameter of the conductor and the thickness of the insulation of the insulated conductor to be received in said respective channel.

4,679,879

## PLUG AND RECEPTACLE CONNECTOR ASSEMBLY

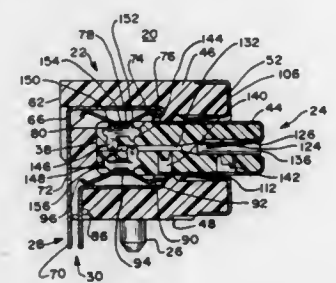
Irvin R. Triner, Stickney, and Craig A. Bixler, Elmhurst, both of Ill., assignors to Molex Incorporated, Ill.

Filed Oct. 3, 1986, Ser. No. 914,892

Int. Cl.<sup>4</sup> H01R 4/24

U.S. Cl. 439-425

17 Claims



1. An electrical plug for use with a flat insulated cable having a plurality of conductors in side-by-side spaced apart relationship, said plug comprising:

- a dielectric plug housing with a first mating end and a second opposed conductor receiving end, oppositely facing plug walls, oppositely facing plug side walls, a receiving cavity disposed between said plug walls and extending from said second conductor receiving end for receiving a portion of said flat cable;
- a plurality of first plug contacts disposed in said plug housing adjacent one of said plug walls, each of said first plug contacts being coupled to one of said plurality of conductors in a first set of alternate conductors;
- a plurality of second plug contacts disposed in said plug housing adjacent to the other of said plug walls, each of said second plug contacts being coupled to one of said plurality of conductors in a second set of alternate conductors;
- a first set of contact planes, each of said plurality of first plug contacts being included in one of said first planes, and a second set of contact planes, each of second plurality of second plug contacts being included in one of said second contact planes, adjacent contact planes in said first and second set of contact planes being offset from each other in a direction between the side walls of said plug housing.

4,679,880

## STRAIN RELIEF ATTACHMENT FOR WIRE CONNECTOR ASSEMBLY

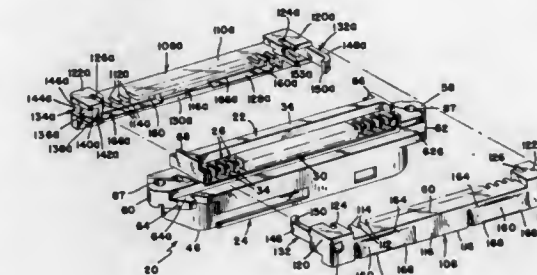
Daniel M. Pitsch, Minneapolis, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Dec. 16, 1985, Ser. No. 809,574

Int. Cl.<sup>4</sup> H01R 4/24

U.S. Cl. 439-404

5 Claims



1. An electrical connector assembly comprising: a wire attaching side including a plurality of insulation displacement connectors each having a wire receiving slot sized to receive an insulation bearing conductive wire of predetermined size within said slot, each of said connectors further having electrically conductive insulation piercing members projecting into said slots and sized to pierce insulation of a wire received within said slot and conductively engage said wire;

- said plurality of connectors arranged in first and second sets with axes of slots within a set parallel and linearly aligned to hold a plurality of wires within said slots with axes of said wires disposed within said slots parallel and linearly aligned;
- said first and second sets disposed in parallel aligned spaced apart relation;
- a pair of strain relief attachments for restraining wires held by said connectors;
- means for securing said strain relief attachments to said assembly with said attachments providing strain relief for wires held by said connector;
- said assembly presenting a mounting surface sized to abut a first surface of a mounting bracket having an opening sized for said wire attaching side to extend through said opening with said mounting surface abutting said first surface;
- said attachments each having locking members on sides thereof to protrude beyond said opening and presenting a locking surface opposing a second surface of said mounting bracket, said locking surface disposed in a plane spaced from said mounting surface a distance approximate to a distance between said first surface and said second surface; said locking member disposed for said mounting bracket to be captured between said lock surface and said mounting surface when said assembly is disposed with said wire attaching side extending through said opening and said mounting surface abutting said first surface; and
- said lock members flexible to be urged toward said wire receiving side.

4,679,881

## ELECTRICAL INTERCONNECTION APPARATUS AND TECHNIQUE

Aaron A. Galvin, Lexington; Hugh D. Dyer, Norton, and Kenneth J. Leff, Halifax, all of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed May 7, 1985, Ser. No. 731,672

Int. Cl.<sup>4</sup> H01R 4/24

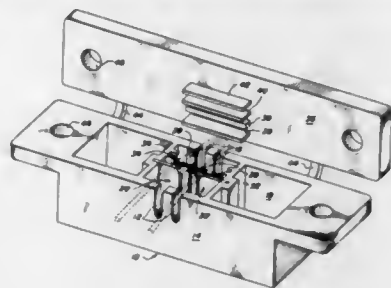
U.S. Cl. 439-392

8 Claims

1. For use in providing a series electrical connection be-

tween a conductor and an electrical unit, apparatus comprising:

- means having a pair of spaced walls, each of the walls including first and second slots in alignment with corresponding first and second slots of the other wall;
- a first insulation displacement (IDC) connector having a groove aligned with and positioned between said first slot and said corresponding first slot;
- a second insulation displacement (IDC) connector electrically separate from the first connector and having a groove aligned with and positioned between said second slot and said corresponding second slot;
- said grooves of said first and second connectors each adapted to engage a conductor such that said conductor and said connector are an electrical communication;



- a knife blade spaced between the insulation displacement connectors and one of the housing walls and having an upper knife edge confronting the corresponding first and second slots;
- the slots of the walls and connector grooves defining a path along which said conductor can be looped, with the loop end of the conductor extending outside one wall adjacent to the knife blade;
- means for coupling each of said connectors to a respective terminal of an electrical unit;
- cover means operative to be secured over the walls and including means operative to force said conductor disposed in the slots of the walls into the grooves of the IDC connectors and also operative to force the conductor against the knife blade to sever the loop end of the conductor at positions adjacent the corresponding first and second slots.

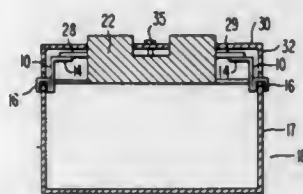
4,679,882

#### SUPPORT CLIPS FOR SUPPORTING ELECTRICAL FIXTURES IN A JUNCTION BOX

Larry E. Mears, P.O. Box 6548, Lake Worth, Fla. 33461  
Filed Sep. 17, 1985, Ser. No. 777,055  
Int. Cl.<sup>4</sup> H02B 1/02

U.S. Cl. 439—569

12 Claims



1. Apparatus for supporting an electrical fixture in a junction box, comprising:  
an electrical fixture having a first end and a second end, a top portion, a first mounting bracket at said first end and a second mounting bracket at said second end, and an aperture in the center of said top for reception of a mounting screw;

- a junction box having four walls;
- a junction box cover having at least a top and at least one aperture in said top for reception of a mounting screw, whereby said electrical fixture may be mounted to said cover solely with a mounting screw through said aperture in said top of said cover and said aperture in said top of said fixture, and whereby said first and second mounting brackets are unsecured to the junction box cover;
- means for secure said junction box cover to said junction box;
- at least a first clip including:  
a lower end having means to secure the clip to the junction box; and  
an upper end having means to support and engage one of said unsecured fixture mounting brackets, whereby said clip supports said one of said unsecured fixture mounting brackets when said junction box cover is secured to said junction box.

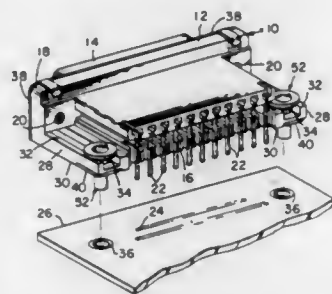
4,679,883

#### SHOULDER EYELET BOARD LOCK

John E. Assini, and Paula A. Kissinger, both of Harrisburg, Pa.,  
assignors to AMP Incorporated, Harrisburg, Pa.  
Filed Sep. 8, 1986, Ser. No. 904,315  
Int. Cl.<sup>4</sup> H01R 4/66, 13/648

U.S. Cl. 439—607

7 Claims



1. An electrical connector assembly for mounting to a printed circuit board, comprising:  
a dielectric housing having a first integral flange having mounting face, an opposed holding face and a hole extending therebetween;  
an eyelet disposed in said hole, said eyelet having end flange means engaging the mounting face and holding face with a generally cylindrical shank extending therebetween; and  
a rivet disposed in the eyelet comprising flange means and a generally tubular shank, the generally tubular shank having a first section within the eyelet including means for providing an interference fit between the rivet and the eyelet and a second section extending beyond the eyelet for securing the assembly to the printed circuit board, whereby the housing, eyelet and rivet form an assembly for mounting in preformed holes in the printed circuit board.

4,679,884

#### FUSED ELECTRICAL PLUG

Eldon J. Klemp, Mayer, Minn., assignor to Litton Systems, Inc.,  
Beverly Hills, Calif.

Filed May 7, 1986, Ser. No. 860,440  
Int. Cl.<sup>4</sup> H01R 13/68

U.S. Cl. 439—106

11 Claims

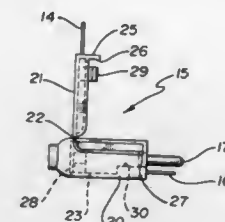
1. A fused electrical appliance plug including at least neutral and positive terminal posts and further comprising:  
a first plug portion from which said neutral terminal post extends along an axis parallel to the principal axis of said first plug body portion, said first plug body portion including a cavity for receiving a fuse;

a second plug body portion from which said positive terminal post extends;

- hinge means securing said first and second plug body portions for pivotal relative movement between an open position wherein said fuse receiving cavity is accessible and a closed position wherein said fuse receiving cavity is inaccessible;

means for

- (i) mechanically positively retaining a fuse on said second plug body portion while said second body portion is in said open position, and



- (ii) establishing an electrical connection through said fuse in said cavity between a cord conductor and said positive terminal post only when said first and second plug body portions are in said closed position and along an axis parallel to the principal axis of said first plug body portion; and  
means for releasably securing said first and second plug body portions in said closed position  
wherein the initial pivoting movement upon opening said first and second plug body portions is substantially perpendicular to the axis of said positive terminal post.

4,679,885

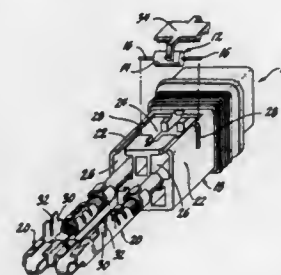
#### ELECTRICAL COMPONENT PACKAGING ASSEMBLY

Charles R. Nestor, Niles; Raymond A. Maga, Poland, and Gregory L. Bensing, Cortland, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1986, Ser. No. 891,994  
Int. Cl.<sup>4</sup> H01R 13/42, 13/66

U.S. Cl. 439—620

3 Claims



1. A package assembly for packaging an electrical component having a lead and for electrically connecting said component lead to a terminal so as to cooperatively mechanically lock said terminal to said package assembly, comprising,

- a housing having a cavity for receiving said component and a first slot sized so that said component lead may be closely fitted therewithin, said housing also having a terminal receiving passage adjacent and generally orthogonal to said first slot, and,

- a terminal having a second slot sized so that said component lead may be closely fitted therewithin and located so as to generally align with said first slot when said terminal is received in said passage, whereby, after said terminal has been so received, said component may then be received in said cavity and said component lead closely fitted within said first and second aligned slots, thereby electrically

connecting said component lead to said terminal and simultaneously mechanically locking said terminal against withdrawal from said passage.

4,679,886

#### MULTI-WIRE CONTACT ASSEMBLY

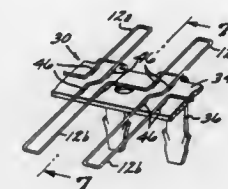
William H. King, Riverside, Calif., assignor to Bourns, Inc.,  
Riverside, Calif.

Division of Ser. No. 754,382, Jul. 11, 1985, Pat. No. 4,631,824.  
This application Dec. 12, 1986, Ser. No. 940,819

Int. Cl.<sup>4</sup> H01R 13/05

U.S. Cl. 439—816

6 Claims



1. A contact assembly for an electronic component, comprising:  
a conductive pin having a shank portion and a tab portion formed at an angle to said shank portion; and  
first and second elongate wire loops each having a first end conductively connected to said tab portion and a second, closed, end extending away from the juncture between said tab portion and said shank portion so as to be resiliently cantilevered, said first and second loops each having a pair of legs extending between said first and second ends thereof, one of the legs of said first loop being interposed between the legs of said second loop, and one of the legs of said second loop being interposed between the legs of said first loop.

4,679,887

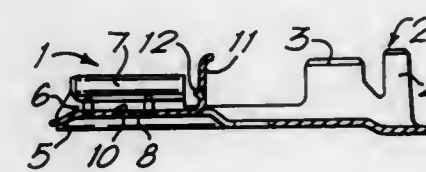
#### ELECTRICAL TERMINAL

Charles L. Jackson, Nr. Tonbridge, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 24, 1982, Ser. No. 361,295  
Int. Cl.<sup>4</sup> H01R 11/22

U.S. Cl. 439—849

3 Claims



1. An electrical terminal for mating with a flat tab male terminal and having a receptacle portion comprising a base and a pair of opposed side walls upstanding from the base, free edge portions of the side walls being turned-in over the base whereby the base, side walls and free edge portions together define a passage to receive from one end a flat tab male terminal, there being an integrally formed tongue extending from the tab-entry end of the base and within the receptacle portion, the tongue having a projection arranged to engage in a hole in a male tab when mated with the terminal to lock the male tab to the terminal, a free end portion of the tongue projecting away from the base to provide a release member by depression of which towards the base the projection on the tongue can be released from the hole in the male tab to allow disconnection, the release member being formed with a projection directed



towards the tab entry end of the receptacle portion and positioned such that the leading end of a male tab being mated with the terminal will engage the release member between the root of the tongue and the projection, the projection serving to prevent movement of the free end of the male tab along the release member towards the free end thereof and thus limit insertion of the male tab into the receptacle portion.

4,679,888

## ELECTRICAL TERMINAL AND A METHOD OF MAKING IT

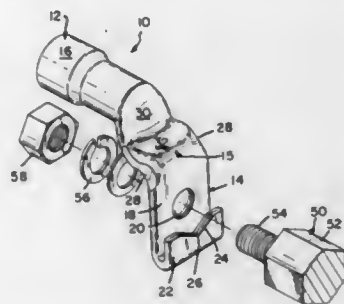
Tom R. Williams, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 5, 1982, Ser. No. 345,956

Int. Cl.<sup>4</sup> H01R 4/30

U.S. Cl. 439—883

1 Claim



1. A stamped and formed electrical terminal comprising an elongated length of tubing with one end providing a cylindrical wire receiving means and the other end being flattened and bent ninety degrees relative to the wire receiving means and having an opening therethru to receive an electrical stud and further with the free end being V-shaped and bent back to face the opening, said V-shaped free end adapted to cooperate with a hexagonal-headed stud which may be positioned in the opening to prevent the terminal from rotating about the stud.

4,679,889

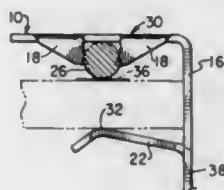
## SOLDER-BEARING LEADS

Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corporation, College Point, N.Y.  
Continuation-in-part of Ser. No. 737,830, May 24, 1985, Pat. No. 4,605,278. This application Oct. 31, 1985, Ser. No. 793,654. The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> H01R 4/02

U.S. Cl. 439—876

12 Claims



1. A solder-bearing lead adapted to be soldered to a conductive surface, comprising:  
an elongated strip-like body portion,  
said body portion having on at least one edge thereof a pair of spaced laterally extending tabs defining an opening therebetween,  
said pair of tabs being bent substantially perpendicular from the body portion strip to form therebetween part of a channel with said body portion forming a floor for said channel,

a solder mass in said channel and bordered by said pair of tabs,  
said tabs being bent inwardly of said channel to retain said solder mass therein.

4,679,890

## CONNECTOR CONTACT TERMINAL

Solomon S. Fineblum, Randolph, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

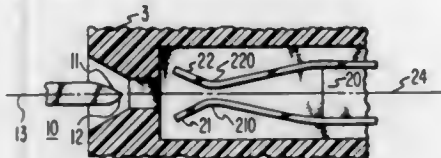
Continuation of Ser. No. 624,345, Jan. 25, 1984, abandoned.

This application Oct. 21, 1985, Ser. No. 788,529

Int. Cl.<sup>4</sup> H01R 3/00

U.S. Cl. 439—884

7 Claims



1. A male pin for engaging a pair of opposing female blades each formed with an arcuate section bowed inwardly toward a central axis to engage the pin comprising:

a pin member with an end thereof having a pair of curvilinear surfaces each corresponding with one of said female blades for engagement therewith with one curvilinear surface formed to extend from the central axis at the pin end at a first radius and the other curvilinear surface opposite said one curvilinear surface formed to extend from the pin end central axis at a second radius less than said first radius for generating a sequential deflection force on the blades as said pin member is inserted along the central axis between the pair of female blade arcuate sections.

4,679,891

## INFRA-RED LENSES

Michael Roberts, Clwyd, Wales, assignor to Pilkington P.E. Limited, United Kingdom

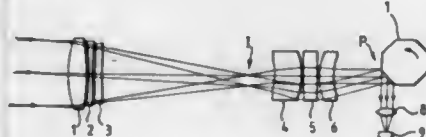
Filed Jul. 3, 1985, Ser. No. 752,370

Claims priority, application United Kingdom, Jul. 14, 1984, 8417993

Int. Cl.<sup>4</sup> G02F 1/02; G02B 9/12, 9/34

U.S. Cl. 350—1.3

13 Claims



1. An infra-red lens having a group of at least three closely spaced lens elements, the group being of positive overall power and the three lens elements being of three different respective infra-red transmitting materials each having a positive thermal coefficient of refractive index, the group comprising a pair of lens elements of materials whose refractive indices are relatively temperature insensitive, the pair consisting of a positively powered lens element and a negatively powered lens element arranged to effect substantial achromatisation and substantial correction of spherical aberration, and the group having a further negatively powered lens element of a material whose refractive index is relatively temperature sensitive and is of lower dispersion and higher refractive index than the materials of the said pair of elements, said further negatively powered lens element being arranged to effect substantial athermalisation.

4,679,892

## COMPONENT FOR AN INTEGRATED OPTICAL SYSTEM

Jan Haisma; Pieter van der Werf, both of Eindhoven; John M. Robertson, deceased, late of Eindhoven, and by Friedrich J. de Haan, administrator, Dommelen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

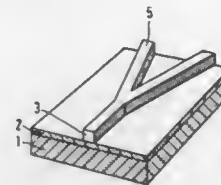
Filed Oct. 5, 1984, Ser. No. 658,109

Claims priority, application Netherlands, Oct. 7, 1983, 8303446

Int. Cl.<sup>4</sup> G02B 6/12

U.S. Cl. 350—96.12

8 Claims



1. A component for an integrated optical system for guiding visible or infrared electromagnetic radiation, said component comprising:

a monocrystalline substrate of a material having a garnet structure and a refractive index  $n_1$ , said substrate not being a waveguide;  
a dielectric layer having a refractive layer  $n_2$  grown epitaxially directly on the substrate,  $n_2$  being smaller than  $n_1$ ; and an optical waveguide layer having a refractive index  $n_3$  grown epitaxially directly on the dielectric layer,  $n_3$  being greater than  $n_2$ .

4,679,893

## HIGH SWITCHING FREQUENCY OPTICAL WAVEGUIDE SWITCH, MODULATOR, AND FILTER DEVICES

O. Glenn Ramer, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

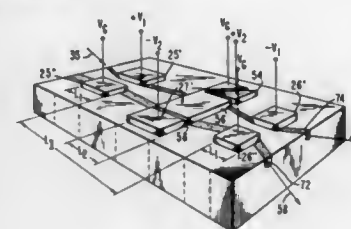
Continuation of Ser. No. 527,149, Aug. 26, 1983. This

application Apr. 14, 1986, Ser. No. 852,081

Int. Cl.<sup>4</sup> G02B 6/10

U.S. Cl. 350—96.14

17 Claims



1. An electro-optical device comprising:

(a) an electro-optic substrate;  
(b) first and second optical channel waveguides provided at a surface of said substrate, said waveguides being generally parallel to one another, optically coupled in first and third regions of said device, and essentially optically isolated from one another in an interposed second region; and  
(c) first, second, and third sets of electrodes associated with said waveguides in said first, second, and third regions, respectively, of said device, said first and third electrode sets being biased so as to effectively transfer light energy between said first and second waveguides, said second electrode set being selectively biased so as to provide a proportionally corresponding relative phase difference in the light energy traveling in each of said waveguides such that light energy introduced into said first waveguide is effectively transferred in part to said second waveguide within said first region and such that light energy is effectively transferred between said first and second wave-

guides in said third region, the transfer taking place in a direction and at a magnitude directly dependent on said corresponding relative phase difference between light energy traveling in said second region of said device.

4,679,894

## ELECTRICALLY SWITCHED FIBER OPTIC DIRECTIONAL COUPLER

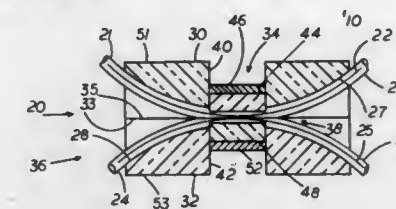
George A. Pavlath, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 20, 1984, Ser. No. 642,215

Int. Cl.<sup>4</sup> G02B 6/26

U.S. Cl. 350—96.15

21 Claims



1. A switchable fiber optic directional coupler for selectively coupling optical signals between a first optical fiber having a first core, a first cladding and a first propagation constant and a second optical fiber having a second core, a second cladding and a second propagation constant comprising:

means for forming an interaction region in which the evanescent field of light propagating in each of said optical fibers interacts with the other of said optical fibers;

control means for interacting with the evanescent fields of light propagating in said optical fibers to control the propagation constants of the fibers and thereby control the coupling of light between said optical fibers, said control means including;

a first block of an interaction material placed adjacent said interaction region;

a second block of an interaction material placed adjacent said interaction region, the first and second blocks cooperating to increase one of the first and second propagation constants while decreasing the other; and

means for applying an electric field to said first and second blocks to control the relative magnitude of first and second propagation constants.

4,679,895

## ADHESIVELESS OPTICAL FIBER CONNECTOR

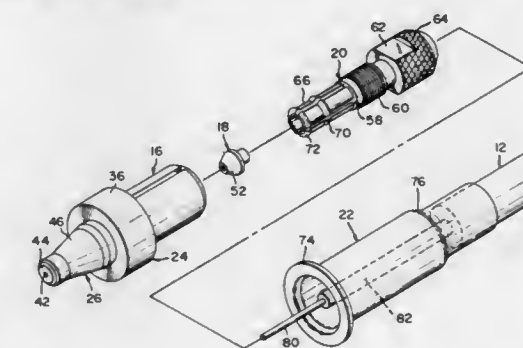
John H. Huber, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 31, 1984, Ser. No. 645,976

Int. Cl.<sup>4</sup> G02B 6/36

U.S. Cl. 350—96.20

7 Claims



1. A connector for an optical fiber comprises a ferrule for surrounding the fiber, a clamp of resiliently compressible material for surrounding the fiber, and a body for connection to the ferrule, the body having a tubular portion divided into fingers for gripping a buffer jacket surrounding the fiber, character-

ized in that, a portion of the clamp is surrounded by the fingers, and another portion of the clamp is in the ferrule and is urged by the fingers against an internal surface of the ferrule that deforms the clamp radially to grip the fiber, and the fingers are in the ferrule and are urged by the internal surface to compress radially against the buffer jacket.

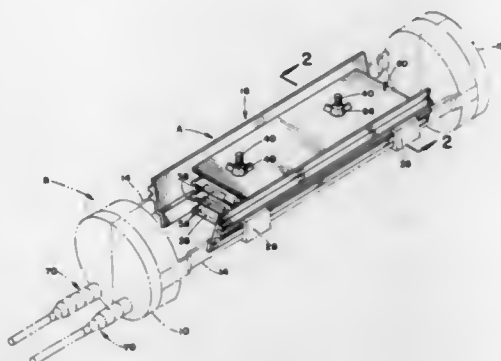
4,679,896

## OPTICAL FIBER SPLICE ORGANIZER

Joseph T. Krafek, Sever Hills; Richard J. Barnes, Mentor, and Erwin H. Goetter, Chesterland, all of Ohio, assignors to Preformed Line Products Company, Cleveland, Ohio  
Filed Sep. 27, 1985, Ser. No. 781,108  
Int. Cl.<sup>4</sup> G02B 6/36

U.S. Cl. 350—96.20

8 Claims



1. An organizing tray assembly for optical fiber splices comprising:

- (a) an elongated, generally channel shaped open ended main frame member including a longitudinally extending bottom wall and a pair of spaced upwardly extending integral side walls;
- (b) a pair of threaded support members extending vertically upwardly from said bottom wall at longitudinally spaced location generally midway between said side walls;
- (c) a plurality of generally rectangular tray members each including a base having spaced longitudinal edges and defining a support surface having a width less than the distance between said side walls, each base having openings through which said support members extend to maintain said tray members generally midway between said side walls in juxtaposed relationship; and,
- (d) spacer means for maintaining said tray members in a predetermined, vertically spaced relationship on said threaded support members, said spacer means comprising upwardly extending bosses formed on said bases about said openings and flanges extending upwardly and inwardly from said longitudinal edges, the height of said bosses and said flanges being substantially equal.

4,679,897

## OPTICAL FIBRE ELEMENT FOR USE IN AN OPTICAL CABLE

Stephen P. Driskel, Astley, England, assignor to BICC Public Limited Company, London, England  
Filed Jun. 18, 1985, Ser. No. 745,929  
Claims priority, application United Kingdom, Jun. 22, 1984, 8415999

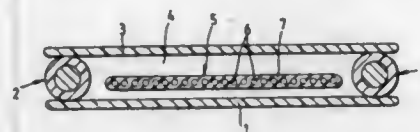
Int. Cl.<sup>4</sup> G02B 6/44

U.S. Cl. 350—96.23

10 Claims

1. An optical fibre element comprising a tape of plastics material having two oppositely disposed major surfaces and having transversely spaced on and secured to one of its major surfaces at least two plastics insulated electric conductors extending lengthwise of the tape; a second tape of plastics

material having two oppositely disposed major surfaces, which second tape overlies the transversely spaced plastics insulated electric conductors with one of its major surfaces secured thereto to form between adjacent pair of plastics insulated conductors an elongate compartment; and, loosely housed in the elongate compartment, at least one optical fibre ribbon comprising a plurality of optical fibres arranged side by side



and embedded in an elongate body of plastics material, the diameters of the plastics insulated electric conductors each being substantially greater than the smaller transverse dimension of the optical fibre ribbon and the transverse distance between said pair of plastics insulated electric conductors being substantially greater than the larger transverse dimension of the optical fibre ribbon.

4,679,898

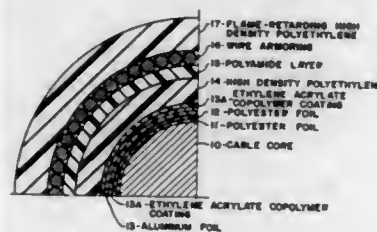
## SIGNAL TRANSMISSION CABLE

Albertus T. M. Grooten, Waddinxveen, Netherlands, assignor to N.K.F. Groep B.V., Rijswijk, Netherlands  
Filed Sep. 16, 1985, Ser. No. 776,328  
Claims priority, application Netherlands, Sep. 18, 1984, 8402858

Int. Cl.<sup>4</sup> H01B 7/22, 11/22

U.S. Cl. 350—96.23

2 Claims



1. A signal transmission cable having a cable core of optical and/or electric conductors enveloped by a gas-tight and liquid-tight sheath, said sheath comprising, in the direction outwardly from said core, an overlapped layer of a metal tape of a thickness of at least 100  $\mu$ m of aluminum or copper, a layer of a synthetic resin adhering to the surface of said metal tape remote from said core, and surrounding said metal tape, a layer of high-density polyethylene adhering to, and surrounding said synthetic resin layer, a layer of polyamide-11 or polyamide-12 provided on and surrounding said layer of polyethylene, an armoring of reinforcing wires or reinforcing tapes surrounding said layer of said polyamide and an outer sheath formed of a synthetic resin surrounding said armoring.

4,679,899

## OPTICAL FIBER

Toshiaki Kobayashi; Kazuo Sanada; Toshiaki Murayama, all of Chiba; Yasuyuki Sugawara, Sakura, and Naoshi Uesugi, Mito, all of Japan, assignors to Fujikura Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan  
Filed Feb. 28, 1985, Ser. No. 706,574

Claims priority, application Japan, Mar. 1, 1984, 59-39184

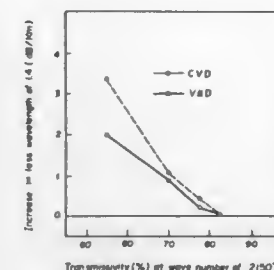
Int. Cl.<sup>4</sup> G02B 6/10

U.S. Cl. 350—96.30

6 Claims

1. An optical fiber of a silica-based material having a coating of cured silicone rubber covering an outer surface thereof, said cured silicone rubber coating, when subjected to an infrared

spectroscopic measurement, having a transmissivity of not less than 70% at a wave number of 2100 to 2200  $\text{cm}^{-1}$  at a coating



thickness of 0.1 mm due to the infrared absorption due to the stretching and vibration of SiH.

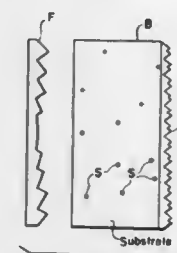
4,679,900

## BULK DIFFUSER FOR A PROJECTION TELEVISION SCREEN

Thomas S. McKechnie, Ossining, and Jill F. Goldenberg, Pelham Manor, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.  
Filed Jun. 5, 1986, Ser. No. 871,009  
Int. Cl.<sup>4</sup> G03B 21/60

U.S. Cl. 350—126

7 Claims



1. A bulk diffuser for a rear projection television screen comprising:

- a substrate having a first index of refraction; and
- a plurality of spheres dispersed through said substrate, said spheres having a second index of refraction which is different from said first index of refraction, a range of diameters of said spheres and a loading density of said spheres being chosen such that a resulting intensity half-angle and an energy half-angle are substantially equal whereby an intensity profile of said bulk diffuser is Gaussian.

4,679,901

## COMPOUND OPTICAL PHASE GRATING AND OPTICAL SWITCH

Hans Dammann, Tangstedt, and Heinrich Kurz, Pinneberg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.  
Division of Ser. No. 574,775, Jan. 27, 1984, Pat. No. 4,585,307.  
This application Nov. 21, 1985, Ser. No. 800,576  
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3303623

Int. Cl.<sup>4</sup> G02B 5/18, 6/34

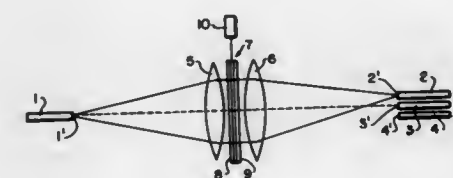
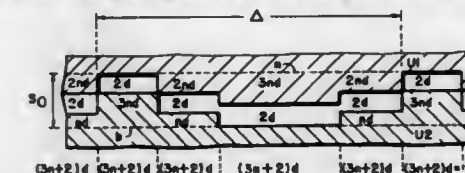
U.S. Cl. 350—162.2

5 Claims

1. An optical switch comprising:  
a first optical port;  
a plurality of second optical ports; and  
a light-deflecting element for optically connecting the first port to one of the second ports;  
characterized in that:  
the light-deflecting element comprises a compound optical phase grating capable of switchably diffracting light into several central diffraction orders;

the second ports are positioned at the central diffraction orders; and

the compound optical phase grating comprises:  
a substantially planar first grating section having parallel grooves, having a grating period, and having a grating profile which is repeated once each grating period; and  
a substantially planar second grating section having parallel grooves, having a grating period equal to the grating period of the first grating section, and having a grating profile which is repeated once each grating period, said second grating section being arranged opposite and parallel to the first grating section with the grooves in the first



grating section parallel to the grooves in the second grating section, the first and second grating sections being movable relative to each other in their planes in a direction perpendicular to the grooves;

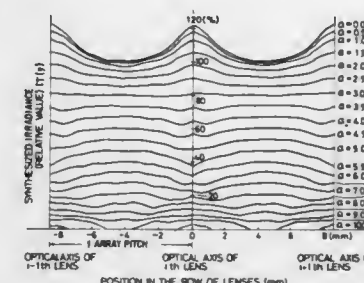
wherein:  
each grating profile is at least substantially parabolic;  
each grating profile is symmetrical about the center of each grating period; and  
when the first and second grating sections are both arranged symmetrically about a common line perpendicular to the grating, the compound grating has an optical path length therethrough which is uniform across the grating.

4,679,902

## IMAGE FORMING OPTICAL APPARATUS

Toshiyuki Inokuchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan  
Continuation of Ser. No. 525,723, Aug. 23, 1983, abandoned.  
This application Aug. 12, 1985, Ser. No. 764,794  
Claims priority, application Japan, Aug. 23, 1982, 57-145978  
Int. Cl.<sup>4</sup> G02B 27/00; G03B 27/52, 27/70  
U.S. Cl. 350—167

3 Claims



1. An optical imaging system for projecting light images from an object surface toward an image surface, said imaging system including a plurality of optical devices comprising a roof mirror lens array, said roof mirror lens array comprising a lens array and a roof mirror array which are fabricated by



precise plastic molding and are integrally elongated, said roof mirror lens array being disposed between the object surface and the image surface, wherein an irradiance distribution at the imaging surface of said roof mirror lens array is given by:

$$L_T(y) = C \sum_{i=1}^N \left[ \frac{x^2}{x_1} V_i \{ (y - (i-1)p)^2 + x^2 \}^{1/2} \right] \frac{Z^4}{\{ (y - (i-1)p)^2 + x^2 + x^2 \}^2} dx$$

where

$L_T(y)$ : irradiance distribution at the imaging surface of the roof mirror lens array  
 $V_i$ : aperture efficiency at the position on the imaging surface  
 $p$ : array pitch of the  $i$ 'th single lens system  
 $x$ : position perpendicular to the array in the image surface  
 $y$ : position parallel to the array in the image surface;  
 $i$ : the  $i$ 'th lens of the roof mirror lens array;  
 and  
 the irradiance unevenness for scanning  $\Delta L_T$  is determined by:

$$\Delta L_T = \frac{L_{T \max} - L_{T \min}}{L_{T \max}}$$

where  $L_{T \max}$  and  $L_{T \min}$ , respectively, indicate the maximum and minimum of the irradiance distribution  $L_T(y)$ ,

a slit being provided having the slit position ( $x_1$ ,  $x_2$ ) and slit width  $x_1$ ,  $x_2$  so that said  $L_T(y)$  is made to be maximum and said  $\Delta L_T$  is made to be minimum.

4,679,903

## OBJECTIVE LENS DRIVING DEVICE

Akihiro Kasahara, Tokyo; Kenya Goto; Akira Yamada, both of Yokohama, and Shoji Watanabe, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

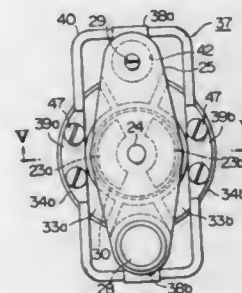
Filed Dec. 26, 1984, Ser. No. 687,002

Claims priority, application Japan, Dec. 27, 1983, 58-246306

Int. Cl.<sup>4</sup> G02B 7/04; F16F 7/12, 15/12

U.S. Cl. 350-247

12 Claims



1. An object lens driving device comprising:

- a base;
- a shaft vertically extending from a central portion of said base;
- a movable member supporting an objective lens;
- bearing means for supporting said movable member to be rotatable around and slidable along said vertical shaft;
- electromagnetic driving means for rotating and shifting said movable member around and along said shaft;
- a coil bobbin provided on said movable member to extend

concentrically with said bearing means for supporting coil means of said electromagnetic driving means; and means including a damper member provided between said movable member and predetermined stationary portions of the objective lens driving device, said damper member being formed into an annular configuration so as to surround said movable member to be symmetric around a central axis of said bearing means for accurately damping both rotational and sliding movements and repositioning to a neutral position of said movable member supporting the objective lens, said damper member being connected along the circumference thereof with movable-side connecting members and stationary-side positioning members secured to said movable member and the predetermined stationary portions of the objective lens driving device, respectively.

4,679,904

## LENS DRIVING DEVICE FOR AN OPTICAL PICKUP UNIT WITH SIMPLIFIED CONSTRUCTION

Toshihiko Kurihara, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

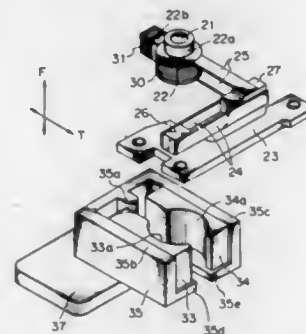
Filed Apr. 23, 1985, Ser. No. 726,597

Claims priority, application Japan, Apr. 23, 1984, 59-059718[U]

Int. Cl.<sup>4</sup> G02B 26/08, 7/02

U.S. Cl. 350-255

3 Claims



1. A lens driving device for an optical pickup unit, comprising:
  - an objective lens for focusing a light beam on a recording surface of a recording medium;
  - a support means for supporting said objective lens so that an optical axis of the objective lens is perpendicular to the surface of the recording medium, and movements of the objective lens in a direction of said optical axis and in a direction perpendicular to the optical axis independently are allowed; and
  - a driving means for driving said objective lens in said direction of said optical axis and in said direction perpendicular to the optical axis, wherein said driving means includes a first coil connected to said objective lens and arranged so that a central axis thereof is substantially parallel to said optical axis, a second coil also connected to said objective lens and arranged so that a central axis thereof is substantially normal to the optical axis, and a magnetic circuit arranged to surround said first and second coils, and to form a single magnetic gap in which said first and second coils are received, for producing interlinkage magnetic flux crossing said first and second coils, thereby producing driving forces for moving said objective lens in the direction of said optical axis and in the direction perpendicular to the optical axis independently when suitable driving currents are supplied to said first and second coils respectively.

4,679,905

## LINEAR ADJUSTMENT APPARATUS

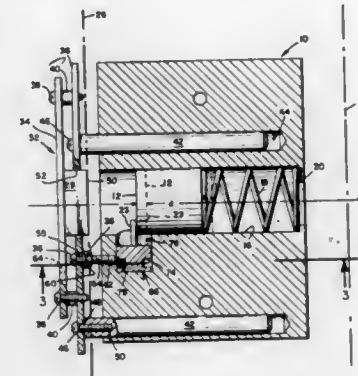
Dwight G. Westover, Sierra Madre, Calif., assignor to Bell & Howell Company, Skokie, Ill.

Filed Aug. 2, 1985, Ser. No. 762,198

Int. Cl.<sup>4</sup> G02B 7/04; F16H 25/18

U.S. Cl. 350-255

13 Claims



1. Image focus adjustable apparatus, comprising in combination:
  - an optics block;
  - an optical image generating device having an optical axis and slidably mounted in said housing along said optical axis;
  - a rotary member rotatably mounted in said optics block about an axis perpendicular to said optical axis and having an eccentric engageable with said optical device for displacing said optical device along said optical axis when said rotary member is rotatably displaced and said eccentric is engaged with said optical device;
  - restraining means carried by said optics block for restraining displacement of said rotary member along said rotary member axis;
  - biasing means carried by said optics block for biasing said optical device to engage said eccentric;
  - linearly positionable means carried by said optics block and adjustably positionable along a line perpendicular to said rotary member axis and displaced therefrom;
  - lever means carried by said rotary member and adapted for contact with said linearly positionable means such that said rotary member is rotatably displaced when said linearly positionable means is linearly repositioned;
  - image receiving means for receiving an image generated by said image generating means; and
  - adjustable support means carried by the optics block for supporting said image receiving means and for adjusting position thereof along said optical axis.

4,679,906

## ANTI-GLARE REAR VIEW MIRROR

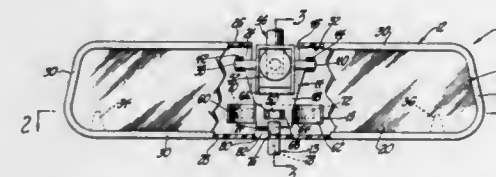
Darrell L. Brandenburg, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1985, Ser. No. 808,727

Int. Cl.<sup>4</sup> B60R 1/04

U.S. Cl. 350-281

4 Claims



1. An anti-glare rear view mirror adapted to be mounted on

a windshield, said mirror comprising a housing supporting a mirror element having two reflecting surfaces of different reflecting powers, said housing including a back wall integrally formed with forwardly extending top and bottom walls so as to define a chamber with said back wall, said back wall having an opening formed therein, a pair of bearing members projecting outwardly from said back wall into said chamber and located on opposite sides of said back wall opening adjacent said top wall, a keyhole shaped opening formed in said bottom wall, a pair of pad members formed on said back wall in said chamber adjacent said bottom wall, a pivot plate member located in said chamber and having a ball support mounted therein at the upper end thereof for connection with said windshield through said opening formed in said back wall, said pivot plate member including a pair of laterally extending cylindrical pivot shaft members respectively snapped into and received within said pair of bearing members, a spring member carried by the lower end of said pivot plate member for engaging said pad members, and an actuator member located in said keyhole shaped opening for rotation about a vertical axis and having a cam member engaging said lower end of said pivot plate member against the continuous bias of said spring member so as to selectively present one or the other of said reflecting surfaces to a viewer.

4,679,907

## METHODS, APPARATUS AND ARTICLES FOR OPTICAL FIBER SYSTEMS

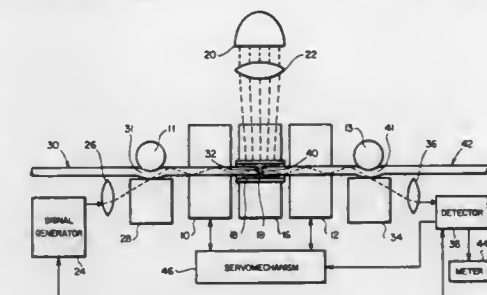
Bruce D. Campbell, Portola Valley; James T. Triplett, Livermore, and Richard E. Tylor, Fremont, all of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Division of Ser. No. 437,053, Oct. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 370,321, Apr., 1982, abandoned, which is a continuation-in-part of Ser. No. 258,079, Apr. 27, 1981, abandoned. This application Apr. 19, 1984, Ser. No. 602,242

Int. Cl.<sup>4</sup> G02B 6/24

U.S. Cl. 350-320

42 Claims



1. A method of withdrawing an optical signal from a core of an optical fiber, the fiber comprising the core, a cladding, and a buffer, comprising the steps of:
  - bending a portion of the optical fiber about a bend radius sufficiently small such that core light can be withdrawn from the fiber core at the bent fiber portion by using an optical coupler, the buffer having a refractive index greater than the cladding;
  - withdrawing part of the optical signal from the optical fiber core through the buffer and into the optical coupler at the bent fiber portion and;
  - detecting the withdrawn optical signal part.

4,679,908

## LASER-FIBER POSITIONING METHOD

John C. Goodwin, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

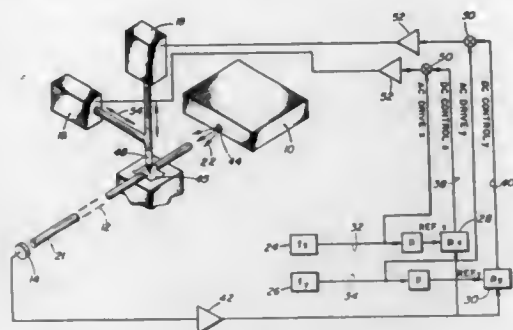
Filed Nov. 12, 1985, Ser. No. 797,328

Claims priority, application Canada, Jun. 28, 1985, 486031

Int. Cl.<sup>4</sup> G02B 6/42

U.S. Cl. 350—320

6 Claims



1. A method of anchoring a fiber to a substrate comprising: attaching a positioner to the fiber using a meltable material so that the positioner is separated from the fiber by said meltable material; moving the positioner to position the fiber in a desired position on the substrate so that the meltable material and a part of the fiber, but not the positioner are in contact with a bead of curable material which in turn is in contact with the substrate; continuously monitoring the position of the fiber and maintaining the fiber in said desired position as the curable material cures and anchors the fiber to the substrate; and when the curable material is cured, melting said meltable material and withdrawing the positioner.

4,679,909

## LIQUID CRYSTAL INPUT/OUTPUT MATRIX PANEL

Hiroshi Hamada; Fumiaki Funada, both of Yamatokoriyama, and Masataka Matsuura, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

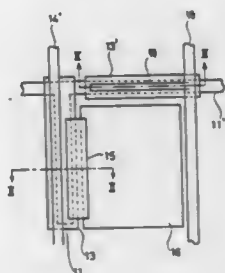
Filed Jun. 17, 1985, Ser. No. 744,961

Claims priority, application Japan, Jun. 20, 1984, 59-128023

Int. Cl.<sup>4</sup> G06F 3/02

U.S. Cl. 350—333

8 Claims



1. An information input/output system comprising: an information matrix display panel including, a plurality of common gate lines arranged in parallel with each other; a plurality of common data write lines arranged in parallel with each other and perpendicular to said common gate lines; a plurality of common data read-out lines in parallel with said data write lines and dispersed therebetween; a plurality of picture display elements each disposed between a common data write line and a common data

read out line and between successive common gate lines, a gate portion of each common gate line extending along an edge of said picture display element perpendicular to said common gate line, said gate portion extending across substantially the entire length of said picture display element;

- a semiconductor region forming a channel between said gate portion and a common data write line;
- a drain electrode formed over a part of said semiconductor region and an edge of said picture display element;
- a light detection layer formed over a region of each said common gate line adjacent to said picture display element and perpendicular to said data read out line;
- a transparent conductive film formed over said light detection layer and connected to said data read out line, said gate portion, semiconductor region, common data write line and drain electrode forming switching means of each said picture display element for applying an output voltage thereto for the display of information on said element, said light detection layer, transparent conductive film and data readout line forming a photoelectric translation cell of each said picture display element for detecting light patterns inputted to said display panel.

4,679,910

## DUAL LIQUID-CRYSTAL CELL-BASED VISIBLE-TO-INFRARED DYNAMIC IMAGE CONVERTER

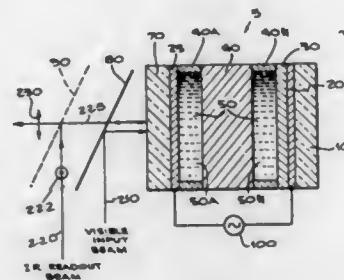
Uzi Efron, Los Angeles, and Bernard H. Soffer, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 20, 1985, Ser. No. 714,145

Int. Cl.<sup>4</sup> G02F 1/135

U.S. Cl. 350—335

22 Claims



1. A visible to infrared dynamic image converter light valve comprising: first and second liquid crystal means for spatially modulating an incident infrared beam by polarization rotation; means for applying a voltage across said first and second liquid crystal means, said polarization rotation in said first and second liquid crystal means being responsive to said applied voltage; photoconductor means, disposed between said first and second liquid crystal means, for receiving a visible wavelength image and for spatially modulating said voltage applied across said first and second liquid crystal means responsively to said image to vary said polarization rotation, said photoconductor means being absorptive of visible wavelength radiation and transparent to infrared radiation; mirror means, disposed adjacent said second liquid crystal means, for reflecting said infrared beam back through said first and second liquid crystal means, whereby said infrared beam passes through said first and second liquid crystal means twice and is polarization rotated in proportion to said visual wavelength image; and polarization means, disposed adjacent said first liquid crystal means, for converting said polarization rotation of said

infrared beam to output intensity modulation to produce an infrared image.

4,679,911

## OPTICAL APPARATUS USING LIQUID CRYSTALS FOR SHAPING THE SPATIAL INTENSITY OF OPTICAL BEAMS HAVING DESIGNATED WAVELENGTHS

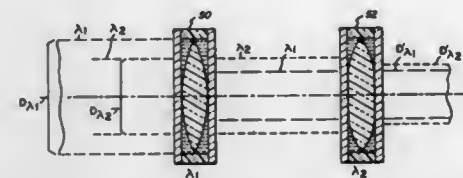
Stephen D. Jacobs, Pittsford, and Kathleen A. Cerqua, Rochester, both of N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,678

Int. Cl.<sup>4</sup> G02F 1/13

U.S. Cl. 350—347 E

16 Claims



1. Apparatus for shaping the profile of an optical beam of given wavelength which is directed along a path, which comprises first and second bodies of cholesteric liquid crystal material having opposite chirality about said path and disposed successively along said path, each of said bodies having a surface transverse to said path which is curved so that the thickness of each of said bodies along said path varies in the direction transverse to said path.

4,679,912

## BINOCULAR EYEPIECE

Fernand R. Loy, Seaux, France, assignor to U.S. Philips Corporation, New York, N.Y.

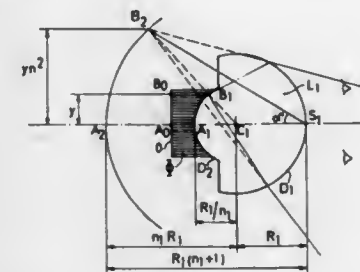
Filed Nov. 3, 1983, Ser. No. 548,275

Claims priority, application France, Nov. 10, 1982, 82 18920

Int. Cl.<sup>4</sup> G02B 25/04

U.S. Cl. 350—410

7 Claims



1. A wide-field eyepiece for viewing an object surface plane, comprising a biconvex thick lens made of a material having an index  $n_1$ , having first and second concentric spherical lens surfaces, each having a respective radius, a line through the common center of said lens surfaces, forming an optical axis of the system, said lens being arranged such that the second lens surface faces the object plane, and has a radius equal to the quotient of the radius of the first lens surface and the index  $n_1$ , and means for forming a magnified virtual image of the object on a spherical surface which is concentric with said lens surfaces and has a radius equal to the product of the radius of the first lens surface and the index  $n_1$ , said virtual image and the image formed on the second lens surface satisfying the aplanatic condition.

184-022 O.G.-87-9

4,679,913

## VARI-FOCAL OBJECTIVE LENS OF SHORT TOTAL LENGTH

Yasuhisa Sato, Kanagawa; Yasuyuki Yamada, Tokyo; Hiroki Nakayama, and Kouji Oizuma, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

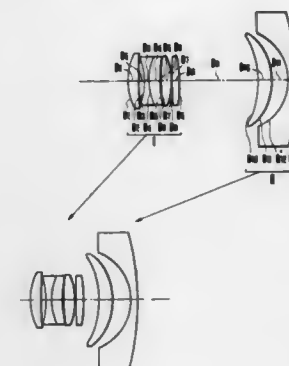
Filed Jun. 28, 1985, Ser. No. 750,698

Claims priority, application Japan, Jul. 2, 1984, 59-137019

Int. Cl.<sup>4</sup> G02B 15/00, 13/18

U.S. Cl. 350—423

10 Claims



1. An objective lens comprising a front lens unit and a rear lens unit with a separation between said two lens unit being varied to vary the focal length of the entire system, said front lens unit having a positive refractive power and consisting of, from front to rear, a positive lens of strong convex curvature toward the front, a negative doublet lens of negative and positive elements cemented together, and a positive lens sub-unit; and said rear lens unit having a negative refractive power and having a positive lens and a negative lens.

4,679,914

## MICROSCOPE SLIDE WITH TOP AND BOTTOM MARKING SURFACES

H. James Rosenberg, Wellesley, Mass., assignor to Erie Scientific Company, Portsmouth, N.H.

Continuation of Ser. No. 775,704, Sep. 13, 1985, abandoned,

which is a continuation of Ser. No. 617,400, Jun. 5, 1985,

abandoned. This application Jun. 2, 1986, Ser. No. 871,144

Int. Cl.<sup>4</sup> G02B 21/34

U.S. Cl. 350—534

10 Claims



1. A microscope slide having a top and bottom surface, said top surface having at least one opaque marking surface located at one end of said slide formed by a coating of a resinous material having a permanent matte finish for accepting a marking, said resinous material including a granular medium, said bottom surface having a frosted surface substantially behind said first marking surface for providing a second marking surface.



4,679,915

## DEFORMABLE MIRROR

Helmut Kriz, and Hansjorg Stadler, both of Rückersdorf, Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

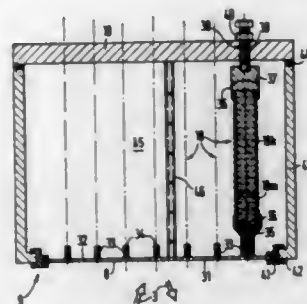
Filed Jan. 21, 1986, Ser. No. 821,064

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1985, 3502025

Int. Cl.<sup>4</sup> G02B 5/08, 7/18

U.S. Cl. 350—611

14 Claims



1. A deformable mirror, particularly designed to compensate for the influences of atmospheric interference on the propagation or spread of high-energy laser beams, comprising a mirror body having a front thin mirror plate with a mirror surface on the front of the mirror plate and a rear surface on the rear of the mirror plate, and rear surface having a plurality of trunnions formed thereon for coaxial connection to a plurality of electrically-actuated adjusting elements engageable with said trunnions and pressed against said trunnions and the rear surface of the mirror plate, and further wherein a sleeve connects each said trunnion with an associated electrically-actuated adjusting element which is supported thereagainst and is encompassed by the sleeve.

4,679,916

## OPTICAL VIEWING APPARATUS WITH TWO MIRRORS CONSECUTIVELY REFLECTING THE LINE OF SIGHT

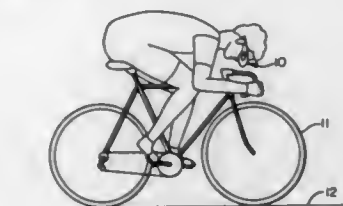
Robert A. Roller, 226 Day St., Tallahassee, Fla. 32304, and Warren L. Roller, 873 Ashwood Dr., Wooster, Ohio 44691

Filed Mar. 5, 1986, Ser. No. 836,293

Int. Cl.<sup>4</sup> G02B 23/08, 17/06, 7/18

U.S. Cl. 350—623

11 Claims



1. An optical viewing apparatus adapted to be worn on the head of a wearer which comprises:  
a frame adapted to be worn by a wearer about the eyes; and  
a first mirror and a second mirror both of which are mounted to said frame in a spaced-apart relationship, wherein one of said mirrors is positioned above the normal line of sight and closer to the face than the other of said mirrors, said mirrors being oriented such that the wearer can view objects at a distance in the horizontal plane in front of the wearer when the head is in a downwardly looking position with the normal line of sight substantially in the vertical plane.

4,679,917

## DEVICE FOR MEASURING INTRAOCULAR LIGHT SCATTER

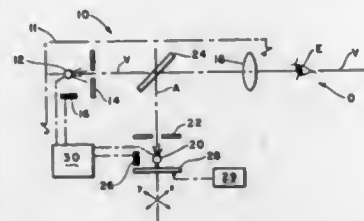
Louis V. Genco, Enon, and Harry L. Task, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 24, 1985, Ser. No. 726,568

Int. Cl.<sup>4</sup> A61B 3/10, 3/02

U.S. Cl. 351—221

16 Claims



1. An optical system for measuring intraocular light scatter in the vision system of a subject, comprising:  
a. a first glare source of light and a second point source of light of respective preselected intensities, said first glare source being of intensity greater than said second point source whereby intraocular haze is generated by said first glare source in said vision system of said subject;  
b. first optical means for projecting an image of said first glare source along a first optical axis into said vision system of said subject;  
c. second optical means for projecting an image of said second point source along a second optical axis intersecting said first optical axis;  
d. means for optically superimposing said image of said second point source onto said image of said first glare source for projection therewith along said first optical axis into said vision system of said subject;  
e. means connected to said second point source for moving said second point source in a plane substantially perpendicular to said second optical axis, whereby said image of said second point source as viewed by said subject is selectively movable with respect to said image of said first glare source; and  
f. measurement means for gauging the observed circumferential extent of said haze in contrast to said image of said second point source.

4,679,918

## OPHTHALMIC GLASS/PLASTIC LAMINATED LENS HAVING PHOTOCHROMIC CHARACTERISTICS AND ASSEMBLY THEREOF

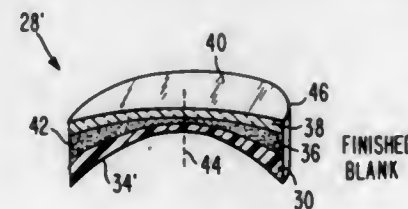
Ronald S. Ace, 5200 J. Philadelphia Way, Lanham, Md. 20706

Filed Oct. 23, 1984, Ser. No. 663,914

Int. Cl.<sup>4</sup> G02C 7/02, 7/10

U.S. Cl. 351—163

46 Claims



1. A glass and plastic composite ophthalmic lens comprising:  
a frontmost glass lens layer having a glass front surface and a glass ocular surface, said ocular surface having a first radius of curvature, said glass layer having a first coefficient of thermal expansion;  
a plastic lens layer concentric with said glass layer and

having a plastic front surface and a plastic ocular surface, said plastic front surface having a second radius of curvature and being adjacent but spaced from said glass layer ocular surface to define a narrow gap therebetween, said plastic layer having a second coefficient of thermal expansion; and  
an optically clear, highly cohesive and adhesive elastomeric bonding material having low tensile strength, and capable of elongation greater than 100% without destruction or permanent deformation within said gap after curing to bond said glass layer to said plastic layer, said adhesive layer having a thickness at the periphery of said gap which is determined by the difference between said first and second coefficients of thermal expansion, by the diameter of the lens, and by the maximum elongation of said elastomeric bonding material so that the elasticity of said bonding material will accommodate changes in the dimensions of said plastic layer with respect to said glass layer due to said difference between said coefficients of thermal expansion over an ambient temperature range of about 300° F. to prevent delamination of and to prevent fracture of said glass and plastic layers.

4,679,919

## OPHTHALMIC PHOTOGRAPHIC APPARATUS

Yuji Itoh, Chigasaki, and Junichi Takahashi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 589,740, Mar. 15, 1984, abandoned.

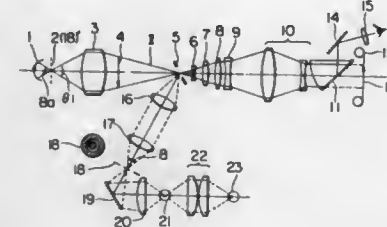
This application Jul. 15, 1986, Ser. No. 884,305

Claims priority, application Japan, Mar. 22, 1983, 58-48095

Int. Cl.<sup>4</sup> A61B 3/14; G03B 29/00

U.S. Cl. 351—206

4 Claims



1. An ophthalmic photographing apparatus having:  
photographing means for photographing the fundus of an eye to be examined at a variable magnification;  
a ring slit having an outside diameter provided in an illuminating optical path for illuminating the fundus of the eye at a position substantially conjugate with the front-eye-part; and  
means for varying the slit width of a ring slit image projected onto the eye to be examined, with a magnification change such that the outside diameter of the ring slit image is not varied.

4,679,920

## AUTOMATIC PERIMETER

Shiomi Takashi, Wako; Kobayashi Katsuhiko, Chiba, and Tago Hideo, Matsudo, all of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,317

Claims priority, application Japan, Feb. 24, 1984, 59-33754; Mar. 16, 1984, 59-50702

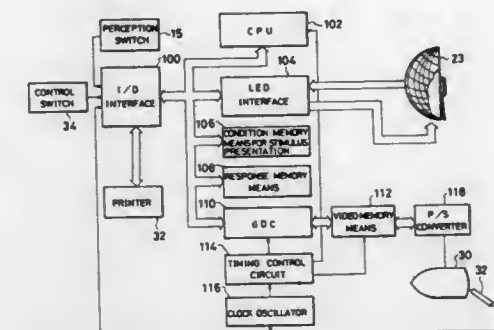
Int. Cl.<sup>4</sup> A61B 3/02

U.S. Cl. 351—226

6 Claims

1. An automatic perimeter comprising stimulus presentation means for presenting stimuli to a patient, presentation condition memory means for memorizing a plurality of presentation conditions, control means for controlling the stimulus presentation means so as to present the stimuli in accordance with the presentation conditions memorized in the presentation condition memory means, response means operated by the patient for

supplying perception signals responding to presented stimuli, response signal memory means for memorizing the perception signals in relation to the presentation condition thereof, output means for supplying output of the perception signals memorized in the response signal memory means, first input means for applying a plurality of first command signals to the control



cylindrical lens, and wherein said negative lens unit and said second and third positive lens units form an image of the target at a position in the vicinity of the focal point on the target side of said first positive lens unit.

4,679,922

# RETRIEVING IMAGES STORED ON WINDOWED DISCS

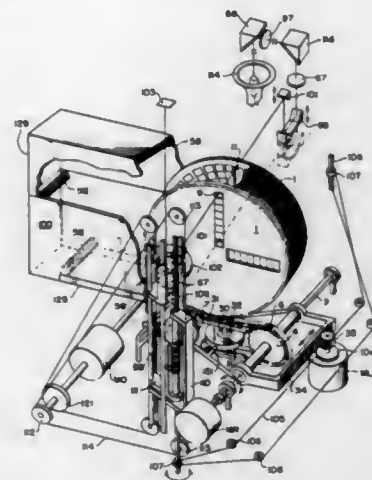
John C. Nelson, 4013 Linden St., Oakland, Calif. 94608

Filed Aug. 3, 1984, Ser. No. 637,584

Int. Cl.<sup>4</sup> G03B 23/06

U.S. Cl. 353—25

34 Claims



1. An apparatus for random access retrieval of micrographic and data images stored along radii of stacked windowed discs, each disc having a closed perimeter and a radially disposed clear window, said apparatus comprising: means for supporting a stack of discs at the perimeter thereof; a selection means for addressing a particular disc carrying desired information while the disc remains in the stack; an optical system comprising projecting means at one end of a stack of discs for projecting a light along an optical axis to an image receiving means at the opposite end of the stack; means for radially moving said optical system thereby moving said optical axis; and means for rotating the disc to a position wherein the selected image is in the optical axis of said system.

4,679,923

# PROTECTING DEVICE FOR TRANSPARENCIES

Bjarne M. Nielsen, Nordre Frihavsgade 65, st.th., DK-2100 Copenhagen O., Denmark

Continuation of Ser. No. 495,602, May 18, 1983, Pat. No. 4,548,487. This application Jul. 31, 1985, Ser. No. 760,828

Claims priority, application Denmark, May 21, 1982, 2307/82

The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

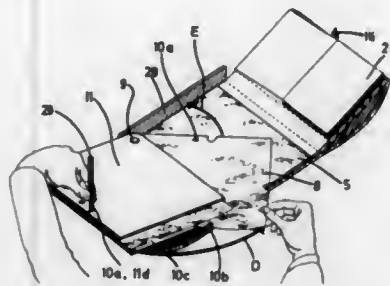
Int. Cl.<sup>4</sup> G03B 21/34

U.S. Cl. 353—120

13 Claims

1. A protecting device for transparencies comprising: an unfoldable file having a bottom cover which forms a frame having a transparent window therein, said file having a pair of side members attached to opposed edges of said bottom cover, at least one of said members being hinged to said bottom cover; a swivel pin mounted on said frame and extending perpendicularly to said frame; a swivel cover mounted on said pin for pivotal movement between a position overlying and parallel to said window when said file is folded and a position offset from and inclined to said window and overlying one of said one side members when said file is in unfolded condition, said one side member being arranged to form a support for said swivel cover and the transparencies therein; in the unfolded condition, and the other side member counterbalancing said swivel cover and transparencies, said swivel cover being adapted to receive

within it a plurality of transparencies to be pivotally mounted on said pin for independent pivotal movement about said pin into and out of said swivel cover so that when said swivel cover overlies said one side member in a file-unfolded condi-



tion, each transparency can be selectively pivoted between a position overlying said window and a position within said swivel cover; and a stop member on said bottom cover for stopping pivotal movement of each transparency when such transparency overlies said window.

4,679,924

# CORONA DISCHARGE PHOTOGRAPHY

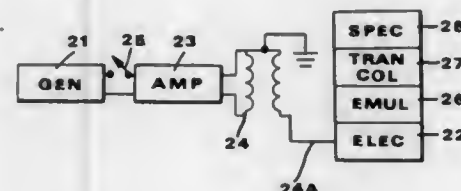
Allen W. Wamsley, 21829 Oakwood, East Detroit, Mich. 48021

Filed Jun. 26, 1986, Ser. No. 878,588

Int. Cl.<sup>4</sup> G03B 41/00; H01T 19/00

U.S. Cl. 354—3

14 Claims



1. In an improved corona discharge photography means for photographing a specimen which utilizes a pulse generator, amplifier means, an electrode and a photographic recording medium, the improvement comprising a transmittance column disposed between the electrode and said specimen, said column being filled with an image-carrying solution to transmit corona discharge from an electrode to said specimen, said corona discharge occurring back and forth through said image-carrying solution to expose said photographic recording medium, said exposure occurring in part by transmittance column reflection.

4,679,925

# CAMERA

Masaharu Kawamura; Yoshihito Harada; Ryuichi Kobayashi; Masayuki Suzuki, all of Kanagawa; Tsunemasa Ohara, and Yoichi Tosaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,783

Claims priority, application Japan, Feb. 10, 1985, 60-24196; Feb. 10, 1985, 60-24197

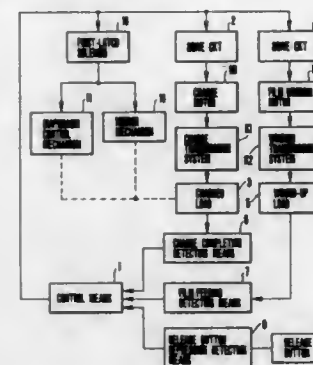
Int. Cl.<sup>4</sup> G03B 1/18

U.S. Cl. 354—173.1

14 Claims

1. A camera capable of both single frame and continuous shootings, comprising:  
(a) first detecting means for detecting the state of said single frame shooting and the state of said continuous shooting;  
(b) charging means for performing a charging operation;

- (c) second detecting means for detecting the termination of the charging operation by said charging means;
- (d) film transporting means for transporting film to make a next exposure;
- (e) third detecting means for detecting the completion of a one-frame advancing operation of said film transporting means; and
- (f) control means for controlling the sequence of release operation of said camera, said control means, when said single-frame shooting state is detected by said first detect-



ing means, enabling the release operation for a next exposure after the completion of the charging operation has been detected by said second detecting means and the completion of the film transporting operation has been detected by said third detecting means, and when said continuous shooting state is detected by said first detecting means, initiating part of the release operation prior to the shutter opening at a time when the completion of the charging operation is detected by said second detecting means.

4,679,926

# MOTOR DRIVEN FILM REWIND DEVICE FOR CAMERA

Nobuyuki Suzuki, Kanagawa, and Masami Shimizu, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 646,631, Aug. 31, 1984, abandoned.

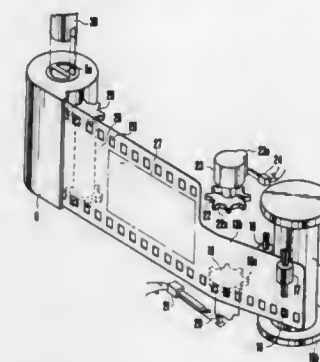
This application Feb. 19, 1986, Ser. No. 831,108

Claims priority, application Japan, Sep. 1, 1983, 58-159052

Int. Cl.<sup>4</sup> G03B 1/18

U.S. Cl. 354—173.11

17 Claims



1. A motor-driven film rewinding device for a camera, comprising:
- (a) film rewinding means for rewinding a coil of film wound up on a film take-up spool of the camera;
  - (b) film movement detecting means for producing a signal which shifts alternately between a first state and a second state as the film moves;
  - (c) timer means, arranged to be reset according to the shift of

the signal produced from said film movement detecting means, for producing a signal upon completion of a time measuring operation carried out for a predetermined period of time, said timer means including a timer circuit which performs a time measurement from the start of an operation of said film rewinding means for a short period of time when the signal of said film movement detecting means shifts and for a long period of time when said signal does not shift; and  
(d) control means for rendering said film rewinding means inoperative according to said signal produced from said timer means.

4,679,927

# IMAGE FORMING APPARATUS

Toshiyuki Sogo, Ebina, and Fumito Ide, Zama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 11, 1985, Ser. No. 775,040

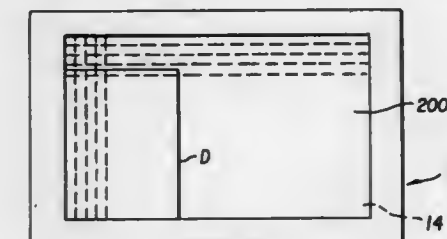
Claims priority, application Japan, Sep. 29, 1984, 59-204441;

Sep. 29, 1984, 59-204484; Sep. 29, 1984, 59-204486

Int. Cl.<sup>4</sup> G03G 15/00

U.S. Cl. 355—3 R

8 Claims



1. An image forming apparatus, wherein an electrostatic latent image is formed on a photosensitive body by a process of electrical charge and image exposure and a reproduced image is formed by the development of the electrostatic latent image, comprising:

- (a) a main body;
- (b) a transparent glass provided at the top of said main body for holding a document;
- (c) image area designating means mounted directly on the upper surface on said transparent glass for designating a required copy area of the document, which includes,
  - (i) first transparent electrode sheet means having a plurality of conductive members arrayed on it in rows in one direction, and
  - (ii) second transparent electrode sheet means provided opposite said first electrode sheet and having a plurality of conductive members arrayed on it in rows at right angles to the conductive members of said first transparent electrode sheet, wherein said image area designating means generates electrical signals from electrical contact points corresponding to the required copy area designated by pressing said first transparent electrode sheet so that the conductive members of first and second transparent electrode sheets electrically contact each other;
- (d) memory means for storing the electrical signals generated by said image area designating means; and
- (e) image formation preventing means for preventing the formation of an electrostatic latent image on said photosensitive body other than in the area to be copied, according to the electrical signals read from said memory means.



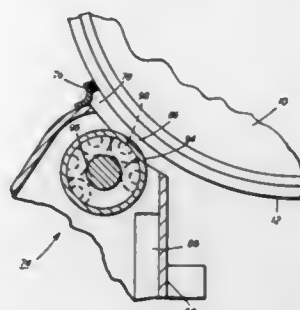
4,679,928

## DEVELOPMENT APPARATUS

Mark A. Massie, Glendora, and Christopher C. Rhodes, Claremont, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 13, 1985, Ser. No. 744,442  
Int. Cl.<sup>4</sup> G03G 15/09

U.S. Cl. 355-3 DD



1. An apparatus for developing an electrostatic latent image recorded on a moving photoconductive member in a development zone, including:

- means, having the exterior surface thereof substantially smooth, for moving developer material into contact with the photoconductive member in the development zone, said moving means moving at a greater velocity than the photoconductive member with a portion of the developer material moving at substantially the same velocity as the photoconductive member and another portion of the developer material moving at substantially the same velocity as said moving means so that shearing of the developer material occurs; and
- means for collecting the developer material moving at a velocity less than the velocity of said moving means in the region of the entrance to the development zone resulting in an extension of the development zone.

4,679,929

## MULTIPLEX IMAGE REPRODUCING APPARATUS

Satoshi Haneda, Hisashi Shoji, and Seichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 656,582, Oct. 1, 1984, Pat. No. 4,599,285.

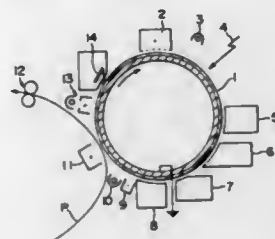
This application May 29, 1986, Ser. No. 868,020

Claims priority, application Japan, Oct. 3, 1983, 58-183152; Oct. 4, 1983, 58-184381; Oct. 7, 1983, 58-187000; Oct. 7, 1983, 58-187001; Dec. 17, 1983, 58-238295; Dec. 17, 1983, 58-238296; Jan. 26, 1984, 59-13167

Int. Cl.<sup>4</sup> G03G 13/08

U.S. Cl. 355-4

35 Claims



1. An apparatus for reproducing multiplex images comprising an image retainer having thereon an electrostatic image-retaining layer, means for forming an electrostatic image on said image retainer, means for developing the electrostatic image formed on the image retainer to form a toner image, an oscillating electric field applied between the image retainer and a developer feeding carrier to develop said electrostatic im-

ages, means for superposing a plurality of toner images on the image retainer, and means for transferring the toner images onto a recording paper in one step.

4,679,930

## ONE-WAY REDUCING AND ENLARGING PRINTER

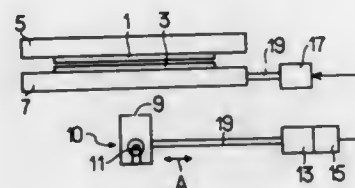
Fumihiko Nishida; Yasumasa Shimizu, both of Kyoto; Tomohiro Yoshida, Neyagawa; Makoto Urata, Kyoto; Tomiji Hotta, Kyoto; Masaji Mizuta, Uji, and Hiroshi Yamashita, Toyonaka, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Apr. 22, 1985, Ser. No. 726,072  
Claims priority, application Japan, May 25, 1984, 59-107137; Feb. 25, 1985, 60-037212

Int. Cl.<sup>4</sup> G03B 27/68

U.S. Cl. 355-52

7 Claims



1. A one-way reducing and enlarging printer comprising:
  - a holder for holding a photosensitive material;
  - a light transmissive negative holder provided under said photosensitive material holder so as to hold a negative opposite to the photosensitive material;
  - a light source provided so as to be movable under said negative holder;
  - a douser having a slit opening and being provided between said light source and the negative, said douser being movable together with said light source;
  - a first driving motor for moving said douser;
  - a second driving motor for moving either one of said photosensitive material holder and said negative holder, said photosensitive material holder and said negative holder being movable relative to one another;
  - signal generating means attached to said first driving motor for generating a signal;
  - means for controlling the relative motion between said photosensitive material holder and said negative holder based upon said signals from said signal generating means; and
  - means for blowing air directly onto a back surface of the photosensitive material so as to bring the photosensitive material into contact with the negative.

4,679,931

## ELECTROPHOTOGRAPHIC APPARATUS

Tetsuo Sueda, Chofu; Mitsuhiro Tokuhara, Chigasaki, and Takeshi Baba, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 753,523, Jul. 10, 1985, abandoned. This application Sep. 15, 1986, Ser. No. 907,168  
Claims priority, application Japan, Dec. 7, 1984, 59-143296

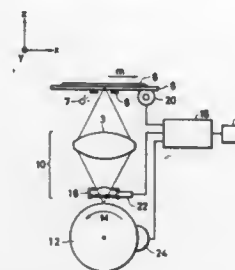
Int. Cl.<sup>4</sup> G03B 27/34, 27/40

U.S. Cl. 355-56

8 Claims

1. An electrophotographic apparatus having:
  - illuminating means for illuminating an original;
  - scanning means for scanning the original;
  - imaging means for imaging the reflected light or the transmitted light from the original on a light-receiving member, said imaging means having at least one variable refractive power element the refractive power of which is varied by varying at least one of the refractive index and the shape thereof;

control means for varying at least one of the refractive index and shape of said variable refractive power element; and



driving means for moving said light-receiving member in synchronism with the scanning of the original.

4,679,933

## DEVICE FOR BIREFRINGENCE MEASUREMENTS USING THREE SELECTED SHEETS OF SCATTERED LIGHT (ISODYNE SELECTOR, ISODYNE COLLECTOR, ISODYNE COLLIMATOR)

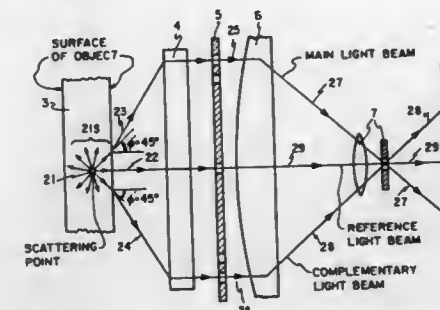
Jerzy T. Pindera, University of Waterloo, Department of Civil Engineering, Waterloo, Ontario, Canada (N2L 3G1)

Filed Feb. 28, 1983, Ser. No. 397,921

Claims priority, application Canada, Jul. 14, 1982, 407208  
Int. Cl.<sup>4</sup> G01B 11/18

U.S. Cl. 356-35

8 Claims



1. Apparatus for measuring state of optical anisotropy or birefringence in solid and liquid bodies comprising (1) a source of radiant energy producing a single, narrow, collimated, primary light beam, circularly or linearly polarized with an adjustable plane of vibration, which is directed into the said body along any selected line of measurement; (2) means for collecting and collimating three primary light sheets—a main light sheet, a complementary light sheet, and a reference light sheet—consisting of light scattered in the said body from the said primary light beam along the line of measurement, the angles between the direction of polarization of the primary light beam given by the direction of the electric field vector and the said three primary light sheets being equal to or close to 0°, 45° and 90°, respectively, where the said primary light sheets consist of scattered light beams carrying information on the state of optical anisotropy or birefringence at each scattering point along the line of measurement; (3) selecting and focusing means for elimination from the said three primary light sheets of all light beams which are scattered under angles oblique to the line of measurement so the resulting three secondary light sheets only consist of originally parallel light beams scattered in the direction normal to the primary light beam which are focused by the said means; (3) means for displaying or recording the distributions of the intensities of light scattered along the line of measurement in the directions given by the said three azimuthal angles using the said three sheets of scattered light.

4,679,932

## METHOD OF AND APPARATUS FOR MEASURING MOVING VELOCITY OF LINEAR OBJECT MOVING AND VIBRATING

Koji Morishita; Hujio Hirose, both of Nagaokakyo; Nobuo Nakatsuka, and Masahiro Nishimura, both of Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

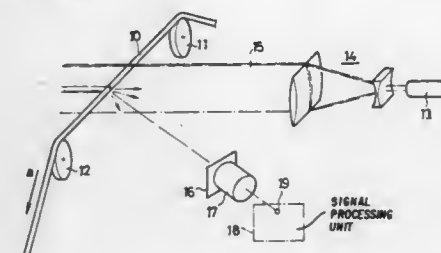
Filed Jul. 6, 1984, Ser. No. 628,314

Claims priority, application Japan, Jul. 7, 1983, 58-124271

Int. Cl.<sup>4</sup> G01P 3/36

U.S. Cl. 356-28

3 Claims



1. A method of measuring the moving velocity of a linear object which is moving while vibrating, said object being a continuous solid substantially linear object, the method comprising the steps of:

- illuminating the linear object with a flat laser beam having a width larger than the amplitude of vibration, the linear object moving in the direction of its length and vibrating perpendicular to the longitudinal direction,
- receiving the scattered light from the linear object by a photoelectric conversion device through a finite-sized elliptic or slit aperture which is disposed with the direction of its minor axis matching the direction of movement of the linear object, and
- cutting off the d.c. component of a speckle signal from the photoelectric conversion device, counting the number of zero-crossings per second of the resulting signal and converting the count value to a signal representing the longitudinal moving velocity of the linear object.

4,679,934

## FIBER OPTIC PYROMETRY WITH LARGE DYNAMIC RANGE

Biswa Ganguly, Beavercreek; Larry P. Goss, Dayton; William M. Roquemore, Dayton, and Darryl D. Trump, Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 8, 1985, Ser. No. 763,575

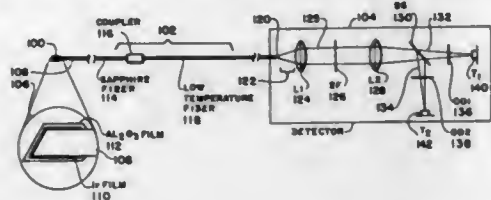
Int. Cl.<sup>4</sup> G01J 5/48

U.S. Cl. 356-43

23 Claims

1. Large temperature range optical pyrometer apparatus comprising:
  - optical beamsplitting means for segregating photon flux optical signals into first and second component optical signals of predetermined segregated intensity range ratio;
  - optic means for transmitting photon flux optical transmission signals from adjacent an elevated temperature work environment to said beamsplitting means;
  - first optical attenuation means for generating from said first

component optical signal a first attenuated optical signal of first intensity ratio relationship with said first component optical signal;  
second optical attenuation means for generating from said second component optical signal a second attenuated optical signal of second intensity ratio relationship with said second component optical signal;  
first optical-to-electrical transducer means, of smaller dynamic range capability than said photon flux energy opti-



cal signal, for generating first electrical signals amplitude responsive to said first attenuated optical signal intensity;  
second optical-to-electrical transducer means of smaller dynamic range capability than said photon flux energy optical signal, for generating second electrical signals amplitude responsive to said second attenuated optical signal intensity; and  
means responsive to the amplitude of a selected one of said first and second electrical signals for generating a pyrometer output temperature indication signal.

4,679,935

## LIGHT DISTRIBUTION OF HEADLIGHT BEAM

Yutaka Fukuda, Tokorozawa; Koji Minagawa, Chiba; Hiroichi Nabeshima, Hidakamachi; Koichi Muneaki, Hino; Yoshikatsu Asano, Shiki; Kazuo Aoki, Hachiohji, and Yutaka Ishizaka, Shinmachi, all of Japan, assignors to Honda Giken Kogyo Kabushikikaisha, Tokyo, Japan

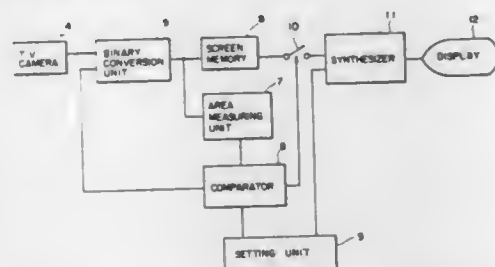
Filed Oct. 25, 1984, Ser. No. 664,828

Claims priority, application Japan, Oct. 28, 1983, 58-201964; Jan. 27, 1984, 59-11894; Aug. 30, 1984, 59-179443

Int. Cl.<sup>4</sup> G01J 1/00

U.S. Cl. 356-121

15 Claims



1. A method for determining a projecting direction of a light beam emitted from a light source, comprising the steps of: projecting a light beam from a light source toward a screen placed opposite to said light source;  
reading a light pattern of said light beam projected on said screen to produce analog image data of the radiant intensity of light segments which comprise said light pattern;  
defining a range of light segments comprising said light pattern in which a proportionality relation holds between  $\log S$  and  $I$  wherein  $I$  equals a given radiant intensity level and  $S$  equals the light segments within said light pattern with radiant intensity level equal to or greater than  $I$ ;  
said proportionality relation being such that a curve representing the rate of change in light intensity with respect to the  $\log S$  will be linear irrespective of the light source used;  
selecting a reference area comprising said segments of said

light pattern wherein said segments are within a range in which said proportionality relation between  $\log S$  and  $I$  holds;  
finding a region corresponding to said selected area of said light pattern by threshold determination from said analog image data of said segments of said light pattern so that said region is comprised of light segments having a radiant intensity equal to or greater than  $I$ ; said region thereby determining the contour of a beam periphery of said projected light beam; and  
determining a projecting direction of said light beam using said region thus found by comparing said region, or a point within said region with predetermined reference marks corresponding to correct alignment and orientation of said headlight.

4,679,936

## PROCESS AND APPARATUS FOR MEASURING OPTICAL DENSITY CHANGES AND TRANSIT TIMES IN TRANSPARENT MATERIALS

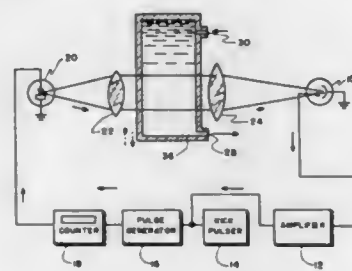
Reinhold Gerharz, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 26, 1982, Ser. No. 362,421

Int. Cl.<sup>4</sup> G01N 21/41

U.S. Cl. 356-128

12 Claims



11. A process of measuring the changing refractive index in a flowing transparent liquid medium on a continuous basis comprising the steps of:  
circulating said transparent liquid medium through an enclosed transparent vessel;  
transmitting pulses of optical radiation through said vessel and transparent liquid medium;  
detecting said pulses of optical radiation;  
demodulating and converting the detected pulses of optical radiation into electrical pulses;  
amplifying said electrical pulses and applying to an externally triggered high rate pulse generator for producing short duration electrical pulses therefrom;  
counting said short duration electrical pulses over a preset counting period; and  
driving a light source in accordance with the arrival of said short duration electrical pulses to propagate the transmitted pulses of optical radiation wherein the process is automatically repeated with the step of said externally triggered pulse generator producing short duration electrical pulses for each repetitive cycle of the mutually complementary optical and electrical pulse in which the pulse repetition rate establishes frequencies which are inversely proportional to transit time delays through said transparent liquid medium.

4,679,937  
SELF LEVELING TRANSMITTER FOR LASER ALIGNMENT SYSTEMS

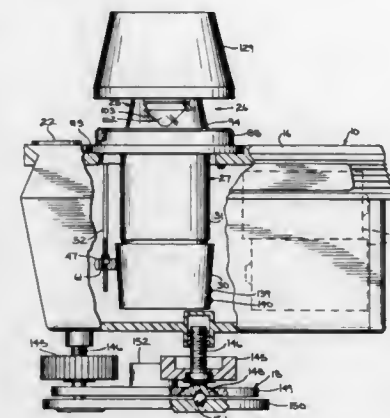
Gary L. Cain, Springfield; Lawrence J. Meyers, Dayton; Ted L. Teach, Dayton, all of Ohio; Joseph F. Rando, Los Altos Hills, Calif., and Theodore J. Markley, Vandalia, Ohio, assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Oct. 18, 1985, Ser. No. 788,800

Int. Cl.<sup>4</sup> G01B 11/26

U.S. Cl. 356-138

12 Claims



1. A transmitter for an alignment system in which a field of electromagnetic radiation is propagated, said transmitter comprising:

a source for providing a beam of electromagnetic radiation directed along a beam axis;  
a bob having a bob longitudinal axis;  
means for supporting the bob within the beam with the bob longitudinal axis parallel to the beam axis in a plumb condition, the beam being redirected omni-directionally by the bob in the plumb condition to define a reference field of radiation in a level condition;  
wherein an angular error between the plumb condition and the beam axis results in the bob longitudinal axis deviating angularly from the plumb condition to maintain the orientation of the reference field in the level condition; and  
a housing surrounding the bob, said housing having an inner surface and an outer surface and being made of a transparent material so that the reflected beam passes through the housing from the inner to the outer surface;  
wherein the housing is filled with a transparent liquid to dampen movements of the bob.

4,679,938

## DEFECT DETECTION IN FILMS ON CERAMIC SUBSTRATES

Alexander L. Flamholz, Monsey, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,158

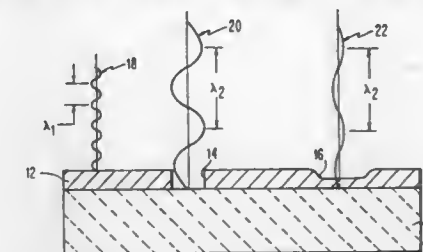
Int. Cl.<sup>4</sup> G01N 21/88

U.S. Cl. 356-237

20 Claims

1. A method of detecting defects in a thin film formed on a fluoresceable substrate comprising:  
illuminating said film with a first radiation;  
generating a second radiation characteristic of the fluorescent spectrum of said substrate; and  
analyzing the intensity of said second radiation to identify

localized regions of the substrate where the intensity of said second radiation is higher than that of the remainder



of the substrate, whereby said localized regions correspond to said defects.

4,679,939

## IN SITU SMALL PARTICLE DIAGNOSTICS

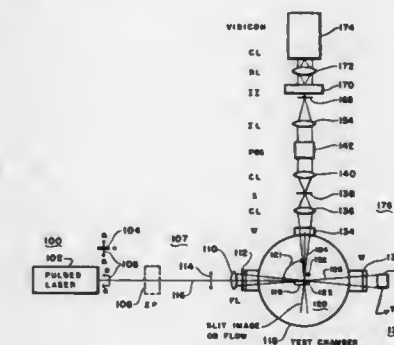
Bill F. Curry, Dechard; John H. Jones, Shelbyville; Brian L. Seiber, Lynwood L. Price, both of Tullahoma; Homer M. Powell, Auburntown, and Earl L. Kiech, Tullahoma, all of Tenn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 23, 1985, Ser. No. 812,206

Int. Cl.<sup>4</sup> G01N 15/02, 21/53

U.S. Cl. 356-336

35 Claims

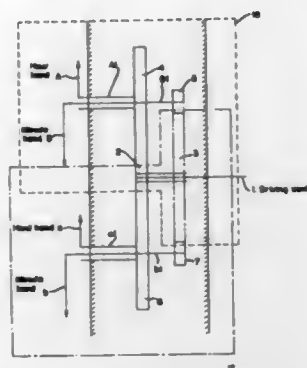


1. Particle stream diagnostic apparatus comprising:  
means for illuminating a cross-section of said particle stream with polarized coherent light directed along a lateral axis traversing said stream and cross-section;  
means for generating a first electrical signal representing light flux from said illuminating means transmitted across said cross-section through said particle stream;  
means located at a predetermined scattering angle with respect to the plane of said cross-section lateral axis and said stream for collecting particle scattered light originating in multiple locations of said illuminated cross-section as first light signals;  
means for segregating said first light signals into component second and third signals of dissimilar polarization angles;  
means for segregating said second and third light signals over an image plane, each said image plane light signal including geometrically identifiable signal areas originating respectively in light form said cross-section multiple locations;  
means for transducing said signal areas in said second and third light signals on said image plane into second and third electrical signal pairs; and  
means for analyzing a plurality of said first, second and third electrical signals.





minute hand, drive means connected to rotate said hour hand 30° for each hour and connected to rotate said minute hand



390° for each hour, said hour and minute hands overlapping at zero minute and zero second of each hour.

4,679,946

# EVALUATING BOTH THICKNESS AND COMPOSITIONAL VARIABLES IN A THIN FILM SAMPLE

Allan Rosencwaig, Danville, and Jon Opsal, Livermore, both of Calif., assignors to Thermo-Wave, Inc., Fremont, Calif.

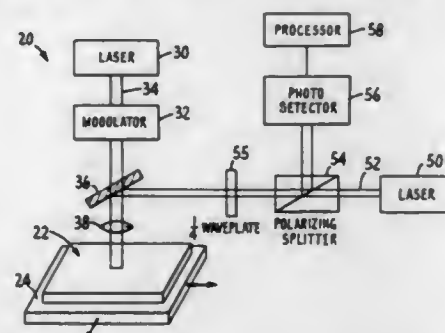
Filed May 21, 1984, Ser. No. 612,077

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl. G01N 21/41, 25/00

U.S. Cl. 374-5

17 Claims



1. Apparatus for evaluating thickness and compositional variables in a layered or thin film sample by analyzing thermal waves in a sample, said thermal waves being generated by a periodic localized heating at a spot on the surface of the sample, said apparatus comprising:

first means for detecting thermal waves, said first means being of the type which generates output signals that are a function primarily of the surface temperature said first means including

a probe for emitting a beam of radiation;

a means for directing the radiation probe beam within a portion of the periodically heated area on the sample surface in a manner such that the radiation probe beam reflects off the surface of the sample; and

a means for measuring the intensity variations of the reflected radiation probe beam resulting from the periodic changes in optical reflectivity induced by the periodic heating with the measured intensity variations being independent of changes in beam diameter and position;

second means for detecting thermal waves, said second means being of the type which generates output signals that are primarily a function of the integral of the temperature beneath the sample surface; and

means for processing the output signals from said first and

second detection means such that information about both layer thickness and compositional variables of the sample may be evaluated.

4,679,947

# METHOD AND APPARATUS FOR MEASURING STEAM QUALITY

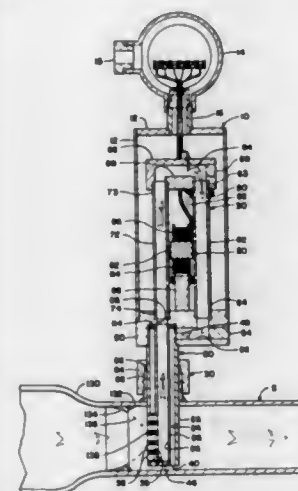
Charles E. Miller; Gerald L. Schlatter, both of Boulder, and Louis T. Yoshida, Longmont, all of Colo., assignors to Engineering Measurements Co., Longmont, Colo.

Filed Jul. 16, 1985, Ser. No. 755,493

Int. Cl. G01N 9/36; G01K 17/06

U.S. Cl. 374-42

46 Claims



1. Apparatus for determining steam quality of wet steam flowing in a steam line, comprising:

densitometer means connected to said steam line for measuring the bulk density of the wet steam flowing in the steam line;

temperature measuring means connected to said steam line for measuring the temperature of the wet steam flowing in the steam line; and

computer means connected to said densitometer means and to said temperature measuring means programmed to output steam quality of the wet steam as a ratio of the temperature to the bulk density measurements.

4,679,948

# RADIATION PROBE FOR CONTACTLESS MEASUREMENT OF THE SURFACE TEMPERATURE OF AN OBJECT

Günter Hempowitz, and Gustav Meyer-Kretschmer, both of Jülich, Fed. Rep. of Germany, assignors to Uranit GmbH, Jülich, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 796,099

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445677

Int. Cl. G01J 5/12

U.S. Cl. 374-129

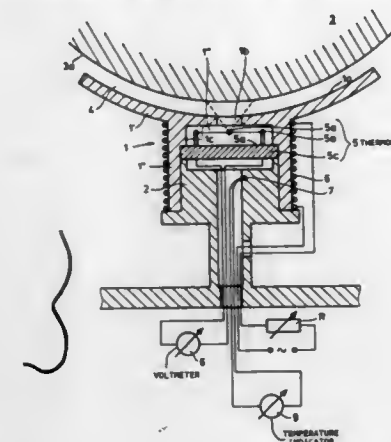
3 Claims

1. Radiation measuring probe for contactless measurement of the surface temperature of an object, independent of the emissivity of the object, comprising:

a radiation receiver;

a housing having interior surfaces defining an interior space, said radiation receiver being disposed in said interior space and thermally insulated with respect to said housing, said housing being formed of a plurality of members including a shield member having a shield surface facing outwardly so as to be towards a surface of the object whose surface temperature is to be measured and a base

member, said shield member having an aperture opening into said shield surface, communicating with the interior space and through which thermal radiation emanating from the object impinges on said radiation receiver, said shield surface being blackened so as to absorb interfering ambient radiation and being configured to correspond to the contour of the surface of the object to be measured,



and said interior surfaces of said housing being of low emissivity; and  
a regulatable heating means for regulating the temperature of said housing to correspond to the temperature of said radiation receiver, with the temperature at which correspondence occurs representing the surface temperature of the object.

4,679,949

# ELECTRONIC THERMOMETER

Tamaki Sakamoto, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

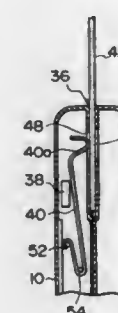
Filed Nov. 8, 1985, Ser. No. 796,104

Claims priority, application Japan, Nov. 8, 1984, 59-234102; Nov. 9, 1984, 59-236187

Int. Cl. G01K 1/14, 3/00

U.S. Cl. 374-183

12 Claims



1. An electronic thermometer for receiving a temperature probe having a temperature sensing means and a terminal portion, comprising:

(a) means for holding the probe including a pair of probe holding members hingedly connected for pivotal movement from an open position to a closed position, whereby the probe is held between said two probe holding members;

(b) a temperature measuring circuit on said holding means;

(c) means for electrically connecting the terminal portion of the probe to said temperature sensing means and to the temperature measuring circuit;

(d) probe switch means on said holding means;

(e) means for operating said probe switch means only when

the probe is held between said members in a predetermined manner;

(f) means for displaying the temperature measured; and  
(g) control means for initiating said temperature measuring circuit upon the actuation of said switching means.

4,679,950

# DRAWER SLIDE WITH INFINITE ADJUSTMENT LOCKING MECHANISM

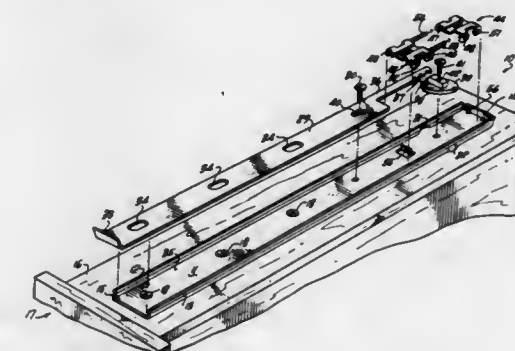
Dale Delmege, Santa Fe Springs, and Richard O. Rask, Whittier, both of Calif., assignors to Standard Precision, Inc., Santa Fe Springs, Calif.

Filed Sep. 22, 1986, Ser. No. 909,555

Int. Cl. A47B 88/10

U.S. Cl. 384-18

16 Claims



1. An improved drawer slide with an infinite adjustment locking mechanism for securing the slide in any fraction of its extension, said slide being of the type having an outer slide member having an inner end and an outer end and a pair of inwardly-facing ball bearing supporting grooves, an inner slide member positioned within said outer slide member, said inner slide member having a pair of outwardly-facing ball-bearing supporting grooves, a plurality of ball bearings held between said pair of grooves on said outer slide member and said pair of grooves on said inner slide member, said ball bearings being positioned by a movable ball retainer, wherein the improvement comprises:

a protrusion positioned on the outer surface of at least one of said pair of outwardly facing ball bearing supporting grooves or one of said pair of inwardly facing ball bearing supporting grooves; and

at least one locking ball retainer held by one of said inner slide member or said outer slide member, said locking ball retainer including at least one locking ball bearing positioned adjacent said protrusion and said locking ball retainer further including means for moving said at least one locking ball bearing into and out of contact with said protrusion, whereby when said at least one locking ball bearing is out of contact with said protrusion, said slide moves freely, but when said at least one locking ball bearing is in contact with said protrusion, the movement of the outer slide member with respect to said inner slide member in the direction of said at least one locking ball bearing causes said at least one locking ball bearing to bind against said protrusion and to inhibit movement of the outer inner slide member in that direction.



4,679,951

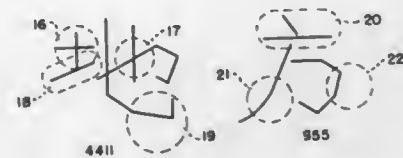
## ELECTRONIC KEYBOARD SYSTEM AND METHOD FOR REPRODUCING SELECTED SYMBOLIC LANGUAGE CHARACTERS

Paul L. King, Joseph E. Grimes, and Richard C. Cochran, all of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 91,862, Nov. 6, 1979, abandoned. This application Sep. 26, 1980, Ser. No. 188,030  
Int. Cl.<sup>4</sup> B41J 5/08

U.S. Cl. 400—110

39 Claims



1. A method of producing ideographic text material utilizing a keyboard having a plurality of keys, each key carrying a single indicium corresponding to a predetermined characteristic stroke configuration found in a graphic character to be produced, comprising:

- storing in a memory a plurality of graphic characters having stroke configurations similar to those of characters to be produced, each stored character having an identifier code based on the stroke configuration of that character;
- selecting one or more keys to construct for a desired character an identifier code corresponding to its characteristic stroke configurations, the step of selecting one or more keys for each desired character including selecting, for each quadrant of a graphic character wherein a characteristic stroke configuration appears, the single key carrying the indicium which most closely identifies the shape of that stroke configuration, the selection of between one and four single keys in sequence combining to produce a constructed identifier code for the desired character;
- calling up from said memory all stored characters having identifier codes identical to the constructed identifier code for said desired character;
- temporarily storing said called-up characters;
- determining whether an ambiguity exists between the number of characters desired and the number of characters called up by said constructed identifier code and placed in temporary storage;
- automatically directing the called-up character to a text storage means if no ambiguity exists; and
- resolving any ambiguities caused by a difference between the number of characters desired and the number of characters called up to select a desired called-up character, and thereafter directing the desired called-up character to the text storage means.

4,679,952

## PRINTING APPARATUS INCLUDING TAB POSITION PLACEMENT CONTROL

Satoshi Hirota, and Kimihiro Nagamine, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan  
Filed Nov. 12, 1985, Ser. No. 797,423

Claims priority, application Japan, Dec. 21, 1984, 59-270160  
Int. Cl.<sup>4</sup> B41J 21/14

U.S. Cl. 400—279

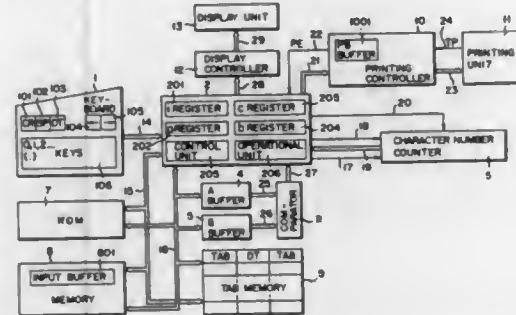
2 Claims

- 1. A printing apparatus including tab position placement control, comprising:
- tab setting means for setting a predetermined digit position as a tab position along a print line comprised of a number of digit positions, with respect to a character data string to be printed on said print line;
- means for inputting the character data string, and for input-

ting tab data designating execution of a tab operation after inputting of the character data string;

memory means, coupled to said inputting means, for storing at specific addresses each character of the character data string and the tab data for designating execution of the tab operation, wherein said specific addresses each correspond to a digit position of the associated character in the character data string as inputted by said inputting means;

processor means including address converting means for converting the specific addresses of certain characters in the character data string as stored in said memory means,



based upon the predetermined digit position set by said tab setting means and after the tab data designating execution of a tab operation is inputted; and

printing means coupled to said processor means for printing the character data string, said printing means including buffer means for storing said certain characters of said character data string at addresses corresponding to the addresses converted by said address converting means so that the printed character data string aligns with the tab position set by the tab setting means at said predetermined digit position along said print line.

4,679,953

## PAPER FEEDING AND EJECTING DEVICE FOR A PRINTING APPARATUS

Masakazu Sone, and Takeshi Nakajima, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

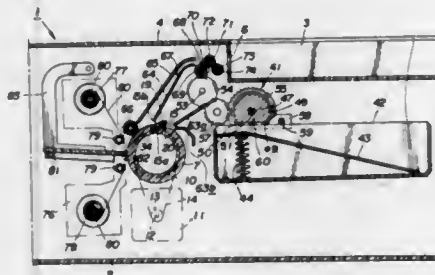
Filed Oct. 24, 1985, Ser. No. 791,204

Claims priority, application Japan, Oct. 27, 1984, 59-162691[U]

Int. Cl.<sup>4</sup> B41J 11/58

U.S. Cl. 400—625

12 Claims



- 1. A paper feeding and ejecting device for a printing apparatus, comprising:
- a platen rotatable in a predetermined direction for winding a sheet of paper therearound during printing of said sheet;
- a magazine for storing a stack of paper sheets;
- feeding roller means disposed above said magazine and being rotatable for feeding a sheet of paper from the top of said stack toward said platen;
- feeding guide means extending between said magazine and

said platen for guiding the sheet of paper being fed by said feeding roller means in a feeding path leading to said platen at a predetermined location on the peripheral surface of the platen;

said platen including in a peripheral surface thereof a cutout extending thereacross to define a chucking seat which, in an initial position of said platen, is disposed at said predetermined location for receiving a leading end portion of a sheet of paper propelled by said feeding roller means in said feeding path, and further comprising electrically energizable sheet gripping means on said platen for securing said leading end portion of a sheet on said chucking seat;

paper sensing means arranged in said platen for sensing the presence of a sheet of paper in said cutout and providing an energizing signal for actuating said sheet gripping means

ejecting roller means linked with said feeding roller means and being operative for ejecting a sheet of paper after the printing thereof;

ejecting guide means for guiding the sheet of paper to be ejected to said ejecting roller means from said platen, said ejecting guide means having an entrance adjacent said peripheral surface of the platen at a location thereon spaced in said predetermined direction of rotation of the platen from said predetermined location to which said feeding path extends;

drive means for said platen including a platen drive motor operative to rotate said platen in said predetermined direction during printing and in the opposed direction during ejecting of a sheet which has been printed, and a reversible roller drive motor, means for rotating said ejecting roller means from said roller drive motor, and means including one-way clutch means for rotating said feeding roller means from said reversible roller drive motor only in response to operation of said reversible roller drive motor in one of its reversible directions and in which said roller drive motor is operated in said one direction during said feeding of a sheet of paper from said stack toward said platen, and said roller drive motor is operated in the opposite one of said reversible directions for ejecting of a sheet of paper after the printing thereof.

4,679,954

## FLEXIBLE PEN WITH SLIDING SLEEVE

Emilio Ambasz, 295 Central Park West, New York, N.Y. 10024  
Filed Jan. 22, 1986, Ser. No. 821,541

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

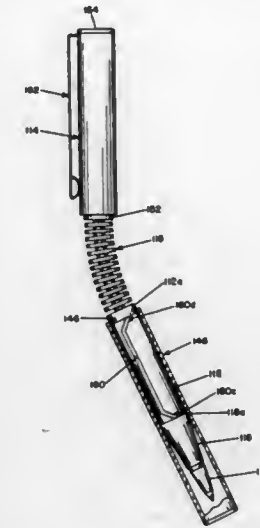
Int. Cl.<sup>4</sup> B43K 9/00, 7/00

U.S. Cl. 401—117

8 Claims

- 1. A pen comprising an elongated one-piece barrel having substantially rigid tip end and head end portions joined to each other by an intermediate integral flexible portion, whereby the barrel can be bent at the flexible portion, a writing tip at the distal end of the tip end portion, a substantially rigid tubular cap member telescopically received over the tip end portion of the barrel and movable along the barrel between (1) a retracted position in which it overlies part of the tip end portion and substantially all of the flexible portion, and thus leaving the writing tip exposed and rendering the pen substantially rigid, and (2) an extended position in which it covers the writing tip and leaves the flexible portion exposed, thus protecting the writing tip and rendering the pen flexible, and means for releasably retaining the cap member in each of the retracted and extended positions, said means including at least one groove in either the outer surface of the tip end of the barrel or the inside surface of the cap member and a boss on the other end of the cap member and barrel received in the groove, the groove being coextensive with the distance between the extended and retracted positions of the cap member and including locking

portions at each end offset circumferentially from adjacent end portions of the groove, whereby the cap member is locked in



said respective portions in the absence of rotation relative to the barrel.

4,679,955

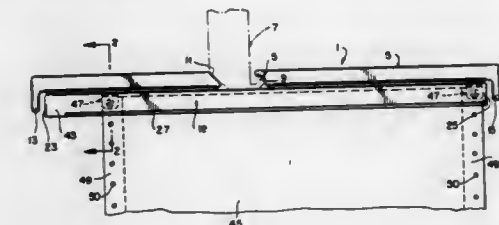
## DOCUMENT HOLDER

Jesse Marsh, Viale Romagna 56/3, 20133 Milan, Italy  
Division of Ser. No. 744,950, Jan. 17, 1985. This application  
Apr. 30, 1986, Ser. No. 857,475

Int. Cl.<sup>4</sup> B42F 3/00, 13/00, 15/00; B42D 15/00

U.S. Cl. 402—4

4 Claims



- 1. A binder element for securing an assembly of sheets provided with alignable apertures, said binder element being adapted to be received in a longitudinal compartment provided by a channel member, said compartment having a particular cross-sectional configuration, which element comprises:

- (a) a base section disposable adjacent an edge of the sheet assembly;
- (b) first and second side sections extending from and hinged to opposite sides of the base section by relatively thin, flexible hinge means for folding onto opposite sides of the sheet assembly;
- (c) a shank pivotally secured to the first side section by relatively thin flexible hinge means for insertion through the aligned apertures of the sheet assembly; and
- (d) means carried by the second side section for detachable engagement with the shank to secure the element to the sheet assembly, said binder element, when said shank is engaged with said means for detachable engagement, conforming substantially to said cross-sectional configuration of said compartment.

4,679,956

## QUICK DISCONNECT DEVICE

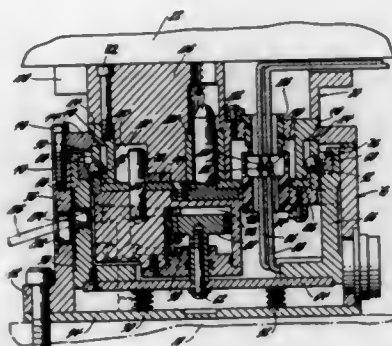
Barry D. Douglas, Palo Alto, Calif., and Frederick A. McCurdy, John K. Bauer, 510 Lenox Ave., Miami Beach, Fla. 33139  
Royal Oak, Mich., assignors to General Motors Corporation,  
Detroit, Mich.

Continuation of Ser. No. 817,280, Jan. 8, 1986, abandoned. This application Aug. 8, 1986, Ser. No. 894,553

Int. Cl.<sup>4</sup> B25G 3/00; F16D 1/00

U.S. Cl. 403-14

8 Claims



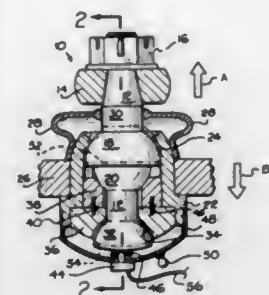
1. A coupling device connecting a work tool to a support and providing a quick disconnect for electrical and fluid connections, said coupling device comprising a first member for rigid connection with said work tool and a second member for rigid connection with said support, a locating pin extending axially from said second member, an opening formed in said first member so when said first and said second members are axially aligned and moved towards each other said locating pin moves into said opening, said first member including a cylindrical base provided with a projecting cylindrical extension, a frusto conical surface formed on the outer surface of said cylindrical base and a locked ring formed on the end of said cylindrical extension, said second member comprising a cylindrical housing which includes a sleeve, a ring member located at the free end of said sleeve and having a frusto conical surface formed on the inner diameter of said ring member that is complementary to said frusto conical surface on said cylindrical base, a cylindrical ball cage spaced radially inwardly from said sleeve and supporting a plurality of balls along the circumference thereof for limited movement in a radial direction out of said ball cage towards said locating pin, said housing having a body portion formed with a cylindrical chamber, a piston located in said chamber, a cam ring located alongside said plurality of balls, means connecting said piston to said cam ring, a cam surface formed on said cam ring so when said piston is in a first position said plurality of balls are pressed by said cam surface radially inwardly out of said ball cage towards the longitudinal center axis of said housing and when said piston is in a second position said plurality of balls are free to float within said ball cage, the arrangement being such that when said first member and said second member are interconnected said one end of said chamber is pressurized to cause said piston to be located in said first position to cause said plurality of balls to engage said lock ring of said first member and urge said frusto conical surface on said cylindrical base of said first member into full surface contact with said frusto conical surface on said ring member of said second member and simultaneously lock said first and second members together, and when the other end of said chamber is pressurized said piston is located in said second position and said first and second members can be separated.

4,679,957

## BALL JOINT SAFETY SYSTEM

John K. Bauer, 510 Lenox Ave., Miami Beach, Fla. 33139  
Filed Jun. 10, 1986, Ser. No. 872,525  
Int. Cl.<sup>4</sup> B25G 3/00

18 Claims



1. A ball joint assembly comprising, a main shaft having a longitudinal axis, a primary ball having an axially symmetric, rounded outer surface coaxially mounted to said main shaft, a primary bearing surface having a shape similar to the primary ball outer surface and being in frictional contact therewith, said primary bearing surface being relatively stationary with respect to said primary ball, a secondary ball having an axially symmetric, rounded outer surface coaxially formed on said main shaft and spaced apart from the primary ball, and a secondary bearing surface having a shape similar to the secondary ball outer surface and adjacent to, but spaced apart from, said secondary ball by a predetermined distance so as to define a substantially uniform gap about said secondary ball outer surface, said secondary bearing surface being relatively stationary with respect to said secondary ball, said main shaft, primary and secondary balls being movable with respect to said primary and secondary bearing surfaces, said gap permitting the secondary ball to move substantially free from contact with said secondary bearing surface with movement of said main shaft.

4,679,958

## BALL JOINT

Akira Mizusawa, Fujisawa, and Daiji Nakama, Chigasaki, both of Japan, assignors to Nifco, Inc., Yokohama, Japan  
Division of Ser. No. 744,304, Jun. 13, 1985, Pat. No. 4,568,216, which is a continuation of Ser. No. 430,361, Sep. 30, 1982, abandoned. This application Dec. 9, 1985, Ser. No. 807,016  
Claims priority, application Japan, Oct. 23, 1981, 56-156928; Jun. 15, 1982, 57-88058

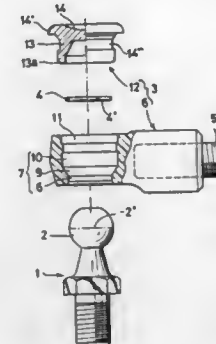
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.  
Int. Cl.<sup>4</sup> F16C 11/00

U.S. Cl. 403-143

2 Claims

1. A ball joint comprising:  
a ball stud having a ball at the leading end thereof;  
a plastic main body having a through hole which comprises a small-diameter portion on one side thereof, a large-diameter portion on the other side thereof and a tapered portion between said small-diameter portion and said large-diameter portion, said large diameter portion having a retaining portion;  
a cup-shaped auxiliary body being snugly fitted in said large-diameter portion of said through hole in said main body and having the leading end thereof extending to said tapered portion of said through hole, said leading end having engaging means which engage said retaining portion to retain said auxiliary body in said through hole;  
a resilient metallic ring for retaining said ball within said

through hole, said resilient metallic ring having a cut therein, whereby said ball stud having said ball inserted into said through hole from said small-diameter portion and passed through said resilient metallic ring while enlarging the diameter of said resilient metallic ring, after inserting said



resilient metallic ring into said through hole from said large-diameter portion and then fitting said cup-shaped auxiliary body snugly in said large-diameter portion, is prevented from being released from said through hole by said resilient metallic ring which is pushed enlarged in diameter by insertion of said ball and which, upon passage of said ball therethrough, is returned to its original state.

4,679,959

## QUICK-CONNECT/DISCONNECT CONNECTOR

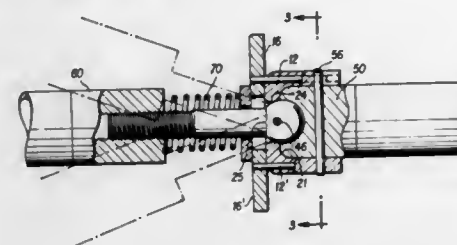
Paul V. Cavaliaro, Canton, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 16, 1986, Ser. No. 919,956

Int. Cl.<sup>4</sup> F16C 3/00, 11/00

U.S. Cl. 403-143

7 Claims



1. Means for detachably connecting together a first member and a second member, comprising:

a shaft;  
means for securing one end of said shaft to said first member; said shaft being formed with a generally spherical head at its end remote from said first member;  
said second member being formed with a generally semi-spherical recess in one face thereof for receiving therein the generally spherical shaft head; and with at least one radially projecting retainer rod;  
a slide member that is mounted for sliding movement on said shaft intermediate said first member and said shaft head, said slide member being formed with at least one pin that projects axially of said shaft from said slide member and toward said second member;  
a sleeve adapted to seat about the end of said second member, said sleeve being generally cup-shaped and formed with a web portion and with an annular wall, said web being formed with an aperture to receive said shaft head therethrough but to prevent passage of said shaft head therethrough, the annular wall of said sleeve being formed with at least one axially-extending opening for the receipt of

said pin or pins therein and with at least one generally L-shaped slot for receiving therein said retainer rod on said second member upon assembly of said sleeve about the end of said second member and manipulation of said sleeve to seat said retainer rod in said slot; and urging means disposed to constantly urge said slide member in its assembled position toward the end of said second member.

4,679,960

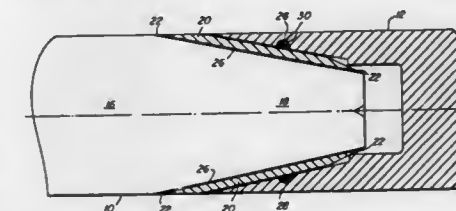
CERAMIC AND METAL BRAZED ARTICLES  
Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 25, 1985, Ser. No. 695,019

Int. Cl.<sup>4</sup> B25G 3/34

U.S. Cl. 403-272

10 Claims



1. An article consisting essentially of:

(a) a ceramic shaft having a truncated conical portion,  
(b) a substantially solid metal shaft having a substantially cylindrical periphery machined with a recess having internal surfaces substantially matching the external surface of said truncated conical portion and with a chamber adjacent said recess  
(c) a ductile active brazing alloy joining the internal surfaces of said truncated conical portion of said ceramic shaft to the matching internal surfaces of said recess of said metal shaft said article having said chamber between the end of said ceramic shaft and said metal shaft.

4,679,961

## COUPLING MECHANISM

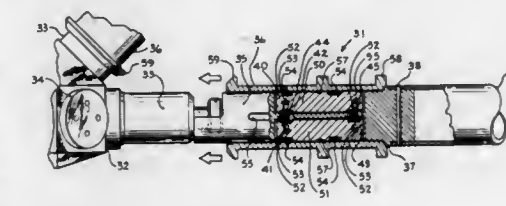
James P. Stewart, Cupertino, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jun. 16, 1986, Ser. No. 874,980

Int. Cl.<sup>4</sup> F16D 1/00

U.S. Cl. 403-341

10 Claims



1. A method of coupling a first object to a second object, said method comprising the steps of:

(a) securing a proximal end of a male member to said first object, said male member being substantially symmetric about an axis of elongation, a distal end of said male member being configured generally as a knob that is symmetric about said axis of elongation;  
(b) securing a proximal end of an elongate female member to said second object, a distal end of said female member having a contoured surface configured to receive said knob on said distal end of said male member when overlapping side contact of said contoured surface with said knob is made from any direction of approach transverse to said axis of elongation of said male member;



- (c) bringing said contoured surface on said female member into overlapping side contact with said knob on said male member to achieve mating engagement between said female member and said male member; and
- (d) moving a sleeve from a first position around an intermediate portion of said female member to a second position around said distal ends of said male and female members when said knob on said male member and said contoured surface on said female member are in overlapping side contact with each other, thereby locking said male and female members in said mating engagement with each other.

4. An apparatus for coupling a first object to a second object, said apparatus comprising:

- (a) a male fixture, said male fixture being substantially symmetric about an axis of elongation, a proximal end of said male fixture being securable to said first object, a distal end of said male fixture having a knob-like extremity that is symmetric about said axis of elongation;
- (b) a female fixture, said female fixture including:
- (i) an elongate cylindrical member, a proximal end of said cylindrical member being securable to said second object, a distal end of said cylindrical member being of partially cylindrical configuration with an inner surface having a recessed portion that is contoured and dimensioned to receive said knob-like extremity on said distal end of said male fixture when overlapping side contact is made between said distal end of said male fixture and said inner surface on said distal end of said cylindrical member of said female fixture from any direction of approach transverse to said axis of elongation of said male fixture; and
- (ii) a sleeve member, said sleeve member being positioned coaxially with respect to said cylindrical member, said sleeve member being slidable longitudinally over said cylindrical member from an OPEN position at which said distal end of said cylindrical member is exposed to permit overlapping side contact between said distal end of said male fixture and said inner surface on said distal end of said cylindrical member of said female fixture to a LOCKED position at which said inner surface on said distal end of said cylindrical member of said female fixture and said knob-like extremity on said distal end of said male member are surrounded by said sleeve member;

said sleeve member thereby coupling said male fixture to said cylindrical member of said female fixture when said knob-like extremity on said distal end of said male fixture has been received in said recessed portion of said inner surface of said cylindrical member of said female fixture and said sleeve member has been slide to said LOCKED position.

4,679,962

## AUTOMOTIVE ROLLING MACHINE

Tohru Mihara, Kyoto; Kiyoshi Sato, Yoshikawa, and Yasuo Terauchi, Kumagaya, all of Japan, assignors to Taisel Road Construction Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 848,477

Claims priority, application Japan, Jul. 31, 1985, 60-168790  
Int. Cl.<sup>4</sup> E01C 19/26

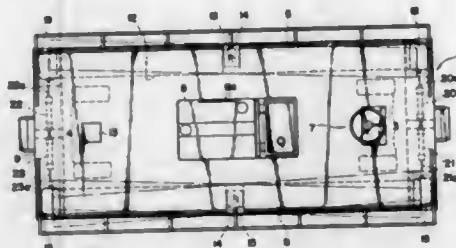
U.S. Cl. 404—126

6 Claims

1. An automotive rolling machine for use in paving a large, flat ground surface comprising:
- a main frame section and a frame mounted therein having a longitudinal axis,
- an elongate pressure roller mounted to at least one side of the main frame section as viewed in the longitudinal direction of said frame,
- laterally extending slider guides provided at the front and rear of the underside of said frame, respectively,
- sliders for steering the roller and slidably fitted into said slider guides,
- at least one elongate center pin provided at a central portion of at least one side of said frame as viewed in the longitudinal

direction thereof in such a manner that the longitudinal axis of said center pin is supported in a vertical orientation, said elongate center pin being mounted for pivotal movement with respect to said frame,

at least one lower frame member for supporting said roller, said at least one lower frame member being fixed to a lower portion of said elongate center pin, respectively, said lower frame member being movably connected, at its front and rear end portions, to said sliders, and



means for moving said slider relative to said frame whereby the longitudinal axis of said roller may effectively be pivoted relative to the longitudinal axis of said main frame, about a pivot axis that is coincident with the axis of said center pin(s), respectively,

whereby the automotive rolling machine may be steered by an operator while it is in use, without deforming the surface to be paved with said roller.

4,679,963

## PLAYGROUND CONSTRUCTION

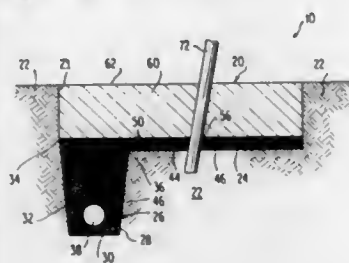
Robert G. Heath, 823 West St., Harrison, N.Y. 10528

Filed May 27, 1986, Ser. No. 866,671

Int. Cl.<sup>4</sup> E02B 13/00

U.S. Cl. 405—36

11 Claims



1. A playground construction comprising:
- an earthen floor distance beneath the surface of the earth having a grade of at least 1°;
- opposing walls extending upwardly from said floor to the surface of the earth;
- a trough in said floor adjacent to one of said walls;
- a layer of water-pervious material lining said trough and said floor and having a blanket section at one end and a flap section at the other end;
- a first layer of aggregate material in said trough and on said floor;
- said first layer of aggregate material enveloped by said layer of water-pervious material, blanket section and flap section; and
- a second layer of aggregate material different in composition from the first layer and extending above said first layer of aggregate material and terminating at the surface of the earth.

4,679,964

## OFFSHORE WELL SUPPORT MINIPLATFORM

Joseph W. Blandford, Houston, Tex., assignor to Seahorse Equipment Corporation, Houston, Tex.

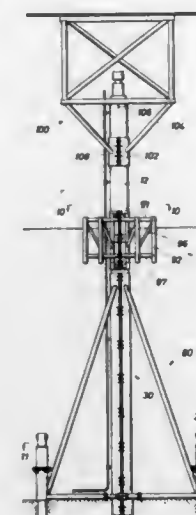
Continuation-in-part of Ser. No. 622,990, Jun. 21, 1984, Pat. No. 4,558,973. This application Dec. 16, 1985, Ser. No. 809,162

The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> E02B 17/02; E02D 31/00

U.S. Cl. 405—216

20 Claims



1. A protective well support system to be installed on an offshore well having an upstanding conductor pipe extending above the seabed, the system comprising:

- (a) an upstanding conductor clamp adapted to encircle the conductor pipe, said conductor clamp formed by two upstanding facing members supported by a bottom engaging frame;
- (b) said frame including a plurality of frame members joined together defining a substantially horizontal rectangular support frame for engaging the seabed;
- (c) a plurality of angularly extending brace members secured at one end to said conductor clamp and at the other end to said frame;
- (d) said conductor clamp being attached to said frame and extending upright thereabove to enable said conductor clamp to fasten about the conductor pipe;
- (e) a boat landing mounted about the conductor pipe, said boat landing formed by at least two sectional components fixedly secured to semicircular clamp members adapted to encircle the conductor pipe for mounting said boat landing components thereon; and
- (f) well platform means supported on bracket means adapted to encircle the conductor pipe for removably securing said well platform means thereon.

4,679,965

## METHOD AND APPARATUS FOR INSTALLING PANELS INTO RECESSES IN THE GROUND

Eberhard Gläser, Aichwald, and Eberhard Beltinger, Stuttgart, both of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart-Möhringen, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 805,873

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1984, 3444690

Int. Cl.<sup>4</sup> E02D 5/20

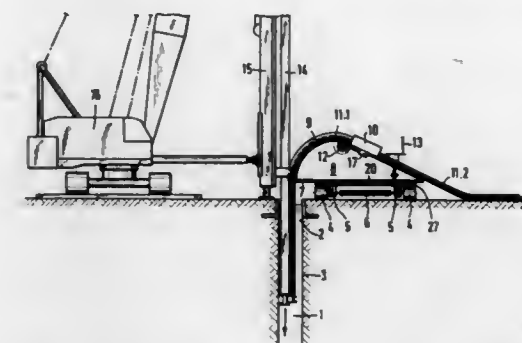
U.S. Cl. 405—258

28 Claims

1. An apparatus for inserting a panel into a substantially vertical suspension-filled slot in the ground to form an underground barrier, said slot having an elongate opening lying in a ground surface, said panel being provided along opposed sub-

stantially vertical edges with reinforcing elements, said apparatus comprising:

deflecting means for bending the panel during an insertion operation along a feed path extending substantially perpendicularly with respect to the opening of the slot so that a leading end portion of said panel at said slot has a substantially vertical orientation extending parallel to said slot and a trailing end portion of said panel has an orientation inclined with respect to said slot, said deflection means including a deflection body with an arcuate surface extending in part parallel to the opening of said slot and having a radius of curvature at least as large as a minimum permissible radius of curvature of said panel in a direction parallel to said feed path and extending from said trailing



end portion to said leading end portion, said deflection body being provided at opposite sides with additional means for aiding a bending of said panel during an insertion operation, said additional means including a pair of slotted tubes at least partially surrounding the reinforcing elements of said panel upon a positioning of said panel on said arcuate surface;

support means operatively coupled to said deflection body for supporting said deflection body in a preselected orientation and a preselected position at the opening of said slot; and

panel shifting means disposable at said slot and engageable with said leading end portion of said panel for moving said panel over said arcuate surface and into said slot.

4,679,966

## ROOF BOLT APPARATUS WITH EXPANSION SHELL AND COUPLING

Paul A. Yacisin, Patton, Pa., assignor to Jennmar Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 808,873, Dec. 13, 1985, abandoned, which is a continuation of Ser. No. 644,348, Aug. 27, 1984, abandoned. This application Sep. 17, 1986, Ser. No. 908,163

Int. Cl.<sup>4</sup> E21D 20/02

U.S. Cl. 405—261

11 Claims

1. Apparatus for supporting a rock formation comprising, an elongated rod positioned in a bore hole of a rock formation,
- said rod having a first threaded end portion and a second threaded end portion, said rod first threaded end portion being positioned adjacent the end of said bore hole,
- an expansion shell assembly engaged to said rod first threaded end portion,
- an elongated bolt positioned in said bore hole below said rod second threaded end portion, said bolt having a first threaded end portion and a second end portion,
- said bolt first threaded end portion being positioned oppositely of said rod second threaded end portion,
- a bearing plate positioned on said bolt second end portion, means for threadedly connecting said bolt to said rod,
- stop means associated with said means for threadedly connecting said bolt to said rod for limiting axial movement of

said bolt relative to said rod to permit unitary rotation of both said bolt and said rod in a preselected direction, said expansion shell assembly being operable upon rotation of said rod to anchor said rod in said bore hole, and



said bolt being operable to rotate in said preselected direction relative to said rod anchored in said bore hole to disengage said stop means to axially advance said bolt relative to said rod and tension said bolt.

4,679,967

## TRUSS BRACKET

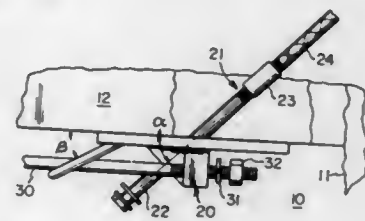
Edward C. Hipkins, Sr., Oakdale, and Frank M. Locotos, Bridgeville, both of Pa., assignors to F. M. Locotos Co., Inc., Pittsburgh, Pa.

Filed Jul. 25, 1985, Ser. No. 758,707

Int. Cl.<sup>4</sup> E21D 20/00

U.S. Cl. 405-288

10 Claims



1. A truss bracket for use in a mine roof support system comprising:

a substantially flat, planar member for engagement with a mine roof, said planar member having an angularly disposed aperture to accommodate an anchor bolt extending into the mine roof;

an extension depending normal to said planar member, said extension having a channel angularly disposed to said planar member and in axial coincidence with said aperture in said planar member to accommodate the anchor bolt extending through said aperture in said planar member and into the mine roof, said extension further having a pair of openings spaced from each other and from said planar member and positioned on opposite sides of said channel, each of said openings to accommodate a tie bar in parallel relationship to said planar member and to each other; and

a tie bar support ring angularly disposed to said planar member and spaced from said extension to form an opening in line with said pair of openings in said extension, said support ring to accommodate said tie bars extending therethrough upon sagging.

4,679,968

## INDEXABLE CUTTER INSERT

Osamu Tsujimura, Kawasaki; Ryoel Hasegawa, Ota, and Masayuki Ohkawa, Kawasaki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

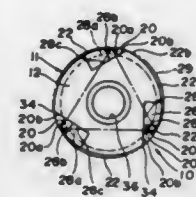
Filed Jun. 25, 1986, Ser. No. 878,774

Claims priority, application Japan, Jun. 28, 1985, 60-98985(U); May 16, 1986, 61-73506(U)

Int. Cl.<sup>4</sup> B23B 27/16; B23C 5/20

U.S. Cl. 407-114

6 Claims



1. A cutter insert of the indexable type for a rotary cutter comprising a body comprising a plate of a generally circular shape defined by a front face, a rear face and a circumferential face lying between said front and rear faces, said body having three notches of a V-shape formed in said circumferential face in circumferentially equally-spaced relation to one another to interrupt said circumferential face to provide three circumferentially equally-spaced side faces, each of said V-shaped notch being defined by a pair of first and second opposed walls converging radially inwardly of said body;

each of said side faces cooperating with said front face to define an arcuate convex cutting edge, so that said cutting edge extends between said first wall of one of each two adjacent V-shaped notches and said second wall of the other, said cutting edge having a leading end where it intersects said first wall of said one notch and also having a trailing end where it intersects said second wall of said other notch, three straight lines each extending between each adjacent ones of said leading ends of said three cutting edges defining a substantially equilateral triangle, each of said arcuate cutting edges assuming a part of a circle having a radius greater than a radius of a circle circumscribing said equilateral triangle;

a marginal portion of said front face disposed adjacent and extending along each cutting edge serving as a rake surface for said cutting edge, said rake surface being recessed adjacent to said first wall of said V-shaped notch so as to slope toward said rear face toward said first wall to provide a convex portion extending between said front face and said first wall;

said first wall of each V-shaped notch sloping toward said trailing end of the adjacent cutting edge at said second wall of said notch and being inclined with respect to a plane disposed perpendicular to said front face and passing through a center of said circle along which said arcuate cutting edge extends and said leading end of said cutting edge disposed at said first wall.

4,679,969

## POSITIVE FEED DRILL CLAMP SYSTEM

Patrick J. Riley, Columbus, Ohio, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 7, 1986, Ser. No. 848,652

Int. Cl.<sup>4</sup> B23B 45/14, 49/02

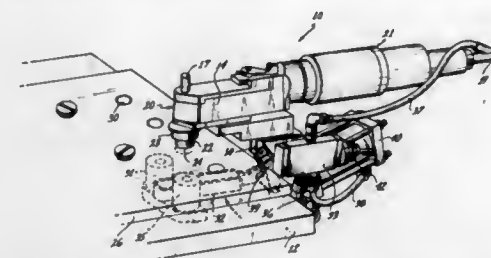
U.S. Cl. 408-87

17 Claims

1. A portable drill system for drilling a hole in a workpiece, comprising:

a drill;  
a drill bit operably connected to the drill;  
a power source connected to the drill for driving said bit;  
feed means for feeding said bit into and out of the workpiece;

a housing for said feed means;  
a guide plate detachably mounted to the workpiece, said guide plate engaging a head portion of said drill to guide said drill bit into a desired location on the workpiece; and



a clamp means connected to said housing for clamping the workpiece against said housing.

4,679,970

## HIGH SPEED TOOLHOLDER FOR A MACHINING CENTER

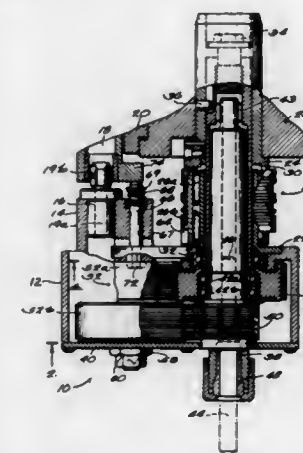
Earl R. Lobneis, Milwaukee, and Robert T. Woythal, West Allis, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Aug. 26, 1981, Ser. No. 296,333

Int. Cl.<sup>4</sup> B23B 47/14

U.S. Cl. 408-128

1 Claim



1. In a tool head adapted to be inserted in the spindle of a machine tool and including a drive mechanism arranged to be actuated by the machine tool spindle for driving a cutter at a rate different than the rate of rotation of the machine tool spindle; a housing enclosing said drive mechanism; an input shaft journaled in said housing and adapted to be coupled to the machine tool spindle for transmitting the drive from the machine tool spindle to said drive mechanism; a hollow bore retention pin extending from said housing for engagement in a suitable opening in the machine tool for retaining said housing stationary while said drive mechanism is being actuated by the machine tool spindle and for communicating with a source of air pressure in the machine tool when said input shaft is coupled to the machine tool spindle for directing the air pressure through the hollow bore in the retention pin for cooling said drive mechanism in said housing; means locking said retention pin to said input shaft whenever the tool head is removed from the spindle so that said retention pin is in position to enter the opening in the machine tool when the tool head is mounted to the machine tool by an automatic tool change mechanism; and release means arranged to be actuated by the movement of the tool head as its input shaft is inserted into the spindle for releas-

ing said locking means to permit said input shaft to be driven by the machine tool spindle relative to said retention pin.

4,679,971

## ROTARY CUTTING TOOL AND PROCESS FOR MAKING SAME

Andreas Maier, Schwendi-Hörsenhausen, Fed. Rep. of Germany, assignor to Hartmetallwerkzeugfabrik Andreas Maier GmbH & Co. KG, Fed. Rep. of Germany

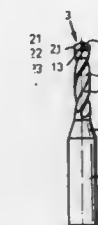
Filed Sep. 1, 1983, Ser. No. 528,531

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1982, 3232686

Int. Cl.<sup>4</sup> B23C 51/02

U.S. Cl. 408-145

19 Claims



1. A rotary cutting tool comprising:

a metallic member centered on an axis;  
a generally cylindrical working head consisting in its entirety of an ultrahard polycrystalline incisive material of polycrystalline diamond or cubic boron-nitride and coaxial with and bonded to one end of said metallic member by metallic interpenetration under vacuum or crystalline growth along a generally transverse interface extending over the entire cross-sectional area of said metallic member;

a tool body; and

a junction separating said elongate metallic member from the tool body and axially spaced from said interface, said junction being preformed from a foil comprising two solder layers on opposite sides of a highly heat-conductive metal wafer, said working head having an end face with at least one frontal cutting edge and a flute for guiding away workpiece chips cut out by said cutting edge, the flute being formed in the working head through said interface into said metallic member and extending at least generally axially past said interface onto an adjoining portion of said elongate metallic member.

4,679,972

## DEVICE IN ROTARY TOOLS

Kjell Andersson, Fagersta, Sweden, assignor to Seco Tools AB, Fagersta, Sweden

Filed Aug. 24, 1983, Ser. No. 526,078

Claims priority, application Sweden, Nov. 12, 1982, 8206434

Int. Cl.<sup>4</sup> B23B 39/00

U.S. Cl. 408-150

8 Claims

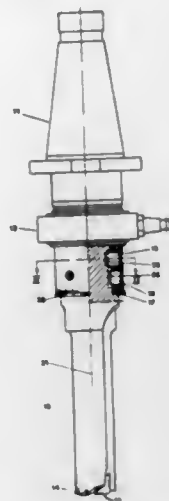
1. A rotary cutting tool such as a drill or shank end mill, comprising:

a tool holder rotatable about a first axis,  
a sleeve carried by said tool holder and rotatable relative thereto about a second axis,  
a tool element including generally radially disposed cutting edge means having a radially inner end situated immediately adjacent said first axis, said tool element mounted in said sleeve such that said sleeve is rotatable relative to said tool element about a third axis spaced from, and disposed parallel to, said second axis such that rotation of said sleeve displaces said third axis relative to said first and second axes along an arcuate path of adjustment to vary the size of a hole being cut by said cutting edge means, said sleeve being arranged such that said second axis is



spaced from, and disposed parallel to, said first axis to minimize the distance by which said inner end of said cutting edge means becomes spaced from said first axis during travel of said third axis along said path of adjustment,

a stop member extending between said holder and said tool element for maintaining a constant rotational position of said tool element with respect to said holder following a rotation of said sleeve, and



said third axis being movable along said path of adjustment between a maximum diameter cutting position and a minimum diameter cutting position of said cutting edge means, said inner end of said cutting edge means being spaced farther from said second axis when said third axis is disposed intermediate said maximum and minimum diameter cutting positions than when said third axis is at either of said cutting positions.

4,679,973

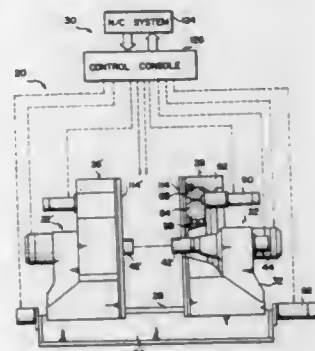
## CRANKSHAFT MILLING MACHINE

Kazuo Kodama, Komatsu, and Keishi Morikawa, Fukui, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,948

Int. Cl.<sup>4</sup> B23C 3/06

U.S. Cl. 409—200



1. A milling machine for machining crankshaft or the like, comprising

(a) means for holding a workpiece generally oriented in a first direction;

(b) a slide reciprocally movable relative to the holding

means in a second direction at right angles with the first direction;

(c) means for controllably moving the slide back and forth in the second direction during machining;

(d) a tool holder rotatably mounted to the slide for rotation about an axis extending generally parallel to the first direction;

(e) means for controllably and angularly reciprocating the tool holder relative to the slide in opposite angular directions within specific limits during machining;

(f) an annular cutting tool rotatably mounted to the tool holder in an eccentric position thereon for bi-directional rotation about an axis extending generally parallel to the first direction, the cutting tool having internal cutting edges bounding a space for receiving with clearance the workpiece being held by the holding means; and

(g) means for revolving the cutting tool relative to the tool holder.

4,679,974

## VEHICLE CHOCK BLOCK APPARATUS FOR RAILROAD CAR TRANSPORT OF VEHICLES

Donald J. Blunden, Plymouth, Mich., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

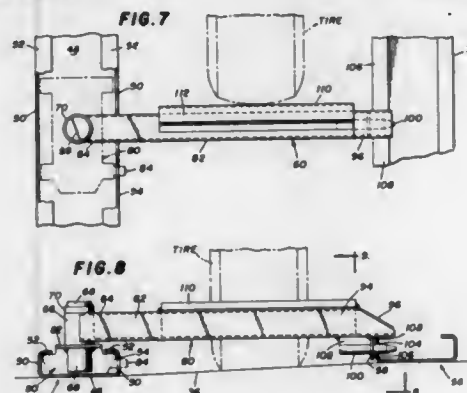
Filed Oct. 28, 1985, Ser. No. 792,306

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> B60P 3/07; B60T 3/00

U.S. Cl. 410—30

12 Claims



1. A railroad car having at least one deck for supporting and transporting four-wheel vehicles such as automobiles and trucks;

a pair of spaced apart first and second parallel tracks, secured to the deck longitudinally of the railroad car, having clearance for the wheels on one side of the vehicle to roll between the tracks;

a pair of movable chock block means for each vehicle transported on the deck to secure the vehicle against longitudinal movement;

each chock block means including a substantially horizontal bar with a first end and a second end;

a carriage permanently secured to the first track so that it cannot be removed from the first track but so that it can be moved along the longitudinal axis of the first track without rotation about a vertical axis;

means connecting the bar first end to the carriage so that the bar first end can rotate about a substantially vertical axis at least about 90°;

the carriage having means for releasably securing the carriage in a fixed position along the first track;

the bar second end having means for releasably securing the bar second end in a fixed position along the second track wherein release of the bar second end from fixed position along the second track requires displacement of the bar

first end along the first track for a short distance and securing the bar second end in fixed position along the second track requires displacement of the bar first end along the first track for a short distance.

4,679,975

## NAIL STRIP WITH COVERED WIRE ATTACHING MEANS

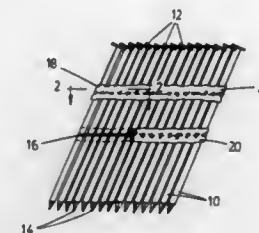
Herbert E. Leistner, 167 Sweeney Drive, Toronto, Ontario, Canada

Filed Apr. 29, 1986, Ser. No. 857,184

Int. Cl.<sup>4</sup> F16B 15/08

U.S. Cl. 411—443

7 Claims



1. A nailing strip for use in a power-operated nailing hammer of the type wherein the operation of said nailing hammer separates a nail from said strip, and drives said nail into a workpiece, and which nailing strip comprises:

a plurality of nails each having a cylindrical shaft and arranged in a strip with said shafts thereof disposed in mutually parallel and spaced apart disposition;

two mutually spaced apart and mutually parallel flexible junction wire means extending across said nailing strip and welded to the cylindrical shaft of each said nail in said strip; and,

flexible and breakable sheath means covering and extending completely around each said wire means between adjacent ones of said nails and over an outer surface of each said junction wire means at each of said nails thereby to enhance the severing of said wire means during driving of a said nail from said strip.

4,679,976

## MANIPULATOR USABLE FOR A GLASS ELECTRODE OR THE LIKE

Eiichi Narishige, and Shinji Yoneyama, both of Tokyo, Japan, assignors to Narishige Scientific Instrument Laboratory, Ltd. and Narishige Corporation Limited, both of Tokyo, Japan

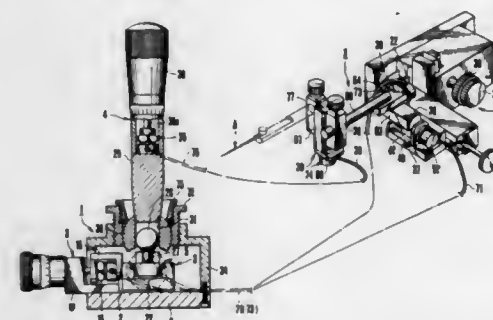
Filed Aug. 2, 1985, Ser. No. 761,802

Claims priority, application Japan, May 17, 1985, 60-105319

Int. Cl.<sup>4</sup> B25J 13/02

U.S. Cl. 414—4

5 Claims



1. A manipulator for manipulating a glass electrode comprising:

an actuating section having the glass electrode mounted thereon, said actuating section including an X-coordinate displacing means for displacing said electrode in an X-

coordinate direction, a Y-coordinate displacing means for displacing said electrode in a Y-coordinate direction, and a Z-coordinate displacing means for displacing said electrode in a Z-coordinate direction, each of said X-coordinate, Y-coordinate and Z-coordinate displacing means including a hydraulic cylinder filled with a hydraulic medium; and

a driving section for driving said actuating section, said driving section including a X-Y coordinate plane driving means, said X-Y coordinate plane driving means comprising an X-coordinate rectilinear driving means and a Y-coordinate rectilinear driving means and a tiltable lever including a Z-coordinate driving means and operatively coupled to said X-Y coordinate plane driving means, each of said X-coordinate, Y-coordinate and Z-coordinate driving means including a hydraulic cylinder filled with a hydraulic medium, the hydraulic cylinder of the X-coordinate rectilinear driving means being in hydraulic communication with the hydraulic cylinder of the Y-coordinate rectilinear driving means being in hydraulic communication with the hydraulic cylinder of the Y-coordinate displacing means and the hydraulic cylinder of the Z-coordinate driving means being in hydraulic communication with the hydraulic cylinder of the Z-coordinate displacing means;

each said hydraulic cylinder of said displacing means including a very small diaphragm; and

each of the displacing means including a baseboard to which a respective hydraulic cylinder is fixedly secured; a slider slidably mounted on said baseboard, said slider including a piston rod means which extends towards said respective hydraulic cylinder, a forwardmost end of said piston rod means operatively engaging the diaphragm of said respective hydraulic cylinder; an end plate member mounted to said baseboard adjacent a rearward end of said slider; and a return spring means extending from said end plate member into an elongated hole defined in said slider for urging said piston rod means into engagement with said diaphragm.

4,679,977

## AUTOMATIC GUIDED VEHICLE

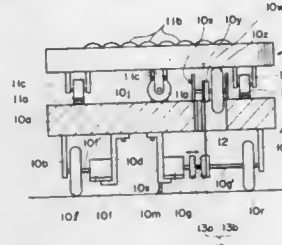
Hideaki Minami, Osaka, Japan, assignor to Tsubakimoto Chain Co., Japan

Filed Nov. 4, 1985, Ser. No. 794,647

Int. Cl.<sup>4</sup> B60P 1/52

U.S. Cl. 414—533

5 Claims



1. An automatic guided vehicle comprising a travelling truck being provided with power sources, driving wheels driven by said power sources respectively, said power sources selectively driving said driving wheels at different speeds for steering.

a loading table for loading an object to be conveyed, being provided above said travelling truck and capable of horizontal turn about a vertical axis, and

a turning means for said loading table, which selectively turns said loading table relative to said travelling truck, said turning means for said loading table makes said loading table turn in the reverse direction with respect to said

travelling truck and at an amount equal to the whirling amount of said travelling truck when said travelling truck whirled for steering.

4,679,978

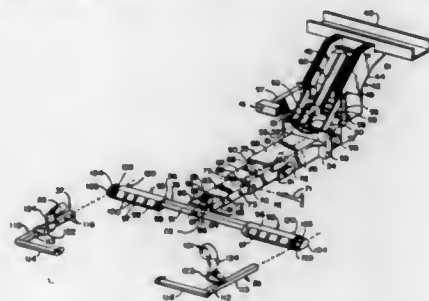
## WHEEL LIFT TOWING ASSEMBLY

Gerald E. Holmes, Chattanooga, Tenn., and Jerry E. Pace, Rossville, Ga., assignors to Century Wrecker Corporation, Ooltewah, Tenn.

Continuation of Ser. No. 530,517, Sep. 9, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 702,739

Int. Cl.<sup>4</sup> B60P 3/12

U.S. Cl. 414-563



1. Apparatus for installation to a tow truck with a low profile rear end comprising a telescoping tow bar assembly means for lifting and towing wheeled vehicles in a position such that a portion of the front end of said towed vehicle extends over the rear end of the truck, said tow bar assembly means having a forward end and a rear end with its forward end extending under the rear portion of said tow truck and with its rear end extending rearwardly from the tow truck, a cross arm pivotally connected between its ends about a vertical pivot axis to the rear end of said tow bar assembly, first and second L-shaped wheel cradles mounted to respective opposite end portions of said cross arm, each said wheel cradle being adapted to confine a wheel of a vehicle to be towed against said respective portion of said cross arm with one portion of said wheel cradle parallel to said cross arm and against a lower circumferential surface portion of said wheel, and a second portion of said wheel cradle coupling said first portion to said respective portion of said cross arm, said wheel cradles being movable along said cross arm closer together or further apart to receive wheels of vehicles of various widths, extension means coupled to said tow bar assembly for telescoping the tow bar assembly to move said cross arm toward and away from the tow truck, support means comprising parallel linkage projecting under the low profile rear end of the tow truck and extending downward to engage said tow bar assembly to retain said tow bar assembly in a substantially horizontal attitude while allowing elevation thereof, and elevation means extending through and coupled to said support means and adapted to move said cross arm, said extension means and said tow bar assembly between a lowest position substantially on the ground and a highest position above the ground, whereby at the lowest position said wheel cradles can capture the front or rear wheels of a wheeled vehicle and the tow bar assembly and the cross arm can be elevated by said elevation means and retracted by said extension means so as to maintain said pivot axis in a substantially vertical orientation and raise and move the forward portion of the towed vehicle to a position adjacent the rear wheels of the tow truck.

4,679,979

## METHOD OF UNLOADING LARGE CONTAINERS

Robert Rasmussen, Berlin, N.J., assignor to Accurate Industries, Inc., Williamstown, N.J.

Division of Ser. No. 468,319, Feb. 22, 1983, Pat. No. 4,599,040.

This application Dec. 9, 1985, Ser. No. 806,911

Int. Cl.<sup>4</sup> B60P 1/48

U.S. Cl. 414-786

4 Claims



1. A method for unloading a plurality of at least four large containers, each of the type including a floor, a right side wall, a left side wall, a front wall and at least one bottom rail affixed to the floor from a trailer to the ground by moving the trailer, the trailer being of the type having at least one main rail having a top surface and a plurality of rollers rotatively secured to the main rail comprising the steps of  
positioning a first portion of at least two of the containers upon a forward part of the trailer and supporting a bottom rail of only one of the containers on some of the rollers; nesting the first portion of containers prior to moving, the nest comprising revolving the said container not having its bottom rail on the rollers and resting a sidewall of the said container upon the floor of the container having its bottom rail supported on the roller;  
positioning a second portion of at least two of the containers upon a rearward part of the trailer and supporting a bottom rail of only one of the second portion of the containers upon others of the rollers;  
rearwardly moving the trailer a short distance and suddenly stopping the rearwardly moving trailer; and  
moving the first and second portions of the containers on the rollers relative to the trailer when the rearward trailer movement stops, and moving all of the containers off of the trailer.

4,679,980

## GRAVITY INSENSITIVE INVENTORY CONTROL DEVICE FOR A TWO-PHASE FLOW SYSTEM

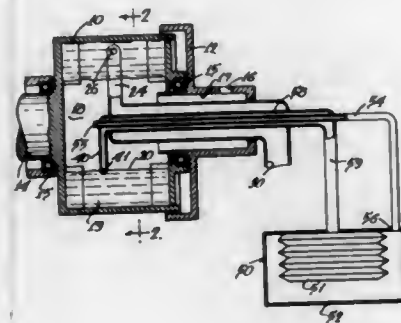
Timothy J. Bland, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 27, 1984, Ser. No. 686,982

Int. Cl.<sup>4</sup> B04B 11/02; B01D 19/00

U.S. Cl. 415-24

12 Claims



11. A liquid inventory control device for a flow system wherein said liquid changes phase to a vapor and back and a pitot pump separates vapor from liquid and pumps the liquid to a component of the flow system comprising, a liquid storage device for storing liquid under pressure, a tube positioned within the pitot pump and in open communication with the

liquid storage device, and said tube having an opening positioned within the pitot pump at a location to establish a desired liquid level in the pitot pump and at which level the pressure at the pitot tube inlet will equal the liquid pressure at the liquid storage device.

4,679,981

## TURBINE RING FOR A GAS TURBINE ENGINE

Alain J. E. Guilbert, Savigny le Temple; Roland R. Mestre, Melun, and Remy P. C. Ritt, Vaux Le Penil, all of France, assignors to S.N.E.C.M.A., Paris, France

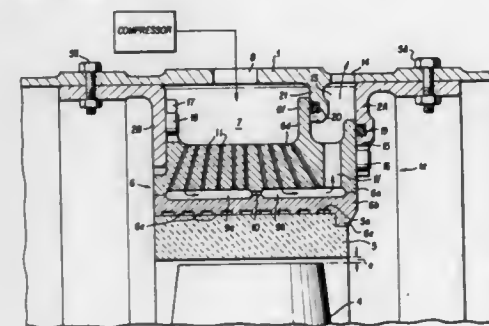
Filed Nov. 15, 1985, Ser. No. 798,318

Claims priority, application France, Nov. 22, 1984, 84 17775

Int. Cl.<sup>4</sup> F04D 29/58

U.S. Cl. 415-116

7 Claims



1. A turbine ring for a gas turbine comprising:  
a turbine casing;  
an annular metallic carrier mounted within the casing;  
a one-piece ring of ceramic abrasion material mounted within the annular carrier, said carrier having means for reducing heat transfer from said ceramic ring to said carrier and means for applying a compression force to the ceramic ring under all operational phases of the gas turbine;  
means connected to a bleed of a compressor of said gas turbine for supplying cooling fluid to the annular carrier; and  
means for regulating the supply of cooling fluid to the annular carrier, whereby only the temperature of the annular carrier is controlled,  
wherein said means for reducing heat transfer includes means for providing a small cross-section of contact between said ceramic ring and said carrier, said means for providing a small area of contact comprising a plurality of projections which extend radially between juxtaposed surfaces of the ceramic ring and the annular carrier, and wherein said means for supplying cooling fluid to the annular carrier lacks means to cool directly other parts of the turbine ring and comprises:  
(a) fluid distribution chamber means defined by the turbine casing and an annular outwardly opening casing of the annular carrier,  
(b) cavity means in the annular carrier adjacent a radially inner surface thereof,  
(c) aperture means in the annular carrier for providing communication between the distribution chamber means and said cavity means, and  
(d) exhaust duct means for exhausting the fluid from said cavity means, said exhaust duct means comprising an opening in said turbine casing, and annular collection chamber in said turbine casing and communicating said annular collection chamber with said cavity means.

4,679,982

## COMPRESSOR BLOW-OFF ARRANGEMENT

Jean G. Boullier, Brunoy, and Gérard E. A. Jourdain, Saintry sur Seine, both of France, assignors to Société Nationale d'Etude et de Construction de Moteur d'Aviation "S. N. E. C. M. A.", Paris, France

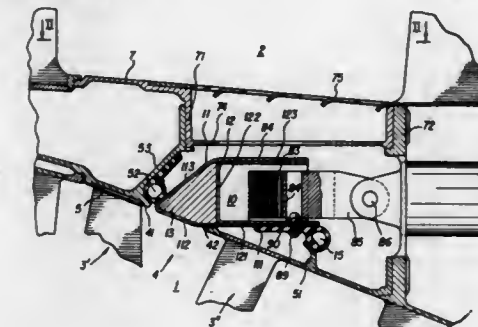
Filed Sep. 6, 1985, Ser. No. 773,226

Claims priority, application France, Sep. 6, 1984, 84 13694

Int. Cl.<sup>4</sup> F04D 27/02

U.S. Cl. 415-145

9 Claims



1. An axial flow compressor of a turbo-jet engine, comprising:  
a compressor casing,  
means defining inner and outer walls of the air flow path having an annular opening therein for controlled blow-off of the air flow,  
an annular movable assembly for opening and closing the said annular opening, and  
means supporting the annular assembly on the compressor casing, said support means comprising a resiliently deformable body with  
at least one elastomer plate, and  
at least two rigid plates secured to opposed faces of the elastomer plate,  
one of the rigid plates being secured to the annular assembly and the other rigid plate being rigid with the said casing, all the plates lying in planes parallel to the direction of movement of the annular assembly.

4,679,983

## WATER PUMP FOR WINDOW WASHER UNIT

Erwin Pietryk, Cologne, and Axel Ranthmann, Pulheim, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 594,517, Mar. 29, 1984, abandoned.

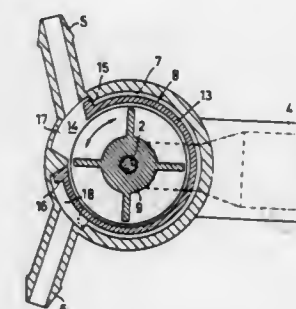
This application Jul. 10, 1986, Ser. No. 883,449

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317155

Int. Cl.<sup>4</sup> F01D 1/30

U.S. Cl. 415-152 A

2 Claims



1. A water pump for a window washer unit of a vehicle, the



pump having a reversible motor, one inlet port and two outlet ports and being arranged to deliver water selectively to either one of the outlet ports in dependence upon the direction of rotation of the motor, wherein the pump comprises an impeller rotatable in a pump housing and a valve body surrounding the impeller, defining the outer periphery of the pump outlet from the impeller, and movable in dependence upon the direction of rotation of the motor to close the other of the two outlet ports, the valve body being in the form of a drum having a slotted hub which is urged by a clamping ring into frictional engagement with the drive shaft to constitute a slipping clutch, and the outer surface of the drum having at least one radially projecting stop cooperating with abutments in the pump housing to define predetermined end positions for the drum in which a radial opening in the drum is selectively aligned with one or the other of the two outlet ports and the remaining outlet port is closed off by the drum.

4,679,984

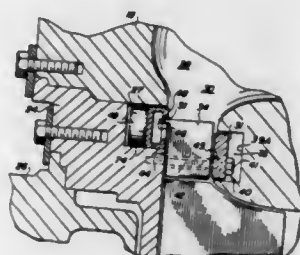
# ACTUATION SYSTEM FOR VARIABLE NOZZLE TURBINE

William R. Swihart, Torrance, and Edwin R. Deacon, Rolling Hills Estates, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 11, 1985, Ser. No. 807,916  
Int. Cl.<sup>4</sup> F01B 25/02

U.S. Cl. 415-163

28 Claims



1. A turbocharger, for use in association with an engine, comprising:
  - an exhaust gas driven turbine rotatably mounted to a shaft having a compressor impeller thereon;
  - a compressor housing enclosing said compressor impeller;
  - a center housing including bearing means for rotatably supporting the shaft;
  - a turbine housing forming a volute therein for directing exhaust gas from said engine to said shaft;
  - a backplate mounted between said center housing and said turbine housing and defining an annular cavity therearound;
  - an annular unison ring positioned within said annular cavity of said backplate;
  - a turbine side wall, independent of said turbine housing, said side wall defining one side of an annular passage, said unison ring and backplate defining the other side;
  - a plurality of vanes pivotably mounted between said backplate and said turbine side wall;
  - means for pivoting said plurality of vanes; and
  - at least three spacers between said backplate and said turbine side wall.

## ENERGY CONVERTER

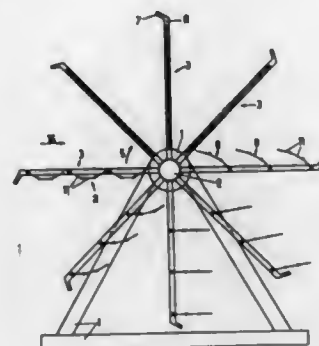
Louis Worms, Fruithoffaan 107-8b Box 114, B-2600 Berchem, Belgium  
PCT No. PCT/NL84/00031, § 371 Date May 10, 1985, § 102(e) Date May 10, 1985, PCT Pub. No. WO85/01325, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 17, 1984, Ser. No. 740,068

Claims priority, application Belgium, Sep. 16, 1983, 2/60204  
Int. Cl.<sup>4</sup> F03D 3/00

U.S. Cl. 416-119

5 Claims



1. An energy converter, comprising:
  - a frame;
  - a rotor mounted in said frame and including
    - a rotor shaft, and
    - a plurality of vanes, each of said vanes having two parallel spokes defining a main vane plane passing through the shaft,
    - a plurality of blades, each of said blades having
      - a middle leaf, a first adjacent leaf and second adjacent leaf,
      - first means connecting said middle leaf to said first adjacent leaf and to said second adjacent leaf about first geometrical axes parallel to said shaft, and
      - second means comprising stops secured to each middle leaf limiting in a first direction the relative hinging of said middle leaf to said first adjacent leaf and the relative hinging of said second adjacent leaf to said middle leaf about said first geometrical axes up to a position wherein said first adjacent leaf, said middle leaf and said second adjacent leaf extend in a single plane,
      - third means for each of said blades connecting hingedly the first adjacent leaf to said spokes about a second geometrical axis parallel to said shaft, the blades thus hinging relative to said spokes about said second geometrical axis, and
      - stops on said spokes for each of said blades limiting, in a second direction opposite to said first direction, the relative hinging of said blades about said second geometrical axis; and
      - an element for connecting the rotor shaft to an energy-converting mechanism.

4,679,986

# ENERGY CONSERVING REFRIGERATION APPARATUS AND METHOD

Milburn E. Dupre, 2105 Chapel Dr., Fairborn, Ohio 45324  
Filed Nov. 20, 1984, Ser. No. 673,320

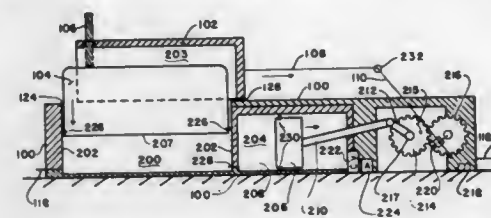
Int. Cl.<sup>4</sup> F04B 25/00, 35/00

U.S. Cl. 417-53

12 Claims

12. A method for compressing a working fluid vapor in a refrigeration cycle comprising the steps of:
  - moving a compression member away from a home position through a vapor intermediate-pressure compressing stroke

by exposing said compression member to atmospheric pressure; returning said compression member to said home position with the urging of exposure to a below atmospheric pressure plenum; applying prime mover derived additional compression to



said vapor, raising said vapor thereby to a pressure corresponding to temperature exceeding the available condensing fluid temperature; and maintaining said below atmospheric pressure at a substantially constant value by intermittently removing leaked atmospheric gases and working fluid vapor from said from said below atmospheric pressure plenum.

4,679,987

# SELF-PRIMING LIQUID RING PUMP METHODS AND APPARATUS

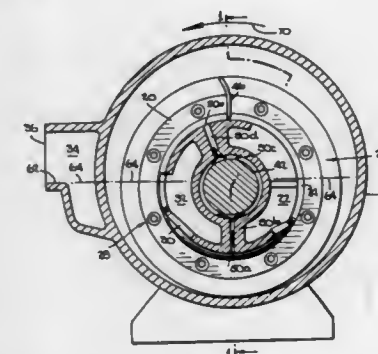
Ole B. Olsen, Newtown, Conn., assignor to The Nash Engineering Company, Norwalk, Conn.

Filed May 19, 1986, Ser. No. 864,269

Int. Cl.<sup>4</sup> F04C 19/00

U.S. Cl. 417-54

14 Claims



1. A liquid ring pump comprising:
  - an annular housing;
  - a gas inlet for admitting to the housing gas to be pumped;
  - a gas outlet for discharging from the housing pumped gas;
  - a rotor rotatably mounted in the housing for cooperating with pumping liquid in the housing to convey gas from the gas inlet to the gas outlet; and
  - a bypass conduit extending from an inlet beyond the gas outlet but before the gas inlet in the direction of rotor rotation to an outlet located beyond the gas inlet but before the gas outlet in the direction of rotor rotation, the bypass conduit inlet being located below the level of the pumping liquid with which the pump is supplied prior to being started from a standstill, the bypass conduit outlet being located above said starting pumping liquid level, and the bypass conduit conveying pumping liquid from its inlet to its outlet during start-up to help the pump establish a gas pressure differential between the gas inlet and gas outlet.
10. The method of operating a liquid ring pump having (a) an annular housing; (b) a gas inlet for admitting to the housing gas to be pumped; (c) a gas outlet for discharging from the housing pumped gas; (d) a rotor rotatably mounted in the

housing for cooperating with pumping liquid in the housing to convey gas from the gas inlet to the gas outlet; and (e) a bypass conduit extending from an inlet located beyond the gas outlet but before the gas inlet in the direction of rotor rotation to an outlet located beyond the gas inlet but before the gas outlet in the direction of rotor rotation, the bypass conduit inlet being located below the bypass conduit outlet, the method comprising the steps of:

- providing in the pump while the rotor is at a standstill a quantity of pumping liquid sufficient to submerge the bypass conduit inlet;
- rotating the rotor to create a relatively high pressure in the pumping liquid adjacent to the bypass conduit inlet, and to thereby cause pumping liquid to flow from the bypass conduit inlet through the bypass conduit and out the bypass conduit outlet to help enable the pump to reduce the gas pressure adjacent to the gas inlet relative to the gas pressure at the gas outlet; and
- supplying additional pumping liquid to the pump at approximately the gas pressure at the gas outlet so that the reduced gas pressure adjacent the gas inlet is effective to pull the additional pumping liquid into the pump.

4,679,988

# TWO-RANGE PRESSURE CONTROL SYSTEM

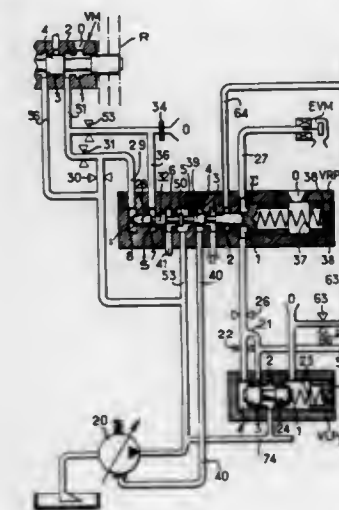
Francois Leorat, Versailles; Patrick Coutant, Rueil Malmaison, and Paul Aubert, Clamart, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 18, 1985, Ser. No. 777,326

Claims priority, application France, Sep. 18, 1984, 84 14261  
Int. Cl.<sup>4</sup> F04B 47/00; G05D 16/00

U.S. Cl. 417-218

10 Claims



1. A pressure control system comprising:
  - variable capacity means for providing a hydraulic line pressure; and
  - means for adjusting said line pressure, comprising:
    - (a) a pressure control valve,
    - (b) a first spool movable in said pressure control valve,
    - (c) spring means in said pressure control valve for biasing said first spool in a first direction,
    - (d) means for supplying a controlled hydraulic reference pressure to a differential section of said first spool for moving said first spool in a direction opposite said first direction,
    - (e) means for modulating said reference pressure,
    - (f) a second spool in said pressure control valve, said second spool being movable in said direction opposite said first direction into contact with said first spool,
    - (g) means for varying said variable capacity means in response to movement of said first spool,

- (h) means for supplying hydraulic pressure to said second spool for moving said second spool in said direction opposite said first direction, comprising:
- a first hydraulic line connected to said pressure control valve for supplying hydraulic pressure to said second spool,
  - a manual valve movable into two positions for selectively connecting said first line to one of said line pressure and zero pressure,
  - a second hydraulic line connected between said first hydraulic line and a source of said line pressure,
  - a first restriction in said first line at a position between said manual valve and a point of connection with said second line, and
  - a second restriction in said second line, whereby when said manual valve is in a position for connecting said first line to zero pressure, said first and second restrictions define a hydraulic potentiometer reducing said line pressure.

4,679,989

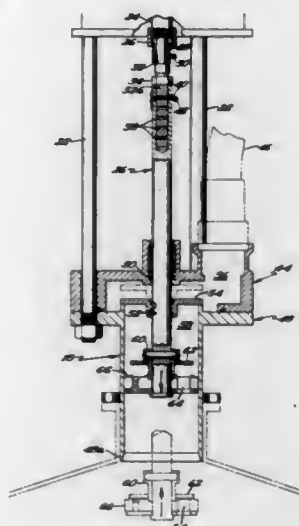
## PUMP SHOVEL BULK UNLOADER

Charles E. Harriman, Bloomington, and Donald S. Nii, Arlington Heights, both of Ill., assignors to Graco Inc., Minneapolis, Minn.

Filed Jul. 16, 1986, Ser. No. 887,023  
Int. Cl.<sup>4</sup> F04B 7/04

U.S. Cl. 417-238

7 Claims



1. A pump for pressurizing and transporting materials of varying viscosity, said pump comprising:
  - a cylinder having an open bottom end;
  - a piston reciprocally located in said cylinder and having top and bottom surfaces;
  - a reciprocating source of power;
  - a connecting rod connecting said piston and said power source, said piston oscillating between top and bottom positions; and
  - means for adjusting the bottom position of said piston between a first position wherein said piston is located in said cylinder and a second position wherein said piston extends outside said open bottom end.

4,679,990

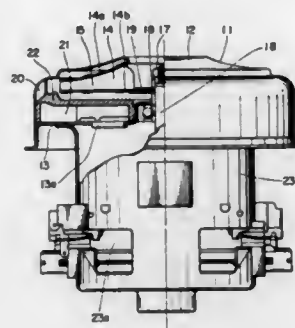
## ELECTRIC BLOWER

Izumi Yamaura, Toyonaka; Masami Fukumoto, Ikeda, and Masao Torigoe, Itami, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Filed Dec. 12, 1985, Ser. No. 808,030

Claims priority, application Japan, Dec. 28, 1984, 59-280375; Dec. 28, 1984, 59-280376; Dec. 28, 1984, 59-280409  
Int. Cl.<sup>4</sup> F04D 29/66; F04B 17/00

U.S. Cl. 417-312

6 Claims



1. An electric blower comprising an impeller of the centrifugal type driven by a motor, an air guide having a diffuser including a plurality of divergent passages into which air flow discharged from said impeller flows and a return passage subsequently directing the air flow from said divergent passages into the interior of said motor, a casing having therein said impeller and said air guide, a guide wall forming said return passage comprising inner guide wall sections, outer guide wall sections and spaces interposed between each inner guide wall section and the corresponding outer guide wall section, an opening being formed at the inner terminal end of each of said spaces, the terminal end of each inner guide wall section at the side of the center of said air guide being set to be directed substantially toward the center of said air guide, the terminal end of each outer guide wall section at the side of said air guide being set to be directed to a point intermediate the length of a line connecting said terminal end of said inner guide wall section and the center of said air guide.

4,679,991

## SUBMERSIBLE PUMP AND WASTEWATER BASIN APPARATUS

Joe A. Harbison, Gladstone, Mo.; Nyle D. LaGrange, and Darryl M. Nielsen, both of Lenexa, Kans., assignors to The Marley-Wylain Company, Mission Woods, Kans.

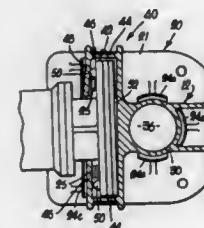
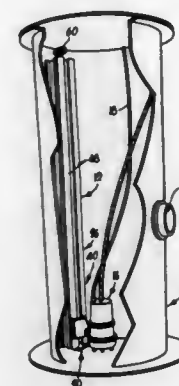
Filed Jan. 21, 1986, Ser. No. 820,692  
Int. Cl.<sup>4</sup> F04B 17/00, 35/00

U.S. Cl. 417-360

11 Claims

1. A tank mounted discharge conduit assembly for use with a submersible pump unit having an outlet flange comprising:
  - a base member connected to said tank; and
  - an upright body having a lowermost end, said body having elongated walls defining a fluid conduit extending at least partially through said body and through said lowermost end,
  - said body having an opening spaced from said end and extending transversely through said walls, said opening being in communication with said conduit,
  - said base member having an upwardly extending portion complementally received in said conduit adjacent said lowermost end to thereby provide support against lateral deflection of said body,
  - said body having structure adapted to support said outlet flange of said submersible pump unit in adjacent relation to said opening to thereby establish a fluid flow path from said pump unit, through said opening and to said conduit,

said structure defining an elongated channel for slidably receiving said outlet flange, said structure including a pair of upright, spaced, U-shaped guides,



said guides having yieldable wall portions for accommodating movement of said flange in a direction generally laterally of the longitudinal axis of said channel.

4,679,992

## TURBO-COMPOUND COMPRESSOR SYSTEM

Kinichiro Watanabe, Kanuma; Kunio Horai, Oyama; Tomoyuki Mashiko, Oyama; Hltoshi Kato, Oyama; Hiromasa Yamaguchi, Oyama, and Toshihiko Nishiyama, Oyama, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

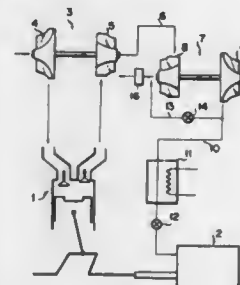
Filed Oct. 1, 1984, Ser. No. 656,374

Claims priority, application Japan, Sep. 29, 1983, 58-149528[U]

Int. Cl.<sup>4</sup> F04B 17/00

U.S. Cl. 417-364

14 Claims



1. In a turbo-compound compressor system including a booster compressor connected to a power recovery turbine which is disposed downstream of the outlet of an expansion turbine in a turbocharger for an internal combustion engine and drivable by the exhaust gas of said engine, and a rotary positive-displacement air compressor drivable by said engine, the air delivered by said booster compressor being supplied to said rotary positive-displacement air compressor through a pipeline means having a throttle valve, the improvement

which comprises a bypass line connected to said pipeline means for preventing surging and having a closing valve.

4,679,993

## FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

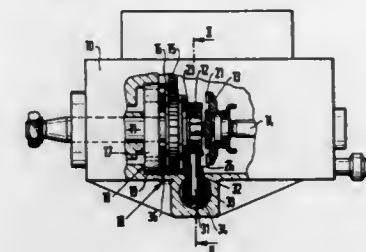
Siegfried Haberland, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Apr. 18, 1986, Ser. No. 853,316

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516867

Int. Cl.<sup>4</sup> F04B 7/06; F16H 25/08

U.S. Cl. 417-490

3 Claims



1. A fuel injection pump for internal combustion engines, in particular a distributor injection pump, comprising a pump and distributor member that both reciprocates axially and simultaneously rotates within a housing and is rotatably connected to a drive shaft via a coupling, said pump and distributor member further having a cam stroke disk provided with cams arranged to be driven by a drive shaft via a roller ring, said roller ring being rotatable in the housing about a predetermined angle coaxially with the drive shaft and having roller ring rollers through which the cam stroke disk cams are driven, said housing being provided with a stationary support ring which axially supports the roller ring, said stationary support ring having an axis and being provided on a surface thereof which rests on the roller ring with indentations embodied as flutes extending radially with respect to the axis of the stationary support ring.

4,679,994

## PISTON VACUUM PUMP

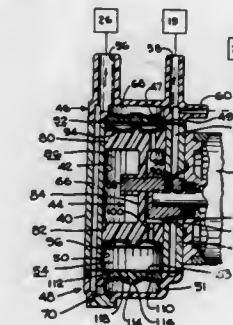
George E. Brown, Niles, Mich., assignor to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 242,000, Mar. 9, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 507,891

Int. Cl.<sup>4</sup> F04B 21/02, 21/04

U.S. Cl. 417-525

4 Claims



3. In a piston pump, the combination of a housing forming a bore, a piston reciprocally disposed within said bore, a pair of covers engageable with said housing to substantially enclose said piston within the bore, said pair of covers cooperating with said housing and said piston to substantially define a pair of variable volume chambers, said piston defining a central



cavity, an input member extending into said central cavity and engaging said piston to impart reciprocating movement thereto, said piston carrying a pair of check valves permitting one way fluid communication between said central cavity and said pair of variable volume chambers, and said housing including an opening for receiving said input member, said opening also providing fluid communication directly between said central cavity and the outside of the bore when said piston is reciprocating, the fluid communication directly between said central cavity and the outside of the bore being primarily through said opening when said piston is reciprocating.

4,679,995

# VARIABLE CAPACITY TYPE PUMP WITH DAMPING FORCE ON CAM RING

Ian T. Bristow, Higham, England, assignor to Hobourn-Eaton, Ltd., Kent, England

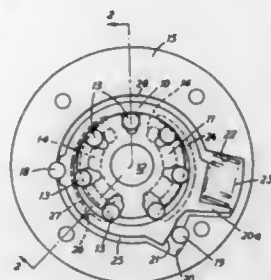
Filed Jul. 5, 1985, Ser. No. 751,974

Claims priority, application United Kingdom, Jul. 5, 1984, 8417148

Int. Cl. F04C 2/344, 15/04

U.S. Cl. 418—26

6 Claims



1. A variable capacity pump incorporating inlet and outlet ports and comprising a rotary carrier having slots at its periphery, piston elements mounted in the slots for radial movement, a cam ring encircling the carrier, the radially inner surface of said cam ring being engaged by the piston elements to pump working fluid from the inlet port to the outlet port of the pump, a casing within which the cam ring is mounted for guided movement to adjust the position of the cam ring relative to the axis of rotation of the carrier and hence the output of the pump, resilient means urging the cam ring into a position in which the quantity of fluid delivered is a maximum, means defining between the casing and the cam ring a first chamber communicating with said outlet port, the fluid pressure in said first chamber acting on the cam ring in opposition to the resilient means, and means whereby a damping force is applied to movement of the cam ring which damping force increases with movement of the cam ring to increase the output of the pump and decreases with movement of the cam ring to reduce the output of the pump.

4,679,996

# ROTARY MACHINE HAVING SCREW ROTOR ASSEMBLY

Masanori Tanaka, Niigata; Atsushi Maehara, Bunsuimachi, and Junichi Kanai, Yoshidamachi, all of Japan, assignors to Hoketsu Industries Co., Ltd., Nishikanbara, Japan

Filed Jan. 26, 1986, Ser. No. 878,800

Claims priority, application Japan, Jun. 29, 1985, 60-99297[U]

Int. Cl. F04C 18/16

U.S. Cl. 418—201

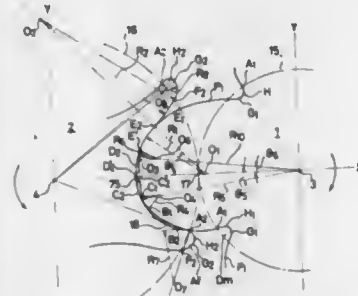
3 Claims

1. A rotary machine having screw rotor assembly comprising a casing having an inner peripheral wall formed by two intersecting cylindrical wall surfaces whose axes are in parallel with each other and two end walls disposed vertically with respect to said axes at each axial end of said inner peripheral wall for forming a closed space in said casing, a male rotor having helical protrusions in the outer periphery thereof and a

female rotor having helical concaves in the outer periphery thereof for receiving said protrusions of said male rotor, said male and female rotors being disposed within said closed space formed in said casing to be rotatable and meshed with each other and an inlet and an outlet ports formed in said casing connected with said closed space formed in said casing, respectively, whereby a compressible fluid introduced in an acting space formed by both said rotors and inner peripheral walls of said casing through said inlet port is compressed or expanded during the rotation of said rotors and is discharged from said outlet port, characterized in that,

a contour line of a tooth profile in a plane perpendicular to a rotating axis of said female rotor is such that a major concave portion except an addendum (Af) formed outside a pitch circle of meshing rotation with the male rotor is formed inside said pitch circle and a contour line of a tooth profile in a plane perpendicular to a rotating axis of said male rotor is such that a major portion except a dedendum (Dm) formed inside a pitch circle of meshing rotation with the female rotor is formed outside said pitch circle;

the tooth profile of the female rotor is formed such that a first portion (G<sub>2</sub>-H<sub>2</sub>) connecting two outermost points (G<sub>2</sub>) and (H<sub>2</sub>) located on tip of said addendum (Af) is formed by a circular arc having a radius equal to the outer diameter of said female rotor and a center of the arc being located at a rotating axis of said female rotor; a second portion (H<sub>2</sub>-A<sub>2</sub>) connecting said point (H<sub>2</sub>) and a point (A<sub>2</sub>) located on the pitch circle of said female rotor is



generated by a point (A<sub>1</sub>) located on the pitch circle of the male rotor tooth profile; a third portion (A<sub>2</sub>-B<sub>2</sub>) connecting said point (A<sub>2</sub>) and a point (B<sub>2</sub>) is formed by a convex circular arc having a radius (R<sub>7</sub>) and a center (O<sub>7</sub>) of the arc being located on a line tangent to the pitch circle of the female rotor at said point (A<sub>2</sub>) and outside the tooth profile of the female rotor; a fourth portion (B<sub>2</sub>-C<sub>2</sub>) connecting said point (B<sub>2</sub>) and a point (C<sub>2</sub>) is formed by an envelope developed by a circular arc (B<sub>1</sub>-C<sub>1</sub>) which is a portion of the tooth profile of the male rotor; a fifth portion (D<sub>2</sub>-E<sub>2</sub>) connecting points (D<sub>2</sub>) and (E<sub>2</sub>) is formed by a concave circular arc having a radius (R<sub>1</sub>) and center (O<sub>1</sub>) of the arc being located on a line (3-4) connecting the rotation centers (3) and (4) of the male and female rotors and outside the pitch circle of the female rotor; a sixth portion (C<sub>2</sub>-D<sub>2</sub>) connecting said points (C<sub>2</sub>) and (D<sub>2</sub>) is formed by a common tangent or similar concave curve of said fourth portion (B<sub>2</sub>-C<sub>2</sub>) and fifth portion (D<sub>2</sub>-E<sub>2</sub>); a seventh portion (E<sub>2</sub>-F<sub>2</sub>) connecting said point (E<sub>2</sub>) and a point (F<sub>2</sub>) is formed by a convex circular arc having a radius (R<sub>2</sub>) and a center (O<sub>2</sub>) of the arc being located on an extension of line (O<sub>1</sub>-E<sub>2</sub>) intersecting at an angle (θ<sub>1</sub>) with said line (3-4) at a position opposite to the center (O<sub>1</sub>) of the fifth portion (D<sub>2</sub>-E<sub>2</sub>) with respect to the point (E<sub>2</sub>) and an eighth portion (F<sub>2</sub>-G<sub>2</sub>) is formed by convex circular arc having a radius (R<sub>3</sub>) and a center (O<sub>3</sub>) of the arc being located on a line connecting said center (O<sub>2</sub>) of said seventh portion (E<sub>2</sub>-F<sub>2</sub>) and said point (F<sub>2</sub>);

the tooth profile of the male rotor is formed such that a first

portion (H<sub>1</sub>-A<sub>1</sub>) connecting a point H<sub>1</sub> located on a bottom land (G<sub>1</sub>-H<sub>1</sub>) of the dedendum (Dm) and the point (A<sub>1</sub>) located on the pitch circle of the male rotor is a generated curve of the point H<sub>2</sub> located on the female rotor tooth profile; a second portion (A<sub>1</sub>-B<sub>1</sub>) connecting said point (A<sub>1</sub>) and a point (B<sub>1</sub>) is formed by an envelope developed by said the arc of said third portion (A<sub>2</sub>-B<sub>2</sub>) of the female rotor tooth profile; a third portion (B<sub>1</sub>-C<sub>1</sub>) connecting said point (B<sub>1</sub>) and a point (C<sub>1</sub>) is formed by a convex circular arc having a radius (R<sub>4</sub>) and a center (O<sub>4</sub>) of the arc being located on a line (3-O<sub>4</sub>) intersecting at an angle (θ<sub>5</sub>) with said line (3-4) connecting the rotating centers (3) and (4) of said male and female rotors and at a predetermined distance apart from said line (3-4); a fourth portion (E<sub>1</sub>-E<sub>1</sub>) connecting points (E<sub>1</sub>) and (E<sub>1</sub>) is formed by an envelope developed by said arc of said fifth portion (D<sub>2</sub>-E<sub>2</sub>) of the female rotor tooth profile; a fifth portion (E<sub>1</sub>-F<sub>1</sub>) is formed by an envelope developed by said seventh portion (E<sub>2</sub>-F<sub>2</sub>) of the female rotor tooth profile; a sixth portion (F<sub>1</sub>-G<sub>1</sub>) is formed by an envelope developed by said eighth portion (F<sub>2</sub>-G<sub>2</sub>) of the female rotor tooth profile and a seventh portion (C<sub>1</sub>-E<sub>1</sub>) is formed such that a portion (E<sub>1</sub>-D<sub>3</sub>) connecting said point (E<sub>1</sub>) and a point (D<sub>3</sub>) is formed by a convex circular arc having a radius (R<sub>6</sub>) and a center (O<sub>6</sub>) of the arc being located on a line (3-O<sub>6</sub>) intersecting at an angle (θ<sub>6</sub>) with said line (3-4) which is tangent to said fourth portion (E<sub>1</sub>-E<sub>1</sub>) at the point (E<sub>1</sub>); a portion (C<sub>1</sub>-WL<sub>1</sub>) connecting said point (C<sub>1</sub>) and a point (WL<sub>1</sub>) located at a predetermined distance apart from said line (3-4) and on the same side with the point (C<sub>1</sub>) with respect to said line (3-4) which is tangent to said third portion (B<sub>1</sub>-C<sub>1</sub>) at the point (C<sub>1</sub>); a portion (D<sub>3</sub>-WL<sub>2</sub>) connecting said point (D<sub>3</sub>) and point (WL<sub>2</sub>) located at a predetermined distance apart from said line (3-4) and on the same side with the point (D<sub>3</sub>) with respect to said line (3-4) which is tangent to said circular arc (E<sub>1</sub>-D<sub>3</sub>) at the point (D<sub>3</sub>); a portion (WD<sub>1</sub>-WD<sub>2</sub>) connecting two points (WD<sub>1</sub>) and (WD<sub>2</sub>) located on a circular arc having similar radius with the outer radius of the male rotor and a center of the arc being located on the rotating center of the male rotor and located opposite positions with respect to said line (3-4) is formed by a line intersecting said line (3-4), and line (WD<sub>1</sub>-WL<sub>1</sub>) connecting said points (WD<sub>1</sub>) and (WL<sub>1</sub>) and line (WD<sub>2</sub>-WL<sub>2</sub>) connecting said points (WD<sub>2</sub>) and (WL<sub>2</sub>), respectively, are formed by a line whereby a seal strip portion formed by said portions (C<sub>1</sub>-WL<sub>1</sub>), (WD<sub>1</sub>-WL<sub>1</sub>), (WD<sub>2</sub>-WL<sub>2</sub>), (D<sub>3</sub>-WL<sub>2</sub>) and (D<sub>3</sub>-WL<sub>2</sub>) is provided on the tip of the male rotor tooth profile.

4,679,997

# APPARATUS FOR DELIVERING LABELS TO BLOW MOLDS OF A PLASTIC CONTAINER BLOWING MACHINE AND REMOVING THE BLOWN CONTAINERS WITH THE LABELS THEREON

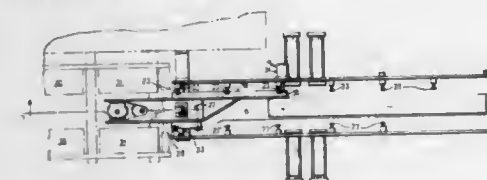
John A. Plenzler; Thomas J. Krall, both of Toledo, and Casimir W. Nowicki, Sylvania, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 25, 1985, Ser. No. 801,441

Int. Cl. B29C 49/24

U.S. Cl. 425—126 R

11 Claims



1. An apparatus for applying labels in a blow molding apparatus which comprises a mold having mold halves that are moved between an open position and a closed position defining a mold cavity against which a plastic parison is blown to define

a hollow plastic container wherein the apparatus precludes access to the upper or lower ends of the mold halves, said apparatus further comprising

a carriage,

means for supporting said carriage for reciprocating movement along an axis,

means for horizontally reciprocating said carriage between a first position externally of the blow mold halves and a second position between the blow mold halves when the blow mold halves are open,

a first magazine positioned at said first position,

a first label pick-up device,

means for supporting said first label pick-up device on said carriage for movement transversely of the direction of movement of the carriage,

means on said carriage for moving said first label pick-up device transversely outwardly to pick up a label when the carriage is at said first position adjacent said label magazine and for moving said first label pick-up device with a label thereon transversely outwardly when the carriage is at the second position for delivering a label to the cavity of the open mold

a first container removal device including gripping elements for engaging a first blown container formed in the mold,

means for supporting said first container removal device on said carriage for movement transversely of the direction of movement of the carriage toward and away from the axis of movement of the carriage,

means on said carriage for moving said gripping elements of said first container removal device outwardly and inwardly such that when the carriage is at said second position, said gripping elements of said first removal device can be moved inwardly toward one another to grip the first blown container prior to delivery of a label to the open mold such that upon movement of said carriage toward the first position, the first blown container is removed from the open mold after which the open mold may be closed about another parison delivery to the open mold having a label thereon for subsequent blowing of said another container when the mold is closed.

4,679,998

# SPINNERET HAVING GROUPS OF ORIFICES WITH VARIOUS INTERORIFICE SPACING

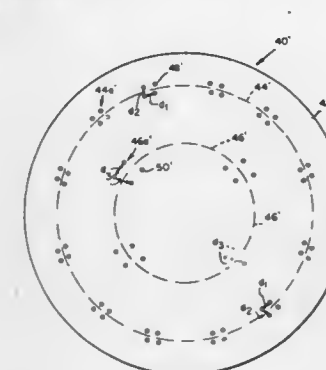
Richard L. Dreibels, and Oliver L. Hunt, both of Waynesboro, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 671,920, Nov. 15, 1984, abandoned. This application Jul. 22, 1986, Ser. No. 887,946

Int. Cl. D01D 5/04

U.S. Cl. 425—72 S

7 Claims



1. A spinneret for the production of spandex filaments extruded into a stream of hot inert gas surrounding the filaments and flowing cocurrently therewith comprising a plate having an outer ring and an inner ring of circumferentially spaced



grouped orifices, each group being comprised of a plurality of orifices spaced from each other, the distance between orifices in each group in the outer ring of groups being less than the distance between the orifices in each group in the inner ring of groups.

4,679,999

# SYNCHRONOUS DRIVE SYSTEM AND METHOD OF MAKING THE SAME

Robert E. Wetzel, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

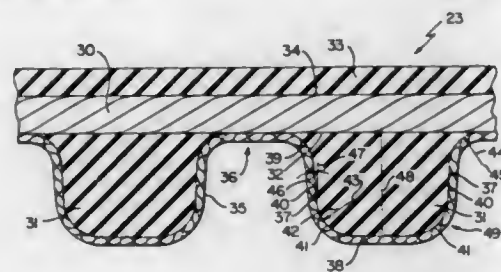
Continuation of Ser. No. 671,392, Nov. 15, 1984, abandoned.

This application Jul. 8, 1986, Ser. No. 883,257

Int. Cl.<sup>4</sup> F16G 1/28; F16H 7/02

U.S. Cl. 474-153

30 Claims



1. In the combination of a toothed pulley and a toothed belt that has the teeth thereof serially mesh with cavities of said pulley that are respectively disposed between adjacent teeth thereof and that respectively have bottoms, each belt tooth having a longitudinal cross-sectional configuration that defines a pair of spaced side face means that respectively have free end portions thereof that are remote from adjacent root means thereof and that are spaced apart from each other by a bottom face means of said tooth, each bottom face means having a center, the improvement wherein said teeth of said pulley and said belt are so constructed and arranged that each belt tooth would have said pair of spaced apart free end portions thereof compressed radially outwardly and inwardly toward each other by the respective adjacent pulley teeth while said bottom face means thereof has its said center spaced from said bottom of the cavity between those respective adjacent pulley teeth if that belt tooth is fully received in the cavity between those respective adjacent pulley teeth and those respective adjacent pulley teeth are just making contact with the land areas of the belt on each side of that belt tooth while being spaced from the respective root means of that belt tooth.

16. In the method of making the combination of a toothed pulley and a toothed belt that has the teeth thereof serially mesh with cavities of said pulley that are respectively disposed between adjacent teeth thereof and that respectively have bottoms, each belt tooth having a longitudinal cross-sectional configuration that defines a pair of spaced side face means that respectively have free end portions thereof that are remote from adjacent root means thereof and that are spaced apart from each other by a bottom face means of said tooth, each bottom face means having a center, the improvement comprising the step of forming said teeth of said pulley and said belt to be so constructed and arranged that each belt tooth would have said pair of spaced apart free end portions thereof compressed radially outwardly and inwardly toward each other by the respective adjacent pulley teeth while said bottom face means thereof has its said center spaced from said bottom of the cavity between those respective adjacent pulley teeth if that belt tooth is fully received in the cavity between those respective adjacent pulley teeth and those respective adjacent pulley teeth are just making contact with the land areas of the belt on each side of that belt tooth while being spaced from the respective root means of that belt tooth.

## 4,680,000 APPARATUS FOR APPLYING LABELS IN THE MOLDS OF A PLASTIC BLOW MOLDING MACHINE

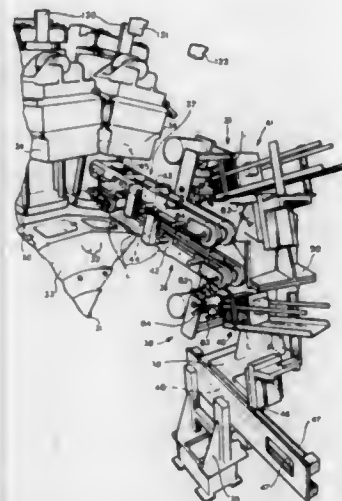
Casimir W. Nowicki, Sylvania; Thomas A. Lucius, Toledo; Ronald S. Kaminiski, Bowling Green, and Robert P. Snyder, Sylvania, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 25, 1985, Ser. No. 802,117

Int. Cl.<sup>4</sup> B29C 49/24

U.S. Cl. 425-126 R

63 Claims



1. In a blow molding apparatus comprising a plurality of sets of mold sections on a wheel rotatable about a horizontal axis wherein the mold sections are relatively moved radially toward and away from one another and when closed define a cavity which encloses a parison and the parison is then blown to the confines of the cavity between the mold sections as the wheel rotates, a first in-mold labeling apparatus comprising

a first source of labels,

first endless conveyor means having a first end extending from said first source of labels and a second end extending to a position adjacent a path of said open mold sections, first label pickup means adjacent the first source of labels for taking labels successively from the first source and delivering said labels to the first conveyor means,

said first conveyor means being operable to receive labels from said first label pickup means adjacent the first end successively and carry the labels in a first path to the second end,

first label placement means adjacent the second end of the first conveyor means, said first label placement means being positioned in the path of the open mold sections for successively removing labels from said first conveyor means and delivering said labels to a first section of each set of open mold sections and,

first means for intermittently driving said first conveyor means carrying a series of labels in a direction to receive labels from said first label pickup means and to transfer the labels successively to said first label placement means.

21. In a blow molding apparatus comprising a plurality of sets of mold sections on a wheel rotatable about a horizontal axis wherein the mold sections are relatively moved radially toward and away from one another and when closed define a cavity which encloses a parison and the parison is then blown to the confines of the cavity between the mold sections as the wheel rotates, an in-mold labeling apparatus comprising

a first in mold applying mechanism and a second in mold label applying mechanism associated with each mold section,

each first and second in mold label applying mechanism comprising

a source of labels,  
a conveyor extending from each said source of labels to a position adjacent the open mold sections,  
a label pickup mechanism adjacent each source of labels for taking labels successively from each said source of labels and delivering them to a first end of respective first and second conveyor,  
a label placement mechanism adjacent a second end of each conveyor positioned in a path of the open mold sections for successively removing labels from a respective conveyor and delivering said labels to a respective mold section, and  
means individual to each conveyor for intermittently driving said conveyor in a direction to receive labels from its respective label pickup mechanism and transfer labels in a path successively to its respective label placement mechanism.

4,680,001

## PASSIVE MOLD COOLING AND HEATING SYSTEM

Michael A. Waters, Elk Grove Village, Ill., assignor to Application Engineering Corporation, Wood Dale, Ill.

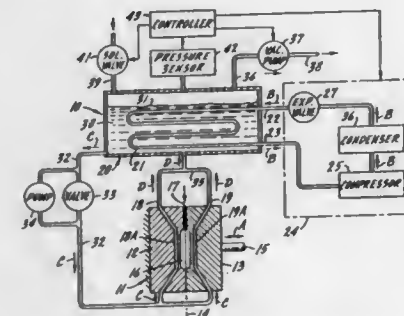
Division of Ser. No. 675,877, Nov. 28, 1984, Pat. No. 4,623,497.

This application Feb. 10, 1986, Ser. No. 827,827

Int. Cl.<sup>4</sup> B29C 33/04

U.S. Cl. 425-144

11 Claims



1. A passive cooling system for cooling a mold for molding articles of plastic material without substantial pumping, the mold including a plurality of vertically extending internal passages for passing a cooling fluid through the mold, the system comprising:

a condenser heat exchanger partially filled with a supply of cooling fluid in a liquid state, the cooling fluid constituting a fluid which changes from its liquid state to its vapor state in response to temperatures occurring in critical portions of the mold passages during operation of the mold, the heat exchanger being positioned so that the upper level of liquid fluid in the heat exchanger is approximately at or above the tip of the mold;

an inlet conduit connecting the heat exchanger, from a point below the upper level of the fluid, to the lower ends of the mold passages;

a return conduit connecting the upper ends of the mold passages back to the heat exchanger;

the heat exchanger, the mold passages, and the inlet and return conduits constituting a closed loop;

and heat exchanger control means for controlling operation of the heat exchanger to maintain a controlled pressure in the loop while condensing vaporized fluid back to its liquid state as the fluid returns from the mold to the heat exchanger;

the heat exchanger control means including means to adjust the controlled pressure to establish a minimum limit temperature for cooling of the mold and means for actuating the heat exchanger to vary the loop pressure in synchronism with the molding cycle.

7. A passive heating system for heating a mold for molding

articles of plastic material without substantial pumping, the mold including a plurality of vertically extending internal passages for passing a heating fluid through the mold, the system comprising:

an evaporator heat exchanger partially filled with a supply of heating fluid in a liquid state, the heating fluid constituting a fluid which changes from its vapor state to its liquid state in response to temperatures occurring in critical portions of the mold passages during operation of the mold, the heat exchanger being positioned so that the upper level of liquid fluid in the heat exchanger is approximately at or below the bottom of the mold;

an inlet conduit connecting the heat exchanger, from a point above the upper level of the fluid, to the upper ends of the mold passages,

a return conduit connecting the lower ends of the mold passages back to the heat exchanger;

the heat exchanger, the mold passages, and the inlet and return conduits constituting a closed loop;

and heat exchanger control means for controlling operation of the heat exchanger to vaporize fluid from the liquid supply in the heat exchanger to maintain the conduits and the mold passages filled with fluid vapor at a controlled pressure;

the heat exchanger control means including means to adjust the pressure to establish a maximum limit temperature for heating of the mold and means for actuating the heat exchanger to vary the loop pressure in synchronism with the molding cycle.

4,680,002

## INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl-Strasse 32, D-7298 Lössburg 1, Fed. Rep. of Germany

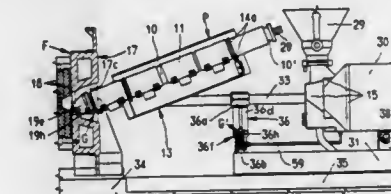
Filed Apr. 15, 1986, Ser. No. 852,148

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1985, 3513410; Jan. 28, 1986, 3602439

Int. Cl.<sup>4</sup> B29C 45/62

U.S. Cl. 425-186

19 Claims



1. In an injection molding machine having a generally horizontal axis, including an injection molding unit, an injection mold assembly, a mold closing unit receiving said injection mold assembly, and a first drive means for inserting said injection molding unit in and withdrawing said injection molding unit from said injection mold assembly; said injection molding unit including a plasticizing cylinder having a frontal end insertable into said injection mold assembly and a rear terminus; a feed screw rotatably and axially displaceably accommodated in said plasticizing cylinder, a carrier block form-fittingly receiving said plasticizing cylinder at the rear terminus thereof, immobilizing means for axially fixing the position of said plasticizing cylinder in said carrier block, second drive means for imparting axial injection strokes to said feed screw and a third drive means for rotating said feed screw; the improvement wherein said plasticizing cylinder, together with said feed screw accommodated therein, is capable of being moved by said first drive means into a released position in which said plasticizing cylinder is slightly withdrawn from said injection mold assembly and is separated from said carrier block; the improvement further comprising a first support means situated adjacent said injection mold assembly for sup-



porting said plasticizing cylinder at said frontal end thereof; and a second support means situated at a distance from said first support means for axially supporting said plasticizing cylinder at said rear terminus thereof; said first and second support means upwardly freely removably supporting said plasticizing cylinder in said released position thereof.

4,680,003

# APPARATUS FOR THE PRODUCTION OF MOLDINGS FROM FLOWABLE REACTIVE COMPONENTS

Klaus Schulte, and Heinrich Ersfeld, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

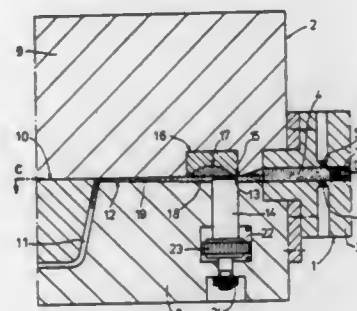
Filed Dec. 20, 1985, Ser. No. 811,254

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1985, 3500235

Int. Cl.<sup>4</sup> B29C 39/26, 45/30

U.S. Cl. 425-206

5 Claims



1. An apparatus for producing moldings from flowable reactive components comprising

- a mold assembly having two halves surrounding a mold cavity,
- a mixing device for combining said reactive components mounted on said mold assembly, said mixing device having a mixing chamber,
- a supply channel in said assembly for supplying said components from said mixing chamber to said mold cavity,
- a throttle device located between said mixing chamber and said mold cavity, said throttle device capable of moving into and out of said supply channel in a direction transverse to the orientation of said supply channel, thereby forming a throttle zone in said supply channel,
- a relaxation chamber located in said supply channel between said throttle device and said mold cavity, said apparatus further characterized in that the dividing plane which separates the mold assembly into halves extends through said supply channel, said throttle zone and said relaxation chamber.

4,680,004

# METHOD AND APPARATUS FOR CONTROLLING GASOLINE VAPOR EMISSIONS

John H. Hirt, Fullerton, Calif., assignor to Hirt Combustion Engineers, Montebello, Calif.

Filed Mar. 4, 1986, Ser. No. 836,097

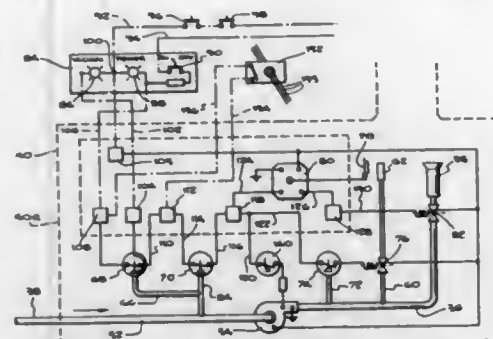
Int. Cl.<sup>4</sup> F23G 7/06

U.S. Cl. 431-5

6 Claims

1. In an apparatus for abatement of gasoline vapor emissions from a vent pipe at a gasoline service station or the like in which a vapor piping system interconnects the vent pipe with gasoline storage tanks and gasoline dispensing nozzles in the service station, said apparatus including a pilot burner with pilot ignition means therefore, a main burner with main burner ignition means therefore, at least first and second vapor pressure switches in said vent pipe for sensing and controlling vapor pressure in said vapor piping system; the combination of: turbine means located downstream from, and controllably

activated by said first and second vapor pressure switches for moving vapor in the vapor piping system so as to maintain a partial vacuum in said vapor piping system; means for sensing the vapor pressure downstream from said turbine means; means responsive to said downstream vapor pressure sensing means for causing, at a selected vapor pressure down-



stream of said turbine means, admission of vapor to said pilot burner; means for igniting said vapor at said pilot burner to provide a pilot flame; means for sensing said pilot flame and upon sensing said pilot flame for causing admission of vapor to the main burner for ignition by said pilot flame.

4,680,005

# PRIMARY GAS FURNACE CONTROL

Frederick J. Geary, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

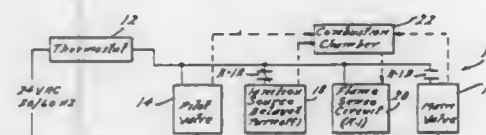
Division of Ser. No. 627,038, Jul. 2, 1984, Pat. No. 4,626,192.

This application Jan. 26, 1986, Ser. No. 879,067

Int. Cl.<sup>4</sup> F23Q 9/08

U.S. Cl. 431-46

2 Claims



1. In a primary control for gas furnaces, the combination including a low voltage circuit adapted to be connected to a source of low voltage AC current, said low voltage circuit including a thermostatic switch, an electrically operable pilot gas valve, an electrically operable main gas valve, pulse generating means for controlling energization of said main gas valve including a programmable unijunction transistor, and first relay means controlling the energization of said main gas valve and said pulse generating means, a high voltage spark generating circuit including a silicon controlled rectifier and spaced electrodes disposed in the path of gas emanating from said pilot valve, said programmable unijunction transistor controlling the conduction of said silicon controlled rectifier, means interfacing said low voltage circuit and said spark generating circuit and providing a substantially higher voltage in said spark generating circuit than in said low voltage circuit, and flame sensing means including a probe disposed in the path of gas emanating from said pilot valve and being subjected to the heat of the gas flame when gas ignition is obtained by said spark generating circuit whereby flame rectification is effected by said probe, said flame sensing means controlling the energization of said main gas valve and said pulse generating means through said first relay means, said means interfacing said low voltage circuit and said spark generating circuit including

voltage doubler means and step up transformer means, capacitor means operably connected to said pulse generating means and effective to maintain energization of said pulse generating means and said spark generating means for a predetermined period of time after flame rectification is effected by said probe, said low voltage circuit including second relay means controlling the energization of said pilot valve, and means for delaying the energization of said second relay means for a preselected period of time following closure of said thermostatic switch.

4,680,006

# BLOWER AUGMENTOR FOR POWER OIL AND POWER GAS BURNERS

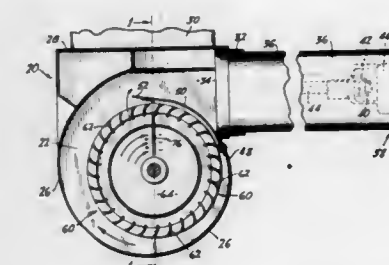
Leonard A. Fisher, Granby, Conn., assignor to The Carlin Company, Windsor, Conn.

Filed May 16, 1985, Ser. No. 734,837

Int. Cl.<sup>4</sup> F23Q 3/00

U.S. Cl. 431-265

7 Claims



1. In an oil burner, in combination:

- a blower comprising a scroll housing and a driven squirrel cage therein, said squirrel cage having an interior air space, and having blades disposed around said interior air space and constituting an air impeller,
- said scroll housing having a tangential air outlet, and further comprising a spiral wall encircling said squirrel cage,
- a stationary barrier wall mounted in the housing and extending into the said interior air space of the squirrel cage, said barrier wall extending outward from and with respect to a central axial area of the squirrel cage to a location adjacent the said blades thereof,
- said housing being wider than the squirrel cage in axial dimension, thereby to provide an end space between the squirrel cage and the housing, in which end space air tends to recirculate in the housing, and
- support and baffle means disposed in the said end space between the housing and squirrel cage, for mounting said barrier wall and for redirecting in outward directions a portion of the circularly travelling recirculating air in the housing.

4,680,007

# LIGHTER WITH ADJUSTABLE FLAME

Friedrich Schächter, Draschestr. 31, Vienna, Austria (A-1232)

Filed Apr. 29, 1985, Ser. No. 728,075

Int. Cl.<sup>4</sup> F23D 13/04

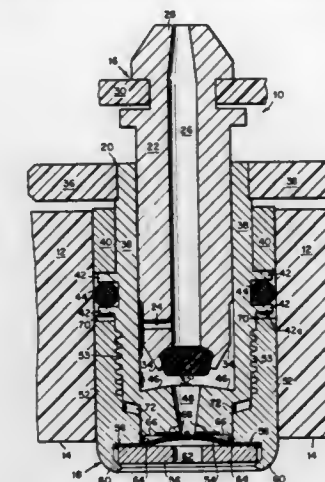
U.S. Cl. 431-344

17 Claims

1. A fuel burning lighter having an adjustable flame height comprising:

- burner means;
- a supply of liquified gaseous fuel;
- valve means positioned between said fuel supply and said burner means;
- a film having top and bottom generally parallel surfaces and micropores oriented substantially perpendicular to said surfaces, a plurality of said micropores of said film being open to allow passage of fuel, said film positioned between

said valve means and said fuel supply in such a manner so that all fuel flowing to said burner means must pass through said open micropores; means for conducting fuel passing through said film and through said valve means to said burner means; and control means located downstream of said film comprising



chamber means of adjustable depth whereby selectively increasing or decreasing the depth of the chamber means correspondingly increases or decreases said plurality of open micropores provided by deflection of the film thereby increasing or decreasing the passage of fuel through said film to said burner means so as to provide a flame of desired height.

4,680,008

# HIGH TEMPERATURE FURNACE FOR INTEGRATED CIRCUIT MANUFACTURE

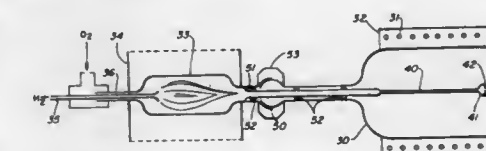
Brian A. Rioux, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 8, 1986, Ser. No. 938,903

Int. Cl.<sup>4</sup> F23J 15/00

U.S. Cl. 432-72

4 Claims



1. A high temperature furnace for the growth of oxide layers on silicon substrates and the like, the furnace comprising: a furnace chamber; heating means for maintaining the internal temperature of the chamber at a temperature greater than the ignition temperature of a gas mixture; and a burn chamber external to the furnace chamber for mixing and burning said gas mixture therein; characterized by: a tube for conveying the gas mixture from the burn chamber to the furnace chamber; one end of the tube protruding into the furnace chamber a sufficient distance that the ambient temperature, contiguous an opening in the tube which expels the gas mixture into the furnace chamber, is greater than said ignition temperature, resulting in ignition of the gas mixture in the furnace chamber which creates a flame front that travels back along the tube into the burn chamber, to initiate and sustain ignition

the burn chamber and the furnace chamber are joined at a mating ball-and-socket joint; and the other end of the tube is flared and clamped between the mating ball-and-socket joint.

4,680,009

# APPARATUS FOR REMOVING OVERSIZE FROM THE HOT MATERIAL DISCHARGED FROM A ROTARY KILN USED TO PRODUCE SPONGE IRON BY A DIRECT REDUCTION OF IRON OXIDE CONTAINING MATERIALS

Helmut Ernst, Offenbach am Main; Alfred Breier, Frankfurt am Main; Manfred Schwalbach, Florsheim; Karl-Heinz Will, Oberursel, all of Fed. Rep. of Germany; Alan B. Cameron, Manurewa, and Peter C. Bates, Waiuku, both of New Zealand, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany and New Zealand Steel Ltd, Auckland, New Zealand

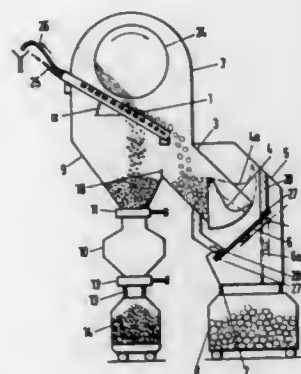
Filed Aug. 1, 1986, Ser. No. 893,113

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527621

Int. Cl.<sup>4</sup> F27B 7/32

U.S. Cl. 432-117

7 Claims



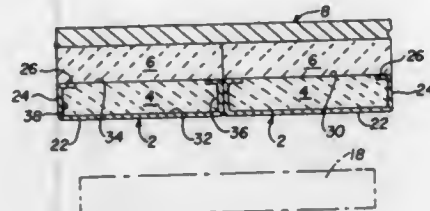
1. In an apparatus for removing oversize from hot material discharged from a rotary kiln used to produce sponge iron by a direct reduction of iron oxide containing materials, the apparatus comprising a stationary kiln head which surrounds and is gas-tightly sealed to a discharge end of a rotary kiln, an oversize discharge device on the kiln head, and a discharge device for the particles which have passed through a sieve-like separator, the improvement wherein: the sieve-like separator comprises a rigid, inclined grate, means for cooling the grate and further comprising: a collecting container for collecting oversize mounted on the kiln head and having a gate valve at the discharge end thereof, an outer container surrounding and gas-tightly sealed to the collecting container and having a gas-tight flap valve, a transport container, a fitting for a gas-tight connection between the collecting container and the transport container, wherein the kiln head is configured to form at least one buffer bin under the grate for the particles falling through the grate, a batching bin under the buffer bin and having a gas-tight upper shutoff valve, a second transport container, the batching bin having: on its discharge side a gas-tight lower shutoff valve with a fitting for a gas-tight connection to the second transport container, and wherein the volume of the batching bin is smaller than the volume of the second transport container.

4,680,010  
RE-RADIATING HEAT SHIELD ASSEMBLY  
Vladimir B. Ginzburg, and Winfried F. Schmiedberg, both of Pittsburgh, Pa., assignors to Wean United Rolling Mills, Inc. and International Rolling Mill Consultants, Inc., both of Pittsburgh, Pa.

Filed Sep. 20, 1985, Ser. No. 778,522  
Int. Cl.<sup>4</sup> F28F 13/00

U.S. Cl. 432-148

5 Claims



1. A heat shield assembly for re-radiating heat comprising an array of thermal insulating blocks disposed in generally side-by-side adjacency, said thermal insulating blocks having a pair of faces and an adjacent lateral surface, a plurality of thermal conducting sheets having first portions covering said first faces of said thermal insulating blocks and second portions covering said adjacent lateral surfaces of said thermal insulating blocks, whereby said first faces and said adjacent lateral surfaces will not be exposed directly to a heat source positioned adjacent to said array thereby reducing losses due to radiation emitted from the heat source, said thermal conducting sheets having third portions covering at least a portion of said second faces of said thermal insulating blocks, a second array of thermal insulating blocks disposed adjacent said second faces of said first array, said thermal conducting sheets composed of a ferrous material, and said first portions of said thermal conducting sheets having an area of about 50 to 70 percent of the area of said thermal conducting sheets contained within said lateral portion and said third portions thereof.

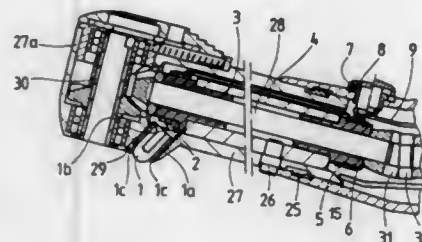
4,680,011  
DENTAL CONTRA-ANGLE HANDPIECE WITH MEANS FOR ILLUMINATING THE TREATMENT AREA  
Jean-Claude Bolnot, Roulers, France, assignor to Micro-Mega S.A., Besancon, France

Filed Mar. 26, 1986, Ser. No. 844,356

Claims priority, application France, Mar. 27, 1985, 85 05016  
Int. Cl.<sup>4</sup> A61C 1/00

U.S. Cl. 433-29

19 Claims



1. A dental contra-angle handpiece having means for illuminating the treatment area comprising: a front part including a head having a tool holder therein for clamping a tool, and at least one miniature bulb disposed on the head and having a central contact; a handle detachably connected to said front part at a front end of the handle and provided with matching

contact means on a rear end of the handle; a rotary shaft mounted in said front part for driving said tool; insulating support means disposed in said front part for rotatively supporting the rotary shaft; a rear socket fitted to the rear end of said handle and provided with electric contact means disposed to engage with the matching contact means for supplying electric power to said bulb; electrical connection means for electrically connecting the central contact of said bulb to the matching contact means comprising a front metal ring electrically connected to the central contact of the bulb, a rear metal ring electrically connected to the front metal ring, said front and rear metal rings being axially spaced from each other and mounted on the insulating support means, and a spring blade mounted in said handle and electrically connected to the matching contact means and extending axially at a junction between said front part and said handle, said spring blade being spaced from said rear metal ring when the front part and the handle are assembled with each other; and a switch mounted on said handle adjacent to said spring blade, said switch being operative to move said spring blade for engagement with said rear metal ring and thus close the electrical connection means.

4,680,012  
PROJECTED IMAGED WEAPON TRAINING APPARATUS

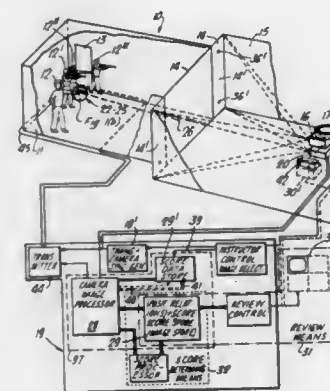
Robert A. Morley, Southport, and James M. Bulck, Stockport, both of England, assignors to Ferranti, plc, Cheadle, England  
Filed Jun. 12, 1985, Ser. No. 743,803

Claims priority, application United Kingdom, Jul. 7, 1984, 8417402; Jan. 28, 1985, 8502110

Int. Cl.<sup>4</sup> F41G 3/26; F41J 5/10

U.S. Cl. 434-22

14 Claims



1. Weapon training apparatus including a high optical transmission back-projection screen of high optical transmissivity; image projection means operable to form a visible target image on the screen by back-projection, said image including one or more datum points; means for changing the projected image; weapon sighting means, directable at the front of the screen by a trainee in a training area, including a weapon discharge trigger mechanism and an optical radiation emitter responsive to operation of the trigger mechanism to direct optical radiation at the screen to impinge thereon in a spot indicative of a simulated projectile impact point; a television camera, located on the same side of the screen as the projector and having a field of view substantially co-extensive with the image projected by the projector, operable to receive at least a part of the projected target image, reflected from the screen, and radiation forming said impact simulating spot, transmitted by the screen, simultaneously as a composite image; and scoring analysis means comprising image processing means operable to determine from the camera video signal the positional relationship between the impact simulating spot and said datum points defined on the camera-viewed target scene, data storage means operable to store data pertaining to said positional relationship and review means including the screen and means to cause said

projector to project onto the screen for viewing an image of said target scene including the impact simulating spot in the positional relationship therewith determined by the image processing means.

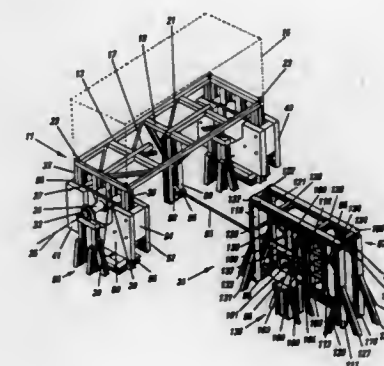
4,680,013  
SHIPBOARD TRANSPORTATION SIMULATOR AND BREAKBULK CARGO TABLE THEREFOR

Mansour Z. Boutros, R.R. 1, Box 121, Thomson, Ill. 61285  
Filed Nov. 15, 1982, Ser. No. 441,843

Int. Cl.<sup>4</sup> G09B 9/06

U.S. Cl. 434-29

13 Claims



1. A shipboard transportation simulator for moving a cargo container in a wave-like simulation, said cargo container having a cargo center of gravity, said simulator comprising: a simulator frame; means for supporting said frame for movement about a real axis; means for driving said frame in movement about said axis; means on said frame for supporting said cargo container with said cargo center of gravity above said axis; said cargo and frame having a combined center of gravity; and means on said frame for balancing the moment about said axis of the cargo center of gravity for locating said combined center of gravity substantially at said axis; whereby said cargo container may be tested upon said simulator by reverse pendulum harmonic motion.

4,680,014  
WELDER'S TRAINER  
Boris E. Paton; Vsevolod V. Vasiliev; Valentin A. Bogdanovskiy; Alexandr I. Baranov; Sergel N. Danilyak, all of Kiev; Viktor A. Schegolev, Moskovskaya; Vladimir A. Chernolvanov, Kaliningrad; Vitaly I. Voloshin, Zhitomir; Viktor M. Gavva, and Vsevolod N. Bernadsky, both of Kiev, all of U.S.S.R., assignors to Institute Problem Modelirovaniya v Energetike a An USSR, Kiev, U.S.S.R.

Filed Nov. 26, 1985, Ser. No. 801,873

Int. Cl.<sup>4</sup> G09B 19/24

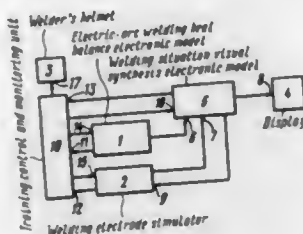
U.S. Cl. 434-234

31 Claims

1. A welder's trainer comprising: a welding situation simulation unit having an input and made in the form of a TV-type display having a screen; a welding electrode simulator having an input and an output; a welding process heat balance electronic model having an input and an output; a welding situation visual synthesis electronic model having inputs and a first and second outputs; said first output of said visual synthesis electronic model connected to said display; a training control and monitoring unit having first, second and third inputs and a first output, said first output con-

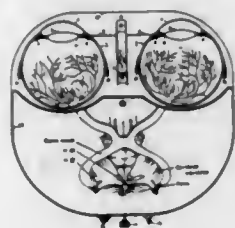


ected to said input of said welding electrode simulator, a second output connected to said input of said heat balance electronic model and a third output connected to said input of said visual synthesis electronic model, said first input connected to the output of the welding electrode simulator, said second input connected to the output of the heat balance electronic model and said third input connected to the second output of the visual synthesis elec-



tronic model, in which said welding situation simulation unit is connected to said visual synthesis electronic model that provides an electronic model for visual synthesis of the welding situation on the display screen that is part of said welding situation simulation unit; the welding situation simulation unit is connected to the trainer monitoring and control unit through the visual synthesis electronic model.

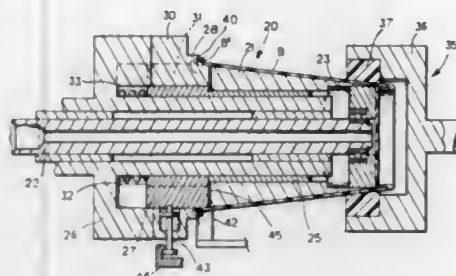
**4,680,015**  
**EYE AND BINOCULAR VISION DEMONSTRATOR**  
Harvey C. Rosen, 2078 Irving Ave., Astoria, Oreg. 97103  
Filed Sep. 30, 1985, Ser. No. 782,127  
Int. Cl.<sup>4</sup> G09B 23/32  
U.S. Cl. 434—271



1. I claim an eye and binocular vision demonstrator for demonstrating the binocular focus function of vision, comprising:

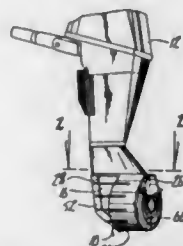
- A casing having upper and lower levels; the lower level having means to hold two simulated eyeballs;
- A pair of simulated eyeballs, including simulated recti muscles, mounted in the lower level of said casing, said eyeballs each being divided into upper and lower sections, the upper sections being removable and the lower sections containing simulated anatomical features, including lenses; said lenses being secured with rods extending through simulated ciliary muscles butting against the lenses;
- A means in the rear of the casing for turning the eyeballs inward, simulating convergence; and the inward pressure of said rods pushing against the lenses causing the lenses to change their curvature, thereby simulating focus accommodation.

**4,680,016**  
**APPARATUS AND METHOD FOR RIMMING CONTAINERS**  
Bobby R. Lynch, R.R. #2 Box 57, Ozark, Mo. 65721  
Filed Jan. 31, 1986, Ser. No. 824,506  
Int. Cl.<sup>4</sup> B31B 1/28  
U.S. Cl. 493—159



1. Apparatus for rimming the open mouth portion of a frustoconically-shaped container blank which includes a rimming die comprising a truncated hollow mandrel member having sloping sides complementary to the tapering sidewalls of the container blank, said mandrel member being mounted on a central shaft for its controlled rotation and axial movement, means for rotating and axially moving said mandrel member with said container blank rotatably mounted thereon, a blank support member within said mandrel, said member mounted for axial movement with said mandrel member and nonrotatively with respect to said central shaft and said mandrel member, and having a radially splined exterior surface complementary to the tapering angle of said container blank sidewalls, a stationary rimming tool member having an annular semi-circular groove adapted to receiving and shaping the open edge of the open mouth portion of said container blank during rimming and a radially splined exterior surface closely adjacent to said annular groove interengagable with said radially splined surface of said blank support member during said axial movement, said combined radially splined exterior surfaces of said blank support member and said rimming tool member being adapted to fully supporting the container open mouth portion during rimming of the open edge.

**4,680,017**  
**MOTORBOAT PROPELLER GUARD FOR IMPROVED PERFORMANCE**  
Dennis E. Eller, 814 N. Wooster, Algona, Iowa 50511  
Filed Mar. 10, 1986, Ser. No. 838,161  
Int. Cl.<sup>4</sup> B63H 5/16  
U.S. Cl. 440—66



1. In combination with a motorboat including a motor, a propeller operatively connected to said motor, a lower housing with opposite leading and trailing edges and terminating in a vertically disposed skeg, said propeller being mounted on said lower housing adjacent said trailing edge and above said skeg, and a pair of horizontally disposed cavitation plates having forward and rearward ends extending laterally from said lower housing and above said propeller, a propeller guard comprising:

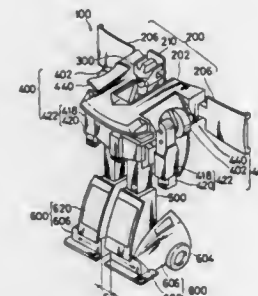
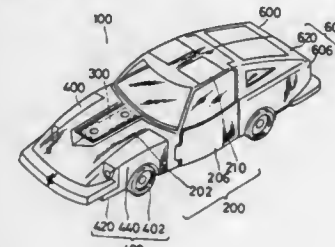
a rigid U-shaped sleeve having a forward end and opposite rearwardly extending legs and an elongated U-shaped channel formed therein, said channel having a closed forward end and open rearward ends which extend at least to the rearward ends of said cavitation plates, said open rear ends of said channels having an effective width therebetween substantially equal to the maximum combined width of said pair of cavitation plates whereby said sleeve is adapted to slide rearwardly into position with said legs extending on each side of said lower housing and with said cavitation plates received within said channel until said forward end of said sleeve engages said leading edge of said lower housing to thereby prevent rearward movement of said guard;

means for closing said open rearward ends of said channel and thereby prevent forward movement of said sleeve; and

a propeller shield having open inlet and outlet ends, being attached to said sleeve for encircling said propeller and thereby protecting said propeller from contact with foreign objects,

a frame member extending downwardly from the forward end of said sleeve and engaging said leading edge of said lower housing substantially along the length thereof, and a plurality of longitudinally disposed ribs extending between said frame member and said shield to further protect said propeller from contact with foreign objects.

**4,680,018**  
**RECONFIGURABLE TOY ASSEMBLY**  
Kouzin Obno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan  
Division of Ser. No. 524,289, Aug. 17, 1983, Pat. No. 4,550,993.  
This application Apr. 7, 1986, Ser. No. 849,211  
Claims priority, application Japan, Oct. 12, 1982, 57-154325[U]; Nov. 5, 1982, 57-167809[U]; Dec. 14, 1982, 57-188580[U]; Feb. 17, 1983, 58-21991[U]  
Int. Cl.<sup>4</sup> A63H 3/46, 17/00  
U.S. Cl. 446—376



1. A reconfigurable toy assembly having a vehicle configuration in a first position and a robotic humanoid configuration in a second position, comprising:

a first element configured to simulate the front portion of a

vehicle in a first position and a robotic humanoid trunk in a second position;

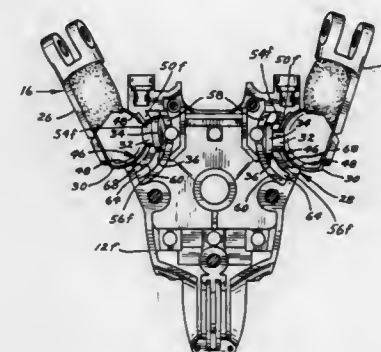
a second element swingably mounted on the upper portion of said first element, said second element being configured to simulate a robotic humanoid head in a second position and received in said first element in a first position;

a pair of third elements pivotally connected to two sides of said first element, said third elements being configured to simulate a lower portion and front wheel portion of a vehicle in a first position and a pair of robotic humanoid arms in a second position;

a pair of fourth elements pivotally connected to the lower portion of said first element, said fourth elements being configured to simulate a pair of robotic humanoid legs in a second position and received in said first element in a first position; and

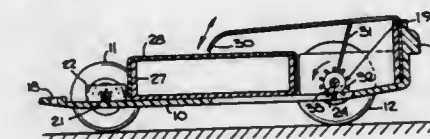
a pair of fifth elements each pivotally connected to the lower portion of the corresponding fourth element.

**4,680,019**  
**TOY FIGURE WITH INDIVIDUALLY POSABLE LIMBS**  
Philip M. Baerenwald, Florence, Ky., and Phillip G. Reed, Loveland, Ohio, assignors to Kenner Parker Toys Inc., Beverly, Mass.  
Filed Jan. 29, 1986, Ser. No. 823,845  
Int. Cl.<sup>4</sup> A63H 3/46  
U.S. Cl. 446—378



1. In a toy figure, a torso, a limb, ball means on said limb, a shank element having one end attached to said ball means, a head on the other end of said shank element having outer and inner sides, said outer side being nearer said ball means, seat means associated with said torso, means acting against the outer side of said head to retain said ball means in engagement with said seat means, and resilient rib means integral with said torso frictionally engaging the inner side of said head so as to hold said limb in various angularly adjusted positions.

**4,680,020**  
**TOY VEHICLE HAVING SIMULATED ENGINE NOISE**  
Melvin R. Kennedy, 2 Fifth Ave., New York, N.Y. 10011; Dietmar Nagel, 147 South Rd., Chester, N.J. 07930, and Abraham A. Arad, 6 Minuteman Hill, Westport, Conn. 06880  
Filed Apr. 14, 1986, Ser. No. 851,461  
Int. Cl.<sup>4</sup> A63H 17/34  
U.S. Cl. 446—414



1. A motorless, free-wheeling toy vehicle which when pro-

pelled by a player to run at a changing speed makes a repetitive sound simulating the noise of an internal combustion engine as a function of running speed, said vehicle comprising:

- A. a chassis having bearings supporting front and rear wheel axles;
- B. a miniature sound producing drum having a resonance chamber and a drum head formed of elastic material enclosing the resonance chamber, said drum being mounted on top of the chassis between the wheel axles;
- C. a clapper cantilevered from one end of the chassis, said clapper being formed of a flat metal spring terminating in a striker that normally rests on the drum head, said spring having a finger located between the striker and the cantilevered end of the clapper and projecting downwardly therefrom at a position displaced from the drum; and
- D. a hub mounted on one of said axles, located outside of said resonance chamber, said hub having spaced teeth which when the axle rotates at a rate depending on the running speed then successively engage the tip of the finger, whereby each time the finger is engaged by a moving tooth of the spaced teeth, the finger is pushed forward to raise the striker above the drum head, and when the finger then falls between adjacent teeth, the striker is released to hit the elastic drum head to generate a low-pitched thumping sound, the repetition rate of the clapper action depending on the running speed of the toy vehicle as determined by the player.

4,680,021

## MULTI-ACTION TOY VEHICLE

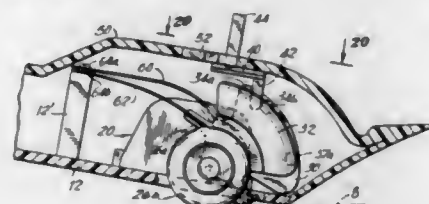
John Maxim, 25 Mill Valley La., North Stamford, Conn. 06903

Filed Aug. 29, 1983, Ser. No. 527,624

Int. Cl.<sup>4</sup> A63H 17/00

U.S. Cl. 446-457

10 Claims



1. A toy vehicle comprising a chassis, wheel means rotatably supported on said chassis for permitting said chassis to roll on a surface, changing means supported on said chassis for changing the center of gravity of said toy vehicle and control means operatively coupled to said changing means for selectively controlling said changing means in response to manual manipulation thereof, said changing means including weight means movably supported on said chassis, said control means selectively adjusting said weight means to adjust the center of gravity of said toy vehicle, said control means being a lever means coupled to said weight means for selectively positioning said weight means on said chassis, said chassis including a front end and a rear end, said wheel means including at least a first front wheel rotatably supported on said front end of said chassis and first and second rear wheels rotatably supported on the rear end of said chassis, said weight means being supported on said chassis proximate said first and second rear wheels, said weight means including a first weight pivotally supported on said chassis proximate said first rear wheel and a second weight pivotally supported on said chassis proximate said second rear wheel, said lever means being operatively coupleable to said first and second weights to selectively pivot said first and second weights whereby the center of gravity of said toy vehicle is changed.

4,680,022

## TOY LINKAGE

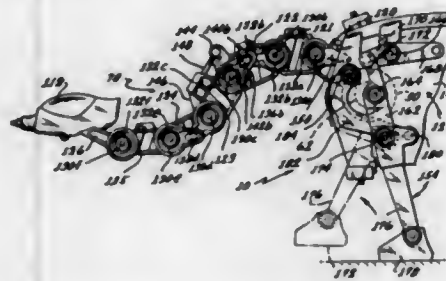
Shiro Hoshino, and Bonpei Fujino, both of Tokyo, Japan, assignors to Tomy Kogyo Co. Inc., Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,424

Claims priority, application Japan, Feb. 26, 1983, 58-27960[U] Int. Cl.<sup>4</sup> A63H 11/20

U.S. Cl. 446-487

6 Claims



1. An articulated linkage which comprises: at least a first link, a second link, a third link and a fourth link pivotally connected to together in a linear array, said second link located between said first and said third link, said third link located between said second and said fourth link; a plurality of joining means equal to the number of said links minus one, a first of said joining means pivotally connecting said first link to said second link, a second of said joining means pivotally connecting said second link to said third link, a third of said joining means pivotally connecting said third link to said fourth link; each of said first, said second, said third and said fourth links having an arm member fixedly attached to said respective first, second, third, and fourth links; said first arm member projecting from said first link across a portion of said second link towards said third link; said third arm member projecting from said third link across a portion of said second link towards said first link; said second arm member projecting from said second link across a portion of said third link towards said fourth link; said fourth arm member projecting from said fourth link across a portion of said third link towards said second link; a boss on said first arm member; a slot in said third arm member; said boss on said first arm member fitting in said slot in said third arm member to operatively connect said first arm member and said third arm member; a boss on said second arm member; a slot on said fourth arm member; said boss on said second arm member fitting in said slot on said fourth arm member to operatively connect said second arm member and said fourth arm member.

4,680,023

## CONTAINER FORMING APPARATUS HAVING IN-LINE BLANKER

Richard F. Varano, Forestville, Conn., assignor to Sherwood Tool, Incorporated, Kensington, Conn.

Filed Apr. 19, 1985, Ser. No. 725,093

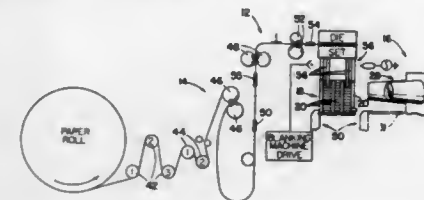
Int. Cl.<sup>4</sup> B31B 1/60

U.S. Cl. 493-75

15 Claims

1. Apparatus comprising a paper receptacle forming machine having a receptacle body forming station, a vertically disposed upwardly open magazine for receiving and containing a supply of vertically stacked receptacle blanks and defined at least in part by a plurality of vertically upwardly extending members, and means for feeding successive receptacle blanks from the bottom of a stack of a receptacle blanks in said magazine to said forming station, and a separate portable blanking machine operable independently of said receptacle forming

machine and having blanking means disposed above the level of said magazine for forming a succession of receptacle blanks, and guide means mounted on and depending from said blanking machine for directing from said blanking means into said



magazine receptacle blanks received from said blanking means, said guide means cooperating with said upwardly extending members and forming a substantial upward extension of said magazine.

4,680,024

## APPARATUS FOR PRODUCING BAGS FROM A TUBULAR SHEET OF THERMALLY WELDABLE FILM MATERIAL

Heinz Focke, and Oskar Balmer, both of Verden, Fed. Rep. of Germany, assignors to Focke &amp; Co., (GmbH &amp; Co.), Verden, Fed. Rep. of Germany

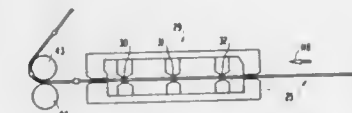
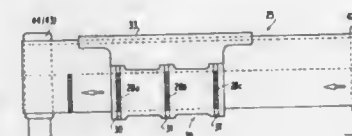
Filed Dec. 3, 1985, Ser. No. 804,031

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446409

Int. Cl.<sup>4</sup> B31B 23/14, 23/64

U.S. Cl. 493-197

21 Claims



1. Apparatus for producing bags from a continuous tubular sheet of thermally weldable film material which is conveyed in stages by a sheet-drive mechanism, and having welding means including a plurality of welding jaws for welding, in a direction transverse to the conveying direction, in the sheet a plurality of transverse welding seams spaced apart in the conveying direction by a distance corresponding to the width of a bag, characterized in that there are provided:

- a sheet-drive mechanism for conveying a thermally weldable film material in stages;
- first means for bringing the welding jaws (30, 31, 32), during a short stationary phase of the film sheet (25), into seam-welding position;
- second means for disengaging, after completion of the welding, the welding jaws from said welding position and returning them to a starting position;
- jaw-drive means for moving said welding jaws in said conveying direction and in the opposite direction; and
- coupling means for coupling the sheet-drive mechanism to said jaw-drive means only when said welding jaws are in the welding position so that said sheet and said welding jaws are moved together in the conveying direction.

4,680,025

## BLOOD COMPONENT COLLECTION SYSTEMS AND METHODS

Robert J. Kruger, Arlington Heights, and Richard L. Brown, Northbrook, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

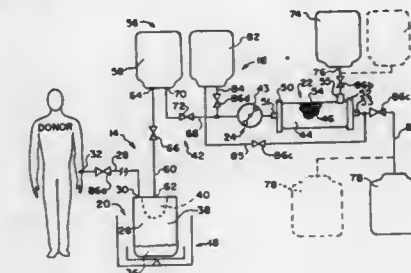
Continuation of Ser. No. 411,058, Aug. 24, 1982, abandoned.

This application Nov. 27, 1984, Ser. No. 833,530

Int. Cl.<sup>4</sup> A61M 37/00

U.S. Cl. 604-6

4 Claims



1. A closed blood component collection system comprising a first portion suited for use with an extracorporeal centrifugal blood processing device, said first portion including a centrifugation container operative for use with the processing device to undergo centrifugation, and first branch conduit means connected to said centrifugation container for introducing whole blood from a donor into said centrifugation container for separation therein into red blood cells and platelet-rich plasma in response to centrifugal forces, and a second portion operative for attachment to pump means and including microporous membrane means operative for filtering the cellular components of blood from the noncellular components of blood, second branch means connecting the centrifugation container with said microporous membrane means and attachable to the pump means for introducing said platelet-rich plasma into said microporous membrane means for filtration into platelet concentrate and virtually platelet-free plasma, a first transfer container, third branch means communicating with said microporous membrane means and said first transfer container for transferring said virtually platelet-free plasma into said first transfer container, a second transfer container, fourth branch means communicating with said microporous membrane means and said second transfer container for transferring said platelet concentrate into said second transfer container, and each of said branch means in said first and second portions of said system comprising a length of flexible tubing integrally connected with said system to form a fluid path which is closed to communication with the atmosphere.

4,680,026

## SUCTION-IRRIGATION EQUIPMENT HAVING A RECIPROCATING VALVE

Barry O. Weightman, 26, Basing Way, Thames Ditton, Surrey, and Graham Deane, "Oakwood", Burleigh Rd., Ascot, Berkshire, both of England

Continuation of Ser. No. 730,259, May 6, 1985, abandoned,

which is a continuation of Ser. No. 473,505, Mar. 8, 1983,

abandoned. This application Mar. 11, 1986, Ser. No. 838,449

Claims priority, application United Kingdom, Mar. 29, 1982, 8209132

Int. Cl.<sup>4</sup> A61M 1/00

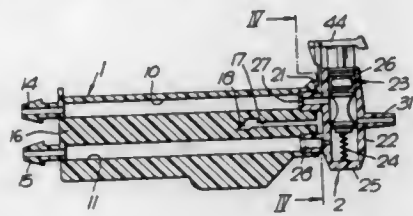
U.S. Cl. 604-33

5 Claims

1. Medico-surgical suction irrigation equipment adapted to



be hand held and including a handle; a first bore extending through said handle, said first bore having a pair of spaced ends located respectively adjacent spaced portions of said handle; means for connecting one end of said first bore to a suction source; a second bore extending through said handle in spaced relation to said first bore, said second bore having a pair of spaced ends located respectively adjacent spaced portions of said handle; means for connecting one end of said second bore to a source of irrigating fluid; valve means comprising a valve housing attached to said handle for connecting said valve means with the other ends of said first and second bores; said valve housing having a single outlet port; a valve member within said housing, said valve member being movable between first and second positions in said housing and having a reduced diameter waist section around which fluid flows through said housing in each of said first and second valve member positions, said valve member being connected to a depressible actuator member located adjacent said handle external of said housing; spring means located within said housing, said spring means urging said valve member up-



wardly in said valve housing to said first position, said valve member being so disposed relative to said handle that said valve member can be displaced downwardly along said housing against the action of said spring means transversely of said bores by pushing down on said actuator member with the finger or thumb of a user of the equipment while said user is holding said equipment at said handle, said downward displacement of the valve member being operative to move said valve member from said first position to said second position relative to said outlet port thereby to connect a selected one of said first or second bores to said outlet port around the said waist section of said valve member such that said outlet port either applies suction or supplies irrigating fluid from said selected one of said bores, said spring means displacing said valve member upwardly from said second position to said first position when said actuator member is released by the user's finger or thumb such that the other of said bores is connected to said outlet port around the same said waist section of said valve member so that said outlet port then either supplies irrigating fluid or applies suction from said other bore.

4,680,027

## NEEDLELESS HYPODERMIC INJECTION DEVICE

James S. Parsons, Laguna Niguel, and Jack S. Gasaway, Irvine, both of Calif., assignors to Injet Medical Products, Inc., Lake Forest, Calif.

Filed Dec. 12, 1985, Ser. No. 808,458

Int. Cl. A61M 5/30

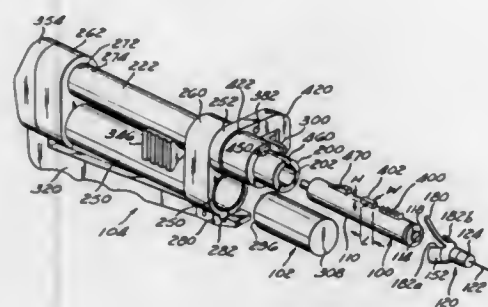
U.S. Cl. 604-68

25 Claims

1. An apparatus for injecting liquid medication through the skin of a person without puncturing the skin, while providing for filling of the medication in the conventional manner used to fill syringes for subcutaneous injections comprising:

- a disposable syringe comprising:
  - a cavity for holding a liquid medication;
  - an aperture in a first end of said syringe through which said liquid medication can flow into and out of said cavity; and
  - a plunger moveable within said cavity for drawing said liquid medication into said cavity and for forcing said liquid medication out of said cavity;
- a needle removably attached to said first end of said syringe

in substantial alignment with said aperture, said needle insertable into a container of said liquid medication so that a selectively variable volume of liquid medication can be drawn into said cavity through said needle and said aperture, the amount of said liquid being that which is needed by the individual, said needle being removable from said syringe after drawing said liquid medication into said cavity so that said first end of said syringe can be placed in contact with the skin without puncturing the skin; and a power supply mechanism for receiving and securely holding said syringe and for providing pressure to forcefully move said plunger in said cavity against said liquid medication so that said liquid medication is ejected through said aperture, said power supply mechanism comprising: a cylinder; a piston within said cylinder, said piston moveable against said plunger of said syringe to force said liquid medication out of said cavity of said syringe; a chamber for receiving a sealed container of a compressed gas;



trigger means for unsealing the sealed container to release said compressed gas when force is applied to said trigger means; means for conducting said released compressed gas to said piston, so that said piston is moved against said plunger to move said plunger against said liquid medication to eject said liquid medication from said cavity through said aperture, said piston and said plunger operable to multiply the pressure provided by said compressed gas to a pressure against said liquid medication sufficient to force said liquid medication through the skin; first safety means for preventing said syringe from being fully inserted into said power supply mechanism while said needle is attached to said syringe so that the power supply mechanism cannot be used to force out the liquid medication; and second safety means for preventing said power supply mechanism from releasing said compressed gas until said syringe is fully inserted so that said power supply mechanism cannot be used to eject objects from said power supply mechanism.

4,680,028

## FLEXIBLE BREAST RECEPTOR FOR BREAST PUMP

Herbert H. Stuart, Nashville, Tenn., assignor to Lact-Assist, Incorporated, Nashville, Tenn.

Filed Jul. 2, 1984, Ser. No. 626,968

Int. Cl. A61M 1/06

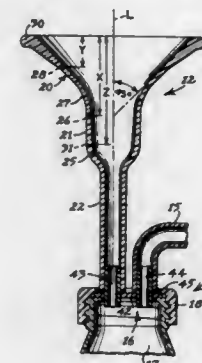
U.S. Cl. 604-74

9 Claims

1. In a breast pump for the human breast having means for creating a vacuum, a breast receptor comprising:

- (a) a skirt having a single frusto-conical wall of flexible material and a longitudinal axis, and terminating in a large open annular rim for receiving in substantially flush engagement a human breast in a lactating position, and having a small open end portion opposite said large open end, said smaller open end portion being larger than the nipple

- of the said human breast so that the nipple extends through said smaller end portion in said lactating position,
- (b) the angle of the frusto-conical wall with respect to said longitudinal axis of said skirt being approximately 40-50 deg.,
- (c) an elongated hollow stem having a tubular wall, a longitudinal axis, and first and second opposite end portions,
- (d) the skirt wall of said smaller open end portion merging with the stem wall of said first open end portion to define an axially continuous transition portion means, said first open end portion being large enough to receive the nipple of the breast extending through said transition portion means in said lactating position,
- (e) said transition portion means extending from said first open end portion of said hollow stem and flaring toward said annular rim to occupy a substantial portion of said skirt wall, the axial length of said transition portion means being greater than midway between the smaller end portion of said transition portion means and said annular rim,
- (f) an elongated receptor tube having a tubular wall of substantially uniform thickness having one end merging with the stem wall of said second end portion, and having an opposite open end adapted to be connected in fluid communication with the means for creating a vacuum,
- (g) the thickness of said stem wall decreasing from its second end portion toward its first end portion,



- (h) the thickness of said annular rim being great enough to engage and establish a vacuum seal against the corresponding portion of the breast in said lactating position,
- (i) the thickness of the wall of said transition portion means being substantially less than the thickness of said annular rim to facilitate collapsing of said transition portion means upon the sides of the nipple and the areola received within and engaging the interior surface of said transition portion means in said lactating position,
- (j) said single frusto-conical skirt wall having an outer surface freely exposed to the grasp of a human operator for squeezing and relaxing said transition portion means,
- (k) the thickness of said transition portion means being sufficiently reduced to permit the optimum transfer of human touch stimulus by finger squeezing the exterior of said transition portion means and sufficiently flexible to contract and expand in response to the varying air pressures within said receptor against the sides of the nipple and the areola in said lactating position, to cause the release of the Human Prolactin Hormone, and
- (l) the thickness of the wall of said receptor tube being sufficient to prevent said wall from collapsing when the air pressure within said receptor tube is reduced under normal pumping action by the means for creating a vacuum.

4,680,029

## VENA CAVAL CATHETER

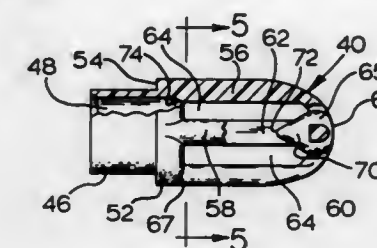
Alan B. Ranford, Des Peres, and David C. Fecht, Manchester, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Feb. 23, 1984, Ser. No. 583,068

Int. Cl. A61M 25/00

U.S. Cl. 604-280

20 Claims



1. A catheter comprising an elongated tube, and a catheter tip including a proximal end portion connected to one end of said tube, a distal end portion having a smoothly contoured outer surface substantially symmetrical about the longitudinal axis of said tip, a plurality of circumferentially spaced, longitudinally extending struts each connected at one end to said proximal end portion and at the opposite end to said distal end portion, and a generally cone-shaped member connected to the inner side of said distal end portion and tapering radially inwardly in the proximal direction with the apex of said cone-shaped member being substantially coincident with the longitudinal axis of said tip.

4,680,030

## GARMENT HAVING IMPROVED, SELF CLOSING, FILAMENTARY FASTENERS

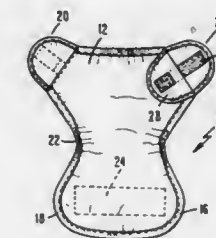
Fredrica V. Coates, 1608 Dublin Rd., Charlottesville, Va. 22903; Richard Jannoni, 16 Whitehall Ave., Edison, N.J. 08820, and Jean Orsini, 813 New York Ave., Raritan, N.J. 08869

Filed Nov. 13, 1985, Ser. No. 797,806

Int. Cl. A61F 13/16

U.S. Cl. 604-391

20 Claims



1. A garment, comprising:

- a first piece of fabric;
- a first fastener means attached to and extending outward from the first piece of fabric, said first fastener means comprising a second piece of fabric having one end attached to the first piece, a first filamentary fastener provided on a portion of said second piece of fabric;
- a second fastener means comprising a second, complementary filamentary fastener on a surface of said first piece of fabric and adapted to be coupled to the first fastener means when the first fabric is folded to be worn; and
- cover means comprising a third piece of fabric attached only at one end to and extending outward from the first piece of fabric and substantially coextensive with the second piece of fabric, a third, complementary filamentary fastener material provided on a portion of the third piece of

fabric face to face and coextensive with at least a portion of the first filamentary fastener; the first and third filamentary fasteners thereby tending to self-close to each other during washing.

4,680,031

## HEART VALVE PROSTHESIS

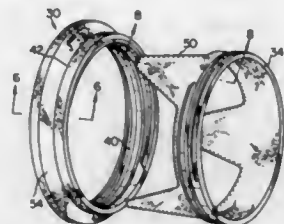
Manuel T. Alonso, Newport Beach, Calif., assignor to Tascon Medical Technology Corporation, Minneapolis, Minn.  
Continuation-in-part of Ser. No. 445,259, Nov. 29, 1982, which is a continuation-in-part of Ser. No. 303,345, Oct. 7, 1982, abandoned. This application Oct. 24, 1984, Ser. No. 664,150  
Int. Cl.<sup>4</sup> A61F 2/24

U.S. Cl. 623-2

25 Claims

8. In a heart valve prosthesis of the type comprising:  
a sewing ring member having a circular first opening therethrough, an exterior wall, and an interior wall surrounding said first opening, said interior wall bearing one or more interior screw threads extending interior to said inner wall and into said first opening;  
a valve member having a second opening therethrough, an exterior wall, and an interior wall surrounding said second opening, said exterior wall of said valve member having exterior screw threads extending exterior to said exterior wall and corresponding to said interior screw threads of

said sewing ring member such that said valve member may be screwed into said sewing ring; and  
a prosthetic heart valve means mounted to said valve member for regulating flow of blood through said second opening through said valve member;  
the improvement wherein:



said sewing ring member is fabricated of a biocompatible plastic, and wherein said heart valve includes a first cloth of biocompatible material embedded within said sewing ring member such that said interior screw threads of said sewing ring member are interior to said first cloth and said exterior wall of said sewing ring member is exterior to said first cloth.

## CHEMICAL

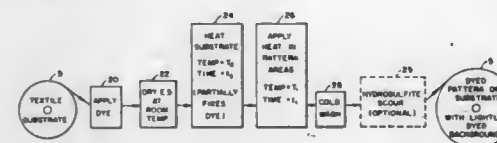
4,680,032

## PROCESS FOR HEAT TREATING TEXTILE SUBSTRATES TO GIVE A COLORED PATTERN

Robert C. Arnott, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.  
Continuation of Ser. No. 476,828, Mar. 18, 1983, abandoned.  
This application Oct. 24, 1985, Ser. No. 792,619  
Int. Cl.<sup>4</sup> D06P 5/00

U.S. Cl. 8-486

12 Claims



1. A method for dyeing the surface of a thermoplastic textile substrate in a desired pattern configuration comprising the steps of:

- applying, substantially uniformly, a heat fixable dye material to said substrate surface without fixing said dye;
- applying heat substantially uniformly to said substrate surface carrying said dye material, said heat being sufficient to fix a quantity of said dye material substantially uniformly over said substrate surface;
- applying heat selectively to said substrate surface in areas defining said desired pattern configuration, said heat being sufficient to increase the fixation level of said dye material in said areas while maintaining said dye material on said substrate surface outside said areas substantially unchanged level of fixation and concentration.

4,680,033

## PROCESS FOR PRODUCING WHITE AND COLORED RESISTS ON POLYAMIDE FIBER MATERIALS USING REACTIVE DYE IN FREE VINYL SULPHONE FORM

Bernd Dürl, Kelkheim, Fed. Rep. of Germany; Johannes Bos, Rothrist, Switzerland; Sienling Ong; Peter Raffel, both of Hofheim am Taunus, Fed. Rep. of Germany, and Kurt Brozat, Hünfelden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany  
Filed Oct. 25, 1985, Ser. No. 791,209

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1984, 3439532

Int. Cl.<sup>4</sup> D06P 3/24, 5/12

U.S. Cl. 8-449

13 Claims

1. In a process for preventing fixation of a vinyl sulfone-type fiber-reactive dyestuff at selected places on a sheetlike textile material, wherein the textile material is first printed in the desired pattern with a white or colored resist paste containing a resist agent for said dyestuff and this pattern is then overprinted, over-padded or over-slop padded with an aqueous paste or dyeing liquor containing the resistable reactive dyestuff, whereby the resist agent deactivates the fiber-reactive moiety of the resistable reactive dyestuff in accordance with the said pattern, and wherein the textile material is subsequently heated in order to fix the resisted pattern and the dyeing with the resistable dyestuff wherever it is still fiber-reactive, the improvement which comprises:

- treating a polyamide fiber-containing material as the textile material, and
- selecting as said resistable reactive dyestuff a dyestuff of the vinyl-sulfone type whose fiber-reactive moiety is either:
  - present from the outset in the free vinylsulfonyl form, or is
  - a precursor of this vinylsulfonyl form derived from esters of mono- or polyvalent, inorganic or organic acids with  $\beta$ -hydroxyethylsulfonyl compounds, which has been converted into the free vinylsulfonyl form, before preparation and application of the said aqueous

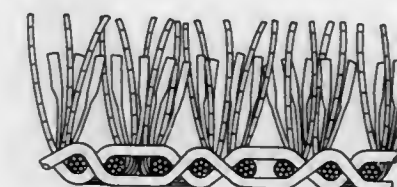
paste or dyeing liquor to the textile material, by treating with alkaline agents.

4,680,034

HIGH CONTRAST PATTERNING PROCESS AND PRODUCT FOR DISPERSE DYED POLYESTER  
Robert C. Arnott, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.  
Continuation of Ser. No. 479,410, Mar. 28, 1983, abandoned.  
This application Apr. 10, 1985, Ser. No. 721,502  
Int. Cl.<sup>4</sup> D06P 5/00

U.S. Cl. 8-481

14 Claims



1. A method for patterning the surface of a textile substrate comprising polyester yarns containing a disperse dye by treating said surface in pattern-wise configuration comprising the steps of:

- selectively applying a heat treatment to pattern areas on said surface of said substrate to enhance the extractability of said dye from at least some polyester yarns within said pattern areas by solvent extraction, while maintaining said surface in pattern-complementary areas in an untreated condition;
- exposing said surface to a solvent which selectively extracts a visually significant quantity of said dye contained in said some polyester yarns in said treated pattern areas before said solvent extracts a visually significant quantity of dye from said untreated pattern-complementary areas, said solvent being selected from the group consisting of methylene chloride, acetone, 1,1,1-trichloroethane, perchloroethylene, and ethanol; and
- halting said solvent extraction after the desired degree of dye extraction in said pattern and pattern-complementary areas has occurred.

4,680,035

## TWO STAGE SLAGGING GASIFIER

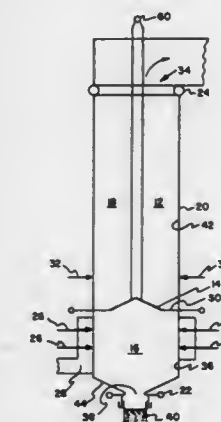
Michael C. Tanca, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 27, 1986, Ser. No. 845,164

Int. Cl.<sup>4</sup> C10J 3/48

U.S. Cl. 48-77

3 Claims



1. In a two stage coal gasifier having an elongated gasifier chamber through which gas is made to flow, said elongated



gasifier chamber being defined by a plurality of elongated members interconnected so as to extend in parallel relation one to another, said elongated gasifier chamber having an opening formed adjacent one end thereof through which the gas after flowing through said elongated gasifier chamber exits from the two stage coal gasifier and having a centrally located slag tap opening formed at the other end thereof through which the slag formed in the two stage coal gasifier exits therefrom, combustor fuel injection means located at a first elevation within said elongated gasifier chamber operative for injecting carbonaceous material therewithin, reductor fuel injection means located at a second elevation within said elongated gasifier chamber operative for injecting carbonaceous material therewithin, the improvement comprising baffle means mounted within said elongated gasifier chamber at a third elevation located between said combustor fuel injection means and said reductor fuel injection means, said baffle means being operative to divide said elongated gasifier chamber into a combustor section and a reductor section, said combustor section extending between said baffle means and said centrally located slag tap opening, said reductor section extending between said baffle means and said opening through which gas exits from the two stage coal gasifier, said baffle means being operative to block off greater than fifty percent of the plan area of said elongated gasifier chamber so as to thereby block radiation from occurring from said combustor section to said reductor section as well as to thereby minimize the possibility of the gas in said reductor section backmixing with the gas in said combustor section, said baffle means having a plan area substantially larger than the plan area of said centrally located slag tap opening so as to thereby cause the slag dropping past said baffle means to fall at a location remote from the location of said centrally located slag tap opening, said baffle means including a plurality of water cooled tubes arranged so as to embody the shape of an inverted Vee with the point of the Vee projecting towards said reductor section, said plurality of water cooled tubes having refractory material secured thereto on the outer surfaces thereof, said baffle means further including first means connected in fluid flow relation to said plurality of water cooled tubes for conveying water thereto and second means connected in fluid flow relation to said plurality of water cooled tubes for conveying water therefrom.

4,680,036

# METHOD OF AUTOMATICALLY CONTROLLING AN ELECTROSTATIC PRECIPITATOR

Wilhelm Leusser, Frankfurt am Main, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

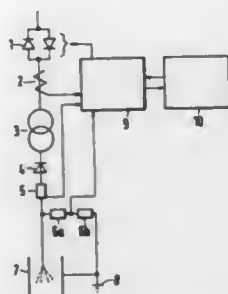
Filed Jul. 11, 1986, Ser. No. 884,368

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526754

Int. Cl.<sup>4</sup> B03C 3/68

U.S. Cl. 55—2

6 Claims



1. A method of operating an electrostatic precipitator to obtain a pure gas having a predetermined dust content with a minimum energy consumption, wherein the voltage applied is automatically controlled by semipulses, comprising:

(a) recording for a given electrostatic precipitator typical

current-voltage characteristics ( $I = f(V, \text{ohm})$ ) for an operation with an unpulsed voltage ( $k = 1$ ) and different dust resistivities;

(b) determining for each characteristic the lowest  $k$  value with which a pure gas having the predetermined dust content is obtained;

(c) associating the thus determined lowest  $k$  value with each characteristic, and continuously automatically controlling the electrostatic precipitator in consideration of said characteristic in such a manner that

(d) the actual characteristic for the operation with an unpulsed voltage is compared with the recorded characteristics and that  $k$  value is selected which corresponds to the recorded characteristic which coincides with the actual characteristic or is next below the actual characteristic.

4,680,037

# LACUNAR COBALT COMPLEXES FOR OXYGEN SEPARATION

Dorai Ramprasad, Allentown, Pa., and Daryle H. Busch, Columbus, Ohio, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

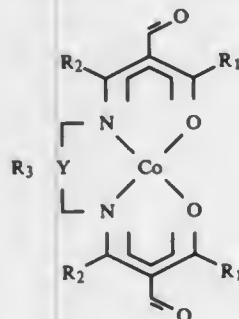
Filed Aug. 28, 1986, Ser. No. 900,935

Int. Cl.<sup>4</sup> B01D 53/22

U.S. Cl. 55—16

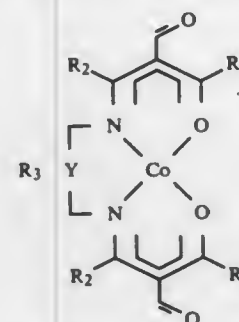
26 Claims

1. A cobalt complex having the structural formula:



wherein each  $R_1$  is independently hydrogen, a phenyl or a  $C_1$ - $C_6$  alkyl group; each  $R_2$  is independently hydrogen or a  $C_1$ - $C_6$  alkyl group;  $R_3$  is a  $C_4$ - $C_{30}$  hydrocarbyl radical connecting the two carbonyl carbons; and  $Y$  is *o*-phenylene,  $-\text{CH}_2\text{CH}_2-$  wherein "a" is 2 or 3,  $-\text{CH}_2\text{CH}_2\text{NR}_4-\text{CH}_2\text{CH}_2-$ , wherein "b" and "c" are independently 1, 2 or 3 and  $R_4$  is hydrogen or a  $C_1$ - $C_{12}$  alkyl group.

15. A method for separating oxygen from a gaseous mixture comprising oxygen and at least one other component, said method comprising: bringing said gaseous mixture into contact with a cobalt complex having the structural formula:



wherein each  $R_1$  is independently hydrogen, a phenyl or a  $C_1$ - $C_6$  alkyl group; each  $R_2$  is independently hydrogen or a  $C_1$ - $C_6$  alkyl group;  $R_3$  is a  $C_4$ - $C_{30}$  hydrocarbyl radical connecting the two carbonyl carbons; and  $Y$  is *o*-phenylene,

$-\text{CH}_2\text{CH}_2-$  wherein "a" is 2 or 3,  $-\text{CH}_2\text{CH}_2\text{NR}_4-\text{CH}_2\text{CH}_2-$ , wherein "b" and "c" are independently 1, 2 or 3 and  $R_4$  is hydrogen or a  $C_1$ - $C_{12}$  alkyl group, such that at least a portion of the oxygen present in the gaseous mixture is reversibly bound to said cobalt complex.

4,680,038

# CYCLONE FILTER WITH ALL METAL FILTERING CANDLE

Frank Titus, Am Katzenpfad 4, D-6148 Heppenheim, Fed. Rep. of Germany

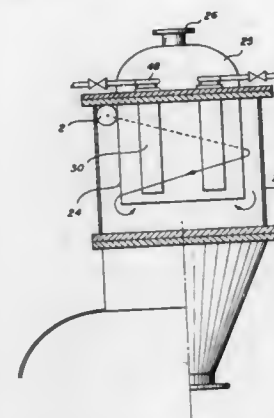
Filed Jun. 18, 1985, Ser. No. 746,228

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1984, 3422592

Int. Cl.<sup>4</sup> B01D 46/04

U.S. Cl. 55—302

2 Claims



1. A filtering apparatus for separation of solids from a solid carrying fluid comprising:

- a housing connected to means for admitting a fluid flow;
- an upper collector chamber for cleansed fluid defined by an intermediate separating wall of said housing, said upper collector chamber exhibiting an outlet;
- at least one candle filter mounted within said housing comprising two concentrically arranged, metal fabric filter cylinders;
- an annular space between said filter cylinders;
- means for closing said annular space at a lower extension of said filter cylinders;
- an annular duct connected at an upper extension of said filter cylinders, leading through said intermediate separating wall and providing open communication between said annular space and said upper collector chamber;
- a plurality of cleaning nozzle means for producing an injection reverse flushing effect to remove solids adhering to said filter cylinders, disposed above and directed into said annular duct; and
- a plurality of wash nozzle means, disposed in an area enclosed by said candle filter and externally to said candle filters, for effecting a superficial cleaning of said filter cylinders in case of a product change in order to prevent contamination, without a need of dismantling or replacing said candle filter.

4,680,039

# SELF-CONTAINED DUST COLLECTOR WITH QUICK RELEASE ADAPTER DUCT

Alan E. Revell, Louisville, Ky., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 19, 1986, Ser. No. 864,420

Int. Cl.<sup>4</sup> B01D 46/48

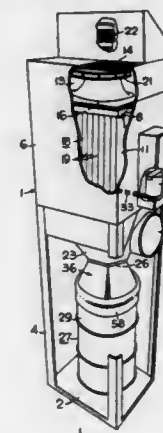
U.S. Cl. 55—341 R

11 Claims

1. In a self-contained dust collector comprising a support frame; a housing mounted on said frame having partition

means therein dividing said housing into a dirty air chamber having a dirty air inlet and a clean air chamber having a clean air outlet, said partition means having an aperture therethrough connecting said dirty air chamber in air flow communication with said clean air chamber; a filter means operatively mounted across said aperture; means for circulating dirty air through said dirty air inlet, into said dirty air chamber, through said filter means into said clean air chamber and out said clean air outlet; a hopper mounted on said frame in dust receiving relation to said filter means and having a first opening constituting a dust discharge port; and a dust storage receptacle spaced from said dust discharge port and having wall means defining a second opening constituting a dust receiving port, the improvement comprising a quick release adapter duct movable to either an open nonduct forming position or a closed duct forming position relative to said storage receptacle, said adapter duct including:

- a semiflexible unitary planar member having an outer periphery and an inner central opening swingably mounted in sealed relation around said dust discharge port;
- a plurality of foldable pleats in said planar member, each of said foldable pleats defined by angularly spaced fold axes on said planar member, each of said fold axes having an outer and an inner end, all of said inner ends of said fold axes for each of said pleats intersecting to form an acute angle having a vertex which is located adjacent said inner central opening, all of said outer ends of said fold axes for



each of said pleats terminating at spaced points on said outer periphery;

said foldable pleats being movable between an open attitude lengthening said outer periphery to cause said planar member to assume said open nonduct forming position and to a closed attitude shortening said outer periphery to cause said planar member to assume said closed duct forming position in which said outer periphery of said planar member is in contact with said receptacle wall means in surrounding relation to said dust receiving port; and

resilient means urging said pleats into said closed attitude to maintain said outer periphery of said planar member in sealed contact with said receptacle wall means when said adapter duct is in said closed duct forming position.

9. A quick release adapter duct movable to either an open nonduct forming position or a closed duct forming position and adapted for installation between spaced apart first and second openings, said quick release adapter duct comprising a unitary semiflexible member having an inner central opening and an outer periphery and a plurality of foldable pleats in said planar member, each of said foldable pleats including at least two angularly spaced fold axes, each fold axis having inner and outer ends with said inner ends of said fold axes of each pleat interconnecting to form an acute angle the vertex of which is located adjacent said inner central opening, and said outer ends of said fold axes of each pleat terminating at spaced apart

points on said outer periphery, said points spaced from each other along said outer periphery a distance sufficient to allow said outer periphery to expand in length as said pleats are opened along said fold axes to permit said planar member to be moved from said closed duct forming position into said open nonduct forming position.

4,680,040

## MULTIPURPOSE FILTERING MATERIAL

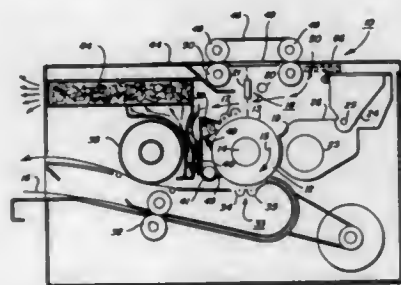
Arthur M. Gooray, Penfield; George J. Heeks; Louis Reale, both of Rochester, and Dipika R. Shah, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 17, 1986, Ser. No. 820,499

Int. Cl.<sup>4</sup> B01D 53/04

U.S. Cl. 55—387

28 Claims



1. A multipurpose filtering material comprising a foraminous support matrix having a plurality of interconnecting voids to permit low impedance to the flow of gaseous material there-through but sufficient to trap particulate material entrained in the gaseous material, the surface of said support matrix being substantially coated with a thin dehydrated alkaline film of an alkali metal silicate to neutralize nitrogen oxide species in the gaseous material, and having adhesively bound thereto a particulate neutralizer for another noxious gas, the surface of said particulate neutralizer being substantially exposed to the flow of gaseous material.

4,680,041

## METHOD FOR COOLING NORMALLY GASEOUS MATERIAL

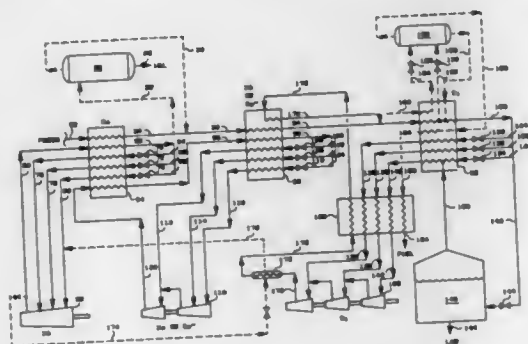
Bradley W. DeLong, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 30, 1985, Ser. No. 814,455

Int. Cl.<sup>4</sup> F25J 3/00

U.S. Cl. 62—11

19 Claims



1. In a method for cooling a normally-gaseous feed stream, having a pressure significantly above ambient pressure, comprising:

- passing said feed stream through an indirect heat exchange means;
- passing a normally-gaseous refrigerant, having a pressure substantially above ambient pressure, through said heat

exchange means, as a first stream, in a concurrent direction with said feed stream;

- dividing said first stream of refrigerant into at least two second streams of refrigerant, as it exits said heat exchange means;
- reducing the pressure of each of said second streams of refrigerant to different, lower pressures; and
- separately passing said second streams of refrigerant, which have thus been reduced in pressure, through said heat exchange means in indirect heat exchange with said feed stream and said first stream of refrigerant and in a countercurrent direction thereto.

4,680,042

## EXTRACTIVE STRIPPING OF INERT-RICH HYDROCARBON GASES WITH A PREFERENTIAL PHYSICAL SOLVENT

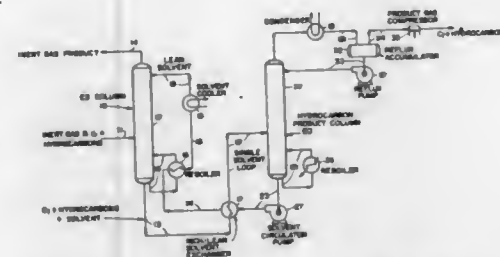
Yuv R. Mehra, Odessa, Tex., assignor to Advanced Extraction Technologies, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 808,463, Dec. 13, 1985, which is a continuation-in-part of Ser. No. 784,566, Oct. 4, 1985, Pat. No. 4,617,038, which is a continuation-in-part of Ser. No. 759,327, Jul. 26, 1985, Pat. No. 4,623,371, which is a continuation-in-part of Ser. No. 758,351, Jul. 24, 1985, Pat. No. 4,601,738, which is a continuation-in-part of Ser. No. 637,210, Aug. 3, 1984, Pat. No. 4,578,094, which is a continuation-in-part of Ser. No. 532,005, Sep. 14, 1983, Pat. No. 4,526,594, which is a continuation-in-part of Ser. No. 507,564, Jun. 24, 1983, Pat. No. 4,511,381, which is a continuation-in-part of Ser. No. 374,270, May 3, 1982, Pat. No. 4,421,535. This application Feb. 13, 1986, Ser. No. 828,988

Int. Cl.<sup>4</sup> F25J 3/00

U.S. Cl. 62—17

37 Claims



1. In a process for treating a natural gas stream containing methane, heavier hydrocarbons, and an inert gas, an improvement comprising selectively extracting natural gas liquids from said natural gas stream with a preferential physical solvent which provides selective capability for recovery according to said selected degree of: (a) ethane in amounts ranging from 2-98%, (b) propane in amounts ranging from 2-99%, (c) butanes in amounts ranging from 2-100%, or (d) pentanes and higher molecular weight hydrocarbons in amounts ranging up to 100%, said improvement comprising the following steps:

A. selecting said preferential physical solvent which is selective for ethane and heavier hydrocarbon components of said gas stream such that:

- relative volatility of methane over ethane is at least 5.0 and the hydrocarbon loading capacity, defined as solubility of ethane in said solvent, is at least 0.25 standard cubic feet of ethane per gallon of said solvent, or
- the preferential factor, determined by the multiplication of relative volatility of methane over ethane by the solubility of ethane in solvent, in standard cubic feet of ethane per gallon of solvent, is at least 1.25;

B. selectively extracting and stripping said natural gas stream with said physical solvent to produce an inert gas stream and a rich solvent stream containing methane and said hydrocarbons heavier than methane; and

C. distilling said rich solvent stream to produce a stream

of said methane and said selected hydrocarbons heavier than methane and a stream of said physical solvent.

4,680,043

## METHOD FOR DENSIFICATION OF POWDERY SILICA AND ARTICLE FORMED THEREBY

Herbert Ginter, Mobile, Ala.; Reinhard Klingel, Wasserlos, and Reinhard Manner, Maintal, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

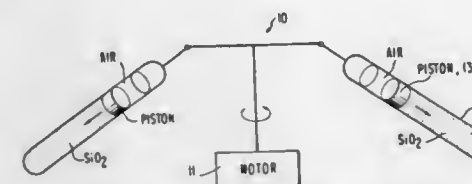
Filed Jul. 22, 1985, Ser. No. 757,811

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429051

Int. Cl.<sup>4</sup> C03B 37/027

U.S. Cl. 65—2

4 Claims



1. Method for the densification of a powdery substance comprising in a first step introducing a powdery substance consisting of pyrogenically prepared silicon dioxide into a centrifuge having an open receptacle and subjecting said powdery substance to centrifugal action in said open receptacle to bring about a predensification of said substance, and subsequently subjecting the powdery substance to additional centrifugal force in the presence of a free flying piston whereby as a result of the additional centrifugal force, additional pressure is created by the piston on the powdery substance to bring about a further densification of the powdery substance.

4,680,044

## METHOD OF MODIFYING THE REFRACTIVE INDEX OF FLUORIDE GLASS

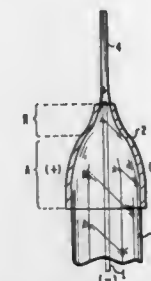
Ricardo C. Pastor, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 25, 1985, Ser. No. 801,666

Int. Cl.<sup>4</sup> C03B 37/027

U.S. Cl. 65—3.11

9 Claims



1. A method of modifying the refractive index of a fluoride glass preform having an outer periphery and an inner core comprising:

- heating the fluoride glass preform to a temperature that is above its glass transition temperature, but below its devitrification temperature;
- inserting a first electrode into the inner core of the preform and surrounding the outer perimeter of the preform with a second electrode of opposite polarity;
- generating an electromotive force using a generating means; and
- applying an electromotive force through the first electrode and the second electrode which causes a movement of positive ions toward the electrode of opposite charge

while simultaneously causing a movement of negative ions toward its electrode of opposite charge such that the movement of these ions results in a modification of the refractive index of the preform.

4,680,045

## METHOD OF PREPARING TUBULAR SILICA GLASS

Haruo Osafune; Sadao Kanbe; Telichiro Mori, and Masahisa Ikejiri, all of Nagano, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,333

Claims priority, application Japan, Oct. 4, 1984, 59-208917; Feb. 13, 1985, 60-26002

Int. Cl.<sup>4</sup> C03B 37/016

U.S. Cl. 65—17

43 Claims



1. A method of preparing tubular silica glass, comprising the steps of:

- preparing a solution of a silicon alkoxide hydrolyzed with an aqueous acid catalyst;
- adding ultra-fine particles of silica to the acid hydrolyzed silicon alkoxide solution to form a sol solution;
- adjusting the pH of the sol solution to between about 3 to 6;
- placing the sol solution into a cylindrical container;
- gelling the sol solution by rotating the container to obtain a tubular gel;
- drying the tubular gel to a dry gel; and
- sintering the dry gel to the tubular silica glass.

4,680,046

## METHOD OF PREPARING PREFORMS FOR OPTICAL FIBERS

Nobutaka Matsuo; Masanobu Motoki; Yoshitaka Itoh; Sadao Kanbe, and Haruo Osafune, all of Nagano, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 782,773

Claims priority, application Japan, Oct. 5, 1984, 59-209362; Feb. 12, 1985, 60-25031

Int. Cl.<sup>4</sup> C03B 37/016

U.S. Cl. 65—17

41 Claims

1. A method of preparing preforms for optical fibers comprising:

- preparing a first sol solution of a silicon alkoxide hydrolyzed with an acid and ultrafine particle silica;
- placing the first sol solution into a container;
- gelling the first sol solution while the container is being rotated at a predetermined rotation rate to obtain a first wet gel having a center hole;
- preparing a second sol solution having a different composition than the first sol solution;
- filling the center hole of the first wet gel with the second sol solution;
- gelling the second sol solution in the first wet gel to obtain a second wet gel;
- drying the first and second wet gels to form a first and second dry gel composite; and
- sintering the first and second dry gel composite to obtain a preform for optical fibers.





ally substituted by fluorine and/or chlorine; C<sub>1</sub>-C<sub>4</sub>-alkylthio which is optionally substituted by fluorine and/or chlorine; amino; C<sub>1</sub>-C<sub>4</sub>-alkylamino or di(C<sub>1</sub>-C<sub>4</sub>-alkyl)-amino.

3. A herbicidal composition comprising a herbicidally effective amount of a benzodisultam according to claim 1 and a diluent.

4. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a benzodisultam according to claim 1.

4,680,053

## HERBICIDAL ALKENYL SULFONAMIDES

George Levitt, Wilmington, Del., and William T. Zimmerman, Landenberg, Pa., assignors to E.I. Du Pont de Nemours and Company, Wilmington, Del.

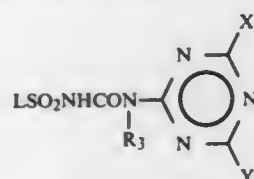
Division of Ser. No. 383,323, Jun. 2, 1982, Pat. No. 4,461,640, which is a continuation-in-part of Ser. No. 328,115, Dec. 7, 1981, abandoned. This application Jul. 13, 1984, Ser. No. 630,873

Int. Cl.<sup>4</sup> C07D 251/46, 251/52; A01N 43/66, 43/70

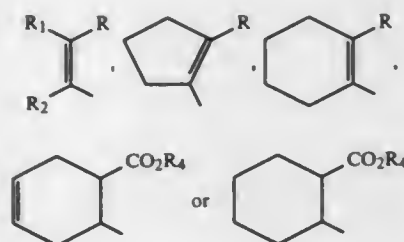
U.S. Cl. 71-93

19 Claims

I. A compound of the formula:



where  
L is



R is F, Cl, Br, C<sub>1</sub>-C<sub>3</sub> alkyl, CO<sub>2</sub>R<sub>4</sub>, C(O)SR<sub>8</sub>, C(O)NR<sub>5</sub>R<sub>6</sub> or S(O)<sub>m</sub>R<sub>7</sub>;

R<sub>1</sub> is H, F, Cl, Br or C<sub>1</sub>-C<sub>3</sub> alkyl;

R<sub>2</sub> is H, F, Cl, Br or C<sub>1</sub>-C<sub>3</sub> alkyl;

R<sub>3</sub> is H or CH<sub>3</sub>;

R<sub>4</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>CH<sub>2</sub>Cl or CH<sub>2</sub>CH=CH<sub>2</sub>;

R<sub>5</sub> is H or C<sub>1</sub>-C<sub>3</sub> alkyl;

R<sub>6</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl; or

R<sub>5</sub> and R<sub>6</sub> may be taken together to form -(CH<sub>2</sub>)<sub>4</sub>-, -(CH<sub>2</sub>)<sub>5</sub>- or -(CH<sub>2</sub>)<sub>2</sub>O(CH<sub>2</sub>)<sub>2</sub>-;

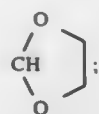
R<sub>7</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl;

R<sub>8</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl;

m is 0, 1 or 2;

X is CH<sub>3</sub> or OCH<sub>3</sub>;

Y is CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, CH<sub>2</sub>OCH<sub>3</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, NH<sub>2</sub>, NHCH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub>, CH(OCH<sub>3</sub>)<sub>2</sub> or



and their agriculturally suitable salts; provided that:

(1) when R is halogen and R<sub>1</sub> and/or R<sub>2</sub> are halogen, then the values of R, R<sub>1</sub> and R<sub>2</sub> must be the same;

(2) when R<sub>1</sub> and R<sub>2</sub> are halogen, then the values of R<sub>1</sub> and R<sub>2</sub> must be the same;

(3) the total number of carbon atoms of R<sub>5</sub> and R<sub>6</sub> is less than or equal to 5;

(4) R<sub>1</sub> and R<sub>2</sub> are not simultaneously H.

12. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid inert diluent.

4,680,054

## TRIAZINE DERIVATIVES, A PROCESS FOR PREPARING THE DERIVATIVES, AND HERBICIDES CONTAINING THE DERIVATIVES AS THE EFFECTIVE COMPONENT

Tetsuo Takematsu, Utsunomiya; Masahiro Nishii, Ichihara, and Izumi Kobayashi, Sodegaura, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 825,817

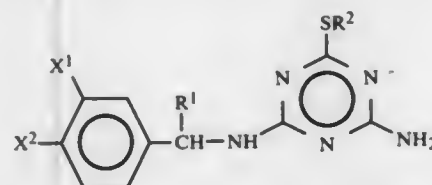
Claims priority, application Japan, Feb. 15, 1985, 60-26549

Int. Cl.<sup>4</sup> C07D 251/52; A01N 43/70

U.S. Cl. 71-93

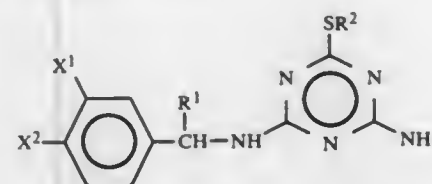
11 Claims

1. A triazine derivative represented by the general formula:



wherein R<sup>1</sup> and R<sup>2</sup> are each an alkyl group having 1 to 4 carbon atoms, and X<sup>1</sup> and X<sup>2</sup> are each a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, or an alkylthio group having 1 to 4 carbon atoms.

3. A herbicide comprising (i) a herbicidal carrier, and (ii) an herbicidally effective amount of a triazine derivative represented by the general formula:



wherein R<sup>1</sup> and R<sup>2</sup> are each an alkyl group having 1 to 4 carbon atoms, and X<sup>1</sup> and X<sup>2</sup> are each a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, or an alkylthio group having 1 to 4 carbon atoms.

7. A herbicide according to claim 3 wherein said carrier is a solid carrier, and said herbicide is formulated as a wettable powder with said triazine derivative being present in an amount of 10 to 55 parts by weight.

4,680,055

## METALLOTHERMIC REDUCTION OF RARE EARTH CHLORIDES

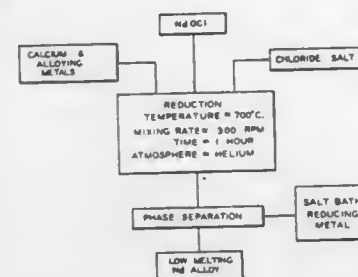
Ram A. Sharma, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1986, Ser. No. 840,762

Int. Cl.<sup>4</sup> C22B 59/00; C01F 11/24

U.S. Cl. 75-84.5

15 Claims



1. A metallothemic method of reducing rare earth chloride and/or oxychloride feedstock to rare earth metal comprising forming a molten bath of Group I or Group II element chloride salts in a reaction vessel; forming a molten metal collection pool having a higher specific gravity than the chloride salt in the vessel; adding a volume of rare earth feedstock less than the volume of said chloride salt bath to the vessel; adding a stoichiometric excess of calcium metal based on said rare earth thereto; agitating the constituents in the vessel such that the rare earth feedstock is reduced to rare earth metal; and allowing the reactions constituents to settle into separate layers respectively containing any excess calcium metal, the chloride salt, and the reduced rare earth metal in the molten metal collection pool.

4,680,056

## CARBONLESS PAPER SOLVENT UTILIZING TRIISOPROPYLTOLUENE

Andrew P. Komin, Wichita, Kans., assignor to Koch Industries, Inc., Wichita, Kans.

Filed Jan. 23, 1986, Ser. No. 821,983

Int. Cl.<sup>4</sup> C09D 11/00

U.S. Cl. 106-21

10 Claims

1. A solvent for dye used in pressure sensitive copying paper comprising (a) one or more members of the group comprising alkylated naphthalenes, diarylmethanes and alkylated biphenyls and (b) triisopropyltoluene.

4,680,057

## EASILY FLUSHABLE TRANSPARENT, STRONG DIARYLYDE YELLOW PIGMENT COMPOSITIONS

Byron G. Hays, Verona, N.J., assignor to BASF Corporation, Inmont Division, Clifton, N.J.

Filed Apr. 12, 1985, Ser. No. 722,971

Int. Cl.<sup>4</sup> C09D 11/08

U.S. Cl. 106-23

7 Claims

1. In an aqueous diarylyde yellow pigment composition comprising the sulfonated coupling product of:

(A) The tetrazo salt of 3,3'-dichlorobenzidine, optionally in admixture with the tetrazo salt of 2,2'-disulfobenzidine, and

(B) An acetoacetylde, optionally in admixture with p-sulfo-acetoacetylde,

the improvement comprising the inclusion of a quaternary ammonium salt selected from the group consisting of di cotyl di methyl, tri octyl methyl, di decyl di methyl, coco benzyl dimethyl, dicoco dimethyl, di soya dimethyl, di H tallow dimethyl, tallow trimethyl/dicoco dimethyl, octadecyl benzyl dimethyl, dodecyl pyridinium, hexadecyl pyridinium, quaternary ammonium salts and dicoco amine/acetic acid and dicoco methyl amine/acetic acid

ammonium salts, thereby producing a sulfonated diarylyde yellow pigment composition having easy flushability, high transparency and high color strength.

4,680,058

## WHITE INK COMPOSITION FOR INK-JET PRINTING

Ryuichi Shimizu, Hitachi; Yasuki Mori, Hitachi; Tsuneaki Kawanishi, Hitachi; Osamu Isao, Hitachi; Hirosada Morisbata, Hitachi, and Tooru Hosoda, Koshigaya, all of Japan, assignors to Hitachi, Ltd. and Dainichiseika Color & Chemicals MFG. Co., Ltd., both of Japan

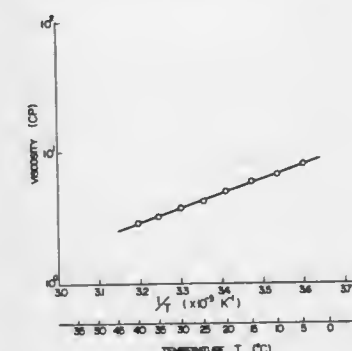
Continuation of Ser. No. 519,674, Aug. 2, 1983, abandoned. This application Mar. 12, 1985, Ser. No. 711,003

Claims priority, application Japan, Aug. 4, 1982, 57-135166

Int. Cl.<sup>4</sup> C09D 11/08

U.S. Cl. 106-23

33 Claims



1. A white ink composition for ink-jet printing, which consists essentially of 4.5 to 40% by weight of inorganic white pigment having a particle size of less than 3 μm on the basis of the ink composition; a binder resin selected from the group consisting of a rosin-modified maleic acid resin, a xylene resin, a rosin-modified xylene resin, an ester gum, a ketone resin, a nitrocellulose, a novolak phenol resin, a resole phenol resin, a rosin-modified phenol resin, an alkylphenol resin, a terpene-modified phenol resin, a glycerine ester of rosin, a polyethyleneglycol ester of rosin, and a hydrogenated rosin or an ester thereof in an amount of 0.1 to 5 parts by weight per part by weight of the inorganic white pigment; 55 to 90% by weight of a solvent capable of dissolving said binder resin selected from the group consisting of an alcohol, a ketone, an ether, an acetate ester and cyclohexanone on the basis of the ink composition; and 0.25 to 5% by weight of a specific resistance-controlling agent capable of adjusting the specific resistance of the composition to less than 2,000 Ω.cm on the basis of the ink composition, said specific resistance-controlling agent being selected from the group consisting of an alkali metal halide; an ammonium halide; a thiocyanate of an alkali metal, an alkaline earth metal or ammonium; and a nitrate of an alkali metal, an alkaline earth metal or ammonium.

4,680,059

## BUILDING MATERIAL

David J. Cook, and Nam W. Lim, both of St. Ives, Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Oct. 1, 1984, Ser. No. 656,725

Claims priority, application Australia, Sep. 30, 1983, PG1660

Int. Cl.<sup>4</sup> C04B 7/34

U.S. Cl. 106-120

15 Claims

1. A building material comprising from 20 to 70% of a reactive amorphous silicate material obtained by combusting a combustible silica containing material which has been reacted with an aqueous solution of an iron salt, from 20 to 60% by weight of a filler containing reactives polyvalent cations, from



10 to 50% by weight of lime and from 0 to 10% by weight of reinforcing fillers.

4,680,060

# PROCESS FOR THE EXTRACTION OF CONTAMINANTS FROM PLASTICS

Ashis S. Gupta, Marietta, and Jerald T. Camp, Loganville, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.  
Filed Sep. 20, 1985, Ser. No. 778,005  
Int. Cl. B08B 30/00

U.S. Cl. 134-26

15 Claims

1. A process for the removal of contaminants from plastic tubing used in syrup lines of a post-mix beverage dispenser, which comprises the steps of:

- flushing said tubing with propylene glycol to extract the contaminants; and
- rinsing said tubing with water to remove any remaining propylene glycol.

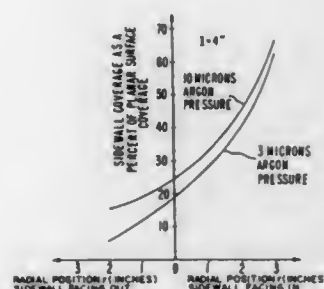
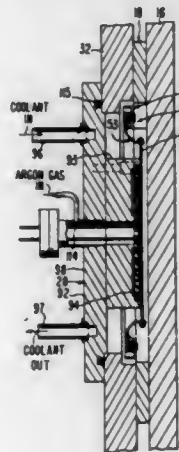
4,680,061

# METHOD OF THERMAL TREATMENT OF A WAFER IN AN EVACUATED ENVIRONMENT

Lawrence T. Lamont, Jr., Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.  
Division of Ser. No. 106,343, Dec. 21, 1979. This application Apr. 7, 1982, Ser. No. 366,433  
Int. Cl. H01L 21/263

U.S. Cl. 148-1.5

19 Claims



1. The method of treating a wafer-like article in a vacuum chamber comprising the steps of positioning the article over a heat-exchanging structure at a station within the vacuum chamber, pushing the article against said structure and maintaining a gas under pressure which is substantially less than atmospheric pressure between the article and said structure to facilitate the conduction of heat between the article and said structure by said gas, said gas being inhibited from flowing from between said structure and article while said article is

being pressed against said structure and said heat conduction by said gas is being facilitated.

4,680,062

# METHOD FOR REDUCING CORE LOSSES OF GRAIN-ORIENTED SILICON STEEL USING LIQUID JET SCRIBING

Tien-Hung Shen, and James A. Salsgiver, both of Sarver, Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.  
Filed Dec. 2, 1985, Ser. No. 803,361  
Int. Cl. H01F 1/04

U.S. Cl. 148-111

8 Claims

1. A method for improving core loss of grain-oriented silicon steel strip, which has been cold rolled to final gauge, said method comprising scribing the steel after said cold rolling in a direction substantially transverse to the rolling direction by directing a pressurized jet of only liquid onto the steel surface to form selected spaced-apart scribe lines.

4,680,063

# METHOD FOR REFINING MICROSTRUCTURES OF TITANIUM INGOT METALLURGY ARTICLES

Russell G. Vogt, Xenia; Daniel Eylon, Dayton, and Francis H. Froes, Xenia, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.  
Filed Aug. 13, 1986, Ser. No. 896,035  
Int. Cl. C22F 1/18

U.S. Cl. 148-11.5 F

8 Claims

1. A process for fabricating forged titanium alloy components which comprises the steps of

- (a) forging a titanium alloy billet to a desired shape;
- (b) heat treating the shaped component at about 4% below to about 10% above the beta-transus temperature of the alloy for about 5 minutes to 4 hours, followed by rapid cooling;
- (c) hydrogenating the component at an elevated temperature to a desired hydrogen level;
- (d) cooling the thus-hydrogenated component at a controlled rate to room temperature;
- (e) dehydrogenating the thus-cooled, hydrogenated component at an elevated temperature to a desired hydrogen level; and
- (f) cooling the thus-dehydrogenated component at a controlled rate to room temperature.

4,680,064

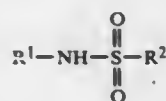
# PHOSPHATE CONVERSION COATING ACCELERATORS

Heinz Portz, Roesrath-Kleinchen, and Othmar V. Ettingshausen, Duesseldorf, both of Fed. Rep. of Germany, assignors to Gerhard Collardin GmbH, Cologne, Fed. Rep. of Germany  
Continuation of Ser. No. 631,022, Jul. 16, 1984, abandoned. This application Sep. 27, 1985, Ser. No. 781,316  
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1983, 3325974  
Int. Cl. C23C 22/12

U.S. Cl. 148-617

36 Claims

1. A phosphating composition for zinc-, iron-, or zinc-iron-phosphate conversion coatings, excluding nitrite as an accelerator, and containing an accelerator which is one of the following compounds, its alkali metal salt or ammonium salt, or any mixture thereof:

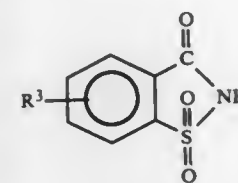


wherein:  
R<sup>1</sup> is

- (i) a C<sub>1-4</sub> linear or branched alkyl radical,
- (ii) a C<sub>5-6</sub> saturated carbocyclic or heterocyclic radical, or
- (iii) an aryl or aralkyl radical having at least 6 members; and

R<sup>2</sup> is

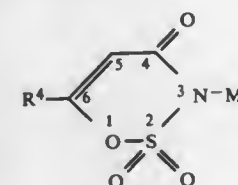
- (i) hydroxy,
- (ii) —O—M<sup>+</sup> in which M<sup>+</sup> is an alkali metal or an ammonium ion, or
- (iii) an aromatic ring having at least 6 members, optionally substituted by a hydroxy, amino, (C<sub>1-3</sub> alkyl)-CO—NH or (carboxy C<sub>1-3</sub> alkyl)-CO—NH radical;



wherein,

R<sup>3</sup> is

- (i) hydrogen,
- (ii) hydroxy, or
- (iii) an amino radical;



wherein:

R<sup>4</sup> is

- (i) hydrogen, or
- (ii) a C<sub>1-4</sub> linear or branched alkyl radical and M<sup>+</sup> is an alkali metal or an ammonium ion.

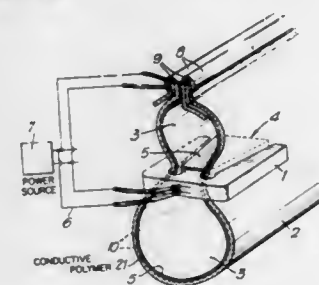
4,680,065

# BRANCH-OFF TECHNIQUE

Jan Vansant, Louvain; Noel Overbergh, Bertem; Valere Bueckers, Zelem-Halen, and Amandus L. E. Pieck, Kortenaeken, all of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.  
Division of Ser. No. 689,622, Jan. 8, 1985, Pat. No. 4,641,009.  
This application Aug. 25, 1986, Ser. No. 900,037  
Claims priority, application United Kingdom, Jan. 10, 1984, 8400508; Sep. 21, 1984, 8424005  
Int. Cl. H01B 13/22

U.S. Cl. 156-49

24 Claims



1. A method of forming a branch-off seal between a sleeve and at least two substrates which comprises:  
(a) positioning at an end portion of the sleeve means for

- forming in the sleeve at least two terminal conduits said means for forming including a heating means;
- (b) positioning the substrates in respective conduits;
- (c) positioning a heat-activatable material within the sleeve at or adjacent the end portion; and
- (d) activating the heat-activatable material by the heating means.

23. A kit-of-parts which comprises a sealing member and a sleeve, wherein the sealing member is positionable within an end portion of the sleeve, and which comprises an elongate member having self contained heating means and an outer surface comprising a heat-activatable sealing material in thermal contact with the heating means.

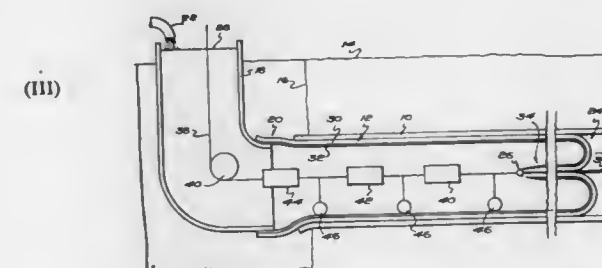
4,680,066

# LINING OF PIPELINES OR PASSAGEWAYS

Eric Wood, Northants, England, assignor to Insituform Group Limited, Isle of Man  
Filed Jul. 15, 1985, Ser. No. 754,722  
Claims priority, application United Kingdom, Jan. 13, 1984, 8418038  
Int. Cl. B32B 31/12

U.S. Cl. 156-156

10 Claims



1. In the method of lining a pipeline or passageway with a flexible tubular liner that includes introducing into said pipeline or passageway a liner comprising an inner tube of resin absorbent material and an outer membrane impervious to fluids, everting said liner during its travel through said pipeline or passageway so that when everted said tube of resin absorbent material is pressed outwardly against the inner surface of said pipeline or passageway and said impervious membrane is disposed inwardly of said everted tube of resin absorbent material, said resin absorbent material being saturated with a light curable resin prior to or after its eversion, and introducing light curing means into the interior of said everted liner to thereby cure said light curable resins, the improvement which comprises controlling the movement of said light curing means through said everted liner by attaching said light curing means to the trailing end of the liner that will be the last to be everted.

4,680,067

# METHOD AND ARRANGEMENT FOR ATTACHING PRINTING PLATES TO A PLATE CYLINDER

John Moore, La Conversion, Switzerland, assignor to De la Rue Giori S.A., Lausanne, Switzerland  
Filed Jun. 4, 1986, Ser. No. 870,441  
Claims priority, application Switzerland, Jul. 26, 1985, 3258/85  
Int. Cl. B32B 31/12, 31/20; B41F 13/08

U.S. Cl. 156-165

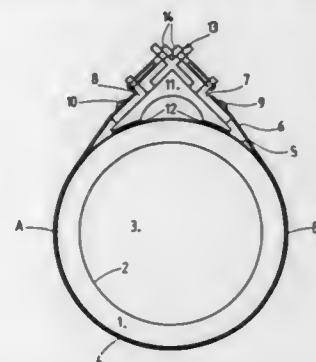
8 Claims

1. Method of attaching printing plates to a plate cylinder of a web fed intaglio printing machine, said plate cylinder comprising a cylindrical barrel of ductile material, having a slightly tapered inner wall, comprising the following steps:

- (a) at least two intaglio printing plates having a total length equal to the circumference of the cylindrical barrel are prepared and bent;
- (b) the cylindrical barrel is expanded radially within the

limits of elastic deformation by using mechanical means so that the outer diameter of the cylindrical barrel after fixing the plates is equal to the diameter it should have in the printing machine;

- (c) a layer of adhesive substance is applied to one portion of the cylindrical barrel which corresponds to the dimensions of said printing plate, but of which layer the length in the peripheral direction is greater than the length of said printing plate;
- (d) one of the printing plates is placed on the cylindrical barrel coated with the adhesive substance, while positioning and holding said one plate in the precise position it should have on the cylindrical barrel;
- (e) on the cylindrical barrel and next to the two edges of the printing plate which are parallel to the axis of the cylindrical barrel, there is disposed at least one sheet having the same thickness and width as the printing plate, and a hardness about the same as that of said plate, and of the same length as the peripheral length of the noncovered surface of the cylindrical barrel for preserving the continuity of the cylindrical barrel surface beyond the portion covered with the printing plate;
- (f) a tightening ribbon is disposed around the printing plate so as to cover this plate completely, the length of said ribbon being greater than that of said plate, so that it will also cover the sheet or sheets at least in the vicinity of the two transverse edges of the plate, the areas of the two ends of the ribbon being tangential to the plate cylinder;



- (g) after softening the adhesive substance tractive forces are exerted at spaced intervals along the two ends of the ribbon in directions orthogonal to the cylindrical barrel axis, by beginning from points located at the centers of the respective ends of the ribbon and advancing symmetrically towards the lateral peripheral edges of the ribbon, so that the excess of adhesive substance will be forced towards said lateral peripheral edges of said cylindrical barrel;

- (h) when the adhesive substance has set, the ribbon and the sheet or sheets is or are removed, then a layer of adhesive substance is applied to another portion of the cylindrical barrel which corresponds to the dimensions of the second printing plate, this second printing plate is applied thereto one or more sheets are disposed as before in the portion of the cylinder surface not covered by the plates, the second printing plate is covered with the ribbon like the first printing plate, and tractive forces are exerted as in the preceding step until the adhesive substance has set, whereafter the ribbon is removed;
- (i) step (h) is repeated until the entire cylindrical surface of the plate cylinder is covered;
- (j) grooves between the adjacent plates are filled up and the areas of these filled grooves are machined to provide an unbroken peripheral surface; and
- (k) the application of forces causing the expansion of the cylindrical barrel is discontinued.

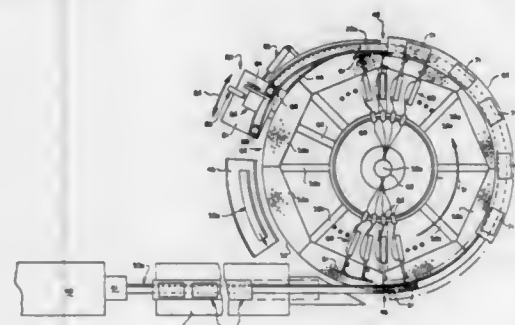
4,680,068

**METHOD FOR FORMING DRUM HANDLING RINGS**  
Donald R. Hofstetter, 11090 Clay St., Montville, Ohio 44064,  
and Louis F. Fow, Jr., 30 Greentree Rd., Chagrin Falls, Ohio 44022

Division of Ser. No. 638,285, Aug. 6, 1984, Pat. No. 4,626,186.  
This application Jul. 7, 1986, Ser. No. 882,473  
Int. Cl.<sup>4</sup> B29C 47/78

U.S. Cl. 156—196

9 Claims



1. A method of forming a ring from a strip of plastic material comprising the steps of:

providing said strip in a non-solidified condition, said strip being curved to a predetermined degree out of a secondary plane B—B generally perpendicular to a primary plane A—A;  
solidifying said curved strip to a predetermined degree wherein it will maintain its curved condition; and  
bending said solidified, curved strip out of said primary plane A—A to form a ring having a geometry dependent on the degree of curvature of said strip out of said secondary plane B—B.

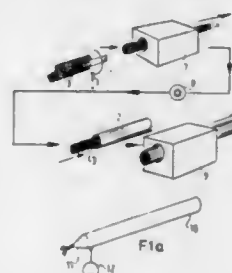
4,680,069

**METHOD FOR THE FABRICATION OF A DOUBLE-WALLED CONSTRUCTION ELEMENT**  
Johan J. M. E. Weyts, Bisschopsdreef 13, 8310 Brugge (Sint-Kruis), Belgium

Filed Feb. 17, 1984, Ser. No. 581,040  
Claims priority, application Netherlands, Feb. 25, 1983, 8300719

Int. Cl.<sup>4</sup> B31D 3/02; B32B 31/04, 31/22  
U.S. Cl. 156—197

17 Claims



1. The method of making a honeycomb-reinforced structure which comprises the steps of:

(a) providing a stack of intermittently joined elongate strips which will form a honeycomb structure when expanded in the direction perpendicular to the strips and machining said stack to present opposite side faces, defined by the cumulative opposite side edges of the strips, which are in predetermined relationship to each other and with the stack presenting a lengthwise dimension commensurate

- with the lengths of the strips and a widthwise dimension commensurate with the cumulative thickness of the strips;
- (b) expanding said stack in the direction perpendicular to said strips to form a honeycomb structure whose widthwise dimension has been increased from said widthwise dimension of the stack to a first predetermined value while the lengthwise dimension of the honeycomb structure has decreased from said lengthwise dimension of the stack to a second predetermined value and honeycomb cells extend between said opposite side faces;
- (c) wrapping and affixing the expanded stack in its widthwise direction around a hollow tubular member having an outer surface whose circumference is equal to said first predetermined value of the widthwise dimension of the honeycomb structure so that said one opposite side face of the honeycomb structure contacts said outer surface and completely encompasses the hollow tubular member to deform the other opposite side face of the honeycomb structure into a predetermined shape; and
- (d) fitting the structure of step (c) lengthwise into an outer hollow tubular member having an inner surface conforming to said predetermined shape of said other opposite side face of the structure of step (c) and joining said other opposite side face to said inner surface to form the honeycomb-reinforced structure.

4,680,070

**TUBES OF MICROPOROUS THERMAL INSULATION MATERIAL**

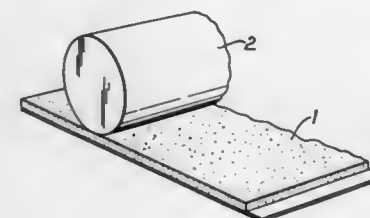
John T. Hughes, Worcester, United Kingdom, assignor to Micropore International Limited, Droltwich, United Kingdom  
Filed Jun. 6, 1985, Ser. No. 742,050

Claims priority, application United Kingdom, Jun. 7, 1984, 8414526

Int. Cl.<sup>4</sup> B29C 1/00

U.S. Cl. 156—218

10 Claims



1. A method of manufacturing a tube of microporous thermal insulation material, which method comprises the steps of: forming a substantially flat slab of microporous thermal insulation material;  
said microporous thermal insulation material formed by compacting a finely divided powder selected from the group consisting of pyrogenic silica, carbon black, and finely divided metal oxides, said microporous thermal insulation material being relatively friable;  
providing on one surface of the slab a membrane which is to form an outer skin of the tube to be produced;  
wrapping the slab and the membrane around a mandrel having a diameter corresponding to the internal diameter of the tube to be produced such that the ends of the slab abut substantially against each other;  
securing the longitudinally extending edges of the membrane relative to each other so as to form a tube; and  
removing the tube from the mandrel.

4,680,071

**METHOD FOR MAKING RUBBER ARTICLES**  
Richard D. Candle, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio  
Filed Jul. 27, 1984, Ser. No. 635,377  
Int. Cl.<sup>4</sup> B29C 53/36

U.S. Cl. 156—218

22 Claims



1. A method for manufacturing an indefinite length thermosetting tubular article comprising the steps of:

(a) plying up a plurality of thermosetting elastomeric layers to form an uncured thermosetting web having a central portion and lateral edge portions;  
(b) curing said central portion of the width of the uncured thermosetting web in compressive engagement with a means for curing for a time sufficient to form a center cured web having a cured central portion, and a first uncured lateral edge portion and a second uncured lateral edge portion;  
(c) overlapping said first uncured lateral edge and second uncured lateral edge portions to form a longitudinal overlap splice; and  
(d) curing the longitudinal overlap splice in compressive engagement with a means for curing for a time sufficient to fully cure the longitudinal splice to form a fully cured tubular web.

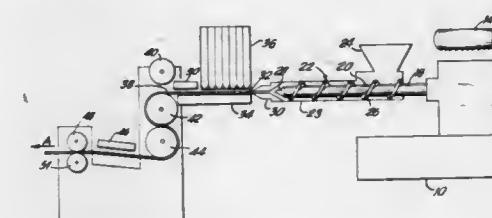
4,680,072

**METHOD AND APPARATUS FOR PRODUCING MULTILAYERED PLASTIC CONTAINING SHEETS**  
John J. Farrell, Greenbrook, N.J., assignor to Wedco Inc., Bloomsbury, N.J.

Filed Apr. 30, 1985, Ser. No. 728,711  
Int. Cl.<sup>4</sup> B29C 47/06

U.S. Cl. 156—243

18 Claims



1. A process for the production of a multilayer plastic sheet comprising sequentially disposing at least two powdered flowable materials onto a melted layer of plastic by means of dropping said materials by gravity flow from a storage vessel onto said plastic, said plastic being conveyed in a given direction, each material corresponding to a separate layer of the resulting multilayer sheet.



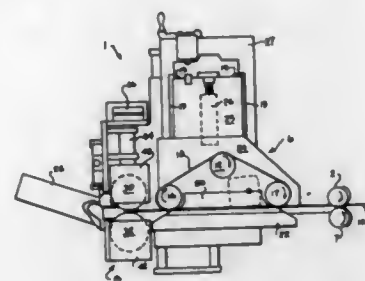
4,680,073

**METHOD AND APPARATUS FOR HEAT SEALING**  
Hans A. Brunner, and Donald E. Vaughan, both of Chesterfield County, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Mar. 17, 1986, Ser. No. 839,938  
Int. Cl.<sup>4</sup> B32B 31/18

U.S. Cl. 156—250

7 Claims



1. A method for forming a fin seal along an edge of a plastics resin film comprising passing an end of said film between a pair of guide rollers, passing said end between a heated, driven band sealing surface and a backup surface to form a sealed region within said end, and subsequently driving said end and cutting excess material from said end, including a portion of said sealed region, to thereby form said edge by passing said end between a rotating drive wheel having a cutting knife therein and a rotating backup wheel, said drive wheel and said backup wheel being sufficiently close to said band such that said end remains in registry during sealing and cutting and said sealed region is cut while at an elevated temperature.

4,680,074

**METHOD FOR PRODUCING A CARRIER MATERIAL FOR THE SOLAR CELLS OF A SOLAR GENERATOR**  
Walter Schmitz, Wedel, and Jürgen Koch, Holm, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 732,813

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418078

Int. Cl.<sup>4</sup> H01L 31/02

U.S. Cl. 156—291

18 Claims



1. A method for producing a carrier material for use in a solar generator composed of a plurality of solar cells electrically conductively connected together, the solar cells being fastened only on one side thereof to the carrier material, said method comprising:

- providing a glass fiber fabric composed of intersecting glass fibers;
- applying liquid plastic composed of a plastic dissolved in a solvent to only the points of intersection of the glass fibers;
- evaporating the solvent; and
- hardening the plastic so that the glass fibers are firmly mechanically connected together by the hardened plastic at the points of intersection.

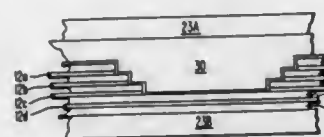
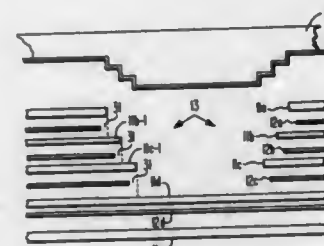
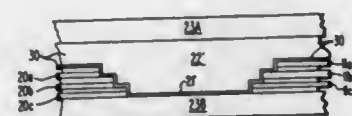
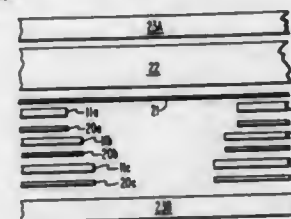
4,680,075

**THERMOPLASTIC PLUG METHOD OF FABRICATING AN INTEGRATED CIRCUIT PACKAGE HAVING BONDING PADS IN A STEPPED CAVITY**  
Norman E. McNeal, Carlsbad, and Richard A. Nagy, Leucadia, both of Calif., assignors to UNISYS Corporation, Detroit, Mich.

Filed Jan. 21, 1986, Ser. No. 819,996  
Int. Cl.<sup>4</sup> B32B 31/20

U.S. Cl. 156—289

13 Claims



1. A method of fabricating an integrated circuit package prior to the placement of a circuit chip therein, said method including the steps of:

- assembling a stack which is comprised of a plurality of superposed thin flat epoxy-glass layers, adhesive layers between said epoxy-glass layers, a staircase-shaped cavity which extends from an outer epoxy-glass layer of said stack to an internal epoxy-glass layer of said stack and goes parallel along a portion of the flat upper surface of said internal epoxy-glass layer and then penetrates through it, and conductors on said internal epoxy-glass layer including bonding pads on said flat upper surface portion;
- inserting into said cavity a thermoplastic plug which is coated with a film of a release material that resists sticking to said epoxy-glass and said adhesive, and which differs from the shape of said cavity by predetermined tolerances and extends over a larger area outside the cavity;
- laminating said stack, while said plug is in said cavity, at a temperature and pressure which causes said plug to soften and conform to the exact shape of said cavity, without sticking in said cavity, and thereby dam said adhesive from flowing onto said bonding pads on said flat upper surface portion; and

removing said thermoplastic plug from said cavity subsequent to said laminating step.

4,680,076

**MULTIPHASE EPOXY THERMOSETS HAVING RUBBER WITHIN DISPERSE PHASE**  
John K. Bard, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 28, 1986, Ser. No. 901,097  
Int. Cl.<sup>4</sup> C09J 5/10; C08K 3/04; C08F 283/10

U.S. Cl. 156—306.9

15 Claims

1. A thermoset comprising a crosslinked epoxy resin matrix with a fracture toughness,  $K_{IC}$ , of at least 1.2 MPa $\sqrt{m}$ , at least one  $T_g$  of at least about 150° C. and comprising a glassy discontinuous phase which contains a rubber phase and is dispersed in a glassy continuous phase that continues throughout said resin matrix, said discontinuous phase constituting at least about 25 volume % of the total volume of said phases.

4,680,077

**LAMINATING METHODS AND APPARATUS USING RESILIENT FACED ROLLERS**  
Thomas C. Hodgson, Auckland, New Zealand, assignor to Strong Plastics Limited, New Zealand

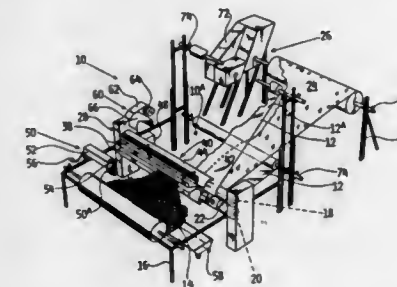
Filed Jun. 20, 1985, Ser. No. 747,140

Claims priority, application New Zealand, Jun. 25, 1984, 208644

Int. Cl.<sup>4</sup> C09J 5/06

U.S. Cl. 156—321

13 Claims



1. An apparatus for laminating a plastics film to a second element comprising a pair of nip gap forming rollers with the peripheral surfaces thereof being covered with natural wool fabricated into a mat form having projecting tufts of fibres, means to feed a plastics film through the nip gap as to be in contact with the natural wool covered surfaces of said rollers, heating means to heat the plastics film whereby at least a first surface thereof distal of the natural wool covered surfaces of said rollers is substantially at a fusion temperature as the film enters the nip gap, means to feed an element through the nip gap whereby a treated surface thereof makes contact with the fused surface of the plastics film and applicator means to dispense an adhesive containing a wetting agent onto the element to thus form the treated surface thereof.

6. A method of laminating a plastics film to a metal network structure comprising the steps of heating a first surface of the film to substantially a fusion temperature therefor, applying an adhesive containing a wetting agent to a surface of said metal network structure, introducing the plastics film and said metal network structure together with the adhesive covered surface of said metal network structure adjacent to the first surface of the plastics film, with in so doing, passing them between a pair of rollers arranged to form a nip gap therebetween, the periph-

4,680,078

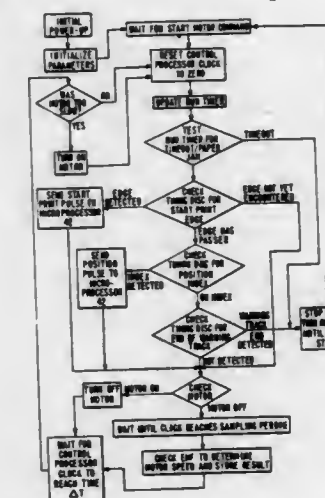
**HAND-HELD LABELER HAVING IMPROVED WEB POSITION SENSING AND PRINT HEAD CONTROL**  
James L. Vanderpool, Kettering, and James M. Bain, Xenia, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 596,346, Apr. 3, 1984, Pat. No. 4,584,047.  
This application Oct. 28, 1985, Ser. No. 791,702

Int. Cl.<sup>4</sup> B65C 9/18, 11/02

U.S. Cl. 156—352

5 Claims



1. A hand-held labeling machine comprising: a housing having a manually engageable handle, the housing having means for holding a label supply roll of a composite web having labels releasably adhered to a backing strip, means for printing on a label at a printing position, means for peeling the printed label from the backing strip, label applying means disposed adjacent the peeling means, means for advancing the web to peel a printed label from the backing strip at the peeling means and advance the printed label into a label applying relationship with the label applying means and to advance another label into the printing position, a motor for driving said advancing means, means for entering selected data to be printed, the printing means including a thermographic print head having a plurality of individually selectable print elements for printing on a thermographic label at a printing position, means coupled to said data entering means for electrically processing the selected data and energizing the individual print elements in a predetermined sequence determined by the selected data to print data on the label, said advancing means including label positioning means for providing a signal representative of the end of the label, means for periodically checking the speed of said motor, and jam detecting means including means for determining the number of times the speed of said motor has been checked, and means for indicating a jam when the number of times the speed of the motor was checked exceeds a predetermined number and if the signal representative of the end of the label has not been received.

4,680,079

**PRINTED CIRCUIT BOARD LAMINATING APPARATUS**  
Shoji Tanaka, Oyama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

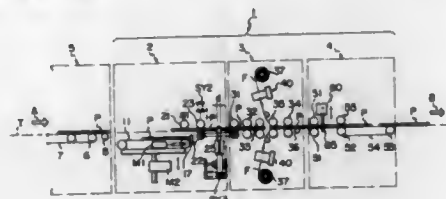
Filed Mar. 14, 1985, Ser. No. 711,635

Claims priority, application Japan, Mar. 16, 1984, 59-049232; Mar. 24, 1984, 59-055242; Mar. 26, 1984, 59-056150; Mar. 26, 1984, 59-057652; Mar. 26, 1984, 59-057653

Int. Cl.<sup>4</sup> B32B 31/00

U.S. Cl. 156—353

12 Claims



1. A printed circuit board laminating apparatus for laminating a film on a surface of each of a plurality of baseboards corresponding to a printed circuit board comprising:

(a) laminating means for continuously feeding a long film, and continuously laminating the film on a surface of each baseboard; and

(b) baseboard feed means for arranging the plurality of baseboards, with a constant gap therebetween, and feeding each baseboard to said laminating means at a first velocity, including

(i) a regular-feed mechanism for continuously feeding a first baseboard of the plurality of baseboards to said laminating means at the first velocity,

(ii) a quick-feed mechanism for feeding a second baseboard of the plurality of baseboards to a waiting position and then to said regular-feed mechanism at a second velocity higher than the first velocity,

(iii) a spacing mechanism for spacing said first and second baseboards, with the constant gap therebetween, and

(iv) a lifting mechanism for moving said quick feed mechanism and down between a lower position, in which the quick-feed mechanism feeds the first and second baseboards, to the waiting position, and an upper position, in which the quick-feed mechanism feeds the first and second baseboards, to said regular-feed mechanism.

4,680,080

**APPARATUS FOR PRODUCING LABELS**

David J. Instance, Past Heap Farm, Pembury, Tunbridge Wells, Kent, United Kingdom

Filed Sep. 27, 1985, Ser. No. 781,001

Claims priority, application United Kingdom, Sep. 27, 1984, 8424449

Int. Cl.<sup>4</sup> B32B 31/00

U.S. Cl. 156—357

20 Claims



1. Apparatus for producing a succession of self-adhesive labels carried on a backing of release material, the apparatus comprising means for conveying along a pathway a laminar material comprising a succession of label base portions, each of which is coated on its reverse side with a pressure sensitive adhesive, and having a backing of a release material; detecting

means situated along the pathway for detecting a succession of particular locations which are spaced along the length of the laminar material; an adhesive applying station situated along the pathway and including an adhesive applicator, which is operable in response to the means for detecting, for applying a layer of adhesive to a particular area on each label base portion; and a label applying station situated along the pathway downstream of the adhesive applying station, the label applying station including label applying means, which are operable in response to the means for detecting, for successively applying individual pre-printed labels to respective successive layers of adhesive so that a pre-printed label covers each area of each label base portion to which adhesive has been applied.

4,680,081

**HAND HELD ELECTRICALLY SELECTABLE LABELER**

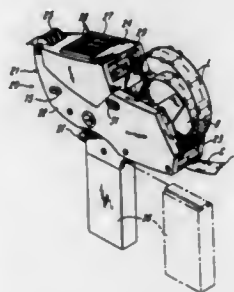
Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 798,260, Nov. 14, 1985, abandoned, which is a division of Ser. No. 674,105, Nov. 19, 1984, Pat. No. 4,591,404, which is a division of Ser. No. 512,820, Jul. 11, 1983, Pat. No. 4,497,682, which is a continuation of Ser. No. 268,320, May 29, 1981, abandoned. This application Oct. 23, 1986, Ser. No. 922,789

Int. Cl.<sup>4</sup> B41J 3/00; B41F 1/00

U.S. Cl. 156—384

12 Claims



1. A hand-held labeler adapter to print and apply pressure sensitive labels releasably secured to a carrier web, comprising: a housing having a front portion, a rear portion and a handle, a label applicator mounted on the front portion, label roll mounting means disposed at the rear portion, thermographic printing elements disposed in the housing for printing on the labels, means for delaminating printed labels, means for advancing the carrier web to bring the labels successively to the thermographic printing elements and the delaminating means, a keyboard on the housing, a control circuit for selectively energizing the printing elements, and wherein the handle depends downwardly from the front the rear portions and contains a rechargeable battery.

4,680,082

**LABEL APPLICATOR**

David A. Kearney, Keene, N.H., assignor to Markem Corporation, Keene, N.H.

Filed Oct. 4, 1985, Ser. No. 784,507

Int. Cl.<sup>4</sup> B65C 9/18, 9/28

U.S. Cl. 156—497

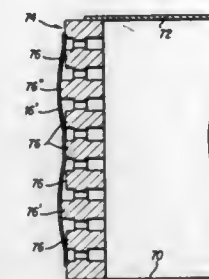
6 Claims

1. An apparatus for receiving and applying labels, comprising:

an enclosure having a generally planar face plate formed with a plurality of openings therein communicating with the interior of the enclosure;

means for maintaining a partial vacuum within said enclosure in order to cause a label to adhere to the outside of the face plate;

means for causing the label to transfer from the face plate to a label receiving surface; and



means on said face plate for causing the adhered label to bow outward from the plane of the face plate.

4,680,083

**CUTTER DEVICE FOR A FILM STRIP ON A LAMINATE**

Tadao Kashiwaba, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

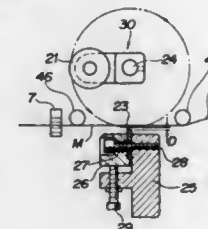
Filed Apr. 10, 1985, Ser. No. 721,856

Claims priority, application Japan, Apr. 13, 1984, 59-74403

Int. Cl.<sup>4</sup> B32B 31/18

U.S. Cl. 156—510

10 Claims



1. A cutter device for partially cutting a laminated strip comprising:

means for positioning the laminated strip along a path; a stationary cutter assembly positioned at one side of the path and having a cutting surface disposed toward the laminated strip positioned along the path; and

a rotatable assembly positioned generally opposite the stationary cutter and on another side of the path opposite the one side, the rotatable assembly comprising a revolving roller for pushing the laminated strip against the cutting surface when the rotatable assembly rotates for partially cutting the laminated strip, said rotatable assembly comprising a rotatable drive shaft, the revolving roller being supported eccentrically relative to the drive shaft for pushing the laminating strip each time the drive shaft rotates.

4,680,084

**INTERFEROMETRIC METHODS AND APPARATUS FOR DEVICE FABRICATION**

Peter A. Helmann, Clifton; Joseph M. Moran, Berkeley Heights, and Ronald J. Schutz, Warren, all of N.J., assignors to American Telephone and Telegraph Company, AT&amp;T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 21, 1984, Ser. No. 642,931

Int. Cl.<sup>4</sup> H01L 21/306; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—626

15 Claims

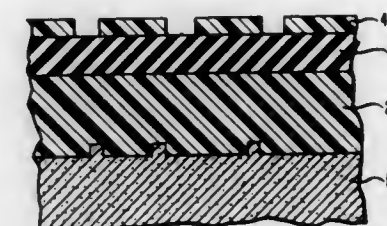
1. A method for fabricating a device, comprising the steps of:

etching at least a portion of a first region of a substrate, which first region overlies a second region of said substrate;

monitoring said etching by illuminating an area of said first region being etched with light and detecting the intensity

of at least a portion of the light reflected from said first region;

terminating said etching based on the detected intensity; and completing the fabrication of said device, Characterized In That



said illuminating light includes nonvisible light which is chosen in relation to said first and second regions so that said first region is substantially transparent, and said second region is substantially opaque, to said nonvisible light.

4,680,085

**METHOD OF FORMING THIN FILM SEMICONDUCTOR DEVICES**

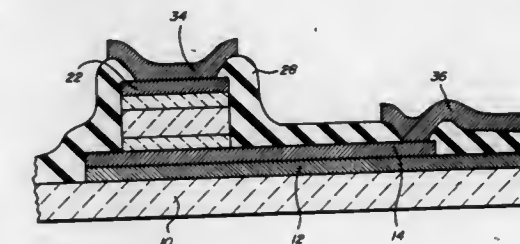
Meera Vijan, Troy; John C. McGill, Rochester, and Paul N. Day, Troy, all of Mich., assignors to Ovonic Imaging Systems, Inc., Troy, Mich.

Filed Apr. 14, 1986, Ser. No. 851,756

Int. Cl.<sup>4</sup> H01L 21/306; B44C 1/22; C03C 15/00; C23F 1/02

U.S. Cl. 156—643

74 Claims



1. A method of forming a thin film semiconductor device having at least one noncrystalline semiconductor layer, comprising the steps of:

(A) depositing said noncrystalline semiconductor layer over a substrate;

(B) forming a first conductive metal layer over first and second adjacent portions of said semiconductor layer;

(C) removing a section of the first conductive metal layer which overlies said second portion of said semiconductor layer; and

(D) removing the second portion of said semiconductor layer by anisotropically etching said semiconductor layer, wherein the section of the first conductive metal layer which overlies said first portion of said semiconductor layer acts as a mask to prevent vertical etching of said first portion of said semiconductor layer, said etching being performed by directing accelerated reactive ions onto the surface of said one semiconductor layer and said mask, said ions being chemically reactive with said one semiconductor layer, whereby a steeply sloping sidewall of said semiconductor layer is formed.



4,680,086

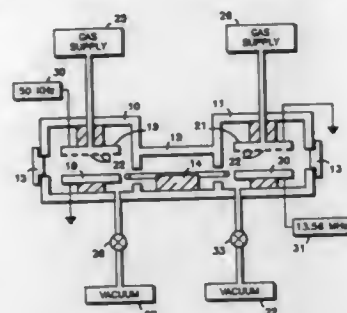
## DRY ETCHING OF MULTI-LAYER STRUCTURES

Patrick K. Thomas, Pflugerville; Dennis C. Hartman, Austin, and Jasper W. Dockrey, Pflugerville, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 20, 1986, Ser. No. 841,976

Int. Cl.<sup>4</sup> H01L 21/306, 21/308

U.S. Cl. 156—643



1. A method for dry etching a multi-layer structure comprising a refractory metal silicide overlying a polysilicon material overlying a dielectric material comprising the steps of: forming a patterned photoresist layer overlying said refractory metal silicide layer of said multi-layer structure to protect portions of said silicide layer; supporting a substrate bearing said multi-layer structure on a grounded electrode in a first parallel plate-type dry etch chamber; energizing a first reactive gas mixture comprising at least one fluorine-containing compound in said first dry etch chamber with energy of a first RF frequency coupled to a power electrode in said first chamber to completely remove unprotected portions of said refractory metal silicide; transporting said substrate from said first dry etch chamber to a second parallel plate-type dry etch chamber after unprotected portions of said refractory metal silicide have been completely removed to expose portions of said polysilicon; supporting said substrate on a powered electrode in said second parallel plate-type dry etch chamber; energizing a second reactive gas mixture comprising at least one chlorine-containing compound in said second dry etch chamber with energy of a second RF frequency higher than said first RF frequency coupled to said powered electrode to completely remove unprotected portions of said polysilicon; and removing said substrate from said second dry etch chamber after exposed portions of said polysilicon have been completely removed wherein the lower energy of the first RF frequency and the support of the substrate on the grounded electrode are such that the silicide is etched rapidly and anisotropically, while the higher energy of the second RF frequency and the support of the substrate on the powered electrode are such that the polysilicon is etched rapidly and anisotropically without substantially etching the dielectric material.

4,680,087

## ETCHING OF DIELECTRIC LAYERS WITH ELECTRONS IN THE PRESENCE OF SULFUR HEXAFLUORIDE

Stephen M. Bobbio, Wake Forest, N.C., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 17, 1986, Ser. No. 819,651

Int. Cl.<sup>4</sup> C03C 15/00; C23F 1/02

U.S. Cl. 156—643

8 Claims

1. In a method of fabricating a semiconductor device wherein a pattern is etched in dielectric film or layer on a silicon substrate, the improvement comprising directing elec-

trons onto the layer in a low pressure sulfur hexafluoride environment to generate a desired pattern in the dielectric layer.

4,680,088

## PROCESS FOR REMOVING INK PARTICLES FROM PAPER PRODUCTS

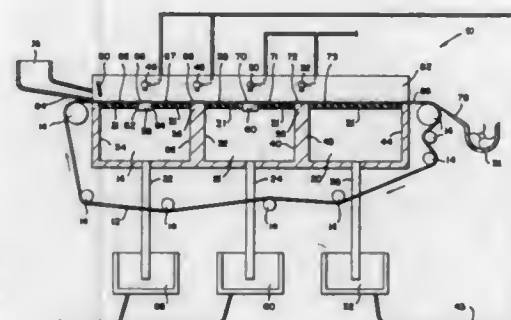
Remberto P. Bastanzuri, Miami, Fla., assignor to Michael Scheck, Miami, Fla., a part interest

Filed Feb. 21, 1985, Ser. No. 703,950

Int. Cl.<sup>4</sup> D21C 9/06, 5/02

U.S. Cl. 162—4

9 Claims



1. A process for removing ink particles from an inked paper product comprising: forming a slurry from the inked paper product; flowing the slurry onto a surface of a semi-permeable conveyor having pores of sufficient size to pass liquid and the ink particles and retain the paper product on the surface of the conveyor; establishing a pressure differential across the conveyor through the pores to draw liquid from the slurry and form a mat from the slurry; showering the mat with liquid in an area where substantially no pressure differential exists across a substantial portion of the conveyor through the pores and preventing substantial flow of liquid through pores of the conveyor in the area where the paper product is being showered to break the mat into a slurry and separate the ink particles from the paper product; and removing the separated ink particles from the paper product.

4,680,089

## PROCESS FOR CONTROLLING THE FORMATION OF SHEET MATERIAL

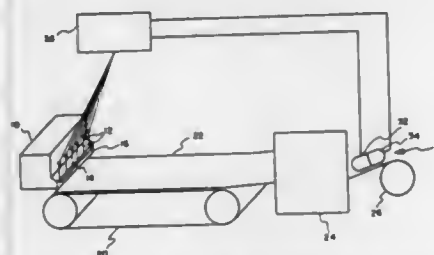
Gurcan Aral, Palo Alto, and Ramesh Balakrishnan, Cupertino, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 693,920, Jan. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,676, Sep. 4, 1984, abandoned. This application Aug. 20, 1986, Ser. No. 898,859

Int. Cl.<sup>4</sup> D21F 7/06, 1/06

U.S. Cl. 162—198

5 Claims



1. A process for controlling the configuration of a thickness-

regulating member which is coupled to a plurality of actuators, the process comprising:

- determining the desired configuration of the thickness-regulating member;
- determining the actuator movements required to substantially obtain the desired configuration of the thickness-regulating member according to the following equation:

$$\bar{Z} = [A]^{-1} \frac{\delta EI}{Kl^3} [Ra] + [J] \bar{Y}$$

where:

$\bar{Z}$  = required actuator movements;

$\bar{Y}$  = required displacements of the thickness-regulating member at each actuator;

$E$  = modulus of elasticity of the thickness-regulating member;

$I$  = cross-sectional moment of inertia of the thickness-regulating member;

$k$  = spring constant of an actuator;

$l$  = distance between actuators;

$[A]$  = a first predetermined matrix;

$[J]$  = identity matrix;

$[Ra]$  = a second predetermined matrix;

wherein said first and second predetermined matrices are determined by modeling a thickness-regulating member and actuator system as an elastic system, without basing the determination on any of the following parameters: spring constants of the actuators, elastic modulus of the thickness-regulating member, and cross-sectional moment of inertia of the thickness-regulating member; and, (c) controlling the actuators based upon the required actuator movements.

4,680,090

## DIRECT HEAT RECYCLING REGENERATIVE STILL

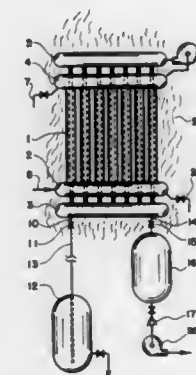
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 492,445, May 6, 1983, and Ser. No. 647,365, Sep. 4, 1984, abandoned. This application Apr. 10, 1985, Ser. No. 721,655

Int. Cl.<sup>4</sup> B01D 1/06, 1/28

U.S. Cl. 202—187

23 Claims



1. A distillation device comprising in combination:

- at least one raw fluid distributor header including at least one raw fluid inlet port;
- at least one distilled fluid collector header including at least one distilled fluid outlet port;
- at least one vapor collector header;
- at least one vapor distributor header;
- a plurality of twin tubings, each of said twin tubings comprising at least one evaporator tubing and at least one condenser tubing arranged in a parallel configuration wherein said twin tubing includes means for enhancing a conductive heat transfer between said evaporator tubing

and said condenser tubing, wherein a plurality of said evaporator tubings included in said plurality of twin tubings connect said raw fluid distributor header and said vapor collector header to one another, and a plurality of said condenser tubings included in said plurality of twin tubings connect said distilled fluid collector header and said vapor distributor header to one another; and

(f) at least one fluid moving means connecting said vapor collector header to said vapor distributor header for forcibly moving vapor from said vapor collector header to said vapor distributor header;

whereby, raw fluid supplied to said plurality of evaporator tubings through said raw fluid distributor header and heated by thermal energy supplied to said plurality of twin tubings evaporates into vapor whereupon said vapor forcibly moved by said fluid moving means from said vapor collector header to said vapor distributor header condenses in said plurality of condenser tubings wherein condensate fluid is collected through said distilled fluid collector header and the latent heat released by the condensing vapor is directly transferred to said plurality of evaporator tubings.

4,680,091

## APPARATUS FOR THE CONTINUOUS VACUUM CLEANING OF OIL

Josef Altmann, Domazlice, and Bohuslav Beran, Ledce, both of Czechoslovakia, assignors to ZLEHIT pri BAN, Sofia, Bulgaria

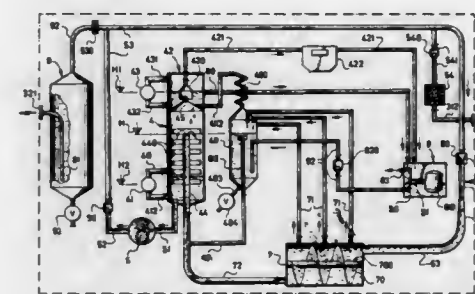
Filed Mar. 24, 1986, Ser. No. 843,063

Claims priority, application Czechoslovakia, Mar. 26, 1985, 2137-85

Int. Cl.<sup>4</sup> B01D 3/02

U.S. Cl. 202—205

6 Claims



1. Apparatus for continuous vacuum cleaning of oil comprising

means designed for utilizing the combined action of quasistationary conditions generated by operation vacuum, and of non stationary conditions generated by a hydrodynamic cavitator sufficient to substantially increase the degree of release and separation of contaminants in oil from an electric transformer including

- a container of an oil system connected to
- a conservator by way of a connecting conduit which is connected to
- a supply conduit which connects the connecting conduit of said container of an oil system and said conservator with a vacuum cleaner which has an inlet filter arranged before a hydrodynamic cavitator which leads to a separator and then to
- a main chamber with an accumulation extension, which has attached a circuit arrangement comprising pick-up means for the oil level controlled by an attached electric motor, said accumulation extension is also connected to
- an auxiliary chamber with a condenser and said accumulation extension is further connected to
- a retention chamber,

a collecting chamber, a pump, an oil cooler by conduits and valves, and a throttling means and the outlet of said vacuum cleaner is finally connected over a discharge conduit and then to an outlet conduit to oil coolers.

4,680,092

# PROCESS FOR DEGASSING, DEHYDRATING AND PRECUT SEPARATION IN STRAIGHT-RUN DISTILLATION OF CRUDE FATTY ACIDS

Hermann Stage, Ludgerstrasse 9, 4400 Muenster, Fed. Rep. of Germany

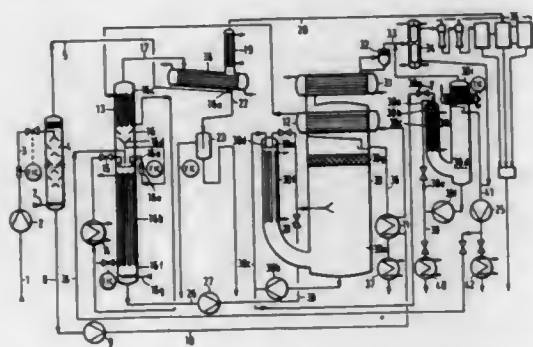
Filed Oct. 5, 1983, Ser. No. 539,288

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3236985

Int. Cl.<sup>4</sup> B01D 3/38; C11C 1/10

U.S. Cl. 203—22

8 Claims



1. A process for degassing, dehydrating and separating pre-cut during a straight-run distillation of crude fatty acids, said process comprising degassing the crude fatty acids in a first stage by effecting a counter current flow between the crude fatty acids and a stripping steam at a temperature below 100° C. and at a pressure between 67 and 400 mbar so as to avoid any appreciable dehydration or pre-cut separation, feeding the degassed fatty acids to a dehydrating and pre-cut separating second stage comprising a pre-cut column having a stripping section with a distributor and a falling film dephlegmation section which is mounted above the distributor, the crude fatty acids being fed into the second stage near the distributor, heating the crude fatty acids in the second stage to form crude fatty acid vapors containing low boiling pre-cut and water, partially condensing the vapors in the dephlegmation section to create reflux of fatty acids while the low boiling pre-cut and water remain completely vaporized, withdrawing the vaporized low boiling point pre-cut and water from the dephlegmation section, condensing the vaporized pre-cut and water, and collecting the condensed pre-cut and water in a decantation tank.

4,680,093

# METAL BONDED COMPOSITES AND PROCESS

Louis G. Morin, Tarrytown, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 358,637, Mar. 16, 1982. This application Jun. 24, 1983, Ser. No. 507,603

Int. Cl.<sup>4</sup> C25D 7/00

U.S. Cl. 204—28

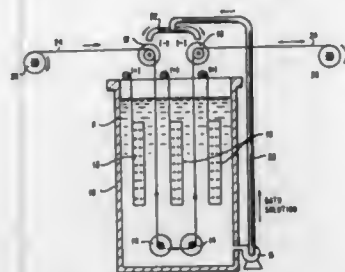
16 Claims

1. A process for the production of a metal composite, said process comprising:

- providing a plurality of electrically conductive core filaments;
- immersing at least a portion of the length of said filaments

in a solution capable of electrolytically depositing at least one metal;

- providing a quantity of electricity and applying an external voltage between the filaments and an electrode immersed in the solution in excess of 10 volts whereby (i) the



metal nucleates substantially uniformly onto the surface of the filaments and (ii) there is produced a substantially uniform, firmly adherent, continuous layer of metal on said core; and

- building up a metal matrix around the metal coated fibers to form a composite material.

4,680,094

# METHOD FOR PRODUCING ALUMINUM, ALUMINUM PRODUCTION CELL AND ANODE FOR ALUMINUM ELECTROLYSIS

Jean-Jacques Duruz, Geneva, Switzerland, assignor to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Feb. 13, 1986, Ser. No. 829,436

Claims priority, application Austria, Feb. 18, 1985, 810064/85

Int. Cl.<sup>4</sup> C25C 3/12, 7/02

U.S. Cl. 204—67

19 Claims

1. A method of producing aluminum by electrolysis of alumina dissolved in a molten cryolite bath using a dimensionally stable anode comprising a substrate which is unstable under the conditions of the aluminum electrolysis, said anode substrate having a coating layer having imperfections through which substrate components may diffuse, which method comprises providing as said coating layer on said anode substrate a layer containing cerium oxyfluoride that is substantially continuous and stable under said electrolysis conditions and that is preserved by maintaining cerium within the electrolyte, and supplying to said coating layer imperfections a substance supplied by providing one or more of an alkali or alkaline earth metal compound to said electrolyte, whereby contamination of product aluminum by anode substrate components diffusing through imperfections in the coating layer is inhibited.

4,680,095

# CONTINUOUS PREPARATION OF DIALKANESULFONYL PEROXIDE

Gregory A. Wheaton, Gloucester, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 3, 1986, Ser. No. 926,286

Int. Cl.<sup>4</sup> C25B 3/02

U.S. Cl. 204—79

10 Claims

1. A process for the continuous preparation of dialkanesulfonyl peroxide by continuously electrolyzing a solution of an alkanesulfonic acid having 1-4 carbons at a sufficient current density to produce dialkanesulfonyl peroxide of the structure  $RSO_2-O-O-O_2SR$  where R is alkyl of 1-4 carbons, wherein the concentration of the alkanesulfonic acid is between 50% and 100% by-weight, in an undivided continuous flow electrolysis cell at an elevated temperature at which a substantial portion of the product dialkanesulfonyl peroxide is in solution, continuously removing the alkanesulfonic acid/dialkanesulfonyl peroxide product mixture from the electrolysis cell to a cooling zone where the product mixture is cooled

below the temperature in the electrolysis cell to precipitate the dialkanesulfonyl peroxide product, continuously recovering the insoluble solid dialkanesulfonyl peroxide product from the alkanesulfonic acid, and continuously recycling the alkanesulfonic acid solution back to the electrolysis cell.

4,680,096

# PLASMA SMELTING PROCESS FOR SILICON

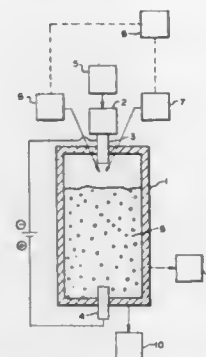
Vishu D. Dosaj, Midland, and Alvin W. Rauchholz, Thomas Township, Saginaw County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 26, 1985, Ser. No. 813,330

Int. Cl.<sup>4</sup> C01B 33/02

U.S. Cl. 204—164

36 Claims



1. A process for producing silicon using a gas plasma as the energy source, said process comprising

- generating a gas plasma in a reactor utilizing a transferred arc configuration in which a minimum of gas is utilized to form the plasma;
- feeding silicon dioxide and a solid reducing agent directly into the reactor and to the plasma;
- passing the plasma gas, the silicon dioxide, and the solid reducing agent into a reaction zone of the reactor;
- recovering molten silicon and the gaseous by-products from the reaction zone.

4,680,097

# METHOD OF PREVENTING UNDESIRABLE GAS GENERATION BETWEEN ELECTRODES OF AN ELECTROCOAGULATION PRINTING SYSTEM

Adrien Castegnier, Outremont, Canada, assignor to Elcorsy Inc., St. Laurent, Canada

Filed Sep. 22, 1986, Ser. No. 909,729

Int. Cl.<sup>4</sup> C25D 13/04, 13/18, 13/20

U.S. Cl. 204—180.1

20 Claims

10. In a method of reproducing an image by electrocoagulation of an electrolytically coagulable colloid, wherein a layer of an aqueous colloidal dispersion containing an electrolytically coagulable colloid, water and a soluble electrolyte is interposed between at least one pair of opposite, electrolytically inert negative and positive electrodes spaced from one another by a gap filled with said aqueous colloidal dispersion and said electrodes are electrically energized to pass electric current through the layer at selected points to cause point-by-point selective coagulation and adherence of the colloid on the positive electrode and formation of a series of corresponding dots of coagulated colloid representative of a desired image, the improvement which comprises coating the positive electrode with an olefinic substance to form micro-droplets thereof on the surface of the positive electrode prior to electrically energizing said electrodes such that upon electrical energization hydrogen generated as a result of electrolysis is consumed by reaction with said olefinic substance, said reaction being carried out in the presence of a metallic oxide catalyst, thereby

preventing undesirable hydrogen generation and accumulation at the negative electrode.

4,680,098

# AQUEOUS RECOVERY OF COBALT OR COBALT AND MANGANESE FROM SOLUTION ALSO CONTAINING OXYGENATED AROMATIC COMPOUNDS

Yuehsung Chang, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 712,975, Mar. 18, 1985. This application Apr. 11, 1986, Ser. No. 850,534

Int. Cl.<sup>4</sup> B01D 13/02

U.S. Cl. 204—182.4

22 Claims

1. An electroanalysis process for recovery of cobalt and manganese ions from a diluting solution comprising said ions and contaminants, which comprises feeding said solution to an electroanalysis separation stack which comprises an anode channel formed by an anode and a cation permeation membrane and at least one, three-channel repeating unit wherein each repeating unit having in sequence channels A, B, and C wherein this repeating unit comprises a Channel A formed by two cation permeation membranes, a Channel B formed by a cation permeation membrane and an anion permeation membrane, and a Channel C formed by an anion permeation membrane and either a cation permeation membrane or a cathode, passing an anolyte comprising an aqueous solution of an acid through the anode channel, feeding diluting solution through the A channels, feeding an electrolyte through the B channels, feeding a catholyte comprising an aqueous solution of a carboxylate produced by reaction of a metallic hydroxide and an organic acid selected from a group consisting of formic, acetic, oxalic, lactic, tartaric, citric, benzoic and phthalic acids in a concentration of at least about 0.01N, through the C channels and removing a concentrate comprising a solution of cobalt and manganese substantially free of contaminants as an effluent from the B channels.

4,680,099

# ELECTROPLATING APPARATUS

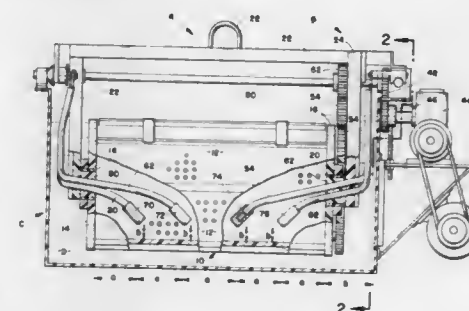
Raymond Singleton, 31653 Electric Blvd., Avon Lake, Ohio 44012

Filed Apr. 7, 1986, Ser. No. 848,942

Int. Cl.<sup>4</sup> C25D 17/20

U.S. Cl. 204—213

3 Claims



1. An electroplating apparatus comprising:

- a work barrel having a first side wall and a second side wall and a longitudinal wall connected to said side walls with at least one of said walls being constructed of a perforate panel, said barrel being pivotal upon a longitudinal axis thereof, adapted to receive articles to be electroplated therein and further adapted to be contained in an associated tank;
- a means for causing rotation of said barrel about said longitudinal axis; and,
- at least four danglers of conductive, insulated cable for carrying an electrical current, said danglers having fixed ends located outside said barrel and electrically connected



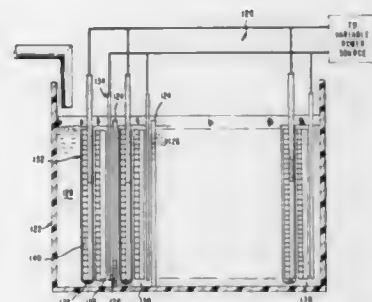
to and pivotal about a fixed conductor, said danglers having free ends extending through side walls of said barrel at generally said longitudinal axis, said free ends having an entrance angle to said longitudinal axis so that said danglers remain substantially free of interference from said side walls when said side walls are rotated with said barrel, each of said free ends terminating radially outward of said longitudinal axis at a termination angle approximating 45° to said longitudinal axis, said danglers being longitudinally positioned generally uniformly within said work barrel and at a generally uniform distance from said longitudinal wall, said danglers including a contactor assembly adapted to contact and provide an electrical path to articles in said barrel as said barrel is rotated about its longitudinal axis.

#### 4,680,100 ELECTROCHEMICAL CELLS AND ELECTRODES THEREFOR

Louis G. Morin, Tarrytown, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 541,611, Oct. 13, 1983, abandoned, which is a continuation of Ser. No. 507,604, Jun. 24, 1983, abandoned, which is a continuation of Ser. No. 358,637, Mar. 16, 1982, abandoned. This application Apr. 26, 1984, Ser. No. 604,397

Int. Cl.<sup>4</sup> C25C 7/02; C25B 9/00, 11/12, 11/02  
U.S. Cl. 204—228 36 Claims



22. A discretionary electro-chemical cell for the plating of at least one selected metal in an electrolytic solution onto an electrode, comprising:

- a tank for containing the electrolyte;
- a cathode including a plurality of fibers, wherein each of said fibers has a thin, uniform and firmly adherent electrically conductive metallic coating thereon; and
- an anode.

23. The discretionary cell as defined in claim 22, further including a variable power source connected to said cathode and anode for regulating voltage, so that the voltage is set at a level to cause a selected metal in the electrolyte to plate on the cathode.

#### 4,680,101 ELECTROLYTE PERMEABLE DIAPHRAGM INCLUDING A POLYMERIC METAL OXIDE

W. Bruce Darlington, Wadsworth, and Donald W. DuBois, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

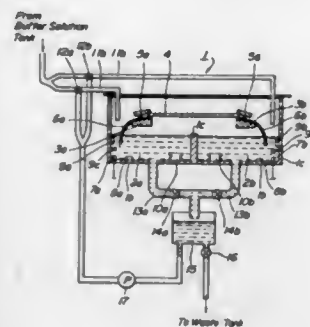
Filed Nov. 4, 1986, Ser. No. 926,688  
Int. Cl.<sup>4</sup> C25B 13/00  
U.S. Cl. 204—295 13 Claims

1. A liquid permeable diaphragm for an electrolytic cell, the diaphragm comprising a major amount of fibrillated polyfluorocarbon, a minor amount of a perfluorinated ion exchange material and a polymeric metal oxide selected from the group consisting of polytitanic acid, polyzirconic acid, polysilicic acid, polyaluminic acid or mixtures thereof.

#### 4,680,102 ELECTROPHORETIC APPARATUS

Shiro Ishiwatari, Hino, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Nov. 22, 1985, Ser. No. 800,683  
Claims priority, application Japan, Nov. 28, 1984, 59-251172  
Int. Cl.<sup>4</sup> C25D 13/00; G01N 21/00  
U.S. Cl. 204—299 R 10 Claims



1. An electrophoretic apparatus for effecting electrophoresis comprising:
  - means for wetting a substrate made of cellulose acetate with a buffer solution;
  - means for applying a sample on the substrate;
  - means for placing the substrate in an electrophoretic chamber containing a buffer solution;
  - means for conducting an electric current through the substrate to form an electrophoretic image on the substrate;
  - means for drying and decoloring the substrate to make said electrophoretic image visible;
  - means for photometering the visible electrophoretic image;
  - means for storing a standard expansion length of a standard electrophoretic image;
  - means for measuring an expansion length of the electrophoretic image of the sample;
  - means for comparing the expansion length of the electrophoretic image of the sample with the standard expansion length of the standard electrophoretic image to derive a variation in the expansion length of the electrophoretic image of the sample; and
  - means for adjusting electrophoretic current, electrophoretic voltage or electrophoretic time, in accordance with said variation in the expansion length of the electrophoretic image.

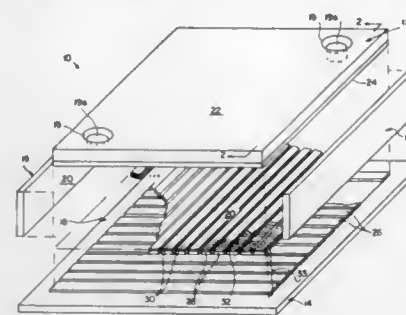
#### 4,680,103 POSITIVE PARTICLES IN ELECTROPHORETIC DISPLAY DEVICE COMPOSITION

Beilin Solomon I., Oakland, and Long K. Truong, San Jose, both of Calif., assignors to EPID, Inc., Florham Park, N.J.

Filed Jan. 24, 1986, Ser. No. 822,297  
Int. Cl.<sup>4</sup> C25D 1/12; G03G 13/00; C23B 13/00; B01K 5/02  
U.S. Cl. 204—299 R 20 Claims

1. A composition useful in electrophoretic display devices comprising:
  - a plurality of discrete particles, substantially each of the

particles including pigment and an organosilane attached thereto, the attached organosilane including a positively

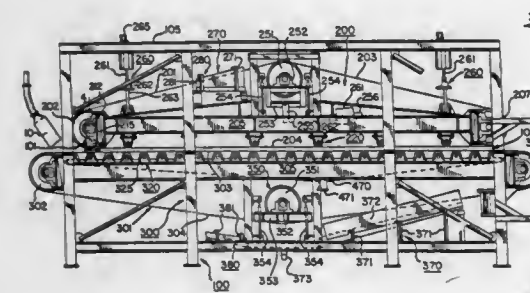


charged ionic functional moiety covalently bonded therein.

#### 4,680,104 APPARATUS FOR DEWATERING CLAY FILTER CAKE

Albert C. Kunkle, Macon, and Edgar J. Maxwell, III, Thomson, both of Ga., assignors to J. M. Huber Corporation, Borger, Tex.

Continuation of Ser. No. 619,330, Jun. 11, 1984, abandoned.  
This application Apr. 21, 1986, Ser. No. 857,401  
Int. Cl.<sup>4</sup> B01D 13/02  
U.S. Cl. 204—300 R 16 Claims



1. An apparatus for dewatering a liquid containing clay material to form a clay cake of at least approximately 70% solids content comprising,
  - at least two electrically conductive conveying mechanisms, each having an outer clay material contacting surface and an inner supported surface, positioned adjacent to but spaced from each other,
  - means for moving said electrically conductive conveying mechanisms in an endless path of movement in the same direction and at the same linear speed,
  - means for introducing liquid containing clay material into the space between and into direct contact with said opposed electrically conductive conveying mechanism for movement therewith and therebetween along at least a portion of said endless path of movement,
  - means for establishing an electric field between said electrically conductive conveying mechanisms of a magnitude sufficient to electrokinetically drive at least a portion of the liquid from the clay material passing therewith and therebetween, and
  - means for maintaining continuous contact between said clay material and said electrically conductive conveying mechanisms without subjecting said clay material to a pressure force substantially in excess of the contact pressure while moving therewith and therebetween along at least a portion of said endless path of movement to permit the electrokinetic forces to drive a sufficient amount of liquid from the clay material to form a clay cake having at least approximately 70% solids material.

#### 4,680,105 HYDRODEMETALLIZATION OF OILS WITH CATALYSTS COMPRISING NICKEL PHOSPHATE AND TITANIUM PHOSPHATE

Daniel M. Coombs, Borger, Tex.; Ted H. Cymbaluk, Bartlesville, Okla.; Brent J. Bertus, Bartlesville, Okla., and Simon G. Kukes, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 5, 1986, Ser. No. 859,980  
Int. Cl.<sup>4</sup> C10G 45/00; B01J 27/185  
U.S. Cl. 208—251 H 17 Claims

1. A process for demetallizing a substantially liquid hydrocarbon-containing feed stream comprising the step of contacting said feed stream, which also contains metals, with a free hydrogen containing gas in the presence of a solid catalyst composition comprising a coprecipitate of nickel phosphate and titanium phosphate, under such contacting conditions as to obtain a hydrocarbon-containing liquid product stream having a reduced concentration of metals.

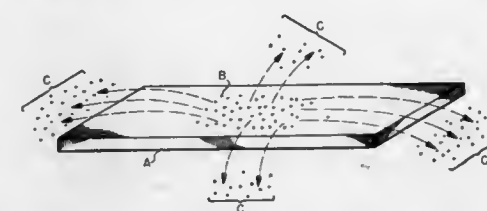
4. A process in accordance with claim 1, wherein said solid catalyst composition comprises a coprecipitate of nickel(II) orthophosphate and titanium(IV) orthophosphate.

14. A process in accordance with claim 1 wherein a decomposable compound of a metal selected from the group consisting of transition metals of Group IB, Group IIB, Group IIIB, Group IVB, Group VB, Group VIB, Group VIIB, and Group VIII of the Periodic Table has been added to said hydrocarbon-containing feed stream.

#### 4,680,106 ELECTRODYNAMIC METHOD FOR SEPARATING COMPONENTS OF A MIXTURE

Louis C. Weiss, Devron P. Thibodeaux, and Mary Ann Godshall, all of Metairie, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 527,730, Aug. 30, 1983, abandoned. This application Jul. 31, 1985, Ser. No. 761,113  
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.  
Int. Cl.<sup>4</sup> B03C 7/00  
U.S. Cl. 209—1 8 Claims



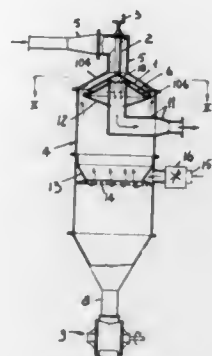
1. An electrodynamic method for separating components of a mixture comprising:
  - (a) feeding onto a horizontal electric undulating traveling wave contact panel a mixture of particles, said mixture comprised of negligibly charged and charged particles;
  - (b) energizing the panel with sufficient A.C. voltage for sufficient time to impart different charge to mass ratios to the individual particles;
  - (c) increasing the potential for sufficient time to a separation voltage; said separation voltage being that which is sufficient to move said charged particles away from said negligibly charged particles;
  - (d) separating the individual particles by cyclically repeating steps (b) and (c) until all of the charged particles are moved off the panel and the negligibly charged particles remain on the panel.

4,680,107  
**DEVICE FOR SEPARATION OF THE COMPONENTS OF EDIBLE MEALS**

Umberto Manola, Brescia, Italy, assignor to The Protein's Technology S.p.A., Campobasso, Italy  
 Filed May 22, 1984, Ser. No. 612,830  
 Int. Cl.<sup>4</sup> B07B 4/02, 11/04

U.S. Cl. 209—139.2

3 Claims U.S. Cl. 209—273



1. Apparatus for the physical separation of components of meal to be used as edible or as chemical-pharmaceutical products, comprising

- (a) a conical, downwardly diverging tray (1) arranged coaxially in the upper portion of a vertical, substantially cylindrical container (4) having at its bottom a discharge conduit (8) controlled by a valve (9);
- (b) means for feeding said meal to be treated above said conical tray (1) so that it will be evenly distributed over a round angle;
- (c) a further conical structure (6) also diverging downwardly, arranged at a short distance below said conical tray (1) and secured to said container (4), said conical structure (6) having an upwardly bent peripheral edge (106) extending beyond the periphery of said conical tray (1) and closely spaced from an inner side surface of said container (4);
- (d) means (2, 3) for adjusting the distance between said conical tray (1) and said conical structure (6) so as to adjust the rate of flow traversing them;
- (e) said conical structure (6) having a bottom (12) formed by a conical upwardly diverging counter-member, so as to avoid turbulence which could affect operation of said apparatus;
- (f) at least one opening (10) in said conical structure (6) connected to a conduit (11) which passes in airtight manner out of said container (4) and is connected to a suction means;
- (g) an annular air inlet means (13) arranged below said conical structure (6) coaxially therewith and connected to at least one conduit (15) opening to the atmosphere under the control of valve means (16), whereby, due to suction exerted by said suction means, an ascending flow of air is formed that permits heavier particles of said meal to drop downwardly and retains lighter particles in suspension to follow an air stream flowing out of said apparatus, through said conical member (1, 6) and said conduit (11) connected to said at least one opening (10).

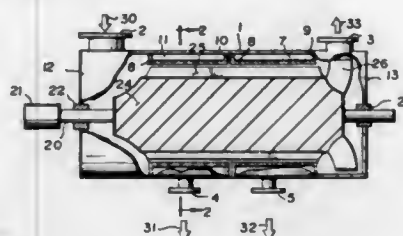
4,680,108  
**SCREENING DEVICE**

Bjorn Abs, Karlstad, Sweden, assignor to Kamy AB, Karlstad, Sweden

Filed Mar. 4, 1986, Ser. No. 836,123

Claims priority, application Sweden, Mar. 4, 1985, 8501030  
 Int. Cl.<sup>4</sup> B07B 1/04

20 Claims



1. A device for screening a fluidizable suspension comprising:

- a housing including a main inlet and a main outlet;
- a rotor having a plurality of ribs formed thereon;
- stationary screen means operatively disposed in said housing between said main inlet and outlet; said stationary screen means defining, with said housing, a chamber;
- means for mounting said rotor in said housing for rotation about an axis, with said ribs rotating past said stationary screen means with a small clearance between said stationary screen means and said ribs;
- means for effecting primary and secondary screening within the same device, comprising means on the outlet side of said screen for dividing said chamber into a plurality of accept chambers; and
- an accept outlet operatively associated with each accept chamber and extending outwardly from said housing.

4,680,109  
**MEMBRANE SEPARATOR**

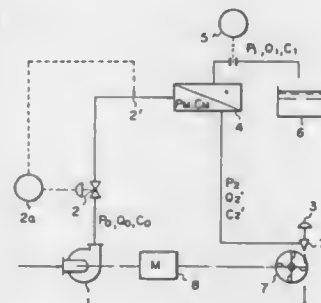
Koichi Yamada, Tokyo; Ichiro Hiraiwa, Kanagawa; Shin Taniguchi, Tokyo, and Toshinari Zengo, Kanagawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed May 17, 1985, Ser. No. 744,008

Int. Cl.<sup>4</sup> B01D 13/00

U.S. Cl. 210—103

6 Claims



1. A membrane separator provided with a pump for pressurizing a feed solution, a semipermeable membrane, a pressure regulating valve disposed in a pipe between said pump and semipermeable membrane, and a power recovering means disposed downstream of the semipermeable membrane at the concentrated solution side, which is adapted to obtain a dilute solution and a concentrated solution by separating the solute from the solution through the semipermeable membrane, said membrane separator having:

- a flow rate controlling apparatus provided with a control circuit which calculates an operation point including

theoretical pressure values and theoretical flow rate values from the solute concentration and osmotic pressure in the feed solution and the minimum required power at a predetermined dilute or concentrated solution flow rate from a performance curve of the pump, a performance curve of the power recovery means, and the relationship between the concentration of the solute and osmotic pressure in the feed solution;

specific pressure and flow rate detecting means which provide specific values to said control circuit to perform the calculations;

a means for regulating said pressure regulating valve in response to the calculated values produced by said control circuit; and

a means for regulating said power recovery means in response to the calculated values produced by said control circuit to minimize the difference between the required power of the pump and the power recovered by the power recovering means.

4,680,110  
**FILTER BLOCK MOUNTED FUEL PROCESSOR APPARATUS**

Leland L. Davis, Saline, Mich., assignor to Davco Manufacturing Corporation, Ann Arbor, Mich.

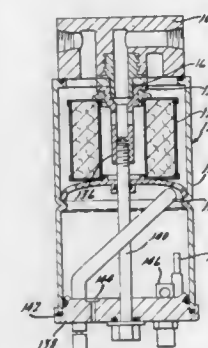
Continuation-in-part of Ser. No. 573,292, Jan. 23, 1984, Pat. No. 4,539,109, which is a continuation-in-part of Ser. No. 463,041, Feb. 1, 1983, Pat. No. 4,495,069, which is a continuation-in-part of Ser. No. 287,149, Jul. 27, 1981, Pat. No. 4,428,351. This application Jun. 25, 1984, Ser. No. 624,413

The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.

Int. Cl.<sup>4</sup> B01B 35/18

U.S. Cl. 210—114

35 Claims



1. A unitary fuel processing and filtering unit, particularly for diesel fuel and operative to separate out water and impurities from the fuel adapted to be mounted to a mounting head having a fuel inlet passage and a fuel outlet passage comprising a housing including a lower portion defining a combined heating and sediment chamber, a concentric annular shaped filtering means positioned within an upper portion of said housing, a top plate having a fuel inlet and fuel outlet, means for conducting said fuel from said top plate inlet to said chamber, and means defining a passage for conducting fuel from said chamber to said filtering means, characterized by heating means in said lower portion operative to heat the incoming fuel by direct contact therewith in said chamber, said heating means including a heated portion in close proximity to said passage, and said heating means extends through a substantial part of the lower portion.

4,680,111  
**SEWAGE TREATMENT EQUIPMENT WITH ACTIVATED SLUDGE PROCESS BEDS**

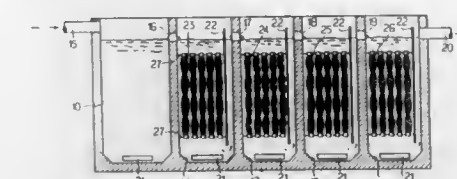
Iwao Ueda, 416, Nanba-cho, Matsubara-sagaru, Nishikiyama-chi-dori, Shimogyo-ku, Kyoto, Japan, assignor to Iwao Ueda and Chie Ueda, both of Kyoto, Japan

Filed Jul. 18, 1986, Ser. No. 886,923

Claims priority, application Japan, Jul. 24, 1985, 60-164661  
 Int. Cl.<sup>4</sup> C02F 3/06

U.S. Cl. 210—150

3 Claims



1. In a sewage treatment equipment with activated sludge process beds in which a plurality of treatment tanks are arranged in a row each communicating with an adjacent tank through a passage, and each of the treatment tanks comprises a plurality of activated sludge process beds disposed vertically above an aeration pipe which is connected with an air in-flow pipe and disposed at the bottom of each tank, each of the activated sludge process beds comprising a cylindrical core composed of a hard synthetic resin resistant to corrosion over a long period of immersion in sewage water, said cylindrical core being wrapped with a porous member, said core being tightened by tightening means, the improvement comprising: an outer peripheral area of the cylindrical core wrapped with the porous member in each activated sludge process bed being increased tank by tank according to disposition of the tanks so as to give variety to kinds of bacteria, breeding ratio between aerobic bacteria and anaerobic bacteria and distribution thereof tank by tank in order.

4,680,112  
**APPARATUS FOR THE LIQUID TREATMENT OF SOLIDS**

Alan Carrol, London, United Kingdom, assignor to Trenchbond Limited, United Kingdom

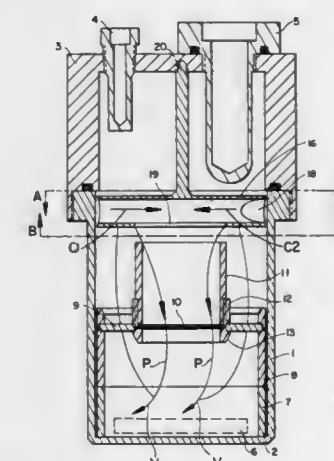
Filed Dec. 21, 1984, Ser. No. 685,146

Claims priority, application United Kingdom, Dec. 23, 1983, 8334304

Int. Cl.<sup>4</sup> B01D 35/18

U.S. Cl. 210—179

12 Claims



1. A separator apparatus for the separation at ambient or elevated temperatures and pressures of a mixture of solid substances by treatment with a solvent, in which mixture one or



more of the components thereof is substantially insoluble under the selected operating conditions, the apparatus comprising:

- a pot having a bottom wall and generally cylindrical sidewall extending upwardly from the bottom wall, the top of the sidewall defining a mouth;
- a lid for closure and pneumatic sealing of said mouth when the apparatus is in use;
- horizontally rotational stirring means arranged in the pot in contact with or in proximity to said bottom wall;
- heating means; and
- temperature responsive means for controlling the heating means;

wherein the pot contains a separator assembly comprising a generally central receptacle for holding said solid mixture, the receptacle including a bottom wall permeable to said solvent but impermeable to said solid mixture and a sidewall extending upwardly from the bottom wall, the separator assembly further comprising one or more spokes extending outwardly from said receptacle for upward passage therethrough of a vortex of the solvent; wherein there are support means compatible with said vortex for supporting the spokes at the outer end regions thereof and arranged so as to support the separator assembly with the base of the receptacle and the spokes spaced above the bottom wall of the pot to define between the bottom wall of the pot and the base of the receptacle and the spokes a space for holding the solvent and the said stirring means in the said solvent; wherein in use the stirring means induces a solvent vortex which runs up to above the top of the separator assembly; and wherein a duct is disposed transversely above the separator assembly so that the duct will not be moved in use by the force of the said vortex thereon, which duct has a length such as to define a small clearance between the ends thereof and the internal sidewall of the pot and has defined at its ends inlets for the solvent vortex, an outlet being defined in the bottom of the duct above the receptacle for the solvent to pour down onto the mixture therein.

4,680,113

#### SIEVE ARRANGEMENT FOR RECOVERING CLEANING PARTICLES FROM A COOLING-WATER STREAM DOWNSTREAM OF A HEAT EXCHANGER

Klaus Elmer, Ratingen, and Wolfgang Gebhardt, Duisburg, both of Fed. Rep. of Germany, assignors to Taproge Gesellschaft mbH, Düsseldorf, Fed. Rep. of Germany

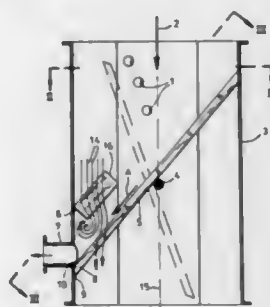
Continuation of Ser. No. 491,034, May 3, 1983, abandoned. This application Apr. 2, 1985, Ser. No. 718,825

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216443

Int. Cl.<sup>4</sup> B01D 35/18

U.S. Cl. 210—181

6 Claims



1. An apparatus for recovering cleaning particles from a liquid stream downstream of a heat exchanger, said apparatus comprising:

- a cylindrical duct,
- traversed by a fluid stream containing particles therein in a first flow direction along a path of the stream, and forming
- a housing having a housing wall formed with an interior wall surface surrounding an axis of the duct;
- at least one sieve having a front surface and a back surface

and having along at least a part of its periphery an elliptical configuration, said sieve being pivotally mounted in said housing for swinging movement, about an axis transverse to said flow direction, between (i) an operative position wherein said sieve is inclined to said flow direction with said front surface generally facing upstream for contact thereof by said particles in said stream to cause said particles to move along said sieve to a downstream region thereof and toward the interior wall surface of said housing, and (ii) an inoperative position wherein said sieve is inclined to said flow direction with said back surface generally facing upstream for reverse flow of liquid through said sieve to cause contaminants to be removed from said front surface of said sieve;

a means fastened to and cooperating with said interior wall surface for forming an elliptical seat having an elliptical contour for said part of said periphery of said sieve, said elliptical seat being located in a position enabling engagement of said seat by said sieve upon the latter being swung to said operative position thereof;

a particle outlet opening into said housing through the housing wall just upstream of said location of said seat for permitting particles moving along said sieve to exit from said housing; and

a deflector plate projecting from said interior wall surface of said housing into the path of said stream, said plate being located upstream of and spaced from both said outlet and said seat, said plate being a curved sheet-metal member following the elliptical contour of said seat and having a simple curvature with a radius of curvature intersecting the axis of said duct, said deflector plate having upstream and downstream planar surfaces, a first edge connected to said interior wall surface along a contour complementary to said elliptical seat and a free end extending toward a center of said duct and terminating at a point downstream of the connection of said first edge of said deflector plate so that said deflector plate is inclined toward said first flow direction, said upstream and downstream planar surfaces lying in a plane which is perpendicular to the surfaces of said sieve when said sieve is in said operative position, said plate defining with the portion of said wall proximate to said downstream surface of said plate a wedge-shaped compartment open toward said sieve and converging outwardly away from the latter for inducing vortex formation between said plate and said sieve along said downstream planar surface for inducing the movement of said particles along said front surface of said sieve to said outlet.

4,680,114

#### WATER PURIFICATION APPARATUS

John Hayes, Berkshire, United Kingdom, assignor to Tarn-Pure Limited, Buckinghamshire, England

PCT No. PCT/GB84/00206, § 371 Date Feb. 8, 1985, § 102(e) Date Feb. 8, 1985, PCT Pub. No. WO85/00034, PCT Pub. Date Jan. 3, 1985

PCT Filed Jun. 14, 1984, Ser. No. 700,880

Claims priority, application United Kingdom, Jun. 14, 1983, 8316213

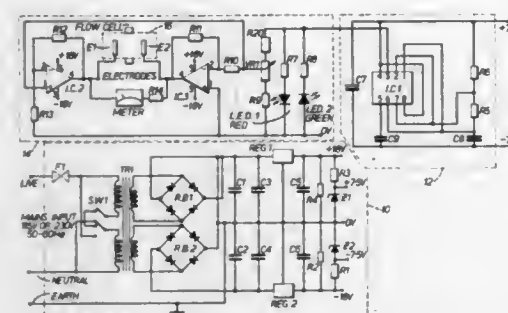
Int. Cl.<sup>4</sup> C02F 1/46

U.S. Cl. 210—192

7 Claims

1. Water purification apparatus comprising a chamber having an inlet for receiving water to be purified and an outlet for discharging purified water, said inlet and said outlet being aligned such that an imaginary straight line passes through; two parallel rod electrodes mounted in the chamber so as to be disposed with their axes aligned in parallel with said imaginary straight line and spaced apart on either side of said straight line whereby there is formed an unimpeded flow path between the two electrodes for flow of water between the inlet

and the outlet, said electrodes containing a metal whose ions have purifying properties when present in the water; and cir-



cuitry connected to said electrodes for maintaining a stable current between said electrodes.

4,680,115

#### FILTRATE DISCHARGE ACCELERATOR SYSTEM FOR CENTER VALVE FILTER DRUMS

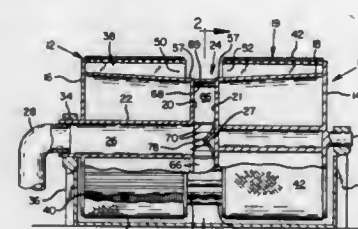
Richard W. LaValley, Vancouver, Wash., assignor to LaValley Industrial Plastics, Inc., Vancouver, Wash.

Filed Dec. 23, 1985, Ser. No. 812,910

Int. Cl.<sup>4</sup> B01D 33/06

U.S. Cl. 210—247

13 Claims



1. In a center valve rotary drum filter for separating wood pulp from its filtrate, including means for supplying subatmospheric pressure, the drum having means defining axially extending surface filtrate channels arranged about the periphery of the drum, the filtrate channels opening into a common central circumferential valve opening, the valve opening being in fluid communication with a drainage conduit centrally disposed and extending axially within the drum, said drainage conduit being in communication with said subatmospheric pressure supply means, the filter further including a stationary valve member seated within a peripheral arcuate segment of the valve opening to close off surface filtrate channels leading to said segment from communication with said subatmospheric pressure supply means, said valve opening being defined by a pair of axially spaced radially extending flow-confining walls, the improvement comprising:

- a plurality of generally radially disposed baffle means circumferentially spaced apart and positioned within said valve opening downstream of the stationary valve, said baffle means extending between the flow-confining walls and subdividing the valve opening into generally radial discrete filtrate flow channels for channelling filtrate flow from the surface filtrate channels into means defining a central opening of said drainage conduit; and
- curved flow passage means between said flow-confining walls, said flow passage means being curved toward the central axis of the drainage conduit for directing filtrate flow to the drainage conduit.

#### 4,680,116 WATER PURIFIER APPARATUS

Minoru Kamiwada, Fukuoka; Kazuyuki Saruwatari, Ogoori; Kazuaki Shimada, and Harumi Higashizima, both of Fukuoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

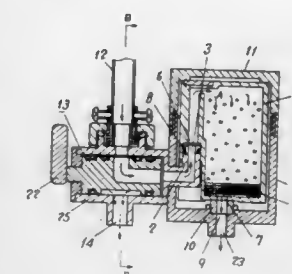
Filed May 8, 1985, Ser. No. 731,794

Claims priority, application Japan, May 8, 1984, 59-92251; May 11, 1984, 59-95002; May 11, 1984, 59-95041; May 16, 1984, 59-97993

Int. Cl.<sup>4</sup> B01D 27/10

U.S. Cl. 210—282

17 Claims



1. A water purifier apparatus comprising:

- (a) a body having a raw water outlet and a purified water outlet conduit;
- (b) a cartridge disposed in said body and housing a filter material, said cartridge having a raw water inlet and a purified water outlet with an enclosed water passage extending therebetween; and
- (c) said raw water outlet of said body and said raw water inlet of said cartridge being coupled to each other in a watertight manner and said purified water outlet of said cartridge being coupled to said purified water outlet of said body in a watertight manner.

4,680,117

#### YOGURT SEPARATOR DEVICE

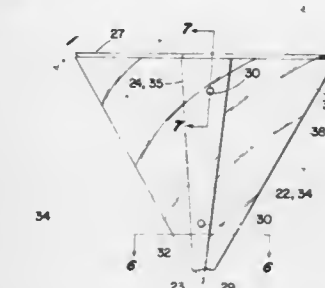
Richard B. Freeman, Gainesville, Fla., assignor to The Gainesville 1920 Corporation, Gainesville, Fla.

Filed Oct. 18, 1985, Ser. No. 788,865

Int. Cl.<sup>4</sup> B01D 23/28

U.S. Cl. 210—469

5 Claims



1. In a yogurt separator device for separating and removing the whey from yogurt, the combination of a flexible fine-mesh screen formed of spaced filaments of synthetic resin, said screen being initially of substantially flat or planar form and providing a configuration presenting edge portions opposed to each other; said screen being formable into an operative tapered yogurt-receiving filter cup with a bottom apex by bringing said opposed edge portions into overlapping relationship to each other; means for securing said edge portions against displacement from said overlapping relationship, whereby the whey drains through said cup while the residue is removably retained thereby; a flexible impermeable self-sustaining backing

element of synthetic resin having a nominal central apex opening to receive the bottom apex to said filter cup and a configuration in planar form which is generally the same as that of said screen, said backing element being impervious to liquid and disposed in substantially laminar relationship to said screen and having edge portions opposed to each other, the portion of the backing element between the opposed edge portions being continuous and free of openings radially outwardly of said central opening; and second means for securing said backing element to said screen, said backing element being formable into a tapered bottom-opening cup-shaped container member external to said cup by bringing said opposed edge portions of said backing element into overlapping relationship with each other; the mesh openings of said screen having a size in the range of from 200 to 400 microns such that a thin film of liquid is formed over each opening by surface tension interaction between the whey and the synthetic resin of said filaments and a wetting action is created at the interface between the fine-mesh screen and the liquid-impervious backing element.

4,680,118

# PLEATED AND SEALED FILTER CARTRIDGE WITH CONNECTED FILM

Jun Taga, Kawasaki, Japan, assignor to Mitsui & Co., Ltd., Tokyo, Japan, a part interest

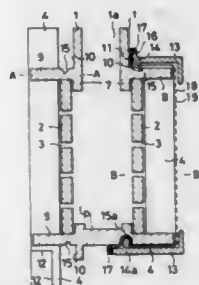
Filed Oct. 21, 1985, Ser. No. 789,572

Claims priority, application Japan, Oct. 19, 1984, 59-21834

Int. Cl.<sup>4</sup> B01D 27/06

U.S. Cl. 210—493.1

4 Claims



1. A cartridge filter comprising:  
a pleat-type porous membrane having a longer length than an effective filtering surface thereof;  
a cylindrical body;  
a lower plate;  
a plurality of fins extending radially from a lower part of said upper cylindrical body and from said lower plate;  
each of said plurality of fins being covered by said pleat-type porous membrane; and  
said pleat-type porous membrane extending through said plurality of fins being folded and disposed along an outer circumference of said upper cylindrical body and fasteningly sealed at one end, wherein a thin and flexible film is connected to said folded or sealed end portion of said porous membrane.

4,680,119

# APPARATUS FOR INTRODUCING A GAS INTO A LIQUID

Grover C. Franklin, Jr., 2250 Warmouth St., San Pedro, Calif. 90732

Filed Apr. 10, 1985, Ser. No. 721,777

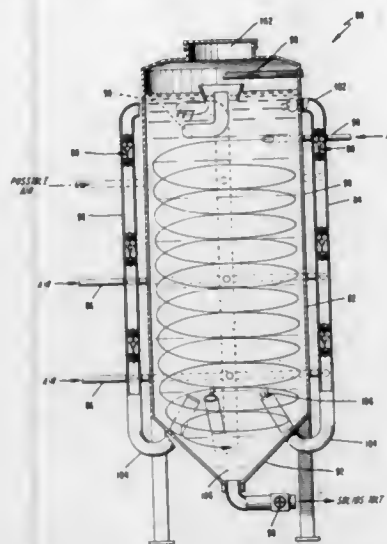
Int. Cl.<sup>4</sup> B01F 3/04

U.S. Cl. 210—512.1

2 Claims

1. An apparatus for simultaneously separating solid particles from a liquid and aerating the liquid comprising:  
a container having an upper cylindrical section and an inverted conical bottom portion, a valving means being provided at the apex of the conical section for removal of

solid particles from the container, a tangential inlet and a central outlet being provided in the top section thereof, at least one vertical conduit in fluid communication with the container, the conduit having an upper end connected tangentially to the top of the container and below the tangential inlet and central outlet, and a bottom portion which is bent upwards and penetrates the container near the bottom of the cylindrical section of the container, the



open end of the bottom portion being disposed near the center of the container, the conduit having disposed therein at least one mixer assembly, each assembly comprising a plurality of turbines, the turbines being free to rotate, spaced apart vertically and having different speeds or directions of rotation; and means for introducing a gas into the conduit at a point below the mixer assembly.

4,680,120

# BONDED PHASE OF SILICA AND CARBOALKOXYALKYL SILANES FOR SOLID PHASE EXTRACTION

Hugh E. Ramsden, Scotch Plains, N.J., and Joseph M. Patterson, New Britain, Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Division of Ser. No. 731,530, May 7, 1985, Pat. No. 4,640,909.

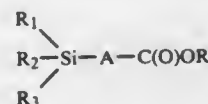
This application Sep. 8, 1986, Ser. No. 904,892

Int. Cl.<sup>4</sup> B01D 15/08

U.S. Cl. 210—635

10 Claims

1. In a solid phase extraction process for the cleanup and purification of 11-nor-Δ-9-tetrahydrocannabinol-9-carboxylic acid from a urine sample, the improvement comprising employing a solid phase bonded silica reaction product of silica and a carboalkoxyalkyl silane of the formula



in which R is an alkyl radical of from 1 to 3 carbon atoms, A is an alkylene group of from 2 to 4 carbon atoms and R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are the same or different and are selected from the group consisting of halogen, an alkoxy group of from 1 to 6 carbon atoms, an alkoxyalkoxy group of from 2 to 5 carbon atoms and an alkyl group of from 1 to 3 carbon atoms, with the proviso that at least one of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> is other than an alkyl group.

4,680,121

# BONDED PHASE OF SILICA FOR SOLID PHASE EXTRACTION

Hugh E. Ramsden, Scotch Plains, N.J., and Joseph M. Patterson, III, New Britain, Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Division of Ser. No. 831,333, Feb. 20, 1986, Pat. No. 4,650,784.

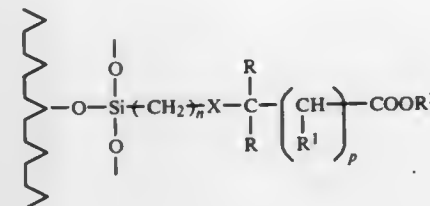
This application Aug. 4, 1986, Ser. No. 892,311

Int. Cl.<sup>4</sup> B01D 15/08

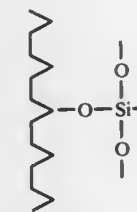
U.S. Cl. 210—635

13 Claims

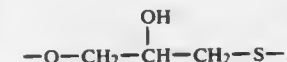
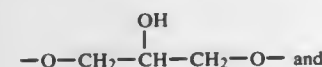
1. In a solid phase extraction process for the cleanup and concentration of 11-nor-Δ-9-tetrahydrocannabinol-9-carboxylic acid from a urine sample the improvement comprising employing a solid phase bonded silica product of the formula:



in which



is the backbone of a silica gel or controlled pore glass, X is selected from the group consisting of —O—, —S—,



each R and R<sup>1</sup> are each independently independently selected from the group consisting of hydrogen, an alkyl group of from 1 to 3 carbon atoms and —CH<sub>2</sub>—, R<sup>2</sup> and R<sup>3</sup> are each independently an alkyl group of from 1 to 4 carbon atoms, n is an integer of from 2 to 5, p is zero or one and m is an integer of from 1 to 4, as the solid phase.

4,680,122

# ULTRAFILTRATION CONTROL FOR HEMODIALYSIS

David Barone, Oklahoma City, Okla., assignor to Organon Teknika Corporation, Oklahoma City, Okla.

Filed Sep. 10, 1983, Ser. No. 534,034

Int. Cl.<sup>4</sup> B01D 13/00

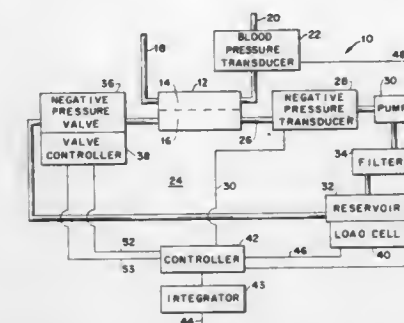
U.S. Cl. 210—637

7 Claims

1. A process for automatically controlling ultrafiltration in a closed dialysis system during hemodialysis comprising the steps of:

causing the flow of blood on one side of a semipermeable membrane, causing the flow of dialysate solution on the other side of said semipermeable membrane; collecting dialysate fluid and ultrafiltrate fluid in a reservoir; measuring the transmembrane pressure; indicating a desired ultrafiltration rate; measuring the total quantity of dialysate fluid and ultrafiltrate fluid in the reservoir at predeter-

mined time intervals; comparing the actual quantity of fluid in the reservoir for each of said time intervals to the required quantity for the desired ultrafiltration rate; calcu-





present in the system water scale inhibiting amounts of a composition having a first component selected from carboxymethylcellulose and its water soluble salts within a molecular weight range of about 90,000 to about 500,000, and a second component consisting of at least one compound selected from gluconic acid, glucoheptonic acid and their water soluble salts; the ratio of the first component to the second component in said composition being between about 1:10 and about 10:1, such that the total resulting concentration of said first and second components in the system water achieves a reduction in scale deposit that is superior to the reduction in scale deposit achieved by an equivalent concentration of either component without the other.

4,680,126

# SEPARATION AND RECOVERY OF REUSABLE HEAVY METAL HYDROXIDES FROM METAL FINISHING WASTEWATERS

James M. Frankard, 175 E. Lake Blvd., and Orville V. Broch, 101 E. Mark St., both of Winona, Minn. 55987  
Filed Feb. 18, 1986, Ser. No. 830,532  
Int. Cl.<sup>4</sup> C02F 1/62

U.S. Cl. 210—710

29 Claims

1. A method for treating wastewaters and sludges from a plating process to facilitate reuse of metal values by the recovery of non-ferrous metal hydroxide, said method comprising the following steps (a) through (f) in the order presented:

- lowering the pH of an aqueous slurry obtained from a plating process from an alkaline pH to an acid pH, said slurry comprising solid ferrous hydroxide and a solid non-ferrous metal hydroxide wherein the non-ferrous metal is selected from the group consisting of zinc, nickel, copper (ii), cadmium, and chromium (III) to dissolve the non-ferrous metal hydroxide;
- converting the ferrous hydroxide to solid ferric hydroxide by aeration of the aqueous acidic slurry;
- isolating the solid ferric hydroxide from the slurry leaving a solution comprising non-ferrous metals;
- raising the pH of the solution of step (c) to precipitate non-ferrous metal hydroxide;
- recovering the precipitated non-ferrous metal hydroxide; and
- introducing said non-ferrous metal hydroxide into the plating process.

4,680,127

# METHOD OF SCAVENGING HYDROGEN SULFIDE

James G. Edmondson, Conroe, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.  
Filed Dec. 13, 1985, Ser. No. 808,590  
Int. Cl.<sup>4</sup> C02F 1/00

U.S. Cl. 210—749

15 Claims

1. A method for reducing the amount of hydrogen sulfide in a hydrogen sulfide-containing aqueous medium without solids formation, wherein said aqueous medium has a pH from neutral to alkaline, which method comprises adding to the aqueous medium an effective amount for the purpose of a glyoxal.

4,680,128

# ANIONIC COPOLYMERS FOR IMPROVED CONTROL OF DRILLING FLUID RHEOLOGY

Robert C. Portnoy, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.  
Filed Apr. 26, 1985, Ser. No. 727,454  
Int. Cl.<sup>4</sup> C09K 7/02

U.S. Cl. 252—8.511

3 Claims

1. An aqueous drilling fluid comprising a water base, calcium ions, a clayey material suspended in said water base, calcium ions and from about 0.25 pounds per barrel (ppb) to about 8 ppb based on the total volume of said fluid of a copolymer consisting essentially of acrylic acid and alkali metal vinyl-sulfonate salt and having a molecular weight (Mw) of from

2,000 to 10,000, wherein the monomer mole ratio of the acrylic acid to sulfonate in the copolymer is 1:1 to 19:1:

4,680,129

# MODIFIED SUCCINIMIDES (X)

Frank Plavac, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.  
Filed Jan. 17, 1986, Ser. No. 820,188  
Int. Cl.<sup>4</sup> C10M 133/16

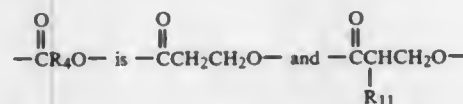
U.S. Cl. 252—51.5 A

16 Claims

1. A polyamino alkenyl or alkyl succinimide wherein one or more of the nitrogens of the polyamino moiety is substituted with:



wherein R<sub>4</sub> is alkylene of from 1 to 6 carbon atoms excluding R<sub>4</sub> groups wherein



wherein R<sub>11</sub> is the remainder of the R<sub>4</sub> group; m is an integer of from 0 to 2; R<sub>5</sub> is alkylene of from 2 to 5 carbon atoms; p is an integer of from 1 to 100; R<sub>6</sub> is selected from the group consisting of hydrogen and hydrocarbyl of from 1 to 30 carbon atoms; and with the proviso that if m is one or two then R<sub>6</sub> is hydrogen.

13. A lubricating oil composition comprising an oil of lubricating viscosity and a dispersant effective amount of a compound as defined in claim 1.

4,680,130

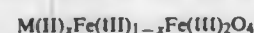
# PREPARATION OF FINELY DIVIDED ISOTROPIC FERRITE POWDERS HAVING THE SPINEL STRUCTURE

Hartmut Hibst, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany  
Filed Sep. 26, 1985, Ser. No. 780,458  
Int. Cl.<sup>4</sup> C04B 35/26

U.S. Cl. 252—62.60

4 Claims

1. A process for the preparation of a finely divided ferrite powder which has the spinel structure, is of the formula



where M is Mg, Mn, Co, Ni, Cu and/or Zn and x is from 0 to 1, and has an essentially isotropic particle shape, wherein an oxygen-containing gas is passed into a coprecipitate prepared from an aqueous alkali metal hydroxide solution, an M(II) salt solution, an iron(II) salt solution and an iron(III) salt solution, the ratio of the iron(III) ions to the sum of the M(II) and Fe(II) ions in the coprecipitate being smaller than that in the resulting ferrite powder of the composition M<sub>2</sub>Fe<sub>3</sub>—xO<sub>4</sub>.

4,680,131

# DETERGENT COMPOSITIONS

Alfred Busch, Grimbergen, and James C. T. B. St. Laurent, Overijse, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio  
Continuation of Ser. No. 598,652, Apr. 10, 1984, abandoned.  
This application Jan. 13, 1986, Ser. No. 818,414

Claims priority, application United Kingdom, Apr. 20, 1983, 8310698

Int. Cl.<sup>4</sup> C11D 7/54

5 Claims

1. A laundry detergent composition comprising:

- from about 2% to about 60% of organic surfactant selected from the group consisting of anionic, nonionic, cationic, ampholytic and zwitterionic surfactants of the mixture thereof;
- from about 1% to about 20% of smectite-type clay selected from the group consisting of saponites, hectorites and sodium and calcium montmorillonites and mixtures thereof;
- from about 0.005 to about 0.02 mmoles % of copper precomplexed with aminopolycarboxylate sequestant having a logarithmic copper stability constant of at least about 11, said aminopolycarboxylate sequestant being selected from the group consisting of ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, hydroxyethylethylenediaminediacetic acid, nitrilotriacetic acid, mixtures thereof and water-soluble salts, thereof, and
- from about 0.5% to about 50% of perborate bleaching agent.

4,680,133

# STRIPPING COMPOSITION CONTAINING AN AMIDE AND A CARBONATE AND USE THEREOF

Irl E. Ward, Easton, Pa., assignor to Environmental Management Associates, Inc., Macungie, Pa.  
Filed Mar. 26, 1986, Ser. No. 844,385

Int. Cl.<sup>4</sup> C09D 9/00; C11D 7/32, 7/50, 7/52

U.S. Cl. 252—153

22 Claims

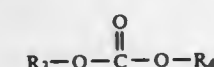
1. A stripping composition comprising a mixture of:  
(a) from about 25% to about 90% by weight of an amide compound of the formula:



(Formula I)

and mixtures thereof, wherein R is selected from the group consisting of hydrogen, methyl, ethyl, propyl and phenyl; R<sub>1</sub> and R<sub>2</sub> are selected from the group consisting of hydrogen and methyl; and

(b) from about 10% to about 75% by weight a carbonate compound of the formula:



(Formula II)

and mixtures thereof, wherein R<sub>3</sub> and R<sub>4</sub> are selected from the group consisting of methyl or ethyl or R<sub>3</sub> and R<sub>4</sub> together form a divalent ethylene, propylene or butylene group of a cyclic carbonate.

7. A stripping composition of claim 1 wherein the amide component is selected from the group consisting of dimethyl acetamide and dimethyl formamide and the carbonate component is selected from the group consisting of propylene carbonate and ethylene carbonate.

4,680,132

# PROCESSING DETERGENT BARS WITH A CAVITY TRANSFER MIXER TO REDUCE GRITINESS

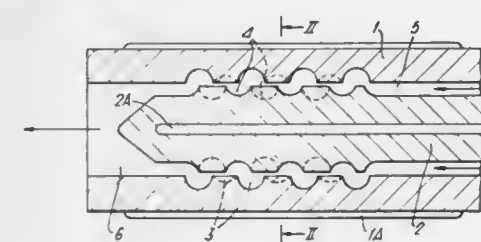
Terence A. Clarke, Richard B. Edwards, and Graeme N. Irving, all of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.  
Continuation of Ser. No. 587,874, Mar. 14, 1984, abandoned, which is a continuation of Ser. No. 479,625, Mar. 28, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 703,457

Claims priority, application United Kingdom, Mar. 29, 1982, 8209051

Int. Cl.<sup>4</sup> B01F 7/02; B29B 1/06; C11D 13/10, 13/18

U.S. Cl. 252—108

6 Claims



1. A process of reducing the gritiness in a soap-containing feedstock wherein the feedstock is subjected to working by passing said feedstock between two closely spaced mutually displaceable surfaces each having a pattern of cavities which overlap during movement of the surfaces so that the material moved between the surfaces traces a path through cavities alternately in each surface, whereby the bulk of the material passes through the shear zone generated in the material by displacement of the surfaces.

4,680,134

# METHOD FOR FORMING SOLID DETERGENT COMPOSITIONS

Bernard J. Heile, Apple Valley, and Terry J. Klos, Minnetonka, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.  
Continuation of Ser. No. 663,473, Oct. 18, 1984, Pat. No. 4,595,520. This application Mar. 17, 1986, Ser. No. 840,455

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> C11D 7/56

U.S. Cl. 252—160

10 Claims

1. A detergent composition comprising:  
(a) about 5–25% of an alkali metal hydroxide;  
(b) a condensed phosphate hardness sequestering agent; and  
(c) an amount of a solidifying agent selected from the group consisting of hydrated sodium carbonate, hydrated sodium sulfate and mixtures thereof, which is effective to harden the detergent composition into a uniform solid.

4,680,135

# CARBOXYLIC/SULFONIC POLYMER AND CARBOXYLIC/POLYALKYLENE OXIDE POLYMER ADMIXTURES FOR USE IN IRON OXIDE DEPOSIT CONTROL

Charles Y. Cha, McMurray, and Richard G. Varsanik, Coraopolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.  
Continuation-in-part of Ser. No. 669,902, Nov. 9, 1984, abandoned. This application Jan. 15, 1986, Ser. No. 819,094

Int. Cl.<sup>4</sup> C02F 5/10

U.S. Cl. 252—180

1 Claim

1. A process for inhibiting formation and deposition of iron oxide in an aqueous system containing calcium ions, comprising

ing adding to said system 0.1 to 25 ppm of an admixture comprising:

(A) a water-soluble polymer having an intrinsic viscosity of 0.05 to 0.5 dl/g, prepared from:

- (i) 50 to 70%, by weight, of an unsaturated carboxylic acid, or its salt; and
- (ii) 30 to 50%, by weight, of an unsaturated sulfonic acid, or its salt; and

(B) a water-soluble polymer having an intrinsic viscosity of 0.05 to 0.5 dl/g prepared from:

- (i) 50 to 70%, by weight, of an unsaturated carboxylic acid or its salt; and
- (ii) 30 to 50%, by weight, of an unsaturated pendant polyalkylene oxide compound; wherein the ratio of (A):(B) is about 1:1, wherein said unsaturated carboxylic acid of (A) or (B) is selected from the group consisting of acrylic acid and methacrylic acid, wherein said unsaturated sulfonic acid is selected from the group consisting of 2-acrylamido-2-methylpropyl sulfonic acid and 2-methacrylamido-2-methylpropyl sulfonic acid, and wherein said unsaturated pendant polyalkylene oxide compound is methoxyallyl polyethylene glycol of the formula:



wherein n ranges from 5-10.

4,680,136

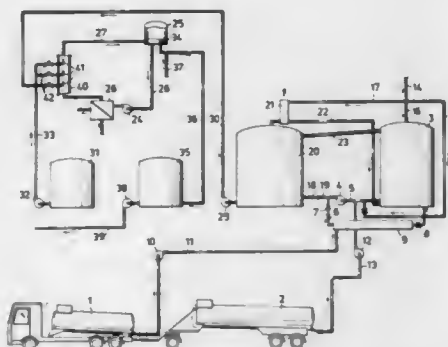
**METHOD FOR PREPARING COMPOSITIONS WHICH CAN BE USED IN THE PRODUCTION OF SODIUM DITHIONITE; AND THE USE OF SUCH COMPOSITIONS**  
Ragnar Bernhard, Falun, Sweden, assignor to Stora Kopparbergs Bergslags AB, Falun, Sweden

Filed May 7, 1985, Ser. No. 731,296

Int. Cl.<sup>4</sup> C01B 17/66; C01D 5/14; C09K 3/00

U.S. Cl. 252-188.2

5 Claims



1. A method for preparing compositions capable of being used in the preparation of sodium dithionite by means of a continuous process using a reducing agent comprising an aqueous solution of sodium borohydride and sodium hydroxide, which method comprises bringing sulphur dioxide into contact with a recirculating aqueous solution of sodium hydroxide and previously absorbed sulphur dioxide to a ratio between sulphur dioxide and the sum of sulphur dioxide and sodium oxide of 0.61-0.66, pressurizing the resultant mixture and introducing liquid sulphur dioxide thereinto to achieve a ratio between sulphur dioxide and the sum of sulphur dioxide and sodium oxide of 0.75-0.81, and adjusting the water content to a concentration of  $\text{SO}_2 + \text{Na}_2\text{O}$  of 10-13 percent by weight.

4,680,137

# LIQUID CRYSTAL ESTER COMPOUND

Toyoshiko Isoyama; Tetsuya Ogawa, both of Yokohama, and Shigeru Sugimori, Musashino, all of Japan, assignors to Chisso Corporation, Japan

Filed Jun. 2, 1986, Ser. No. 869,682

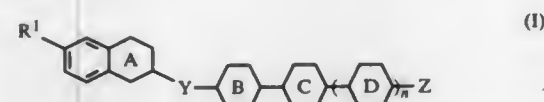
Claims priority, application Japan, Jun. 10, 1985, 60-125490; Jun. 25, 1985, 60-138783

Int. Cl.<sup>4</sup> C09K 19/32; C07C 69/76, 69/74; G02F 1/13

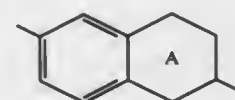
U.S. Cl. 252-299.62

9 Claims

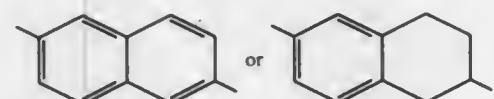
1. A liquid crystal ester compound expressed by the formula



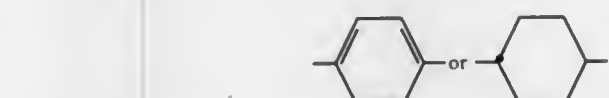
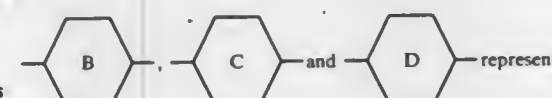
wherein  $\text{R}^1$  represents an alkyl group or an alkoxy group each of 1 to 10 carbon atoms;



represents



Y represents  $-\text{COO}-$  or  $-\text{OCO}-$ ; any of



in represents 0 or 1; and Z represents an alkyl group or an alkoxy group each of 1 to 10 carbon atoms, or a halogen atom of F, Cl or Br.

4,680,138

# SILVER SENSING MATERIAL FOR USE ON FILM

Delbert E. Sayles, Sr., 3814 N. 88th St., Omaha, Nebr.

Filed Oct. 22, 1985, Ser. No. 790,247

Int. Cl.<sup>4</sup> H01B 1/04, 1/02

U.S. Cl. 252-503

7 Claims

1. In a paint composition comprising a conductive metal, selected from the group consisting of silver, gold and aluminum, suspended in Butyl Acetate as a liquid vehicle, the improvement comprising approximately 23.9% by weight of Toluene in the liquid vehicle, the conductive metal being 20 to 30% by weight of the composition.

4,680,139

# ELECTROSTATICALLY CONDUCTIVE PREMOLD COATING

Charles F. Williams, Brunswick, and Atam P. Sahni, Solon, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio  
Division of Ser. No. 720,992, Apr. 8, 1985, Pat. No. 4,587,160, which is a continuation-in-part of Ser. No. 503,861, Jun. 13, 1983, abandoned. This application May 2, 1985, Ser. No. 728,084

Int. Cl.<sup>4</sup> H01B 1/06

U.S. Cl. 252-511

7 Claims

1. A powdered electroconductive coating composition having a particle size of at least 100 mesh adaptable to be applied and cured to a final, finish coating over a compatible synthetic resinous substrate and chemically bonded thereto, the powdered composition comprising a partially cured, thermosetting synthetic resin having graphite dispersed throughout each particle, wherein the graphite is in the form of flake having a particle size of about 5 to 80 microns, or a mixture of said graphite flake and graphite fiber and is present in sufficient quantity to render said cured coating electroconductive.

4,680,140

# METAL POWDER-CONTAINING COMPOSITIONS

Yoshiteru Kageyama, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,789

Claims priority, application Japan, Jan. 31, 1985, 60-17216; Jan. 31, 1985, 60-17217

Int. Cl.<sup>4</sup> H01B 1/06

U.S. Cl. 252-512

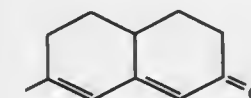
14 Claims

1. A metal powder-containing polymer composition consisting essentially of:

- (a) powder of a metal having an amino compound or a mixture of an amino compound and a silane coupling agent compound thereon, the mean particle size of the metal powder being in the range of 0.01 to 100 microns, and
- (b) a thermoplastic resin comprising a carboxyl group-containing thermoplastic resin, the carboxyl group content of the carboxyl group-containing thermoplastic resin being 0.01 to 15% by weight of the resin.



1. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of adding to said perfume composition, cologne or perfumed article, an aroma augmenting or enhancing quantity of 4,4A,5,6-tetrahydro-7-methyl-2-(3H)-naphthalenone having the structure:



4,680,143

# DETERGENT COMPOSITIONS

David J. Edge, Chester; Appaya R. Naik, Merseyside, and Melvin Scott, Cheshire, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 551,457, Nov. 14, 1983, abandoned.

This application Jun. 25, 1985, Ser. No. 748,150

Claims priority, application United Kingdom, Nov. 16, 1982, 8232643

Int. Cl.<sup>4</sup> C11D 1/83

U.S. Cl. 252-553

9 Claims

1. A foaming liquid detergent composition in the form of a stable aqueous solution containing from 16 to 40% by weight of an active detergent mixture comprising

- (a) a water-soluble salt of a dialkyl ester of sulphosuccinic acid in which the alkyl groups may be the same or different, in an amount of at least 2% by weight based on the total composition,
- (b) a  $\text{C}_9$ - $\text{C}_{15}$  alkylbenzene sulphonate, and
- (c) a  $\text{C}_{10}$ - $\text{C}_{18}$  alkyl ether sulphate, wherein the weight ratio of (a) to (b) is from 4:1 to 0.1:1 and the weight ratio of (a)+(b) to (c) is from 2.5:1 to 1:1.



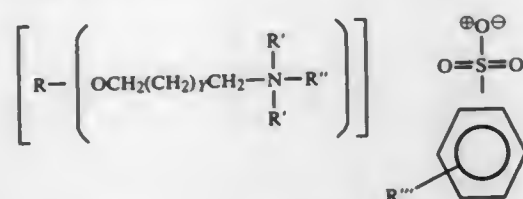
4,680,144

**BENZENE SULFONATE QUATERNARY AMMONIUM SALTS OF ORGANIC SUNSCREEN CARBOXYLIC ACIDS**  
Donald E. Conner, Clifton, N.J., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 623,206, Jan. 21, 1984, abandoned. This application Oct. 29, 1986, Ser. No. 924,340  
Int. Cl. C07C 87/68, 95/08; A61K 7/06; A01K 7/42

U.S. Cl. 260—501.15 4 Claims

1. As a novel composition of matter, a benzene sulfonate quaternary salt of an organic sunscreen carboxylic acid corresponding to the formula:



wherein the R is an acyl derived from the group consisting of p-amino benzoyl, p-dimethyl amino benzoyl, p-methoxy cinnamoyl, p-methoxy benzal, and cinnamal malonoyl; R' is an alkyl group having from 1 to 2 carbon atoms; R'' is an alkyl group having from 10 to 20 carbon atoms; R''' is selected from the group consisting of H and CH<sub>3</sub>; and Y is an integer of 0 to 1.

4,680,145

**PROCESS FOR PRODUCING DIPEROXIC ACIDS**

Keith M. Taylor, Ballwin; Liou-Liang Horng, Clayton, and Timothy K. Hirzel, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 646,720, Sep. 4, 1984. This application Aug. 1, 1986, Ser. No. 891,825

Int. Cl. C07C 178/00

U.S. Cl. 260—502 R

12 Claims

1. A process for making alkyl or phenyl substituted-butane diperoxoic acid which comprises reacting hydrogen peroxide with alkyl or phenyl substituted succinic anhydride in a strong acid reaction medium and in the presence of a water immiscible reaction modifier in the range from about 0.25 ml. to about 2 ml. of said modifier per gram of said anhydride, said amount of modifier being sufficient to prevent a gelled reaction mass and substantially less than required to dissolve the alkyl or phenyl substituted-butane diperoxoic acid.

4,680,146

**PROCESS FOR THE PREPARATION OF 4,4'-DINITROSTILBENE-2,2'-DISULPHONIC ACID SALTS**

Guido Skipka, Stolberg, and Friedrich Dürholz, Remscheid, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 9, 1986, Ser. No. 861,486

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519552

Int. Cl. C07C 143/24

U.S. Cl. 260—505 R

16 Claims

1. A process for the preparation of 4,4'-dinitrostilbene-2,2'-disulphonic acid salts comprising oxidizing nitrotoluene-2-sulphonic acid or salts thereof in an aqueous alkaline medium, adding potassium, calcium and/or magnesium ions during the process at the same rate at which the 4,4'-dinitrostilbene-2,2'-disulphonic acid is formed, the amount of added potassium, calcium and/or magnesium ions being 10 to 150 mol % at any particular time during the process, relative to the amount of 4,4'-dinitrostilbene-2,2'-disulphonic acid present in the reaction

mixture at that particular time, and removing the precipitated salt of 4,4'-dinitrostilbene-2,2'-disulphonic acid.

4,680,147

**PROCESS FOR THE ISOLATION UNDER MILD CONDITIONS OF PARAFFINSULFONATE AND SULFURIC ACID FROM REACTION MIXTURES FROM PARAFFIN SULFOXIDATION**

Rudolf Pistorius, Hünstetten, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany  
Continuation of Ser. No. 629,994, Jul. 12, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 804,312

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325516

Int. Cl. C07C 143/02

U.S. Cl. 260—513 R

5 Claims

1. A process for the isolation under mild conditions of paraffinsulfonate from the aqueous reaction mixtures which result from the sulfoxidation of n-paraffins, from which sulfur dioxide has been removed by degassing, and which contain higher molecular weight sulfonic acids, sulfuric acid, n-paraffins and water, which process comprises allowing at least one aliphatic alcohol having 2 to 8 carbon atoms and at least one less-polar solvent to act on such reaction mixtures at the same time, removing the aqueous phase which has separated out and contains sulfuric acid, and neutralizing the product phase containing paraffinsulfonates, evaporating it and driving out the remaining paraffin using superheated steam; said less polar solvents being carbon tetrachloride, chloroform, 1,2-dichloroethane, 1,1,2-trichloro-trifluoroethane, or methylene chloride.

4,680,148

**MOBILE POND AERATING SYSTEM**

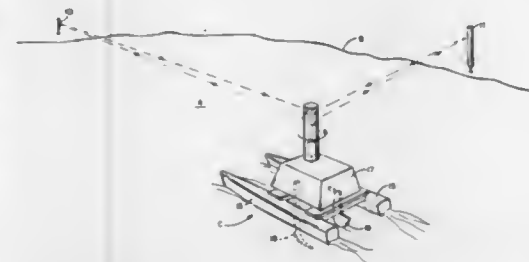
Dominic S. Arbisi, Minnetonka, and Coy E. Replogle, Minneapolis, both of Minn., assignors to Aeris Water Resources, Inc., Eden Prairie, Minn.

Filed May 30, 1985, Ser. No. 739,291

Int. Cl. B01F 3/04

U.S. Cl. 261—120

3 Claims



1. An aerating system for aerating substantially all areas of a pond of water surrounded by a bordering shoreline, said system comprising:

a self-propelled flotation unit,  
a subsurface aerating discharge nozzle mounted on said unit for discharging aeration gas into the water below the surface thereof,  
programmed means mounted on board the unit free from any connection with the shoreline for guiding and propelling the flotation on the water surface in a substantially predetermined path so that the aerating discharge for the nozzle effectively distributes the aerating gas to substantially all areas of the pond with complete freedom of controlled movement without restraints connected to the shoreline,

said electronic control system comprising a sending, computing and automatic control of the direction and speed of the unit and which includes a laser beam timed transmit-

4,680,150

**METHOD FOR MANUFACTURING FOAMED PLASTICS**

Hiromichi Matsuda, Nagoya, Japan, assignor to Inoue MTP Kabushiki Kaisha, Aichi, Japan

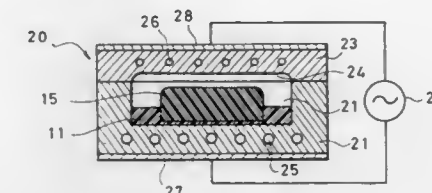
Filed Jul. 30, 1985, Ser. No. 760,806

Claims priority, application Japan, Jan. 31, 1985, 60-18418

Int. Cl. B29C 67/22, 65/30

U.S. Cl. 264—26

9 Claims



**MOLD AND METHOD FOR SPIN CASTING A PRECISELY CONFIGURED ARTICLE**

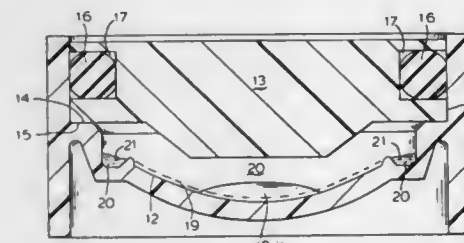
David L. Rawlings, Bayville; Robert E. Glick, Huntington Station, both of N.Y., and Robert Chang, Philadelphia, Pa., assignors to International Hydron Corporation, Woodbury, N.Y.

Filed May 19, 1986, Ser. No. 865,217

Int. Cl. B29D 11/00

U.S. Cl. 264—2.1

15 Claims



1. In a mold for spin casting a precisely configured article which possesses at least one precisely configured surface for spin casting the article from an initially liquid polymerization reaction mixture containing at least one substance which is volatile under spin casting conditions and means for sealing the mold cavity against any appreciable loss of said volatile substance from beyond the open space lying between the upper surface of the liquid polymerization reaction mixture and the lower surface of said sealing means, the improvement which comprises a reservoir which is separate from said precisely configured surface and which communicates with said open space, said reservoir being adapted to receive a quantity of liquid volatile substance such that during spin casting, volatilized substance from the contents of the reservoir will be present in the open space reducing the loss of volatile substance from the polymerization reaction mixture.

6. A method of spin casting a precisely configured article which comprises:

(a) spinning a mold containing a predetermined quantity of a liquid polymerizable material containing at least one component which is volatile under spin casting conditions, said spinning being carried out about the vertical axis of the mold and at a speed which is sufficient to cause the liquid polymerizable material contained in the mold to be radially outwardly displaced and to thereby assume a predetermined geometric configuration, said mold being provided with gas-tight sealing means to prevent appreciable loss of volatile component during spinning, there being a volume of open space defined between the upper surface of the liquid polymerizable mixture and the lower surface of the sealing means, said mold being further provided with a reservoir containing a quantity of liquid volatile substance such that during said spinning of the mold, volatilized substance from the contents of the reservoir will be present in the open space reducing the loss of volatile substance from the liquid polymerization reaction mixture to said open space; and,

(b) causing the liquid polymerizable material in the spinning mold to undergo polymerization thereby providing a shape-retaining, precisely configured solid polymeric article.

1. A method for manufacturing molded plastics having a predetermined shape by heating a plastic raw material which is located in molding dies having electrodes by applying high frequency voltage to the electrodes to melt and plasticize the plastic raw material, so that a foaming agent contained in the plastic material dissolves, wherein said method comprises; introducing a flowable shell forming material in the molding dies and introducing a core forming material having a foaming agent mixed therein in or on the shell forming material so that the core forming material is upstanding in the molding dies, said core forming material having a hardness which is sufficient to maintain its original shape when it is located in or on the shell forming material; clamping the molding dies together; and initially heating the shell forming material and subsequently the core forming material by the application of high frequency voltage thereto until the core forming material foams, enlarges in size and forces the shell forming material to flow in the mold cavity and surround the foamed core to form a molded composite foamed resin article.

4,680,151

**INJECTION PRESSURE MONITORING METHOD AND APPARATUS**

Shigeru Fujita, Numazu; Hideo Banzai, Mishima, and Hideo Tanaka, Numazu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 592,016, Mar. 21, 1984, Pat. No. 4,585,931.

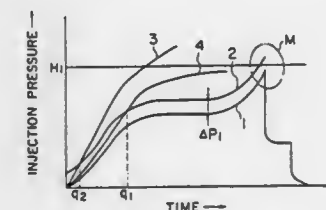
This application Feb. 12, 1986, Ser. No. 828,684

Claims priority, application Japan, Mar. 23, 1983, 58-48450

Int. Cl. B29C 47/92

U.S. Cl. 264—40.3

3 Claims



1. A method of monitoring data regarding continuously varying injection pressure in an injection process of an injection molding machine comprising the steps of: detecting data regarding the injection pressure as a variable of time using multipoint sampling for one injection operation cycle of said machine, storing detected data of said one injection operation cycle as reference data, detecting data regarding the injection pressure as a variable of time using multipoint sampling for another injection operation cycle of said machine, comparing said stored reference data with said detected data regarding the

injection pressure in said another injection operation cycle, and generating an alarm information when a deviation between said detected data for said another operation cycle and said reference data exceeds a predetermined limit.

4,680,152

# METHOD FOR MONITORING DEVIATIONS IN THE DIMENSIONS OF A CONTINUOUSLY EXTRUDED PROFILE STRIP

Gerd Capelle, Langenhagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

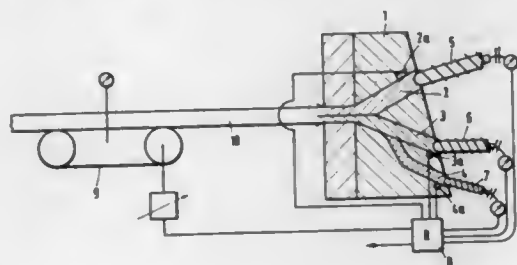
Filed Aug. 28, 1985, Ser. No. 770,231

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434903

Int. Cl.<sup>4</sup> B29C 47/92

U.S. Cl. 264—40.4

1 Claim



1. A method of monitoring deviations in the weight per unit length of a profiled strip formed by feeding a plurality of separately extruded mixtures into a common profile strip extruding nozzle in which said separate mixtures are combined to form said strip, comprising the steps of:

- measuring the extrusion pressure and temperature of each mixture after being separately extruded and before the strip is extruded by the strip extruding nozzle;
- providing and storing in a control device the desired pressure and temperature values of each mixture, the desired weight per unit length value of the profile strip, and the desired percentages of mixtures comprising the strip;
- simultaneously feeding each mixture to the strip extruding nozzle to produce an extruded profile strip comprised of said mixtures;
- continuously weighing the extruded profile strip to determine the weight per unit length of the profile strip;
- comparing the actually determined weight per unit length of the strip with the stored desired weight per unit length, and determining the variation;
- comparing the actually measured pressure and temperatures of each mixture with the corresponding control value for each such mixture, and determining the variation; and
- adjusting the feed rate of one or more of said mixtures where deviations exist,

whereby the desired percentages of mixtures is reestablished and the measured weight per unit length of the strip is made equal to the desired weight per unit length of the strip.

4,680,153

# PROCESS FOR MANUFACTURING HIGHLY POROUS MINERALIC BODIES OF POLYMORPHIC STRUCTURE

Reiner Kinder, Leipzig; Johannes Teubel, Freiberg; Herbert Schuster, and Christine Fanslau, both of Leipzig, all of German Democratic Rep., assignors to Institut für Energetik - Zentralstelle für Rationelle Energieanwendung, Leipzig, German Democratic Rep.

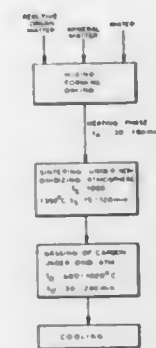
Filed May 29, 1984, Ser. No. 614,920

Claims priority, application German Democratic Rep., May 27, 1983, 251337

Int. Cl.<sup>4</sup> B28B 1/50

U.S. Cl. 264—44

12 Claims



(FLOW DIAGRAM - VARIANT 1)

1. A process for manufacturing highly porous mineralic bodies for use as adsorbents with heterogeneous pore structure which can be subjected to temperatures in excess of 1000° C. and can be regenerated many times, comprising the steps of:

- producing a mixture consisting predominantly of mineralic matter including fly ash and alkaline-earth compounds with reactive organic admixtures up to 15% in terms of the carbon content by weight of the mineralic matter;
- heating said mixture in a nonoxidizing atmosphere to a sintering temperature of said mineralic matter between 1000° C. and 1350° C. for 30 to 180 minutes;
- maintaining said mixture at said sintering temperature in said nonoxidizing atmosphere for a period of 15 to 120 minutes and long enough to enable consolidation of said mineralic matter into a coherent structure interpenetrated by carbonized organic matter; and
- exposing said structure to an oxidizing atmosphere at a reduced temperature for 30 to 240 minutes of 600° C. to 1000° C. and high enough to burn off and gasify the carbonized matter with a resulting increase of the porosity of said structure so that the pore configuration thereof is heterogeneous.

4,680,154

# METHOD OF MAKING CERAMIC ARTICLES

Saburo Matsubara, Yokohama, and Shinichi Yagi, Kawasaki, both of Japan, assignors to Nippon Oil Co., Ltd., Japan

Filed Apr. 3, 1985, Ser. No. 719,344

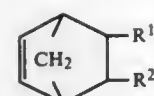
Claims priority, application Japan, Apr. 14, 1984, 59-73931

Int. Cl.<sup>4</sup> C04B 35/64

U.S. Cl. 264—63

6 Claims

1. A method of making ceramic articles which comprises the steps of shaping a composition for the manufacture of ceramics and firing the resulting shaped green body, characterized in that the composition for the manufacture of ceramics contains (a) 100 parts by weight of ceramic powder; (b) 0.2 to 20 parts by weight of an organic binder comprising one or more members selected from the group consisting of ring-opening homopolymers and copolymers derived from (1) bicyclo[2.2.1]heptene-2 and its derivatives, which are represented by the formula



where R<sup>1</sup> is —H, —CH<sub>3</sub>, —CO<sub>2</sub>CH<sub>3</sub> or —OCOCH<sub>3</sub>, R<sup>2</sup> is —H or —OCOCH<sub>3</sub>, and R is —OCOCH<sub>3</sub> when R<sup>2</sup> is —OCOCH<sub>3</sub>, and (2) dicyclopentadiene; and 0.1 to 300 parts by weight of (c) a plasticizer and/or (d) a hydrocarbon solvent.

4,680,155

# METHOD OF PRODUCING SHAPED ARTICLES HAVING A SIMULATED MARBLE APPEARANCE

Malcolm P. Rochefort, Darwen, and Richard Wood, Blackburn, both of England, assignors to Imperial Chemical Industries PLC, London, England

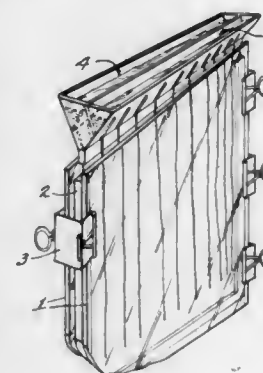
Filed Apr. 22, 1985, Ser. No. 725,812

Claims priority, application United Kingdom, May 9, 1984, 8411824

Int. Cl.<sup>4</sup> B29C 39/12

U.S. Cl. 264—73

9 Claims



1. A method of forming a shaped article having the appearance of simulated marble wherein polymerisable materials are polymerised within the cavity of a mould or cell characterized in that the mould is filled with a stream of a fluid polymerisable composition comprising at least two compositions of different colors wherein the at least two compositions are caused to flow into the mould or cell in contacting streams as a pattern of lines following the flow path of the compositions into the mould and the polymerisation process is conducted with the mould or cell disposed so that the flow lines are on a height gradient relative to each other, whereby limited mixing of the composition takes place by thermal convection currents during the polymerisation whilst the polymerisable compositions are sufficiently fluid.

4,680,156

# SHEATH CORE COMPOSITE EXTRUSION AND A METHOD OF MAKING IT BY MELT TRANSFORMATION COEXTRUSION

John R. Collier, Athens, Ohio, assignor to Ohio University, Athens, Ohio

Filed Oct. 11, 1985, Ser. No. 786,441

Int. Cl.<sup>4</sup> B29C 47/86

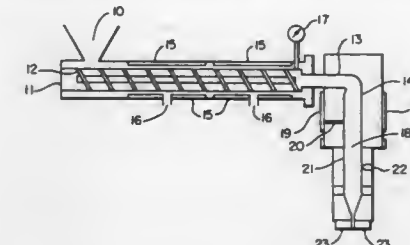
U.S. Cl. 264—171

5 Claims

1. A method of making a composite extrusion having an inner core and an outer sheath which comprises causing said inner core-forming material to assume a molecular orientation coaxial to the longitudinal axis of said core while said core-forming material is in a molten state and in a confined space, surrounding said core-forming material with a liquid sheath-forming material while in said confined space, withdrawing said molecularly-oriented core-forming mate-

(I)

rial while surrounded by said sheath-forming material from said confined space through a reducing die having a temperature gradient between said confined space and the exit from said die of an amount such that crystallization of



at least the outer skin of said formed core will occur prior to said extrusion leaving said die but such that said sheath-forming material will not crystallize until said extrusion exits said die.

4,680,157

# METHOD FOR THE PREPARATION OF A CRYSTALLINE THERMOPLASTIC RESIN SHEET

Atsushi Fujii, Kisarazu; Kazuhisa Kaneda, and Yoshihiro Tokiya, both of Ichihara, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 757,076

Claims priority, application Japan, Jul. 25, 1984, 59-153206; Jul. 27, 1984, 59-155520

Int. Cl.<sup>4</sup> B29C 47/88

U.S. Cl. 264—180

8 Claims

1. A method for the preparation of a crystalline polypropylene-based resin sheet having excellent transparency which comprises:

- extruding a molten crystalline thermoplastic resin into a sheet;
- quenching the extruded resin sheet by passing said resin sheet through a slit where cooling water is flowing in contact with said resin sheet and in the same direction thereby quenching said resin sheet, said cooling water flowing through said slit at a higher velocity than the velocity of said resin sheet through said slit to provide a quenched resin sheet; and
- heating said quenched resin sheet at a temperature from 10° to 60° below the melting point of said resin to heat treat said quenched resin sheet;
- stretching said quenched and heat treated resin sheet at a temperature of from 5° to 70° lower than the melting point of the resin, the stretch ratio being from 1.02 to 1.2 times.

4,680,158

# CIRCULAR PELLETIZING MACHINE AND METHOD OF CONTROLLING THE SAME

Jürgen Hinzpeter, and Ingo Schmidt, both of Schwarzenbek, Fed. Rep. of Germany, assignors to Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 870,313

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520203

Int. Cl.<sup>4</sup> B29B 9/00

U.S. Cl. 264—40.5

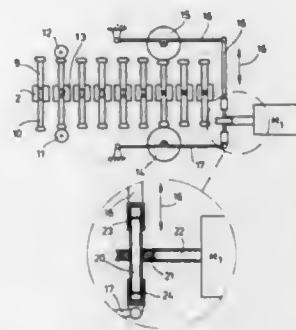
7 Claims

1. A circular pelletizing machine for compressing of powder or grain materials, comprising a rotatable matrix disc with a plurality of circumferentially distributed matrices; upper and lower punches located above and below said matrix disc respectively; at least two pre-pressing elements movable relative to one another and acting upon said upper and lower stamps so as to pre-press pellets of a material; at least two main pressing elements movable relative to one another and acting upon said



upper and lower stamps so as to finally press the pellets of the material; an adjusting motor arranged to adjust a distance between said main pressing elements relative to one another; computer means arranged to control said adjusting motor; and means for measuring a pressing force of said pre-pressing elements and supplying data of the measurement to said computer means so that said computer means controls said adjusting motor and therefore the distance between said main pressing elements in dependence upon the measured pressing force of said pre-pressing elements to avoid application of a pressing force by the main pressing elements above a predetermined limit.

4. A method of controlling a circular pelletizing machine in



which the material to be pressed is accommodated in matrices of a matrix disc, pre-pressed by upper and lower stamps under the action of pre-pressing elements, and then finally pressed by the upper and lower stamps under the action of main pressing elements, the method comprising the steps of adjusting a distance between the main pressing elements by an adjusting motor which is controlled by computer means; measuring a pressing force on the pre-pressing elements; and supplying data of the measurement to the computer means so that the computer means control the adjusting motor and thereby the distance between the main pressing elements in dependence upon the measured pressing force of the pre-pressing elements to avoid application of a pressing force by the main pressing elements above a predetermined limit.

4,680,159

**STORAGE CONTAINER ASSEMBLY FOR ACCOMMODATING INDIVIDUAL FUEL RODS OF IRRADIATED NUCLEAR REACTOR FUEL ELEMENTS**  
Helfrid Lehr, Karlsdorf, and Bernd Pontani, Alzenau, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 767,182  
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430243

Int. Cl. G21F 5/00

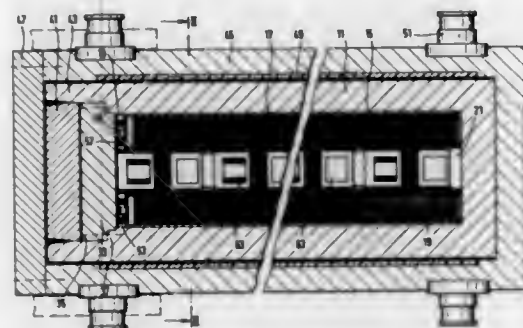
U.S. Cl. 376-272

8 Claims

1. A nuclear waste storage container assembly for storing radioactively-contaminated structural pieces and fuel rods of disassembled irradiated nuclear reactor fuel elements, the fuel rods giving off decay heat and the structural pieces giving off a decay heat less than the fuel rods, the storage container assembly comprising:

- a vessel defining a longitudinal axis and having a base wall and a cylindrical side wall extending upwardly from said base wall to conjointly define a storage space of circular cross section extending in the direction of said axis, said vessel further having an opening at one longitudinal end thereof communicating with said storage space;
- a plurality of elongated cans for storing said fuel rods therein, each of said cans having a circular-segmented cross section with one curved wall defining a curved wall

surface having a radius of curvature corresponding to the radius of curvature of said cylindrical side wall; holding means for holding said plurality of cans and including structure defining a shaft-like enclosure extending in the direction of said axis for storing said structural pieces; said holding means being adapted for insertion into said storage space so as to cause said cans to be disposed radially of and in surrounding relationship to said axis; said holding means being configured to hold said cans in a circle-like arrangement one adjacent the other with the respective curved wall surfaces of all of said cans being in flush direct contact engagement with the cylindrical inner wall surface of said side wall so as to permit the direct



transfer of said decay heat from all of said cans through said curved wall surfaces thereof directly to said vessel; each of said cans having respective mutually adjacent radial walls extending from said curved wall thereof which are limited in radial direction so as to permit said cans to be accommodated in said holding means in surrounding relationship to said enclosure; cover means for closing off said opening of said vessel; and, hold-down resilient means for holding said cans in position within said storage space and against the inner wall surface of said base wall so as to permit the transfer of further amounts of said decay heat from all of said cans directly to said vessel.

4,680,160

**METHOD OF FORMING A ROTOR**

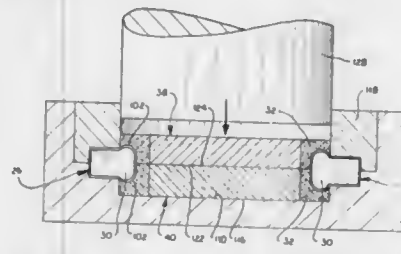
Randolph C. Helmink, Indianapolis, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 11, 1985, Ser. No. 807,943

Int. Cl. B22F 7/00

U.S. Cl. 419-6

16 Claims



1. A method of forming a rotor having a circular hub with a plurality of blades projecting from the hub, said method comprising the steps of forming a plurality of hub sections, said step of forming a plurality of hub sections including hot isostatically pressing powdered metal to at least partially form the hub sections, plastically deforming the hub sections by applying force against the hub sections while the hub sections are at a temperature below the gamma-prime solvus temperature of the powdered metal which was hot isostatically pressed in forming the hub sections, thereafter, placing end portions of a plurality

of blades between a pair of hub sections, and bonding the pair of hub sections together with the blades projecting from the hub sections.

4,680,161

**METHOD OF PRODUCING SLIDING COMPOSITE MATERIAL**

Takashi Muto, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Filed Aug. 13, 1986, Ser. No. 896,018

Claims priority, application Japan, Sep. 2, 1985, 60-193384  
Int. Cl. B22F 5/00

U.S. Cl. 419-3

5 Claims



1. A method of producing a composite sliding material provided with a metal strip, an adhesive layer bonded to the metal strip and surface layer bonded to the adhesive layer, comprising the steps of:

- preparing the metal strip, a powder for the adhesive layer which powder contains no solid lubricant, and another powder for the surface layer which powder contains a solid lubricant;
- disposing the powder for the adhesive layer onto the metal strip;
- sintering the powder for the adhesive layer so that the adhesive layer bonded to the metal strip is formed;
- disposing said another powder for the surface layer onto the sintered adhesive layer;
- sintering said another powder disposed on the adhesive layer so that the surface layer bonded to the adhesive layer is formed; and
- subjecting to a rolling operation the sintered surface layer and the adhesive layer bonded to the metal strip.

4,680,162

**METHOD FOR PREPARING AG-SNO SYSTEM ALLOY ELECTRICAL CONTACT MATERIAL**

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Japan

Continuation-in-part of Ser. No. 680,667, Dec. 11, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,430

Int. Cl. C21D 1/00

U.S. Cl. 419-21

2 Claims

1. A method of making electrical contact materials, comprising mixing powders of Sn, SnO and Ag in the weight percentages of 0.5-10% Sn, 0.5-15% SnO and the balance being Ag when the weight % of Sn is less than 4.5, said balance being Ag and at least one of In in the range of 0.1-5 weight % and Bi in the range of 0.01-5 weight %, when the weight % of Sn is greater than 4.5, forming said mixture into a powdered-metallurgically prepared alloy compact, and treating said alloy compact to effect complete internal oxidizing thereof.

4,680,163

**PROCESS AND APPARATUS FOR STERILIZING CONTAINERS**

Benno Blidschun, Herford, and Ernst G. Lierke, Schwalbach, both of Fed. Rep. of Germany, assignors to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany

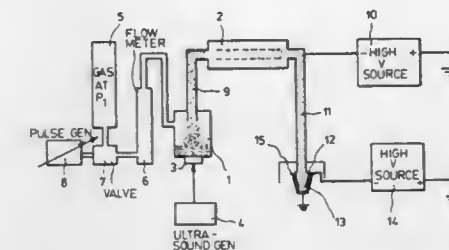
Filed Apr. 9, 1985, Ser. No. 721,311

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414268; Nov. 2, 1984, 3440014

Int. Cl. A61L 2/18, 2/26

U.S. Cl. 422-28

31 Claims



1. A process for sterilizing containers comprising the steps of:

- agitating a liquid sterilizing agent at an ultrasonic frequency to cause atomization thereof whereby droplets are formed in a first zone;
- entraining the atomized sterilizing agent in a carrier gas stream;
- imparting an electrical charge to the droplets of atomized sterilizing agent;
- depositing the charged droplets of atomized sterilizing agent on a surface of a container to be sterilized under the influence of an electrostatic field by positioning the container to be sterilized within a cavity defined by a first electrode, positioning a second electrode at least partly within the container to be sterilized, and establishing the electrostatic field in a second zone distinct from said first zone, said second zone being located between the first and second electrodes.

4,680,164

**CENTRIFUGAL ANALYZER**

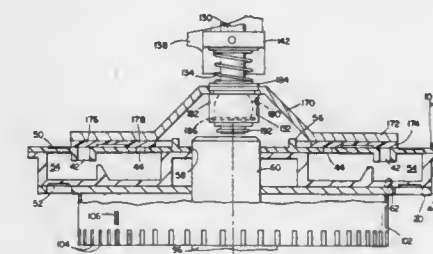
Norman G. Kelln, Spokane, Wash., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Jul. 18, 1985, Ser. No. 756,860

Int. Cl. G01N 21/07

U.S. Cl. 422-72

14 Claims



1. A centrifugal analyzer system that employs a centrifugal analyzer rotor in the concurrent analyses of a plurality of fluid samples, each centrifugal analyzer rotor having a body portion that has a top surface and that defines a circumferential array of elongated cuvettes, and each cuvette having a loading port, comprising an analysis compartment, loading and analysis stations spaced from one another in said analysis compartment,

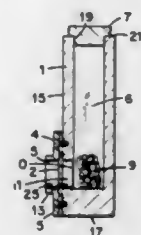
means at each of said loading and analysis stations for receiving a centrifugal analyzer rotor,  
drive means at said analysis station for spinning a rotor at at least one thousand rpm for mixing sample and reagent materials in cuvettes of a rotor and for maintaining rotation of a rotor at a slower rotational speed during an analysis interval for the concurrent analyses of a plurality of fluid samples, said drive means having a rotation axis, hold-down structure at said analysis station, said hold-down structure including  
a support aligned with the rotation axis of said drive means, an annular hold-down member secured to said support for free rotation relative to said support about said rotation axis of said drive means, for  
accommodation means coupled between said support and said hold-down member for seating said hold-down member in engagement with a top surface of a rotor on said rotor receiving means at said analysis station, said accommodation means including a self-aligning bearing assembly,  
guide structure for said support to maintain said support in alignment with the axis of said drive, and  
means operative to move said hold-down member along the rotation axis of said drive means between a seating position in engagement with a rotor and a second position spaced from a rotor on said rotor receiving means at said analysis station to permit a rotor to be removed from said drive means.

4,680,165

**DOSIMETER FOR MONITORING VAPORS AND AEROSOLS OF ORGANIC COMPOUNDS**  
Tuan Vo-Dinh, 625 Gulfwood Rd., Knoxville, Tenn. 37923  
Filed Mar. 19, 1982, Ser. No. 359,791  
Int. Cl.<sup>4</sup> G01N 31/00

U.S. Cl. 422—88

2 Claims

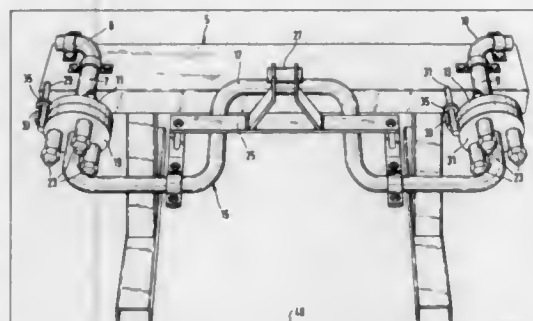


1. A dosimeter for in situ collection and direct detection of vapors and aerosols of polynuclear aromatic compounds by room temperature phosphorimetry comprising a base, a diffusion chamber secured to and extending outwardly from said base to define an open outer end of said chamber and an inner end of said chamber adjacent to said base, said base defining a bore terminating in register with said diffusion chamber and said bore containing a sorbent material and a grid whereby said sorbent material is maintained in spaced relation with filter paper which contains a heavy atom compound to collect said vapors and aerosols of polynuclear aromatic compounds by absorption, said filter paper having an exterior surface and being secured to said base adjacent to said inner end of said diffusion chamber with said exterior surface of said filter paper having exposure to said diffusion chamber, whereby, said heavy atom compound on said filter paper increases the absorptivity of said filter paper for said vapors and aerosols of polynuclear aromatic compounds during collection and enhances phosphorescence emission of said collected polynuclear aromatic compounds on said filter paper during detection, the dosimeter further comprising a solvent supplied to said sorbent material for improving the absorptivity of said filter paper containing a heavy atom compound.

4,680,166  
**ARRANGEMENT FOR CENTERING AND MANIPULATING CONDUITS IN A LARGE-AREA CELL FOR REPROCESSING IRRADIATED NUCLEAR FUEL**  
Jürgen Forster, Minden, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany  
Filed Aug. 26, 1985, Ser. No. 769,585  
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431325  
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.  
Int. Cl.<sup>4</sup> G21C 19/44

U.S. Cl. 422—159

4 Claims



1. In a large-area cell containing equipment for reprocessing irradiated nuclear fuels, the equipment having a stationary conduit with an end flange connectable to a removable conduit unit also having an end flange, said end flanges having respective rotational axes and conjointly defining an interface when disposed one next to the other, the large-area cell being equipped with remote handling apparatus for moving the removable flanged conduit unit relative to the stationary conduit, a centering and manipulating arrangement for facilitating the remotely manipulated connection of the end flange of the removable flanged conduit unit to the end flange of the stationary conduit, the arrangement comprising:  
an upwardly open guide cradle attached to the peripheral edge of one of said end flanges, said cradle being mounted laterally on said one end flange and parallel to the rotational axis of said one end flange;  
said guide cradle including a catch ring disposed thereon at a predetermined location rearward of the interface of the end flanges; and,  
a guide pin fixedly mounted on the other one of said end flanges so as to be received in said guide cradle so as to extend through said catch ring when said end flanges are connected to each other.

4,680,167

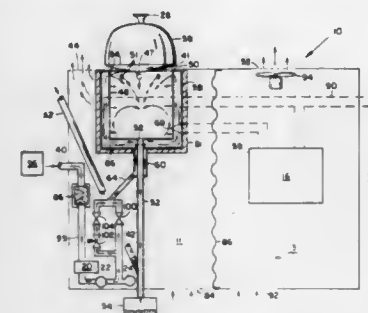
**CONTROLLED ATMOSPHERE OVEN**  
Thomas W. Orlando, San Antonio, Tex., assignor to Alcor, Inc., San Antonio, Tex.  
Division of Ser. No. 465,109, Feb. 9, 1983, Pat. No. 4,568,426.  
This application Jan. 29, 1986, Ser. No. 823,637  
Int. Cl.<sup>4</sup> B01D 3/42; F27B 5/00; G01N 31/12

U.S. Cl. 422—199

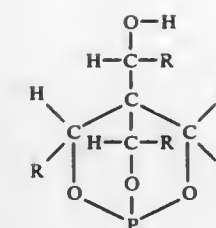
5 Claims

1. An oven for heating a material in a preselected gas atmosphere, comprising:  
a first chamber normally having a first gas therein, said first chamber having an opening for receiving said material therethrough and being adapted to receive said material therein;  
means for sealing said opening in said first chamber after said material is received therethrough;  
a second chamber surrounding said first chamber, said second chamber being adapted to receive said preselected gas therein and said first chamber having at least one gas inlet

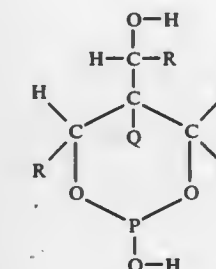
port therethrough to permit said preselected gas to flow from said second chamber into said first chamber;  
heating means located within said second chamber for heating said first chamber, thereby to heat said material therein;  
means for introducing said preselected gas to said second chamber to thereby displace said first gas from said first chamber, said first chamber having a gas outlet port there-through to permit said first gas to flow outward therefrom during said displacement thereof by said preselected gas; and  
first gas receiving means connected to said first chamber for receiving said first gas during said displacement thereof by said preselected gas, said gas outlet port permitting communication between said first chamber and said first gas



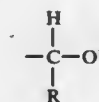
receiving means, wherein said second chamber comprises an outer chamber and an ante chamber in communication therewith, and the structure being such that said preselected gas is introduced to said ante chamber and said ante chamber surrounds said first gas receiving means, said preselected gas within said ante chamber causing said first gas to condense within said first gas receiving means;  
said means for introducing a preselected gas to said second chamber including a plurality of gas conveying conduits which merge into one conduit feeding said preselected gas into said second chamber, with means for controlling the gas flow through said conduits to increase the flow rate of said preselected gas to said second chamber when purging said first chamber and when cooling said oven and to decrease the flow rate during heating of said material.



wherein each R individually represents a hydrogen atom or an alkyl group having not more than three carbon atoms, or of the formula



wherein Q represents a hydrogen atom or an alkyl group having not more than three carbon atoms or a group of the formula



and R, in each occurrence, represents a hydrogen atom or an alkyl group having not more than three carbon atoms, to obtain an aqueous extract phase containing at least a portion of said metals and an organic raffinate phase from which said metals have at least in part been extracted, and (b) phase separating the aqueous extract phase from the organic raffinate phase.

4,680,168

**EXTRACTION OF GROUP 8 METALS FROM ORGANIC SOLUTIONS**

Brian L. Goodall, and Paulus A. M. Grothhuis, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 10, 1986, Ser. No. 872,569

Claims priority, application United Kingdom, Jun. 20, 1985, 8515656

Int. Cl.<sup>4</sup> C01G 55/00

U.S. Cl. 423—22

20 Claims

1. A process for the extraction of one or more metals of Group 8 of the Periodic Table of the Elements from an organic medium, which comprises (a) contacting the organic medium with an aqueous phase in the presence of a cyclic phosphite of the formula

4,680,169

**REMOVAL OF AMMONIUM ION FROM ACIDIC LIQUORS**

Thomas R. Morgan, Jordan, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 30, 1985, Ser. No. 814,831

Int. Cl.<sup>4</sup> C01B 21/00

U.S. Cl. 423—53

4 Claims

1. A process for reducing ammonium ion concentration in an ammonium ion-containing, acidic liquor comprising sodium dichromate and having a pH of 2.5–4.5, said process comprising oxidatively converting ammonium ion in said acidic liquor, to nitrogen with a reagent consisting essentially of a persulfate at a temperature above ambient.



4,680,170

## SYNTHESIS OF ZEOLITIC MATERIALS USING ION-EXCHANGE RESIN

Barrie M. Lowe, Edinburgh, Scotland, and Stuart G. Fegan, Pretoria, South Africa, assignors to Imperial Chemical Industries PLC, England

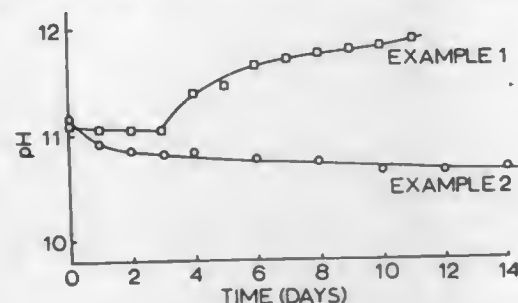
Filed Apr. 10, 1985, Ser. No. 721,605

Claims priority, application United Kingdom, Apr. 10, 1984, 8409285

Int. Cl.<sup>4</sup> C01B 33/28

U.S. Cl. 423-329

11 Claims



1. A method for the preparation of a crystalline zeolite material which comprises reacting an aqueous mixture comprising at least one source of silica and an ion exchange resin, and crystallizing the resulting zeolite material at a temperature no greater than the decomposition temperature of the ion exchange resin, said ion exchange resin maintaining the pH of the reaction mixture at a relatively constant level.

4,680,171

## VISUALIZATION OF A BLOODSTREAM CIRCULATION WITH BIODEGRADABLE MICROSPHERES

William Shell, 956 Chantilly Rd., Los Angeles, Calif. 90077

Filed Mar. 15, 1985, Ser. No. 712,032

Int. Cl.<sup>4</sup> A61K 49/04

U.S. Cl. 424-5

3 Claims

1. A method of visualizing an arterial circulation in the bloodstream of a subject comprising the steps of:

- selecting a quantity of microspheres bearing an x-ray absorbent material which will enable generation of an x-ray image and for a desired duration when injected into the bloodstream of a subject;
- injecting biodegradable x-ray absorbent microspheres into the bloodstream of the subject at a point in the subject's circulatory system such that said microspheres are carried in the bloodstream to an arterial circulation area sought to be visualized and which remain in the circulatory system for a time sufficient to be subjected to X-ray imaging;
- subjecting said arterial circulation area to X-rays to form an X-ray image of said arterial circulation area and causing the microspheres to absorb the X-rays to render them X-ray opaque for contrast against surrounding or adjacent tissue;
- examining said X-ray image for the presence of white areas on an X-ray film to represent the presence of said microspheres, which will enable visualization of said arterial circulation by means of the absorption of X-rays by said microspheres; and
- thereafter permitting the microspheres to become degraded in the body after a period of time for visualization which is sufficient to enable X-ray imaging but which is not sufficiently long to create damage to the tissue in which the visualization of the arterial circulation is taking place.

4,680,172

## DEVICES AND METHODS FOR TREATING MEMORY IMPAIRMENT

Lewis J. Leeson, Roseland, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 5, 1985, Ser. No. 708,466

Int. Cl.<sup>4</sup> A61F 7/02

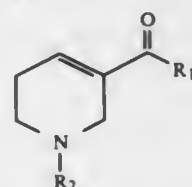
U.S. Cl. 424-449

11 Claims

1. A device for the transdermal administration of a drug for the treatment of memory impairment comprising

- a drug impermeable backing layer;
- a drug permeable rate controlling membrane sealed to one side of said backing layer as to define at least one drug reservoir compartment therebetween;
- an adhesive layer;
- a drug or composition thereof within said hollow drug reservoir;

said drug comprising a memory improving effective amount of a compound having the formula



wherein R<sub>1</sub> is OH, lower alkoxy, or NR<sub>3</sub>R<sub>4</sub>; and each of R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> is independently H or lower alkyl; said composition comprising said drug and at least one pharmaceutically acceptable adjunct; whereby said drug is delivered in a controlled, continuous manner to a patient to which said device has been applied.

4,680,173

## AEROSOL DISPENSING SYSTEM

Norman D. Burger, 11621 Segrell Way, Culver City, Calif. 90230, assignor to Norman D. Burger, Los Angeles and Nicholas A. Mardesich, Palos Verdes Estates, both of Calif., a part interest

Continuation-in-part of Ser. No. 193,350, Oct. 2, 1980, which is a continuation of Ser. No. 789,639, Apr. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 727,799, Oct. 1, 1976, abandoned. This application Apr. 9, 1981, Ser. No. 252,306

Int. Cl.<sup>4</sup> A61K 7/38, 9/12

U.S. Cl. 424-47

14 Claims

1. In an aerosol system for dispensing an antiperspirant where the system includes a metal container having a valve-controlled spray, a valve for dispensing the contents thereof, and a dip tube extending from said valve to said container contents, a propellant for said system, and wherein said contents includes an anti-perspirant material such as the astringent salts of multi-valent cations, divalent astringent salts, trivalent astringent salts, tetravalent astringent salts and aluminum astringent salts, wherein said anti-perspirant material if dissolved in water forms a material corrosive with respect to the exposed metal of said container, the improvement comprising:

- a super-hydrophobic powdered fumed silica having a particle size of between 0.007 microns and 15 nm, a surface area of from 120 m<sup>2</sup>/g to 225 m<sup>2</sup>/g as measured by the nitrogen adsorption, B.E.T., a bulk density of from 3 to 10 lbs./ft<sup>3</sup>,
- said super-hydrophobic silica being present in an amount of up to about 5.5% by weight of the container contents, water in an amount sufficient to increase the effectiveness of said anti-perspirant material, and
- said super-hydrophobic fumed silica encapsulating at least said water to form a multiplicity of encapsulated drops whose outer surface is the fumed silica and whose contents include at least said water, thereby to prevent contact between said water and any exposed metal of said metal container.

4,680,174

## INDUCTION OF IMMUNE RESPONSE BY IMMUNIZATION WITH ENCAPSULATED ANTIGEN-PRODUCING CELLS

Allan P. Jarvis, Jr., Newburyport; George A. Koch, Medfield, both of Mass., and Paul G. Abrams, Washington, D.C., assignors to Damon Biotech, Inc., Needham Heights, Mass.

Filed May 24, 1984, Ser. No. 613,803

Int. Cl.<sup>4</sup> A61K 39/395; C12N 15/00; C12P 21/00

U.S. Cl. 424-85

30 Claims

1. A process for inducing an immune response in an animal body, said process comprising the steps of:

- providing a living cell which secretes an antigen capable of inducing an immune response in said animal body;
- encapsulating said cell within a membrane comprising pores and defining an intracapsular volume with which said cell is suspended;
- controlling the dimensions of the pores to permit passage therethrough of said antigen but to preclude passage therethrough of said cell;
- implanting said encapsulated cell in said animal body;
- permitting said secreted antigen to traverse said membrane within said animal body to induce an immune response; and
- harvesting an antibody complementary to said antigen from the circulatory system of said animal body.

4,680,175

## INTERFERON ADMINISTRATION VEHICLES

Leonard F. Estis, North Brunswick; Sean A. Evans, High Bridge, and Douglas Testa, Neshanic Sta., all of N.J., assignors to Interferon Sciences, Inc., New York, N.Y.

Filed Feb. 7, 1984, Ser. No. 577,911

Int. Cl.<sup>4</sup> A61K 45/02, 31/745

U.S. Cl. 424-85

11 Claims

1. An interferon preparation to be administered topically to a patient suffering from a disease which responds therapeutically to interferon comprising:

- one or more interferons, the amount of the one or more interferons being sufficient to therapeutically affect the disease from which the patient is suffering;
- a vehicle base compatible with the interferon or interferons being administered; and
- an effective amount of one or more protease inhibitors for the purpose of reducing the rate of decay of the biological activity of the interferon or interferons due to proteolytic agents.

4,680,176

## DELETION MUTANT OF A HERPESVIRUS AND VACCINE CONTAINING SAID VIRUS

Antonius J. M. Berns, Grave, and Arnold L. J. Gielkens, Lelystad, both of Netherlands, assignors to Centraal Diergeneeskundig Instituut, Lelystad, Netherlands

Filed Oct. 12, 1984, Ser. No. 660,097

Claims priority, application Netherlands, Oct. 12, 1983, 8303501

Int. Cl.<sup>4</sup> A61K 39/12; C12N 15/00, 7/04

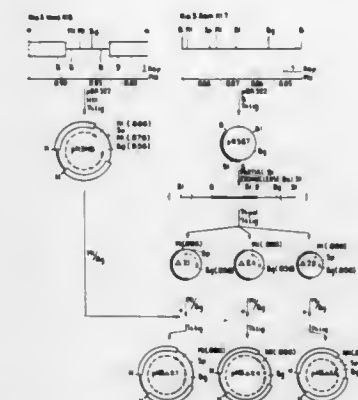
U.S. Cl. 424-89

8 Claims

1. A live deletion mutant of a pseudorabies virus derived from a parental strain having a parental genome of about 160,000 nucleotide pairs, said parental genome comprising

- two inverted repeats, each of which contains cleavage sites for the restriction endonucleases BamHI and KpnI, BamHI digestion of the parental genome yielding two pairs of restriction fragments derived entirely from the sequence of the inverted repeats, the larger fragment of each pair being designated as BamHI fragments 5; and
- KpnI digestion of the genome yielding two fragments, designated KpnI fragment E and kpnI fragment H, each of said KpnI fragments containing the distal end of one of the inverted repeats;
- a unique sequence located between the inverted repeats,

said unique sequence comprising a BamHI restriction fragment of about 7 kilobase pairs in length designated BamHI fragment 7, said BamHI fragment 7 containing a cleavage site for the restriction endonuclease SalI, wherein cleavage at the SalI site produces two unequal fragments from BamHI fragment 7, one fragment of about five kilobase pairs in length and the other of about two kilobase pairs in length; and



- a gene for thymidine kinase, said deletion mutant being characterized by one or more deletions, said deletions being located in
  - a portion of an inverted repeat which is common to BamHI fragment 5 and either KpnI fragment E or KpnI fragment H;
  - the about five kilobase pair SalI fragment of BamHI fragment 7, or
  - both.

4,680,177

## PROCESSES FOR THE PRODUCTION OF BLOOD PRODUCTS

Charles R. W. Gray, Forest Row, and Neville Crawford, St. Albans, both of England, assignors to Trustees of the Garfield Weston Trust for Research into Heart Surgery; The Royal College of Surgeons of England and British Postgraduate Medical Federation, all of London, England

PCT No. PCT/GB83/00127, § 371 Date Jan. 3, 1984, § 102(e) Date Jan. 3, 1984, PCT Pub. No. WO83/03830, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 28, 1983, Ser. No. 579,905

Claims priority, application United Kingdom, Apr. 28, 1982, 8212306

Int. Cl.<sup>4</sup> A61K 35/14, 35/16, 35/18, 35/28

U.S. Cl. 424-101

14 Claims

1. A process for the production of products for clinical use chosen from blood proteins, blood cells, plasma proteins, plasma cells, bone marrow proteins, or bone marrow cells comprising

- treating freshly shed blood or fresh bone marrow with an anticoagulant comprising a neutral salt which does not bind calcium ions,
- thereafter deriving said products for clinical use from the treated blood or marrow, and then reducing the toxicity of said products by removal of the ions of the salt below their toxic levels.

4,680,178

## ANTITUMOR AGENT COMPRISING FR-900216

Sumio Kiyoto, Ikeda; Masakuni Okuhara, Sakura; Eiko Kino, Tsuchiura; Hirokazu Tanaka, Sakura; Hatsuo Aoki, Ikeda; Masanobu Kohsaka, Sakai, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 16, 1984, Ser. No. 631,244

Claims priority, application Japan, Jul. 21, 1983, 58-133506; Mar. 2, 1984, 59-40748

Int. Cl.<sup>4</sup> A61K 35/70, 35/72, 31/42

U.S. Cl. 424—122

2 Claims

2. A method of treating lymphocytic leukemia, melanoma or mammary carcinoma in a subject in need of such treatment comprising administering to said subject an effective amount of a pharmaceutical composition comprising an effective amount of FR-900216 substance having the following physical and chemical properties:

- (1) Molecular weight: 625 (Mass spectrum)
- (2) Molecular formula:  $C_{35}H_{47}NO_9$
- (3) Melting point: 130°–135° C. (dec.)
- (4) Specific rotation:  $[\alpha]_D^{20} = +140^\circ$  C. (c = 1, CHCl<sub>3</sub>)
- (5) Ultraviolet absorption spectrum:

$$\lambda_{CH_3OH}^{max} = 232 \text{ nm } (\epsilon = 11,300)$$

$$= 238 \text{ nm (sh.)}$$

$$= 285 \text{ nm (sh.)}$$

$$= 296 \text{ nm } (\epsilon = 55500)$$

$$= 308 \text{ nm } (\epsilon = 70300)$$

$$= 324 \text{ nm } (\epsilon = 51900)$$

(6) Infrared absorption spectrum:

$\nu_{max}^{KBr}$ : 3450, 3140, 2960, 2920, 1730, 1715 (sh.), 1607, 1575, 1455, 1445, 1435, 1377, 1360, 1343, 1305, 1280 (sh.), 980, 970, 950, 930, 915, 905, 895, 875, 860, 850, 835, 825, 790, 780, 755, 705, 670, 635,  $cm^{-1}$

(7) <sup>1</sup>H Nuclear magnetic resonance spectrum (CDCl<sub>3</sub>, inner standard: tetramethylsilane):

as shown in FIGURE of the accompanying drawing.

(8) <sup>13</sup>C Nuclear magnetic resonance spectrum (CDCl<sub>3</sub>, inner standard: tetramethylsilane):

$\delta$  (ppm): 9.65, 11.41, 11.71, 13.77, 14.32, 19.93, 22.57, 29.24, 31.49, 31.85, 34.16, 35.86, 36.40, 37.98, 45.32, 54.18, 56.12, 63.77, 65.10, 76.81, 82.33, 89.25, 120.80, 123.77, 126.44, 129.29, 135.97, 136.21, 136.57, 137.67, 138.51, 139.54, 160.84, 168.01, 169.34

(9) Solubility:

Freely soluble: methanol, ethanol, acetone, ethyl acetate

Soluble: chloroform, benzene

Slightly soluble: hexane, diethyl ether

Insoluble: water

(10) Color reaction:

Positive: Dragendorff's reaction, iodine reaction

Negative: Ferric chloride reaction, Molisch's reaction, Ninhydrin reaction, Ehrlich's reaction

(11) Nature:

Weakly basic substance or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,680,179

## COCONUT FRUIT(S) FLAVORED BRANDY

Leonida L. M. Lidman, 12 Irwin Pl., Hazlet, N.J. 07730

Filed Jul. 20, 1984, Ser. No. 633,058

Int. Cl.<sup>4</sup> C12G 1/00

U.S. Cl. 426—15

8 Claims

1. In the process of producing coconut brandy, according to the steps of (1) utilizing boiled spring water and finely ground sulphur to thin out the sap of unopened coconut inflorescence, (2) boiling the resulting sap mixture while stirring same, (3) trapping the vapor produced through said boiling and (4) condensing said vapor in a sealed container to produce the brandy product, wherein the improvement comprises at least one of:

- (a) substituting calamansi juice and jackfruit meat for said finely ground sulphur so as to improve the clarity of the coconut brandy produced; and
- (b) substituting the juice from 5–18 day old coconut for said boiled spring water so as to improve the consistency of the coconut brandy produced.

4,680,180

## LOW ALCOHOL BEER PREPARED WITH HYDROGENATED STARCH HYDROLYZATE

Guy Bussiere, La Gorgue; Marius Zimmermann, Hazebrouck, and Michel Huchette, Merville, all of France, assignors to Roquette Freres, Lestrem, France

Filed May 9, 1984, Ser. No. 608,445

Claims priority, application France, May 11, 1983, 83 07922

Int. Cl.<sup>4</sup> C12C 11/04, 9/00

U.S. Cl. 426—16

8 Claims

1. In a process for manufacturing a low alcohol-content beer comprising the successive steps of mashing consisting in heating a mixture of malt and water, filtering of the resulting product obtained by mashing to provide draff and a wort, washing of the draff, diluting of the wort, sterilizing of the wort by boiling in the presence of hops, cooling and filtering of the wort, seeding of the wort with yeast, fermenting of the yeast-containing wort to produce beer, the improvement comprising replacing, before the sterilization of the wort by boiling in the presence of hops, a proportion of the malt by an equivalent amount of a hydrogenated starch hydrolysate whose composition on dry matter is as follows: content of substances of DP 1 (degree of polymerisation) between 0.1 and 35%, content of substances of DP 2 between 0.1 and 45%, content of products of DP > 20 less than 45%, the remainder of content being up to 100% with substances of DP 3 to 20, the amount of hydrogenated starch hydrolysate being selected such that the final beer is provided with 0.1 to 2% by weight of the said hydrogenated hydrolysate.

4,680,181

## CHEESE PRODUCT AND METHOD OF MANUFACTURE

Michael Leavitt, Hamilton, and David S. Huls, Corvallis, both of Mont., assignors to Hamilton House Marketing, Inc., Missoula, Mont.

Continuation of Ser. No. 575,821, Feb. 1, 1984, abandoned. This application Jan. 3, 1986, Ser. No. 816,682

Int. Cl.<sup>4</sup> A23C 19/02

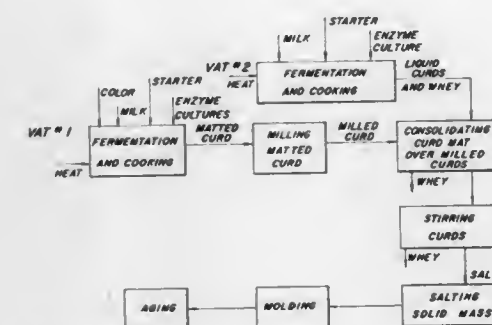
U.S. Cl. 426—36

13 Claims

1. A method for making a resultant cheese having discrete cheddared curd pieces within a matrix of stirred curds in which the resultant cheese does not have a tendency to separate along distinct boundaries that define zones, and has a flavor distinct from those of its component curds and the ability to age without the resulting deterioration of flavor and

consistency common to stirred curd cheese, comprising the following steps:

- (a) treating a first quantity of milk with a starter to ripen the milk;
- (b) treating the ripened first quantity of milk with a coagulating agent to form a first coagulated mass of a first curd and a first whey;
- (c) cutting the first coagulated mass to facilitate the separation of the whey from the curd;
- (d) heating and stirring the cut mass to further facilitate the separation of the whey from the curd;
- (e) removing the whey leaving a resultant curd;
- (f) cheddaring the resultant curd to elongate the resultant curd and reduce the moisture content and increase the acidity of the resultant curd to form firm, discrete cheddared curd pieces;
- (g) treating a second quantity of milk with a starter to ripen the milk;
- (h) treating the ripened second quantity of milk with a coagulating agent to form a second coagulated mass of a curd and a whey;



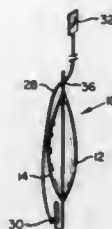


# 4,680,185 INFUSION PACKAGE

Barbara D. Ilk, 17658 NE Couch, Portland, Oreg. 97230  
Filed Feb. 6, 1986, Ser. No. 826,742  
Int. Cl.<sup>4</sup> A47G 19/16

U.S. Cl. 426—83

10 Claims



1. An infusion package comprising a first water pervious side panel and a second water pervious side panel, said side panels being joined together adjacent their edge margins to define an enclosure with one open side forming a mouth through which material may be added to the package, said side panels being flexible and capable of having portions thereof folded over toward one side of the package to close said mouth, an elongate flexible member secured adjacent one of its ends to the outer side of said first side panel in the region that is to be folded over, such that said member remains on the outside of said package when said portions of the panels are folded over, and means defining an aperture on said package adjacent the joined edge margins of said side panels in a region opposite said mouth but not extending into the interior of the package, said aperture being adapted to receive a portion of said flexible member therethrough when said flexible member is fed down from the folded portions and across said second side panel with remainder portions of said member remote from said secured one end extending beyond through and beyond said aperture in a direction away from said mouth, such that a user may hold said remainder portion of said flexible member to suspend said package in an inverted orientation with the folded over portions of the side panels at the bottom of the suspended package and maintained closed by said flexible member in said inverted position.

4,680,186

# PORTION CONTROLLED SLICED FRESH WHOLE MUSCLE MEAT PRODUCT

Roger C. Sheehy, Providence, R.I., and Irwin Muskat, Manchester, N.H., assignors to Granite State Packing Company, Inc., Manchester, N.H.

Continuation-in-part of Ser. No. 670,362, Nov. 9, 1984, Pat. No. 4,574,087. This application Dec. 17, 1985, Ser. No. 810,078. The portion of the term of this patent subsequent to Mar. 4, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> A23L 1/31

U.S. Cl. 426—129

8 Claims

1. A process of producing a series of portion-controlled packaged fresh boneless sliced whole muscle red-blooded meat product the slices of which are of substantially the same weight and size, comprising the following steps:

- (1) trimming a series of fresh, boneless red-blooded whole muscle meat pieces of a single cut but of varying weights, squaring each piece;
- (2) sorting and grouping the pieces so trimmed into at least three weight ranges, the pieces in each weight range having a length equal to the median length thereof,  $\pm 7\%$ , along the longitudinal axis of the muscle;
- (3) setting the blade spacing and number of blades of a single pass multi-blade slicer to suit said median length for one of said weight range groups of said pieces, as confined under pressure as specified in step 4, and produce slices there-

from of a pre-determined weight for each slice, including the two end slices;

- (4) passing said pieces of said one weight range group one at a time across the grain through said multi-blade slicer under confining pressure to reduce the unrestrained length of each piece by at least 7% but without distortion or buckling of the muscle, said confining pressure being effected by having each piece forcibly passed under the pressure of a ram through two confining end walls and under a confining top surface pressing the piece against a bottom surface on which the piece rests to give a rectangular confining passageway thereby cutting each piece into slices of said predetermined weight;
- (5) similarly setting the blade spacing and number of blades of a single pass multi-blade slicer to suit said median lengths for each of the other of the said weight range groups of pieces and produce slices therefrom of said pre-determined weight for each slice, and slicing each said weight range group as in step 4; and
- (6) packing said pieces so sliced for shipment; said pieces and the slices therefrom having not been crust chilled or frozen at any time during processing.

4,680,187

# PORTION CONTROLLED SLICED COOKED WHOLE MUSCLE MEAT PRODUCT

Roger C. Sheehy, Providence, R.I., and Irwin Muskat, Manchester, N.H., assignors to Granite State Packing Company, Inc., Manchester, N.H.

Continuation-in-part of Ser. No. 630,362, Nov. 9, 1984, Pat. No. 4,574,087. This application Dec. 17, 1985, Ser. No. 810,075. The portion of the term of this patent subsequent to Mar. 4, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> A23L 1/31

U.S. Cl. 426—129

12 Claims

1. A process of producing a series of portion controlled sliced cooked whole muscle boneless meat selected from the group consisting of roast prime rib, sirloin strip and pork loin, the slices of which are of a substantially uniform thickness, weight and plate coverage, comprising the following steps:
- (1) trimming a batch of at least 25 pieces of said whole muscle boneless meat;
  - (2) cooking the pieces to a pre-determined degree of doneness;
  - (3) removing said pieces from the cooking means and while said pieces so cooked are still hot:
  - (a) sorting and grouping each of said pieces into at least two weight ranges, A and B;
  - (b) compacting the pieces in each weight range group against the longitudinal axis of the muscle to a pre-determined length for each of said weight ranges;
  - (c) chilling each piece while so compacted;
  - (4) setting the blade spacing and number of blades of a first single pass multi-blade slicer to suit said pre-determined length for said weight range A group of said pieces as crimped as stated in step 5, and produce slices therefrom of a pre-determined weight for each slice including the two end slices;
  - (5) passing said pieces of said weight range A group while still chilled one at a time across the grain through said multi-blade slicer while maintaining the ends of a piece as it passes therethrough under a confining pressure to reduce the unrestrained length of each piece by at least 3% but without dislocation or buckling of the muscle thereby cutting each piece into slices of said predetermined weight including the two end slices;
  - (6) setting the blade spacing and number of blades of a second single pass multi-blade slicer to suit said pre-determined length for said weight range B group of pieces and product slices therefrom of said pre-determined weight for each slice including the two end slices;
  - (7) passing said pieces of said weight range B group one at a time sideways through said second single pass multi-blade

slicer while maintaining the ends of a piece as it passes therethrough under a confining pressure to reduce the unrestrained length of each piece by at least 3% but without dislocation or buckling of the muscle; and

- (8) vacuum packing said pieces so sliced for shipment, said slicing and all steps subsequent thereto being done in a manner to virtually exclude air from contacting the faces of facing slices.

4,680,188

# PROCESS FOR IMPROVING THE TECHNICAL EFFICIENCY AND PRESERVATION QUALITY OF CANNED MUSHROOMS

Claude Agulhon, Varrains, France, assignor to Royal Champignon, Saumur, France

Continuation of Ser. No. 505,013, Jun. 10, 1983, abandoned. This application Apr. 15, 1986, Ser. No. 852,392

Claims priority, application France, Jun. 11, 1982, 82 10373 Int. Cl.<sup>4</sup> A23L 1/212

U.S. Cl. 426—281

7 Claims

1. A process of canning mushrooms consisting essentially of steps (a) to (g) in the following order:
- (a) dressing the mushrooms and immersing the dressed mushrooms in an edible aqueous saline solution containing between about 15 g/l and 60 g/l of NaCl;
  - (b) subjecting the immersed mushrooms to a reduced absolute pressure of between about 12 mm and 15 mm Hg for a time effective to deaerate the mushrooms;
  - (c) increasing the pressure to about ambient pressure;
  - (d) allowing the mushrooms immersed in said edible aqueous saline solution to stand at a temperature and for a period of time effective to attain a net drained weight within about 5% or less of the net drained weight of the mushrooms prior to dressing;
  - (e) draining the mushrooms and placing the drained mushrooms in a can;
  - (f) juicing the mushrooms with water; and
  - (g) sealing the can; with the proviso that the mushrooms are not subjected to blanching.

4,680,189

# INGESTIBLE, HIGH DENSITY, COMPRESSED-TABLET FIBER-COMPOSITION

Robert W. Schumacher, Kenvil, and Mary B. Houston, Morristown, both of N.J., assignors to Warner-Lambert Company

Filed Jul. 7, 1986, Ser. No. 882,799

Int. Cl.<sup>4</sup> A23L 1/29

U.S. Cl. 426—285

22 Claims

1. A method for preparing an ingestible, high density, compressed-tablet fiber-composition which comprises:
- (A) blending at least one high fiber source and a microcrystalline cellulose compression aid to form a homogenous blend;
  - (B) mixing water with the blend of step (A) at a weight ratio of about 1.5:1 to about 2.5:1, based on the weight of water to the weight of the blend, for a time sufficient to form a cohesive, deformable, plastic mass;
  - (C) drying the plastic mass of step (B) to a moisture content of less than about 8% by weight, based on the weight of the dried material;
  - (D) milling the dried product of step (C) to recover granules having a particle size of about 125 to about 840 microns;
  - (E) blending the granules of step (D) with a tableting lubricant; and
  - (F) compressing the composition of step (E) into a tablet to form a high density, fiber tablet containing about 30% to about 95% dietary fiber, based on the total weight of the compressed-tablet fiber-composition.

4,680,190

# DATE PROCESSING METHOD

Albert Spiel, Yonkers, N.Y., and Henry C. Spanier, West Milford, N.J., assignors to Nabisco Brands, Parsippany, N.J. Continuation of Ser. No. 732,738, May 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 544,182, Oct. 21, 1983, Pat. No. 4,578,275. This application Aug. 19, 1986, Ser. No. 898,777

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> A23L 1/212

U.S. Cl. 426—302

6 Claims

1. Process for treating light colored, sucrose-type dates grown domestically to impart thereto the darker appearance, the flavor, the soft-chewy texture and the shelf-stability of imported invert sugar-type dates grown in the Middle East region, comprising:
- (a) steaming the domestic dates at a temperature and for a period of time which are sufficient to darken the domestic dates to substantially the same darkness as that of imported dates, said temperature being at least 175° F.; and
  - (b) drying the steamed domestic dates to provide shelf-stable, treated dates, the size and shape of said shelf-stable, treated domestic dates being substantially the same as the size and shape of said starting domestic dates,
- said shelf-stable, treated domestic dates not having been expanded from the original size of said starting domestic dates, before or during step (a) or between steps (a) and (b) or during step (b) and no composition containing at least one saccharide sugar sweetening agent contacting or being applied to said starting domestic dates before or during step (a) or between steps (a) and (b) or during step (b).

4,680,191

# CROSS-CUT EXTRUSION METHOD

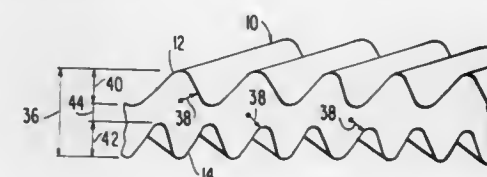
David L. Budd, Plano, and David P. Fowler, Irving, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Feb. 5, 1985, Ser. No. 698,250

Int. Cl.<sup>4</sup> A21D 8/00; A23P 1/12

U.S. Cl. 426—439

20 Claims



1. A method of making an extruded substantially planar snack food product having a variety of texture characteristics, the product having a plurality of parallel ridges and valleys on one face and a plurality of parallel ridges and valleys on an opposite face, the parallel ridges and valleys on the two faces extending at an angle relative to each other, the method comprising:
- (a) extruding edible material to form a moving imperforate tubular member of said edible material, the tubular member having non-intersecting parallel ridges and valleys on the inside and outside surfaces of the tubular member formed during extrusion and during movement of the extruded tubular member to thereby produce an extruded tubular member having parallel ridges and valleys extending in a substantially helical pattern on at least one surface of the tubular member with the parallel ridges and valleys on the inside and outside surfaces extending at an angle relative to each other; and
  - (b) forming the extruded member into a substantially planar snack food product having a variety of texture characteristics.





particles, and subsequently removing said film, said film having a small, substantially uniform thickness dimensions, a low index of refraction, and high transparency so as to exhibit a negligible optical effect during photoscreening operations.

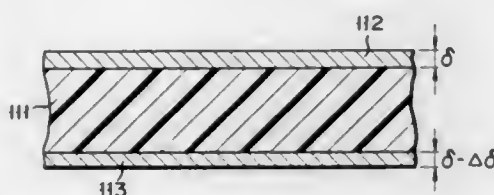
4,680,197

# METHOD OF MANUFACTURING PERPENDICULAR MAGNETIC RECORDING FLOPPY DISK

Masayuki Sagoi, and Reiji Nishikawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan. Continuation-in-part of Ser. No. 711,713, Mar. 14, 1985, abandoned, which is a division of Ser. No. 505,480, Jun. 17, 1983. This application Dec. 2, 1985, Ser. No. 803,337. Claims priority, application Japan, Jun. 25, 1982, 57-109528. Int. Cl.<sup>4</sup> B05D 5/12

U.S. Cl. 427-129

8 Claims



1. A method of manufacturing a perpendicular magnetic recording floppy disk comprising the steps of: forming a first magnetic recording layer by sputtering a perpendicularly magnetizable material on one side of a plastic film substrate; and forming a second magnetic recording layer by sputtering said perpendicularly magnetizable material on the other side of said plastic film substrate, after forming said first magnetic recording layer, said second magnetic recording layer having a thickness greater than that of said first magnetic recording layer when a curl of the first magnetic recording layer on the plastic film substrate, resulting from forming the first magnetic recording layer on the plastic film substrate, is to the outside with respect to said first magnetic recording layer.

4,680,198

# METHOD OF PRODUCING A SCRATCH RESISTANT COATING ON A SHEET OF THERMOPLASTIC MATERIAL

Julius-Ludwig Herczeg, Bolligen; Martin Lenhard, Ittigen, and Ernst Flückiger, Toffen, all of Switzerland, assignors to Gurit-Worbla AG, Ittigen, Switzerland. Filed Jul. 11, 1985, Ser. No. 753,862. Claims priority, application Switzerland, Jul. 13, 1984, 3412/84. Int. Cl.<sup>4</sup> B05D 5/06

U.S. Cl. 427-164

7 Claims

1. In a method of producing a scratch resistant coating on a sheet of thermoplastic material comprising the steps of applying a three-dimensionally crosslinkable resin to the sheet, curing and subjecting the coated sheet, after the curing of the resin, to the action of heat and uniform area pressure between polished surfaces to obtain an optically smooth surface of the coating.

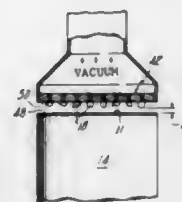
# METHOD FOR DEPOSITING A LAYER OF ABRASIVE MATERIAL ON A SUBSTRATE

John H. Vontell, Manchester, and Roscoe A. Pike, Granby, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 21, 1986, Ser. No. 842,591  
Int. Cl.<sup>4</sup> B05D 1/12

U.S. Cl. 427-199

7 Claims



1. A method for depositing a single layer of particles on the surface of an article, wherein the particles are spaced apart from each other on said surface in substantially noncontacting relation in a desired pattern, comprising the steps of:

- (a) drawing a suction through transfer tool means having a plurality of apertures spaced apart from each other in said desired pattern while the tool means is adjacent to a container of the particles, wherein the suction holds one particle over each aperture;
- (b) applying an adhesive to the surface of the article;
- (c) positioning the article relative to the apertures such that each particle substantially overlies its desired location on the article surface; and
- (d) adjusting the suction such that the particles are released from the tool means and drop onto the article surface to form said desired pattern, wherein the particles are held to the article surface by the adhesive.

4,680,200

# METHOD FOR PREPARING COLLOIDAL SIZE PARTICULATE

Jitka Solc, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1985, Ser. No. 757,238  
Int. Cl.<sup>4</sup> B01J 13/02

U.S. Cl. 427-213.34

6 Claims

1. A method for preparing a colloidal size particulate comprising the steps of (1) emulsifying a hydrophobic, emulsion polymerizable monomer in an aqueous colloidal dispersion of essentially water-insoluble organic solid particles that have not been pretreated with polymer, acid or other conventional anchoring agents, said dispersion being maintained with a surfactant and/or emulsifier, and (2) subjecting the resulting emulsion to emulsion polymerization conditions to form a stable, fluid aqueous colloidal dispersion of the particulate wherein essentially every organic solid particle is coated with the hydrophobic polymer resulting from said polymerization such that substantially all of the organic particles are maintained in a discrete spaced apart relationship to each other by the hydrophobic polymer.

4,680,201

# COATING FOR ELECTROPHORESIS TUBE

Stellan Hjerten, Institute of Biochemistry, University of Uppsala Biomedical Center, P.O. Box 576, S-751 23, Uppsala, Sweden

Filed Oct. 30, 1985, Ser. No. 792,724  
Int. Cl.<sup>4</sup> B05D 7/22

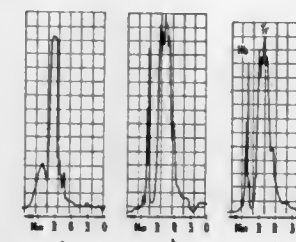
U.S. Cl. 427-230

6 Claims

1. A method for preparing a thin-wall, narrow-bore capillary

tube for use in electrophoretic separation, said method comprising:

contacting a solution of a monomeric bifunctional compound with the inside of the tube, where the bifunctional compound includes a first functional group capable of covalent attachment to the tube wall and a second functional group capable of polymerization to form a monomolecular coating;



washing the tube free of non-bound monomeric bifunctional compound; and introducing free monomer to the inside of the tube in order to react the covalently bound monomeric second functional group with free monomer to form a monomolecular polymeric coating.

4,680,202

# FABRIC FINISH WITH ALPHA OLEFIN RESINS AND PROCESS

E. Michael Coyle; Fred J. Reichley; Calvin J. Verbrugge, and John G. Villarreal, all of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Division of Ser. No. 802,631, Nov. 27, 1985, which is a division of Ser. No. 659,979, Oct. 12, 1984, Pat. No. 4,623,683. This application Apr. 8, 1986, Ser. No. 849,592. Int. Cl.<sup>4</sup> B32B 9/00

U.S. Cl. 427-389.9

8 Claims

1. A process for imparting a fabric finish to a textile material which comprises:

- (a) impregnating said textile material with an aqueous fabric finishing composition comprising a solubilized polymer of from about 40 to 51 mole percent of at least one 1-alkene having at least 10 carbon atoms and from about 60 to 49 mole percent of maleic anhydride; and
- (b) fixing said composition as a film on said textile material employing elevated heat and pressure.

4,680,203

# PROTECTIVE COATING ON CONCRETE CONSTRUCTION

Hirohisa Maki, Neyagawa, and Katsuaki Matsuo, Kyoto, all of Japan, assignors to Dai-ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed May 13, 1986, Ser. No. 862,877

Claims priority, application Japan, May 13, 1985, 60-101752; May 22, 1985, 60-111000; Jun. 3, 1985, 60-121050; Jul. 31, 1985, 60-170060. Int. Cl.<sup>4</sup> B05D 3/02

U.S. Cl. 427-393.6

7 Claims

1. A method of forming a protective coating on concrete or mortar construction which comprises coating said construction with a polyurethane coating composition comprising:

- (A) a polyol component having an average hydroxyl number from 30 to 450 mg KOH/g, at least 5 equivalent % of which is a polyol having a backbone chain consisting solely of carbon atoms or a mixture of said polyol component and a polyamine component having the sum of average hydroxyl number and average amine number of from 30 to 450 mg KOH/g; and
- (B) an organic polyisocyanate curing agent, the proportion of said component (B) in terms of the NCO equivalent

thereof relative to the active hydrogen equivalent of said component (A) being from 0.6 to 1.5.

4,680,204

# COLOR PLUS CLEAR COATING SYSTEM UTILIZING INORGANIC MICROPARTICLES

Suryya K. Das; Jerome A. Seiner, both of Pittsburgh; Paul P. Greigiger, Allison Park; James E. Jones, Lower Burrell; Raymond F. Schappert, Glenshaw, and William G. Boberski, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 783,324, Oct. 2, 1985, which is a continuation of Ser. No. 529,420, Sep. 6, 1983, abandoned. This application Jun. 27, 1986, Ser. No. 879,767. Int. Cl.<sup>4</sup> B05D 3/02

U.S. Cl. 427-407.1

26 Claims

1. A method of coating a substrate comprising the steps of: (A) coating a substrate with one or more applications of a basecoating composition comprising:

- (1) an organic film-forming resin, and where the film-forming resin can be crosslinked, optionally a crosslinking agent for the film-forming resin;
- (2) substantially colorless, substantially inorganic microparticles of silica stably dispersed in the basecoating composition, the microparticles of silica prior to incorporation in the basecoating composition ranging in size from about 1 to about 150 nanometers wherein the silica is in the form of a stable colloidal dispersion of the silica in water, and wherein the inorganic microparticles are present in the basecoating composition in an amount ranging from about 1 to about 30 percent by weight based on the weight of organic film-forming resin, optional crosslinking agent, and inorganic microparticles;
- (3) an aqueous solvent system for the film-forming resin, and
- (4) pigment particles to form a basecoat; and

(B) coating the basecoat with one or more applications of a topcoating composition comprising:

- (1) an organic film-forming resin, which may be the same as or different from the film-forming resin of the basecoating composition, and where the film-forming resin of the topcoating composition can be crosslinked, optionally a crosslinking agent for the film-forming resin of the topcoating composition, and
- (2) a solvent system for the organic film forming resin of the topcoating composition to form a transparent topcoat.

4,680,205

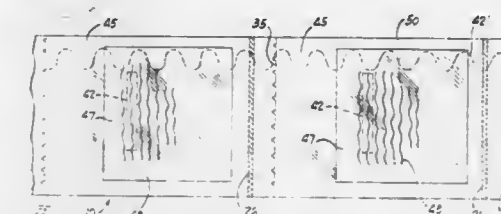
# CONTINUOUS WEB REGISTRATION

Hershey Lerner, Hudson, and Bernard Lerner, Peninsula, both of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation of Ser. No. 378,428, May 14, 1982, abandoned, which is a continuation of Ser. No. 166,500, Jul. 7, 1980, abandoned. This application Sep. 12, 1983, Ser. No. 531,424. Int. Cl.<sup>4</sup> B44F 1/10

U.S. Cl. 428-29

27 Claims



1. An elongated web comprising:

- (a) a pair of plies in face-to-face relationship with one another;

- (b) a visible coating on at least one surface of at least one of the plies;
- (c) said coating being in the form of a repetitive pattern to provide a series of separable web sections;
- (d) the web including a series of spaced, transversely disposed, portions delineating the ends of the sections;
- (e) each of the sections being adapted for separation from the web to provide a commodity substantially identical to commodities formed by separation of the other of the web sections; and
- (f) normally invisible, registration enabling indicia on at least one of the plies, the indicia on stimulation by radiation of a given intensity emitting wave shifted electromagnetic radiation of significantly different intensity than that radiated or reflected by the coating and the web plies upon exposure to a given intensity of electromagnetic radiation of a certain wavelength range even though the wave shifted and the radiated or reflected radiations may include radiation of substantially identical wavelengths.

polyethylene film having a transverse direction draw ratio selected from greater than 1 to less than 3 and a machine



direction draw ratio of less than 6 but greater than the transverse direction draw ratio.

4,680,206

## SEALED DOUBLE GLAZING UNIT

Brian Yoxon, Hoole, and William Thilwind, Wladle, both of England, assignors to Pilkington Brothers P.L.C., St. Helens, England

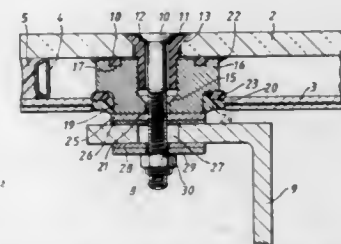
Filed Feb. 11, 1986, Ser. No. 828,271

Claims priority, application United Kingdom, Feb. 19, 1985, 8504275

Int. Cl.<sup>4</sup> E06B 3/24

U.S. Cl. 528—34

18 Claims



1. A sealed double glazing unit comprising: an outer pane and an inner pane which are spaced apart by perimeter sealing means, and at least one fixing means for fixing the unit to a supporting member, which fixing means is attached to one of said panes inwardly of said perimeter sealing means without obstructing the outer edge of the unit, said fixing means being operable to permit the unit to flex under wind load without impairing the sealing of the unit by said perimeter sealing means.

4,680,207

## THERMOPLASTIC SACK

Charles R. Murray, Toronto, Canada, assignor to C-I-L Inc., North York, Canada

Filed Jul. 23, 1986, Ser. No. 888,569

Int. Cl.<sup>4</sup> B32B 27/08

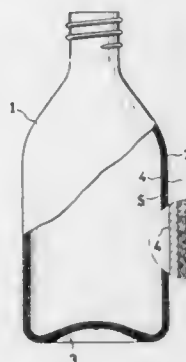
U.S. Cl. 428—35

13 Claims

1. A thermoplastic shipping sack having walls comprising a cold-drawn unbalanced biaxially oriented linear low density

polyethylene film having a transverse direction draw ratio selected from greater than 1 to less than 3 and a machine direction draw ratio of less than 6 but greater than the transverse direction draw ratio.

1. In a biaxially oriented container having three layers in section obtained by concentrically injecting two kinds of plastics into a cavity to mold a bottomed parison and stretch-blow molding said parison to form said biaxially oriented container with excellent heat-resistance and gas barrier properties, an intermediate layer of said container being formed of plastic containing selected lengths of glass fiber; said glass fiber having a length of 1-4 mm and being present in a percentage of 0.5-3.0 percent by weight with respect to said plastic which forms said intermediate layer, said plastic material of said intermediate layer being selected from the group consisting of polyethylene terephthalate, saponified ethylene-vinylacetate copolymer, ethylene-vinylalcohol copolymer, and m-xylene-type polyamide.



4,680,208

## BIAXIALLY ORIENTED PLASTIC CONTAINER WITH EXCELLENT HEAT-RESISTANCE AND GAS BARRIER PROPERTIES

Dalichi Aoki; Yoshinori Nakamura; Hiroyuki Orimoto, and Kazumi Machida, all of Sakakimachi, Japan, assignors to Nissei ASB Machine Co., Ltd., Japan

Filed Feb. 28, 1985, Ser. No. 706,474

Claims priority, application Japan, Mar. 2, 1984, 59-40071

Int. Cl.<sup>4</sup> B27N 5/02; B65D 23/00

U.S. Cl. 428—35

2 Claims

4,680,209

## SELF STICKING CARPET TILES

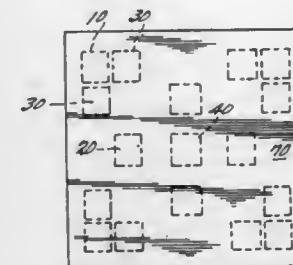
Walter C. Zybko; William Wald, and Thomas V. McClure, all of Lexington, Va., assignors to Burlington Industries, Inc., Greensboro, Md.

Continuation-in-part of Ser. No. 837,352, Mar. 7, 1986, which is a continuation-in-part of Ser. No. 712,035, Mar. 15, 1985, Pat. No. 4,617,210. This application Jul. 14, 1986, Ser. No. 884,929

Int. Cl.<sup>4</sup> B32B 7/14; D04H 1/08

U.S. Cl. 428—35

42 Claims



1. A tile system comprising a plurality of tiles having adhesive and non-stick material on the backs thereof, said adhesive being provided for adhering said tiles to a surface, being non-releaseably applied to said backs and having release properties as to surface other than those covered with adhesive, said adhesive and said non-stick material being arranged on said backs such that two of said plurality of tiles may be placed in back-to-back contact so that the adhesive on one tile will contact the non-stick material on the other tile and vice versa, whereby said two tiles in back-to-back contact may be readily separated from one another.

4,680,210

## REPOSITIONABLE DIRECTIONAL MARKERS

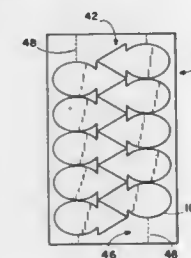
Dan E. Corcoran, 4640 Scenic Ave., Central Point, Oreg. 97502

Filed May 12, 1986, Ser. No. 862,108

Int. Cl.<sup>4</sup> B32B 7/06

U.S. Cl. 428—42

8 Claims



1. A stationary product comprising:
- (a) a sheet of stock;
- (b) an elongate adhesive strip of releasable, reusable adhesive arranged on said stock;
- (c) said stock including an array of discrete elongate directional markers formed therefrom, said markers arranged substantially perpendicular to said elongate strip;
- (d) each of said markers including a directional portion proximate one end, said directional portions of said markers arranged on said adhesive strip;
- (e) each of said markers in said array including a non-directional portion, said non-directional portions of said markers in said array defining a pair of elongate rows parallel to and on either side of said adhesive strip; and
- (f) said directional portions of said markers are arranged adjacent to each other and intermesh with, and point in the opposite direction from, said adjacent directional portions.

184-022 O.G.-87-12

4,680,211

## RECORDING DISKS

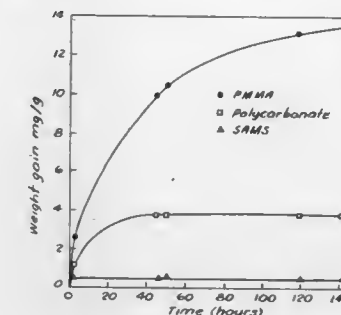
Thomas E. Evans, and Christine M. Bowen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 25, 1985, Ser. No. 758,904

Int. Cl.<sup>4</sup> B32B 3/02

U.S. Cl. 428—65

8 Claims



1. A recording disk adapted for the magnetic or optical recording or retrieval of information comprising a copolymer of at least one vinyl aromatic monomer and alpha-methylstyrene prepared by anionically polymerizing the vinyl aromatic monomer and alpha-methylstyrene at a temperature greater than about 61° C. and less than the ceiling temperature of the vinyl aromatic monomer.

4,680,212

## STAIN RESISTANT NYLON FIBERS

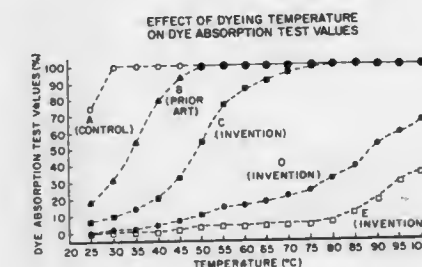
Randolph C. Blyth, Gulf Breeze, and Pompilio A. Ucci, Pensacola, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 834,804, Mar. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 643,606, Aug. 23, 1984, abandoned, which is a continuation of Ser. No. 562,370, Dec. 16, 1983, abandoned. This application Oct. 2, 1986, Ser. No. 914,507

Int. Cl.<sup>4</sup> B32B 27/34

U.S. Cl. 428—97

28 Claims



1. An undyed stain resistant nylon fiber characterized by having a coating on the surface thereof comprising one or more stain blockers in an amount sufficient to provide a fiber having a dye absorption test value at 25° C. of no greater than 7% and a dye absorption value at 100° C. of no less than 30%.



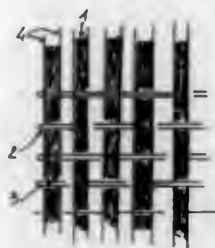
4,680,213

**TEXTILE REINFORCEMENT USED FOR MAKING LAMINATED COMPLEXES, AND NOVEL TYPE OF LAMINATE COMPRISING SUCH A REINFORCEMENT**  
André Fourezon, Mariac, France, assignor to Etablissements les fils d'Auguste Chomarat et Cie, Paris, France  
Filed Mar. 25, 1986, Ser. No. 844,010

Claims priority, application France, Apr. 4, 1985, 85 05346  
Int. Cl.<sup>4</sup> B32B 5/12

U.S. Cl. 428—105

9 Claims



1. A textile reinforcement matrix for making laminated complexes comprising:

- at least one layer of reinforcing yarns, said reinforcing yarns being arranged in a parallel relationship in said at least one layer to form strips, said strips having first and second edges and being spaced apart from one another;
- at least one layer of first binding yarns disposed transversely across said at least one layer of reinforcing yarns, and being present in a lesser amount than said reinforcing yarns; and
- at least one second binding yarn disposed in a parallel relationship with said strips of reinforcing yarns, said at least one second binding yarn being positioned along said first and second edges of each of said strips of reinforcing yarns, said at least one layer of first binding yarns and said at least one second binding yarn defining stable and non-deformable holes having a definite shape.

4,680,214

**REINFORCED FOAM COMPOSITES**

Kurt C. Frisch, Grosse Ile, and Kaneyoshi Ashida, Farmington Hills, both of Mich., assignors to Polymetrics Corporation, Monroe, Mich.

Filed Mar. 12, 1986, Ser. No. 838,942

Int. Cl.<sup>4</sup> B05D 5/12

U.S. Cl. 428—107

20 Claims

1. A high-density foam formed by foaming with an amount of foaming agent such that the density is at least twenty pounds per cubic foot, a foam composition comprising:

- (A) a foam-forming organic polyisocyanate component having a functionality of greater than two;
- (B) a multi-polyol component, constituent polyols of which comprise a rigid polyol having an equivalent weight between about 100 and about 160, a hydroxyl number of about 250 to about 800, and a functionality of at least four; an aromatic polyester polyol having an equivalent weight between about 100 and about 400, a hydroxyl number of about 150 to about 600, and a functionality of 2 to 3; and a flexible polyol having an equivalent weight between about 1000 and about 2500, a hydroxyl number between about 25 and 60, and a functionality of not greater than three;
- said constituent polyols being in the proportions of about 50 to about 75 parts rigid polyol, about 20 to about 50 parts aromatic polyester polyol, and about 1 to about 20 parts flexible polyol in a total amount of 100 parts;
- (C) a catalyst selected from the group consisting of urethane catalysts, trimerization catalysts, and mixtures thereof; said urethane catalyst being an essential component when the isocyanate index is between about 100 and about 115 and said trimerization catalyst being an essential compo-

nent when the isocyanate index is between about 125 and about 500; and the isocyanate component (A) and the polyol component (B) being in proportions which give an isocyanate index between about 100 and about 500; and (D) a surfactant suitable for use in urethane foams; said constituent polyols being compatible so that the admixture thereof is substantially homogeneous at the foaming temperature and has a consistency such that fillers and reinforcing fibers can be suspended therein in an amount of about 10 to about 50 percent based on the total weight of the composition.

4,680,215

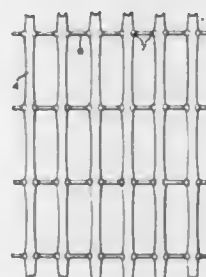
**MESH STRUCTURE AND LAMINATE MADE THEREWITH**

Frank B. Mercer, Blackburn, England, assignor to P.L.G. Research Limited, Blackburn, England  
Division of Ser. No. 765,186, Aug. 13, 1985, Pat. No. 4,618,385, which is a continuation of Ser. No. 510,252, Jul. 1, 1983, abandoned. This application Aug. 6, 1986, Ser. No. 893,826  
Claims priority, application United Kingdom, Jul. 6, 1982, 8219477

Int. Cl.<sup>4</sup> B32B 5/12

U.S. Cl. 428—107

10 Claims



1. An integral, biaxially-molecularly-orientated mesh structure, comprising:

- continuous, substantially parallel, molecularly-uniaxially-orientated main strands with the orientation therein extending substantially uniformly from end to end and generally parallel to said main strands, said main strands being of substantially rectangular cross-section with their width substantially greater than their thickness; and
- discontinuous, uniaxially-molecularly-orientated interconnecting strands with the orientation therein extending generally parallel to the direction of said interconnecting strands, said interconnecting strands extending in a direction generally at right angles to said main strands and interconnecting said main strands at a plurality of positions spaced along the edge of each said main strand, each said interconnecting strand being generally symmetrical about a line at right angles to said main strands, to thereby define a generally regular mesh structure having generally four-sided mesh openings, each said mesh opening being defined by two said main strands and two said interconnecting strands, and the cross-sectional area at the mid-points of said interconnecting strands being less than the minimum cross-sectional area of said main strands;
- there being adjacent each end of each said interconnecting strand a zone of plastics material which is thicker than the material of the remainder of the respective said interconnecting strand.

4,680,216

**METHOD FOR STABILIZING THICK HONEYCOMB CORE COMPOSITE ARTICLES**

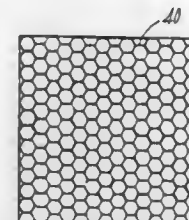
Gary J. Jacaruso, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 4, 1984, Ser. No. 647,308

Int. Cl.<sup>4</sup> B32B 3/12

U.S. Cl. 428—116

2 Claims



1. A method of making a fiber reinforced composite article having a honeycomb core wherein the honeycomb core has a thickness greater than one inch, comprising:

- bonding a layer of resin impregnated, woven, continuous graphite fibers to one of the open-cell surfaces of the honeycomb core,
- curing the resin thereby stabilizing the honeycomb core, cutting the stabilized honeycomb core to net shape,
- laying up one or more layers of reinforced matrix material onto the shaped, stabilized honeycomb,
- heating under vacuum and pressure to cure the resin matrix resulting in a honeycomb core containing composite with the honeycomb core having substantially retained its pre-bonded shape.

4,680,217

**POLYESTER FILM FOR MAGNETIC RECORDING MEDIA**

Tateo Kanesaki, Nagahama; Shigeo Utsumi, Yokohama, and Kichinojo Tomitaka, Kawasaki, all of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 818,920, Jan. 15, 1986, abandoned, which is a continuation of Ser. No. 599,333, Apr. 12, 1984. This application Oct. 3, 1986, Ser. No. 914,582

Claims priority, application Japan, May 2, 1983, 58-77928

Int. Cl.<sup>4</sup> G11B 5/70

U.S. Cl. 428—141

1 Claim

1. A polyester film for magnetic recording media having excellent flatness, slipperiness and ability to retain a magnetic layer applied thereto, said film having minute protrusions on the surface thereof including roughness units each of which consists of a minute protrusion and a recess therearound having a longer diameter of at least 3  $\mu\text{m}$ , wherein the number of said roughness units per square mm, A, (number/1  $\text{mm}^2$ ), satisfies the relation (1):

$$10 < A \leq 1400$$

the proportion of the number of the roughness units to the total number of the protrusions B (%) satisfies the relation (2):

$$5 \leq B \leq 30$$

the center line average roughness  $R_a$  ( $\mu\text{m}$ ) ranges from 0.013 to 0.019 and the number of secondary interference fringes,  $H_2$  (number/1  $\text{mm}^2$ ), measured by the multiple interference method ranges from 9 to 40; the ratio of the peak value of the (1 1 0) face measured by X-ray diffractometry to the peak value of the (1 0 0) face satisfies the relation (4):

$$0.10 \leq I(1\ 1\ 0)/I(1\ 0\ 0) \leq 0.21$$

and the difference between the maximum thickness and the

minimum thickness R ( $\mu\text{m}$ ) and the average thickness of the film  $\bar{x}$  ( $\mu\text{m}$ ) satisfies the relation (5):

$$R/\bar{x} < 0.10$$

(5).

4,680,218

**MAGNETIC RECORDING MEDIUM**

Akihiro Kimura, Sagami-hara; Toshio Ando, Fujisawa, and Toshikazu Nishihara, Zama, all of Japan, assignors to Victor Company of Japan, Japan

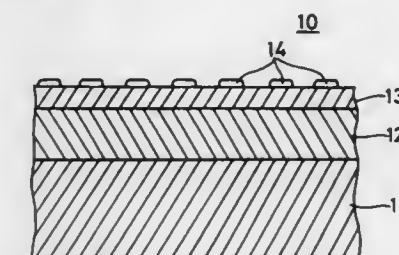
Filed Sep. 23, 1985, Ser. No. 779,160

Claims priority, application Japan, Sep. 29, 1984, 59-202963; Sep. 29, 1984, 59-202964

Int. Cl.<sup>4</sup> G11B 5/64, 5/72

U.S. Cl. 428—195

7 Claims



1. A magnetic recording medium comprising:

- a base;
- a magnetic layer formed on the base, said magnetic layer being made of a magnetic material;
- a lubricant layer formed on the magnetic layer, said lubricant layer being made of a lubricant material having lubricity; and having a thickness in a range of approximately 5 nm to 200 nm; and
- a corrosion resisting layer formed on the lubricant layer, said corrosion resisting layer being made of a corrosion resisting material having corrosion resistance and being distributed locally on said lubricant layer so that at least a part of said lubricant layer is exposed, said corrosion resisting layer having a thickness in a range of approximately 1 nm to 7 nm.

4,680,219

**MOLDABLE FIBROUS SHEET AND A METHOD FOR MANUFACTURING SAME**

(1); Michel Vernois, Courbevois, and Francois Paugam, Casteljalous, both of France, assignors to Isoroy, Lisieux, France  
Filed Mar. 19, 1985, Ser. No. 713,744

Claims priority, application France, Mar. 20, 1984, 84 04308  
Int. Cl.<sup>4</sup> D03D 13/00

U.S. Cl. 428—222

8 Claims

1. A moldable fibrous sheet formed by superimposing fine layers, said sheet having a cellulose fiber and textile fiber base, and having a composition comprising from 5 to 95% by weight of cellulose fibers obtained by dry shredding, from about 0.5 to 10% of undulated textile fibers having at least two half-waves of undulation per centimeter of length said undulated fibers by virtue of their undulation of at least two half-waves per container of length being mechanically bonded to other fibers in the sheet, said fine layers being sewn but not rigidly connected to each other.

4,680,220

**DIELECTRIC MATERIALS**

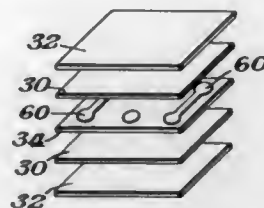
Daniel D. Johnson, Yorklyn, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Feb. 26, 1985, Ser. No. 705,538

Int. Cl.<sup>4</sup> B32B 5/16

U.S. Cl. 428—241

35 Claims



1. A dielectric material comprising a fabric having fibers and interstices between said fibers, in which at least a portion of the fibers in said fabric are treated fluorocarbon fibers, such treatment making the fluorocarbon fibers wettable by an uncured thermosetting resin, the fabric being impregnated within said interstices between said fibers with a thermosetting resin cured to at least the semi-cured, B-stage state, the dielectric constant of said dielectric material being less than 3.5.

4,680,221

**CHEMICAL-RESISTANT FILTER MATERIAL**

Sadamitsu Murayama, Takatsuki, and Makoto Tanaka, Toyonaka, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 23, 1985, Ser. No. 812,319

Claims priority, application Japan, Dec. 25, 1984, 59-271843

Int. Cl.<sup>4</sup> B01D 39/04, 39/08, 39/16

U.S. Cl. 428—246

14 Claims

1. A chemical resist filter material comprising a fibrous structure made of organic fibers, the fiber surface of which is coated with at least one inorganic oxide selected from the group consisting of oxides of silicon, aluminum and lithium.

4,680,222

**PROCESS AND DEVICE FOR ELECTRIC WINDING INSULATION BY IMPREGNATION, AND STABILIZED VARNISH WITHOUT SOLVENT USABLE THEREIN**

Alain Anton, Chaponnay, France, assignor to Alstom-Atlantique, S.A., Paris Cedex, France

Filed Jul. 13, 1984, Ser. No. 630,598

Claims priority, application France, Jul. 13, 1983, 83 11723

Int. Cl.<sup>4</sup> H01B 3/04, 3/08, 3/40, 17/60

U.S. Cl. 428—251

14 Claims

1. A process of insulating a winding of electrical conductors with isocyanurate and oxazolidone cycle resins, the process comprising wrapping around the conductors a glass cloth and porous mica paper tape loaded with a quaternary ammonium salt for catalyzing the condensation of isocyanate and epoxy compounds, impregnating the tape with a solvent-free varnish containing an isocyanate compound and a liquid epoxy resin, and then subjecting the impregnated tape to a varnish polymerization thermal treatment, wherein said quaternary ammonium salt is a benzyl-trialkylammonium halide with an alkyl chain containing 3 carbon atoms at the most.

11. An insulation device formed by impregnation of an electric winding, including a glass cloth and porous mica paper tape loaded with a quaternary ammonium salt catalyzing the condensation of isocyanate and epoxy compounds into isocyanurate and oxazolidone cycles, with a solvent-free varnish made from an isocyanate compound and a liquid epoxy resin, and hardened by thermal treatment in the presence of the quaternary ammonium salt, characterized in that the quater-

nary ammonium salt is a benzyl-trialkylammonium halide with an alkyl chain containing at the most 3 carbon atoms.

4,680,223

**FIBROUS INNER WEB FOR SHEET VINYL FLOORING GOODS**

Peter G. Bither, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 22, 1985, Ser. No. 801,106

Int. Cl.<sup>4</sup> D04H 1/08

U.S. Cl. 428—280

9 Claims

4. A fibrous web, useful as an inner layer in a multi-layer sheet floor covering material, prepared from a composition comprising

- (a) from about 4% to about 15% woodpulp,
  - (b) from about 5% to about 10% glass fibers,
  - (c) from about 4% to about 15% polyolefin pulp containing carboxylic functionality,
  - (d) from 0 to about 5% polyolefin pulp devoid of carboxylic functionality,
  - (e) from about 30% to about 65% inorganic filler,
  - (f) from about 10% to about 15% thermoplastic polymeric binder, other than polyvinyl chloride, and
  - (g) from 0 to about 20% polyvinyl chloride,
- all percentages being by weight based on the total weight of the composition.

4,680,224

**REINFORCED PLASTIC**

James E. O'Connor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 584,418, Mar. 6, 1984, which is a

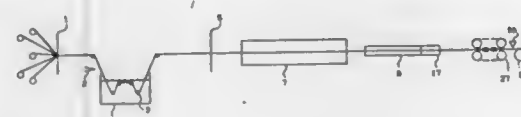
continuation-in-part of Ser. No. 483,013, Apr. 7, 1983. This

application Sep. 9, 1985, Ser. No. 773,965

Int. Cl.<sup>4</sup> D02G 3/00

U.S. Cl. 428—294

14 Claims



1. A reinforced plastic comprising
- (a) a roving of reinforcing material having unidirectionally aligned fibers in
  - (b) a poly(arylene sulfide) matrix.

4,680,225

**MAGNETIC TAPE HAVING A LEADER TAPE**

Hiroshi Ogawa; Chiaki Mizuno; Yasuo Tamai, and Koozi Kamiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 1, 1985, Ser. No. 750,358

Claims priority, application Japan, Jun. 29, 1984, 59-133010

Int. Cl.<sup>4</sup> G11B 5/627

U.S. Cl. 428—323

18 Claims

1. A magnetic tape having a leader tape comprising a coating layer provided on one or both sides of a support at least one end of said magnetic tape, characterized in that the coating layer contains, as predominant components, an electrically conductive powder having a mean grain size of 0.001 to 1  $\mu$ m and a volume resistance of  $10^0$  to  $10^8 \Omega$ -cm and being at least one member selected from the group consisting of  $\text{SnO}_2$ ,  $\text{In}_2\text{O}_3$ ,  $\text{ZnO}$ ,  $\text{BaTiO}_3$ , and  $\text{SrTiO}_3$  which have been modified to provide electrical conductivity and a binder and the leader tape has a percent photo-transmission of at least 20%.

4,680,226

**HEAT SENSITIVE TYPE ADHESIVE CONNECTOR**

Yoshio Takeda, Nara, Japan; assignor to Sharp Kabushiki Kaisha, Osaka, Japan

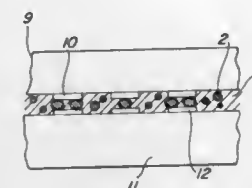
Filed Jan. 24, 1986, Ser. No. 821,965

Claims priority, application Japan, Jan. 28, 1985, 60-14952

Int. Cl.<sup>4</sup> B32B 5/16

U.S. Cl. 428—327

14 Claims



1. A heat sensitive type adhesive connector for providing electrical connection between terminals disposed on base members comprising:

- a sheet made of a heat sensitive resin-type adhesive material, for causing said base members to adhere together; and
- electrically conductive and elastic particles uniformly scattered in the sheet, for providing electrical connection between the terminals.

4,680,227

**FIRE-RETARDING RESIN COMPOSITION AND LAMINATED PRODUCT THEREOF**

Yoshiki Aoyagi, Yokohama; Masatoshi Suzuki, Fujisawa; Tadashi Inoue, Yokohama, and Kunio Tsukakoshi, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,168

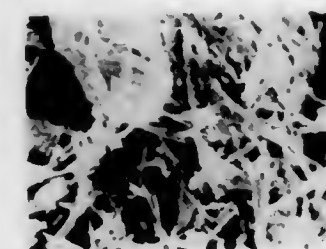
Claims priority, application Japan, Nov. 27, 1984, 59-249973;

Dec. 19, 1984, 59-267891

Int. Cl.<sup>4</sup> B32B 5/16, 15/08

U.S. Cl. 428—331

7 Claims



1. A laminated product composed of a plurality of metal sheets; and a fire-retarding resin composition in a sheet form, said fire-retarding resin composition consisting essentially of 100 parts by weight of polyolefin resin, and 10 to 100 parts by weight of hydrate of calcium silicate containing therein 30% by weight or more of platy crystals and/or needle-shaped crystals with its aspect ratio of 3 or higher, said hydrate being in the form of powder granule composed of a secondary aggregate, in which said platy crystals and/or needle-shaped crystals are aggregated, and having its bulk density of 0.5 or lower, and said metal sheets being laminated on both surfaces of said fire-retarding resin sheet.

4,680,228

**ADHESION OF RUBBER TO ARAMID CORDS**

Satish C. Sharma, Mogadore, Ohio, assignor to GenCorp Inc., Akron, Ohio

Filed Mar. 3, 1986, Ser. No. 835,141

Int. Cl.<sup>4</sup> C08L 63/00; C09J 3/14

U.S. Cl. 428—378

24 Claims

1. A method for adhering a poly(p-phenylene terephthalam-

ide) reinforcing element to a rubber compound which comprises (I) treating said element with a composition comprising an aqueous alkaline dispersion of from about 10 to 50%, by weight of solids comprising (a) at least one rubbery vinyl pyridine copolymer latex, (b) at least one water soluble or dispersible epoxide having an average of from about 2 to 4 epoxide groups per molecule and (c) a water soluble or dispersible polyfunctional amine curing agent selected from the group consisting of primary, secondary and tertiary amines and mixtures of said amines, (b) being used in an amount of from about 10 to 30 parts by weight per 100 parts by weight of (a) on a dry weight basis and (c) being used in an amount of from about 2 to 8 parts by weight per 100 parts by weight of (a) on a dry weight basis, heating said treated element at a temperature of from about 200° to 600° F. for from about 300 to 5 seconds to remove essentially all of the water from said composition and to provide said element with a heat cured or heat set dry adhesive in an amount of up to about 20%, total by weight (dry) based on the weight of said reinforcing element, and (II) combining said dried and heat cured adhesive containing reinforcing element with an unvulcanized vulcanizable rubber compound and vulcanizing the same.

4,680,229

**FLAME-RESISTANT HYDROCARBON POLYMER COMPOUNDS, AND INSULATED ELECTRICAL PRODUCTS THEREOF**

Joseph E. Betts, Westport, Conn., and Fred F. Holub, Schenectady, N.Y., assignors to General Electric Company, Bridgeport, Conn.

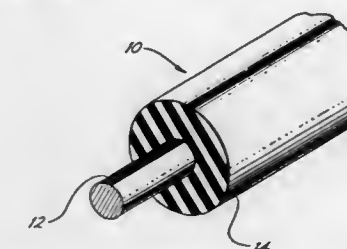
Continuation of Ser. No. 516,609, Jul. 25, 1983, abandoned, which is a continuation of Ser. No. 285,655, Jul. 21, 1981,

abandoned, which is a continuation-in-part of Ser. No. 816,854, Jul. 18, 1977, abandoned. This application Jul. 22, 1985, Ser. No. 737,357

Int. Cl.<sup>4</sup> B32B 15/00, 25/20

U.S. Cl. 428—389

17 Claims



1. An electrical conductor comprising a metallic conductive element having a halogen-free, flame-resistant, crosslink curable polyolefin polymer compound insulation thereabout comprising the following, in the approximate relative parts by weight of

Polyolefin	100
Organopolysiloxane gum	2-20
Organic Lead compound	1-15

11. An electrical conductor comprising a metallic conductor element having a halogen-free, flame-resistant, crosslink cured polyethylene compound insulation thereabout comprising the cured product of the following, in the approximate parts by weight of

Polyethylene	100
Organopolysiloxane gum	2-20
Dibasic lead phthalate	1-5
Fumed silica	1-6
Antioxidant	0-5
Antimony oxide	0-15
Organic peroxide curing agent	1-10



4,680,230

**PARTICULATE CERAMIC USEFUL AS A PROPPANT**  
James L. Gibb, Woodbury, Minn.; James A. Laird, St. Joseph, Wis.; George W. Lee, St. Paul, and William C. Whitcomb, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 18, 1984, Ser. No. 571,739

Int. Cl.<sup>4</sup> B32B 5/16; C04B 38/06; C09K 3/00

U.S. Cl. 428—403

16 Claims



1. A particulate fired ceramic made from raw materials which comprise about: 50-97 parts by weight of mineral particulates; 3-50 parts by weight alumina; and at least one part by weight binder; wherein the mineral particulates comprise a ceramic mineral which melts below about 1300° C., does not substantially sublime or volatilize below 1300° C., vitrifies upon cooling, and has a fired density of less than about 2.9 grams per cubic centimeter; wherein the binder is characterized by adhering the mineral particulate and alumina powder together after pelletizing but before firing; and wherein the particulate ceramic itself is characterized by:
  - (i) an outer region of the particles which is rich in alumina concentration as compared to the region near the center of the particles; and
  - (ii) a fired density less than about 2.9 grams per cubic centimeter.

4,680,231

**LOW-VELOCITY ELECTRON EXCITED PHOSPHOR**  
Tatsuo Yamanaka, and Hisamitsu Takahashi, both of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Nov. 20, 1985, Ser. No. 800,034

Claims priority, application Japan, Nov. 28, 1984, 59-249707

Int. Cl.<sup>4</sup> C09K 11/50

U.S. Cl. 428—407

6 Claims

1. Low-velocity electron excited phosphor comprising: a phosphor material selected from the group consisting of  $Y_2O_3:Eu$ ;  $Y_2O_3:Eu$ ;  $YVO_4:Eu$ ;  $(Zn_{1-x}Cd_x)S:Ag$   $0.65 < x \leq 0.9$ ;  $Zn_3(PO_4)_2:Mn$ ;  $Cd_2B_2O_5:Mn$ ;  $Zn(S_{1-x}Se_x):Cu$   $0.05 \leq x \leq 0.6$ ;  $Zn(S_{1-x}Se_x):Cu, Al$   $0.05 \leq x \leq 0.6$ ;  $(Zn_{1-x}Cd_x)S:Ag, Al$   $0.5 < x \leq 0.7$ ;  $(Zn_{1-x}Cd_x)S:Ag, Al$   $0 \leq x \leq 0.2$ ;  $(Zn_{1-x}Cd_x)S:Cu$   $0.1 < x \leq 0.2$ ;  $(Zn_{1-x}Cd_x)S:Cu, Al$   $0.1 < x \leq 0.2$ ;  $CaSiO_3:Pb, Mn$ ;  $(Zn_{1-x}Cd_x)S:Cu, Al$   $0 \leq x \leq 0.1$ ;  $SrGa_2S_4:Eu^{2+}$ ;  $Y_3(Al_{1-x}Ga_x)_2O_{12}:Ce$   $0 \leq x \leq 0.5$ ;  $Zn_2SiO_4:Mn$ ;  $Y_2O_3:Tb$ ;  $La_2O_3:Tb$ ;  $(Zn_{1-x}Cd_x)S:Ag$   $0.3 \leq x \leq 0.5$ ;  $ZnS:Ag, Al$ ;  $ZnS:Cu, Al$ ;  $ZnS:Cu, Au, Al$ ;  $Zn_2SiO_4:Mn, As$ ;  $(Zn_{1-x}Cd_x)S:Cu$   $0 \leq x \leq 0.1$ ;  $(Zn_{1-x}Cd_x)S:Ag, Al$   $0.3 \leq x \leq 0.5$ ;  $ZnS:Ag$ ;  $ZnS:Ag, Al$ ;  $Zn(S, Se):Ag$ ;  $Zn(S, Se):Ag, Al$ ;  $Y_2SiO_5:Ce$ ;  $SrGa_2S_4:Ce$ ;  $Ca_2MgSiO_5:Ce$ ;  $(Ca, Mg)_2SiO_4:Ti$ ;  $(Ba, Mg)_2O_2 \cdot 6Al_2O_3:Eu^{2+}$ ;  $(Sr, Ba)_3(PO_4)_2:Eu^{2+}$  and  $Ca_2B_5O_9Cl:Eu^{2+}$ , said phosphor material being in the form of particles; a conductive material selected from the group consisting of  $In_2O_3$ ;  $SnO_2$ ;  $ZnO$ ;  $TiO_2$ ;  $WO_3$ ;  $Nb_2O_5$ ;  $CdS$ ; and  $Cu_2S$ , said conductive material being the form of fine particles having a particle distribution of which median is 0.1-2.4  $\mu$  and a standard deviation of 0.7  $\mu$  or less; and an organic binder said conductive material of fine particles being deposited on the surface of said particles of said phosphor material by means of said organic binder which is either water-soluble or organic solvent-soluble.

4,680,232  
**ABRASION AND UV RESISTANT COATING COMPOSITIONS**

Arnold Factor, Scotia, and Gantam A. Patel, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

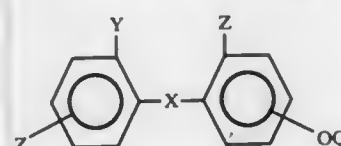
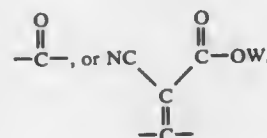
Filed Jan. 2, 1986, Ser. No. 815,614

Int. Cl.<sup>4</sup> B32B 9/04, 13/12, 27/36; C09K 3/14

U.S. Cl. 428—412

14 Claims

1. A UV stabilized coating composition comprising a water/aliphatic alcohol solids dispersion of a partial condensate derived from organotrialkoxysilane and containing at least about 30 weight percent methyltrisilanol, and a colloidal dispersion of colloidal silica and a colloidal metal, colloidal metal alloy or colloidal metal salt, said metal being selected from the group consisting of antimony, aluminum, gold, silver, copper, tin, cadmium and indium, said dispersion comprising about 5 to 70 weight of the solid portion of the coating composition, and an effective amount of a silylated ultraviolet light absorbing agent capable of co-reacting with the organotrialkoxysilane and having the formula

wherein  
X is

Y is H or OH; Z is H, OH, OQ or OW, where at least one Z in the ortho position is OH if Y is H; Q is  $-CH_2(CH_2)_nSi(R'')_x(OR''')_y$  and W is  $-C_mH_{2m+1}$  where x is 0, 1 or 2, y is 1, 2 or 3, x+y=3, n=0, 1 or 2, m=1 to 18, R'' is alkyl having 1 to 6 carbon atoms and each R''' is independently selected from the group consisting of alkyl or alkanoyl having 1 to 6 carbon atoms.

2. A solid substrate having at least one surface coating with a cured composition of claim 1.
3. A solid substrate as in claim 12 which comprises polycarbonate.

4,680,233

**SEALING MATERIAL**

Geary E. Camin, Los Altos, and William D. Uken, Fremont, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 2, 1985, Ser. No. 730,405

Int. Cl.<sup>4</sup> B32B 27/40

U.S. Cl. 428—424.6

21 Claims

1. A sealing material comprising in combination:
  - a. an elastomeric sealant comprising a polysiloxane, a polyurethane, a polybutyl or a triblock copolymer and having a cone penetration from about 100-350 (10<sup>-1</sup> mm) and an ultimate elongation of at least 50%; and
  - b. a backing material disposed on a surface of the elastomeric sealant comprising an air drying or air curing material which is liquid, dissolved in a solvent or dispersed in a carrier and which, when dried or cured, sufficiently adheres to the surface of the elastomeric sealant and provides means for installation of the elastomeric sealant on a substrate and which reduces the surface tack of the elastomeric sealant.

4,680,234

**WEATHERABLE COEXTRUDED FLEXIBLE FILMS AND LAMINATED STRUCTURE**

Robert H. Kelch, Granville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed May 13, 1985, Ser. No. 732,981

Int. Cl.<sup>4</sup> B32B 15/08, 27/00

U.S. Cl. 428—461

10 Claims

1. A coextruded flexible film particularly adapted for use as a weatherable surface coating by lamination to a substrate having a first layer comprising a blend of a vinyl chloride polymer, an interpolymer comprising ethylene and at least one carboxylic acid or ester thereof containing ethylenic unsaturation, and a chlorinated polyolefin and a second layer comprising a normally solid thermoplastic adhesive comprising an interpolymer of an olefin and at least one copolymerizable comonomer selected from the group consisting of carboxylic acids and esters thereof having ethylenic unsaturation.

4,680,235

**RECORDING MATERIAL FOR INK JET PRINTING**

Kakuiji Murakami, Shizuoka; Eiichi Akutsu, Ichikawa, and Tamotsu Aruga, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 22, 1985, Ser. No. 714,873

Claims priority, application Japan, Mar. 23, 1984, 59-54314

Int. Cl.<sup>4</sup> B41M 5/00

U.S. Cl. 428—414.4

13 Claims

1. An ink jet recording material for forming images thereon with an ink composition by ink jet printing comprising a non-porous base material and a surface recording layer formed thereon, said surface recording layer containing a surface active agent selected from the group consisting of anionic and cationic surface active agents which does not form a material insoluble in said ink composition when contacted with a dye contained in said ink composition, and a binder agent which is soluble or swells in an aqueous ink.

4,680,236

**ELECTRODELESS HETEROGENEOUS POLYPYRROLE COMPOSITE**

Ronald E. Myers, Strongsville, and Ephraim Buhks, North Royalton, both of Ohio, assignors to The BF Goodrich Company, Akron, Ohio

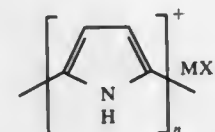
Filed Feb. 18, 1986, Ser. No. 830,299

Int. Cl.<sup>4</sup> B32B 27/08; H01B 1/06

U.S. Cl. 428—515

6 Claims

1. A conductive composite consisting essentially of
  - (i) a normally insulating host polymer having an arbitrary shape and sufficient thickness to have heterogeneously deposited, on and within said polymer, for a depth of at least 1 micron,
  - (ii) a first poly(2,5-pyrrole) ("PP") species in combination with a counterion of a Group VIII metal halide represented by the structure



wherein,

n is an integer in the range from 2 to about 1000;

M represents a Group VIII metal selected from the group consisting of iron, nickel, and cobalt; and,

X represents chlorine, or bromine; so that there is one  $MX^-$  anion for each repeating unit consisting of from 3 to about 10 connected pyrrole rings, said combination

of first species of PP and counterion being present in an amount sufficient to form a semiconductive composite; and,

(iii) a conductive species electrodeposited on said semiconductive composite in an amount sufficient to increase the conductivity of said semiconductive composite.

4,680,237

**COLORED FLOOR FINISH**

Michael T. Kenney, 29055 S.W. Parkway, Space A., and Jeffrey S. Rhoades, 28900 S.W. Parkway, No. 14, both of Wilsonville, Oreg. 97070

Filed Feb. 7, 1986, Ser. No. 827,089

Int. Cl.<sup>4</sup> B32B 27/08; B05D 3/02

U.S. Cl. 428—520

14 Claims

1. A method of placing colored indicia or tints on a porous surface, the method comprising the steps of: forming a base layer by applying an unpigmented metal interlock acrylic finish to said surface; and forming a pigmented layer by applying a pigmented metal interlock acrylic finish over said base layer, said pigmented finish containing an effective amount up to 50% of a paint comprised of a calcined earth pigment in an acrylic polymer emulsion.

4,680,238

**THERMOSTATIC METAL**

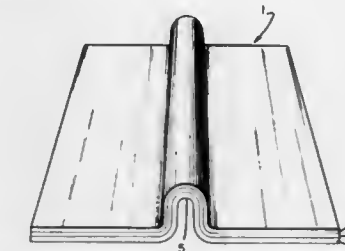
Jacob L. Ornstein, and Michael A. Hydock, Greensboro, both of N.C., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,361

Int. Cl.<sup>4</sup> B32B 15/18, 33/00

U.S. Cl. 428—617

6 Claims



1. A thermostatic metal comprising a layer of a low expansion metal bonded to a layer of a high expansion metal, the outer surface of one of said layers comprising a layer of similar composition but containing, in addition, a sufficient amount of a grain growth limiting additive to prevent orange peel when said thermostatic metal is bent into a desired shape.

4,680,239

**EXHAUST DEVICE HAVING A HEAT-INSULATING LAYER COMPRISING INORGANIC MICROBALLOONS AND A REFRACTORY LAYER AND METHOD OF MANUFACTURING SAME**

Mitsuru Yano, Okagaki; Tomoyuki Kido, Kitakyushu, and Yoshiyuki Ochi, Mizumaki, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jan. 10, 1986, Ser. No. 817,687

Claims priority, application Japan, Jan. 11, 1985, 60-2722;

Apr. 22, 1985, 60-85901

Int. Cl.<sup>4</sup> B32B 9/00, 7/02; B05D 7/22

U.S. Cl. 428—688

7 Claims

1. An exhaust device comprising: a metal portion for passing high temperature exhaust gases therethrough, said metal portion having interior surfaces;

a heat-insulating layer adhered directly to said interior surfaces, said heat-insulating layer consisting of heat-resistant microballoons having a particle size in the range of from about 10 to 500  $\mu\text{m}$  and an inorganic binder, said heat-insulating layer having a thickness of greater than about 1.5 mm; and

a refractory layer consisting essentially of a refractory material having a particle size of about 10 to 500  $\mu\text{m}$  and an inorganic binder, said refractory layer overlaying said heat-insulating layer and having a thickness greater than about 0.5 mm.

2. A method of manufacturing an exhaust device having on its inner surface a heat-insulating layer and a refractory layer, comprising:

a first step of forming said heat-insulating layer by conducting at least one cycle of the following steps:

(a) coating said inner surface with an inorganic binder solution;

(b) immediately adhering heat-insulating microballoons to the inorganic binder solution layer, said microballoons being fully and uniformly impregnated with said inorganic binder solution; and

(c) drying and solidifying the resulting heat-insulating microballoon layer by heat treatment; and

a second step of forming a refractory layer by conducting at least one cycle of the following steps:

(d) coating the surface of said heat-insulating layer with an inorganic binder solution;

(e) immediately adhering a refractory material to the inorganic binder solution layer, said refractory material being fully and uniformly impregnated with said inorganic binder solution; and

(f) drying and solidifying the resulting refractory material layer by heat treatment.

4,680,240

# METHOD FOR STARTING FUEL CELL POWER SYSTEMS

Nobuhiro Furukawa, Hirakata; Shuzo Murakami, and Masato Nishioka, both of Ibaraki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

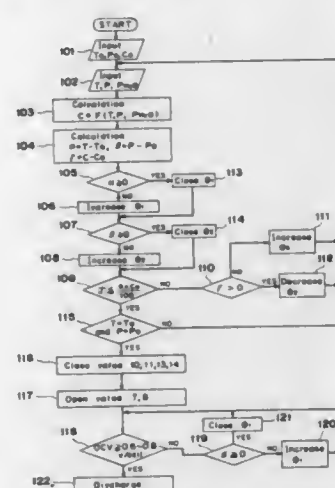
Filed Jul. 17, 1986, Ser. No. 886,497

Claims priority, application Japan, Jul. 19, 1985, 60-160701

Int. Cl. H01M 8/04

U.S. Cl. 429-13

1 Claim



1. A method for starting fuel cell power systems comprising heating a fuel cell stack to a predetermined operating temperature with a circulating heat-exchanger fluid, while feeding a pressurized inert gas into a pressure vessel and process gas chambers of the fuel cell stack to increase pressures in the process gas chambers and pressure vessel to a predetermined pressure, detecting a temperature of the stack and a pressure of the inert gas in the process gas chambers, and controlling a

vapor pressure in the inert gas fed to said chambers in proportion to said detected temperature and pressure in the process gas chambers so that a volume of a hygroscopic electrolyte is approximately kept constant.

4,680,241

# METHOD FOR RESTORING THE LOST CAPACITY OF NICKEL BATTERIES AND BATTERIES FORMED THEREBY

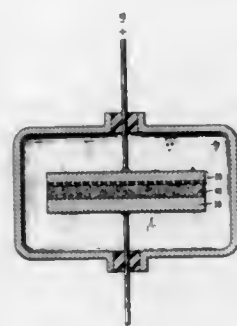
Christopher K. Dyer, Summit, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 556,138, Nov. 29, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 705,050

Int. Cl. H01M 10/44; H02J 7/06

U.S. Cl. 429-49

10 Claims



1. A method for making a battery which includes a nickel positive electrode, a negative electrode, and an electrolyte, said nickel positive electrode having an initial capacity less than a theoretical capacity, C, of said battery, comprising the step of

cycling said battery at least 10 times, each cycle including both a discharging step during which the amount of charge withdrawn from the battery,  $q_D$ , is greater than or equal to about 5 percent of the capacity achieved during the previous cycle, and a charging step

in which the charging rate is greater than C/10 per hour, the amount of charge delivered to said battery during said charging step,  $q_C$ , is greater than  $q_D$  and is chosen so that a temperature of said electrolyte does not exceed about 30 degrees Centigrade.

4,680,242

# WRAPPED BATTERY PLATE

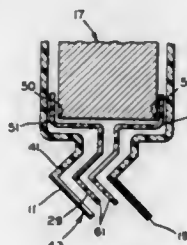
Robert D. Simonton, Fremont, and Douglas E. Breese, Oregon, both of Ohio, assignors to Fremont Special Machine Company, Inc., Fremont, Ohio

Continuation of Ser. No. 747,716, Jun. 24, 1985, abandoned. This application Aug. 4, 1986, Ser. No. 871,306

Int. Cl. H01M 2/18

U.S. Cl. 429-136

11 Claims



1. A wrapped battery plate comprising a rectangular plate having opposed major faces having longitudinal sides and

transverse sides, and having edges at the intersections of said sides with said major faces; a single rectangular wrapper sheet of flexible material which is permeable to electrolyte and compatible with the products of electrolytic action within the cell in which the wrapped plate is adapted to be utilized said sheet being wrapped around said longitudinal sides and longitudinal edges of said plate and having opposed longitudinal margins in close proximity over their lengths laying against one of said major faces of said plate, a joint between said opposed longitudinal margins of said wrapper sheet over their length on said one face of said plate with the joined wrapper sheet margins generally parallel to said one face; a first transverse margin region of said wrapper sheet extending between said longitudinal sides at one end of said wrapper sheet and projecting beyond the transverse side and edges of said plate proximate said one end of said wrapper sheet; a broad area bond along said first transverse margin region of said wrapper sheet between portions of the sheet transverse margin overlaying each other and projecting beyond the proximate transverse side of said plate closely adjacent said transverse side and said bond area being of a width of at least the thickness of the plate and of a length corresponding to the length of the plate transverse side; and an accordion pleat extending along said broad area bond parallel to the adjacent transverse side of the plate and having portions of said bond on each side of the pleat fold.

4,680,243

# METHOD FOR PRODUCING A MASK FOR USE IN X-RAY PHOTOLITHOGRAPHY AND RESULTING STRUCTURE

Alexander R. Shmukunas, Palo Alto, and Barry Block, Los Altos Hills, both of Calif., assignors to Micronix Corporation, Los Gatos, Calif.

Filed Aug. 2, 1985, Ser. No. 761,993

Int. Cl. G21K 5/00; G03F 9/00; B44C 1/22; C23F 1/02

U.S. Cl. 430-5

61 Claims



28. A mask for use in photolithography comprising:

a silicon ring;

an x-ray transparent layer of material supported by said silicon ring;

a glass ring bonded to said silicon ring, said bond being produced by a field assisted thermal bonding process.

4,680,244

# LIGHT-SENSITIVE RECORDING MATERIAL FOR THE PRODUCTION OF A PRINTING FORM OR PRINTED CIRCUIT WITH PHOTOCONDUCTIVE LAYER AND LIGHT-SENSITIVE OVERLAYER

Peter Lebmann, Kelkheim, Fed. Rep. of Germany, and Manfred Michel, Suzano, Brazil, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 712,660

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409888

Int. Cl. G03C 5/14, 1/495, 1/54

U.S. Cl. 430-66

8 Claims

1. A light-sensitive recording material comprised of (A) an electrically conductive support which is suitable for the production of printing forms or printed circuits, (B) at least one photoconductive layer having a first and a second surface, said photoconductive layer (i) containing a resin binder which is soluble in an aqueous alkaline or alcoholic alkaline solvent and (ii) being applied along said first surface to said support, and (C) a light-sensitive covering layer applied to said second surface of said photoconductive layer, said covering layer

comprising a photochemically reactive composition which contains at least one compound having a solubility in an aqueous alkaline or alcoholic alkaline solvent which is increased by actinic radiation, whereby said solvent is capable of decoupling actinic radiationexposed portions of said covering layer and portions of said photoconductive layer located beneath the portions of said covering layer.

4,680,245

# ELECTROPHOTOGRAPHIC POSITIVELY CHARGEABLE DEVELOPER CONTAINING SILICA TREATED WITH A NITROGEN CONTAINING SILANE COUPLING AGENT AND METHOD OF DEVELOPING

Koshi Suematsu, Kawasaki, and Eiichi Imai, Narashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 596,090, Apr. 2, 1984, abandoned. This application Nov. 12, 1986, Ser. No. 929,495

Claims priority, application Japan, Apr. 12, 1983, 58-63935; May 31, 1983, 58-96511; May 31, 1983, 58-96512; Jun. 22, 1983, 58-112411; Jun. 23, 1983, 58-113965

Int. Cl. G03G 9/08

11 Claims

U.S. Cl. 430-110

1. A dry developing method, which comprises: (a) disposing an electrostatic image bearing member having an electrostatic image on its surface and a developer carrying member having a surface for carrying an insulating dry developer thereon with a gap between said electrostatic image bearing member and said developer carrying member; and

(b) coating said insulating dry developer on said developer carrying member, wherein said insulating dry developer is positively chargeable and comprises toner particles containing a binder resin and a colorant or a magnetic powder, and fine silica particles treated with a nitrogen-containing silane coupling agent represented by the formula:



wherein R is an alkoxy group or chlorine, m is an integer of from 1 to 3, Y is an unsaturated nitrogen-containing heterocyclic group or derivative thereof, and n is an integer of from 1 to 3, wherein  $m+n$  is 4; and

(c) bringing the coated insulating developer to said gap, wherein the insulating developer on said developer carrying member surface at said gap has a thickness thinner than said gap and causing the insulating developer to jump to the electrostatic image to effect development.

4,680,246

# METHOD FOR PRODUCING AN ELECTROPHOTOGRAPHIC ELEMENT

Motohisa Aoki, and Hironobu Iwanaga, both of Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 709,902, Mar. 8, 1985, abandoned, which is a division of Ser. No. 508,038, Jun. 27, 1983, abandoned. This application Jun. 6, 1986, Ser. No. 873,451

Claims priority, application Japan, Jun. 29, 1982, 57-112423

Int. Cl. G03G 5/00

U.S. Cl. 430-133

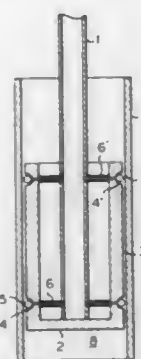
1 Claim

1. A process for producing an electrophotographic element, which comprises:

inserting a hollow, cylindrical, solid bottomed closed ended member, having at least one circumferential groove formed in the outside wall thereof and at least one fluid-tight inflatable member mounted within said at least one groove or mounted covering the opening of the groove and communicating a hollow rod with said inflatable member, within a lower portion of a hollow, bottomless cylindrical body having a uniform inner diameter surface portion;



feeding a fluid through said hollow rod to inflate said inflatable member so as to contact said uniform inner diameter surface portion of said bottomless cylindrical body;  
immersing said bottomless cylindrical body in a liquid containing a photosensitive material so as to coat an outside surface of said cylindrical body, to confine an ambient gas beneath said solid bottomed closed ended member and to



prevent said liquid containing a photosensitive material from entering into the inner space of said cylindrical body except a lowermost portion thereof; and  
separating said bottomless, cylindrical body from said liquid containing said photosensitive material so as to form a uniform photosensitive layer on said outside surface thereof.

4,680,247

#### PHOTOGRAPHIC PROCESSING COMPOSITION WITH POLY(DIACETONE ACRYLAMIDE) OXIME AND STYRENE-BUTADIENE LATEX

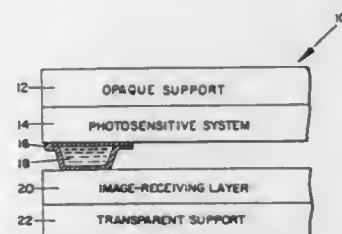
Richard J. Murphy, Dennis Port, Mass., assignor to Polaroid Corporation, Patent Dept., Cambridge, Mass.

Filed Mar. 31, 1986, Ser. No. 846,587

Int. Cl.<sup>4</sup> G03C 5/54, 5/26

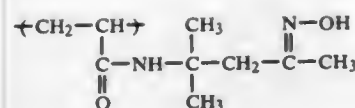
U.S. Cl. 430—215

9 Claims



4. A photographic product for forming a diffusion transfer image within a permanent laminate comprising, in combination, a first support carrying at least one photosensitive silver emulsion layer, each said silver halide emulsion having associated therewith an image-forming material; a second support carrying an image-receiving layer; and a photographic processing composition adapted to be distributed between the silver halide layer or layers and the image-receiving layer and effective to develop the silver halide emulsion or emulsions after photoexposure and form a transfer image in said image-receiving layer and effective to mask the developed silver halide layer or layers and provide a light-reflecting background for the viewing of said transfer image, said photographic processing composition comprising an aqueous alkaline medium having therein:

a polymeric oxime viscosity-increasing agent comprising recurring units of the formula



said polymeric oxime viscosity-increasing agent being present in an amount in the range of about 0.5% to about 1% by weight of the composition;  
a light-reflecting pigment; and  
a carboxylated styrene-butadiene latex, said carboxylated styrene-butadiene latex being present in an amount in the range of about 1.5% to about 3% by weight of the composition.

4,680,248

#### USE OF DESICCANT TO CONTROL EDGE FUSION IN DRY FILM PHOTORESIST

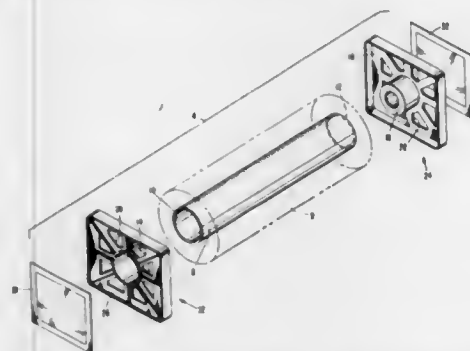
Donald J. Roach, Gloucester, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 19, 1985, Ser. No. 767,210

Int. Cl.<sup>4</sup> G03C 3/00; G03B 17/26

U.S. Cl. 430—270

3 Claims



1. An element comprising a laminate of an aqueous developable photoresist composition sandwiched between a film support and a protective cover sheet enclosed in a moisture proof container with an amount of dessiccant sufficient to maintain the relative humidity below about 20% inside said container.

4,680,249

#### PHOTOPOLYMERIZABLE COMPOSITION CONTAINING CARBOXY BENZOTRIAZOLE

Gregory C. Weed, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

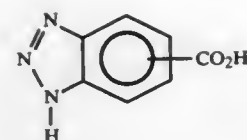
Filed May 28, 1986, Ser. No. 867,431

Int. Cl.<sup>4</sup> G03C 1/76

U.S. Cl. 430—281

2 Claims

1. In a photosensitive composition comprising  
(a) addition polymerizable ethylenically unsaturated monomer,  
(b) an initiating system activatable by actinic radiation  
(c) an amphoteric polymer derived from interpolymerization of (1) at least one basic comonomer which is an acrylic or methacrylic acrylamide or methacrylamide, an aminoalkyl acrylate or methacrylate or mixture of any of these; (2) at least one acidic comonomer containing one or more carboxyl groups and (3) at least one further comonomer which is acrylic or methacrylic in character; wherein the improvement comprises incorporation in the composition of  
(d) a carboxy benzotriazole of the formula:



4,680,250

#### COMPOSITE ALUMINUM SHEET FOR PRESENSITIZED LITHOGRAPHIC PRINTING PLATE COMPRISING A SUPPORT HAVING SPECIFIED CENTER LINE AVERAGE ROUGHNESS

Hironori Kitamura, Nagaokakyo, and Kanji Noma, Osaka, both of Japan, assignors to Nippon Foil Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 541,778, Oct. 13, 1983, abandoned.

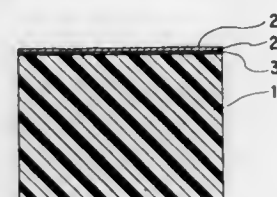
This application Nov. 25, 1985, Ser. No. 801,502

Claims priority, application Japan, Dec. 6, 1982, 57-214527

Int. Cl.<sup>4</sup> G03F 7/02; G03C 1/76

U.S. Cl. 430—302

8 Claims



1. A composite sheet for a presensitized lithographic printing plate, comprising a support of a synthetic resin film and an aluminum foil thereon, said aluminum foil having a matt surface with a roughness of 0.20 to 0.65  $\mu\text{mR}_a$  on one surface thereof and a thickness of from 7 to 80  $\mu\text{m}$ , said foil prepared by twice or more pack rolling doubled aluminum foils under the conditions of a roll load of 100 to 250 kg/mm, a rolling speed of 100 to 800 m/min and a reduction per pass of 20 to 65%, said aluminum foil positioned on said support so that the matt surface thereof faces outside.

4,680,251

#### PROCESS FOR THE OZONE PROTECTION OF PHOTOPOLYMER FLEXOGRAPHIC PRINTING PLATES BY TREATMENT WITH LIQUID POLYETHERS

Manfred Schober, Offenbach, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 18, 1985, Ser. No. 724,771

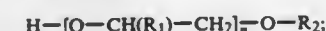
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415045

Int. Cl.<sup>4</sup> G03F 7/10, 7/02

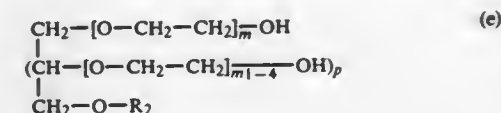
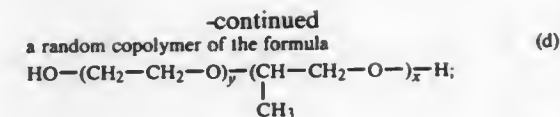
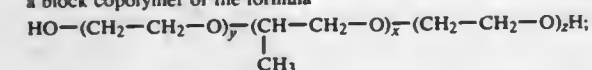
U.S. Cl. 430—306

9 Claims

1. A process for the ozone protection of an imagewise exposed and developed photopolymer flexographic printing plate, having an elastomeric, thermoplastic polymeric binder, which comprises applying to the exposed and developed surface of the flexographic printing plate at least one known liquid polyether of the formulas:



a block copolymer of the formula



wherein

R<sub>1</sub>=H, or methyl

R<sub>2</sub>=H, alkyl or alkylene with C<sub>12</sub>-C<sub>18</sub>, and saturated and unsaturated fatty acid radicals with C<sub>12</sub>-C<sub>18</sub>.

p=1-4

and wherein n, m and m<sub>1-4</sub> and x, y, and z are so selected that the molecular weight ( $\bar{M}_n$ ) of the molecule is about 500 to 5000.

4,680,252

#### SILVER HALIDE LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL FOR RADIOGRAPHIC USE

Akio Suzuki, Takeo Koitabashi, Masatoshi Iwata, Hisashi Yamaguchi, and Syoji Matsuzaka, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

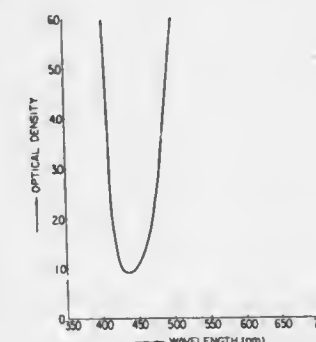
Continuation of Ser. No. 659,857, Oct. 11, 1984, abandoned, which is a continuation of Ser. No. 406,854, Aug. 9, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 757,518

Claims priority, application Japan, Aug. 21, 1981, 56-130215

Int. Cl.<sup>4</sup> G03C 1/02, 1/06, 1/76

U.S. Cl. 430—364

6 Claims



1. A silver halide light-sensitive photographic material for radiographic use comprising a transparent support provided with a silver halide emulsion layer on both sides thereof, said support having a blue light transmission density  $D_S$  and said material having a blue light transmission density  $D_M$ , both before development, whereby  $0.35 \leq D_M - D_S \leq 0.60$ .

4,680,253

#### COLOR PHOTOGRAPHIC MATERIAL

Yoshihiko Shibahara, and Hideto Ikoma, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 25, 1986, Ser. No. 832,707

Claims priority, application Japan, Feb. 26, 1985, 60-37117

Int. Cl.<sup>4</sup> G03C 1/10, 7/26, 1/46

U.S. Cl. 430—504

7 Claims

1. A silver halide color photographic material which comprises a support having coated thereon at least one blue-sensitive silver halide emulsion layer, at least one green-sensitive silver halide emulsion layer and at least one red-sensitive silver halide emulsion layer, characterized in that the gradation of each of the blue-, green- and red-sensitive layers satisfies the following relation:





liquid taken out of said first fermenter is then heated and introduced into a first flash tank for dividing it into a first alcohol-containing vapor and a first separated liquid; the first separated liquid is cooled and part of it is recycled to the first fermenter and the balance is introduced into the second fermenter; the fermentation liquid taken out of the second fermenter is then heated and introduced into a second flash tank for separating it into a second alcohol-containing vapor and a second separated liquid; the second separated liquid is cooled and part of it is recycled to the second fermenter; the same procedure being repeated in the same manner for each fermenter, except for the final fermenter in the series, so that a liquid separated in a given flash tank is cooled and part of it is recycled to the fermenter associated with said given flash tank and the balance is introduced into the next following fermenter to provide the fermentation liquid for the next following fermenter, and wherein in each heating step the portion of the fermentation liquid that is removed from the preceding fermenter is heated to 50° to 80° C., and each flash tank is held under a reduced pressure of 60 to 300 mg Hg absolute.

4,680,264

**CLASS II MOBILIZABLE GRAM-NEGATIVE PLASMID**  
Alfred Publer, Reinhard Simon, and Ursula Priefer, all of Blefeld, Fed. Rep. of Germany, assignors to Lubrizol Genetics, Inc., Boulder, Colo.

Filed Jul. 1, 1983, Ser. No. 510,334

Int. Cl.<sup>4</sup> C12N 15/00, 1/20, 1/00; C07N 17/00

U.S. Cl. 435—172.3 27 Claims

1. A composite DNA plasmid capable of replication in *E. coli* that is mobilizable, not self-transmissible, and having a broad host range that is co-extensive with plasmid RSF1010, comprising:

- a first DNA segment obtained from a plasmid containing a replicon functional in *E. coli*; and
- a second DNA segment having a maximum length of 6 kb, said second DNA segment characterized by a RSF1010 mob-locus operably linked to a RSF1010 replicon.

4,680,265

**METHOD OF SELECTING RECOMBINANT DNA-CONTAINING STREPTOMYCES**

Virginia A. Birmingham, Indianapolis, and Eugene T. Seno, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 25, 1984, Ser. No. 653,975

Int. Cl.<sup>4</sup> C12N 15/00, 1/20, 1/00; C12P 21/00, 21/02, 21/04, 19/34; C12R 1/365, 1/465, 1/485; C07H 21/04

U.S. Cl. 435—172.3 46 Claims

1. A method for selecting a recombinant DNA-containing Streptomyces host cell, said method comprising:

- transforming a tylosin-sensitive, restrictionless Streptomyces host cell with a recombinant DNA cloning vector capable of autonomous replication or integration in said Streptomyces host cell, said vector comprising a DNA sequence that confers resistance to tylosin, and
- culturing said transformed cell under growth conditions suitable for selection for tylosin resistance, subject to the limitation that said host cell is susceptible to transformation, cell division and culture.

4,680,266

**CELL CULTURE CHAMBER WITH MEANS FOR AUTOMATIC REPLENISHMENT OF NUTRIENT**

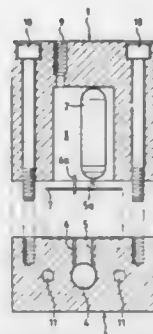
Alexander Tschopp, Zürich, Switzerland; Claudy-Gabrielle Gruenblat-Nordau, Paris, France; Beat Huber, Hombrechtikon, and Augusto Cogoli, Zürich, both of Switzerland, assignors to Contraves AG, Zürich, Switzerland

Filed Nov. 21, 1985, Ser. No. 800,583

Int. Cl.<sup>4</sup> C12M 3/00

U.S. Cl. 435—284

2 Claims



1. An apparatus for performing cell-biological experiments, especially under zero gravity conditions, comprising:

- a housing;
- said housing defining a pump cavity, a cell culture chamber, an inlet passage leading from said pump cavity to said cell culture chamber and an outlet passage leading from said cell culture chamber to said pump cavity;
- an osmotic fluid pump located in said pump cavity and connected to said inlet passage for continuously dispensing a desired cell culture medium from said osmotic fluid pump into said cell culture chamber; and
- said outlet passage serving for removal of expended cell culture medium from said cell culture chamber and return of said expended cell culture medium into said pump cavity.

4,680,267

**FERMENTOR CONTROL SYSTEM**

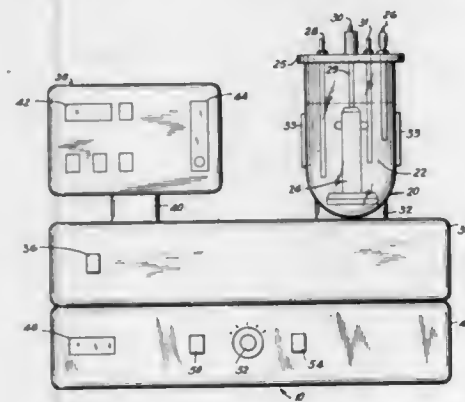
Lee B. Eppstein, New Brunswick; Robert D. Mohler, Bridgewater, and Shaul Reuveny, Highland Park, all of N.J., assignors to New Brunswick Scientific Company, Inc., Edison, N.J.

Filed Mar. 1, 1985, Ser. No. 707,363

Int. Cl.<sup>4</sup> C12M 1/36

U.S. Cl. 435—289

20 Claims



1. An apparatus for controlling a dissolved oxygen and pH of a medium during a bioreaction process in a vessel, comprising: pH sensing means for generating a signal related to the pH of the medium; dissolved oxygen sensing means for generating

a signal related to the dissolved oxygen in the medium; valve means for selectively applying quantities of air, N<sub>2</sub>, O<sub>2</sub> and CO<sub>2</sub> to the medium; and control means for producing a control signal for controlling the operation of the valve means so that a substantially fixed volume of gas consisting of one or more of air, CO<sub>2</sub>, N<sub>2</sub> and O<sub>2</sub> is added to the medium, said control means determining in response to the dissolved oxygen and pH signals the amount of CO<sub>2</sub>, O<sub>2</sub> and/or N<sub>2</sub> required to effect dissolved oxygen and pH correction and calculating from the required amounts the quantities of air, N<sub>2</sub>, O<sub>2</sub> and/or CO<sub>2</sub> to compensate for the displacement of air as a result of the CO<sub>2</sub> added by adding N<sub>2</sub> when the N<sub>2</sub> required is greater than the CO<sub>2</sub> required, and adding O<sub>2</sub> when the amount of N<sub>2</sub> required is less than the amount of CO<sub>2</sub> required; whereby the effect of the CO<sub>2</sub> correction on the dissolved oxygen is substantially minimized.

4,680,268

**IMPLANTABLE GAS-CONTAINING BIOSENSOR AND METHOD FOR MEASURING AN ANALYTE SUCH AS GLUCOSE**

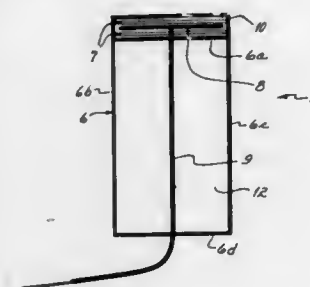
Leland Clark, Jr., Cincinnati, Ohio, assignor to Children's Hospital Medical Center, Cincinnati, Ohio

Filed Sep. 18, 1985, Ser. No. 777,234

Int. Cl.<sup>4</sup> C12M 1/34

U.S. Cl. 435—291

45 Claims



1. A device for sensing a product or reactant of an enzyme reaction with an analyte as a measure of the analyte comprising a gas permeable membrane having opposed sides, an enzyme on one side of said membrane for enzymatic reaction with the analyte in presence of oxygen to provide the product or reactant, a closed container for containing oxygen on the opposite side of said membrane to supply oxygen through said membrane for the enzymatic reaction, and means for sensing the product or reactant as a function of the analyte.

41. A method of sensing a product or reactant of an enzyme reaction with an analyte as a measure of the analyte comprising providing a gas permeable membrane having opposed sides, providing an enzyme on one side of the membrane for enzymatic reaction with the analyte in presence of oxygen to generate the product or reactant, providing a closed container containing oxygen on the opposite side of the membrane to supply oxygen through the membrane for the enzymatic reaction, and sensing the product or reactant which functions as a measure of the analyte.

4,680,269

**METHOD AND APPARATUS FOR PREVENTING CROSS-CONTAMINATION OF BIOCHEMICAL TEST WELLS IN A MICROTITER TEST PLATE**

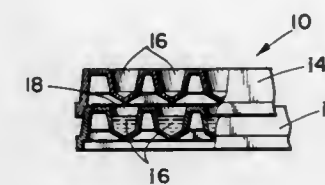
Harry B. Naylor, Lakewood, Colo., assignor to Pasco Laboratories, Inc., Wheatridge, Colo.

Filed Apr. 15, 1985, Ser. No. 723,360

Int. Cl.<sup>4</sup> C12M 1/20

U.S. Cl. 435—301

5 Claims



1. In combination in a test kit for use in evaluating the effectiveness of antibacterial agents to kill pathogenic bacteria, which comprises: a base having a plurality of upwardly-opening wells, a lid fitted to the base and having a cover-forming portion spaced above the wells therein cooperating therewith to confine and define a common atmosphere above the wells, and a porous sheet impregnated with an acidic compound effective to intercept and neutralize alkaline gases evolved in the wells therebeneath when positioned to cover said wells, said lid including means projecting from the underside of said cover-forming portion positioned and adapted to engage said sheet and hold same in substantially sealed relation atop the wells in the base.

4,680,270

**METHOD AND APPARATUS FOR CONDUCTING FLOW ANALYSIS**

Hiroshi Mitsumaki, Nobuyoshi Takano, and Naoya Ono, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

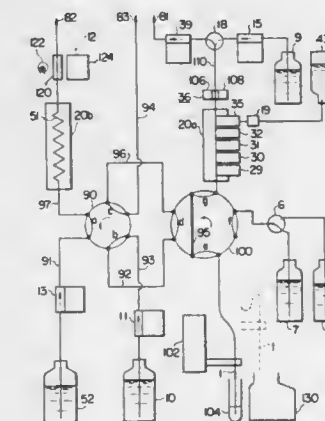
Filed Jun. 29, 1983, Ser. No. 509,050

Claims priority, application Japan, Jul. 2, 1982, 57-113951

Int. Cl.<sup>4</sup> G01N 35/08, 27/40

U.S. Cl. 436—52

15 Claims



1. A method of flow analysis using a switch-valve having a volumetric section and a first analytical detector with at least one ion selective electrode, comprising the steps of: communicating said volumetric section and said first detector, aspirating an undiluted liquid sample through conduits in both said volumetric section and said first detector, switching said switch-valve to force out the undiluted sample within said volumetric section with a diluent, diluting said sample with said diluent while transferring said





4,680,278

## PROCESS FOR PREPARING ALUMINUM NITRIDE POWDER

Hiroshi Inoue, Kawaguchi; Akihiko Tsuge, Yokohama, and Katsutoshi Komeya, Oiso, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1985, Ser. No. 812,012

Claims priority, application Japan, Dec. 24, 1984, 59-270950  
Int. Cl.<sup>4</sup> C04B 35/58

U.S. Cl. 501—98

8 Claims

1. A process for preparing aluminum nitride powder, which comprises mixing (i) aluminum hydroxide powder, (ii) carbon powder or a substance capable of forming carbon powder by heating and (iii) at least one of additives selected from the group consisting of aluminum nitride powder, silicon nitride powder, silicon carbide powder and powder of substances capable of forming the powder corresponding to these powders, and baking the mixture thus obtained in a non-oxidative atmosphere containing nitrogen.

4,680,279

## ABRASION RESISTANT REFRACTORY COMPOSITION

Thomas R. Kleeb, Pittsburgh, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 748,260, Jun. 24, 1985. This application Feb. 24, 1986, Ser. No. 832,915

Int. Cl.<sup>4</sup> C04B 35/18, 7/32

U.S. Cl. 501—124

6 Claims

1. A refractory composition consisting essentially of 0.5 to 5 weight percent volatilized silica; 3.0 to 15 weight percent —65 mesh alumina; 20 to 40 weight percent calcium aluminate cement; and the balance a refractory consisting essentially of a fire clay aggregate.

4,680,280

## SULFUR TOLERANCE OF ZEOLITIC REFORMING CATALYSTS

Sue D. Pandey, Berkeley, and Waldeen C. Buss, Kensington, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 15, 1985, Ser. No. 712,584

Int. Cl.<sup>4</sup> B01J 29/06, 29/12

U.S. Cl. 502—66

16 Claims

1. A reforming catalyst comprising a large-pore zeolite selected from the group consisting of the potassium, sodium, rubidium, or cesium forms of zeolite L and at least one reforming catalytic metal selected from the group consisting of Group VIII noble metals, having enhanced sulfur tolerance achieved by adding at least one desulfurization metal.

2. A catalyst according to claim 1 wherein at least one of said desulfurization metals is selected from the group consisting of the Group VIB metals.

11. A catalyst according to claim 1 wherein said zeolite is impregnated with said desulfurization metal prior to being impregnated with said catalytic metal.

12. A catalyst according to claim 1 wherein said catalyst also comprises an inorganic oxide binder.

4,680,281

PROCESS OF PRODUCING A V<sub>2</sub>O<sub>5</sub>-AND-ALKALI-METAL-SULFATE-CONTAINING CATALYST FOR OXIDIZING SO<sub>2</sub> TO SO<sub>3</sub>

Wolfgang Fennemann, Karben, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 693,089

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401676

Int. Cl.<sup>4</sup> B01J 27/055, 21/08, 23/02, 23/16

U.S. Cl. 502—218

4 Claims

1. A process for producing a catalyst for converting SO<sub>2</sub> to SO<sub>3</sub> which comprises the steps of:

(a) impregnating silica prefabricated carrier bodies with an

impregnating solution which contains 600 to 1100 grams H<sub>2</sub>SO<sub>4</sub> and 140 to 830 grams V<sub>2</sub>O<sub>5</sub> and alkali metal sulfate per liter at a temperature between 60° C. and the boiling temperature of the impregnating solution;

(b) drying the impregnated carrier bodies with agitation at a temperature of up to 700° C. to form a V<sub>2</sub>O<sub>5</sub> and alkali metal sulfate catalyst; and

(c) activating said V<sub>2</sub>O<sub>5</sub> and alkali metal sulfate catalyst by heating it under oxidizing conditions at a temperature of 750° to 900° C. for 5 to 120 minutes in counterflow to an oxidizing gas atmosphere.

4,680,282

## POLLUTION CONTROL CATALYST FOR INTERNAL COMBUSTION ENGINE EXHAUST GASES AND PROCESS FOR PRODUCING IT

Gilbert Blanchard, Le Plessis-Belleville, and Michel Prigent, Ruell Malmaison, both of France, assignors to Pro-Catalyse, Ruell Malmaison, France

Filed Jul. 30, 1985, Ser. No. 760,575

Claims priority, application France, Jul. 30, 1984, 84 12047  
Int. Cl.<sup>4</sup> B01J 21/06, 23/10, 23/44, 23/46

U.S. Cl. 502—304

23 Claims

1. A catalyst adapted for the treatment of internal combustion engine exhaust gases, which comprises (1) a support having (2) an active catalytic phase deposited thereon, said active catalytic phase comprising catalytically effective amounts of (i) zirconium, (ii) cerium, (iii) palladium, and (iv) at least one of the metals iridium and rhodium, said catalyst being produced by a process comprising (i) coating said support with a mixture of an alumina binder and an alumina filler, (ii) drying and calcinating said coated support, (iii) depositing cerium and zirconium on the support resulting from step (ii), (iv) drying and calcinating the support, (v) depositing palladium and iridium and/or rhodium on the carrier resulting from step (iv), and (vi) drying and calcinating the deposited carrier.

4,680,283

## ANALOGS OF SUBSTANCE P AND ELEDOISIN

Daniel F. Veber, Ambler, and Roger Freidinger, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 852,479, Apr. 16, 1986, which is a continuation of Ser. No. 654,432, Sep. 26, 1984. This

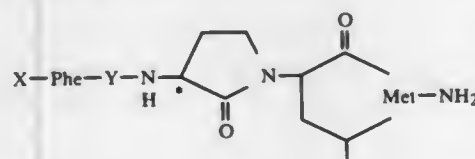
application Aug. 20, 1986, Ser. No. 898,274

Int. Cl.<sup>4</sup> A61K 37/02; C07K 7/02, 5/08, 5/10

U.S. Cl. 514—17

12 Claims

1. A compound of structural formula:



wherein

X is <Glu, <Glu-Gln, Ac-Ala, Ac-Phe, or Ac; and  
Y is Phe, N-Me-Phe, Ile, Val or Tyr.

4,680,284

## MODIFIED PHENYLALANINE PEPTIDYLAMINODIOLS

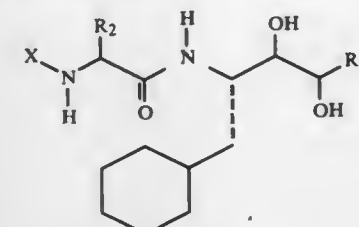
Jay R. Luly; Jacob J. Plattner, both of Libertyville, and Anthony K. Fung, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 693,951, Jan. 23, 1985, abandoned. This application Jan. 16, 1986, Ser. No. 818,714  
Int. Cl.<sup>4</sup> A61K 37/02; C07K 5/08; C07D 217/22, 217/00; C07C 103/00, 103/20

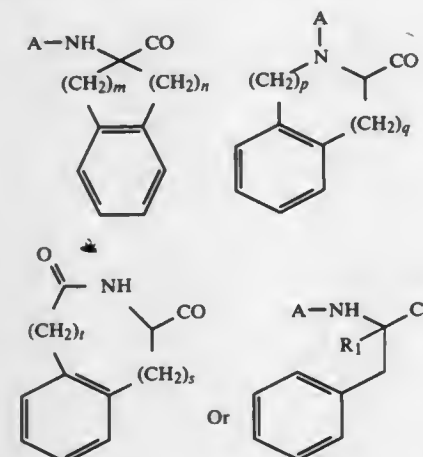
U.S. Cl. 514—18

9 Claims

1. A renin inhibiting compound of the formula:



wherein R<sub>2</sub> is loweralkyl or arylalkyl; R<sub>3</sub> is loweralkyl; X is



wherein A is hydrogen or an N-protecting group, R<sub>1</sub> is loweralkyl or arylalkyl, M is 1-3, m is 1-3, p is 1-3, q is 1-3, s is 1-3, and t is 0-2 and pharmaceutically acceptable salts thereof.

4,680,285

## TREATMENT OF MALIGNANT TUMORS WITH 2-(β-D-RIBOFURANOSYLTHIAZOLE-4-CARBOXAMIDE) RELATED COMPOUNDS

Roland K. Robins, Provo, Utah, assignor to Viratek, Inc., Costa Mesa, Calif.

Continuation of Ser. No. 631,931, Jul. 18, 1984, abandoned, which is a continuation of Ser. No. 324,455, Nov. 24, 1981, abandoned, which is a continuation-in-part of Ser. No. 216,197, Dec. 15, 1980, abandoned. This application Feb. 27, 1985, Ser. No. 706,084

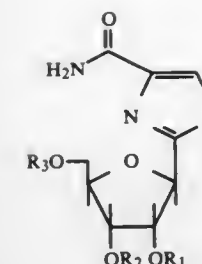
Int. Cl.<sup>4</sup> A61K 31/70; C07H 5/00

U.S. Cl. 514—23

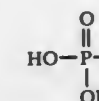
16 Claims

1. A method of treating tumors in warm blooded animals comprising:

administering to said warm blooded animals an effective amount of a pharmaceutical composition containing as the active component at least about 0.1 percent by weight, based on the total weight of the composition, a compound of the structure:



wherein R<sub>1</sub> and R<sub>2</sub> are H or C<sub>1</sub>-C<sub>18</sub> acyl and R<sub>3</sub> is H, C<sub>1</sub>-C<sub>18</sub> acyl or



and physiologically acceptable salts thereof.

4,680,286

## USE OF SELENIUM-CONTAINING COMPOUNDS FOR NEGATING THE TOXIC EFFECTS OF GOLD COMPOUNDS USED IN THE TREATMENT OF RHEUMATOID ARTHRITIS, AND A NOVEL SELENIUM-CONTAINING GOLD COMPOUND AND USE THEREOF AS AN ANTI-RHEUMATOID ARTHRITIS MEDICINE

Richard F. Stockel, 457 Rolling Hills Rd., Bridgewater, N.J. 08807, and Phillip E. Dumas, 137 Louise Dr., Morrisville, Pa. 19067

PCT No. PCT/US83/01239, § 371 Date Apr. 9, 1985, § 102(e) Date Apr. 9, 1985

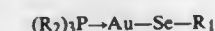
Continuation-in-part of Ser. No. 347,708, Feb. 11, 1982, abandoned. This PCT application Aug. 10, 1983, Ser. No. 735,424

Int. Cl.<sup>4</sup> A61K 31/70; C07H 23/00

U.S. Cl. 514—23

5 Claims

1. A selenium-containing gold compound having the general formula:



(1)

wherein

R<sub>1</sub> stands for an unsubstituted or substituted glucose radical, an unsubstituted or substituted malic acid radical, an unsubstituted or substituted malate radical, or an unsubstituted or substituted phenylcarbamoylmethyl radical; and

R<sub>2</sub> stands for a linear or branched alkyl group having 1 to 4 carbon atoms.

4,680,287

## N-GLYCOSYLATED CARBOXAMIDE DERIVATIVES AS GROWTH-PROMOTERS IN LIVESTOCK FEEDING

Oswald Lockhoff, Cologne; Peter Stadler, Haan; Martin Scheer, Wuppertal; Friedrich Berschauer, Wuppertal, and Anno de Jong, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,241

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1983, 3339694

Int. Cl.<sup>4</sup> A61K 31/70

U.S. Cl. 514—42

6 Claims

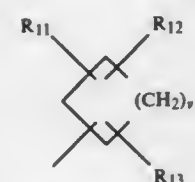
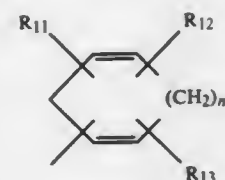
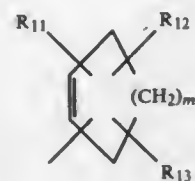
1. A method of promoting the growth of animals which comprises administering to such animals a growth promoting effective amount of a compound of the formula





wherein

R<sub>10</sub> is alkyl (C<sub>1-12</sub>), alkenyl (C<sub>3-12</sub>), alkynyl (C<sub>3-12</sub>) cycloalkyl (C<sub>3-8</sub>)alkyl (C<sub>1-6</sub>), phenylalkyl (C<sub>7-12</sub>), phenyl, phenylalkoxy (C<sub>7-16</sub>), or aminoalkyl (C<sub>1-12</sub>);  
(iv) a radical of formula IIIc, IIId or IIIe,

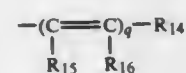


wherein

R<sub>11</sub>, R<sub>12</sub> and R<sub>13</sub>, independently, are hydrogen or lower alkyl,

m is a whole number from 0 to 4,  
n is a whole number from 0 to 3, and  
v is a whole number from 0 to 5,

(v) a radical of formula IIIf,

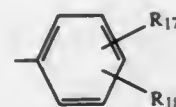


wherein

R<sub>14</sub> is lower alkyl, alkoxy (C<sub>1-12</sub>)carbonyl, alkenyl (C<sub>3-12</sub>), alkynyl (C<sub>3-12</sub>), phenylalkyl (C<sub>7-12</sub>) or phenyl,  
R<sub>15</sub> and R<sub>16</sub>, independently, are hydrogen or lower alkyl, and

q is a whole number from 0 to 5, or

(vi) a radical of formula IIIg



wherein

R<sub>17</sub> and R<sub>18</sub>, independently, are hydrogen, halogen of atomic number from 9 to 53, trifluoromethyl, hydroxy, nitro, lower alkyl or lower alkoxy, with the general proviso that R<sub>1</sub> is not a radical of formula IIa when R<sub>6</sub> is a radical of formula IIIg or phenyl or phenylalkyl,

(b) R<sub>1</sub> is a radical of formula IIa to IIe, as defined above, R<sub>2</sub>, R<sub>5</sub> and R<sub>6</sub> are as defined above, and R<sub>3</sub> and R<sub>4</sub> together are -(CH<sub>2</sub>)<sub>u</sub>- wherein u is a whole number from 1 to 8.

or a chemotherapeutically acceptable salt thereof.

8. The compound according to claim 1 which is 4-[N-methyl-N-(1-naphthylmethyl)]aminocrotonic acid ethyl ester.

# 4,680,292 CARBAPENEMS AND 1-METHYLCARBAPENEMS HAVING A 2-HETEROARYLIUMALIPHATIC SUBSTITUENT

Burton G. Christensen, Cliffside; Thomas N. Salzmann, North Plainfield, and James V. Heck, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

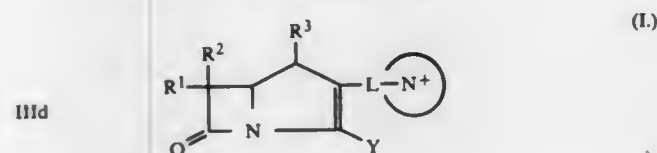
Filed Dec. 13, 1984, Ser. No. 681,180

Int. Cl.<sup>4</sup> C07D 487/04; A61K 31/40

U.S. Cl. 514-210

26 Claims

1. A compound having the formula:



wherein:

R<sup>3</sup> is hydrogen or methyl;  
R<sub>1</sub> and R<sub>2</sub> are independently H, CH<sub>3</sub>, CH<sub>3</sub>CH<sub>2</sub>-, (CH<sub>3</sub>)<sub>2</sub>CH-, HOCH<sub>2</sub>, CH<sub>3</sub>CH(OH)-, (CH<sub>3</sub>)<sub>2</sub>C(OH)-, FCH<sub>2</sub>-, F<sub>2</sub>CH-, F<sub>3</sub>C-, CH<sub>3</sub>CH(F)-, CH<sub>3</sub>CF<sub>2</sub>-, or (CH<sub>3</sub>)<sub>2</sub>C(F)-;

wherein



is a quaternary, monocyclic or bicyclic, substituted or unsubstituted heteroaryl group containing (a) when monocyclic, up to 3 heteroatoms and up to 6 total ring atoms or (b) when bicyclic up to 5 heteroatoms and 9-10 ring atoms, which is optionally substituted by one or more of the groups independently selected from

(1) a substituted or unsubstituted C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>2</sub>-C<sub>6</sub> alkenyl, C<sub>5</sub>-C<sub>7</sub> cycloalkenyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl, or (C<sub>3</sub>-C<sub>7</sub> cycloalkyl)methyl;

(2) a substituted or unsubstituted C<sub>3</sub>-C<sub>7</sub> heterocycloalkyl or (C<sub>3</sub>-C<sub>7</sub> heterocycloalkyl)methyl having up to 3 hetero ring atoms;

(3) an unsubstituted or substituted phenyl or heteroaryl radical;

(4) an unsubstituted or substituted phenyl (C<sub>1</sub>-C<sub>4</sub> alkyl) or heteroaryl (C<sub>1</sub>-C<sub>4</sub> alkyl) radical;

(5) a trifluoromethyl or pentafluoroethyl group;

(6) a halogen atom;

(7) an unsubstituted or substituted C<sub>1</sub>-C<sub>4</sub> alkoxy radical;

(8) a hydroxyl group;

(9) an unsubstituted or substituted (C<sub>1</sub>-C<sub>6</sub> alkyl) carbonyloxy radical;

(10) a carbamoyloxy radical which is unsubstituted, monosubstituted or disubstituted on the nitrogen with a C<sub>1</sub>-C<sub>4</sub> alkyl group;

(11) a C<sub>1</sub>-C<sub>6</sub> alkylthio radical, C<sub>1</sub>-C<sub>6</sub> alkylsulfinyl radical or a C<sub>1</sub>-C<sub>6</sub> alkylsulfonyl radical each of which is unsubstituted or substituted in the alkyl group;

(12) a sulfo group;

(13) a sulfamoyl group which is unsubstituted, monosubstituted, or disubstituted on nitrogen with a C<sub>1</sub>-C<sub>4</sub> alkyl group;

(14) an amino group;

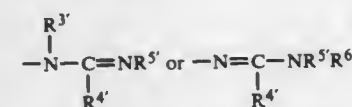
(15) a mono(C<sub>1</sub>-C<sub>4</sub> alkyl) amino or di(C<sub>1</sub>-C<sub>4</sub> alkyl) amino radical each of which is unsubstituted or substituted in the alkyl group;

(16) a formylamino group;

(17) an unsubstituted or substituted (C<sub>1</sub>-C<sub>6</sub> alkyl) carbonylamino radical;

(18) a (C<sub>1</sub>-C<sub>4</sub> alkoxy) carbonylamino radical;

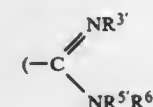
- (19) a ureido group in which the terminal nitrogen atom is unsubstituted or monosubstituted with a C<sub>1</sub>-C<sub>6</sub> alkyl group;  
(20) an arylsulfonamido or (C<sub>1</sub>-C<sub>6</sub> alkyl) sulfonamido group;  
(21) a cyano group;  
(22) a formyl or acetalized formyl radical;  
(23) an unsubstituted or substituted (C<sub>1</sub>-C<sub>6</sub> alkyl) carbonyl radical wherein the carbonyl group is free or acetalized;  
(24) an unsubstituted or substituted phenylcarbonyl or heteroarylcarbonyl radical;  
(25) a hydroxyiminomethyl radical in which the oxygen or carbon atom is optionally substituted by a C<sub>1</sub>-C<sub>4</sub> alkyl group;  
(26) a carboxyl group;  
(26a) a 5-tetrazolyl group;  
(27) a (C<sub>1</sub>-C<sub>6</sub> alkoxy) carbonyl radical;  
(28) a carbamoyl radical which is unsubstituted, monosubstituted, or disubstituted on the nitrogen atom with a C<sub>1</sub>-C<sub>4</sub> alkyl group;  
(29) a N-hydroxy carbamoyl or N-(C<sub>1</sub>-C<sub>4</sub> alkoxy) carbamoyl radical in which the nitrogen atom may be additionally substituted by a C<sub>1</sub>-C<sub>4</sub> alkyl group;  
(30) a thiocarbamoyl group;  
(31) an amidino group



wherein R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup> are hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, or wherein two of the groups together form a C<sub>3</sub>-C<sub>6</sub> alkylidene radical optionally interrupted by a heteroatom and joined to either one or two nitrogen atoms to form a ring;

(32) a guanidino group in which R<sup>4</sup> above is NR<sup>5</sup>R<sup>6</sup>;

(33) a carbamimidoyl group



wherein R<sup>3</sup>, R<sup>5</sup> and R<sup>6</sup> are as defined above;

- (34) a cyano (C<sub>1</sub>-C<sub>4</sub> alkyl) radical;  
(35) a carboxy (C<sub>1</sub>-C<sub>4</sub> alkyl) radical;  
(36) a sulfo (C<sub>1</sub>-C<sub>4</sub> alkyl) radical;  
(37) a carbamoyl (C<sub>1</sub>-C<sub>4</sub> alkyl) radical;  
(38) a hydroxy (C<sub>1</sub>-C<sub>4</sub> alkyl) radical;  
(39) an amino (C<sub>1</sub>-C<sub>6</sub> alkyl) radical which is unsubstituted, monosubstituted, or disubstituted on the nitrogen atom with C<sub>1</sub>-C<sub>4</sub> alkyl groups; and  
(40) a 5-tetrazolyl (C<sub>1</sub>-C<sub>4</sub> alkyl) radical;  
wherein the substituents in groups (7), (9), (11), (15), (17), (23), and (24) are selected from hydroxy, C<sub>1</sub>-C<sub>4</sub>alkoxy, mercapto, amino, mono- or di(C<sub>1</sub>-C<sub>4</sub>alkyl)amino, cyano, halo, CF<sub>3</sub>, COOH, sulfo, carbamoyl, and sulfamoyl, and wherein the substituents in groups (1)-(4) are selected from those defined in groups (5)-(33).

L is a bridging group comprising substituted or unsubstituted C<sub>1</sub>-C<sub>4</sub> straight, C<sub>2</sub>-C<sub>6</sub> branched or C<sub>3</sub>-C<sub>7</sub> cycloalkyl groups wherein the substituents are selected from C<sub>1</sub>-C<sub>6</sub> alkyl, O-C<sub>1</sub>-C<sub>6</sub> alkyl, S-C<sub>1</sub>-C<sub>6</sub> alkyl, CF<sub>3</sub>, N(C<sub>1</sub>-C<sub>6</sub> alkyl)<sub>2</sub>;

Y is

- (i) -COOH, a pharmaceutically acceptable ester or salt thereof;  
(ii) COOR wherein R is a removeable carboxy protecting group, e.g., p-nitrobenzyl, o-nitrobenzyl, benzyl, or allyl;  
(iii) COOM wherein M is an alkali metal; or

(iv) COO<sup>-</sup> provided that when Y is other than (iv) a counterion Z<sup>-</sup> is present.

4,680,293

# 3-IMIDAZOLYLALKYL-, TRIAZOLYLALKYL-, PYRIDINYLALKYL-1,2,3-BENZOTRIAZIN-4(3H)-ONES AND DERIVATIVES THEREOF

William B. Wright, Jr.; Andrew S. Tomcufcik, both of Bergen, N.J., and Joseph W. Marsico, Jr., Rockland, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

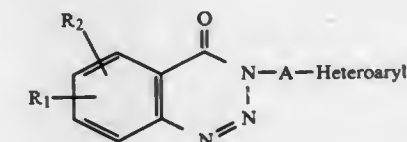
Filed Mar. 3, 1986, Ser. No. 835,501

Int. Cl.<sup>4</sup> A61K 31/53; C07D 253/08

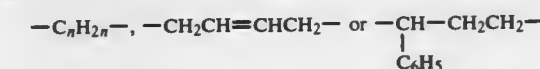
U.S. Cl. 514-243

20 Claims

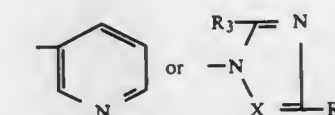
1. A compound selected from the group consisting of those of the formula:



wherein A is a divalent moiety of the formula:

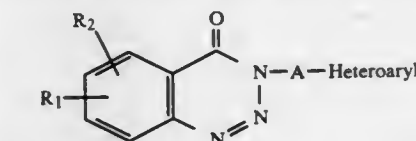


wherein n is an integer from 3 to 10, inclusive; R<sub>1</sub> and R<sub>2</sub> may be the same or different and may be selected from the group consisting of hydrogen, halogen, trifluoromethyl, alkoxy having from one to four carbon atoms, alkyl having from one to four carbon atoms, nitro and amino; wherein Heteroaryl is

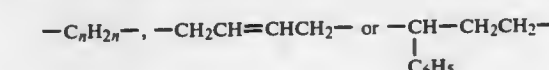


wherein R<sub>3</sub> and R<sub>4</sub> may be hydrogen, alkyl having from one to four carbon atoms or phenyl and X is CH or N; together with the pharmaceutically acceptable salts thereof.

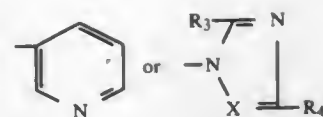
14. A method of inhibiting thromboxane synthetase enzyme in a mammal which comprises administering internally to said mammal a thromboxane synthetase enzyme inhibiting amount of a compound selected from those of the formula:



wherein A is a divalent moiety of the formula:



wherein n is an integer from 3 to 10, inclusive; R<sub>1</sub> and R<sub>2</sub> may be the same or different and may be selected from the group consisting of hydrogen, halogen, trifluoromethyl, alkoxy having from one to four carbon atoms, alkyl having from one to four carbon atoms, nitro and amino; wherein Heteroaryl is



wherein  $R_3$  and  $R_4$  may be hydrogen, alkyl having from one to four carbon atoms or phenyl and  $X$  is  $CH$  or  $N$ ; together with the pharmaceutically acceptable salts thereof.

#### 4,680,294 PESTICIDAL NOVEL NITROMETHYLENE DERIVATIVES

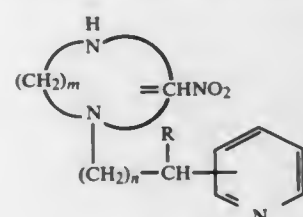
Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Shinzo Kagabu, Tokyo, and Koichi Moriya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Division of Ser. No. 699,756, Feb. 8, 1985. This application Feb. 5, 1986, Ser. No. 826,433

Claims priority, application Japan, Feb. 16, 1984, 59-26020  
Int. Cl.<sup>4</sup> A61K 31/395, 31/44; C07D 401/06

U.S. Cl. 514-256 6 Claims

1. A nitromethylene derivative of the formula



in which

$R$  is a hydrogen atom or a lower alkyl group,  
 $m$  is 3 or 4, and  
 $n$  is 0, 1, 2 or 3,

or an insecticidally mitocidally or nematocidally effective salt thereof.

5. A method of combating insects, mites or nematodes which comprises applying thereto or to a habitat thereof an insecticidally, mitocidally or nematocidally effective amount of a nitromethylene derivative or salt thereof according to claim 1.

#### 4,680,295 OCTAHYDROPYRIDO[1,2-C]PYRIMIDINONES AND HEXAHYDROPYRIDO[1,2-C]PYRIMIDINEDIONES

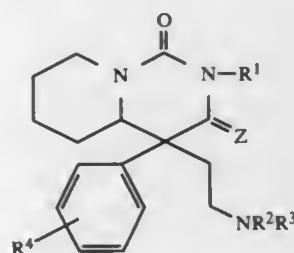
Kerry W. Fowler, Chicago, and Robert J. Chorvat, Lake Bluff, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Feb. 3, 1986, Ser. No. 825,723

Int. Cl.<sup>4</sup> C07D 471/04; A61K 31/505

U.S. Cl. 514-258

1. A compound of the formula:



and pharmaceutically acceptable acid addition salts, wherein  $R^1$  is:

- (a) hydrogen;
- (b)  $C_1$ - $C_6$  alkyl;

- (c)  $C_2$ - $C_6$  hydroxyalkyl; or
- (d)  $-(CH_2)_n-Y$ ,  
wherein  
 $n$  is 1 or 2;  
 $Y$  is:  
(a)  $C_5$ - $C_8$  cycloalkyl; or  
(b)

- (a)  $C_5$ - $C_8$  cycloalkyl; or



wherein  
 $R_5$  and  $R_6$  independently are:

- (a) hydrogen;
- (b)  $C_1$ - $C_6$  alkyl;
- (c)  $C_1$ - $C_6$  alkoxy; or
- (d) halogen;

$R^2$  and  $R^3$  are independently  $C_1$ - $C_6$  alkyl;  
 $R^4$  is:

- (a) hydrogen;
- (b)  $C_1$ - $C_6$  alkyl;
- (c)  $C_1$ - $C_6$  alkoxy;
- (d) halogen; or
- (e) phenyl; and

$Z$  is  $=O$  or  $=N-R^7$ ,

wherein

- $R^7$  is:  
(a) hydrogen; or  
(b)  $C_2$ - $C_6$  alkanoyl.

26. A method for treating cardiac arrhythmia in mammals comprising administering a therapeutically effective amount of at least one compound of claim 1 to a mammal in need of such treatment.

#### 4,680,296 PIPERIDINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Philippe Manoury, Verrieres le Buisson; Jean Binet, Breuillet, and Elisabeth Dewitte, St Gratien, all of France, assignors to Synthelabo, Paris, France

Filed Oct. 15, 1985, Ser. No. 787,971

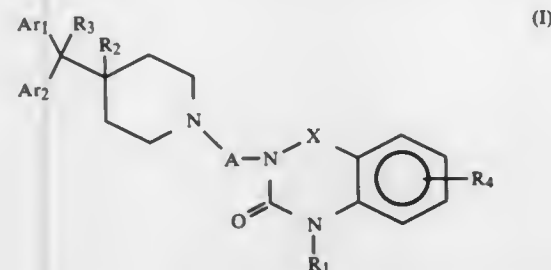
Claims priority, application France, Oct. 16, 1984, 84 15847;  
Jul. 10, 1985, 85 10533; Jul. 10, 1985, 85 10534; Jul. 10, 1985, 85 10535

Int. Cl.<sup>4</sup> A61K 31/505; C07D 401/04

U.S. Cl. 514-259

5 Claims

1. Piperidine derivatives which are compounds of formula (I)



wherein  $Ar_1$  and  $Ar_2$  independently represent a phenyl group optionally substituted by a halogen atom, a thienyl group or a pyridinyl group,  $A$  represents an alkylene group of 2 to 6 carbon atoms,  $X$  represents a CO group or a bond,  $R_1$  represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, either  $R_2$  represents a hydrogen atom and  $R_3$  represents a hydrogen atom or a hydroxy group, or  $R_2$  and  $R_3$  together

represent a bond, and  $R_4$  represents a hydrogen or halogen atom, or pharmaceutically acceptable acid addition salts thereof.

5. A pharmaceutical composition which contains, as active ingredient, an effective amount of a piperidine derivative as claimed in claim 1 in association with a pharmaceutically acceptable excipient.

#### 4,680,297 TRICYCLIC POSITIVE INOTROPIC AGENTS

David J. Blythin, N. Caldwell, and Robert W. Watkins, Bloomfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

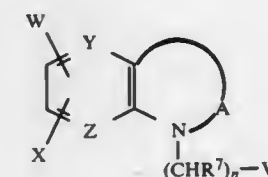
Continuation of Ser. No. 513,544, Jul. 14, 1983, abandoned. This application Jun. 20, 1985, Ser. No. 746,914

Int. Cl.<sup>4</sup> A61K 31/50, 31/495, 31/44

U.S. Cl. 514-293

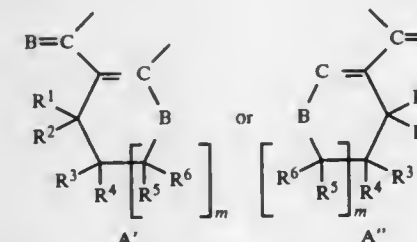
21 Claims

1. A method for increasing cardiac contractility in a mammal which method comprises administering to said mammal a positive inotropic effective amount of a compound having the structural formula I



wherein:

$A$  is



$B$  is independently oxygen or sulfur;

$R^1$ - $R^6$  may be the same or different and are hydrogen or alkyl having from 1 to 6 carbon atoms;

$m$  is 0 or 1, provided that, when  $m$  is 0,  $R^2$  and  $R^4$  may be joined to form a carbon to carbon bond;

$n$  is 0, 1 or 2;

$W$  and  $X$  may be the same or different and are hydrogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, halogen, trifluoromethyl, nitro, cyano, carboxy, hydroxy, alkenyloxy having from 3 to 8 carbon atoms, alkenyloxy having from 3 to 8 carbon atoms, cycloalkyl having from 4 to 8 carbon atoms,  $S(O)_p$  wherein  $p$  is 0, 1 or 2 and  $R^a$  is alkyl having from 1 to 6 carbon atoms, or phenoxy wherein the benzene ring may be substituted with any of the other substituents  $W$  and  $X$ ;  $Y$  and  $Z$  may be the same or different and are  $CH$  or  $N$ ;  $V$  is phenyl, naphthyl, indenyl, indanyl, pyridyl, pyrimidinyl, thienyl, furyl or thiazolyl, any of which may be substituted with  $W$  and  $X$  as defined herein; and  $R^7$  is independently hydrogen or alkyl having from 1 to 6 carbon atoms.

#### 4,680,298 TRICYCLIC ANTI-ALLERGY AND USE AS ANTI-INFLAMMATORY AGENTS

David J. Blythin, North Caldwell, N.J., assignor to Schering Corporation, Kenilworth, N.J.

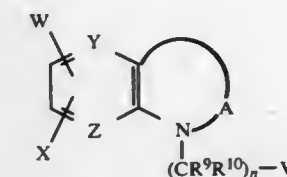
Continuation-in-part of Ser. No. 499,584, May 31, 1983. This application Apr. 9, 1984, Ser. No. 597,887

Int. Cl.<sup>4</sup> A61K 31/495, 31/435; C07D 491/00, 455/04

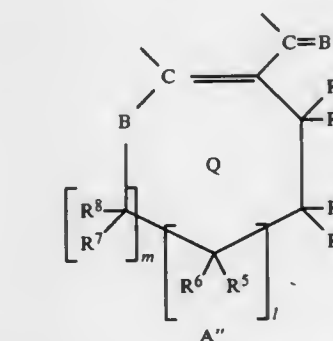
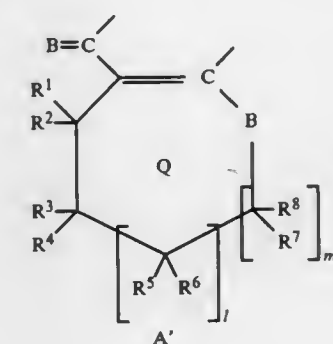
U.S. Cl. 514-293

47 Claims

1. A compound having the structural formula I



or pharmaceutically acceptable salts thereof, wherein  $A$  is



$B$  is independently oxygen or sulfur;  $R^1$ - $R^8$  may be the same or different and are hydrogen or alkyl having from 1 to 6 carbon atoms and two adjacent  $R^1$ - $R^8$  substituents may be combined to form an additional carbon to carbon bond;

$l$  and  $m$  may be the same or different and are 0 or 1;

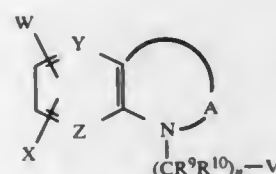
the ring labeled,  $Q$ , may optionally contain up to two additional double bonds;  $n$  is 0, 1 and 2;

$W$  and  $X$  may be the same or different and are hydrogen, hydroxy, alkyl having from 1 to 6 carbon atoms, halogen, nitro, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, cyano, cycloalkyl having from 3 to 7 carbon atoms, alkenyloxy having from 3 to 6 carbon atoms,  $S(O)_p$  wherein  $p$  is 0, 1 or 2 and  $R^a$  is alkyl having from 1 to 6 carbon atoms,  $NHSO_2R^a$  {wherein  $R^a$  is as defined herein},  $NHSO_2CF_3$ ,  $NHCOCF_3$ ,  $SO_2NH_2$ ,  $COR^b$  {wherein  $R^b$  is  $OH$ ,  $NH_2$  or  $OR^c$  (wherein  $R^c$  is as defined herein)},  $O-D-COR^b$  {wherein  $D$  is alkylene having from 1 to 4 carbon atoms and  $R^b$  is as defined herein}, or  $NHCOR^c$  {wherein  $R^c$  is hydrogen, alkyl having from 1 to

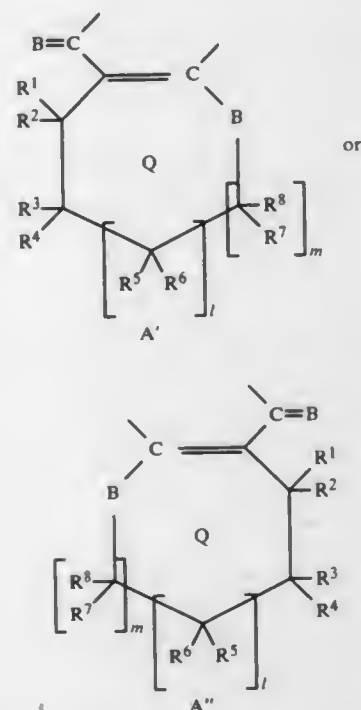


6 carbon atoms, alkoxy having from 1 to 6 carbon atoms,  $\text{COR}^d$  (wherein  $\text{R}^d$  is hydroxy or alkoxy having from 1 to 6 carbon atoms) or  $\text{NHR}^e$  (wherein  $\text{R}^e$  is hydrogen or alkyl having from 1 to 6 carbon atoms), or phenoxy {wherein the benzene ring may be substituted with any of the other substituents W and X}; Y and Z may be the same or different and are CH or N; V is phenyl, naphthyl, indenyl, indanyl, pyridyl, pyrimidinyl, thienyl, furyl or thiazolyl, any of which may be substituted with W and X as defined herein;  $\text{R}^9$  and  $\text{R}^{10}$  are independently hydrogen or alkyl having from 1 to 6 carbon atoms; and 2'-methylpyrano-5',6':3,4-(1-phenyl-2-2-oxo-1,2-dihydroquinoline) is excluded.

23. A pharmaceutical composition for treating allergic reactions which comprises a compound having the structural formula I



or pharmaceutically acceptable salts thereof, in combination with a pharmaceutically acceptable carrier, wherein A is



B is independently oxygen or sulfur;  $\text{R}^1$ - $\text{R}^8$  may be the same or different and are hydrogen or alkyl having from 1 to 6 carbon atoms and two adjacent  $\text{R}^1$ - $\text{R}^8$  substituents may be combined to form an additional carbon to carbon bond; l and m may be the same or different and are 0 or one; the ring labeled, Q, may optionally contain up to two additional double bonds; n is 0, 1 and 2; W and X may be the same or different and are hydrogen, hydroxy, alkyl having from 1 to 6 carbon atoms, halogen, nitro, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, cyano, cycloalkyl having from 3 to 7 carbon atoms, alkenyloxy having from 3 to 6 carbon atoms,

alkenyloxy having from 3 to 6 carbon atoms,  $\text{S(O)}_p\text{R}^a$  {wherein p is 0, 1 or 2 and  $\text{R}^a$  is alkyl having from 1 to 6 carbon atoms},  $\text{NHSO}_2\text{R}^a$  {wherein  $\text{R}^a$  is as defined herein},  $\text{NHSO}_2\text{CF}_3$ ,  $\text{NHCOCF}_3$ ,  $\text{SO}_2\text{NH}_2$ ,  $\text{COR}^b$  {wherein  $\text{R}^b$  is OH,  $\text{NH}_2$  or  $\text{OR}^c$  (wherein  $\text{R}^c$  is as defined herein)},  $\text{O-D-COR}^b$  {wherein D is alkylene having from 1 to 4 carbon atoms and  $\text{R}^b$  is as defined herein},  $\text{NHCOR}^c$  {wherein  $\text{R}^c$  is hydrogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms,  $\text{COR}^d$  (wherein  $\text{R}^d$  is hydroxy or alkoxy having from 1 to 6 carbon atoms) or  $\text{NHR}^e$  (wherein  $\text{R}^e$  is hydrogen or alkyl having from 1 to 6 carbon atoms)}, or phenoxy {wherein the benzene ring may be substituted with any of the other substituents W and X};

Y and Z may be the same or different and are CH or N; V is phenyl, naphthyl, indenyl, indanyl, pyridyl, pyrimidinyl, thienyl, furyl or thiazolyl, any of which may be substituted with W and X as defined herein; and  $\text{R}^9$  and  $\text{R}^{10}$  are independently hydrogen or alkyl having from 1 to 6 carbon atoms.

4,680,299

# 2-PHENYL-4-QUINOLINECARBOXYLIC ACIDS AND PHARMACEUTICAL COMPOSITIONS THEREOF

David P. Hesson, Wilmington, Del., assignor to E.I. Du Pont de Nemours and Company, Wilmington, Del.

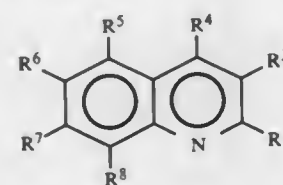
Continuation-in-part of Ser. No. 605,104, Apr. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 516,319, Jul. 22, 1983, abandoned. This application Apr. 26, 1985, Ser. No. 727,808

Int. Cl. C07D 409/04, 215/16; A61K 31/47

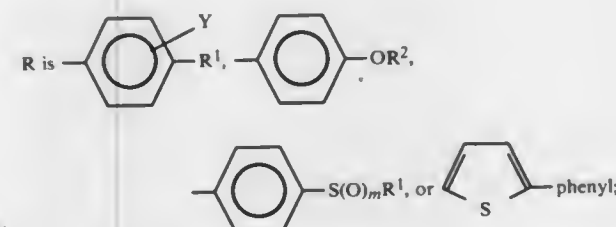
U.S. Cl. 514-311

22 Claims

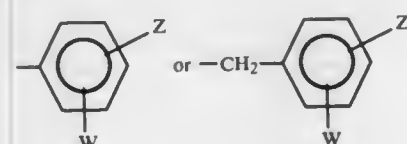
1. A compound having the formula:



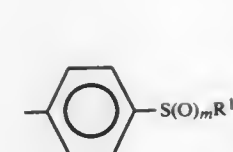
wherein



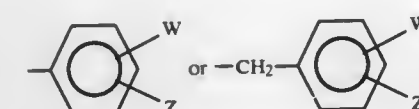
$\text{R}^1$  is cyclohexyl,



when R is



$\text{R}^1$  can be in addition alkyl of 3-4 carbon atoms;  $\text{R}^2$  is



$\text{R}^3$  is H, alkoxy of 1-3 carbon atoms, or alkyl of 1-2 carbon atoms;

$\text{R}^4$  is  $\text{CO}_2\text{H}$  or  $\text{CO}_2\text{R}^{11}$ ;

$\text{R}^5$ ,  $\text{R}^6$ ,  $\text{R}^7$  and  $\text{R}^8$  are independently H, F, Cl, Br, I,  $\text{CH}_3$ ,  $\text{CF}_3$ ,  $\text{SCH}_3$  or  $\text{CH}_2\text{CH}_3$ , at least two of  $\text{R}^5$ ,  $\text{R}^6$ ,  $\text{R}^7$ , and  $\text{R}^8$  being H;

$\text{R}^9$  and  $\text{R}^{10}$  are independently H or alkyl of 1 to 3 carbon atoms;

$\text{R}^{11}$  is  $(\text{CH}_2)_2\text{NR}^9\text{R}^{10}$ ;

W, Y and Z are independently H, F, Cl, Br, alkyl of 1-5 carbon atoms,  $\text{NO}_2$ , OH,  $\text{CF}_3$  or  $\text{OCH}_3$ ;

m is 0 or 1; or

a pharmaceutically suitable salt thereof;

with the following provisos:

(1) when  $\text{R}^4$  is  $\text{CO}_2\text{H}$ ,  $\text{R}^1$  is phenyl or phenoxy, and  $\text{R}^5$ ,  $\text{R}^7$  and  $\text{R}^8$  are H,  $\text{R}^6$  cannot be Br;

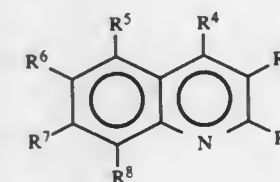
(2)  $\text{R}^5$ ,  $\text{R}^6$  and  $\text{R}^7$  cannot all be H;

(3) when  $\text{R}^4$  is  $\text{CO}_2\text{CH}_2\text{CH}_2\text{N}(\text{CH}_3)_2$ ,  $\text{R}^6$  is  $\text{CH}_2\text{CH}_3$ , or  $\text{R}^7$  is Cl,  $\text{R}^1$  cannot be cyclohexyl;

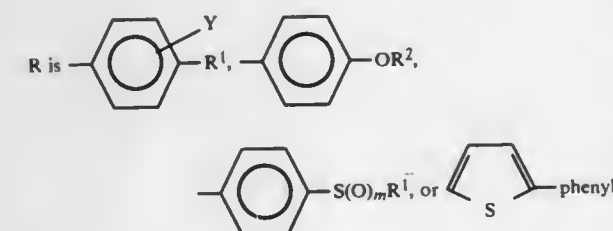
(4) when  $\text{R}^1$  is cyclohexyl and  $\text{R}^3$  is H,  $\text{R}^6$  must be Cl or F, but  $\text{R}^6$  and  $\text{R}^8$  cannot both be Cl; and

(5) when  $\text{R}^6$  is  $\text{CH}_3$ ,  $\text{R}^7$  cannot be Cl.

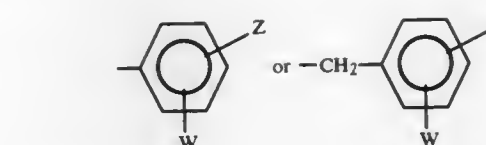
3. A pharmaceutical composition consisting essentially of a suitable pharmaceutical carrier and at least one compound having the formula:



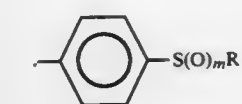
wherein



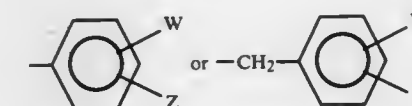
$\text{R}^1$  is  $\text{CH}_3\text{CH}_2(\text{CH}_2)_3\text{CH}$ , alkyl of 5-12 carbon atoms, cyclohexyl,



when R is



$\text{R}^1$  can be in addition alkyl of 3-4 carbon atoms;  $\text{R}^2$  is



$\text{R}^3$  is H, alkoxy of 1-3 carbon atoms, or alkyl of 1-2 carbon atoms;

$\text{R}^4$  is  $\text{CO}_2\text{H}$  or  $\text{CO}_2\text{R}^{11}$ ;

$\text{R}^5$ ,  $\text{R}^6$ ,  $\text{R}^7$  and  $\text{R}^8$  are independently H, F, Cl, Br, I,  $\text{CH}_3$ ,  $\text{CF}_3$ ,  $\text{SCH}_3$  or  $\text{CH}_2\text{CH}_3$ , at least two of  $\text{R}^5$ ,  $\text{R}^6$ ,  $\text{R}^7$ , and  $\text{R}^8$  being H;

$\text{R}^9$  and  $\text{R}^{10}$  are independently H or alkyl of 1 to 3 carbon atoms;

$\text{R}^{11}$  is  $(\text{CH}_2)_2\text{NR}^9\text{R}^{10}$ ;

W, Y and Z are independently H, F, Cl, Br, alkyl of 1-5 carbon atoms,  $\text{NO}_2$ , OH,  $\text{CF}_3$  or  $\text{OCH}_3$ ;

m is 0 or 1; or

a pharmaceutically suitable salt thereof;

with the following provisos:

(1)  $\text{R}^5$ ,  $\text{R}^6$  and  $\text{R}^7$  cannot all be H;

(2) when  $\text{R}^4$  is  $\text{CO}_2\text{CH}_2\text{CH}_2\text{N}(\text{CH}_3)_2$ ,  $\text{R}^6$  is  $\text{CH}_2\text{CH}_3$ , or  $\text{R}^7$  is Cl,  $\text{R}^1$  cannot be cyclohexyl;

(3) when  $\text{R}^1$  is cyclohexyl and  $\text{R}^3$  is H,  $\text{R}^6$  must be Cl or F, but  $\text{R}^6$  and  $\text{R}^8$  cannot both be Cl; and

(4) when  $\text{R}^6$  is  $\text{CH}_3$ , then  $\text{R}^7$  cannot be Cl.

4,680,300

# ANTI-INFLAMMATORY GUANIDINES

Peter Nelson, Los Altos, and Stefan H. Unger, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

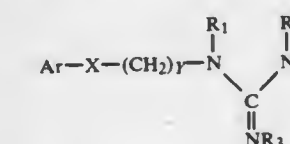
Filed Jan. 10, 1985, Ser. No. 690,295

Int. Cl. A61K 31/47, 31/155; C07C 129/00

U.S. Cl. 514-312

21 Claims

1. A compound having the formula



where

Ar is naphthyl, biphenyl, or quinoliny;

X is oxygen or NH;

Y is 2 to 8;

$\text{R}_1$  is phenyl, substituted phenyl, hydrogen, or lower alkyl; and

$\text{R}_2$  and  $\text{R}_3$  are each independently alkyl, cycloalkyl, phenyl, substituted phenyl, or thiazolyl;

or a pharmaceutically acceptable salt thereof.

19. A pharmaceutical composition having anti-inflammatory

activity or useful for the treatment of psoriasis which comprises an effective amount for the purpose intended of a compound of claim 1 and a pharmaceutically acceptable excipient.

4,680,301

# 6-ISOTHIOCYANATO-2,5-SUBSTITUTED BENZOTHAZOLES OR BENZOXAZOLES USEFUL AS ANTHELMINTIC EFFECTIVE AGENTS

Vittal R. Rao, Bombay, India, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 11, 1985, Ser. No. 774,776

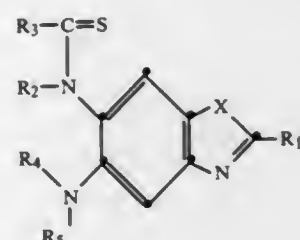
Claims priority, application United Kingdom, Sep. 19, 1984, 8423697

Int. Cl.<sup>4</sup> A61K 31/435; C07D 413/04, 417/04

U.S. Cl. 514—321

12 Claims

1. A benzazole compound of the formula



wherein

X is sulphur or oxygen;

R<sub>1</sub> is lower alkyl or lower alkenyl;

R<sub>2</sub> is hydrogen;

R<sub>3</sub> is lower alkylthio which is unsubstituted or mono substituted by carboxy or esterified carboxy; or R<sub>2</sub> and R<sub>3</sub> together represents a bond; and

R<sub>4</sub> and R<sub>5</sub> are hydrogen or lower alkyl; or R<sub>4</sub> and R<sub>5</sub> together with the nitrogen to which they are attached, represents a member selected from the group consisting of pyrrolidino, piperidino, hexahydroazepino, octahydroazocino, morpholino, thiamorpholino, and piperazino which is unsubstituted or substituted on carbom atoms by lower alkyl or phenyl and said piperazino is N-unsubstituted or N-substituted by a substituent selected from lower alkyl, phenyl, lower alkanoyl, benzoyl, lower alkoxycarbonyl, and lower alkane sulphonyl;

or a salt thereof.

12. A method for the treatment of parasitic infections by helminths which comprises administering to a living body suffering from parasitic infections an effective amount of a compound of formula I as claimed in claim 1.

4,680,302

# 1-ALKYL-3-HYDROXY-3-PHENYLPYPERIDINES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, France

Filed Jan. 29, 1986, Ser. No. 823,595

Claims priority, application France, Feb. 1, 1985, 85 01410; Jul. 10, 1985, 85 10550

Int. Cl.<sup>4</sup> C07D 211/42; A61K 31/445

U.S. Cl. 514—327

3 Claims

1. 1-Ethyl-3-hydroxy-3-phenylpiperidine and its addition salts.

3. A method of treatment of depression which comprises administering to a person in need of such a treatment an antidepressive effective amount of 1-ethyl-3-hydroxy-3-phenylpiperidine according to claim 1 or one of its non-toxic addition salts.

4,680,303

# THIOFORMAMIDE DERIVATIVES AND USE IN INHIBITING GASTRIC SECRETION

Jean C. Aloup, Villeneuve-le-Roi; Jean Bouchaudon, Morsang-sur-Orge; Daniel Farge, Thiais, and Claude James, Paris, all of France, assignors to Rhone-Poulenc Sante, Courbeville, France

Filed Nov. 18, 1985, Ser. No. 798,846

Claims priority, application France, Nov. 20, 1984, 8417648

Int. Cl.<sup>4</sup> C07D 409/00, 401/00; A61K 31/44

U.S. Cl. 514—336

3 Claims

1. N-Methyl-2-(6-methyl-2-pyridyl)-1,3-dithiane-2-carbothiamide.

3. Method of inhibiting gastric secretion which comprises administering to a subject in whom such inhibition is desired an effective amount of a thioformamide as claimed in claim 1.

4,680,304

# FEED COMPOSITIONS CONTAINING 2-(α-PYRIDYL)-Δ<sup>2</sup>-HETEROCYCLIC COMPOUNDS

Govind K. Menon, Downingtown, Pa., and Winfred J. Sanders, Mt. Laurel, N.J., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

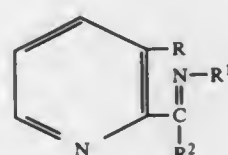
Filed Mar. 12, 1985, Ser. No. 710,791

Int. Cl.<sup>4</sup> A61K 31/44

U.S. Cl. 514—340

12 Claims

1. An animal feed composition supplemented by a quantity of a compound of the formula:



in which:

R is hydrogen or hydroxy;

R<sup>1</sup> is hydrogen or, when also attached to R<sup>2</sup>, methylene, oxo or aza; and

R<sup>2</sup> is hydroxylamino or, when taken together with R<sup>1</sup> and the imino to which it is attached, forms a five-membered heterocycle, wherein the five-membered heterocycle is Δ<sup>2</sup>-imidazolyl, Δ<sup>2</sup>-oxadiazolyl, Δ<sup>2</sup>-thiadiazolyl or Δ<sup>2</sup>-triazolyl, the heterocycle being optionally C-substituted with one or two methyl, carboxamido, hydroxy, carbomethoxy or carbethoxy groups;

or a nontoxic, stable salt thereof, which is effective for increasing the growth rate or feed efficiency of a meat producing monogastric animal but which is nontoxic to the animal.

4,680,305

# USE OF SULFONYLDIHYDROPYRIDINES AS MEDICAMENTS FOR THE TREATMENT OF ASTHMA

Egbert Wehinger, Wuppertal, Fed. Rep. of Germany, and Robertson Towart, Stoke Poges, United Kingdom, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 8, 1986, Ser. No. 816,937

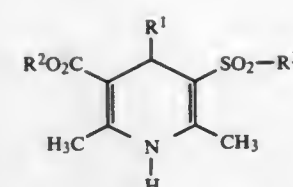
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501695

Int. Cl.<sup>4</sup> A61K 31/44

U.S. Cl. 514—347

6 Claims

1. A method of treating a patient suffering from asthma which comprises administering to such patient an asthma-relieving amount of a 5-sulphonyl-1,4-dihydropyridine of the formula



in which

R<sup>1</sup> is aryl having 6 or 10 C atoms, optionally substituted by 1 to 3 identical or different substituents selected from the group consisting of halogen, cyano, nitro, trifluoromethyl, trifluoromethoxy, alkoxy, carbonyl having up to 4 C atoms, carboxyl, alkoxy having up to 4 C atoms or straight-chain or branched alkyl having up to 4 C atoms, or is pyridyl, thienyl, furyl or benzoxadiazolyl,

R<sup>2</sup> is straight-chain, branched or cyclic, saturated or unsaturated alkyl having up to 7 C atoms, which can be interrupted in the chain by 1 or 2 oxygen and/or sulphur atoms, and which is optionally substituted by halogen, cyano, nitro, cyano, carboxyl, alkoxy, carbonyl with up to 4 C atoms, aryl having 6 or 10 C atoms, or an amino group, it being possible for the amino group to carry 1 or 2 identical or different substituents from the group comprising alkyl with up to 4 C atoms, aryl having 6 to 10 C atoms or alkaryl having 7 to 10 C atoms,

R<sup>3</sup> is aryl having 6 to 10 C atoms which can optionally be substituted by 1 to 3 identical or different substituents selected from the group consisting of halogen, cyano, nitro, trifluoromethyl, trifluoromethoxy, alkoxy having up to 4 C atoms, or dialkylamino, or is a straight-chain, branched or cyclic alkyl having up to 8 C atoms, which can optionally be substituted by cyano, halogen or nitro.

4,680,306

# SPRIO-IMIDAZOLONES FOR TREATMENT OF DIABETES COMPLICATIONS

Christopher A. Lipinski, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/US84/01155, § 371 Date Mar. 14, 1986, § 102(e) Date Mar. 14, 1986, PCT Pub. No. WO86/00807, PCT Pub. Date Feb. 13, 1986

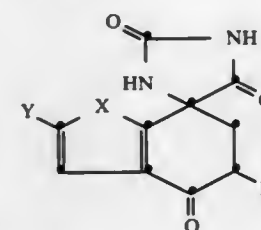
PCT Filed Jul. 20, 1984, Ser. No. 842,109

Int. Cl.<sup>4</sup> A61K 31/415; C07D 491/107, 495/10

U.S. Cl. 514—389

8 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein:

X is oxygen or sulfur;

Y is hydrogen, halo or alkyl having 1-4 carbon atoms; and

R is hydrogen, methyl or ethyl.

7. A method for treating diabetes complications in a mammal comprising administering an effective amount of a compound according to claim 1.

4,680,307

# CARBACYCLIN ANALOGS

Masami Muraoka, Toyonaka; Toshio Nakamura, Nishioomiya; Akihiko Sugie, Toyonaka; Keiichi Ono, Osaka, and Michihiro Yamamoto, Nishioomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 26, 1984, Ser. No. 574,125

Claims priority, application Japan, Feb. 1, 1983, 58-15837

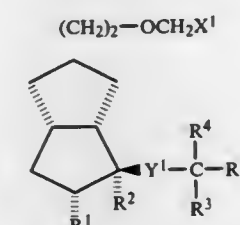
Int. Cl.<sup>4</sup> C07C 59/62, 69/734, 69/78; C07D 315/00; A61K

31/185, 31/215, 31/235, 31/35

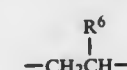
U.S. Cl. 514—460

43 Claims

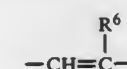
1. A compound of the formula:



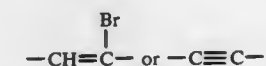
wherein X<sup>1</sup> is a free carboxyl group or an esterified carboxyl group selected from the group consisting of C<sub>1</sub>-C<sub>4</sub> alkoxy, carbonyl, phenoxy, carbonyl, naphthoxy, carbonyl, benzyloxy, carbonyl, phenethoxy, carbonyl, (C<sub>1</sub>-C<sub>4</sub> alkoxy)methoxy, carbonyl, (C<sub>2</sub>-C<sub>5</sub> alkanoyloxy)methoxy, carbonyl, (C<sub>3</sub>-C<sub>7</sub> cycloalkyloxy)methoxy, carbonyl, phenylcarbonylmethoxy, carbonyl and (hydroxy C<sub>1</sub>-C<sub>4</sub> alkoxy)methoxy, carbonyl, Y<sup>1</sup> is a group of the formula:



(R<sup>6</sup> is a hydrogen atom or a C<sub>1</sub>-C<sub>4</sub> alkyl group),



(R<sup>6</sup> is as defined above),



R<sup>1</sup> is a hydrogen atom, a hydroxyl group or a hydroxy group protected with C<sub>1</sub>-C<sub>4</sub> alkanoyl, benzoyl, tetrahydropyranyl, tetrahydrofuryl or (C<sub>1</sub>-C<sub>4</sub> alkoxy)methyl, R<sup>2</sup> is a hydrogen atom or R<sup>1</sup> and R<sup>2</sup>, when taken together, mean a single linkage to form a double bond between the carbon atoms to which they are linked, R<sup>3</sup> is a hydroxyl group or a hydroxy group protected with C<sub>1</sub>-C<sub>4</sub> alkanoyl, benzoyl, tetrahydropyranyl, tetrahydrofuryl or (C<sub>1</sub>-C<sub>4</sub> alkoxy)methyl, R<sup>4</sup> is a hydrogen atom or a C<sub>1</sub>-C<sub>4</sub> alkyl group, R<sup>5</sup> is a hydrogen atom, a C<sub>1</sub>-C<sub>12</sub> alkyl group, a C<sub>2</sub>-C<sub>12</sub> alkenyl group, a C<sub>2</sub>-C<sub>12</sub> alkynyl group, a C<sub>3</sub>-C<sub>10</sub> cycloalkyl group, a C<sub>4</sub>-C<sub>10</sub> cycloalkenyl group, a hydroxy C<sub>1</sub>-C<sub>12</sub> alkyl group, a phenyl group unsubstituted or substituted with a halogen atom, a hydroxyl group, a C<sub>1</sub>-C<sub>4</sub> alkyl group, a trifluoromethyl group, or a C<sub>1</sub>-C<sub>4</sub> alkoxy group or a group of the formula: A-B (A is a C<sub>1</sub>-C<sub>7</sub> alkylene chain and B is a C<sub>3</sub>-C<sub>10</sub> cycloalkyl group, a C<sub>4</sub>-C<sub>10</sub> cycloalkenyl group, a C<sub>1</sub>-C<sub>12</sub> alkoxy group, a C<sub>3</sub>-C<sub>10</sub> cycloalkoxy group, a C<sub>4</sub>-C<sub>10</sub> cycloalkenyloxy group, or a phenyl or phenoxy group unsubstituted or substituted with a halogen atom, a hydroxy group, a C<sub>1</sub>-C<sub>4</sub> alkyl group, a trifluoromethyl group or a C<sub>1</sub>-C<sub>4</sub> alkoxy group); or a non-toxic pharmaceutically acceptable salt thereof.

41. The method of treating ulcers by administering to a patient an antiulcer effective amount of a compound as claimed in claim 1.



42. The method of treating thrombosis by administering to a patient an antithrombotic effective amount of a compound as claimed in claim 1.

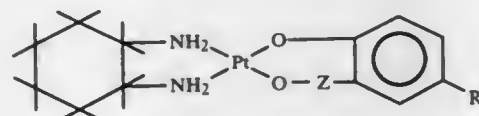
4,680,308

# STABLE SOLUBLE 1,2-DIAMINOCYCLOHEXANE PLATINUM COMPLEXES

Paul Schwartz, Rockville; Devinder S. Gill, Silver Spring, both of Md., and Kenneth J. McGrath, Manassas, Va., assignors to Andrus Research Corporation, Bethesda, Md.  
Filed Dec. 26, 1985, Ser. No. 813,451  
Int. Cl.<sup>4</sup> C07F 15/00

U.S. Cl. 514—492

1. A platinum complex of the formula



wherein Z is —CO— or a single bond and R is —COOH or —SO<sub>3</sub>H, or a pharmaceutically acceptable salt thereof.

4,680,309

# METHODS AND COMPOSITIONS FOR TREATING INFLAMMATION OR ARTHRITIS

Gerald L. Maurer, Fairfield, Ohio, assignor to National Research Laboratories, Cincinnati, Ohio  
Continuation of Ser. No. 447,424, Dec. 6, 1982, abandoned. This application Feb. 3, 1986, Ser. No. 825,674  
Int. Cl.<sup>4</sup> A01N 55/02; A61K 31/30

U.S. Cl. 514—499

1. A method of alleviating an inflammatory disorder in an animal which comprises delivering to the site of the inflammation of said disorder an effective anti-inflammatory amount of a metal complex consisting of dialkali metal monoheavy metal chelate of an alpha or beta-hydroxy polycarboxylic acid.

4,680,310

# TETRAHYDRONAPHTHALENE DERIVATIVES

Urs Hengartner, Basel, and Henri Ramuz, Birsfelden, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

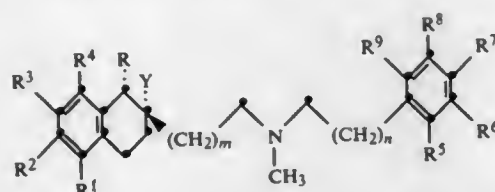
Filed Oct. 10, 1985, Ser. No. 786,253

Claims priority, application Switzerland, Oct. 11, 1984, 4870/84

Int. Cl.<sup>4</sup> H61K 31/24; C07D 317/44, 319/14; C07C 149/20, 69/00, 39/17, 43/18; C07B 93/08

U.S. Cl. 514—539

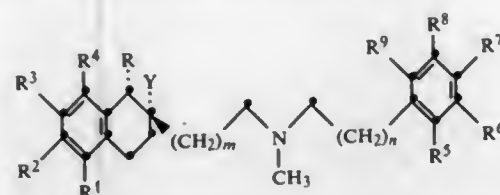
1. A compound of the formula



wherein R is hydrogen or lower-alkyl, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> each independently is hydrogen, halogen or lower-alkoxy or two of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> on adjacent carbon atoms taken together are methylenedioxy or ethylenedioxy, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup> each independently is hydrogen, halogen, C<sub>1</sub>-C<sub>10</sub>-alkoxy, lower alkylthio, lower-alkoxy-lower-alkoxy or ω,ω,ω-trifluoro-lower alkoxy or two of R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup> on adjacent carbon atoms taken together are methylenedioxy or ethylenedioxy, Y is hydroxy, lower-alkylcarbonyloxy, lower-alkoxy-lower-alkylcarbonyloxy, lower-alkoxy-carbonyloxy, lower-alkoxy-

lower-alkoxycarbonyloxy, lower-alkylthio-lower-alkylcarbonyloxy or benzylcarbonyloxy optionally mono- or di-substituted on the benzene ring by lower-alkyl, lower-alkoxy, halogen or nitro, m is the number 1 or 2 and n is the number 1, 2 or 3, its optical antipode, or a racemate thereof, or a pharmaceutically acceptable acid addition salt thereof.

24. A composition for controlling high blood pressure containing an effective amount of a compound of the formula:



wherein R is hydrogen or lower-alkyl, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> each independently is hydrogen, halogen or lower-alkoxy or two of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> on adjacent carbon atoms taken together are methylenedioxy or ethylenedioxy, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup> each independently is hydrogen, halogen, C<sub>1</sub>-C<sub>10</sub>-alkoxy, lower alkylthio, lower-alkoxy-lower-alkoxy or ω,ω,ω-trifluoro-lower-alkoxy or two of R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup> on adjacent carbon atoms taken together are methylenedioxy or ethylenedioxy, Y is hydroxy, lower-alkylcarbonyloxy, lower-alkoxy-lower-alkylcarbonyloxy, lower-alkoxy-carbonyloxy, lower-alkoxy-lower-alkoxycarbonyloxy, lower-alkylthio-lower-alkylcarbonyloxy or benzylcarbonyloxy optionally mono- or di-substituted on the benzene ring by lower-alkyl, lower-alkoxy, halogen or nitro, m is the number 1 or 2 and n is the number 1, 2 or 3, its optical antipode or a racemate thereof or a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier material.

4,680,311

# METHOD FOR THE TREATMENT OF SYSTEMIC MYCOSIS

Naoharu Watanabe, Kounosu; Kazuo Numata, Ageo; Michio Yamagishi, Yoshimi; Taku Mizutani; Sadafumi Omura, both of Ageo, and Hideyo Yamaguchi, Kawasaki, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed Apr. 7, 1986, Ser. No. 848,483

Claims priority, application Japan, Apr. 18, 1985, 60-81360

Int. Cl.<sup>4</sup> A61K 31/195

U.S. Cl. 514—561

1. A method for the treatment of candidiasis in mammals which comprises administering (S)-2-amino-5-hydroxy-4-oxopentanoic acid in a therapeutically effective amount to said mammals suffering from candidiasis.

2 Claims

4,680,312

# STABLE PROSTAGLANDIN E GELS UTILIZING COLLOIDAL SILICON DIOXIDE AS A GEL-FORMING AGENT

Brian S. Johnson, Crawley, United Kingdom, assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 613,006, May 21, 1984, abandoned, which is a continuation of Ser. No. 470,656, Feb. 28, 1983, abandoned. This application Nov. 21, 1984, Ser. No. 674,357

Claims priority, application United Kingdom, Mar. 22, 1982, 8208322

Int. Cl.<sup>4</sup> A61K 31/19, 31/557

U.S. Cl. 514—573

1. In a stable dosage form of PGE<sub>2</sub> consisting essentially of PGE<sub>2</sub> in triacetin, an improvement which comprises: colloidal silicon dioxide (CSD) as a gel forming additive thereto in a concentration by weight of CSD in said stable dosage form from about not less than 8 percent to about not more than 15 percent.

1 Claim

4,680,313

# ACCELERATION OF LIPID METABOLISM USING VANILLYLAMINE DERIVATIVES

Kazuo Iwai, Kyoto, Japan, assignor to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 742,317, Jun. 7, 1985, abandoned. This application Feb. 24, 1986, Ser. No. 834,102

Claims priority, application Japan, Jun. 11, 1984, 59-119460; Jun. 11, 1984, 59-119461; Dec. 26, 1984, 59-281691

Int. Cl.<sup>4</sup> A61K 31/16, 31/35

U.S. Cl. 514—627

1. A method of accelerating lipid metabolism for reduction or prevention of accumulation of body fat in a subject, comprising:

administering to said subject a lipid metabolism accelerating amount of a vanillylamine derivative selected from the group consisting of vanillylamine, a vanillylamide derived from an unsaturated carboxylic acid wherein said acid has from 8 to 18 carbon atoms, or a vanillylamide derived from a saturated carboxylic acid wherein said saturated carboxylic acid has from 2 to 22 carbon atoms, in a food substance.

9 Claims

4,680,314

# PROCESS FOR PRODUCING A NATURALLY-DERIVED CAROTENE/OIL COMPOSITION BY DIRECT EXTRACTION FROM ALGAE

Arthur M. Nonomura, Del Mar, Calif., assignor to Microbio Resources, Inc., San Diego, Calif.

Filed Aug. 30, 1985, Ser. No. 771,402

Int. Cl.<sup>4</sup> A61K 31/07, 31/355

U.S. Cl. 514—725

1. A process for the production of a naturally-derived composition consisting essentially of carotene dissolved in edible oil, which comprises:

a. providing a slurry of carotene-containing algae suspended in water;  
b. concentrating the algae at or near the surface of the water and thereafter removing a portion of the water to form a wet algal concentrate;  
c. adding oil to the wet algal concentrate and homogenizing the mixture to form an oil/water emulsion and allowing said emulsion to exist for a time and at a temperature sufficient to extract the carotene from the algae into the oil by direct contact of the oil with the algae; and thereafter separating the oil phase containing the carotene from the water and recovering the naturally-derived composition consisting essentially of the oil containing carotene dissolved therein.

20 Claims

4,680,315

# POWDER MIXTURE HAVING HIGH PROPYLENE GLYCOL CONTENT AND PROCESS FOR THE PREPARATION THEREOF

Denes Bezzegh; Karoly Magyar; Jozsef Kelemen; Gabor Zalai; Attila Mandi, and Janos Egri, all of Budapest, Hungary, assignors to EGYT Gyogyszervezeszeti Gyar, Budapest, Hungary

Filed Jan. 7, 1985, Ser. No. 689,222

Claims priority, application Hungary, Jan. 6, 1984, 2251-39/84

Int. Cl.<sup>4</sup> A61K 31/045

U.S. Cl. 514—738

1. A method of incorporating propylene glycol into veterinary medicines and animal feeds which comprises: mixing propylene glycol with a solid carrier selected from the group consisting of magnesium oxide, magnesium peroxide and magnesium carbonate and mixtures thereof in a weight ratio of from 75 to 25% propylene glycol to 25 to 75% of solid carrier to form a powder mixture, and thereafter incorporating the mixture into the veterinary medicine or animal feed.

6 Claims

4,680,316

# HOT APPLIED, EXPANDABLE SEALER

William A. Douglas, Richmond Heights, Mo., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 15, 1985, Ser. No. 787,343

Int. Cl.<sup>4</sup> C08J 9/00

U.S. Cl. 521—89

1. A hot applicable, pumpable heat expandable, thermosetting sealing composition particularly adapted for use in the automotive industry comprising: about 10 percent to about 25 percent by weight of styrene-butadiene rubber, about 5 percent to about 20 percent by weight of thermoplastic resins is an aliphatic or aromatic hydrocarbon resin having a melting point from about 32° F.(0° C.) to about 248° F.(120° C.), about 0.5 percent to about 3 percent by weight of an accelerator activator, to about 0.2 percent by weight to about 0.75 percent by weight of a vulcanizing agent, about 25 percent by weight to about 35 percent by weight of a plasticizer, about 20 percent by weight to about 60 percent by weight of filler, about 0.5 percent by weight to about 2 percent by weight of a blowing agent, about 1 percent to about 10 percent by weight of a thickening agent about 4 percent to about 40 percent by weight of an oil or plasticizer, said composition having a sulfonamide accelerator present at concentrations of about 0.5 percent to about 3.0 percent by weight,

wherein the sealing composition can be applied to the surface of the structure to be sealed at an elevated temperature and after cooling to below about 100° F. can withstand the high pressure spraying of automotive cleansing tanks without being dislodged and will expand and cure upon exposure to paint curing processes.

5 Claims

4,680,317

# MOLDING COMPOSITION FOR CROSSLINKED FOAM MATERIAL FROM POLYOLEFINS AND ETHYLENE-PROPYLENE ELASTOMER, AND PROCESS FOR THE PRODUCTION OF THE FOAM MATERIAL

Werner Kühnel, Neunkirchen-Schoeneshof, and Paul Spielau, Troisdorf-Eschmar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 408,769, Aug. 17, 1982, abandoned.

This application Apr. 29, 1985, Ser. No. 727,739

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132439

Int. Cl.<sup>4</sup> C08J 9/10

U.S. Cl. 521—89

1. An expandable molding composition for the production of a crosslinked foam material that has a predominantly closed cell structure with an average pore size of not more than 500 μm and that is a mixture consisting essentially of polyethylene and a partially crystalline ethylene-propylene terpolymer, and a blowing agent, in the presence of a crosslinking agent, the amount of the terpolymer in said composition, per 100 parts by weight of polyethylene, being 25-150 parts by weight, and said terpolymer having a tensile strength at break of at least 8.0N/mm<sup>2</sup>, a Mooney viscosity (ML 1+4/100) larger than 50, with a melting heat (according to DSC) ΔH<sub>m</sub> of at least 10 J/g, and a content of 60-80% by weight of ethylene, 10-38% by weight of propylene and 2-10% of a non-conjugated diene tercomponent of ethylidene norbornene or 1,4-hexadiene.

18 Claims

4,680,318

## FOAMING RESIN COMPOSITION

Masaki Fujii, Shiroh Gotoh, Hideaki Nakagawa, and Ryolchi Ito, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

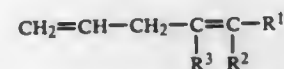
Filed Nov. 7, 1986, Ser. No. 928,040

Claims priority, application Japan, Nov. 14, 1985, 60-255698; Nov. 14, 1985, 60-255699

Int. Cl.<sup>4</sup> C08J 9/10

U.S. Cl. 521-95

1. A foaming resin composition comprising an unsaturated random copolymer consisting of from 85 to 99.4 mol % of propylene, from 0.5 to 14 mol % of ethylene, and from 0.1 to 10 mol % of a branched 1,4-diene represented by the formula (I):



wherein R<sup>1</sup> represents an alkyl group having not more than 8 carbon atoms; and R<sup>2</sup> and R<sup>3</sup> each represents a hydrogen atom or an alkyl group having not more than 8 carbon atoms, provided that R<sup>2</sup> and R<sup>3</sup> do not simultaneously represent a hydrogen atom, and a chemical foaming agent, said chemical foaming agent being employed in an amount of from 0.1 to 30% by weight based on the total weight of the composition.

4,680,319

## ACCELERATED CROSSLINKING OF POLYOLEFINS GRAFTED WITH SILANES

Franco Gimpel, Via F. Nullo 18, 20129 Milano, and Corrado Brichta, Milan, both of Italy, assignors to Franco Gimpel, Milan, Italy

Continuation-in-part of Ser. No. 566,300, Dec. 28, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 728,212

Claims priority, application Italy, Dec. 12, 1983, 24121 A/83; Apr. 27, 1984, 20702 A/84

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> C08K 3/34

U.S. Cl. 523-210

1. A composition crosslinkable by exposure to irradiation with electromagnetic microwaves or to water in liquid or vapor phase, which comprises an olefin polymer having grafted thereon an unsaturated silane containing hydrolyzable groups, and 0.1 to 20% of a hydrated, partially dehydrated or dehydrated zeolite in powder form based on the weight of the olefin polymer.

4,680,320

## METHOD FOR PREPARATION OF DROPLETS

Kyouji Uku, and Shinji Kato, both of Takasago, Japan, assignors to Kanagafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1985, Ser. No. 805,523

Claims priority, application Japan, Dec. 6, 1984, 59-258572

Int. Cl.<sup>4</sup> C08F 2/18

U.S. Cl. 523-313

1. A method of preparing droplets without forced vibration wherein a dispersion phase insoluble or sparingly soluble in an aqueous continuous phase is injected in the form of a laminar flow into the continuous phase through an orifice, the method being characterized in that when the viscosity of the dispersion phase is  $\mu'$  and the viscosity of the continuous phase is  $\mu$ , the viscosity ratio  $\mu'/\mu$  between the two phases is adjusted to the range of from 0.9 to 4 to produce droplets having a uniform diameter without using forced vibration.

4,680,321

## AGGLOMERATION

Everett S. Graham, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Nov. 4, 1985, Ser. No. 794,374

Claims priority, application Canada, Nov. 26, 1984, 468636

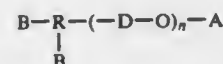
Int. Cl.<sup>4</sup> C08J 3/06; C08L 9/04, 9/08, 9/10

U.S. Cl. 523-335

9 Claims

1. A process for agglomerating the particles of a latex of a synthetic polymer derived from monomers comprising at least about 60 percent of a monomer selected from the group consisting of butadiene, isoprene and a mixture thereof; and not more than 40 percent of a monomer selected from the group consisting of styrene,  $\alpha$ -methyl styrene, p-methyl styrene, chlorostyrene, vinyl chloride, vinylidene chloride, acrylonitrile and a mixture thereof, stabilized at a pH of greater than 9 with a pH sensitive emulsifier which comprises:

- adjusting the pH of the latex to from about 7.7 to about 9.5 with a weak acid;
- adding to the latex
  - from about 0.01 to about 1.0 parts by weight per 100 parts by weight of polymer of an agglomerating agent of the formula



wherein

R is an organic hydrophobic radical,

A is H or a radical of the formula R-(D-O)<sub>m</sub>H,

B is H or (D-O)<sub>q</sub>H

D is a C<sub>2-5</sub> alkylene radical,

m, n and q are integers from 23 to about 455; and

- from about 0.01 to about 5 parts per 100 parts of polymer solids of a dispersing agent,
- maintaining the latex at a temperature from about 20 to less than 40° C. for a period of time from about 2 to 6 hours so as to agglomerate the polymer particles of the latex;
- adjusting the pH of the agglomerated latex to above 9.5.

4,680,322

## COMPOSITION FOR FORMING A LAYER OF THE SUPPORTING PLATE FOR USE IN LITHOGRAPHY AND PROCESS FOR PRODUCING THE COMPOSITION

Yuzo Yokota, Otsu; Kanji Noma, Osaka; Kiyotaka Kawase, Kusatsu; Hironori Kitamura, Nagaokakyō, and Masayuki Kamigaito, Takatsuki, all of Japan, assignors to Nippon Foil Mfg. Co., Ltd., Osaka, Japan

Filed Nov. 4, 1985, Ser. No. 794,846

Claims priority, application Japan, Nov. 5, 1984, 59-233845; Jun. 24, 1985, 60-138817

Int. Cl.<sup>4</sup> C08L 0/63, 5/04; G03C 1/76

U.S. Cl. 523-416

21 Claims

1. A composition for forming a layer (A) of a supporting plate (B) for use in lithography, comprising (I) an aqueous solution containing (1) methylolmelamines and (2-1) polyvinyl alcohol, zirconium nitrate and a hardening catalyst of said methylolmelamines or (2-2) an epoxy compound, and (II) a water-insoluble inorganic powdery material dispersed in said aqueous solution.

4,680,323

## METHOD AND COMPOSITION FOR THE PREPARATION OF CONTROLLED LONG-ACTING PHARMACEUTICALS FOR ORAL ADMINISTRATION

Hans Lowey, 1045 Nine Acres La., Mamaroneck, N.Y. 10543

Filed Dec. 1, 1983, Ser. No. 556,844

Int. Cl.<sup>4</sup> A61K 9/22, 9/26; C08L 1/26

U.S. Cl. 524-43

26 Claims

1. A sustained release pharmaceutical carrier suitable for admixture with active ingredients comprising:

- 5.5-98.5% by weight of hydroxypropyl methylcellulose;
- 0.25-4.5% by weight of hydroxypropyl cellulose;
- 1-90% by weight of a carboxyvinyl polymer.

10. A sustained release pharmaceutical composition which comprises a carrier and an active therapeutic agent incorporated within said carrier, said carrier comprising:

- 5.5-98.5% by weight of hydroxypropyl methylcellulose;
- 0.25-4.5% by weight of hydroxypropyl cellulose;
- 1-90% by weight of a carboxyvinyl polymer.

4,680,324

## FIRE-RETARDANT PLASTICS WITH GLYCOSIDE ADDITIVE

Nelson E. Malwitz, Brookfield, Conn., assignor to Sealed Air Corporation, Danbury, Conn.

Filed Aug. 23, 1985, Ser. No. 768,611

Int. Cl.<sup>4</sup> C08K 50/07, 3/32, 3/10

U.S. Cl. 524-58

17 Claims

1. A plastic composition having fire-retardant properties, said composition comprising a melt producible plastic composition, a fire-retardant compound comprising at least one member selected from the group consisting of antimony compounds, phosphorous compounds, chlorine compounds and bromine compounds, and a glycoside.

4,680,325

## ANTI-OXIDANT ISOCYANURATE ESTER OF THIOAMIDOPHENOL AND POLYOLEFINS STABILIZED THEREWITH

Neil Dunski; Ali A. Bazzi, both of Creve Coeur, and Henry J. Buehler, St. Louis, all of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 692,078, Jan. 17, 1985, Pat. No. 4,569,959. This application Feb. 10, 1986, Ser. No. 827,988

The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> C07D 251/34; C08K 5/34; C08J 5/34

U.S. Cl. 524-101

5 Claims

1. As a new compound 1,3,5-tris-(2-hydroxyethyl)-[2-mercapto-(3',5'-di-tert-butyl-4'-hydroxypropionanilide)-]acetate)isocyanurate.

2. A composition of matter comprising a polyolefin normally subject to oxidative deterioration and a stabilizing amount of the compound of claim 1.

4,680,326

## POLY(ARYLENE SULFIDE) COMPOSITION WITH IMPROVED INSULATION RESISTANCE AND CRACKING RESISTANCE

John E. Leland; James S. Dix, and Roy F. Wright, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 723,985, Apr. 16, 1985, abandoned.

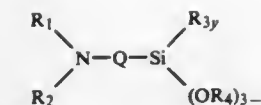
This application Jul. 29, 1986, Ser. No. 892,722

Int. Cl.<sup>4</sup> C08K 5/54, 5/34, 5/16

U.S. Cl. 524-106

33 Claims

- A composition comprising:
  - in the range of about 30 to about 80 weight percent poly(arylene sulfide), based on the total weight of the composition,
  - a reinforcing material,
  - in the range of about 0.5 to about 10 weight percent low density polyethylene, based on the total weight of the composition, and
  - at least one organosilane represented by the general formula:



where

R<sub>1</sub> and R<sub>2</sub> are individually selected from the group consisting of hydrogen, alkyl, alkaryl, aminoalkyl, carboxyalkyl, aminoalkyl, aryl, aralkyl, carbamoyl, hydroxyalkyl, and vinylalkylaminoalkyl groups containing 1 to 10 carbon atoms, and where R<sub>1</sub> and R<sub>2</sub> also may be joined by a valance bond to form a cyclic structure of from 5 to 16 atoms including the nitrogen atom therein, R<sub>3</sub> and R<sub>4</sub> are individually selected from the group consisting of alkyl and cycloalkyl groups containing 1 to 6 carbon atoms, Q is a divalent hydrocarbon radical containing from 1 to 18 carbon atoms, and y is 0, 1, or 2, wherein said composition provides an electrical insulation resistance of at least 1.0×10<sup>9</sup> ohms, and said composition provides good crack resistance.

4,680,327

## STABILIZERS

Albert Hetteche, Hessheim; Stefan Weiss, Neckargemuend; Hubert Trauth, Dudenhofen; Peter Lechten, Frankenthal, and Michael Horner, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 29, 1986, Ser. No. 823,744

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3504981

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> C08K 5/15

U.S. Cl. 524-110

3 Claims

1. A stabilizer for plastics which contains  
(a) 2,5,7,8-tetramethyl-2-(2'-stearyloxyethyl)chroman and  
(b) glyceryl monostearate, glyceryl tri-12-hydroxystearate, a partial ester of stearic acid with a condensate of trimethylolpropane and glycerol in a molar ratio of from 1:10 to 10:1, triglyceryl stearate, tetraglyceryl stearate, or a mixture of these stearates, the weight ratio of (a) to (b) being from 1:10 to 10:1.

3. A plastic containing from 0.05 to 1% by weight, based on the plastic, of a stabilizer as claimed in claim 1.

4,680,328

## INSECT RESISTANT POLYETHYLENE COMPOSITION SUITABLE FOR WIRE AND CABLE APPLICATIONS

Gregory L. Dohrer, Clnte, and George W. Knight, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 676,341, Nov. 29, 1984, abandoned. This application Dec. 9, 1985, Ser. No. 806,904

Int. Cl.<sup>4</sup> C08K 5/53

U.S. Cl. 524-137

19 Claims

1. A composition suitable for forming into and use as electrical cable jacketing, electrical junction boxes or drip irrigation tubing, and having resistance to attack from insects for an extended period of time, consisting essentially of:

- at least about 75 weight percent polyethylene having a melt index from about 0.01 to about 100 and a density from about 0.900 to about 0.975 g/cc, said polyethylene selected from the group consisting of low density polyethylene, high density polyethylene, linear low density polyethylene, and combinations thereof;
- from about 5 to about 25 weight percent of a compatibility additive selected from the group consisting of: chlorinated polyethylenes containing from about 10 to about 50 percent by weight chlorine and having a viscosity of about 5,000-40,000 Pa-s at 190° C. and a shear rate of



145/sec.; ethylene-n-butyl acrylate copolymers having a melt flow value of about 0.5-2000 and containing from about 10 to about 50 weight percent n-butyl acrylate; and combinations thereof; and  
(c) an insecticidally effective amount, up to about 8 weight percent of an insecticide selected from halopyridyl phosphates.

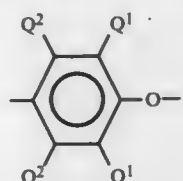
4,680,329

# BLEND OF POLYPHENYLENE ETHERS WITH PHOSPHORUS-CONTAINING POLYMERS

Sterling B. Brown, and Dennis J. McFay, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

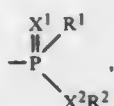
Filed Aug. 19, 1985, Ser. No. 766,626  
Int. Cl.<sup>4</sup> C08L 7/04

U.S. Cl. 524-143 27 Claims  
1. A resinous composition obtained by preparing a blend comprising a major proportion of  
(A) at least one polyphenylene ether selected from the group consisting of:  
(1) those comprising structural units having the formula



wherein each Q<sup>1</sup> and each Q<sup>2</sup> is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl wherein at least two carbon atoms separate the halogen atom from the benzene ring, hydrocarbonoxy, or halo-hydrocarbonoxy wherein at least two carbon atoms separate the halogen and oxygen atoms; and

(2) graft copolymers thereof;  
or a blend thereof with at least one polystyrene, and minor proportions of  
(B) at least one hydrocarbon polymer characterized by the presence within its molecular structure of 0.4-1.8% by weight of phosphorus as groups having the formula



wherein X<sup>1</sup> is oxygen or sulfur; R<sup>1</sup> is lower alkyl or X<sup>2</sup>R<sup>3</sup>; X<sup>2</sup> is O, S or NR<sup>4</sup>; each of R<sup>2</sup> and R<sup>3</sup> is independently H, one equivalent of a metal or ammonium cation, lower alkyl, halo-substituted lower alkyl or silyl; and R<sup>4</sup> is hydrogen or lower alkyl; and

(C) at least one fatty acid salt.

2. A composition according to claim 1 wherein R<sup>1</sup> is X<sup>2</sup>R<sup>3</sup>, each of X<sup>1</sup> and X<sup>2</sup> is oxygen and each of R<sup>2</sup> and R<sup>3</sup> is a cation or lower alkyl, and component C is a zinc salt of a saturated fatty acid.

3. A composition according to claim 2 wherein the polyphenylene ether is a poly(2,6-dimethyl-1,4-phenylene ether) having a number average molecular weight of about 5,000-40,000.

6. A composition according to claim 3 wherein there is additionally blended into said composition (D) at least one additional plasticizer, said plasticizer being a polar material melting at least 50° C. below the processing temperature of the resinous components of the composition.

9. A composition according to claim 6 wherein component A is a blend of said polyphenylene ether with a polystyrene,

said blend containing about 10-90% by weight polyphenylene ether.

4,680,330

# STRETCHABLE CLING FILM COMPOSITION BASED ON POLYETHYLENE

Bernard Berrier, Chateaufort les Martigues, and Jean P. Thiersault, Ville D'Avray, both of France, assignors to BP Chemicals Limited, London, England

Filed Dec. 12, 1985, Ser. No. 807,975

Claims priority, application France, Dec. 28, 1984, 84 19979  
Int. Cl.<sup>4</sup> C08K 5/01, 5/20; C08L 23/00, 91/06

U.S. Cl. 524-230 7 Claims

1. A composition based on ethylene polymer and suitable for the manufacture of stretchable cling film characterized in that the composition comprises from 80 to 99% by weight of at least one homopolymer or copolymer of ethylene having a density less than or equal to 0.935, and a total of from 1 to 20% by weight, based on the total composition of components (a) and (b) comprising

(a) at least one cling agent selected from liquid polybutene, polyisobutene having a number average molecular weight in the range 500 and 10000 and an atactic polypropylene having a weight average molecular weight in the range 500 and 50000, and

(b) at least one crystalline wax having one or more melting points, (as determined by differential scanning calorimetry) between 50° and 200° C. and a number average molecular weight between 250 and 15000 and wherein the quantity of the crystalline wax lies in the range 0.1% to 10% by weight of the total weight of (a) and (b) together.

4,680,331

# AQUEOUS COATING COMPOSITION OF FLUOROCARBON RESIN

Takeshi Suzuki, Nagaokakyo; Shigetake Tomimaga, Ibaraki, and Masanori Nakai, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 758,240, Jul. 24, 1985, abandoned. This application Feb. 25, 1986, Ser. No. 832,622  
Claims priority, application Japan, Jul. 25, 1984, 59-154969  
Int. Cl.<sup>4</sup> C08K 5/54

U.S. Cl. 524-269 7 Claims

1. A fluorocarbon resin aqueous coating composition comprising:

(a) a fluorocarbon resin, and based on the amount by weight of the resin  
(b) about 1 to about 10% by weight of a silicone emulsion (calculated as silicone oil contained),  
(c) about 1 to about 40% by weight of a flaky inorganic material, and  
(d) about 3 to about 10% by weight of a nonionic surfactant, or a mixture of nonionic surfactant and anionic surfactant, the composition containing about 25 to about 75% by weight of water based on the whole composition.

4,680,332

# INK JET COMPOSITIONS AND PROCESS FOR PREPARATION THEREOF

Michael L. Hair, Oakville; Kar P. Lok, Sarnia; Christopher K. Ober; Melvin D. Croucher, both of Oakville, and Raymond W. Wong, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 24, 1986, Ser. No. 822,173

Int. Cl.<sup>4</sup> C08K 5/05, 5/06

U.S. Cl. 524-377 18 Claims

1. A heterophase ink jet composition comprised of a water insoluble polymer dispersed in a liquid medium selected from the group consisting of water, an alcohol, wherein the polymer contains therein an solvent soluble dye and a nonionic stabilizer permanently attached to the polymer, and mixtures of water and an alcohol; and wherein the resulting ink composition

tion has a surface tension of from about 45 to about 65 dynes/cm.

4,680,333

# REMOVABLE HOT MELT PRESSURE SENSITIVE ADHESIVE

Irwin J. Davis, Bridgewater, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 14, 1986, Ser. No. 852,005

Int. Cl.<sup>4</sup> C08K 5/09

U.S. Cl. 524-394 13 Claims

1. A removable pressure sensitive hot melt adhesive composition consisting essentially of:

(a) 25 to 50% by weight of an A-B-A block copolymer where the A component is styrene or a homologue thereof and the B component is isoprene;  
(b) 20 to 50% by weight of a substantially aliphatic hydrocarbon resin having a softening point less than about 30° C;  
(c) 0 to 30% by weight of a substantially aliphatic hydrocarbon resin having a softening point of about 80 to 150° C;  
(d) 0 to 25% by weight of mineral oil or petrolatum;  
(e) 0.25 to 3% by weight of a metallic salt of a C<sub>14</sub> to C<sub>19</sub> fatty acid; and  
(f) 0.2 to 2% of an antioxidant.

4,680,334

# FLAME RETARDANT POLYMER COMPOSITIONS CONTAINING MOLYBDENUM COMPOUNDS AND SULFUR-CONTAINING POLYMERS

Lawrence R. Wallace, Evansville, Ind., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 26, 1985, Ser. No. 780,365

Int. Cl.<sup>4</sup> C08K 3/32, 3/30, 3/28, 3/26, 3/24, 3/22

U.S. Cl. 521-406 9 Claims

1. Flame retardant compositions comprising chlorosulfonated polyethylene together with at least one resin selected from the group consisting of chlorinated polyethylene and polyvinyl chloride, wherein the chlorosulfonated polyethylene is present at a concentration such that the sulfur content of the total polymer composition is at least 0.1 parts per hundred resin, in combination with molybdenum in sufficient concentration to provide flame suppression, wherein the molybdenum is provided by molybdenum oxides and molybdenum containing salts selected from the group consisting of halides, phosphates, carbonates, oxyhalides, halide hydrates, acetates, nitrates, sulfides, chromates and molybdates.

4,680,335

# POLYMER COMPOSITIONS

Pauline B. Chambers; Stephen W. Bedder, and Paul J. Akers, all of Coventry, United Kingdom, assignors to Courtaulds PLC, United Kingdom

Filed Mar. 18, 1986, Ser. No. 840,855

Claims priority, application United Kingdom, Mar. 20, 1985, 8507221

Int. Cl.<sup>4</sup> C08J 3/02; C08K 3/20

U.S. Cl. 524-301 8 Claims

1. An aqueous polymer latex composition which is a stable blend of two aqueous polymer latices (A) and (B), said latices (A) and (B) each comprising polymer particles having a polymeric core formed by emulsion polymerisation of one or more olefinically unsaturated monomers and a polymeric shell formed on the core by emulsion polymerisation of one or more olefinically unsaturated monomers in the presence of the core, the polymeric shell of the emulsion polymer particles of latex (A) containing functional groups capable of reacting with functional groups in the polymeric shell of the emulsion polymer particles of latex (B) to cause cross linking between the particles of the two latices.

4,680,336

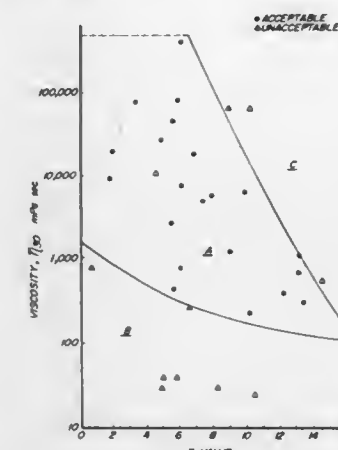
# METHOD OF FORMING SHAPED HYDROGEL ARTICLES

Hans O. Larsen, Farum, and Ture Kindt-Larsen, Vedbaek, both of Denmark, assignors to Vistakon, Inc., Jacksonville, Fla. Continuation-in-part of Ser. No. 673,805, Nov. 21, 1984. This application Feb. 19, 1985, Ser. No. 703,009

Int. Cl.<sup>4</sup> B29D 11/00

U.S. Cl. 524-548

23 Claims



1. In the method of preparing shaped hydrogel articles by forming a polymerization mixture comprising one or more hydrophilic monomers, a cross-linking agent, and from about 20 to 95% by volume of an inert water displaceable diluent, polymerizing said mixture in substantially the desired configuration of the shaped hydrogel article to obtain a shaped gel of a hydrophilic polymer and said diluent, and thereafter replacing said diluent with water to obtain said shaped hydrogel article, the improvement comprising employing as said diluent an organic compound or mixture of compounds having a viscosity and R-value falling within Area A of FIG. 1, said viscosity being from about 100 to 500,000 M Pa sec at 30° C., and said R-value being from 0 to about 16 as determined by the Hansen cohesion parameters for the diluent and the polymer according to the following equation

$$R = [(\delta_{p1} - \delta_{p2})^2 + (\delta_{h1} - \delta_{h2})^2]^{0.5}$$

wherein  $\delta_{p1}$ ,  $\delta_{h1}$  respectively are Hansen polar and hydrogen bonding cohesion parameters for the polymer, and  $\delta_{p2}$ ,  $\delta_{h2}$  are the corresponding parameters of the diluent.

4,680,337

# TRANSPARENT IMPACT POLYMERS

Harry A. Bilech, Lexington; Richard A. Di Manno, and Robert J. Gorka, both of Leominster, all of Mass., assignors to Polysar Financial Services S.A., Fribourg, Switzerland

Filed Dec. 23, 1985, Ser. No. 812,375

Int. Cl.<sup>4</sup> C08F 287/00

U.S. Cl. 525-53

8 Claims

1. A process for the preparation of a thermoplastic composition having good toughness and strength properties and a high degree of transparency, which process comprises the step of providing a feed mixture comprising (a) from about 25 to about 75 parts by weight of a styrenic monomer selected from the group consisting of styrene, p-methyl styrene, tertiary butyl styrene, dimethyl styrene and the nuclear brominated or chlorinated derivatives thereof, (b) from about 7 to about 30 parts by weight of butyl acrylate, (c) from about 10 to about 50 parts by weight of methyl methacrylate and from about 2 to about 20 parts by weight of a block copolymer selected from the group consisting of diblock and triblock copolymers of styrene-butadiene, styrene-butadiene-styrene, styrene-isoprene, sty-

rene-isoprene-styrene, partially hydrogenated styrene-butadiene-styrene and partially hydrogenated styrene-isoprene-styrene linear or radial block copolymers having a weight average molecular weight of not less than about 75,000 and a styrene content of from about 20 to about 50 weight percent, for a total of 100 parts by weight of said feed mixture, subjecting said feed mixture to polymerization in (i) an agitated reaction vessel at about 80° to about 100° C. for a time of from about 3 to about 6 hours and (ii) at least one and up to five further reaction vessels in series at about 100° to about 160° C. for a time of from about 2 to about 6 hours such that from about 60 to about 90 weight percent of the polymerizable monomers have been polymerized, passing the so-polymerized mixture to a devolatilization system comprising a devolatilization preheating means and a devolatilization vessel to remove unpolymerized monomers, to yield a thermoplastic composition.

4,680,338

## BIFUNCTIONAL LINKER

Boby M. Sundoro, West Orange, N.J., assignor to Immunomedics, Inc., Newark, N.J.

Filed Oct. 17, 1985, Ser. No. 788,284

Int. Cl.<sup>4</sup> C07G 7/02; C08K 3/30; A61F 13/04

U.S. Cl. 525-54.1

21 Claims

1. A selective bifunctional sequential linker having the formula



wherein Q is a homoaromatic or heteroaromatic ring system; A is a single bond or an unsubstituted or substituted divalent C<sub>1-30</sub> bridging group; Y is O or S; and Z is Cl, Br, I, N<sub>3</sub>, N-succinimidyl, imidazolyl, 1-benzotriazolyl, OAr where Ar is an electron-deficient activating aryl group, or OC(O)R where R is -A-Q-N=C=Y or C<sub>4-20</sub> tertiary-alkyl.

4,680,339

## CARBOXYLATE CONTAINING MODIFIED ACRYLAMIDE POLYMERS

Dodd W. Fong, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

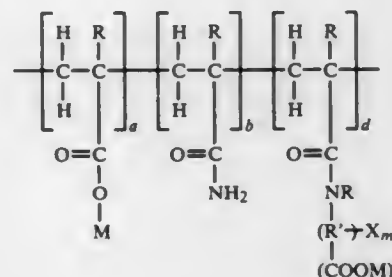
Filed Feb. 24, 1986, Ser. No. 831,964

Int. Cl.<sup>4</sup> C08F 8/40, 8/32

U.S. Cl. 525-54.11

8 Claims

1. A process to synthesize water-soluble carboxylated polymers having randomly repeated mer units represented by the formula:

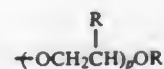


wherein

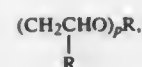
M is chosen from hydrogen, lower alkyl (C<sub>1-4</sub>) groups, alkali metal, alkaline earth metal, primary, secondary or tertiary amine salts, quaternary amines and ammonium ion, and mixtures thereof;

R' is a multi-covalent hydrocarbonaceous bridging group having from one to sixteen carbon atoms and being chosen from linear alkyl, branched alkyl, cyclic, aromatic, aralkyl, alkaryl, heterocyclic and olefinic groups;

X is chosen from -SO<sub>3</sub>M-, PO<sub>3</sub>M<sub>2</sub>-, -COOR-, -OR-, -R'NR'', -R'N+R<sub>3</sub>Hal



wherein  
R'' is



R and mixtures thereof, and

R is individually chosen, at each occurrence, from H and lower alkyl (C<sub>1-4</sub>) groups;

and wherein

a, b, and d are integers with the following relationships;

a/b is from zero to 100

b/d is from 0.01 to 100

a/d is from zero to 100,

and the sum of a+b+d is sufficient to provide a molecular weight of at least 1000,

and the ratio of d:(a+b) is from 20:1 to 1:100;

and wherein

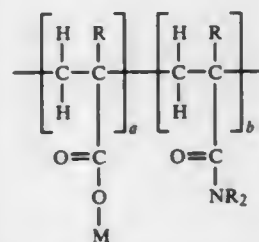
p ranges between 1 and 16, and

m ranges between 0 and 16, and

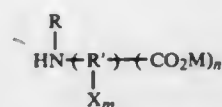
n ranges between 1 and 16, provided that when m is zero, the sum of m+n is from 1 to 20;

which process comprises reacting, in a common solvent, at a temperature of at least 100° C.;

A. a polymer having a molecular weight of at least 500, and having pendant amide functional groups, and represented by the structure:



wherein R, M, a, b have the same meanings as above; with  
B. a chemical reactant having the structure:



wherein R, R', M, X, m, and n have the meanings above; wherein the mole ratio of chemical reactant to pendant amide groups in the polymer ranges between about 5:1 to about 1:100; and reacting for an effective amount of time to accomplish at least a 2 percent conversion of chemical reactant to carboxylated pendant groups on the polymer; and then recovering the water-soluble carboxylated polymer.

4,680,340

## EASY TO OPEN PACKAGE AND A METHOD OF MAKING SAME

Aurelio Oreglia, Mozzate; Paolo Botto, and Claudio Freschi, both of Milan, all of Italy, assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

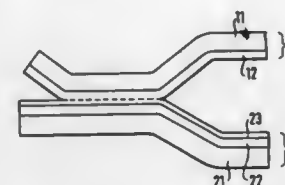
Filed Nov. 29, 1985, Ser. No. 803,032

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504463

Int. Cl.<sup>4</sup> C08L 51/04, 33/02, 33/04

U.S. Cl. 525-72

4 Claims



1. A seal layer for an easy to open package consisting essentially of

(a) 40% or less, by weight, of a first polymer having a melt flow index of less than 5 selected from the group consisting of ionomers and ethylene/vinyl acetate copolymers, and

(b) 60% or more by weight of a second polymer having a melt flow index greater than 20 being selected from the group consisting of low density polyethylene, ethylene/vinyl acetate copolymers, and modified ethylene/vinyl acetate copolymers, whereby the second polymer is a low density polyethylene if the first polymer is an ethylene/vinyl acetate copolymer.

4,680,341

## EPOXY RESINS BASED ON TETRAGLYCIDYL DIAMINES

Richard H. Newman-Evans, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

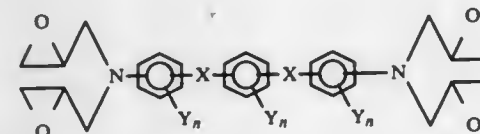
Filed Apr. 17, 1986, Ser. No. 853,052

Int. Cl.<sup>4</sup> C08G 59/28

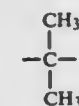
U.S. Cl. 525-113

33 Claims

1. A tetraglycidate of the formula



wherein  
X = O, S,



-CH<sub>2</sub>-, C=O;  
Y = halogen, C<sub>1-4</sub> alkyl; and  
n = 0 to 4.

4,680,342

## FLAME RESISTANT ALKENYL AROMATIC COMPOUNDS AND POLYMERS CONTAINING CHEMICALLY BONDED PHOSPHORUS AND BLENDS WITH POLYPHENYLENE ETHER

Robert J. Axelrod, Glenmont, and Glenn D. Cooper, deceased, late of Delmar, by Rose H. Cooper, executrix, all of N.Y., assignors to General Electric Company, Selkirk, N.Y.

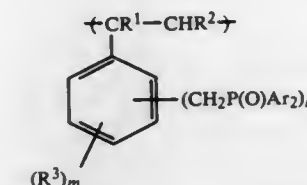
Division of Ser. No. 566,341, Dec. 28, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 803,448

Int. Cl.<sup>4</sup> C08F 8/00, 13/02; C08L 71/04

U.S. Cl. 525-132

9 Claims

1. A flame retardant polymer comprising units of the formula



in which R<sup>1</sup> and R<sup>2</sup> are independently selected from the group consisting of alkyl having from 1 to 6 carbon atoms, alkenyl having from 1 to 6 carbon atoms, and hydrogen; R<sup>3</sup> is selected from the group consisting of alkyl having from 1 to 6 carbon atoms, alkenyl having from 1 to 6 carbon atoms, halogen and hydrogen; Ar is selected from the group consisting of monocyclic and dicarbocyclic aromatic radicals unsubstituted and substituted with up to 5 substituents selected from among halogen and alkyl having from 1 to 3 carbon atoms; m is zero or a whole number from 1 to 3; and n is a whole number from 1 to 3.

4,680,343

## CHLORINATED POLY(VINYL CHLORIDE) THERMOPLASTIC ALLOYS

Bing-lin Lee, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 27, 1986, Ser. No. 844,639

Int. Cl.<sup>4</sup> C08L 69/00

U.S. Cl. 525-148

20 Claims

1. A thermoplastic high impact polymer alloy composition; comprising:

from about 20% to about 70% by weight of a chlorinated poly(vinyl chloride) containing from 57% to about 75% by weight of chlorine therein;  
from about 10% to about 80% by weight of an aromatic polycarbonate;  
an effective amount of an ethylene-based functional polymer so that the polymer alloy has an Izod notch impact strength of at least 1.0 ft-lb/in;  
wherein said alloy amount is based upon the total weight of said chlorinated poly(vinyl chloride), said polycarbonate, and said ethylene-based functional polymer, and wherein said polymer alloy has a melt processing temperature of 230° C. or less.

4,680,344

## BLENDS OF IONOMERS AND LINEAR POLYESTERS

James N. Coker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 730,052, May 3, 1985, abandoned. This application Mar. 26, 1986, Ser. No. 844,125

Int. Cl.<sup>4</sup> C08L 33/02

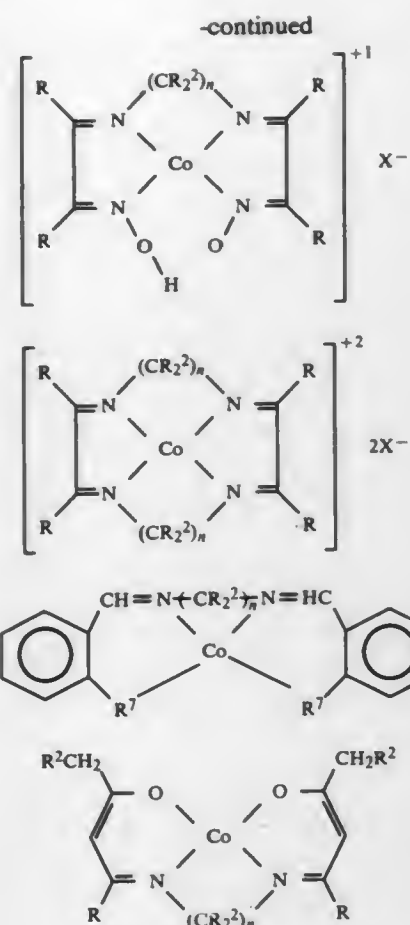
U.S. Cl. 525-176

4 Claims

1. A composition consisting essentially of  
(a) about 60-85% of an ionomer consisting of a direct copolymer of 80-95% of ethylene and 5-20% of an α,β-unsaturated carboxylic acid selected from the group con-







wherein each R, independently, is phenyl or C<sub>1</sub> to C<sub>12</sub> alkyl wherein each α-carbon atom contains two hydrogen atoms, or R and R on adjacent carbon atoms, taken together, is C<sub>5</sub> to C<sub>8</sub> cycloalkylene, unsubstituted in the α-positions; R<sup>2</sup> is H or C<sub>x</sub>H<sub>2x+1</sub> wherein x is 1 to 12; each R<sup>3</sup>, independently, is H or C<sub>1</sub> to C<sub>12</sub> branched or straight alkyl; R<sup>2</sup> is 0 or NH; n is 2 or 3; and X<sup>-</sup> is NO<sub>3</sub><sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>, I<sup>-</sup>, BF<sub>4</sub><sup>-</sup>, PF<sub>6</sub><sup>-</sup>, SbF<sub>6</sub><sup>-</sup> or R'COO<sup>-</sup> wherein R<sup>1</sup> is C<sub>1</sub> to C<sub>12</sub> alkyl; provided, however, each of either or both aromatic rings in VIII optionally is substituted with a benzo group and optionally contains up to four substituents.

4,680,353

## PROCESS FOR PRODUCTION OF STYRENE POLYMERS

Nobuhide Ishihara; Masahiko Kuramoto, both of Sodegaura, and Miehtake Uoi, Ichihara, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan  
Filed Oct. 23, 1986, Ser. No. 923,395  
Claims priority, application Japan, Nov. 11, 1985, 60-252531; May 6, 1986, 61-101927

Int. Cl.<sup>4</sup> C08F 4/64

U.S. Cl. 526—160

3 Claims

1. A process for producing styrene polymers which comprises polymerizing styrene or styrene derivatives by the use of a catalyst comprising:

- (A) a titanium compound, and  
(B) a contact product of an organoaluminum compound and a condensation agent.

4,680,354

## LOW MOLECULAR WEIGHT POLYMERS AND COPOLYMERS

Ju-Chai Lin, Strongsville, and Kirk J. Abbey, Seville, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio  
Filed May 21, 1986, Ser. No. 865,555  
Int. Cl.<sup>4</sup> C08F 4/06

U.S. Cl. 526—172

11 Claims

1. A process for producing a low molecular weight polymer comprising copolymerizing ethylenically unsaturated monomers comprising a methacrylic monomer or a mixture of methacrylic and acrylic monomers, polymerized alone or with other ethylenic monomer in the presence of an effective amount of free-radical initiator in combination with 0.1 ppm to 5,000 ppm, basis monomer weight, Cobalt(II) nitrilomethylidene dipyrrole complex catalyst comprising a Cobalt(II) nitrilomethylidene dipyrrole complex modified by a basic ligand selected from the group consisting of amines, trisubstituted phosphines, and imidazole to produce a low molecular weight methacrylic polymer having a weight average molecular weight between 200 and 30,000.

4,680,355

## PROCESS FOR PREPARATION OF FLUORINE CONTAINING POLYMER FILMS

Akihiko Nakahara, Kumage; Kunlaki Takata, and Yuji Iseki, both of Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan  
Continuation of Ser. No. 710,851, Mar. 12, 1985, abandoned.  
This application Jul. 31, 1986, Ser. No. 891,060  
Claims priority, application Japan, Mar. 12, 1984, 59-45398; Mar. 22, 1984, 59-53499

Int. Cl.<sup>4</sup> B05D 3/02

U.S. Cl. 526—243

18 Claims

1. A process for the preparation of fluorine-containing polymer films having a multi-layer structure, which comprises flow-casting a fluorine-containing vinyl monomer, which is liquid under polymerization conditions, in the form of film having a thickness of from 10 μ to 1 mm, polymerizing the flow-cast monomer in the presence of a gas phase having a fluorine-containing olefin to form a polymer, flow-casting a fluorine-containing olefin to form a polymer, flow-casting a fluorine-containing vinyl monomer, which is liquid under polymerization conditions, in the form of a film having a thickness of from 10 μ to 1 mm on the so-formed polymer and polymerizing the newly flow-cast monomer in the presence of a gas phase having a fluorine-containing olefin, each so-formed polymer layer containing 5 to 95 mole % of the fluorine-containing olefin units.

4,680,356

## COLORLESS LIGAND-RELEASING MONOMERS AND POLYMERS AND THEIR USE TO PROVIDE DYES WITH METAL IONS

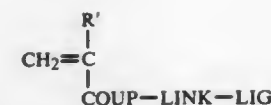
William N. Washburn, Ionia, and Kenneth R. Hollister, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Division of Ser. No. 688,224, Jan. 2, 1985, Pat. No. 4,577,998.  
This application Aug. 9, 1985, Ser. No. 764,152  
Int. Cl.<sup>4</sup> C08F 28/06, 226/06, 234/02

U.S. Cl. 526—256

5 Claims

1. An essentially colorless, hydrophilic ligand-releasing polymer comprising:

- (a) recurring units derived from an ethylenically unsaturated polymerizable hydrophilic monomer in a number sufficient to render said polymer hydrophilic, and  
(b) recurring units derived from an ethylenically unsaturated polymerizable monomer represented by the structure:



wherein R' is hydrogen or lower alkyl, LINK is —COO—, —CONH—, —O—, —S—, —SO<sub>2</sub>O— or —SO<sub>2</sub>NH— COUP is a photographic color coupling moiety which can be cleaved from LINK by an oxidized developer composition, and  
LIG is a ligand capable of complexing with metal ions, while joined to said polymer, to form a dye.

4,680,357

## INTERPOLYMERS OF ETHYLENE AND ALKENYL PYRIDINES AND PREPARATION THEREOF

David P. Flores; John G. Meiller, and James D. Massie, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1985, Ser. No. 737,989

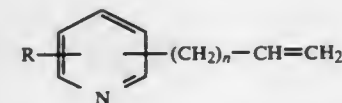
Int. Cl.<sup>4</sup> C08F 26/06

U.S. Cl. 526—265

38 Claims

1. An interpolymer exhibiting utility as an adhesive to metallic substrates, consisting essentially of:

- (a) from about 93 to about 97 mole percent ethylene on an interpolymer basis; and  
(b) interpolymerized therewith, from about 3 to about 7 mole percent on an interpolymer basis of an alkenyl pyridine having the formula:



wherein n is 0 or an integer from 1 to about 10, R is hydrogen, ω-alkenyl having 2-12 carbon atoms, hydroxyl, amino, carboxyl, cyano, formyl, sulfo, halo, benzyl, benzoyl, phenyl, alkoxy, hydroxyalkyl, aminoalkylene, α-alkanoyl-ω-alkenyl, or alkyl having 1-10 carbon atoms.

4,680,358

## STYRYL TERMINATED MACROMOLECULAR MONOMERS OF POLYETHERS

Simon H. Yu, North Ridgeville, Ohio, assignor to The B F Goodrich Company, Akron, Ohio

Filed Nov. 8, 1985, Ser. No. 796,364

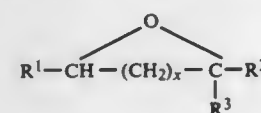
Int. Cl.<sup>4</sup> C07C 41/03, 43/23, 43/178; C08F 220/20, 116/16

U.S. Cl. 526—292.9

14 Claims

1. A process for the manufacture of a polyether macromer having a styryl group near one end and a hydroxyl group at the other, comprising, polymerizing

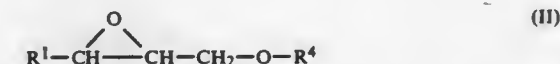
- (A) a cationically ring-openable cyclic ether selected from the group consisting of  
(i) at least one alkylene oxide having the structure



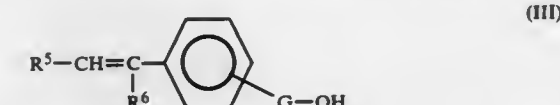
wherein,

x is an integer in the range from 0 to about 4, except that when x > 1, a second alkylene oxide having x = 1 or 0 must be present, and,  
R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl (having from 1 to about 20 carbon atoms) and haloalkyl, and, C<sub>6</sub>-C<sub>20</sub> aryl

and aralkyl, and, at least one of R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> is hydrogen; and,  
(ii) an aliphatic or aromatic glycidyl ether having the structure



wherein R<sup>1</sup> has the same connotation as hereinabove; and, R<sup>4</sup> represents a member selected from the group consisting of C<sub>1</sub>-C<sub>20</sub> alkyl or substituted alkyl, haloalkyl, alkoxyalkyl, aryl (Ar), substituted aryl (Ar-Q), wherein Q represents C<sub>1</sub>-C<sub>10</sub> alkyl, haloalkyl; and,  
(B) a monoolefinically ("styryl") unsaturated primary or secondary alcohol represented by the structure



wherein,

G, if present, is in an ortho-, meta-, or para- position of the phenyl ring which may be substituted, said position being relative to that of the olefinically unsaturated group, and is a spacer selected from the group consisting of branched or linear alkyl, aralkyl, haloalkyl, haloaralkyl, alkoxy, haloalkoxy, aralkoxy and haloaralkoxy, each having from 1 to about 20 carbon atoms (C<sub>1</sub>-C<sub>20</sub>); and,

R<sup>5</sup> and R<sup>6</sup> are selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>10</sub> alkyl (having from 1 to about 20 carbon atoms) and haloalkyl, and, at least one of R<sup>5</sup> and R<sup>6</sup> is always H;

in the presence of an effective amount of

(C) a cationic initiator selected from the group consisting of Friedel-Crafts acids, relatively strong protic organic and inorganic acids, oxonium salts and stable carbenium ions; so as to produce a macromer having the structure



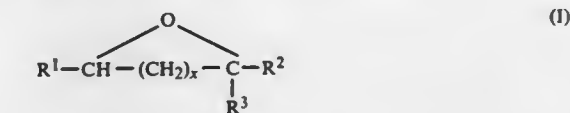
wherein

R represents the residue of said styryllycally unsaturated alcohol,

M represents the residue of at least one said cyclic ether which is ring-opened, and,  
m represents an integer in the range from 2 to about 500.

10. A polyether macromer having a styryl group near one end, a hydroxyl group at the other, and having a molecular weight distribution not exceeding 5.0 and being formed by polymerizing

- (A) a cationically ring-openable cyclic ether selected from the group consisting of  
(i) at least one alkylene oxide having the structure

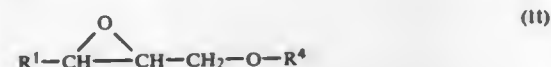


wherein,

x is an integer in the range from 0 to about 4, except that when x > 1, a second alkylene oxide having x = 1 or 0 must be present, and,  
R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl (having from 1 to about 20 carbon atoms) and haloalkyl, and, C<sub>6</sub>-C<sub>20</sub> aryl and aralkyl, and, at least one of R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> is hydrogen; and,

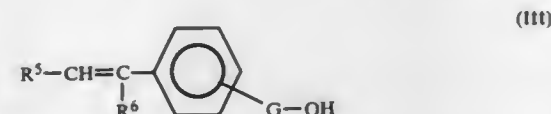


(ii) an aliphatic or aromatic glycidyl ether having the structure



wherein  $\text{R}^1$  has the same connotation as hereinabove; and,  $\text{R}^4$  represents a member selected from the group consisting of  $\text{C}_1$ - $\text{C}_{20}$  alkyl or substituted alkyl, haloalkyl, alkenyl substituted alkenyl, haloalkenyl, alkoxyalkyl, aryl (Ar), substituted aryl (Ar-Q), wherein Q is selected from the group consisting of  $\text{C}_1$ - $\text{C}_{10}$  alkyl, haloalkyl,  $\text{C}_2$ - $\text{C}_{10}$  alkenyl or haloalkenyl; and,

(B) a monoolefinically ("styrylally") unsaturated primary or secondary alcohol represented by the structure



wherein,

G, if present, is in an ortho-, meta-, or para- position of the phenyl ring which may be substituted, said position being relative to that of the olefinically unsaturated group, and is a spacer selected from the group consisting of branched or linear alkyl, aralkyl, haloalkyl, haloaralkyl, alkoxy, haloalkoxy, aralkoxy and haloaralkoxy, each having from 1 to about 20 carbon atoms ( $\text{C}_1$ - $\text{C}_{20}$ ); and,

$\text{R}^5$  and  $\text{R}^6$  are selected from the group consisting of hydrogen,  $\text{C}_1$ - $\text{C}_{10}$  alkyl (having from 1 to about 20 carbon atoms) and haloalkyl, and, at least one of  $\text{R}^5$  and  $\text{R}^6$  is always H;

in the presence of an effective amount of

(C) a cationic initiator selected from the group consisting of Friedel-Crafts acids, relatively strong protic organic and inorganic acids, oxonium salts and stable carbenium ions; so as to produce a macromer having the structure



wherein

R represents the residue of said styrylally unsaturated alcohol,

M represents the residue of at least one said cyclic ether which is ring-opened, and,

m represents an integer in the range from 2 to about 500; whereby said macromer is produced in conjunction with at least a trace quantity of cyclic oligomer of said cyclic ether.

4,680,359

**MOLDING COMPOSITIONS FOR OPTICALLY READABLE INFORMATION-STORAGE MEDIA**  
Ralf Liebler, Darmstadt, and Klaus Albrecht, Mainz, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 16, 1984, Ser. No. 661,366

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337890

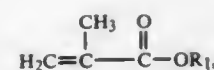
Int. Cl.<sup>4</sup> C08F 20/10

U.S. Cl. 526-309

12 Claims

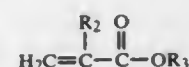
1. A copolymer, adaptable to use as a molding composition for making optically readable data storage media, said copolymer being free of aromatic groups and comprising

(A) from 20 to 70 percent by weight of at least one ester of the formula



wherein  $\text{R}_1$  is derived from an alcohol,  $\text{R}_1\text{OH}$ , which is cyclohexanol, an alkyl-substituted cyclohexanol wherein each alkyl has up to 12 carbon atoms, a cyclohexylalkanol, or a bicyclic or tricyclic alcohol, with the proviso that a homopolymer of such an ester have a Vicat softening temperature (in conformity with DIN 53460) above  $80^\circ\text{C}$ ;

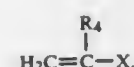
(B) from 10 to 60 percent by weight of at least one ester of the formula



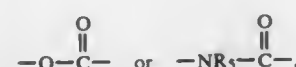
wherein  $\text{R}_2$  is hydrogen or methyl and  $\text{R}_3$  is a linear or branched aliphatic group having from 2 to 22 carbon atoms, with the proviso that a homopolymer of such an ester have a Vicat softening temperature (in conformity with DIN 53460) below  $90^\circ\text{C}$ ;

(C) from 20 to 40 percent by weight of methyl methacrylate; and

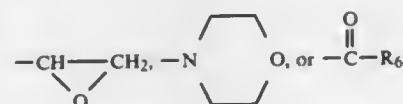
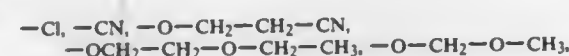
(D) from 0 to 20 percent of at least one aprotic monomer having a polar group X, of the formula



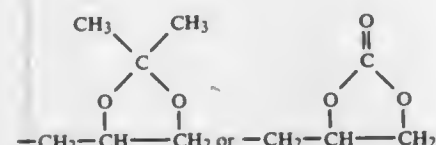
wherein  $\text{R}_4$  is hydrogen or methyl and X is  $-\text{CN}$  or  $-\text{Y}-\text{A}-\text{Z}$ , wherein Y is



wherein  $\text{R}_5$  is alkyl having from 1 to 6 atoms, A is a hydrocarbon chain having from 1 to 8 carbon atoms, and Z is



wherein  $\text{R}_6$  is ( $\text{C}_1$ - $\text{C}_3$ )-alkyl or phenyl, or wherein A-Z is



# 4,680,360 **PROCESS FOR PRODUCING POLY(ALLYLAMINE) DERIVATIVES**

Toshio Ueda, Koriyama; Yoshinori Sato, Fukushima, and Susumu Harada, Koriyama, all of Japan, assignors to Nitto Boseki Co., Ltd, Fukushima, Japan

Filed Nov. 13, 1984, Ser. No. 671,004

Claims priority, application Japan, Nov. 14, 1983, 58-213699; Nov. 18, 1983, 58-216359

Int. Cl.<sup>4</sup> C08F 4/04, 26/02

U.S. Cl. 526-310

5 Claims

1. A process for producing a poly(allylamine) derivative, which comprises polymerizing an inorganic acid salt of monoallylamine with a radical-polymerization initiator having an azo group in the molecule, converting the resulting poly(allylamine salt) into poly(allylamine), and reacting the resulting poly(allylamine) with an acrylic compound having an electron attracting group adjacent to the double bond.

4,680,361

# **NOVEL POLYMERS AND CROSSLINKED COMPOSITIONS MADE THEREFROM**

Joseph V. Koleske, Charleston, W. Va.; Donald F. Smith, Bridgewater, and Robert J. Weber, Neshaun, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 20, 1986, Ser. No. 831,199

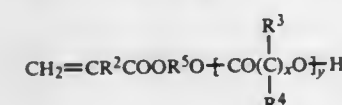
Int. Cl.<sup>4</sup> C08F 20/64

U.S. Cl. 526-318

25 Claims

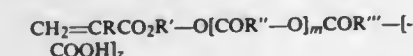
1. A crosslinked composition comprising one or more prepolymers obtained by polymerizing, to a molecular weight of about 300 to about 150,000, one or more ethylenically unsaturated monomers with a composition comprising:

- 0 to 10 weight percent of a lactone;
- 0 to about 10 weight percent of hydroxyethyl acrylate or methacrylate;
- 0 to about 2 weight percent of one or more diacrylates;
- 0 to about 10 weight percent of products resulting from Michael addition, acrylate polymerization, transesterification reactions, or other side reactions;
- 0 to about 50 weight percent of a reactive monomer of the following average formula:



wherein  $\text{R}^5$  is a divalent radical,  $\text{R}^2$  is either hydrogen or methyl, each of  $\text{R}_3$  and  $\text{R}_4$  is hydrogen, phenyl, or lower alkyl having 1 to about 6 carbon atoms, x is an integer having a value of up to about 10, and y is an integer having a value up to about 20;

- 0 to 20 weight percent, of the reaction product of hydroxyethyl acrylate or methacrylate and an anhydride; and
- remainder to 100 weight percent of a reactive monomer of the following average formula:



wherein R is H, methyl or ethyl,  $\text{R}'$  is an alkylene radical having 2 to about 12 carbons,  $\text{R}''$  is an alkylene radical having about 1 to about 10 carbons,  $\text{R}'''$  is a divalent radical having 2 to about 20 carbons, m is an integer having a value of 1 to about 20, and z is an integer having a value of 1 to about 4;

and reacting said prepolymer or prepolymers with one or more crosslinking compounds capable of reacting with carboxyl and/or hydroxyl groups.

4,680,362

# **EMBEDDING MEDIA SUITABLE FOR THE PREPARATION OF THIN SECTIONS OF EMBEDDED BIOLOGICAL MATERIALS**

Jean-Dominique Acetarin, Saint Louis, France; Werner Villiger, Basel, and Eric Carlemalm, Therwil, both of Switzerland, assignors to Chemische Werke Lowi GmbH, Waldkraiburg, Fed. Rep. of Germany

Filed Mar. 20, 1986, Ser. No. 841,563

Claims priority, application European Pat. Off., Mar. 22, 1985, 85103388.6

Int. Cl.<sup>4</sup> C08F 20/28

U.S. Cl. 526-320

13 Claims

1. A method of producing an essentially non-polar embedding medium, which comprises the step of admixing ethyl methacrylate, n-butyl methacrylate, 1,3-butanediol diol dimethacrylate and a free radical polymerisation initiator at a ratio by weight of ethyl methacrylate:n-butyl methacrylate of 1.24 to 2.70:1, a ratio by weight of the combined ethyl methacrylate and n-butyl methacrylate:1,3-butanediol dimethacrylate of 11.14 to 16:1, and the polymerization initiator being included in the mixture in a small amount of from about 0.2% to about 1% by weight at above  $-70^\circ\text{C}$ ., and 0.50% to 1.25% at below  $-70^\circ\text{C}$ ., based on the total weight of the resulting embedding medium, the purity of each of the components being at least 90% by weight.

4,680,363

# **ONE COMPONENT SILICONE COMPOSITIONS WITH GOOD BONDING PROPERTIES**

Melvin D. Beers, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 363,629, Mar. 30, 1982, abandoned.

This application Jan. 13, 1984, Ser. No. 571,138

Int. Cl.<sup>4</sup> C08G 77/06, 77/18

U.S. Cl. 528-14

2 Claims

1. A process for forming a one component RTV silicone rubber composition with good bonding properties at high humidity conditions, comprising:

- mixing
- 100 parts by weight of a silanol end-stopped diorganopolysiloxane polymer having a viscosity from 100 to 1,000,000 centipoise at  $25^\circ\text{C}$  where the organo groups are monovalent hydrocarbon radicals;
- from 0.1 to 10 parts by weight of an acyloxy functional cross-linking agent of the formula



where R is a monovalent hydrocarbon radical of 1 to 8 carbon atoms,  $\text{R}^1$  is an acyl radical of 2 to 30 carbon atoms, and m is 0 or 1;

- from 0.01 to 10 parts by weight of a curing promoter which is a salt of a carboxylic acid; and
- about 4 parts by weight of a magnesium or zinc salt of a carboxylic acid as an acid scavenger.

4,680,364

# **ROOM TEMPERATURE VULCANIZABLE SILICONE COMPOSITIONS HAVING IMPROVED ADHESION**

Gary M. Lucas, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 746,144, Jun. 18, 1985, abandoned.

This application Aug. 11, 1986, Ser. No. 895,522

Int. Cl.<sup>4</sup> C08G 77/06

U.S. Cl. 528-15

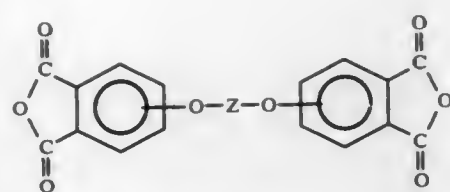
19 Claims

1. A curable composition comprising:

- a polydiorganosiloxane wherein the silicon atom at each polymer chain end is terminated with at least two hydrolyzable groups,
- an effective amount of non-chelate metal salt of a mono-



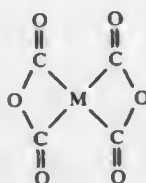




with a diamine of the formula

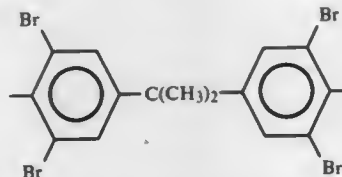
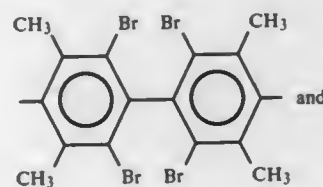
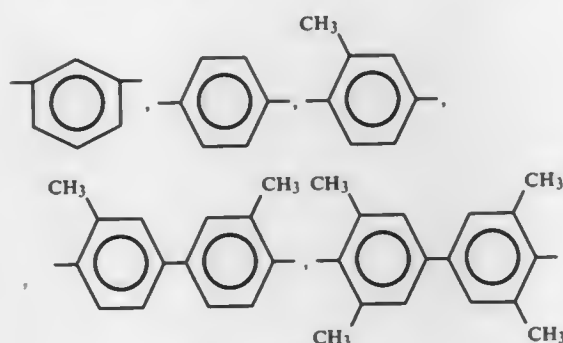


under imidization conditions for a time sufficient to produce amine-terminated oligomers;  
(b) heating in a second reactor at least one dianhydride of the formula

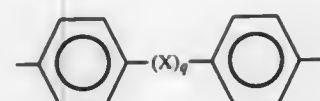


and an inert solvent to a temperature equal to or greater than the first reactor; and

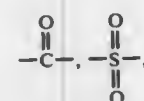
(c) metering the contents of the first reactor into the contents of the second reactor at a rate of addition such that water can be removed from the reaction mixture as it is formed and heating the resulting mixture for a time sufficient to complete the imidization reaction, wherein the molar ratio of total dianhydride reacted to total diamine reacted is 1:0.5 to 1:2 and from about 78 to 99 mole percent of the total dianhydride is reacted in step (a) and wherein —O—Z—O— is in the 3 or 3'- and 4 or 4'-positions and Z is a member of the class consisting of (1)



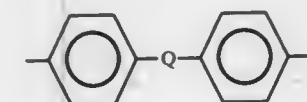
and (2) divalent organic radicals of the general formula:



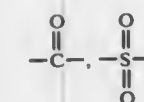
where X is a member selected from the class consisting of divalent radicals of the formulas, —C<sub>7</sub>H<sub>2</sub>y—,



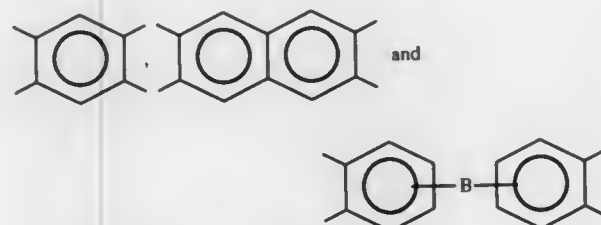
—O— and —S— where q is 0 or 1, y is a whole number from 1 to 5, R is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2 to about 20 carbon atoms, C(2-8) alkylene terminated polydiorganosiloxane, and (c) divalent radicals included by the formula



where Q is a member selected from the class consisting of —O—,



—S—, and —C<sub>x</sub>H<sub>2x</sub>—, and x is a whole number from 1 to 5 inclusive, and M is a tetravalent radical selected from the class consisting of



where B is an electron-withdrawing group.

4,680,374

### OPTICAL DISC SUBSTRATE MADE OF A COPOLYCARBONATE

Masayoshi Hasuo, Yokohama; Seichi Mukai, Kunitachi; Hiroshi Urabe; Seiji Yoshida, both of Kawasaki, and Masahiro Nukui, Sagami, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Aug. 15, 1985, Ser. No. 765,802

Claims priority, application Japan, Aug. 24, 1984, 59-175078  
Int. Cl.<sup>4</sup> C08G 63/62

U.S. Cl. 528—204

6 Claims

1. A transparent optical disc substrate having a double refraction of not greater than  $5 \times 10^{-5}$  prepared from a polycarbonate containing at least 5 wt.%, based on the total carbonate bond-constituting units of the polycarbonate, of (1) carbonate bond-constituting units of the formula:

4,680,376

### PROCESS FOR THE CONTINUOUS PRODUCTION OF HIGH-MOLECULAR POLYBUTYLENETEREPHTHALATE

Helmut Heinze, Frankfurt, and Fritz Wilhelm, Karben, both of Fed. Rep. of Germany, assignors to Davy McKee A.G., Fed. Rep. of Germany

Filed Jun. 5, 1986, Ser. No. 871,000

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1985, 3544551

Int. Cl.<sup>4</sup> C08G 63/04, 63/34

U.S. Cl. 528—279

7 Claims

1. In a process for the continuous production of high molecular weight polybutyleneterephthalate by esterification of terephthalic acid with 1,4-butanediol in the presence of organo-tin and/or organo-titanium compounds and the subsequent polycondensation of the esterification product obtained, the improvement comprising:

- continuously feeding a terephthalic acid/1,4 butanediol paste containing said catalyst into the first esterification reactor as the beginning process stage;
- carrying out the esterification during the first stage at temperatures of 225° to 260° C. and at absolute pressures of 0.1 up to a maximum of 1 bar;
- precondensing the esterification product from the first stage during a second stage at temperatures of 230° to 260° C. and at pressures of 10 to 200 mbar;
- continuously polycondensing said precondensate at temperatures of 240° to 265° C. and at pressures of 0.25 to 25 mbar;
- condensing 1,4-butanediol distilled off from said first and following process stages;
- removing water and tetrahydrofuran from said condensed 1,4-butanediol; and
- recycling said 1,4-butanediol to said first esterification reactor, at a total molar ratio of fresh and recycled 1,4-butanediol to terephthalic acid from 2 to 3.8.

4,680,375

### POLYMERIC CYANINE DYE

Mohamed A. Elmasry, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

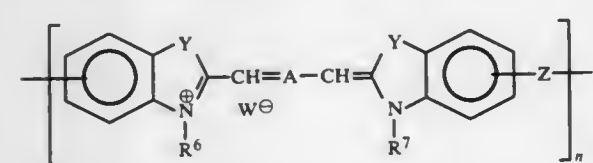
Filed Mar. 11, 1985, Ser. No. 710,077

Int. Cl.<sup>4</sup> C08G 12/26, 73/06

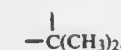
U.S. Cl. 528—253

13 Claims

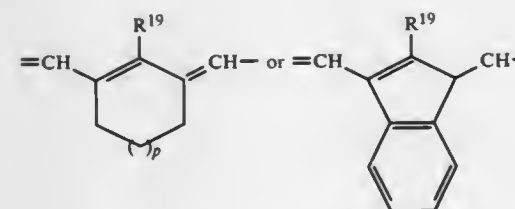
1. A polymeric tricyanin dye with a rigidized chain having tricyanin polymeric dye units of formula I:



wherein  
Y is



—S—, —Se— or —O—,  
A is



in which R<sup>19</sup> is alkyl, —Cl, amino, alkyl (C<sub>1</sub> to C<sub>4</sub>) substituted amino, phenyl or cyclized amine, and  
p is 0 or 1,  
R<sup>6</sup> and R<sup>7</sup> independently are alkyl of (C<sub>1</sub>—C<sub>30</sub>),  
Z is —SO<sub>2</sub>—, —(CH<sub>2</sub>)<sub>m</sub>—, or vinylene, wherein m is an integer of 1 to 20,  
W is a dye anion, and  
n is an integer 2 to 10,000.

4,680,378

### CYANATE FUNCTIONAL MALEIMIDE AND POLYAMINE COPOLYMER

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

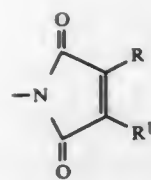
Filed Oct. 1, 1985, Ser. No. 782,643

Int. Cl.<sup>4</sup> C08G 83/00, 73/12

U.S. Cl. 528—322

4 Claims

1. A polymerizable or curable composition which comprises (A) at least one thermosettable compound which simultaneously contains in the same molecule only one maleimide group or substituted maleimide group which group is represented by the formula



wherein each R and R' is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; and only one cyanate group; and  
(B) at least one material containing a plurality of aromatic amine groups; and  
components (A) and (B) are present in a quantity which provides a mole ratio of amine to total maleimide, substituted maleimide and cyanate groups of from about 0.001 to about 1:1.

4,680,379

# HOMOGENEOUS COPOLYAMIDE COMPRISED OF HEXAMETHYLENEDIAMINE/ADIPIC ACID/SHORT CHAIN DIACID/DIMER ACID AND CATALYTIC PREPARATION THEREOF

Jean Coquard, Craonne, and Jean Goletto, Ecully, both of France, assignors to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Filed Feb. 7, 1986, Ser. No. 826,926

Claims priority, application France, Feb. 7, 1985, 85 01912  
Int. Cl.<sup>4</sup> C08G 69/34, 69/04

U.S. Cl. 528—336

21 Claims

1. A process for the preparation of a homogeneous, high melting, flexible copolyamide, comprising (a) prepolymerizing either (i) mixture of adipic acid and hexamethylenediamine, or admixture thereof with at least one other short-chain dicarboxylic acid, or (ii) mixture of (1) a salt of adipic acid, or salt of admixture of adipic acid with at least one other short-chain dicarboxylic acid, and hexamethylenediamine, together with (2) free hexamethylenediamine, said prepolymerization (a) being carried out in the presence of a catalytically effective amount of a strong inorganic oxyacid, or strong organic oxyacid other than a carboxylic acid, or alkali or alkaline earth metal salt thereof, said resulting prepolymer having amino end groups, and thence (b) polycondensing said prepolymer with a fatty acid dimer.

4,680,380

# ODOR-FREE CHLOROSULFONATED POLYOLEFINS

George M. Benedikt, Lakewood, and Dennis A. Barnes, Brunswick, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 19, 1983, Ser. No. 459,066

Int. Cl.<sup>4</sup> C08K 3/32, 3/26, 3/22

U.S. Cl. 528—485

16 Claims

1. A method for eliminating the sulfur dioxide odor of vapor phase chlorosulfonated polyolefins comprising mixing with vapor phase chlorosulfonated polyolefins containing less than 300 ppm of free sulfur dioxide, less than 2 weight parts per 100 weight parts of polyolefin, of stabilizing amounts of inorganic additives selected from the group consisting of aluminum hydroxide, barium carbonate, barium hydroxide, magnesium hydroxide, magnesium oxide, potassium phosphate, sodium carbonate, disodium hydrogen phosphate and trisodium phosphate.

4,680,381  
PROCESS FOR ISOLATING POLYMER  
Masahiro Asada, and Miyuki Azuma, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan  
Continuation of Ser. No. 697,692, Feb. 4, 1985, abandoned, which is a continuation of Ser. No. 435,245, Oct. 19, 1982, abandoned. This application Sep. 16, 1985, Ser. No. 776,100  
Claims priority, application Japan, Oct. 20, 1981, 56-168039  
Int. Cl.<sup>4</sup> C08F 6/00

U.S. Cl. 528—501

17 Claims

1. A process for isolating a polymer which consists essentially of the steps of admixing a 1 to 80% by weight solution of a first polymer in an organic solvent which is substantially immiscible with water, with 50 to 10,000 parts of a 0.001 to 1% by weight aqueous solution of a water-soluble polymeric dispersant, and while agitating distilling away said organic solvent from the mixture in the form of a suspension, thereby depositing particles of said first polymer, said parts being parts by weight per 100 parts of the organic solvent solution.

4,680,382

# ANALOGUES OF ACTINOMYCIN D

Sisir K. Sengupta, Needham, Mass., assignor to Trustees of Boston University, Boston, Mass.

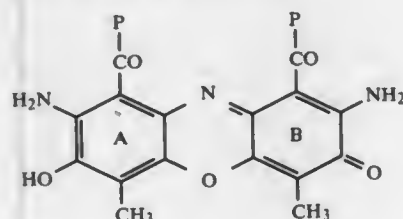
Filed Feb. 3, 1986, Ser. No. 825,290

Int. Cl.<sup>4</sup> C07K 5/12

U.S. Cl. 530—317

2 Claims

1. The compound having the formula:



wherein P =  $\text{Thr-D-Val-Pro-Sar-MeVal}$

4,680,383

# MONOCLONAL ANTIBODY TO HUMAN T CELLS

Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical, Raritan, N.J.

Division of Ser. No. 432,453, Oct. 4, 1982, Pat. No. 4,515,894, which is a division of Ser. No. 22,132, Mar. 20, 1979, Pat. No. 4,363,799. This application Aug. 10, 1984, Ser. No. 639,563  
The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.

Int. Cl.<sup>4</sup> C07K 15/00; A61K 39/395

U.S. Cl. 530—387

4 Claims

1. Mouse monoclonal antibody which reacts with essentially all normal human peripheral T cells.

4,680,384

# DYES, THEIR PREPARATION AND USE

Karl Seitz, Oberwil; Henri Riist, Arlesheim, and Karl Hoegerle, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

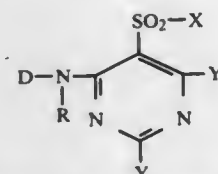
Continuation of Ser. No. 513,121, Jul. 13, 1983, abandoned, which is a continuation of Ser. No. 339,193, Jan. 13, 1982, abandoned, which is a division of Ser. No. 112,979, Jan. 17, 1980, Pat. No. 4,325,869, which is a continuation of Ser. No. 903,632, May 8, 1978, abandoned. This application Jul. 19, 1984, Ser. No. 632,558

Claims priority, application Luxembourg, May 9, 1977, 77286  
Int. Cl.<sup>4</sup> C09B 45/00

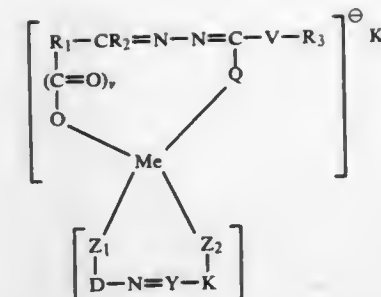
U.S. Cl. 534—622

16 Claims

1. A dye of the formula



in which D is the radical of a monoazo, polyazo or metal complex azo dye, R is hydrogen or a low molecular weight alkyl group which may be substituted by halogen or hydroxyl, X is alkyl or alkenyl which may be substituted by halogen, alkoxy or aryl, one Y is a halogen atom and the other Y is halogen, alkyl which may be substituted by halogen, alkenyl which may be substituted by halogen or is a nitro, cyano, carboxyl, carboxylic acid ester, carboxamide, sulfonamide, sulfo or sulfonic acid ester group, amino, hydroxylamino, hydrazino, phenylhydramino, sulfophenylhydrazino, alkyl-amino or dialkylamino which may be substituted in the alkyl moiety by hydroxy, alkoxy, chloro, phenyl, sulfato or sulfo, cyclohexylamino, N-alkyl-N-phenylamino, N-sulfomethyl-N-phenylamino, phenylamino which may be substituted by alkyl, alkoxy, chloro, amino, hydroxy, nitro, carboxy, acetylaminio, ureido, sulfomethyl or sulfo, naphthylamino which may be substituted by amino, hydroxy or sulfo, pyridylamino, benzothiazolylamino, quinolylamino, pyrimidylamino, morpholine, piperidino, piperazino, hydroxy, alkoxy which may be substituted by alkoxy, alkoxyalkoxy or carboxy, phenoxy which may be substituted by chloro, nitro, carboxy or sulfo, naphthoxy which may be substituted by sulfo, mercapto, alkylthio which may be substituted by cathoxy, or is thiouride, phenylthio which may be substituted by C1-4-alkyl, C1-4-alkoxy, C1-6-acylamino, amino, alkylamino, dialkylamino, the ureido, hydroxyl, sulfo or carboxyl group, or halogen, or is naphthylthio which may be substituted by C1-4-alkyl, C1-4-alkoxy, C1-6-acylamino, amino, alkylamino, dialkylamino, the ureido, hydroxyl, sulfo or carboxyl group or halogen.



wherein:

D is the radical of a benzene, naphthalene or heterocyclic diazo component;  
Y is nitrogen or —CH;  
K is the radical of a coupling component if Y is nitrogen, or an o-hydroxyaldehyde radical if Y is —CH;  
Ka is a cation;  
Me is chromium or cobalt;  
Z1 is —O— or —COO— ortho to N=Y;  
Z2 is —O— or —NR vicinal to N=Y, wherein R is hydrogen, or a C1-C4alkyl or phenyl radical;  
R1 is a direct bond or a C1-C8-alkyl, C1-C8-alkenyl, or aryl radical or heterocyclic radical containing 1 to 3 sulfur, oxygen or nitrogen atoms;  
R2 is hydrogen or a C1-C8-alkyl or aryl radical;  
R3 is hydrogen or a C1-C8alkyl, aryl or amino radical, or a heterocyclic radical containing 1 to 3 sulfur, oxygen or nitrogen atoms;  
V is a direct bond or oxygen;  
Q is oxygen or sulfur; and  
w is 0 or 1.

4,680,386

# 6-O-METHYLERYTHROMYCIN A DERIVATIVE

Shigeo Morimoto; Takashi Adachi, both of Saitama; Toshifumi Asaka, Ageo; Yoshiaki Watanabe, Kodaira, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

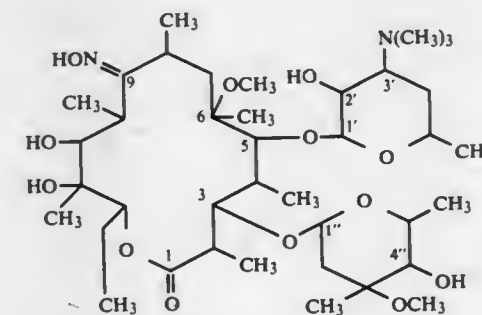
Filed Oct. 21, 1985, Ser. No. 789,771

Claims priority, application Japan, Oct. 26, 1984, 59-225543  
Int. Cl.<sup>4</sup> A61K 71/31

U.S. Cl. 536—7.4

2 Claims

1. A 6-O-methylerythromycin A derivative represented by the formula



and the salts thereof.

4,680,385

# METAL DYE COMPLEXES CONTAINING AN AZO OR AZOMETHINE DYE AND A COLORLESS LIGAND WITH THE C=N=N=C GROUP

Gerhard Back, Lörrach, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 28, 1985, Ser. No. 717,733

Claims priority, application Switzerland, Apr. 6, 1984, 1751/84

Int. Cl.<sup>4</sup> C09B 45/06, 45/16; D06P 1/10, 3/24

U.S. Cl. 534—695

10 Claims

1. A chromium or cobalt complex of the formula



4,680,387

# PREPARATION OF POLYHALO-COPPER PHthalOCYANINES HAVING A HIGH COLOR STRENGTH

Joachim Kranz, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,391

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442118

Int. Cl.<sup>4</sup> C09B 47/04, 47/08

U.S. Cl. 540—136

4 Claims

1. In a process for preparing a polyhalocopper phthalocyanine having high color strength by recrystallization of a finely divided, agglomerated crude polyhalocopper phthalocyanine in an organic aqueous phase at elevated temperatures, the improvement comprising heating said crude polyhalocopper phthalocyanine to 80°–130° C. with benzoic acid, toluic acid, ethylbenzoic acid, or a mixture thereof, and maintaining said elevated temperature until the desired pigmentary form has formed.

4,680,388

# O-SULFATED SPIRO $\beta$ -LACTAM HYDROXAMIC ACIDS

Joseph E. Sundeen, Yardley, Pa.; William H. Koster, East Amwell Township; Hunterdon County, and Robert Zahler, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 728,432, Apr. 29, 1985, Pat. No. 4,638,060.

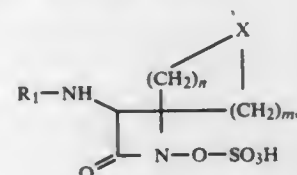
This application Jul. 31, 1986, Ser. No. 891,494

Int. Cl.<sup>4</sup> C07D 487/10, 491/107, 495/10, 471/10

U.S. Cl. 540—203

6 Claims

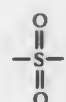
1. A compound having the formula



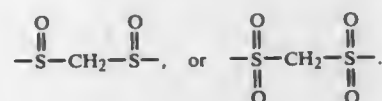
or a pharmaceutically acceptable salt thereof, wherein

R<sub>1</sub> is acyl; and

n and m are each independently 1, 2, 3 or 4, the sum of n+m  $\leq$  5 and X is —O—, —S—, or



or n and m are each 1 and X is —S—CH<sub>2</sub>—S—,



4,680,389

# TEMPERATURE STABLE CRYSTALLINE DI(1-METHYL-2-PYRROLIDINONE) AND DI(N-FORMYL-PYRROLIDINE) ADDUCTS OF CEPHALOSPORIN DERIVATIVES

Murray A. Kaplan, Syracuse; Joseph B. Bogardus, and Robert A. Lipper, both of Manlius, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jan. 10, 1986, Ser. No. 817,646

Int. Cl.<sup>4</sup> C07D 501/46

U.S. Cl. 540—222

4 Claims

1. High temperature stable crystalline adducts of 7-[(Z)-2-methoxyimino-2-(2-aminothiazol-4-yl)acetamido]-3-[(1-methyl-1-pyrrolidinyl)methyl]-3-cephem-4-carboxylate selected from the group consisting of the di(1-methyl-2-pyrrolidinone) adduct, di(N-formyl-pyrrolidine) adduct, and 1-methyl-2-pyrrolidinone adduct-NaCl complex.

4. A method for preparing a 7-[(Z)-2-methoxyimino-2-(2-aminothiazol-4-yl)acetamido]-3-[(1-methyl-1-pyrrolidinyl)methyl]-3-cephem-4-carboxylate (1-methyl-2-pyrrolidinone) adduct-NaCl complex comprising:

- admixing 10–100 mg/ml of lyophilized zwitterion-NaCl complex in 1-methyl-2-pyrrolidinone,
- inducing crystallization with seed crystals of a 1-methyl-2-pyrrolidinone adduct-NaCl, and
- isolating the (1-methyl-2-pyrrolidinone) adduct-NaCl complex.

4,680,390

# ESTERS OF

# 7-[2-(2-AMINOTHIAZOL-4-YL)-2-(SYN)-METHOX- YMINOACETAMIDO]-3-METHYL-CEPH-3-EM-4-CAR- BOXYLIC ACID

Michihiko Ochiai, Suita; Akira Morimoto, Ikeda, and Yoshihiro Matsushita, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 922,423, Jul. 6, 1978, Pat. No. 4,520,194, which is a division of Ser. No. 787,258, Apr. 13, 1977, abandoned, which is a division of Ser. No. 428,032, Sep. 29, 1982, Pat. No. 4,278,671. This application Oct. 4, 1984, Ser. No. 657,778

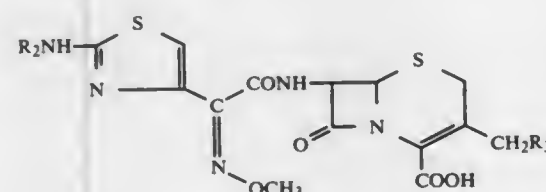
Claims priority, application Japan, Apr. 14, 1976, 51-42885; Sep. 8, 1976, 51-108102

Int. Cl.<sup>4</sup> C07D 501/22

U.S. Cl. 540—228

3 Claims

1. An ester selected from the group consisting of lower alkoxymethyl, 1-lower alkoxyethyl, lower alkylthiomethyl, pivaloyloxymethyl, acetoxymethyl, 1-acetoxyethyl and 1-ethoxycarbonyloxyethyl esters of a 7-[2-(2-aminothiazol-4-yl)-2-(syn)-methoxyiminoacetamido]cephalosporin derivative of the formula:



wherein R<sub>3</sub> is hydrogen and R<sub>2</sub>NH is an amino group which may optionally be protected.

4,680,391

# SUBSTITUTED AZETIDINONES AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

Raymond A. Firestone, Fanwood, and Peter L. Barker, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

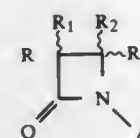
Continuation-in-part of Ser. No. 557,030, Dec. 1, 1983, abandoned. This application Apr. 10, 1985, Ser. No. 721,811

Int. Cl.<sup>4</sup> C07D 205/08, 401/04, 403/04; A61K 31/395

U.S. Cl. 540—355

11 Claims

1. A compound of formula



wherein:

R is hydrogen or C<sub>1</sub>-alkyl;

R<sup>1</sup> is

- hydrogen;
- C<sub>1</sub>-alkyl;
- C<sub>1</sub>-alkoxy;
- C<sub>1</sub>-alkenyl; or
- phenyl or phenyl substituted with one or more radicals selected from the group consisting of loweralkyl, hydroxy, alkoxy, halo, nitro, loweralkylthio, arylthio, mercapto, amino, cyano, carboxy, aminosulfonyl, aminosulfinyl, carbamoyl, carbamoyloxy, loweralkyl or aryl sulfonyl, loweralkyl or aryl sulfinyl, SO<sub>3</sub>R<sup>5</sup>, azido, or carboxamido;

R<sup>2</sup> is hydrogen;

R<sup>3</sup> is

- SR<sup>5</sup> wherein R<sup>5</sup> represents C<sub>1</sub>-alkyl, phenyl or substituted phenyl as previously defined;
- SOR<sup>5</sup>;
- C<sub>1</sub>-alkanoyloxy;
- COOB or CONBB<sub>1</sub> wherein B and B<sub>1</sub> independently represent
  - H;
  - straight or branched alkyl having from 1 to 20 carbon atoms;
  - aryl having from 6 to 10 carbon atoms;
  - cycloalkyl having from 3 to 8 carbon atoms;
  - straight or branched alkenyl having from 2 to 20 carbon atoms;
  - straight or branched alkynyl having from 2 to 20 carbon atoms;
  - aralkyl, alkaryl, aralkenyl, aralkenyl, alkenylaryl or alkenylaryl wherein alkyl, aryl, alkenyl and alkynyl are as previously defined; the above groups (a)–(g) can be unsubstituted or can be substituted by one or more selected radicals from the group consisting of loweralkyl, hydroxy, alkoxy, halo, nitro, loweralkylthio, arylthio, mercapto, cyano, carboxy, aminosulfonyl, aminosulfinyl, carbamoyl, carbamoyloxy, loweralkyl or aryl sulfonyl, loweralkyl or aryl sulfinyl, SO<sub>3</sub>R<sup>5</sup>, azido, amino, or carboxamido;
- phenyl or substituted phenyl as previously defined; and

A is

- SO<sub>3</sub>R<sup>5</sup>; or
- SO<sub>3</sub>—M<sup>+</sup> wherein M<sup>+</sup> represents (a) an alkali anion selected from a group consisting of Na<sup>+</sup> and K<sup>+</sup>; or (b) a quaternary ammonium group of formula N<sup>+</sup>(R<sup>5</sup>)<sub>4</sub>.

4,680,392

# SUBSTITUTED CAPROLACTAM DERIVATIVES AS ANTIHYPERTENSIVES

Elbert E. Harris; Arthur A. Patchett, both of Westfield, and Eugene D. Thorsett, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

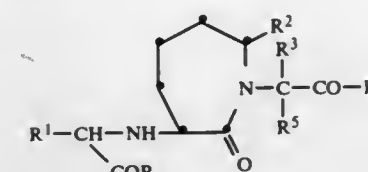
Continuation-in-part of Ser. No. 394,749, Jul. 2, 1982, Pat. No. 4,629,787, which is a continuation-in-part of Ser. No. 282,580, Jul. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 179,305, Aug. 18, 1980, abandoned. This application May 19, 1986, Ser. No. 864,234

Int. Cl.<sup>4</sup> C07D 223/10, 223/12

U.S. Cl. 540—527

28 Claims

1. A compound of the formula:



wherein

R and R<sup>4</sup> are the same or different and are hydroxy, C<sub>1</sub>–C<sub>8</sub>-alkoxy, C<sub>2</sub>–C<sub>12</sub>-alkenoxy, C<sub>6</sub>–C<sub>12</sub>-aryloxy, di-C<sub>1</sub>–C<sub>8</sub>-alkylamino–C<sub>1</sub>–C<sub>8</sub>-alkoxy, acylamino–C<sub>1</sub>–C<sub>8</sub>-alkoxy selected from the group: acetylaminooethoxy, nicotinoylaminoethoxy, and succinamidoethoxy; pivaloyloxyethoxy, C<sub>6</sub>–C<sub>12</sub>-aryl–C<sub>1</sub>–C<sub>8</sub>-alkoxy, hydroxy–C<sub>1</sub>–C<sub>8</sub>-alkoxy dihydroxy–C<sub>1</sub>–C<sub>8</sub>-alkoxy amino, hydroxyamino; R<sup>1</sup> is hydrogen, C<sub>1</sub>–C<sub>12</sub>-alkyl which include branched and unsaturated alkyl groups, substituted C<sub>1</sub>–C<sub>8</sub>-alkyl wherein the substituent(s) can be halo, C<sub>1</sub>–C<sub>8</sub>-alkoxy, C<sub>6</sub>–C<sub>12</sub>-aryloxy, amino, C<sub>1</sub>–C<sub>8</sub>-alkylamino, hydroxy, di-C<sub>1</sub>–C<sub>8</sub>-alkylamino, amino–C<sub>1</sub>–C<sub>8</sub>-alkylthio, amino–C<sub>1</sub>–C<sub>8</sub>-alkoxy, acetamido, benzamido, C<sub>6</sub>–C<sub>12</sub>-arylamino, guanidino, phthalimido, mercapto, C<sub>1</sub>–C<sub>8</sub>-alkylthio, C<sub>6</sub>–C<sub>12</sub>-aryloxy, carboxy, carboxamido or carbo–C<sub>1</sub>–C<sub>8</sub>-alkoxy, C<sub>6</sub>–C<sub>12</sub>-aryl–C<sub>1</sub>–C<sub>8</sub>-alkyl, C<sub>6</sub>–C<sub>12</sub>-aryl–C<sub>2</sub>–C<sub>8</sub>-alkenyl; substituted C<sub>6</sub>–C<sub>12</sub>-alkyl–C<sub>1</sub>–C<sub>8</sub>-alkyl wherein the alkyl portion may be substituted by amino, hydroxy acetamido or benzamido, R<sup>2</sup> is hydrogen, C<sub>1</sub>–C<sub>8</sub>-alkyl, unsubstituted C<sub>3</sub>–C<sub>10</sub>-cycloalkyl, amino–C<sub>1</sub>–C<sub>8</sub>-alkyl, C<sub>1</sub>–C<sub>12</sub>-alkylamino–C<sub>1</sub>–C<sub>8</sub>-alkyl, hydroxy–C<sub>1</sub>–C<sub>12</sub>-alkyl, acetamido- or benzamido–C<sub>1</sub>–C<sub>8</sub>-alkyl, di-C<sub>1</sub>–C<sub>12</sub>-alkylamino–C<sub>1</sub>–C<sub>8</sub>-alkyl including polyethyleneamino–C<sub>3</sub>–C<sub>10</sub>-cycloalkyl, C<sub>6</sub>–C<sub>12</sub>-aryl–C<sub>1</sub>–C<sub>8</sub>-alkyl, C<sub>6</sub>–C<sub>12</sub>-aryl, substituted C<sub>6</sub>–C<sub>12</sub>-aryl wherein the substituent is halo, C<sub>1</sub>–C<sub>12</sub>-alkyl, amino–C<sub>1</sub>–C<sub>12</sub>-alkyl, or C<sub>1</sub>–C<sub>12</sub>-alkoxy; R<sup>3</sup> is hydrogen, C<sub>1</sub>–C<sub>8</sub>-alkyl, phenyl, phenyl C<sub>1</sub>–C<sub>8</sub>-alkyl, hydroxyphenyl–C<sub>1</sub>–C<sub>8</sub>-alkyl, hydroxy–C<sub>1</sub>–C<sub>8</sub>-alkyl, amino–C<sub>1</sub>–C<sub>8</sub>-alkyl, acetamido- or benzamido–C<sub>1</sub>–C<sub>8</sub>-alkyl, guanidino–C<sub>1</sub>–C<sub>8</sub>-alkyl, imidazolyl–C<sub>1</sub>–C<sub>8</sub>-alkyl, indolyl–C<sub>1</sub>–C<sub>8</sub>-alkyl, mercapto–C<sub>1</sub>–C<sub>8</sub>-alkyl or C<sub>1</sub>–C<sub>8</sub>-alkyl thio–C<sub>1</sub>–C<sub>8</sub>-alkyl;

R<sup>5</sup> is hydrogen or C<sub>1</sub>–C<sub>8</sub>-alkyl;

and, the pharmaceutically acceptable salts thereof.

4,680,393

# PROCESS FOR THE SELECTIVE SYNTHESIS OF TERTIARY ALKANOLAMINES

John A. Marsella, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 8, 1986, Ser. No. 861,029

Int. Cl.<sup>4</sup> C07C 85/06, 91/06; C07D 295/08

U.S. Cl. 544—170

23 Claims

1. In a process for the preparation of a tertiary alkanolamine by reacting a secondary amine with an alkanediol at a temperature between 150°–200° C., the method for improving the selectivity for mono-aminated product which comprises: carrying out said reaction in the presence of a compound or com-

plex of ruthenium in chemical combination or in admixture with an organic phosphine ligand, said ligand being present in an amount such that the ratio of gram mole ligand/gram atom ruthenium is greater than 5.

4,680,394

**METHOD OF PREPARING FORMALDOXIME TRIMER**  
John H. Bonfield, Basking Ridge, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.  
Filed Sep. 23, 1985, Ser. No. 778,935  
Int. Cl.<sup>4</sup> C07D 251/06

U.S. Cl. 544—193

7 Claims

1. A process for the manufacture of formaldoxime trimer which comprises:

- reacting formaldehyde, as paraformaldehyde to the substantial exclusion of aqueous formaldehyde, with a slight stoichiometric excess dihydroxylamine sulfate;
- treating the reaction product of step (a) by adding ammonia at least stoichiometrically equivalent to the paraformaldehyde and substoichiometric relative to the dihydroxylamine sulfate;
- steam stripping the reaction product of step (b) to recover the formaldoxime as a vapor; and
- squellch condensing the emergent vapor from step (c) on a continuously flush wetted condensing surface; and
- generating the formaldoxime trimer by cooling the condensate of step (d) to 0°–5° C.

4,680,395

SULFONYLSOUREAS

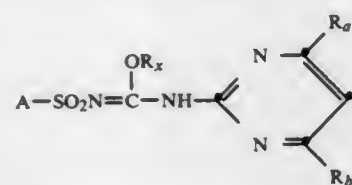
Haukur Kristinsson, Bottmingen, and Werner Töpfl, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.  
Division of Ser. No. 542,312, Oct. 14, 1983, Pat. No. 4,521,597.  
This application Mar. 1, 1985, Ser. No. 707,325  
Claims priority, application Switzerland, Oct. 25, 1982, 6202/82

Int. Cl.<sup>4</sup> C07D 239/69

U.S. Cl. 544—321

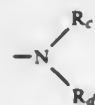
2 Claims

1. A pyrimidyl-sulfonyl isourea of the formula



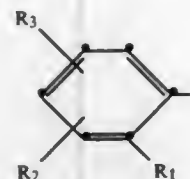
in which

R<sub>a</sub> is the difluoromethoxy group,  
R<sub>b</sub> is halogen, C<sub>1</sub>–C<sub>5</sub>-alkyl, C<sub>1</sub>–C<sub>5</sub>-haloalkyl, C<sub>1</sub>–C<sub>5</sub>-alkoxy, C<sub>1</sub>–C<sub>5</sub>-haloalkoxy, C<sub>1</sub>–C<sub>5</sub>-alkylthio, C<sub>2</sub>–C<sub>10</sub>-alkoxyalkyl or C<sub>2</sub>–C<sub>10</sub>-alkoxyalkoxy or is an amino group



wherein

R<sub>c</sub> is hydrogen, methyl or ethyl, and  
R<sub>d</sub> is hydrogen, methyl, ethyl or methoxy,  
A is a radical of the formula



R<sub>1</sub> is halogen, nitro, trifluoromethyl, C<sub>1</sub>–C<sub>5</sub>-alkyl, C<sub>1</sub>–C<sub>5</sub>-alkoxy, —COR<sub>7</sub>, —S(O)<sub>m</sub>—C<sub>1</sub>–C<sub>5</sub>-alkyl, —SO<sub>2</sub>R<sub>10</sub>, XR<sub>11</sub> or —OSO<sub>2</sub>C<sub>1</sub>–C<sub>5</sub>-alkyl,  
R<sub>2</sub> is hydrogen,  
R<sub>3</sub> is hydrogen,  
R<sub>7</sub> is hydrogen, C<sub>1</sub>–C<sub>5</sub>-alkyl, C<sub>1</sub>–C<sub>5</sub>-haloalkyl, C<sub>1</sub>–C<sub>5</sub>-alkoxy, C<sub>1</sub>–C<sub>5</sub>-haloalkoxy, C<sub>2</sub>–C<sub>10</sub>-alkoxyalkoxy, C<sub>3</sub>–C<sub>5</sub>-alkenyl, C<sub>3</sub>–C<sub>5</sub>-alkynyl, phenoxy, benzyloxy, C<sub>1</sub>–C<sub>5</sub>-alkylthio or —NR<sub>8</sub>R<sub>9</sub>,  
R<sub>8</sub> is hydrogen, C<sub>1</sub>–C<sub>5</sub>-alkyl, cyanoalkyl having a maximum of 5 carbon atoms, methoxy, ethoxy or C<sub>3</sub>–C<sub>5</sub>-alkenyl,  
R<sub>9</sub> is hydrogen, C<sub>1</sub>–C<sub>5</sub>-alkyl or C<sub>3</sub>–C<sub>5</sub>-alkenyl, or  
R<sub>8</sub> and R<sub>9</sub> together with the nitrogen atom binding them form a 5- or 6-membered, saturated heterocycle which can contain an oxygen or sulfur atom as ring member,  
R<sub>10</sub> is C<sub>1</sub>–C<sub>5</sub>-haloalkoxy or —NR<sub>8</sub>R<sub>9</sub>,  
R<sub>11</sub> is C<sub>1</sub>–C<sub>5</sub>-alkyl which is substituted by halogen or C<sub>1</sub>–C<sub>5</sub>-alkoxy, or C<sub>2</sub>–C<sub>5</sub>-alkenyl which is unsubstituted or substituted by halogen or C<sub>1</sub>–C<sub>5</sub>-alkoxy,  
R<sub>x</sub> is C<sub>1</sub>–C<sub>5</sub>-alkyl,  
X is oxygen or —S(O)<sub>m</sub>— and  
m is zero, one or two.

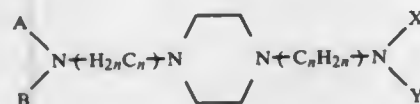
4,680,396

**BIS(AMINOALKYL)PIPERAZINE DERIVATIVES AND THEIR USE AS METAL ION CONTROL AGENTS**  
Druce K. Crump, Lake Jackson; Jaime Simon, Angleton, and David A. Wilson, Richwood, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.  
Filed Feb. 24, 1984, Ser. No. 583,526  
Int. Cl.<sup>4</sup> C07D 295/12

U.S. Cl. 544—337

21 Claims

1. The compounds having the formula



wherein n is 2 or 3 and wherein substituents A, B, X and Y each are independently selected from the group consisting of hydrogen, hydroxyalkyl (wherein the alkyl group has 2–6 carbon atoms), methylenephosphonic, hydroxymethyl-, hydroxyethyl- and hydroxypropylsulfonic acid radicals, carboxylic acid radicals (having 2–4 carbon atoms) and the alkali, alkaline earth metal, ammonium and amine salts of any of the phosphonic, sulfonic or carboxylic acid compounds, and wherein at least one of A, B, X and Y is other than a hydrogen.

4,680,397

APOVINCAMINOL DERIVATIVE

Tibor Keve; Béla Zsados; György Fekete, all of Budapest; János Galambos, Érd; Margit Barta née Bukovecz, Budapest; László Szporny, Budapest; Lilla Forgács, Budapest; Árpád Király, Budapest; Gyöngyvér Soós, Budapest; Béla Kiss, Vecsés, and Mária Zájer née Balázs, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary  
Filed Apr. 25, 1985, Ser. No. 727,130  
Claims priority, application Hungary, Apr. 25, 1984, 1582/84  
Int. Cl.<sup>4</sup> C07D 461/00

U.S. Cl. 546—51

1 Claim

1. 18β-Hydroxy-apovincaminol 3',4',5'-trimethoxybenzoate.

4,680,398

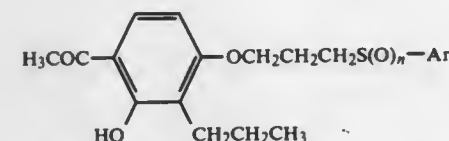
**PYRAZOLO[1,5-A]PYRIDINES AND BENZIMIDAZOLES, USEFUL AS ANTIALLERGIC AGENTS**

Tsutomu Irikura, Tokyo; Keigo Nishino, Oomiya; Kyuya Okamura, Oomiya, and Toshiya Ikeda, Oomiya, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan  
Filed Jan. 30, 1986, Ser. No. 824,099  
Claims priority, application Japan, Feb. 14, 1985, 60-27267  
Int. Cl.<sup>4</sup> C07D 471/04, 235/28

U.S. Cl. 546—121

10 Claims

1. Compounds having general formula (I)



wherein Ar is a pyrazolo[1,5-a]pyridin-3-yl ring which may be substituted by a straight or branched alkyl group having 1 to 4 carbon atoms, or Ar is a benzimidazol-2-yl ring, and n is an integer of 0 to 2, or a pharmaceutically acceptable salt thereof.

4,680,399

**PROCESS FOR THE ISOLATION AND PURIFICATION OF PODOPHYLLOTOXIN**

Ole Buchardt, Værløse, Denmark, assignor to Pharma-medica a-s, Herlev, Denmark  
Filed Sep. 9, 1985, Ser. No. 773,929  
Claims priority, application United Kingdom, Sep. 26, 1984, 8424269

Int. Cl.<sup>4</sup> C07D 405/14

U.S. Cl. 546—139

11 Claims

1. In a process for obtaining purified podophyllotoxin from an impure podophyllotoxin containing starting material, the improvement comprising forming a solution of said starting material, forming a solid complex of podophyllotoxin and an aromatic or heteroaromatic compound other than benzene, and separating the solid complex from the solution.

4,680,400

**HERBICIDAL CYCLOHEXANE-1,3-DIONE-5-ISOQUINOLINE DERIVATIVES**

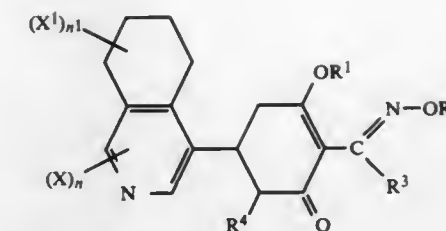
Graham J. Bird, North Melbourne; Graeme J. Farquharson, Reservoir, and Keith G. Watson, Box Hill North, all of Australia, assignors to ICI Australia Limited, Victoria, Australia  
Division of Ser. No. 591,372, Mar. 20, 1984. This application Nov. 12, 1986, Ser. No. 929,473  
Claims priority, application Australia, Apr. 7, 1983, PF8781; May 5, 1983, PF9189

Int. Cl.<sup>4</sup> C07D 471/04

U.S. Cl. 546—141

3 Claims

1. A compound of formula



wherein:

X, which may be the same or different, are independently selected from the group consisting of C<sub>1</sub> to C<sub>3</sub> alkyl, C<sub>1</sub> to C<sub>3</sub> alkoxy and halogen;  
X<sup>1</sup>, which may be the same or different, are selected from hydroxy or two of X<sup>1</sup> on the same carbon may form an oxo group;  
R<sup>1</sup> is selected from the group consisting of hydrogen and the alkali metals;  
R<sup>2</sup> is selected from the group consisting of C<sub>1</sub> to C<sub>3</sub> alkyl, C<sub>1</sub> to C<sub>3</sub> fluoroalkyl, allyl and propargyl;  
R<sup>3</sup> is selected from the group consisting of C<sub>1</sub> to C<sub>3</sub> alkyl;  
R<sup>4</sup> is hydrogen;  
n is zero or an integer selected from 1 to 2; and  
n<sup>1</sup> is zero or an integer selected from 1 to 2.

4,680,401  
**PREPARATION OF HALOGENATED QUINOLONECARBOXYLIC ACIDS**

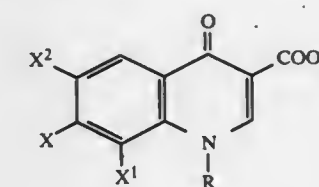
Klaus Grohe, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Jul. 12, 1985, Ser. No. 754,563  
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426483

Int. Cl.<sup>4</sup> C07D 215/16

U.S. Cl. 546—153

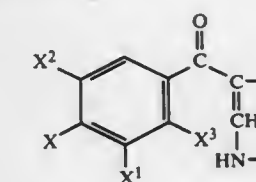
3 Claims

1. In the preparation of a halogenated quinolonecarboxylic acid of the formula



in which

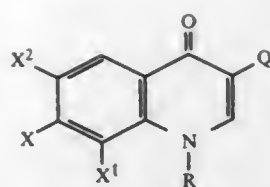
R is alkyl with 1–3 carbon atoms, 2- fluoroethyl, phenyl, methoxy or cyclopropyl,  
X is halogen, and  
X<sup>1</sup> and X<sup>2</sup> each independently is hydrogen or halogen, wherein the compound



in which

X<sup>3</sup> is halogen, and R, X, X<sup>1</sup> and X<sup>2</sup> are as defined above, is condensed to form a cyclic product of the structure





and such cyclic product is hydrolyzed, the improvement wherein Q is  $\text{—C=N}$ .

4,680,402

## BENZOYL-PHENYL-PIPERIDINE DERIVATIVES

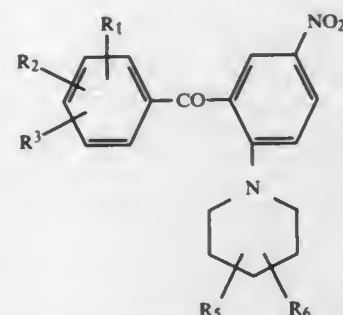
Bernard Majole, Dijon; Francois Bellamy, Saulon-la-Rue; Pierre Dodey, and Jacques Robin, both of Dijon, all of France, assignors to Societe de Recherches Industrielles (S.O.R.I.), Paris, France

Continuation-in-part of Ser. No. 697,160, Feb. 1, 1985, abandoned, which is a division of Ser. No. 391,915, Jun. 24, 1982, Pat. No. 4,528,294. This application May 30, 1986, Ser. No. 868,443

Claims priority, application France, Jun. 29, 1981, 81 12745 Int. Cl.<sup>4</sup> C07D 295/10, 211/52, 211/46, 211/14

U.S. Cl. 546—235 2 Claims

1. A compound corresponding to the formula:



in which:

$R_1$  and  $R_2$ , which are identical or different, each represent an atom of hydrogen, a halogen, a lower alkyl group or a lower alkoxy group;  
 $R_3$  represents an atom of hydrogen;  
 $R_5$  and  $R_6$ , which are identical or different, each represent an atom of hydrogen, a lower alkyl group, an OH group, a phenyl group or a benzyl group, and  
 wherein at least one of  $R_1$ ,  $R_2$ ,  $R_5$  and  $R_6$  is other than hydrogen.

4,680,403

PROCESS FOR PRODUCING N-PROTECTED- $\alpha$ -L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Kunio Hisamitsu, Funabashi; Tadashi Takemoto, Kawasaki; Toyoto Hijiya, Yokosuka, and Satoji Takahashi, Yokkaichi, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan Filed Dec. 10, 1985, Ser. No. 806,811

Claims priority, application Japan, Jan. 17, 1985, 60-6304 Int. Cl.<sup>4</sup> C07D 307/22

U.S. Cl. 546—247 8 Claims

1. A process for producing N-protected- $\alpha$ -L-aspartyl-L-phenylalanine methyl ester which comprises esterifying L-phenylalanine with methanol in the presence of a strong acid as catalyst, adding, to the resulting solution, an aqueous alkaline solution to neutralize the acid catalyst and a water-immiscible organic solvent to extract the free L-phenylalanine methyl ester thus formed, collecting the organic layer, and reacting

the L-phenylalanine methyl ester dissolved in said collected organic layer with N-protected-L-aspartic anhydride.

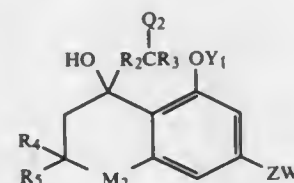
4,680,404  
BENZOPYRANS

James F. Egger, Stonington; Michael R. Johnson, Gales Ferry, and Lawrence S. Melvin, Jr., Ledyard, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 457,171, Jan. 13, 1983, Pat. No. 4,486,428, which is a continuation-in-part of Ser. No. 358,751, Mar. 16, 1982, abandoned. This application Aug. 9, 1984, Ser. No. 639,151 Int. Cl.<sup>4</sup> C07D 311/20, 405/04

U.S. Cl. 546—269 8 Claims

1. A compound of the formula



where

$M_2$  is O,  $Q_2$  is CN or COOR<sub>7</sub> where  $R_7$  is hydrogen, alkyl having from one to four carbon atoms or benzyl;  $Y_1$  is hydrogen, alkyl having from one to four carbon atoms, benzyl, benzoyl or alkanoyl having from one to five carbon atoms;

$R_2$  and  $R_3$  are each hydrogen, methyl or ethyl;

$R_4$  is hydrogen, alkyl having from one to six carbon atoms or  $\text{—(CH}_2\text{)}_z\text{—C}_6\text{H}_5$  where  $z$  is an integer from one to four;

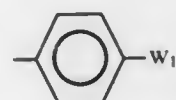
$R_5$  is hydrogen, methyl or ethyl;

$Z$  is selected from the group consisting of

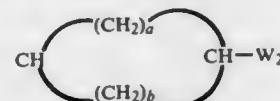
(a) alkylene having from one to nine carbon atoms;

(b)  $\text{—(alk}_1\text{)}_m\text{—X—(alk}_2\text{)}_n\text{—}$  wherein each of  $(\text{alk}_1)$  and  $(\text{alk}_2)$  is alkylene having from one to nine carbon atoms, with the proviso that the summation of carbon atoms in  $(\text{alk}_1)$  plus  $(\text{alk}_2)$  is not greater than nine; each of  $m$  and  $n$  is 0 or 1;  $X$  is selected from the group consisting of O, S, SO and SO<sub>2</sub>; and

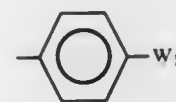
$W$  is selected from the group consisting of hydrogen, methyl, pyridyl, piperidyl,



wherein  $W_1$  is selected from the group consisting of hydrogen, fluoro and chloro; and



wherein  $W_2$  is selected from the group consisting of hydrogen and



$a$  is an integer from 1 to 5 and  $b$  is 0 or an integer from 1 to 5; with the proviso that the sum of  $a$  and  $b$  is not greater than 5.

4,680,405

## PROCESS FOR PREPARING

2-[(N-2-PYRIDYLCARBOMOYL)METHYL]SACCHARIN  
 Vincenzo Iannella, Viale Bianca Maria 20, Milan, Italy  
 Division of Ser. No. 631,616, Jul. 17, 1984, Pat. No. 4,587,335, which is a division of Ser. No. 385,175, Jun. 4, 1982, Pat. No. 4,474,955. This application Feb. 10, 1986, Ser. No. 828,037  
 Claims priority, application Italy, Jul. 17, 1981, 22364 A/81; Aug. 7, 1981, 23432 A/81

Int. Cl.<sup>4</sup> C07D 417/12

U.S. Cl. 546—270 7 Claims

1. A process for preparing 2-[(N-2-pyridylcarbomoyl)methyl]saccharin (IX) comprising reacting a mixture of 2-carboxymethyl saccharin (VIII), 2-aminopyridine (IV) and tri-n-butylamine, in dichloromethane, with 1-methyl-2-chloropyridine iodine (X); and recovering the resulting 2-[(N-2-pyridylcarbomoyl)methyl]saccharin (IX).

4,680,406

## PROCESS FOR FLUORINATING HALOGENATED ORGANO-COMPOUNDS

George S. Fujioka, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 15, 1985, Ser. No. 787,190

Int. Cl.<sup>4</sup> C07D 211/72; C07C 17/20, 19/08, 21/24

U.S. Cl. 546—345 5 Claims

1. A process for preparing a fluorine-containing compound from a halogen-containing organic compound comprising:

- injecting hydrogen fluoride into a liquid pool of aliphatic or aromatic reactant containing at least one halogen which is not fluorine;
- removing from said liquid pool a volatilized mixture of said aliphatic or aromatic reactant and hydrogen fluoride;
- passing said mixture of reactant and hydrogen fluoride over a catalyst bed to facilitate formation of a fluorine-containing compound; and
- recovering said fluorine-containing compound from said catalyst bed.

4,680,407

## CERTAIN ALKALI METAL BIS-PHENETHYL OR TRIS-PHENETHYL-PYRIDINES USEFUL AS MULTIFUNCTIONAL ANIONIC INITIATORS

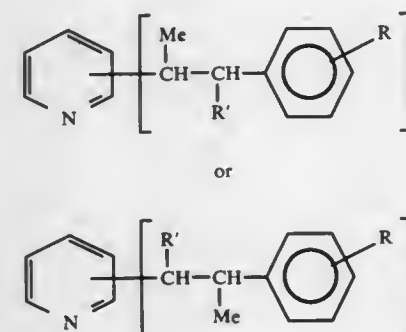
Arnaldo Roggero, S. Donato Milanese, Italy, assignor to Eni-Chem Elastomeri S.p.A., Palermo, Italy

Filed Dec. 3, 1984, Ser. No. 677,344

Claims priority, application Italy, Dec. 5, 1983, 24019 A/83 Int. Cl.<sup>4</sup> C07D 213/24

U.S. Cl. 546—348 7 Claims

1. A multifunction anionic initiator of the formula



wherein

Me = an alkali metal

$R'$  = hydrogen or a  $C_{1-12}$  alkyl group; and

$n$  = an integer of 2 or 3.

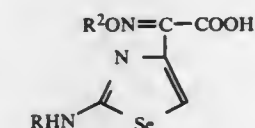
4,680,408

## ACYL DERIVATIVES

Roland Reiner, Basel, and Urs Weiss, Pratteln, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.  
 Continuation of Ser. No. 600,930, Apr. 16, 1984, abandoned, which is a division of Ser. No. 305,870, Sep. 28, 1981, Pat. No. 4,458,072. This application Jun. 9, 1986, Ser. No. 872,320  
 Int. Cl.<sup>4</sup> C07D 293/06

U.S. Cl. 548—100 2 Claims

1. A compound of the formula



VII

wherein  $R$  is a cleavable group selected from the group consisting of t-butoxycarbonyl, trityl, trifluoroacetyl, chloroacetyl, bromoacetyl and iodoacetyl and  $R^2$  is hydrogen, lower alkyl or COOR<sup>3</sup>-lower alkyl, wherein  $R^3$  is hydrogen, a cation of a base or a readily hydrolyzable ester group selected from the group consisting of lower alkanoyloxyalkyl, lower alkoxy-carbonyloxyalkyl, lactonyl, lower alkoxyethyl, lower alkanoylaminomethyl, benzyl and cyanomethyl, and reactive functional derivatives of these compounds selected from the group consisting of halides, azides, anhydrides, reactive esters and amides thereof.

4,680,409

## HYDRAZIDE CONTAINING DERIVATIVES OF 2-AMINO-4-THIAZOLE-ACETIC ACID

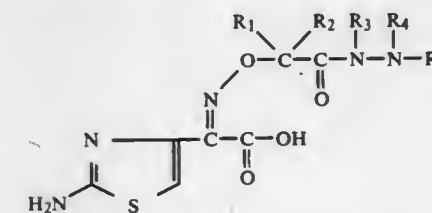
Uwe D. Treuner, Regensburg, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 658,849, Oct. 9, 1984, Pat. No. 4,610,824. This application Dec. 23, 1985, Ser. No. 812,658

Int. Cl.<sup>4</sup> C07D 277/40

U.S. Cl. 548—194 4 Claims

1. A compound having the formula

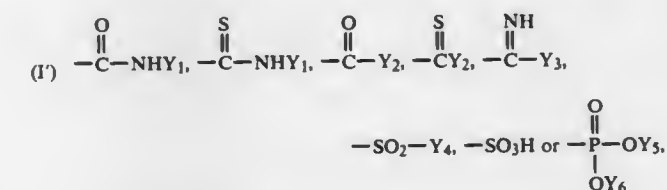


wherein

$R_1$  and  $R_2$  are each independently hydrogen or alkyl of 1 to 4 carbon atoms, or  $R_1$  and  $R_2$  together with the carbon atom to which they are attached form a cycloalkyl ring;

$R_3$  is hydrogen or alkyl;

$R_4$  is hydrogen or alkyl, and  $R_5$  is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl,



or together  $R_4$  and  $R_5$  are  $\text{—CH}_2\text{Y}$ ; wherein  $Y_1$  is hydrogen, alkyl, phenyl, substituted phenyl, methylcarbonyl, trifluoromethylcarbonyl, phenylcarbonyl, (substituted phenyl)carbonyl, carboxymethyl, methylsulfonyl, phenyl-

sulfonyl, (substituted phenyl)sulfonyl, aminocarbonyl, aminocarbonylamino, aminoethyl, hydroxy, alkoxy, amino, alkyamino, dialkyamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, 1-pyrrolidinyl or 1-piperidinyl; Y<sub>2</sub> is hydrogen, alkyl, phenyl, substituted phenyl, alkoxy, formyl, carbonyl, aminocarbonyl, aminothiocarbonyl, methylaminocarbonyl, methylaminothiocarbonyl, trifluoromethyl, phenylmethyl, (substituted phenyl)methyl, phenyloxymethyl, (substituted phenyl)oxymethyl, cyanomethyl, hydroxymethyl, alkoxymethyl, aminomethyl, methylcarbonylamino, aminocarbonylamino, methylsulfonylamino, methylsulfonylaminomethyl, carboxymethyl, aminocarbonylmethyl, alkoxy carbonylmethyl, hydroxyaminocarbonylmethyl, or azidomethyl; Y<sub>3</sub> is amino, alkyl, alkylthio, carboxythio, alkoxy carbonylthio or aminocarbonylthio; Y<sub>4</sub> is alkyl, amino, hydroxyamino, alkoxyamino, methylcarbonylamino, or phenylcarbonylamino; Y<sub>5</sub> is hydrogen or alkyl; Y<sub>6</sub> is hydrogen, alkyl, carboxymethyl, or aminocarbonylmethyl; and Y<sub>7</sub> is phenyl or substituted phenyl; wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms; the term "cycloalkyl" refers to cycloalkyl groups having 3, 4, 5, 6 or 7 carbon atoms; the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or carboxyl groups.

4,680,410

# PREPARATION OF N- AND S-1,2-ETHYLENICALLY UNSATURATED ORGANIC COMPOUNDS

Pen C. Wang, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 2, 1984, Ser. No. 585,945

Int. Cl.<sup>4</sup> C07D 207/12, 263/04, 261/02, 231/04

U.S. Cl. 548—231 14 Claims

1. A process for the preparation of a compound selected from the group consisting of N- and S-1,2-ethylenically unsaturated organic compounds which comprises

- contacting a compound selected from the group consisting of N- and S-silylated organic compounds with an aldehyde, wherein the aldehyde has a hydrogen atom bonded to the carbon adjacent to the carbonyl moiety, at elevated temperatures under conditions such that a compound selected from the group consisting of N- and S-siloxyalkyl-substituted organic compounds is prepared; and
- pyrolyzing the compound selected from the group consisting of N- and S-1-siloxyalkyl-substituted organic compounds under conditions such that the siloxy moiety is eliminated to prepare the compound selected from the group consisting of N- and S-1,2-ethylenically unsaturated compounds.

4,680,411

# PYRANO[2,3-G]INDOLES USEFUL AS ANTI-ULCEROUS, ANTI-INFLAMMATORY AND ANTALGIC AGENT

Francois Picart, Dijon, France, assignor to Societe de Recherches Industrielles, Paris, France

Division of Ser. No. 276,643, Jun. 23, 1981, Pat. No. 4,436,915.

This application Mar. 12, 1984, Ser. No. 588,566

Claims priority, application France, Jun. 26, 1980, 80 14246

The portion of the term of this patent subsequent to Mar. 13,

2001, has been disclaimed.

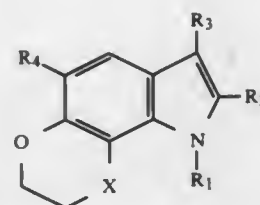
Int. Cl.<sup>4</sup> C07D 491/06; A61K 31/40

U.S. Cl. 548—430

8 Claims

1. Pyranoindeole compounds selected from the group consisting of:

- pyrano[2,3-g]indoles of the formula: and



- pharmaceutically acceptable acid addition salts thereof: in which:

X represents a group CH<sub>2</sub>, CHOH, or CO;

R<sub>1</sub> represents an atom of hydrogen, a lower alkyl group, or an aminoalkylene group —(CH<sub>2</sub>)<sub>n</sub>—NR'R'' (in which n is a whole number between 1 and 4 and R' and R'' which are identical or different, each represent H or a lower alkyl);

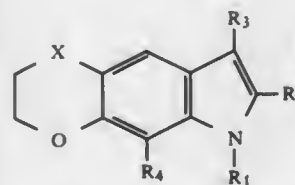
R<sub>2</sub> represents an atom of hydrogen;

R<sub>3</sub> represents an atom of hydrogen, a CHO group, CO—CONR'R'' (in which n, R', R'' are defined as hereinabove), or (CH<sub>2</sub>)<sub>n</sub>NH'R<sub>4</sub> (in which R' and R'' are CH<sub>3</sub> and n is 1); and

R<sub>4</sub> represents an atom of hydrogen, halogen, or a lower (C<sub>1</sub>—C<sub>4</sub>) alkoxy.

2. Pyranoindeole compounds selected from the group consisting of:

- the pyrano[3,2-f]indoles of the formula: and



- pharmaceutically acceptable acid addition salts thereof: in which:

X represents CH<sub>2</sub>;

R<sub>1</sub> represents an atom of hydrogen;

R<sub>2</sub> represents an atom of hydrogen;

R<sub>3</sub> represents an atom of hydrogen, or a CHO group; and

R<sub>4</sub> represents an atom of hydrogen, or an atom of halogen.

4,680,412

# PREPARATION OF FLUOROPHTHALIMIDES

Gerhard Hamprecht, Weinheim; Juergen Varwig, Heidelberg, and Wolfgang Rohr, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 31, 1984, Ser. No. 615,806

Claims priority, application Fed. Rep. of Germany, Jun. 3,

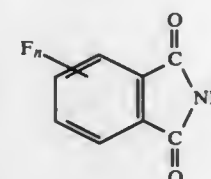
1983, 3320089

Int. Cl.<sup>4</sup> C07D 209/48

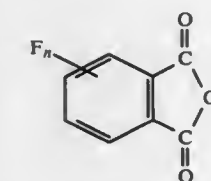
U.S. Cl. 548—480

4 Claims

1. A process for the preparation of a fluorophthalimide of the formula



where n is 1 or 2, which comprises: reacting a fluorophthalic anhydride of the formula



where n has the above meanings, with urea in the presence of a solvent at elevated temperatures, wherein from 0.4 to 0.8 mole of urea is used per mole of fluorophthalic anhydride, an aliphatic sulfone is employed as the solvent, and the reaction is carried out first at 110°–140° C. and then at 150°–170° C.

4,680,413

# PROCESS FOR THE PRODUCTION OF 3-PHENYL-4-CYANOPYRROLES

Yoshikazu Genda, Syogawa; Hiroyuki Muro, Shinminato; Kiyoharu Nakayama, Himi; Yoshiaki Miyazaki, and Yoshiji Sugita, both of Takaoka, all of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

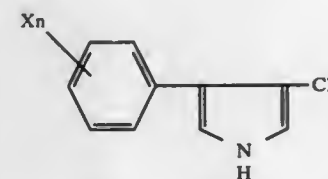
Filed Dec. 30, 1985, Ser. No. 814,893

Int. Cl.<sup>4</sup> C07D 207/34, 405/04, 207/22

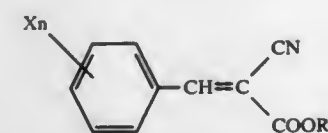
U.S. Cl. 548—526

1 Claim

1. A process for the production of a compound having the formula:



which comprises a reaction of a compound having the formula:



with a compound having the formula

R<sup>2</sup>SO<sub>2</sub>CH<sub>2</sub>NC

wherein

X is same or different substituent(s) selected from the group consisting of halogen, C<sub>1</sub>-alkyl, C<sub>1</sub>-haloalkyl, C<sub>1</sub>-alkylamino, C<sub>1</sub>-alkoxy, nitro, cyano and methylenedioxy;

COOR<sup>1</sup> is carboxylic acid or ester;

R<sup>2</sup> is C<sub>3</sub>-cyclic hydrocarbon which may be substituted by

substituent(s) not giving negative effects to said reaction;

n is 0, 1 or 2.

in an organic solvent in the presence of base(s).

4,680,414

# SUBSTITUTED-3-(2,3-DIHYDRO-1H-INDEN-5-YL)-4-HYDROXY-1H-PYRROLE-2,5-DIONES

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 605,734, May 1, 1984, Pat. No. 4,604,403.

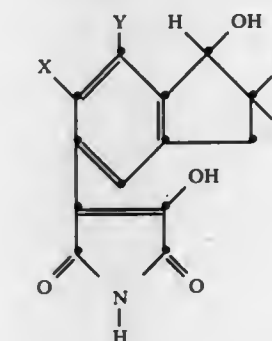
This application Feb. 20, 1986, Ser. No. 832,488

Int. Cl.<sup>4</sup> C07D 207/40; A61K 31/40

U.S. Cl. 548—544

5 Claims

1. A compound of the formula:



in which R and R' are different entities and wherein X and Y are each selected from methyl and chloro;

R is (C<sub>3</sub>—C<sub>6</sub>) cycloalkyl, (C<sub>3</sub>—C<sub>6</sub>) cycloalkyl-lower alkyl, phenyl, methoxyphenyl, hydroxyphenyl, thienyl, benzyl, phenethyl, lower alkyl, lower alkenyl, lower alkynyl;

R' is lower alkenyl; lower alkynyl or lower alkyl, provided that R is not cycloalkyl or lower alkyl when R' is lower alkyl and X and Y are both chloro, and the pharmaceutically acceptable salts thereof.

4,680,415

# INTERMEDIATES FOR 7-FLUORO DIHYDRO PGI COMPOUNDS

George W. Holland, North Caldwell; Hans Maag, Upper Montclair, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 747,740, Jun. 24, 1985, Pat. No. 4,634,782.

This application Sep. 8, 1986, Ser. No. 885,993

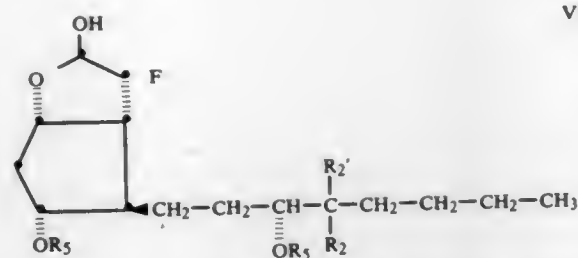
Int. Cl.<sup>4</sup> C07D 307/935

U.S. Cl. 549—214

8 Claims

1. A compound of the formula:





wherein R<sub>2</sub> is hydrogen, methyl or fluoro, R<sub>2</sub>' is fluoro, hydrogen, trifluoromethyl, or methyl; R<sub>5</sub> is tri(lower alkyl)silyl; with the proviso that when R<sub>2</sub>' is trifluoromethyl, R<sub>2</sub> is hydrogen or methyl; optical antipodes or racemates thereof.

4,680,416

## ANTIBIOTIC CL-1565 COMPLEX DERIVATIVES

Gerard C. Hokanson; Richard H. Bunge; Timothy R. Hurley, and James C. French, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.  
Continuation of Ser. No. 493,888, May 12, 1983, abandoned.

This application Jul. 16, 1985, Ser. No. 755,389

Int. Cl.<sup>4</sup> C07D 309/32

U.S. Cl. 549—292

3 Claims

1. A compound having the name 5,6-dihydro-6-(3,4,6,13-tetrahydroxy-3-methyl-1,7,9,11-tridecatetraenyl)-2H-pyran-2-one.

3. A compound having the name 5,6-dihydro-5-hydroxy-6-(3,4,6,13-tetrahydroxy-3-methyltrideca-tetraenyl)-2H-pyran-2-one.

4,680,417

2,6-DIOXO-2,6-DEHYDROBENZO[1:2-B,4:5-B]DIFURANS  
Ronald W. Kenyon, Manchester, and Derek Thorp, Heywood, both of England, assignors to Imperial Chemical Industries Plc, London, England

Filed Oct. 29, 1985, Ser. No. 792,645

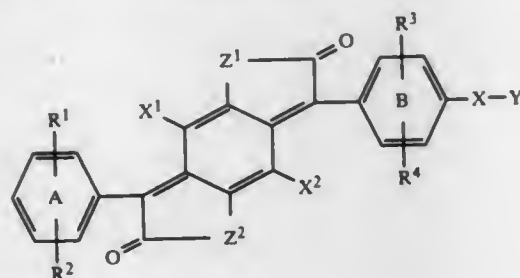
Claims priority, application United Kingdom, Nov. 19, 1984, 8429170

Int. Cl.<sup>4</sup> C07D 493/14

U.S. Cl. 549—299

7 Claims

1. A compound of the formula:



wherein,

Z<sup>1</sup> and Z<sup>2</sup> are —O—;

X<sup>1</sup> and X<sup>2</sup> are selected from H, halogen, cyano, C<sub>1-4</sub>-alkyl, C<sub>1-4</sub>-alkoxy, phenyl and phenyl substituted by a group selected from hydroxy, halogen, nitro, C<sub>1-4</sub>-alkyl and C<sub>1-4</sub>-alkyloxy, carbamoyl, sulphonyl, or —COOL<sup>3</sup>, wherein L<sup>3</sup> is selected from H, C<sub>1-4</sub>-alkyl and phenyl;

R<sup>1</sup> to R<sup>4</sup> are each independently selected from H, C<sub>1-4</sub>-alkyl, C<sub>1-4</sub>-alkoxy, C<sub>1-4</sub>-alkenyl, halogen and the group —X—Y;

X is —O— or —S—; and

Y is C<sub>2-10</sub>-alkenyl provided that, the substituents on rings A and B are different.

VIII

4,680,418

## PROCESS FOR THE PRODUCTION OF A (1R,CIS)-4-ACETYL-6,6-DIMETHYL-3-OXABICYCLO-(3.1.0)-HEX-2-ONE

Arun K. Mandal; Damodar G. Jawalkar, and Satish W. Mahajan, all of Maharashtra, all of India, assignors to IEL Limited, Calcutta, India

Filed Sep. 26, 1985, Ser. No. 780,651

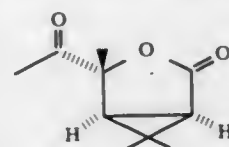
Claims priority, application United Kingdom, Sep. 28, 1984, 8424561

Int. Cl.<sup>4</sup> C07D 307/93

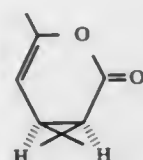
U.S. Cl. 549—305

10 Claims

1. A process for the production of (1R,Cis)-4-acetyl-6,6-dimethyl-3-oxabicyclo-(3.1.0)-hex-2-one of the formula:



which comprises reacting (1R,Cis)-4,7,7-trimethyl-3-oxabicyclo(4.1.0)-hept-4-en-2-one of the formula:



with bromine at a temperature of from 0° C. to 25° C. and treating the brominated reaction mixture at ambient temperature with water, an aqueous solvent solution or an aqueous base solution.

4,680,419

SPIROKETALS AND PROCESS FOR PREPARING SAME  
Stephen J. Nelson, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

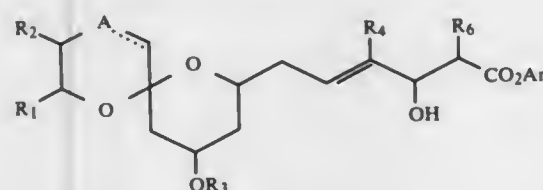
Filed Jul. 22, 1985, Ser. No. 757,659

Int. Cl.<sup>4</sup> C07D 309/10, 309/30

U.S. Cl. 549—343

4 Claims

1. A compound of Formula XIV



wherein A is —CH—, or —CH<sub>2</sub>—;

wherein . . . is a single bond when A is —CH<sub>2</sub>— and a double bond when A is —CH—;

wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>4</sub>, and R<sub>6</sub>, being the same or different, are hydrogen or C<sub>1-5</sub> alkyl;

wherein R<sub>3</sub> is hydrogen; C<sub>1-5</sub> alkyl; benzoyl optionally substituted with one, 2 or 3 C<sub>1-4</sub> alkyl, C<sub>1-3</sub> alkoxy, halo, C<sub>1-3</sub> alkylthio, trifluoromethyl, nitro; phenyl(-C<sub>1-3</sub>)alkyl optionally substituted with one, 2 or 3 C<sub>1-4</sub> alkyl, C<sub>1-4</sub> alkoxy, halo, nitro or trifluoromethyl; C<sub>2-6</sub> alkoxyalkyl; C<sub>2-6</sub> alkylthioalkyl; C<sub>1-6</sub> alkanoyl; tetrahydropyranyl; C<sub>1-4</sub> alkyl diphenyl silyl; di(C<sub>1-4</sub> alkyl) phenyl silyl; or tri(C<sub>1-4</sub>)alkyl silyl; and

wherein Ar is phenyl substituted at the 2-, 2,6- or 2,4,6-positions with C<sub>1-5</sub> alkyl.

4,680,420

## PROCESS FOR THE PRODUCING 2,5-DIMETHOXYTETRAHYDROFURAN AND 2,5-DIETHOXYTETRAHYDROFURAN

Juan Andrade, Ridgewood, N.J., and Günter Prescher, Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,296

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544046

Int. Cl.<sup>4</sup> C07D 307/20

U.S. Cl. 549—476

7 Claims

1. A process for producing 2,5-dimethoxytetrahydrofuran and 2,5-diethoxytetrahydrofuran, comprising reacting 4,4-dimethoxy-1-butanol or 4,4-diethoxy-1-butanol with a strongly acidic ion exchange resin at a temperature of between 0° and 70° C.

4,680,421

## COMPOSITION AND METHOD FOR COKE RETARDANT DURING PYROLYTIC HYDROCARBON PROCESSING

David R. Forester, The Woodlands, and Dwight K. Reid, Houston, both of Tex., assignors to Betz Laboratories, Inc., Treviso, Pa.

Filed Sep. 6, 1985, Ser. No. 773,402

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> C07C 4/02

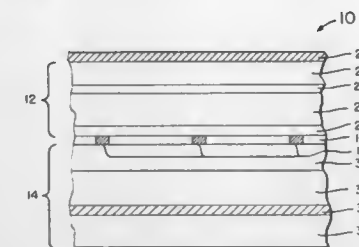
U.S. Cl. 585—648

28 Claims

1. A method of inhibiting the formation and deposition of pyrolytic coke on the heated metal surfaces of the structural and associated parts of a pyrolysis furnace which is being used to crack a petroleum feed stock to produce lower hydrocarbon fractions and said metal surfaces thereof having a temperature of about 1600° F. or above, which method comprises adding to the feedstock before and/or during cracking thereof a coke inhibiting amount of an ammonium borate compound.

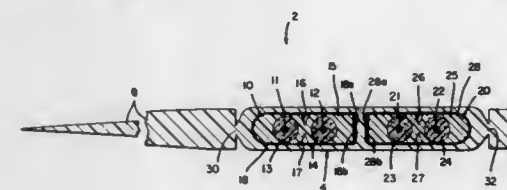
# ELECTRICAL

**4,680,422**  
**TWO-TERMINAL, THIN FILM, TANDEM SOLAR CELLS**  
 Billy J. Stanbery, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.  
 Filed Oct. 30, 1985, Ser. No. 792,942  
 Int. Cl.<sup>4</sup> H01L 27/14, 31/06  
 U.S. Cl. 136—249 49 Claims



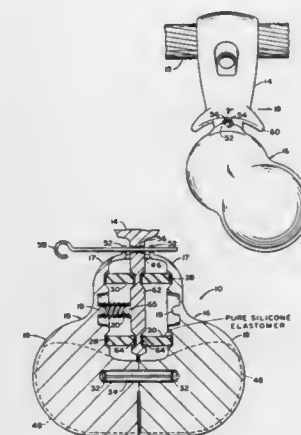
1. A polycrystalline, tandem, photovoltaic transducer, comprising:  
 (a) an upper cell having a bandgap of about 1.7 eV and comprising a heterojunction of n-type CdSe and p-type ZnTe, the junction being formed by depositing the ZnTe on the CdSe at low temperatures below about 350° C.;  
 (b) a lower cell electrically connected to the upper cell, having a bandgap of about 1.0 eV, and comprising a thin film heterojunction between a graded ternary I-III-VI<sub>2</sub> semiconductor and a thin film II-VI semiconductor window layer.

**4,680,423**  
**HIGH PERFORMANCE FLAT CABLE**  
 Glenn E. Bennett, Harrisburg, Pa.; Raymond J. Look, Largo, Fla.; Frank P. Dola, Hudson, Fla.; Richard E. Thurman, and Paul P. Siwinski, both of Seminole, Fla., assignors to AMP Incorporated, Harrisburg, Pa.  
 Filed Mar. 4, 1985, Ser. No. 707,935  
 Int. Cl.<sup>4</sup> H01B 7/08, 11/00  
 U.S. Cl. 174—36 18 Claims



18. A high impedance, low cross-talk cable for use in transmitting high frequency signals comprising a plurality of signal conductors, spaced side by side in the same plane, each signal conductor being separately surrounded by first insulating material, a second insulating material surrounding the first insulating material, the dielectric constant of the first insulating material being less than the dielectric constant of the second insulating material, the second insulating material imparting dimensional stability to the signal conductors, the second insulating material individually surrounding each signal conductor and the first insulating material therearound, the second insulating material comprising means for holding the signal conductors in parallel configuration along precisely spaced centerlines, an EMI shield surrounding the second insulating material, and a third insulating material, the EMI shield being encapsulated in the third insulating material.

**4,680,424**  
**OVERHEAD CONDUCTOR DAMPING DEVICE WITH DIE CAST COMPONENTS AND METHOD OF MAKING THE SAME**  
 Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.  
 Filed Dec. 6, 1985, Ser. No. 805,818  
 Int. Cl.<sup>4</sup> H02G 7/14 20 Claims



1. A device for damping vibrations of an overhead conductor, comprising:  
 a clamp arm,  
 a die cast weight and housing comprised of opposed weight and housing halves located on opposed sides of said clamp arm and having spherical outer surfaces to minimize corona and tooling costs,  
 a window provided in the weight and housing for accommodating the clamp arm,  
 said clamp arm extending through said window,  
 tubular elastomer damping members located between and bonded to the clamp arm and weight and housing halves such that the damping members support the weight and housing halves on the clamp arm, and damping is effected by flexing of the damping members without occurrence of sliding movement between components of the damping device, and  
 means securing the weight and housing halves, clamp arm and damping members together.

19. A method of making a device for damping the vibrations of overhead electrical conductors, said method comprising the steps of:  
 providing hollow cylindrical-shaped elastomer damping members, said damping members having parallel planar ends,  
 providing parallel planar surfaces on opposed walls of a housing structure for housing the damping members and on opposed surfaces of a clamp arm for clamping to an overhead conductor,  
 applying a layer of substantially wet flexible adhesive to the planar surfaces of the housing structure and clamp arm, locating the damping members between the planar surfaces of the housing structure and clamp arm in a manner that seats the ends of the damping members in the flexible adhesive, and  
 joining the ends of the damping members to the clamp arm and housing structure by pressing the ends against the layers of adhesive and allowing the adhesive to dry.



4,680,425

## CABLE STRAIN RELIEF DEVICE

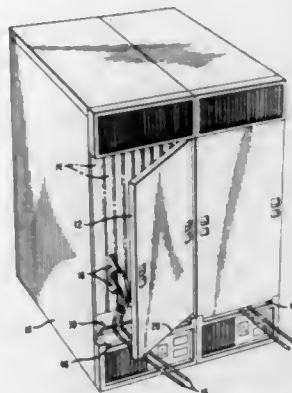
Floyd G. Speraw, Lexington, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 19, 1985, Ser. No. 746,895

Int. Cl.<sup>4</sup> H01R 13/585

U.S. Cl. 174—50

6 Claims



1. A cable strain relief device for protecting cables and their associated connectors from strains and other physical damage comprising:

- a cabinet having at least one surface;
- at least one cable having an associated connector connected to said cabinet;
- a rigid U-shaped bracket for engaging and constraining the cable and having end portions projecting parallel to the bottom of the U-shape; and
- rigid means engaging said end portions, to permit said U-shaped bracket to pivot about said end portions, said means affixed to the at least one surface of said cabinet in a position proximate said at least one cable and its associated connector such that said U-shaped bracket fits over and constrains said at least one cable with a substantially 90° bend so that a pull force on said at least one cable will cause said at least one cable to engage and rotate said U-shaped bracket in a direction toward said at least one surface of said cabinet thereby squeezing said at least one cable between said U-shaped bracket and said at least one surface of said cabinet so as to prevent the transmission of the pull force to said associated connector.

4,680,426

## ELECTRICAL SWITCHES

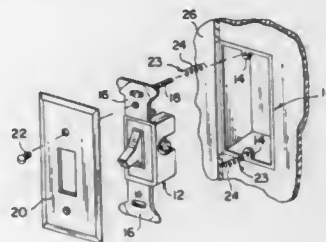
Ralph L. Hawker, and George Spector, both of 233 Broadway RM 3615, New York, N.Y. 10007

Filed Aug. 19, 1985, Ser. No. 766,978

Int. Cl.<sup>4</sup> H02G 3/12

U.S. Cl. 174—57

2 Claims



1. An improved outlet box with an electrical fixture, said outlet box being of the type having two mounting tabs, said electrical fixture of the type having two mounting straps, two mounting screws, a cover plate and at least one plate screw,

wherein the improvement comprises means for biasing said electrical fixture in a forward position so that said electrical fixture can be mounted at a proper position with respect to a finished wall surface irrespective of the thickness of said wall and said cover plate can be mounted to said electrical fixture by said at least one plate screw, wherein said biasing means includes two deflection spools, each said spool being of a flexible material and having a hollow barrel with a plurality of vertical slots therein, said barrel is circumposed about one of said mounting screws between said mounting tab and said mounting strap for biasing said electrical fixture in a forward position.

4,680,427

## FIRE RESISTANT CAST CABLE CONNECTION

Gunther John, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

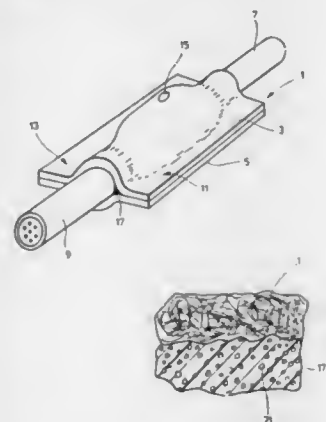
Filed Aug. 15, 1985, Ser. No. 765,680

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432158

Int. Cl.<sup>4</sup> H02G 15/113

U.S. Cl. 174—88 R

7 Claims



1. A cast cable connection comprising cables with their conductors interconnected, and surrounding said conductors, a housing containing a cured filler resin therein, said housing comprising flexible fibrous ceramic material bound together by a fire resistant inorganic binding agent, said housing being sufficiently porous to provide increased adhesion between said housing and said filler resin and to provide a substantially integral unit therebetween.

4,680,428

## ELECTRIC FENCE INSULATOR CAP

Robert M. Wilson, Jr., Battle Creek, Mich., assignor to Dare Products, Inc., Battle Creek, Mich.

Filed Aug. 22, 1986, Ser. No. 899,164

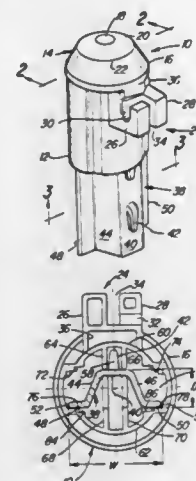
Int. Cl.<sup>4</sup> H01B 17/14; A01K 3/00

U.S. Cl. 174—158 F

4 Claims

1. A fence post cap for installation on the top of a U-post, said U-post having legs which diverge from a central flat bight portion to outwardly extending flanges in a plane parallel to said central bight portion, said bight portion having longitudinally spaced outwardly extending fastening lugs, said cap comprising: a tubular body having an oblong cross-section with its wall symmetrical about a longer and a shorter axis at right angles to each other; a sloped top closing one end of said tubular body; two opposed pairs of adjacent longitudinally extending parallel ribs projecting inwardly from said wall parallel to said shorter axis with one rib of each pair being on each side of said shorter axis, the ribs of each pair being spaced apart a distance sufficient to receive a fastening lug therebetween; stepped ledges extending inwardly from said wall sym-

metrically arranged on both sides of said shorter and longer axes and parallel to said longer axis; whereby said cap can be driven onto said U-post by impacting said top, at least one of said ribs then contacting the flat bight portion of said post and each of said post flanges then contacting one of said stepped



ledges for guiding said cap, and said cap then being retained on said post by the coaction of the cap wall against the ends of said flanges or the coaction of at least one of the ribs acting on the bight portion and the stepped ledges acting on the flanges of said U-post.

4,680,429

## TOUCH PANEL

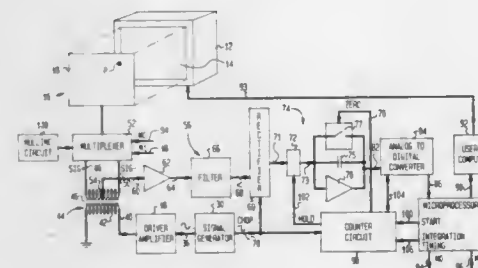
Bruce Murdock, Beaverton, and Daniel G. Teichner, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 15, 1986, Ser. No. 819,949

Int. Cl.<sup>4</sup> G08C 21/00

U.S. Cl. 178—19

27 Claims



1. A touch panel device for determining the touch location at which a touch sensing surface of the device is touched comprising:

- signal generator means for producing an alternating-current voltage output;
- transformer means having a primary winding means connected to the signal generator output so as to be driven by the signal generator means, the transformer means also having a secondary winding means with first and second secondary winding outputs and a center tap, the secondary winding means providing a panel scanning signal as the primary winding means is driven by the signal generator output;
- switching means for selectively coupling the secondary winding means to the touch sensing surface so as to selectively apply the panel scanning signal to the touch sensing surface and generate touch current signals at the center tap upon touching of the panel; and
- panel output signal processing means having a first input

coupled to the center tap of the transformer means for receiving the touch current signals, the panel output signal processing means comprising means for determining the touch location from the touch current signals.

4,680,430

## COORDINATE DETECTING APPARATUS

Kazuo Yoshikawa, Atsugi; Toru Asano, Kawasaki; Hisashi Yamaguchi, Atsugi; Hideaki Takizawa, and Shizuo Andoh, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

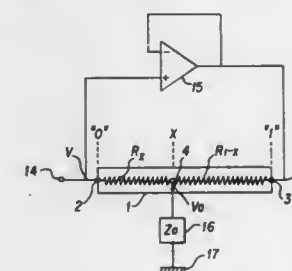
Filed Feb. 27, 1985, Ser. No. 706,224

Claims priority, application Japan, Feb. 29, 1984, 59-37919; Feb. 29, 1984, 59-37914; Feb. 29, 1984, 59-37915

Int. Cl.<sup>4</sup> G08C 21/00

U.S. Cl. 178—19

20 Claims



1. An apparatus for detecting the coordinate of a point on a plane, comprising:

- a resistive film means forming the plane, said resistive film means having an effective region used for the coordinate detection, said effective region being substantially rectangular and having a pair of ends disposed in a direction in parallel to a relevant coordinate axis;
- a buffer means having an input and an output, said input being connected to one end of said film means and said output being connected to the other end of said film means, said buffer means having substantially infinite impedance and unit voltage gain; and
- measuring means connected to said input of said buffer means, to measure an impedance between an end of said film means and ground, wherein the point, whose coordinate on the plane is to be detected, is indicated by applying a load to the point.

4,680,431

## DATA NETWORK INTERFACE MODULE WITH CIRCUITRY FOR DISCONNECTING A MODULE THAT HAS LOST SUPPLY VOLTAGE

Werner Flach, Amberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 5, 1985, Ser. No. 805,325

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445521

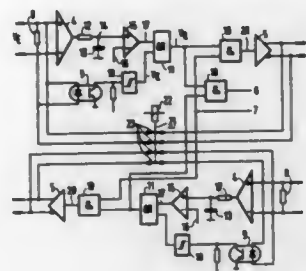
Int. Cl.<sup>4</sup> H04L 25/02; H04B 3/44

U.S. Cl. 178—69 R

13 Claims

1. An interface module for connecting a bus station with a data network, comprising a first receive portion for receiving a first input signal from a first input line on the data network, the first input signal being capable of at least one of a plurality

of valid states including a first ready state, the first receive portion comprising means for simulating the first ready state at



the output of the first receive portion if the first input signal is not in a valid state.

4,680,432

## COMPACT ELECTRONIC DEVICE

Kazuhiro Sugiyama, and Yoshio Kawai, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

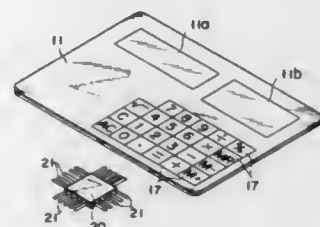
Filed Jul. 22, 1985, Ser. No. 757,849

Claims priority, application Japan, Aug. 7, 1984, 59-165062; Aug. 7, 1984, 59-165063; Aug. 7, 1984, 59-0165064

Int. Cl.<sup>4</sup> H01H 3/12

U.S. Cl. 200-5 A

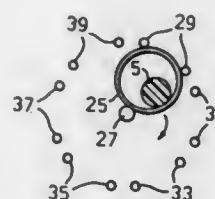
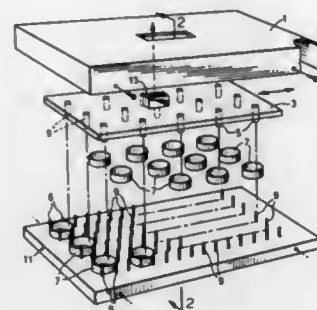
42 Claims



1. A method for fabricating a key switch comprising the steps of:

- forming a first conductive layer on a first surface;
- forming connecting terminals on said first surface;
- forming a first conductive pattern on said first surface for connecting said first conductive layer with some electrodes of an electronic component and for connecting other electrodes of the electronic component with said connecting terminals;
- forming an insulating layer covering said first conductive pattern but leaving the connecting terminals and the first conductive layer exposed;
- forming a plurality of anisotropically electrical conductive islands on said first conductive layer;
- forming a second conductive layer on said islands; and
- forming a second conductive pattern on a side of said insulating layer opposite from the first conductive pattern for connecting said second conductive layer to said connecting terminals.

4,680,433  
CONTACT ASSEMBLY FOR A SWITCH  
Donald H. MacAdam, Ancaster, Canada, assignor to Annulus Technical Industries, Inc., Ancaster, Canada  
Filed Jan. 7, 1986, Ser. No. 816,822  
Int. Cl.<sup>4</sup> H01H 1/12, 15/06, 21/76  
U.S. Cl. 200-16 D 17 Claims



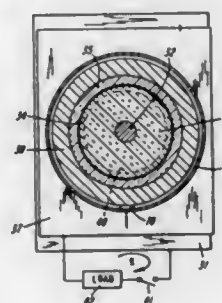
1. A contact assembly for a switch, comprising a resiliently deformable loop of conductive material, and a plurality of fixed abutments unattached to the loop extending perpendicular to the plane of the loop and defining a path of movement for the loop, in passing along which path the loop is stressed by passing between at least two abutments, the location of the abutments being such that the stress of the loop as it moves along the path exhibits minima and maxima at defined locations, at least certain of the abutments providing electrical contacts to the loop such as to complete at least one electrical circuit through the loop at at least one defined location corresponding to a stress minimum, and in which the stress maxima is defined by at least two abutments.

4,680,434  
EXPLOSIVE-DRIVEN, HIGH SPEED, ARCLESS SWITCH  
Phillip J. Skogmo, and Tillman J. Tucker, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 2, 1986, Ser. No. 859,164  
Int. Cl.<sup>4</sup> H01H 39/00

U.S. Cl. 200-61.08

14 Claims



1. An explosive-actuated, single-use, fast-acting, arcless switch for a high current circuit, comprising:

a frangible conductive foil element having opposed first and second surfaces providing a low impedance path between an input and an output for a high current in said circuit; a hard dielectric surface positioned against the first surface of said frangible foil and provided with a predetermined pattern of grooves, the surface between said grooves extending from said input to said output; and explosive force-generating means for generating an explosive force acting on the second surface of said frangible foil towards said grooved hard dielectric surface, said foil over said grooves being ruptured by said explosive force, thereby providing a current path only through the unruptured foil between said grooves to increase the impedance of said switch between said input and said output.

4,680,435  
ROCKER SWITCH FOR SLIDING OR PIVOTING CONTACT LEVER

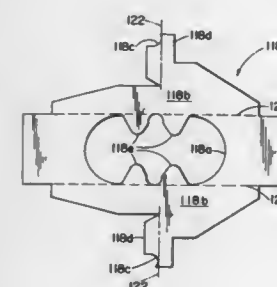
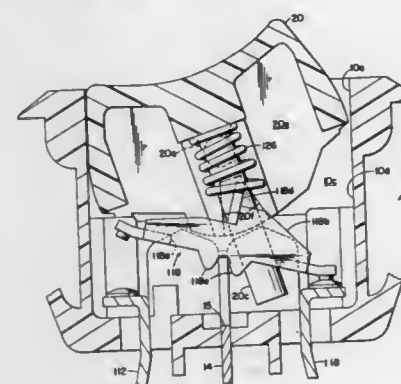
Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Filed Mar. 11, 1986, Ser. No. 838,915

Int. Cl.<sup>4</sup> H01H 5/06, 21/42, 1/06

U.S. Cl. 200-68.2

4 Claims



1. A switch comprising a base of insulating plastic and defining an upwardly open cavity, at least two fixed contacts spaced along the bottom wall of said base cavity, one of said fixed contacts having an upper edge defining a contact lever fulcrum and the other fixed contact defining an upwardly facing butt contact, a rocker actuator pivotally supported in said switch base for movement on a pivot axis defined in said base and located above said fulcrum, said actuator having a depending portion, a lower end of said depending portion extending downwardly below said fulcrum, said actuator having laterally spaced wall portions, a coil spring provided on said depending portion generally between said actuator wall portions, said spring having an upper end engaging a rocker defined land downwardly facing, a movable contact lever having a central saddle portion provided on said fixed contact fulcrum for pivotal movement of said lever between first and second limit positions, said contact lever having a butt contact spaced from said saddle portion for engaging selectively said fixed butt

contact in a first limit position of said contact lever, said lever having a U-shaped cross section with an opening in the base of the U to provide clearance for said depending actuator portion, said U-shape contact lever further including laterally spaced wall portions, upper edges of said contact lever wall portions defining laterally spaced lands for engaging a lower end of said coil spring, said wall portions of said contact lever provided between said actuator wall portions, and means provided in part on said actuator wall portions and in part on said contact lever wall portions for achieving positive movement of said lever in response to movement of said rocker actuator.

4,680,436  
PROXIMITY SWITCH IN MOUNTING ARRANGEMENT  
Walter Brausfeld, Hanover; Helmut Gottling, Isernhagen; Rudolf Moller, Gehrden; Peter Muller, Hanover, and Gerhard Scharnowski, Gehrden, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Steuerungstechnik GmbH & Co., Hanover, Fed. Rep. of Germany

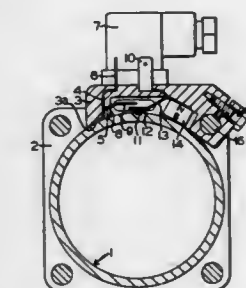
Filed Jul. 28, 1986, Ser. No. 879,688

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523371; Mar. 21, 1986, 3609537

Int. Cl.<sup>4</sup> H01H 35/38

U.S. Cl. 200-82 E

12 Claims



1. A contactless proximity switch and mounting arrangement for determining the position of a movable member within a cylinder, said contactless proximity switch and mounting arrangement comprising:

- (a) a switch housing mounted at a predetermined position on the cylinder;
- (b) a contact opening formed in said switch housing having a portion thereof open toward an exterior surface of the cylinder;
- (c) a permanent magnet disposed in said contact opening and having a first pole in contact with the exterior surface of the cylinder;
- (d) a switch element having at least a first and second contact member being disposed in said contact opening, said first contact member being coupled to a second pole of said permanent magnet, and said second contact member being electrically connected to the exterior surface of the cylinder at a spaced-apart position relative to where said first pole of said permanent magnet contacts the exterior surface; and
- (e) the movable member being composed of a ferromagnetic material which, as the movable member nears to within a predetermined distance of such predetermined position, allows a magnetic field exerted by said permanent magnet to be conducted thereover such that such spaced-apart position between said first pole of said permanent magnet and said electrical connection to said second contact member is bridged thereby closing said first and second contact members.



4,680,437

## ADJUSTABLE FLOAT ASSEMBLY FOR PUMPS

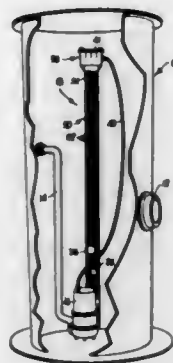
Nyle D. La Grange; Darryl M. Nielsen, both of Lenexa, Kans., and Joe A. Harbison, Gladstone, Mo., assignors to The Marley-Wylain Company, Mission, Kans.

Filed Jan. 13, 1986, Ser. No. 818,011

Int. Cl.<sup>4</sup> H01H 35/18

U.S. Cl. 200—84 R

13 Claims



1. A fluid level indicator assembly comprising:
  - a support having a pair of elongated, upright wall portions spaced from each other to define an elongated channel therebetween which extends in an upright direction and which is open in horizontal directions;
  - an elongated electrical lead means extending through said open channel in a generally horizontal direction and having structure engaged with both of said wall portions; and
  - switch means electrically connected to said lead means and being operably responsive to the pressure of fluid, said spacing between said pair of wall portions being complementally configured to said lead means structure to engage said pair of wall portions to grippingly engage said structure at any one of a number of vertical, selected positions along the length of said channel while enabling said lead means in each of said positions to extend through said channel in a generally horizontal direction to thereby adjustably position the height of said switch means.

4,680,438

LAMINATED MATERIAL FOR ELECTRICAL CONTACTS AND METHOD OF MANUFACTURING SAME

Karin Witting, Maintal; Dieter Pöss, Hanau, and Rudolf Schnabl, Rodenbach, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,874

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509039

Int. Cl.<sup>4</sup> H01H 1/02

U.S. Cl. 200—268

6 Claims



1. A laminated material for an electrical contact, comprising:
  - (a) a support of a base metal or base metal alloy;
  - (b) a contact layer of titanium nitride having a first and a second surface, said first surface being in contact with a surface of the support; and
  - (c) a mixed layer of titanium nitride and at least one noble metal selected from the group of gold, silver, palladium,

platinum, ruthenium, rhodium and iridium, the mixed layer having a thickness of from about 1/10 to about 3/10 of that of the titanium nitride layer but not greater than about 0.45 micrometers, and having a noble metal content of from 40 to 95%, said mixed layer being in contact with said second surface.

4,680,439

## PLASTIC MICROWAVE OVEN CAVITY

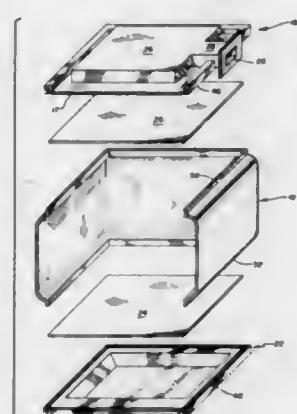
Ronald W. Millman, Bloomington, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 30, 1986, Ser. No. 869,214

Int. Cl.<sup>4</sup> H05B 6/64

U.S. Cl. 219—10.55 R

8 Claims



1. A plastic microwave oven cavity assembly comprising:
  - (a) a top and a bottom generally pan-shaped member, each having a microwave impermeable coating on the interior thereof; and
  - (b) a side wall member having a microwave impermeable coating on the exterior thereof;
 wherein said top and bottom members are each joined to said side wall member by seam means for connecting the microwave impermeable coatings of said top, bottom and side wall members into a substantially continuously microwave impermeable surface sufficient to contain microwave energy within said cavity.

4,680,440

SHIELDING ARRANGEMENT AND METHOD FOR TIG

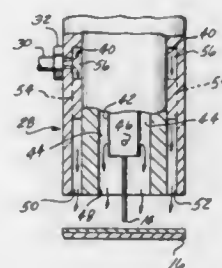
Loren E. Barlet, 58100 Romeo Plank Rd., Mt. Clemens, Mich. 48044

Filed Apr. 7, 1981, Ser. No. 251,797

Int. Cl.<sup>4</sup> B23K 9/16

U.S. Cl. 219—75

9 Claims



1. In an arc welding apparatus of the type including a weld-

ing electrode mounted within an electrode holder, a gas cup surrounding said electrode and carried by said holder, and means for supplying inert gas flow in a surrounding relationship to said electrode during welding operations to thereby achieve a shielding of said electrode, means for applying an electrical potential to said electrode to establish a welding arc and controls for initiating and terminating application of said electrical potential, said welding controls including means for initiating inert gas flow upon initiation of said welding arc, the improvement comprising:

means for establishing a surrounding flow of hydrogen gas upon initiation of said welding arc, including an annular space creating a flow of said hydrogen in a cylindrical pattern radially outwardly spaced from and parallel to said inert gas flow and in surrounding relationship thereto, said means further including means responsive to activation of said welding controls to initiate said hydrogen gas flow whereby said hydrogen gas is ignited by initiation of said welding arc and forms completely surrounding curtain of burning hydrogen gas during said welding operations.

4,680,441

## PRESSURE REGULATOR CONTROL SYSTEM

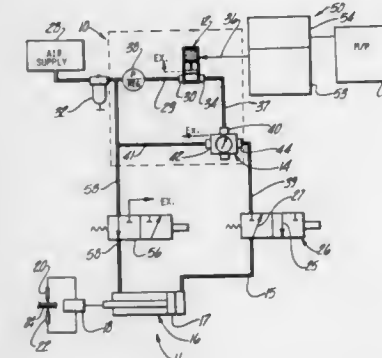
Lorne McKendrick, 365 W. Girard Ave., Madison Heights, Mich. 48071

Filed Jun. 29, 1984, Ser. No. 626,379

Int. Cl.<sup>4</sup> B23K 11/10

U.S. Cl. 219—91.1

6 Claims



6. In combination with a pair of welding electrodes and means for displacing said electrodes into and out of engagement with a workpiece, said means for displacing comprising a cylinder having a piston slidably displaceable within the cylinder, a supply of pressurized air, and fluid passage means connecting said supply to said cylinder on at least one side of said piston, the improvement comprising:
  - means for regulating the pressure delivered to said cylinder, said means for regulating comprising:
    - means for generating an electrical signal corresponding to a desired air pressure,
    - transducer means for establishing a first predetermined output pressure which is continuously variable in response to said electrical signal,
    - means for reducing the pressure of said pressurized air prior to said transducer,
    - air pilot operated pressure regulator means for establishing a second predetermined output pressure which is a discrete multiple of said first predetermined output pressure,
    - and valve means for selectively applying said second predetermined output pressure to said cylinder on one side of said piston.

4,680,442  
APPARATUS FOR CUTTING MULTIPLE LAYERS OF FABRIC

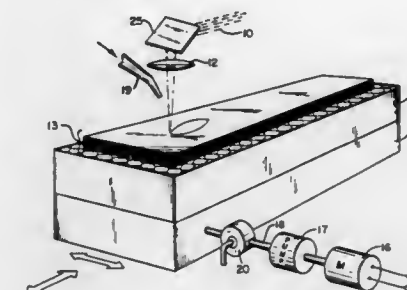
Theodore J. Baner, Hudson, Wis.; Donald P. Herke, Roseville, Minn.; Edward A. Bork, Star Prairie, and William E. Lawson, Somerset, both of Wis., assignors to Laser Machining, Inc., Somerset, Wis.

Filed Apr. 4, 1986, Ser. No. 848,218

Int. Cl.<sup>4</sup> B23K 26/00

U.S. Cl. 219—121 LG

3 Claims



1. In combination in a laser cutting apparatus for cutting multiple sheets of fabric into patterns, the improvement comprising:
  - (a) a table having a plurality of knife edge support members extending upwardly and disposed to support a honeycomb structure;
  - (b) a honeycomb cellular structure having heat absorbing characteristics and having multiple vertically extending openings formed therein permitting substantially vertical airflow therethrough, said honeycomb structure being constructed and arranged to support multiple layers of limp fabric in flat contiguous relationship while said airflow moves through said openings;
  - (c) a source of vacuum pressure including vacuum pressure regulating means having at least a negative pressure of 5 inches H<sub>2</sub>O;
  - (d) a focused laser beam directed downwardly from above said honeycomb structure and the layers of fabric, for burning a pattern in the multiple layers of fabric;
  - (e) a vacuum table supporting said honeycomb cellular structure and connected to said source of vacuum pressure, said airstream movement increasing as a result of said laser beam cutting the fabric and thereby creating an increase in air movement substantially in line with said laser beam; and
  - (f) said laser cutting apparatus being devoid of layer separating and liquid spraying means adjacent the focus of said laser beam.

4,680,443

PROCESS AND APPARATUS FOR ELECTRON BEAM WELDING GRIDS FOR A NUCLEAR FUEL ASSEMBLY

Bernard Vere, Eybens, and Paul Mathevon, Bollene, both of France, assignors to Cogema, Framatome et Uranium Pechiney, France

Filed Mar. 12, 1985, Ser. No. 710,685

Claims priority, application France, Mar. 13, 1984, 84 03839

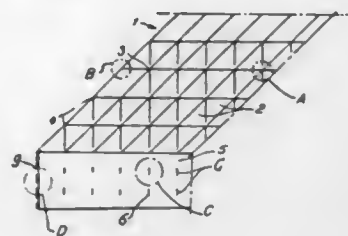
Int. Cl.<sup>4</sup> B23K 9/00

U.S. Cl. 219—121 ED

11 Claims

1. Method of welding a grid comprising a belt and two sets of strips whose end portions are fastened to said belt, comprising the steps of: placing said grid in a holding frame having passages for access to spots to be welded on two larger surfaces and on four sides of the grid; seizing said frame containing said grid with an orientation device for angular movement, supporting said orientation device with a cross motion table for movements in directions perpendicular to a line of welding radiation and moving said device to cause each spot to be

welded on a surface of said grid to pass through said line of welding radiation and energizing said welding radiation; repeating the movement and energization sequences after the frame has been tilted by 90° around a first axis perpendicular to the line of welding radiation by means of said orientation



device, in order to produce welds on all of the two surfaces and on two of said sides of said grid; and repeating the movement and energization sequences after the frame has been moved into two opposite orientations successively by tilting around a second axis at right angles to the first, in order to produce welds on the two last sides, and depositing the frame.

4,680,444

#### HAIRSETTER SYSTEM FOR ELECTRICALLY HEATING HAIR ROLLERS

Jorgen Skovdal, Trumbull; Daniel Santhouse, Stratford, both of Conn.; Borge Jensen, Kalundborg, Denmark, and Vito Carlucci, Stratford, Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Apr. 25, 1985, Ser. No. 726,865

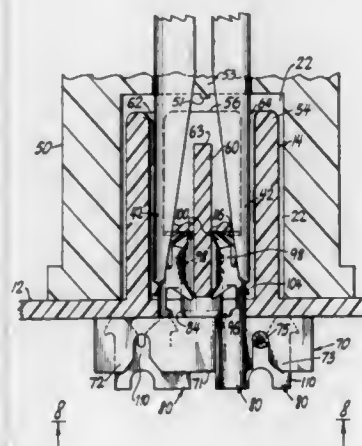
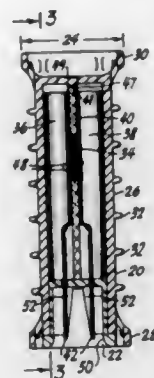
Int. Cl.<sup>4</sup> H05B 3/00; A45D 2/36; H01R 13/20; H01C 7/02  
U.S. Cl. 219—222 9 Claims

1. In a hairsetter for electrically heating at least one hair roller, each said hair roller having an electrically activated internal heat generating material and a pair of plug members operatively electrically connected thereto and extending into a recess within one end of said roller, said hairsetter having at least one electrical socket member, each socket member including a pair of electrical contact pins receiving said pair of plug members, and means for completing an electrical connection between said contact pins of said socket member and a source of electrical power, the improvement wherein:

each said socket member comprises an electrically insulated socket housing for receiving the end of said roller having said recess, said housing having a first hollow cylindrical portion with an outside diameter smaller than the inside diameter of said recess and having a second cylindrical portion concentrically aligned within said first cylindrical portion in spaced relation to the inner surface thereof to form an annular space therebetween, a pair of radially extending diametrically opposed rib members connecting said first and second cylindrical portions to form the annular space therebetween into two arcuate spaces, each adapted to receive one of said plug members one of said contact pins being inserted into each of said arcuate spaces; and wherein

each of said plug members is tapered to a point of predetermined radius at the distal end thereof, each said plug member having along its length a curved surface of sub-

stantially uniform radius of curvature, the concave sides of each of said curved surfaces facing each other and



symmetrically situated about the longitudinal axis of said roller.

4,680,445

#### ELECTRONICALLY-CONTROLLED HEATING DEVICE FOR INFUSION LIQUIDS

Genshiro Ogawa, 13-3, Oaza Inuyama Aza Nishikoken, Inuyama-shi, Aichi-ken, Japan

Filed Sep. 6, 1985, Ser. No. 773,020

Claims priority, application Japan, Sep. 6, 1984, 59-187112; Nov. 12, 1984, 59-238185; Nov. 30, 1984, 59-182557[U]; Jan. 9, 1985, 60-1185[U]

Int. Cl.<sup>4</sup> H05B 1/02; A61F 7/00; B67D 5/62; F24H 1/12  
U.S. Cl. 219—299 5 Claims

1. A device for heating infusion liquid, such as instillation liquid and blood transfusion liquid, to be injected to a human body, comprising:

a casing having an open top and a closed bottom, with an inlet cutout section and an outlet cutout section formed on one side wall thereof;

a liquid heating bag removably mounted within said casing and having an inlet end for connection to a source of liquid, an outlet end for connection to a human body, and a flow passage extending between said inlet and outlet ends in a zigzag line, said heating bag being disposed within said casing with said inlet and outlet ends received in said inlet and outlet cutout sections of said casing, respectively;

a first and a second heating plate mounted on the bottom of said casing, said first heating plate being adapted to heat a half part of the bag on the inlet side of said heating bag,

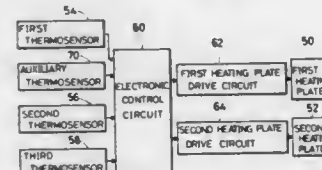
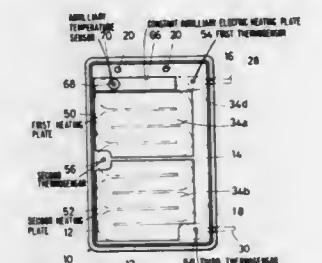
and said second heating plate being adapted to heat the other half part of the bag on the outlet side of said heating bag;

an openable cover connected to the top of said casing in coextensive relation thereto;

a push plate mounted on the inner surface of said cover and adapted to hold said heating bag against said first and second heating plates;

a first thermosensor located within said casing between said inlet cutout section and said first heating plate to measure temperature in the vicinity of the inlet of the bag;

a second thermosensor located within said casing between said first heating plate and said second heating plate to measure temperature in the vicinity of the middle of the bag;



a third thermosensor located within said casing between said second heating plate and said outlet cutout section to measure temperature in the vicinity of the outlet of the bag; and

control means located within said casing for controlling heating rates of said first and second heating plates, said control means including means for controlling said first heating plate in accordance with the temperature of the liquid in the vicinity of the inlet of the bag and the middle of the bag, as measured by said first and second thermosensors, respectively, and said control means further including means for controlling said second heating plate in accordance with the temperature of the liquid in the vicinity of the outlet of the bag, as measured by said third thermosensor.

4,680,446

#### SUPPLEMENTAL ELECTRIC WATER HEATER UNIT FOR COMPENSATING COOLING OF A HOT WATER SUPPLY LINE

Steven W. Post, 3310 Redwood Cove, Jonesboro, Ark. 72401

Filed Oct. 1, 1985, Ser. No. 782,460

Int. Cl.<sup>4</sup> H05B 1/02, 3/82; F24H 1/20; F24D 17/00  
U.S. Cl. 219—312 16 Claims

16. A hot water line accommodator for interposition between a hot water supply and a utility tap in proximity to the latter thereby to provide immediate hot water as needed, irrespective of standing line water temperature from the heater, comprising,

a receptacle for receiving line water and discharging heated water therefrom,

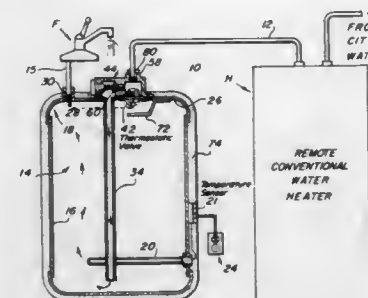
said receptacle having a discharge connection at the upper portion thereof adapted to be connected to a utility tap, heating means for heating water in said receptacle, means controlling said heating means in response to the temperature of water in said receptacle,

an inflow connection on said receptacle adapted to be con-

nected to a hot water supply and having a thermostatic valve associated therewith,

said inflow connection having a first branch for directing water to the bottom portion of the receptacle and a second branch directing water to the upper portion of the receptacle,

said inflow connection having means cooperating with said thermostatic valve to close said second branch in response



to incoming water below a predetermined temperature and direct the water through said first branch toward the bottom of said receptacle, and to close said first branch in response to water above a predetermined water temperature and direct the water through said second branch into the top of said receptacle, whereby relatively cooler water will be heated by said heating means before exiting said discharge connection and relatively hotter water is enabled to pass directly to said discharge connection.

4,680,447

#### COOLED OPTICAL WINDOW FOR SEMICONDUCTOR WAFER HEATING

Imad Mahawili, Sunnyvale, Calif., assignor to Genus, Inc., Mountain View, Calif.

Continuation of Ser. No. 522,638, Aug. 11, 1983, Pat. No. 4,550,684. This application Jul. 19, 1985, Ser. No. 756,739. The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> H05B 1/00

U.S. Cl. 219—343 11 Claims

1. An apparatus for heating a wafer of semiconductor material comprising:

housing means for containing said wafer;

heating means external to said housing means for generating light for directly heating said wafer;

window means interposed between said heating means and said wafer, for transmitting said light into the interior of said housing means and in the direction of said wafer, said window means comprising a first wall and a second wall with a space therebetween for channeling the flow of cooling liquid, with said second wall forming at least a portion of the innermost surface of said housing means, and said walls arranged such that said light passes through both of said walls and through said cooling liquid before impinging on said wafer; and

fluid control means for actively cooling said second wall by pumping cooling liquid between said walls.

4,680,448

#### INFRARED SPACE HEATER

Earl L. Fester, Rte. 7, Box 307, Springfield, Mo. 65802

Filed Mar. 7, 1986, Ser. No. 837,254

Int. Cl.<sup>4</sup> H05B 1/00; F24H 3/02

U.S. Cl. 219—365 20 Claims

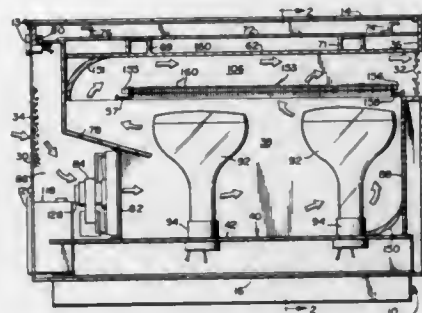
1. A space heater comprising:

a casing having a cool air inlet and a heated air outlet;

a fan disposed within said casing adjacent said cool air inlet;



an electrically powered heat source disposed within said casing between said fan and said heated air outlet;  
a heat exchanger mounted adjacent said electrically powered heat source;  
air passageway defining means for defining a path of air movement through the casing from the cool air inlet, past the heat source, through and past the heat exchanger, and out the heated air outlet; and



said heat exchanger comprising a plurality of spaced parallel tubes of high heat conductivity material elongated in a dimension leading from the interior of said casing to said heated air outlet, and a plurality of spaced parallel fins of high heat conductivity material, said fins connected to said tubes and extending perpendicular thereto.

4,680,449

**HEATER FOR HEATING HEAT SHRINKABLE TUBE**  
Takeshi Yamada, Sakura; Yasukuni Osato, Narashino, and Okosu Watanabe, Chiba, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,821

Claims priority, application Japan, Oct. 19, 1984, 59-219786  
Int. Cl.<sup>4</sup> F27D 11/00

U.S. Cl. 219—385

6 Claims



1. A heater for heating a heat shrinkable tube fitted over an elongated member, which heater comprises:
  - (a) a base having an elongated support plate of a thermally conductive material, adapted to support said elongated member carrying said heat shrinkable tube;
  - (b) a first heating portion at a central portion of said support plate defined by the presence of a heater element attached to the underside of said support plate;
  - (c) a second heating portion on said support plate defined by the end portions of said support plate extending outwardly in opposite directions from said first heating portion;
  - (d) a third heating portion defined by a pair of parallel spaced upright plates of thermally conductive material disposed on the top of said support plate and extending across said first heating portion coextensive with said support plate;
  - (e) whereby when said heater element is activated heat is transferred to said support plate, the central portion of said heat shrinkable tube above said first heating portion is heated first, so that said tube is heat shrunk at its central portion first and then towards its opposite ends.

4,680,450

**APPARATUS FOR CONTROLLING THE HEATING OF COMPOSITE MATERIALS**

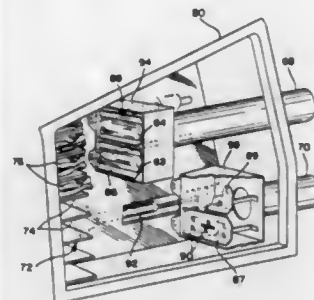
Russell E. Thorson, Outagamie County, and Douglas J. Marver, Marathon County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 30, 1985, Ser. No. 760,441

Int. Cl.<sup>4</sup> F27D 11/00

U.S. Cl. 219—388

7 Claims



1. Apparatus for heating composite materials comprising at least one first source of radiant energy, means to regulate the wave length of radiant energy given off by said at least one first source of radiant energy, at least one second source of radiant energy, means to regulate the wave length of radiant energy given off by said second source of radiant energy and means to move material to be heated past said first and said second heat sources wherein said radiant energy is predominantly infrared energy, said at least one first source is regulated to emit a predominant wave length of 3.5 microns and said at least one second source is regulated to emit a predominant wave length of about 5.5 microns and said at least one second source is downstream from said at least one first source.

4,680,451

**APPARATUS USING HIGH INTENSITY CW LAMPS FOR IMPROVED HEAT TREATING OF SEMICONDUCTOR WAFERS**

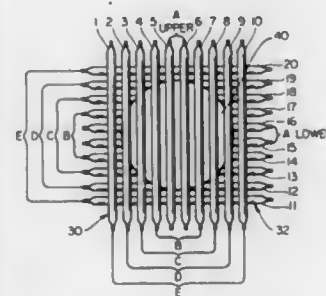
Anita S. Gat, and Eugene R. Westerberg, both of Palo Alto, Calif., assignors to A. G. Associates, Sunnyvale, Calif.

Filed Jul. 29, 1985, Ser. No. 760,160

Int. Cl.<sup>4</sup> F27B 5/14; H05B 1/02

U.S. Cl. 219—411

22 Claims



1. Apparatus for heating semiconductor wafers of various diameters and establishing desired radial temperature gradients comprising
  - a first plurality of parallel lamps,
  - a second plurality of parallel lamps, said second plurality of lamps being spaced from and skewed with respect to said first plurality of lamps whereby a semiconductor wafer can be positioned therebetween,
  - means electrically connecting pairs of lamps in said first plurality of lamps beginning with innermost lamps and

extending outwardly and means electrically connecting pairs of lamps in said second plurality of lamps, beginning with innermost lamps and extending outwardly, and means electrically interconnecting each pair of electrically connected lamps in said first plurality of lamps with a pair of electrically connected lamps in said second plurality of lamps whereby the interconnected pairs of lamps are simultaneously and equally energized to establish desired temperature gradients.

4,680,452

**ELECTRIC HOTPLATE WITH A THERMOSTAT**

Karl Fischer, Felix Schreder, both of Oberderdingen, and Robert Kicherer, Kniptlingen, all of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

Division of Ser. No. 511,104, Jul. 6, 1983, Pat. No. 4,605,841.

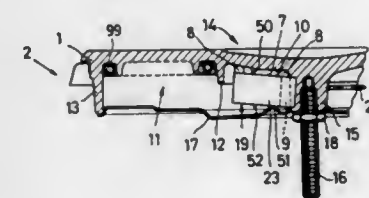
This application May 8, 1986, Ser. No. 861,083

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 8219461; Jul. 14, 1982, 3226264; Sep. 28, 1982, 8227145; Jan. 20, 1983, 3301689

Int. Cl.<sup>4</sup> H05B 3/68

U.S. Cl. 219—449

28 Claims



3. An electric hotplate, comprising:
  - a hotplate body including a central zone without direct heating means applied thereto, and a heated outer zone provided with heating resistors;
  - electric circuitry for connecting the heating resistors to a source of electrical energy including a thermostat positioned on a bottom side of the hotplate body and having a casing made from an insulating material;
  - the casing of the thermostat having a recess with a snap-action switch and a bimetallic strip acting on the switch disposed in the recess;
  - an upper side of the casing being spaced at a distance from the bottom side of the hotplate body with the casing being mounted on the hotplate body, and the recess of the casing being open and uncovered on one whole side of the casing;
  - at least one projection projecting upwards at the upper side of the casing in the vicinity of the recess, the projection abutting against the bottom side of the hotplate body with the casing being mounted on the hotplate body;
  - ventilation gaps being provided between the upper side of the casing and the bottom side of the hotplate body for venting the snap-action switch and the bimetallic strip.

4,680,453

**VEHICLE PERFORMANCE COMPUTER**

R. Dell Pugh, 13622 Pine Villa La., Ft. Myers, Fla. 33912

Filed Feb. 14, 1986, Ser. No. 829,170

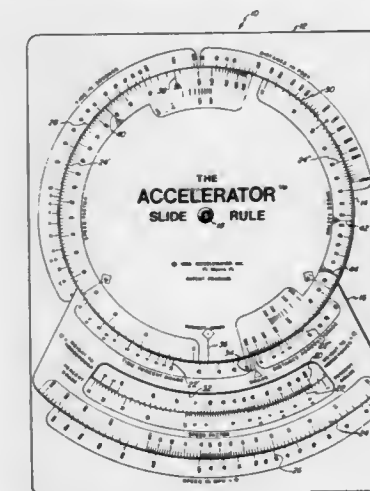
Int. Cl.<sup>4</sup> G06C 3/00

U.S. Cl. 235—88 R

13 Claims

1. A vehicle performance computer in the form of a circular slide rule for determining the relationship between the vehicle performance parameters of time, distance, braking, coasting, and acceleration as a function of vehicle weight, horsepower, speed, and roadway percent grade, said computer comprising:
  - a substantially planar base having a center and also including: a first logarithmic scale arcuately disposed about said base

- center and having indicia associated therewith representing the speed of the vehicle;
- a second logarithmic scale arcuately disposed about said base center in a predetermined position with respect to said first logarithmic scale and having indicia associated therewith representing the weight-to-horsepower of the vehicle;
- a third logarithmic scale arcuately disposed about said base center in a predetermined position with respect to said first and second logarithmic scales and having indicia associated therewith representing the required time for the vehicle to alter its speed from one particular speed to another;
- a substantially planar intermediate slide having a center and rotatably mounted atop said base whereby both said centers are aligned, said intermediate slide including:
  - a fourth logarithmic scale arcuately disposed about said intermediate slide center and having indicia associated therewith representing the percent grade upon which the vehicle is traveling;
  - a window arcuately disposed about said intermediate slide center in a predetermined position with respect to said fourth logarithmic scale for viewing said second logarithmic scale therethrough in cooperative viewable alignment with said fourth logarithmic scale;



- a fifth logarithmic scale arcuately disposed about said intermediate slide center in a predetermined position with respect to said fourth logarithmic scale in cooperative viewable alignment with said first logarithmic scale and having indicia associated therewith representing the speed factor of the vehicle as a percent of the maximum attainable stable vehicle speed in relation to a particular current vehicle speed on a particular percent grade;
- a sixth logarithmic scale arcuately disposed about said intermediate slide center in a predetermined position with respect to said fourth and fifth logarithmic scales and having indicia associated therewith representing time percent grade in proportion to said fourth logarithmic scale;
- a brake tick mark disposed in a particular position to said sixth logarithmic scale;
- a substantially planar circular top slide having a center and rotatably mounted atop said intermediate slide whereby all three said centers are aligned, said top slide including:
  - a seventh logarithmic scale arcuately disposed about said top slide center in cooperative viewable alignment with said sixth logarithmic scale and said brake tick mark and having indicia associated therewith representing said speed factor;
  - a first percent grade tick mark disposed in a particular position with respect to said seventh logarithmic scale in

cooperative viewable alignment with said sixth logarithmic scale and said brake tick mark;

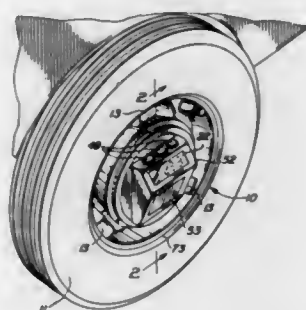
a braking time tick mark disposed in a particular position with respect to said seventh logarithmic scale and in cooperative viewable alignment with said third logarithmic scale for indicating on said third logarithmic scale a particular required time for the vehicle to brake to a particular speed;

a coast time tick mark disposed in a particular position with respect to said seventh logarithmic scale and in cooperative viewable alignment with said third logarithmic scale for indicating on said third logarithmic scale a particular required time for the vehicle to coast to a particular speed.

4,680,454

## ODOMETER FOR GOLF CART

Robert E. Zeaman, 1727 W. Pershing, Phoenix, Ariz. 85029, and David E. Meyer, 7140 W. Mescal St., Peoria, Ariz. 85345  
Filed Oct. 3, 1986, Ser. No. 914,944  
Int. Cl.<sup>4</sup> G01C 22/00; G06M 1/10  
U.S. Cl. 235—95 R 10 Claims



1. An odometer for mounting on a wheel of power driven and/or hand moved golf carts comprising:  
a frame,  
means for securing said frame to a wheel of a golf cart for rotation therewith around its axis,  
shaft means for attachment to said frame axially of the wheel of the golf cart,  
said shaft means having a magnetic head mounted thereon for rotation therewith and a pendulum supported on said shaft means and independent of its movement,  
a housing mounted on said pendulum,  
said housing containing a sensor positioned adjacent said magnetic head for energization thereof by said magnetic head upon rotation of said frame, and  
counting means mounted within said housing and energized by said sensor for actuation thereof upon rotation of said magnetic head,  
said counting means comprises an indicator mounted on said housing for illustrating its count, and  
switch means mounted on said housing for selectively resetting said counting means,  
whereby the rotation of an associated golf cart wheel results in said counting means measuring the distance traveled by the golf cart.

4,680,455

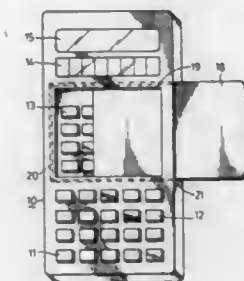
## METHOD OF MANIPULATING A CALCULATION AND DEVICE USED THEREWITH

Calven Kuo, Taipei, Taiwan, assignor to Anorra Mechatronics Corp., Taipei, Taiwan  
Filed Mar. 31, 1986, Ser. No. 846,178  
Int. Cl.<sup>4</sup> G06C 7/02 9 Claims

1. A method of manipulating a calculator having a first face portion provided with numeral keys (11) and ordinary function keys (12) and a second face portion provided with special function keys (13), comprising the ordered steps of: selecting a

desired auxiliary card from a set of such cards, said selected card having selected special function key manipulation instructions provided thereon; operatively superimposing said selected auxiliary card with the special function keys of the calculator; and manipulating the selected special function keys in accordance with the instructions on the selected auxiliary card.

5. A combination calculator and manipulation device, comprising:



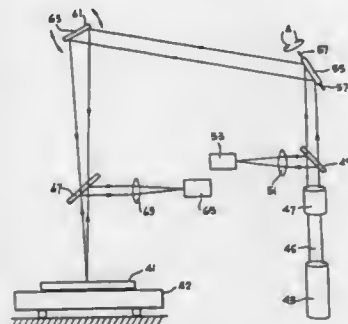
a calculator body including numeral keys (11), ordinary function keys (12) and special function keys (13) provided thereon;  
a set of auxiliary cards (17), each having different selected special function key manipulation instructions provided thereon; and  
means for operatively superimposing a selected one of said auxiliary cards with said special function keys on said calculator body.

4,680,456

## DATA SYSTEM EMPLOYING WALLET-SIZE OPTICAL CARD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.  
Continuation-in-part of Ser. No. 673,572, Nov. 21, 1984, Pat. No. 4,544,835, and Ser. No. 673,573, Nov. 21, 1984, Pat. No. 4,542,288, each is a continuation-in-part of Ser. No. 566,966, Dec. 29, 1983, Pat. No. 4,500,777, which is a continuation-in-part of Ser. No. 492,691, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 763,028  
Int. Cl.<sup>4</sup> G06K 7/10 1 Claim

U.S. Cl. 235—454



1. A system for sequentially recording transaction data by means of a laser comprising,  
a wallet size card with a transparent plastic laminating material protectively bonded to a strip of erasable high resolution direct-read-after-write optically reflective read laser recording material adhered to one side of the card, being laser recordable in place on said card and having a mini-

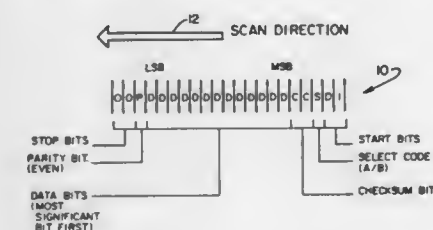
mal laser recording capacity of 250,000 binary bits, having laser created data spots in a surrounding optically contrasting field of said strip, representing accumulated transaction data, with a dimension of said spots being less than 25 microns, the optical reflective contrast ratio of said spots with respect to the surrounding field being at least two to one,  
laser means having a beam disposed in laser writing relation with respect to said strip for writing said spots, representing transaction data, the spots having a size of less than 25 microns,  
a light detector means disposed in reading relation with respect to said strip for reading said spots, and  
means for providing relative motion between the laser beams and the card for reading transaction data on the card and sequentially writing transaction data onto said card.

4,680,457

## CODE READER

John A. Robertson, Chillicothe, Ohio, assignor to Telesis Controls Corporation, Chillicothe, Ohio  
Filed Mar. 7, 1985, Ser. No. 708,974  
Int. Cl.<sup>4</sup> G06K 7/10 26 Claims

U.S. Cl. 235—470



1. Apparatus for reading a code provided as a word deriving sequence of radiation definable transitions carried on an object and selectively spaced from said first to last in accordance with a predetermined ratio defining first-bit and second-bit information, comprising:

imaging means for imaging at least a portion of said code carrying object for generating an imaged output signal having image signal transitions occurring in a time spaced sequence corresponding with said code sequence of spaced transitions;

signal treatment means responsive to said imaging means for converting said image signal transition into a corresponding train of pulses;

sequencer means for receiving said train of pulses and having a sequence of timing stages positioned from first to last for selectively delaying the transmission of said pulses there-through to establish a sequence of pulse occurrence timing signals commencing with said train of pulses;

first sampling network means responsive to a given said timing signal established in conjunction with a sampling said timing stage positioned subsequent in said sequence from said first stage for deriving a valid first-bit condition following a first interval corresponding with a said time spaced sequence representing said first-bit select spacing and responsive to a next said timing signal occurring during said valid first-bit condition established at a next pulse said timing stage position prior in said sequence to said sampling timing stage to provide a first-bit datum;

second sampling network means responsive simultaneously with said first sampling network means to said given timing signal for deriving a valid second-bit condition following a second interval corresponding with a said time spaced sequence representing said second-bit select spacing and responsive to said next timing signal occurring during said valid second-bit condition established by said next pulse timing stage to provide a second bit datum; serial-to-parallel alignment means responsive to each said

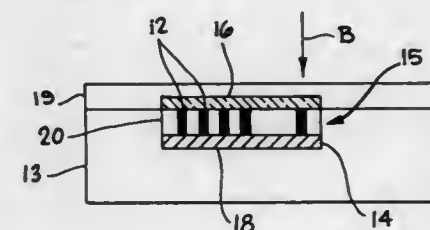
first-bit datum and said second-bit datum in the sequence of their occurrence for deriving a serial alignment corresponding therewith defining a word and having a parallel output corresponding therewith representing said word; and  
control means responsive to said parallel output for carrying out the decoding thereof.

4,680,458

## LASER RECORDING AND STORAGE MEDIUM

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.  
Continuation-in-part of Ser. No. 673,573, Nov. 21, 1984, Pat. No. 4,542,288, which is a continuation-in-part of Ser. No. 566,966, Dec. 29, 1983, Pat. No. 4,500,777, which is a continuation-in-part of Ser. No. 492,691, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Sep. 10, 1985, Ser. No. 774,563  
Int. Cl.<sup>4</sup> G06K 19/00 11 Claims

U.S. Cl. 235—487



1. An optical data recording and information storage medium comprising,

a transparent substrate and an overlying exposed and developed, high resolution emulsion layer, said emulsion layer containing prerecorded optically readable data spots, and a vapor deposited, optically reflective, laser recording layer disposed over said emulsion layer, said layer capable of recording laser written spots having a dimension in the range between 2 and 50 microns written at speeds of at least 1000 bits per second.

4,680,459

## UPDATABLE MICROGRAPHIC POCKET DATA CARD

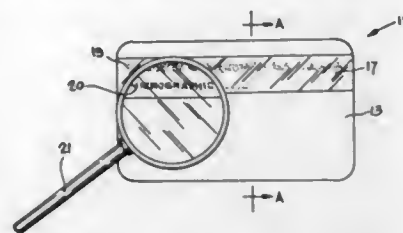
Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.  
Continuation-in-part of Ser. No. 721,383, Apr. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 693,856, Jan. 22, 1985, which is a continuation-in-part of Ser. No. 443,596, Nov. 22, 1982, Pat. No. 4,503,135, which is a continuation-in-part of Ser. No. 238,832, Feb. 27, 1981, Pat. No. 4,360,728, and a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Nov. 14, 1985, Ser. No. 798,146  
Int. Cl.<sup>4</sup> G06C 19/00 15 Claims

U.S. Cl. 235—487

1. An updatable micrographic data card comprising,  
a wallet size card having a strip of optical contrast laser recording material disposed thereon,  
a plurality of laser written micrographic characters disposed



on said strip, each character formed of a matrix of laser recorded character spots, said micrographic characters as the applied voltage is maintained above an erasure voltage light emission is maintained even though the applied voltage drops below the characteristic threshold voltage, and has the



being eye readable using at least 20 power magnification, but not eye readable using 5 power magnification or less.

4,680,460

# SYSTEM AND METHOD FOR MAKING RECORDABLE WALLET-SIZE OPTICAL CARD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 673,572, Nov. 12, 1984, Pat. No. 4,544,835, and a continuation-in-part of Ser. No. 673,573,

Nov. 21, 1984, Pat. No. 4,542,288, which is a

continuation-in-part of Ser. No. 566,966, Dec. 29, 1983, Pat. No.

4,500,777, which is a continuation-in-part of Ser. No. 492,691,

May 11, 1983, abandoned, which is a continuation-in-part of Ser.

No. 238,833, Feb. 27, 1981, abandoned. This application Aug. 6,

1985, Ser. No. 763,029

Int. Cl.<sup>4</sup> G06K 7/10

U.S. Cl. 235-488

6 Claims



1. A method of making an optical data card comprising, prerecording information on a strip of immediate read laser recording material, adhering said strip to a wallet-size card base, said strip being laser recordable in place on said card, bonding a protective transparent laminating material to the recording surface of said strip, recording information on said strip with a laser through the laminating material and reading said information of said strip with said laser as said information is written.

4,680,461

# PICTURE INTENSIFIER TUBE WITH MEMORIZATION

Jean C. Boit, and Jean P. Galves, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 419,572, Sep. 17, 1982, abandoned. This application Sep. 12, 1985, Ser. No. 775,947

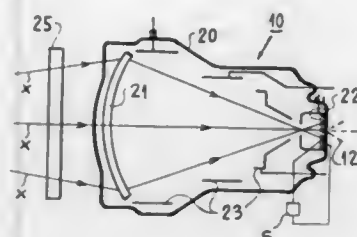
Claims priority, application France, Sep. 22, 1981, 81 17848

Int. Cl.<sup>4</sup> H01J 31/50

U.S. Cl. 250-213 VT

2 Claims

1. A picture intensifier tube comprising a vacuum enclosure enclosing at opposite ends an input screen which is adapted to be irradiated with radiation corresponding to the image to be intensified and incorporates a photocathode for emitting electrons corresponding to the image, simultaneously over its entire emitting surface, and an output screen separated by space from the input screen and positioned to be bombarded by the emitted electrons for providing the intensified image, characterized in that the output screen comprises an electroluminescent cell which has a pair of opposed surfaces, is adapted for emitting visible light rays when an alternating voltage of amplitude larger than that of a characteristic threshold voltage is applied between its surfaces, has hysteresis such that so long



property that electron bombardment effectively augments the applied voltage so that even an applied voltage lower than the characteristic threshold voltage permits emission of visible light.

4,680,462

# FLUID DROP DETECTION SYSTEM

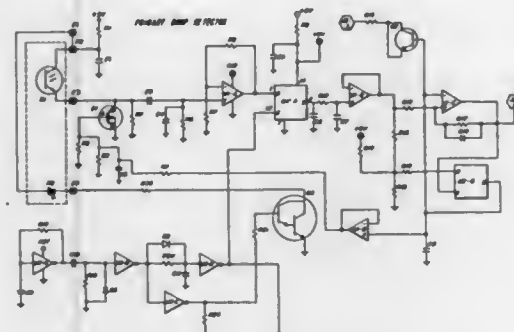
Dean L. Kamen, Bedford, N.H., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 11, 1984, Ser. No. 680,487

Int. Cl.<sup>4</sup> G01V 9/04

U.S. Cl. 250-222.1

11 Claims



1. A system, for detecting the presence of successive drops of fluid in a fluid drop path, comprising: a system input for connection to a photoelectric transducer so situated as to have a change in electrical output upon the presence of a drop in the fluid drop path; storage means, having an input in communication with the system input such that the input to the storage means is substantially equal to the output of the photoelectric transducer, for continuously storing and providing as an output a quantity related to the value of the photoelectric transducer output, the storage means further including gating means for gating off the storage means from the photoelectric transducer output on receiving a drop signal indicating the presence of a drop in the drop fall path so that the quantity stored and provided as an output by the storage means is related only to the value of the photoelectric transducer output in the absence of a drop; and

comparator means, connected to the storage means and in communication with the system input, for comparing the quantity stored in the storage means with the present value of the photoelectric transducer output and for providing output related to such comparison, wherein the output from the comparator means is in communication with the storage means.

4,680,463

# APPARATUS FOR CHECKING CONTAINERS

Pieter H. Lutgendorf, Deventer, and Gerrit J. Kleianibbelink, Ugchelen, both of Netherlands, assignors to Hajime Industries Ltd., Tokyo, Japan

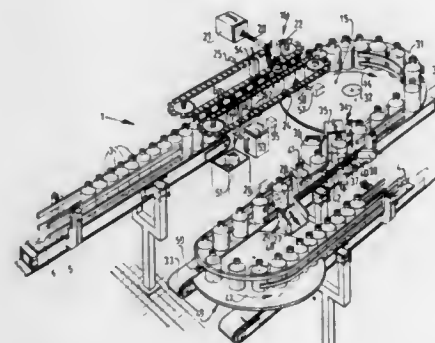
Filed Apr. 12, 1984, Ser. No. 599,696

Claims priority, application Netherlands, Apr. 22, 1983, 8301420; Aug. 29, 1983, 8303007

Int. Cl.<sup>4</sup> G01N 9/04

U.S. Cl. 250-223 B

14 Claims



1. Apparatus for inspecting containers for defects, each container being of the type having a bottom and a neck presenting an open mouth and each defining an axis passing through its bottom and through its open mouth, which comprises the combination of transport means for traveling the containers along a predetermined path having a rectilinear portion, said transport means including, in said rectilinear portion of the path, means for suspending the containers from the necks thereof so that their axes travel along a line of the rectilinear path portion, sensing means for viewing along a vertical optical axis penetrating said rectilinear portion of the path and for generating a rejection signal in response to detection of each defective container, illuminating means for momentarily illuminating each container in coordinated relation to the passage of its axis relative to the position of said optical axis, and ejection means responsive to the rejection signals for ejecting the defective containers.

4,680,464

# OPTICAL DETECTING SYSTEM FOR ARTICLE COUNTING MACHINE

Charles F. Bross, Chicago, Ill., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 27, 1985, Ser. No. 802,548

Int. Cl.<sup>4</sup> G06M 7/02; B65B 57/14

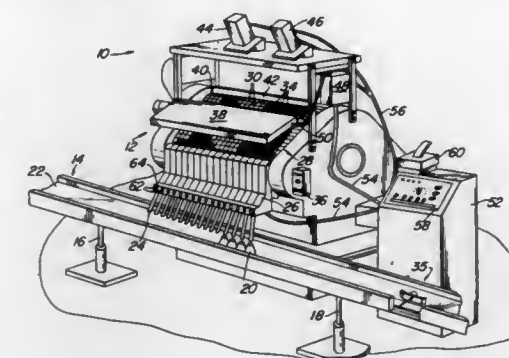
U.S. Cl. 250-223 R

21 Claims

1. In a machine for counting individual articles and delivering a preselected quantity of said articles into a plurality of receptacles arranged in a rank, the machine having an endless conveyor having elongated article receiving flights adapted to receive, transport and discharge the articles into the receptacles, each article receiving flight having a plurality of spaced article receiving locations therealong, each for receiving a single article and corresponding to one of said receptacles, apparatus for detecting the presence and absence of individual articles in said article receiving flights prior to discharge, comprising: (a) illuminating means for illuminating said article receiving

locations with an optical beam for producing optically-detectable indications of the presence or absence of an article in one or more individual article receiving locations,

(b) reflective means for displaying said optically-detectable indications,



(c) optical detector means operatively associated with said reflective means for detecting said indications and for generating an electronic signal representative of said indications, and

(d) processor means for processing said electronic signal and generating in response thereto a second electronic signal indicative of the presence or absence of an article in one or more individual article receiving locations.

4,680,465

# MULTI-AXIS FORCE CONTROLLER

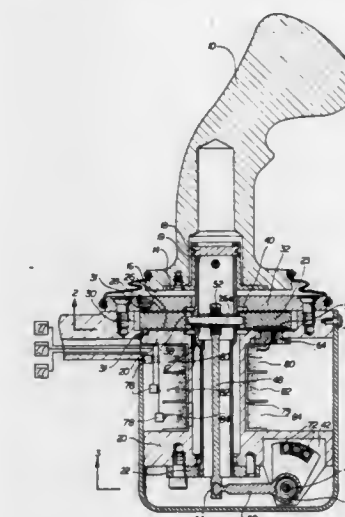
Curtis E. Stevens, Irvine, Calif., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed Apr. 23, 1984, Ser. No. 603,001

Int. Cl.<sup>4</sup> G01D 5/34

U.S. Cl. 250-229

15 Claims



1. A controller that provides control signals in response to force commands, said controller comprising:

- a body;
- a flexure element having one end laterally and longitudinally fixed to said body;
- a handle secured to the end of the flexure element opposite from said body such that force commands applied to said handle are transmitted to said flexure element,

a position ring concentrically arranged about said flexure element and maintained in said body, said ring being movable with respect to said body in a plane orthogonal to the longitudinal axis of the flexure element; and  
position sensing means connected to said body and to said position ring, said sensing means being responsive to the movement of said position ring to provide control signals.

4,680,466

# DISPLACEMENT TRANSDUCER WHICH SIMULTANEOUSLY EXTRACTS SIGNALS VIA SEQUENTIAL SWITCHING

Hajime Kawahara; Yutaka Ono, and Mitsuhiro Nikaido, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

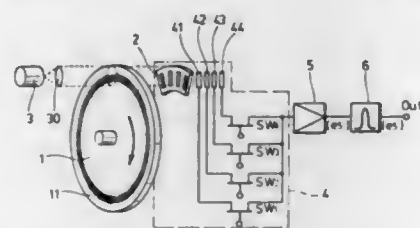
Filed Apr. 19, 1985, Ser. No. 725,088

Claims priority, application Japan, Apr. 20, 1984, 59-79564; May 10, 1984, 59-93650; May 10, 1984, 59-93651; May 10, 1984, 59-93652

Int. Cl.<sup>4</sup> G01D 5/34

U.S. Cl. 250—231 SE

11 Claims



1. A displacement transducer comprising  
a code disk comprising a plurality of light permeable slits formed therein and arranged with a first fixed pitch in the direction of displacement;  
a light source for emitting parallel light beams which pass through said light permeable slits of said code disk;  
an image sensor comprising a plurality of or a plurality of sets of light receiving elements, said plurality or plurality of sets being arranged with a second fixed pitch in the direction of displacement, said second pitch being larger than said first pitch, and switching means for successively extracting signals from each of said receiving elements in order of direction of displacement;  
a band pass filter for extracting a fundamental wave component from the signals obtained from said receiving elements and switched by said switching means;  
control means for driving said switching means with timing signals related to the fundamental wave frequency; and  
phase measuring means for receiving output signals from said band pass filter and under the control of said control means for processing the output signals to measure the phase shift of the fundamental wave component at the zero point of the wave and producing signals indicative of the displacement of the code disk in proportion to the said phase shift.

4,680,467

# ELECTRON SPECTROSCOPY SYSTEM FOR CHEMICAL ANALYSIS OF ELECTRICALLY ISOLATED SPECIMENS

Charles E. Bryson, III, Palo Alto, Calif., and Douglas L. Jones, Aloha, Oreg., assignors to Kevex Corporation, Foster City, Calif.

Filed Apr. 8, 1986, Ser. No. 849,478

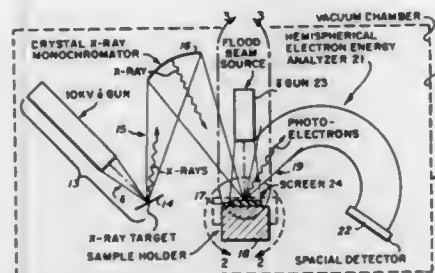
Int. Cl.<sup>4</sup> H01J 49/08

U.S. Cl. 250—305

12 Claims

1. In a method for analyzing a specimen under analysis, the steps of:  
bombarding an electrically isolated surface region of the specimen under analysis at subatmospheric pressure with a beam of ionizing radiation to produce secondary emission

from the bombarded surface region of the specimen and to cause said bombarded surface region of the isolated specimen to have a resultant positive surface charge;  
flooding the bombarded surface of the specimen with a stream of electrons to neutralize the region of positive surface charge;  
positioning a transparent electrode overlaying the surface of the beam bombarded region of the specimen in spaced relation therewith, said electrode being at least partially transparent to the bombarding beam of radiation and to the resultant secondary emission;  
operating the transparent electrode at a potential relative to



that of the surface of the specimen and relative to that of the flooding electron stream such that the flooding electrons pass through the transparent electrode on the way toward the specimen and are reflected in the region between the electrode and the specimen back through the transparent electrode; and  
analysing the energies of the secondary emission emanating from the bombarded specimen and passing through the transparent electrode to obtain an indication of the chemical character of the bombarded surface region of the specimen under analysis, whereby the resolution of the secondary emission analysis is increased in use due to the operation of the transparent electrode.

4,680,468

# PARTICLE DETECTOR

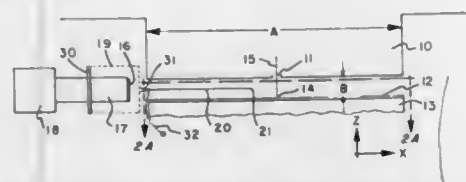
Claude Bouchard, Nepean, and Pierre Boulanger, Vanier, both of Canada, assignors to Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee, Ottawa, Canada

Filed Aug. 5, 1985, Ser. No. 762,291

Int. Cl.<sup>4</sup> G01N 23/22

U.S. Cl. 250—310

16 Claims



1. A detector for detecting secondary charged particles emitted by an area of a specimen in response to particle beam bombardment thereof, said area being located in a confined space, said detector comprising  
(a) means including a particle detecting device for providing an output proportional to the number of said secondary charged particles received by such device,  
(b) means for applying to the particle detecting device a first voltage of opposite sign to that of the charge on the secondary particles,  
(c) a grid located between the detecting device and the bombardment area,  
(d) means for applying to the grid a second voltage no greater than, and of the same sign as, the first voltage, and

(e) an elongate probe projecting into the vicinity of said bombardment area in said confined space, and  
(f) means for applying to the probe a third voltage no greater than, and of the same sign as, the second voltage whereby to set up an electrostatic field around said probe to cause said secondary charged particles to orbit the probe and travel to the detecting device.

4,680,469

# FOCUSING DEVICE FOR A TELEVISION ELECTRON MICROSCOPE

Setsuo Nomura, Tokyo, and Shigeto Isakozawa, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

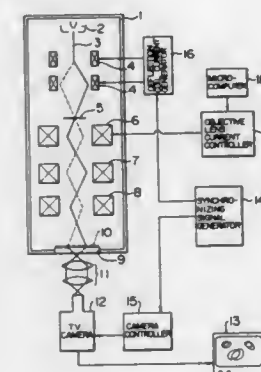
Filed Aug. 16, 1985, Ser. No. 766,272

Claims priority, application Japan, Aug. 17, 1984, 59-170471; Sep. 19, 1984, 59-194672

Int. Cl.<sup>4</sup> H01J 37/26

U.S. Cl. 250—311

8 Claims



1. A focusing device for a transmission type electron microscope displaying an enlarged image of a sample on a television, comprising:  
means for changing alternately the incident angle of the electron beam on the sample in response to incident angle control signals having a predetermined frequency;  
electron lens means for focusing the electron beam at a predetermined position by deflecting the electron beam passing through the sample;  
a television apparatus for visualizing and displaying the image thus formed;  
a focal point adjustment means for adjusting the focal length of said electron lens means on the basis of the image of said television apparatus and for forming an enlarged image of the sample at said predetermined position; and  
a signal generator means for feeding said television apparatus with vertical scanning signals and said means for changing alternately the incident angle of the electron beam with incident angle control signals having said predetermined frequency in synchronism with said vertical scanning signals, said signal generator means generating said incident angle control signals in such a manner that said incident angle of the electron beam varies during the blanking intervals of said vertical scanning signals.

4,680,470

# METHOD AND APPARATUS FOR CRACK DETECTION AND CHARACTERIZATION

Jerry D. Heald, 7145 Via Colina, San Jose, Calif. 95139  
Continuation-in-part of Ser. No. 565,384, Dec. 27, 1983. This application Aug. 17, 1984, Ser. No. 641,930

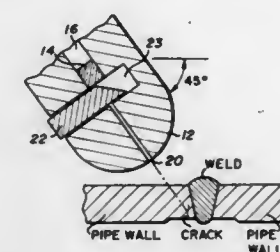
Int. Cl.<sup>4</sup> G01T 1/169

U.S. Cl. 250—358.1

5 Claims

1. A nondestructive examining method for detecting and characterizing anomalies in radioactively-contaminated structures comprising:  
placing a gamma radiation detector in proximity to a surface

of a structure to be examined, said detector including a radiation-proof housing with a beam slit therein for conducting gamma radiation from only a very small volume of material to said detector, said detector further including conversion means coupled thereto to convert said radiation to electrical signals;  
scanning said surface while maintaining said detector in proximity to said surface;  
measuring and recording said gamma radiation emitted by said structure at a plurality of points about said structure and at various angles relative to the surface, the measuring of gamma radiation including measuring at each point and angle the general background radiation and the radiation



due to the inside surface contamination and crack contamination and further measuring and recording a location of said housing relative to a predetermined starting point on said structure for each of said plurality of points wherein gamma radiation is measured, and pairing said measurement locations with said gamma radiation measurements, such that a plurality of data sets, comprising positional coordinates paired with radiation level values are generated; and  
comparing the amount of radiation detected at each point and angle with the amount detected at each preceding point and angle along each scan direction, such that a graphical representation, including depth, of the anomaly may be developed at each scan location.

4,680,471

# INTEGRATED CIRCUIT PACKAGING

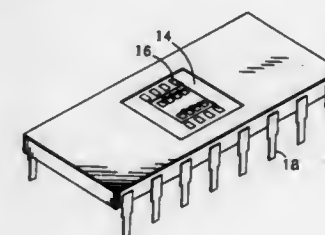
Steven L. Morris, and Gary C. Lewis, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 20, 1985, Ser. No. 713,922

Int. Cl.<sup>4</sup> G01T 1/22

U.S. Cl. 250—370

9 Claims



1. A method for fabricating an integrated circuit comprising:  
fabricating a semiconductor die having an integrated circuit formed therein;  
assembling the die into a package of a packaging material, the radiation properties of which have been characterized as follows:  
fabricating a means for detecting radiation using a semiconductor fabrication technique;  
packaging the means for detecting radiation into said package of said packaging material using integrated circuit packaging techniques; and



measuring the radiation emitted by said package of the packaging material by said means for detecting radiation within the package.

4,680,472

# PROCESS AND APPARATUS FOR THE STABILIZATION OF MEASURING RESULTS FURNISHED BY AN "ELECTRON CAPTURE" DETECTOR WITH IDENTIFICATION OF ANOMALIES AFFECTING THE DETECTOR

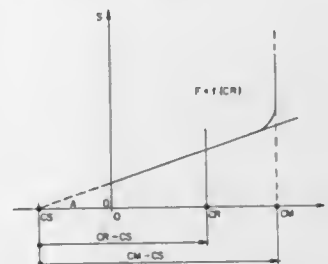
Claude Mendes, Yerville, France, assignor to Giravions Dorand, Saresses, France

Filed Jan. 14, 1986, Ser. No. 818,635

Claims priority, application France, Jan. 14, 1985, 85 00423  
Int. Cl.<sup>4</sup> G01N 27/66

U.S. Cl. 250—386

8 Claims



1. An electron capture detector for measuring the presence of an added component in a vector gas comprising means for applying a voltage to a measuring electrode source, means for varying said voltage in value or pulse frequency to maintain the current collected by said electrode equal to a constant reference current, and means for using the varying voltage as a measurement signal; said detector further comprising means to set said reference current according to a law of proportionality intermediate a maximum current and a spontaneous current at the ends of a useful linear curve section of a current curve determined by preliminary measurements carried on a pure vector gas.

4,680,473

# RADIATION IMAGE READ-OUT APPARATUS INCLUDING SELECTIVE STIMULATING RAY REFLECTION PREVENTING MEANS

Terumi Matsuda; Toshitaka Aagano; Junji Miyahara; Nobuyoshi Nakajima, and Shigeru Saotome, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

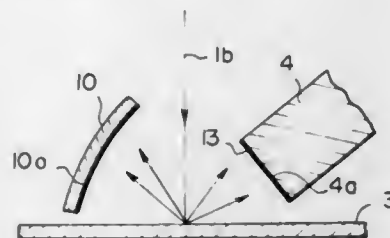
Filed Mar. 11, 1985, Ser. No. 710,255

Claims priority, application Japan, Mar. 9, 1984, 59-45075; Nov. 28, 1984, 59-250704

Int. Cl.<sup>4</sup> G01T 1/105

U.S. Cl. 250—484.1

15 Claims



1. A radiation image read-out apparatus including a scanning optical system for scanning a stimulative phosphor sheet carrying a radiation image stored therein by stimulating rays, a light guide member having a light input face positioned in the vicinity of a portion of said stimulative phosphor sheet scanned by

said stimulating rays, said light guide member guiding light, which is emitted by said stimulative phosphor sheet in proportion to the stored radiation energy when said stimulative phosphor sheet is scanned by said stimulating rays, from said light input face, a light guiding mirror positioned outside said light guide member in the vicinity of said light input face and said portion of said stimulative phosphor sheet scanned by said stimulating rays, said light guiding mirror reflecting the light emitted by said scanned portion to said light input face, and a photoelectric converter for receiving the light guided by said light guide member and photoelectrically converting it into an electric signal,

wherein the improvement comprises

- (i) a stimulating ray reflection preventing means positioned between said portion of said stimulative phosphor sheet scanned by said stimulating rays and said light guiding mirror, and
- (ii) a means for preventing transmission of said stimulating rays and transmitting the light emitted by said stimulative phosphor sheet in proportion to the stored radiation energy, said means positioned between said light guiding mirror and said photoelectric converter.

4,680,474

# METHOD AND APPARATUS FOR IMPROVED ION DOSE ACCURACY

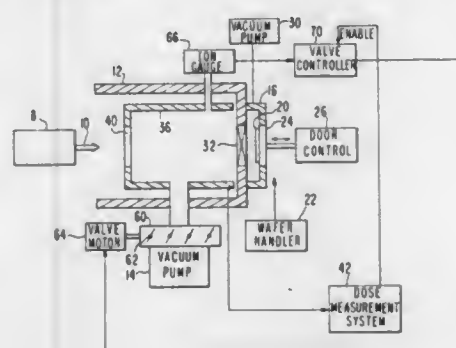
Norman L. Turner, Gloucester, and John D. Pollock, Rockport, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 22, 1985, Ser. No. 736,888

Int. Cl.<sup>4</sup> H01J 37/18

U.S. Cl. 250—492.2

8 Claims



1. Ion implantation apparatus comprising:  
a processing chamber;  
means for evacuating the chamber to a baseline pressure;  
means for introducing a workpiece into the chamber thereby causing an undesired increase in chamber pressure;  
means for directing a beam of positively charged ions at the workpiece; and  
means for controlling the pressure in the chamber after introduction of the workpiece within a specified intermediate pressure range higher than said baseline pressure, thereby reducing pressure variations during implantation.

4,680,475

# APPARATUS FOR DETECTING AN INTERFACE IN FLUIDS UTILIZING PLURAL MULTIPLEXED LIGHT EMITTERS AND RECEIVERS

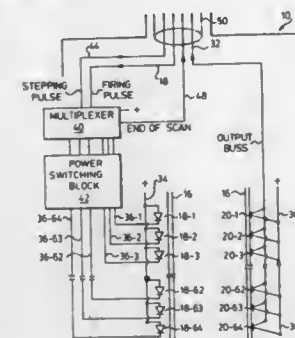
John R. Tansony; Scott A. Langstaff, and Robert W. Tansony, all of Mississauga, Canada, assignors to Markland Specialty Engineering Ltd., Mississauga, Canada

Filed Jan. 31, 1985, Ser. No. 760,855

Int. Cl.<sup>4</sup> G01N 15/06, 21/00

U.S. Cl. 250—577

28 Claims



1. A detector probe for immersion in a fluid, said probe comprising:  
an axially elongated sheath;  
transmitting means comprising a large plurality of axially spaced apart radiating devices contained within said sheath;  
receiving means comprising a corresponding plurality of detecting devices contained within said sheath, each of which is transversely opposed to a radiating device and spaced therefrom by a gap defined by a continuous passage in said sheath into which said fluid may flow;  
said sheath including continuously formed window means at least partially transparent to the radiation of said radiating devices sealing said sheath at opposed sides of said gap;  
a pair of electrical busses entering said sheath;  
first circuit means connecting one said buss in parallel relation to the devices of one of said transmitting means and said receiving means, and  
second circuit means including multiplexing means contained within said sheath for connecting the other said buss sequentially to the devices of the other of said transmitting means and said receiving means, so as to sequentially generate on the buss connected to said receiving means a value from each detecting device.

4,680,476

# PHOTOSENSITIVE ROW TRANSFER DEVICE PROVIDED WITH NEGATIVE FEEDBACK AMPLIFIERS

Jean L. Berger, Grenoble; Louis Brissot, St. Egreve, and Yves Cazaux, Grenoble, all of France, assignors to Thomson-CSF, Paris, France

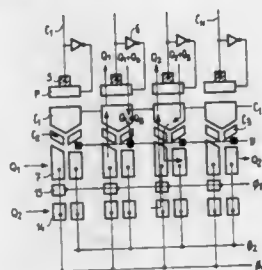
Filed Sep. 30, 1985, Ser. No. 782,139

Claims priority, application France, Oct. 9, 1984, 84 15493

Int. Cl.<sup>4</sup> H04N 3/14

U.S. Cl. 250—578

15 Claims



1. A photosensitive row transfer device having a photosensi-

tive zone of M rows, each row having N photosensitive points, and a buried channel charge transfer row memory comprising N diodes adjacent respectively to N transfer gates, the N photosensitive points of each row being connected in parallel by N conductive columns to said N diodes, said row memory providing bulk transfer to a buried channel charge transfer read register of the signal charges of a same row, said photosensitive device having negative feedback amplifiers, each amplifier having a threshold voltage, and having an input connected both to a column and to a diode of the row memory and an output connected to an adjacent transfer gate, said device further comprising means for adjusting the threshold voltage of each amplifier, so that the operating point of the assembly constituted by each amplifier, an associated diode and an adjacent transfer gate to which said amplifier is connected, is located in the high gain portion of the transfer characteristic of the amplifier.

4,680,477

# CONTACT TYPE DOCUMENT READING DEVICE WITH UNIFORM LINE-TO-LINE CONDUCTOR CAPACITANCE

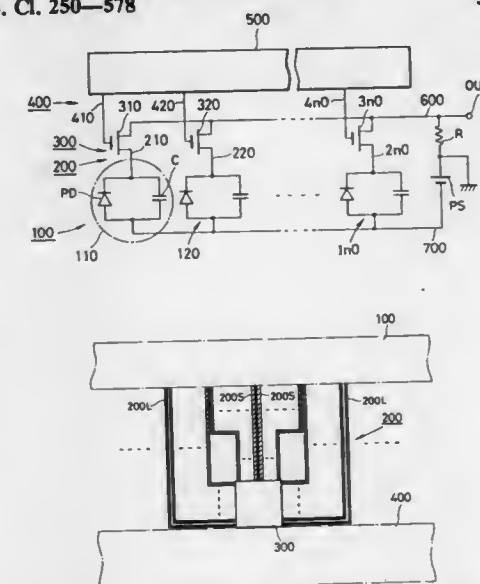
Shigeru Sato, and Takashi Ozawa, both of Ebina, Japan, assignors to Fuji Xerox Co. Ltd., Tokyo, Japan

Filed Jun. 18, 1985, Ser. No. 745,880

Claims priority, application Japan, Jun. 22, 1984, 59-128923  
Int. Cl.<sup>4</sup> H01J 40/14

U.S. Cl. 250—578

5 Claims



1. A document reading device of a charge storage type comprising a plurality of light receiving elements arranged on a substrate in a main scanning direction of a document, a plurality of driving means, each driving the corresponding one of said plurality of light receiving means and a plurality of conductor means for electrically connecting between said light receiving means and driving means respectively, wherein line-to-line capacitances of said plurality of conductor means are made substantially the same.

4,680,478

# EFFICIENT FUEL UTILIZATION SYSTEM

Frank E. Wicks, 1 Nicholas Ave., Schenectady, N.Y. 12309

Filed Dec. 31, 1984, Ser. No. 687,813

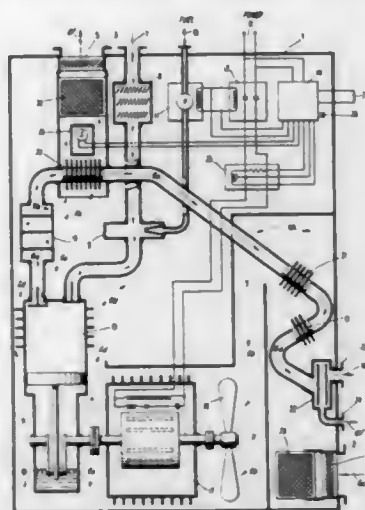
Int. Cl.<sup>4</sup> F02G 5/02

U.S. Cl. 290—2

8 Claims

1. A forced hot air heating system, comprising:  
an electric generator;  
means for driving the electric generator;

an exhaust system engaged with said driving means for exhausting hot gasses from said driving means; said exhaust system including a condensing heat exchanger arranged in a downward direction for cooling the hot



gasses below the condensing temperature of the water vapor in the hot gasses; means for creating an air flow around the condensing heat exchanger and the driving means to extract heat therefrom; and means for ducting said heated air flow for useful purposes.

4,680,479

# METHOD OF AND APPARATUS FOR PROVIDING PULSE TRAINS WHOSE FREQUENCY IS VARIABLE IN SMALL INCREMENTS AND WHOSE PERIOD, AT EACH FREQUENCY, IS SUBSTANTIALLY CONSTANT FROM PULSE TO PULSE

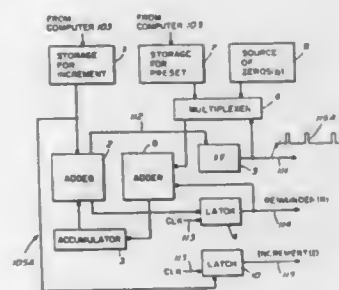
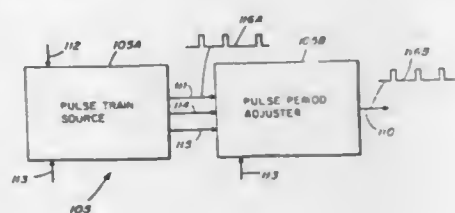
Sydney A. Alonso, Norwich, Vt., assignor to New England Digital Corporation, White River Junction, Vt.

Filed Jul. 29, 1985, Ser. No. 759,861

Int. Cl.<sup>4</sup> H03K 5/135, 3/64

U.S. Cl. 307-265

25 Claims



1. Apparatus for generating successive electrical pulses whose period is predetermined to be substantially constant, that comprises:

means for generating a first train of electrical pulses, some of

whose periods vary from the predetermined substantially constant period by an unacceptable amount; means for noting the period between successive pulses of the first pulse train to determine when a next successive pulse in the first pulse train exceeds the predetermined substantially constant period by an unacceptable amount; means for storing each pulse of the first pulse train to a permit time delay of the pulse; and means for adjusting, when necessary, the output time of a pulse, in an output pulse train derived from the first pulse train, to correct for inexactness of the period thereof to provide an output pulse whose period is at an acceptably constant period with respect to the next previous pulse in the output pulse train, and hence, to provide an output pulse train in the form of successive pulses wherein the period between pulses is substantially constant.

4,680,480

# OUTPUT DRIVER CIRCUIT FOR LSI AND VLSI ECL CHIPS WITH AN ACTIVE PULLDOWN

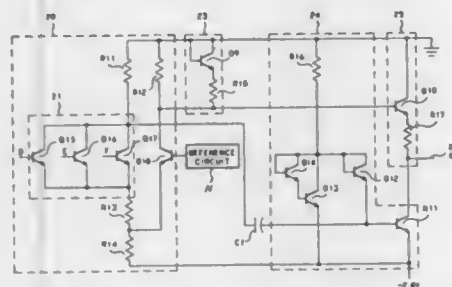
Daniel F. Hopta, Bolton, Mass., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Aug. 31, 1984, Ser. No. 646,601

Int. Cl.<sup>4</sup> H03K 19/013, 19/003, 19/086, 17/04

U.S. Cl. 307-270

9 Claims



1. In large scale integration (LSI) and very large scale integration (VLSI) emitter coupled logic (ECL) circuit chips, an output driver circuit for interfacing said circuit chips with external circuits that use logic levels different from said circuit chips, comprising:

a differential amplifier having a multiplicity of input signal lines and a plurality of output signal lines; a bias circuit which establishes the switching level of said differential amplifier; an emitter follower output circuit having an input line connected to a first output signal line of said differential amplifier; an output level temperature compensation circuit connected to the input line of said emitter follower output circuit; an active pulldown circuit connected to an output line of said emitter follower output circuit; and a capacitor connected between a second output of said differential amplifier and said active pulldown circuit.

4,680,481

# INTEGRATED JK-FLIPFLOP CIRCUIT INCLUDING HOT-ELECTRON TRANSISTORS

Doris Schmitt-Landsiedel, and Gerhard Dorda, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 636,922

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3330079

Int. Cl.<sup>4</sup> H03K 3/356

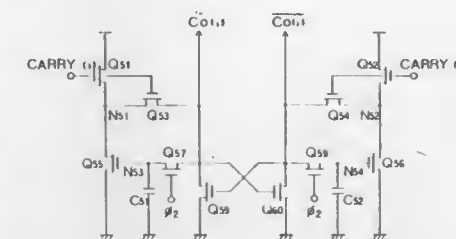
13 Claims

U.S. Cl. 307-279

1. An integrated JK-flip-flop, comprising: first and second cross-coupled inverters formed of respective first and second transistors and respective first and

second resistor elements connected in series with the respective first or second transistors; a first circuit node between the first transistor and first resistor element being connected to a control terminal of the second transistor, and a second circuit node between the second transistor and second resistor element being connected to a control terminal of the first transistor; said first circuit node being connected via a third inverter to a gate of a first field effect transistor which has its source-drain path connected between said second circuit node and a terminal at reference potential, and said second circuit node being connected via a fourth inverter to a gate of a second field effect transistor which has its source-drain path connected between said first circuit node and the reference terminal; a gate of the first field effect transistor being connected to the reference terminal via a first control element whose control input represents a first input of the flip-flop, and a gate of the second field effect transistor being connected to the reference terminal via a second control element

connected to the first input/output node, the switch circuit means being responsive to the inversion control signal so as to



bring its output to a voltage condition opposite to that held in the charge storage means.

4,680,483

# COMPARATOR CIRCUIT

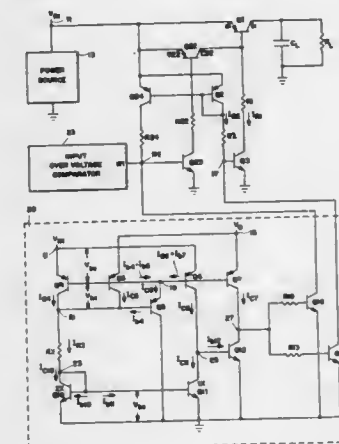
Raymond L. Giordano, Raritan Township, Hunterdon County, N.J., assignor to RCA Corporation, Somerville, N.J.

Filed Feb. 28, 1986, Ser. No. 834,387

Int. Cl.<sup>4</sup> H03K 5/24, 17/16

U.S. Cl. 307-355

7 Claims



1. The combination comprising: first and second nodes for application thereto of a first and a second voltage, respectively; first, second, and third transistors, each one of said first, second and third transistors having an input electrode and an output electrode defining the ends of a main conduction path and a control electrode; means connecting the input electrode of said first transistor to said first node; means connecting the input electrode of said second transistor to said second node; means connecting the input electrode of said third transistor to one of said first and second nodes; means connecting the control electrodes of said first, second and third transistors to a common biasing node; means connecting the output electrodes of said first and second transistors in common at a first summing node for producing a first current into said first summing node which is the sum of the currents in said first and second transistors; and current mirror means having an input connected to said first summing node and having an output connected to the output electrode of said third transistor at a second summing node for producing at said second summing node a current which is the difference between the current flowing in the output electrode of said third transistor and a

whose control input represents a second input of the flip-flop; the first and second transistors of the first and second cross-coupled inverters each comprising a hot electron transistor (HET) of a tunnel emission type having an emitter layer, insulator layer, base layer, and collector layer; the third and fourth inverters comprising respective third and fourth field effect transistors; each HET being combined with the respective third or fourth field effect transistor such that the HET emitter layer comprises an inversion layer in a channel region of the respective field effect transistor, the base layer of the HET being a first part of a gate electrode of the respective field effect transistor, an insulating layer between the HET base layer and a first part of said channel region, and the collector layer of the HET which has a portion over the HET base layer representing a remaining portion of the gate electrode of the respective field effect transistor and which covers a remaining second part of the channel region.

4,680,482

# INVERTER FOR USE IN BINARY COUNTER

Takashi Obara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 16, 1986, Ser. No. 886,156

Claims priority, application Japan, Jul. 16, 1985, 60-157414

Int. Cl.<sup>4</sup> H03K 3/356

U.S. Cl. 307-279

11 Claims

1. An inverter for use in a binary counter comprising a flip-flop having first and second input/output nodes respectively applied with input signals of opposite polarities, first switch means connected between the first input/output node and a third node and turned on and off in response to a control clock signal, charge storage means connected to the third node so as to hold the potential on the first input/output node when the first switch means is turned on, and switch circuit means connected between a supply voltage and a ground and having a first input connected to the third node, a second input connected to receive an inversion control signal, and an output



current proportional to said first current flowing in said output of said current mirror means.

4,680,484

## WIRED-AND FET LOGIC GATE

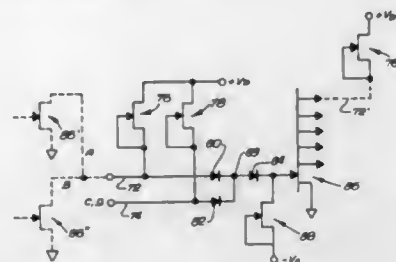
Chris H. Saunders, Huntington Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 19, 1984, Ser. No. 663,004

Int. Cl.<sup>4</sup> H03K 19/094

U.S. Cl. 307—448

5 Claims



## 1. A logic circuit comprising:

- a plurality of wired-AND input circuits, each of which has a single pull-up field-effect transistor (FET) and a single input terminal connectable directly to a plurality of input signal lines to be logically ANDed together, the single input terminal being connectable to the plurality of input signal lines without any circuit elements being interposed between the input terminal and the plurality of input signal lines;
  - a FET output circuit having a common gate circuit and multiple independent drain output lines, which are connectable directly to input terminals of similar logic circuits, the multiple independent drain output lines being connectable to the input terminals of similar logic circuits without any circuit elements being interposed between the drain output lines and the input terminals; and
  - circuit means for logically ORing the plurality of wired-AND input circuits and applying the resultant signal to the gate circuit of the FET output circuit;
- wherein the FET output circuit acts as a voltage pull-down circuit when one or more of the outputs is applied to the input terminals of similar logic circuits, thereby allowing the one or more outputs to be applied to the input terminals of the similar logic circuits without any circuit elements being interposed between the one or more outputs and the input terminals, thus providing a logic circuit with fewer parts, low power dissipation and small time delays.

4,680,485

## QUAD-STATE CONTROL SIGNAL INPUT CIRCUIT

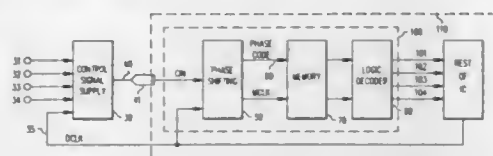
Marc K. Uhrey, Layton, Utah, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 19, 1985, Ser. No. 747,075

Int. Cl.<sup>4</sup> G11C 8/00; H03K 17/56; G05F 5/00; H03L 7/00

U.S. Cl. 307—463

12 Claims



1. A circuit for decoding a control signal which uses high, low and open states to alternately represent any one of four select signals, comprising:

- the control signal input terminal for receiving a control signal;
- a clock signal source;
- four select output lines;
- a phase-shifting circuit for producing a phase code signal which is phase shifted from the clock signal as a function of the control signal;
- a memory connected to said phase-shifting circuit and having two bit stores which, in response to opposite and respective direction transitions in the clock signal, sample the phase code signal, and having respective output terminals for the sample values; and
- a logic decoder circuit connected to said memory and being responsive to the four possible combinations of memory samples to select a corresponding output line.

4,680,486

## COMBINATIONAL LOGIC CIRCUITS IMPLEMENTED WITH INVERTER FUNCTION LOGIC

John E. Price, Palo Alto, and Larry W. De Clue, Saratoga, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

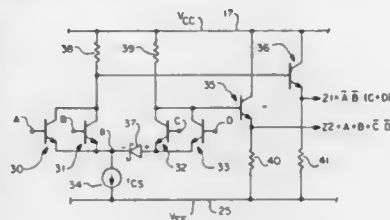
Filed Mar. 12, 1984, Ser. No. 588,919

The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> H03K 19/092, 19/086, 17/60

U.S. Cl. 307—475

4 Claims



## 1. A combinational logic circuit comprising:

- at least two respective input lines respectively coupled for receiving respective input signals at conventional ECL levels;
- a forward biased schottky diode;
- a first input transistor including a base coupled to a respective first input line of said at least two input lines;
- first resistor means connected between a collector of said first input transistor and a supply voltage, VCC;
- second resistor means coupled to the supply voltage, VCC;
- a first level shift bipolar transistor including an emitter connected through said forward biased Schottky diode to an emitter of said first input transistor, including a base coupled to a second input line of said at least two input lines, and including a collector coupled through said second resistor means to the VCC supply voltage, said first level shift transistor producing respective level shifted signal representations of respective input signals received by said second input line; and
- means to perform a combinational logic operation upon the respective input signals received by said first input line and upon the respective level shifted signal representations produced by said first level shift transistor in conjunction with said forward biased Schottky diode.

4,680,487

## INPUT/OUTPUT PORT INCLUDING AUXILIARY LOW-POWER TRANSISTORS

Mikio Kobayashi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

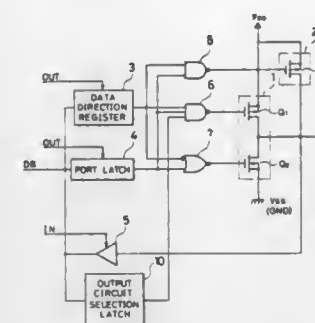
Filed Aug. 19, 1986, Ser. No. 898,033

Claims priority, application Japan, Aug. 19, 1985, 60-125758[U]

Int. Cl.<sup>4</sup> H03K 17/687

U.S. Cl. 307—475

6 Claims



1. An input/output port selectively having a data input mode and a data output mode, comprising:
- a common input/output terminal for receiving or supplying data from or to an external device;
  - a pair of first and second transistors connected in series between a first voltage source and a second voltage source which is lower in voltage level than said first voltage source, a junction between said pair of first and second transistors being connected to said common input/output terminal;
  - a third transistor lower in power than said pair of first and second transistors and connected between said first voltage source and said common input/output terminal;
  - first control means for controlling said pair of first and second transistors such that said pair of first and second transistors are turned on and off in a complementary fashion in accordance with data to be output when said port is set in the data output mode; and
  - second control means for controlling said pair of first and second transistors and also said third transistor such that said pair of first and second transistors are maintained turned off and said third transistor is set either turned off or on when said port is set in the data input mode.

4,680,488

## MOSFET-TYPE DRIVING CIRCUIT WITH CAPACITIVE BOOTSTRAPPING FOR DRIVING A LARGE CAPACITIVE LOAD AT HIGH SPEED

Koichiro Okumura, and Masayoshi Ohkawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 15, 1984, Ser. No. 621,313

Claims priority, application Japan, Jun. 15, 1983, 58-106990; Jul. 18, 1983, 58-130657

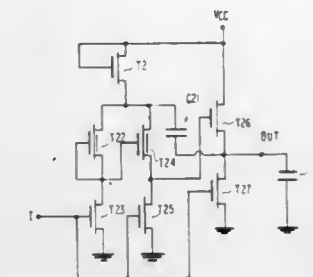
Int. Cl.<sup>4</sup> H03K 17/10

U.S. Cl. 307—482

10 Claims

1. A driving circuit comprising an impedance element having a first terminal connected to a first voltage terminal and a second terminal, said impedance element transferring electric charge at said first voltage terminal to said second terminal and transferring substantially no electric charge at said second terminal to said first voltage terminal thereby to allow said second terminal to assume a potential larger than the potential at said first voltage terminal, a first series circuit of first and second field effect transistors coupled between said second terminal of said impedance element and a second voltage terminal, a second series circuit of third and fourth field effect transistors coupled between said second terminal of said impedance element and said second voltage terminal, a third series circuit of fifth and sixth field effect transistors coupled between said first voltage terminal and said second voltage terminal, a capacitor means coupled between said second terminal of said impedance element and the intermediate junction of said third series circuit, means for supplying gates of said second, fourth and sixth transistors with an input signal, means for connecting a gate of said first transistor to the intermediate junction of said

dance element and said second voltage terminal, a third series circuit of fifth and sixth field effect transistors coupled between said first voltage terminal and said second voltage terminal, a capacitor means coupled between said second terminal of said impedance element and the intermediate junction of said third series circuit, means for supplying gates of said second, fourth and sixth transistors with an input signal, means for connecting a gate of said first transistor to the intermediate junction of said



- first series circuit, means for connecting the intermediate junction of said first series circuit to a gate of said third transistor, and means for connecting the intermediate junction of said second series circuit to a gate of said fifth transistor, wherein the potential at said second terminal of said impedance element is raised above the potential at said first voltage terminal through said capacitor means in response to a rise in potential at said intermediate junction of said third series circuit.

4,680,489

## CONTROLLABLE PIECEWISE LINEAR GAIN CIRCUIT

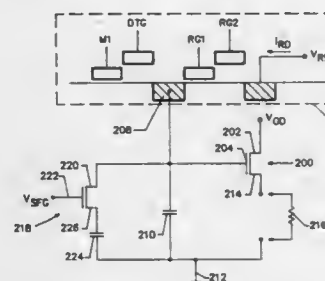
Scott B. Stetson, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 25, 1986, Ser. No. 911,588

Int. Cl.<sup>4</sup> H03G 3/32; H04N 9/77, 3/14

U.S. Cl. 307—493

5 Claims



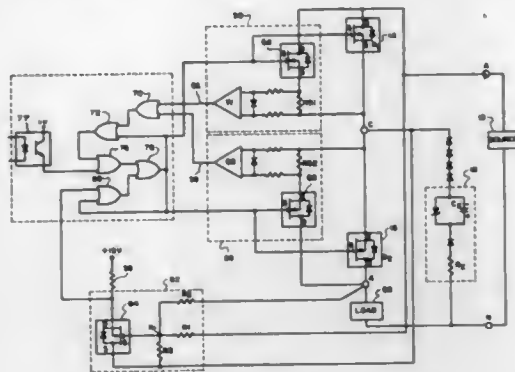
1. A controllable, piecewise linear gain circuit, comprising:
- a first field effect transistor, the drain of which is connected to a first source of bias voltage and the gate of which is connected to the input to the circuit;
  - a first capacitor connected between the gate of the first field effect transistor and a common ground;
  - a second field effect transistor, the drain of which is connected to the gate of the first field effect transistor and the gate of which is connected to a second source of bias voltage;
  - a second capacitor connected between the source of the second field effect transistor and the common ground;
- whereby the output voltage of the circuit may be measured across an output resistance connected between the common ground and the source of the first field effect transistor, such that the second field effect transistor will turn on and connect the second capacitor to the output of the circuit when a predetermined amount of charge has accumulated on the first capacitor, thereby reducing the gain of the circuit.

4,680,490

## MOSFET AC SWITCH

Richard H. Baker, Bedford, and Edward L. Maddox, Lexington, both of Mass., assignors to Gould Inc., Rolling Meadows, Ill.  
Filed Apr. 2, 1985, Ser. No. 719,110  
Int. Cl.<sup>4</sup> H03K 17/13, 5/153, 17/687  
U.S. Cl. 307-575

12 Claims



1. A solid state relay responsive to a control signal and for use with an impedance load and a source of alternating electrical power, said solid state relay comprising:

means for turning on said solid state relay operatively connected to the load and the source and responsive to said control signal having a first predetermined state and to a substantially zero voltage crossing of said alternating electrical power of said source, thereby connecting said load to said source, when said first predetermined state of said control signal and said zero voltage crossing occur at substantially the same point in time, said means for turning on having;

first switch means operatively connected in series with second switch means for connecting and disconnecting the load to the source, said first and second switch means in series with the load, said source operatively connected across said series connection of said first and second switch means and the load;

means for sensing voltage of the source and operatively connected across said first and second switch means and to a common node of said first and second switch means, said voltage sensing means outputting a voltage sensing signal when the source voltage substantially crosses zero;

means for controlling said first and second switch means, said controlling means receiving the control signal and said voltage sensing signal, said controlling means operatively connected to at least said first and second switch means for causing said first and second switch means to turn on or turn off; and

wherein said controlling means turns on said first and second switch means when said controlling means receives said voltage sensing signal indicating substantially zero voltage across said first and second switch means and when the control signal indicates turn on, said turning on of said first and second switch means causing the load to be connected to the source;

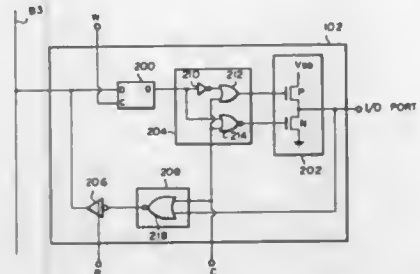
means for turning off said solid state relay operatively connected to the load and the source and responsive to said control signal having a second predetermined state different from said first predetermined state and to a substantially zero current crossing of said alternating electrical power of said source, thereby disconnecting said load from said source when said second predetermined state of said control signal and said zero current crossing occur at substantially the same point in time.

4,680,491

## CMOS DATA INPUT-OUTPUT CIRCUIT

Hiroshi Yokouchi, and Kazuhiko Miyazaki, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan  
Filed May 29, 1985, Ser. No. 739,304  
Claims priority, application Japan, May 30, 1984, 59-108475  
Int. Cl.<sup>4</sup> H03K 17/56, 19/096, 19/00  
U.S. Cl. 307-579

6 Claims



1. A CMOS data input-output circuit for controlling a bidirectional transmission of information between a data bus and an I/O port comprising:

a memory means connected to a bit line of said data bus for temporarily receiving information on said bit line of said data bus in response to a write signal;

a CMOS output buffer means including a P-MOS transistor and an N-MOS transistor which are serially connected, said P-MOS transistor having a gate and having a source connected to a power source and having a drain connected to said I/O port, said N-MOS transistor having a gate and having a source connected to a ground and having a drain connected to said I/O port;

an output control means having an output connected to the output of said memory means, and having a first output connected to said gate of said P-MOS transistor of said CMOS output buffer means and a second output connected to said gate of said N-MOS transistor of said CMOS output buffer means, and for placing said I/O port in an electrically floating condition when a control signal is input thereto;

an input buffer means having an input and having an output connected to said bit line of said data bus for selectively transmitting information on said I/O port to said bit line of said data bus in response to a read signal input thereto; and an input control means having an output connected to said input of said input buffer means, a first input connected to said I/O port and a second input for receiving said control signal; wherein an output of said input control means is fixed at a predetermined logic level when said control signal is inputted to said second input of said input control means during a power-down operation.

4,680,492

## AUDIO-FREQUENCY ELECTROMECHANICAL VIBRATOR

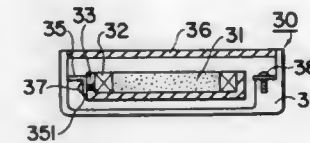
Yasuji Tamura, Ojima, Japan, assignor to Sanden Corporation, Gunma, Japan  
Filed Sep. 11, 1985, Ser. No. 775,011  
Claims priority, application Japan, Sep. 11, 1984, 59-188901  
Int. Cl.<sup>4</sup> H02K 41/00

5 Claims

U.S. Cl. 310-15  
1. An audio frequency electromechanical vibrator comprising:

a flat plate shaped permanent magnet which is magnetized in a predetermined direction;  
a coil wound around said permanent magnet in a direction different than said predetermined direction;  
a yoke in which said permanent magnet and said coil are disposed;

a case element for elastically supporting said yoke, said case element being magnetically attractive to said yoke; and



means for applying an alternating current to said coil for causing said magnetic force to change thereby causing a vibratory displacement of said yoke with respect to said case element.

4,680,493

## VENTILATING DEVICE FOR A GENERATOR

Gerhard Ziegler, Besigheim; Karl Gregotsch, Flacht, and Rudolf Herrmann, Flein, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

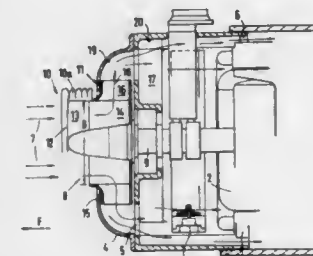
Filed Jun. 24, 1985, Ser. No. 747,570

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 3423319

Int. Cl.<sup>4</sup> H02K 9/06

U.S. Cl. 310-62

3 Claims



1. A ventilating arrangement for a motor vehicle generator of the type having a rotor-stator unit arranged in a housing provided with air guiding ducts, said ventilating arrangement comprising:

the housing having air guiding ducts;

a radial directing fan wheel held on a shaft of the rotor upstream of the rotor-stator unit having an inlet diameter;

a drive pulley formed as an air delivery wheel on the shaft, said air delivery wheel comprising supporting ribs forming radial guide blades, which act as a precompressing fan, said precompressing fan having an outlet area approximately equal to the inlet diameter of the fan wheel,

a front side cover means surrounding at least the downstream side of the fan wheel and held to the housing with a running gap between the cover and housing;

the side cover means forming a curved inside air guiding surface entering into a cylindrical housing surface of the housing; said air-guiding surface being disposed opposite and spaced from the air current radially emerging from the fan wheel;

the cover means in the housing closing off a front side high-pressure space which downstream has a larger cross-section than in the area of a radial air outlet of the fan wheel; and

wherein the cover means directs air flow axially through a plurality of flow paths in the motor vehicle generator.

4,680,494  
MULTIPHASE MOTOR WITH FACIALLY  
MAGNETIZED ROTOR HAVING N/2 PAIRS OF POLES  
PER FACE

Michel Grosjean, 1, rue des Narcisses, CH-2504 Bienne, Switzerland  
PCT No. PCT/CH84/00119, § 371 Date Mar. 28, 1985, § 102(e)  
Date Mar. 28, 1985, PCT Pub. No. WO85/00705, PCT Pub. Date Feb. 14, 1985

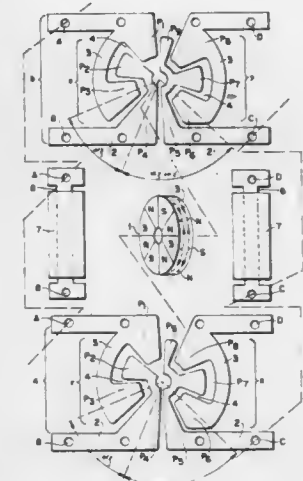
PCT Filed Jul. 30, 1984, Ser. No. 720,409

Claims priority, application Switzerland, Jul. 28, 1983, 4128/83

Int. Cl.<sup>4</sup> H02H 37/00

U.S. Cl. 310-156

15 Claims



1. A multiphase motor comprising:

a rotor having first and second faces, each face having N/2 pairs of magnetic rotor poles distributed around the axis of rotation of said rotor, adjacent rotor poles on each face having opposite polarities, the rotor poles on the first face being directly opposite the rotor poles of the same polarity on the second face, where:  $N=2mn$ ,  $n$  being a positive integer, and  $m$  being a positive integer greater than 1;

a stator, surrounding said rotor, and having stator poles concentric to said rotor, said stator formed with  $m$  phases, each phase comprising a first and second pair of polar pieces, each pair of polar pieces comprising an internal and an external polar piece being substantially coplanar and being interpositioned one within the other and separated by a sinuous air gap, said first pair of polar pieces of each phase being substantially identical to said second pair of polar pieces and being located on opposite sides of said rotor, wherein for all polar pieces of  $m-1$  phases, as well as for a first polar piece of each of said first and second pair of polar pieces of the remaining phase, the stator poles are full and are spaced apart by an angular interval at least approximately as large as that between adjacent rotor poles, wherein  $(N/2m)-1$  stator poles of a second polar piece of each of said first and second pair of polar pieces of said remaining phase are full, and wherein the  $m$  remaining stator poles of said second polar piece are fractional, the sum of the angular arcs of all fractional stator poles being approximately equal to the angular arc of a full stator pole; and

a core for each phase, said internal polar pieces of each phase being magnetically connected to a first end of a respective core, and said external polar pieces of each phase being magnetically connected to a second end of said respective core;

wherein each core has at least one coil wound thereon, and wherein each phase in phase shifted from all other phases.



4,680,495

## SPARK PROTECTED ALTERNATOR

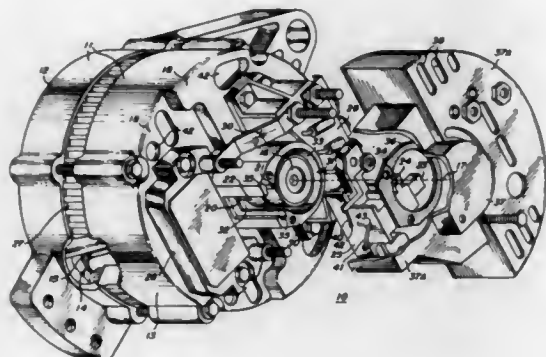
George E. Chiampas, Chicago; John P. Finnegan, West Chicago, both of Ill., and Henry Villegas, Buffalo, N.Y., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 15, 1986, Ser. No. 863,665

Int. Cl.<sup>4</sup> H02K 5/136, 5/14

U.S. Cl. 310—220

10 Claims



1. An alternator/electric machine comprising:  
a housing for effectively encasing at least a rotor within an internal cavity formed by said housing;  
a shaft rotatable about an axis, said rotor mounted to said shaft within said housing, said shaft rotatably passing through a fixed end plate of said housing and having an extension of said shaft from said end plate being external to said internal cavity;  
commutating (slip) rings connected to said rotor and mounted on said shaft extension;  
brush assembly means comprising an insulating brush holder fixed to said housing and having metal brushes attached to the brush holder which mate with said commutating rings; said end plate having integral extensions thereof which form side walls of an external cavity external to said internal cavity, said side walls partially radially, with respect to said axis, surrounding said shaft extension and commutating rings, said external cavity having one axial end effectively closed by said end plate and an open axial end;  
one of said brush holder and said side walls having projections therein which mate with slots in the other one of said brush holder and said side walls to radially close said external cavity with said brush holder, a portion of said brush holder positioned radially external to said external cavity and providing electrical access to said brushes; and  
end cap means fixed to said housing to effectively close said open axial end of said external cavity with respect to ambient atmosphere surrounding said housing, wherein said end plate and end cap means, together with said brush holder and side walls, effectively isolate said external cavity from ambient atmosphere surrounding the housing, and wherein said projections and slots provide a fixed labyrinth seal for effectively isolating said external cavity from ambient atmosphere surrounding the housing.

4,680,496

## APPARATUS FOR CONVEYING ELECTROSTATIC CHARGES, IN PARTICULAR FOR VERY HIGH VOLTAGE ELECTROSTATIC GENERATORS

Michel Letournel, Strasbourg Cronenbourg; Jean-Marie Helbold, Mundolsheim, and Claude Teissier, Lingolsheim, all of France, assignors to Centre National de la Recherche Scientifique, France

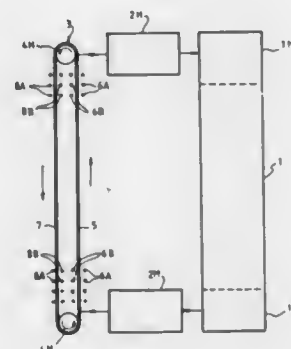
Filed Jul. 29, 1986, Ser. No. 891,681

Claims priority, application France, Jul. 31, 1985, 85 11731

Int. Cl.<sup>4</sup> H02N 1/00

U.S. Cl. 310—308

14 Claims



1. In or for apparatus for conveying electrostatic charges within an ambient gas atmosphere, in particular for very high voltage electrostatic generators, of the type comprising:  
(a) a flat insulating belt (3) movable in a closed cycle between an earthed or low voltage zone (1M) and a very high voltage zone (1H), the zones being spaced apart from one another, sections of the belt moving towards or away from a respective zone;  
(b) means (2M) for depositing electric charges on the belt in the earthed zone;  
(c) means (2H) for extracting electric charges from the belt in the high voltage zone; and  
(d) two structures (6, 8) respectively placed close to each belt section between the two zones for the purpose of controlling the electric field along the belt between the said zones,  
the improvement wherein each of these structures (6, 16, 26) extends continuously along a length of the respective belt section (5), each structure being of insulating or non-conductive material in the direction of movement of the belt, and wherein each structure comprises, on its side facing the belt, a flat surface (60, 160, 260) designed to produce a cushion (50) of ambient gas between itself and the belt.

4,680,497

## SURFACE ACOUSTIC WAVE DEVICES

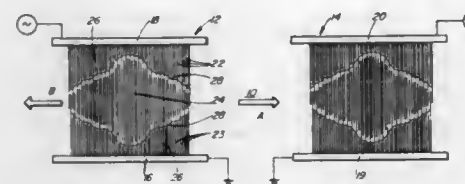
Grantley O. Este, Stittsville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 28, 1986, Ser. No. 856,553

Int. Cl.<sup>4</sup> H01L 41/08

U.S. Cl. 310—313 C

6 Claims



1. A surface acoustic wave (SAW) device having an interdigitated transducer (IDT) comprising first and second voltage rails, first and second pluralities of parallel conducting electrodes extending inwardly from respective voltage rails, said rails and said electrodes formed on a piezoelectric substrate, electrodes of said first plurality being interleaved with electrodes of said second plurality to establish an interleaved or apodized area adjacent to a non-interleaved area, said apodized area varying in width along the IDT, the electrodes in the non-interleaved areas being electrically linked by a linking conductor extending close to a boundary between the apodized area and the non-interleaved area.

4,680,498

## INPUT CIRCUIT IN ULTRASONIC APPARATUS

Wasao Takasugi, Higashiyamato; Ryuichi Shinomura, Hachioji, and Norio Yokozawa, Fuchu, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 827,602

Claims priority, application Japan, Feb. 8, 1985, 60-21763

Int. Cl.<sup>4</sup> H01L 41/08

U.S. Cl. 310—319

6 Claims



1. An input circuit in an ultrasonic apparatus comprising:  
a piezoelectric transducer having a predetermined inter-electrode capacitance;  
a reception amplifier for amplifying an output electric signal from said piezoelectric transducer;  
means electrically connecting said piezoelectric transducer to said reception amplifier and having a predetermined equivalent capacitance; and  
said reception amplifier having an input impedance which is lower than a parallel impedance composed of said inter-electrode capacitance and said equivalent capacitance at a frequency of said output electric signal, said reception amplifier including a current mirror type amplifier electrically connected to said piezoelectric transducer and an output amplifier for amplifying an output of said current mirror type amplifier.

4,680,499

## PIEZOELECTRIC ULTRASONIC TRANSDUCER WITH ACOUSTIC MATCHING PLATE

Shin'ichiro Umemura, Hachioji; Hiroshi Takeuchi, Matsudo; Kageyoshi Katakura, and Chitose Nakaya, both of Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Apr. 9, 1986, Ser. No. 849,833

Claims priority, application Japan, Apr. 10, 1985, 60-74289; Aug. 30, 1985, 60-189662

Int. Cl.<sup>4</sup> H01L 41/08

U.S. Cl. 310—334

5 Claims



1. An ultrasonic transducer comprising:  
a piezoelectric plate having both surfaces thereof metallized and at least one of the surfaces having a plurality of isolated metallized areas;  
a backing material formed on the back surface of said piezoelectric plate; and  
an acoustic matching plate formed on the front surface of said piezoelectric plate, having a longitudinal wave velocity within  $\pm 25\%$  of a longitudinal wave velocity of said piezoelectric plate and having a thickness equal to one half of a thickness of said piezoelectric plate.

4,680,500

## INTEGRAL GRID/CATHODE FOR VACUUM TUBES

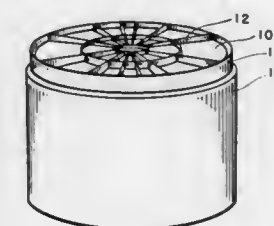
Erik S. Buck, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 6, 1986, Ser. No. 836,876

Int. Cl.<sup>4</sup> H01J 1/46, 1/52, 17/04, 17/12, 19/38

U.S. Cl. 313—348

9 Claims



1. The method of forming an integrated grid-cathode structure comprising the steps of:  
forming a plug in the form of a honeycomb structure having parallel open cells, using a strong, insulating material which resists wetting by barium at barium vapor temperatures, with one end being designated the grid end for a control grid;  
placing said plug in a fixture which is a receptacle for said grid end of the plug;  
filling the open cells in the honeycomb structure of the plug with cathode material which include barium compounds, to thereby form a cathode matrix;  
removing the plug from the fixture; and  
at some time following formation of the plug, forming a

control grid by coating said grid end of the plug with conductive material.

6. An integrated grid-cathode structure comprising: a plug in the form of a honeycomb structure having parallel open cells, of a strong, insulating material which resists wetting by barium at barium vapor temperatures; a control grid comprising a conductive coating on one end of said plug; and a cathode matrix of a material which includes barium compounds, formed in the open cells of the honeycomb structure of the plug, the cathode matrix being recessed to provide a given spacing of the control grid from the cathode.

4,680,501

# STRENGTHENING MEANS FOR A CRT IN-LINE ELECTRODE COMPONENT

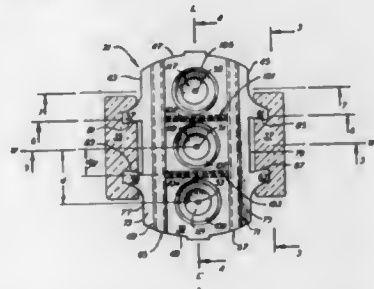
Floyd K. Collins, Seneca Falls, and George E. Hassler, Auburn, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Aug. 6, 1982, Ser. No. 405,819

Int. Cl.<sup>4</sup> H01J 29/82

U.S. Cl. 313-456

8 Claims



1. Improved strengthening means for a substantially planar one-piece electrode component in a plural electrode in-line multi-beam cathode ray tube electron gun assembly integrated by a plurality of longitudinal insulative support members, said electrode component evidencing alpha and beta surfaces and having opposed side and end regions with defining L-L' and W-W' axes thereacross; said component having a center and two side-related spatially positioned apertures therethrough located in an in-line relationship substantially coinciding with said L-L' axis, the center aperture being located at the intersection of said L and W axes, with said side-related apertures oriented equidistantly therefrom along said L-L' axis on either side of said W-W' axis; said strengthening means comprising:

at least one longitudinal channel located in each of the side regions of said component in parallel relationship with said L-L' axis, each of said channels being indented inward from said beta surface of said component for the full length of said region to form a longitudinal rib projecting from said alpha surface, each of said channels being an open-ended trough formation having width and depth dimensions formed by three adjoining longitudinal surfaces defining an outer wall portion, an inner wall portion and a bottom portion therebetween, each of said channels displaced inwardly from either side of said component to form ledges in the beta surface between the channels and the side edges of the component, the ledge edges being substantially parallel with said L-L' axis and extending along the full length of said side region; each of the channel-related ledges having an outstanding dimension at least substantially equal to the thickness of the component material and supporting projections extending from either side of said component; the supporting projections being integral planar extensions of said ledge formations.

4,680,502  
INDEX TYPE COLOR PICTURE TUBE  
Naomitsu Watanabe, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,784

Claims priority, application Japan, Jan. 29, 1984, 59-133103  
Int. Cl.<sup>4</sup> H01J 29/20; C09K 11/08

U.S. Cl. 313-468

6 Claims

1. An index type color picture tube having a stripe type fluorescent screen with stripes of a zinc sulfide-based green color phosphor, a zinc sulfide-based blue color phosphor, a red color phosphor, and a phosphor for index detection, which comprises the red color phosphor being a mixture of a  $Y_2O_3S:Eu$  phosphor containing not more than 2 ppm of Tb and a  $Y_2O_3:Eu$  phosphor, or a  $Y_2O_3S:Eu$  phosphor containing 5 to 30 ppm of Tb.

4,680,503

GLASS COMPOSITION SUITABLE FOR USE IN A FLUORESCENT LAMP AND IN A CATHODE-RAY TUBE, FLUORESCENT LAMP AND CATHODE-RAY TUBE MANUFACTURED USING THIS GLASS COMPOSITION  
Gijbertus A. C. M. Spliering, Denise M. Krol, and Gary E. Thomas, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

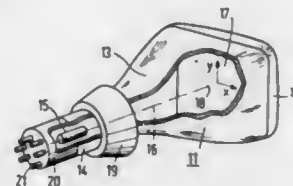
Filed Oct. 8, 1985, Ser. No. 785,421

Claims priority, application Netherlands, Oct. 10, 1984, 8403076

Int. Cl.<sup>4</sup> H01J 31/00; C03C 3/108, 3/105, 3/072

U.S. Cl. 313-480

2 Claims



1. A fluorescent lamp comprising a hermetically sealed glass lamp envelope, in which two electrodes connected to current supply wires are provided, between which electrodes a discharge takes place during operation of the lamp, the lamp envelope being filled with a gas atmosphere and a metal which evaporates at least partially during operation of the lamp, characterized in that the lamp envelope is manufactured from a glass composition which consists essentially of silicon dioxide, aluminium oxide, boron oxide, barium oxide, and lead oxide, characterized in that the glass composition consists essentially of the following components in the specified quantities in % by weight:

SiO <sub>2</sub>	30-55	ZrO <sub>2</sub>	0-10
Al <sub>2</sub> O <sub>3</sub>	5-20	CaO	0-8
B <sub>2</sub> O <sub>3</sub>	4-18	MgO	0-3
BaO	10-25	SrO	0-5
PbO	10-30		

in which the total amount of CaO, MgO and SrO is less than 10% by weight and in which the glass composition, apart from small amounts of impurities, is free from alkali metal oxides.

4,680,504

# ELECTRON DISCHARGE DEVICE HAVING A NARROW RANGE SPECTRAL RESPONSE

Fred A. Helvy, Manheim Township, Lancaster County, and Arthur F. McDonle, East Hempfield Township, Lancaster County, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 11, 1985, Ser. No. 786,530

Int. Cl.<sup>4</sup> H01J 40/02, 43/28

U.S. Cl. 313-524

2 Claims

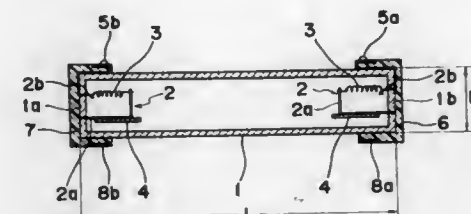


1. In an electron discharge device having an envelope including a sidewall and an input faceplate, and a photoemissive cathode within said envelope for providing photoelectrons in response to radiation incident thereon, the improvement comprising

said input faceplate being an ultraviolet transmitting filter which transmits radiation predominantly in the ultraviolet portion of the electromagnetic spectrum but transmits essentially no radiation in the visible portion of the electromagnetic spectrum, and

said photoemissive cathode having an intrinsic responsivity extending from the near-ultraviolet portion through the visible portion of the electromagnetic spectrum, the combination of said filter faceplate and said photoemissive cathode limiting said device to a responsivity within the wavelength range of about 300 to less than 400 nanometers.

connected to a first lead wire at a first end of the filament and a second lead wire at a second end of the filament; a second electrode means provided at said second end; and



an elongated getter located inside said glass tube, said elongated getter being adjacent and parallel to said elongated filament.

4,680,506

# INVERTER-TYPE MICROWAVE OVEN POWER SUPPLY

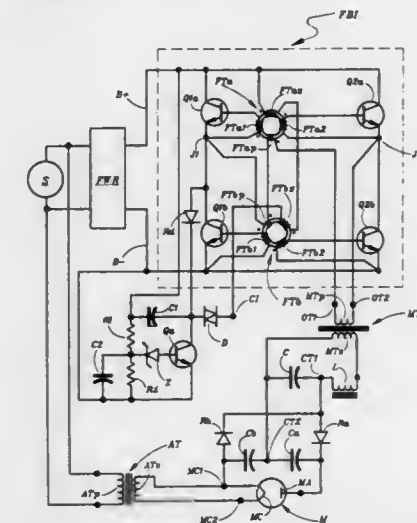
Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010

Filed Dec. 10, 1984, Ser. No. 679,929

Int. Cl.<sup>4</sup> H05B 39/00, 41/14

U.S. Cl. 315-102

9 Claims



1. A power supply for a magnetron in a microwave oven, said magnetron having an anode and a cathode, said cathode having to be incandescent in order for the magnetron to effectively conduct anode current, said power supply comprising: rectifier means connected with an AC source and operable to provide periodic relatively low-magnitude low-frequency DC voltage pulses;

inverter means powered by these DC voltage pulses and operable, but only when receiving an actuating input of trigger pulses synchronized with the DC voltage pulses, to provide at an inverter output intermittent periodic bursts of relatively low-magnitude high-frequency square-wave voltage, said square-wave voltage being of frequency substantially higher than that of said DC voltage pulses; transformer connected with said inverter output and operative to provide at a secondary output voltage-magnified transformations of said intermittent periodic bursts of relatively high-magnitude high-frequency square-wave voltage;

a series-combination of an inductor and a capacitor connected across this secondary output, said series-combination being resonant at or near the frequency of said square-wave voltage and operative to provide at a tertiary output

4,680,505

# SMALL SIZE DISCHARGE LAMP HAVING SUFFICIENT ARC LENGTH AND HIGH LUMINOUS EFFICIENCY

Fumiaki Funada; Hiroshi Hamada, both of Yamatokoriyama, and Osamu Inoue, Himeji, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Ushio Denki Kabushiki Kaisha, Tokyo, both of Japan

Filed Oct. 17, 1985, Ser. No. 788,455

Claims priority, application Japan, Oct. 17, 1984, 59-155858[U]; Nov. 15, 1984, 59-239543; Aug. 6, 1985, 60-119862[U]

Int. Cl.<sup>4</sup> H01J 61/06, 61/26, 61/30

U.S. Cl. 313-558

12 Claims

1. A discharge lamp comprising:

a glass tube having first and second ends, with an outer diameter thereof being smaller than 5 millimeters and a length thereof being shorter than 300 millimeters;

a first electrode means provided at said first end, said first electrode means comprising an elongated filament provided inside said glass tube and extending parallel to an axial direction of said glass tube, said filament being con-



intermittent periodic bursts of relatively high-magnitude high-frequency sinusoidal voltage; rectifier and filter means connected with said tertiary output and operative to rectify and filter said bursts of high-magnitude high-frequency voltage, and to provide to the magnetron intermittent periodic low-frequency anode current pulses; conditioning means operative to provide heating power to said cathode, thereby to make it incandescent; and actuating means operative to provide said actuating input, but only after said conditioning means has provided said heating power for at least a minimum period of time.

4,680,507

## LIQUID METAL ION SOURCE

Kaoru Uemura, Kokubunji; Tooru Ishitani, Sayamashi, and Hifumi Tamura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

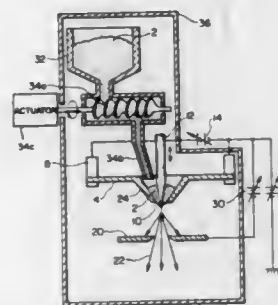
Filed Nov. 9, 1984, Ser. No. 669,796

Claims priority, application Japan, Nov. 11, 1983, 58-210854

Int. Cl. H01J 7/24

U.S. Cl. 315-111.81

7 Claims



1. A liquid metal ion source comprising a reservoir which holds a source material to-be-ionized in a melted state; an emitter which emits from its tip, ions of the melted source material fed from said reservoir; an extracting electrode which applies a high electric field to the tip of said emitter, thereby to extract the ions from said tip of said emitter; tank means for storing the source material which is a particulate material, said tank means having a storage capacity for the particulate source material which is larger than the storage capacity of said reservoir; transfer means for transferring said particulate source material from said tank means to said reservoir, said transfer means being spatially separated from said reservoir so as to inhibit heat transfer from said reservoir to said tank means; and a vacuum chamber for enclosing said reservoir, said emitter, said extracting electrode, said tank means and said transfer means, said vacuum chamber maintaining said reservoir, said emitter, said extracting electrode, said tank means and said transfer means in a vacuum state; whereby said liquid metal ion source is operable for a long time period with a stable ion emission characteristic and reduced power consumption by inhibiting heat transfer.

4,680,508

## LOAD CONTROL CIRCUIT

William M. Rucki, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed May 9, 1986, Ser. No. 861,675

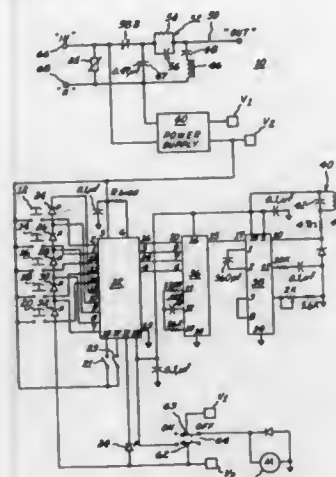
Int. Cl. H05B 37/00

U.S. Cl. 315-166

15 Claims

1. A control circuit for controlling the electrical power supplied by an a-c power supply line at a first predetermined frequency; said control circuit comprising: electronic data storage means connected electrically in series in said power line for controlling the supplying of electrical power downstream at least one electrical load;

electronic data storage means for storing a plurality of predetermined load control data; manually operable means for selecting one of said plurality of predetermined load control data for application of said power supply line;



control signal encoding means for converting said one of a plurality of load control data to a data signal; and transmitter means for transmitting said data signal at a second predetermined frequency substantially different from said first predetermined frequency to said power supply line.

4,680,509

## METHOD AND APPARATUS FOR STARTING HIGH INTENSITY DISCHARGE LAMPS

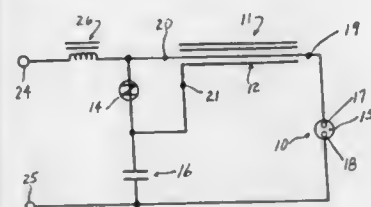
Charles N. Fallier, Jr., Westford, and James N. Lester, Rockport, both of Mass., assignors to GTE Laboratories, Inc., Waltham and GTE Products Corporation, Danvers, both of, Mass.

Filed Dec. 23, 1985, Ser. No. 812,577

Int. Cl. H05B 37/00

U.S. Cl. 315-290

21 Claims



1. Apparatus for starting a high pressure discharge lamp of the type including a discharge tube having a pair of electrodes sealed therein and enclosing a fill material which emits light during discharge, said apparatus comprising:

a spiral line pulse generator including two conductors and two insulators, each in the form of an elongated sheet, in an alternating and overlapping arrangement which is rolled together in a spiral configuration having a plurality of turns for forming an electromagnetic wave transmission line during operation;

a ferromagnetic core means disposed in relation to said spiral configuration for increasing the distributed inductance of said spiral line generator, and thereby increasing the electromagnetic wave transit time in the transmission line formed by the spiral line generator;

said spiral line pulse generator including an output terminal

coupled to one of said lamp electrodes and a pair of input terminals, one of said input terminals and another of the lamp electrodes being adapted for coupling to a source of AC lamp operating power; a switch means coupled across said input terminals, and thus between the conductors of the spiral line generator for periodically short-circuiting said conductors during operation; and pulse circuit return means coupled from the other of the input terminals of said spiral line generator to said last mentioned lamp electrode; whereby said spiral line generator, upon application of a source of AC lamp operating power and periodic operation of said switch means, provides at said pulse output, high voltage, short duration pulses of sufficient energy to initiate discharge in said high pressure discharge lamp.

4,680,510

## COLOR MONITOR WITH IMPROVED SYNCHRONIZATION

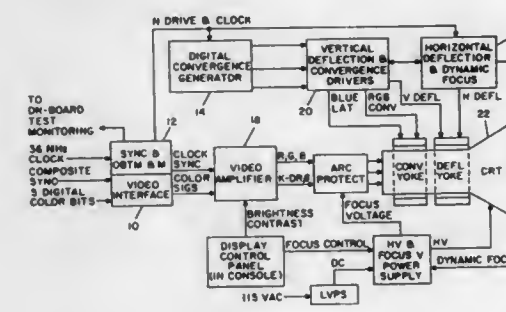
Robert H. Spieth, Ronkonkoma; Chuen W. Louie, Richmond Hill; John L. Volk, Eatons Neck; Darrell D. Roelofs, Huntington Station; Anthony N. DeLorenzo, Ft. Salonga, all of N.Y.; Arthur L. Romeo, Los Angeles, Calif., and Thomas L. Mayer, Greenlawn, N.Y., assignors to Hazeltine Corporation, Commack, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,925

Int. Cl. H01J 29/70, 29/76

U.S. Cl. 315-368

7 Claims



1. A color video monitor having a high resolution display, comprising:

first means for amplifying an input video signal; second means for producing color convergence signals; third means connected to receive said color convergence signals from said second means for providing a vertical deflection signal and color convergence driver signals for said color video monitor;

fourth means connected to the third means for providing a horizontal deflection signal and a dynamic focus signal for said color video monitor;

a cathode ray tube;

means coupled to said cathode ray tube for receiving said color convergence driver signals, said vertical deflection signal and said horizontal deflection signal for controlling the display on said cathode ray tube; and

fifth means synchronizing said second, third and fourth means to an external clock and its associated video input signal including horizontal synchronization pulses and vertical synchronization pulses, said color convergence signals, said vertical deflection signals and said horizontal deflection signals each being synchronized to said external clock.

4,680,511

## VIDEO APPARATUS FOR GENERATING A CONDUCTIVELY ISOLATED CONTROL SIGNAL

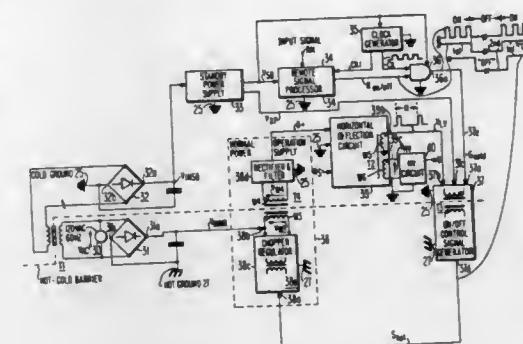
William V. Fitzgerald; Ronald E. Fernsler, and Kevin E. Norrup, all of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1986, Ser. No. 845,689

Int. Cl. H01J 29/70

U.S. Cl. 315-411

20 Claims



1. A power supply apparatus, comprising: a source of a first on-off control signal having an on-state and an off-state for providing normal operation on-off control; means responsive to said first on-off control signal for generating a first AC signal of constant frequency and width during one of said on or off-states and not during the other of said on or off-states; a signal transformer having a first winding coupled to said first AC signal for developing in a second winding thereof a second AC signal of constant frequency and width during said one on or off state and not during said other on or off state; a source of input supply voltage; and a power supply coupled to said source of input supply voltage and to said second winding of said signal transformer for developing an operating voltage only during the on-state of said first on-off control signal.

4,680,512

## FAULT PROTECTION APPARATUS FOR TRACTION MOTOR CIRCUIT

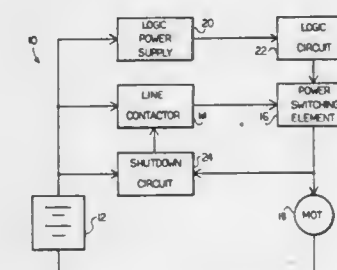
Grant C. Melocik, Chardon, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed May 19, 1986, Ser. No. 864,237

Int. Cl. H02H 7/08

U.S. Cl. 318-139

2 Claims



1. Apparatus for controllably disabling a electrical motor circuit in response to detecting a predetermined condition of a pulse modulated power switching element, said electrical motor circuit including an electrical motor serially connected to a power supply through said power switching element, comprising:





the variable control signal to said drive control section for variably controlling the speed of said DC motor, and a short-circuit decision section having means for short-circuiting said first and second terminal ends of said drive control section in response to a particular setting value signal set at said variable setting section, so as to apply the full source voltage ( $V_b$ ) to said motor in order to obtain a maximum motor speed from said DC motor greater than which is obtained through operation of said drive control section.

4,680,518

## SERVOMOTOR VELOCITY CONTROL METHOD

Mitsuo Kurakake, Hino; Keiji Sakamoto, and Yukio Toyosawa, both of Hachioji, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

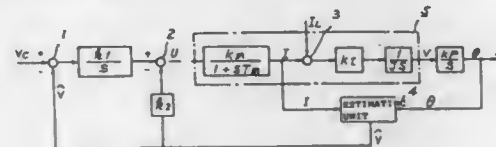
PCT No. PCT/JP86/00010, § 371 Date Sep. 8, 1986, § 102(e) Date Sep. 8, 1986, PCT Pub. No. WO86/04194, PCT Pub. Date Jul. 17, 1986

PCT filed Jan. 11, 1986, Ser. No. 908,701

Claims priority, application Japan, Jan. 12, 1985, 60-003702 Int. Cl. G05B 13/00

U.S. Cl. 318—561

2 Claims



1. A servomotor velocity control method in which position information from a rotary encoder mounted on a servomotor driving a mechanical load is fed back and a torque command signal is produced for application to the servomotor, said method comprising the steps of:

- comparing a reference velocity set for said servomotor and the motor velocity;
- calculating an estimated value of load torque when the motor velocity is less than said reference velocity;
- calculating an estimated value of velocity of the servomotor based on position information from said rotary encoder, motor current of the servomotor and said estimated value of load torque; and
- calculating the torque command signal based on said estimated value of velocity and a velocity command signal.

4,680,519

## RECURSIVE METHODS FOR WORLD-TO-JOINT TRANSFORMATION FOR A ROBOT MANIPULATOR

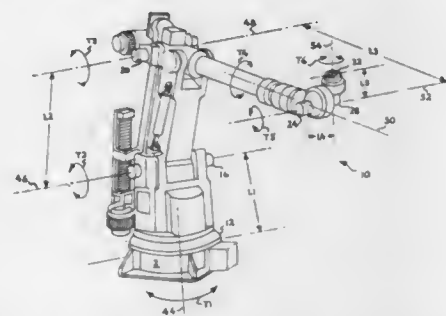
Sujeet Chand, Charlottesville, Va., and Ahmad Sadre, Fox Point, Wis., assignors to General Electric Co., Charlottesville, Va.

Filed Sep. 23, 1985, Ser. No. 778,830

Int. Cl. G05B 19/18

U.S. Cl. 318—568

12 Claims



1. In an articulated manipulator of the type having at least a first, a second, and a third link respectively associated with a first, a second, and a third axis of rotation of motion about an offset wrist, each link and motion being associated with a first,

a second, and a third joint, a method of determining a first, a second, and a third joint angle, respectively, for each of the axis of rotation to provide control data for activating actuators being associated with a corresponding joint, to permit positioning of an end of the manipulator at a desired point, said method comprising the steps of:

- (A) obtaining data identifying a desired end point position and orientation, the data including an end point position vector and an end point approach orientation vector;
- (B) multiplying the end point approach orientation vector by the length of the first link;
- (C) producing a first set of coordinates, by subtracting the result of step (B) of multiplying from the end point position vector;
- (D) determining a first vector from the first set of coordinates along the first axis of rotation with a length of the first link;
- (E) setting initially a second set of coordinates equal to the first set of coordinates;
- (F) determining from the second set of coordinates a second vector along the third axis of rotation, with a length of the third link;
- (G) calculating the cross-product of the first vector and second vector, to produce a third vector;
- (H) multiplying the third vector by the length of the second link;
- (I) computing an estimate of the second set of coordinates by subtracting the result of step (H) of multiplying, from the first set of coordinates;
- (J) repeating steps (F) of determining, through steps (I) of computing, until the difference between any two successive estimations is less than a predetermined minimum value;
- (K) determining said joint angles from the second set of coordinates;
- (L) generating position commands from said joint angles; and
- (M) sending the position commands to the actuator associated with a manipulator joint to control the manipulator joint.

4,680,520

## ZERO-POINT RETURN METHOD

Kenichi Toyoda, Hino; Shinsuke Sakakibara, Komae, and Haruyuki Ishikawa, Tokyo, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP85/00395, § 371 Date Mar. 7, 1986, § 102(e) Date Mar. 7, 1986, PCT Pub. No. WO86/00728, PCT Pub. Date Jan. 30, 1986

PCT filed Jul. 12, 1985, Ser. No. 843,697

Claims priority, application Japan, Jul. 12, 1984, 59-144606 Int. Cl. G05B 11/18

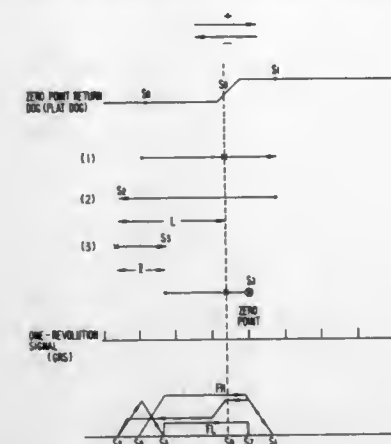
U.S. Cl. 318—594

2 Claims

1. A zero-point return method in which a control unit for controlling a servomotor operating a movable machine element controls a zero-point return operation of the movable machine element based on a changeover signal produced by a flat dog, the method including:

- (a) a first step in which the control unit stops the movable machine element when the changeover signal produced by said flat dog is detected, thereafter reverses the movable machine element and, after again receiving the changeover signal, moves the movable machine element a first predetermined distance and stops the movable machine element;
- (b) a second step in which, after the first step ends, the control unit moves the movable machine element a second predetermined distance smaller than said first predetermined distance toward a changeover signal detection point and stops the movable machine element; and
- (c) a third step in which, after the second step ends, the control unit moves the movable machine element in a

direction the same as that of the second step and stops the movable machine element at a first rotation signal of the



servomotor after the changeover signal produced by said is detected.

4,680,521

## STABILIZATION AID FOR A VEHICLE-OR VESSEL-BORNE SEARCH UNIT

Jan Hofman, Haarboerborst 21, Enschede, Netherlands

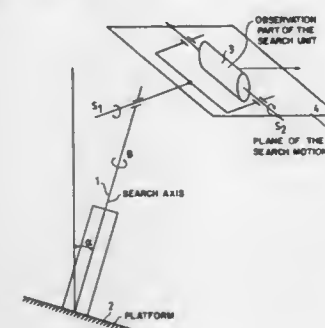
Continuation of Ser. No. 542,838, Oct. 17, 1983. This application Mar. 21, 1986, Ser. No. 842,765

Claims priority, application Netherlands, Oct. 19, 1982, 8204027

Int. Cl. B64C 17/06; H01Q 1/34

U.S. Cl. 318—649

4 Claims



1. A stabilization aid for a vehicle/vessel-borne search unit having an observation part mounted for continuous rotation about a search axis which is fixed with respect to the vehicle/vessel, said stabilization aid comprising:

- (a) first and second servomechanisms for moving the observation part about two mutually-perpendicular axes  $S_1$  and  $S_2$ , respectively, and which are perpendicular to the search axis, to stabilize said observation part with respect to an earth-fixed reference axis;
- (b) means for measuring the angular velocity  $\alpha$  of the observation part about the search axis and its angular position  $B$  relative thereto and for converting such measured values to signals  $\phi_1$  for controlling each of the first and second servomechanisms to stabilize the observation part against variations in  $\alpha$  and  $B$ ;
- (c) a feed-forward circuit connected to said converting means for deriving from signals  $\phi_1$  compensating signals  $\phi_2$ , each such compensating signal corresponding to the variations in the corresponding control signal  $\phi_1$  due to changes in  $\alpha$  and  $B$ ;
- (d) and a computer for applying to each of the first and

second servomechanisms for a signal  $\phi_1$  corresponding to the sum of the  $\phi_1$  and  $\phi_2$  signals for such servomechanisms, the  $\phi_1$  signals causing the servomechanisms to instantaneously compensate the observation part for disturbing torques caused by non-uniformities of motion thereof around the axes  $S_1$  and  $S_2$  due to inclination of the search axis with respect to the earth-fixed reference axis.

4,680,522

## RADIATION PATH AXIS DIRECTING SYSTEM

John S. St. Clair, Dunfermline, and Nicolas L. Brignall, Edinburgh, both of Scotland, assignors to Ferranti plc, Cheshire, England

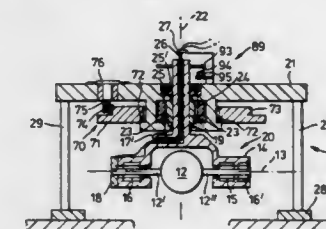
Filed Nov. 8, 1985, Ser. No. 796,116

Claims priority, application United Kingdom, Nov. 9, 1984, 8425859

Int. Cl. G05B 1/06; G02B 26/08; G01C 3/08

U.S. Cl. 318—664

26 Claims



1. A radiation path axis directing system comprising a body rotatable about a first axis each side of a datum point and supporting a reflector rotatable about a second axis in the body orthogonal to the first, said reflector being arranged to deflect a radiation path axis along the first axis either side of the second axis in dependence on the orientation of the reflector about the second axis, and control means including a body drive motor responsive to demand of a new radiation path axis to position the body at an angular position with respect to the datum position at which the second axis is orthogonal to the demanded radiation path axis and orientate the reflector about the second axis to cause the radiation path axis to be deflected at the appropriate side of the second axis to define the direction of the demanded radiation path axis.

4,680,523

## APPARATUS AND METHOD FOR HANDLING ARTICLES IN AUTOMATED ASSEMBLY PROCESSES

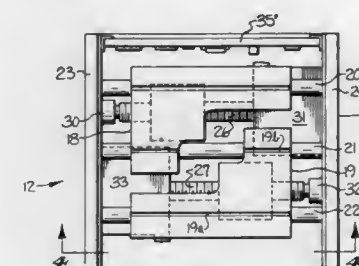
Peter G. Gourmas, Cary, and Paul T. Wolfe, Apex, both of N.C., assignors to Lord Corporation, Erie, Pa.

Filed Mar. 13, 1986, Ser. No. 839,346

Int. Cl. G05B 19/40

U.S. Cl. 318—685

24 Claims



1. For use in connection with a robotic article handling apparatus, a gripper assembly for handling an article, comprising:

- a housing,
- a pair of fingers depending from said housing,

guided carriage means in said housing mounting said fingers for independent selective movement toward and away from one another;

a separate stepper motor operable in response to discrete electrical pulses and drivably connected to each finger for effecting said movement thereof in discrete incremental steps of predetermined extent and at selected step rates proportional to the rates of said electrical pulses, said step rates including a relatively high approach rate at which said finger is driven toward an article to be handled and a relatively low closing rate at which said finger is driven when in proximity with the article;

proximity sensing means associated with each finger for sensing its proximity with said article;

force sensing means associated with each finger for sensing the gripping forces generated by gripping engagement between the finger and said article;

compliant means associated with each finger for undergoing progressive displacement in response to increase of said gripping forces;

digital-type control means connected to each said motor and sensing means for so controlling the rate of said electrical pulses as to cause said motor to vary the step rate of said incremental movement of said finger driven thereby, said control means being operable in response to sensed proximity of said finger to said article to cause reduction of the rate of movement of said finger from its said approach rate to its said closing rate, and said control means being operable to cause cessation of movement of said finger when a predetermined magnitude of gripping force has been sensed by said force sensing means.

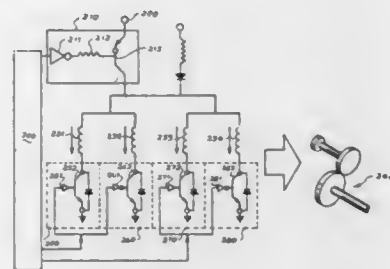
#### 4,680,524 MECHANISM FOR POSITIONING AN OUTPUT MEMBER

Phuc K. Do, Charlotte; Joel G. Goodwin, Concord, and Nicholas J. Krull, Charlotte, all of N.C., assignors to IBM Corporation, Armonk, N.Y.

Filed Apr. 15, 1986, Ser. No. 852,255  
Int. Cl.<sup>4</sup> H02P 8/00

U.S. Cl. 318—696

7 Claims



1. A mechanism for positioning an output member comprising a step motor, a mechanical transmission connecting said step motor to said output member, and means for controlling said step motor, wherein the improvement comprises:

means in said controlling means providing a movement command specifying a number of steps to be performed by said step motor;

means for delivering units of electrical energy to said step motor in response to the number of steps specified to be performed by said step motor to move said output member to a desired position, each of said units being delivered in succession to said motor to urge movement of said motor in the same direction, said electrical energy delivering means comprising;

means for detecting the condition that a single step remains to be performed; and

means responsive to whether a single remaining step is detected for selectively supplying electrical energy units to said step motor at different energy time rates, wherein the

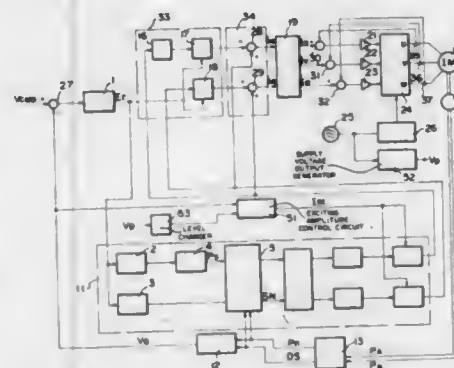
rate at which an energy unit for a single remaining step delivers energy to said step motor is substantially slower than the rate at which energy is supplied by units delivered for the other steps specified to be performed by said step motor.

#### 4,680,525 INDUCTION MOTOR DRIVING SYSTEM

Katsuo Kobari, Tachikawa, and Hiroshi Ishida, Tokyo, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan  
Continuation of Ser. No. 413,334, Aug. 23, 1982, abandoned.  
This application May 2, 1985, Ser. No. 728,467  
Claims priority, application Japan, Dec. 30, 1980, 55-186753  
Int. Cl.<sup>4</sup> H02P 5/40

U.S. Cl. 318—798

4 Claims



1. An induction motor driving system operatively connected to an induction motor generating a rotational speed signal and a driving supply voltage and operatively connected to receive an exciting current command signal, said induction motor driving system comprising:

exciting current amplitude controlling means, operatively connected to the induction motor, for receiving the rotational speed signal and outputting an amplitude signal;

means, operatively connected to said exciting current amplitude controlling means and the induction motor, for receiving the amplitude signal and increasing the current amplitude of the induction motor in dependence upon the amplitude signal;

detecting means, operatively connected to the induction motor, for receiving and detecting the level of the driving supply voltage of the induction motor and varying the rotational speed signal in accordance with the level of the driving supply voltage;

a supply voltage output circuit providing a supply voltage; and

a level changer, operatively connected between said supply voltage output circuit and said exciting current amplitude controlling means, for receiving and level changing the supply voltage and providing the level changed supply voltage and the rotational speed signal to said exciting current amplitude controlling means.

#### 4,680,526 METHOD OF CONTROLLING INVERTER-DRIVEN INDUCTION MOTOR

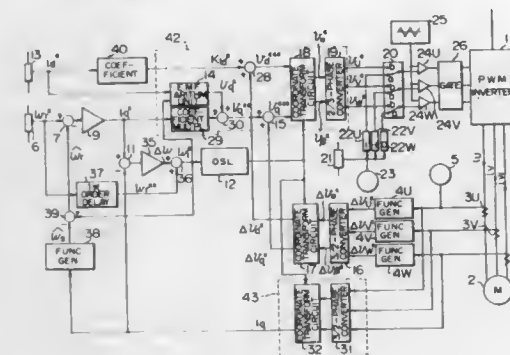
Toshiaki Okuyama, Ibaraki; Takayuki Matsui, Hitachi; Noboru Fujimoto, Hitachi, and Yuzuru Kubota, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 766,945  
Claims priority, application Japan, Aug. 21, 1984, 59-173713; Apr. 5, 1985, 60-72875

Int. Cl.<sup>4</sup> H02P 5/40

U.S. Cl. 318—802

2 Claims



1. A method of controlling an induction motor driven by a voltage-type inverter, wherein the magnitude and phase of a primary current supplied to said induction motor are controlled by controlling a torque current component and an exciting current component independently and by controlling an output voltage of said inverter, said method comprising the steps of:

detecting a value of said primary current flowing to said induction motor;

determining said torque current component based on the detected value of said primary current and a phase reference signal for controlling said output voltage of said inverter;

controlling said output voltage and corresponding frequency of said voltage-type inverter in accordance with said torque current component;

estimating rotational speed of said induction motor based on said torque current component;

comparing said estimated rotational speed of said induction motor with a speed command signal; and

controlling the rotational speed of said induction motor based on the result of such comparison.

#### 4,680,527 ELECTRICAL BATTERY INCLUDING APPARATUS FOR CURRENT SENSING

Robert L. Benenati, Tamarac, and Wayne K. Moy, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 6, 1986, Ser. No. 894,217  
Int. Cl.<sup>4</sup> H02J 7/00; H01M 10/44

U.S. Cl. 320—2

3 Claims

1. A multicell battery adapted for interconnection to an energy consuming electronic device comprising:

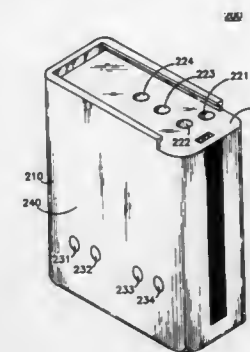
a battery housing having an external surface;

a plurality of cells coupled together in series and situated in said housing and including positive and negative electrical terminals at opposed ends of said plurality of cells;

first and second electrical contacts situated on the external surface of said battery housing and coupled to said positive and negative terminals, respectively;

a first resistor connected in series between two adjacent cells

of said plurality of cells to form the connection between said adjacent cells, said resistor having opposed ends, and



third and fourth electrical contacts situated on the external surface of said battery housing, each coupled to a respective end of said first resistor.

#### 4,680,528 BATTERY CHARGING DEVICE

Toshio Mikami, and Yasuo Nagasawa, both of Saitama, Japan, assignors to Toko, Inc., Tokyo, Japan

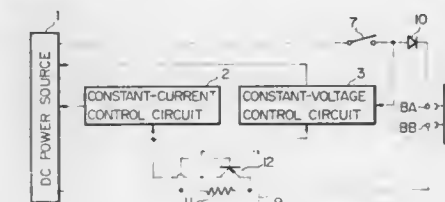
Filed Mar. 4, 1986, Ser. No. 835,935

Claims priority, application Japan, Mar. 5, 1985, 60-31268[U]

Int. Cl.<sup>4</sup> H02J 7/00

U.S. Cl. 320—32

2 Claims



1. A battery charging device, comprising:

a DC power source, output terminals for a battery, and a charging-starter switch connected between said DC power source and said output terminals so as to provide DC power at the output terminals by turning on the charging-starter switch;

a current detecting circuit connected to the output terminals for detecting whether or not a battery is connected to the output terminals and for detecting a current flowing to the battery;

a voltage control circuit responsive to a signal derived from said current detecting circuit to provide a charging voltage or stand-by voltage of a predetermined magnitude at the output terminals; and

a current control circuit responsive to said signal to charge the battery with a current of a predetermined magnitude; said current detecting circuit being OR-connected to said voltage control circuit and to said current control circuit.



4,680,529

## APPARATUS FOR CONTROLLING GENERATOR FOR VEHICLE

Keiichi Komurasaki, Shiro Iwatani, and Shinji Nishimura, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

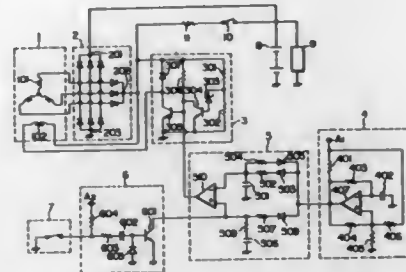
Filed May 27, 1986, Ser. No. 866,979

Claims priority, application Japan, May 31, 1985, 60-82742[U]

Int. Cl.<sup>4</sup> H02J 7/14; H02P 9/10

U.S. Cl. 322-28

4 Claims



1. A control apparatus for a vehicle generator having an output voltage connected to a battery, said apparatus controlling the output voltage of the generator by controlling the field winding current of the generator comprising:  
 an operating state detector for detecting an operating state of said vehicle and for generating an output signal representative thereof;  
 a reference clock generator for producing reference clock pulses;  
 a regulator means connected to the field winding for varying the field current and controlling the output voltage of said vehicle generator to a predetermined regulated value in accordance with modulated reference clock pulses; and  
 a modulator means operated responsive to an output signal from said operating state detector for gradually changing the width of the reference clock pulses upon the occurrence of said operating state for gradually varying the field current to gradually reduce the output voltage of the generator connected to the battery over a predetermined period after the occurrence of the operating state of said vehicle.

4,680,530

## VOLTAGE REGULATOR FOR GENERATOR USED IN AUTOMOBILE

Keiichi Mashino, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

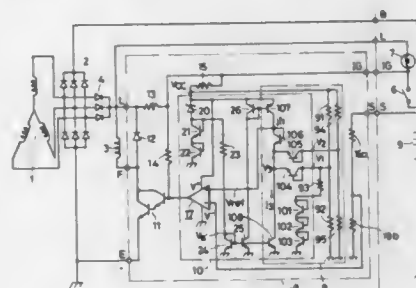
Filed Jan. 30, 1986, Ser. No. 824,087

Claims priority, application Japan, Feb. 1, 1985, 60-16555; Feb. 20, 1985, 60-30411

Int. Cl.<sup>4</sup> H02J 7/14

U.S. Cl. 322-33

9 Claims



1. In a voltage regulator of a generator for an automobile, said voltage regulator having a comparator for comparing an

output voltage of the generator with a reference voltage and including means for regulating the output voltage of the generator, a reference voltage generating means comprising:

- a constant voltage source for generating a constant voltage, said constant voltage source having a positive pole and a negative pole;
- first and second voltage dividers connected across said constant voltage source for dividing the voltage of said constant voltage source;
- a series circuit comprised of a thermo-sensitive element and a resistor that are connected between a voltage division point of said first voltage divider and said negative pole of said constant voltage source;
- a first diode having an anode thereof connected to a voltage division point of said first voltage divider and having a cathode;
- a second diode having an anode thereof connected to a voltage division point of said second voltage divider and a cathode thereof connected to the cathode of said first diode; and
- a third diode having a cathode thereof connected to the cathode of said first and second diodes, and providing said reference voltage at an anode thereof.

4,680,531

## METHOD FOR ATTENUATING AT LEAST ONE ELECTRIC HARMONIC OF THE SYSTEM FREQUENCY IN A MULTI-PHASE ALTERNATING-CURRENT SYSTEM

Antoine Rey, Basel, and Herbert Stemmler, Kirchdorf, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

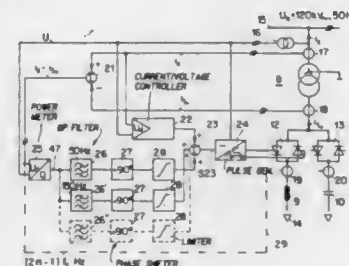
Filed Aug. 19, 1986, Ser. No. 898,019

Claims priority, application Fed. Rep. of Germany, May 15, 1986, 3616334

Int. Cl.<sup>4</sup> G05F 1/70

U.S. Cl. 323-206

19 Claims



1. Method for attenuating at least one electric harmonic with respect to the system frequency in a multi-phase alternating-current system, to which is connected at least one impedance by a magnetically saturable transformer and at least one phase-controlled alternating current switch which is controlled as a function of an equidistant control signal of a current/voltage controller, comprising:

- generating a stabilizing signal as a function at least of the current through said at least one impedance;
- generating at least one electric power signal as a function of the input voltage of the transformer and as a function of at least the current through one impedance;
- filtering each power signal for each electric harmonic to be compensated;
- phase-displacing each filtered power signal by +90°; and
- superimposing each filtered and phase-displaced power signal on the equidistant output signal of the current/voltage controller for use as a control signal for the alternating-current switches.

4,680,532

## FALSE TRIGGERING PROTECTION FOR SWITCHING DEVICE OF A CAPACITIVE LOAD PULSER CIRCUIT

Abdallah M. Itani, Ballston Spa; Peter W. Dietz, Greenwich, and Gerald J. Carlson, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

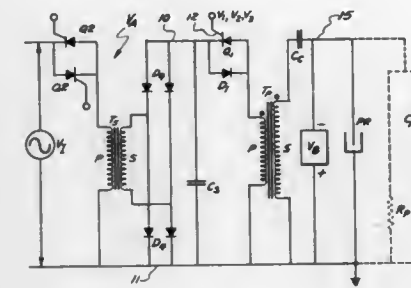
Filed Aug. 1, 1985, Ser. No. 761,458

Int. Cl.<sup>4</sup> B03C 3/01

U.S. Cl. 323-240

16 Claims U.S. Cl. 323-240

19 Claims



1. In a circuit for generating a voltage pulse across a load, the load voltage pulse being characterized by a period of rising voltage followed by a period of falling voltage, said periods separated by a transition period, said circuit comprising a switching element having a control electrode which serves to initiate heavy current conduction through the element in response to a control pulse, said current falling to zero during said transition period, current being thereafter shunted around said element during said period of falling load voltage, an improved means for protecting said element from damage due to sparkover occurring in said load comprising means for applying a first control pulse to said control electrode to initiate said load voltage pulse and means for applying a second control pulse during the occurrence of each said transition period to said control electrode to render said element substantially conductive within said transition period.

4,680,534

## DRIVE METHOD FOR SWITCHING POWER CONVERTER AND APPARATUS USING THIS METHOD

Yoshio Tanaka, Kanagawa, and Toshihiro Onodera, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

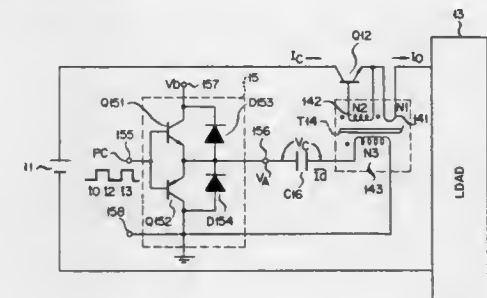
Filed Mar. 24, 1986, Ser. No. 843,383

Claims priority, application Japan, Mar. 29, 1985, 60-65238; Jan. 30, 1986, 61-18716

Int. Cl.<sup>4</sup> G05F 1/56

U.S. Cl. 323-290

10 Claims



1. A circuit for generating a voltage pulse across a load, the load voltage pulse being characterized by an initial period during which said voltage rises from a base value toward a peak, followed by a period during which said load voltage returns to said base value near the termination of said voltage pulse, said circuit comprising a switching element having a control electrode, means for applying a first control signal to said control electrode to initiate current conduction through the element in a first direction accompanied by said rise in voltage across said load, means for terminating current through said element near said peak, means for shunting current around said element in a direction opposite to said first direction during an energy recover period accompanied by a decreasing load voltage, means for protecting said element from damage due to sparkover occurring in said load by applying a second control signal to said control electrode in response to a detected sparkover to render said element substantially conductive during at least a portion of said pulse, said second control signal adapted to maintain said switching element in a substantially conductive state independent of the actual time at which said sparkover is detected at least through the time when said termination of said pulse would occur if no sparkover had actually taken place.

1. A drive method for a switching power converter which includes a current transformer having primary, secondary, and tertiary windings wound around a saturable magnetic core, and a switching transistor having a base emitter path or base-collector path positively feedback-coupled through the primary

and secondary windings of said current transformer, said drive method comprising the steps of:

- applying a drive pulse to the tertiary winding of said current transformer to turn on said switching transistor at a leading edge of said drive pulse, so that an emitter current or collector current of said switching transistor flows into the primary winding of said current transformer;
- magnetically saturating the core of said current transformer by the emitter current or collector current of said switching transistor, so that an inductance of the secondary winding of said current transformer is reduced by magnetic saturation of said core;
- flowing a turn-off current, in a direction to turn off said switching transistor, between said secondary winding and the base of said switching transistor upon a decrease in inductance at the secondary winding of said current transformer; and
- setting a trailing edge of said drive pulse applied to the tertiary winding of said current transformer to occur at a time after the flow of said turn-off current is terminated, wherein an ON/OFF duty cycle of said switching transistor can be changed by changing a period from the trailing edge of said drive pulse to the next leading edge thereof.

4,680,535

## STABLE CURRENT SOURCE

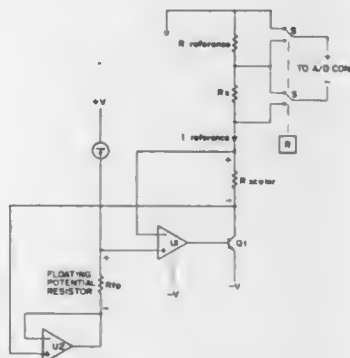
Shlomo S. Talmor, Syosset, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 788,236, Oct. 17, 1985. This application Jan. 29, 1986, Ser. No. 823,672

Int. Cl.<sup>4</sup> G05F 3/04

U.S. Cl. 323—312

15 Claims



1. A stable current source circuit for supplying a current of known magnitude  $I_{ref}$ , comprising a scaler resistor having the current of known magnitude  $I_{ref}$  passing therethrough to develop a voltage drop thereacross, a floating potential circuit connected to said scaler resistor in a loop circuit, and a differential amplifier coupled to differentially measure the voltages across said scaler resistor and said floating potential circuit and provide an output indicative thereof which determines  $I_{ref}$ , such that the voltage drop across the scaler resistor equals the voltage drop across the floating potential and the current  $I_{ref}$  through said scaler resistor remains constant at a known magnitude.

4,680,536  
DIMMER CIRCUIT WITH INPUT VOLTAGE  
COMPENSATED SOFT START CIRCUIT

Lynn Roszel, Richardson, and Jim Tabor, Dallas, both of Tex., assignors to Prescolite, Inc., San Leandro, Calif.

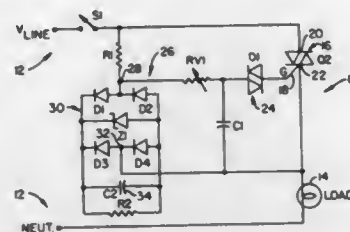
Continuation of Ser. No. 467,233, Feb. 17, 1983, abandoned.

This application Oct. 4, 1985, Ser. No. 784,543

Int. Cl.<sup>4</sup> G05F 5/02

U.S. Cl. 323—321

2 Claims



1. A circuit for controlling the delivery of A.C. electrical voltage from a source to a load comprising:
  - a switch means for selectively conducting current from a A.C. source to the load, and switch means including gate lead means for initiating said selective conduction of current from the A.C. source to the load;
  - means for triggering said gate lead means of said switch means, said triggering means being operably connected in series with said gate lead means of said switch means;
  - means for activating said triggering means during a selected time interval to cause said switch means to conduct current from the A.C. source to the load during a period relative to said selected time interval when said triggering means is activated, said activating means being operatively connected to said triggering means, said means for activating said triggering means including:
    - a variable resistor;
    - a capacitor, said capacitor being connected to said variable resistor;
- means for producing a regulated square wave voltage for driving said variable resistor and connected capacitor, said means for producing a regulated square wave voltage for driving said variable resistor and connected capacitor being connected in parallel with said capacitor and variable resistor between said line source of A.C. voltage and the load, said means for producing a regulated square wave voltage including a full wave rectifier bridge and a regulator diode connected across said bridge; and
- means for delaying the operation of said activating means causing said switch means to progressively increase successive periods of conduction of current from the source to the load, said means for delaying the operation of said activating means comprising a capacitor connected across said means for producing a regulated square wave voltage such that said capacitor charges to the value of said regulated square wave voltage.

4,680,537

## METHOD AND APPARATUS FOR TESTING A CONDUCTIVITY SENSING CIRCUIT

Francis M. Miller, Snyder, N.Y., assignor to Conax Florida Corporation, St. Petersburg, Fla.

Filed Apr. 12, 1985, Ser. No. 722,679

Int. Cl.<sup>4</sup> G01R 31/02

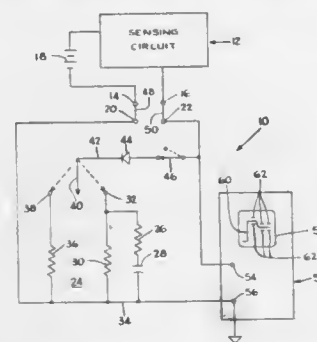
U.S. Cl. 324—500

14 Claims

1. Apparatus for testing a circuit which senses the condition of an electrical quantity, said quantity being electrical conductivity, said sensing circuit having a pair of sensing terminals, a sensor portion operatively connected to said terminals for indicating a predetermined condition of the electrical quantity associated with a load connected between said terminals, and a current conducting component which is activated in response

to a predetermined amount of energy supplied thereto after said sensor indicates said condition of said electrical quantity, said component to be activated in response to conductivity greater than a given value, said testing apparatus comprising:

- a pair of terminals for connection to said sensing circuit terminals;
- a network connected to said terminals for simulating a load having the electrical quantity to which said sensing circuit is responsive, said network having at least one branch which simulates the existence of said predetermined condition in said load, said branch including timing means causing said predetermined condition to be simulated for a period of time adequate to test the response of



said sensing circuit but inadequate to provide sufficient energy to activate said component, said network branch having an initial low resistance to simulate conductivity greater than said given value and which then is changed in response to said timing means to a high resistance to simulate conductivity lower than said predetermined value thereby enabling testing the electrical continuity of said component in response to conductivity greater than said given value and in a manner preventing activation of said component; and

- (c) monitoring means connected to said terminals for comparing the actual response of said sensing circuit to the load simulation provided by said network to the desired response of said network.

4,680,538

## MILLIMETER WAVE VECTOR NETWORK ANALYZER

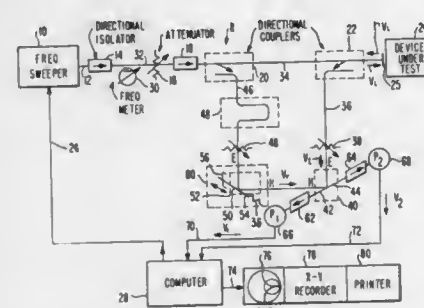
G. Conrad Dalman, and Hiroshi Kondoh, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jan. 15, 1985, Ser. No. 691,613

Int. Cl.<sup>4</sup> G01R 27/04

U.S. Cl. 324—58 R

21 Claims



1. A millimeter wave vector network analyzer, comprising:
  - a source of millimeter wave signals;
  - waveguide means for directing said signals onto a device to be tested;
  - a first directional coupler connected to said waveguide

means for providing a reference sample of the signal incident on said device;

a reference waveguide channel for receiving said reference sample;

a second directional coupler connected to said waveguide means for providing a test sample of the signal reflected from said device;

a test waveguide channel for receiving said reflected signal test sample; a magic tee hybrid, having two inputs and two outputs;

controllable phase shifter means connected in at least one of said reference and test waveguide channels;

means connecting said reference channel to a first input of said hybrid to direct said reference sample to said hybrid;

means connecting said test channel to a second input of said hybrid to direct said test sample to said hybrid, said hybrid combining said reference and said test samples vectorially;

first and second power detectors connected to first and second outputs, respectively, of said hybrid, said power detectors providing scalar information which is a function of the magnitude of the reflection coefficient of said device and the phase of the reflection coefficient of said device; and

means responsive to said scalar information to provide the phase and magnitude of the reflection coefficient of said device.

4,680,539

## GENERAL LINEAR SHIFT REGISTER

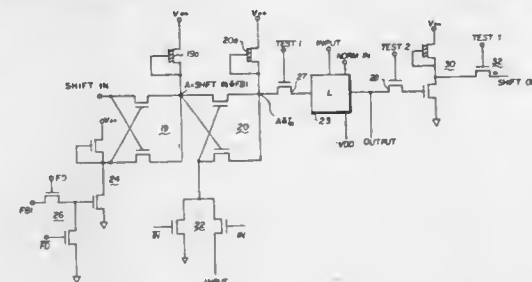
Mon Y. Tsai, River Vale, N.J., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,217

Int. Cl.<sup>4</sup> G01R 31/28; G11C 19/00

U.S. Cl. 324—73 R

6 Claims



1. A programmable linear feedback shift register for self-testing a VLSI circuit, said register having a plurality of two bit stages, each stage comprising:
  - a first exclusive NOR circuit for receiving a binary shift signal from a preceding stage, and a feedback signal;
  - a second exclusive NOR circuit for receiving a first logical signal from said first exclusive NOR circuit, and an input signal;

a cross-coupled register connected to receive a signal from said VLSI circuit during normal VLSI circuit operation, and a signal from said second exclusive NOR circuit during a test operation;

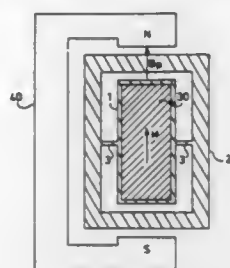
an inverter circuit for receiving an output signal from said cross-coupled register, said inverter circuit supplying a shift signal for application to a subsequent stage first exclusive NOR circuit; and

means for coupling said second exclusive NOR circuit output during a first test interval to said cross-coupled register, and an output signal from said cross-coupled register to said inverter during a second test interval.





axis; and means on said support for creating a polarization field in the plane of said flap and perpendicular to its hinge axis of



rotation, said polarization field magnetizing the ferromagnetic coating.

4,680,545

# METHOD FOR REDUCTION OF ACOUSTICAL NOISE GENERATED BY MAGNETIC FIELD GRADIENT PULSES

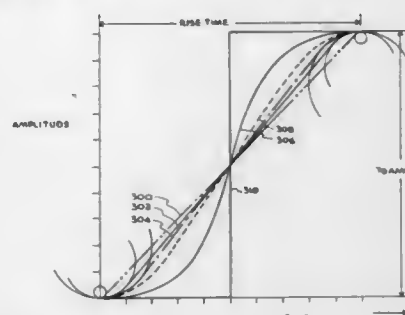
Floyd L. Gray, Hales Corners; Thomas F. Schubert, Pewaukee; Kenneth M. Bradshaw, Waukesha, and Joshua O. Kolawole, Wauwatosa, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Jan. 4, 1985, Ser. No. 688,677

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—307

7 Claims



I. A method of reducing acoustical noise generated by high frequency components of current pulses used to energize magnetic field gradient coils which form part of an MR scanner apparatus, said method comprising the steps of: shaping at least one of the leading and trailing edges of at least one of said current pulses used to energize at least one of said magnetic field gradient coils so as to substantially eliminate said high frequency components; and applying said shaped current pulse to said one of said gradient coils.

4,680,546

# METHODS OF, AND PULSE SEQUENCES FOR, THE SUPPRESSION OF UNDESIRE RESONANCES BY GENERATION OF QUANTUM COHERENCE IN NMR IMAGING AND SPECTROSCOPY

Charles L. Dumoulin, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 27, 1986, Ser. No. 822,730

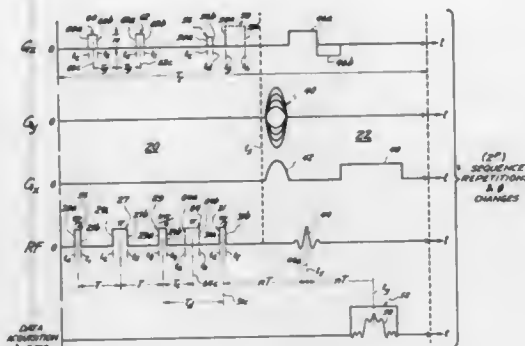
Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—307

20 Claims

1. A method for suppressing undesired response signals in nuclear magnetic resonance (NMR) imaging while obtaining desired NMR signals receivable from a sample containing nuclei which are spin-coupled to one another, comprising the steps of:

- evoking a NMR response signal from the sample responsive to an excitation signal sequence;
- preceding each NMR excitation signal sequence with a signal subsequence predeterminedly selected for generating at least one selected one of zero-quantum and multiple-quantum coherence of the spin populations of a selected coupled-spin system in the sample;



- providing at least one detection signal in the subsequence for converting the at least one selected coherence into a desired NMR response signal receivable from the sample, while simultaneously substantially decreasing the final response amplitude of at least one single-quantum coherence signal present in the total response signal from the sample; and
- generating an image of the sample responsive to the at least one selected coherence.

4,680,547

# GRADIENT FIELD SWITCH FOR IMPROVED MAGNETIC RESONANCE IMAGING/SPECTROSCOPY SYSTEM

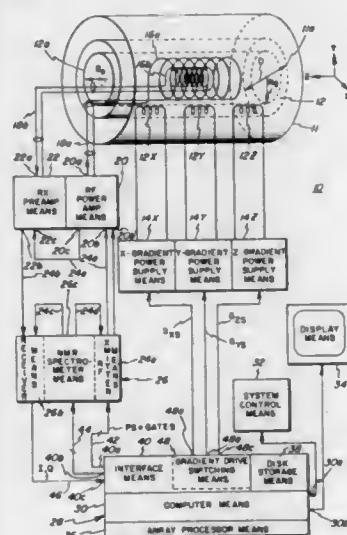
William M. Leue, Albany; Raymond J. Hodsoll, Jr., Galway, both of N.Y.; Gary H. Glover, Oconomowoc, Wis., and John T. Adamchick, Amsterdam, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,115

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—309

13 Claims



1. In a nuclear magnetic resonance system for the production of localized chemical-shifted spectra and images from a non-ferromagnetic sample positioned in a system imaging volume

containing a main static magnetic field, said system including a plurality N of means each for generating a different magnetic field gradient in the main static magnetic field along only one associated different one of a plurality N of substantially orthogonal axes of said imaging volume, with each magnetic field gradient having characteristics established by one associated one of a like plurality N of gradient-defining signals, the improvement of said system including a gradient field switch comprising:

- a plurality N of input means each for receiving a different one of the like plurality N of gradient-defining signals;
- a like plurality N of output means each for providing one of a like plurality N of output signals to one associated different one of the magnetic gradient field generating means;
- means for switching the gradient-defining signal received at any one of the input means to a selected one of the output means, different from all other ones of the output means to which any other signal from any other one of the input means is switched; and
- means receiving data from the system for controlling the present configuration of said switching means between said input means and said output means to select a desired one of a plurality of viewing directions, each definable with respect to the axes of the sample-containing volume, without requiring movement of said sample or any physical portion of said system.

4,680,548

# RADIO FREQUENCY FIELD COIL FOR NMR

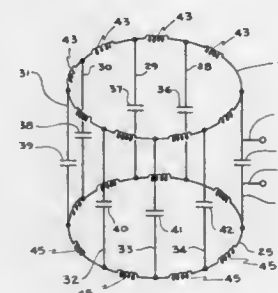
William A. Edelstein; John F. Schenck, both of Schenectady; Otward M. Mueller, Ballston Lake, all of N.Y., and Cecil E. Hayes, Wauwatosa, Wis., assignors to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 659,043, Oct. 9, 1984, abandoned. This application Jul. 16, 1986, Ser. No. 884,674

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—318

17 Claims



- I. An NMR radio frequency (RF) coil comprising:
- a pair of conductive loop elements spaced along a common longitudinal axis, each of said conductive loop elements including a plurality of serially-connected capacitive elements spaced along the peripheries thereof; and
  - a plurality of axial conductive segments electrically interconnecting said conductive loop elements at points between adjacent ones of said serially-connected capacitive elements.

4,680,549

# NMR COIL ARRANGEMENT

Jukka Tantt, Espoo, Finland, assignor to Instrumentarium Corp., Finland

Filed Jan. 10, 1985, Ser. No. 690,303

Claims priority, application Finland, Jan. 20, 1984, 840232

Int. Cl.<sup>4</sup> G01R 33/20

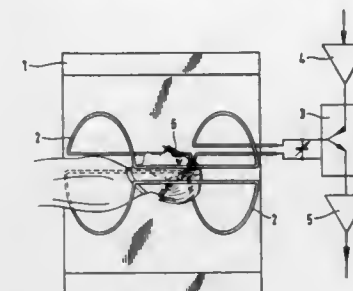
U.S. Cl. 324—318

13 Claims

1. A coil arrangement for an NMR apparatus for obtaining

NMR data from a target to be examined, said arrangement comprising:

- first coil means (2) for exciting the nuclei of a target area by transmitting a radio frequency signal during a period of signal transmission and for receiving a signal emitted by the nuclei of the target area during a period of NMR signal detection; and
- second coil means (6) electrically unconnected from said



first coil means but having a magnetic coupling to said first coil means, said second coil means being placed in the vicinity of a limited section of a target for enhancing the magnitude of a signal emitted by the limited section of the target, the signal enhancement obtained by said second coil means changing the relative contributions to the total received signal from the portions attributable to the limited and other sections of the target area in favor of the signal portion from said limited section.

4,680,550

# HIGH-FREQUENCY ANTENNA DEVICE IN APPARATUS FOR NUCLEAR SPIN TOMOGRAPHY AND METHOD FOR OPERATING THIS DEVICE

Norbert Krause, Heroldsbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

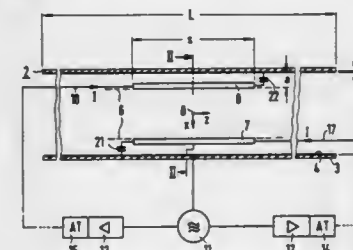
Filed Mar. 19, 1985, Ser. No. 713,635

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410204

Int. Cl.<sup>4</sup> G01B 33/20

U.S. Cl. 324—318

20 Claims



1. An antenna device for generating a high-frequency magnetic field in an apparatus for nuclear spin tomography, comprising:

- (a) an energy source;
- (b) at least two conductor sections of predetermined length which extend on an imaginary cylinder surface parallel to the direction of the axis of the imaginary cylinder and are arranged for current flow in opposite directions when one end of each of said sections is connected to said energy source;
- (c) a tubular enclosure arranged at a predetermined distance concentrically with respect to the imaginary cylinder surface, surrounding the conductor sections, said enclosure being at least largely permeable to low frequencies for magnetic gradient fields, containing electrically highly conductive material and connected to said energy source,



said tubular enclosure extending in the axial direction beyond the end of the conductor sections by a predetermined amount to form a circular waveguide antenna with aperiodic wave propagation in a cut-off mode at the axial ends of said enclosure, the coupling elements of which are said conductor sections; and

(d) means for reflecting the waves of the high-frequency field terminating the other ends of said conductors so that a high-frequency field oscillating in phase is formed by the tubular enclosure and the conductor sections which field is attenuated axially beyond said conductor sections.

4,680,551

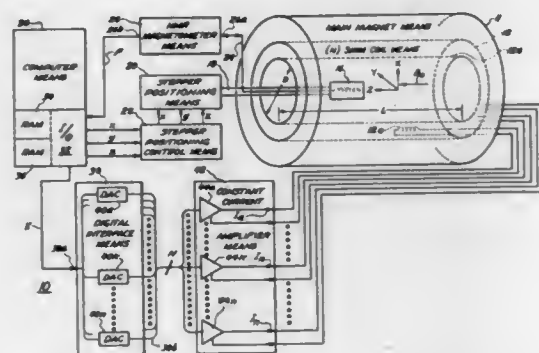
# METHOD FOR HOMOGENIZING A STATIC MAGNETIC FIELD OVER AN ARBITRARY VOLUME

Matthew O'Donnell, Schenectady; Steven G. Karr, Scotia; William D. Barber, Ballston Lake, all of N.Y.; Jish M. Wang, East Brunswick, N.J., and William A. Edelstein, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 7, 1985, Ser. No. 785,140  
Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—320

14 Claims



1. A method for minimizing the inhomogeneity of a static magnetic field, produced by a main magnet means, over a selected arbitrary volume, by operation of a plurality N of shimming coil means each independently an associated shimming magnetic field over that same volume, comprising the steps of:

- measuring the magnitude of the main magnet static field, in the absence of all shimming fields, at a plurality of locations  $X_i$  upon the surface of an imaginary sphere defined to enclose the arbitrary volume;
- measuring the magnitude and polarity of each of the N shimming fields, with respect to the magnitude and polarity of a DC current flowing through the associated shimming coil means, at the same plurality of locations  $X_i$  upon the imaginary sphere surface;
- determining the weighted mean-square error E of the total field, to the homogeneous field, at each of another plurality of points  $Y_i$  within the volume of said imaginary sphere; and
- selecting the magnitude and polarity of each current flowing through an associated one of the N shimming coils means to provide each of the N associated shimming fields with a magnitude and a polarity acting to substantially minimize the error E and the inhomogeneity of the main magnet field in the arbitrary volume.

4,680,552

# APPARATUS FOR MEASURING IMPURITIES IN SUPER-PURE WATER WITHOUT EXPOSURE TO SURROUNDING ATMOSPHERE

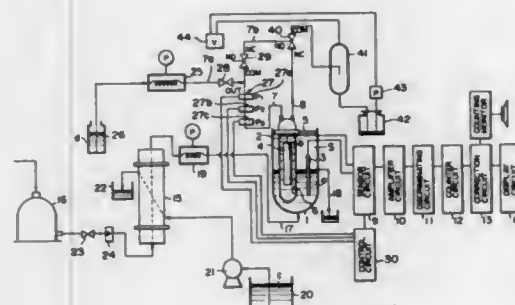
Kozo Shirato, Omiya; Kazuo Hiratazumi, Narashino; Kazuyasu Kawashima, Yokohama; Shinya Okuyama; Masashi Kobayashi, both of Tokyo; Minoru Tanaka, Kawaguchi; Akira Takeya, Tokyo; Yoshio Yamamoto, Kawaguchi; Yasuo Koyama, Warabi; Satoshi Shinohara, and Toru Yunoki, both of Chigasaki, all of Japan, assignors to Erma Optical Works, Ltd., Tokyo and Ulvac Service Corporation, Kanagawa, both of Japan

Filed Feb. 19, 1985, Ser. No. 702,641

Claims priority, application Japan, Nov. 21, 1984, 59-247535  
Int. Cl.<sup>4</sup> G01N 27/02, 27/00, 27/28

U.S. Cl. 324—439

4 Claims



- An apparatus for measuring the impurities in super-pure water taken from a source of super-pure water without the super-pure water being exposed to the surrounding atmosphere prior to the measurement, said apparatus including
  - a sealed container which defines an interior space which is isolated from said surrounding atmosphere,
  - a sample supply means sealingly connected between said source of super-pure water and said sealed container so as to feed a sample mixture containing super-pure water into the interior space in said container,
  - an overflow pipe sealingly connected to said sealed container to remove excess sample mixture from the interior space in said container,
  - a sensor circuit,
    - a negative electrode located in the interior space in said sealed container and extending into the sample mixture in the interior space in said sealed container, said negative electrode being electrically connected to said sensor circuit,
    - a hollow sensor tube sealingly extending into the interior space in said container such that a lower end thereof is in said sample mixture, said lower end including a small hole therein,
    - a positive electrode located in said hollow sensor tube, said positive electrode being electrically connected to said sensor circuit,
  - means for applying a constant DC voltage through said negative and positive electrodes,
  - means for supplying an electrolyte to said hollow sensor tube to surround said positive electrode therein, and
  - means for removing the electrolyte from said hollow sensor tube.

4,680,553

# INTERMEDIATE FREQUENCY AMPLIFIER WITH SIGNAL STRENGTH DETECTION CIRCUIT

Katsuji Kimura; Yoshihiko Kasai, Asazawa; Hiroshi; Yukio Yokoyama, Sasaki; Yutaka; Koji Yamasaki, and Toshifumi Sato, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 800,831

Claims priority, application Japan, Jan. 18, 1985, 60-6844; Mar. 18, 1985, 60-55168; Apr. 9, 1985, 60-75133; Jul. 11, 1985, 60-153010; Jul. 18, 1985, 60-159364; Nov. 1, 1985, 60-245861; Nov. 1, 1985, 60-245862

Int. Cl.<sup>4</sup> H03F 3/45

U.S. Cl. 330—2

11 Claims



1. An intermediate frequency amplifier stage, comprising: a plurality of intermediate frequency amplifiers each including a differential amplifier, a plurality of double balanced differential circuits individually coupled to input and output terminals of an associated differential amplifier in the intermediate frequency amplifier for full-wave rectifying the output of a corresponding intermediate frequency amplifier, and an adder circuit for adding rectification outputs of the respective double balanced differential circuits.

4,680,554

# REAL TIME NETWORK RECEIVER SYSTEM FAST SETTLING AMPLIFIER

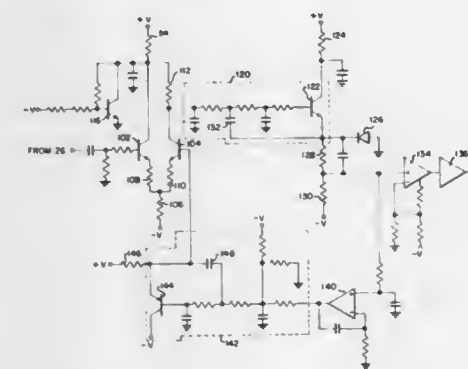
James K. Roberge, Lexington, Mass., assignor to Aetna Telecommunications Laboratories, Westboro, Mass.

Filed Sep. 25, 1985, Ser. No. 779,945

Int. Cl.<sup>4</sup> M03F 3/45, 1/34

U.S. Cl. 330—260

11 Claims



1. A fast settling amplifier for recovering two level digital signals from a communication network comprising:
  - means for receiving dual level signals from a communication network;
  - means for amplifying said dual level signals about a reference signal level which reference signal level is representative of a point midway between said dual signal levels;

comparator means for providing said two level digital signals from said amplified dual level signal; feedback path means responsive to the amplified dual level signals for establishing said reference signal level including; an integrator receiving said amplified dual level signal and providing an integrated amplified dual level signal; and a feedback low pass filter receiving said integrated amplified dual level signal to remove signal ripple therefrom, and providing a signal to said means for amplifying at said reference signal level.

4,680,555

# WIDE FREQUENCY RANGE, SWITCHED BAND-OSCILLATOR

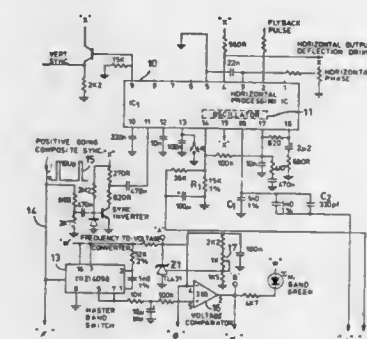
Gerald Waldeck, Waterloo, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Jan. 30, 1986, Ser. No. 880,570

Int. Cl.<sup>4</sup> H03B 5/20

U.S. Cl. 331—108 D

13 Claims



1. Apparatus for providing a wide frequency range, switched-band, output signal from an oscillator, said apparatus comprising: an oscillator including a network having first and second different types of impedances, said impedances determining the frequency of the output signal of said oscillator; means for switching into and out of said network additional impedance of said first type to switch between two bands of frequencies, an upper band and a lower band, said bands having an overlapping band of frequencies, said switching means comprising frequency-to-voltage converting means having an input terminal for receiving an input signal having a frequency within said wide frequency range and having an output terminal at which is provided an output signal having a magnitude that varies responsive to the frequency of said input signal, voltage comparator means for comparing the magnitude of said output signal of said converting means with the magnitude of a reference signal and producing a control signal having a certain characteristic when said output signal is of a magnitude indicative of said input signal having a frequency within said upper band and a characteristic different from said certain characteristic when said output signal is of a magnitude indicative of said input signal having a frequency within said lower band, switching between said control signals having different characteristics taking place within said overlapping band of frequencies, and means responsive to said control signal for adding or removing additional impedance of said first type to or from said network depending upon the characteristic of said control signal; and means for supplying said input signal to said oscillator.

4,680,556

## DIGITAL MODULATION APPARATUS

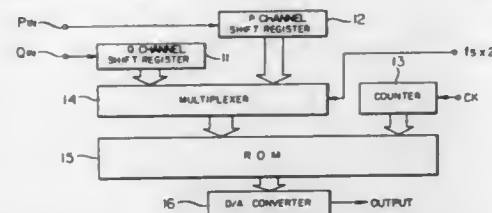
Shigeki Nakamura; Makoto Ohnishi, both of Tokyo, and Yasufumi Takahashi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1986, Ser. No. 850,097

Claims priority, application Japan, Apr. 10, 1985, 60-74215  
Int. Cl.<sup>4</sup> H03C 3/00

U.S. Cl. 332-16 R

3 Claims



1. A digital modulator comprising:  
first means including memory elements for storing quantized values obtained by combining impulse responses from a roll-off filter which operates at a sampling frequency which is four times the frequency of a modulated carrier signal for a length of successive input data bits;  
second means for determining an address, for a bit pattern associated with the bit length of the input data, indicating a content stored in said memory elements; and  
third means for effecting a D/A conversion on the quantized value obtained from said first means.

4,680,557

## STAGGERED GROUND-PLANE MICROSTRIP TRANSMISSION LINE

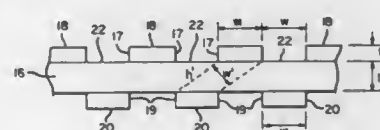
Peter M. Compton, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 22, 1985, Ser. No. 725,450

Int. Cl.<sup>4</sup> H01P 3/08

U.S. Cl. 333-1

3 Claims



1. A transmission line for an electrical signal comprising a plurality of signal-carrying conductors having parallel edges disposed on one side of a strip of dielectric material, each of said conductors being spaced apart from each other across said strip by a spacing W between adjacent edges, a plurality of ground-plane conductors having parallel edges disposed parallel to said signal-carrying conductors and arranged on the opposite side of said strip in staggered relation with respect to said signal-carrying conductors such that each of said ground-plane conductors occupies a position corresponding to a location of one of said spacings between adjacent signal-carrying conductors, wherein the edges of each of the signal-carrying conductors are substantially congruent with the respective edges of the ground-plane conductors occupying said spacings on either side of each of said signal-carrying conductors.

4,680,558

## CORRUGATED TRANSITION DEVICE FOR USE BETWEEN A CONTINUOUS AND A CORRUGATED CIRCULAR WAVEGUIDE WITH SIGNAL IN TWO DIFFERENT FREQUENCY BANDS

Subir Ghosh, and Aluizio P. Junior, both of Sao Paulo, Brazil, assignors to Telecomunicacoes Brasileiras S/A - Telebras, Brasilia, Brazil

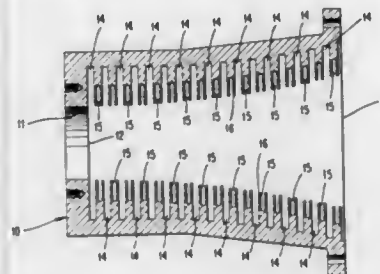
PCT No. PCT/BR84/00007, § 371 Date Sep. 5, 1985, § 102(e) Date Sep. 5, 1985, PCT Pub. No. WO85/02945, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 27, 1984, Ser. No. 776,167

Claims priority, application Brazil, Dec. 27, 1983, 8307286[U]  
Int. Cl.<sup>4</sup> H01P 1/16, 5/08

U.S. Cl. 333-21 R

9 Claims



1. In a transition device operable in a first frequency band and a second, distinctly different frequency band comprising a waveguide having first and second ports and having a tapered interior boundary wall containing alternately positioned first and second type slots of distinct relative configuration aligned transverse to the axis of said waveguide, the improvement comprising: said first and second type slots each configured near said first port to have (i) respective first and second susceptances for signals in said first frequency band, which first and second susceptances are each non-zero and substantially equal in magnitude, with one of said first and second susceptances being capacitive and the other being inductive, and (ii) respective third and fourth susceptances for signals in said second, distinctly different frequency band, which third and fourth susceptances are each non-zero and substantially equal in magnitude, with one of said third and fourth susceptances being capacitive and the other being inductive, such that said first and second susceptances, in combination, and said third and fourth susceptances, in combination, provide respective and simultaneous high susceptance mutual resonance conditions between adjacent ones of said first and second type slots for said first and second frequency bands as are required for simultaneous matching of said device with a continuous waveguide at said first port, for signals in said first and second frequency bands.

4,680,559

## RF SPLITTER CIRCUIT

Hilmer I. Swanson, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 14, 1985, Ser. No. 711,627

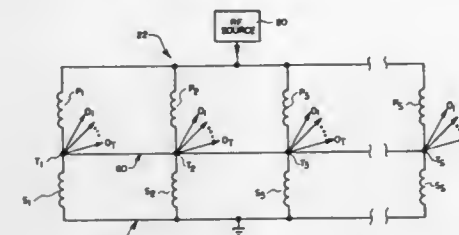
Int. Cl.<sup>4</sup> H03H 7/48

U.S. Cl. 333-100

8 Claims

1. A signal splitter for supplying N load devices of varying impedances with N signals such that each of the N signals is of essentially the same magnitude and phase, said splitter including:  
a plurality of S step-down transformers, each transformer having a primary winding and a secondary winding which is series connected between a common signal source and ground,  
each said transformer having an output terminal located at the junction interconnecting its primary and secondary windings,

each junction being interconnected together in common with the other junctions such that all of said primary windings are in parallel to each other and all of said secondary windings are in parallel to each other,



each said junction providing an output terminal having T outputs connected thereto so that said splitter has N total outputs, where N=ST, for driving N load devices.

4,680,560

## ELECTRICAL FILTER DEVICE

Tadahiro Yorita; Haruo Matsumoto, both of Kanazawa, and Itsuo Nakatsuji, Ishikawa, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

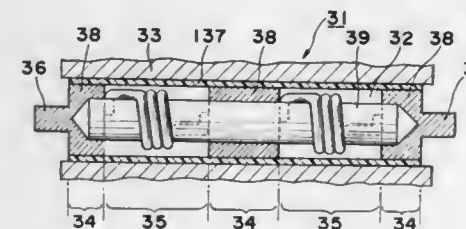
Filed Mar. 26, 1986, Ser. No. 844,469

Claims priority, application Japan, Apr. 3, 1985, 60-70395; Sep. 25, 1985, 60-211891

Int. Cl.<sup>4</sup> H01P 1/205, 1/202; H03H 7/01

U.S. Cl. 333-206

10 Claims



1. In an electrical filter device which comprises a casing, filter elements in said casing, and input and output ports mounted on an outer wall of said casing, with said input and output ports being electrically connected to said filter elements, the improvement comprising  
at least one axial low-pass filter provided between said filter elements and one of said input and output ports, said axial low-pass filter further including  
an outer conductor having an axial bore,  
a plurality of capacitors arranged in said bore at predetermined intervals, each capacitor utilizing said outer conductor as an outer capacitor electrode, having an intermediate dielectric member with a cylindrical cross section, and having a conductive inner capacitor electrode,  
said inner capacitor electrodes of said capacitors being mounted at said predetermined intervals on an insulating axis member with spaces being defined therebetween, and  
at least one inductor mounted on said axis member in a space between a pair of adjacent said inner capacitor electrodes, and electrically connected to said pair of inner capacitor electrodes.

4,680,561

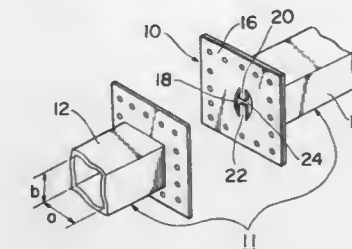
## MICROWAVE WAVEGUIDE FILTER HAVING A METAL PLATE WHICH INCLUDES A RESONANT APERTURE THEREIN

Tadao Shirai, Tokyo, Japan, assignor to Nec Corporation, Japan  
Filed May 29, 1985, Ser. No. 738,952

Claims priority, application Japan, May 30, 1984, 59-110160  
Int. Cl.<sup>4</sup> H01P 1/212

U.S. Cl. 333-208

3 Claims



2. A microwave filter for use in a rectangular waveguide, said filter comprising:  
a plate member of electrically conductive material, said plate having a thickness less than one-tenth of the wavelength of a frequency to be suppressed,  
said plate defining a circular opening having a diameter which is less than the length of the short side of said rectangular waveguide, and  
said plate further having two opposed projections which extend inwardly, from diametrically opposing positions on the circumference of said circular opening, toward the center of said opening, the ends of said projections defining a gap therebetween at the center of the circle,  
said plate member being arranged in said rectangular waveguide, parallel with the electric field in the waveguide and normal to the magnetic field in the waveguide.

4,680,562

## INTEGRAL CIRCUIT INTERRUPTER WITH SEPARABLE MODULES

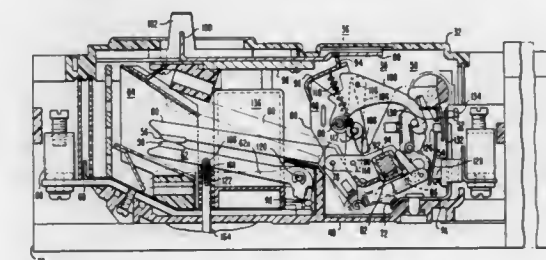
Walter V. Bratkowski, McKeesport, and John A. Wafer, Beaver, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 29, 1985, Ser. No. 759,719

Int. Cl.<sup>4</sup> H01H 77/06

U.S. Cl. 335-16

5 Claims



1. A circuit breaker comprising:  
an electrically insulating housing;  
a circuit breaker within the housing and including first and second separable contacts operable between open and closed contact positions;  
the circuit breaker including a releasable lever movable when released to a tripped position to effect automatic opening of the contacts in response to a first predetermined current condition;  
the circuit breaker also including a current detector for monitoring said first predetermined current condition and



for automatically tripping the releasable lever in response to said first predetermined overcurrent condition; the first contact being mounted on a first movable contact carrying arm coupled to the releasable lever; the second contact being mounted on a second contact carrying arm being movable between open and closed positions; electromagnetic actuating means for moving the second contact arm between said open and closed positions; modular sensor means for monitoring current flow and for automatically actuating only the electromagnetic means in response to a second predetermined current condition and the modular sensor means being removably mounted and replaceable by modular sensor means of different current ratings.

4,680,563

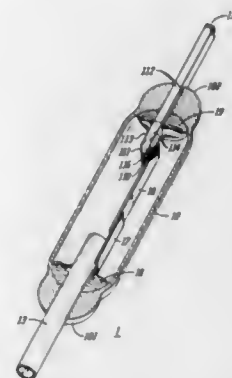
## RELAY SWITCH APPARATUS

James T. Hanlon, Worthington, Ohio, and Paul W. Renaut, Lee's Summit, Mo., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 6, 1986, Ser. No. 837,069  
Int. Cl.<sup>4</sup> H01H 1/08, 29/00

U.S. Cl. 335—58

11 Claims



1. A mercury switch construction (1) comprising contact structures (11, 13) oppositely supported in an envelope member (10) with free ends thereof positioned to engage each other CHARACTERIZED IN THAT said contact structures comprises means (11) extending into the envelope member and having a mercury-wetted surface (113) located along one side thereof and having an opening (111) at a free end positioned inside the envelope member extending from said mercury-wetted surface through said means for forming a mercury contact (117) at a surface of said means opposite said mercury-wetted surface.

4,680,564

## MULTI-POLE MOLDED CASE CIRCUIT BREAKER WITH A COMMON CONTACT OPERATING CROSSBAR MEMBER

Bernard DiMarco, Lilburn, Ga., and Charles W. Stanford, Bellefontaine, Ohio, assignors to Siemens-Allis, Inc., Atlanta, Ga.

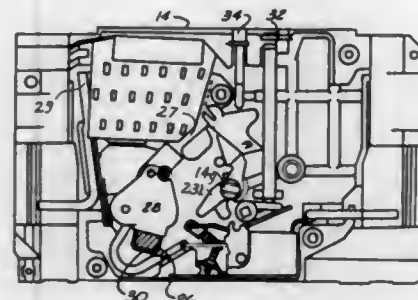
Filed Oct. 1, 1984, Ser. No. 656,233  
Int. Cl.<sup>4</sup> H01H 73/02

U.S. Cl. 335—16

9 Claims

1. A multi-pole circuit breaker, comprising:  
a first pole having a molded housing containing a frame mounted on the housing, a handle assembly mounted on the frame with a handle protruding through an opening in the housing and operable between an ON position and an OFF position, a fixed contact, a movable contact operable between an open position and a closed position, a linkage

assembly connecting the movable and the handle assembly for movement of the contacts between the closed and open positions in response to movement of the handle between the ON and OFF positions, and a tripping mechanism having a tongue protruding through an opening in the housing;  
a second pole having a molded housing containing a fixed



contact, a movable contact operable between an open position and a closed position, a tripping mechanism with groove accessible through an opening in the housing and being mateable with said tongue; and  
a crossbar member connecting the movable contacts of the first and second poles, said contacts moving in unison with the crossbar in response to actuating the tripping mechanism.

4,680,565

## MAGNETIC FIELD DEVICE FOR A SYSTEM FOR THE ACCELERATION AND/OR STORAGE OF ELECTRICALLY CHARGED PARTICLES

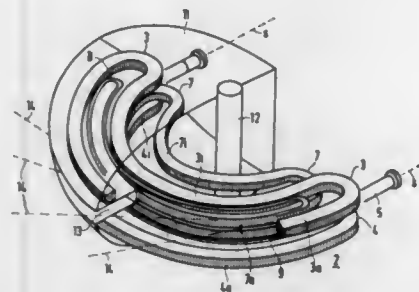
Andreas Jahnke, Forchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 16, 1986, Ser. No. 874,495  
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522528

Int. Cl.<sup>4</sup> H01F 7/22

U.S. Cl. 335—216

8 Claims



1. A magnetic-field device for a system for at least one of the acceleration and storage of electrically charged particles, particularly electrons, the particle trajectory of which has curved sections, and having an appropriately curved dipole magnet having a concave section and a convex section, the dipole magnet comprising superconducting windings for generating a magnetic guiding field for the particle beam which has a weakly focusing effect due to field gradients thereof, each dipole magnet being at least largely free of iron and having associated therewith a superconducting supplemental winding, said superconducting supplemental winding being curved to match said superconducting windings of said dipole magnet, and having a convex section which adjoins a region of the concave sections of the curved windings of the dipole magnet,

whereby the required field gradients can substantially be generated.

4,680,566

## COIL WITH MAGNETISABLE ROD CORE

Walter Goseberg, and Alfred Pollack, both of Hanover, Fed. Rep. of Germany, assignors to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

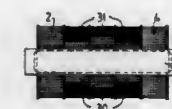
Filed Aug. 15, 1985, Ser. No. 765,967

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3429976; Jul. 18, 1985, 3525649

Int. Cl.<sup>4</sup> H01F 27/28, 27/34

U.S. Cl. 336—181

9 Claims



1. In a coil with a magnetisable rod core having three adjacent coaxially positioned windings distributed roughly uniformly with respect to said rod core, and in which the two outer windings have approximately equal numbers of turns, the improvement wherein: said rod core is immovably positioned so that it is fully immersed in the third centre winding and at least partially immersed in said outer windings so that said outer windings have approximately equal inductances; said outer windings are connected in series opposition such that when an alternating voltage is applied across said outer windings, their magnetic fields in said rod core are mutually opposed, whereby the mutual coupling between said centre winding and said series connected outer windings is minimized; said centre winding of a of is the primary or secondary winding of a line drive transformer and is conductively isolated from said outer windings; a further winding forming the other of said secondary or primary windings of said transformer is disposed only above said centre winding; and said outer windings which are connected in series are arranged as a vertical integration coil for a television apparatus.

4,680,567

## TIME DELAY ELECTRIC FUSE

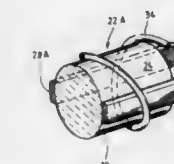
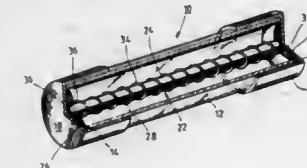
Carl H. Edwards, Elizabethtown, Ky., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 10, 1986, Ser. No. 827,575

Int. Cl.<sup>4</sup> H01H 85/04

U.S. Cl. 337—164

8 Claims



1. A time delay fuse comprising:  
an insulative housing including first and second ends, first

and second electrically conductive ferrules attached on said first and second ends of said housing, respectively.  
a fuse element including in combination, an elongated substantially straight electrically insulated core within said housing, at least one substantially straight, flat, wire extending along the external length of said core, a second longer wire being supported by said core and engaging said straight wire so as to establish a plurality of point contacts between said straight wire and said longer wire, and  
said straight and longer wires each being electrically connected in series with said conductive ferrules, said straight and longer wires each having a first end and a second end, wherein said first end of said straight wire and said first end of said longer wire each being electrically connected to said first ferrule and wherein said second end of said straight wire and said second end of said longer wire each being electrically connected to said second ferrule.

4,680,568

## ELECTRICAL COMPONENT HAVING FUSE ELEMENT, AND METHOD OF USING SAME

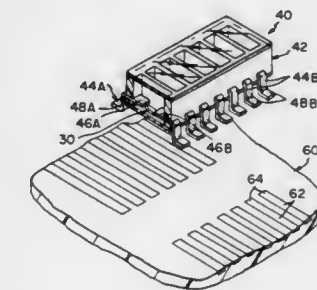
Mark Corrao, Wyoming, Mich., and David T. Shaffer, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 29, 1986, Ser. No. 857,204

Int. Cl.<sup>4</sup> H01H 85/02, 85/14

U.S. Cl. 337—186

10 Claims



1. An electrical component mountable to an electrical article to complete at least one of a plurality of circuit paths thereon, comprising:

a housing means;  
a like plurality of pairs of opposing contact means secured in said housing means, each of said contact means having an outer contact section extending outwardly from said housing means and mateable to a corresponding contact means of said article and further having an inner contact section spaced from the inner contact section of the associated other of said contact means; and  
a fuse element associated with each said pair of contact means mechanically and electrically secured to and between said inner contact sections thereof, the fuse element between the inner contact sections of at least a selected one of said pairs of contact means having been opened by being melted by a selected programming current applied to said at least one selected pair of contact means prior to mounting to said electrical article to retain the associated at least one said circuit path in an open condition, whereby said component is programmed, and said article is programmed by said component mounted thereto.

4,680,569

## SEMICONDUCTOR PRESSURE SENSOR

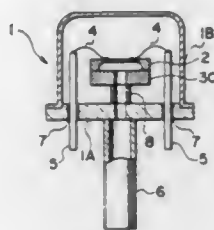
Bunshiro Yamaki, Fujisawa; Sadatake Kikuchi, Hyogo, and Yutaka Tomisawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 27, 1984, Ser. No. 654,940

Claims priority, application Japan, Sep. 30, 1983, 58-180440  
Int. Cl.<sup>4</sup> G01L 1/22

U.S. Cl. 338—42

10 Claims



1. A semiconductor pressure sensor comprising: a hollow shell comprising a mount plate having a bore provided therethrough and a cap fixed on the mount plate; a pressure inlet tube fixed to the mount plate and projecting toward the outside of the shell; the pressure inlet tube communicating with the bore; a semiconductor chip received within said shell, said semiconductor chip being provided with a thin diaphragm portion in which a strain gauge is formed; a base member on which said semiconductor chip is mounted, said base member having a coefficient of thermal expansion similar to that of said semiconductor chip; and a thin tubular supporting member to which said base member is fixed, said thin tubular supporting member communicating with said bore and having a coefficient of thermal expansion similar to that of said semiconductor chip; said base member being bonded to said thin tubular supporting member by a soft solder material, and said thin tubular supporting member being bonded to said mount plate by a hard solder material.

4,680,570

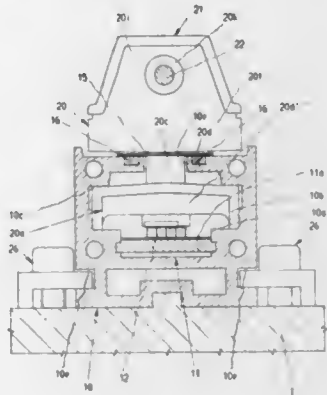
## LINEAR POTENTIOMETER FOR MEASURING TRAVEL

Karl Hehl, Arthur-Hehl-Strasse 32, D-7298 Lossburg 1, Fed. Rep. of Germany  
Filed May 1, 1986, Ser. No. 857,956  
Claims priority, application Fed. Rep. of Germany, May 3, 1985, 3115880; Oct. 5, 1985, 3535587

Int. Cl.<sup>4</sup> H01C 10/38

U.S. Cl. 338—176

11 Claims



1. A linear potentiometer for measuring the relative move-

ment between two component parts comprising in combination:

- a elongated housing in the form of a metal tubular profiled member of approximately rectangular cross section which is securable to one of the component parts, said housing having a longitudinal slit disposed symmetrically with respect to a vertical plane of symmetry in its upper horizontal wall, a plurality of guide shoulders formed in the inner surface of each of its side walls, and a plurality of permanent magnets disposed on the upper surface of said upper wall adjacent said slit;
- a covering band of spring steel, which rests on said upper surface of said upper wall of said housing to cover said longitudinal slit and is normally retained there by said permanent magnets;
- a molded integral slide formed of a high polymer plastic and connectable via a joint to the other of the component parts, said slide being movable along the length of said housing and including a pair of spaced horizontal guide ribs slidably supported on said guide shoulders of said housing and connected together via a slide body portion having a middle section whose upper end extends through said longitudinal slit and above said upper wall and there forms a horizontal anchoring plate which extends cross wise symmetrically to said vertical plane of symmetry, a joint chamber defined by a plurality of vertical walls, at least one of which extends transverse to said plane of symmetry, molded onto the upper surface of said anchoring plate, and at least one opening for said covering band extending through said anchoring plate with said opening being defined on one side by said one wall of said chamber and on its opposite side by a region of said slide body portion, said covering band extending through said opening and over said region of said anchoring plate;
- a wiper for a resistance element mounted on the lower end of said slide body portion beneath said region of said anchoring plate; and
- an elongated resistance element disposed within said housing beneath said slit and said wiper.

4,680,571

## TRAILER CREEP ALARM

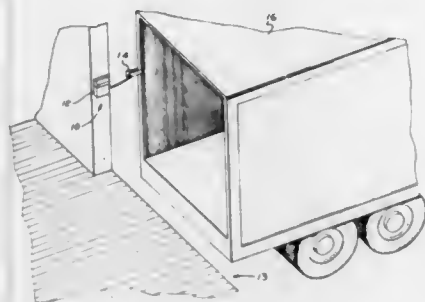
Ronald Keklak, Amston, Conn.; Michael V. Couture, Holyoke, Mass.; John C. Whitehouse, Winsted, Conn., and Marshall W. Payne, Chicopee, Mass., assignors to Dedicated Technologies, Inc., Springfield, Mass.

Filed Mar. 13, 1985, Ser. No. 711,447

Int. Cl.<sup>4</sup> B60Q 1/00; G08B 21/00

U.S. Cl. 340—52 R

27 Claims



1. A creep alarm comprising:
  - (a) an outer housing that is adapted to be fastened onto a wall at a loading dock;
  - (b) a clamp that is magnetically held against the outside of the housing and which can be removed for quick attachment to a nearby trailer or truck;
  - (c) said clamp being connected to a free end of a spring-tensioned, retractable cord that is spool fed from inside the housing;

sioned, retractable cord that is spool fed from inside the housing;

- (d) a spring-loaded spool assembly that is rotatably mounted within the housing for windingly storing the cord;
- (e) means for automatically arming the alarm in a "ready" position after the clamp and cord have been drawn away from the housing and clamped onto the trailer or truck and a preset delay has occurred, wherein the arming means comprises a spring-biased actuating arm that is rotatably mounted within the housing, adjacent to the spool assembly, said arm having a flange that is adapted to extend through a vertical slot in the housing, whereby said flange is normally abutted by the clamp, when the clamp is magnetically held against the housing, to prevent the arm from rotating and accidentally arming the alarm; and,
- (f) triggering means for automatically turning on an electrically operated horn inside the housing if the cord is subsequently tugged a preselected amount after the clamp and cord have been drawn away from the housing and the alarm has been armed.

4,680,572

## CHORD ENTRY KEYING OF DATA FIELDS

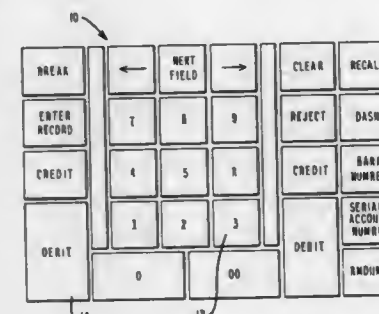
Patrick G. Meguire, Ithaca, and Thomas J. Pitoniak, Trumansburg, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 14, 1981, Ser. No. 330,639

Int. Cl.<sup>4</sup> H04Q 4/00; G06F 3/02

U.S. Cl. 340—365 R

12 Claims



1. A keyboard system having a plurality of data keys and function keys arranged in a manner to be operated by one or both hands, and logic means permitting chord entry keying of characters into the keyboard upon substantially simultaneous depression of more than one key of the keyboard wherein data is entered upon depression of one or more data keys and upon depression of a function key within a predetermined time frame prior to or after the depression of the last data key.

4,680,573

## INTRUSION WARNING WIRE FENCE

Jacques Ciordinik, Bologna, and Alessandro Penzo, Crespellano, both of Italy, assignors to CL.A.R.A S.p.A., Bologna, Italy  
Continuation of Ser. No. 407,731, Aug. 12, 1982, abandoned.

This application Oct. 22, 1985, Ser. No. 790,310

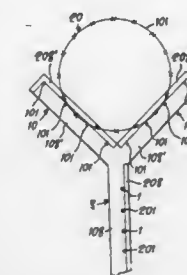
Claims priority, application Italy, Aug. 19, 1981, 12606 A/81  
Int. Cl.<sup>4</sup> G08B 13/00, 13/18

U.S. Cl. 340—541

6 Claims

1. An intrusion warning wire fence comprising:
  - (a) at least one tubular wire helically coiled in the shape of a concertina wire;
  - (b) at least one energy conductor loosely contained within a lumen of said tubular wire;
  - (c) a warning system responsive to any variation of conduction capability of said at least one conductor;
  - (d) notch or groove means extending transversely to and weakening said tubular wire;
  - (e) barbed means on said tubular wire; and

- (f) two inclined V-arranged arms for supporting said wire therebetween, said arms being directed inward and out-



wards of a fence and mounted on tops of posts arranged between sections of said fence.

4,680,574

## APPLIANCE ANTI-THEFT CIRCUITRY

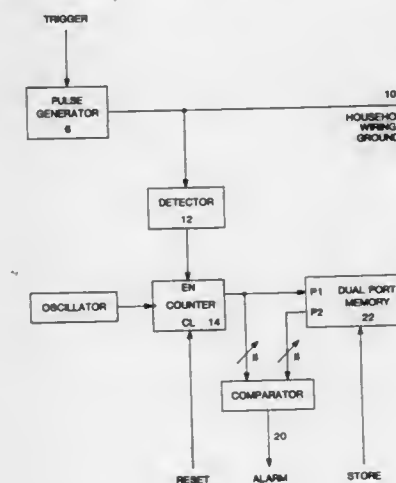
Bryan J. Ruffner, 2818 N. 24th St., Arlington, Va. 22207

Filed Mar. 22, 1985, Ser. No. 717,128

Int. Cl.<sup>4</sup> G08B 13/14

U.S. Cl. 340—571

6 Claims



1. An alarm device for detecting the removal of an electrical apparatus when plugged into a three-terminal power-supply outlet having a hot terminal and electrically interconnected neutral and grounded terminals where said alarm device comprises:

- circuitry for cyclically applying a voltage across said neutral and grounded terminals;
- circuitry for timing the return of an inverted electrical reflection of said applied voltage caused by the point of interconnection of said interconnected neutral and grounded terminals;
- circuitry for electrically storing the measured time of said inverted electrical reflection;
- circuitry for comparing a stored value of said measured time with subsequent values of said measured time;
- and circuitry for generating an alarm signal when a stored value of said measured time and a subsequent value of said measured time differ by more than a predetermined amount.



4,680,575

## LIQUID LEVEL DETECTING DEVICE

Mitsuhiko Yazaki, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

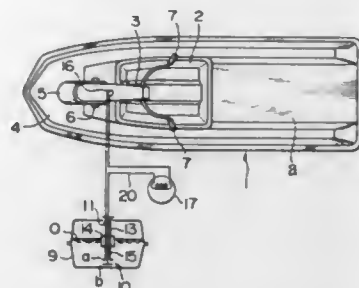
Filed Dec. 27, 1984, Ser. No. 686,676

Claims priority, application Japan, Dec. 28, 1983, 58-202321[U]

Int. Cl.<sup>4</sup> G08B 21/00; H01H 35/18

U.S. Cl. 340—624

1 Claim



1. In a boat having an engine, the combination comprising:
  - a generator driven by the engine,
  - a tank for engine liquid,
  - a liquid level detecting device including a float provided within said tank,
  - a liquid level detecting switch operated by said float and turned on when the liquid level drops to a preset level,
  - said liquid level detecting switch comprising fixed electrical contact means and flexible electrical contact means which close the circuit under the weight of said float when the liquid level drops to said preset level,
  - a liquid level warning means connected in series with said switch, and
  - circuit means free of a central switch connecting said series connected liquid level detecting switch and warning means to a power supply provided exclusively by said generator of said engine for providing a low engine liquid level warning while the engine is operating.

4,680,576

## PHOTOELECTRIC SMOKE DETECTOR AND ALARM SYSTEM

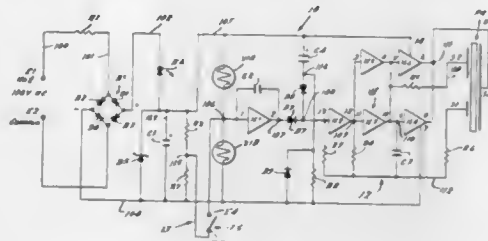
Frederick T. Bauer, Holland, Mich., assignor to Gentex Corporation, Zeeland, Mich.

Filed Nov. 29, 1982, Ser. No. 445,083

Int. Cl.<sup>4</sup> G08B 17/10

U.S. Cl. 340—630

4 Claims



1. In a smoke detector and alarm system, the combination including housing means defining a light tight interior chamber, said housing means having an inlet opening and an outlet opening each communicating with said interior chamber, means in said housing means including a plurality of baffles defining a tortuous passageway preventing the passage of ambient light into said interior chamber while permitting air and airborne particulate matter contained therein to flow into said interior chamber from said inlet opening and out of said

interior chamber through said outlet opening, piezoceramic electrically activatable alarm means carried by said housing means, an illuminating circuit including a gallium aluminum arsenide light emitting diode mounted in said interior chamber, means providing a direct current supply for said light emitting diode, a smoke sensing circuit including dual photoelectric means formed on the same substrate and the electrical conductivity of each of which varies as a function of the amount of light impinging thereon, said dual photoelectric means being connected in series and being electrically connected to said means providing a direct current supply for said light emitting diode, means mounting said dual photoelectric means in said interior chamber in proximity to said light emitting diode whereby light emanating from said light emitting diode impinges upon one of said dual photoelectric means at all times and impinges upon the other of said dual photoelectric means to change the conductivity of said dual photoelectric means when airborne particulate matter is present in said interior chamber, and means activatable in response to a differential in the conductivity of said dual photoelectric means for activating said piezoceramic alarm means.

4,680,577

## MULTIPURPOSE CURSOR CONTROL KEYSWITCH

David H. Straayer; Patrick J. Franz, both of Colton, and Eugene F. Lynch, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

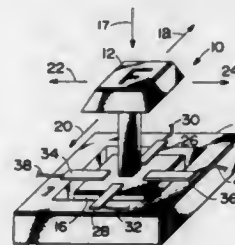
Continuation of Ser. No. 555,792, Nov. 28, 1983, abandoned.

This application Apr. 18, 1986, Ser. No. 854,687

Int. Cl.<sup>4</sup> H01H 25/00

U.S. Cl. 340—711

11 Claims



1. A keyboard system for operator entry of characters and control functions to a computer and computer display or the like, said keyboard system comprising:
  - a plurality of, finger tip sized, alpha-numeric character keys organized in a preset pattern wherein:
    - each key includes a vertically displaceable key cap having a corresponding alpha-numeric designation assigned thereto, and detection means coupled thereto for detecting vertical displacement of the key; and
    - at least one of said plurality of alpha-numeric keys includes mounting means for permitting lateral motion in any direction, and for said at least one alpha-numeric key the corresponding detection means also detects lateral displacement thereof; and
  - processor means coupled to the individual detection means of each of said plurality of alpha-numeric character keys for initiating a signal corresponding to the alpha-numeric designation assigned to any key for which vertical displacement was detected, and for initiating cursor control signals to position the cursor on the computer display in response to lateral displacement of such a key.

4,680,578

## BASELINE TRANSPOSITION AND CHARACTER SEGMENTING METHOD FOR PRINTING

Klaus-Juergen Hornig, Sulzbach, and Hans-Henning Thiesens, Kelkheim, both of Fed. Rep. of Germany, assignors to Mergenthaler Linotype GmbH, Eschborn, Fed. Rep. of Germany

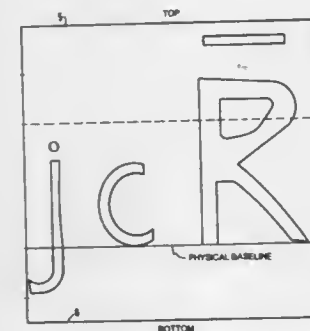
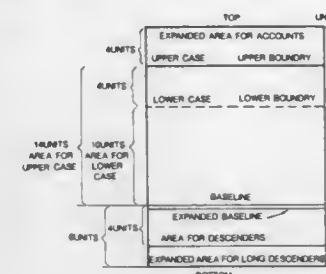
Filed May 17, 1984, Ser. No. 611,563

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317842

Int. Cl.<sup>4</sup> G09G 1/06

U.S. Cl. 340—731

4 Claims



1. A method for imaging a master encoded character, having an encoded character physical baseline and a fixed size, on a display having a fixed size at a pre-determined size larger than said display size in a first dimension, comprising the steps of:
  - identifying characters for imaging on said display, at a size larger than the said display size and extending beyond the limits of the maximum size of said display in said first dimension,
  - identifying point data at specified locations in the encoded data defining the character relative to the encoded character physical baseline for dividing the encoded character into encoded separate sections, whereby each of said encoded separate sections is to be of a size no greater than said display size in said first dimension when said encoded separate sections are displayed;
  - identifying a location in said separate encoded sections for inserting an encoded logical baseline and referencing said encoded logical baseline for said encoded separate sections to said encoded character physical baseline,
  - referencing said encoded character physical baseline and said encoded logical baseline to a respective display physical baseline and referencing said respective display physical baseline to its projection in an imaging surface movable relative to said display, and
  - moving said imaging surface to locate the respective logical baselines for said separate encoded sections projected onto said imaging surface in the same relative relationship to the projection of said encoded character physical baseline on said imaging surface as said encoded logical baseline as to said encoded character physical baseline.

4,680,579

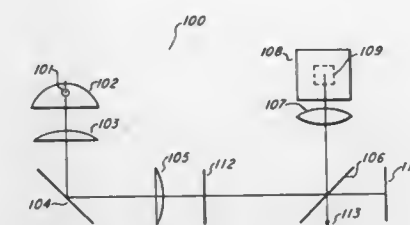
## OPTICAL SYSTEM FOR PROJECTION DISPLAY USING SPATIAL LIGHT MODULATOR DEVICE

Granville E. Ott, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 8, 1983, Ser. No. 530,327

Int. Cl.<sup>4</sup> G09G 3/34

16 Claims



1. An electronic display device comprising:
  - a light source;
  - a first optical system for forming a substantially collinear beam of light from said light source;
  - a Schlieren optical device having alternating reflecting and transmitting portions for forming respective reflecting and transmitting optical paths, said Schlieren optical device disposed to receive light from said first optical system at an angle;
  - a second optical system disposed to receive light from one of said reflecting or transmitting optical paths of said Schlieren optical device for focusing light received from said Schlieren optical device to a focal point;
  - a deformable mirror device disposed near said focal point for receiving light from said source optical system, said deformable mirror device having a matrix of a plurality of individually electrically deformable mirror cells, each mirror cell normally reflecting light received from one type of said reflecting and transmitting portions of said Schlieren optical device back to similar type portions and being electrically deformable to reflect at least some light received from one type of said reflecting and transmitting portions of said Schlieren optical device back to another type of said reflecting and transmitting portions of said Schlieren optical device;
  - a nonreciprocal optical device disposed between said light source and said Schlieren optical device for transmitting more light from said light source to said Schlieren optical device than reflected back to said light source and for reflecting more light back to said Schlieren optical device than transmitted from said Schlieren optical device to said light source; and
  - a viewing screen disposed for receiving light reflected by deformed mirror cells of said deformable mirror device.

4,680,580

## ACTIVE MATRIX-ADDRESSED LIQUID-CRYSTAL DISPLAY DEVICE

Yukito Kawahara, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Feb. 18, 1983, Ser. No. 467,799

Claims priority, application Japan, Feb. 23, 1982, 57-27588

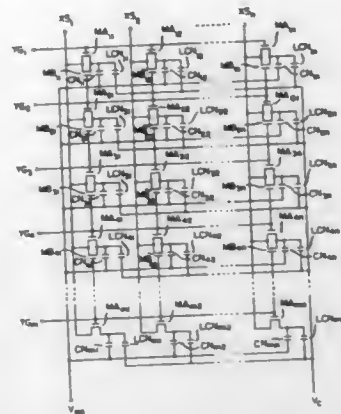
Int. Cl.<sup>4</sup> G09G 3/36

U.S. Cl. 340—784

20 Claims

1. An active matrix-addressed liquid-crystal display device comprising: a semiconductor substrate, a transparent substrate, and a liquid crystal sandwiched between said semiconductor substrate and said transparent substrate, said semiconductor substrate comprising matrix liquid-crystal driving cells each comprised of a capacitor for holding a signal voltage to drive the liquid crystal, an electrode for driving the liquid crystal corresponding to a unit picture element, and a switching element having a gate for addressing each of the picture elements,

column electrodes to apply a signal voltage for driving the liquid crystal, and row electrodes for scanning the gates to



address said switching elements, wherein said switching elements belonging to some of the rows comprise MOS transistors connected in parallel to different row electrodes.

4,680,581

### LOCAL AREA NETWORK SPECIAL FUNCTION FRAMES

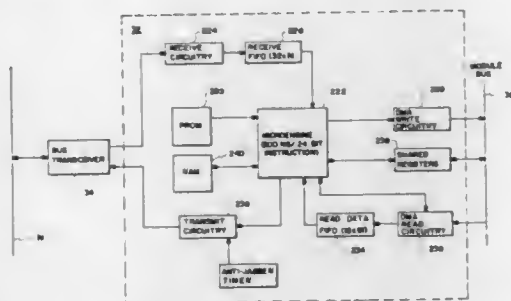
Tony J. Kozlik, and Bruce J. Landini, both of Phoenix, Ariz., assignors to Honeywell Inc., Phoenix, Ariz.

Filed Mar. 28, 1985, Ser. No. 716,912

Int. Cl.<sup>4</sup> H04Q 9/00; G05B 23/02; H04J 6/00

U.S. Cl. 340—825.06

5 Claims



1. In a local area network having a plurality of nodes (16) wherein the local area network utilizes a token passing scheme for communicating between nodes (16), each node (16) having an interface apparatus (32, 34) which operates independently of a processor (38) associated with said node (16), each node (16) being capable of operating in an on-line mode and an off-line mode, wherein a node (16) in the off-line mode is responsive to a message frame identified as a special function frame, the special function frame containing diagnostic-type commands which are to be performed by the node (16) in the off-line mode, and further wherein the node (16) in the off-line mode does not participate in normal communications of the local area network including the token passing or the receiving of information frames, a method of diagnosing and recovering a second node (16) from a first node (16), the method implemented by the second node (16) comprising the steps of:

- waiting (101, 105, 110) to receive the message frame addressed to the second node (16);
- determining (115) if the message frame is a special function frame, and if the message frame is determined to be the special function frame;
- insuring (120, 125, 135) that the node is in an off-line mode;
- determining (130, 140, 150, 155, 160, 165, 170, 175, 180, 185) the type of special function frame to perform the

command specified by the type of special function frame, the function performed being monitored and analyzed by the first node (16) to determine and diagnose fault conditions of the second node (16); and

(e) returning to the step of waiting of step (a).

4,680,582

### INFORMATION REPORTING MULTIPLEX SYSTEM

Ezequiel Mejia, Longueville, Canada, assignor to Honeywell Ltd., Scarborough, Canada

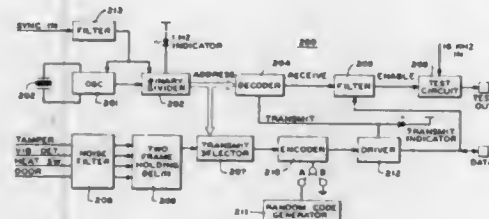
Filed May 20, 1981, Ser. No. 265,478

Claims priority, application Canada, Jul. 15, 1980, 356261

Int. Cl.<sup>4</sup> G08B 5/24

U.S. Cl. 340—825.17

28 Claims



1. A system for reporting information comprising: a plurality of remote stations each connected to at least one sensor and having a synchronization terminal for receiving periodic synchronization signals, a time slot generator connected to synchronization terminal for supplying an enabling signal at a predetermined amount of time after receiving a synchronization signal wherein the time slot for each station occurs at a substantially different time after receipt of a synchronization signal, a data terminal, and a transmit circuit connected to said time slot generator and to said sensor for supplying information derived from said sensor to said data terminal upon receiving said enabling signal;
- a master station having a synchronization generator, a synchronization terminal connected to said synchronization generator for receiving synchronization signals therefrom, a data terminal, and information receiving means connected to said data terminal of said master station for receiving said information supplied by said plurality of remote stations; and,
- communication means interconnecting said data terminals and said synchronization terminals of said master station and said plurality of remote stations.

4,680,583

### TERMINAL ADDRESS ASSIGNMENT IN A BROADCAST TRANSMISSION SYSTEM

Wayne D. Grover, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 1, 1985, Ser. No. 697,543

Int. Cl.<sup>4</sup> H04Q 3/00; G05B 23/02; H04V 3/24

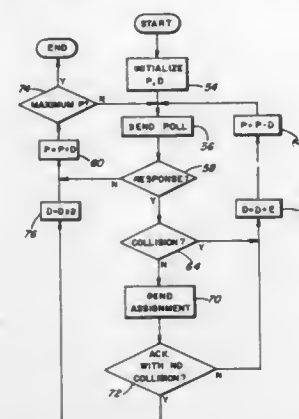
U.S. Cl. 340—825.52

11 Claims

1. A method of assigning addresses to a plurality of terminals in a broadcast transmission system in which in normal operation messages and said addresses are transmitted between a master station and said terminals, the method comprising the steps of:

- transmitting from the master station a general polling message to which any terminal may respond;
- transmitting a response from each terminal which receives the general polling message and which does not have an assigned address;
- varying at the master station at least one parameter which affects the bit error rate of the terminals;

- (d) repeating steps (a) to (c) until the master station receives only one response, whereby one terminal is isolated;
- (e) transmitting an assigned address from the master station to the isolated terminal; and



- (f) repeating steps (a) to (e) until each of the terminals has an assigned address.

4,680,584

### ACOUSTIC PRELAUNCH WEAPON COMMUNICATION SYSTEM

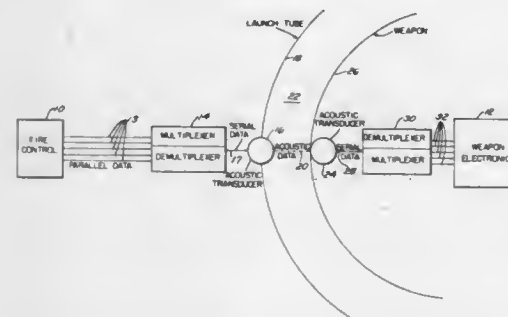
Steven S. Newsom, Middletown, R.I., and James M. McCarthy, Mattapoisett, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1985, Ser. No. 730,024

Int. Cl.<sup>4</sup> F42B 19/10; G08C 19/10; H04B 11/00

U.S. Cl. 340—850

2 Claims



1. An acoustic prelaunch weapon communication system for providing information between a fire control system and a launchable underwater weapon electronic system comprising: first multiplexing means adapted to receive parallel data electrical signals from said fire control system for converting said parallel data electrical signals to serial data multiplexed electrical signals, said first multiplexing means further comprises first parallel electrical lines connected to said fire control system and a first multiplexer/demultiplexer unit connected to said first parallel electrical lines;
- a launch tube;
- first acoustic transducer means mounted on a wall of said launch tube and connected to receive said serial data multiplexed electrical signals for converting said serial data electrical signals to acoustic data signals and transmitting said acoustic data signals, said first acoustic transducer means further comprises a first serial electrical line connected to said first multiplexer/demultiplexer unit and a first acoustic transducer connected to said first serial electrical line;
- a launchable underwater weapon;
- a cavity adapted to contain seawater located between and

separating said launch tube and said launchable underwater weapon;

second acoustic transducer means mounted to the shell of said launchable underwater weapon and connected to receive said acoustic data signals from said first acoustic transducer means for converting said acoustic data signals to serial data multiplexed electrical signals, said second acoustic transducer means further comprises a second acoustic transducer and a second serial electrical line connected to said second acoustic transducer;

second multiplexing means located within the shell of said launchable underwater weapon and connected to receive said serial data multiplexed electrical signals and for demultiplexing said serial data multiplexed electrical signals and converting them to parallel data signals and adapted to provide said parallel data signals to said launchable underwater weapon electronic system, said second multiplexing means further comprises a second multiplexer/demultiplexer unit connected to said second serial electrical line and second parallel electrical lines connected between said second multiplexer/demultiplexer unit and said launchable underwater weapon electronic system, said second multiplexing means further adapted to receive parallel data electrical signals from said launchable underwater weapon electronic system for converting said parallel data electrical signals to serial data multiplexed electrical signals;

said second acoustic transducer means connected to receive said serial data multiplexed electrical signals from said second multiplexing means for converting said serial data electrical signals to acoustic data signals and transmitting said acoustic data signals;

said first acoustic transducer means connected to receive said acoustic data signals from said second acoustic transducer means for converting said acoustic data signals to serial data multiplexed electrical signals; and

said first multiplexing means connected to receive said serial data multiplexed electrical signals from said first acoustic transducer means and for demultiplexing said serial data multiplexed electrical signals and converting them to parallel data multiplexed signals and adapted to provide said parallel data multiplexed signals to said fire control system.

4,680,585

### PULSE-EXCITED, AUTO-ZEROING MULTIPLE CHANNEL DATA TRANSMISSION SYSTEM

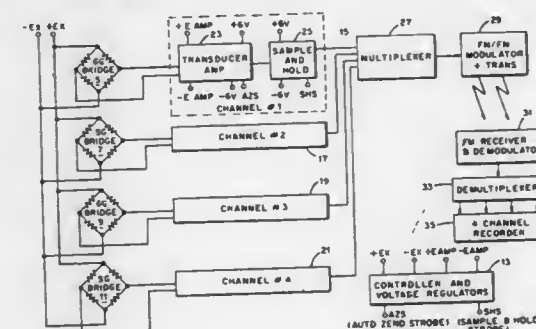
George E. Fasching, Morgantown, W. Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 22, 1985, Ser. No. 704,114

Int. Cl.<sup>4</sup> G01C 15/08

U.S. Cl. 340—870.13

3 Claims



1. A multiple channel data transmission system, comprising: a plurality of data channels, each channel including a trans-



ducer for generating an output signal proportional to a variable to be measured in response to the application of a transducer excitation pulse thereto, a transducer amplifier means for amplifying the output of said transducer in response to the application of an amplifier excitation pulse, a sample-and-hold circuit means for sampling and holding the output level of said amplifier means in response to a sample-and-hold strobe pulse applied thereto and an auto zeroing means for nulling the output of said amplifier means in response to an auto zero strobe pulse applied thereto;

- a control means for cyclically generating at a selected cycle rate said transducer excitation pulse, said amplifier excitation pulse, said sample-and-hold strobe pulse and said auto zero strobe pulse so that said amplifier means is excited for a preselected period during which said auto zero strobe pulse is generated followed by said transducer excitation pulse and said sample-and-hold strobe pulse is generated during said transducer excitation pulse so that the value stored by said sample-and-hold circuit means is updated during each cycle of said control means, thereby producing pseudo-continuous outputs from said sample-and-hold circuit means of each said plurality of data channels;
- a transmitter means including a multiplexer means for continuously sampling said pseudo-continuous outputs of each of said data channels and multiplexing said signals onto a single channel to produce a modulated signal to be transmitted; and
- a receiver means for receiving said modulated signal.

4,680,586

#### GENERATOR CAPABLE OF PRODUCING MULTIPLE SIGNALS WITH DIFFERENT FREQUENCIES AND A TRANSMITTER WHICH INCLUDES A SIGNAL GENERATOR OF THIS KIND

Patrick Marchand, Fraconville, France, assignor to Jeumont-Schneider Corporation, Puteaux, France

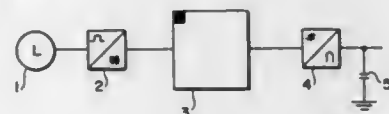
Filed Sep. 24, 1985, Ser. No. 779,672

Claims priority, application France, Sep. 26, 1984, 84 14784

Int. Cl.<sup>4</sup> G08C 19/26

U.S. Cl. 340—870.26

6 Claims



1. Signal generator apparatus comprising a memory having storage locations storing, in digital form, successive samples of the amplitude of the sum of a multiple number of analog signals of different predetermined frequencies, said frequencies being selected such that said samples collectively correspond to a different integer number of cycles for each of said signals, address counter means connected to said memory for successively addressing said storage locations, a clock connected to control said address counter means, digital-to-analog converter means connected to said memory for converting said samples into an analog signal which is substantially equivalent to said sum of said signals, and capacitive smoothing means connected to the output of said digital-to-analog converter means for smoothing the analog signal output of said digital-to-analog converter means.

4,680,587

#### INSTRUMENT LANDING SYSTEM

John P. Chisholm, Olympic Valley, Calif., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Aug. 14, 1985, Ser. No. 765,490

Int. Cl.<sup>4</sup> G01S 13/86

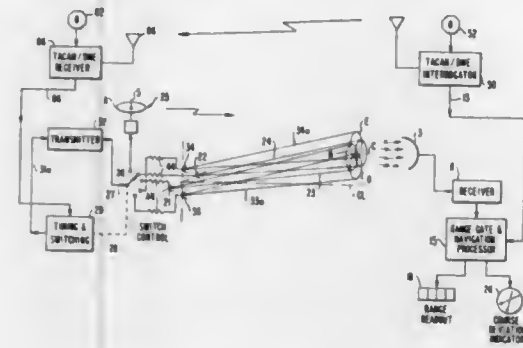
U.S. Cl. 342—33

9 Claims

1. An improved landing system for landing an aircraft along a preferred landing guidance path including a predetermined

glideslope and a centerline, the landing system being of the type having ground installations each including a trigger input operative in response to reception of an interrogating signal from a landing aircraft to actuate a transmitter to radiate a sequence of responses to the aircraft which responses include precision guidance signals radiated through directional guidance antennas directed along the guidance path, and the landing system having airborne installations each including means for receiving said responses and means for processing them to provide indications for guiding the landing of the aircraft, the improvements comprising:

- (a) at each participating ground installation, a TACAN/DME receiver tuned to a DME frequency assigned to that particular ground installation, the TACAN/DME



receiver having a trigger output occurring in response to reception of an interrogating signal, which output is connected to the trigger input of the ground installation; and

- (b) in each participating aircraft an airborne installation including a TACAN/DME interrogator and antenna means for radiating interrogating signals to a ground installation, the interrogator being tunable to assigned DME frequencies whereby to select and uniquely interrogate a particular one of the ground installations, and the interrogator having a timing signal output connected to the airborne processing means for indicating the instant of transmission of each interrogating signal, whereby received responses to interrogating signals will be synchronous with the interrogating signals generated in a particular airborne installation.

4,680,588

#### RADAR SYSTEM WITH INCREMENTAL AUTOMATIC GAIN CONTROL

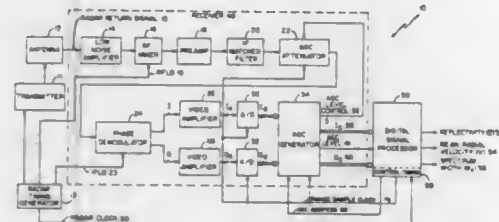
Robert H. Cantwell, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 5, 1985, Ser. No. 804,944

Int. Cl.<sup>4</sup> G01S 7/34

U.S. Cl. 342—92

28 Claims



1. A receiver having a variable dynamic range for processing input signals from a plurality of transmission sweeps each of said sweeps having a plurality of range cells comprising:

means for converting analog video signal representations of said input signals to digital words;

means for adjusting a dynamic range of said receiver to correspond to a range of possible amplitudes of said input signals in response to an incremental automatic gain control (AGC) level;

means coupled between said adjusting means and said converting means for generating said video signal representations for said plurality of range cells in each of said sweeps, each of said video signal representations having a real component; and

means coupled to said converting means for generating said incremental AGC level for each one of said range cells in a next one of said sweeps, said incremental AGC level determined by an absolute value of (one of) said real component of said digital words of said video signal representations, an A/D limit condition set by said absolute value, an AGC level for a corresponding one of said range cells in a present one of said sweeps, an A/D limit condition for a corresponding range cell in a previous sweep and an A/D level guardband.

4,680,589

#### ADAPTIVE FAST FOURIER TRANSFORM WEIGHTING TECHNIQUE TO INCREASE SMALL TARGET SENSITIVITY

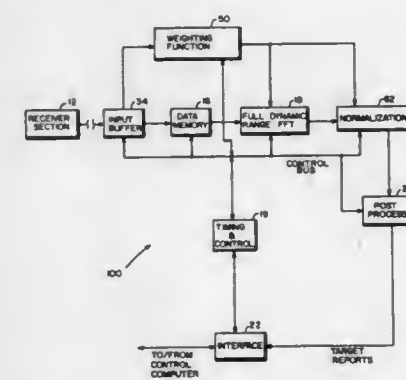
Stephen M. Bryant, Baltimore, and Donald J. Speir, Columbia, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 2, 1984, Ser. No. 656,844

Int. Cl.<sup>4</sup> G01S 7/32

U.S. Cl. 342—196

14 Claims



1. A radar signal processor, having an FFT circuit for processing receiver signal data, said data including a plurality of information-bearing range gates, said FFT circuit disposed for applying one of a plurality of weighting functions to a respective individual range gate, said FFT circuit thereby producing an output signal generally resulting in amplitude difference between various respective individual range gates, said radar signal processor comprising:

- an input buffer for determining the magnitude of each of said range gates, wherein said input buffer makes an input buffer magnitude determination in the form of a maximum amplitude for each said range gate over a discrete period using a magnitude detector and a Log<sub>2</sub> computer computing the Log<sub>2</sub> of such detected vector magnitude for each said range gate, said input buffer including a Log<sub>2</sub> interim maximum amplitude memory and a comparator, said comparator and said Log<sub>2</sub> memory cooperating to determine a largest Log<sub>2</sub> value per range gate per discrete period;
- a weighting function selecting circuit connected between said input buffer and said FFT circuit, responsive to said input buffer magnitude determination, said weighting

function selecting circuit selecting a weighting function to be applied to each said respective individual range gate, and

a normalization circuit connected with and receiving the output signal of said FFT circuit, said normalization circuit normalizing amplitude differences in the output signal of said FFT circuit.

4,680,590

#### POSITION FINDING SYSTEM

Eric Lowe, St Albans, England; Martin C. Poppe, Cambridge, Vt., and Andrew Stratton, Farnborough, England, assignors to Terrafix Limited, Weyln, England

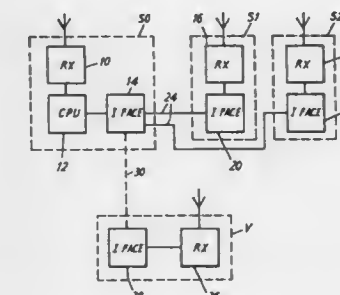
Filed Aug. 2, 1984, Ser. No. 637,204

Claims priority, application European Pat. Off., Aug. 9, 1983, 83304611.3

Int. Cl.<sup>4</sup> G01S 5/10

U.S. Cl. 342—457

14 Claims



1. In a position finding system of the type in which synchronized radio signals are transmitted from a plurality of transmitters stationed at known geodetic positions, to enable the position of mobile receivers to be determined from the phases of signals received from a plurality of transmitters, the improvement comprising:

- a plurality of geographically separated fixed receiving stations having known geodetic positions,
- calculating means at a common station for receiving phase information from all of the fixed receiving stations and for calculating therefrom the apparent geodetic azimuths of the transmitters corresponding to the wavefront directions at the fixed receiving stations, and
- means for calculating azimuth corrections from the differences between true and apparent geodetic azimuths.

4,680,591

#### HELICAL ANTENNA ARRAY WITH RESONANT CAVITY AND IMPEDANCE MATCHING MEANS

Walter J. Axford, Chalfont St. Peter; Francis R. Trumble, Maidenhead, and Charles W. Turner, Virginia Water, all of England, assignors to EMI Limited, Hayes, England

Filed Jun. 27, 1984, Ser. No. 625,246

Claims priority, application United Kingdom, Jul. 1, 1983, 8317938

Int. Cl.<sup>4</sup> H01Q 1/36, 1/40

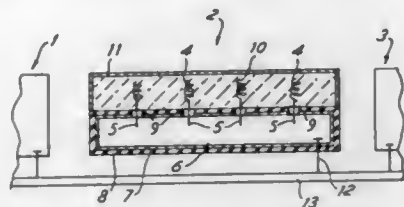
U.S. Cl. 343—853

5 Claims

1. An antenna array comprising:

- a plurality of helical antenna elements, each having a straight stem end portion;
- means to combine signals received at the respective helical antenna elements;
- means to define a single resonant cavity, the single resonant cavity constituting signal-combining means;
- a wall member defining a surface of the single resonant cavity, said wall member having a number of apertures which communicate with the single resonant cavity and said wall member providing support for the helical antenna elements;

each said helical antenna element being mounted over said wall member such that the straight stem extends through a respective aperture with the free end of the stem within the single resonant cavity, thereby to provide coupling between the elements and the cavity;  
electrically-conductive material, of the wall member, forming the cavity-defining surface of that wall member;



means to control impedance between the helical antenna elements and the cavity;  
the impedance-control means being constituted by a predetermined value of thickness of the electrically-conductive material of the wall member.

4,680,592

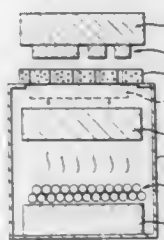
### IMAGE FORMATION METHOD SUBLIMING INK THROUGH A GAS PERMEABLE MEMBRANE

Masanaga Imamura, Fujinomiya, and Isao Mizuno, Gotenba, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan  
Filed Mar. 25, 1986, Ser. No. 843,942

Claims priority, application Japan, Apr. 17, 1985, 60-82007  
Int. Cl.<sup>4</sup> G01D 9/00, 15/10

U.S. Cl. 346-1.1

1 Claim



1. An image formation method utilizing a dyestuff liable to sublime or gasify, said method comprising the steps of:  
forming a thin film of said dyestuff on the back surface of a gas permeable film; and  
heating a heating element adjacent the back surface of said gas permeable film in response to a signal indicative of an image to generate from said dyestuff thin film a dyestuff gas flow which is representative of the image and which permeates through said gas permeable film so that said dyestuff deposits on acceptor paper adjacent the front surface of said gas permeable film to form the image on the back surface of said acceptor paper.

4,680,593

### THERMAL PRINT HEAD

Shozo Takeno, Yokohama; Toshio Shimizu, and Takashi Saito, both of Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Nippon Telegraph & Telephone Corporation, Tokyo, both of, Japan  
Filed Jan. 21, 1986, Ser. No. 820,095

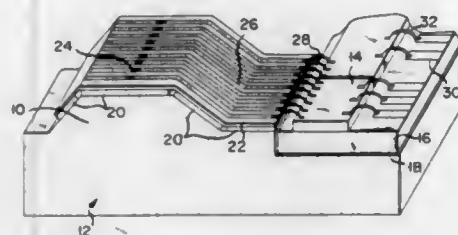
Claims priority, application Japan, Jan. 21, 1985, 60-7459  
Int. Cl.<sup>4</sup> G01D 15/10; H05B 1/00

U.S. Cl. 346-76 PH

8 Claims

1. A thermal head comprising:  
a substrate having a projection;  
a rigid thin plate secured to the substrate and divided into a

plurality of sections in accordance with a change in the level of the surface of the substrate;  
a flexible insulating film coated over the upper surface of the rigid thin plate;  
a plurality of heating elements provided on the flexible insulating film so that the heating elements correspond in location to the projection of the substrate, the heating elements being arranged in a predetermined pattern;



a plurality of lead wires provided on the flexible insulating film, one end of each of the lead wires being electrically connected to the heating elements; and  
an integrated circuit for driving the heating elements, the integrated circuit being located in a lower position on the substrate than the heating elements and being electrically connected to the other ends of the lead wires to selectively drive the heating elements.

4,680,594

### SINGLE BEAM DIRECT READ DURING WRITE AND WRITE PROTECT SYSTEM FOR USE IN AN OPTICAL DATA STORAGE SYSTEM

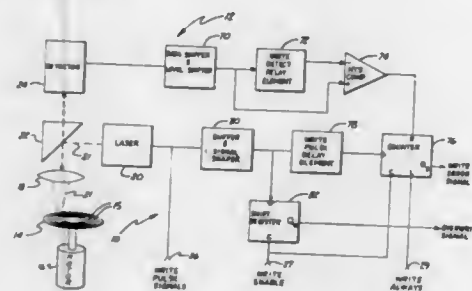
Roger R. Bracht, Colorado Springs, Colo., assignor to Optotech, Inc., Colorado Springs, Colo.

Filed Apr. 2, 1986, Ser. No. 847,274

Int. Cl.<sup>4</sup> G01D 9/42; G11B 5/09

U.S. Cl. 346-108

11 Claims



1. Direct read during write apparatus for use in an optical data storage system, including:

an optical disk;  
laser means for producing a beam of radiation to write data onto the optical disk during write operations;  
radiation detector means for producing signals representative of radiation received from the optical disk, wherein the signals include write detect signals representative of radiation detected during write operations; and  
slope detector means responsive to the radiation detector means for producing verification signals indicative of the accuracy of write operations as a function of a slope of the write detect signals.

4,680,595

### IMPULSE INK JET PRINT HEAD AND METHOD OF MAKING SAME

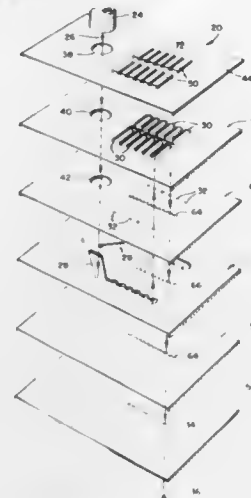
Antonio S. Cruz-Urbe, Cobalt; David W. Hubbard, Stamford, and Gopalan Raman, Bethel, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 6, 1985, Ser. No. 795,584

Int. Cl.<sup>4</sup> G01D 15/16

U.S. Cl. 346-140 R

29 Claims



1. An impulse ink jet print head comprising:  
a plurality of operating plates held together in a superposed relationship including at least:  
a first plate including a pair of proximately disposed nozzles therein for ejecting droplets of ink therethrough;  
a second plate defining a pair of generally coplanar elongated ink chambers having relatively long sidewalls and relatively short endwalls, said chambers being axially aligned along their major axes and proximately opposed to one another at their said endwalls, each of said chambers connected to an ink supply and having an outlet for directing ink toward an associated one of said nozzles in said first plate;  
each of said nozzles having a central axis extending transversely of the planes of said plates and intersecting said second plates at proximate extremities of each of said chambers;  
said plates having passage means connecting each of said nozzles with an associated one of said outlets, the passage means associated with each of said chambers being proximately disposed; and  
a third plate contiguous with said second plate and including driver means for displacing ink in each of said chambers thereby causing the ejection of ink droplets from each of said nozzles.

4,680,596

### METHOD AND APPARATUS FOR CONTROLLING INK-JET COLOR PRINTING HEADS

David J. Logan, Glastonbury, Conn., assignor to Metromedia Company, Secaucus, N.J.

Continuation of Ser. No. 637,143, Aug. 2, 1984, abandoned. This application Jun. 3, 1986, Ser. No. 873,079

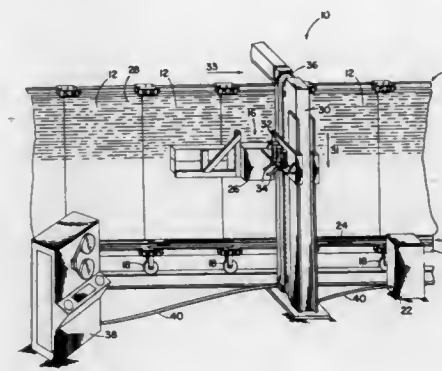
Int. Cl.<sup>4</sup> G01D 15/18; H04N 1/40, 1/23

U.S. Cl. 346-140 PD

10 Claims

1. Apparatus for controlling an ink-jet printing means in a large scale graphic system to apply dots of one color and of substantially fixed size to a plurality of pixel areas located sequentially along a line scanned by said printing means and within each of which pixel areas, potential dot positions form an array identical for all pixel areas, said apparatus comprising:  
means for producing a sequential series of image density signals each representative of the color tone value at

which a respective one of said pixel areas is to be printed by dots of said one color, said density signals having any one of F integral values;  
means for providing, for at least one of said integral values which said density signals may take, a tabular listing of a number of different patterns according to which dots may be arranged in a pixel area to produce the tone value corresponding to said one integral value;  
means for randomly selecting a different one of said patterns from said tabular listing whenever a density signal of said one integral value appears, and  
means for operating said ink-jet printing means to apply dots



in a pattern randomly selected from said tabular listing onto the dot positions of the associated pixel are in the sequence of pixel areas to be printed, each of said dot positions comprising a pixel area being available to receive a dot and being printed when a corresponding dot comprising the random pattern is to be printed in the dot position, wherein the pattern of an immediately adjacent advance pixel area is randomly selected from the tabular listing and the pattern of an immediately adjacent trailing pixel area in the sequence is randomly selected from the tabular listing, each of said immediately adjacent pixel areas in a sequence of pixel areas for a given integral value being printed with a different randomly selected pattern.

4,680,597

### SELF-CONTAINED TYPE PRESSURE SENSITIVE RECORD SHEET

Shigeo Okamoto, Suita, and Tomoharu Shiozaki, Amagasaki, both of Japan, assignors to Kanzaki Paper Manufacturing Co. Ltd., Tokyo, Japan

Filed Aug. 8, 1985, Ser. No. 763,703

Claims priority, application Japan, Aug. 16, 1984, 59-171326  
Int. Cl.<sup>4</sup> B41M 5/16

U.S. Cl. 503-214

3 Claims

1. A self-contained type pressure sensitive record sheet prepared by coating a substrate with a mixture of microcapsules containing a color former and an inorganic solid acid as a color acceptor and drying the resulting coating, the mixture containing 10 to 30% by weight of polyvinyl alcohol based on the weight of the inorganic solid acid, said polyvinyl alcohol having a polymerization degree of 400 to 2400.



4,680,598

## CHROMOGENIC MATERIALS EMPLOYING FLUORAN COMPOUNDS

Takeo Obitsu, Ohmiya; Tetsuo Igaki, Kawagoe; Kimiaki Kinoshita, Kitamoto; Morio Nanbu, Fujimi, and Shinichi Satoh, Tokyo, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Japan

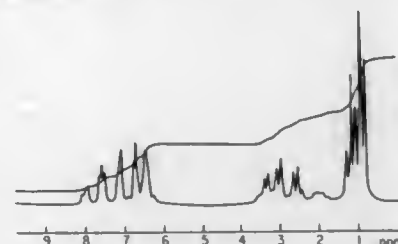
Filed Apr. 8, 1986, Ser. No. 849,759

Claims priority, application Japan, Apr. 18, 1985, 60-81361; Feb. 21, 1986, 61-35094

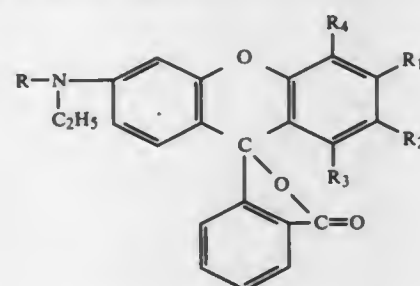
Int. Cl.<sup>4</sup> B41M 5/16, 5/18, 5/22

U.S. Cl. 503-217

58 Claims



1. A chromogenic recording material which comprises a substrate, a fluoran compound of the formula



wherein R is an isobutyl or isopentyl group, R<sub>1</sub> is hydrogen, a halogen atom or an alkyl group, R<sub>2</sub> is hydrogen, a halogen atom or an alkyl group, R<sub>3</sub> is hydrogen, and R<sub>4</sub> is hydrogen, or R<sub>4</sub> and R<sub>1</sub> as well as R<sub>2</sub> and R<sub>3</sub>, when taken together with the carbon atoms to which they are attached, form a substituted or unsubstituted benzene ring wherein the substituent is a halogen atom, as a color forming component, and a color developer capable of causing the color formation of the fluoran compound.

4,680,599

## CATHODE RAY TUBE DISPLAY SYSTEM AND METHOD HAVING BIDIRECTIONAL LINE SCANNING

Ronald D. Wertz, Boulder; James H. Orszulak, Nederland, and Christopher L. Sweeney, Denver, all of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Apr. 29, 1985, Ser. No. 728,387

Int. Cl.<sup>4</sup> G09G 1/14

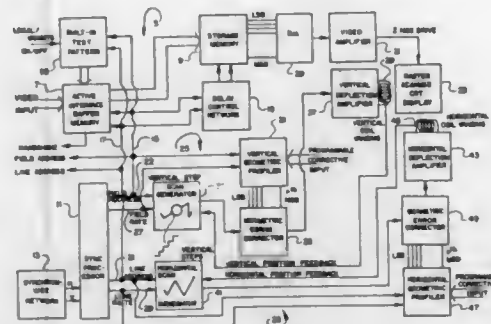
U.S. Cl. 340-744

20 Claims

1. A cathode ray tube display system having bidirectional line scanning, said system comprising: memory means for receiving video information and storing said received information by scan lines; coupling means connected with said memory means for coupling stored video information from said memory means by said scan lines to a cathode ray tube for display thereby; deflection means for deflecting the beam of said cathode ray tube to thereby effect raster scanning of said cathode ray tube by individual lines and for controlling the direction of raster scanning for each scan line of said cathode ray tube so that said lines are alternately scanned in opposite

directions starting with a predetermined one of said lines; and

control means connected with said memory means and said deflection means so that video information coupled from said memory means through said coupling means to said cathode ray tube for display there is coupled from said memory means in the same order as received by said



memory means with respect to said predetermined one of said scan lines and every other succeeding line thereafter, and is coupled from said memory means in reverse order as received by said memory means with respect to the line succeeding said predetermined one of said scan lines and every other succeeding line thereafter, whereby said received video information is displayed at said cathode ray tube without requiring retrace between scan lines.

4,680,600

## SEMICONDUCTOR DEVICE

Akinori Tahara, Zushi; Hiromu Enomoto, Kawasaki, and Yasushi Yasuda, Machida, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 625,156, Jun. 27, 1984, abandoned.

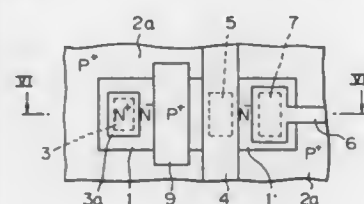
This application Oct. 21, 1986, Ser. No. 921,811

Claims priority, application Japan, Jun. 30, 1983, 58-116954

Int. Cl.<sup>4</sup> H01L 29/56, 29/90, 27/04

U.S. Cl. 357-15

7 Claims



1. A semiconductor device formed on a semiconductor substrate having a first conductivity type and having an input circuit for protecting an internal circuit, said input circuit comprising:

- a first impurity region having a second conductivity type connected to an external terminal and having an island-shape formed on said semiconductor substrate and surrounded by an isolation region having an opposite conductivity type;
- a clamp diode comprising an electrode layer in contact with said first impurity region; and
- a PN junction type protection diode comprising a second impurity region having said first conductivity type, said second impurity region crossing said first impurity region remote from said clamp diode electrode layer at a position between said clamp diode and a portion of said first impurity region connected to said external terminal and extending to said isolation region;

the reverse withstand voltage of said PN junction type protection diode being smaller than that of said clamp diode, whereby excessive current flow through said clamp diode due to a high positive voltage applied to said external terminal is prevented.

4,680,601

## SCHOTTKY POWER DIODE

Heinz Mittelhner, and Bernd Kolbesen, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 494,697, May 16, 1983, abandoned.

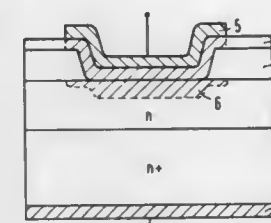
This application Jul. 15, 1986, Ser. No. 885,814

Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219606

Int. Cl.<sup>4</sup> H01L 29/86

U.S. Cl. 357-15

6 Claims



1. A Schottky power diode comprising: a semiconductor substrate having a given band gap, said semiconductor substrate comprising monocrystalline silicon material, an insulating layer disposed on said substrate, a semi-insulating intermediate layer at least partly disposed on said insulating layer, and a Schottky contact disposed on said intermediate layer, said intermediate layer being disposed between said Schottky contact and said substrate, said intermediate layer having a density of localized states from  $10^{17}$  to  $10^{20}$  eV cm<sup>-3</sup>, said intermediate layer having a band gap larger than said given band gap in said semiconductor substrate, said intermediate layer having a resistivity of between  $10^5$  and  $10^{11}$  ohm cm, said intermediate layer being partly disposed on said insulating layer and being partly disposed on said substrate in a window formed in said insulating layer and said Schottky contact extending beyond the edge of said window formed in said insulating layer on to said intermediate layer.

4,680,602

## LIGHT EMITTING DIODE

Hisatsune Watanabe, and Akira Usui, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

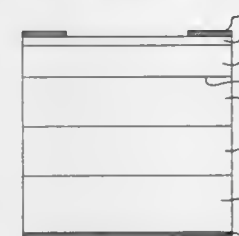
Filed Sep. 6, 1984, Ser. No. 647,744

Claims priority, application Japan, Sep. 6, 1983, 58-163453

Int. Cl.<sup>4</sup> H01L 33/00

U.S. Cl. 357-17

14 Claims



1. A light emitting diode comprising a multilayer semiconductor crystal having a p-n hetero junction structure comprising a substrate of a first conductivity type, a GaAsP graded layer of said first conductivity type formed on said substrate, an active layer of GaAsP of said first conductivity type formed on said graded layer, and a window layer of either InGaP or

InGaAsP of a second conductivity type formed on said active layer;

a first electrode provided on the top surface of said crystal and having an aperture permitting the exit of light emitted from an emitting region of said active layer through said window layer; and

a second electrode provided on the bottom surface of said crystal.

4,680,603

## GRADED EXTENDED DRAIN CONCEPT FOR REDUCED HOT ELECTRON EFFECT

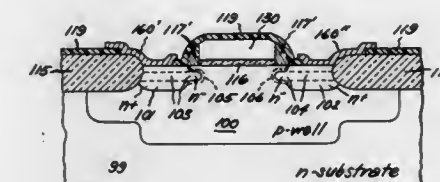
Ching-Yen Wei, and Joseph M. Pimbley, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,640

Int. Cl.<sup>4</sup> H01L 29/78, 29/08, 29/36

U.S. Cl. 357-23.3

16 Claims



1. A metal oxide semiconductor field effect transistor comprising:

a semiconductor body doped with a first polarity dopant; an insulating layer disposed over a portion of said body; and an electrically conductive gate electrode disposed over said insulating layer so as to be electrically insulated from said semiconductor body;

said semiconductor body having a source region heavily doped with a second polarity dopant and a drain region heavily doped with said second polarity dopant, said source and drain regions being disposed in said semiconductor body to a specified depth on either side of said gate electrode;

said semiconductor body also having a lightly doped protrusion extending from at least one of said source and said drain regions, said dopant in said protrusion being a second polarity dopant, each said protrusion being disposed beneath the surface of said semiconductor body and extending toward the region beneath said gate electrode, each said protrusion being spaced apart from the boundary between said semiconductor body and said insulating layer and each said protrusion having a graded region substantially surrounding said protrusion, said protrusion also including at least two second polarity dopants exhibiting distinct diffusivity characteristics.

4,680,604

## CONDUCTIVITY MODULATED MOS TRANSISTOR DEVICE

Akio Nakagawa, Hiratsuka, and Kiminori Watanabe, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 707,556, Mar. 4, 1985, abandoned. This application Nov. 13, 1986, Ser. No. 930,083

Claims priority, application Japan, Mar. 19, 1984, 59-52810

Int. Cl.<sup>4</sup> H01L 29/78, 29/74

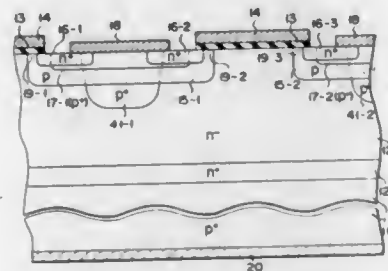
U.S. Cl. 357-23.4

5 Claims

1. A conductivity modulated MOS transistor device comprising:

- a first semiconductor layer of one conductivity type;
- a second semiconductor layer of an opposite conductivity

- type, formed in contact with said first semiconductor layer;
- a first semiconductor region of said one conductivity type formed by diffusion in a surface area of said second semiconductor layer;
- a second semiconductor region of said opposite conductivity type formed by diffusion in a surface region of said first semiconductor region to face said second semiconductor layer, the surface region of said first semiconductor region sandwiched between said second semiconductor region and said second semiconductor layer forming a channel region, and a source electrode formed on the second semiconductor region;
- a gate region including a gate insulation layer formed at least on said channel region, and a gate electrode formed on the gate insulation layer;



- a third semiconductor region of said one conductivity type formed by diffusion in said first semiconductor region without entering the channel region, and shallower than said first semiconductor region and deeper than said second semiconductor region, and including a portion which lies outside a vertical projection of said source electrode directly under said second semiconductor region and has a higher impurity concentration than said first semiconductor region; and
- a fourth semiconductor region of said one conductivity type formed by diffusion from central portions of the surface of said third semiconductor region within the vertical projection of said third semiconductor region and deeper than the first semiconductor region without extending to said portion of said third semiconductor region and said channel region.

4,680,605

#### HIGH VOLTAGE DEPLETION MODE TRANSISTOR WITH SERPENTINE CURRENT PATH

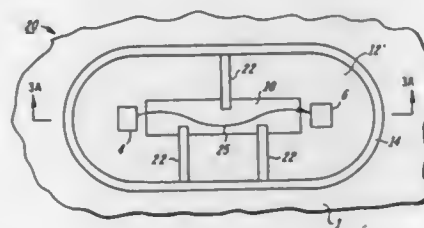
Russel A. Martin, Santa Monica, and Steven A. Buhler, Redondo Beach, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 588,172, Mar. 12, 1984, abandoned.

This application Jan. 13, 1986, Ser. No. 818,384  
Int. Cl.<sup>4</sup> H01L 29/06, 29/78, 27/02, 29/34

U.S. Cl. 357—23.11

2 Claims



1. An MOS transistor including source and drain regions of one conductivity type formed in a substrate of the other conductivity type, a channel region of said one conductivity type

between and connecting said source and drain regions, a gate electrode overlying at least a portion of said channel region, and a conductive barrier ring displaced from and surrounding said regions,

the improvement comprising a plurality of thin, highly doped, non-opposed, surface regions of said other conductivity type extending from said barrier ring to beneath said gate electrode for restricting the flow of source to drain current to a serpentine path beneath said gate electrode.

4,680,606

#### SEMICONDUCTOR TRANSDUCER

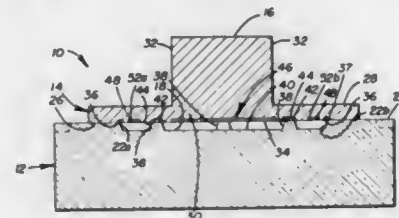
James W. Knutti; Henry V. Allen, both of Fremont; Kurt E. Petersen, San Jose, and Carl R. Kowalski, Fremont, all of Calif., assignors to Tactile Perceptions, Inc., Fremont, Calif.

Filed Jun. 4, 1984, Ser. No. 617,122

Int. Cl.<sup>4</sup> H01L 29/84; G01B 7/16

U.S. Cl. 357—26

27 Claims



1. A semiconductor transducer comprising:  
a substrate having a well formed in one surface thereof;  
a semiconductor layer having first and second substantially parallel surfaces, the edge portions of said first surface being bonded to said substrate about the periphery of said well, said layer forming a diaphragm over said well;  
a pedestal projecting outwardly from said second surface and being disposed above said well for deflecting said diaphragm in response to a force applied to said pedestal, said pedestal having one or more side walls being substantially orthogonal to said second surface;  
integrated circuit means for transducing deflections of said diaphragm into an electrical signal and being formed at said first surface within said diaphragm, said integrated circuit means having means for sensing deflections of said diaphragm and means responsive to said sensing means for developing said electrical signal as a function of the deflection of said diaphragm; and  
means for electrically conducting said signal to a point on said substrate exteriorly of said semiconductor layer.

4,680,607

#### PHOTOVOLTAIC CELL

Takeo Fukatsu; Masaru Takeuchi, both of Kyoto, and Kazuyuki Goto, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed May 3, 1985, Ser. No. 730,670

Claims priority, application Japan, May 11, 1984, 59-94915;  
Jun. 5, 1984, 59-114842

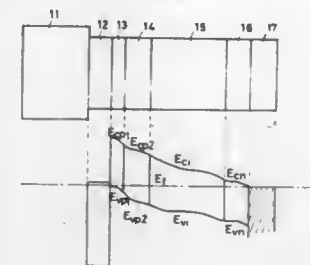
Int. Cl.<sup>4</sup> H01L 27/14

U.S. Cl. 357—30

18 Claims

1. A photovoltaic cell comprising:  
a transparent substrate,  
a transparent first electrode layer on said substrate,  
a first semiconductor layer of a first conductivity type on said first electrode layer, said first semiconductor layer being approximately 25 to 300 Å in thickness and having activation energy of less than 0.3 eV for generation of major carriers,  
a second semiconductor layer of the first conductivity type on said first semiconductor layer, said second semiconductor layer being approximately 100 to 1000 Å in thick-

- ness and having activation energy of more than 0.3 eV for generation of major carriers,  
a third semiconductor layer of a second conductivity type on said second semiconductor layer,



- a fourth semiconductor layer of a third conductivity type on said third semiconductor layer, and  
a second electrode layer on said fourth semiconductor layer.

4,680,608

#### SEMICONDUCTOR DEVICE

Yukio Tsuzuki, Nukata; Masami Yamaoka, Anjo, and Sboji Toyoshima, Kounan, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

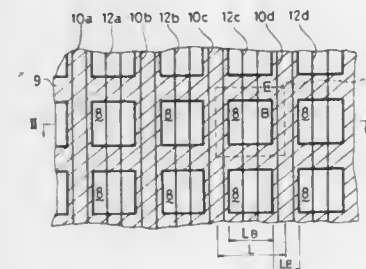
Filed Feb. 1, 1985, Ser. No. 697,571

Claims priority, application Japan, Feb. 7, 1984, 59-21324

Int. Cl.<sup>4</sup> H01L 29/72

U.S. Cl. 357—36

4 Claims



1. A semiconductor device comprising:  
a substrate acting as a collector area with a first conduction type;  
a base area, having a second conduction type, reverse to said first conduction type of said substrate, said base area being formed on said substrate; and  
an emitter area having said first conduction type, and which is formed in said base area in a mesh-like pattern, wherein the width of said emitter area ranges from 50 to 10 microns.

4,680,609

#### STRUCTURE AND FABRICATION OF VERTICALLY INTEGRATED CMOS LOGIC GATES

Iain D. Calder, Nepean; Thomas W. Macelwee, and Abdalla A. Naem, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 24, 1984, Ser. No. 653,192

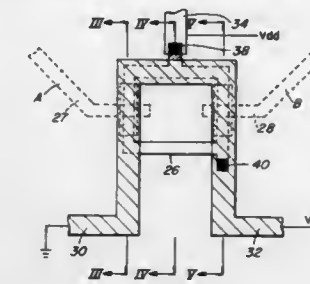
Int. Cl.<sup>4</sup> H01L 27/02, 29/04, 29/78

U.S. Cl. 357—42

19 Claims

1. A vertically integrated MOS logic gate comprising first and second active semiconductor layers, one of the active semiconductor layers having an open loop with a pair of parallel legs and an interconnecting portion extending between said parallel legs, said open loop being formed by at least two transistors, one of said transistors having a source region, a channel region and a drain region positioned along one of said

parallel legs and the other of said transistors having a source region, a channel region and a drain region positioned along the other of said parallel legs, and the other active semiconductor layer having at least one closed loop in which are formed a plurality of transistors, the transistors in one semiconductor layer being substantially vertically aligned with respect to transistors in the other semiconductor layer and having respective common control gates located between the layers, each



control gate controlling one vertically coincident transistor pair, each transistor in said closed loop having a source and a drain region separated by a channel region, at least one of the vertically aligned transistor pairs having drain regions contacting one another at a contact zone, a first and a second lead connected to the open loop to connect the open loop transistors in series, and a third and a fourth lead connected to the or each close loop to connect the closed loop transistors in parallel.

4,680,610

#### SEMICONDUCTOR COMPONENT COMPRISING BUMP-LIKE, METALLIC LEAD CONTACTS AND MULTILAYER WIRING

Erich Pammer, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

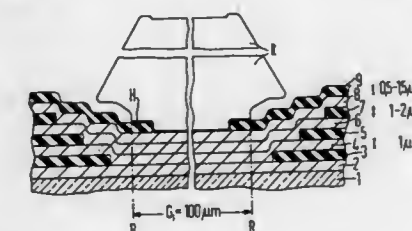
Filed Oct. 22, 1984, Ser. No. 663,364

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343367

Int. Cl.<sup>4</sup> H01L 23/50, 29/40

U.S. Cl. 357—68

11 Claims



1. In a semiconductor component contact structure a multi-layer wiring formed of a plurality of conductive tracks separated by insulating layers is provided on the semiconductor component, and wherein bump-like, metallic lead contacts are provided at contact locations, at a given contact location the lead contact being connected to a plurality of the conductive tracks through an aperture formed in a passivation layer lying over the multi-layer wiring, wherein the improvement comprises:

an area being defined by a maximum horizontal expanse of a portion of the lead contact in overlying contact with the final passivation layer;  
insulating layers at said contact location lying outside of a vertical projection of said area;  
the conductive tracks forming a layer sequence beneath the lead contact, the lead contact having a projection through



the aperture of the passivation layer in electrical abutting contact with a top one of the conductive tracks; and the individual insulating layers terminating in the horizontal direction outwardly of and at different distances from the projection of said area.

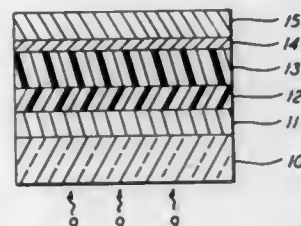
4,680,611

**MULTILAYER OHMIC CONTACT FOR P-TYPE SEMICONDUCTOR AND METHOD OF MAKING SAME**  
Bulent M. Basol, Los Angeles, Calif., assignor to Sohio Commercial Development Co., Cleveland, Ohio

Filed Dec. 28, 1984, Ser. No. 687,092

Int. Cl.<sup>4</sup> H01L 23/48

U.S. Cl. 357—71



1. An ohmically conductive contact for a thin film p-type semiconductor compound formed of at least one of the metal elements of Class IIB of the Periodic Table of Elements and at least one of the non-metal elements of Class VIA of the Periodic Table of Elements comprising a first layer of copper contiguous with said p-type semiconductor compound and having a layer thickness of from about 5 Angstroms to about 50 Angstroms and a second layer thereon comprising at least a second conductive metal.

4,680,612

**INTEGRATED SEMICONDUCTOR CIRCUIT INCLUDING A TANTALUM SILICIDE DIFFUSION BARRIER**

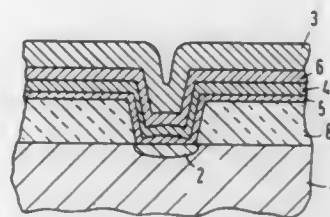
Konrad Hieber, Bernau; Franz Neppl, and Konrad Schöber, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany  
Filed Mar. 24, 1986, Ser. No. 843,380

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3513002

Int. Cl.<sup>4</sup> H01L 23/48

U.S. Cl. 357—71

10 Claims



1. An integrated semiconductor circuit comprising: a silicon substrate having an impurity doped circuit therein, a layer of silicon dioxide formed on said substrate and having a contact hole therein overlying said circuit, an outer contact interconnect layer composed of aluminum or an aluminum alloy for providing electrical contact to said circuit, a tantalum disilicide diffusion barrier layer disposed between said circuit and said interconnect layer, and

a layer of substantially pure tantalum both above and below said tantalum disilicide diffusion barrier layer.

4,680,613

**LOW IMPEDANCE PACKAGE FOR INTEGRATED CIRCUIT DIE**

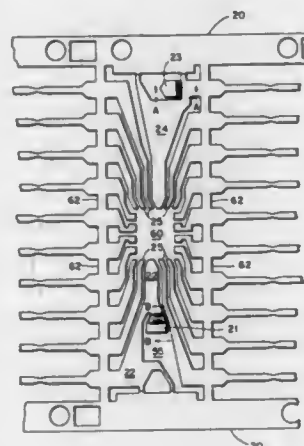
Wilbert E. Daniels, West Buckston, and Dana J. Fraser, South Portland, both of Me., assignors to Fairchild Semiconductor Corporation, Palo Alto, Calif.

Filed Dec. 1, 1983, Ser. No. 557,119

Int. Cl.<sup>4</sup> H01L 23/48, 23/30

U.S. Cl. 357—72

27 Claims



1. A low inductive impedance dual in-line package for an integrated circuit die comprising:

a lead frame formed with a plurality of electrically active lead fingers lying in a common plane and including a ground lead finger, said lead frame formed with a central opening without a die attach paddle and without paddle support fingers;

a ground plate forming a die attach plane parallel with said lead frame for supporting an integrated circuit die attached to one side of the ground plate, said ground plate having an area substantially coextensive with the area of the common plane of the lead fingers and a die attach side facing the lead frame, said ground plate being spaced from the lead frame for imaging signal fields of the lead fingers in the ground plate;

a dielectric layer formed between the lead frame and ground plate;

electrical contact means providing parallel electrical coupling between the ground lead finger of the lead frame and the ground plate thereby providing a ground path through the ground plate with planar configuration to minimize inductive impedance to ground current and to minimize cross coupling of signals between the electrically active lead fingers;

an integrated circuit die bonded to the die attach side of the ground plate and aligned within the central opening of the lead frame; said integrated circuit die being formed with a ground terminal pad;

and interconnect lead wire means bonded between the ground terminal pad of the integrated circuit die and the ground plate.

4,680,614

**PLANAR VOID FREE ISOLATION STRUCTURE**

Klaus D. Beyer, 3 Tamidan Rd., Poughkeepsie, N.Y. 12601, and Victor J. Silvestri, R.D. 9, Beverly Ct., Hopewell Junction, N.Y. 12533

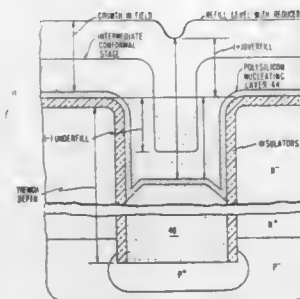
Division of Ser. No. 624,425, Jun. 24, 1984, Pat. No. 4,528,047.

This application Mar. 14, 1985, Ser. No. 711,554

Int. Cl.<sup>4</sup> H01L 21/95, 27/04

U.S. Cl. 357—50

7 Claims



1. A void free isolated semiconductor structure comprising: a pattern of substantially vertically sided trenches within a semiconductor body; a first insulating layer upon the sidewalls of said trenches; combined void free epitaxial silicon and polycrystalline silicon layers substantially located inside said trenches, said combined silicon layers comprising, an epitaxial layer extending from the base of said trenches and filling said trenches up to between about 0.3 to 4.0 micrometers from the upper surface of said trenches, said epitaxial layer having a planar upper surface, said planar upper surface being substantially parallel to said base of said trench, and a polycrystalline silicon layer over said planar upper surfaces of said epitaxial layer; a second insulating layer covering the exposed upper surface of said polycrystalline silicon layer and the exposed surfaces of said first insulating layer, isolating said pattern of trenches from adjoining structures that exist over said trenches.

4,680,615

**SILICON SEMICONDUCTOR COMPONENT WITH AN EDGE CONTOUR MADE BY AN ETCHING TECHNIQUE, AND METHOD FOR MANUFACTURING THIS COMPONENT**

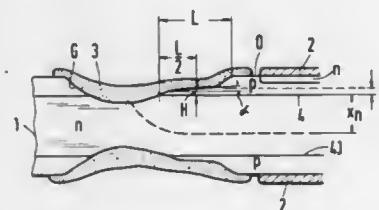
Oswald Götzenbrucker, Worms, and Gerhard Popp, Lampertheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany  
Filed Jun. 14, 1985, Ser. No. 744,811

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422051

Int. Cl.<sup>4</sup> H01L 29/06, 21/306; B44C 1/22; C03C 15/00

U.S. Cl. 357—55

6 Claims



6. Silicon semiconductor component with a wafer-like silicon semiconductor body with an edge contour made by an etching technique, comprising a p-region parallel to a principal

surface of the semiconductor body, a n-region beneath the p-region, a pn-junction, a more heavily doped p-region and a less heavily doped n-region, a passivating ditch in the principal surface between the more heavily doped n-region and the pn-junction leading into the passivating ditch, in which the edge contour has a flank length designated L which runs between the emergence of the pn-junction into the passivating ditch and the principal surface of the semiconductor body, and has a small angle of inclination designated  $\alpha$  of  $1^\circ$  to  $7^\circ$  with the angle of inclination  $\alpha$  of the edge contour nearly uniform over the major part of the flank length L and that the following relationships:

$$L = (0.8 \dots 1.6) \cdot x_n \text{ and}$$

$$H = (0.5 \dots 1.2) \cdot x_p \text{ where}$$

H = the height of the p-doped silicon layer over the pn-junction, measured in the center of the flank length L,

$x_n$  = the extent of the space charge zone into the n-region,

$x_p$  = the extent of the space charge zone into the p-region at cut-off voltage of the component.

4,680,616

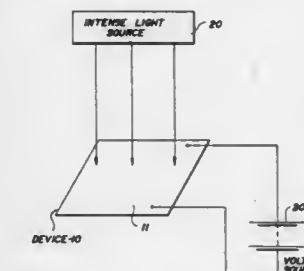
**REMOVAL OF DEFECTS FROM SEMICONDUCTORS**  
Alan E. Delahoy, Rocky Hill, and Thomas Tonon, Princeton, both of N.J., assignors to Chronar Corp., Princeton, N.J.

Filed May 9, 1986, Ser. No. 861,555

Int. Cl.<sup>4</sup> H01L 31/06, 31/18

U.S. Cl. 357—59

14 Claims



1. The method of removing defects from an amorphous semiconductor having a PIN junction therein, which comprises the steps of

(a) applying a reverse bias potential to the semiconductor to create an electric field across said P-I-N junction; and  
(b) irradiating said semiconductor with photon energy greater than the semiconductor bandgap energy, wherein said reverse bias potential is applied before the irradiation; and

(c) extinguishing said irradiation before removing said bias potential, thereby preventing degradation that would occur in the presence of irradiation without bias.

4. The method of claim 1 wherein the reverse bias potential is in the range from 1 to 10 volts and the radiation has an intensity in the range from 1 to 100 suns.

4,680,617

**ENCAPSULATED ELECTRONIC CIRCUIT DEVICE, AND METHOD AND APPARATUS FOR MAKING SAME**  
Milton I. Ross, 400 College Ave., Haverford, Pa. 19041

Filed May 23, 1984, Ser. No. 613,172

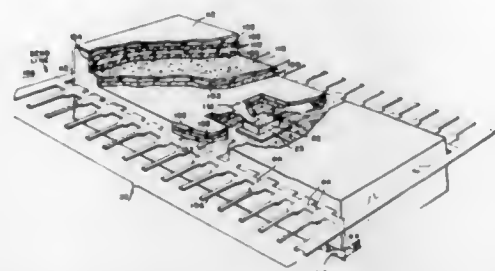
Int. Cl.<sup>4</sup> H01L 23/28, 39/02, 23/48, 25/04

U.S. Cl. 357—72

38 Claims

1. An encapsulated electronic circuit device comprising: a first assembly including at least one electronic circuit device connected by bonded wires to an array of conductive leads extending therefrom; and a second assembly including plural generally parallel mutu-

ally laminated layers of plastic resin and fiber completely surrounding and encapsulating said first assembly except located on the semiconductor surface between the conductor tracks and which contacts parts of the conductor tracks, said



for the distal ends of said leads which remain exposed for external electrical connections.

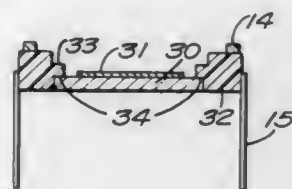
**4,680,618**  
**PACKAGE COMPRISING A COMPOSITE METAL BODY BROUGHT INTO CONTACT WITH A CERAMIC MEMBER**

Toshio Kuroda, and Koichi Kumazawa, both of Nagoya, Japan, assignors to Narumi China Corporation, Nagoya, Japan  
Filed Sep. 7, 1983, Ser. No. 530,093

Claims priority, application Japan, Sep. 9, 1982, 57-157684  
Int. Cl.<sup>4</sup> H01L 23/02

U.S. Cl. 357-74

2 Claims



1. A package for use in encapsulating a semiconductor device, said package comprising a first member of a ceramic material and a second member of composite material comprising by weight of about 1 to 30% of a copper portion and about 99 to 70% of a preselected material selected from the group consisting of tungsten and molybdenum in the form of a porous block, said porous block having been impregnated with said copper portion from the molten state of said copper.

**4,680,619**  
**SEMICONDUCTOR DEVICE HAVING SILICON CONDUCTOR TRACKS CONNECTED BY A METAL SILICIDE TRACK**

Jan Lohstroff, and Wilhelmus J. M. J. Josquin, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

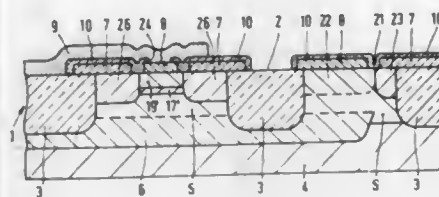
Filed Aug. 31, 1984, Ser. No. 645,897  
Claims priority, application Netherlands, Sep. 15, 1983, 8303179

Int. Cl.<sup>4</sup> H01L 29/04

U.S. Cl. 357-86

8 Claims

1. A semiconductor device comprising a semiconductor body of silicon having a first main surface, a conductor structure with conductor tracks which are spaced apart at said surface, which tracks comprise silicon of two opposite conductivity types and which are connected to each other in an electrically conducting manner, and a layer of metal silicide, at least at the area of the conductive connection the conductor tracks being located on the semiconductor surface and being connected to each other by said layer of metal silicide which is



layer of metal silicide connecting together said conductor tracks and said semiconductor surface.

**4,680,620**  
**MEASUREMENT OF SC/H PHASE USING A SUBCARRIER TIME MARK GENERATOR AND A CALIBRATED PHASE SHIFTER**

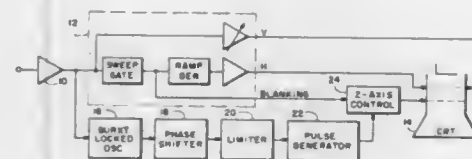
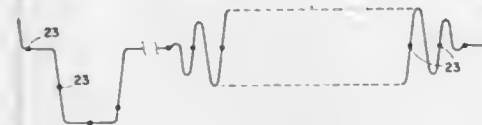
Daniel G. Baker, Aloha, and Kenneth M. Ainsworth, Bend, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 6, 1986, Ser. No. 836,944

Int. Cl.<sup>4</sup> H04N 17/02, 9/44

U.S. Cl. 358-10

10 Claims



1. Apparatus for indicating the timing relationship between a reference point of an input signal that repeats at a first, lower frequency and a signal element that repeats at a second, higher frequency, comprising a display device having a display surface, means for generating a visible dot on the display surface, first deflection means for repeatedly deflecting the position of the visible dot in a first direction at a uniform rate and in synchronism with the repetition of the input signal, and second deflection means for deflecting the position of the visible dot in a second direction that is substantially perpendicular to said first direction by a distance that depends substantially linearly upon the amplitude of the input signal, whereby the display device displays a visible trace representing the waveform of at least a part of the input signal, and the apparatus also comprising signal generator means for generating a continuous repetitive signal having a repetition frequency that is integrally related to said second frequency, phase adjustment means for selectively varying the phase of the continuous repetitive signal relative to said signal element, and modulator means for modulating the visible dot in response to the continuous repetitive signal, in a selected dimension other than spatially in a linear relationship with the amplitude of the continuous repetitive signal, whereby the visible trace includes features indicating the phase of the continuous repetitive signal and the phase relationship between the signal element and the reference point can be determined by calibrated adjustment of the phase of the continuous repetitive signal.

**4,680,621**  
**METHOD AND APPARATUS FOR VARIABLE PHASING OF PERIODIC SIGNALS**

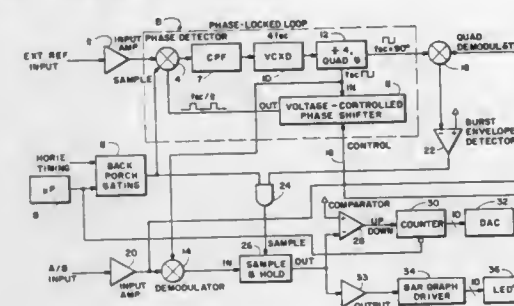
Daniel G. Baker, Aloha, and Margaret A. Feisel, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 16, 1985, Ser. No. 776,313

Int. Cl.<sup>4</sup> H04N 9/45, 9/44; H04L 7/00, 25/36

U.S. Cl. 358-19

11 Claims



1. A method of generating a periodic output signal at a selectively variable phase relative to a periodic input signal, comprising comparing the input signal with a third periodic signal that has a frequency which is less than the frequency of the input signal and that has a duty cycle which is equal to one-half of the ratio of the frequency of the third periodic signal to the frequency of the periodic input signal, detecting the phase difference between the input signal and that frequency component of the third periodic signal which has the same frequency as the input signal, generating said output signal at a frequency such as to maintain a predetermined phase relationship between the periodic input signal and said frequency component, and selectively varying the phase of said output signal relative to said third periodic signal.

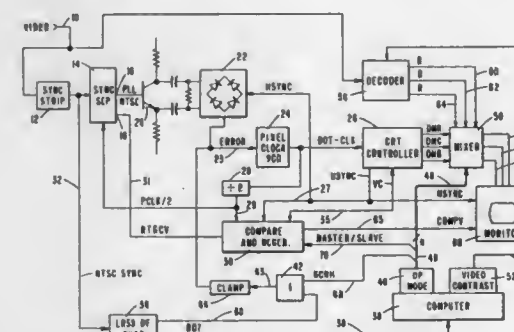
**4,680,622**  
**APPARATUS AND METHOD FOR MIXING VIDEO SIGNALS FOR SIMULTANEOUS PRESENTATION**  
Lawrence C. Barnes, Apipka, and Robert G. Mankedick, Longwood, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 11, 1985, Ser. No. 700,567

Int. Cl.<sup>4</sup> H04N 5/272, 5/262

U.S. Cl. 358-22

14 Claims



1. An apparatus for combining two video signals comprising: a first input for receiving a first video signal having a first amplitude; a second for receiving a second video signal having a second amplitude; proportioning means connected to said first and second inputs, said proportioning means for algebraically adding a fixed portion of said first amplitude with a fixed portion of said second amplitude to give a composite amplitude,

said fixed portions of said first and second amplitudes being inversely proportional to one another; and output means connected to said proportioning means for providing said composite amplitude for video display.

**4,680,623**  
**SOLID STATE COLOR IMAGING APPARATUS PRODUCING CHROMINANCE AND LUMINANCE SIGNALS FROM UNSATURATED ORES OF N COLOR SIGNALS**

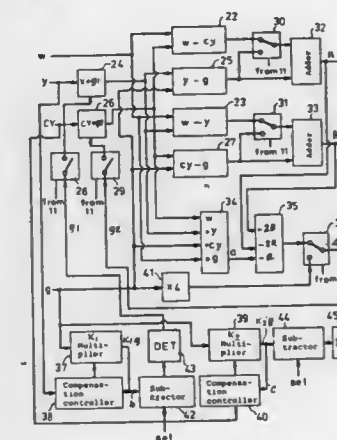
Makoto Fujimoto, Ibaraki; Yoshinori Kitamura, Takatsuki; Atsushi Morimura, Nara, and Hiroki Matsuoka, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 11, 1985, Ser. No. 700,382

Claims priority, application Japan, Feb. 15, 1984, 59-26324  
Int. Cl.<sup>4</sup> H04N 9/077, 9/04

U.S. Cl. 358-44

4 Claims



1. A solid state color imaging apparatus comprising: a plurality of color filters of n different predetermined colors arranged in a predetermined manner; a solid state imaging sensor for receiving light from an image through said color filters and producing therefrom n color signals having varying levels; operation means for receiving said n color signals from said solid state imaging sensor and operating upon said signals for producing at least one of chrominance signals and a luminance signal either in a first mode such that said at least one of chrominance signals and a luminance signal are produced using all of said n color signals, or in a second mode in which said at least one of chrominance signals and a luminance signal are produced by using only n-1 of said n color signals wherein one of the n color signals is omitted because it has reached a predetermined saturation level; and control means, responsive to said n color signals and connected to said operation means, for switching the mode of operation of said operation means from said first mode to said second mode when said control means determines that one of said n color signals has reached its predetermined saturation level.



4,680,624

# SIGNAL PROCESSING CIRCUIT FOR A COLOR VIDEO CAMERA PROVIDING SHADING CORRECTION BY VARYING THE BLACK CLAMPING LEVEL

Toshio Murakami, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

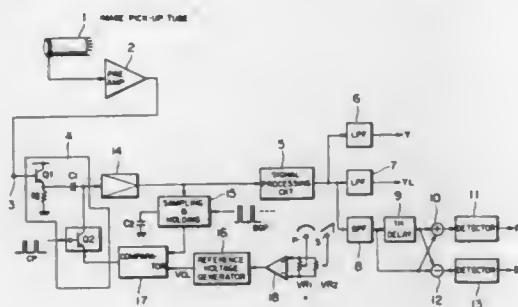
Filed Jul. 25, 1984, Ser. No. 634,070

Claims priority, application Japan, Jul. 25, 1983, 58-134341; Jul. 29, 1983, 58-137544; Jul. 29, 1983, 58-137543

Int. Cl.<sup>4</sup> H04N 9/077, 5/18, 9/64, 9/68

U.S. Cl. 358-44

13 Claims



1. A signal processing circuit for a color video camera in which a color video signal is obtained by using a single image pickup device provided with a color stripe filter on a photoconductive surface, said circuit comprising:

a clamping circuit for clamping a black level of a video signal produced from the image pickup device to a predetermined level determined by an externally applied reference potential;

correcting means for superimposing onto said reference potential a signal having a waveform with a polarity opposite to that of a shading waveform in said video signal;

means for deriving a luminance signal and a plurality of color difference signals from an output signal of said clamping circuit;

means for modulating a carrier chrominance signal with said derived color difference signals;

variable gain amplifier means for amplifying said carrier chrominance signal modulated with said color difference signals;

means for detecting the level of a luminance component of a video signal produced from said image pickup device; and means for controlling the gain of said variable gain amplifier means when said detecting means detects that the level of said luminance component is lower than a first predetermined level.

4,680,625

# METHOD AND APPARATUS FOR MULTICOLOR IMAGE FORMING

Hisashi Shoji, Satoshi Haneda, and Seichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,335

Claims priority, application Japan, Jul. 18, 1984, 59-150448; Jul. 18, 1984, 59-150449; Jul. 18, 1984, 59-150450; Jul. 18, 1984, 59-150451

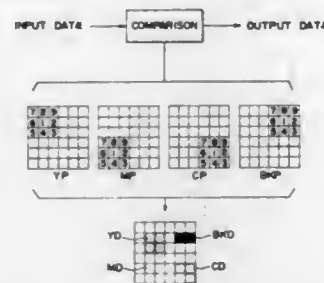
Int. Cl.<sup>4</sup> H04N 1/46

U.S. Cl. 358-80

13 Claims

1. A color image forming apparatus comprising means for applying an original image data consisting of a plurality of different color informations for conversion, means for converting said original image data, means for forming a latent image on a single image retainer on the basis of a result of said converting means, a plurality of developing means for developing said latent image with toners of mutually different colors, means for transferring a toner image formed on said image retainer to a transfer material, wherein toner images of a plural-

ity of mutually different colors form a multicolor toner on said image retainer by repeating the formation and development of



said latent image and are transferred in one step onto said transfer material.

4,680,626

# COLOR IMAGE PROCESSING SYSTEM FOR CONVERTING ANALOG VIDEO-TO-DIGITAL DATA

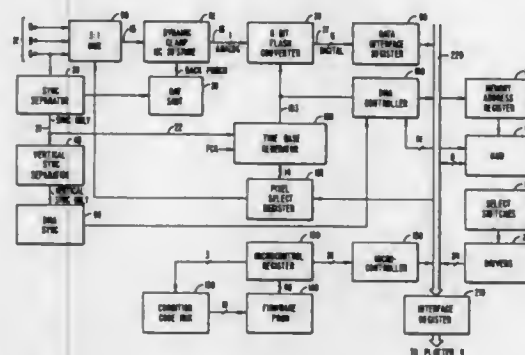
Michael F. Deering, Mountain View, and Galen Collins, San Jose, both of Calif., assignors to Benson, Inc., Mountain View, Calif.

Filed Apr. 9, 1985, Ser. No. 721,359

Int. Cl.<sup>4</sup> H04N 1/46, 5/78

U.S. Cl. 358-80

20 Claims



1. A system for converting analog video information including first timing signals to digital data-to-control apparatus for reproducing the information, the system comprising:

converter means connected to receive the analog video information supplied thereto for extracting samples of the analog video information and converting the samples to digital data;

converter control means connected to receive at least the first timing signals and in response thereto supply second timing signals after a specified delay to the converter means to control when the converter means extracts samples of the analog video information;

storage means connected to the converter means for storing the digital data therefrom;

microcontroller means connected to the converter control means to provide data indicative of the specified delay and connected to the storage means for processing the data in the storage means according to a stored program in the microcontroller means; and

interface means connected to the microcontroller means for receiving the processed data therefrom and supplying it to the apparatus for reproducing the information.

17. A method for converting from a pixel of a first three-color system to a second-color system which includes three colors and black comprising:

providing a measure of the intensity of each of three colors of the pixel;

generating a color look-up table defining a desired relationship between measures of intensity of the first three-color system and desired intensity of the second color system; converting from the measured intensity of the first three-color system to desired intensity of the second color system with the color look-up table;

replacing the intensity of whichever color of the second color system has the least intensity with that same intensity of black;

removing intensity from each of the two remaining colors in an amount equal to the intensity of black;

adding intensity back to the two remaining colors to thereby create a specified intensity for each of the colors and black;

generating a threshold table defining a threshold intensity for each color and black at which a bilevel display device having a limited plurality of colors will print an appropriate one of the limited plurality of colors;

comparing the resulting intensities of each color of the second color system and black with the threshold intensity from the threshold table; and

printing an appropriate one of the colors or black if the specified intensity of that color or black is in a defined relationship to the threshold intensity.

4,680,627

# APPARATUS FOR CHECKING PATTERNS ON PRINTED CIRCUIT BOARDS

Akira Sase, Katsuta; Takeo Nagata, Hitachi; Masao Fukunaga; Yutaka Sakurai, both of Katsuta, and Yoshikatsu Satomi, deceased, late of Mito, by Fumiko Satomi, legal representative, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

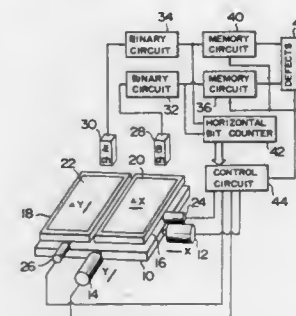
Filed Mar. 12, 1986, Ser. No. 838,713

Claims priority, application Japan, Mar. 19, 1985, 60-55205

Int. Cl.<sup>4</sup> H06N 7/18

U.S. Cl. 358-101

12 Claims



1. An apparatus for checking patterns on printed circuit boards comprising:

inspection table means for fixing thereon at least two printed circuit boards on which patterns to be compared with each other are formed;

imager means for imaging the respective patterns on the respective printed circuit boards;

display means for displaying images of the patterns imaged by said imager means; and

comparing means for comparing said images of the patterns, said printed circuit boards each having registration patterns each including orthogonal straight line segments,

said apparatus further comprising registration means for matching images of the registration patterns formed on the respective printed circuit boards and displayed on said display means.

4,680,628

# REALTIME DIGITAL DIAGNOSTIC IMAGE PROCESSING SYSTEM

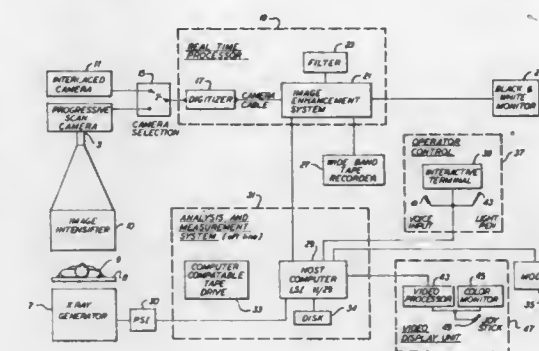
David R. Wojcik, Woburn; Richard J. Jones, Winchester, and James M. Anferio, Reading, all of Mass., assignors to Ittek Corporation, Lexington, Mass.

Filed Jan. 4, 1984, Ser. No. 568,013

Int. Cl.<sup>4</sup> H04N 5/32

U.S. Cl. 358-111

29 Claims



1. Apparatus for processing a fluoroscopic image comprising:

- a television camera operating at a frame rate of at least 30 frames per second providing an analog video output;
- means to digitize series of individual frames of said analog video output to provide frames of digital image information representative of the analog signal;
- a plurality of frame processors coupled in series for carrying out arithmetic and logical operations on said frames of digital image information coupled to receive the output of said digitizer;
- a 2-D digital finite impulse response filter operable on said individual frames of digital image information coupled to said frame processors;
- means to convert frames of digital image information processed in said frame processors and 2-D filter back into frames of an analog signal; and
- a television display coupled to the output of said means to convert for displaying said processed signal.

4,680,629

# DISPLAY UNIT

Nobuo Fukushima, Nagasaki, and Shuji Iwata, Hyogo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

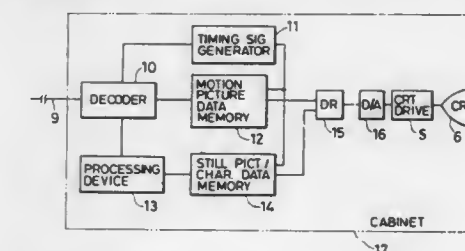
Filed Feb. 27, 1985, Ser. No. 706,412

Claims priority, application Japan, Feb. 28, 1984, 59-38313

Int. Cl.<sup>4</sup> H04N 7/087, 7/08

U.S. Cl. 358-147

1 Claim



1. A display unit comprising: a decoder receiving on an output terminal a signal containing motion picture, still picture and character data and command data in a multiplex mode; a motion picture data memory, said decoder applying said mo-

tion picture data directly to an input of said motion picture data memory; a still picture and character data memory; a processing device receiving still picture and character data from said decoder for processing said still picture and character data and applying said still picture and character data to said still picture and character data memory; timing means, responsive to an output of said decoder, for controlling read-out of contents of said motion picture data memory and said still picture and character data memory; an OR gate receiving on first and second inputs thereof outputs of said motion picture data memory and said still picture and character data memory, respectively in accordance with operation of said timing means; a digital-to-analog converter receiving on an input thereof an output of said OR gate; a CRT drive circuit receiving on an input thereof an output of said digital-to-analog converter; and a CRT driven by said CRT drive device.

4,680,630

# APPARATUS FOR PROCESSING DIGITAL VIDEO SIGNALS TO PRODUCE A TELEVISION IMAGE BY LINE AND FIELD SEQUENTIAL SCANNING

Anthony J. Field, Cambridge, Great Britain, assignor to U.S. Philips Corporation, New York, N.Y.

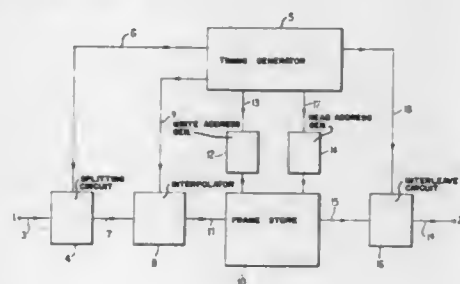
Filed Sep. 11, 1985, Ser. No. 775,065

Claims priority, application United Kingdom, Sep. 14, 1984, 8423323

Int. Cl.<sup>4</sup> H04N 5/14, 9/75

U.S. Cl. 358—160

7 Claims



1. Apparatus for processing input video signals having the form of digitally encoded samples and being arranged so that successive samples produce a television picture on a display screen by line and field sequential scanning; the apparatus comprising a field store; a first address generator for generating a set of addresses for addressing memory locations in the field store, the set of addresses being generated from input signals defining a given geometrical modification of the television picture represented by the input video signal samples; an interpolator for receiving said input video signals and producing interpolated samples in response to said input signals defining the given geometrical modification, said first address generator being effective to assign to each interpolated sample, one of said memory locations indicated by one of said addresses of said set of addresses; and a second address generator for generating addresses of at least a selected part of the field store to enable said interpolated samples to be read from the locations of the selected part of the field store to form a series of video signal samples which represent a modified television picture: characterized in that said apparatus further comprises a sample generator for producing, from the input video signal samples, samples which occur at twice the rate at which samples are written into the field store, and means for supplying the generated samples to the interpolator twice in each input line scanning period, that the field store comprises at least two parts, a first part for storing odd numbered samples of each output video line of a field and a second part for storing even numbered samples of each output video line of the field; that said set of addresses generated by said first address generator comprises a first sub-set which assigns said interpolated samples to the first part of the field store and a second sub-set which assigns said interpolated samples to the second part of

said field store; and that said apparatus still further comprises means for supplying to an output said successive samples read from locations of the field store indicated by the second address generator such that said successive samples at the output are derived alternately from the first part and the second part.

4,680,631

# TELEVISION COMPOSITE VIDEO SIGNAL PROCESSING CIRCUIT

Motoi Yagi, Zushi, and Tadao Miyabayashi, Tokyo, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

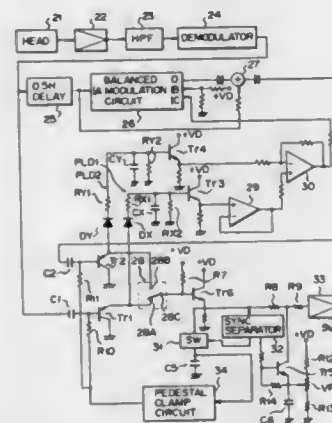
Filed Sep. 11, 1985, Ser. No. 774,976

Claims priority, application Japan, Sep. 19, 1984, 59-196219; Sep. 29, 1984, 59-204916

Int. Cl.<sup>4</sup> H04N 5/14

U.S. Cl. 358—160

26 Claims



1. A television composite video signal processing circuit for producing a television composite video signal for image display, comprising:

a reproduction circuit for deriving a reproduction signal which is obtained by repeatedly reading out a composite video signal of one field from a video signal memory means to constitute a composite video signal for displaying a one-frame image in accordance with a  $\frac{1}{2}$  interlaced scanning procedure, wherein said reproduction circuit is arranged so that said composite video signal includes peak levels above a certain pedestal level, and a sync tip level below said pedestal level;

0.5H delay means, constituted by a charge-coupled device, for delaying the reproduction signal from said reproduction circuit by  $\frac{1}{2}$  of a horizontal sync period;

signal selecting means for alternately passing therethrough a delayed reproduction signal from said delay means and the reproduction signal from said reproduction circuit for every field;

pedestal clamp means for selectively setting pedestal levels of the delayed reproduction signal from said delay means and the reproduction signal from said reproduction circuit to match the pedestal levels with each other on accordance with an output signal from said signal selecting means;

peak level correction means for correcting a peak level of one of a delayed video signal of the delayed reproduction signal from said delay means, and a nondelayed video signal of the nondelayed reproduction signal from said reproduction circuit, in accordance with a peak level difference between the delayed and nondelayed video signals to match the peak levels of the delayed and nondelayed video signals with each other; and

sync tip level setting means for setting to a preset potential sync tip levels of the delayed and nondelayed reproduction signals which are supplied from said delay means and

said reproduction circuit through said signal selecting means.

4,680,632

# TELEVISION DISPLAY SYSTEM WITH FLICKER REDUCTION PROCESSOR HAVING BURST LOCKED CLOCK AND SKEW CORRECTION

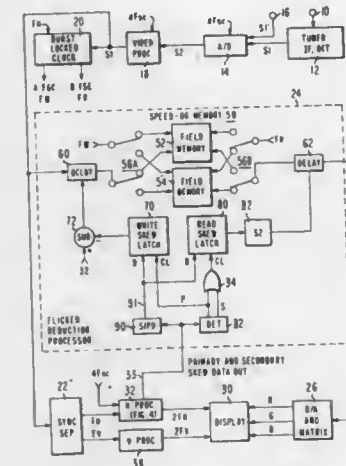
Donald H. Willis, Indianapolis; Russell T. Flieg, Noblesville, and Todd J. Christopher, Indianapolis, all of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1985, Ser. No. 761,215

Int. Cl.<sup>4</sup> H04N 7/01

U.S. Cl. 358—166

6 Claims



1. In a television display system of the type comprising:

(a) a video source for providing a video input signal of a given line rate and a given field rate;

(b) a clock source for providing read and write clock signals;

(c) memory means connected to said sources and responsive to said write clock signal for storing at least one field of said video signal and responsive to said read clock signal for providing a video output signal having a field rate N-times said given field rate and a line rate at least N-times said given line rate, N being an integer greater than unity; and

(d) display means coupled to said memory means for displaying said video output signal;

the improvement comprising:

(e) means for applying said video input signal to said clock source for synchronizing said clock signals at integer multiples of the frequency of a color subcarrier component of said video input signal;

(f) skew generator means responsive to at least said write clock signal and to a horizontal synchronizing component of said video input signal for providing a write clock skew indicating signal of each line stored in said memory means and a read clock skew indicating signals for each line recovered from said memory means signal; and

(g) means coupled to said memory means and to said skew generator means for imparting an effective delay to each line of said video output signal as a function of a difference between said skew indicating signals; and wherein said delay means comprises:

first circuit means for storing said write clock skew indicating signal with each line of said at least one field of said video input signal in said memory means;

second circuit means for recovering said write clock skew indicating signal from said memory means;

third means for subtracting the recovered write clock skew indicating signal from said read clock skew indicating signal to form a difference signal; and

fourth means for delaying said video output signal as a function of said difference signal.

4,680,633

# CIRCUIT AND METHOD FOR PRODUCING ACCURATE DC RESTORED VIDEO WAVEFORM, HORIZONTAL SYNC PULSES, AND VERTICAL SYNC PULSES

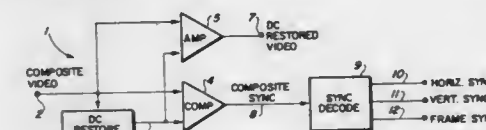
Richard C. Gerdes, and Peter R. Vokac, both of Tucson, Ariz., assignors to Third Domain, Inc., Tucson, Ariz.

Filed Apr. 24, 1985, Ser. No. 726,624

Int. Cl.<sup>4</sup> H04N 5/04, 5/16

U.S. Cl. 358—171

17 Claims



I. A method of operating a video circuit comprising the steps of:

(a) applying a first signal, which is a composite video signal, to a negative input of a first differential amplifier and to an input of a negative sensing peak sense and hold circuit, to produce a first DC reference voltage that is equal to the negative sync tip voltage of the first signal;

(b) applying the first DC reference voltage to the positive input of the first differential amplifier to cause the first differential amplifier to produce a second signal that is an inverted replica of the first signal and has its level shifted so that the voltage of a sync tip portion of the second signal is equal to a ground reference voltage;

(c) applying the second signal to a negative input of a second differential amplifier;

(d) sensing the voltage of the second signal during a back porch portion thereof and producing a second DC reference voltage representative of the voltage of the back porch portion of the second signal;

(e) applying the second DC reference voltage to the positive input of the second differential amplifier and a fraction of the second DC voltage to the positive input of a comparator;

(f) coupling the output of the second differential amplifier through a diode to the negative input of the comparator to cause the comparator to produce a composite sync signal containing a series of narrow negative going pulses during a pre-equalization portion thereof followed by a plurality of narrow serration pulses during a vertical sync pulse interval portion thereof;

(g) applying the composite sync signal to a first monostable multivibrator and to an input of a first latch;

(h) causing an output of the first monostable multivibrator to produce pulses which are wider than the narrow negative-going pulses during the pre-equalization period of the composite sync signal but narrower than the interval between the serration pulses; and

(i) clocking the first latch with a trailing edge of the output pulses produced by the first monostable multivibrator in order to produce a jitter-free vertical sync signal that undergoes a jitter-free transition in response to a transition between the pre-equalization portion and the vertical sync pulse interval portion of the composite sync signal.



4,680,634

**SYSTEM FOR PROCESSING PICTURE INFORMATION**  
 Keiichi Nambu, Satoru Tokui, and Tatsuro Onuma, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

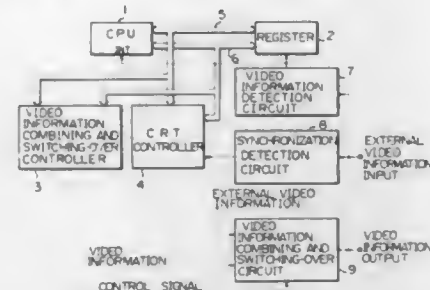
Filed Oct. 19, 1984, Ser. No. 662,560

Claims priority, application Japan, Oct. 21, 1983, 58-197455

Int. Cl.<sup>4</sup> H04N 5/268

U.S. Cl. 358—181

3 Claims



1. A system for processing a picture information signal generated by a picture information signal generation operation and an external video signal supplied from an external video source, comprising:

a central processing unit for executing programs including a program for generating said picture information signal; input means for receiving said external video signal; external video signal detection means connected to said input means, for generating a detection signal when said external video signal is present at said input means; register means connected to said central processing unit and said external video signal detection means for temporarily storing said detection signal from said external video signal detection means; control means connected to said central processing unit and responsive to said detection signal for generating a control signal; and

output means receiving said picture information signal and said external video signal and responsive to said control signal, for supplying at least said external video signal to an output thereof and in response to the absence of said control signal for selectively supplying said picture information signal to said output whereby said central processing unit selectively controls said output means

wherein said central processing unit comprises: an interrupt terminal for receiving said detection signal; said central processing unit operable for reading a content of said register means for operating said control means to supply said control signal to said output means so that said picture information signal and said external video signal are combined at said output means when said detection signal is present in said register means, and operating said control means to stop said control signal so that said picture information signal is output from said output means when said detection signal is not present in said register means.

4,680,635

**EMISSION MICROSCOPE**

Neeraj Khurana, Los Gatos, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Apr. 1, 1986, Ser. No. 846,874

Int. Cl.<sup>4</sup> H04N 7/18

U.S. Cl. 358—211

24 Claims

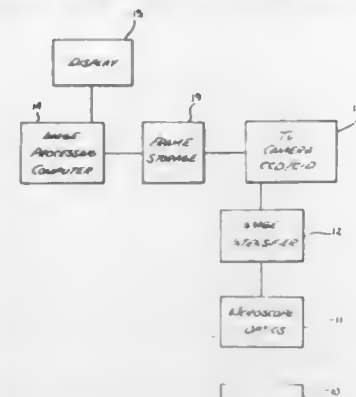
1. A microscope comprising:

optical means comprising first and second lenses, said second lens for reducing the magnification of said first lens, said optical system outputting an optical image;

intensifier means coupled to said optical means, said intensi-

fier means for intensifying said optical image and outputting an intensified image;

camera means coupled to said intensifier means for converting said intensified image to an electronic image signal;



processing means coupled to said camera means for removing noise from said electronic image signal and enhancing said electronic image signal;

display means coupled to said processing means for displaying a display image generated from said electronic image signal.

4,680,636

**DRIVER CIRCUIT FOR TWO-DIMENSIONAL IMAGE SENSOR**

Kazushige Ooi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

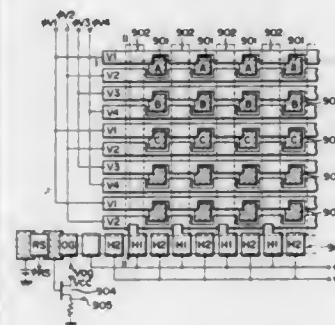
Filed Nov. 12, 1985, Ser. No. 797,019

Claims priority, application Japan, Nov. 13, 1984, 59-237556

Int. Cl.<sup>4</sup> H04N 3/14

U.S. Cl. 358—213.18

22 Claims



1. A driver circuit for an image sensor operating in a field storage mode in which field shifting including even field shifting and odd field shifting is carried out, said image sensor having a two-dimensional optical area including photo-sensitive elements providing signal charges representing an image formed on said optical area, and having register means for transferring the signal charges from said photosensitive elements to outside of said image sensor in accordance with given signals provided thereto, said register means including vertical transmission register means for transferring signal charges along the vertical direction of said two-dimensional optical area, said driver circuit comprising:

generator means for generating and providing said given signals to said register means, said given signals including vertical driving signals applied to said vertical transmission register means to transfer signal charges along the vertical direction, each of said vertical driving signals including field shift pulses effecting said even or odd field

4,680,638

**CONCEALMENT OF DEFECTS IN A VIDEO SIGNAL**  
 Ian Childs, Sutton, England, assignor to British Broadcasting Corporation, London, England

Filed Jul. 14, 1983, Ser. No. 513,680

Claims priority, application United Kingdom, Jul. 16, 1982, 8220619

Int. Cl.<sup>4</sup> H04N 9/04

U.S. Cl. 358—214

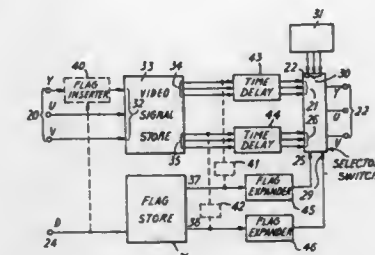
24 Claims

shifting and including line shift pulses effecting line shifting which is repeated during field shifting;

circuit means, coupled to said generator means, for stopping signal charge transferring by said register means for a given period of time, so that the amplitude of a first signal component of said given signals used for even field shifting substantially matches the amplitude of a second signal component contained in said given signals used for odd field shifting;

wherein said vertical driving signals comprise a first vertical driving signal which is applied to first horizontal arrays of said photo-sensitive elements, and a second vertical driving signal which is applied to second horizontal arrays of said photo-sensitive elements; and

wherein said circuit means includes potential adjusting means for adjusting said second vertical driving signal such that the potential of said second vertical driving signal substantially matches that of said first vertical driving signal for a fixed period within said given period of time.



1. A telecine machine provided with apparatus for concealing defects in an input video signal from said machine, said apparatus comprising:

input means for receiving an input video signal representing a film area of a film frame;

video store means coupled to said input means for storing the input video signal to provide a stored video signal representing a different film area;

blemish signal deriving means for deriving a first blemish signal indicating the presence of a blemish on the film area represented by the input video signal;

blemish signal storing means for storing the first blemish signal to provide a stored blemish signal associated with the stored video signal; and

selection means for providing an output video signal in dependence upon said first blemish signal and said stored blemish signal, said selection means being operative such that:

in the absence of said first blemish signal the input signal is selected as the output signal, and

in the presence of the first blemish signal the stored video signal is normally substituted therefor, and

suppression means responsive to the stored blemish signal to control the selection means to suppress substitution of the stored video signal into the input video signal.

4,680,639

**VIEWFINDER FOR TV CAMERA USE WITH MEANS FOR ENHANCING THE CONTRAST LEVEL OF THE VIEWFINDER IMAGE**

Haruo Isono, Hideo Kusaka, and Takeshi Hasegawa, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Japan

Filed Aug. 1, 1985, Ser. No. 761,505

Claims priority, application Japan, Aug. 9, 1984, 59-165583

Int. Cl.<sup>4</sup> G03B 13/02

U.S. Cl. 358—224

4 Claims

1. A viewfinder for a TV camera in which a contour of a viewed picture is emphasized so as to correspond to the sharpness corrected for the spatial frequency performance of a visual system at close viewing distance of about three times of a screen height, comprising:

at least one contour signal forming means for forming a contour signal representing said contour by subtracting each of respective halves of non-delayed and full-delayed picture signals from a half-delayed picture signal respectively obtained through a series connection of first and second delay circuits individually having delay time related to a screen size of said viewfinder, said series connection being applied with an input picture signal, said input signal, an output of said first delay circuit, and an



1. A solid-state image sensor comprising:

an optical area formed of photosensitive elements which provide signal charges representing an image detected by said optical area, and

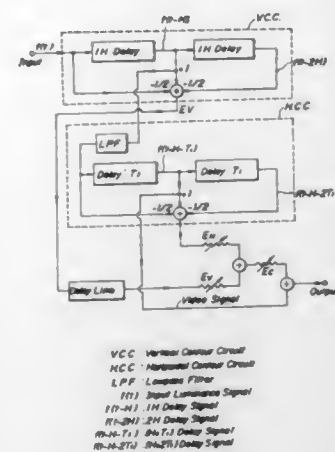
register means for transferring the signal charges from said photosensitive elements to an output region of said image sensor in accordance with given pulses, said register means including:

horizontal register means for providing an image sensor output representing the image detected by said optical area, said horizontal register means having horizontal transfer electrodes and a final stage electrode independent of said horizontal transfer electrodes, said final stage electrode being arranged between said horizontal transfer electrodes and said output region from which said image sensor output is obtained;

first circuit means for supplying said horizontal transfer electrodes with a first signal of horizontal driving pulses so that signal charge transferring is performed, said first signal of horizontal driving pulses having a prescribed blank period during which no horizontal driving pulses are present; and

second circuit means for supplying said final stage electrode with a final stage driving pulse signal which includes horizontal driving pulses generated when said horizontal driving pulses appear in said first signal and during said prescribed blank period of said first signal.

output of said second delay circuit providing said non-delayed, half-delayed and full-delayed picture signals, respectively;



wherein said at least one contour signal forming means is provided for at least the horizontal scanning direction of the viewing screen.

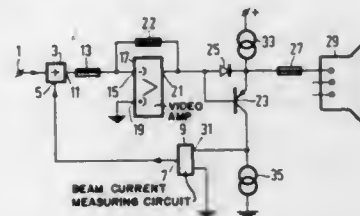
#### 4,680,640 APPARATUS FOR REDUCING BEAM CURRENT MEASUREMENT ERRORS

Pieter G. Blanken, and Pieter van der Zee, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1986, Ser. No. 833,628  
Claims priority, application Netherlands, Mar. 6, 1985, 8500622; Sep. 27, 1985, 8502636  
Int. Cl.<sup>4</sup> H04N 5/68

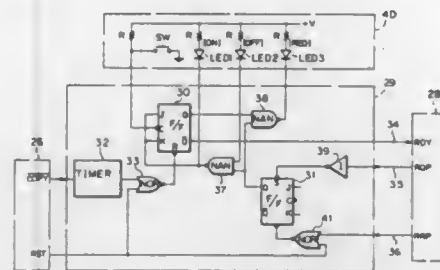
U.S. Cl. 358—243

4 Claims



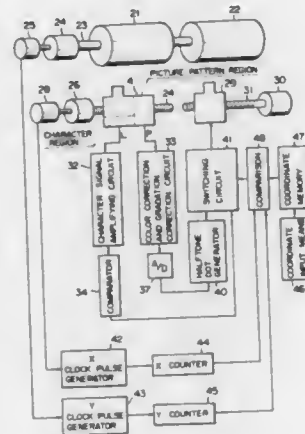
1. A picture display device comprising a picture display tube a cathode of which is coupled to the emitter of an emitter-follower drivable by a video amplifier, a negative feedback signal input of the video amplifier being coupled to an input of the emitter-follower and the collector of the emitter-follower being coupled to an input of a beam current measuring circuit, while an anti-blocking circuit is coupled to the cathode of the picture display tube to prevent blocking of the beam current measuring circuit due to leakage currents in the picture display tube, characterized in that the anti-blocking circuit is a circuit producing an emitter-follower current of the order of magnitude of at least approximately one hundred micro-amperes, while a current source is coupled to the input of the beam current measuring circuit for draining the emitter-follower current produced by the anti-blocking circuit.

#### 4,680,641 IMAGE PROCESSING SYSTEM Tamotsu Nakazawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan Filed Jul. 19, 1985, Ser. No. 756,724 Claims priority, application Japan, Jul. 28, 1984, 59-158281 Int. Cl.<sup>4</sup> H04N 1/32 U.S. Cl. 358—257 8 Claims



1. An image processing system comprising:  
read means for reading an image and producing an electrical image signal;  
print means for printing an image; and  
mode selection means for selecting between an off-line mode for printing the image by said print means in accordance with the electrical image signal from said read means and an on-line mode for printing the image by said print means in accordance with another image signal, wherein said mode selection means preferentially selects the on-line mode.

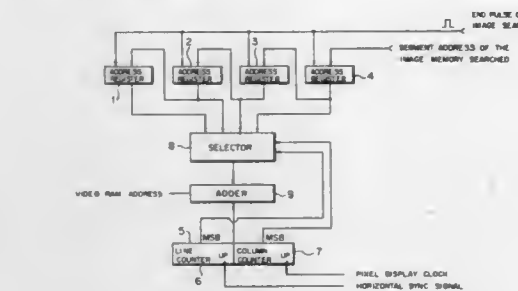
#### 4,680,642 PICTURE SCANNING AND RECORDING METHOD WITH SELECTION BETWEEN TWO DIFFERENTLY PROCESSED SIGNALS Noriyuki Shimano; Isao Tokura, both of Uji, and Mitsuhiro Yamada, Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan Filed Jun. 1, 1984, Ser. No. 616,389 Claims priority, application Japan, Jun. 7, 1983, 58-100236 Int. Cl.<sup>4</sup> H04N 1/40 5 Claims



1. A picture scanning and recording method, wherein said method includes:  
placing an original picture, having a plurality of regions, on a recording drum,  
arranging a plurality of photodetectors to detect each region of the original picture,  
scanning photoelectrically the original picture and generating a plurality of picture signals and pulse values,

processing each picture signal into at least two different processed signals,  
and selecting, depending upon a comparison of the pulse value and preset data stored in a memory, which processed signal is to be outputted to a recording head.

#### 4,680,643 IMAGE DISPLAY APPARATUS Toshio Horiguchi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan Filed Mar. 15, 1985, Ser. No. 711,921 Claims priority, application Japan, Mar. 19, 1984, 59-51079 Int. Cl.<sup>4</sup> H04N 1/40 4 Claims

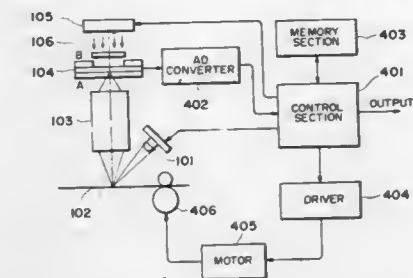


1. An image display apparatus for simultaneously displaying a plurality of selected separate images on one screen of a video display, comprising:  
image data segment address-storing means for storing respective segment addresses of a plurality of selected image data stored in an image memory file, said segment address storing means is formed by a plurality of address registers of which an output of a front address register stage thereof is cascade connected to an input of the next address register stage thereof; and  
image display memory address-forming means for selectively taking-out said stored segment addresses and forming image display memory addresses of an image display memory for one picture plane on which said plurality of selected image data are to be combined and simultaneously displayed, said segment address storing means is configured in a manner such that a segment address of new image data to be displayed subsequently to an image presently being displayed is input to the address register at the forefront stage, and a load pulse is applied to all of said address registers upon completion of the selection of said new image data and the content of each of said address registers is sequentially changed,  
wherein contents of said image memory file in which said plurality of selected image data are stored are read-out on the basis of said image display memory addresses whereby said plurality of selected image data are simultaneously displayed on one screen of a video display means.

#### 4,680,644 METHOD AND APPARATUS FOR READING AN IMAGE Yoshiaki Shirato, Machida; Toshiyuki Komatsu, Yokohama; Shinichi Seito, Isehara; Tatsundo Kawai, Hiratsuka; Hirofumi Iwamoto, Machida; Katsumi Nakagawa, Kawasaki, and Yasuo Kuroda, Sagami, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Filed Jul. 17, 1985, Ser. No. 755,797 Claims priority, application Japan, Jul. 23, 1984, 59-151379; Jul. 23, 1984, 59-151383 Int. Cl.<sup>4</sup> H04N 1/024 18 Claims

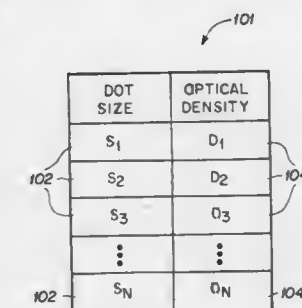
1. An image reading method in which a light obtained through an object to be read is converted into an electric signal by a photoelectric converting means having opposed first and

second surfaces and performing a reading, said method comprising the steps of:  
allowing a light for compensation to illuminate the second surface of said photoelectric converting means to cause a signal for compensation to be generated therefrom; and



performing a reading of an image by illuminating the first surface of said photoelectric converting means and compensating the resulting read signal by use of said compensation signal.

#### 4,680,645 METHOD FOR RENDERING GRAY SCALE IMAGES WITH VARIABLE DOT SIZES Gary J. Disposto, Mt. View; Larry R. Mather, Menlo Park, and John D. Meyer, Mt. View, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif. Filed Aug. 25, 1986, Ser. No. 899,358 Int. Cl.<sup>4</sup> H04N 1/04, 1/22; G01D 15/18 6 Claims



1. A method of generating a gray scale image on a surface comprising a matrix of pixels, the method comprising the steps of:  
depositing a first dot of a predetermined size on a selected pixel on the surface;  
determining a gray level error of the deposited first dot;  
scaling the error and assigning the scaled error to a pixel adjacent to the selected pixel;  
determining a size of a second dot in response to the scaled error to provide a second dot of a predetermined size;  
depositing the second dot of a predetermined size on the adjacent pixel.



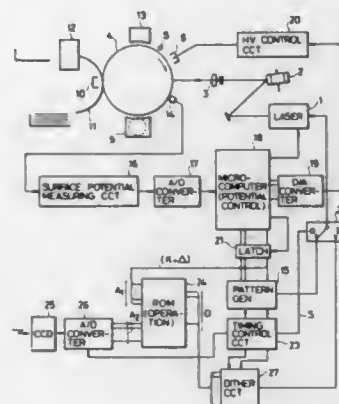
4,680,646

## IMAGE FORMING DEVICE FOR REPRODUCING A HALF-TONE IMAGE

Yoshinori Ikeda, Taira, and Takao Aoki, Abiko, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 28, 1984, Ser. No. 645,083

Claims priority, application Japan, Sep. 5, 1983, 58-162069; Sep. 5, 1983, 58-162070

Int. Cl.<sup>4</sup> H04N 1/21, 1/23, 1/29; G01D 15/14  
U.S. Cl. 358—298 19 Claims



1. An image forming device comprising: recording means for forming an electrostatic latent image on a recording medium according to image data; developing means for developing said electrostatic latent image; dot forming means for forming dots on said recording means; pattern generation means for forming a predetermined half-tone pattern, made of a plurality of dots, with said dot forming means; detection means for detecting a value of said electrostatic latent image on said recording medium corresponding to a density of said predetermined half-tone pattern; and correction means for correcting the image data to be recorded by said recording means according to an output from said detection means to control the ratio of the area of the recording portion to the area of the non-recording portion for a predetermined area.

4,680,647

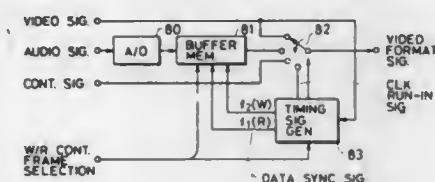
## METHOD FOR RECORDING AND REPRODUCING VIDEO FORMAT SIGNAL

Yoshiaki Moriyama, Saitama, Japan, assignor to Pioneer Electronics Corporation, Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,694

Claims priority, application Japan, Sep. 26, 1983, 58-178648; Sep. 26, 1983, 58-178649; Sep. 26, 1983, 58-178651; Sep. 26, 1983, 58-178661

Int. Cl.<sup>4</sup> H04N 5/76  
U.S. Cl. 358—343 17 Claims



1. A method of recording a video format signal of the type having a plurality of successive line signal portions, with each line signal portion including a horizontal synchronizing signal portion followed by an information signal portion, said video format signal corresponding to a two-dimensional image of a

plurality of lines and containing digital data having a predetermined clock timing and synchronizing signals for determining synchronizing timing for detecting said digital data, said method comprising the steps of:

- dividing said two-dimensional image into a plurality of blocks each containing at least one line;
- generating said video format signal with said digital data included in the information signal portion of said video format signal corresponding to a first of said blocks and with synchronizing signals for determining the synchronizing timing for detecting said digital data in the information signal portion of said video format signal corresponding to a second of said blocks; and
- recording said video format signal on a recording medium.

4,680,648

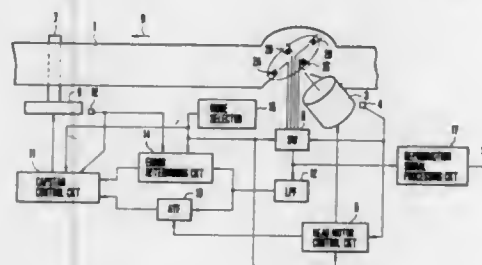
## INFORMATION SIGNAL REPRODUCING APPARATUS

Nobutoshi Takayama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 663,863

Claims priority, application Japan, Oct. 24, 1983, 58-199783; Oct. 24, 1983, 58-199784

Int. Cl.<sup>4</sup> H04N 5/783; G11B 21/10  
U.S. Cl. 360—10.2 20 Claims



1. An information signal reproducing apparatus arranged to reproduce an information signal from recording tracks formed on a record bearing medium one after another in a direction intersecting the moving direction of the record bearing medium with a plurality of kinds of pilot signals repeatedly superimposed on the information signal, comprising:

- (a) moving means for moving said record bearing medium in the direction intersecting said recording tracks;
- (b) first generating means for generating a first cyclic signal having a cycle corresponding to a moving speed of said moving means performed on the record bearing medium;
- (c) reproducing means for reproducing signals from said record bearing medium;
- (d) second generating means for generating a second cyclic signal having a cycle corresponding to a recurrent period of one of said plurality of kinds of pilot signals in the signals reproduced by said reproducing means; and
- (e) discriminating means for discriminating the pitch of said recording tracks by using the first and second cyclic signals.

4,680,649

## BACK-SPACE EDITING CONTROL CIRCUIT FOR ROTARY-HEAD MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

Yoshio Tokuyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 10, 1986, Ser. No. 818,180

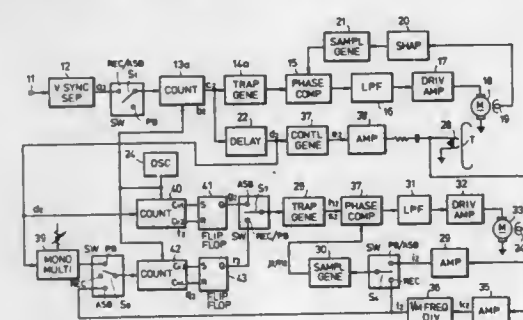
Claims priority, application Japan, Jan. 12, 1985, 60-3740  
Int. Cl.<sup>4</sup> G11B 27/02; H04N 5/91

U.S. Cl. 360—14.2 8 Claims

1. A back-space editing control circuit for a recording and reproducing apparatus which first assumes an assembly state before actually assuming a recording state when an operation mode of the recording and reproducing apparatus is switched

from a recording pause mode to a recording mode, said recording and reproducing apparatus using a control signal reproduced from a magnetic tape in said assembly state to control a rotational phase of a capstan motor so that information tracks formed on the magnetic tape are accurately scanned until said recording state is reached, said back-space editing control circuit comprising:

- vertical synchronizing signal separating means for separating a vertical synchronizing signal from an input video signal;
- control signal generating means for generating a control signal from an output signal of said vertical synchronizing signal separating means;
- control head means supplied with the control signal from said control signal generating means for recording the control signal on the magnetic tape in said recording state and for reproducing the control signal from the magnetic tape in said assembly state and a reproducing mode of the recording and reproducing apparatus;
- rotation detecting means for detecting a rotational phase of said capstan motor and for generating a rotation detection signal;
- sampling signal producing means for producing a sampling signal, said sampling signal being produced from the control signal which is reproduced by said control head means in said assembly state and being produced from said rotation detection signal in said recording state;
- trapezoidal wave signal producing means for producing a



trapezoidal wave signal, said trapezoidal wave signal being produced from the output signal of said vertical synchronizing signal separating means in said assembly state and being produced from said rotation detection signal in said recording state, said trapezoidal wave signal producing means comprising oscillator means for generating a signal having a constant frequency, first and second counters for counting the output signal of said oscillator means, said first counter being reset by the output signal of the vertical synchronizing signal separating means and producing first and second output signals when a counted value reaches first and second threshold values, respectively, said second counter being reset by a signal based on said rotation detection signal in said assembly state and running free with a predetermined frequency in said recording state to produce third and fourth output signals when a counted value reaches third and fourth threshold values, respectively, a square wave signal generating circuit for generating a square wave signal which rises and falls responsive to the first and second output signals of said first counter in said assembly state and responsive to the third and fourth output signals of said second counter in said recording state, and a trapezoidal wave generating circuit for generating the trapezoidal wave signal from the output square wave signal of said square wave signal generating circuit; and

driving and control means for comparing phases of the trapezoidal wave signal from said trapezoidal wave signal producing means and the sampling signal from said sampling signal producing means to produce a phase error

signal and for driving and controlling the rotational phase of said capstan motor by use of said phase error signal.

4,680,650

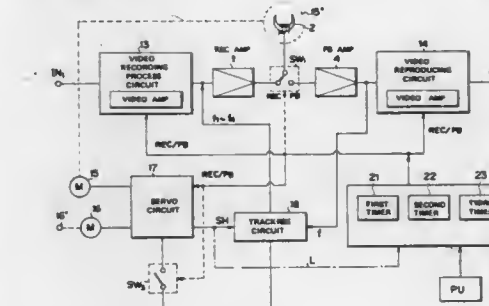
## MAGNETIC VIDEO SIGNAL RECORDING AND REPRODUCING SYSTEM

Takao Miyazaki, and Hideo Yamamoto, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed May 8, 1985, Ser. No. 732,203

Claims priority, application Japan, May 16, 1984, 59-99300  
Int. Cl.<sup>4</sup> G11B 21/10, 5/588, 15/18

U.S. Cl. 360—33.1 6 Claims



1. A magnetic recording system in a video tape recorder capable of operating in recording and reproduction modes, comprising:

- a video recording process circuit which has a first video amplifier and which transmits input video signals to video heads so that said video heads record the video signals on a magnetic tape when the video tape recorder is in the recording mode;
- a video reproduction process circuit which has a second video amplifier and which receives video signals reproduced from the magnetic tape by said video heads when the video tape recorder is in the reproduction mode;
- a servo circuit which controls a cylinder driving motor for driving a rotary cylinder having thereon said video heads and which controls a capstan motor adapted to drive a capstan, movement of said capstan effecting movement of the magnetic tape;
- an automatic tracking circuit which supplies said servo circuit with an auto tracking signal, said servo circuit controlling said capstan motor in response to said auto tracking signal; and
- a system control circuit which controls said video recording process circuit, said video reproduction process circuit, said servo circuit and said automatic tracking circuit; wherein said system control circuit includes first, second and third timers which respectively time first, second and third time intervals, and means responsive to actuation of a pause button of the video tape recorder when the video tape player is in the recording mode for causing said first and second video amplifiers and said servo circuit to be changed from a recording mode to a reproduction mode, for activating said first timer and causing said capstan motor to rotate said capstan in a reverse direction for said first time interval of said first timer in order to move the video tape back by a predetermined distance and for stopping said capstan motor after expiration of said first time interval, and means responsive to deactuation of said pause button for causing said capstan motor to resume rotation in a forward direction so as to transport the tape in a forward direction, for activating said second timer and for causing said servo circuit to change back into its recording mode on expiration of said second time interval, said automatic tracking circuit establishing auto tracking during said second time interval, and means for activating said third timer upon expiration of said second timer and

for causing said video amplifiers to change back into their recording mode upon expiration of said third time interval; and

wherein said auto tracking circuit includes: a four-frequency signal generator which produces four pilot signals of different frequency, said video recording process circuit superposing said pilot signals on said video signals; means for extracting said pilot signals from signals reproduced from the magnetic tape by said video heads; balance-modulating means for balance-modulating the extracted pilot signals and the pilot signals from said four-frequency signal generator; and means responsive to an output signal of said balance-modulating means representative of a tracking error for producing said auto tracking signal.

4,680,651

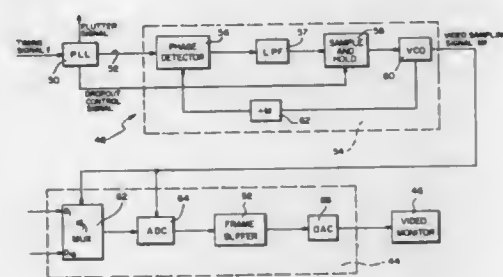
**TIMING SIGNAL DROPOUT COMPENSATION CIRCUIT**  
Kurt V. Blessinger, Cardiff-By-The-Sea, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1986, Ser. No. 897,890

Int. Cl. H04N 5/93, 5/782

U.S. Cl. 360—38.1

4 Claims



1. In video reproduction apparatus in which video information is recorded in a plurality of longitudinal video tracks on recording media, and in which a timing signal is recorded in a timing track parallel to the video information tracks, timing signal dropout compensation circuit comprising:

means for reproducing a timing track signal from said timing track on said recording media at it is moved past said reproducing means, wherein said timing signal is susceptible to changes in frequency caused by variations in speed of said recording media as it is moved past said reproducing means;

first phase lock loop (PLL) circuit means for producing a first phase locked timing signal which is phase locked to and has the same frequency as said timing track signal reproduced from said media, said first PLL circuit means including means for producing a dropout control signal which is a function of a loss of lock of said reproduced timing track signal caused by a dropout in said timing track signal;

second phase lock loop circuit means for producing a video sampling signal which is used in the reproduction of said video information from said media and which is phase locked to said first phase locked timing signal and which has a frequency which is a multiple of said first phase locked timing signal, said second PLL circuit means being responsive to said dropout control signal produced by said first PLL circuit means to continue to produce said video sampling signal during the period of said timing track signal dropout;

wherein said first and second PLL circuit means have loop bandwidths which are sufficient to follow frequency variations in the timing track signal reproduced from the recording media without loss of lock of the timing track signal.

4,680,652

**DEVICE FOR DETECTING A SPACE BETWEEN ADJACENT BLOCKS OF DATA RECORDED IN A RECORDING MEDIUM**

Takeshi Ito, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki, Kawasaki, Japan

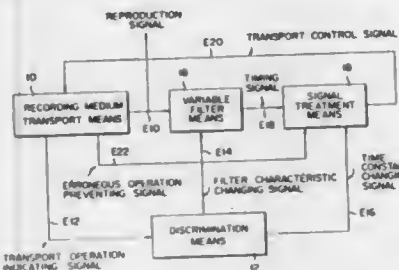
Continuation of Ser. No. 361,789, Mar. 25, 1982, Pat. No. 4,442,464, which is a continuation of Ser. No. 151,916, May 21, 1980, abandoned. This application Nov. 16, 1983, Ser. No. 552,437

Claims priority, application Japan, May 24, 1979, 54-64191 The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl. G11B 15/16, 15/52, 19/10

U.S. Cl. 360—72.1

17 Claims



1. A detector for detecting a space between adjacent blocks of data recorded on a recording medium, said detector comprising:

- recording medium transport means having several operation modes, for transporting a recording medium at different speeds, for providing a reproduction signal corresponding to data recorded on said recording medium and for issuing a transport operation indicating signal identifying the operation mode of said transport means;
- means for discriminating said transport operation indicating signal and for providing a filter characteristic changing signal in accordance with said transport operation indicating signal;
- variable filter means, responsive to said filter characteristic changing signal, for filtering said reproduction signal and for providing a timing signal, the filtering characteristic of said variable filter means changing in accordance with said filter characteristic changing signal; and
- signal treatment means, coupled to said discriminating means and responsive to said timing signal, for generating a transport control signal to change the operation mode of the recording medium transport means.

4,680,653

**ROTATING STORAGE DEVICE TRACK FORMAT EMULATION**

Chan Y. Ng, Norman K. Ouchi, David T. Wang, all of San Jose, Calif., and Wellington C. Yu, Wing On Life Garden, Singapore, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1986, Ser. No. 866,632

Int. Cl. G11B 5/012

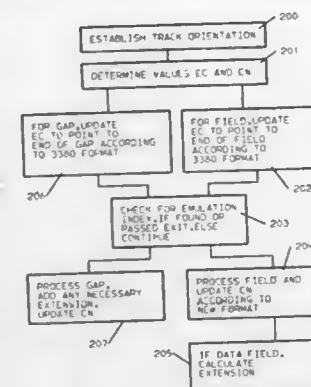
U.S. Cl. 360—72.2

17 Claims

1. A method for locating a record in response to location information generated according to a first recording format on a moving storage device operating according to a second recording format, comprising the steps of:

- determining an original angular position of the record according to the first recording format from the location information;
- calculating in response to the original angular position and a parameter a preferred angular position for the record according to the second recording format;

determining an actual angular position of the record recorded according to the second recording format; and



processing an extension of the record to compensate for the difference between the preferred angular position and the actual angular position.

4,680,654

**LID LOCKING MECHANISM FOR AN AUTOMATIC TAPE CASSETTE LOADING AND UNLOADING APPARATUS**

Kazunori Shibuya, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

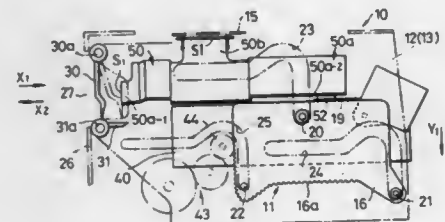
Filed Oct. 3, 1984, Ser. No. 657,359

Claims priority, application Japan, Oct. 5, 1983, 58-154668

Int. Cl. G11B 15/00

U.S. Cl. 360—96.5

6 Claims



1. A lid locking mechanism for a lid of an automatic tape cassette loading and unloading apparatus, said automatic tape cassette loading and unloading apparatus comprising a tape cassette inserting opening through which a tape cassette is inserted, said tape cassette inserting opening having a horizontally elongated shape, a lid for covering said tape cassette inserting opening in a vertically hanging position thereof and for uncovering said tape cassette inserting opening in a substantially horizontal position thereof, said lid being rotatable about an imaginary center line which extends along an upper edge of said tape cassette inserting opening, said lid assuming the substantially horizontal position when pushed by the tape cassette which is inserted through said tape cassette inserting opening, a tape cassette holder for accommodating and holding the tape cassette which is inserted through said tape cassette inserting opening, and holder moving means for moving said tape cassette holder between first and second positions, said tape cassette holder opposing said tape cassette inserting opening in said first position, said second position being lower than said first position, said lid locking mechanism comprising:

- a rotatable locking member for locking said lid so as to prevent said lid from uncovering said tape cassette inserting opening when said rotatable locking member assumes a first rotational position, said rotatable locking member opposing a rear surface of said lid which is in the vertically hanging position and blocking said lid from rotating

to the substantially horizontal position when said rotatable locking member assumes said first rotational position; and a support mechanism for rotatably supporting said rotatable locking member, said support mechanism being located at a position higher than said tape cassette inserting opening, said rotatable locking member having an edge remote from said support mechanism which rests on the tape cassette holder such that said rotatable locking member rotates upwardly to a second rotational position when the tape cassette holder moves to said first position, said rotatable locking member being eccentrically supported by said support mechanism such that said rotatable locking member moves to said first rotational position under its own weight when the tape cassette holder moves from the first position to the second position, said rotatable locking member being displaced from a position opposing the rear surface of said lid, which is in the vertically hanging position, when said rotatable locking member assumes said second rotational position.

4,680,655

**DISK SUPPORTING DEVICE**

Katsuyuki Sugawara, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

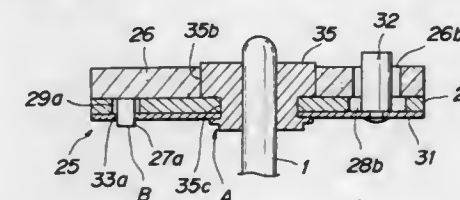
Filed Jan. 24, 1986, Ser. No. 822,061

Claims priority, application Japan, Jan. 24, 1985, 60-8945[U]

Int. Cl. G11B 17/02

U.S. Cl. 360—97

7 Claims



1. In a magnetic disk supporting device for a magnetic recording and playback apparatus including an annular table, an annular yoke and a generally annular leaf spring which are disposed one upon another and surround an upright shaft extending from a disk driving unit, and a disk drive pin upstanding from said leaf spring, extending through said yoke and said table and having an upper end projecting above said table, the improvement which comprises a bush surrounding said shaft adjacent to the top thereof and secured thereto, said table, yoke and leaf spring being fitted about said bush and held together by said bush, said table having a plurality of bosses which position it relative to said leaf spring, said table being formed from a magnetic material.

4,680,656

**PLURAL-DISK ROTATABLE DISK MEMORY WITH AIR CIRCULATION SYSTEM**

Klaus Manzke, Westheim; Richard Schneider, Heidelberg, and Lambert Kohl, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 513,250, Jul. 13, 1983, abandoned. This application Sep. 15, 1986, Ser. No. 908,872

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1982, 8220180[U]

Int. Cl. G11B 5/012

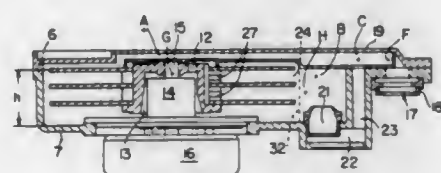
U.S. Cl. 360—98

6 Claims

1. A rotatable disk memory apparatus comprising a substantially sealed housing having a bottom section and a top section with joints therebetween, in said housing a substantially thimble-shaped hub mounting a plurality of mutually spaced disks for rotation with said



hub, said disks forming together with said hub a disk assembly,  
 a drive shaft secured to said hub,  
 motor means mounted outside of said housing for rotating said hub by means of said drive shaft, said shaft being rotatably mounted in bearing means and said bearing means being surrounded by said thimble-shaped hub, and an air circulating system having air-flow determining elements including  
 an outer peripheral space adjacent to the disk assembly, beyond said peripheral space and near the bottom of said housing a vertically downwardly oriented filter means for cleaning the centrifugally driven air,  
 a low pressure compartment beyond and below said filter means,  
 a breather filter connecting the interior of the housing to atmosphere,  
 an air supply channel located near the top of said housing and extending from beyond the filter means to near the center of rotation of the disk assembly, and



a substantially vertically extending duct connecting said low pressure compartment with said supply channel and said breather filter,  
 the air flow determining elements of said system being designed so that in said peripheral space a first, low air pressure is generated at the bottom of the housing, and a second, higher air pressure near the top of the housing, said joints being located in the zone of said second air pressure near the top of the housing to preclude contaminants from entering into the housing,  
 orifices being provided in the top side of the thimble-shaped hub for permitting the air supplied through said channel to enter the inside of said thimble-shaped hub, and a third air pressure approximately equal to that of the first air pressure being generated on the inside of the hub adjacent the bearing means whereby the build-up of a considerable negative air pressure, relative to atmosphere, on the inside of the hub is avoided and hence contamination of the inside of the hub by air entering through the bearing means substantially prevented.

4,680,657

# METHOD AND APPARATUS FOR REPRODUCING MAGNETICALLY RECORDED SIGNALS WITH A D.C. BIASING MAGNETIC FIELD PRODUCED BY A D.C. BIASING COIL

Hiroichi Naito, Kaisel, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 5, 1985, Ser. No. 773,067

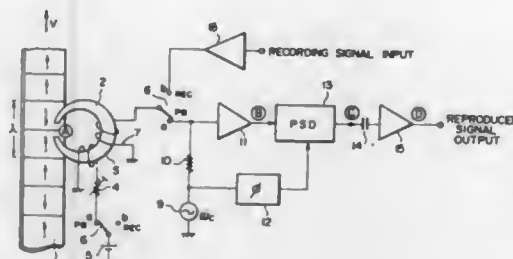
Claims priority, application Japan, Sep. 7, 1984, 59-187359  
 Int. Cl.<sup>4</sup> G11B 5/335, 5/09

U.S. Cl. 360-111

3 Claims

1. An apparatus for reproducing magnetically recorded signals contained in a magnetic recording medium, comprising:  
 a magnetic head with a resistance and an inductance, the resistance and the inductance defining an impedance, the magnetic head including a core having a magnetic path;  
 a D.C. biasing coil mounted on said core;  
 means for supplying D.C. current to said D.C. biasing coil;  
 a signal detecting coil mounted on said core;  
 carrier oscillator means for supplying A.C. current at a predetermined frequency to said signal detecting coil;  
 an output resistor with a resistance, the resistance of the output resistor being greater than the absolute value of the

impedance of the magnetic head, the output resistor being electrically connected in series between said signal detecting coil and said carrier oscillator means;  
 a phase sensitive detector connected to said signal detecting coil, said output resistor being electrically connected in series between said detector and said carrier oscillator means; and  
 means for delivering an electrical signal at said predetermined frequency from said carrier oscillator means to said



phase sensitive detector, said electrical signal being in phase with an output signal from said signal detecting coil that is a function of the resistance of the magnetic head; wherein said phase sensitive detector detects signals from said signal detecting coil that are in phase with the electrical signal from the signal delivering means; whereby an output signal from said signal detecting coil that is a function of the inductance of the magnetic head is undetected, thereby reducing noise.

4,680,658

# APPARATUS FOR CORRECTING A TIME BASE ERROR AND FOR COMPENSATING DROPOUTS INCLUDED IN A REPRODUCED VIDEO SIGNAL

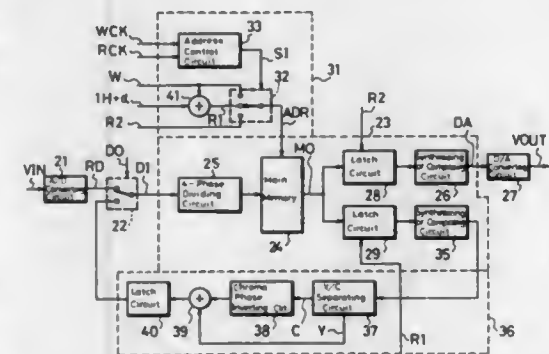
Mitsushige Tatami, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,079

Claims priority, application Japan, May 26, 1984, 59-107294  
 Int. Cl.<sup>4</sup> H04N 5/94, 5/95

U.S. Cl. 360-36.2

5 Claims



1. An apparatus for correcting a time base error and for compensating a dropout included in a video signal reproduced from a record medium by using a transducing head comprising:  
 analog-to-digital converter means for converting the reproduced video signal to a digital video data stream;  
 a single random access memory means for memorizing said digital video data stream;  
 correct video data producing circuit means connected to said memory means for producing correct video data from said digital video data stream read out from said memory means;  
 switching circuit means controlled by a dropout detecting

pulse for selectively supplying said digital video data and said correct video data to said memory; and  
 control circuit means for controlling a write and read operation of said memory means, said control circuit means having a write address generator for generating a write address signal indicating a write address of said memory at which an output signal of said switching circuit means is written into said memory means upon the generation of said write address signal, a first read address generator for generating a first read address signal indicating a read address of said memory means, said first read address signal being asynchronous with said write address signal so that digital video data memorized in said memory means is read out without said time base error, and a second read address generator for generating a second read address signal generated previous to said generation of said write address signal, said second read address signal indicating an address differing from said write address by a predetermined distance so that said digital video data read out from said memory means is supplied back to said memory means for compensating a dropout via said correct video data producing circuit during a generation of said dropout detecting pulse.

4,680,659

# TAPE DRIVE MECHANISM HAVING TORQUE TRANSMITTING GEAR ASSEMBLIES

Kaetsu Imai, Maebashi, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

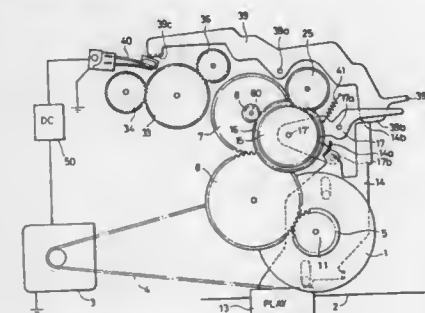
Filed Jul. 12, 1983, Ser. No. 513,137

Claims priority, application Japan, Jul. 16, 1982, 57-107865[U]

Int. Cl.<sup>4</sup> G11B 5/008, 15/00, 15/32; G65H 16/10

U.S. Cl. 360-96.3

5 Claims



1. A mechanism for tape recording/reproducing apparatus, comprising:

- a plurality of manually operated playback, fast-forward and rewind function bars for effecting playback, fast-forward, and rewind operations, each of said bars being movable from a nonworking position to a working position in response to manual operation;
- a supply gear coaxially coupled to a spindle adapted for coupling with a first tape reel;
- a takeup gear coaxially coupled to a spindle adapted for coupling with a second tape reel;
- a first gear assembly including a first gear driven by a motor, a second gear located in coaxial relationship with said first gear and first slip-frictionally coupling means positioned between said second gear and said first gear;
- a second gear assembly including a pair of third and fourth gears, second slip-frictionally coupling means positioned between said third and fourth gears and means operable in response to said playback function bar; wherein, when said playback function bar is moved to the working position, said third and fourth gears are engaged to said first gear and said takeup gear, respectively, for transmitting the rotation of said motor to the takeup gear through said

first gear, said third gears, said second slip-frictionally coupling means and said fourth gear;  
 a third gear assembly operable in response to said fast-forward function bar; wherein, when said fast-forward function bar is moved to the working position, said second gear is engaged to said takeup gear for transmitting the rotation of said motor to the takeup gear through said first gear, said first slip-frictionally coupling means and said second gear; and  
 a fourth gear assembly operable in response to said rewind function bar; wherein, when said rewind function bar is moved to the working position, said second gear is engaged to said supply gear for transmitting the rotation of the motor to the supply gear through said first gear, said first slip-frictionally coupling means and said second gear.

4,680,660

# GUIDE GROOVE FOR A GUARD PANEL ON A MAGNETIC TAPE CASSETTE

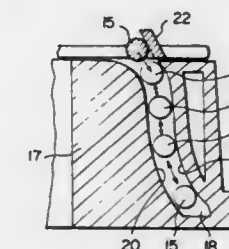
Masaki Ueda, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Jan. 3, 1986, Ser. No. 815,950

Claims priority, application Japan, Jan. 7, 1985, 60-364[U]  
 Int. Cl.<sup>4</sup> G11B 23/02

U.S. Cl. 360-132

1 Claim



1. A magnetic tape cassette comprising upper and lower case halves for housing a magnetic tape therein, and a guard panel swingably supported to cover the magnetic tape exposed at an aperture section formed at the front face of the case constituted by the upper and lower case halves, wherein said guard panel comprises an outer cover for covering the outer surface of said magnetic tape, said outer cover of said guard panel is approximately U-shaped and constituted by a front wall for covering the outer surface of said magnetic tape, and a pair of side walls extending normal to said front wall and rearwardly of ends of said front wall, and an inner cover having a guide boss on each of two side wall surfaces and supported on said outer cover for movement in synchronization with opening and closing of said outer cover to cover the inner surface of said magnetic tape when said outer cover is closed, said inner cover is approximately T-shaped and constituted by an upper wall for covering an upper side of said aperture section, and a leg wall for covering the inner surface of said magnetic tape, and said guide boss is projected from each of two side wall surfaces of said leg wall, said lower half is provided with an inner cover open/close guide groove formed for slide engagement with said guide boss and extending approximately vertically at each of inner wall sections of tape pull-out holes formed at opposite ends of said aperture section, and said upper half is provided with an auxiliary guide rib formed as a guide wall extending upwardly from an upper end of a front side edge of said open/close guide groove when said upper half is combined with said lower half to constitute said case, wherein said auxiliary guide rib of said upper half is adapted to contact and hold said guide boss of said inner cover of said guard panel, and then guide said guide boss into said inner cover open/close guide groove of said lower half during assembly of said magnetic tape cassette.

4,680,661

## MAGNETIC DISK CARTRIDGE

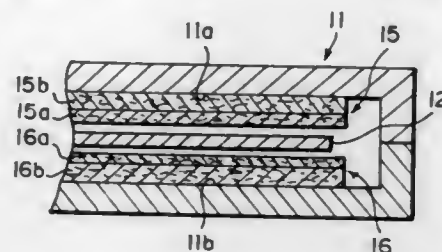
Kengo Oishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Dec. 26, 1985, Ser. No. 813,762

Claims priority, application Japan, Jan. 7, 1985, 60-726

Int. Cl.<sup>4</sup> G11B 23/03

U.S. Cl. 360-133



1. A magnetic disk cartridge having a case, a flexible magnetic disk sheet rotatably housed in the case, and at least one liner secured to an inner wall surface of the case facing the magnetic disk sheet so that the liner contacts the magnetic disk sheet, wherein said liner is constituted by two superimposed layers, one of the layers being a nonwoven fabric layer for contact with said magnetic disk sheet, and the other layer being a chemical dust attraction layer secured to the inner wall surface of said case.

4,680,662

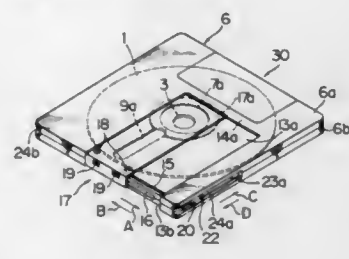
DISK CARTRIDGE HAVING A SHUTTER MECHANISM  
Yasuhisa Fukushima, Hirakata; Masuo Maruyama, Moriguchi, and Benichi Miyazaki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 24, 1985, Ser. No. 737,495

Claims priority, application Japan, Jun. 12, 1984, 59-121142; Jul. 5, 1984, 59-101814[U]; Jul. 11, 1984, 59-104879[U]; Apr. 11, 1985, 60-76937

Int. Cl.<sup>4</sup> G11B 23/03

U.S. Cl. 360-133



1. A cartridge comprising:

- a cartridge box including a receptacle for rotatably accommodating a disk, a central hole adapted to receive a rotating means for the rotation of said disk and a head slit adapted to receive a head for recording, reproducing or erasing information on said disk;
  - a shutter which is movable along guide grooves formed on the outer surfaces of said cartridge box for opening and closing said central hole and said head slit;
  - a slider for moving said shutter to open or close said central hole and said head slit;
  - guide groove means for movably guiding said slider; and
  - an elastic member for resiliently biasing said shutter in a direction of normally closing said central hole and said head slit;
- said receptacle having an inner wall which is concentric with said central hole and is cylindrical-shaped to completely surround the entire periphery of said disk, thereby preventing said disk from being exposed to the outside except through said central hole and said head slit, and

said shutter normally closing said central hole and said head slit to shut said disk in said receptacle.

4,680,663

## POWER SUPPLY INSTALLATION FOR DC ELECTRIC RAILROAD

Teiji Nogi, Tokyo, and Toyomi Gondo, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Meldensha, Tokyo, Japan

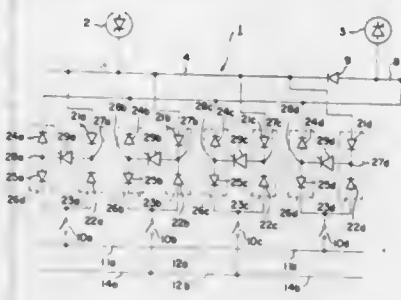
Filed Jun. 16, 1986, Ser. No. 874,505

Claims priority, application Japan, Jun. 17, 1985, 60-131466

Int. Cl.<sup>4</sup> H02M 7/00

U.S. Cl. 361-2

5 Claims



1. A power supply installation in a direct current railroad supplying a direct current power to an at least one first electric car power supply line, which comprises:

- (a) a power rectifier for converting an alternating current power to a direct current power in powering operation;
- (b) a power inverter for converting a direct current power to an alternating current power in regenerative operation;
- (c) a stopper diode connected between an output side of said power rectifier and an input side of said power inverter;
- (d) a first pair of diodes each having a cathode connected to each other, said first pair of diodes being connected between the output side of said power rectifier and the at least one electric car power supply line;
- (e) a second pair of diodes each having an anode connected to each other, said second pair of diodes being connected between the input side of said power inverter and the at least one electric car power supply line; and
- (f) a breaker connected between a first common junction point of the cathodes of said first pair of diodes and a second common junction point of the anodes of said second pair of diodes, for simultaneously controlling a connection or a disconnection of a powering current supplied from said power rectifier to the electric car power supply line and a regenerative current supplied from the electric car power supply line to said power inverter.

4,680,664

## OVERCURRENT PROTECTION CIRCUIT FOR POWER TRANSISTORS

John M. Leuthen, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 9, 1985, Ser. No. 806,873

Int. Cl.<sup>4</sup> H02H 3/04

U.S. Cl. 361-91

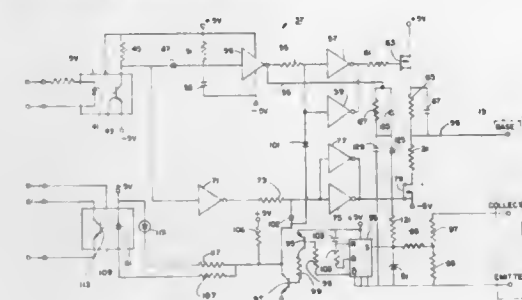
3 Claims

1. A protection circuit for a power transistor of the type having its collector and emitter connected to positive and negative DC rail lines, and having a base that when supplied with positive current, causes the power transistor to conduct, and when supplied with negative current, causes the power transistor to cut off, the circuit comprising in combination: positive and negative control transistors, one having an input connected to a positive voltage source, and the other having an input connected to a negative voltage source, each control transistor having an output being connected to the base of the power transistor for providing positive

current while the positive control transistor is on, and negative current while the negative control transistor is on;

control means for supplying energizing signals to the control transistors to turn on the positive control transistor and off the negative control transistor, and deenergizing signals to the control transistors to turn off the positive control transistor and on the negative control transistor;

latch means comprising a bistable multivibrator having an input connected to the power transistor for monitoring the voltage across the collector and emitter, and if the voltage exceeds a selected level while the power transistor is on, providing a disabling output;



disabling means connected to the multivibrator and to the control means for turning off the positive control transistor and for turning on the negative control transistor when the disabling means receives a disabling output from the multivibrator; and

clamp means for holding the input of the multivibrator to a low value below the threshold level while the control means is supplying a deenergizing signal to the control transistors, to prevent triggering of the multivibrator while the power transistor is off, the clamp means including a clamp line extending from the control means to the input of the multivibrator, and including blocking means in the clamp line for blocking the energizing signals from the input of the multivibrator to hold the input of the multivibrator to the low value.

4,680,665

## GAS DISCHARGE ARRESTER

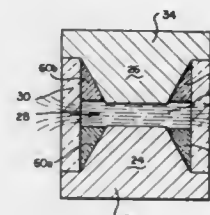
John S. Bonnesen, Northbrook, and Timothy J. Sporer, Bensenville, both of Ill., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Dec. 3, 1985, Ser. No. 804,056

Int. Cl.<sup>4</sup> H02H 9/06

U.S. Cl. 361-120

4 Claims



3. In a surge voltage arrester of the type having a gas-tight housing wherein a pair of discharge electrodes are arranged with their active electrode surfaces facing each other and spaced apart in a tubular insulating body, the improvement comprising: two axially spaced annular conductor bands attached to the inner surface of said body, said bands being of a predetermined type of conductive material, said bands covering the inner circumference of said body, one of said bands being in electrical contact with one of said electrodes and the

other of said bands being in electrical contact with the other of said electrodes, said conductor bands being the only conductive material of said predetermined type on said inner surface of said body.

4,680,666

## MR MAGNET WIRING HARNESS CIRCUIT

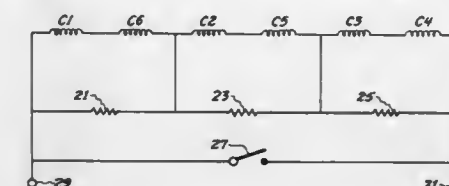
Pedro A. Rios, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 7, 1986, Ser. No. 848,552

Int. Cl.<sup>4</sup> H01H 47/00

U.S. Cl. 361-141

2 Claims



1. A wiring harness circuit for a shielded superconducting magnetic resonance magnet comprising:

- a plurality of coils of superconductor wire connected in series with one another, said coils symmetrically arranged about a plane of symmetry; and
- a plurality of resistors, each said resistor connected in parallel with a symmetric pair of coils so that a quench in any one coil results in the same current flow in the coil symmetric thereto.

4,680,667

## SOLENOID DRIVER CONTROL UNIT

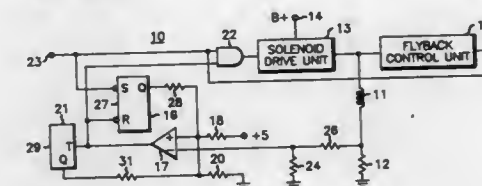
Adelore F. Petrie, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 23, 1985, Ser. No. 778,997

Int. Cl.<sup>4</sup> F02D 41/30; H01H 47/32

U.S. Cl. 361-154

16 Claims



1. In a solenoid driver control circuit having a control signal input for receiving a control signal, current sense means for providing a current sense signal indicative of current flowing through a solenoid, solenoid drive means for selectively allowing current to flow through said solenoid from a power source, and threshold comparator means for comparing at least one threshold signal with said current sense signal and for providing an output signal in response thereto to control said solenoid drive means, an improvement comprising:

- (a) minimum threshold means for providing a minimum threshold to said threshold comparator means;
- (b) maximum threshold means for initially providing a maximum threshold to said threshold comparator means at the initiation of said control signal, said maximum threshold means being responsive to said threshold comparator means to only provide said maximum threshold to said threshold comparator means until said current through said solenoid at least equals a preselected peak current; and
- (c) timing means responsive to said threshold comparator means for causing said threshold comparator means to provide said output signal to said solenoid drive means for a specified period of time subsequent to said current



through said solenoid at least equalling said preselected peak current, such that current will flow through said solenoid from said power source during said specified period of time.

4,680,668

## ANTI-STATIC DEVICE

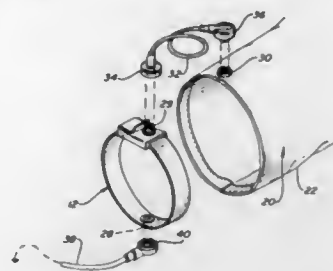
Nathan L. Belkin, Clearwater, Fla., assignor to Superior Surgical Mfg. Co., Inc., Seminole, Fla.

Filed Dec. 28, 1984, Ser. No. 687,381

Int. Cl.<sup>4</sup> A61N 1/14

U.S. Cl. 361—220

6 Claims



1. A device for dissipating electro-static electricity from a person wearing a static protective garment comprising:
  - a means for continuously conducting electricity between the garment and the person including a conductive wristlet to be worn by the person having means for conducting electricity between the wristlet and a sleeve of the garment, a conductive fastener on said wristlet, a conductive fastener on said sleeve which conductively mates with said conductive fastener on said wristlet, and
  - a means for continuously conducting electricity from the garment or person to a ground.

4,680,669

## CORONA DISCHARGING APPARATUS

Hiroaki Tsuchiya; Kazuki Tanaka, both of Yokohama, and Keishi Osawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

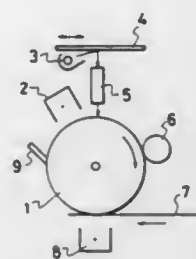
Filed Jan. 24, 1984, Ser. No. 573,341

Claims priority, application Japan, Jan. 25, 1983, 58-10244; Jan. 25, 1983, 58-10245; Jan. 25, 1983, 58-10246

Int. Cl.<sup>4</sup> H01T 23/00

U.S. Cl. 361—230

13 Claims



1. A corona discharging apparatus comprising:
  - a corona discharge electrode;
  - shield means surrounding said corona discharge electrode, said shield means including an opening for permitting at least corona discharge current to pass therethrough;
  - support means for supporting said corona discharge electrode;
  - supersonic vibrator means for vibrating said corona discharge electrode to remove foreign matter from said corona discharge electrode; and
  - drive means for applying a drive voltage to said supersonic vibrator means, a constant-current source of high voltage

for applying a high voltage to said corona discharge electrode, and comparator means for comparing a voltage applied to said corona discharge electrode with a predetermined range of voltage, said drive means being adapted to operate if the voltage applied to said corona discharge electrode is out of said predetermined range of voltage.

4,680,670

## FAIL SAFE CERAMIC CAPACITOR

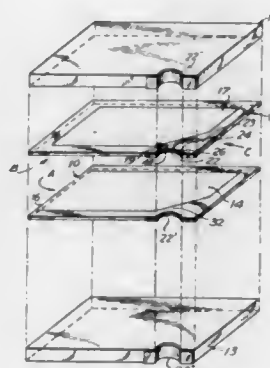
Ning-Huat Chan, Myrtle Beach, S.C., assignor to AVX Corporation, Great Neck, N.Y.

Filed Sep. 29, 1986, Ser. No. 912,255

Int. Cl.<sup>4</sup> H01G 1/11, 4/10

U.S. Cl. 361—275

3 Claims



1. A fail safe monolithic ceramic capacitor comprising a plurality of superposed layers of dielectric ceramic material, conductive layers of electrode material interposed between such dielectric layers, alternate said conductive layers extending to a first face of said capacitor, first termination means formed on said first face of said capacitor and electrically connecting said alternate layers, the layers intermediate said alternate layers including a reduced cross section area defining a fuse as well as a discrete conductive tab portion extending to a third face of said capacitor spaced from said first face, said tab portion and reduced cross section area of said intermediate conductive layer having portions exiting at proximately spaced positions at a second face of said capacitor, a band of low melt metal in electrical bridging relation of the respective exiting portions of said tab portion and reduced cross section areas of said intermediate conductive layers, and second termination means on said third face of said capacitor linking said tab portions of said intermediate conductive layers.

4,680,671

## HIGH VOLTAGE AND HIGH ENERGY STORAGE DEVICE AND A PULSE GENERATOR INCLUDING THE APPLICATION THEREOF

Jean-Claude A. Brion, Ormoy la Riviere; Claude Brunaud, Ver sur Mer; Robert P. H. Jean, Greysur Yverres, and René H. Machet, Jouy le Moutier, all of France, assignors to Societe de Verrerie et de Thermometrie, Paris, France

Filed May 1, 1985, Ser. No. 729,411

Claims priority, application France, May 2, 1984, 84 06814

Int. Cl.<sup>4</sup> H01G 4/38; H05B 37/00

U.S. Cl. 361—329

16 Claims

1. A high voltage and high energy storage device for storing energy, said storage device comprising:
  - an annular assembly surrounding a central core of hard insulating material having an axial central bore extending therethrough,
  - said assembly comprising a plurality of concentric ring structures having first and second sides, each of said plurality of ring structures being respectively disposed

4,680,673

## ENCAPSULATED HOUSING FOR DISSIPATING HEAT PRODUCED BY ELECTRICAL CIRCUITS

Jean C. Taverdet, Orange, France, assignor to Societe Xeram, Courbevoie, France

Filed May 8, 1985, Ser. No. 731,948

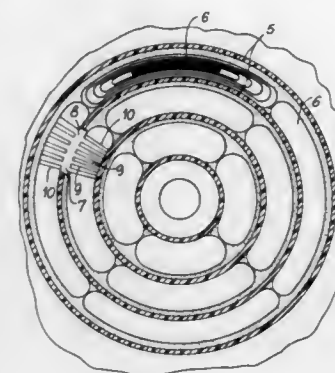
Claims priority, application France, May 11, 1984, 84 07297

Int. Cl.<sup>4</sup> H05K 7/20

U.S. Cl. 361—385

17 Claims

around an insulating separating element for electrically insulating the respective said ring structure disposed therearound from a concentrically adjacent said ring structure, each of said ring structures comprising a plurality of flat energy storage elements disposed side-by-side in a cylindrical arrangement around said respective insulating separating element, each of said energy storage elements comprising wound electrically conductive bands covered by a film of dielectric material;



1. Housing for the dissipation of heat produced by electrical circuits, comprising a metallic armature provided in its upper portion with a recess, the bottom of said recess being intended for the attachment of the electrical circuits, and lateral walls of said recess support connections through the intermediary of insulating seals, a cover being disposed at the surface of said recess in such a way as to render it hermetically sealed, and said armature having in a lower portion cooling means for the circulation of at least one cooling fluid, said cooling means comprising a metallic single-piece assembly having lateral walls and separating channels which are arranged in parallel directions and are regularly spaced apart, and said channels having openings formed between the ends of certain of said channels, in such a way as to obtain a circulation network, and two metallic elements disposed on lateral walls of said single-piece assembly so as to seal off the ends of the channels and the openings, the cooling means comprising at least two openings as an inlet and an outlet of the cooling fluid.

4,680,672

## MOLDED CASE CIRCUIT BREAKER WITH FRONT ACCESSIBLE CONTROL PANEL

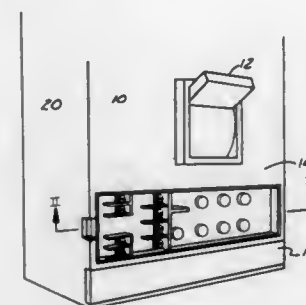
William E. May, Lawrenceville; Rex McColloch, Jr., Snellville, and William A. King, Lithonia, all of Ga., assignors to Siemens-Allis, Atlanta, Ga.

Filed Nov. 8, 1985, Ser. No. 796,542

Int. Cl.<sup>4</sup> H02B 1/04

U.S. Cl. 361—353

11 Claims



1. A molded case circuit breaker, comprising:
  - a molded case having a front, a front portion defining an opening, first and second grooves adjacent opposed boundaries of the front portion opening and a side portion with an opening adjacent the front portion opening;
  - a circuit board positioned in said first and second grooves on the interior of the molded case; and
  - a terminal mounted on the circuit board and accessible from the front.

4,680,674

## MODULAR COMPUTER SYSTEM WITH INTEGRAL ELECTRONIC BUS

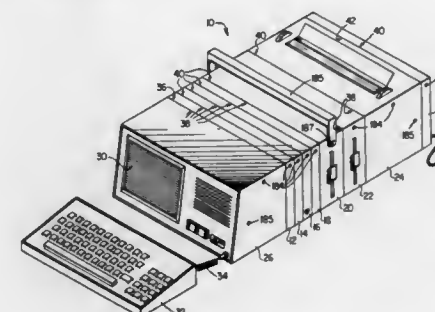
Fergus E. Moore, 4801 Hidden Oaks La., Arlington, Tex. 76017

Filed Jul. 16, 1984, Ser. No. 631,251

Int. Cl.<sup>4</sup> H05K 1/12

U.S. Cl. 361—395

16 Claims



1. A modular computer system, including one or more component modules, each comprising:
  - a casing, including substantially parallel front and rear surfaces, said surfaces having a predetermined dimension;
  - a computer component contained by said casing;
  - an array of surface-mount printed circuit board connectors extending outwardly from said front surface of said casing at a predetermined location, each connector incorporating a conductor having an end portion forming a leaf spring

contact for abutting and establishing electrical connection with a surface contact of an adjacent module;

a receptacle extending into said casing from said rear surface, wherein interior dimensions of said receptacle substantially correspond to exterior dimensions of said array of connectors and said connectors are aligned with said receptacle;

an array of surface contacts mounted within the receptacle for abutting and establishing electrical connection with the leaf spring contacts of the connectors of an adjacent module;

a predetermined number of the contacts of the connectors and the receptacle being electrically connected to said component within said casing;

each of said connector contacts is electrically connected to a corresponding contact of said receptacle for transmitting a predetermined signal between said connector and receptacle, said corresponding contacts being aligned on said connector and receptacle such that two or more of said component modules may be stacked with said front end rear surfaces of adjacent modules abutting and with contacts of the connectors and receptacles of adjacent component modules abutting, thereby allowing formation of an electrical bus between adjacent modules with minimal frictional resistance; and

further comprising an input/output module including:

a casing including a rear surface having dimensions substantially equivalent to the predetermined dimensions of said front and rear surfaces of said component module casing;

a keyboard interface contained by said input/output module casing;

a visual display contained by said input/output module casing;

an input/output receptacle extending into said input/output module casing from the rear surface thereof at a location corresponding to the location of said receptacle of said component module, wherein the interior dimensions of said input/output module receptacle are substantially equivalent to the exterior dimensions of said array of component module connectors; and

said receptacle of said input/output module includes an array of surface contacts, a predetermined number of which are electrically connected to said display and keyboard interface within said input/output module casing, wherein each of said contacts of said input/output module is disposed in a predetermined location within said input/output module receptacle and interconnected with a corresponding contact of said component module connector, means for mechanically securing together adjacent front and rear surfaces of two or more component modules.

4,680,675

**PRINTED CIRCUIT BOARD TERMINAL DEVICE**  
Hideo Sato, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

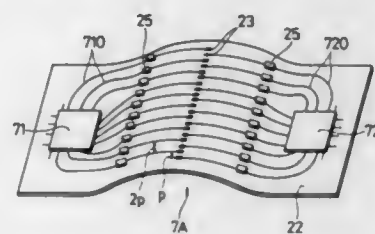
Filed Apr. 22, 1985, Ser. No. 725,814

Claims priority, application Japan, Apr. 25, 1984, 59-83332

Int. Cl. H05K 7/06

U.S. Cl. 361—397

1 Claim



1. A planar printed circuit board of flexible material upon which a first driver and a second driver are mounted and at

least one lead terminal section is formed with terminal patterns which extend in a planar line and are closely spaced and have a pitch "p", a first plurality of planar signal output lines formed on one side of said one lead terminal section and extending parallel to each other with pitch of "2p" and connected to a first group of alternate ones of said terminal patterns on said one lead terminal section and connected to said first driver and said first signal output lines and said first group of alternate ones of said terminal patterns lying in a first plane, and a second plurality of planar signal output lines formed on a second side of said one lead terminal section and extending parallel to each other with a pitch of "2p" and connected to a second group of planar alternate ones of said terminal patterns on said one lead terminal section and connected to said second driver and said second signal output lines and said second group of terminal patterns lying in a second plane, wherein a first portion of said printed circuit board upon which said first driver is mounted can be bent so as to lie in a different plane from said lead terminal section, wherein a second portion of said printed circuit board upon which said second driver is mounted can be bent so as to lie in a different plane from said lead terminal section, with a first plurality of resistors mounted on said printed circuit board in series with said first plurality of signal output lines, and a second plurality of resistors mounted on said printed circuit board in series with said second plurality of signal output lines.

4,680,676

**PORTABLE RADIO HOUSING WITH LOGIC AND RF SHIELDING**

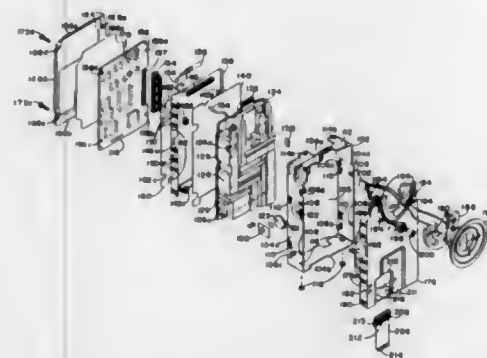
Nickle A. Petratos, Sunrise; David Karl, Tamarac, and William M. Bradford, Fort Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 6, 1986, Ser. No. 816,521

Int. Cl. H05K 7/06

U.S. Cl. 361—424

14 Claims



1. A housing for electromagnetically shielding electronic circuits, said housing comprising in combination:

a conductive frame having a multiplicity of sides surrounding a central opening;

a first circuit substrate having front and rear surfaces, said first substrate being positioned in said opening of said frame;

a first electromagnetic shield positioned over said rear surface of said first substrate, said first shield having front and rear surfaces and a plurality of sides substantially perpendicular to said surfaces, certain of said sides of said first shield having spring fingers contacting said frame, said first shield having an opening;

a second circuit substrate having front and rear surfaces positioned over said rear surface of said first shield;

an electrical interconnection between said first and second circuit substrates, said interconnection including first and second mating connectors respectively electrically connected to said first and second substrates, said electrical

interconnection passing through said opening in said first shield; and

a second electromagnetic shield positioned over said rear surface of said second circuit substrate.

4,680,677

**FREESTANDING LUMINAIRE HAVING FLOOR-SUPPORTED FRAME INTEGRATED WITH LIGHT FIXTURE**

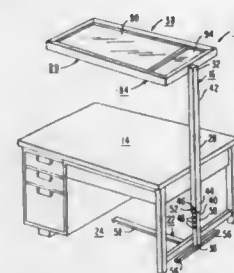
John J. Ross, 328 D. Babcock Blvd., Gibsonia, Pa. 15044

Filed Mar. 18, 1985, Ser. No. 713,221

Int. Cl. F21V 13/00

U.S. Cl. 362—33

13 Claims



1. A freestanding luminaire, comprising:

(a) a floor-supported frame including an overhead beam arrangement supported in a cantilevered fashion;

(b) lighting means including at least one lamp mounted to said beam arrangement; and

(c) a light enclosure attached to said overhead beam arrangement and surrounding said beam arrangement and said lamp mounted to said beam arrangement so as to define a light fixture which directs the light produced by said lamp upwardly and downwardly therefrom;

(d) said overhead beam arrangement including a central longitudinally extending beam, and a plurality of cross beams attached to said central beam at spaced locations therealong so as to extend in transverse relationship to the longitudinal extent of said central beam and to support said at least one lamp therebetween.

4,680,678

**LIGHTING FIXTURE FOR VEHICLE**

Akihiro Iwaki, Ichihara, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 888,154

Int. Cl. B60Q 1/00

U.S. Cl. 362—61

15 Claims



1. A lighting fixture for a vehicle, comprising:

a housing;

a plurality of light source units each including a plurality of

light emitting diodes, said light source units emitting light of at least one color and said light source units being arranged relative to each other at predetermined spaced relations within said housing;

at least one incandescent light bulb in said housing mounted rearwardly of said plurality of light source units; and

light transmitting means in spaces between said light source units and arranged forwardly of said at least one incandescent light bulb so as to be illuminated by said at least one incandescent light bulb, said light transmitting means, when illuminated by said at least one incandescent light bulb, producing at least one different color light than that produced by said light source units.

4,680,679

**MOTOR VEHICLE MAIN BEAM HEADLAMP INCORPORATING AN ELLIPTICAL REFLECTOR AND A PARABOLIC REFLECTOR**

Gilbert Dilouya, Paris, France, assignor to Cibie Projecteurs, France

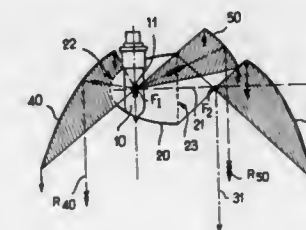
Filed Apr. 17, 1986, Ser. No. 853,060

Claims priority, application France, Apr. 22, 1985, 85 06050

Int. Cl. B60Q 1/04

U.S. Cl. 362—61

8 Claims



1. A headlamp of the type comprising:

a light source;

a two-focus elliptical reflector having a base, a base focus and a front focus, said base and said base focus being disposed in the vicinity of said light source and close to the base of the reflector, and said front focus being disposed in front of said base focus; and

a parabolic reflector adapted to reflect light from said front focus in a direction substantially along a vehicle axis and having its focus in the vicinity of said front focus of said elliptical reflector;

wherein the base of the elliptical reflector is provided with an opening for directly passing light from said light source, and wherein a first sector of a parabolic type reflector is provided with its focus in the vicinity of said light source and is disposed to reflect such light after passing through said opening along the vehicle axis direction to increase the on-axis main beam light intensity.

4,680,680

**COMBINATION VEHICLE LAMP DEVICE**

Akihiro Iwaki, Ichihara, and Masayoshi Tajima, Tokyo, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1986, Ser. No. 871,074

Claims priority, application Japan, Jun. 14, 1985, 60-89909

Int. Cl. B60Q 1/26

U.S. Cl. 362—80

19 Claims

1. A combination-type vehicle lamp device for motor vehicles, comprising:

a single housing;

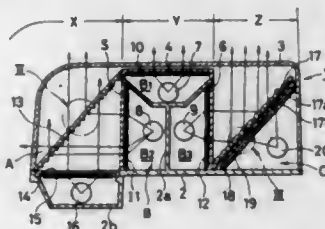
an outer lens mounted on said housing;

said housing being divided into plural chambers for effecting plural light indications, said chambers including a central chamber located at a central portion of said housing and two side chambers;

a generally Y-shaped wall in said central chamber for divid-

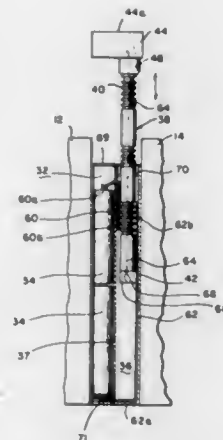


ing said central chamber into a plurality of small chambers, said small chambers including a first forward-facing small chamber facing said outer lens and two side-facing small chambers facing in opposite directions toward respective side chambers of said housing;  
 at least one respective lamp being disposed in each of said small chambers;  
 red color lenses arranged to color red the light emitted by each of said respective lamps in said small chambers of said central chamber;  
 first and second inclined lenses respectively arranged in said side chambers of said housing for reflecting or refracting light emitted from respective ones of said plural lamps in said side-facing small chambers of said central chamber in



the forward direction of said outer lenses, each of said inclined lenses being disposed inclined to an optical axis in each of said side chambers of said housing;  
 a first lamp disposed at the back side of one of said inclined lenses with an amber-color lens therebetween, said first lamp being in the side chamber in which its associated inclined lens is arranged;  
 a second lamp disposed at the back side of the other of said inclined lenses with a clear lens therebetween, said second lamp being in the side chamber in which its associated inclined lens is arranged;  
 light emitted from each of said first and second lamps being emitted in the forward direction toward said outer lens through each of said respective inclined lenses.

compartment and a closed position in which said supporting arm is disposed within said second compartment; and



said reading light being movably mounted relative to said supporting arm for directing light in different directions.

4,680,682

## WATERPROOF FLASHLIGHT

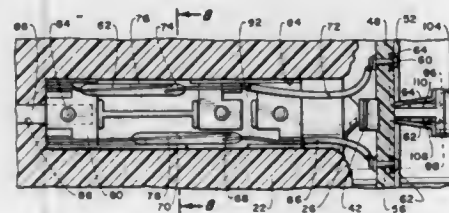
David H. Parker, 2255 Jefferson St., Torrance, Calif. 90501

Filed Sep. 8, 1986, Ser. No. 904,699

Int. Cl.<sup>4</sup> F21L 7/00

U.S. Cl. 362-158

3 Claims



1. A waterproof flashlight comprising:
  - a tubular barrel having an internal chamber, said internal chamber being adapted to receive a battery;
  - a light bulb mounted on said tubular barrel, said light bulb extending at least partially within said internal chamber, said light bulb being adapted to electrically connect with the battery, said light bulb having a high beam and a low beam;
  - a lens housing mounted on said tubular barrel enclosing said light bulb;
  - waterproof sealing means mounted between said lens housing and said tubular barrel for preventing entry of water

4,680,681

## INTEGRAL BOOK COVER AND READING LIGHT

Carl Fisherman, Franklin Lakes, N.J., and Eric Beare, Kowloon, Hong Kong, assignors to Photo Audio Consumer Electronics Marketing Corporation, New York, N.Y.

Filed Jul. 7, 1986, Ser. No. 882,725

Int. Cl.<sup>4</sup> A47B 19/00

U.S. Cl. 362-98

10 Claims

1. A book cover and reading light comprising:
  - a book cover having a central spine section, and two outer covers each pivotally connected to opposite edges of said central spine section;
  - an elongated housing mounted on said central spine section and including a first compartment for receiving batteries and a second compartment for receiving a supporting arm for a reading light;
  - said supporting arm being disposed for movement relative to said second compartment between an open position in which said supporting arm extends out of said second

into said internal chamber, said waterproof sealing means comprising at least one elastomeric O-ring seal;  
 a switch assembly mounted on said tubular barrel, said switch assembly being movable between an off position and a low beam position and a high beam position; and  
 said switch assembly including a magnet mounted exteriorly of said tubular barrel and a magnetically operable switch assembly mounted within said internal chamber of said tubular barrel, said magnetically operable switch assembly being operable by said magnet with the electromagnetic force of said magnet being conducted through the wall of said tubular barrel.

4,680,683

## BATTERY AND BULB CONVERSION CARTRIDGE FOR SELF-FEEDING CANDLE HOLDER

Robert W. Schenke, P.O. Box 271, and Reynold A. Schenke, P.O. Box 59, both of Paradise, Pa. 17562

Filed Jun. 2, 1986, Ser. No. 869,324

Int. Cl.<sup>4</sup> F21L 7/00

U.S. Cl. 362-190

3 Claims



1. In combination with a simulated candle including a one-piece upstanding outer tubular member for receiving a consumable candle and having a tapered upper end defining a reduced diameter upper end axial opening with whose periphery the upper end outer periphery of a consumable candle may abut, an electrically conductive inner tube removably telescopically received within said outer tubular member through the lower end thereof to a position spaced immediately below and abutted against the inner surfaces of said outer tubular member disposed below and about said opening, the upper end of said inner tube defining bulb base receiving socket means including relatively electrically insulated wall and center contact means constructed of electrically conductive material, a storage battery slidably disposed in said inner tube and including an upper contact for electrical contact with said center contact means and an outer contact defining case relative to which said upper contact is insulated, a removable plug closing the lower end of said outer tubular member, electrically conductive compression spring means disposed within said outer tubular member above and contacting said plug and projecting upwardly into the lower end of said inner tube for engagement, while under compression, with said battery, the lower end of said spring being electrically connected to said outer tubular member, the lower end of said inner tube being frictionally electrically connected with said outer tubular member, said socket wall contact means being electrically connected to said inner tube, said inner tube being constructed of electrically conductive material and the upper end of said inner tube being abutted against and in electrical contact with the inner surfaces of said outer tubular member disposed below and about said

opening, said inner tube and spring, upon removal of said plug, being removable from the lower end of said outer tubular member, the lower end of said inner tube including outwardly flared portions by which said inner tube is frictionally electrically and slidably frictionally engaged with the opposing inner surfaces of said outer tubular member, the upper end of said inner tube comprising a diametrically reduced portion of said inner tube, said battery being received within said inner tube below said upper end thereof, said spring exerting an upward thrust on said battery with the upper end of the outer contact defining case of said battery electrically contacting the inner surfaces of the diametrically reduced portion of said inner tube.

4,680,684

## BED READING LAMP, PARTICULARLY FOR HOSPITAL BEDS

Wolfgang Wolber, Götzis, Austria, assignor to Zumtobel Aktiengesellschaft, Austria

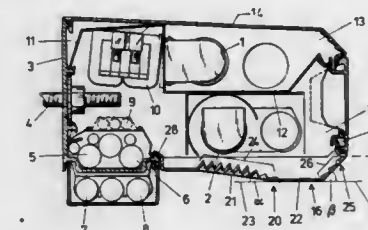
Filed Oct. 24, 1985, Ser. No. 790,746

Claims priority, application Austria, Oct. 31, 1984, 3468/84

Int. Cl.<sup>4</sup> F21V 5/02

U.S. Cl. 362-223

7 Claims



1. Bed reading lamp, particularly for hospital rooms, comprising a lamp housing, which is preferably attachable to a wall of a room comprising at least one tubular, elongate lamp and a reflector and at least one cover which closes a light outlet opening provided in the lower area of said housing and which is translucent and serves to guide the light and comprises a lower first portion and a front upright second portion connected to the latter, characterized in that said first portion (20) of said cover (16) located under said lamp (2) has a horizontal part (22) and a part (21) which is inclined downwardly toward said horizontal part (22) at an angle  $\alpha$  of approximately 6° to 10° relative to said horizontal part (22) said inclined part (21) having a prismatic profile (24) parallel to the axis of said lamp (2) on its side facing said lamp (2) and said second portion (25) comprises a prismatic profile (26) at its inside and encloses an angle  $\beta$  of approximately 40°-50° relative to said horizontal part (22), wherein the height (H) of said prismatic profiles (24) of said inclined part (21) decreases and said aperture angle increases toward the horizontal part (22) of said first portion (20).

4,680,685

## LIGHT PANEL

Peter Altman, Philadelphia, Pa., assignor to Light and Sound Specialties, Inc., Philadelphia, Pa.

Filed Aug. 5, 1986, Ser. No. 893,503

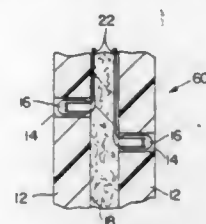
Int. Cl.<sup>4</sup> F21V 11/00

U.S. Cl. 362-240

12 Claims

1. A light panel device comprising:

a thermoplastic translucent body having at least one hole therethrough and an exposed and an unexposed surface;



a lamp placed within each hole so as not to project beyond the exposed surface; and  
a fiberglass backing layer secured to the unexposed surface.

#### 4,680,686 ELECTRIC 3-PHASE SUPPLY DEVICE FOR AN OZONIZER

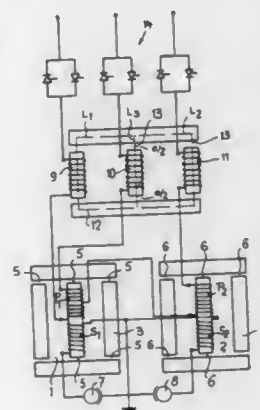
Paul Chapsal, and Jean-Francois Petitimbart, both of Garges-les-Gonnesse, France, assignors to Tralligaz "Cle Generale de l'Ozone", Garges-les-Gonnesse, France

Filed Dec. 23, 1985, Ser. No. 812,682

Claims priority, application France, Dec. 28, 1984, 84 20046  
Int. Cl.<sup>4</sup> H02M 5/00

U.S. Cl. 363—10

5 Claims



1. A power supply device for connection to a 3-phase mains supply of an ozonizer comprising at least two capacitive discharge elements, said device comprising two single-phase step-up voltage transformers having air gaps connected in a Scott circuit, and connected between the 3-phase mains supply and said discharge elements.

#### 4,680,687 SWITCH-MODE POWER SUPPLY HAVING A FREE-RUNNING FORWARD CONVERTER

Harald Stasch, Neuried, and Rudolf Schlierjott, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,146

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429103

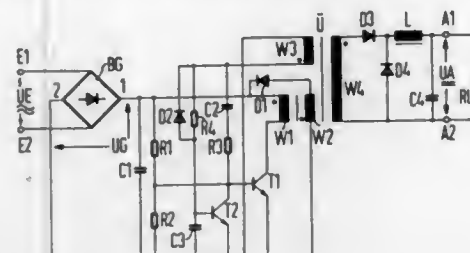
Int. Cl.<sup>4</sup> H02M 3/335

U.S. Cl. 363—18

5 Claims

1. A switch-mode power supply comprising:  
a rectifier including an input for receiving a.c. voltage and an output for delivering d.c. voltage; and  
a free-running converter including a switching transistor, a transformer connected to said switching transistor, an output circuit, including a free-wheeling diode, connected to said transformer for delivering d.c. voltage, and control

means connected to said transformer and to said switching transistor and operable to always switch on said switching



transistor in the currentless state of said free-wheeling diode.

#### 4,680,688 DC/DC CONVERTER

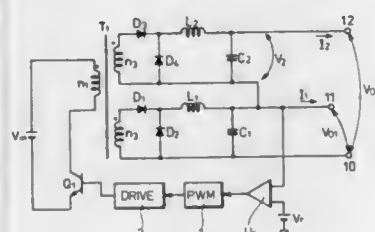
Kiyoharu Inou; Hideaki Matsumura, and Hitoshi Saito, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Oct. 11, 1985, Ser. No. 786,661

Claims priority, application Japan, Oct. 23, 1984, 59-222698  
Int. Cl.<sup>4</sup> H02M 3/335

U.S. Cl. 363—21

7 Claims



1. A DC/DC converter comprising  
at least one converter comprising  
a transformer having a primary coil and a plurality of secondary coils;  
a switching circuit adapted to turn ON and OFF a supply of input DC voltage to said primary coil;  
rectifying and smoothing circuits for rectifying and smoothing AC voltages obtained in said secondary coils;  
a plurality of output terminals for outputting a plurality of DC output voltages from said rectifying and smoothing circuits;  
circuit means for obtaining the sum of output voltages from respective rectifying and smoothing circuits; and  
control means responsive to the lowest DC output voltage from said rectifying and smoothing circuits for controlling the ON-OFF operation of said switching circuit, thereby to maintain said lowest DC output voltage at a constant level; wherein one of said output terminals of the lowest DC output voltage is a common terminal;  
wherein said input DC voltage is obtained by rectifying an AC voltage supplied through a noise filter, and wherein said noise filter comprises common mode chokes connected in parallel with respective power lines, and capacitors connected in parallel with respective common mode chokes and said capacitors having the same capacitance value, said capacitance value being selected so that the resonance frequency of said capacitances in combination with said common mode chokes, falls in a predetermined range.

#### 4,680,689 THREE-PHASE AC TO DC POWER CONVERTER WITH POWER FACTOR CORRECTION

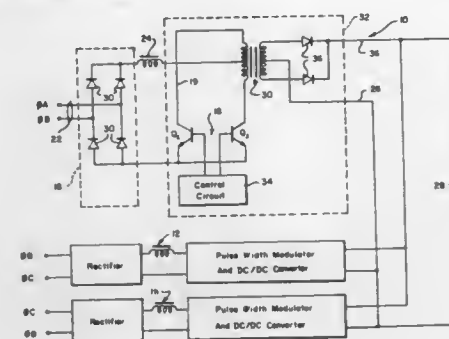
Donald W. Payne, 2450 Transit Ave., Anaheim, Calif. 92804, and Bruce Hemp, La Mirada, Calif., assignors to Donald W. Payne, Anaheim, Calif.

Filed Jan. 23, 1984, Ser. No. 573,086

Int. Cl.<sup>4</sup> H02M 1/12, 7/155

U.S. Cl. 363—26

2 Claims



1. A method of converting three-phase AC to DC voltage wherein the power factor is substantially corrected and current harmonics are reduced, comprising the steps of:

- individually rectifying each phase of the three-phase AC voltage to form a full wave rectified variable voltage source;
  - generating a series of spaced apart timing pulses having a frequency substantially greater than the frequency of said AC voltage source;
  - using said timing pulses to control the flow of DC current from each full wave rectified variable voltage source to an energy storing inductor such that the flow of DC current to said inductor is linear and is proportional to the instantaneous magnitude of the variable voltage supplied by said voltage source; and,
  - successively transferring all of the energy stored in said inductor to a load in the time intervals between said timing pulses.
- steps (C) and (D) being performed such that the AC to DC voltage conversion results in a substantially resistive load being presented to said AC voltage source.

#### 4,680,690 INVERTER FOR USE WITH SOLAR ARRAYS

Arthur F. Dickerson, 245 Hacienda Ave., San Luis Obispo, Calif. 93401

Continuation-in-part of Ser. No. 662,783, Oct. 19, 1984, Pat. No. 4,591,965, This application May 23, 1986, Ser. No. 866,863

Int. Cl.<sup>4</sup> H02M 1/12

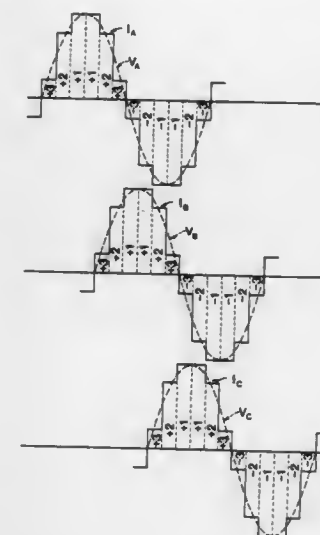
U.S. Cl. 363—43

2 Claims

1. A system for generating a six phase alternating current on the lines L<sub>1</sub>, L<sub>2</sub> . . . L<sub>6</sub>, comprising in combination:  
a first high power array having a positive terminal and having a negative terminal denoted by D<sub>1</sub>;  
a first low power array having a positive terminal and having a negative terminal denoted by D<sub>2</sub>, the positive terminals of said first high power array and of said first low power array being connected to a common positive terminal denoted by C<sup>+</sup>;  
a second high power array having a negative terminal and having a positive terminal denoted by D<sub>1</sub>';  
a second low power array having a negative terminal and having a positive terminal denoted by D<sub>2</sub>', the negative terminals of said second high power array and of said second low power array being connected to a common negative terminal denoted by C<sup>-</sup>;  
switching means connected to the terminals D<sub>1</sub>, D<sub>2</sub>, C<sup>+</sup>,

D<sub>1</sub>', D<sub>2</sub>', and C<sup>-</sup> and connected to the lines L<sub>1</sub> . . . L<sub>6</sub> for generating a first phase A on the line L<sub>1</sub> by

- connecting D<sub>2</sub>' to L<sub>1</sub> for an interval of 30° starting at 0° and again at 150°
- connecting D<sub>1</sub>' to L<sub>1</sub> for an interval of 30° starting at 30° and again at 120°
- connecting C<sup>+</sup> to L<sub>1</sub> for an interval of 60° starting at 60°
- connecting D<sub>2</sub> to L<sub>1</sub> for an interval of 30° starting at 180° and again at 330°
- connecting D<sub>1</sub> to L<sub>1</sub> for an interval of 30° starting at 210° and again at 300°
- connecting C<sup>-</sup> to L<sub>1</sub> for an interval of 60° starting at 240°



for generating a second phase B on the line L<sub>2</sub> by repeating steps (a) through (f) with L<sub>2</sub> substituted for L<sub>1</sub> and with 120° added to all of the starting phases, for generating a third phase C on the line L<sub>3</sub> by repeating steps (a) through (f) with L<sub>3</sub> substituted for L<sub>1</sub> and with 240° added to all of the starting phases, for generating a fourth phase A on the line L<sub>4</sub> by repeating steps (a) through (f) with L<sub>4</sub> substituted for L<sub>1</sub> and with 180° added to all of the starting phases, for generating a fifth phase B on the line L<sub>5</sub> by repeating steps (a) through (f) with L<sub>5</sub> substituted for L<sub>1</sub> and with 300° added to all of the starting phases, and for generating a sixth phase C on the line L<sub>6</sub> by repeating steps (a) through (f) with L<sub>6</sub> substituted for L<sub>1</sub> and with 420° added to all of the starting phases.

#### 4,680,691 METHOD AND SYSTEM FOR PREVENTING AN EXCESSIVE VOLTAGE BUILD-UP IN A POWER CONVERTER SYSTEM

Teruo Yoshino, and Katsuro Itoh, both of Fuchu, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 6, 1986, Ser. No. 871,365

Claims priority, application Japan, Jun. 10, 1985, 60-124283  
Int. Cl.<sup>4</sup> H02H 7/00

U.S. Cl. 363—51

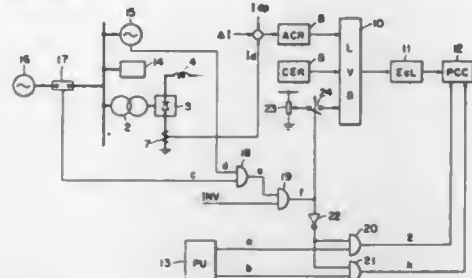
4 Claims

1. A method for operating a power converter connected between a DC bus line and an AC bus line, said AC bus line provided with a synchronous condenser and connected to an AC power system through a breaker, comprising the steps of:  
detecting whether or not said breaker is opened;  
detecting whether or not said synchronous condenser is under operation;  
detecting whether or not said power converter works as inverter; and  
driving said power converter at a firing angle cancelling a capacitive reactive power of said AC bus line when said



breaker is opened, said synchronous condenser is under operation, and said power converter works as inverter.

3. A system for operating a power converter connected between a DC bus line and an AC bus line, said AC bus line provided with a synchronous condenser and connected to an AC power system through a breaker, comprising:  
first means for generating a second signal while said breaker is opened;



second means for generating a second signal while said synchronous condenser is under operation;  
third means for generating a third signal while said power converter works as inverter; and  
control means for driving said power converter at a predetermined firing angle upon reception of said first, second and third signals thereby consuming on said AC bus line a reactive power sufficient for cancelling a capacitive reactive power of said AC bus line.

4,680,692

#### CONTROL APPARATUS OF AC/DC POWER CONVERTER

Takami Sakai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

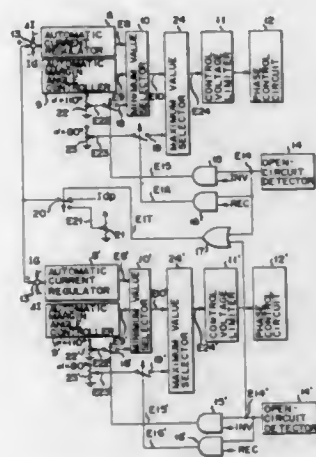
Filed Dec. 12, 1985, Ser. No. 808,047

Claims priority, application Japan, Dec. 28, 1984, 59-276119

Int. Cl.<sup>4</sup> H02J 3/36

U.S. Cl. 363—35

14 Claims



1. A control apparatus of an AC/DC power converter whose power converting operation depends on a control angle and which is coupled to a power line of an AC power system, said AC/DC power converter being provided with an automatic current regulator which provides a current control voltage corresponding to said control angle, comprising:  
detector means for detecting an open-circuit of the power line of said AC power system, and generating a detection signal which indicates the open-circuit of said power line;  
set means, coupled to said detector means, for setting, in accordance with the generation of said detection signal, said control angle at a predetermined value which is used

for controlling the power converting operation of said AC system when said open-circuit occurs, comprising,  
first control voltage means for providing a first control voltage corresponding to said predetermined value, and second control voltage means for providing a second control voltage corresponding to said predetermined value;  
lock means, coupled to said detector means, for locking, in accordance with the generation of said detection signal, a current set value of said automatic current regulator at a given value when said open circuit occurs;  
an automatic margin angle controller which provides a margin angle control voltage;  
minimum value selector means, coupled to said automatic margin angle controller, said automatic current regulator and said first control voltage means, for selecting the minimum one of said current control voltage, said margin angle control voltage and said first control voltage, and providing a selected control voltage representing the selected minimum one which is used for controlling the power converting operation of said AC system; and  
maximum value selector means, coupled to said minimum value selector means and said second control voltage means, for selecting the maximum one of said selected control voltage and said second control voltage, and providing a selected control signal representing the selected maximum one which is used for controlling the power converting operation of said AC system.

4,680,693

#### CONTINUOUS HIGH D.C. VOLTAGE SUPPLY PARTICULARLY FOR AN X-RAY EMITTER TUBE

Claude Carron, Montmagny, France, assignor to Thomson-CGR, Paris, France

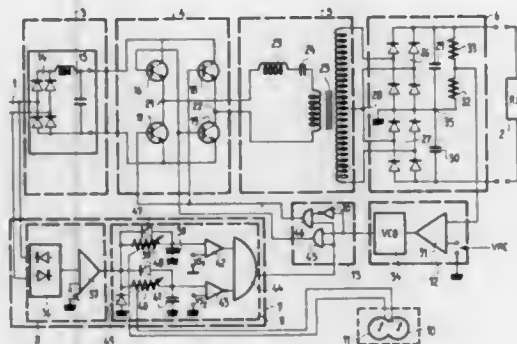
Filed Feb. 10, 1986, Ser. No. 827,725

Claims priority, application France, Feb. 12, 1985, 85 01971

Int. Cl.<sup>4</sup> H02P 13/20

U.S. Cl. 363—98

5 Claims



1. A high voltage d.c. supply which receives alternating electrical energy from a general single-phase distribution mains, comprising:  
means for periodically tapping said energy from said mains during periods having a duration less than a half-wave of the alternating electrical energy to thereby produce periodically chopped high d.c. voltage synchronized with said alternating electrical energy;  
means for regulating said chopped high voltage wherein said regulating means includes a frequency modulator for modulating an oscillating frequency of a ripple generator and wherein said means for periodically tapping said energy includes a means for validating that said regulating means is operating.

4,680,694

#### OZONATOR POWER SUPPLY

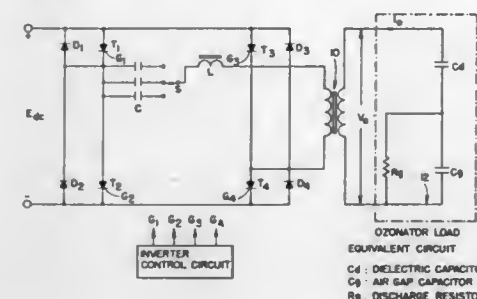
Anh N. Huynh, Edgewood, Ky., and Phoivos D. Ziogas, Brossard, Canada, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,737

Int. Cl.<sup>4</sup> H02M 7/521

U.S. Cl. 363—136

9 Claims



1. A power supply circuit for an ozonator comprising:  
a. a DC/AC semiconductor switch bridge inverter coupled at its input terminals of a resonant network, said semiconductor switch bridge inverter comprising a first semiconductor switch means for conducting through the resonant network in a first direction and a second semiconductor switch means for conducting through the resonant network in a second direction;  
b. said resonant network having a step up high voltage transformer with its primary winding coupled to said semiconductor switch bridge inverter and its secondary winding coupled to the ozonator; and  
c. an inverter control circuit for controlling the gating electrodes of said first and second semiconductor switch means, said inverter control circuit comprising first and second AND gate means for controlling gating of said first and second semiconductor switch means, for generating a switching frequency square wave signal and applying it to a first input of each of said first and second AND gate means, and means for generating a high frequency pulse train and applying it to a second input of each of said first and second AND gate means, such that the first and second AND gate means generate gating signals to cause said first and second semiconductor switch means to operate in a pulse burst modulation mode wherein the switching frequency of the square wave signal controls the timing between pulse bursts, and the number of high frequency pulses within each pulse burst is controlled by the frequency of the high frequency pulse train and the width of each pulse in the square wave signal.

4,680,695

#### CROSS COUPLED CURRENT REGULATOR

Russel J. Kerkman, and Timothy M. Rowan, both of Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation of Ser. No. 735,659, May 20, 1985, abandoned.

This application Oct. 27, 1986, Ser. No. 922,775

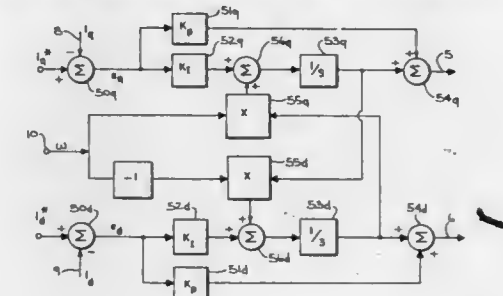
Int. Cl.<sup>4</sup> H02P 13/30, 5/40

U.S. Cl. 363—160

5 Claims

1. In a variable frequency power supply which receives a plurality of sinusoidal current command signals and produces sinusoidal output currents to a load, a polyphase current regulator for receiving the plurality of sinusoidal current command signals and producing composite control signals, each current regulator phase comprising:  
first summing means for receiving at one input one of said sinusoidal current command signals and receiving at a second input a sinusoidal current feedback signal indicative of sinusoidal output current supplied to said load, the first summing means being operable to produce an error signal which is indicative of the difference between the

sinusoidal current command signal and the sinusoidal current feedback signal;  
second summing means for receiving at one input a signal proportional to said error signal and for receiving at a second input a cross coupled signal, the second summing means being operable to produce a summed signal which is proportional to the sum of the signals applied to its two inputs;  
an integrator having an input connected to receive the summed signal from the second summing means and being operable to produce an integrator output signal which is the integral of the summed signal applied to its input;  
third summing means for receiving at one input the integrator output signal and for receiving at a second input a



signal proportional to said error signal, the third summing means being operable to produce one of the composite control signal which is proportional to the sum of the signals applied to its inputs; and  
means for producing said cross coupled signal which includes:  
(a) a multiplier having its output connected to the second summing means,  
(b) means for coupling to one input on the multiplier a signal which is proportional in magnitude to the frequency of said one sinusoidal current command, and  
(c) means for coupling to another input on the multiplier a signal received from another of said current regulator phases.

4,680,696

#### INK JET RECORDER WITH IMPROVED SYSTEM FOR TRANSPORTING INK TO OR FROM RECORDING HEADS

Ryuichi Ebinuma, Hiratsuka; Yoshifumi Hattori, Yamato, and Hiroo Ichihashi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 684,117, Dec. 20, 1984, abandoned.

This application Sep. 29, 1986, Ser. No. 913,613

Claims priority, application Japan, Dec. 26, 1983, 58-244131;

Dec. 26, 1983, 58-244132; Dec. 26, 1983, 58-244133; Dec. 26, 1983, 58-244134; Dec. 26, 1983, 58-244135; Dec. 26, 1983, 58-244136; Dec. 26, 1983, 58-244138

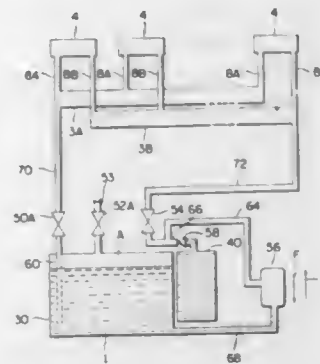
Int. Cl.<sup>4</sup> G01D 15/18, 15/16

U.S. Cl. 346—75

16 Claims

1. An ink-jet recorder comprising:  
a head having a plurality of head elements for discharging ink to record a pattern;  
a first tank for storing ink to be supplied to said head elements;  
a second tank for storing ink to be supplied to said first tank; and  
an ink transport system for transporting the ink among said head elements, said first tank and said second tank;  
said ink transport system including:  
(a) first distribution means connected to a head port for each said head element;

- (b) second distribution means connected to another head port for each said head element;
- (c) first transport means arranged between said first tank and said first distribution means to form a first transport path for the ink;
- (d) first switching means arranged in said first transport means to selectively block said first transport path;
- (e) second transport means arranged between said first tank and said second distribution means to form a second transport path for the ink;
- (f) second switching means arranged in said second transport means to selectively block said second transport path;
- (g) a pump disposed in said second transport means between said first tank and said second switching means and having a first port connecting to said first tank and



a second port connecting to said second switching means, said pump being operable in a first direction to transport the ink from said second port to said first port in a second direction to transport the ink from said port to said second port;

- (h) third transport means connected to said second tank and having back-flow prevention means for regulating the flow of ink to only the direction flowing from said second tank, said third transport means transporting the ink from said second tank to said second port; and
- (i) third switching means for opening an air chamber in said first tank to atmosphere while ink is flowing through said first or second distribution means to or from said head elements, whereby ink can be transported through said ink transport system without escaping to the atmosphere.

4,680,697

## NUMERICAL CONTROL SYSTEM

Nobuyuki Kiya, Hachioji, and Motoaki Yoshino, Sugino, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan  
PCT No. PCT/JP85/00032, § 371 Date May 31, 1985, § 102(e)  
Date May 31, 1985, PCT Pub. No. WO85/03366, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 26, 1985, Ser. No. 739,672

Claims priority, application Japan, Jan. 26, 1984, 59-012428  
Int. Cl. G06F 15/46; G05B 19/18

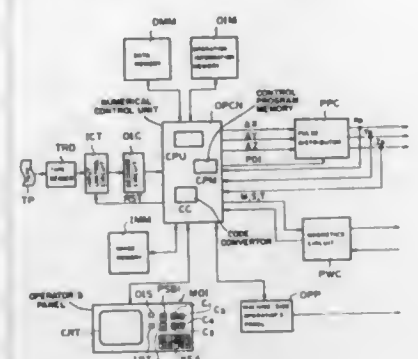
U.S. Cl. 364-171

9 Claims

1. A numerical control method for a system including a numerical control unit for performing numerical control on the basis of operation information necessary for numerical control and having an operation information memory, and a numerical control operator panel with only numeric and cursor control keys and a display unit, the numerical control method comprising the following steps:

- (a) entering, into the numerical control unit, a numeric code of a character of operation information output by using the numeric keys provided on the numerical control oper-

- ator's panel and converting the code into one or more text characters corresponding to the code;
- (b) displaying, by the numerical control unit, on the display unit, the operation information converted into the one or more text characters by step (a);



- (c) storing, by the numerical control unit, in the operation information memory, the operation information displayed by step (b); and
- (d) performing, by the numerical control unit, numerical control processing on the basis of the operation information stored by step (c).

4,680,698

## HIGH DENSITY ROM IN SEPARATE ISOLATION WELL ON SINGLE WITH CHIP

Jonathan Edwards, Bristol; David L. Waller, Avon, and Michael D. May, Bristol, all of England, assignors to Inmos Limited, Bristol, England

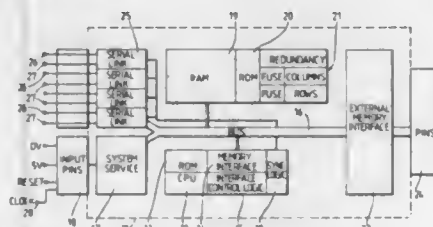
Filed Nov. 16, 1983, Ser. No. 552,601

Claims priority, application United Kingdom, Nov. 26, 1982, 8233733

Int. Cl. G06F 13/00, 15/16, 7/48; H01L 27/02

U.S. Cl. 364-200

15 Claims



1. A network of interconnected microcomputers, each microcomputer comprising:

- (a) a single integrated circuit chip having a substrate of semiconductor material of a first type,
- (b) an on-chip high density RAM array having at least one K byte for holding a program containing instructions for execution by said on-chip processor,
- (c) a plurality of communication links each forming an interconnection with an adjacent microcomputer in the network,
- (d) an instruction pointer circuit for addressing said RAM to obtain program instructions therefrom,
- (e) an instruction receiving circuit coupled to said RAM for receiving said instructions from said program stored in said RAM,
- (f) an instruction decoder circuit coupled to said receiving circuit for decoding instructions received by said instruction receiving circuit,

- (g) a plurality of on-chip transistors comprising circuitry operable independently of the operation of said RAM,
- (h) first isolation well means formed in said substrate of a semiconductor material of different type than said substrate, said first isolation well means containing all of said memory cells of said high density RAM array, and
- (i) second isolation well means separate from said first isolation well means and formed in said substrate of a semiconductor material of different type than said substrate, said second isolation well means containing some of said transistors which are operable independently of said operation of said RAM,

whereby each microcomputer in the network operates in accordance with instructions from program in its on-chip RAM and each on-chip RAM is protected from noise due to operation of independently operating transistors.

4,680,699

## TERMINAL CONTROL APPARATUS FOR PARALLEL EXECUTION OF DATA EDITING AND DATA TRANSMISSION/RECEPTION CONTROL

Megumi Uchino, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

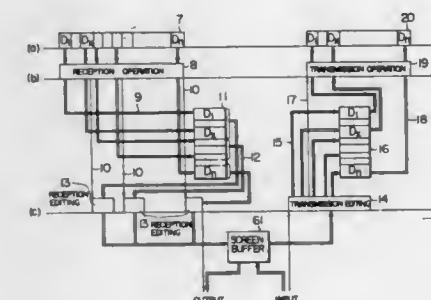
Filed May 14, 1984, Ser. No. 609,833

Claims priority, application Japan, May 13, 1983, 58-83627

Int. Cl. G06F 3/02

U.S. Cl. 364-200

3 Claims



1. A terminal control apparatus for controlling data transfer between a terminal device and a central processor comprising: buffer memory means;

terminal control means connected to said terminal device for controlling transfer of data to and from said terminal device and editing of said data, including first means for editing first data received from said terminal device into a format for transfer to said central processor and for storing the edited first data into said buffer memory means, and second means for reading out from said buffer memory means a predetermined amount of second data to be transferred from said central processor to said terminal device, for editing it into a format suitable for transfer to said terminal device, and for transferring the predetermined amount of the edited second data to said terminal device;

communication control means connected to said central processor for controlling transfer of data to and from said central processor, including third means for reading out from said buffer memory means a predetermined amount of the edited first data which has been stored therein by said terminal control means and for transferring the predetermined amount of the edited first data to said central processor, and fourth means for writing the second data to be transferred from said central processor to said terminal device into said buffer memory means; and

interface control means connected between said terminal control means and said communication control means for controlling said communication control means to read out the predetermined amount of the edited first data from said buffer memory means and transfer it to said central processor each time said terminal control means has writ-

ten said predetermined amount of the edited first data into said buffer memory means and at the same time said terminal control means is writing a further predetermined amount of edited first data into said buffer memory means, and controlling said terminal control means to read out from said terminal device said predetermined amount of the second data from said buffer memory means and transfer the predetermined amount of the edited second data to said terminal device each time said communication control means has written the predetermined amount of the second data into said buffer memory means and at the same time said communication control means is writing a further predetermined amount of the second data into said buffer memory means.

4,680,700

## VIRTUAL MEMORY ADDRESS TRANSLATION MECHANISM WITH COMBINED HASH ADDRESS TABLE AND INVERTED PAGE TABLE

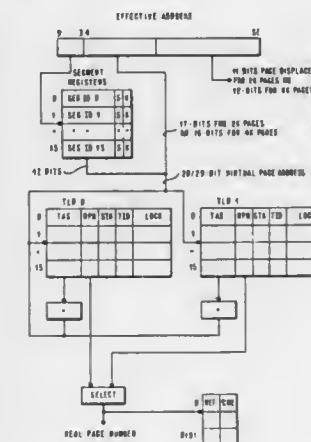
Phillip D. Hester, and Richard O. Simpson, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 558,244, Dec. 7, 1983, abandoned. This application Dec. 19, 1986, Ser. No. 945,228

Int. Cl. G06F 13/00, 9/36

U.S. Cl. 364-200

14 Claims



1. A data processing system comprising:

a central processing unit for accessing information stored in page frames by providing a virtual memory address from a virtual memory address space, said virtual memory address space including a plurality of page frame addresses,

a first memory for storing information organized as a plurality of page frames and accessible by memory addresses represented by a real memory address space and wherein the virtual memory address space includes a substantially larger number of page frames than the real memory address space;

means connected to the central processing unit and the first memory for converting virtual memory addresses received from the central processing unit into real memory addresses for accessing information from single page frames from said first memory, said converting means including:

means for hashing a selected virtual address to produce a hashed address;

a first table having a list of hashed addresses each with a corresponding predetermined initial virtual address and a pointer to an entry in a second table;

said second table having a list of virtual addresses corresponding to the initial virtual addresses in the first table



and further having a location in the second table corresponding directly to a unique page frame in the real memory address space and each virtual address including a corresponding link address, said link address connecting a plurality of noncontiguous virtual addresses that when hashed produce the same hashed address; and means for receiving an input virtual memory address, hashing said input virtual memory address with said hashing means to produce an input hashed address, selecting a location in said first table in accordance with said input hashed address, searching the corresponding linked address locations until the input virtual memory address is located, locating the corresponding input virtual address in the second table and its corresponding real address.

4,680,701

# ASYNCHRONOUS HIGH SPEED PROCESSOR HAVING HIGH SPEED MEMORIES WITH DOMINO CIRCUITS CONTAINED THEREIN

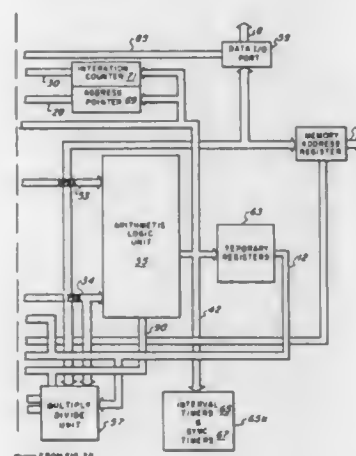
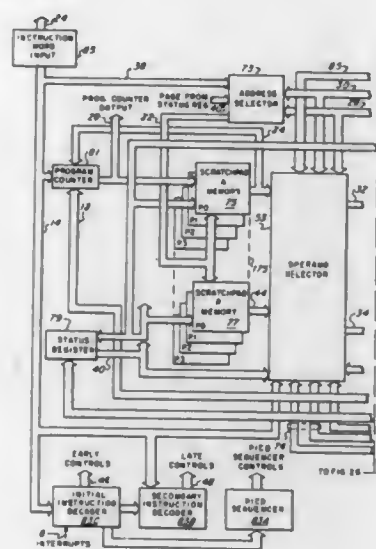
Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 11, 1984, Ser. No. 598,946

Int. Cl. G06F 15/00; B01F 15/02

U.S. Cl. 364-200

3 Claims



1. An asynchronous high speed processor system comprising: high speed processor means for executing each program instruction in a single fetch cycle; an instruction means for communicating instructions to the high speed processor means;

a data memory for communicating data to the high speed processor means; the high speed processor means includes: an arithmetic logic unit (ALU) for performing arithmetic and logic operations upon the data provided by the data memory means under control of instructions from the instruction memory means, said arithmetic logic unit (ALU) requires two operands for operation in a single fetch cycle, the high speed processor means further includes: first memory means connected to said ALU so as to communicate the first operand, and second memory means connected to said ALU so as to communicate the second operand; and means for prefetching an instruction from the instruction memory means for an operation of the arithmetic logic unit upon data provided by the data memory means and wherein the means for prefetching comprises a memory having a plurality of stages for decoding the prefetched instruction and said memory further includes a domino circuit means responsive to a signal from the high speed processor means for providing a plurality of completion pulses indicating the availability of the prefetched instruction for use by said ALU with each single completion pulse representative of the maximum signal propagation time delay through a predetermined single stage of the memory.

4,680,702

# MERGE CONTROL APPARATUS FOR A STORE INTO CACHE OF A DATA PROCESSING SYSTEM

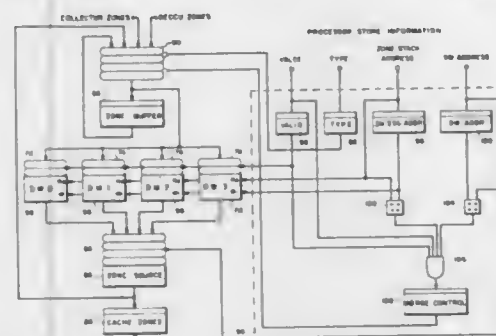
Daniel M. McCarthy, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 27, 1984, Ser. No. 604,769

Int. Cl. G06F 12/08

U.S. Cl. 364-200

8 Claims



1. A computer system comprising:

A central processor unit, CPU, having at least one execution unit means for executing instructions and producing processor data words, a store into cache for storing data words, means for issuing store into cache commands, and CPU circuit means interconnecting the execution unit means, the store into cache, and the means for issuing store into cache commands, the receipt of a store into cache command by the cache causing the cache to store at least one zone of data bits from a pair of processor data words produced by the execution unit means, each data word consisting of a predetermined number of bits which number is a multiple of the number of bits in a zone; and hierarchical memory system means operatively connected to the CPU for storing in and reading out of said memory system means blocks of system data words at locations of the memory system means having addresses, each block of system data words having a block address, a block address being the address of a block of addressable locations of the memory system means;

said execution unit means producing as the result of the execution of an instruction at least one zone of processor data in a pair of processor data words for storage in the store into cache;

means connected to the CPU circuit means for producing zone control bits having a predetermined binary value to

identify the zones of each pair of processor data words containing processor data produced by said execution unit means for storage in the store into cache; means connected to the CPU circuit means for producing the block address of each pair of processor data words produced by the execution unit means for storage in the store into cache;

said store into cache, in response to the receipt by the cache of a store into cache command, of a pair of processor data words, of a block address of the pair of processor data words, and of the zone control bits for said pair of processor data words, storing in said cache the bits of the zones of the processor data words containing processor data identified by zone control bits having said predetermined binary value said bits of the zones of the processor data words being stored in locations corresponding to the block address of said pair of processor data words;

register means connected to the CPU circuit means for storing the zone control bits produced by the means for producing zone control bits;

means operatively connected to the register means for extracting the zone control bits from the register means upon the receipt of a store to cache command for a block of system data words having the same block address as that of processor data words previously stored in the store into cache, said zone control bits having said predetermined binary value identifying the zones of the data words stored in the cache containing processor data; and

means operatively connected to the means for extracting zone control bits and responsive to the zone control bits having said predetermined binary value for inhibiting the cache from storing corresponding zones of system data words of a block of system data words read out of hierarchical memory system means and transmitted from the hierarchical memory system means to the CPU.

4,680,703

# DATA PROCESSING SYSTEM WITH REORGANIZATION OF DISK STORAGE FOR IMPROVED PAGING

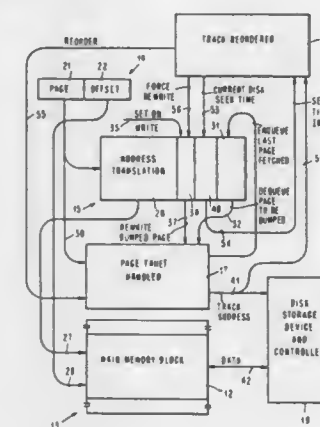
Thomas A. Kriz, Sandy Hook, Conn., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 25, 1984, Ser. No. 624,485

Int. Cl. G06F 12/12; G11B 20/12

U.S. Cl. 364-200

1 Claim



1. In a data processing system having means for transferring pages of data between tracks of a disk storage device and page locations of a main memory, including means for selecting a track address, means for bumping a page from main memory when a page location is needed for an addressed page, including means for rewriting a bumped page into the next available tracks as pages are bumped from main memory, and including means for identifying data pages in page locations of main

memory and for identifying whether the page in memory has been changed from the page on disk, and means for selectively rewriting a page from memory onto disk only if a change has been made,

apparatus for reordering the pages on the tracks of the disk for reduced track seek time, comprising,

means for maintaining a queue of pages brought into main memory from the disk,

means for measuring track seek time and means for maintaining a list containing the track seek time for each page location, wherein said means for maintaining the seek time list comprises

storage means for holding the seek time for each page location,

means providing the address of the track last accessed and the track currently being accessed, and

means for forming the absolute difference between said last and currently accessed track addresses and for storing a function of the difference as the track seek time in said storage means for the page location storing data from said currently addressed track

means operable when the tracks are to be reordered for requiring said means for selectively rewriting to rewrite each page without regard to whether a change has been made in a page,

means for calculating the average seek time for said page locations, means for providing a reference value of track seek time and means for comparing said average seek time with said reference seek time, said means for comparing providing a binary-valued signal signifying that the pages are to be reordered on the tracks of the disk for reduced seek time when said average reaches said reference or signifying that said average is below said reference, and

means in said page transferring means for identifying a set of disk tracks available for storing the pages from memory, and means operable in response to said signal that the pages are to be reordered for controlling said page transferring means for rewriting the pages into a physical sequence of said available tracks according to the sequence of pages in said queue,

whereby after said reference is reached the pages transferred to the disk from main memory are physically reordered on the disk in the sequence in which they were previously fetched from the disk and whereby subsequently fetching the same pages in approximately the same order may improve the average seek time.

4,680,704

# OPTICAL SENSOR APPARATUS AND METHOD FOR REMOTELY MONITORING A UTILITY METER OR THE LIKE

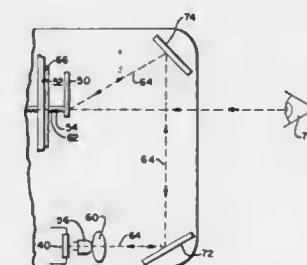
Lawrence R. Konicek, Richfield; Steven K. Case, St. Louis Park, and Gerald M. Kackman, St. Paul, all of Minn., assignors to TeleMeter Corporation, Minneapolis, Minn.

Filed Dec. 28, 1984, Ser. No. 687,089

Int. Cl. G01B 11/2; G01R 11/00; G01K 9/00

U.S. Cl. 364-525

20 Claims



19. An optical sensor apparatus for reading a meter having

one or more indicators representative of the meter reading; comprising:

- light source means for providing a source of light, the light source means directing the light generally toward a faceplate of the meter;
- lens means for focusing the light reflected off the meter faceplate;
- optically sensitive image detector means for receiving the light focused thereon by the lens means including an array of light sensitive elements; and
- control means operatively interconnected to the image detector means for receiving signals from the image detector means representative of the light intensity to which the light sensitive elements of the image detector means are exposed and for creating a digitized image of the meter faceplate based on the signals received from the image detector means, said control means further including storage means for storing the digitized image of the meter faceplate, said control means including shutter means for controlling the exposure of the image detector means to the reflected light.

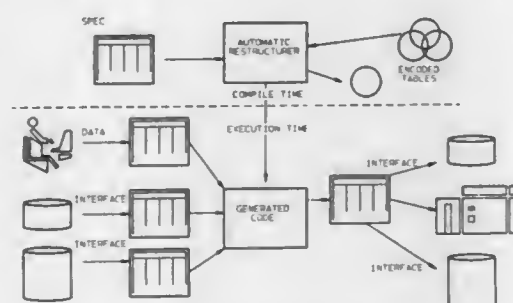
4,680,705

## AUTOMATIC DATA RESTRUCTURER

Nan-Chiang Shu, Rolling Hills, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Sep. 13, 1985, Ser. No. 775,868  
Int. Cl. G06F 9/00

U.S. Cl. 364-300

9 Claims



1. In an electronic information processing system where input and output data structures are prespecified, a method for generating object code, which object code conforms the input data into the output data structure at execution time, comprising the steps of:

- ascertaining in said system the shape of a given input and output data structure as being either (1) of a flat form, (2) of a one-branch form, or (3) of a tree form;
- determining in said system a minimal subset of operations selected from a set of operations consisting of trimming, flattening, grafting, or stretching for conforming the input into the output data structure according to the difference in ascertained shapes;
- determining in said system each instance when a selected operation is to be invoked; and
- executing in said system the order of operations specified by steps (a) through (c) upon said input data structure.

4,680,706

## RECLOSER CONTROL WITH INDEPENDENT MEMORY

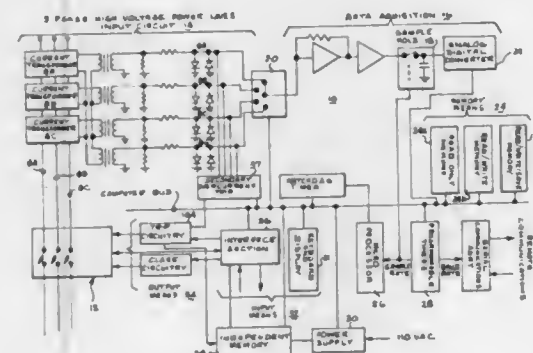
Thomas J. Bray, Shaker, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.  
Filed May 31, 1984, Ser. No. 615,563  
Int. Cl. G01R 19/00; H01H 47/00

U.S. Cl. 364-492

8 Claims

1. A recloser control comprising:  
an input circuit for sensing current in each phase of a power line comprised of a first phase, a second phase, a third phase and a ground, and for sensing current in the ground,

and providing an analog signal corresponding to the current in each of said phases and said ground;  
a data acquisition means including a sample and hold circuit for sampling the analog outputs of the input circuit and maintaining each analog output sampled for a desired preselected holding period, and an analog to digital converter for converting the analog output of the sample and hold circuit to a digital form, said digital form providing an input signal to a processing means;  
memory means for storing command information in digitized form including normalizing references, time current characteristics, instantaneous trip values, number of operations associated with a given time current characteristic, time intervals for selected measurements and operations, and status information such as digitized current magnitudes from said data acquisition means;  
processing means for generating an equivalent to a mean square value for each input signal from said data acquisition means, comparing the mean square equivalent values of the inputs with a preselected one of a number of time current characteristics stored in memory means in accordance with other command information stored in the



memory means, and issuing an operation command which causes a recloser to change its state between close and trip conditions;

a power supply for selectively supplying power to the other portions of the recloser control from the power line being protected, said power supply including a storage means to supply power when the power lines being protected are interrupted;

output means for activating trip means in the recloser in accordance with operation commands from the processor means or trip signal from the secondary overcurrent trip circuitry, or close means in the recloser in accordance with operational commands from the processor means;

input means for entering command information; and  
independent memory means interconnected among said power supply storage means, said processor means and said input means, said independent memory means supplying information to said processor means and being alterable by said processor when said processor means is supplied sufficient operating power and, being alterable by said input means, when said processor means is not supplied sufficient operating power.

4,680,707

## ELECTRONIC CASH REGISTER AND METHOD FOR DEFINING PRINT CHARACTERS

Yuji Iida, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

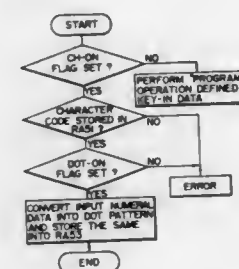
Filed Jan. 28, 1985, Ser. No. 695,449

Claims priority, application Japan, Feb. 6, 1984, 59-19791

Int. Cl. G07G 1/12; G06F 15/22

U.S. Cl. 364-405

15 Claims



1. An electronic cash register comprising:  
a keyboard having indicia keys including numeral keys, first to fourth function keys and department keys;  
mode setting means having a registration mode and a program mode;  
dot printing means for executing a printing operation in accordance with a received dot pattern having dots placed in lines forming a matrix of rows and columns;  
first memory means for storing a plurality of character codes to designate selected characters and storing a plurality of character patterns representing, respectively, a plurality of said selected characters, each stored character pattern being formed with said lines of dots forming a matrix of rows and columns;

second and third memory means; and  
data processing means for, when the mode setting means is set in said registration mode, generating sales data in response to a key operation in said keyboard and storing it into said second memory means, reading out a character pattern from said first memory means in accordance with said sales data and supplying it to the dot printing means, and when the mode setting means is set in said program mode, said data processing means storing data which is generated by operating said indicia keys and said first function key into said third memory means as character code data, storing line address data which is generated by operating the indicia keys and said second function key, storing into the third memory means a character pattern which is produced by operating selected ones of the indicia keys to each of which has been assigned a unique identity corresponding to only one dot in at least one of said lines of the matrix of rows and columns, and reading out the character pattern stored in said third memory means in response to the operation of said fourth function key and storing said character pattern into a memory area in said first memory means that is designated by the character code data stored in the third memory means.

184-022 O.G.-87-17

4,680,708

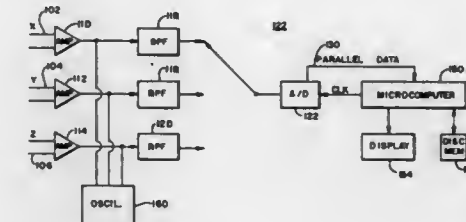
## METHOD AND APPARATUS FOR ANALYZING ELECTROCARDIOGRAPHIC SIGNALS

Hans D. Ambos; Michael E. Cain, and Burton E. Sobel, all of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 591,647, Mar. 20, 1984, abandoned. This application Nov. 5, 1984, Ser. No. 668,245  
Int. Cl. A61B 5/04; G06F 15/42

U.S. Cl. 364-417

35 Claims



1. A method for analyzing electrocardiogram (ECG) signals to determine the presence or absence of a predetermined frequency content in a preselected portion of said ECG signals comprising the steps of:

- converting analog ECG signals to digital ECG signals;
- performing a fast Fourier transform (FFT) on said preselected portion of said digital ECG signals; and
- determining a figure of merit (FOM) associated with the frequency content of said at least a preselected portion of said ECG signals from said output of said Fourier transform step, whereby said determination of the presence or absence of said predetermined frequency content can be determined from the value of said FOM.

4,680,709

## BACK PROJECTION IMAGE RECONSTRUCTION APPARATUS AND METHOD

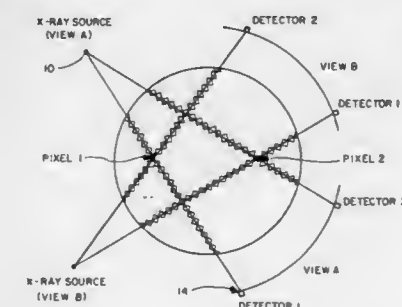
Nallaswamy Srinivasan; Sharon L. Banaszewski, both of Waukegan, and Kishore C. Acharya, West Ellis, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 13, 1984, Ser. No. 670,595

Int. Cl. G06G 15/42; G06G 7/60

U.S. Cl. 364-414

10 Claims



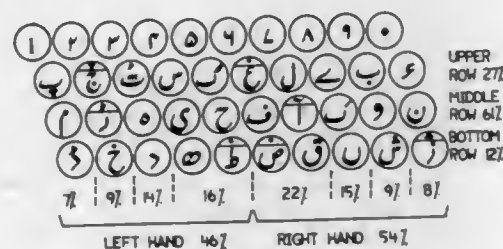
1. Circuitry for calculating pixel values from detector measurements in a CT scanner and the like in which a plurality of detectors measure attenuated radiation from a fan beam radiation source for consecutive projection views along a plane through an object located between said source and said plurality of detectors, said circuitry comprising  
means for identifying by calculation a detector for use in back projection through a first pixel in a first view,  
means for identifying by calculation a detector for use in back projection through said first pixel for a second view,  
means for identifying through interpolation a detector for use in back projection through said pixel for views inter-



mediate said first and second views based on said calculated detector identifications for said first pixel, means for identifying a detector for use in back projection through a second pixel for said first view, means for identifying a detector for use in back projecting through said second pixel for said second view, means for identifying by interpolation a detector for use in back projecting said second pixel for views intermediate said first and second views based on said calculated detectors for said second pixel, and means for identifying by interpolation detectors for use in back projecting through pixels intermediate said first and second pixels for said first and second views and views therebetween based on said identified detectors for use in back projecting through said first and second pixels.

4,680,710

**COMPUTER COMPOSITION OF NASTALIQ SCRIPT OF THE URDU GROUP OF LANGUAGES**  
Akeel H. Kizilbash, 2/51-G.P.E.C.H.S., Karachi-29, Pakistan  
Filed Nov. 19, 1984, Ser. No. 673,195  
Int. Cl.<sup>4</sup> G06F 15/38, 7/60; G09G 1/18; B41J 5/00  
U.S. Cl. 364-419 13 Claims



1. A method for computer composing the Urdu group of languages in true Nastaliq script in a highly esthetic manner conforming to the style and elegance of the traditional norms and conventions of the script, which comprises:

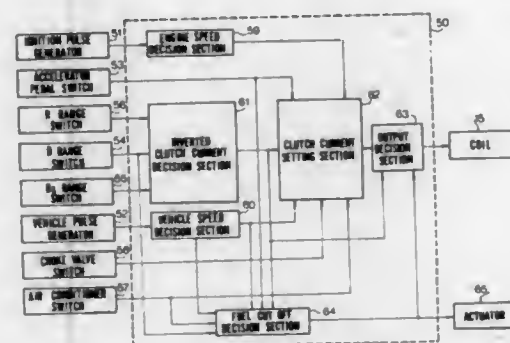
- expanding the character set of the Urdu group of languages by the inclusion of additional whole characters and allocating a key for said characters on a computer keyboard entry device, said keyboard having Urdu characters mapped to said keys by matching frequency of occurrence of a character with finger agility, by pattern recognition of similar characters, by rationalizing finger workload, and by minimal use of a shift key;
- storing in the computer memory digitized constituent elements of every whole character of the expanded set of said Urdu group of languages and every shosha having a representative shape of a whole character when joined together in a ligature as a combination of a Common Body Group having common body shapes, a Rest Body Group having a portion of a character joined with their respective common body to complete the whole character body, and a Diacritic Mark Group having means for identifying a specific member of a particular character family;
- defining a set of rules and their application in a computer program for automatically selecting, composing, and combining the computer stored characters and shoshas, for detecting End of Ligature special characters for ending ligatures, for minimum interligature spacing, for proper vertical positioning of characters and ligatures, and for correct positioning of Araabs having means for identifying Urdu vowel sounds, all according to the conventions of the script;
- entering into the computer with the keyboard entry device an interword space after each character to compose the whole character and omitting said interword space for combining commonly occurring pairs of words;
- bit mapping the wholly formed word "Allah" and assigning said word a key on said keyboard;
- displaying on the computer screen whole characters from right to left with a screen blinking cursor in a space at the

beginning of a word, formation of the word by entry of space, and movement of the cursor to the space at the end of the word;

- shifting numerals from right to left on the computer display screen thereby maintaining their left to right order as entered; and
- repositioning tall ligatures for proper vertical and language orientation on the computer display screen to avoid interline overlap.

4,680,711

**CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION**  
Motohisa Miyawaki, Chofu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan and Van Doorne's Transmissie B. V., RA Tilburg, Netherlands  
Filed Jan. 29, 1985, Ser. No. 695,977  
Claims priority, application Japan, Feb. 1, 1984, 59-17296  
Int. Cl.<sup>4</sup> B60K 41/22; F02D 29/02; F16D 27/16  
U.S. Cl. 364-424.1 5 Claims



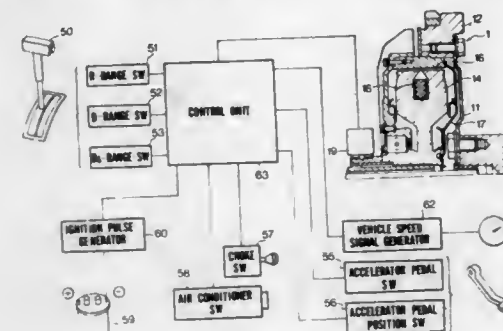
- A system for controlling an infinitely variable transmission for an engine mounted on a vehicle comprising: an electromagnetic clutch for connecting a crankshaft of the engine with an input shaft of the transmission; first means for sensing vehicle speed and for producing a signal when the vehicle speed exceeds a predetermined value; second means for detecting the neutral state of the transmission; third means for detecting the forward drive state of the transmission; fourth means for detecting a released position of an accelerator pedal of the vehicle; fifth means for cutting off fuel under conditions of existence of output signals of the first means, third means and fourth means; and sixth means for disengaging the electromagnetic clutch with a delay in response to an output signal of the second means under the condition of fuel cut off.

4,680,712

**SYSTEM FOR CONTROLLING AN ELECTROMAGNETIC CLUTCH FOR A VEHICLE**  
Ryuzo Sakakiyama, Tokyo, and Toshio Takano, Hamura, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Jan. 29, 1985, Ser. No. 695,978  
Claims priority, application Japan, Jan. 31, 1984, 59-15421  
Int. Cl.<sup>4</sup> B60K 41/22; F16D 27/16  
U.S. Cl. 364-424.1 4 Claims

- A system for controlling an electromagnetic clutch for a motor vehicle having an infinitely variable belt-drive transmission which has a drive range, a reverse range and a neutral range, and a selector lever for selecting the ranges, the system comprising:

vehicle speed detecting means for producing a vehicle speed signal;  
first switch means for detecting the position of the selector lever and for producing output signals depending on the reverse range, drive range a neutral range;  
second switch means for producing output signals dependent on depression and release of an accelerator pedal of the vehicle;  
first means for producing a reverse clutch current signal dependent on a signal of the first switch means indicative of a neutral position of the selector lever;  
second means for producing a vehicle start clutch current signal dependent on the signal from the second switch

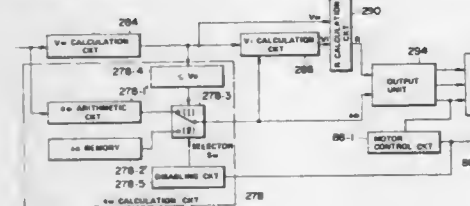


- means at the depression of the accelerator pedal and on a signal from the vehicle speed detecting means at a low vehicle speed;
- third means for producing a small drag current signal dependent on the signal at low vehicle speed and on the signal from the second switch means at the release of the accelerator pedal;
- fourth means for producing a lock-up engage current signal dependent on the signal at middle and high vehicle speed; and
- output decision means applied with each of the current signals for controlling the current passing through a coil in the electromagnetic clutch in dependency on the applied current signal.

4,680,713

**ANTI-SKID BRAKE CONTROL SYSTEM WITH OPERATION CONTROL FOR A PRESSURE REDUCTION FLUID PUMP IN HYDRAULIC BRAKE CIRCUIT**  
Jun Kubo, Hino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan  
Filed Apr. 17, 1984, Ser. No. 601,329  
Claims priority, application Japan, May 16, 1983, 58-84087; May 16, 1983, 58-84091  
Int. Cl.<sup>4</sup> B60T 8/34 5 Claims

U.S. Cl. 364-426 25 Claims



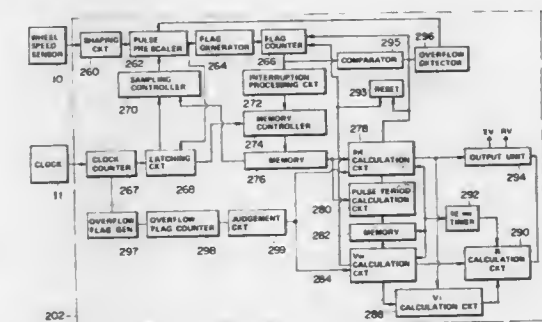
- An anti-skid brake control system for an automotive vehicle comprising: a hydraulic brake circuit including a wheel cylinder for applying braking pressure to a vehicle wheel; a pressure control valve disposed within said hydraulic

brake circuit for increasing the fluid pressure in said wheel cylinder in a first position thereof, decreasing the fluid pressure in a second position thereof and holding the fluid pressure at a constant value in a third position thereof;  
first means for detecting wheel speed and producing a first signal having a value representative of the wheel speed;  
a second means for detecting wheel acceleration and producing a second signal having a value representative of the wheel acceleration;  
a third means, responsive to said first and second signals, for deriving a control signal for selecting one of said first, second and third positions of said pressure control valve, said third means being responsive to said second signal value decreasing less than a given deceleration threshold to initiate derivation of said control signal for selecting said third position, said deceleration threshold serving as a criteria for initiating anti-skid brake control;  
a fourth means receiving said first signal for producing a command to replace said second signal value by a predetermined value which is representative of a lesser deceleration value than said deceleration threshold when said first signal value becomes less than a given wheel speed threshold which is representative of a low wheel speed criteria; and  
a fifth means for detecting the presence of said control signal selecting said third position for disabling said fourth means when anti-skid control is performed.

4,680,714

**ANTI-SKID BRAKE CONTROL SYSTEM WITH REDUCED DURATION OF WHEEL ACCELERATION AND DECELERATION CALCULATION**  
Jun Kubo, Hino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan  
Filed Apr. 17, 1984, Ser. No. 601,364  
Claims priority, application Japan, Apr. 23, 1983, 58-70900  
Int. Cl.<sup>4</sup> B60T 8/34 25 Claims

U.S. Cl. 364-426



- An anti-skid brake control system for an automotive vehicle comprising: a hydraulic brake circuit including a wheel cylinder for applying braking force to a vehicle wheel; a pressure control valve disposed within said hydraulic brake circuit and operative to increase fluid pressure in said wheel cylinder in a first position and to decrease fluid pressure in said wheel cylinder in a second position; a wheel speed sensor means for producing a sequence of sensor signal pulses separated by intervals, said intervals representative of the detected wheel rotation speed; a timer means for producing a timer signal; a first means, responsive to said sensor signal pulses, for sampling a value of said timer signal at a given number of sensor signal pulses so as to detect input timing of said given number of said sensor signal pulses and storing the sampled input timing, said first means deriving said given number of sensor signal pulses so that an interval of sam-

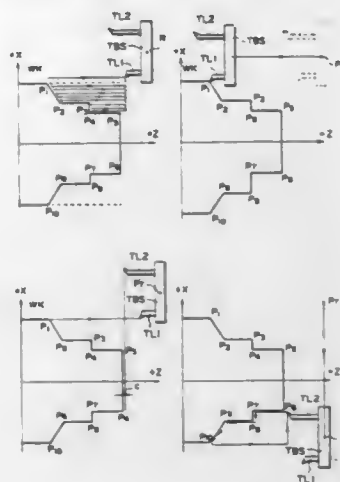






position another one of the tools at a machining location in a second quadrant and machining is performed by the other tool, said method comprising the steps of:

- (a) automatically moving the tool rest along the Z-axis to a point  $P_z$  at which none of the tools will contact the workpiece when the tool rest is moved along the Z-axis from the first quadrant to the second quadrant, a Z-axis coordinate value of the point  $P_z$  being determined in accordance with a maximum length of said juxtaposed tools;



- (b) selecting one of the tools for machining the workpiece in the second quadrant;  
 (c) automatically moving the tool rest along the X-axis from the point  $P_z$  to a point  $P_x$  in the second quadrant at which an X-axis position of the selected tool coincides with an X-axis coordinate value of a machining starting point at which machining is to be started by the selected tool; and  
 (d) performing machining in the second quadrant using the selected tool.

4,680,720

## DOT INTERPOLATION CONTROL SYSTEM

Jiro Yoshii, Saitama; Akira Komatsu, and Hiroshi Ishii, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

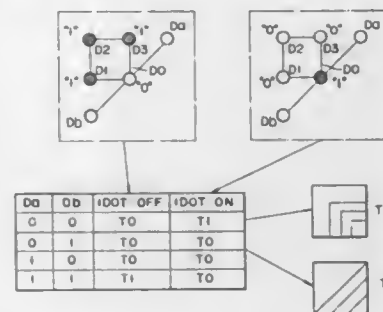
Filed Oct. 15, 1984, Ser. No. 661,192

Claims priority, application Japan, Oct. 17, 1983, 58-193752; Oct. 17, 1983, 58-193753; Oct. 17, 1983, 58-193754; Oct. 17, 1983, 58-193755; Oct. 17, 1983, 58-193756; Oct. 17, 1983, 58-193757; Oct. 17, 1983, 58-193758

Int. Cl. 4 G06F 15/66; H04N 1/04

U.S. Cl. 364-521

16 Claims



15. A dot pattern interpolation system, comprising:  
 a dot pattern memory for storing character pattern data consisting of a predetermined dot matrix format;  
 dot data obtaining means for obtaining dot data of four

adjacent dots of a desired position from said dot pattern memory;  
 interpolated value obtaining means for obtaining an interpolated value consisting of a plurality of bits in a region surrounded by said four adjacent dots from said dot data of said four adjacent dots;  
 memory means for storing a comparing value for making a comparison with said interpolated value; and  
 interpolated value compared means for comparing said interpolated value with said comparing value, and obtaining a discrimination output representing an OFF-dot, or ON-dot, said discrimination output being controlled by changing said comparing value stored in said memory means and said comparing value of said memory means being changed in accordance with an enlargement/reduction ratio for said dot pattern.

4,680,721

## CIRCUIT ARRANGEMENT FOR GENERATING AN ELECTRIC VELOCITY SIGNAL

Gerhard Pludemann, Nussbach, Fed. Rep. of Germany, assignor to Mavilor Systemes S.A., Switzerland

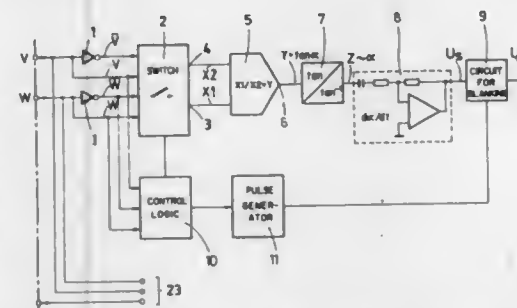
Filed Nov. 28, 1984, Ser. No. 675,842

Claims priority, application Switzerland, Dec. 22, 1983, 6853/83

Int. Cl. 4 G01P 3/42; G01R 23/00

U.S. Cl. 364-565

6 Claims



1. Circuit arrangement for generating an electric velocity signal which is proportional to the velocity of a moving part and particularly to the speed of rotation of a rotating part, consisting of two continuous input signals ( $w$ ,  $v$ ) which are periodically changeable as a function of the position of this moving part, and particularly of the angle of rotation ( $\phi$ ), and which are phase-shifted with respect to each other by approximately  $90^\circ$ , both having each in the mean the same frequency and a constant amplitude ratio and a sinusoidal or sine-like characteristic, a simple or integral multiple ( $N$ ) of the duration of the period ( $T$ ) of one input signal ( $w$ ,  $v$ ) being equal to the time in which the moving part covers a certain distance and particularly a rotating part carries out one full revolution, comprising:

- (a) an inversion circuit (1) for inverting the two input signals ( $w$ ,  $v$ );  
 (b) a curve change-over switch (2) having inputs for the input signals ( $w$ ,  $v$ ) and the inverted input signals ( $\bar{w}$ ,  $\bar{v}$ ) and having a first and a second output (3, 4) which are connected in predeterminable sequence with respective similar sections of the input and inverted input signals, retaining their relative phase relationships, one signal sequence of periodically repetitive signal sections ( $x1$  and  $x2$ , respectively) each appearing at the first and at the second output (3, 4), which signal sections are in a range of values which is suitable for dividing the first signal section ( $x1$ ) electrically by the second signal section ( $x2$ );  
 (c) a dividing circuit (5) which is connected to the outputs (3, 4) of the curve change-over switch (2) and which will divide in each case the signal section ( $x1$ ) originating from the first output (3) by the signal section ( $x2$ ) originating

- from the second output (4) whilst forming a sequence of quotient signals ( $y$ ) which correspond to finite sections of a variation with time of a tangent function or of a tangent-like function of the path co-ordinate of the moving part and especially of the angle of rotation ( $\alpha = N \cdot \phi$ );  
 (d) a tangent/arc tangent converter circuit (7) which follows the divider circuit (5), for converting the quotient signals ( $y$ ) into a sequence of path signals ( $z$ ) which correspond to the arc tangent function or to an arc tangent-like function of these quotient signals ( $y$ ) and in each case represent the variation of the path co-ordinates and particularly of the angle of rotation ( $\alpha$ ) as a function of time ( $t$ ) within successive intervals defined by the signal sections ( $x1$ ,  $x2$ );  
 (e) a first differentiating circuit (8) which follows the converter circuit (7), for differentiating the path co-ordinates represented by the path signals ( $z$ ), particularly of the angle ( $\alpha$ ) after time ( $t$ ), a sequence of voltage sections  $u$ , being formed which are interrupted by step positions and the voltage of which is proportional to the velocity of the moving part; and  
 (f) a circuit (9) which blanks out the step positions and which supplies an analog voltage ( $u$ ) which is proportional to the velocity of the moving part, said circuit (9) being connected to and processing the output of said differentiating circuit (8).

4,680,722

## ARRANGEMENT FOR DETERMINING THE STARTING INSTANT OF THE LEADING EDGE OF A HIGH-FREQUENCY PULSE

Jean-Pierre Tomasi, Les Molières, France, assignor to U.S. Philips Corporation, New York, N.Y.

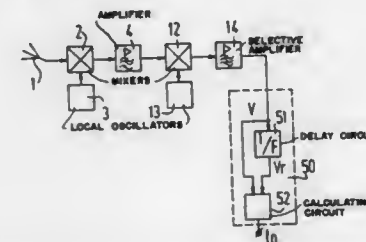
Filed Feb. 11, 1985, Ser. No. 700,150

Claims priority, application France, Feb. 15, 1984, 84 02284

Int. Cl. 4 H04N 3/14

U.S. Cl. 364-569

7 Claims



1. An arrangement for determining the starting instant  $t_0$  of the leading edge of a received high-frequency pulse signal  $V$  of the form  $V = A \cdot (t - t_0) \cdot \sin 2\pi F t$ , where  $V$  is the instantaneous voltage,  $A$  is the slope of the leading edge,  $t$  is the time ( $t > t_0$ ), and  $F$  is the frequency,

said arrangement comprising:

- (a) receiving means for receiving the pulse signal  $V$ ;  
 (b) delay means electrically connected to the receiving means for delaying the received pulse signal  $V$  by a time equal to  $k/2F$  (where  $k$  is an integer) and thereby producing a second pulse signal  $V_R$  of the form  $V_R = A \cdot (t - t_0 - k/2F) \cdot \sin 2\pi F t$ ; and  
 (c) processing means electrically-connected to the receiving means and to the delay means for determining  $t_0$  from the signals  $V$  and  $V_R$  by performing the calculation

$$t_0 = \frac{k(-1)^k V}{2F[(-1)^k V - V_R]}$$

and for producing a signal representative of  $t_0$ .

4,680,723

## SIGNAL PROCESSOR FOR MATRIX ARRAYS

David T. Whinray, and Gwilym J. Tilsley, both of Hatfield, England, assignors to British Aerospace PLC, London, England

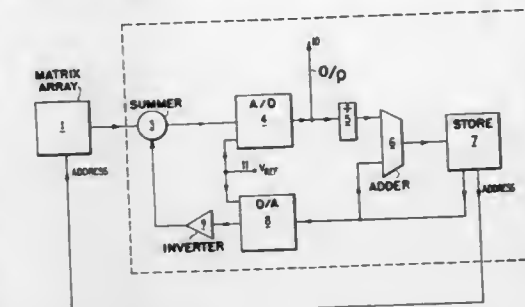
Filed Oct. 11, 1984, Ser. No. 659,957

Claims priority, application United Kingdom, Oct. 14, 1983, 8327594

Int. Cl. 4 G01T 1/20

U.S. Cl. 364-571

5 Claims



1. A signal processing system for applying offsets to analog input signals received one after another from a plurality of signal forming elements to compensate for any differences in the characteristics of the different elements, the system comprising:

subtracting means having a first input for receiving said analog input signals and having a second input for receiving further analog signals for forming difference signals dependent upon said input signals minus values dependent upon said further analog signals;  
 N-bit analog to digital converter means connected to the subtracting means for forming N-bit digital signals representative of successive samples of said difference signals;  
 digital signal adding means having two inputs and an output, one of said two inputs being connected to the analog to digital converter means for receiving said N-bit digital signals and the adding means supplying at its output the sum values of signals applied to its two inputs;  
 store means connected to the output and the other of said two inputs of the adding means, the store means having a plurality of storage locations corresponding to respective ones of said signal forming elements for storing at said locations respective sum values received from the output of the adding means and also for supplying the stored sum values to said other input of the adding means to initiate the formation of new sum values by the adding means; and  
 M-bit digital to analog converter means connected to said store means and said second input of the subtracting means for receiving M-bit digital sum values read from the storage locations of the store means and for converting them to form said further analog signals, the number of bits  $M$  being greater than  $N$ .

4,680,724

## SHEET-LIKE MINIATURIZED ELECTRONIC DEVICE

Kazuhiro Sugiyama, and Tatsuo Shimazaki, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 490,581, May 2, 1983, abandoned. This application Feb. 4, 1986, Ser. No. 825,953

Claims priority, application Japan, Dec. 3, 1982, 57-212150

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

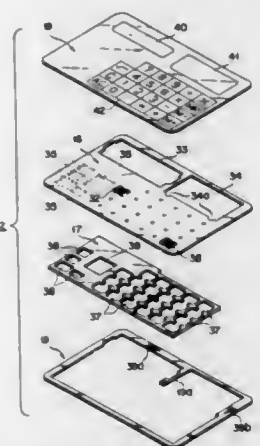
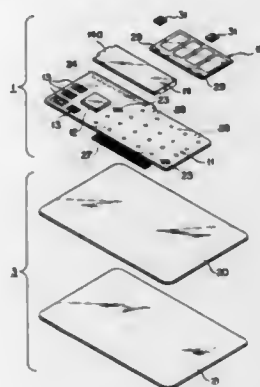
Int. Cl. 4 G06F 15/02

U.S. Cl. 364-708

16 Claims

1. A flat miniaturized electronic device comprising:  
 a flat and thin insulating sheet with a conductive wiring pattern thereon;  
 an electronic component coupled to said conductive wiring

pattern, said electronic component having one end surface in the same plane as a first face of said insulating sheet with its opposite end surface projecting from the plane of a second face of said insulating sheet opposite to said first face;  
a first cover mounted opposite to the first face of said insulating sheet and having key indicia thereon;  
switch means between said first cover and the first face of said insulating sheet for actuating an electrical connection



to said conductive wiring pattern upon contact of said key indicia by an operator;  
a second cover having a flat outer surface and the same periphery as said first cover and mounted opposite to the second face of said insulating sheet so as to form a gap between the second cover and, respectively, the second face of said insulating sheet and the projecting end surface of said electronic component; and  
an adhesive layer filling said gap.

4,680,725

## DUAL FUNCTION DECIMAL KEY

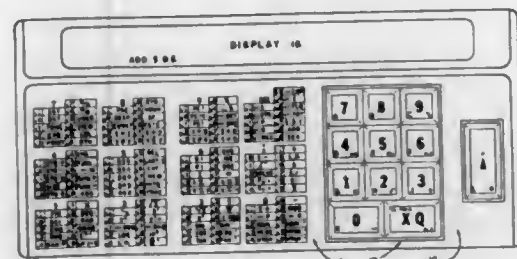
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, Harahan, La.  
Continuation of Ser. No. 459,997, Jan. 21, 1983, Pat. No. 4,567,567. This application Sep. 25, 1985, Ser. No. 779,923  
The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.  
Int. Cl.<sup>4</sup> G06F 3/027

U.S. Cl. 364-709

7 Claims

1. In a computer for performing a plurality of operations with a decimal point key located on a keyboard having numerical digit entry keys to enter in sequence a set of numerical digits to form a numerical word and key responsive means operating the computer in several modes including a data entry

mode in which selected arithmetic calculation functions are produced from instructions manually entered by the keyboard, the combination comprising, decimal point entry means including said decimal point key and a data processing system operable to make a decimal point entry from the decimal point key with the computer operating in the computer data entry mode, function executing means for processing the numerical word in accordance with said selected arithmetic calculation func-



4,680,726

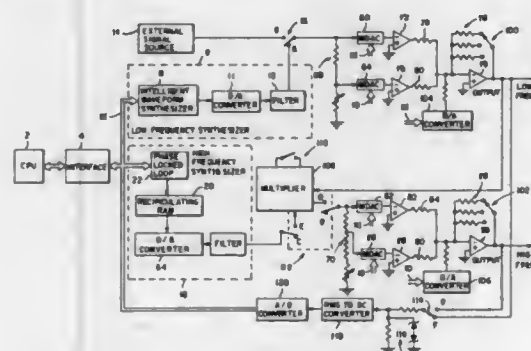
## FUNCTION GENERATOR

Jacob H. Malka, Fair Lawn, and Marc Osetec, Wood-Ridge, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 18, 1984, Ser. No. 662,320  
Int. Cl.<sup>4</sup> G06F 1/02; H03C 1/00

U.S. Cl. 364-721

17 Claims



1. A function generator, characterized by:  
means for providing a low frequency output function signal;  
means for providing a high frequency output function signal;  
means responsive to the low frequency output function signal for providing a high resolution, low frequency output function signal;  
means responsive to the high frequency output function signal for providing a high resolution, high frequency output function signal;  
means for combining the high frequency output function signal and the high resolution, low frequency output function signal for providing an amplitude modulated signal;  
and  
switching means connected to the high frequency output function signal means and the combining means, and selectively operating for connecting the high frequency output

function signal to the combining means, and for disconnecting said signal from said combining means.

4,680,727

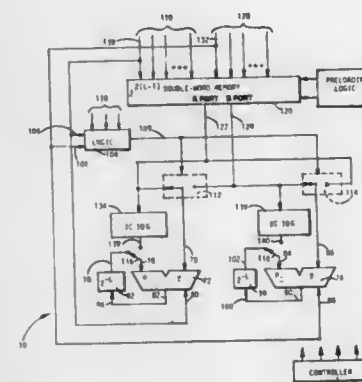
## COMPLEX MULTIPLIER FOR BINARY TWO'S COMPLEMENT NUMBERS

Stanley A. White, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 24, 1984, Ser. No. 653,179  
Int. Cl.<sup>4</sup> G06F 7/52

U.S. Cl. 364-754

20 Claims



12. An apparatus for performing complex multiplication of a complex multiplier comprising a multiplier real portion and a multiplier imaginary portion, and a complex multiplicand comprising a multiplicand real portion and a multiplicand imaginary portion, wherein said multiplicand real portion comprises a plurality of real L-bit subwords and said multiplicand imaginary portion comprises a plurality of imaginary L-bit subwords, wherein L is greater than 1, and wherein said complex multiplication apparatus comprises:

- a memory having first and second output ports, wherein said memory has stored in it first and second numbers representative of said complex multiplier so that when said memory is addressed with a pair of said real and imaginary L-bit subwords, a first memory output is produced at said first memory output port and a second memory output is produced at said second memory output port;
- a first adder/subtractor having an output port, a first input port connected to said first memory output port for receiving said first memory output, and a second input port connected to said output port for receiving a first recirculation input, wherein said first adder/subtractor combines said first memory output and said first recirculation input to produce a first adder/subtractor output on said output port;
- a first scaling multiplier connected to said first adder/subtractor between said output and said second input to shift said first adder/subtractor output L bits;
- a second adder/subtractor having an output port, a first input port connected to said second memory output port for receiving said second memory output, and a second input port connected to said output port for receiving a second recirculation input, wherein said second adder/subtractor combines said second memory output and said second recirculation input to produce a second adder/subtractor output on said output port; and
- a second scaling multiplier connected to said second adder/subtractor between said output and said second input to shift said second adder/subtractor output L bits.

4,680,728

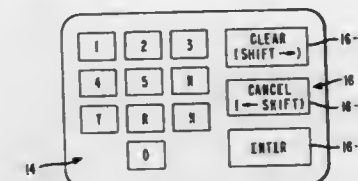
## USER-FRIENDLY TECHNIQUE AND APPARATUS FOR ENTERING ALPHANUMERIC DATA THROUGH A NUMERIC KEYBOARD

William N. Davis, II, Centerville, and Ruth E. Nash, Kettering, both of Ohio, assignors to NCR Corporation, Dayton, Ohio  
Filed Oct. 17, 1984, Ser. No. 661,548

Int. Cl.<sup>4</sup> G06F 3/03

U.S. Cl. 364-900

1 Claim



1. A process for entering and editing character data being comprised of a predetermined number of characters using an entry terminal having a display and also having a keyboard having a predetermined number of character entry keys presented in a first array and a predetermined number of function keys, with said predetermined character entry keys being fewer in number than said predetermined number of characters; said process comprising the steps:

- presenting on said display more than one cluster of characters to be selected, with each said cluster containing fewer than said predetermined number of characters, and with at least some of said clusters of characters having a function symbol included therein, each said function symbol corresponding to an editing function for use in editing said character data; each said cluster of characters and said function symbol when included therein being presented on said display in a second array for selection;
- selecting, via a said function key, that one of said clusters of characters which contains the character to be entered via said terminal or which contains the function symbol desired for editing;
- actuating one of said character entry keys whose position in said first array bears a predetermined relationship to the position in said second array held by the character to be entered or the said function symbol desired to be entered for use in editing;

said first and second arrays corresponding to each other and said actuating step comprising selecting that one of said character entry keys in said first array which occupies the same position in said first array as the character or function symbol to be selected occupies in said second array; said clusters of characters being aligned along a line on said display and said selecting step comprising sequentially making active on said display said clusters of characters and function symbols when included therein when moving in a first direction along said line until said cluster which contains the character or the function symbol to be entered is reached using a first said function key, and said selecting step also comprising sequentially making active on said display said clusters of characters and function symbols when included therein when moving in a second direction opposite to said first direction along said line until said cluster which contains the character or the function symbol to be entered is reached using a second said function key;

said editing comprising using a first one of said function symbols for moving a cursor to the left along a line of characters on said display; using a second one of said function symbols for moving said cursor to the right along said line of characters on said display; using a third one of said function symbols for deleting a said character shown on said line of characters on said display; using a fourth one of said function symbols for inserting a space in said





a serializer/deserializer (SERDES) shift register (14) having a latches that can be loaded in parallel, an extension register (16) having (n-1) latches, said extension register and said SERDES shift register being connected in series; selection means (18, 22, 24) for forming in said extension register a shift register the number of selected latches of which will vary dependent upon the length of the string of such that the number of selected latches is equal to (n-r), means (36, 38, 46, 48, 44, 32) for interconnecting the latches of the SERDES register, those of the string of latches, and ones of the extension register latches selected by said selection means to form a register, such that bits can be circulatorily shifted serially from said SERDES shift register and said extension register to said string of latches; means (6, 8, 20-W) for sequentially writing into the SERDES register the bytes to be loaded in the string of latches, and clock and writing means (26, 40, 20-W) for selectively applying to the latches in said ring network clock pulses causing the bits in the ring network to be shifted, to load in parallel in the SERDES register the byte that includes the residual bits, in the low order bit positions of the byte cause n bits to be shifted in the ring network, load the k bytes in succession in the SERDES shift register, and cause n bits to be shifted after loading each byte.

4,680,734

## SEMICONDUCTOR MEMORY DEVICE

Fumio Baba, Kawasaki, and Yoshihiro Takemae, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

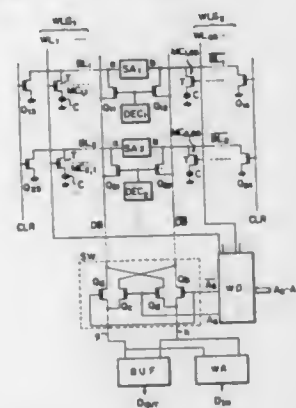
Filed Aug. 5, 1985, Ser. No. 762,531

Claims priority, application Japan, Aug. 11, 1984, 59-167276

Int. Cl. G11C 7/00

U.S. Cl. 365-190

12 Claims



1. A semiconductor memory device operatively connected to receive a clear control signal and input data, and to generate output data, said memory device comprising:

- a plurality of bit-line pairs;
- a plurality of memory cells operatively connected to respective bit lines of said bit-line pairs;
- a plurality of sense amplifiers, operatively connected between said bit-line pairs, each of said sense amplifiers corresponding to one of said bit-line pairs and each having a pair of complementary signal terminals operatively connected to respective bit lines of said corresponding bit-line pairs;
- a pair of data buses, operatively connected to said bit-line pairs, for inputting and outputting data to and from a selected bit-line pair;
- a data inverting circuit, operatively connected to said pair of data buses, for selectively inverting the input/output data such that the charging states of respective memory cells connected to said bit-line pairs become equal for the same

input/output data and for outputting complementary signals; and a clamp circuit, operatively connected to said bit-line pairs, for drawing the potentials of said bit-line pairs to a predetermined potential in response to the clear control signal applied when the contents of all of said memory cells are to be cleared.

4,680,735

## SEMICONDUCTOR MEMORY DEVICE

Junichi Miyamoto, and Jun-ichi Tsujimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

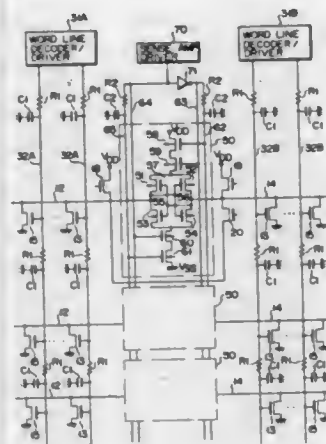
Filed Jul. 26, 1985, Ser. No. 759,142

Claims priority, application Japan, Sep. 21, 1984, 59-197924

Int. Cl. G11C 7/02

U.S. Cl. 365-210

8 Claims



5. A semiconducting device comprising:

- a plurality of bit line pairs, each pair of bit lines being respectively connected to a memory cell and to a dummy cell which are respectively selected by signals derived from word lines;
- a plurality of means for sensing data by amplifying a potential difference between each pair of bit lines;
- a first transistor having a gate connected between said data-sensing means and the power source for receiving at the gate, with a minimum time delay, a control signal to control the active state of each of said data-sensing means; and
- a plurality of second transistors each having a gate connected between said data-sensing means and the power source respectively, said second transistor being connected in series to said first transistor, and for receiving, at the respective gates, said control signal with predetermined time delays, each of the predetermined time delays being substantially equal to the time delay of a signal on the word line connected to the memory cell associated with the data-sensing means.

4,680,736

## METHOD FOR OPERATING A USER MEMORY DESIGNED A NON-VOLATILE WRITE-READ MEMORY, AND ARRANGEMENT FOR IMPLEMENTING THE METHOD

Hartmut Schrenk, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

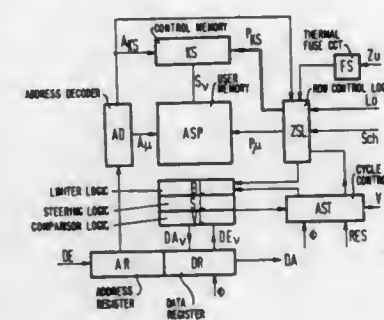
Filed Apr. 23, 1984, Ser. No. 603,146

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315047

Int. Cl. G11C 7/00

U.S. Cl. 365-218

13 Claims



1. Method for operating a user memory which is designed as a non-volatile write-read memory comprising: storing, before each erase operation performed on the user memory, in a control memory a control bit in an empty memory location of the control memory, and inhibiting an erase operation on the user memory before having stored the control bit.

4,680,737

## SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Kanji Oishi, Koganei, and Takashi Shinoda, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

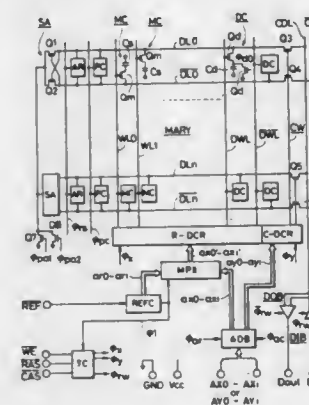
Filed Apr. 29, 1985, Ser. No. 727,922

Claims priority, application Japan, May 7, 1984, 59-89420

Int. Cl. G11C 7/00

U.S. Cl. 365-222

13 Claims



1. A semiconductor integrated circuit device which includes memory cells that need to be periodically refreshed, and which includes means for performing an inspection step which examines refresh characteristics and means for generating a signal for use in determining a refresh period, said semiconductor integrated circuit device comprising:

- a timer circuit which generates output signals for determining a refresh timing of said memory cells and which comprises a program circuit which changes the period of said output signals according to said signal.

4,680,738

## MEMORY WITH SEQUENTIAL MODE

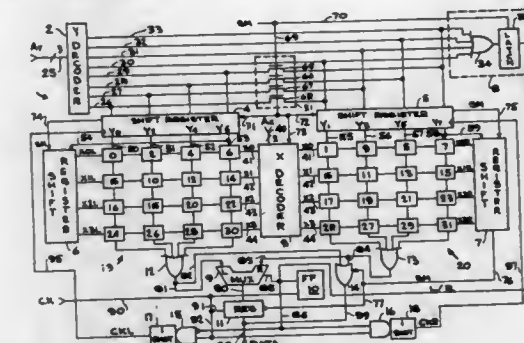
Aloysius T. Tam, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 30, 1985, Ser. No. 760,712

Int. Cl. G11C 8/00

U.S. Cl. 365-239

11 Claims



1. A memory comprising:

- a plurality of rows and columns of memory cells;
- a column decoder;
- a row decoder;
- first means responsive to an output from each of said column and row decoders for addressing a first row and column of said memory cells; and
- second means responsive to a single control signal having a predetermined logical level and a plurality of clock pulses for automatically addressing each of said columns and each of said rows in a predetermined sequence to access the contents of the remainder of said memory cells.

4,680,739

## PROCESS FOR REMOVING ALL AMBIGUITY FROM THE MEASUREMENT BY DOPPLER EFFECT OF THE SPEED OF A MOVING TARGET

Olivier Lannuzel, Meaux, France, assignor to CGR Ultrasonic, Paris, France

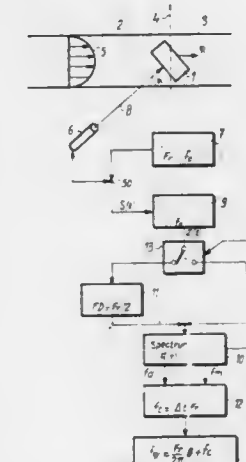
Filed Apr. 4, 1985, Ser. No. 719,702

Claims priority, application France, Apr. 6, 1984, 84 05485

Int. Cl. G01S 9/66; A61B 5/02; G01F 1/708

U.S. Cl. 367-90

13 Claims



1. Process for removing all ambiguity from the measurement by Doppler effect of the speed of a target comprising the steps in which a pulse vibrating at a sonic or acoustical frequency is emitted





4,680,746

## RECORDING DISC ROTARY DRIVE CONTROL APPARATUS

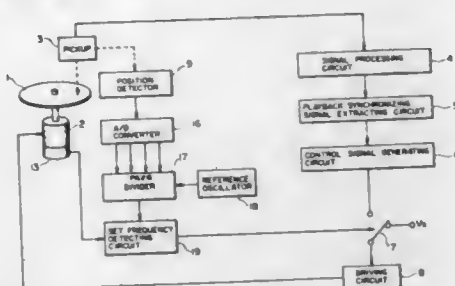
Hitoshi Senso, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 713,113

Claims priority, application Japan, Mar. 16, 1984, 59-51651 Int. Cl.<sup>4</sup> G11B 19/24

U.S. Cl. 369—50

1 Claim



1. A recording disc rotary drive control apparatus wherein data is written on a recording disc with a substantially constant packing line density, said control apparatus comprising: position detecting means for detecting a distance covered by a pickup for reading said recording disc, the pickup being moved from a reference position in the radial direction thereof, and producing a position detecting signal representing the distance covered thereby; first pulse signal generating means for generating a position pulse signal with a period proportional to said position detecting signal; a motor for rotating said recording disc; second pulse signal generating means for generating a rotational pulse signal having a frequency proportional to the rate of rotation of said motor; switching signal generating means for counting pulses of said position pulse signal starting with the generation of said rotational pulse signal, and producing a switching signal for a period from when a pulse of said rotational pulse signal is produced until the counted value reaches a predetermined value; control signal generating means for generating a control signal for controlling the rate of rotation of said motor according to the output signal of said pickup; means for generating an accelerating signal for increasing the rate of rotation of said motor; driving means for driving said motor according to a driving signal; and switching means for applying said control signal to said motor as said driving signal when said switching signal is present and applying said accelerating signal to said motor as said driving signal while said switching signal is not present.

4,680,747

## MULTI-MESSAGE PHONOGRAPH SYSTEM

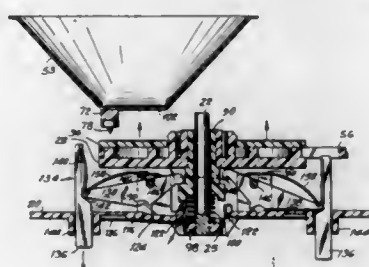
Joseph W. Blake, III, 88 Main St., New Canaan, Conn. 06840

Filed Nov. 7, 1985, Ser. No. 795,888

Int. Cl.<sup>4</sup> G11B 27/00, 3/78

U.S. Cl. 369—65

36 Claims



1. A system for selecting one message of a plurality of messages of equally spaced concentric spiral grooves on a phono-

graphic disc and for playing the selected message, each said selected message having a starting point on the periphery area of the disc and a termination point at the center area of the disc, comprising:

a housing having walls including a base wall forming a compartment, a shaft having one end perpendicularly secured to said base wall and an opposite end positioned in said compartment, speaker means mounted in said compartment, arm means rotatably secured to said housing and movable in an arc on an arm plane perpendicular to said shaft, said arm means being operatively connected to said speaker means,

means for keeping said arm means aligned in said arm plane, record means including said disc axially mounted a said opposite end of said shaft and rotatably movable perpendicular to said shaft, said record means being axially movable relative to said shaft between contact and non-contact positions, wherein said contact position the disc is in operative contact with said pickup means and in said non-contact position the disc is spaced from said arm means,

said record means including a cylindrical column axially mounted around said shaft, said column including a main column portion and a base column portion of greater diameter than said main column portion, said base column portion having a planar ring face transverse to said shaft extending outwardly relative to said shaft directed towards said main column portion,

said arm means being movable between said starting point and said termination point of the disc during rotation of said record means in said contact position, said arm means being positioned at a certain periphery position in preparation for contact with said starting point of said selected message,

drive means mounted in said compartment operatively connected to said record means for rotating said record means,

a source of power for energizing said drive means, a plurality of selecting means equal in number to the number of messages on the disc, each of said plurality of selecting means being movable between inactivated and activated positions, any one of said plurality of selecting means adapted to be moved from said inactivated position to said activated position to initiate selection of said selected messages to be played wherein said record means is moved from said contact position to said non-contact position, each of said plurality of selecting means being aligned relative to starting points of associated messages and to said certain periphery position of said pickup means, said plurality of selecting means being a plurality of elements including push-buttons having opposed inner and outer button portions, said inner button portions being disposed in said housing and said outer button portions being spaced outwardly from said base wall, said push-buttons being movable generally parallel to said shaft for operation by a user at said outer button portion,

said plurality of elements further including rotatable arms having opposed inner and outer arm portions radially disposed around said shaft at equal intervals, said push-buttons forming shoulders in said compartment, said arm outer portions being positioned at said shoulders, said elements further including flexible strands joining said upper portion of said push-buttons and said arm outer portions,

said rotatable arms further including pressing fingers at said arm inner portions, wherein in said contact position of said record means said pressing fingers are axially spaced from said ring face of said column and are in pressing contact upon said ring face of said column during movement of said record means from said contact position to said non-contact position,

said base wall forming a plurality of radial slots aligned with said elements and also forming a plurality of holes spaced

radially outwardly from each of said slots, said holes being adapted to slidably receive said push-buttons, means associated with said selecting means upon said base wall for holding said record means in said non-contact position, means for de-energizing said drive means upon said pickup means reaching said termination point of said message in said contact position of said record means during rotation of said record means, means associated with said record means for releasing said means for holding and thereupon releasing said record means from said non-contact position upon rotation of said record means to said activated selected means of said plurality of selecting means, first biasing means for pressing said record means from said non-contact position to said contact position upon release of said means for holding, second biasing means for pressing said plurality of selecting means towards said inactivated positions, wherein said record means is biased to said contact position with said starting point for said selected message being aligned with said certain position of said arm means.

4,680,748

## RECORDED DISK PLAYBACK APPARATUS

Koichi Kobayashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 9, 1985, Ser. No. 763,958

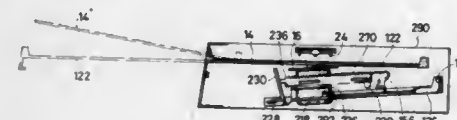
Claims priority, application Japan, Dec. 19, 1984, 59-266331;

Dec. 27, 1984, 59-273629; Jun. 20, 1985, 60-132914

Int. Cl.<sup>4</sup> G11B 19/10, 1/00, 17/04

U.S. Cl. 369—77.1

17 Claims



1. A recorded disk reproducing apparatus for reproducing information memorized in a recorded disk by means of a pick-up head, comprising:

- a main chassis housed in a main frame of the recorded disk reproducing apparatus;
- a sub-chassis supported at one end thereof by said main chassis and pivotable around said one end of the sub-chassis;
- a carriage attaching the pick-up head thereto and movable on said sub-chassis for moving the pick-up head in the radial direction of the recorded disk;
- a turn table for putting the recorded disk thereon, said turn table being placed on the sub-chassis and rotated by a turn table motor;
- a disk clasper rotatably disposed above the turn table at a fixed position with respect to said main chassis to hold the disk between the disk clasper and the turn table by the pivotal movement of the sub-chassis;
- a first mechanism which moves the carriage and pivots said sub-chassis around said one end thereof;
- driving means for driving said first mechanism.

4,680,749

## DUPLEX RADIO TRANSCEIVER HAVING IMPROVED DATA/TONE AND AUDIO MODULATION ARCHITECTURE

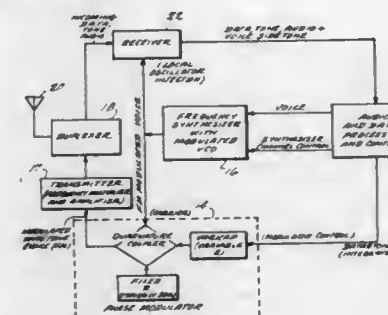
Arvid E. England; Stephen R. Wynn; Rodney A. Dolman, all of Lynchburg, Va.; Frederick J. Highton, Tucson, Ariz., and Rickey D. Harris, Forest, Va., assignors to General Electric Company, Lynchburg, Va.

Filed May 15, 1985, Ser. No. 734,369

Int. Cl.<sup>4</sup> H04J 9/00

U.S. Cl. 370—11

27 Claims



1. A duplex radio transceiver for transmitting and receiving voice and data signals comprising: an r.f. receiver having a local oscillator injection signal input port and a detected output port; a signal synthesizer providing an FM carrier/injection signal which is frequency modulated by said voice signals; said receiver local oscillator injection signal port being connected to receive said FM carrier/injection signal; a phase modulator connected to also receive said FM carrier/injection signal and to phase modulate such signal by said data signals thereby providing a complex FM output signal; and an r.f. transmitter connected to transmit said complex FM output signals.

4,680,750

## UNIVERSAL HIGH-SPEED SPAN LINE SWITCH

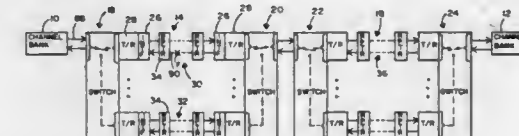
Clifford A. Davidow, Reno, Nev., assignor to Lynch Communication Systems, Inc., Reno, Nev.

Filed Oct. 1, 1984, Ser. No. 656,550

Int. Cl.<sup>4</sup> H04J 3/02; H04B 3/46

U.S. Cl. 370—16

17 Claims



1. In a PCM telephone span line switch which is arranged to automatically transfer data signals from a span containing a failed span line to a spare span, and which at times during its operation substitutes internally generated code and keep-alive signals for one or more of the data signals normally transmitted through said switch over a group of resonant span lines from a channel bank, the phase of said internally generated signals being independent of the phase of said data signals, the method of preventing span line disturbances as a result of the operation of said switch, comprising the steps of:

- (a) interposing, between each transmission from said switch of signals in one of said phases and a transmission of signals in the other of said phases, a transmission of a signal consisting of a number of consecutive zeroes sufficient to prevent the occurrence in said span of signal errors sufficient to trigger a transfer operation in another span line



switch downstream from said span, but insufficient to prevent its interpretation of said interposed signal as a loss-of-signal condition.

4,680,751

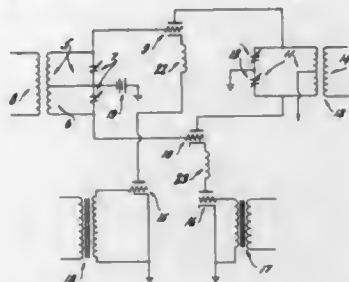
## POLARIZED CARRIER MODULATION

James W. Bryan, 4910 Mud Ln., Louisville, Ky. 40229  
Continuation of Ser. No. 810,271, Jun. 27, 1977, abandoned.  
This application Nov. 2, 1979, Ser. No. 90,648

Int. Cl.<sup>4</sup> H04J 3/02

U.S. Cl. 370-78

1 Claim



1. A polarity multiplexer comprising: a push-pull amplifier comprising two amplifying means each amplifying a different exclusive portion of a carrier signal applied to its input, two modulation amplifiers receiving respective different input signals and each providing a respective modulation output signal, an inductor coupling each modulation output signal in series with a respective amplifying means to thereby modulate the output of each amplifying means in accordance with the modulation output signal, whereby different input signals are modulated on respective portions of the carrier having different polarities.

4,680,752

## TIME SWITCH IN A TIME DIVISION SWITCHING NETWORK

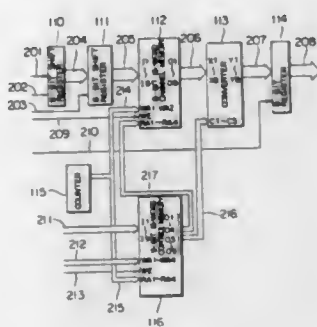
Tetsuo Takemura, Kamakura, and Shinobu Gohara, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed May 23, 1984, Ser. No. 613,392

Claims priority, application Japan, May 24, 1983, 58-90030; May 24, 1983, 58-90031

Int. Cl.<sup>4</sup> H04Q 11/04

U.S. Cl. 370-63

17 Claims



1. A time switch comprising: memory means including a channel memory for writing bits contained in each time slot of an incoming multiplexed highway into said channel memory according to a fixed address designation corresponding to the time slot of the incoming multiplexed highway and for reading said bits out of said channel memory according to a variable address designation corresponding to a time slot of an outgoing multiplexed highway; converter means for converting the bits read out of said

channel memory to a universal signal, so that a bit stream in the incoming multiplex highway is rate-adapted to a predetermined bit rate of the time slot of the outgoing multiplex highway, in accordance with a conversion mode designation; and

a control memory for supplying said variable address designation to said memory means and said conversion mode designation to said converter means in synchronism with each other.

4,680,753

## SYSTEM AND METHOD FOR CONTROLLING NETWORK BUS COMMUNICATIONS FOR INPUT-OUTPUT INTERLOCKING INFORMATION AMONG DISTRIBUTED PROGRAMMABLE CONTROLLERS

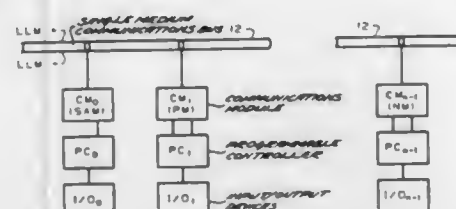
Temple L. Fulton, Elizabethon, and William O. Perkins, Johnson City, both of Tenn., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 3, 1985, Ser. No. 719,174

Int. Cl.<sup>4</sup> H04J 3/02, 3/12

U.S. Cl. 370-85

21 Claims



1. In a system for controlling a process using a network of distributed programmable controllers coupled to a communications bus each adapted to receive input information relating to the process, to determine appropriate output information based on the input information and to generate output signals to selected output devices to control the process, apparatus for controlling communications of tightly coupled information among the controllers comprising communication module means coupled between each programmable controller and the communications bus, each of the communication module means adapted to broadcast and receive data over the communications bus, each of the module means adapted to operate as an active monitor exercising exclusive control over broadcasting activity on the network granting in turn time slots to each other module means on the network enabling said each other module means to broadcast data during its respective time slot and each of the module means also being adapted to operate as a non-monitor adapted to broadcast data to all other module means on the network only when enabled by an active monitor, each of the communications module means being adapted to operate as a passive monitor which in addition to broadcasting data to all other module means in the network when enabled by the active monitor also continuously monitors broadcasting activity on the network and after a selected time interval of no broadcasting activity becomes an active monitor exercising exclusive control over broadcasting activity on the network, the system including timing means to provide an indication of the expiry of the selected time interval, means to select any one of the module means as a user selected active monitor and means to assign any selected one of the communication module means other than the active monitor as a passive monitor.

4,680,754

## MULTI-FUNCTION BUS

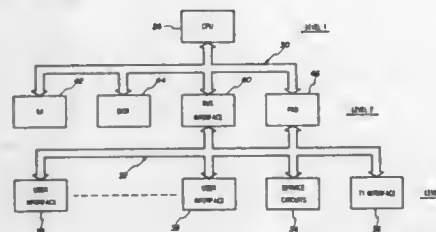
William A. Fechalos, Naperville, Ill., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 3, 1985, Ser. No. 740,372

Int. Cl.<sup>4</sup> H04J 3/02, 3/12

U.S. Cl. 370-85

1 Claim



1. A multi-function bus for use with a central processor system, user devices having user interfaces and a host switching interface unit, said multi-function bus comprising:

a first pre-determined number of transmit and receive lines connecting a central processing system, the user interfaces and the host switching interface unit;

a second pre-determined number of channels on each of said transmit and receive lines, said channels grouped on said multi-function bus in a frame, each frame having a pre-determined number of bits and each bit having a pre-determined bit period, each of such channels having end bits and appearing serially within said frame, said frame also including a frame synchronization bit;

means for transferring information to and from said host switching interface in a serial mode on said multi-function bus; and

means for transferring information between said central processing system and said user interfaces in a parallel mode on said multi-function bus;

said multi-function bus operated in a serial mode, and in a parallel mode, by said first and second means for transferring information by utilizing one-half of each bit period for serially transmission and the other one-half bit period for parallel transmission.

4,680,755

## REAL-TIME END OF PACKET SIGNAL GENERATOR

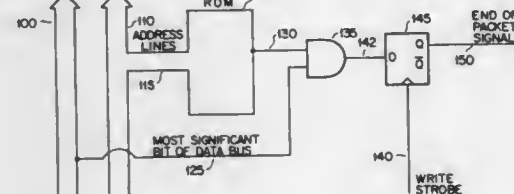
Stephen P. Reames, Colorado Springs, Colo., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Nov. 14, 1985, Ser. No. 798,054

Int. Cl.<sup>4</sup> H04J 3/02, 3/24, 3/12

U.S. Cl. 370-85

2 Claims



1. An apparatus for generating an end-of-packet signal, said end-of-packet signal indicating, in real time, the occurrence, of the tail end of a local area network packet, said packet being transmitted on a local area network, said apparatus comprising: a local area network coprocessor, said coprocessor being resident in a host device, said host device having memory and a memory address bus, said coprocessor being

adapted to receive local area network packets in bit serial form from a local area network transmission medium, to store said packets in host device memory in a uniform structured format, to create and maintain an associated status word for each stored packet, the most significant bit of each said status word being set to true when the end of said packet is received, and to generate a write-strobe-signal whenever said coprocessor is in a write-to-memory cycle;

a memory-address-comparison means for comparing the address in host device memory to which said coprocessor is writing with addresses of said status words, and for generating an output signal when the address in host device memory being written to by said coprocessor is the address of one of said status words;

an electronic logic gate having inputs said output signal of said memory-address-comparison means and the most significant data-bit of data words written to said memory of said host device, said electronic logic gate producing a true output when both of said inputs are true; and

a clocked flip-flop circuit, having as input the output of said electronic logic gate, and having as clock signal the write-strobe-signal of said coprocessor, said clocked flip-flop circuit producing as output said end-of-packet signal.

4,680,756

## MULTI-NETWORK SYSTEM

Naohiko Sugimoto, Katsuta; Shunji Inada, Hitachi, and Nagatoshi Usami, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

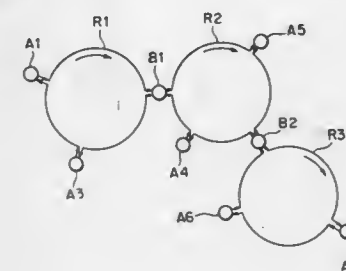
Filed Mar. 14, 1986, Ser. No. 839,509

Claims priority, application Japan, Mar. 18, 1985, 60-52379

Int. Cl.<sup>4</sup> H04J 3/02

U.S. Cl. 370-88

3 Claims



1. Multi-network system for transmitting data among a plurality of stations, each of which is connected to one of transmission lines, a plurality of said transmission lines being connected with each other through bridge stations, comprising:

a plurality of stations, each of which is connected to one of the transmission lines, sends, receives and relays data consisting of a means for forming the own address of the station including the number of transmission line to which the station is connected, a means for forming the destination address including the number of transmission line, to which the destination station which should receive data sent by the former station is connected, and a means for sending the data having the destination address and the own address of the former station in the form of address information in the transmitted data frame at the moment of sending the data; and

at least one bridge station connected with two different transmission lines, which sends, receives and relays data and relays data between the different transmission lines, consisting of a memory means storing data sent by the own station and data to be relayed between the different transmission lines, a means for judging at the moment of the reception of the data whether the number of transmission line contained in the address information of the received data frame is different from the number of trans-

mission line, from which the data have been received, or not and when they are different, storing received data containing the address information in said memory means; a means for setting a flag representing the relay between the transmission lines in connection with the received data stored in said memory means and when data sent by the own station are stored in said memory means, a flag indicating that they are not data relayed between different transmission lines in connection with said data; a means for forming the own address including the number of transmission line for each of the transmission lines with which the own station is connected; a means for forming the destination address including the number of transmission line, with which the destination station which should receive the data sent by the own station is connected; and a transmission means for judging at the moment of sending data whether the flag in connection with the sent data stored in said memory means represents a relay between the different transmission lines or not; when the flag represents a relay between the different transmission lines, sending the relevant data in the form of a data frame, which are the received data, including the address information; and when the flag doesn't represent any relay between the different transmission lines, sending the relevant data in the form of a data frame having said destination address and the own address of the station as the address information.

4,680,757

# METHOD OF AND APPARATUS FOR STORING PRIORITY LEVELS IN TOKEN-RING NETWORK SYSTEM

Toshiyuki Murakami, Hitachi; Norihiko Sugimoto, Katsuta, and Naoki Ogawa, Omura, all of Japan, assignors to Hitachi, Ltd. and Process Computer Engineering, Inc. Hitachi, both of Tokyo, Japan

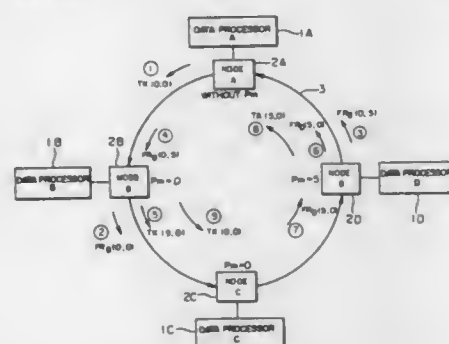
Filed Apr. 15, 1986, Ser. No. 852,311

Claims priority, application Japan, Apr. 15, 1985, 60-78291

Int. Cl. H04J 3/26

U.S. Cl. 370-89

9 Claims



1. A method of storing priority levels in a token-ring network system having a ring transmission link and a plurality of nodes accommodated in the ring transmission link, each node being capable of transmitting/receiving a token and a frame, wherein each node can reserve in a frame being passed through said transmission link a priority level for a frame that the node of its own requests for transmission and can transmit the frame of its own requested for transmission when acquiring a right to transmission by receiving a token, said method comprising, for storing priority levels at each node, the steps of:

reading, upon receipt of the frame transmitted from its own node, values of current and reservation priority levels; comparing the read values of both the priority levels and storing, when the value of reservation level is higher than the value of current priority level, said value of reservation level in storing means having the same number of bits as that of grades of the priority level with bit positions

respectively corresponding to values of the priority level, by setting to one state a value at a bit position of said storing means corresponding to at least said value of reservation level; reading, upon receipt of a token, a value of current priority level in said token; and comparing the read value of priority level in said token with the highest value of priority levels stored in said storing means and upon coincidence, resetting to the other state a value at a bit position of said storing means corresponding to at least said highest value.

4,680,758

# SWITCHING SYSTEM HAVING TONE TRUNK

Masayuki Kamazaki, Yokohama; Toshio Shimoe, Kawasaki, and Koso Murakami, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

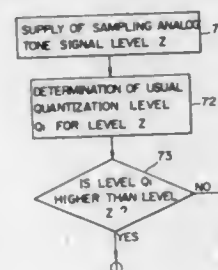
Filed Mar. 28, 1986, Ser. No. 845,587

Claims priority, application Japan, Mar. 30, 1985, 60-64993

Int. Cl. H04J 3/12

U.S. Cl. 370-110.2

8 Claims



1. A switching system comprising:

a plurality of telephone sets for each subscriber; a network which is operative to achieve a switching operation of digital signals to be communicated between the plurality of telephone sets by way of respective line circuits having a coder and decoder; and a tone trunk which is operative to store, in a digital memory thereof, at least one predetermined digital tone signal, in the form of digital codes, for supplying, by way of the network and said decoder, the corresponding analog tone signal to the telephone sets, in which the digital codes are coded in such a way that the decoded analog tone signal is accompanied by a quantizing noise, created during a conversion from the analog tone signal to the digital tone signal, which quantizing noise is substantially the same as a white noise.

4,680,759

# STANDARD/PROPORTIONAL MULTIPLEXER

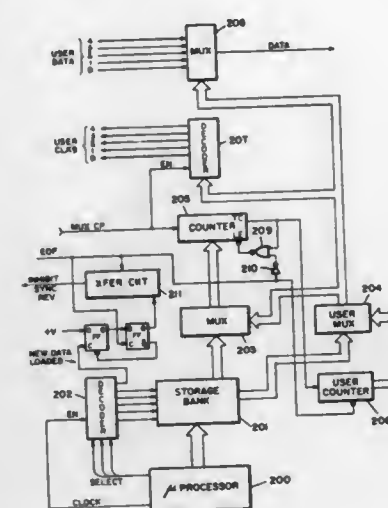
Larry J. Miller, South Jordan; Clifford T. Johnson, Sandy, and Glen D. Rattlingourd, Salt Lake City, all of Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Oct. 15, 1984, Ser. No. 660,742

Int. Cl. H04J 3/04, 3/22

U.S. Cl. 370-112

15 Claims



1. A multiplexer system comprising, control means, register means connected to receive and store signals from said control means, counter means connected to receive signals from said register means and to supply address signals to said control means thereby to select the signal produced by said control means, user data signal supplying means for supplying data signals from user means, multiplexer means connected to said register means to receive coded signals therefrom in order to select which data signals are passed through said multiplexer means from said user data signal supplying means, clock signal supplying means, demultiplexer means connected to said register means to receive said coded signals in order to select which clock signals are generated by said demultiplexer means, data supply means connected to supply further data signals to said multiplexer means, first shift register means for operating on said further data signals in parallel or serial fashion and supplying said further data signals to said multiplexer means, and data handling means for operating upon said further data signals to supply said further data signals to said first shift register means directly or in inverse sequence.

4,680,760

# ACCELERATED TEST APPARATUS AND SUPPORT LOGIC FOR A CONTENT ADDRESSABLE MEMORY

Grady L. Giles; Jesse R. Wilson, and Terry V. Hulett, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 5, 1985, Ser. No. 762,656

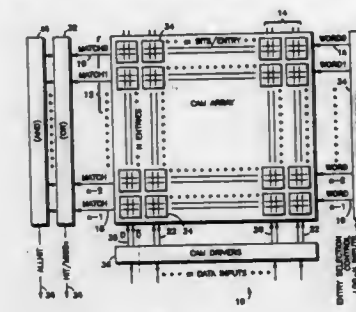
Int. Cl. G06F 1/00

U.S. Cl. 371-21

5 Claims

1. A content addressable memory (CAM) array comprising: n entries of m bits per entry; a word line and a match line for each entry, wherein the match line has a state; a bit line and a complementary bit line for each bit; n x m bit cells each having a word line, a match line a bit line and a complementary bit line, each bit cell further comprising a memory element and an exclusive OR compara-

tor of the cell's bit value with a value presented on the bit lines; a HIT/MISS\* means for ORing of the states of the n match lines, the HIT/MISS\* means having an output; wherein the improvement comprises an ALLHIT means



separate from the HIT/MISS\* means for monitoring the states of the n match lines, performing an operation with the states from the n match lines and providing an output signal giving the result of the operation, wherein the ALLHIT means is selected from the group of means consisting of an AND gate and a scan path.

4,680,761

# SELF DIAGNOSTIC CYCLIC ANALYSIS TESTING SYSTEM (CATS) FOR LSI/VLSI

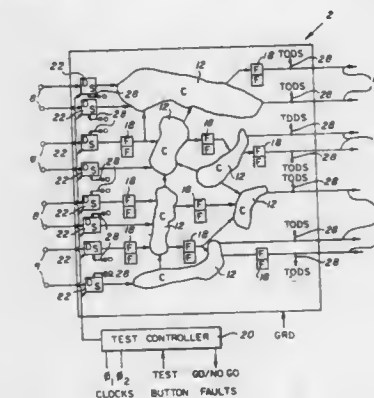
Donald C. Burkness, 1709 Glenkarney Pl., Silver Spring, Md. 20902

Filed Jan. 30, 1986, Ser. No. 824,223

Int. Cl. G01R 31/28

U.S. Cl. 371-25

16 Claims



1. A method for testing an integrated circuit including a plurality of inputs, a plurality of outputs, and a plurality of logic devices connected between the inputs and outputs, each of the logic devices including a plurality of logic gates and memory elements, comprising the steps of

(a) isolating a first logic device to be tested from the remaining logic devices by turning off all external circuit inputs; (b) reconfiguring said first logic device to include all logic gates and memory elements to simulate a non-linear binary sequence generator; (c) presetting the memory elements of said first logic device to a known start setting, respectively; (d) clocking said first logic device for a given number of steps to define a testing cycle to operate the logic gates and memory elements as the non-linear binary sequence generator, the memory elements achieving a known setting under normal operating conditions and a different setting under fault conditions;





and reflective to radiation emitted from said gain material over a predetermined wavelength interval about said peak emission line to provide feedback in said gain cavity; an etalon filter section butt coupled to the remaining end of said gain cavity optical fiber, said etalon filter section comprising a pair of filters spaced apart in parallel by a predetermined length of material transparent to any radiation emitted from by said gain cavity, one of said parallel filters being in direct physical contact with said core and perpendicular to the longitudinal axis of said core with the other of said parallel filters serving as the emitting end of said laser, said predetermined length of said transparent material in combination with the reflection characteristics of said pair of parallel filters being such that etalon filter section operates as a Fabry-Perot resonator in reflection with a periodic reflectivity characteristic having a peak reflectivity centered at said peak emission line of said gain material and gradually dropping to no reflectivity on either side of said peak reflectivity, said etalon filter section and the resonant characteristics of said gain cavity being structured and arranged with respect to one another to jointly operate to enhance laser action at said peak emission line and to preclude it beyond a wavelength interval centered about said peak emission line, said predetermined length of said transparent material being such that said etalon filter section is no longer than the distance over which the wave train energy from said fiber core remains substantially planar so that said etalon filter section is inside the divergent region from said fiber core to enhance feedback in said gain cavity; and means for pumping energy into said gain cavity to raise the interval energy level of said gain material such that only a small part of the ion population thereof, corresponding to a predetermined bandwidth about said peak emission line, is raised above laser threshold for said gain material so that said laser emits radiation only over narrow lines over a narrow wavelength interval centered about said peak emission line.

4,680,768

# SEMICONDUCTOR LASER WITH A QUANTUM WELL LAYER INCLUDING A DISORDERED REGION

Katsumi Yagi, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Japan

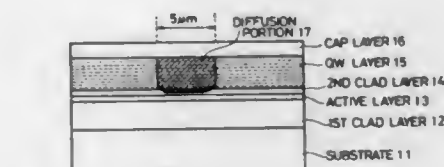
Filed Jul. 15, 1985, Ser. No. 755,079

Claims priority, application Japan, Jul. 19, 1984, 59-149954

Int. Cl.<sup>4</sup> H01S 3/19

U.S. Cl. 372-45

18 Claims



1. In a semiconductor laser:
  - a active layer substantially oscillating laser beams;
  - a first clad layer provided in contact with one principal surface of said active layer and being larger in band gap energy and smaller in optical refractive index than said active layer;
  - a second clad layer provided in contact with the other principal surface of said active layer and being larger in band gap energy and smaller in optical refractive index than said active layer; and
  - a quantum well (QW) layer contiguous to a surface of one of said first and second clad layers, the surface of said one clad layer contiguous to said QW layer being opposite the surface of said one clad layer which is in contact with said

active layer, said QW layer being in quantum well structure and including a disordered portion spaced from said active layer and a non-disordered portion.

4,680,769

# BROADBAND LASER AMPLIFIER STRUCTURE

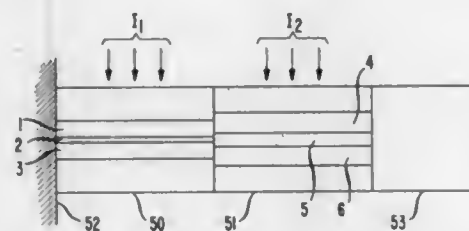
Stewart E. Miller, Middletown Township, Monmouth County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 21, 1984, Ser. No. 673,584

Int. Cl.<sup>4</sup> H01S 3/098, 3/10

U.S. Cl. 372-50

25 Claims



1. An injection laser which comprises first and second active laser regions having first and second ends, wherein the first and second active laser regions are disposed against one another at the second ends thereof,
  - first and second means for injection pumping the first and second active laser region to produce gain over a wavelength region in each the wavelength at which the gain of the first active laser region is a maximum being different than the wavelength at which the gain of the second active laser region is a maximum, the wavelength regions overlapping to produce a combined gain distribution over a broader wavelength region than the wavelength regions of either the first or second active laser regions alone,
  - a partial reflector of laser radiation generated at the first end of the first active laser region, and
  - a wavelength selective partial reflector of the laser radiation disposed at the first end of the second active laser region to form a laser cavity between the partial reflector and the wavelength selective partial reflector.

4,680,770

# DUAL BEAM GAS ION LASER

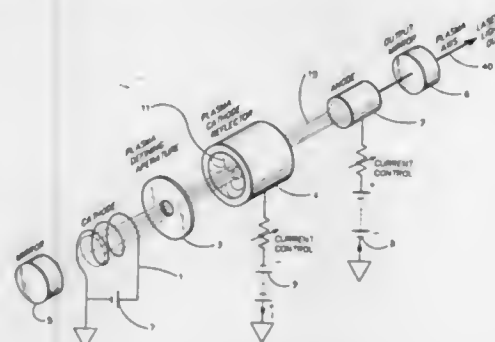
William E. Bell, Jerome, Ariz., and George J. Collins, Fort Collins, Colo., assignors to Lasertechnics, Inc., Albuquerque, N. Mex.

Filed Jan. 21, 1986, Ser. No. 821,156

Int. Cl.<sup>4</sup> H01S 3/08

U.S. Cl. 372-99

40 Claims



1. A dual beam gas ion laser comprising:

- a vacuum enclosure having a longitudinal optical axis that is defined by a resonant cavity having a mirror at each end thereof, one or both of which is employed to extract power from the laser;
- a thermionic cathode having an axial opening therein and being positioned within the vacuum enclosure such that its axial opening is coaxial with the longitudinal optical axis of the vacuum enclosure for allowing an unobstructed optical path between the two mirrors;
- an anode having an axial opening therein and being positioned within the vacuum enclosure in spaced apart relationship to the thermionic cathode and such that its axial opening is coaxial with the longitudinal optical axis of the vacuum enclosure for allowing an unobstructed optical path between the two mirrors;
- at least two plasma defining aperture means, each having an aperture therein and each being positioned within the vacuum enclosure such that its aperture is in alignment with the longitudinal optical axis of the vacuum enclosure, one of said plasma defining aperture means being positioned proximate to the thermionic cathode and the other of said plasma defining aperture means being positioned proximate to the anode such that both of said plasma defining aperture means are positioned between the thermionic cathode and the anode;
- a photocathode reflector having an axial opening therein and having a geometric inner surface, the photocathode reflector being positioned within the vacuum enclosure between the apertures in the plasma defining aperture means such that its axial opening is coaxial with the longitudinal optical axis of the vacuum enclosure and such that the geometric focus of the geometric inner surface of the photocathode reflector lies substantially on the longitudinal optical axis of the vacuum enclosure;
- first power supply means electrically connected for heating the thermionic cathode to produce thermionic emission of electrons therefrom;
- second power supply means electrically connected between the thermionic cathode and the anode for accelerating the electrons thermionically emitted by the thermionic cathode to form a longitudinal plasma arc along a portion of the longitudinal optical axis between the anode and the thermionic cathode, the longitudinal plasma arc being generally in alignment with the apertures of the plasma defining aperture means;
- third power supply means electrically connected to the photocathode reflector to accelerate electrons produced by a combination of photon and ion bombardment of the geometric inner surface of the photocathode reflector to form a glow discharge electron beam that is transverse to said longitudinal plasma arc; and
- gas port means in the vacuum enclosure for permitting evacuation of the vacuum enclosure and for admitting one or more gases into the vacuum enclosure.

4,680,771

# MIRROR ADJUSTMENT DEVICE IN LASER OSCILLATOR

Ryoji Koseki, Buena Park, Calif., assignor to Amada Engineering Service Co., Inc., La Mirada, Calif.

Filed Dec. 31, 1985, Ser. No. 814,981

The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

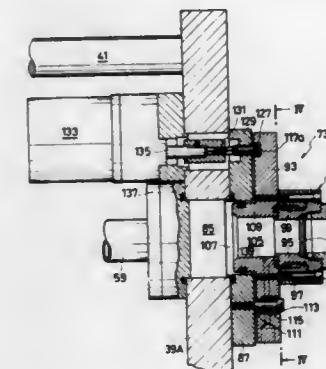
Int. Cl.<sup>4</sup> H01S 3/08

U.S. Cl. 372-107

9 Claims

1. A mirror adjustment device for a laser oscillator comprising:
  - a mirror holder for installing one of an output and rear laser mirror, said mirror holder supported on a support plate, said mirror holder being mounted on said support plate for free rotation about a first axis which is parallel to the X

axis and a second axis which is parallel to the Y axis, and an adjustment motor connected with said mirror holder



for selective, slight rotation of said mirror holder about said first axis and said second axis.

4,680,772

# DIGITAL SIGNAL REPEATER INCLUDING MEANS FOR CONTROLLING A TRANSMITTER

Kouzou Kage, Tokyo, Japan, assignor to NEC Corporation, Japan

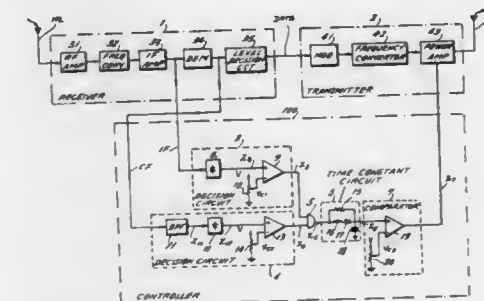
Filed Aug. 16, 1985, Ser. No. 766,262

Claims priority, application Japan, Aug. 25, 1984, 59-175844

Int. Cl.<sup>4</sup> H04B 7/17

U.S. Cl. 375-4

22 Claims



15. A digital signal repeater system comprising:

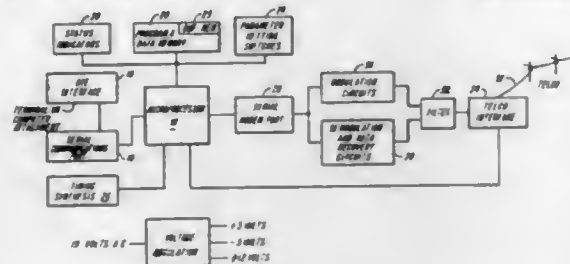
- (a) a receiver for receiving an input signal, producing signals related to such input signal, and producing a demodulated receiver output signal;
- (b) a transmitter for transmitting an output signal modulated by such receiver output signal; and
- (c) a controller for
  - (i) receiving such signals related to such input signal from the receiver;
  - (ii) processing such signals related to such input signal to detect (1) whether such input signal is present, and (2) whether such signals related to such input signal include a predetermined clock frequency component; and
  - (iii) producing a control signal for controlling said transmitter, such control signal being indicative of whether said two conditions are detected.



4,680,773  
**DATA TELECOMMUNICATIONS SYSTEM AND METHOD UTILIZING A MULTI-MODE MODEM**  
 Anthony P. Amundson, Holliston, Mass., assignor to Microcom, Inc., Norwood, Mass.  
 Filed Oct. 30, 1985, Ser. No. 792,766  
 Int. Cl.<sup>4</sup> H04B 1/38

U.S. Cl. 375-8

25 Claims



1. A method of initiating data telecommunications between two units of data terminal equipment over communication lines, each unit of said data terminal equipment having a modem connected between the unit and the communication lines, at least one of said modems being capable of operating under a special mode and under a normal mode, said special mode providing optimized data transmission that paces the flow of data between said two modems and provides error detection in a transmitted data stream by a receiving modem and automatic retransmission of said data stream by an initiating modem when an error occurs and said normal mode providing direct, non-optimized data transmission that provides transmission of the data stream without any analysis of the data stream, said method comprising the steps of:

- establishing a physical connection between said initiating modem and said receiving modem;
- transmitting a stream of data characters from said initiating modem of said receiving modem over communication lines;
- examining in said receiving modem a next character in said data stream transmitted by said initiating modem to said receiving modem;
- attempting to establish a special mode link between said initiating and receiving modems if said next character examined by said receiving modem is a special mode indicating character and attempting to establish a normal mode link if said character is a normal mode indicating character;
- repeating steps (c) through (d) after fetching a new data character from the data stream until either a special mode indicating character or a normal mode indicating character is detected or until a preselected period of time has elapsed;
- continuing the transmission by said initiating modem of said stream of data if a special or normal mode link is established until said stream is transmitted.

4,680,774  
**METHOD AND CIRCUIT FOR SUPPRESSION OF QUANTIZING NOISE AMBIGUITIES**  
 Karl-Heinz Klein, Wiesbaden-Erbenheim, and Wilfried Richter, Rosdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed Jan. 16, 1986, Ser. No. 819,891  
 Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504762

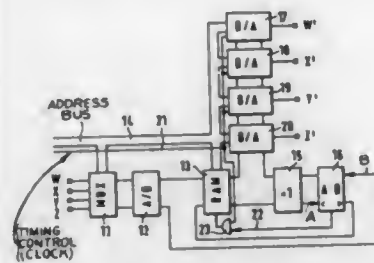
U.S. Cl. 375-26

Int. Cl.<sup>4</sup> H03M 1/66

13 Claims

1. Method to reduce or eliminate quantizing noise errors upon digital transmission of analog signals by analog/digital (A/D) conversion, transmission of digital signals, and subsequent digital/analog (D/A) reversion into analog signals,

with minimum or no distortion between the original analog signal and the reconverted analog signal, comprising, in accordance with the invention, the steps of storing a first digitized signal representative of a first analog value;



comparing first and second sequential digitized signals, discriminating between similar and dissimilar digital signal values and determining the degree of dissimilarity; and controlling the D/A conversion to change a conversion of the second digitized signal to an analog signal with respect to the first stored signal only if the discriminated degree of dissimilarity exceeds a predetermined level.

4,680,775  
**DEVICE FOR CODING-DECODING A BINARY DIGITAL SIGNAL BIT STREAM FOR AN "OQPSK" DIGITAL MODULATOR-DEMODULATOR WITH FOUR PHASE STATES**

Jean Exarque, Levallois-Perret, and Michel Camand, Courbevoie, both of France, assignors to Societe Anonyme Dite, Levallois-Perret, France

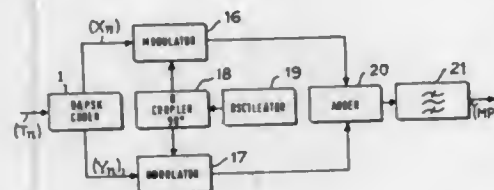
Filed Jan. 29, 1985, Ser. No. 696,130

Claims priority, application France, Jan. 31, 1984, 84 01466

Int. Cl.<sup>4</sup> H04L 27/18

U.S. Cl. 375-39

4 Claims



1. Device for coding and decoding a binary signal digital bit stream for an OQPSK digital circuit having a modulator and demodulator with four phase states of the kind in which a binary digital signal bit stream with bit rate D is applied in phase with synchronization clock pulses to the input of a coder which produces two digital bit streams with bit rate D/2 at respective first and second inputs of said modulator and a decoder at the output of said demodulator restores a binary digital bit stream with bit rate D, in which device said coder comprises a circuit adapted to divide by 2 frequency of synchronization clock pulses so as to produce synchronization pulses having a period twice that of said synchronization clock pulses, a first logic circuit having inputs connected to receive the bits of said digital bit stream with bit rate D and said synchronization pulses in phase with each bit of said digital bit stream and an output for connection to said first input of said modulator and to deliver each bit of a first digital bit stream with bit rate D/2, said first logic circuit comprises means for assigning each bit of said first digital bit stream with bit rate D/2 the binary value 1 or 0 in accordance with the following logic equation:

$$X_n = (T_n \oplus H_n/2) \oplus X_{n-1}$$

$X_n$  represents the state of the nth bit of the first digital bit stream with bit rate D/2,  
 $T_n$  represents the complement of the state of the nth bit of the digital bit stream with bit rate D,  
 $\oplus$  represents the operator "OR",  
 $H_n/2$  represents the state of the nth synchronization pulse,  
 $(T_n \oplus H_n/2)$  represents the complement of the function  $(T_n \oplus H_n/2)$ ,  
 $\oplus$  represents the logic operator "exclusive-OR",  
 $X_{n-1}$  represents the state of the (n-1)th bit of the first digital bit stream with bit rate D/2,  
 a second logic circuit has an input connected to receive the bits of the digital bit stream with bit rate D and an output for connection to a second input of said modulator and to deliver the bits of a second digital bit stream with bit rate D/2, said second logic circuit is connected to the output of said first logic circuit and comprises means for assigning to each bit of said second digital bit stream with bit rate D/2 the binary value 1 or 0 in accordance with the following logic equation:

$$Y_n = T_n \oplus X_n \oplus X_{n-1} \oplus Y_{n-1}$$

in which equation:

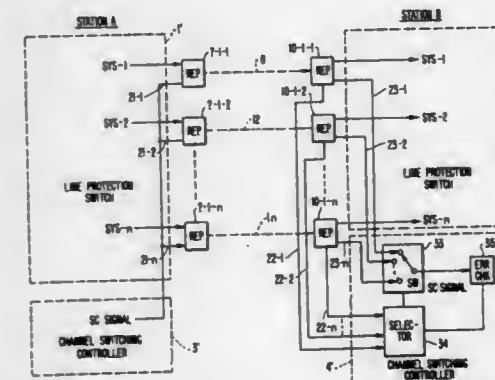
$Y_n$  represents the state of the nth bit of the second digital bit stream with bit rate D/2,  
 $T_n$  represents the state of the nth bit of the digital bit stream with bit rate D,  
 $X_{n-1}$  and  $Y_{n-1}$  respectively represent the states of the (n-1)th bits of said first and second digital bit streams with bit rate D/2,  
 said decoder comprises a third logic circuit for restoring at the output of said decoder said digital bit stream with bit rate D formed from said first and second digital bit streams with bit rate D/2 as demodulated by said demodulator, and said third logic circuit comprises means for assigning to each restored bit the binary value 1 or 0 in accordance with the following equation:

$$T_n = X_n \oplus X_{n-1} \oplus Y_n \oplus Y_{n-1}$$

4,680,776  
**PROTECTION SWITCHING SYSTEM FOR CARRIER TRANSMISSION LINE**  
 Satoshi Ikeuchi, Kawasaki, and Ikuo Taniguchi, Inagi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
 Filed Nov. 9, 1984, Ser. No. 669,836  
 Claims priority, application Japan, Nov. 11, 1983, 58-212030; Nov. 18, 1983, 58-217402; Jan. 25, 1984, 59-011256  
 Int. Cl.<sup>4</sup> H04L 7/02

U.S. Cl. 375-40

21 Claims

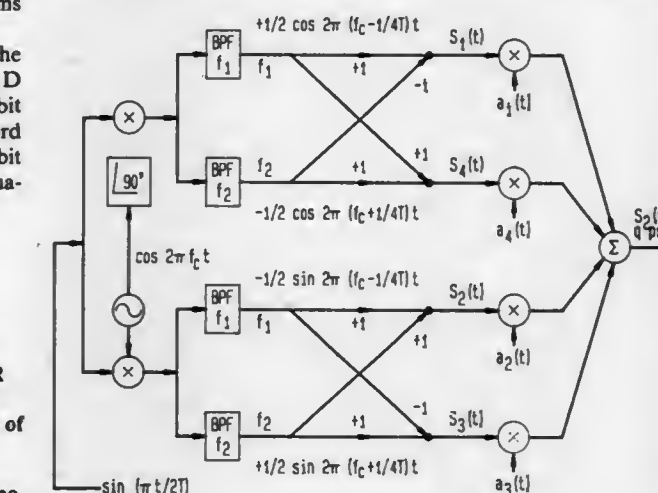


1. A protection switching system for a digital carrier trans-

mission line transmitting pulse code modulation bit frames having an auxiliary bit area, comprising:  
 terminal stations, each including a selector for receiving auxiliary signals and means for detecting trouble on the digital carrier transmission line;  
 at least one main transmission line, operatively connected to said terminal stations, for transmitting main signals between said terminal stations;  
 means for detecting trouble on said at least one main transmission line; and  
 at least one stand by line, operatively connected to said terminal stations, for transmitting the main signal when said means detects trouble on said at least one main transmission line, the auxiliary signals between said terminal stations being transmitted in parallel using at least two lines among said at least one main transmission line and said at least one stand by line, utilizing the auxiliary bit area of the pulse code modulation bit frames, and the selector selecting the auxiliary signals received over one of said stand by line and said main transmission line which is operating normally.

4,680,777  
**QUADRATURE-QUADRATURE PHASE SHIFT KEYING**  
 Debabrata Saha, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, Mich.  
 Filed Aug. 13, 1984, Ser. No. 640,057  
 Int. Cl.<sup>4</sup> H04L 27/10; H04J 11/00; H03C 3/00  
 U.S. Cl. 375-53

18 Claims



1. A modulation method for modulating simultaneously four streams of data pulses, the modulation method comprising the steps of:

- combining a pulse-shaping signal with respective ones of first and second carrier signal components, each of said first and second carrier signal components having the same frequency as the other and a quadrature phase relationship with respect to the other, to produce first and second composite modulation signals, each having first and second frequency components;
- combining subtractively said first and second frequency components associated with each of said first and second composite modulation signals, to produce first and third modulation signals;
- combining additively said second and first frequency components associated with each of said first and second composite modulation signals, to produce second and fourth modulation signals; and
- combining said first, second, third, and fourth modulation signals with respective ones of the four streams of data pulses, to produce respectively corresponding first, sec-

ond, third, and fourth modulated streams of pulses having predetermined pulse shapes and quadrature pulse phase relationships with respect to one another.

# **4,680,778** **FAST ACQUISITION CIRCUIT FOR SYNCHRONOUS DIGITAL RECEIVER OPERATING IN WIDEBAND NOISE**

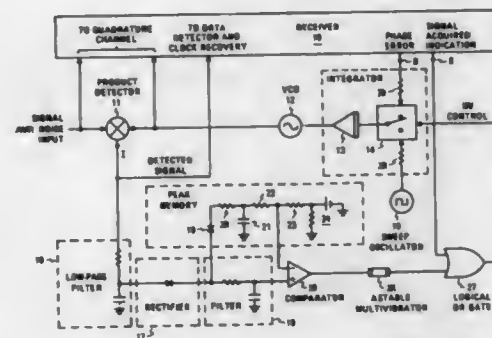
Jerome V. Krinock, Owensboro, Ky., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1985, Ser. No. 783,132

Int. Cl.<sup>4</sup> H04L 27/06

U.S. Cl. 375-97

4 Claims



1. In a synchronous receiver for receiving a digitally modulated signal having a carrier and a known data rate, said receiver requiring frequency sweep to acquire the digitally modulated signal from within a frequency band that is much wider than the signal spectrum but having the propensity to false lock onto data sidebands spaced from the carrier at multiples of a known frequency interval, or, because of wideband noise, being unable to employ a frequency discriminator function, said receiver comprising:

- a product detector, having a signal input to which the digitally modulated signal couples, an oscillator input, and a baseband output;
- a variable frequency oscillator, having a control input and an output whose frequency is an approximately linear function of the control input, said output coupled to the oscillator input of the product detector;
- means for producing a phase error signal indicating the phase difference between the carrier of the digitally modulated signal and the output of the variable frequency oscillator;
- an integrator having an input coupled to said phase error signal and having an output coupled to the control input of the variable frequency oscillator;
- means for sweeping the frequency of the variable frequency oscillator at a predetermined sweep repetition rate to acquire the digitally modulated signal, comprising:
  - a square wave generator for producing a square wave sweep waveform having predetermined amplitude and period and
  - sweep control means for selectively coupling either the output of the square wave generator or the output of the means for producing the phase error signal to the input of the integrator; and
- a logical signal-acquired indicator, which asserts when the receiver has acquired the digitally modulated signal but which does not assert during false locks,
- a signal acquisition circuit in said receiver for controlling the sweep control means, comprising:
  - a first low pass filter, coupled to the baseband output of the product detector, whose cutoff frequency is substantially less than said known frequency interval to remove wideband noise from said baseband output and to produce a filtered baseband output;
  - a first rectifier means, coupled to the output of the low pass

- filter, for rectifying the filtered baseband output and producing a rectified baseband output;
- a second low pass filter, coupled to the rectifier means and having a cutoff frequency lower than said known data rate and higher than the predetermined sweep repetition rate, for recovering the envelope of the rectified baseband output and producing an envelope signal;
- an envelope peak memory for detecting the peaks of the envelope signal and producing an envelope peak memory signal, comprising:
  - a second rectifier means and capacitor coupled to the output of the first rectifier means and having a discharge time constant several times the period of the square wave sweep waveform and
  - means for establishing a minimum charge on said capacitor sufficient, in the absence of signal but presence of noise, to back bias the first rectifier means, whereby the output of the peak memory means, which is proportional to the charge on the capacitor, eventually increases, in the presence of significant detected signal, from a level less than to a level greater than that of the envelope signal;
- comparator means, coupled to the sweep control means, for producing a first logical output when the envelope signal exceeds the envelope peak memory signal and a second, different logical output when the envelope peak memory signal exceeds the envelope signal;
- an astable multivibrator, whose output asserts in response to the first logical output from the comparator means and remains asserted for a significant fraction of half the period of the square wave sweep waveform after discontinuance of the first logical output from the comparator means;
- a logical OR gate, which has one input coupled to the output of the astable multivibrator, another input coupled to the signal-acquired indicator, and an output coupled to the sweep control means, whereby the output of the astable multivibrator causes the sweep control means to couple the input of the integrator to the output of the square wave sweep generator to attempt signal acquisition or to the phase error signal to test signal acquisition until the signal has been acquired, after which the signal-acquired indicator asserts and causes the input of the integrator to remain coupled to the phase error signal.

# **4,680,779** **DISTRIBUTED CLOCK SYNCHRONIZATION IN A DIGITAL DATA SWITCHING SYSTEM**

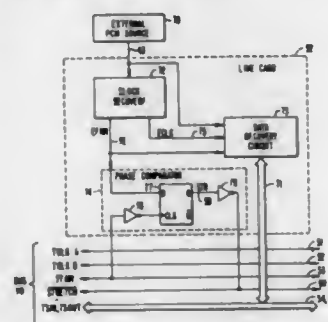
John F. Wakerly, Mountain View, Calif., assignor to David Systems, Inc., Sunnyvale, Calif.

Filed Jan. 14, 1985, Ser. No. 692,006

Int. Cl.<sup>4</sup> H04L 7/00

U.S. Cl. 375-107

14 Claims



1. A clock synchronization system in a digital PBX switch having one or more line card modules and a central control module, comprising
  - a first clock for generating timing signals at a first clock

frequency greater than a nominal frequency, said first clock in said central control module, a circuit coupled to said local first clock for lowering said first clock frequency, said lowering circuit in said central control module, and a comparator means having a first input coupled to said first clock, and having an output coupled to said lowering circuit for activating said lowering circuit when a second input of said comparator means is coupled to a second clock, said second clock operating at substantially said nominal frequency, to lower said first clock frequency to synchronize said first clock frequency with said second clock, said comparator means in said one or more of said line card modules to distribute said clock synchronization system.

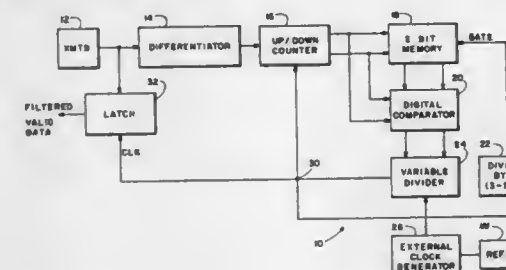
# **4,680,780** **CLOCK RECOVERY DIGITAL PHASE-LOCKED LOOP** Agoston Agoston, Beaverton, and Robert G. Sparkes, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 1, 1986, Ser. No. 858,425

Int. Cl.<sup>4</sup> H03D 3/24, 3/18

U.S. Cl. 375-120

9 Claims



1. A digital phase-locked loop circuit for synchronizing a clock to a serial data stream comprising:
  - (a) variable clock means for producing a series of clock pulses whose frequency is a function of a coded input signal;
  - (b) up/down counter means responsive to said serial data stream and to said clock pulses for counting in a first direction when the phase of said data stream leads said clock pulses, and for counting in a second direction when the phase of said data stream lags said clock pulses; and
  - (c) comparator means for comparing a present count of said up/down counter means with a previous count of said up/down counter means, and for providing said coded input signal to said variable clock means to increase the frequency of said variable clock means when the phase of said serial data stream leads said clock pulses, and to decrease the frequency of said variable clock means when the phase of said serial data stream lags said clock pulses.

# **4,680,781** **DATA TELECOMMUNICATIONS SYSTEM AND METHOD WITH UNIVERSAL LINK ESTABLISHMENT** Anthony P. Amundson, Holliston, and Nathan Melhorn, Framingham, both of Mass., assignors to Microcom, Inc., Norwood, Mass.

Filed Oct. 30, 1985, Ser. No. 793,583

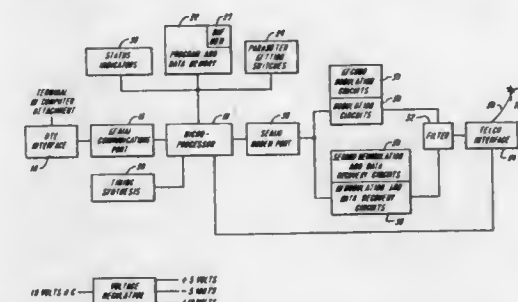
Int. Cl.<sup>4</sup> H04L 1/08, 27/00

U.S. Cl. 375-8

9 Claims

7. A method for establishing a data telecommunications connection between an initiating unit of data terminal equipment and a receiving unit of data terminal equipment, each of the units having an associated modem connected between said unit and communication lines, each of said modems including a means to provide operation at a high speed (4800 bps or

above) and a means to provide operation and at a low speed (2400 bps or below), said method comprising the steps of: establishing a physical connection between said initiating modem and said receiving modem at the low speed; determining whether said initiating modem and said receiving modem are capable of operating under a special, optimizing matched protocol that provides error detection in a transmitted data stream and automatic retransmission of said data stream when an error occurs;



if said initiating modem and said receiving modem are capable of operating under said matched protocol, establishing a link connection between said initiating modem and said receiving modem under said matched protocol and determining a class of operation under said matched protocol; if said class of operation is a class providing operation at a high speed, utilizing said link connection to establish a physical connection between said initiating modem and said receiving modem at said high speed.

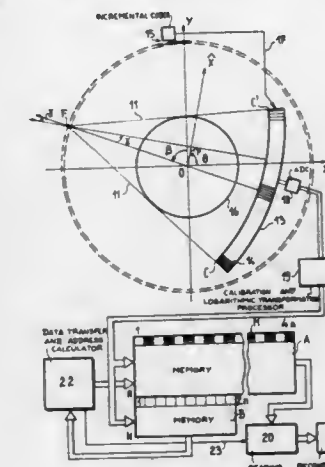
# **4,680,782** **TOMODESITOMETRY IMAGE ACQUISITION AND RECONSTRUCTION PROCESS AND A TOMODESITOMETER USING THIS PROCESS** Siv Chang Tan, Paris; Tri Hue Nguyen, Le Pre St. Gervais, and Claude Benchimol, Paris, all of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 19, 1984, Ser. No. 662,715

Claims priority, application France, Oct. 25, 1983, 83 16995  
Int. Cl.<sup>4</sup> A61B 6/00

U.S. Cl. 378-4

12 Claims



1. A process for image reconstruction by tomodesitometry of the type including the steps of rotating a radiation source and detectors assembly in the plane of a cross-section the image of which is to be displayed, said radiation source emitting a beam of penetrating radiation in the form of a fan, and



taking and storing a succession of image views for different angles of rotation of the source and detectors assembly with respect to a fixed reference axis, of said plane, the detectors of said assembly being arranged to converge towards a focal point of said radiation source and each view being sampled for angles  $\gamma$  representative of the detectors and indexed from a straight line joining the center of rotation of said radiation source and detectors assembly to said focal point, the angular shift between two adjacent detectors being constant  $\Delta\gamma$  and the angular shift between views being constant; with the angular shift between said straight line and the detector the nearest thereto adjusted to  $\{\Delta\gamma/4\}$  and the following conditions being provided:  $\pi/\Delta\gamma = N$ , with  $N$  a positive integer, assuming  $\gamma = (1+\alpha)\gamma$ , where  $\alpha$  is a coefficient dependent on the speed of rotation of the source and detectors assembly and on the time for acquisition of a view, said process further comprising the steps of:

taking and storing two series of views ( $V_i$ ,  $W_i$ ) with an angular shift between views of  $h\Delta\beta$  for the first series ( $V_i$ ) and  $\Delta\beta$  for the second series ( $W_i$ ), at least some of the views of the two series being shifted with respect to each other by  $|\Delta\gamma/2|$  with  $\Delta\beta = 2\Delta\gamma$ ,  $h$  being a positive integer, completing the views of the first series by sampled values of the second series whose coordinates  $(\theta', \gamma')$  located in the space  $(\theta, \gamma)$  with  $\theta = \beta + \gamma$ , satisfy the relationship:  $(\theta', \gamma') = (\theta' + (2k+1)\pi, -\gamma')$  with  $k$  a relative integer,  $(\theta, \gamma)$  being the coordinates in space  $(\theta, \gamma)$  of desired sampled values of the first series; and applying a reconstruction algorithm, comprising a convolution and back projection, to the completed views of the first series for reconstituting an image.

4,680,783

### TELEPHONE SECURITY VIOLATION DETECTION DEVICE

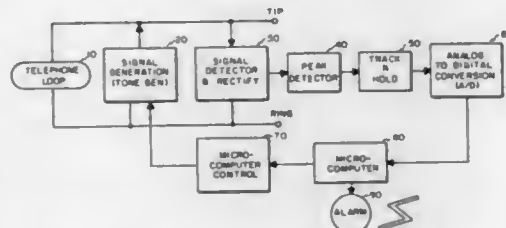
Eduard F. B. Boeckmann, Hantsville, Ala., assignor to GTE Communication Systems, Inc., Northlake, Ill.

Filed Dec. 16, 1985, Ser. No. 808,978

Int. Cl. H04M 1/24

U.S. Cl. 379-6

4 Claims



1. The method of detecting unauthorized connections to a telephone line intended to intercept voice or data messages, comprising the steps of:

- measuring the impedance of said telephone line as a first preliminary step;
- storing said measurement as a base line value as a second preliminary step;
- generating a test tone and applying said tone to the telephone line;
- measuring the voltage level on said telephone line;
- connecting a shunt resistance across said telephone line;
- remeasuring the voltage on said line with said shunt resistance connected;
- computing the equivalent source impedance based on said two measuring steps;
- comparing the computed results to said base line value; and
- if the computed results vary from the base line value a predetermined amount giving indication of an unauthorized connection, generating an alarm signal.

### 4,680,784 TRAFFIC SIMULATOR FOR TESTING EXCHANGES TAKING THE SUBSCRIBER-SYSTEM INTERACTION INTO ACCOUNT

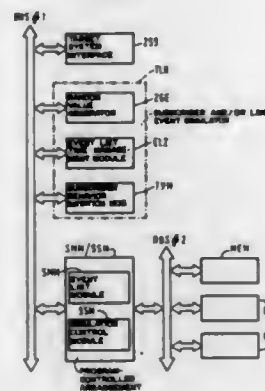
Ralf Lehnert, Kalchreuth; Phuoc Tran-Gia, Bietigheim-Bissingen, and Wolfram Lempennau, Stuttgart, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,147

Int. Cl. H04M 3/28

U.S. Cl. 379-11

3 Claims



1. An improved traffic simulator for testing a telephone exchange, which simulates the behavior of subscribers and lines connected to the exchange by producing random event variables such as call distances, call durations and reaction times which actuate a program-controlled control arrangement which checks the reaction of the exchange to such events and mixes the statistical technical parameters of the exchange; such improvement being characterized in that the instantaneous behavior of the subscriber and line simulations are not predetermined, but adapt themselves randomly to the system reactions, and that such simulator comprises a first circuit arrangement (TVM) for producing the subscriber and line event simulations, a second circuit arrangement (ELZ) for determining event instants, a third circuit arrangement (ZGE) for producing the random event variables, an interface unit ZSS for transmitting absolute simulation instants to the exchange, and a simulation control (SIS) to which the exchange transfers reports of received events; whereby the reaction times of the exchange to such events can be measured without measuring the internal time delays of the simulator.

4,680,785

### PERSONAL-SIGNALING COMMUNICATION SYSTEM

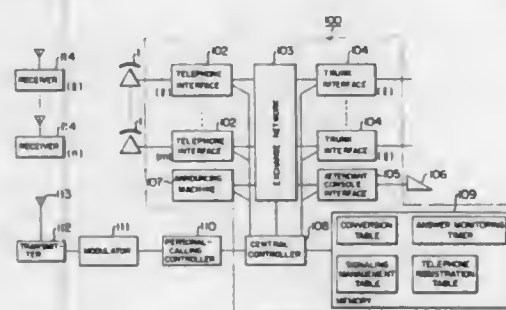
Tadahiko Akiyama, and Yoshio Otsuka, both of Koriyama, Japan, assignors to Nippon Communication Industrial Co., Ltd., Fukushima, Japan

Filed Oct. 3, 1984, Ser. No. 657,199

Int. Cl. H04M 1/276, 1/57; H04Q 7/04

U.S. Cl. 379-57

4 Claims



1. A personal-signaling communication system comprising: a portable memory device provided with memory means for

storing personal identification information and a portable receiver device provided with receiver means operable in response to receipt of a wireless personal signaling code to provide an indication of received signaling;

a plurality of communication terminal units connected by way of respective lines to an exchange facility and each provided with a reader to read personal identification information stored in said portable memory device and each of which includes means for transferring said personal identification information, a called number signal and an off-hook signal to said exchange facility;

a wireless pager device connected to receive a personal signaling code from said exchange facility for transmitting said personal signaling code by wireless communication to said portable receiver device; and

said exchange facility including means for converting a called number signal, received from a communication terminal unit along with a caller's personal identification information, to a personal signaling code, memory means for storing a personal signaling code in correspondence with said received caller's personal identification information to form a signal management table, comparison means responsive to reception of personal identification information and an off-hook signal from a communication terminal unit for comparing the received personal identification information with data forming said signaling management table as stored in said memory means, first means responsive to said comparison means not detecting the received personal identification information in said signaling management table for transferring a personal signaling code from said converting means to said wireless pager device and for storing said received personal identification information along with said caller's personal identification information in said signaling management table in said memory means, and second means responsive to said comparison means detecting the received personal identification information in said signaling management table for effecting connection selectively between the communication terminal unit from which the personal identification information is received and a line to another communication terminal unit identified by caller's personal identification information derived from said signaling management table in said memory means.

4,680,786

### COMMUNICATION SYSTEM FOR PROVIDING BUSINESS COMMUNICATION FEATURES TO CELLULAR MOBILE TELECOMMUNICATION CUSTOMERS

Rolin C. Baker, Boulder; Steven E. Brown, Arvada; John R. Lothrop, Longmont; Roman Lozyniak, Westminster, and Paul E. Miller, Northglenn, all of Colo., assignors to AT&T Company and AT&T Information Systems Inc., both of Holmdel, N.J.

Filed Oct. 1, 1985, Ser. No. 782,312

Int. Cl. H04M 1/00

U.S. Cl. 379-60

14 Claims

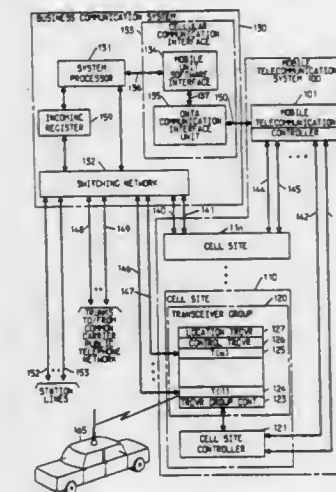
1. A mobile telecommunication complex for providing business communication services to mobile telephone units comprising:

- a mobile telecommunication system which provides mobile telecommunication services to one or more mobile telephone units;
- a business communication system, including a system processor which controls the operation of said business communication system in response to station status activity associated with a call connection stored therein, for providing business communication services to communication circuits connected to said business communication system;
- one or more communication links connecting said mobile telecommunication system and said business communication

system for carrying voice communication signals therebetween;

one or more data links connecting said business communication system and said mobile telecommunication system for carrying data therebetween;

wherein said mobile telecommunication system is responsive to control messages from any one of said mobile telephone units for establishing a communication connection between said mobile telephone unit and one of said communication links and for transmitting a control message to said business communication system via one of said data links describing the state of the call connection on said



communication link connected to said one mobile telephone unit;

cellular communication interface means connected between said data links and said system processor for converting said control message from said mobile telecommunication system to station status activity data associated with said call connection, which station status activity data is written by said interface means into said business communication system; and

wherein said system processor is responsive to said station status activity data for providing business communication service to said communication link associated with said one mobile telephone unit.

4,680,787

### PORTABLE RADIOTELEPHONE VEHICULAR CONVERTER AND REMOTE HANDSET

Patrick J. Marry, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

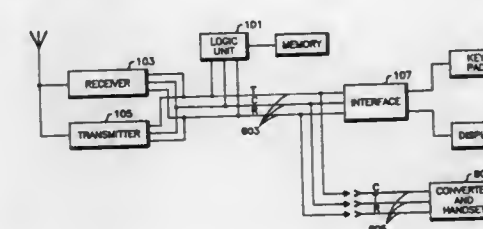
Continuation of Ser. No. 673,650, Nov. 21, 1984, abandoned.

This application Sep. 12, 1986, Ser. No. 907,125

Int. Cl. H04Q 7/04

U.S. Cl. 379-63

38 Claims



1. A portable radiotelephone having a logic unit, which communicates information with a first internal data device via a data bus and adapted to accept a detachable second external data device on the data bus comprising:

means for detecting the presence of the second data device on the data bus;  
 means, responsive to said detection of the presence of the second data device, for excluding the first data device and including the second data device in the logic unit information communication; and  
 means for detecting a subsequent absence of the second data device from the data bus and for including the first data device while excluding the second data unit from the logic unit information communications.

4,680,788

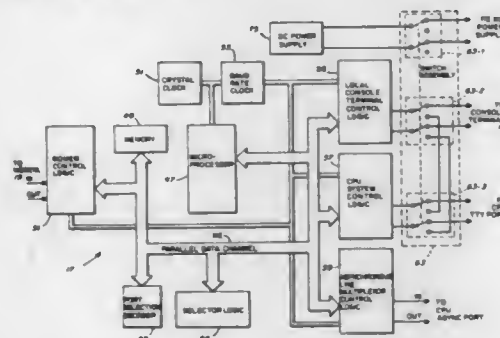
## MICROPROCESSOR BASED CONTROL AND SWITCHING DEVICE

Craig A. Cordeiro, Westford, and John P. Graham, Marlboro, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Aug. 31, 1983, Ser. No. 528,566  
 Int. Cl.<sup>4</sup> H04M 11/00

U.S. Cl. 379-93

22 Claims



1. A computer network for transmitting and receiving data over a telephone line comprising:
  - a. a local site, said local site including:
    - i. a CPU having a TTY port and an ASYNC port,
    - ii. a local console,
    - iii. a modem coupled to said telephone line, and
    - iv. a control and switching device coupled through separate lines to said TTY port, to said ASYNC port, to said modem and to said local console for controlling the flow of data between said CPU said local console and said modem, and
  - b. a remote site, said remote site including:
    - i. a remote terminal, and
    - ii. a modem coupled to said remote terminal and to said telephone line,
  - c. said control and switching device including:
    - i. a first port for coupling said control and switching device to said local console,
    - ii. a second port for coupling said control and switching device to said TTY port,
    - iii. a third port for coupling said control and switching device to said ASYNC port,
    - iv. a fourth port for coupling said control and switching device to said modem, and
    - v. a switch assembly having a set of three switches for operating said control and switching device in any one of three modes, one switch arranged to connect said local console to said TTY port and power down said control and switching device for operation in a first mode, another switch arranged to connect said local console to said TTY port and connect said modem at said local site to said ASYNC port for operation in a second mode and said third switch arranged to electronically connect both said local console and said modem at said local site to either said TTY port or said ASYNC port for operation in a third mode.

# 4,680,789

## AUDIO TRANSMISSION CIRCUIT COMPRISING A TRANSMIT AMPLIFIER IN THE FORM OF A LINE VOLTAGE STABILIZER

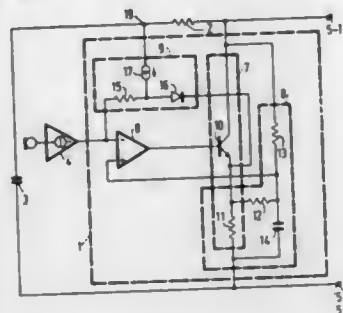
Peter J. M. Sijbers; Henricus J. M. Otten, both of Eindhoven, and Petrie J. Van Der Plaats, Hilversum, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 26, 1985, Ser. No. 705,766

Int. Cl.<sup>4</sup> H04M 1/60

U.S. Cl. 379-395

3 Claims



1. An improved transmit amplifier which stabilizes the subscriber line voltage of a telephone set connected to such line, such telephone set comprising such transmit amplifier and a high-output impedance microphone pre-amplifier, such transmit amplifier being supplied with direct voltage by the subscriber line; such transmit amplifier comprising: an input stage constituted by a feedback operational amplifier having an inverting input and a non-inverting input, the inverting input thereof being connected to the output of the microphone pre-amplifier; an output stage formed by an output transistor having an emitter resistor, such output stage being arranged in parallel with the subscriber line; and a reference voltage source for producing a reference voltage for line voltage stabilization; such improvement being characterized in that such transmit amplifier further comprises:
  - a voltage divider formed by a first resistor and a parallel arrangement of a second resistor and a capacitor, such voltage divider being in parallel with the subscriber line and the junction of said first and second resistors being connected to the non-inverting input of said operational amplifier, the emitter resistor of said output transistor forming part of said second resistor;
  - and a feedback circuit connecting the inverting input of said operational amplifier to the emitter of said output transistor, such feedback circuit comprising said reference voltage source and a feedback resistor.

4,680,790

## BEDSIDE CONTROL MODULE FOR HEALTHCARE STATIONS AND THE LIKE

Richard F. Packard, Stevens Point, and Kenneth R. Cover, Plover, both of Wis., assignors to Joerns Healthcare, Inc., Stevens Point, Wis.

Filed Aug. 22, 1985, Ser. No. 768,206

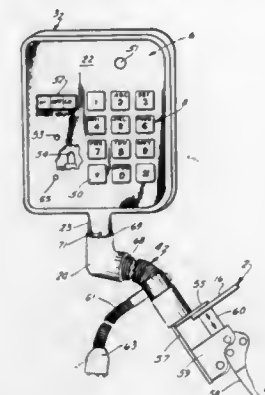
Int. Cl.<sup>4</sup> H04Q 1/00; H04M 1/00

U.S. Cl. 379-432

38 Claims

36. A bedside communicator for hospital beds and the like, comprising:
  - a control panel;
  - an adjustable arm supporting said control panel in a cantilevered fashion at a position over the bed for access thereto by a patient reclined on the bed; and
  - a loud speaker telephone having a push-button dial comprising a large-button membrane switch encompassing a major portion of said control panel and a push-button line connect/disconnect controller mounted on said control panel for manual operation by the patient; and wherein said adjustable arm is sufficiently stiff that said arm will not

normally flex as a result of manipulation of either said dial or said line connect/disconnect controller, and is sufficiently flexible to permit manual deflection of said arm by



patients and other users, whereby the patient can initiate outgoing telephone calls and terminate the same with a single hand from a reclined position in the bed.

4,680,791

## DIGITAL VIDEO SIGNAL PROCESS APPARATUS FOR USE IN A VIDEO TAPE RECORDER

Hideaki Kato, and Shigeru Araki, both of Tokyo, Japan, assignors to NEC Corporation, Japan

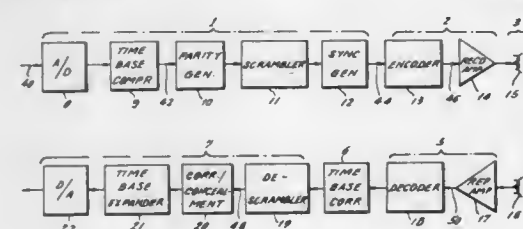
Filed May 30, 1985, Ser. No. 739,137

Claims priority, application Japan, May 31, 1984, 59-112720; Aug. 22, 1984, 59-174739

Int. Cl.<sup>4</sup> H04N 7/167

U.S. Cl. 380-8

12 Claims



1. A processing apparatus for producing a scrambled signal from a video signal, said video signal being coded to include a cyclic error correcting code, said video signal being organized in a plurality of blocks, each block having a plurality of sub-blocks, each of said sub-blocks including a synchronizing code representing a period of said sub-block, said apparatus comprising:
  - means for adding address information varying in its content at every sub-block to said synchronizing code;
  - means, responsive to said address information, for generating a pseudo-random signal based on said address information and having a different code pattern with respect to each of said sub-blocks; and
  - means responsive to said pseudo-random signal for scrambling said video signal with said pseudo-random signal.

4,680,792

## DEMODULATOR COMPRISING AN INDICATOR CIRCUIT FOR USE IN COMMON TO CANCELLATION OF A PILOT SIGNAL AND AN INDICATION OF A RECEPTION STATE

Kouichi Tanaka; Takeshi Kuwajima, and Kiyoshi Amazawa, all of Tokyo, Japan, assignors to NEC Corporation and Clarion Co., Ltd., both of Tokyo, Japan

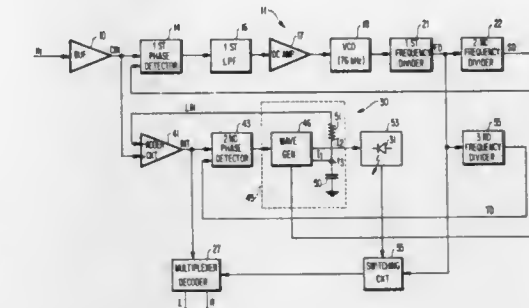
Filed Mar. 5, 1985, Ser. No. 708,454

Claims priority, application Japan, Mar. 5, 1984, 59-41614

Int. Cl.<sup>4</sup> H04H 5/00

U.S. Cl. 381-12

6 Claims



1. A demodulator for use in producing a demodulated signal in response to a circuit input signal which is one of a stereophonic signal accompanied by a pilot signal of a predetermined frequency or a monophonic signal accompanied by no pilot signal, said demodulator comprising signal producing means responsive to said circuit input signal for producing a first local frequency signal having a frequency equal to said predetermined frequency and a second local frequency signal having a frequency equal to said predetermined frequency and a phase different from a phase of said local frequency signal, wherein the improvement comprises:
  - intermediate signal producing means responsive to said circuit input signal and a local input signal to generate an intermediate signal;
  - demodulating means coupled to said intermediate signal producing means for demodulating said intermediate signal into said demodulated signal;
  - phase detecting means coupled to said intermediate signal producing means and responsive to said second local frequency signal for detecting a phase difference between said pilot signal and said second local frequency signal on reception of said stereophonic signal;
  - first circuit means coupled to said phase detecting means and responsive to said first local frequency signal for producing first and second currents dependent on said phase difference;
  - second circuit means for feeding said first current back to said intermediate signal producing means as said local input signal, said second circuit means forming a negative feedback loop together with said intermediate signal producing means; and
  - indicating means responsive to said second current for indicating reception of said stereophonic signal.

4,680,793

## NOISE ELIMINATING CIRCUIT

Yoshiro Sugai, and Hiroyuki Kimura, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,753

Claims priority, application Japan, Apr. 24, 1984, 59-82447

Int. Cl.<sup>4</sup> H04H 5/00

U.S. Cl. 381-13

6 Claims

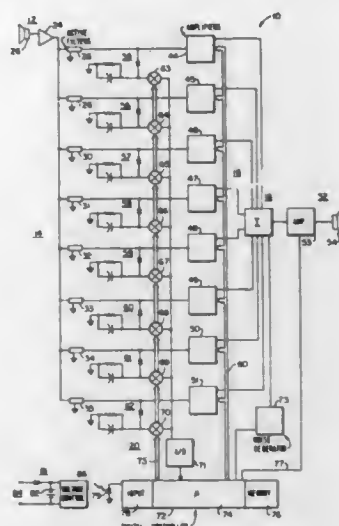
1. A noise eliminating circuit for use in a TV audio multi-demodulator circuit, said noise eliminating circuit comprising: a subsignal demodulator circuit for demodulating a subsignal





ling the operation thereof, wherein said audio signal processing circuit comprises:

- means for receiving an audio frequency electrical signal;
- means for separating said audio frequency signal into a plurality of frequency bandwidths;
- means for separately amplifying any audio frequency signal present in each of said bandwidths;
- means for summing the amplified audio frequency signals from each of said bandwidths to produce a reconstituted signal; and



means for controlling said means for separately amplifying including means for sampling any audio frequency signals present in each of said bandwidths and means for determining, in response to the audio frequency signals sampled from all of said bandwidths, an amplification level for each bandwidth for said means for separately amplifying; said means for sampling including an analog-to-digital converter, individual detector means for producing an analog signal representative of the level of audio frequency signal present in each of said bandwidths, and means for sequentially connecting said individual detector means to said analog-to-digital converter.

4,680,799

## HEARING AID

Hans Henneberger, Effeltrich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

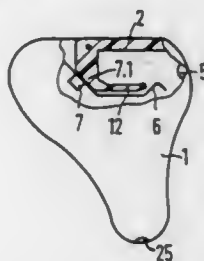
Continuation of Ser. No. 619,521, Jun. 11, 1984, abandoned.

This application Jan. 6, 1986, Ser. No. 873,146

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 8318579[U]

Int. Cl.<sup>4</sup> H04R 25/02

U.S. Cl. 381-68.6



1. A hearing aid with a housing having a shape adapted for insertion into an outer auditory canal which includes a micro-

phone, an amplifier, a receiver and a power source, the housing having a generally frustoconical shape including a planar base portion serving as an exposed wall when the hearing aid is in the outer auditory canal, the exposed wall having an aperture and cover, the cover adapted to close over the aperture and including retaining means on its inner side for accepting and securing the power source, a recess in the housing adapted to contain the retaining means, said recess being accessible via the aperture, a control having an actuating member mounted in said recess in a location to provide access to the actuating member such that it can be adjusted when the cover is opened.

4,680,800

## MOVING-COIL LOUDSPEAKER UNIT

Graham Bank; Stephen Scaife, and Gareth Millward, all of Yorkshire, England, assignors to Wharfedale Loudspeaker Limited, Leeds, England

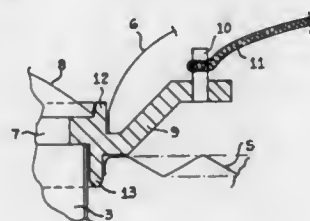
Filed Apr. 23, 1985, Ser. No. 726,368

Claims priority, application United Kingdom, Apr. 24, 1984, 8410417

Int. Cl.<sup>4</sup> H04R 9/04, 9/06

U.S. Cl. 381-194

4 Claims



1. A moving coil loudspeaker drive unit comprising a diaphragm, a voice coil, a voice coil former and rear suspension spider, the improvement comprising an electrically insulating build-ring adapted to cooperate with one end of the voice coil former and to interconnect the rear suspension spider with the coil former and to accurately locate said spider with respect to the voice coil, and at least one radially extending projection on said build-ring incorporating at least one electrical terminal electrically connected to the voice coil.

4,680,801

## SIGN VERIFICATION

Harry J. C. Etherington, Surrey; Paul C. Joslin, Berks, and Rowland A. G. Dunkley, Bedfordshire, all of England, assignors to The De La Rue Company PLC, England

Filed Aug. 30, 1985, Ser. No. 774,595

Claims priority, application United Kingdom, Jan. 9, 1984, 8400390; PCT Int'l Appl., Jan. 9, 1985, PCT/GB85/00009

Int. Cl.<sup>4</sup> G06K 9/00

U.S. Cl. 382-3

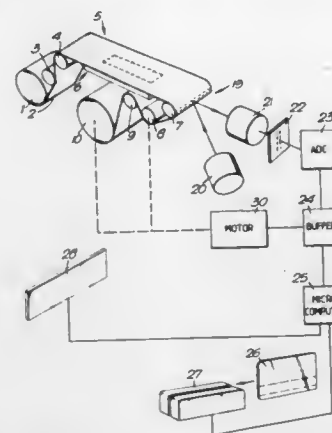
20 Claims

1. A method of determining whether the writer of a contemporaneously written sign is the same as the writer of a previously written sign, at least one characteristic feature of said previously written sign having been prerecorded, the method comprising the steps of:

- (a) obtaining a contemporaneously written sign;
- (b) detecting at least one characteristic feature of said contemporaneously written sign;
- (c) comparing each detected feature of said contemporaneously written sign with a corresponding prerecorded feature of said previously written sign;
- (d) generating an acceptance signal if the differences between the detected and the prerecorded features lie within first predetermined limits;
- (e) if an acceptance signal cannot be generated, obtaining at least one further contemporaneously written sign and

repeating steps (b) to (d) with respect to each further contemporaneously written sign;

- (f) if an acceptance signal cannot be generated for any of said at least one further contemporaneously written sign, comparing the differences between the characteristic features of each contemporaneously written sign and the corresponding characteristics of said previously written sign and, if all the differences fall within second predetermined limits; then



- (g) comparing characteristic features of each of said contemporaneously written sign with corresponding characteristic features of the remaining said contemporaneously written signs and generating an acceptance signal if the differences between said corresponding features of all said contemporaneously written signs lie within third predetermined limits.

4,680,802

## POSTURE JUDGEMENT SYSTEM IN IMAGE PROCESSING

Yoshie Nishida, Yokohama; Selji Hata, Fujisawa, and Akira Miyakawa, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP85/00144, § 371 Date Dec. 23, 1985, § 102(e) Date Dec. 23, 1985, PCT Pub. No. WO85/04502, PCT Pub. Date Oct. 10, 1985

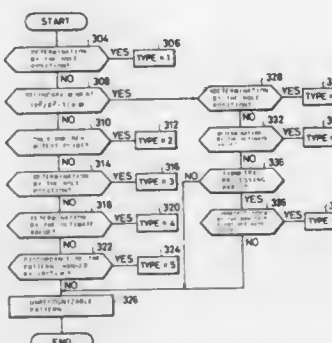
PCT Filed Mar. 25, 1985, Ser. No. 807,880

Claims priority, application Japan, Mar. 26, 1984, 59-56200

Int. Cl.<sup>4</sup> G06K 9/00

U.S. Cl. 382-8

3 Claims



1. A posture judgement system in an image processor which recognizes the existence, position and posture of an object and assembles the object by a robot, comprising:  
means for imaging objects to provide an input image signal;  
means for preparing standard data from the image input

signal by classifying the image input signal as representing a:

- first type of object if the posture of the object part can be determined on the basis of angles and distances between the centroid of the object and the centroid of each hole included within the object;
- second type of object if the posture of the object can be determined on the basis of a ratio  $|Y^2/X^2 - 1|$  of a major axis to a minor axis and a single longest distance connecting the centroid of the object to the periphery of the object;
- third type of object if the posture of the object can be determined on the basis of the ratio of a major axis to a minor axis and a pattern of positions of a plurality of holes in the object;
- fourth type of component part if the component part is neither a first, second nor third type and if the posture can be determined on the basis of the points at which successive lengths connecting the centroid on the component part and the periphery change from increasing to decreasing values, and the ratio of a major axis to a minor axis;
- fifth type of component part if the component part is neither a first, second, third nor fourth type and if the posture of the component part can be determined on the basis of the ratio of a major axis to a minor axis after the posture has been changed by 180 degrees;
- sixth type of component part if the posture of the component part can be determined on the basis of the ratio of a major axis to a minor axis and angles and distances between lines connecting the centroid of the component part and the centroids of each hole in the component part;
- seventh type of component part if the component part is neither a first nor sixth type and if the posture of the component part can be determined on the basis of points at which the lengths connecting the centroid of the component part and the periphery of the component part change from increasing to decreasing values;
- eighth type of component part if the component part is neither a first, sixth nor seventh and if the posture of the component part can be determined on the basis of a determination of senmetry;
- unrecognizable pattern if the component part is neither a first, second, third, fourth, fifth, sixth, seventh nor eighth type;

and means for recognizing the posture of the desired component parts by comparing the standard data with parameters providing a basis for determining the type of component part represented by said image input signals.

4,680,803

## METHOD AND APPARATUS FOR ISOLATING IMAGE DATA FOR CHARACTER RECOGNITION

Antonio Dilella, Waterloo, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 17, 1984, Ser. No. 683,074

Int. Cl.<sup>4</sup> G06K 9/34

U.S. Cl. 382-9

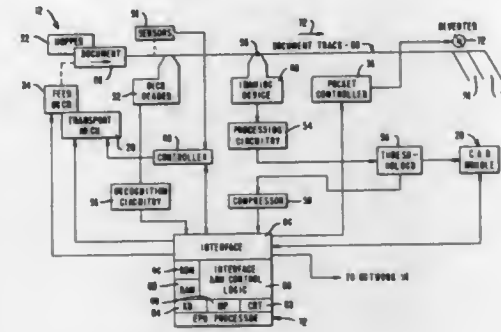
8 Claims

1. A process of segmenting data bits derived in response to scanning characters, comprising the steps of:

- (a) isolating a discrete group of said data bits which may be associated with more than one character;
- (b) examining said discrete group of data bits according to predetermined criteria in search for a possible joint between first and second groups of data bits within said group;
- (c) selecting a segmentation vector according to second predetermined criteria to separate said first and second groups of data bits; and
- (d) separating said first and second groups of data bits at said joint along a selected said segmentation vector; said data bits consisting of binary ones and zeros and said selecting step including the step of:



(c-1) finding the length of the shortest segmentation vector consisting of binary ones which lies within a predetermined range and which also provides a path of binary zero from the outward end of said segmentation vector to a predetermined side of the associated object; said predetermined range being given by the equation:



$$MP - MP/2 \leq R \leq (MP + MP/2);$$

wherein MP is equal to the midpoint of said discrete group of data bits and R is equal to said predetermined range.

#### 4,680,804 METHOD FOR DESIGNATING A RECOGNITION MODE IN A HAND-WRITTEN CHARACTER/GRAPHIC RECOGNIZER

Soshiro Kazunuki, Katsuta; Hiroshi Shojima, Hitachi; Takatori Yokoyama, Hitachi; Yasushi Fukunaga, Hitachi, and Kotaro Hirasawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

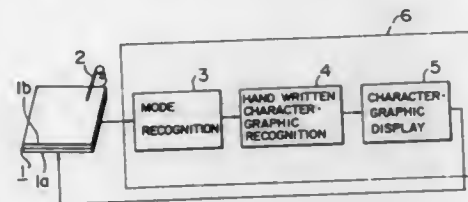
Filed Mar. 28, 1985, Ser. No. 716,943

Claims priority, application Japan, Mar. 28, 1984, 59-58298

Int. Cl.<sup>4</sup> G06K 9/00

U.S. Cl. 382-13

8 Claims

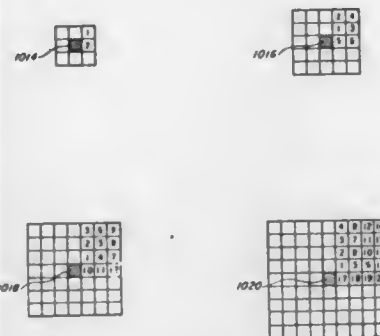


1. A method for designating a recognition mode in a hand-written character/graphic recognizer for recognizing a character/graphic in a character recognition mode or a graphic recognition mode designated in accordance with stroke information supplied from input means which samples a hand-written character/graphic and converts it to the stroke information, and converting the recognized character/graphic to a character/graphic code, said method comprising the steps of: extracting a characteristic value of the character/graphic from the stroke information supplied from said input means, said characteristic value being the stroke length determined from coordinates of the stroke included in the stroke information; discriminating between character information and graphic information based on the extracted characteristic value each time each stroke information is supplied from said input means; and designating one of the character recognition mode and the graphic recognition mode in accordance with the result of said discrimination.

#### 4,680,805 METHOD AND APPARATUS FOR RECOGNITION OF DISCONTINUOUS TEXT

Warner C. Scott, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Filed Nov. 17, 1983, Ser. No. 552,956  
Int. Cl.<sup>4</sup> G06K 9/30, 9/48  
U.S. Cl. 382-22

5 Claims



1. The method of character recognition comprising:
  - (a) storing data representative of a sample character having individual pixels in the sample character,
  - (b) locating a starting pixel on the periphery of said sample character,
  - (c) storing the starting pixel as a reference pixel,
  - (d) testing pixels starting on a pixel located in a column and a row adjacent to the column and row of the starting pixel and testing all pixels in that adjacent column for K number of pixels, K being variable and greater than 1;
  - (e) testing each pixel in the next adjacent column to the just tested column starting on a pixel in a row adjacent to the row of the reference pixel, performing the testing for K columns,
  - (f) testing each pixel in the same row as the reference pixel, performing the testing for K pixels in that same row,
  - (g) stopping the testing of steps d-f whenever a black pixel is located, storing it as the reference pixel and repeating steps d-h,
  - (h) when steps d-f have been completed and no black cell has been located rotating the reference coordinates 90 degrees so as to present a new set of columns and rows, the old rows now being columns and the old columns now being rows with respect to the reference cell and repeating steps d-h,
  - (i) stopping the testing when the beginning pixel has been returned to as the starting pixel,
  - (j) recognizing the sample character, and;
  - (k) outputting an indication of the identity of the sample character.

#### 4,680,806 EDGE LOCATION MEASURING HEAD

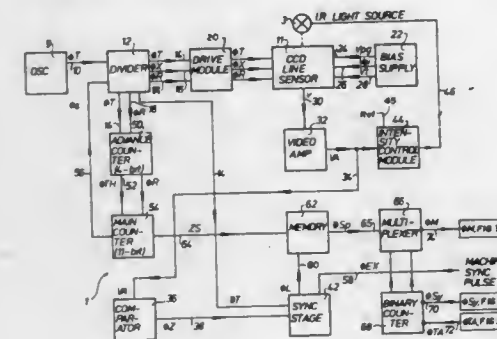
Claus A. Bolza-Schünemann, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany  
Filed Jun. 17, 1985, Ser. No. 745,047  
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1984, 3444172; Dec. 20, 1984, 3446531  
Int. Cl.<sup>4</sup> G06K 9/00

U.S. Cl. 382-65

7 Claims

1. An arrangement for recording the position of an edge of a body, preferably an edge of a print carrier in a rotary printing machine, characterized by the improvement that a first oscillator is in effective contact via a dataline with a pulse divider stage; that said pulse divider stage is in effective contact via corresponding signal lines with a drive module stage, via data

lines with an advance counter, and via a signal line with a synchronization stage; that the advance counter is in effective contact via signal lines with a main counter and via a signal line with said pulse divider stage; that the main counter is in effective contact via a signal line with a memory stage, and said memory stage is in effective contact with a multiplexer stage via a signal line; that said drive module stage is in effective contact via signal lines with a CCD line sensor and that this, in turn, is in effective contact with a voltage supply stage and via a signal line with a video amplifier stage;



that said video amplifier stage is in effective contact via signal lines with an intensity control module and with a comparator, the output of the comparator being in effective contact via a signal line with said synchronization stage; that said synchronization stage is in effective contact via a signal line with said memory stage; that a third counter is provided which is in effective contact via signal lines with said multiplexer; that said synchronizing stage has an input for an external switch pulse; that said multiplexer has a pulse output; and that said third counter has inputs for the acceptance of synchronization and clock pulses.

#### 4,680,807 METHOD AND DEVICE FOR IDENTIFYING DATA SUPPORTS

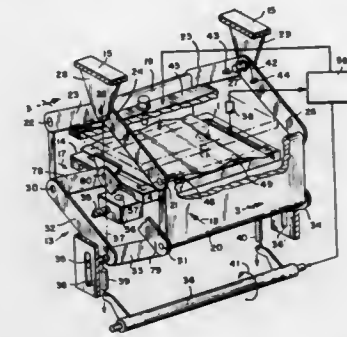
Hermann Stockburger, Kirmachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Niedere Str. 36, D-7730 Villingen, both of Fed. Rep. of Germany  
Continuation of Ser. No. 592,535, May 14, 1984, abandoned, which is a continuation of Ser. No. 247,165, Mar. 24, 1981, Pat. No. 4,493,107. This application Sep. 11, 1985, Ser. No. 774,860  
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1980, 3011317  
The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.  
Int. Cl.<sup>4</sup> G06K 9/00

U.S. Cl. 382-58

4 Claims

1. A device for identifying a data support, comprising: means for engaging said data support; means for moving an engaged data support into an automatic processing system including a detection system for detecting information on said data support along a linear detection path; and aligning means for aligning said data support in a detection position to bring said linear detection path into coincidence with a central track between two opposed edges of the data support, including
  - a first alignment member engaging a first edge of said opposed edges of said data support and a second alignment member engaging a second edge of said opposed edges of said data support, said first and second alignment members being disposed on opposite sides of said linear detection

track and being reciprocally movable in an operating direction parallel to the plane of the data support transversely to said linear detection path, and driving means for moving said first alignment member in said operating direction towards said linear detection path

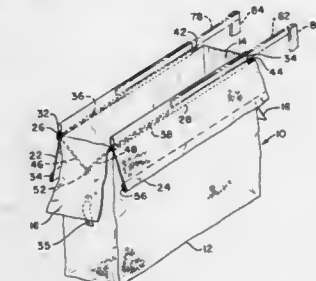


and simultaneously moving said second alignment member in a direction opposite to said operating direction of said first alignment member towards said linear detection track while keeping both alignment members symmetrically disposed on opposite sides of said linear detection tracks.

#### 4,680,808 COMPACTOR RECEPTACLE

Maurice Paleschuck, 140 Redwood Dr., Roslyn, N.Y. 11576  
Filed Jan. 3, 1986, Ser. No. 816,061  
Int. Cl.<sup>4</sup> B65D 33/10  
U.S. Cl. 383-9

16 Claims



1. In combination a compactor, a receptacle within said compactor for the collection of refuse and adapted to be crushed thereby to compact the trash contained therein, said receptacle comprising a bag with an open end and formed from a porous fabric of hydrophobic material capable of containing liquid in the absence of the application of a pressure in said liquid means adapted for suspending said bag with the open end up within said compactor, the latter said means including means adjacent the opening in said bag for facilitating the insertion and withdrawal of said bag into and out of said compactor, and said compactor including means for crushing the sides of said bag thereby compacting the refuse therein.

4,680,809

## LIGHT WAVEGUIDE COUPLING DEVICE

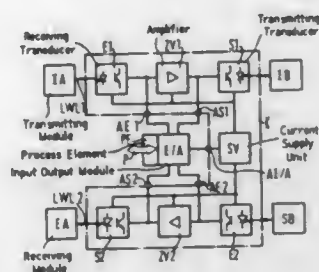
Hans-Otto Hartkopf, and Christoph Zeller, both of Brunswick, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany  
Filed May 4, 1984, Ser. No. 607,014

Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317541

Int. Cl.<sup>4</sup> G02F 1/00; G02B 6/28; H04B 3/38

U.S. Cl. 455—601

6 Claims



1. A light waveguide device for use in a light waveguide transmission system to regenerate an optical signal even at locations where no data branching is provided, said device comprising two channels with one channel for each direction of transmission of optical signals, each channel having receiving transducer means for converting the optical signals into electrical signals, amplifying means to regenerate the electrical signals into amplified electrical signals, and transmitting transducer means for converting the amplified electrical signals into optical signals for further transmission on an optical waveguide of the system, each channel having at least one connection terminal being connected between an output of the receiving transducer means and an input of the transmitting transducer means, each connection terminal being directly accessible from the outside of the device so that the device can be subsequently used to link another unit into the system with signals in each channel being coupled out to the unit and another signal from the unit being coupled into each channel.

4,680,810

## MEANS FOR CONTROLLING A SEMICONDUCTOR DEVICE AND COMMUNICATION SYSTEM COMPRISING THE MEANS

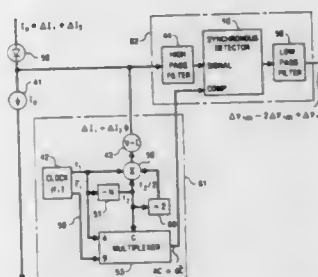
Robert G. Swartz, Highlands, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Labs, Murray Hill, N.J.

Filed Jun. 28, 1985, Ser. No. 749,746

Int. Cl.<sup>4</sup> H04B 9/00

U.S. Cl. 455—609

30 Claims



1. A communication system comprising a semiconductor laser source of electromagnetic radiation having a V/I characteristic that relates a laser voltage to a laser current that comprises a bias current;  
means for modulating the radiation at a signal frequency;

an optical fiber transmission channel;  
means for coupling the modulated electromagnetic radiation into the optical fiber at a first fiber location; and  
means for detecting the modulated electromagnetic radiation, after its transmission through the optical fiber from the first to a second fiber location;

CHARACTERIZED IN THAT the system further comprises regulating means adapted for maintaining the bias current substantially equal to the current corresponding to a predetermined point on the V/I characteristic, the regulating means comprising

(a) first means that comprise

(i) test current generating means that are conductively connected to the laser source such that the laser current comprises a test current comprising at least a first nonsinusoidal component having a frequency  $f_1$  that is substantially lower than the signal frequency, with the laser voltage comprising a test current-caused component; and

(ii) means, responsive to the laser voltage, for producing a first signal that is substantially proportional to the test current-caused component of the laser voltage;

(b) second means, responsive to the first signal, for producing a second signal that is substantially proportional to a derivative of the V/I characteristic at the predetermined point on the V/I characteristic;

(c) third means, responsive to the second signal, for obtaining an error signal, with the amplitude of the error signal being a function of the amplitude of the second signal; and

(d) fourth means for changing the bias current in response to the error signal.

4,680,811

## VEHICLE TO FIXED STATION INFRARED COMMUNICATIONS LINK

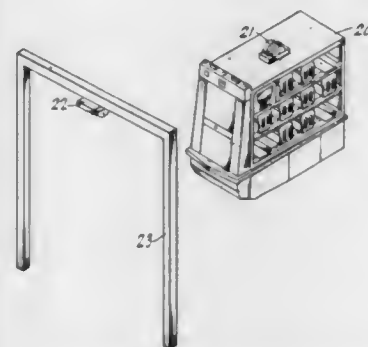
James G. Harper, Louis G. Bailey, both of Dallas; Robert B. McJohnson, Pilot Point; Ganesh Rajagopal, Richardson, and Don R. Walker, Coppell, all of Tex., assignors to Veeco Integrated Automation Inc., Dallas, Tex.

Filed Dec. 13, 1984, Ser. No. 681,113

Int. Cl.<sup>4</sup> H04B 9/00

U.S. Cl. 455—617

14 Claims



1. An infrared communications link for optically transmitting and receiving information to control an automatically guided vehicle in an electromagnetically hostile environment, said link comprising:

transmitting means disposed at a fixed location in said electromagnetically hostile environment for processing a signal into a pulsed data signal;

an infrared light source, disposed at said fixed location, having a plurality of infrared illumination devices disposed in a predetermined arc, and coupled to said transmitting means for converting the pulsed data signal into pulsed infrared energy, each of said infrared illumination

devices for transmitting said pulsed infrared energy to a predetermined location in said hostile environment, said transmitting means including means for mounting said infrared illumination devices so that said predetermined locations overlap wherein said infrared illumination devices include a plurality of light emitting diodes disposed at predetermined locations on the outer surface of a half cylindrical pod;

infrared detecting means disposed on said vehicle for detect-

ing the pulsed infrared energy of said infrared light source;

receiving means disposed on said vehicle and coupled to said infrared detecting means for recovering the pulsed data signal from the pulsed infrared energy;

an infrared light source and transmitting means disposed on said vehicle; and

infrared detecting means and receiving means disposed at said fixed location, said infrared detecting means including a plurality of photodiodes also disposed on the outer surface of said half cylindrical pod.



# DESIGNS

JULY 14, 1987

290,780

## BABY PANTS

Eva Wistrand, St. Lund, S-64 040 St. Sundby, Sweden

Filed Nov. 6, 1984, Ser. No. 668,666

Claims priority, application Fed. Rep. of Germany, May 7, 1984, MR 22 620

Term of patent 14 years

U.S. Cl. D2-10



290,782

## ATHLETIC SHOE OUTSOLE

Guy Grubel, Methuen, Mass., assignor to Converse Inc., North Reading, Mass.

Filed Sep. 11, 1984, Ser. No. 649,430

Term of patent 14 years

U.S. Cl. D2-320



290,781

## ATHLETIC SHOE OUTSOLE

Guy Grubel, Methuen, Mass., assignor to Converse Inc., North Reading, Mass.

Filed Sep. 11, 1984, Ser. No. 649,429

Term of patent 14 years

U.S. Cl. D2-320



290,783

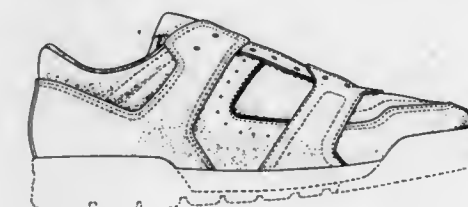
## SHOE UPPER

Lawrence Selbiger, Portland, and Bruce MacGregor, Lake Oswego, both of Oreg., assignors to PENSA, Inc., Portland, Oreg.

Filed Aug. 22, 1986, Ser. No. 899,030

Term of patent 14 years

U.S. Cl. D2-314



290,784

## ORTHOPEDIC CANE

Moussa Moshiri, 11200 Lockwood Dr., Apartment 1720, Silver Spring, Md. 20901

Filed Jun. 12, 1985, Ser. No. 743,899

Term of patent 14 years

U.S. Cl. D3—7



290,786

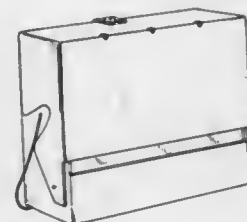
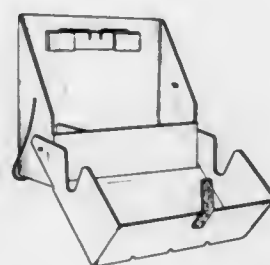
## TOILETRY CASE

Stephen J. Townley, 2190 Como Ave., St. Paul, Minn. 55108

Filed Nov. 26, 1984, Ser. No. 675,086

Term of patent 14 years

U.S. Cl. D3—39



290,785

## COMPARTMENTED CARRYING CONTAINER

Hanora M. P. Kelly, 135 High Street, Uxbridge, Middlesex, England

Filed Dec. 17, 1984, Ser. No. 682,229

Claims priority, application United Kingdom, Oct. 25, 1984, 1022887

Term of patent 14 years

U.S. Cl. D3—30.1



290,787

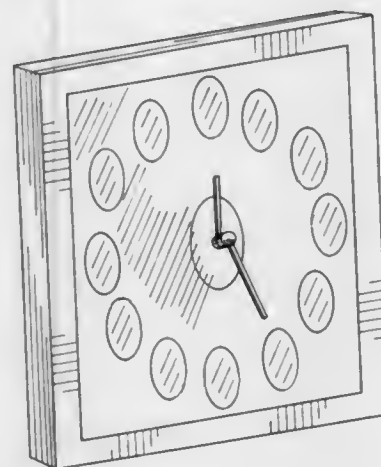
## COMBINATION PHOTOGRAPHIC FRAME AND CLOCK

Dell T. Chisholm, 1010 Fairmount Ave., St. Paul, Minn. 55105

Filed Apr. 8, 1983, Ser. No. 483,213

Term of patent 14 years

U.S. Cl. D6—301



290,788

## SEAT

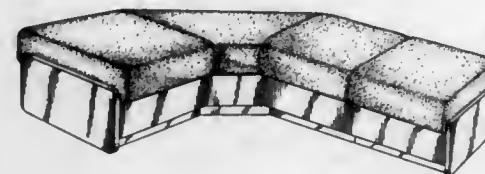
William B. Raftery, Arlington, Tex., assignor to Steelcase, Inc., Grand Rapids, Mich.

Division of Ser. No. 494,120, May 13, 1983. This application

Oct. 21, 1985, Ser. No. 789,557

Term of patent 14 years

U.S. Cl. D6—355



290,789

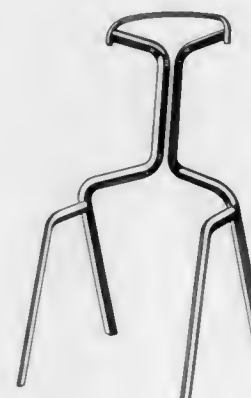
## FRAME FOR A STACK CHAIR

Gerd Lange, Kapsweyer, Fed. Rep. of Germany, assignor to Fixtures Manufacturing Corporation, Kansas City, Mo.

Filed Jan. 14, 1985, Ser. No. 691,409

Term of patent 14 years

U.S. Cl. D6—380



290,791

## MODULAR DISPLAY RACK

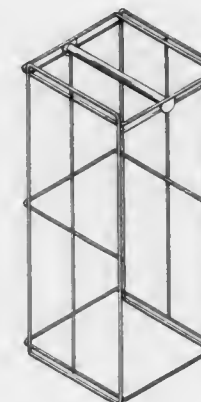
Melvin E. Kester, Concord, N.C., assignor to Fieldcrest Cannon, Inc., Eden, N.C.

Filed Aug. 30, 1984, Ser. No. 646,361

The portion of the term of this patent subsequent to Jul. 14, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—411



290,792

## MODULAR DISPLAY RACK

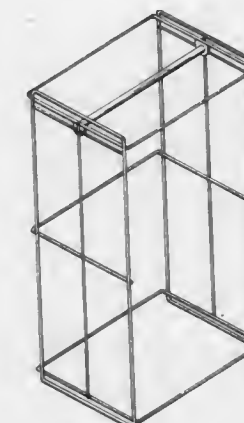
Melvin E. Kester, Concord, N.C., assignor to Fieldcrest Cannon, Inc., Eden, N.C.

Filed Aug. 30, 1984, Ser. No. 646,358

The portion of the term of this patent subsequent to Jul. 14, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—411



290,790

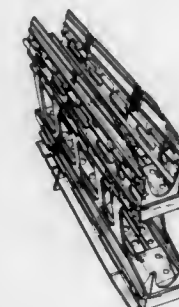
## DISPENSER RACK FOR CANS OR BOTTLES

Walter Nathan, Glencoe, and Armand S. Zucker, Skokie, both of Ill., assignors to RTC Industries, Inc., Chicago, Ill.

Filed Mar. 26, 1985, Ser. No. 716,328

Term of patent 14 years

U.S. Cl. D6—408





290,793

## DISPLAY STAND

Rudolph Lakezich, and Richard Lakezich, both of 1211 N. Maple, Royal Oak, Mich. 48067

Continuation of Ser. No. 418,408, Sep. 9, 1982. This application  
Sep. 24, 1984, Ser. No. 653,098

Term of patent 14 years

U.S. Cl. D6—462



290,795

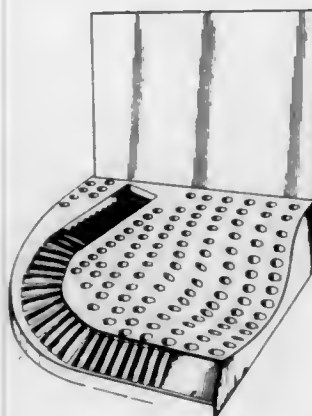
## MERCHANDISING DISPLAY

James L. Gebhardt, Alpharetta, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 12, 1984, Ser. No. 660,468

Term of patent 14 years

U.S. Cl. D6—469



290,796

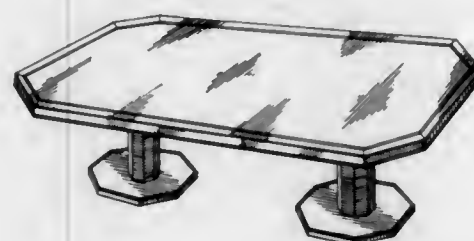
## TABLE

Robert B. Becker, North Salem, N.Y., assignor to Helikon Furniture Co., Taftville, Conn.

Filed Nov. 26, 1984, Ser. No. 674,607

Term of patent 14 years

U.S. Cl. D6—480



290,794

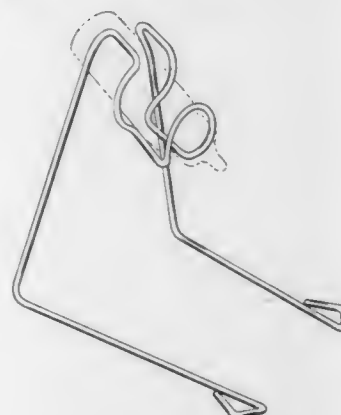
## NURSING BOTTLE HOLDER

Frank C. Mingledorff, Jr., Rte. 10, Box 221, Canton, Ga. 30114

Filed Apr. 29, 1985, Ser. No. 728,655

Term of patent 14 years

U.S. Cl. D6—462



290,797

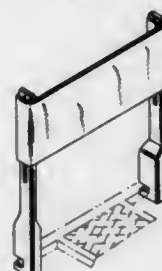
## FOLDABLE BACK REST FOR A CANOE SEAT

Robert M. Hartt, R.F.D. #1, Box 5100, Morrisville, Vt. 05661

Filed Feb. 11, 1985, Ser. No. 700,529

Term of patent 14 years

U.S. Cl. D6—502



290,798

## LAVATORY BRUSH WITH STAND

Alessandro Zuliani, Udine, Italy, assignor to Cosdatto SpA, Martignacco, Italy

Filed Mar. 1, 1985, Ser. No. 707,328

Claims priority, application Italy, Sep. 3, 1984, 60435/84

Term of patent 14 years

U.S. Cl. D6—551



290,799

## GOBLET OR SIMILAR ARTICLE

David H. Inns, Retford, England, assignor to Glass Blubs Limited, Chesterfield, England

Division of Ser. No. 535,986, Sep. 26, 1983, Pat. No. Des.

284,631. This application May 14, 1986, Ser. No. 863,402

Claims priority, application United Kingdom, May 12, 1983, 1012993

Term of patent 14 years

U.S. Cl. D7—13



290,800

## CAVIAR DISPLAY UNIT

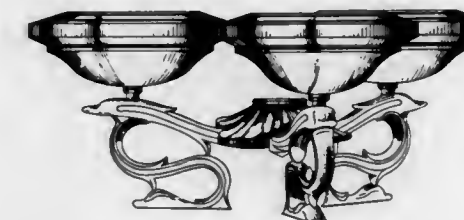
Christian Petrossian, 12 Rue Duroc, Paris, France 75007

Filed Jun. 22, 1984, Ser. No. 623,780

Claims priority, application France, Dec. 23, 1983, 213,620

Term of patent 14 years

U.S. Cl. D7—22



290,801

## CAVIAR DISPLAY UNIT

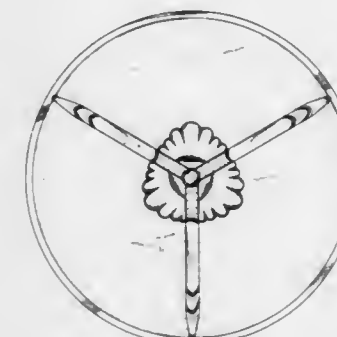
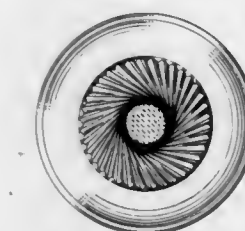
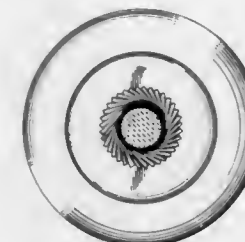
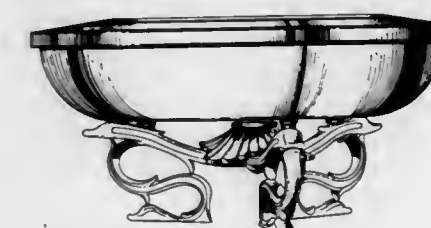
Christian Petrossian, 12 Rue Duroc, Paris, France 75007

Filed Jun. 25, 1984, Ser. No. 623,783

Claims priority, application France, Dec. 23, 1983, 213,621

Term of patent 14 years

U.S. Cl. D7—22



290,802

## CAVIAR DISPLAY UNIT

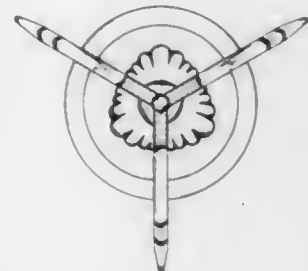
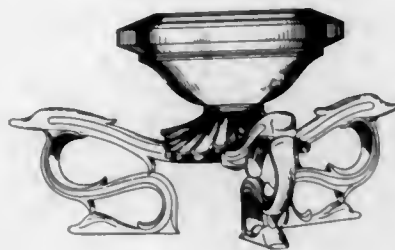
Christian Petrossian, 12 Rue Duroc, Paris, France 75007

Filed Jun. 22, 1984, Ser. No. 623,779

Claims priority, application France, Dec. 23, 1983, 213,619

Term of patent 14 years

U.S. Cl. D7—22



290,804

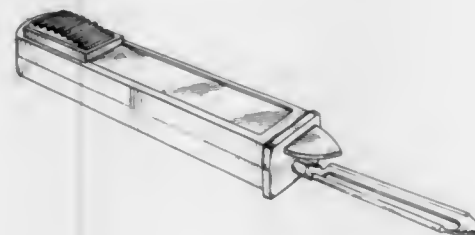
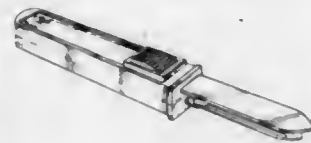
## COMBINED FOOD PEELER AND SLICER

Lee R. Chasen, Port Chester, N.Y., assignor to Coats &amp; Clark, Inc., Stamford, Conn.

Filed Feb. 21, 1985, Ser. No. 703,938

Term of patent 14 years

U.S. Cl. D7—147



290,805

## MICROWAVE OVEN

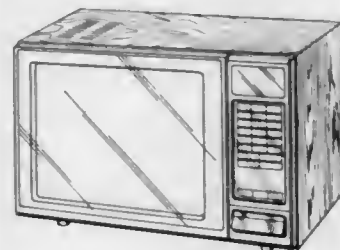
Masayoshi Kubo; Kensuke Mizuma; Masuo Ichihara, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 19, 1984, Ser. No. 662,940

Claims priority, application Japan, Apr. 19, 1984, 59-15843

Term of patent 14 years

U.S. Cl. D7—351



290,803

## PASTRY MAKER

Michael J. Sommerfield, Swenson Dr., Rte. 7, Chippewa Falls, Wis. 54729

Filed Mar. 18, 1985, Ser. No. 713,008

Term of patent 14 years

U.S. Cl. D7—43



290,806

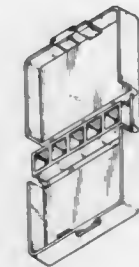
## TELEPHONE LIGHT BULB REPLACEMENT TOOL

Kenneth W. Hotchkiss, 8898 Ute Dr., Blue Mountain, Golden, Colo. 80401; George H. Bramhall, 212 Pine Brook Hills, Boulder, Colo. 80302, and John A. Popken, 6 Sunset Cir., Longmont, Colo. 80501

Filed May 21, 1984, Ser. No. 612,704

Term of patent 14 years

U.S. Cl. D8—14



290,807

## RESISTANCE WELDING ELECTRODE

Russell A. Nippert, Columbus, Ohio, assignor to The Nippert Company, Delaware, Ohio

Filed Aug. 13, 1984, Ser. No. 640,282

Term of patent 14 years

U.S. Cl. D8—30



290,808

## KITCHEN SCISSORS

Erkki O. Linden, Billnäs, Finland, assignor to Oy Fiskars AB, Helsinki, Finland

Filed Oct. 25, 1983, Ser. No. 545,368

Term of patent 14 years

U.S. Cl. D8—57



290,809

## GARDEN HOSE HOLDER

James J. Elliott, 700 Museum Dr., Charlotte, N.C. 28207

Filed Nov. 4, 1985, Ser. No. 794,460

Term of patent 14 years

U.S. Cl. D8—356



290,810

## CONTAINER FOR DISPENSING BAGS FOR BAGGING SOILED DIAPERS AND THE LIKE

Karen L. Miller, 123 E. Dennett, Fresno, Calif. 93728; Linda L. Turner, 53681 Ave. 131, Madera, Calif. 93637, and Erma L. Henderson, 5715 E. Austin Way, Fresno, Calif. 93727

Filed Nov. 19, 1984, Ser. No. 672,932

Term of patent 14 years

U.S. Cl. D9—318

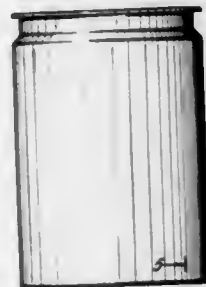




290,811  
DRUM

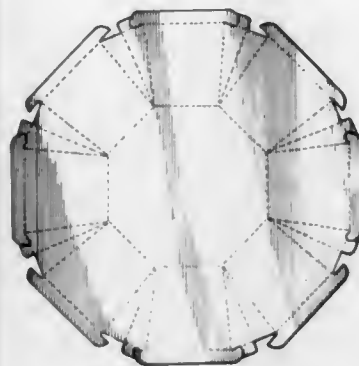
C. Peyton Cleveland, Jr., Dallas, Tex., assignor to International Chempack Corporation, Hurst, Tex.  
Filed Aug. 3, 1984, Ser. No. 637,417  
Term of patent 14 years

U.S. Cl. D9—349

290,813  
BLANK FOR AN OCTAGONAL TRAY

Hampton E. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.  
Filed Mar. 21, 1985, Ser. No. 714,213  
Term of patent 14 years

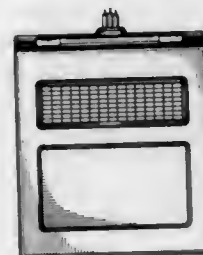
U.S. Cl. D9—433

290,814  
TIMER

Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.

Filed Mar. 11, 1985, Ser. No. 710,316  
Term of patent 14 years

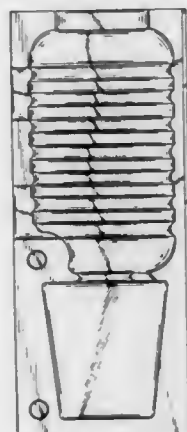
U.S. Cl. D10—40

290,812  
PLANT PACKAGE

Albert J. Voges, Leidsestraat 83, 2182 DJ Hillegom, Netherlands

Filed Feb. 5, 1985, Ser. No. 698,294  
Term of patent 14 years

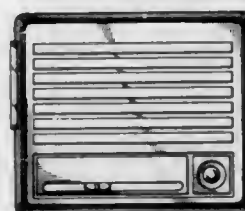
U.S. Cl. D9—426

290,815  
TIMER

Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.

Filed Mar. 18, 1985, Ser. No. 712,523  
Term of patent 14 years

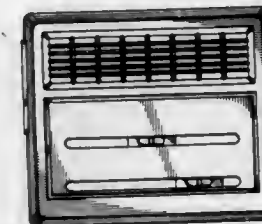
U.S. Cl. D10—40

290,816  
TIMER

Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.

Filed Mar. 11, 1985, Ser. No. 710,402  
Term of patent 14 years

U.S. Cl. D10—40



## 290,817

## ELECTRONIC CURRENCY TESTER

John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong

Filed Nov. 6, 1984, Ser. No. 668,862

Claims priority, application United Kingdom, May 24, 1984, 1019888

Term of patent 14 years

U.S. Cl. D10—46



## 290,818

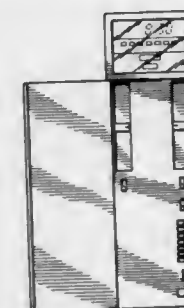
## CONTROLLER FOR AIR CONDITIONERS

Hisashi Tomozawa, Odawara; Hideyuki Ikeda, Kanagawa; Isao Arai, Hiratsuka, and Shigeru Saito, Yokohama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1984, Ser. No. 682,092

Claims priority, application Japan, Jul. 4, 1984, 59-27675  
Term of patent 14 years

U.S. Cl. D10—49



## 290,819

## SINGLE TURN CURRENT TRANSFORMER FOR USE AS A CURRENT SENSOR

Bayard W. Hart, Colorado Springs, Colo., assignor to Dayle R. Smith, Colorado Springs, Colo.

Filed Jun. 25, 1984, Ser. No. 624,393

Term of patent 14 years

U.S. Cl. D10—80



## 290,820

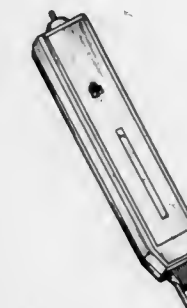
## PORTABLE WATER QUALITY TESTER

Jack P. Slovak, Huntington Beach, Calif., assignor to Pro Water Systems, Inc., Costa Mesa, Calif.

Filed Aug. 20, 1984, Ser. No. 642,379

Term of patent 14 years

U.S. Cl. D10—81



290,821  
JEWEL

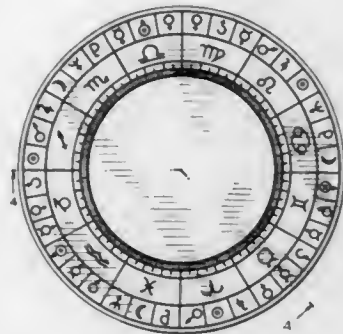
Peter Deville, Dietzenbach, Fed. Rep. of Germany, assignor to Deville Verlag GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,444

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 73 MR 9252; Mar. 21, 1984, 73 MR 9284

Term of patent 14 years

U.S. Cl. D11-89



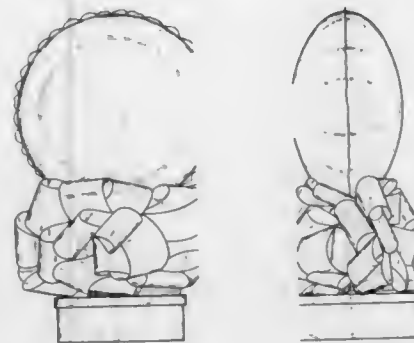
290,823

COMBINED BALLOON AND CANDY CENTERPIECE

Gail Gardiner, and Arthur R. Gardiner, both of 24 Kevin Rd., Commack, N.Y. 11725

Filed Oct. 14, 1986, Ser. No. 918,800

Term of patent 14 years



290,824

MOTORCYCLE

Takeo Miura, Saitama, and Junji Kikuchi, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 677,721

Claims priority, application Japan, Jun. 5, 1984, 59-23248

Term of patent 14 years

U.S. Cl. D12-110



290,822

SPRING LOADED FLAG

Martin J. McEntee, 4898 Beach Blvd., Buena Park, Calif. 90621

Filed May 14, 1984, Ser. No. 609,885

Term of patent 14 years

U.S. Cl. D11-166



290,825

INFANT CARRIER

Richard A. Mathies, and JoAnne Mathies, both of 675 Oberlin Ave., Kensington, Calif. 94708

Filed Dec. 5, 1984, Ser. No. 678,299

Term of patent 14 years

U.S. Cl. D12-129

290,826  
AUTOMOBILE TIRE

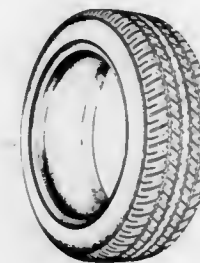
Kozaburo Nakaseko, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Sep. 11, 1984, Ser. No. 649,379

Claims priority, application Japan, Jul. 2, 1984, 59-27519

Term of patent 14 years

U.S. Cl. D12-147

290,828  
AUTOMOBILE TIRE

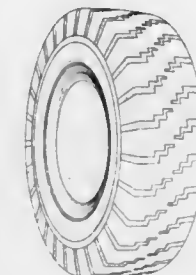
Takashi Nishimura, and Masafumi Kawakami, both of Hyogo, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Jul. 10, 1984, Ser. No. 629,469

Claims priority, application Japan, Apr. 16, 1984, 59-15439  
The portion of the term of this patent subsequent to May 19, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D12-150



290,829

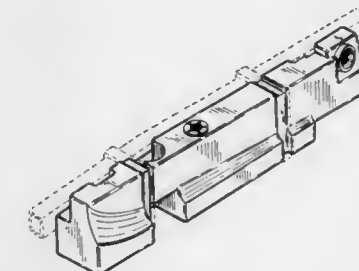
AUXILIARY VEHICLE GAS TANK

Lynn A. Balek, 1627 8th SW., Mason City, Iowa 50401

Filed Sep. 27, 1985, Ser. No. 781,051

Term of patent 14 years

U.S. Cl. D12-155



290,827

TIRE FOR A VEHICLE WHEEL

Peter R. Marriott, Hurley Near Atherstone, England, assignor to Dunlop Limited, United Kingdom

Filed Jun. 20, 1984, Ser. No. 622,585

Claims priority, application United Kingdom, Jan. 14, 1984, 1017319

Term of patent 14 years

U.S. Cl. D12-147



290,830

GRILLE FOR AN AUTOMOBILE

Shinichi Inada, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Nov. 21, 1985, Ser. No. 806,000

Term of patent 14 years

U.S. Cl. D12-163





290,831

## GEAR SHIFT LEVER FOR BICYCLES

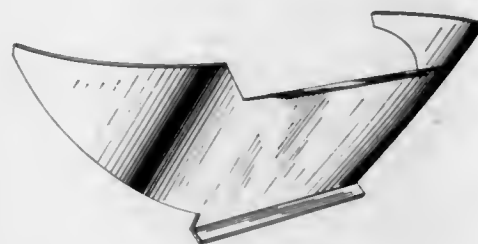
Henri Jay, Dijon, France, assignor to Etablissements le Simplex, France  
 Filed May 9, 1984, Ser. No. 608,557  
 Claims priority, application France, Sep. 11, 1983, 83 4159  
 Term of patent 14 years  
 U.S. Cl. D12—179



290,832

## WIND DEFLECTOR FOR VEHICLES

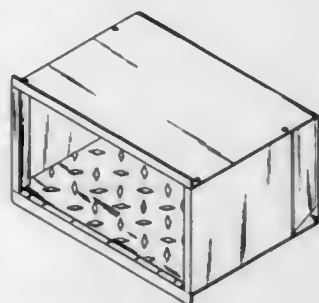
Mark A. Mayhugh, 3324 S. Glen Park Ct., New Berlin, Wis. 53151  
 Filed Oct. 8, 1985, Ser. No. 785,573  
 Term of patent 14 years  
 U.S. Cl. D12—181



290,833

## STEP FOR A VEHICLE

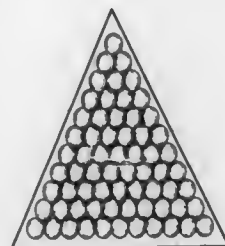
Ralph L. Walters, 1109 38th Ave., Meridian, Miss. 39305  
 Filed Dec. 10, 1984, Ser. No. 680,470  
 Term of patent 14 years  
 U.S. Cl. D12—203



290,834

## SAIL

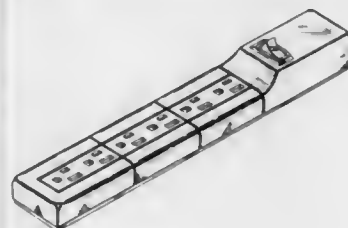
Howard N. Christ, 291 Cedar Ave., Islip, N.Y. 11751  
 Filed Oct. 28, 1985, Ser. No. 791,982  
 Term of patent 14 years  
 U.S. Cl. D12—317



290,835

## MULTI-OUTLET CENTER

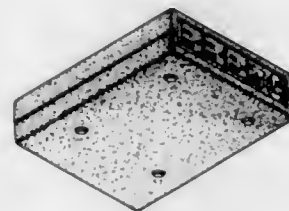
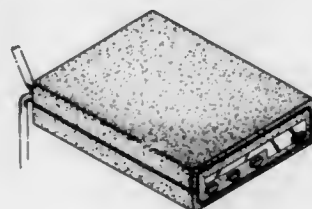
Robert H. Lovett, Eden Prairie; Jay J. Kakuk, Minneapolis, and  
 Bart T. Ellson, Eden Prairie, all of Minn., assignors to The  
 Toro Company, Minneapolis, Minn.  
 Filed Dec. 11, 1985, Ser. No. 807,718  
 Term of patent 14 years  
 U.S. Cl. D13—30



290,836

## SWITCHING STATION

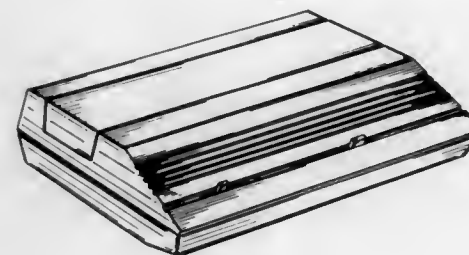
Klaus H. Oesterheld, Woodside, and Carlos Martinez, Brooklyn, both of N.Y., assignors to Kensington Microwave Limited, New York, N.Y.  
 Filed Dec. 5, 1984, Ser. No. 678,324  
 Term of patent 14 years  
 U.S. Cl. D13—32



290,837

## TELEPHONE ANSWERING MACHINE

Arthur T. Martinez, Long Beach, Calif., assignor to Fortel, Inc., Compton, Calif.  
 Filed Sep. 18, 1984, Ser. No. 651,757  
 Term of patent 14 years  
 U.S. Cl. D14—4



290,839

## TELEPHONE

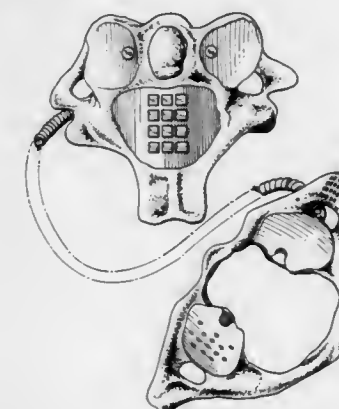
Jal-Ming Chen, No. 166, Sec. 1, Chung-Shan Rd., Yung-Ho, Taipei Hsien, Taiwan  
 Filed Jan. 27, 1986, Ser. No. 822,592  
 Term of patent 14 years  
 U.S. Cl. D14—53



290,840

## SKELETAL SPINAL BONE-SHAPED TELEPHONE SET

Donald L. Hensley, 3445 Gulling Rd., Reno, Nev. 89503  
 Filed Jul. 22, 1986, Ser. No. 887,915  
 Term of patent 14 years  
 U.S. Cl. D14—53



290,838

## MICROPHONE

Rebecca M. Stames, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.  
 Filed Jan. 23, 1985, Ser. No. 693,759  
 Term of patent 14 years  
 U.S. Cl. D14—12



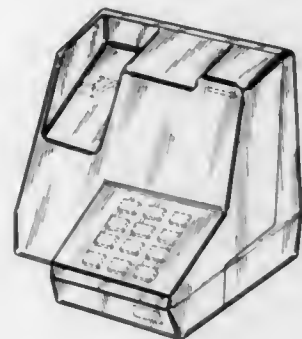
290,841

**HOUSING FOR A DESK TELEPHONE PAYSTATION  
BASE**E. Randall Cochran, Decatur, Ala., assignor to GTE Communi-  
cation Systems, Northlake, Ill.

Filed Feb. 15, 1985, Ser. No. 702,283

Term of patent 14 years

U.S. Cl. D14—60



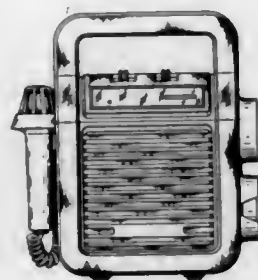
290,843

**COMBINED RADIO AND MICROPHONE**Patrick J. Murphy, Buffalo, N.Y., assignor to The Quaker Oats  
Company, Chicago, Ill.

Filed Jan. 23, 1985, Ser. No. 693,786

Term of patent 14 years

U.S. Cl. D14—72



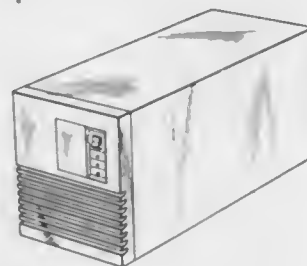
290,844

**DISC DRIVE**Shinji Shibuya, Koganei; Koushirou Adachi, Tokorozawa, and  
Yasuji Morishita, Odawara, all of Japan, assignors to Hitachi,  
Ltd., Tokyo, Japan

Filed Nov. 19, 1984, Ser. No. 672,592

Term of patent 14 years

U.S. Cl. D14—109



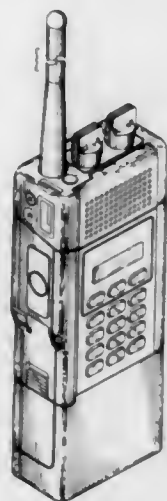
290,842

**PORTABLE TWO-WAY RADIO OR SIMILAR ARTICLE**William J. Scheid, and Bruce A. Claxton, both of Coral Springs,  
Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 23, 1984, Ser. No. 664,286

Term of patent 14 years

U.S. Cl. D14—68



290,845

**COMBINED WORD PROCESSOR-PRINTER**Takahisa Yubisui; Hiroshi Sakaguchi; Katsuhiko Iida; Megumi  
Shinohara, and Tadahiko Saimen, all of Osaka, Japan, assign-  
ors to Sharp Corporation, Osaka, Japan

Filed May 16, 1984, Ser. No. 610,671

Claims priority, application Japan, Nov. 16, 1983, 58-49947

U.S. Cl. D14—111



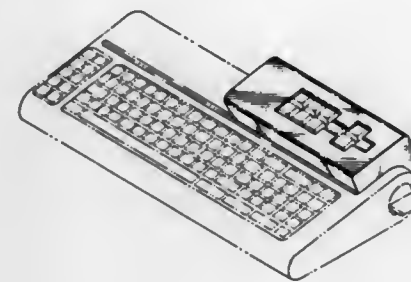
290,846

**COMPUTER KEYBOARD CASING**Leonard J. Genest, 1331 E. Edinger Ave., Santa Ana, Calif.  
92705

Filed Oct. 9, 1984, Ser. No. 659,106

Term of patent 14 years

U.S. Cl. D14—114



290,847

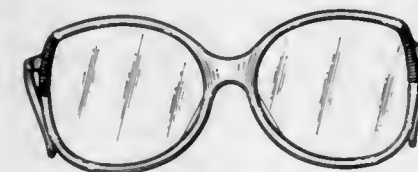
**EYEGLASS FRAME**Ulrich J. Haas, Vienna, Austria, assignor to Optyl Eyewear  
Fashion International Corp., Norwood, N.J.

Filed Dec. 20, 1985, Ser. No. 811,392

Claims priority, application Fed. Rep. of Germany, Aug. 5,  
1985, 16 272

Term of patent 14 years

U.S. Cl. D16—119



290,848

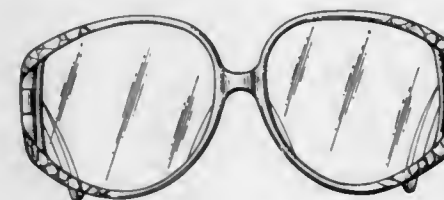
**EYEGLASS FRAME**Ulrich J. Haas, Vienna, Austria, assignor to Optyl Eyewear  
Fashion International Corp., Norwood, N.J.

Filed Dec. 20, 1985, Ser. No. 811,338

Claims priority, application Fed. Rep. of Germany, Aug. 5,  
1985, 16272

Term of patent 14 years

U.S. Cl. D16—119



290,849

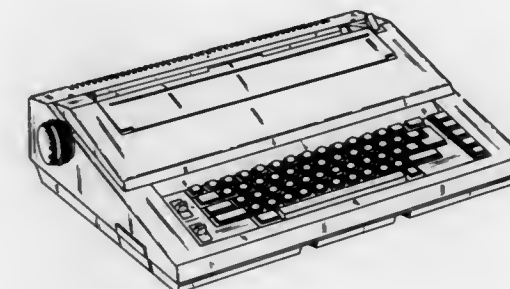
**ELECTRONIC TYPEWRITER**Bernd Gubbe, Nuremberg, and Klaus D. Krause, Dietershofen,  
both of Fed. Rep. of Germany, assignors to Triumph-Adler  
A.G., Nuremberg, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,435

Claims priority, application Switzerland, Jul. 2, 1985,  
DM/005492

Term of patent 14 years

U.S. Cl. D18—1



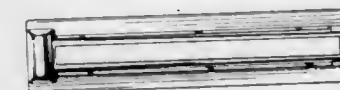
290,850

**COMPUTER PRINTER STAND**Jac H. Yon, Houston, Tex., and Brad Nemeth, San Francisco,  
Calif., assignors to Wendell R. Brooks, Inc., Fort Worth, Tex.

Filed Aug. 4, 1986, Ser. No. 892,210

Term of patent 14 years

U.S. Cl. D18—23



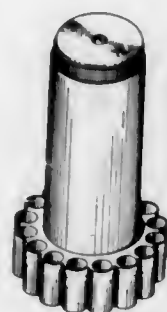


290,851  
CRAYONKenkichi Yoshida, Tokyo, Japan, assignor to Kabushiki Kaisha  
Bancho, Tokyo, JapanFiled Sep. 4, 1984, Ser. No. 647,019  
Term of patent 14 years

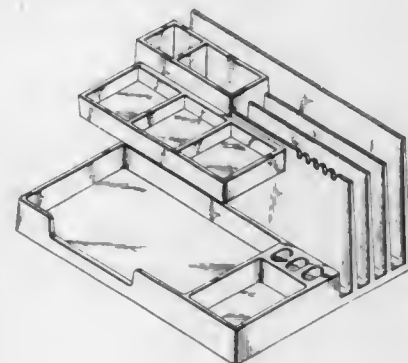
U.S. Cl. D19—41

290,853  
CRAYON HOLDERMel Appel, Livingston, N.J., assignor to The Mel Appel Com-  
pany, Short Hills, N.J.Filed Dec. 13, 1984, Ser. No. 681,307  
Term of patent 14 years

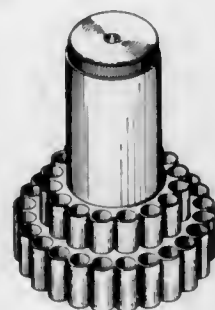
U.S. Cl. D19—85

290,852  
DESK-TOP ORGANIZERHenry C. H. Wang, Taipei, Taiwan, assignor to Two Powers  
Enterprise Co., Ltd., Taipei, TaiwanFiled Nov. 29, 1984, Ser. No. 675,987  
Term of patent 14 years

U.S. Cl. D19—75

290,854  
CRAYON HOLDERMel Appel, Livingston, N.J., assignor to The Mel Appel Com-  
pany, Short Hills, N.J.Filed Dec. 13, 1984, Ser. No. 681,305  
Term of patent 14 years

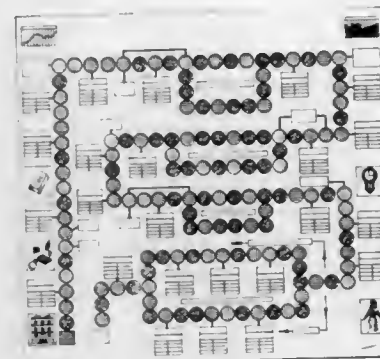
U.S. Cl. D19—85

290,855  
GAME BOARD

James J. Manning, 308 Winkworth Pkwy., Syracuse, N.Y. 13215

Filed Nov. 28, 1984, Ser. No. 675,898  
Term of patent 14 years

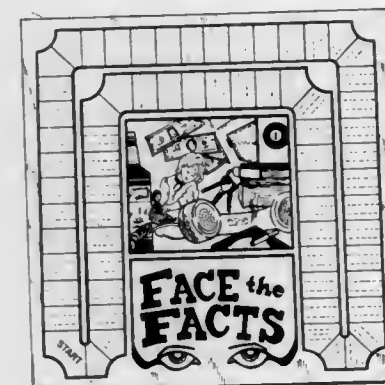
U.S. Cl. D21—25

290,856  
GAME BOARD

Joan M. Lester, Rte. 1, Box 139A, Effie, Minn. 56639

Filed Feb. 27, 1985, Ser. No. 706,139  
Term of patent 14 years

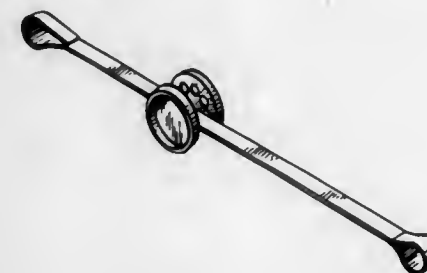
U.S. Cl. D21—25

290,857  
COMBINED MAGNETIC SPINNER AND TRACKWAY

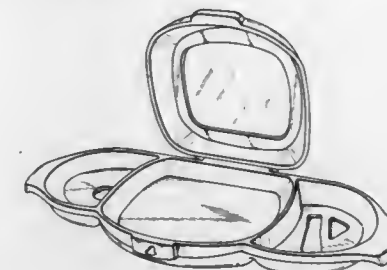
Raymond J. Lohr, 5043 Sterrettania Rd., Erie, Pa. 16506

Filed Mar. 11, 1985, Ser. No. 710,488  
Term of patent 14 years

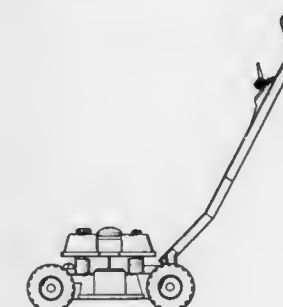
U.S. Cl. D21—92

290,858  
TOY VANITYM. Allyson Smith, East Aurora, N.Y., assignor to The Quaker  
Oats Company, Chicago, Ill.Filed Jan. 25, 1985, Ser. No. 695,182  
Term of patent 14 years

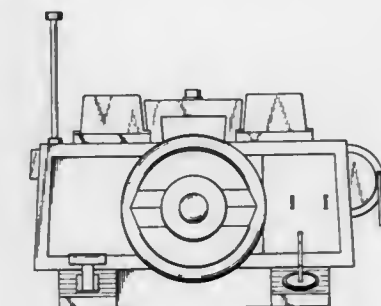
U.S. Cl. D21—121

290,859  
TOY LAWNMOWERLarry R. Nagode, and David E. Moomaw, both of East Aurora,  
N.Y., assignors to The Quaker Oats Company, Chicago, Ill.Filed Jan. 23, 1985, Ser. No. 693,784  
Term of patent 14 years

U.S. Cl. D21—124

290,860  
TOY DASHBOARDHoward S. Kametsky, Buffalo, N.Y., assignor to The Quaker  
Oats Company, Chicago, Ill.Filed Jan. 23, 1985, Ser. No. 693,742  
Term of patent 14 years

U.S. Cl. D21—142



290,861

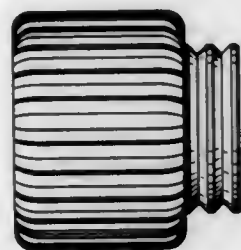
## TOY TIRE AND WHEEL ASSEMBLY

W. Porter Clanton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 23, 1985, Ser. No. 693,747

Term of patent 14 years

U.S. Cl. D21-141

290,863  
DOLL

Otis L. Dockery, 2214 Maple Gate, Missouri City, Tex. 77489

Filed Mar. 11, 1985, Ser. No. 710,373

Term of patent 14 years

U.S. Cl. D21-177



290,862

## BOY CLOWN RAG DOLL

Betty L. Koester, R.R. 1, Box 232, Poseyville, Ind. 47633, and Janet F. Adler, R.R. 2, Box 219, Hanstadt, Ind. 47639

Filed Feb. 15, 1985, Ser. No. 702,163

Term of patent 14 years

U.S. Cl. D21-173

290,864  
DOLL

Anita I. McLellan, 541 Charlotte Dr., San Marcos, Calif. 92069

Filed Dec. 14, 1984, Ser. No. 682,256

Term of patent 14 years

U.S. Cl. D21-185



290,865

## SKI POLE HANDLE

Jan H. Rustad, Lillehammer, Norway, assignor to Trygve Lilledahl Skistavfabrikk A/S, Lillehammer, Norway

Filed Apr. 3, 1984, Ser. No. 596,424

Claims priority, application Norway, Nov. 2, 1983, 64.561

Term of patent 14 years

U.S. Cl. D21-230



290,866

## CARTRIDGE CASE

M. Gaines Chestnut, 17219 W. 57th Pl., Golden, Colo. 80401

Filed Jul. 5, 1984, Ser. No. 627,816

Term of patent 14 years

U.S. Cl. D22-108



290,867

## FISHING LURE

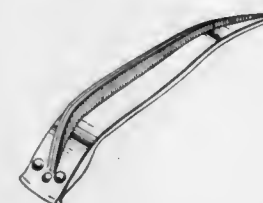
Ernest J. Ross, 2306 - 153rd Street, Surrey, British Columbia, Canada V4A 4R2

Filed Nov. 16, 1984, Ser. No. 672,287

Claims priority, application Canada, May 25, 1984, 25-05-84-12

Term of patent 14 years

U.S. Cl. D22-126



290,868

## HAND-HELD BATTERY OPERATED TOOL FOR STRIPPING FISHING LINE FROM A REEL AND FOR SHARPENING FISH HOOKS

James T. Rumbaugh, Spirit Lake, Iowa, assignor to Berkley, Inc., Spirit Lake, Iowa

Filed Sep. 28, 1984, Ser. No. 655,648

Term of patent 14 years

U.S. Cl. D22-149



290,869

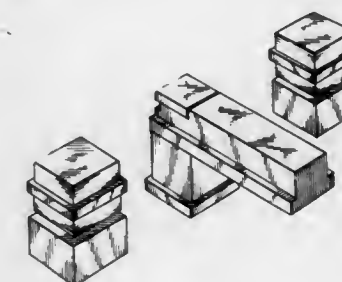
## LAVATORY SET

Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,247

Term of patent 14 years

U.S. Cl. D23-25



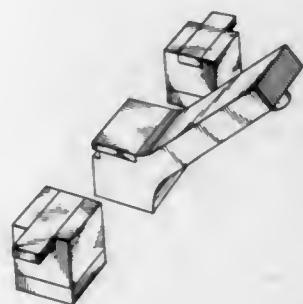


290,870  
LAVATORY SET

Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc.,  
Long Island City, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,248  
Term of patent 14 years

U.S. Cl. D23—25

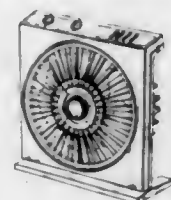


290,872  
ELECTRIC FAN

Shaichi Kouno, Tokorozawa; Toshiyuki Utsuki, Tokyo; Hideki  
Sakae, Hino, and Kenichi Watanabe, Hitachi, all of Japan,  
assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 704,728  
Claims priority, application Japan, Nov. 2, 1984, 59-45114  
Term of patent 14 years

U.S. Cl. D23—155

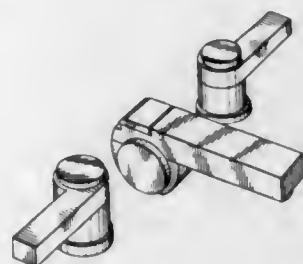


290,871  
LAVATORY SET

Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc.,  
Long Island City, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,245  
Term of patent 14 years

U.S. Cl. D23—25

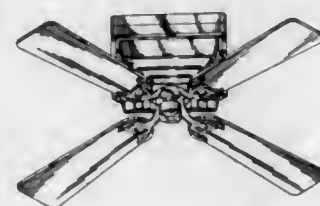


290,873  
CEILING FAN

Shang C. Chen, No. 140, Chung Shan Rd., Feng Yuan City,  
Taiwan

Filed Sep. 18, 1985, Ser. No. 777,100  
Term of patent 14 years

U.S. Cl. D23—158

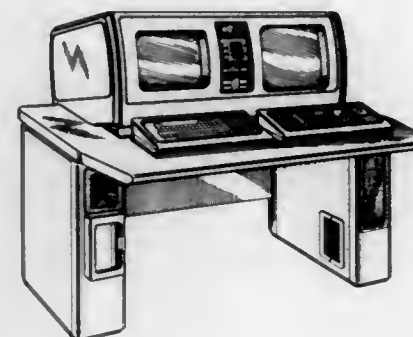


290,874  
OPERATOR CONSOLE FOR COMPUTERIZED  
TOMOGRAPHY SCANNER SYSTEM

Kenneth E. Wagner, Chesterland, Ohio, assignor to Technicare,  
Corporation, Cleveland, Ohio

Filed Aug. 1, 1984, Ser. No. 636,540  
Term of patent 14 years

U.S. Cl. D24—2

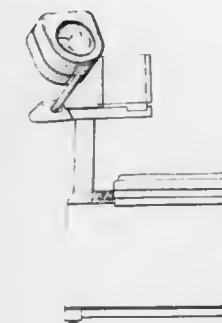


290,876  
AUTOMATIC APPARATUS FOR MEASURING OF  
ARTERIAL BLOOD PRESSURE

Giovanni Arduini, Milan; Lorenzo Bonfanti, Usmate, and Gian-  
franco Salvemini, Binasco, all of Italy, assignors to Daniele  
Ghigini, Pavia, Italy

Filed Oct. 9, 1984, Ser. No. 658,632  
Claims priority, application Italy, Apr. 11, 1984, 21515/84[U]  
Term of patent 14 years

U.S. Cl. D24—21



290,877  
MID-FACIAL ZYGOMA SKELETAL IMPLANT  
Vincent C. Giampapa, 5 Franklin Ave., Ste. G-3, Belleville, N.J.  
07109, and George C. Peck, 1200 Rte. 46, Clifton, N.J. 07013  
Filed Mar. 26, 1984, Ser. No. 593,265  
Term of patent 14 years

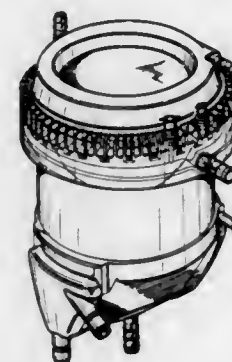
U.S. Cl. D24—33



290,875  
OXYGENATOR FOR USE IN OPEN HEART  
Anthony Badolato, Willingboro, N.J.; Edmund R. Corey, Jr.,  
Montclaire, and James G. Barrera, Audubon, both of Pa.,  
assignors to McNellab, Inc., Fort Washington, Pa.

Filed Jan. 8, 1985, Ser. No. 690,006  
Term of patent 14 years

U.S. Cl. D24—8



290,878  
MID-FACIAL MAXILLA SKELETAL IMPLANT  
Vincent C. Giampapa, 5 Franklin Ave., Ste. G-3, Belleville, N.J.  
07109, and George C. Peck, 1200 Rte. 46, Clifton, N.J. 07013  
Filed Mar. 26, 1984, Ser. No. 593,254  
Term of patent 14 years

U.S. Cl. D24—33



290,879

**MID-FACIAL ZYGOMATIC ARCH SKELETAL IMPLANT**  
 Vincent C. Giampapa, 5 Franklin Ave., Ste. G-3, Belleville, N.J. 07109, and George C. Peck, 1200 Rte. 46, Clifton, N.J. 07013  
 Filed Mar. 26, 1984, Ser. No. 593,255  
 Term of patent 14 years

U.S. Cl. D24—33



290,882

**SYNTHETIC RESIN TUBE**

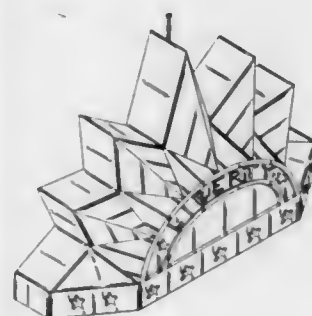
Kouji Inoue, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Japan  
 Filed Oct. 22, 1984, Ser. No. 663,617  
 Claims priority, application Japan, Jul. 18, 1984, 59-29966  
 Term of patent 14 years

U.S. Cl. D25—73

290,883  
CANDLE

Joseph J. Comazzi, P.O. Box 985, Greensboro, N.C. 27402,  
 assignor to Joseph J. Comazzi, Greensboro, N.C.  
 Filed Dec. 5, 1985, Ser. No. 804,889  
 Term of patent 14 years

U.S. Cl. D26—7



290,880

**PORTABLE URINE SPECIMEN COLLECTOR FUNNEL**  
 Joan Blanton, 4612 N. Habana Ave., Tampa, Fla. 33614  
 Continuation-in-part of Ser. No. 495,820, May 18, 1983,  
 abandoned. This application Jun. 11, 1984, Ser. No. 619,077  
 Term of patent 14 years

U.S. Cl. D24—54

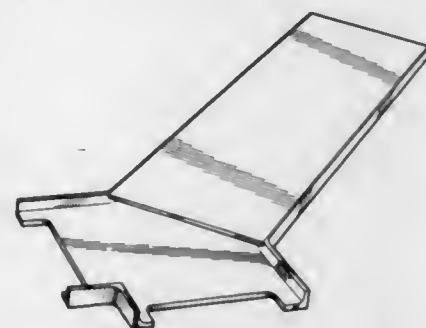


290,881

**CORNER PIECE FOR A BASE PLATE VENTILATION SYSTEM**

Christer Rittinge, Nybrogatan 3, S-252 50 Helsingborg, Sweden  
 Filed Oct. 11, 1984, Ser. No. 659,705  
 Claims priority, application Sweden, Apr. 18, 1984, 84-1283  
 Term of patent 14 years

U.S. Cl. D25—55

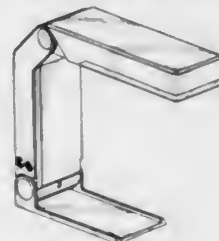


290,884

**PORTABLE RECHARGEABLE LIGHT**

Kolchiro Sano, Satoru Usami, and Tadahide Okuno, all of  
 Osaka, Japan, assignors to Matsushita Electric Industrial Co.,  
 Ltd., Osaka, Japan  
 Filed Nov. 28, 1984, Ser. No. 675,576  
 Claims priority, application Japan, May 31, 1984, 59-22454  
 Term of patent 14 years

U.S. Cl. D26—65



290,885

**TABLE LAMP**

Uko Morita, 182 Halleck St., Brooklyn, N.Y. 11231  
 Filed Apr. 5, 1984, Ser. No. 597,183  
 Term of patent 14 years

U.S. Cl. D26—110



290,887

**ELECTRIC SHAVER**

Florian Seiffert, Wiesbaden, Fed. Rep. of Germany, and Kazuyoshi Yonezawa, Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Japan  
 Filed Aug. 6, 1985, Ser. No. 763,014  
 Claims priority, application Japan, Mar. 4, 1985, 59-8418  
 Term of patent 14 years

U.S. Cl. D28—49

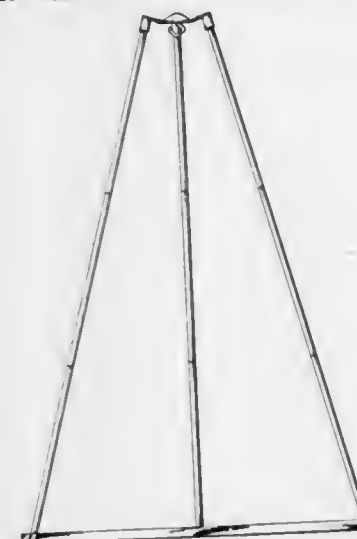


290,886

**TRIPOD STAND FOR A LANTERN OR SIMILAR ARTICLE**

Rudolph B. Meoli, Brea, and Keith W. Biaylock, Orange, both of  
 Calif., assignors to Kamp Industries, Inc., Brea, Calif.  
 Continuation of Ser. No. 715,283, Mar. 25, 1985, abandoned.  
 This application Apr. 28, 1986, Ser. No. 858,240  
 Term of patent 14 years

U.S. Cl. D26—138



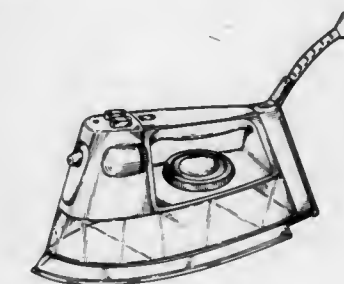
290,888

**STEAM IRON**

Franz A. Stützer, and Michael Knöchner, both of Offenbach am  
 Main, Fed. Rep. of Germany, assignors to Rowenta-Werke  
 GmbH, Offenbach am Main, Fed. Rep. of Germany  
 Filed Sep. 30, 1985, Ser. No. 781,940  
 Claims priority, application Fed. Rep. of Germany, Mar. 28,  
 1985, 5 MR 10588

Term of patent 14 years

U.S. Cl. D32—70





290,889

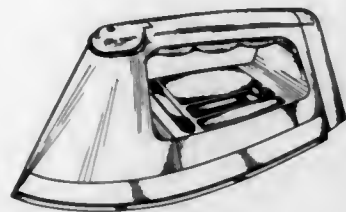
## STEAM IRON

Norman A. Steinkamp, La Grange Park, Ill., assignor to John Zink Company, Tulsa, Okla.

Filed May 31, 1985, Ser. No. 740,130

Term of patent 14 years

U.S. Cl. D32—70



290,890

## ELECTRIC IRON

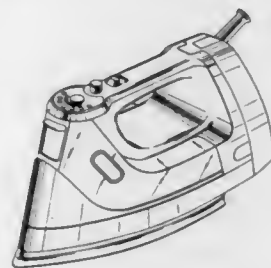
Koichi Ueno; Nobuhiro Umehara, and Osamu Otaki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshiba Heating Appliances Co., Ltd., Kamo, both of, Japan

Filed Oct. 30, 1985, Ser. No. 792,862

Claims priority, application Japan, Jul. 15, 1985, 60-29912

Term of patent 14 years

U.S. Cl. D32—70



290,891

## STEAM IRON

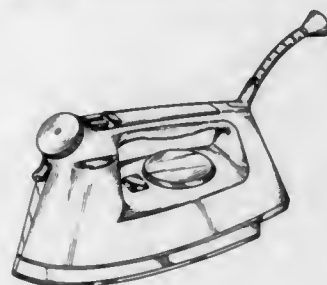
Franz A. Stützer, and Michael Knöchner, both of Offenbach am Main, Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 781,766

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 5 MR 10588

Term of patent 14 years

U.S. Cl. D32—70



290,892

## COMBINED FLOOR SCRUBBER AND MOP

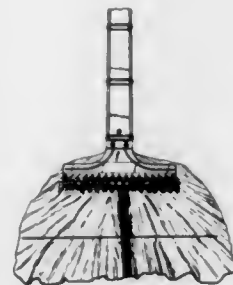
Hans E. Slany, Mulbergerstrasse 90, D-7300 Easlingen/Neckar, Fed. Rep. of Germany

Filed Nov. 15, 1984, Ser. No. 671,549

Claims priority, application Fed. Rep. of Germany, May 24, 1984, 6 MR 1331

Term of patent 14 years

U.S. Cl. D32—15



290,893

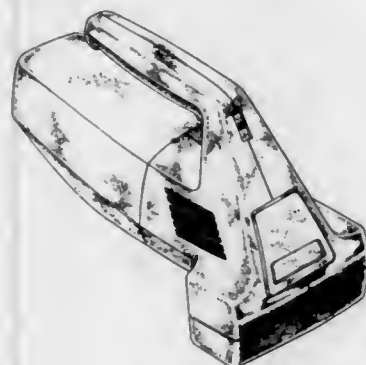
## HAND HELD SUCTION CLEANER OR THE LIKE

John D. Essex, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Mar. 22, 1985, Ser. No. 714,986

Term of patent 14 years

U.S. Cl. D32—18



290,894

## VACUUM CLEANER

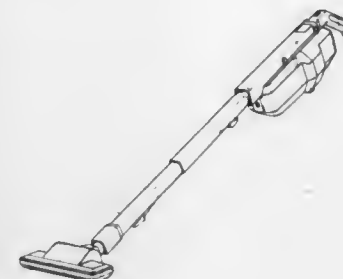
Isshin Miyamoto; Yasuo Nagamatsu; Toshiya Moriyama, and Masaharu Sakamoto, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1984, Ser. No. 686,781

Claims priority, application Japan, Jun. 27, 1984, 59-26464

Term of patent 14 years

U.S. Cl. D32—22



290,895

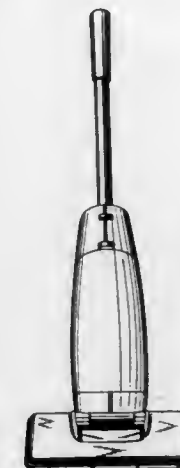
## BATTERY POWERED SUCTION BROOM

Joyce K. Thomas, and Samuel E. Hohulin, both of Lexington, Ill., assignors to National Union Electric Corporation, Cleveland, Ohio

Filed Feb. 22, 1985, Ser. No. 704,386

Term of patent 14 years

U.S. Cl. D32—22



290,896

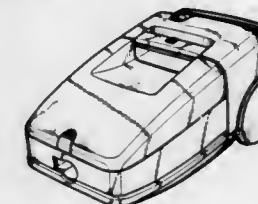
## VACUUM CLEANER

Young S. Kim, Terrace Sunnyvale, Calif., assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 3, 1984, Ser. No. 677,181

Term of patent 14 years

U.S. Cl. D32—24

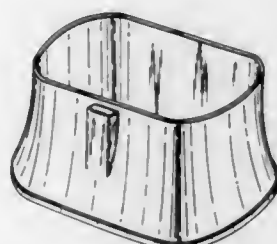


290,897  
BUCKET

Kenneth F. Streit, Mt. Prospect, Ill., assignor to Geerpres, Inc., Muskegon, Mich.

Filed May 16, 1985, Ser. No. 735,171  
Term of patent 14 years

U.S. Cl. D32—53



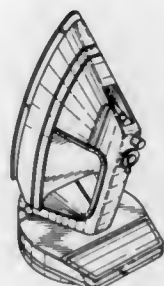
290,898

COMBINED IRON AND BASE THEREFOR

Ronald E. Babros, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Oct. 16, 1985, Ser. No. 787,886  
Term of patent 14 years

U.S. Cl. D32—68



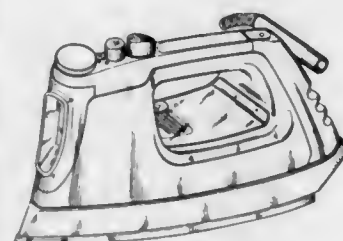
290,899

ELECTRIC IRON

Serge Brun, Lyons, France, assignor to Calor S.A., Lyons, France

Filed Jun. 11, 1985, Ser. No. 743,652  
Claims priority, application France, Dec. 19, 1984, 845720  
Term of patent 14 years

U.S. Cl. D32—70



## LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF JULY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. G. Associates: See—  
Gal, Anita S.; and Westerberg, Eugene R., 4,680,451, Cl. 219-411.000.
- Aadams Merchandising, Inc.: See—  
Kakavas, Dorothy A., 4,679,818, Cl. 280-33.99A.
- Aagano, Toshitaka: See—  
Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,680,473, Cl. 250-484.100.
- AB Tetra Pak: See—  
Inoko, Kenji, 4,679,685, Cl. 198-461.000.
- Abbey, Kirk J.: See—  
Lin, Ju-Chui; and Abbey, Kirk J., 4,680,354, Cl. 526-172.000.
- Abbott Laboratories: See—  
Luly, Jay R.; Plattner, Jacob J.; and Fung, Anthony K., 4,680,284, Cl. 514-18.000.
- Abdo, Milton K.; and Jennings, Alfred R., Jr., to Mobil Oil Corporation. Method for modifying injectivity profile with ball sealers and chemical blocking agents. 4,679,629, Cl. 166-281.000.
- Abe, Masao; and Miura, Nobuo, to Honda Giken Kogyo Kaishiki Kaisha. Ignition system. 4,679,540, Cl. 123-602.000.
- Abe, Takao: See—  
Suma, Tetsuro; Abe, Takao; and Ogawa, Tetsuo, 4,680,763, Cl. 371-37.000.
- Abo, Keiju: See—  
Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Nakano, Masaki, 4,679,466, Cl. 74-863.000.
- Abrams, Paul G.: See—  
Jarvis, Allan P., Jr.; Koch, George A.; and Abrams, Paul G., 4,680,174, Cl. 424-85.000.
- Abreu, Edward. Scoring guide and glass cutter system. 4,679,476, Cl. 83-886.000.
- Accurate Industries, Inc.: See—  
Rasmussen, Robert, 4,679,979, Cl. 414-786.000.
- Ace, Ronald S. Ophthalmic glass/plastic laminated lens having photochromic characteristics and assembly thereof. 4,679,918, Cl. 351-163.000.
- Acetarin, Jean-Dominique; Villiger, Werner; and Carlemalm, Eric, to Chemische Werke Lowi GmbH. Embedding media suitable for the preparation of thin sections of embedded biological materials. 4,680,362, Cl. 526-320.000.
- Acharya, Kishore C.: See—  
Srinivasan, Nallaswamy; Banaszewski, Sharon L.; and Acharya, Kishore C., 4,680,709, Cl. 364-414.000.
- Ackermann, Horst W.; Masek, Petr; and Servaux, Jean, to Nestec S.A. Resealable pack. 4,679,701, Cl. 220-404.000.
- Adachi, Masao: See—  
Goto, Yasuo; and Adachi, Masao, 4,679,465, Cl. 74-805.000.
- Adachi, Takashi: See—  
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,680,386, Cl. 536-7.400.
- Adamchick, John T.: See—  
Leue, William M.; Hodsoll, Raymond J., Jr.; Glover, Gary H.; and Adamchick, John T., 4,680,547, Cl. 324-309.000.
- Adams, George W. Township, city and regional land arrangement. 4,679,363, Cl. 52-169.300.
- Adams, Ronald D.: See—  
Chia, E. Henry; and Adams, Ronald D., 4,679,613, Cl. 164-453.000.
- ADC Telecommunications, Inc.: See—  
Pitsch, Daniel M., 4,679,880, Cl. 439-404.000.
- Adell, Robert, to U.S. Product Development Company. Method of de-emphasizing the gap between a door edge and adjacent structure. 4,679,290, Cl. 29-407.000.
- Adenco Engineering AB: See—  
Jilken, Ann-Christin, 4,679,371, Cl. 52-574.000.
- Adenier, Herve: See—  
Chaveron, Henri; Pontillon, Jean; Billon, Michel; Adenier, Herve; and Kamoun, Ahmed, 4,679,498, Cl. 99-483.000.
- Adler, David M. Exercise device. 4,679,788, Cl. 272-93.000.
- Advanced Extraction Technologies, Inc.: See—  
Mehra, Yuv R., 4,680,042, Cl. 62-17.000.
- Advanced Micro Devices, Inc.: See—  
Ramachandra, Govardhan; and Bhatt, Kiran M., 4,679,310, Cl. 29-577.000.
- Tam, Aloysius T., 4,680,738, Cl. 365-239.000.
- Advanced Micro Electronic Components and Systems: See—  
Bove, Bertrand, 4,679,643, Cl. 177-210.000.
- Advanced Products Ltd.: See—  
Livne, Avinoam, 4,679,615, Cl. 165-1.000.
- AE PLC: See—  
Munro, Robert; and Day, Roger A., 4,679,493, Cl. 92-212.000.
- Aeras Water Resources, Inc.: See—  
Arbisi, Dominic S.; and Replogle, Coy E., 4,680,148, Cl. 261-120.000.
- Aetna Telecommunications Laboratories: See—  
Roberge, James K., 4,680,554, Cl. 330-260.000.
- Agfa Gevaert Aktiengesellschaft: See—  
Wernicke, Ubbö; Meckl, Heinz; Donner, Hans-Gunter; and Frosch, Jürgen, 4,680,123, Cl. 210-683.000.
- Agoston, Agoston; and Sparkes, Robert G., to Tektronix, Inc. Clock recovery digital phase-locked loop. 4,680,780, Cl. 375-120.000.
- Agulhon, Claude, to Royal Champignon. Process for improving the technical efficiency and preservation quality of canned mushrooms. 4,680,188, Cl. 426-281.000.
- Ahroni, Joseph M. Electric plug with snap-fitted housing components. 4,679,877, Cl. 439-425.000.
- Ahs, Bjorn, to Kamy AB. Screening device. 4,680,108, Cl. 209-273.000.
- Aikawa, Hiroshi: See—  
Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, 4,679,778, Cl. 267-140.100.
- Ainsworth, Kenneth M.: See—  
Baker, Daniel G.; and Ainsworth, Kenneth M., 4,680,620, Cl. 358-10.000.
- Air Products and Chemicals, Inc.: See—  
Marsella, John A., 4,680,393, Cl. 544-170.000.
- Air Products and Chemicals, Inc.: See—  
Ramprasad, Dorai; and Busch, Daryle H., 4,680,037, Cl. 55-16.000.
- Aisan Kogyo Kabushiki Kaisha: See—  
Okamura, Masayuki, 4,679,440, Cl. 73-118.100.
- Aisin Seiki Kabushiki Kaisha: See—  
Hattori, Takemi; and Kawamura, Reiki, 4,679,855, Cl. 297-486.000.
- Inden, Masahiro; Kuwana, Kazutaka; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,679,589, Cl. 137-596.170.
- Nishikawa, Masumi; and Ishikawa, Masanobu, 4,679,457, Cl. 74-441.000.
- Aisin-Warner Limited: See—  
Hayakawa, Yoichi; Kawai, Masao; Taga, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,679,450, Cl. 74-752.00A.
- Ajinomoto Co., Inc.: See—  
Hisamitsu, Kunio; Takemoto, Tadashi; Hijiya, Toyoto; and Takahashi, Satoji, 4,680,403, Cl. 546-247.000.
- Iwai, Kazuo, 4,680,313, Cl. 514-627.000.
- Akademet for de Tekniske Videnskaber, Svejsecentralen: See—  
Lund, Svend, 4,679,448, Cl. 73-866.500.
- Akers, Paul J.: See—  
Chambers, Pauline B.; Bedder, Stephen W.; and Akers, Paul J., 4,680,335, Cl. 524-501.000.
- Akiyama, Tadahiko; and Otsuka, Yoshio, to Nippo Communication Industrial Co., Ltd. Personal-signaling communication system. 4,680,785, Cl. 379-57.000.
- Akutsu, Eiichi: See—  
Murakami, Kakuji; Akutsu, Eiichi; and Aruga, Tamotsu, 4,680,235, Cl. 428-414.400.
- Akzo nv: See—  
Klugar, Karl; and Van Santvoort, Gerardus P. T. M., 4,679,731, Cl. 238-2.000.
- Weidenhaupt, Wolfgang; and Dismon, Peter, 4,679,387, Cl. 57-212.000.
- Aladdin Engineering & Mfg: See—  
Horn, Edward R.; and Kot, Norbert J., II, 4,679,782, Cl. 269-228.000.
- Albrecht, Klaus: See—  
Liebler, Ralf; and Albrecht, Klaus, 4,680,359, Cl. 526-309.000.
- Alcor, Inc.: See—  
Orlando, Thomas W., 4,680,167, Cl. 422-199.000.
- Alesson, Thomas, to Nicholson Division, Datron Systems, Inc. Thermostatic steam trap with self-centering valve. 4,679,727, Cl. 236-56.000.
- Allaire, Eugene J. Bottle top. 4,679,697, Cl. 215-295.000.
- Allard, Andre, to Beloit Corporation. Heated variable crown roll. 4,679,287, Cl. 29-116.0AD.
- Allegheny Ludlum Corporation: See—  
Shen, Tien-Hung; and Salsgiver, James A., 4,680,062, Cl. 148-111.000.
- Allen-Bradley Company: See—  
Kerkman, Russel J.; and Rowan, Timothy M., 4,680,695, Cl. 363-160.000.
- Allen, Henry V.: See—  
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,680,606, Cl. 357-26.000.
- Allen, Mark L. High security cylinder lock. 4,679,418, Cl. 70-380.000.
- Allied Corporation: See—  
Bobbio, Stephen M., 4,680,087, Cl. 156-643.000.



Bonfield, John H., 4,680,394, Cl. 544-193,000.  
Brown, George E., 4,679,994, Cl. 417-525,000.  
Kosarski, Raymond, Jr.; and Jackson, Robert W., 4,679,397, Cl. 60-562,000.  
Lakhani, Amir A.; and Oliver, Laurence C., 4,679,311, Cl. 29-579,000.  
Malka, Jacob H.; and Osetec, Marc, 4,680,726, Cl. 364-721,000.  
Morgan, Thomas R., 4,680,169, Cl. 423-53,000.  
Myers, Lawrence R.; Bach, Lloyd G.; and Gaiser, Robert F., 4,679,864, Cl. 303-6,000.  
Wilson, Robert K., 4,679,491, Cl. 91-369,00A.  
Allis-Chalmers Corporation: See—  
Revell, Alan E., 4,680,039, Cl. 55-341,00R.  
Alonso, Manuel T., to Tascon Medical Technology Corporation. Heart valve prosthesis, 4,680,031, Cl. 623-2,000.  
Alonso, Sydney A., to New England Digital Corporation. Method of and apparatus for providing pulse trains whose frequency is variable in small increments and whose period, at each frequency, is substantially constant from pulse to pulse, 4,680,479, Cl. 307-265,000.  
Aloup, Jean C.; Bouchaudon, Jean; Farge, Daniel; and James, Claude, to Rhone-Poulenc Sante. Thioformamide derivatives and use in inhibiting gastric secretion, 4,680,303, Cl. 514-336,000.  
Alpen Dairy Foods Pty. Limited: See—  
Kilroy, Stanley A. R., 4,680,194, Cl. 426-602,000.  
Alps Electric Co., Ltd.: See—  
Fujioka, Kazunori, 4,680,517, Cl. 318-332,000.  
Sugawara, Katsuyuki, 4,680,655, Cl. 360-97,000.  
Alroy, Yoram A.: See—  
Stanley, Smith B.; and Alroy, Yoram A., 4,679,261, Cl. 5-183,000.  
Alsenz, Richard H. Temperature responsive compressor pressure control apparatus and method, 4,679,404, Cl. 62-175,000.  
Alstom: See—  
Rodriguez, Francis; and Roblin, Jean-Paul, 4,679,824, Cl. 285-27,000.  
Alstom-Atlantique, S.A.: See—  
Anton, Alain, 4,680,222, Cl. 428-251,000.  
Altizer, C. Clark: See—  
Schultz, Roy D.; England, Thomas R.; and Altizer, C. Clark, 4,679,313, Cl. 29-596,000.  
Altman, Peter, to Light and Sound Specialties, Inc. Light panel, 4,680,685, Cl. 362-240,000.  
Altmann, Josef; and Beran, Bohoslav, to ZLEHIT pri BAN. Apparatus for the continuous vacuum cleaning of oil, 4,680,091, Cl. 202-205,000.  
Aluminum Company of America: See—  
Hawkins, Ronald G., 4,680,424, Cl. 174-42,000.  
Aluminum Ladder Company: See—  
Bennett, Ronald W.; and MacDonald, Ellie H., 4,679,657, Cl. 182-113,000.  
Amada Company, Limited: See—  
Hirata, Tadashi; Ikeda, Hidekatsu; Arima, Yoshitaka; and Kashihara, Yoshihiko, 4,679,473, Cl. 83-157,000.  
Amada Engineering Service Co., Inc.: See—  
Koseki, Ryoji, 4,680,771, Cl. 372-107,000.  
Amazawa, Kiyoshi: See—  
Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, 4,680,792, Cl. 381-12,000.  
Ambasz, Emilio. Flexible pen with sliding sleeve, 4,679,954, Cl. 401-117,000.  
Ambos, Hans D.; Cain, Michael E.; and Sobel, Burton E., to Washington University. Method and apparatus for analyzing electrocardiographic signals, 4,680,708, Cl. 364-417,000.  
Amdahl Corporation: See—  
Price, John E.; and De Clue, Larry W., 4,680,486, Cl. 307-475,000.  
American Cyanamid Company: See—  
Morin, Louis G., 4,680,093, Cl. 204-28,000.  
Morin, Louis G., 4,680,100, Cl. 204-228,000.  
Wright, William B., Jr.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., 4,680,293, Cl. 514-243,000.  
American District Telegraph Company: See—  
Galvin, Aaron A.; Dyer, Hugh D.; and Leff, Kenneth J., 4,679,881, Cl. 439-392,000.  
American Standard Inc.: See—  
Pearse, Richard H., Jr., 4,679,411, Cl. 62-519,000.  
American Telephone and Telegraph Company, AT&T Bell Laboratories: See—  
Dyer, Christopher K., 4,680,241, Cl. 429-49,000.  
Fineblum, Solomon S., 4,679,890, Cl. 439-884,000.  
Hanlon, James T.; and Renaut, Paul W., 4,680,563, Cl. 335-58,000.  
Heimann, Peter A.; Moran, Joseph M.; and Schutz, Ronald J., 4,680,084, Cl. 156-626,000.  
American Telephone and Telegraph Company, AT&T Bell Labs: See—  
Swartz, Robert G., 4,680,810, Cl. 455-609,000.  
American Tourister, Inc.: See—  
Wickman, John A., 4,679,670, Cl. 190-18,00A.  
Amerock Corporation: See—  
Bates, Wayne C., 4,679,352, Cl. 49-192,000.  
Amoco Corporation: See—  
Chang, Yuehsung, 4,680,098, Cl. 204-182,400.  
Amor, Bernard: See—  
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangelios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542,000.  
AMP Incorporated: See—  
Assini, John E.; and Kissinger, Paula A., 4,679,883, Cl. 439-607,000.

Bennett, Glenn E.; Look, Raymond J.; Dola, Frank P.; Thurman, Richard E.; and Siwinski, Paul P., 4,680,423, Cl. 174-36,000.  
Bright, Edward J., 4,679,318, Cl. 79-840,000.  
Corrao, Mark; and Shaffer, David T., 4,680,568, Cl. 337-186,000.  
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,679,319, Cl. 29-843,000.  
Huber, John H., 4,679,895, Cl. 350-96,200.  
Jackson, Charles L., 4,679,887, Cl. 439-849,000.  
Regla, Juan; and Lazaro, Jose, 4,679,876, Cl. 439-426,000.  
Williams, Tom R., 4,679,888, Cl. 439-883,000.  
Amsted Industries Incorporated: See—  
Sieradzki, Christopher; and Jeffreys, Lyman W., 4,679,447, Cl. 73-865,800.  
Sieradzki, Christopher Z., 4,679,358, Cl. 51-165,720.  
Amundson, Anthony P., to Microcom, Inc. Data telecommunications system and method utilizing a multi-mode modem, 4,680,773, Cl. 375-8,000.  
Amundson, Anthony P.; and Melhorn, Nathan, to Microcom, Inc. Data telecommunications system and method with universal link establishment, 4,680,781, Cl. 375-8,000.  
Analogic Corporation: See—  
Neumann, Leopold, 4,680,798, Cl. 381-68,400.  
Andeen, Bruce R., to Helix Technology Corporation. Cooling heat exchanger, 4,679,402, Cl. 62-55,500.  
Anderson, Paul T.; and Irwin, Lawrence, to Babcock & Wilcox Company, The. Vacuum sealing device for insulated steam injection tubing, 4,679,378, Cl. 53-405,000.  
Andersson, Kjell, to Seco Tools AB. Device in rotary tools, 4,679,972, Cl. 408-150,000.  
Ando, Toshio: See—  
Kimura, Akihiro; Ando, Toshio; and Nishihara, Toshikazu, 4,680,218, Cl. 428-195,000.  
Andoh, Shizuo: See—  
Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, 4,680,430, Cl. 178-19,000.  
Andrade, Juan; and Prescher, Gunter, to Degussa Aktiengesellschaft. Process for the producing 2,5-dimethoxytetrahydrofuran and 2,5-dithoxytetrahydrofuran, 4,680,420, Cl. 549-476,000.  
Andros Analyzers Incorporated: See—  
Parnoff, George K.; and Sultan, Steven L., 4,679,573, Cl. 128-716,000.  
Andrus Research Corporation: See—  
Schwartz, Paul; Gill, Devinder S.; and McGrath, Kenneth J., 4,680,308, Cl. 514-492,000.  
Angelety, Albert, Sr. Fishing apparatus, 4,679,346, Cl. 43-20,000.  
Annulus Technical Industries, Inc.: See—  
MacAdam, Donald H., 4,680,433, Cl. 200-16,00D.  
Antezana, Luis F., to Nicholson Manufacturing Corporation. Log-bundling and cutoff apparatus, 4,679,475, Cl. 83-420,000.  
Anthony, James R.; and Lortz, Allan R., to Indiana Mills & Manufacturing, Inc. Remote harness web adjuster, 4,679,852, Cl. 297-464,000.  
Anthony, Jean M., to Tomtec, N.V. Device for performing therapeutic treatments, 4,679,551, Cl. 128-67,000.  
Anton, Alain, to Alstom-Atlantique, S.A. Process and device for electric winding insulation by impregnation, and stabilized varnish without solvent usable therein, 4,680,222, Cl. 428-251,000.  
Aoi, Kazuo; and Tsuchida, Naoki, to Yamaha Hatsudoki Kabushiki Kaisha. Valve arrangement for internal combustion engine, 4,679,532, Cl. 123-90,220.  
Aoki, Daiichi; Nakamura, Yoshinori; Orimoto, Hiroyuki; and Machida, Kazumi, to Nissei ASB Machine Co., Ltd. Biaxially oriented plastic container with excellent heat-resistance and gas barrier properties, 4,680,208, Cl. 428-35,000.  
Aoki, Hatsu: See—  
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsu; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122,000.  
Aoki, Kazuo: See—  
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koihiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121,000.  
Aoki, Motohisa; and Iwanaga, Hirohito, to Mitsubishi Chemical Industries Limited. Method for producing an electrophotographic element, 4,680,246, Cl. 430-133,000.  
Aoki, Takao: See—  
Ikeda, Yoshinori; and Aoki, Takao, 4,680,646, Cl. 358-298,000.  
Aosai, Fumito: See—  
Nakamoto, Hideo; Aosai, Fumito; Fukushima, Hiroshi; and Suda, Eriko, 4,680,368, Cl. 528-49,000.  
Aoyagi, Yoshiki; Suzuki, Masatoshi; Inoue, Tadashi; and Tsukakoshi, Kunio, to Mitsubishi Chemical Industries Ltd. Fire-retarding resin composition and laminated product thereof, 4,680,227, Cl. 428-331,000.  
Appelzweig, Norman, to Progenics, Inc. Treatment of obesity and diabetes using sapogenins, 4,680,289, Cl. 514-172,000.  
Application Engineering Corporation: See—  
Waters, Michael A., 4,680,001, Cl. 425-144,000.  
Applied Medical Technics B.V.: See—  
van Waalwijk van Doorn, Ernst S. C.; de Vries, Joseph D. M.; and de Vries, Franciscus J. M., 4,679,546, Cl. 128-1,00R.  
Ara, Masato: See—  
Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, 4,679,382, Cl. 56-10,100.  
Arad, Abraham A.: See—  
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,680,020, Cl. 446-414,000.

Araki, Shigeru: See—  
Kato, Hideaki; and Araki, Shigeru, 4,680,791, Cl. 380-8,000.  
Araki, Yoshitsugu. Optical parts driving mechanism in optical information reader, 4,680,743, Cl. 369-44,000.  
Aral, Gurcan; and Balakrishnan, Ramesh, to Measurix Corporation. Process for controlling the formation of sheet material, 4,680,089, Cl. 162-198,000.  
Arbisi, Dominic S.; and Replogle, Coy E., to Aeras Water Resources, Inc. Mobile pond aerating system, 4,680,148, Cl. 261-120,000.  
Archer, Virgil L.: See—  
Smith, Donald P.; and Archer, Virgil L., 4,679,542, Cl. 126-21,00A.  
Arima, Yoshitaka: See—  
Hirata, Tadashi; Ikeda, Hidekatsu; Arima, Yoshitaka; and Kashihara, Yoshihiko, 4,679,473, Cl. 83-157,000.  
Arimitsu, Satoshi: See—  
Washizu, Shoichi; Morijiri, Takeshi; Kogure, Kazuo; and Arimitsu, Satoshi, 4,679,668, Cl. 188-353,000.  
Arimune, Hisao: See—  
Yamada, Takashi; Arimune, Hisao; and Maeda, Takashi, 4,680,742, Cl. 369-13,000.  
Arnott, Robert C., to Milliken Research Corporation. Process for heat treating textile substrates to give a colored pattern, 4,680,032, Cl. 8-486,000.  
Arnott, Robert C., to Milliken Research Corporation. High contrast patterning process and product for disperse dyed polyester, 4,680,034, Cl. 8-481,000.  
Arsenian, Sergei G.: See—  
Debabov, Vladimir G.; Tsygankov, Yuri D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Yuri I.; Strongin, Alexander Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Yuri A., 4,680,260, Cl. 435-68,000.  
Artz, Gerd; Figge, Dieter; and Philipp, Clemens, to Fried. Krupp Gesellschaft mit beschränkter Haftung. Guide assembly for a twin-belt continuous casting mold, 4,679,612, Cl. 164-431,000.  
Artzi, Peter; Rottmayr, Hans; and Bauer, Wolfgang, to Schubert & Salzer. Process and apparatus for friction spinning, 4,679,388, Cl. 57-263,000.  
Aruga, Tamotsu: See—  
Murakami, Kakuji; Akutsu, Eiichi; and Aruga, Tamotsu, 4,680,235, Cl. 428-414,000.  
Asada, Masahiro; and Azuma, Miyuki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for isolating polymer, 4,680,381, Cl. 528-501,000.  
Asahi Kasei Kogyo Kabushiki Kaisha: See—  
Kai, Hisao; Ochiai, Kensuke; and Nisato, Takeshi, 4,679,718, Cl. 225-48,000.  
Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Tooru, to Toyo Soda Manufacturing Co., Ltd. Method of polymerizing vinyl monomers with coated reactor, 4,680,349, Cl. 526-62,000.  
Asaka, Toshifumi: See—  
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,680,386, Cl. 536-7,400.  
Asano, Shuichi: See—  
Yamamoto, Kazuo; and Asano, Shuichi, 4,679,821, Cl. 280-808,000.  
Asano, Toru: See—  
Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, 4,680,430, Cl. 178-19,000.  
Asano, Yoshikatsu: See—  
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koihiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121,000.  
Asbill, Clarence M., III: See—  
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., 4,679,583, Cl. 137-84,000.  
Ashida, Kaneyoshi: See—  
Frisch, Kurt C.; and Ashida, Kaneyoshi, 4,680,214, Cl. 428-107,000.  
Assini, John E.; and Kissinger, Paula A., to AMP Incorporated. Shoulder eyelet board lock, 4,679,883, Cl. 439-607,000.  
Associated Mechanical Contractors, Inc.: See—  
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Astra Plastique: See—  
Bonnenfant, Yvon; Odet, Philippe; Perne, Raymond; and Thevenot, Claude, 4,679,696, Cl. 215-252,000.  
AT&T Company: See—  
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AT&T Information Systems Inc.: See—  
Baker, Robin C.; Brown, Steven E.; Lothrop, John R.; Lozyniak, Roman; and Miller, Paul E., 4,680,786, Cl. 379-60,000.  
Atlantic Richfield Company: See—  
Perkins, Thomas K., 4,679,626, Cl. 166-248,000.  
Aubert, Paul: See—  
Leorat, Francois; Coutant, Patrick; and Aubert, Paul, 4,679,988, Cl. 417-218,000.  
Aufiero, James M.: See—  
Wojcik, David R.; Jones, Richard J.; and Aufiero, James M., 4,680,628, Cl. 358-111,000.  
Auger, Genevieve: See—  
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangelios; Martinez, Jean; Blanot, Didier;

Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542,000.  
Aurora Mechatronics Corp.: See—  
Kuo, Calvin, 4,680,455, Cl. 235-146,000.  
Autoliv Development AB: See—  
Emanuelson, Bjorn, 4,679,853, Cl. 297-468,000.  
Automated Packaging Systems, Inc.: See—  
Lerner, Hershey; and Lerner, Bernard, 4,680,205, Cl. 428-29,000.  
Automatic Switch Company: See—  
Vollmer, David J.; and Greame, James E., 4,679,767, Cl. 251-129,150.  
Automobiles Citroen: See—  
Taunay, Claude, 4,679,841, Cl. 296-76,000.  
Automobiles Peugeot: See—  
Taunay, Claude, 4,679,841, Cl. 296-76,000.  
AVX Corporation: See—  
Chan, Ning-Huat, 4,680,670, Cl. 361-275,000.  
Axelrod, Robert J.; and Cooper, Glenn D., deceased (Cooper, executrix; by Rose H.), to General Electric Company. Flame resistant alkenyl aromatic compounds and polymers containing chemically bonded phosphorus and blends with polyphenylene ether, 4,680,342, Cl. 525-132,000.  
Axford, Walter J.; Trumble, Francis R.; and Turner, Charles W., to EMI Limited. Helical antenna array with resonant cavity and impedance matching means, 4,680,591, Cl. 343-853,000.  
Azuma, Miyuki: See—  
Asada, Masahiro; and Azuma, Miyuki, 4,680,381, Cl. 528-501,000.  
B. F. Goodrich Company, The: See—  
Benedikt, George M.; and Barnes, Dennis A., 4,680,380, Cl. 528-485,000.  
Kramer, James H., 4,679,517, Cl. 114-45,000.  
Lee, Biing-lin, 4,680,343, Cl. 525-148,000.  
Yu, Simon H., 4,680,358, Cl. 526-292,900.  
B & J Rocket Rsp A/S: See—  
Holst, Svend; Jensen, Niels; and Jensen, Georg, 4,679,354, Cl. 51-76,00R.  
Baba, Fumio; and Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor memory device, 4,680,734, Cl. 365-190,000.  
Baba, Takeshi: See—  
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Babcock & Wilcox Company, The: See—  
Anderson, Paul T.; and Irwin, Lawrence, 4,679,378, Cl. 53-405,000.  
Knudsen, James K.; Smith, Jane E.; Budan, Victor J.; Wroblewski, David J.; and Skuratovsky, Eugene, 4,679,445, Cl. 73-861,240.  
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangelios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, to Institut National de la Sante et de la Recherche Medicale. Metal polypeptides, 4,680,276, Cl. 436-542,000.  
Bach, Lloyd G.: See—  
Myers, Lawrence R.; Bach, Lloyd G.; and Gaiser, Robert F., 4,679,864, Cl. 303-6,000.  
Back, Gerhard, to Ciba-Geigy Corporation. Metal dye complexes containing an azo or azomethine dye and a colorless ligand with the C=N—N=C group, 4,680,385, Cl. 534-695,000.  
Baerenwald, Philip M.; and Reed, Phillip G., to Kenner Parker Toys Inc. Toy figure with individually posable limbs, 4,680,019, Cl. 446-378,000.  
Baffi, Robert A.: See—  
Wagner, Daniel B.; and Baffi, Robert A., 4,680,275, Cl. 436-518,000.  
Baggen, Constant P. M. J.: See—  
Suzuki, Tadao; Sako, Yoichiro; Furukawa, Shunsuke; Furuya, Tsuneo; and Baggen, Constant P. M. J., 4,680,764, Cl. 371-40,000.  
Bailey, Louis G.: See—  
Harper, James G.; Bailey, Louis G.; McJohnson, Robert B.; Rajagopal, Ganesh; and Walker, Don R., 4,680,811, Cl. 455-617,000.  
Bailleul, Gilles; and Sannes, Tjerk, to U.S. Philips Corporation. Screened cable insulated by means of mineral insulation material and method of manufacturing such a cable, 4,679,317, Cl. 29-828,000.  
Bain, James M.: See—  
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Baits, Stephen S.; and Reynolds, Richard W., to Sundstrand Corporation. Differential transmission mechanism for a constant speed drive, 4,679,462, Cl. 74-687,000.  
Baker, Daniel G.; and Ainsworth, Kenneth M., to Tektronix, Inc. Measurement of SC/H phase using a subcarrier time mark generator and a calibrated phase shifter, 4,680,620, Cl. 358-10,000.  
Baker, Daniel G.; and Feisel, Margaret A., to Tektronix, Inc. Method and apparatus for variable phasing of periodic signals, 4,680,621, Cl. 358-19,000.  
Baker, Richard H.; and Maddox, Edward L., to Gould Inc. MOSFET AC switch, 4,680,490, Cl. 307-575,000.  
Baker, Robin C.; Brown, Steven E.; Lothrop, John R.; Lozyniak, Roman; and Miller, Paul E., to AT&T Company; and AT&T Information Systems Inc. Communication system for providing business communication features to cellular mobile telecommunication customers, 4,680,786, Cl. 379-60,000.  
Baker, Ross G., Jr., to Intermedics, Inc. Low threshold cardiac pacing electrodes, 4,679,572, Cl. 128-786,000.  
Balakrishnan, Ramesh: See—  
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- Ball Corporation: See—  
Doud, Wilbur O.; 4,680,050, Cl. 65-79.000.  
Wert, Ronald D.; Orzulak, James H.; and Sweeney, Christopher L.; 4,680,599, Cl. 340-744.000.
- Ballantyne, David B., to General Motors Corporation. Method of making a lubricated hinge pin. 4,679,285, Cl. 29-11.000.
- Ballentine, Paul H., to Carrier Corporation. Method and apparatus for measuring the pore size of enhanced tubes. 4,679,423, Cl. 73-37.500.
- Balmer, Oskar: See—  
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- Bartscher, Peter: See—  
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- Bates, Wayne C., to Amerock Corporation. Hardware for mounting a window sash. 4,679,352, Cl. 49-192.000.
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- Bauer, John K. Ball joint safety system. 4,679,957, Cl. 403-27.000.
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- Beers, Melvin D., to General Electric Company. One component silicone compositions with good bonding properties. 4,680,363, Cl. 528-14.000.
- Behring, Daniel F. Convertible stand. 4,679,655, Cl. 182-33.000.
- Beilin Solomon I.; and Truong, Long K., to EPID, Inc. Positive particles in electrophoretic display device composition. 4,680,103, Cl. 204-299.00R.
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- Bell & Howell Company: See—  
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- Beltran, Adrian M.: See—  
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- Benest, Glenn: See—  
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- Benson, Inc.: See—  
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- Bertus, Brent J.: See—  
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- Bethlehem Steel Corp.: See—  
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- BF Goodrich Company, The: See—  
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- Billon, Michel: See—  
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- Binet, Jean: See—  
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- Birchfield, Conny. Fish line sinker. 4,679,349, Cl. 43-44.970.
- Bird, Graham J.; Farquharson, Graeme J.; and Watson, Keith G., to ICI Australia Limited. Herbicidal cyclohexane-1,3-dione-5-isquinoline derivatives. 4,680,400, Cl. 546-141.000.
- Birmingham, Virginia A.; and Seno, Eugene T., to Eli Lilly and Company. Method of selecting recombinant DNA-containing streptomycetes. 4,680,265, Cl. 435-172.300.
- Biher, Peter G., to Hercules Incorporated. Fibrous inner web for sheet vinyl flooring goods. 4,680,223, Cl. 428-280.000.
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- Blackmer, David E.; and Townsend, James H., Jr., to Kintek, Inc. Sound encoding system. 4,680,796, Cl. 381-23.000.
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- Blake, William S., to Realex Corporation. Unit dose liquid dispenser. 4,679,714, Cl. 222-449.000.
- Blanchard, Gilbert; and Prigent, Michel, to Pro-Catalyse. Pollution control catalyst for internal combustion engine exhaust gases and process for producing it. 4,680,282, Cl. 502-304.000.
- Blanchard, Pierre; and Cortot, Jean P., to Thomson-CSF. Process for producing silicide or silicon gates for an integrated circuit having elements of the gate-insulator-semiconductor type. 4,679,301, Cl. 29-571.000.
- Bland, Timothy J., to Sundstrand Corporation. Gravity insensitive inventory control device for a two-phase flow system. 4,679,980, Cl. 415-24.000.
- Blandford, Joseph W., to Seahorse Equipment Corporation. Offshore well support miniplatform. 4,679,964, Cl. 405-216.000.
- Blanken, Pieter G.; and van der Zee, Pieter, to U.S. Philips Corporation. Apparatus for reducing beam current measurement errors. 4,680,640, Cl. 358-243.000.
- Blanot, Didier: See—  
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- Blessinger, Kurt V., to Eastman Kodak Company. Timing signal drop-out compensation circuit. 4,680,651, Cl. 360-38.100.
- Blidschun, Benno; and Lierke, Ernst G., to Kolbus GmbH & Co. KG. Process and apparatus for sterilizing containers. 4,680,163, Cl. 422-28.000.
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- Blunden, Donald J., to Thrall Car Manufacturing Company. Vehicle chock block apparatus for railroad car transport of vehicles. 4,679,974, Cl. 410-30.000.
- Blyth, Randolph C.; and Ucci, Pompilio A., to Monsanto Company. Stain resistant nylon fibers. 4,680,212, Cl. 428-97.000.
- Blythin, David J.; and Watkins, Robert W., to Schering Corporation. Tricyclic positive inotropic agents. 4,680,297, Cl. 514-293.000.
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- Bobbio, Stephen M., to Allied Corporation. Etching of dielectric layers with electrons in the presence of sulfur hexafluoride. 4,680,087, Cl. 156-643.000.
- Boberski, William G.: See—  
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- Boddy, Ian; and Gurteen, Shaun, to Britax Wingard Limited. Exterior rearview mirrors for vehicles. 4,679,758, Cl. 248-479.000.
- Boeckmann, Eduard F. B., to GTE Communication Systems, Inc. Telephone security violation detection device. 4,680,783, Cl. 379-6.000.
- Boehmig, Robert. Building construction method. 4,679,374, Cl. 52-745.000.
- Boeing Company, The: See—  
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- Bogardus, Joseph B.: See—  
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- Bogdanovsky, Valentin A.: See—  
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- Boggiano, John: Apparatus and method for processing fava beans having pods and seeds. 4,680,192, Cl. 426-482.000.
- Boggs, Ronald M.: See—  
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- Bois, Daniel: Process for producing zones for the electrical isolation of the components of an integrated circuit. 4,679,304, Cl. 29-576.00W.
- Boit, Jean C.; and Galves, Jean P., to Thomson-CSF. Picture intensifier tube with memorization. 4,680,461, Cl. 250-213.0VT.
- Boiti, Franco: See—  
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- Bolza-Schunemann, Claus A., to Koenig & Bauer Aktiengesellschaft. Edge location measuring head. 4,680,806, Cl. 382-65.000.
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- Bonnenfant, Yvon; Odet, Philippe; Perne, Raymond; and Thevenot, Claude, to Societe Generale des Eaux Minerales de Vittel; and Astra Plastique. Container and sealing assembly. 4,679,696, Cl. 215-252.000.
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- Lech, Thaddeus, Jr.; and Mullard, Bruce A., 4,679,679, Cl. 192-106.200.
- Borg-Warner Corporation: See—  
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- Habel, Paul A., Jr.; and Kulczycki, Elaine S., 4,679,678, Cl. 192-106.200.
- Bork, Edward A.: See—  
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- Bos, Johannes: See—  
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- Boston University, Trustees of: See—  
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- Botto, Paolo: See—  
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- Boulanger, Pierre: See—  
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- Bourns, Inc.: See—  
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- Boutros, Mansour Z. Shipboard transportation simulator and breakbulk cargo table therefor. 4,680,013, Cl. 434-29.000.
- Bove, Bertrand, to Advanced Micro Electronic Components and Systems. Capacitive weighing device. 4,679,643, Cl. 177-210.00C.
- Bowen, Christine M.: See—  
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- Box, Clyde O. Trailer suspension system. 4,679,819, Cl. 280-680.000.
- BP Chemicals Limited: See—  
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- Bracht, Roger R., to Optotech, Inc. Single beam direct read during write and write protect system for use in an optical data storage system. 4,680,594, Cl. 346-108.000.
- Brackett, John R., Jr. Electrical plug lock. 4,679,873, Cl. 439-134.000.
- Bradford, William M.: See—  
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- Bradley, Terry. Log splitter. 4,679,607, Cl. 144-193.00A.
- Bradshaw, Kenneth M.: See—  
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- Bragard, Adolphe: See—  
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- Brandenburg, Darrell L., to General Motors Corporation. Anti-glare rear view mirror. 4,679,906, Cl. 350-281.000.
- Brandenstein, Manfred; Klupfel, Norbert; Pape, Gebhard; Haas, Roland; and Schmiechen, Rolf, to SKF GmbH. Worm gear. 4,679,458, Cl. 74-458.000.
- Bratkowski, Walter V.; and Wafer, John A., to Westinghouse Electric Corp. Integral circuit interrupter with separable modules. 4,680,562, Cl. 335-16.000.
- Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, to WABCO Westinghouse Steuerungstechnik GmbH & Co. Proximity switch in mounting arrangement. 4,680,436, Cl. 200-82.00E.
- Bray, Thomas J., to Cooper Industries, Inc. Recloser control with independent memory. 4,680,706, Cl. 364-492.000.
- Brazeway, Inc.: See—  
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- Breese, Douglas E.: See—  
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- Breier, Alfred: See—  
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- Brems, John H. Weight responsive rotary retardation device. 4,679,666, Cl. 188-290.000.
- Bricas, Evangelios: See—  
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- Bright, Edward J., to AMP Incorporated. Application tool and method for positioning electrical sockets on circuit boards for surface soldering. 4,679,318, Cl. 79-840.000.
- Brignall, Nicolas L.: See—  
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- Brion, Jean-Claude A.; Brunaud, Claude; Jean, Robert P. H.; and Machet, Rene H., to Societe de Verrerie et de Thermometrie. High voltage and high energy storage device and a pulse generator including the application thereof. 4,680,671, Cl. 361-329.000.
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- Bristow, Ian T., to Hobourn-Eaton, Ltd. Variable capacity type pump with damping force on cam ring. 4,679,995, Cl. 418-26.000.
- Britax Wingard Limited: See—  
Boddy, Ian; and Gurteen, Shaun, 4,679,758, Cl. 248-479.000.
- British Aerospace PLC: See—  
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- British Broadcasting Corporation: See—  
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- British Petroleum Company p.l.c., The: See—  
Jee, Trevor P., 4,679,598, Cl. 138-103.000.
- British Postgraduate Medical Federation: See—  
Gray, Charles R. W.; and Crawford, Neville, 4,680,177, Cl. 424-101.000.
- Broch, Orville V.: See—  
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- Brock, Marilyn A.; and Scheffer, Daniel G., to Ohaus Scale Corporation. Spring-type adjustable mounting for weighing scale flexures. 4,679,642, Cl. 177-164.000.
- Brocklebank, Norman; and Cooper, Alan, to J. C. Bamford Excavators Limited. Earth moving machine. 4,679,336, Cl. 37-103.000.
- Brocksieper, Manfred: See—  
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- Bross, Charles F., to Pennwalt Corporation. Optical detecting system for article counting machine. 4,680,464, Cl. 250-223.00R.
- Brother Kogyo Kabushiki Kaisha: See—  
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- Brotherton, Thomas W., to Economy Forms Corporation. Concrete form having adjustable curvature and method for producing same. 4,679,763, Cl. 249-189.000.
- Brown, Boveri & Cie AG: See—  
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- Brown, David M.: See—  
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- Brown, George E., to Allied Corporation. Piston vacuum pump. 4,679,994, Cl. 417-525.000.
- Brown, Richard I.: See—  
Kriger, Robert J.; and Brown, Richard I., 4,680,025, Cl. 604-6.000.

- Brown, Sterling B.; and McFay, Dennis J., to General Electric Company. Blends of polyphenylene ethers with phosphorus-containing polymers. 4,680,329, Cl. 524-143.000.
- Brown, Steven E.: See—  
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- Brozat, Kurt: See—  
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- Brunaud, Claude: See—  
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- Brunner, Hans A.; and Vaughan, Donald E., to Reynolds Metals Company. Method and apparatus for heat sealing. 4,680,073, Cl. 156-250.000.
- Brunswick Corporation: See—  
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- Bryan, James W. Polarized carrier modulation. 4,680,751, Cl. 370-78.000.
- Bryant, Stephen M.; and Speir, Donald J., to United States of America, Air Force. Adaptive fast Fourier transform weighting technique to increase small target sensitivity. 4,680,589, Cl. 342-196.000.
- Bryson, Charles E., III; and Jones, Douglas L., to Kevex Corporation. Electron spectroscopy system for chemical analysis of electrically isolated specimens. 4,680,467, Cl. 250-305.000.
- Bubon, Frank: See—  
Blumenfeld, John F.; and Bubon, Frank, 4,680,051, Cl. 65-346.000.
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- Buchinger, Robert: See—  
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- Buck, Erik S., to United States of America, Air Force. Integral grid/cathode for vacuum tubes. 4,680,500, Cl. 313-348.000.
- Budan, Victor J.: See—  
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- Budd, David L.; and Fowler, David P., to Frito-Lay, Inc. Cross-cut extrusion method. 4,680,191, Cl. 426-439.000.
- Budzich, Tadeusz, to Caterpillar Inc. Compensated fluid flow control valve. 4,679,492, Cl. 91-420.000.
- Buehler, Henry J.: See—  
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- Buhks, Ephraim: See—  
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- Buhler, Steven A.: See—  
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- Bulmahn, Gerald L. Apparatus for extending the frame of a tractor. 4,679,634, Cl. 172-250.000.
- Bunge, Richard H.: See—  
Hokanson, Gerard C.; Bunge, Richard H.; Hurley, Timothy R.; and French, James C., 4,680,416, Cl. 549-292.000.
- Burger, Norman D., to Burger, Norman D.; and Mardesich, Nicholas A., a part interest. Aerosol dispensing system. 4,680,173, Cl. 424-47.000.
- Burhans, Frank M., to Boeing Company, The. Latch system. 4,679,750, Cl. 244-129.400.
- Burkness, Donald C. Self diagnostic Cyclic Analysis Testing System (CATS) for LSI/VLSI. 4,680,761, Cl. 371-25.000.
- Burlington Industries, Inc.: See—  
Zybko, Walter C.; Wald, William; and McClure, Thomas V., 4,680,209, Cl. 428-35.000.
- Burns, William W.: See—  
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- Burton, James A., to Hydral Company. Hawser chain seal assembly. 4,679,800, Cl. 277-34.000.
- Busa, Denis: See—  
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- Busch, Daryle H.: See—  
Ramprasad, Dorai; and Busch, Daryle H., 4,680,037, Cl. 55-16.000.
- Bushman, Matthew J.: See—  
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- Buss, Waldeen C.: See—  
Pandey, Sue D.; and Buss, Waldeen C., 4,680,280, Cl. 502-66.000.
- Bussiere, Guy; Zimmermann, Marius; and Huchette, Michel, to Roquette Freres. Low alcohol beer prepared with hydrogenated starch hydrolyzate. 4,680,180, Cl. 426-16.000.
- Butka, Kemal. Ship with stabilizing device. 4,679,521, Cl. 114-124.000.
- Byrnes, Donn A. Apparatus for simplifying the launching and retrieval of a boat from its trailer. 4,679,812, Cl. 280-406.00A.
- C-I-L Inc.: See—  
Murray, Charles R., 4,680,207, Cl. 428-35.000.
- C. van der Lely N.V.: See—  
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- Cain, Gary L.: See—  
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- Cain, Michael E.: See—  
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- Calder, Iain D.; Macelwee, Thomas W.; and Naem, Abdalla A., to Northern Telecom Limited. Structure and fabrication of vertically integrated CMOS logic gates. 4,680,609, Cl. 357-42.000.
- Calgon Corporation: See—  
Cha, Charles Y.; and Varsanik, Richard G., 4,680,135, Cl. 252-180.000.
- Camand, Michel: See—  
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- Cameron, Alan B.: See—  
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- Camin, Geary E.; and Uken, William D., to Raychem Corporation. Sealing material. 4,680,233, Cl. 428-424.600.
- Camp, Jerald T.: See—  
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- Campanella, Ermen: See—  
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- Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee: See—  
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- Cannon, Robert B., to Robert B. Cannon, Inc. Take-apart fitting for multi-tube heat exchanger. 4,679,622, Cl. 165-154.000.
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- Ikedo, Yoshinori; and Aoki, Takao, 4,680,646, Cl. 358-298.000.
- Itoh, Yuji; and Takahashi, Junichi, 4,679,919, Cl. 351-206.000.
- Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,679,925, Cl. 354-173.100.
- Nakazawa, Tamotsu, 4,680,641, Cl. 358-257.000.
- Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumu, Kouji, 4,679,913, Cl. 350-423.000.
- Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.
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- Suematsu, Koshi; and Imai, Eiichi, 4,680,245, Cl. 430-110.000.
- Suzuki, Nobuyuki; and Shimizu, Masami, 4,679,926, Cl. 354-173.110.
- Takayama, Nobutoshi, 4,680,648, Cl. 360-10.200.
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- Cantwell, Robert H., to Raytheon Company. Radar system with incremental automatic gain control. 4,680,588, Cl. 342-92.000.
- Capelle, Gerd, to Hermann Berstorff Maschinenbau GmbH. Method for monitoring deviations in the dimensions of a continuously extruded profile strip. 4,680,152, Cl. 264-40.400.
- Capshe, Charles E.: See—  
Miro, Nemesio D.; Farha, Floyd E.; and Capshe, Charles E., 4,680,351, Cl. 526-125.000.
- Capuano, Frank G.: See—  
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- Cardiac Pacemakers, Inc.: See—  
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- Carlin Company, The: See—  
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- Carlinswitch, Inc.: See—  
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- Carlson, Gerald J.: See—  
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- Itani, Abdallah M.; Carlson, Gerald J.; and Dietz, Peter W., 4,680,533, Cl. 323-240.000.
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- Carmine, Benjamin C. Attachment for lawn trimmer. 4,679,385, Cl. 56-16.900.



- Carpenter, Richard H., to Commonwealth Technology Incorporated. Helicopter rotor fouling. 4,679,504, Cl. 102-348.000.
- Carrier Corporation: See—  
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- Carrol, Alan, to Trenchbond Limited. Apparatus for the liquid treatment of solids. 4,680,112, Cl. 210-179.000.
- Carron, Claude, to Thomson-CGR. Continuous high d.c. voltage supply particularly for an X-ray emitter tube. 4,680,693, Cl. 363-98.000.
- Carson, Dennis W.; Schmitt, Robert J.; Seneker, Carl A.; Van Kuren, Thomas A.; and Wallace, David R., to PPG Industries, Inc. Flexible primer composition and method of providing a substrate with a flexible multilayer coating. 4,680,346, Cl. 525-486.000.
- Cartmoch, Frederick A.; and Knackstedt, Jack S., to Drazil, Jaromir Vlacav. Material working machine with vibrating tool carrier. 4,679,337, Cl. 37-118.00R.
- Case, Steven K.: See—  
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- Casio Computer Co., Ltd.: See—  
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Sugiyama, Kazuhiro; and Kawai, Yoshio, 4,680,432, Cl. 200-5.00A.  
Sugiyama, Kazuhiro; and Shimazaki, Tatsuo, 4,680,724, Cl. 364-708.000.
- Caspari, Richard B., to Chattanooga Corporation. Drape for arthroscopic surgery. 4,679,552, Cl. 128-132.00D.
- Cassal, Jean-Marie, to Hoffmann-La Roche Inc. Steroids for the treatment of hypercholesterolemia. 4,680,290, Cl. 514-182.000.
- Cassoli, Paolo, to Cassoli s.r.l. Macchine Automatiche Confezionatrici. Automatic bundling machine. 4,679,379, Cl. 53-438.000.
- Cassoli s.r.l. Macchine Automatiche Confezionatrici: See—  
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- Castellani, Giovanni. Shaft-mounted planetary speed-reducing gear unit featuring a balanced, self-aligning and self-distancing ring gear. 4,679,464, Cl. 74-788.000.
- Caterpillar Inc.: See—  
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- Caumont, Jean-Francois, to Tempo Sanys. Method of making a hydrophilic cotton fleece. 4,679,278, Cl. 19-66.00C.
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- Cavestany, Adrian V., to Raypak, Inc. Gas-fired outdoor spa and hot tub heater. 4,679,545, Cl. 126-330.00R.
- Cazaux, Yves: See—  
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- Cedraeus, Hugo: See—  
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- Celanese Corporation: See—  
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Berns, Antonius J. M.; and Gielkens, Arnold L. J., 4,680,176, Cl. 424-89.000.
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- Century Wrecker Corporation: See—  
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- Cerqua, Kathleen A.: See—  
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- Cervantes, Ramiro E., Sr. Automatically adjustable ladder support. 4,679,652, Cl. 182-200.000.
- CGR Ultrasonic: See—  
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- Cha, Charles Y.; and Varsanik, Richard G., to Calgon Corporation. Carboxylic/sulfonic polymer and carboxylic/polyalkylene oxide polymer admixtures for use in iron oxide deposit control. 4,680,135, Cl. 252-180.000.
- Chamberlain, Thomas E.: See—  
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- Chambers, Pauline B.; Bedder, Stephen W.; and Akers, Paul J., to Courtaulds PLC. Polymer compositions. 4,680,335, Cl. 524-501.000.
- Chan, Ning-Huat, to AVX Corporation. Fail safe ceramic capacitor. 4,680,670, Cl. 361-275.000.
- Chan, Tsui C.; and Han, Yu-Pin, to Thomson Components-Mostek Corp. Method of making a trench capacitor and dram memory cell. 4,679,300, Cl. 29-571.000.
- Chand, Subject; and Sadre, Ahmad, to General Electric Co. Recursive methods for world-to-joint transformation for a robot manipulator. 4,680,519, Cl. 318-568.000.
- Chang, Phillip, to International Business Machines Corporation. Magnetic brush developer. 4,679,527, Cl. 118-658.000.
- Chang, Robert: See—  
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- Chang, Yuehsung, to Amoco Corporation. Aqueous recovery of cobalt or cobalt and manganese from solution also containing oxygenated aromatic compounds. 4,680,098, Cl. 204-182.400.
- Chappuis, Clyde L.: See—  
Heldenbrand, Stanley W.; and Chappuis, Clyde L., 4,679,867, Cl. 312-287.000.
- Chapsal, Paul; and Petitimbert, Jean-Francois, to Trailgaz "Cie Generale de l'Ozone". Electric 3-phase supply device for an ozonizer. 4,680,686, Cl. 363-10.000.
- Chase, Fred G., Sr.: See—  
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- Chattanooga Corporation: See—  
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- Chaveron, Henri; Pontillon, Jean; Billon, Michel; Adenier, Herve; and Kamoun, Ahmed, to Clextral. Installation for preparing a chocolate paste. 4,679,498, Cl. 99-483.000.
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- Chen, John Y.; and Henderson, Richard C., to Hughes Aircraft Company. Method of fabricating high density MOSFETs with field aligned channel stops. 4,679,303, Cl. 29-571.000.
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- Collins, Galen: See—  
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- Collins, George J.: See—  
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Carpenter, Richard H., 4,679,504, Cl. 102-348.000.
- Compagnie Generale de Material Orthopedique: See—  
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- Conner, Donald E., to Mallinckrodt, Inc. Benzene sulfonate quaternary ammonium salts of organic sunscreen carboxylic acids. 4,680,144, Cl. 260-501.150.
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- Cook, David J.; and Lim, Nam W., to Unisearch Limited. Building material. 4,680,059, Cl. 106-120.000.
- Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., to Phillips Petroleum Company. Hydrodemetallization of oils with catalysts comprising nickel phosphate and titanium phosphate. 4,680,105, Cl. 208-251.00H.
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- Cooper, Alan: See—  
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- Cooper, Glenn D., deceased: See—  
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- Cooper Industries, Inc.: See—  
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Edwards, Carl H., 4,680,567, Cl. 337-164.000.
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- Corcoran, Dan E. Repositionable directional markers. 4,680,210, Cl. 428-42.000.
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- Courtaulds PLC: See—  
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- Coutant, Patrick: See—  
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- Couture, Michael V.: See—  
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- Coyle, E. Michael; Reichley, Fred J.; Verbrugge, Calvin J.; and Villarreal, John G., to S. C. Johnson & Son, Inc. Fabric finish with alpha olefin resins and process. 4,680,202, Cl. 427-389.900.
- Coyle, William E., Sr. Power tongs controller with persisting torque. 4,679,469, Cl. 81-470.000.
- Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. Substituted-3-(2,3-dihydro-1H-inden-5-yl)-4-hydroxy-1H-pyrrole-2,5-diones. 4,680,414, Cl. 548-544.000.
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- Crook, James C. Digital speed control of motors. 4,680,515, Cl. 318-318.000.
- Crop Control Products Limited: See—  
Pay, Christopher C., 4,679,735, Cl. 239-708.000.
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Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, 4,679,930, Cl. 355-52.000.

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Jarvis, Allan P., Jr.; Koch, George A.; and Abrams, Paul G., 4,680,174, Cl. 424-85.000.

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Dare Products, Inc.: See—  
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Day, Roger A.: See—  
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De La Rue Company PLC, The: See—  
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by De Luca, Raymond F., to Georgia-Pacific Corporation. Device for preventing napkins from bunching at the dispensing opening in a paper napkin dispenser. 4,679,703, Cl. 221-52.000.

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Deseret Medical, Inc.: See—  
Hanlon, Stephen P.; Kerby, Walter L.; Purdy, Edmund R.; and Strom, James, 4,679,567, Cl. 128-675.000.

Detampel, Heinz; Hillemann, Frank; Jobst, Wolfgang; and Prien, Manfred, to General Motors Corporation. Motor vehicle windshield cowl plate. 4,679,845, Cl. 296-192.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Touch responsive musical tone generator. 4,679,478, Cl. 84-1.100.

Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH: See—  
Forster, Jürgen, 4,680,166, Cl. 422-159.000.

Lahr, Helmut; and Pontani, Bernd, 4,680,159, Cl. 376-272.000.

Devall, Jeffrey E.; and Reinke, Ronald E., to Borg-Warner Automotive, Inc. Vapor vent control valve. 4,679,580, Cl. 137-39.000.

de Vries, Franciscus J. M.: See—  
van Waalwijk van Doorn, Ernst S. C.; de Vries, Joseph D. M.; and de Vries, Franciscus J. M., 4,679,546, Cl. 128-1.00R.

de Vries, Joseph D. M.: See—  
van Waalwijk van Doorn, Ernst S. C.; de Vries, Joseph D. M.; and de Vries, Franciscus J. M., 4,679,546, Cl. 128-1.00R.

Dewitte, Elisabeth: See—  
Manoury, Philippe; Binet, Jean; and Dewitte, Elisabeth, 4,680,296, Cl. 514-259.000.

Diafol Company, Limited: See—  
Kanesaki, Tateo; Utsumi, Shigeo; and Tomitaka, Kichinojo, 4,680,217, Cl. 428-141.000.

DiCenzo, Daniel A., to NCR Corporation. Interface circuit for connecting peripheral equipment to a computer terminal. 4,680,732, Cl. 364-900.000.

Dickerson, Arthur F. Inverter for use with solar arrays. 4,680,690, Cl. 363-43.000.

Diehl GmbH & Co.: See—  
Kriz, Helmut; and Stadler, Hansjörg, 4,679,915, Cl. 350-611.000.

Rommel, Jochen; and Buchinger, Robert, 4,679,776, Cl. 267-140.100.

Rudenaer, Werner; Furst, Wilhelm; and Liebl, Norbert, 4,679,503, Cl. 102-208.000.

Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Müller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Joachim; Rof, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal benzodisulfam derivative, compositions and method of use therefor. 4,680,052, Cl. 71-91.000.

Dietch, Leonard, to Zenith Electronics Corporation. Method for shadow mask protection during manufacture. 4,680,196, Cl. 427-68.000.

Dietz, Peter W.: See—  
Itani, Abdullah M.; Dietz, Peter W.; and Carlson, Gerald J., 4,680,532, Cl. 323-240.000.

Itani, Abdullah M.; Carlson, Gerald J.; and Dietz, Peter W., 4,680,533, Cl. 323-240.000.

Dilella, Antonio, to NCR Corporation. Method and apparatus for isolating image data for character recognition. 4,680,803, Cl. 382-9.000.

Dill, Walter R.; Walker, Michael L.; and Ford, William G. F., to Halliburton Company. Composition and method of stimulating subterranean formations. 4,679,631, Cl. 166-307.000.

Dilouya, Gilbert, to Cibie Projecteurs. Motor vehicle main beam headlamp incorporating an elliptical reflector and a parabolic reflector. 4,680,679, Cl. 362-61.000.

Di Manno, Richard A.: See—  
Bilech, Harry A.; Di Manno, Richard A.; and Gorka, Robert J., 4,680,337, Cl. 525-53.000.

DiMarco, Bernard; and Stanford, Charles W., to Siemens-Allis, Inc. Multi-pole molded case circuit breaker with a common contact operating crossbar member. 4,680,564, Cl. 335-16.000.

Di Marco, Joel E.: See—  
Goldsmith, Wesley R.; and Di Marco, Joel E., 4,679,329, Cl. 33-538.000.

DiMatteo, Paul; and Chubb, Charles F., to Nova Technologies, Inc. Reclinable wheelchair apparatus. 4,679,259, Cl. 5-81.00R.

Dimier, Jean P.: See—  
Pascal, Roger; and Dimier, Jean P., 4,679,815, Cl. 280-618.000.

Dirck, Ronald L. Removable cab top for vehicles. 4,679,847, Cl. 296-218.000.

Dismon, Peter: See—  
Weidenhaupt, Wolfgang; and Dismon, Peter, 4,679,387, Cl. 57-212.000.

Disposito, Gary J.; Mather, Larry R.; and Meyer, John D., to Hewlett-Packard Company. Method for rendering gray scale images with variable dot sizes. 4,680,645, Cl. 358-298.000.

Dix, James S.: See—  
Leland, John E.; Dix, James S.; and Wright, Roy F., 4,680,326, Cl. 524-106.000.

Do, Phuc K.; Goodwin, Joel G.; and Krull, Nicholas J., to International Business Machines Corporation. Mechanism for positioning an output member. 4,680,524, Cl. 318-696.000.

Dockrey, Jasper W.: See—  
Thomas, Patrick K.; Hartman, Dennis C.; and Dockrey, Jasper W., 4,680,086, Cl. 156-643.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: See—  
Srock, Rainer; Herrmann, Ursula; and v. Rotberg, Bernhard, 4,679,820, Cl. 280-781.000.

Ziegler, Gerhard; Gregotsch, Karl; and Herrmann, Rudolf, 4,680,493, Cl. 310-62.000.

Dodey, Pierre: See—  
Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, 4,680,402, Cl. 546-235.000.

Dohrer, Gregory L.; and Knight, George W., to Dow Chemical Company, The. Insect resistant polyethylene composition suitable for wire and cable applications. 4,680,328, Cl. 524-137.000.

Dola, Frank P.: See—  
Bennett, Glenn E.; Look, Raymond J.; Dola, Frank P.; Thurman, Richard E.; and Siwinski, Paul P., 4,680,423, Cl. 174-36.000.

Doland, George D. Autoclock circuit for error correcting block decoders. 4,680,765, Cl. 371-42.000.

Dolganov, Grigory M.: See—  
Debabov, Vladimir G.; Tsygankov, Yuri D.; Chistoserov, Andrei J.; Sverdllov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Yuri I.; Strongin, Alexander Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Yuri A., 4,680,260, Cl. 435-68.000.

Dolman, Rodney A.: See—  
Englund, Arvid E.; Wynn, Stephen R.; Dolman, Rodney A.; High-ton, Frederick J.; and Harris, Rickey D., 4,680,749, Cl. 370-11.000.

Donn Incorporated: See—  
Shirey, Richard, 4,679,375, Cl. 52-777.000.

Donner, Hans-Gunter: See—  
Wernicke, Ubbö; Meckl, Heinz; Donner, Hans-Gunter; and Frosch, Jürgen, 4,680,123, Cl. 210-683.000.

Donohie, Paul J.; Gray, Gary L.; and Capuano, Frank G., to Rendoll Paper Company. Carton and blank for packaging ice cream or the like. 4,679,694, Cl. 206-611.000.

Dorda, Gerhard: See—  
Schmitt-Landsiedel, Doris; and Dorda, Gerhard, 4,680,481, Cl. 307-279.000.

Dorr-Oliver Incorporated: See—  
Culkin, Joseph B., 4,679,439, Cl. 73-61.400.

Dosaj, Vishu D.; and Rauchholz, Alvin W., to Dow Corning Corporation. Plasma smelting process for silicon. 4,680,096, Cl. 204-164.000.

Doskocil, Walter: See—  
Müller, Johann; Trieschmann, Christa; Doskocil, Walter; and Preiner, Gerhard, 4,680,365, Cl. 528-15.000.

Doss, James D., to United States of America, Energy. Implantable apparatus for localized heating of tissue. 4,679,561, Cl. 128-422.000.

Dothan, Felix: See—  
Lund, Walter; Berman, Lou; and Dothan, Felix, 4,679,570, Cl. 128-715.000.

Dotzler, Josef; and Meier, Johann, to Grammer Sitzsysteme GmbH. Spring arrangement. 4,679,760, Cl. 248-602.000.

Doud, Wilbur O., to Ball Corporation. Glassware molding machine with unitary axis molding and method of molding glassware. 4,680,050, Cl. 65-79.000.

Dougherty, Robert C., to Durodyne, Inc. High tensile strength removable hose covering. 4,679,600, Cl. 138-128.000.

Doughty, John: See—  
Seddon, Alan E.; and Doughty, John, 4,679,672, Cl. 191-41.000.

Douglas, Barry D.; and McCurdy, Frederick A., to General Motors Corporation. Quick disconnect device. 4,679,956, Cl. 403-14.000.

Douglas, William A., to United Technologies Automotive, Inc. Hot applied, expandable sealer. 4,680,316, Cl. 521-89.000.

Dow Chemical Company, The: See—  
Crump, Druce K.; Simon, Jaime; and Wilson, David A., 4,680,396, Cl. 544-337.000.

Dohrer, Gregory L.; and Knight, George W., 4,680,328, Cl. 524-137.000.

Evans, Thomas E.; and Bowen, Christine M., 4,680,211, Cl. 428-65.000.

Flores, David P.; Meiller, John G.; and Massie, James D., 4,680,357, Cl. 526-265.000.

Fujioka, George S., 4,680,406, Cl. 546-345.000.

Hefner, Robert E., Jr., 4,680,378, Cl. 528-322.000.

Kelch, Robert H., 4,680,234, Cl. 428-461.000.

Lipp, Charles W., 4,679,733, Cl. 239-432.000.

Miller, Theodore E., Jr.; and Iskandarani, Ziad, 4,679,428, Cl. 73-61.10C.

Solc, Jitka, 4,680,200, Cl. 427-213.340.

Treybig, Duane S., 4,680,347, Cl. 525-519.000.

Wang, Pen C., 4,680,410, Cl. 548-231.000.

Williams, Janet C., 4,680,370, Cl. 528-167.000.

Dow Corning Corporation: See—  
Dosaj, Vishu D.; and Rauchholz, Alvin W., 4,680,096, Cl. 204-164.000.

Draeger, Erich, to Veglia. Probe for measuring the level of a liquid. 4,679,432, Cl. 73-295.000.

Drayer, William, to General Motors Corporation. Integral evaporator and accumulator for air conditioning system. 4,679,410, Cl. 62-503.000.



- Drazil, Jaromir Vaclav: See—  
Carternack, Frederick A.; and Knackstedt, Jack S., 4,679,337, Cl. 37-118.00R.
- Dreibelbis, Richard L.; and Hunt, Oliver L., to Du Pont de Nemours, E. I., and Company. Spinneret having groups of orifices with various interorifice spacing. 4,679,998, Cl. 425-72.00S.
- Dresser Europe S.A.: See—  
Kok, Frans J. J. A., 4,679,830, Cl. 285-323.000.
- Dresser Industries, Inc.: See—  
Crawford, Micheal B., 4,679,640, Cl. 175-374.000.  
Kleeb, Thomas R., 4,680,279, Cl. 501-124.000.  
Wolff, Harold E., 4,679,584, Cl. 137-269.000.
- Drexler, Jerome, to Drexler Technology Corporation. Data system employing wallet-size optical card. 4,680,456, Cl. 235-454.000.
- Drexler, Jerome, to Drexler Technology Corporation. Laser recording and storage medium. 4,680,458, Cl. 235-487.000.
- Drexler, Jerome, to Drexler Technology Corporation. Updatable micrographic pocket data card. 4,680,459, Cl. 235-487.000.
- Drexler, Jerome, to Drexler Technology Corporation. System and method for making recordable wallet-size optical card. 4,680,460, Cl. 235-488.000.
- Drexler Technology Corporation: See—  
Drexler, Jerome, 4,680,456, Cl. 235-454.000.  
Drexler, Jerome, 4,680,458, Cl. 235-487.000.  
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Drexler, Jerome, 4,680,460, Cl. 235-488.000.
- Driskel, Stephen P., to BICC Public Limited Company. Optical fibre element for use in an optical cable. 4,679,897, Cl. 350-96.230.
- Druffel, Erich, to Durkoppwerke GmbH. Thread-tensioning device for a bobbin housing. 4,679,513, Cl. 112-229.000.
- DuBois, Donald W.: See—  
Darlington, W. Bruce; and DuBois, Donald W., 4,680,101, Cl. 204-295.000.
- Ducharme, Gerard E.: See—  
Smith, Gordon M.; Chase, Fred G., Sr.; and Ducharme, Gerard E., 4,679,764, Cl. 251-14.000.
- Dueringer, Rudi, to S. Franzen Sohne GmbH & Co. Closure mechanism for suitcases or the like. 4,679,833, Cl. 292-113.000.
- Duforestel, Guy G.; Lechaczynski, Michel A.; Poiraud, Clement Y.; and Viallon, Paul P., to International Business Machines Corporation. Device for serializing/deserializing bit configurations of variable length. 4,680,733, Cl. 364-900.000.
- Dumas, Phillip E.: See—  
Stockel, Richard F.; and Dumas, Phillip E., 4,680,286, Cl. 514-23.000.
- Dumoulin, Charles L., to General Electric Company. Methods of, and pulse sequences for, the suppression of undesired resonances by generation of quantum coherence in NMR imaging and spectroscopy. 4,680,546, Cl. 324-307.000.
- Dunkley, Rowland A. G.: See—  
Etherington, Harry J. C.; Joslin, Paul C.; and Dunkley, Rowland A. G., 4,680,801, Cl. 382-3.000.
- Dunlop, Raymond B.; and Taylor, William E. G. Gravity pipe transport system. 4,679,704, Cl. 222-56.000.
- Dunski, Neil; Bazzi, Ali A.; and Buehler, Henry J., to Mallinckrodt, Inc. Anti-oxidant isocyanurate ester of thioamidophenol and polyolefins stabilized therewith. 4,680,325, Cl. 524-101.000.
- Du Pont de Nemours, E. I., and Company: See—  
Coker, James N., 4,680,344, Cl. 525-176.000.
- Dreibelbis, Richard L.; and Hunt, Oliver L., 4,679,998, Cl. 425-72.00S.
- Forrest, Albert W., Jr., 4,679,283, Cl. 26-73.000.
- Hasircoglu, Alexander W., 4,679,868, Cl. 439-495.000.
- Janowicz, Andrew H.; and Melby, Lester R., 4,680,352, Cl. 526-147.000.
- Schober, Manfred, 4,680,251, Cl. 430-306.000.
- Wallace, Lawrence R., 4,680,334, Cl. 521-406.000.
- Weed, Gregory C., 4,680,249, Cl. 430-281.000.
- Dupre, Milburn E. Energy conserving refrigeration apparatus and method. 4,679,986, Cl. 417-53.000.
- Durholz, Friedrich: See—  
Skipka, Guido; and Durholz, Friedrich, 4,680,146, Cl. 260-505.00R.
- Durkoppwerke GmbH: See—  
Druffel, Erich, 4,679,513, Cl. 112-229.000.
- Durl, Bernd; Bos, Johannes; Ong, Sienling; Raffel, Peter; and Brozat, Kurt, to Hoechst Aktiengesellschaft. Process for producing white and colored resists on polyamide fiber materials using reactive dye in free vinyl sulphone form. 4,680,033, Cl. 8-449.000.
- Durodyne, Inc.: See—  
Dougherty, Robert C., 4,679,600, Cl. 138-128.000.
- Duruz, Jean-Jacques, to ELTECH Systems Corporation. Method for producing aluminum, aluminum production cell and anode for aluminum electrolysis. 4,680,094, Cl. 204-67.000.
- Dvorak, Robert E.; and Fattedad, Frank D. Board game apparatus representing transportation. 4,679,798, Cl. 273-254.000.
- Dyer, Christopher K., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method for restoring the lost capacity of nickel batteries and batteries formed thereby. 4,680,241, Cl. 429-49.000.
- Dyer, Hugh D.: See—  
Galvin, Aaron A.; Dyer, Hugh D.; and Leff, Kenneth J., 4,679,881, Cl. 439-392.000.
- Dynamit Nobel Aktiengesellschaft: See—  
Kuhnel, Werner; and Spielau, Paul, 4,680,317, Cl. 521-89.000.
- Dynisco, Inc.: See—  
Wareham, William, 4,679,438, Cl. 73-726.000.
- Dziedzic, Jerome J., to Flur Wire & Metal Inc. Workpiece holder for coating processes. 4,679,526, Cl. 118-503.000.
- E.G.O. Elektro-Gerate Blanc u. Fischer: See—  
Fischer, Karl; Schreder, Felix; and Kicherer, Robert, 4,680,452, Cl. 219-449.000.
- E.I. Du Pont de Nemours and Company: See—  
Hesson, David P., 4,680,299, Cl. 514-311.000.
- Levitt, George; and Zimmerman, William T., 4,680,053, Cl. 71-93.000.
- E. R. Squibb & Sons, Inc.: See—  
Opie, Eric A.; and Clement, Thomas J., 4,679,557, Cl. 128-305.000.  
Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, 4,680,388, Cl. 540-203.000.
- Treuner, Uwe D., 4,680,409, Cl. 548-194.000.
- Eastern Company, The: See—  
Weinerman, Lee S.; and Vargus, Joel T., 4,679,835, Cl. 292-197.000.
- Eastman Kodak Company: See—  
Blessinger, Kurt V., 4,680,651, Cl. 360-38.100.
- Cumbo, Peter E.; and Fricker, Robert F., 4,680,259, Cl. 435-11.000.
- Maskasky, Joe E., 4,680,254, Cl. 430-567.000.
- Maskasky, Joe E., 4,680,255, Cl. 430-567.000.
- Maskasky, Joe E.; and Jones, Ralph W., 4,680,256, Cl. 430-567.000.
- Washburn, William N.; and Hollister, Kenneth R., 4,680,356, Cl. 526-256.000.
- Ebara Corporation: See—  
Yamada, Koichi; Hiraiwa, Ichiro; Taniguchi, Shin; and Zengo, Toshinari, 4,680,109, Cl. 210-103.000.
- Ebinuma, Ryuichi; Hattori, Yoshifumi; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Ink jet recorder with improved system for transporting ink to or from recording heads. 4,680,696, Cl. 346-75.000.
- Ecklund, Lawrence M., to Motorola, Inc. Dual purpose variable Q filter. 4,680,795, Cl. 381-15.000.
- Ecolab Inc.: See—  
Heile, Bernard J.; and Klos, Terry J., 4,680,134, Cl. 252-160.000.
- Economy Forms Corporation: See—  
Brotherton, Thomas W., 4,679,763, Cl. 249-189.000.
- Ed. Zublin Aktiengesellschaft: See—  
Glaser, Eberhard; and Beitingger, Eberhard, 4,679,965, Cl. 405-258.000.
- Edelstein, William A.; Schenck, John F.; Mueller, Otward M.; and Hayes, Cecil E., to General Electric Company. Radio frequency field coil for NMR. 4,680,548, Cl. 324-318.000.
- Edelstein, William A.: See—  
O'Donnell, Matthew; Karr, Steven G.; Barber, William D.; Wang, Jish M.; and Edelstein, William A., 4,680,551, Cl. 324-320.000.
- Edge, David J.; Naik, Appaya R.; and Scott, Melvin, to Lever Brothers Company. Detergent compositions. 4,680,143, Cl. 252-553.000.
- Edmondson, James G., to Betz Laboratories, Inc. Method of scavenging hydrogen sulfide. 4,680,127, Cl. 210-749.000.
- Edwards, Carl H., to Cooper Industries, Inc. Time delay electric fuse. 4,680,567, Cl. 337-164.000.
- Edwards, Jonathan; Waller, David L.; and May, Michael D., to Immos Limited. High density ROM in separate isolation well on single with chip. 4,680,698, Cl. 364-200.000.
- Edwards, Richard B.: See—  
Clarke, Terence A.; Edwards, Richard B.; and Irving, Graeme N., 4,680,132, Cl. 252-108.000.
- Efron, Uzi; and Soffer, Bernard H., to Hughes Aircraft Company. Dual liquid-crystal cell-based visible-to-infrared dynamic image converter. 4,679,910, Cl. 350-335.000.
- Egawa, Yoshinori, to Yamaichi Electric Mfg. Co., Ltd. IC package connector. 4,679,871, Cl. 439-70.000.
- Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. Benzopyrans. 4,680,404, Cl. 546-269.000.
- Egri, Janos: See—  
Bezzegh, Denes; Magyar, Karoly; Kelemen, Jozsef; Zalai, Gabor; Mandi, Attila; and Egri, Janos, 4,680,315, Cl. 514-738.000.
- EGYT Gyogyszervegyezeti Gyar: See—  
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- Eimer, Klaus; and Gebhardt, Wolfgang, to Taprogge Gesellschaft mbH. Sieve arrangement for recovering cleaning particles from a cooling-water stream downstream of a heat exchanger. 4,680,113, Cl. 210-181.000.
- Eisenblatter, Gerd. Lamellar end grinding wheel. 4,679,360, Cl. 51-337.000.
- Eklund, Karl-Erik, to Oy Wartsila AB. Arrangement in a roll wrapping apparatus for the application of headers. 4,679,376, Cl. 53-137.000.
- Eklund, Dan, to Oy Wartsila AB. Arrangement for web coating. 4,679,524, Cl. 118-122.000.
- Elcorsy Inc.: See—  
Castegnier, Adrien, 4,680,097, Cl. 204-180.100.
- Electricite de France Service National: See—  
Mancel, Gerard, 4,679,529, Cl. 122-441.000.
- Electrohome Limited: See—  
Waldeck, Gerald, 4,680,555, Cl. 331-108.00D.
- Eli Lilly and Company: See—  
Birmingham, Virginia A.; and Seno, Eugene T., 4,680,265, Cl. 435-172.300.
- Eller, Dennis E. Motorboat propeller guard for improved performance. 4,680,017, Cl. 440-66.000.
- Elliott Turbomachinery Co., Inc.: See—  
Strickler, Roger D., 4,679,399, Cl. 60-646.000.
- Ellis, Leslie G., to Rodger, Ian Gordon. Crusher having opposed and balanced driver jaws. 4,679,742, Cl. 241-266.000.

- Elmasry, Mohamed A., to Minnesota Mining and Manufacturing Company. Polymeric cyanine dye. 4,680,375, Cl. 528-253.000.
- Elpan, Aps: See—  
Keldmann, Erick C. V., 4,679,617, Cl. 165-56.000.
- ELTECH Systems Corporation: See—  
Duruz, Jean-Jacques, 4,680,094, Cl. 204-67.000.
- Emanuelson, Bjorn, to Autoliv Development AB. Seat belt anchorage. 4,679,853, Cl. 297-468.000.
- Emhart Industries, Inc.: See—  
Blumenfeld, John F.; and Bubon, Frank, 4,680,051, Cl. 65-346.000.
- EMI Limited: See—  
Axford, Walter J.; Trumble, Francis R.; and Turner, Charles W., 4,680,591, Cl. 343-853.000.
- Engineering Measurements Co.: See—  
Miller, Charles E.; Schlatter, Gerald L.; and Yoshida, Louis T., 4,679,947, Cl. 374-42.000.
- England, Thomas R.: See—  
Schultz, Roy D.; England, Thomas R.; and Altizor, C. Clark, 4,679,313, Cl. 29-596.000.
- Englund, Arvid E.; Wynn, Stephen R.; Dolman, Rodney A.; Highton, Frederick J.; and L'Arris, Rickey D., to General Electric Company. Duplex radio transceiver having improved data/tone and audio modulation architecture. 4,680,749, Cl. 370-11.000.
- Enichem Elastomeri S.p.A.: See—  
Roggero, Arnaldo, 4,680,407, Cl. 546-348.000.
- Enomoto, Hiromu: See—  
Tahara, Akinori; Enomoto, Hiromu; and Yasuda, Yasushi, 4,680,600, Cl. 357-15.000.
- Ensci Incorporated: See—  
Horiuchi, Tetsuro, 4,680,277, Cl. 501-27.000.
- Enviro-Spray Systems, Inc.: See—  
Magid, David J.; Svitila, Barbara; and Kalriess, William, 4,679,706, Cl. 222-130.000.
- Environmental Management Associates, Inc.: See—  
Ward, Irl E., 4,680,133, Cl. 252-153.000.
- EPID, Inc.: See—  
Beilin Solomon I.; and Truong, Long K., 4,680,103, Cl. 204-299.00R.
- Eppink, Jay M., to Hughes Tool Company. Downhole progressive cavity type drilling motor with flexible connecting rod. 4,679,638, Cl. 175-107.000.
- Eppstein, Lee B.; Mohler, Robert D.; and Reuveny, Shaul, to New Brunswick Scientific Company, Inc. Fermentor control system. 4,680,267, Cl. 435-289.000.
- Erie Scientific Company: See—  
Rosenberg, H. James, 4,679,914, Cl. 350-534.000.
- Eriksson, Bo G.: See—  
Petitjean, Robert; and Eriksson, Bo G., 4,679,729, Cl. 237-8.00R.
- Erma Optical Works, Ltd.: See—  
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.
- Ernst, Helmut; Breier, Alfred; Schwalbach, Manfred; Will, Karl-Heinz; Cameron, Alan B.; and Bates, Peter C., to Metallgesellschaft Aktiengesellschaft; and New Zealand Steel Ltd. Apparatus for removing oversize from the hot material discharged from a rotary kiln used to produce sponge iron by a direct reduction of iron oxide containing materials. 4,680,009, Cl. 432-117.000.
- Ersfeld, Heinrich: See—  
Schulte, Klaus; and Ersfeld, Heinrich, 4,680,003, Cl. 425-206.000.
- Esselte Moto International GmbH: See—  
Volk, Heinrich, 4,679,500, Cl. 101-111.000.
- Esselte Pendaflax Corporation: See—  
Hetzler, Norbert, 4,679,339, Cl. 40-10.00R.
- Etablissements les fils d'Auguste Chomarat et Cie: See—  
Fourizon, Andre, 4,680,213, Cl. 428-105.000.
- Este, Grantley O., to Northern Telecom Limited. Surface acoustic wave devices. 4,680,497, Cl. 310-313.00C.
- Estis, Leonard F.; Evans, Sean A.; and Testa, Douglas, to Interferon Sciences, Inc. Interferon administration vehicles. 4,680,175, Cl. 424-85.000.
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- Evans, Sean A.: See—  
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- Ewing, James H., to MKS Instruments, Inc. Flowmeter-controlled valving. 4,679,585, Cl. 137-486.000.
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- Exxon Chemical Patents Inc.: See—  
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- Exxon Research and Engineering Company: See—  
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- Eylon, Daniel: See—  
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- Factor, Arnold; and Patel, Gautam A., to General Electric Company. Abrasion and UV resistant coating compositions. 4,680,232, Cl. 428-412.000.
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- Falcon Jet Corporation: See—  
Ryan, James M.; and Gilmore, Arthur H., 4,679,749, Cl. 244-122.00R.
- Fallier, Charles N., Jr.; and Lester, James N., to GTE Laboratories, Inc.; and GTE Products Corporation. Method and apparatus for starting high intensity discharge lamps. 4,680,509, Cl. 315-290.000.
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- Farha, Floyd E.: See—  
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- Farkas, Frank J., to General Motors Corporation. Drainscock and drain hole for a liquid vessel. 4,679,618, Cl. 165-71.000.
- Farquharson, Graeme J.: See—  
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- Farrell, John J., to Wedco Inc. Method and apparatus for producing multilayered plastic containing sheets. 4,680,072, Cl. 156-243.000.
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- Fegan, Stuart G.: See—  
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- Fennig, Jeffrey A.: See—  
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- Fernsler, Ronald E.: See—  
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- Ferriere Nord SpA: See—  
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- Ferriola, John J.: See—  
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- Ferro Corporation: See—  
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- Fest, Christa: See—  
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- Fester, Earl L.: Infrared space heater, 4,680,448, Cl. 219-365.000.
- Fettig, Robert P.; Bushman, Matthew J.; and Miller, Glenn M., to Kelley Company Inc.: Dock seal, 4,679,364, Cl. 52-173.0DS.
- F'Geppert, Erwin, to United States of America, Army: Concave-conver gear pair having staggered teeth, 4,679,459, Cl. 74-460.000.
- Fidler, Jerry D.: See—  
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- Field, Anthony J., to U.S. Philips Corporation: Apparatus for processing digital video signals to produce a television image by line and field sequential scanning, 4,680,630, Cl. 358-160.000.
- Field, Bruce F.; and Kasper, Joseph G., to Tennant Company: Automatic tool force compensator for a surface maintenance machine, 4,679,271, Cl. 15-49.000.
- Fields, Eddie L.: Self-tripping rippers, 4,679,635, Cl. 172-260.500.
- Figge, Dieter: See—  
Anz, Gerd; Figge, Dieter; and Philipp, Clemens, 4,679,612, Cl. 164-431.000.
- Figgie International Inc.: See—  
Mitchell, Hal D.; and Walker, Donald R., 4,679,253, Cl. 2-2.000.
- Fineblum, Solomon S., to American Telephone and Telegraph Company, AT&T Bell Laboratories: Connector contact terminal, 4,679,890, Cl. 439-884.000.
- Finfinger, Gerald L.; King, Roger L.; and Marshall, Thomas E., to United States of America, Interior: Gas content determination of evaporite formations using acoustic emissions during dissolution, 4,679,435, Cl. 73-594.000.
- Finn, Chris J.; and Youngner, Daniel W., to Honeywell Inc.: Process for controlling mobile ion contamination in semiconductor devices, 4,679,308, Cl. 29-576.00B.
- Finnegan, John P.: See—  
Chiampas, George E.; Finnegan, John P.; and Villegas, Henry, 4,680,495, Cl. 310-220.000.
- Firestone, Raymond A.; and Barker, Peter L., to Merck & Co., Inc.: Substituted azetidines as anti-inflammatory and antidegenerative agents, 4,680,391, Cl. 540-355.000.
- Fischer, Bruno: See—  
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- Fischer, Karl; Schreder, Felix; and Kicherer, Robert, to E.G.O. Elektro-Gerate Blanc u. Fischer: Electric hotplate with a thermostat, 4,680,452, Cl. 219-449.000.
- Fish, Donald D., to W. F. Meyers Company, Inc.: Belt-configured saw for cutting slots into stone, 4,679,541, Cl. 125-21.000.
- Fish, William R.: See—  
Blau, David A.; and Fish, William R., 4,679,568, Cl. 128-696.000.
- Fisher, Leonard A., to Carlin Company, The: Blower augmentor for power oil and power gas burners, 4,680,006, Cl. 431-265.000.
- Fisher Scientific Company: See—  
Kelln, Norman G., 4,680,164, Cl. 422-72.000.
- Fisherman, Carl; and Beare, Eric, to Photo Audio Consumer Electronics Marketing Corporation: Integral book cover and reading light, 4,680,681, Cl. 362-98.000.
- Fitt, Peter W., to I C Gas International Limited: Absorption refrigeration cycle, 4,679,409, Cl. 62-476.000.
- Fitzgerald, William V.; Fernsler, Ronald E.; and Nortrup, Kevin E., to RCA Corporation: Video apparatus for generating a conductively isolated control signal, 4,680,511, Cl. 315-411.000.
- Flach, Werner, to Siemens Aktiengesellschaft: Data network interface module with circuitry for disconnecting a module that has lost supply voltage, 4,680,431, Cl. 178-69.00R.
- Flamholz, Alexander L., to International Business Machines Corporation: Defect detection in films on ceramic substrates, 4,679,938, Cl. 356-237.000.
- Fleenor, Richard P.: See—  
Sheehan, Neil J.; Oppenlander, Jon E.; and Fleenor, Richard P., 4,679,446, Cl. 73-864.130.
- Fletcher, Gary S., Jr.: See—  
Fuller, Milton E.; and Fletcher, Gary S., Jr., 4,679,426, Cl. 73-53.000.
- Flindt, Werner; and Noll, Hans, to Klockner Wilhelmsburger GmbH: Method and apparatus for welding two pipes along their line of penetration, 4,679,722, Cl. 228-168.000.
- Fling, Russell T.: See—  
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- Florence, Max, to Sulcabrush Inc.: Toothbrush, 4,679,272, Cl. 15-106.000.
- Flores, David P.; Meiller, John G.; and Massie, James D., to Dow Chemical Company, The: Interpolymers of ethylene and alkenyl pyridines and preparation thereof, 4,680,357, Cl. 526-265.000.
- Flow Industries, Inc.: See—  
Olsen, John H., 4,679,826, Cl. 285-149.000.
- Fluckiger, Ernst: See—  
Herczeg, Julius-Ludwig; Lenhard, Martin; and Fluckiger, Ernst, 4,680,198, Cl. 427-164.000.
- Flur Wire & Metal Inc.: See—  
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- FMC Corporation: See—  
Lambrecht, Emiel, 4,679,474, Cl. 83-171.000.
- Focke & Co., (GmbH & Co.): See—  
Focke, Heinz; and Balmer, Oskar, 4,680,024, Cl. 493-197.000.
- Focke, Heinz; and Balmer, Oskar, to Focke & Co., (GmbH & Co.): Apparatus for producing bags from a tubular sheet of thermally weldable film material, 4,680,024, Cl. 493-197.000.
- Fogelberg, Mark J., to Borg-Warner Corporation: Transmission anti-clash and anti-rattle brake, 4,679,663, Cl. 188-82.100.
- Fogg, Stephen W., to Bendix Limited: Two-circuit fluid pressure control valve, 4,679,594, Cl. 137-627.500.
- Fong, Dodd W., to Nalco Chemical Company: Carboxylate containing modified acrylamide polymers, 4,680,339, Cl. 525-54.110.
- Ford, David M., to Ford Motor Company: Assembly for mounting a vibrating body, 4,679,759, Cl. 248-562.000.
- Ford Motor Company: See—  
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- Pietryk, Erwin; and Rauthmann, Axel, 4,679,983, Cl. 415-152.00A.
- Thorn, John E.; and Burns, William W., 4,679,698, Cl. 220-86.00R.
- Ford, William G. F.: See—  
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- Forester, David R.; and Reid, Dwight K., to Betz Laboratories, Inc.: Composition and method for coke retardant during pyrolytic hydrocarbon processing, 4,680,421, Cl. 585-648.000.
- Forgacs, Lilla: See—  
Keve, Tibor; Zsador, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.
- Forman, Harold: Label resealing container, 4,679,693, Cl. 206-610.000.
- Forrest, Albert W., Jr., to Du Pont de Nemours, E. I., and Company: Device for biaxially stretching film, 4,679,283, Cl. 26-73.000.
- Forster, Jürgen, to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH: Arrangement for centering and manipulating conduits in a large-area cell for reprocessing irradiated nuclear fuel, 4,680,166, Cl. 422-159.000.
- Foster, Donald D.; and Moore, David G., to Realex Corporation: Orifice cover slide actuator lock for viscous product dispenser, 4,679,712, Cl. 222-384.000.
- Foster, Joseph S., to Pro-Staff Fuels Ltd.: Dual fuel engines, 4,679,538, Cl. 123-525.000.
- Foster, Raymond K.: Bearing system for reciprocating floor conveyor, 4,679,686, Cl. 198-750.000.
- Fouchey, John W.; and Chamberlain, Thomas E., to Chrysler Motors Corporation: Front wheel drive vehicle, automatic toe set alignment system, therefor, 4,679,327, Cl. 33-203.130.
- Fourzeon, Andre, to Etablissements les fils d'Auguste Chomarat et Cie: Textile reinforcement used for making laminated complexes, and novel type of laminate comprising such a reinforcement, 4,680,213, Cl. 428-105.000.
- Fournie, Phillippus J.: Device for cleaning teeth, 4,679,577, Cl. 132-92.00R.
- Fourrey, Francois: See—  
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- Fow, Louis F., Jr.: See—  
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- Fowler, David P.: See—  
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- Fowler, Kerry W.; and Chorvat, Robert J., to G. D. Searle & Co.: Octahydropyrido[1,2-c]pyrimidines and hexahydropyrido[1,2-c]pyrimidinediones, 4,680,295, Cl. 514-258.000.
- Frank, Dieter: Forked thill head attachment, 4,679,518, Cl. 114-98.000.
- Frank, Gerald L.: See—  
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- Frankard, James M.; and Broch, Orville V.: Separation and recovery of reusable heavy metal hydroxides from metal finishing wastewaters, 4,680,126, Cl. 210-710.000.
- Frankel, Eric; and Plucinski, Andrzej J., to Becton, Dickinson and Company: Blood sample needle assembly with vein indicator, 4,679,571, Cl. 128-764.000.
- Franklin, Grover C., Jr.: Apparatus for introducing a gas into a liquid, 4,680,119, Cl. 210-512.100.
- Franz, Patrick J.: See—  
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- Fraser, Dana J.: See—  
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- Freeman, Richard B., to Gainesville 1920 Corporation, The: Yogurt separator device, 4,680,117, Cl. 210-469.000.
- Freidinger, Roger: See—  
Veber, Daniel F.; and Freidinger, Roger, 4,680,283, Cl. 514-17.000.
- Fremont Special Machine Co., Inc.: See—  
Simonton, Robert D.; Cattano, John D.; and Mason, Robert K., 4,679,316, Cl. 29-731.000.
- Simonton, Robert D.; and Breese, Douglas E., 4,680,242, Cl. 429-136.000.

- French, James C.: See—  
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- Freschi, Claudio: See—  
Oreglia, Aurelio; Botto, Paolo; and Freschi, Claudio, 4,680,340, Cl. 525-72.000.
- Frettem, Peter O.: Flexible stretcher device, 4,679,260, Cl. 5-82.00R.
- Fricker, Robert F.: See—  
Cumbo, Peter E.; and Fricker, Robert F., 4,680,259, Cl. 435-11.000.
- Fried, Krupp Gesellschaft mit beschränkter Haftung: See—  
Ariz, Gerd; Figge, Dieter; and Philipp, Clemens, 4,679,612, Cl. 164-431.000.
- Hansen, Kolbjorn, 4,679,741, Cl. 241-206.000.
- Kiefer, Silvan, 4,679,444, Cl. 73-827.000.
- Friedman, Jack C.: Finger manipulated oral hygiene device, 4,679,274, Cl. 15-167.00R.
- Friesen, Terry V.: Sailboard assembly having a limited displacement mast, 4,679,516, Cl. 114-39.000.
- Frisch, Kurt C.; and Ashida, Kaneyoshi, to Polymetrics Corporation: Reinforced foam composites, 4,680,214, Cl. 428-107.000.
- Frito-Lay, Inc.: See—  
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- Froes, Francis H.: See—  
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- Frosch, Jürgen: See—  
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- Froschle, Reinhard: See—  
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- Fruehan, Mark T.; Fennig, Jeffrey A.; and Kapadia, Jayant K., to Westinghouse Electric Corp.: Transit vehicle door control apparatus, 4,679,508, Cl. 105-341.000.
- Fry, Steven A.; and Stafford, Rodney L.: Seat for a truck bed, 4,679,840, Cl. 296-64.000.
- Fuji Heavy Industries Ltd.: See—  
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- Fuji Kogyo Kabushiki Kaisha: See—  
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- Sakakiyama, Ryuzo, 4,679,674, Cl. 192-0.052.
- Sakakiyama, Ryuzo; and Takano, Toshio, 4,680,712, Cl. 364-424.100.
- Fuji Photo Film Co., Ltd.: See—  
Chikamasa, Hiroshi; and Sakaguchi, Masaaki, 4,679,744, Cl. 242-67.30R.
- Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,680,473, Cl. 250-484.100.
- Naito, Hiroichi; Mizuno, Chiaki; Tamai, Yasuo; and Kamiyama, Kozi, 4,680,225, Cl. 428-323.000.
- Oishi, Kengo, 4,680,661, Cl. 360-133.000.
- Sato, Hideaki; and Yagihara, Morio, 4,680,257, Cl. 430-614.000.
- Shibahara, Yoshihiko; and Ikoma, Hideto, 4,680,253, Cl. 430-504.000.
- Ueda, Masaki, 4,680,660, Cl. 360-132.000.
- Fuji Seiki Machine Works, Ltd.: See—  
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- Fuji Xerox Co. Ltd.: See—  
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- Fujii, Atsushi; Kaneda, Kazuhisa; and Tokiya, Yoshihiro, to Idemitsu Petrochemical Co., Ltd.: Method for the preparation of a crystalline thermoplastic resin sheet, 4,680,157, Cl. 264-180.000.
- Fujii, Masaki; Gotoh, Shiroh; Nakagawa, Hideaki; and Ito, Ryoichi, to Mitsubishi Petrochemical Co., Ltd.: Foaming resin composition, 4,680,318, Cl. 521-95.000.
- Fujikura Ltd.: See—  
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- Yamada, Takeshi; Osato, Yasukuni; and Watanabe, Okosu, 4,680,449, Cl. 219-385.000.
- Fujimoto, Makoto; Kitamura, Yoshinori; Morimura, Atsushi; and Matsuo, Hiroki, to Matsushita Electric Industrial Co., Ltd.: Solid state color imaging apparatus producing chrominance and luminance signals from unsaturated ores of n color signals, 4,680,623, Cl. 358-44.000.
- Fujimoto, Noboru: See—  
Okuyama, Toshiaki; Matsui, Takayuki; Fujimoto, Noboru; and Kubota, Yuzuru, 4,680,526, Cl. 318-802.000.
- Fujino, Bonpei: See—  
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- Fujioka, George S., to Dow Chemical Company, The: Process for fluorinating halogenated organo-compounds, 4,680,406, Cl. 546-345.000.
- Fujioka, Kazunori, to Alps Electric Co., Ltd.: Motor drive control device, 4,680,517, Cl. 318-332.000.
- Fujisawa Pharmaceutical Co., Ltd.: See—  
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsu; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.
- Fujita, Hiroo, to Citizen Watch Co., Ltd.: Micro-dimensional measurement apparatus, 4,679,941, Cl. 356-384.000.
- Fujita, Shigeru; Banzai, Hideo; and Tanaka, Hideo, to Toshiba Kikai Kabushiki Kaisha: Injection pressure monitoring method and apparatus, 4,680,151, Cl. 264-40.300.
- Fujitsu Limited: See—  
Baba, Fumio; and Takemae, Yoshihiro, 4,680,734, Cl. 365-190.000.
- Ikeuchi, Satoshi; and Taniguchi, Ikuo, 4,680,776, Cl. 375-40.000.
- Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, 4,679,320, Cl. 29-848.000.
- Kumazaki, Masayuki; Shimoe, Toshio; and Murakami, Koso, 4,680,758, Cl. 370-110.200.
- Tahara, Akinori; Enomoto, Hiromu; and Yasuda, Yasushi, 4,680,600, Cl. 357-15.000.
- Tanaka, Shoji, 4,680,079, Cl. 156-353.000.
- Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, 4,680,430, Cl. 178-19.000.
- Fujiwara, Yoshinari: See—  
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- Fukatsu, Takeo; Takeuchi, Masaru; and Goto, Kazuyuki, to Sanyo Electric Co., Ltd.: Photovoltaic cell, 4,680,607, Cl. 357-30.000.
- Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koichi; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha: Light distribution of headlight beam, 4,679,935, Cl. 356-121.000.
- Fukumoto, Masami: See—  
Yamaura, Izumi; Fukumoto, Masami; and Torigoe, Masao, 4,679,990, Cl. 417-312.000.
- Fukunaga, Masao: See—  
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.
- Fukunaga, Yasushi: See—  
Kusunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Fukunaga, Yasushi; and Hirasawa, Kotaro, 4,680,804, Cl. 382-13.000.
- Fukushima, Hiroshi: See—  
Nakamoto, Hideo; Aasai, Fumito; Fukushima, Hiroshi; and Suda, Eriko, 4,680,368, Cl. 528-49.000.
- Fukushima, Nobuo; and Iwata, Shuji, to Mitsubishi Denki Kabushiki Kaisha: Display unit, 4,680,629, Cl. 358-147.000.
- Fukushima, Yasuhisa; Maruyama, Masuo; and Miyazaki, Benichi, to Matsushita Electric Industrial Co., Ltd.: Disk cartridge having a shutter mechanism, 4,680,662, Cl. 360-133.000.
- Fuller, Milton E.; and Fletcher, Gary S., Jr.: Wave shape chemical analysis apparatus and method, 4,679,426, Cl. 73-53.000.
- Fulton, Temple L.; and Perkins, William O., to Texas Instruments Incorporated: System and method for controlling network bus communications for input-output interlocking information among distributed programmable controllers, 4,680,753, Cl. 370-85.000.
- Funada, Fumiaki; Hamada, Hiroshi; and Inoue, Osamu, to Sharp Kabushiki Kaisha; and Ushio Denki Kabushiki Kaisha: Small size discharge lamp having sufficient arc length and high luminous efficiency, 4,680,505, Cl. 313-558.000.
- Funada, Fumiaki: See—  
Hamada, Hiroshi; Funada, Fumiaki; and Matsuura, Masataka, 4,679,909, Cl. 350-333.000.
- Funaki, Takashi; and Nakatsuka, Katsuto, to Yakumo Industrial Corporation, a part interest: Vibration damping equipment, 4,679,775, Cl. 267-64.270.
- Fung, Anthony K.: See—  
Luly, Jay R.; Plattner, Jacob J.; and Fung, Anthony K., 4,680,284, Cl. 514-18.000.
- Furst, Wilhelm: See—  
Rudenauer, Werner; Furst, Wilhelm; and Liebl, Norbert, 4,679,503, Cl. 102-208.000.
- Furukawa, Nobuhiro; Murakami, Shuzo; and Nishioka, Masato, to Sanyo Electric Co., Ltd.: Method for starting fuel cell power systems, 4,680,240, Cl. 429-13.000.
- Furukawa, Shunske: See—  
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- Furuya, Tsuneo: See—  
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- Futaba Denshi Kogyo Kabushiki Kaisha: See—  
Yamaura, Tatsuo; and Takahashi, Hisamitsu, 4,680,231, Cl. 428-407.000.
- G. D. Searle & Co.: See—  
Fowler, Kerry W.; and Chorvat, Robert J., 4,680,295, Cl. 514-258.000.
- G. Dueterloh GmbH: See—  
Klie, Juergen; and Weiss, Hans-Wilhelm, 4,679,533, Cl. 123-179.00F.
- G.F. S.r.l.: See—  
Gatti, Giorgio; and Ferrari, Loris, 4,679,270, Cl. 15-29.000.
- Gainesville 1920 Corporation, The: See—  
Freeman, Richard B., 4,680,117, Cl. 210-469.000.
- Gaiser, Robert F.: See—  
Myers, Lawrence R.; Bach, Lloyd G.; and Gaiser, Robert F., 4,679,864, Cl. 303-6.00C.
- Gaiti, Giorgio; and Ferrari, Loris, to G.F. S.r.l.: Wash brush operated by the wash water, 4,679,270, Cl. 15-29.000.
- Galambos, Janos: See—  
Keve, Tibor; Zsador, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.



Galbraith, Douglas C., to Leland Stanford Junior University, Board of Trustees of the. Wide band inductive transdermal power and data link. 4,679,560, Cl. 128-419.00R.

Gallagher, Patrick E.; and Greenberg, Ronald A., to General Electric Company. Process for the production of a random copolymer containing repeating polyimide units and repeating polyetherimide units. 4,680,373, Cl. 528-185.000.

Galloway, James J.; and Madrigal, Anthony. Mechanical device for transmitting signals through a swivel connection. 4,679,645, Cl. 180-65.800.

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Galvin, Aaron A.; Dyer, Hugh D.; and Leff, Kenneth J., to American District Telegraph Company. Electrical interconnection apparatus and technique. 4,679,881, Cl. 439-392.000.

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Garcia, Augusto M.: See—  
Orero, Francisco O.; and Garcia, Augusto M., 4,679,523, Cl. 116-173.000.

Garfield Weston Trust for Research into Heart Surgery, Trustees of the: See—  
Gray, Charles R. W.; and Crawford, Neville, 4,680,177, Cl. 424-101.000.

Garrett Corporation, The: See—  
Swihart, William R.; and Deacon, Edwin R., 4,679,984, Cl. 415-163.000.

Gasaway, Jack S.: See—  
Parsons, James S.; and Gasaway, Jack S., 4,680,027, Cl. 604-68.000.

Gat, Anita S.; and Westberg, Eugene R., to A. G. Associates. Apparatus using high intensity CW lamps for improved heat treating of semiconductor wafers. 4,680,451, Cl. 219-411.000.

Gates Rubber Company, The: See—  
Newberry, Mark A.; and Kemper, Dennis C., 4,679,599, Cl. 138-104.000.

Gavva, Viktor M.: See—  
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexander I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

Geagley, Bradley: See—  
Sherin, Alan; Geagley, Bradley; and Benest, Glenn, 4,679,797, Cl. 273-251.000.

Geary, Frederick J., to Robertshaw Controls Company. Primary gas furnace control. 4,680,005, Cl. 431-46.000.

Gebhardt, Wolfgang: See—  
Eimer, Klaus; and Gebhardt, Wolfgang, 4,680,113, Cl. 210-181.000.

Geering, Hans P.: See—  
van Zanten, Anton; Heess, Gerhard; and Geering, Hans P., 4,679,866, Cl. 303-104.000.

Geiser, Markus; and Vandevor, Claude, to Samedia SA. Guide-bar device for multi-spindle lathe. 4,679,470, Cl. 82-2.700.

Geisthardt, Alan C., to Jack Walters & Sons, Corp. Interconnecting of wooden members. 4,679,367, Cl. 52-233.000.

Geitner, Otto: See—  
Schieber, Hans; and Geitner, Otto, 4,679,412, Cl. 66-71.000.

Genco, Louis V.; and Task, Harry L., to United States of America, Air Force. Device for measuring intraocular light scatter. 4,679,917, Cl. 351-221.000.

GenCorp Inc.: See—  
Sharma, Satish C., 4,680,228, Cl. 428-378.000.

Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, to Nippon Soda Co., Ltd. Process for the production of 3-phenyl-4-cyanopyrroles. 4,680,413, Cl. 548-526.000.

Genentech, Inc.: See—  
Bochner, Barry R.; Olson, Kenneth C.; and Pai, Rong-Chang, 4,680,262, Cl. 435-68.000.

General Electric Company: See—  
Axelrod, Robert J.; and Cooper, Glenn D., deceased, 4,680,342, Cl. 525-132.000.

Beers, Melvin D., 4,680,363, Cl. 528-14.000.

Betts, Joseph E.; and Holub, Fred F., 4,680,229, Cl. 428-389.000.

Brown, Sterling B.; and McFay, Dennis J., 4,680,329, Cl. 524-143.000.

Chand, Sujat; and Sadre, Ahmad, 4,680,519, Cl. 318-568.000.

Dumoulin, Charles L., 4,680,546, Cl. 324-307.000.

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Factor, Arnold; and Patel, Gautam A., 4,680,232, Cl. 428-412.000.

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Gray, Floyd L.; Schubert, Thomas F.; Bradshaw, Kenneth M.; and Kolawole, Joshua O., 4,680,545, Cl. 324-307.000.

Itani, Abdallah M.; Dietz, Peter W.; and Carlson, Gerald J., 4,680,532, Cl. 323-240.000.

Itani, Abdallah M.; Carlson, Gerald J.; and Dietz, Peter W., 4,680,533, Cl. 323-240.000.

Kelm, James S.; MacLin, Harvey M.; Vickers, Edward C.; and Wakeman, Thomas G., 4,679,400, Cl. 60-722.000.

Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., 4,679,314, Cl. 29-598.000.

Leue, William M.; Hodson, Raymond J., Jr.; Glover, Gary H.; and Adamchick, John T., 4,680,547, Cl. 324-309.000.

Lucas, Gary M., 4,680,364, Cl. 528-15.000.

O'Donnell, Matthew; Karr, Steven G.; Barber, William D.; Wang, Jish M.; and Edelstein, William A., 4,680,551, Cl. 324-320.000.

Rios, Pedro A., 4,680,666, Cl. 361-141.000.

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Srinivasan, Nallaswamy; Banaszewski, Sharon L.; and Acharya, Kishore C., 4,680,709, Cl. 364-414.000.

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General Kinematics Corporation: See—  
Spence, James F., 4,679,708, Cl. 222-161.000.

General Motors Corporation: See—  
Ballantyne, David B., 4,679,285, Cl. 29-11.000.

Bayer, Dean M.; McCoy, Larry J.; Thomson, Chris A.; Tran-barger, Thomas P.; and Rodriguez, Marco E., 4,679,837, Cl. 293-102.000.

Brandenburg, Darrell L., 4,679,906, Cl. 350-281.000.

Detampel, Heinz; Hillemann, Frank; Jobst, Wolfgang; and Prien, Manfred, 4,679,845, Cl. 296-192.000.

Douglas, Barry D.; and McCurdy, Frederick A., 4,679,956, Cl. 403-14.000.

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Farkas, Frank J., 4,679,618, Cl. 165-71.000.

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Gold, Thomas P.; and Vogel, John E., 4,679,777, Cl. 267-140.100.

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King, Donald J.; and Lederman, Frederick E., 4,679,676, Cl. 192-45.000.

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Nestor, Charles R.; Maga, Raymond A.; and Bensing, Gregory L., 4,679,885, Cl. 439-620.000.

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Pupillo, Dominic S.; and Scheff, Luben, 4,679,836, Cl. 292-216.000.

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Blome, Eugene R., 4,679,689, Cl. 206-334.000.

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Bauer, Frederick T., 4,680,576, Cl. 340-630.000.

Genus, Inc.: See—  
Mahawili, Imad, 4,680,447, Cl. 219-343.000.

Georgia-Pacific Corporation: See—  
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Geosource, Inc.: See—  
Wales, C. Ernest; and Peterson, Mitchell F., 4,680,741, Cl. 367-189.000.

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Portz, Heinz; and Ettingshausen, Othmar V., 4,680,064, Cl. 148-617.000.

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GerroKaiser Dosenwerk GmbH & Co KG: See—  
Jendick, Manfred, 4,679,659, Cl. 184-15.200.

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Merten, Gerhard; Rafael, Werner; and Schlusener, Horst, 4,679,429, Cl. 73-168.000.

Ghosh, Subir; and Junior, Aluizio P., to Telecomunicacoes Brasileiras S/A - Telebras. Corrugated transition device for use between a continuous and a corrugated circular waveguide with signal in two different frequency bands. 4,680,558, Cl. 333-21.00R.

Gibb, James L.; Laird, James A.; Lee, George W.; and Whitcomb, William C., to Minnesota Mining and Manufacturing Company. Particulate ceramic useful as a proppant. 4,680,230, Cl. 428-403.000.

Gibbons, David L., to Marathon Oil Company. Oil recovery process using a viscosity adjusted gelation system. 4,679,625, Cl. 166-270.000.

Gibson, William H., to Otis Elevator Company. Modular gearless elevator drive. 4,679,661, Cl. 187-20.000.

Gielkens, Arnold L. J.: See—  
Berns, Antonius J. M.; and Gielkens, Arnold L. J., 4,680,176, Cl. 424-89.000.

Giles, Grady L.; Wilson, Jesse R.; and Hulett, Terry V., to Motorola, Inc. Accelerated test apparatus and support logic for a content addressable memory. 4,680,760, Cl. 371-21.000.

Gill, Devinder S.: See—  
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Gillespie, Arthur B.: See—  
Scott-Kestin, Colin B.; Pike, Roger B.; Watkins, Roger D.; Gillespie, Arthur B.; and Deighton, Michael O., 4,679,430, Cl. 73-290.00V.

Gillette Company, The: See—  
Kirk, Bryan R., 4,679,324, Cl. 30-346.580.

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Ryan, James M.; and Gilmore, Arthur H., 4,679,749, Cl. 244-122.00R.

Gimpel, Franco; and Brichta, Corrado, to Gimpel, Franco. Accelerated crosslinking of polyolefins grafted with silanes. 4,680,319, Cl. 523-210.000.

Gingline, Lin, to Te-Chin Handicraft Enterprise Co., Ltd. Arm rest and handrail assembly for baby carriage. 4,679,806, Cl. 280-47.380.

Ginter, Herbert; Klingel, Reinhard; and Manner, Reinhard, to Degussa Aktiengesellschaft. Method for densification of powdery silica and article formed thereby. 4,680,043, Cl. 65-2.000.

Ginzburg, Vladimir B.; and Schmiedberg, Winfried F., to Wean United Rolling Mills, Inc.; and International Rolling Mill Consultants, Inc. Re-radiating heat shield assembly. 4,680,010, Cl. 432-148.000.

Giordano, Raymond L., to RCA Corporation. Comparator circuit. 4,680,483, Cl. 307-355.000.

Girard, Donald A. Ski stiff in torsion. 4,679,813, Cl. 280-602.000.

Giravions Dorand: See—  
Mendes, Claude, 4,680,472, Cl. 250-386.000.

Glaser, Eberhard; and Beitinger, Eberhard, to Ed. Zublin Aktiengesellschaft. Method and apparatus for installing panels into recesses in the ground. 4,679,965, Cl. 405-258.000.

Glaser, Robert L., to L. M. Becker & Co., Inc. Multiple chamber automated vending machine. 4,679,684, Cl. 194-350.000.

Glick, Robert E.: See—  
Rawlings, David L.; Glick, Robert E.; and Chang, Robert, 4,680,149, Cl. 264-2.100.

Glidden Company, The: See—  
Lin, Ju-Chui; and Abbey, Kirk J., 4,680,354, Cl. 526-172.000.

Glover, Gary H.: See—  
Leue, William M.; Hodson, Raymond J., Jr.; Glover, Gary H.; and Adamchick, John T., 4,680,547, Cl. 324-309.000.

GMF Robotics Corporation: See—  
Hansen, Robert E., Jr.; Murray, James R.; and Zald, Roberta L., 4,679,297, Cl. 29-568.000.

Goding, David J.; and Ramos, Remigio R., to General Motors Corporation. Railway truck with improved steering linkage, detachable suspension and traction motor mounted brake. 4,679,506, Cl. 105-136.000.

Godshall, Mary Ann: See—  
Weiss, Louis C.; Thibodeaux, Devron P.; and Godshall, Mary Ann, 4,680,106, Cl. 209-1.000.

Goetter, Erwin H.: See—  
Krafick, Joseph T.; Barnes, Richard J.; and Goetter, Erwin H., 4,679,896, Cl. 350-96.200.

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Feller, Otto; Brocksieper, Manfred; and Luckger, Rolf, 4,679,472, Cl. 82-19.000.

Gohara, Shinobu: See—  
Takemura, Tetsuo; and Gohara, Shinobu, 4,680,752, Cl. 370-63.000.

Gold Star Co., Ltd.: See—  
Kim, Kyo S., 4,679,745, Cl. 242-75.400.

Gold, Thomas P.; and Vogel, John E., to General Motors Corporation. Hydraulic-elastomeric mount displacement decoupler. 4,679,777, Cl. 267-140.100.

Golden Star, Inc.: See—  
Wilson, Charles G., 4,679,859, Cl. 300-21.000.

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McKechnie, Thomas S.; and Goldenberg, Jill F., 4,679,900, Cl. 350-126.000.

Goldman, John G., to Mercury Plastics, Inc. Modular display apparatus for sign panels. 4,679,341, Cl. 40-611.000.

Goldsmith, Wesley R.; and Di Marco, Joel E. Combined primary and secondary sine bars. 4,679,329, Cl. 33-538.000.

Goldstein, Gideon: See—  
Kung, Patrick C.; and Goldstein, Gideon, 4,680,383, Cl. 530-387.000.

Goletto, Jean: See—  
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Gomez Harlow, James B. 4 Plus double loader. 4,679,343, Cl. 42-87.000.

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Nogi, Teiji; and Gondo, Toyomi, 4,680,663, Cl. 361-2.000.

Gonzalez, Ramon. Table game. 4,679,793, Cl. 273-85.00R.

Goodall, Brian L.; and Grothenhuis, Paulus A. M., to Shell Oil Company. Extraction of Group 8 metals from organic solutions. 4,680,168, Cl. 423-22.000.

Goodman, Steve F.: See—  
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Goodwin, Joel G.: See—  
Do, Phuc K.; Goodwin, Joel G.; and Krull, Nicholas J., 4,680,524, Cl. 318-696.000.

Goodwin, John C., to Northern Telecom Limited. Laser-fiber positioning method. 4,679,908, Cl. 350-320.000.

Goodyear Tire & Rubber Company, The: See—  
Candle, Richard D., 4,680,071, Cl. 156-218.000.

Strader, Don S., 4,679,443, Cl. 73-826.000.

Gooray, Arthur M.; Heeks, George J.; Reale, Louis; and Shah, Dipika R., to Xerox Corporation. Multipurpose filtering material. 4,680,040, Cl. 55-387.000.

Gora, Hans-Joachim: See—  
Hoerig, Klaus; and Gora, Hans-Joachim, 4,679,649, Cl. 180-291.000.

Gorka, Robert J.: See—  
Bilech, Harry A.; Di Manno, Richard A.; and Gorka, Robert J., 4,680,337, Cl. 525-53.000.

Goseberg, Walter; and Pollack, Alfred, to Telefunken Fernseh und Rundfunk GmbH. Coil with magnetisable rod core. 4,680,566, Cl. 336-181.000.

Goss, Larry P.: See—  
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Gotanda, Motohiro. Door unlocking device. 4,679,834, Cl. 292-169.130.

Gotaverken Arendal AB: See—  
Bengtsson, Lars; and Sjolander, Johan, 4,679,632, Cl. 166-345.000.

Goto, Kazuyuki: See—  
Fukatsu, Takeo; Takeuchi, Masaru; and Goto, Kazuyuki, 4,680,607, Cl. 357-30.000.

Goto, Kenya: See—  
Kasahara, Akihiro; Goto, Kenya; Yamada, Akira; and Watanabe, Shoji, 4,679,903, Cl. 350-247.000.

Goto, Yasuo; and Adachi, Masao. Eccentric swing gear transmission. 4,679,465, Cl. 74-805.000.

Gotoh, Shiroh: See—  
Fujii, Masaki; Gotoh, Shiroh; Nakagawa, Hideaki; and Ito, Ryoi-chi, 4,680,318, Cl. 521-95.000.

Gottling, Helmut: See—  
Bräusfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,680,436, Cl. 200-82.00E.

Gotzenbrucker, Oswald; and Popp, Gerhard, to Brown, Boveri & Cie AG. Silicon semiconductor component with an edge contour made by an etching technique, and method for manufacturing this component. 4,680,615, Cl. 357-55.000.

Gould Inc.: See—  
Baker, Richard H.; and Maddox, Edward L., 4,680,490, Cl. 307-575.000.

Uhrey, Marc K., 4,680,485, Cl. 307-463.000.

Goumas, Peter G.; and Wolfe, Paul T., to Lord Corporation. Apparatus and method for handling articles in automated assembly processes. 4,680,523, Cl. 318-685.000.

Grabbe, Dimitry G.; and Korsunsky, Iosif, to AMP Incorporated. Tool and method for removing connector housings from terminals mounted on a substrate. 4,679,319, Cl. 29-843.000.

Graco Inc.: See—  
Harriman, Charles E.; and Nii, Donald S., 4,679,989, Cl. 417-238.000.

Mommsen, Gordon V.; Fender, Norman N.; Karwoski, Stanley G.; Scherer, William C.; and Lind, Robert J., 4,679,734, Cl. 239-692.000.

Graham, Everett S., to Polysar Limited. Agglomeration. 4,680,321, Cl. 523-335.000.

Graham, John P.: See—  
Cordeiro, Craig A.; and Graham, John P., 4,680,788, Cl. 379-93.000.

Grammer Sitzsysteme GmbH: See—  
Dotzler, Josef; and Meier, Johann, 4,679,760, Cl. 248-602.000.

Granite State Packing Company, Inc.: See—  
Sheehy, Roger C.; and Muskat, Irwin, 4,680,186, Cl. 426-129.000.

Sheehy, Roger C.; and Muskat, Irwin, 4,680,187, Cl. 426-129.000.

Gray, Barbara J. Power driven track shoe spike socket wrench. 4,679,468, Cl. 81-121.100.

Gray, Charles F., Jr.; Meisenburg, Gary L.; and Zemlicka, Alvin, to Brunswick Corporation. Marine drive shift mechanism with detent canister centered neutral. 4,679,682, Cl. 192-21.000.

Gray, Charles R. W.; and Crawford, Neville, to Garfield Weston Trust for Research into Heart Surgery, Trustees of the; Royal College of Surgeons of England, The; and British Postgraduate Medical Federation. Processes for the production of blood products. 4,680,177, Cl. 424-101.000.

Gray, Floyd L.; Schubert, Thomas F.; Bradshaw, Kenneth M.; and Kolawole, Joshua O., to General Electric Company. Method for reduction of acoustical noise generated by magnetic field gradient pulses. 4,680,545, Cl. 324-307.000.

Gray, Gary L.: See—  
Donohie, Paul J.; Gray, Gary L.; and Capuano, Frank G., 4,679,694, Cl. 206-611.000.

Greame, James E.: See—  
Vollmer, David J.; and Greame, James E., 4,679,767, Cl. 251-129.150.

Greco, Carl C., to Stauffer Chemical Company. Purified catalyst support. 4,680,350, Cl. 526-125.000.

Green, Sidney J.: See—  
Johnson, Christopher F.; and Green, Sidney J., 4,679,441, Cl. 73-798.000.

Greenberg, Ronald A.: See—  
Gallagher, Patrick E.; and Greenberg, Ronald A., 4,680,373, Cl. 528-185.000.

Greenwood, Christopher J., to Leyland Vehicles Limited. Driveline for regenerative braking. 4,679,646, Cl. 180-165.000.

Gregory, Mark, to Potterton International Limited. Electrical control unit. 4,679,728, Cl. 237-1.00R.

Gregotsch, Karl: See—  
Ziegler, Gerhard; Gregotsch, Karl; and Herrmann, Rudolf, 4,680,493, Cl. 310-62.000.

Greigiger, Paul P.: See—  
Das, Surya K.; Seiner, Jerome A.; Greigiger, Paul P.; Jones, James E.; Schapper, Raymond F.; and Boberski, William G., 4,680,204, Cl. 427-407.100.



- Gribshaw, Franklin C.: See—  
Lang, Paul W.; and Gribshaw, Franklin C., 4,679,574, Cl. 131-365.000.
- Grimes, Joseph E.: See—  
King, Paul L.; Grimes, Joseph E.; and Cochran, Richard C., 4,679,951, Cl. 400-110.000.
- Grogler, Gerhard: See—  
Kopp, Richard; Grogler, Gerhard; Hess, Heinrich; and Konig, Klaus, 4,680,367, Cl. 528-44.000.
- Grohe, Klaus, to Bayer Aktiengesellschaft. Preparation of halogenated quinolonecarboxylic acids. 4,680,401, Cl. 546-153.000.
- Grooten, Albertus T. M., to N.K.F. Groep B.V. Signal transmission cable. 4,679,898, Cl. 350-96.230.
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- Grosjean, Michel. Multiphase motor with facially magnetized rotor having N/2 pairs of poles per face. 4,680,494, Cl. 310-156.000.
- Grote, Paul: See—  
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- Grothenhuis, Paulus A. M.: See—  
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- Grove, John A., to United States Steel Corporation. Apparatus for significantly decreasing undesired variation in the alignment of adjustable continuous caster mold walls. 4,679,614, Cl. 164-436.000.
- Grover, Wayne D., to Northern Telecom Limited. Terminal address assignment in a broadcast transmission system. 4,680,583, Cl. 340-825.520.
- Gruenblat-Nordau, Claudy-Gabrielle: See—  
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- Grumman Aerospace Corporation: See—  
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- GTE Communication Systems, Inc.: See—  
Boeckmann, Eduard F. B., 4,680,783, Cl. 379-6.000.
- GTE Laboratories, Inc.: See—  
Fallier, Charles N., Jr.; and Lester, James N., 4,680,509, Cl. 315-290.000.
- Onorato, Paulette I. K.; and Su, Sophia R., 4,680,049, Cl. 65-18.100.
- GTE Products Corporation: See—  
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- Landry, Richard E.; and Reed, Joel G., 4,679,623, Cl. 165-166.000.
- Mizuhara, Howard, 4,679,960, Cl. 403-272.000.
- Ornstein, Jacob L.; and Hydock, Michael A., 4,680,238, Cl. 428-617.000.
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- Guntly, Thomas G.; and Schultz, Curtis L., to Tecumseh Products Company. Primer for float-type carburetors. 4,679,534, Cl. 123-187.50R.
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- Gurries & Okamoto, Inc.: See—  
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- Gutierrez-Rubio, Joaquin, to Sociedad Anonima de Racionalizacion y Mecanizacion (Sadrym). Apparatus for sizing and peeling longated cylindrical bodies of vegetable matter. 4,679,499, Cl. 99-591.000.
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- H. Stoll GmbH & Co.: See—  
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- Haberland, Siegfried, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,679,993, Cl. 417-490.000.
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- Hakimi, Farhad; Po, Hong; and Snitzer, Elias, to Polaroid Corporation. Optical fiber laser. 4,680,767, Cl. 372-6.000.
- Hall, Dwayne A. Fishing line strike indicator. 4,679,345, Cl. 43-17.000.
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- Halloran, Kevin J. Three-sided tip tray. 4,679,691, Cl. 206-557.000.
- Ham, Yong S. Baseball exercising device. 4,679,790, Cl. 273-26.00E.
- Hamada, Akihiko: See—  
Yamada, Mikio; and Hamada, Akihiko, 4,679,794, Cl. 273-235.00R.
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- Hamar, Martin R. Control system for a continuous cell target readout in a laser measurement system. 4,679,940, Cl. 356-375.000.
- Hamberger, Helmut; Stephen, Adrian; Stutz, Anton; and Stutz, Peter, to Sandoz Ltd. Propenylamines, processes for their production and pharmaceutical compositions containing them. 4,680,291, Cl. 514-183.000.
- Hamburger, Jean: See—  
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- Hamilton House Marketing, Inc.: See—  
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- Hamilton, Malcolm F., to Hozelock-ASL Ltd. Fluid supply system, a connector and a valve. 4,679,705, Cl. 222-90.000.
- Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand held electrically selectable labeler. 4,680,081, Cl. 156-384.000.
- Hammerling, Ulrich; Koo, Gloria C.; and Tada, Nobuhiko, to Sloan-Kettering Institute for Cancer Research. Process for sex determination in man by use of monoclonal antibodies to the H-Y antigen. 4,680,258, Cl. 435-7.000.
- Hammermeister, Dale P.: See—  
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- Hamprecht, Gerhard; Varwig, Juergen; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Preparation of fluorophthalimides. 4,680,412, Cl. 548-480.000.
- Han, Yu-Pin: See—  
Chan, Tsiu C.; and Han, Yu-Pin, 4,679,300, Cl. 29-571.000.
- Hanada, Seigo: See—  
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- Hanada, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichi, to Konishiroku Photo Industry Co., Ltd. Multiplex image reproducing apparatus. 4,679,929, Cl. 355-4.000.
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- Hanks, James V.; Raines, Charles D.; and Dayen, Leonid, to Horton Manufacturing Co., Inc. Coupling clutch. 4,679,675, Cl. 192-67.00R.
- Hanlon, James T.; and Renault, Paul W., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Relay switch apparatus. 4,680,563, Cl. 335-58.000.
- Hanlon, Stephen P.; Kerby, Walter L.; Purdy, Edmund R.; and Strom, James, to Deseret Medical, Inc. Pressure transducer. 4,679,567, Cl. 128-675.000.
- Hanosh, Alan L. Registration device for use in silk screen printing. 4,679,501, Cl. 101-114.000.
- Hansen, Dale G. Spare tire carrier. 4,679,717, Cl. 224-42.060.
- Hansen, David L.: See—  
Kruz, Gary; and Hansen, David L., 4,679,488, Cl. 91-1.000.
- Hansen, Kolbjorn, to Fried. Krupp Gesellschaft mit beschränkter Haftung. Crusher with rotary plates. 4,679,741, Cl. 241-206.000.
- Hansen, Robert E., Jr.; Murray, James R.; and Zald, Roberta L., to GMF Robotics Corporation. Method for changing the tooling in a robot-based system and system utilizing same. 4,679,297, Cl. 29-568.000.
- Harada, Susumu: See—  
Ueda, Toshio; Sato, Yoshinori; and Harada, Susumu, 4,680,360, Cl. 526-310.000.
- Harada, Yoshiharu: See—  
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- Harada, Yoshihito: See—  
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- Harbison, Joe A.; LaGrange, Nyle D.; and Nielsen, Darryl M., to Marley-Wylain Company. The Submersible pump and wastewater basin apparatus. 4,679,991, Cl. 417-360.000.
- Harbison, Joe A.: See—  
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- Harbor Branch Oceanographic Institute Inc.: See—  
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- Hardy, Derrick, to Bercorit & Herweg Limited. Valve. 4,679,768, Cl. 251-159.000.
- Harken, Olaf T. Mainsail reefing and furling device and method. 4,679,520, Cl. 114-104.000.
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- Harper, James G.; Bailey, Louis G.; McJohnson, Robert B.; Rajagopal, Ganesh; and Walker, Don R., to Veeco Integrated Automation Inc. Vehicle to fixed station infrared communications link. 4,680,811, Cl. 455-617.000.
- Harriman, Charles E.; and Nii, Donald S., to Graco Inc. Pump shovel bulk unloader. 4,679,989, Cl. 417-238.000.
- Harris Corporation: See—  
Swanson, Hilmer I., 4,680,559, Cl. 333-100.000.
- Talmor, Shlomo S., 4,680,535, Cl. 323-312.000.
- Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., to Merck & Co., Inc. Substituted caprolactam derivatives as antihypertensives. 4,680,392, Cl. 540-527.000.
- Harris, Monty E.; and Sukup, Richard A., to Western Company of North America. The Hydraulic setting tool. 4,679,624, Cl. 166-120.000.
- Harris, Rickey D.: See—  
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- Harrison, William M. Method of oil recovery. 4,679,627, Cl. 166-249.000.
- Harsco Corporation: See—  
Johnson, Bruce S., 4,679,771, Cl. 254-273.000.
- Hartford, Louise D.: See—  
Kavoussi, James P.; and Hartford, Louise D., 4,679,943, Cl. 368-12.000.
- Hartkopf, Hans-Otto; and Zeller, Christoph, to Siemens Aktiengesellschaft. Light waveguide coupling device. 4,680,809, Cl. 455-601.000.
- Hartman, Dennis C.: See—  
Thomas, Patrick K.; Hartman, Dennis C.; and Dockrey, Jasper W., 4,680,086, Cl. 156-643.000.
- Hartmetallwerkzeugfabrik Andreas Maier GmbH & Co. KG: See—  
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- Hasegawa, Takeshi: See—  
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- Hashimoto, Isao; Kinoshita, Tosuke; Uchida, Masahiro; and Uchiyama, Susumu, to Kawasaki Jukogyo Kabushiki Kaisha. Vertical roller mill. 4,679,739, Cl. 241-121.000.
- Hashimoto, Yasuhiko: See—  
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- Hasiroglu, Alexander W., to Du Pont de Nemours, E. I., and Company. Multiconductor electrical cable terminations and methods and apparatus for making same. 4,679,868, Cl. 439-495.000.
- Hassler, George E.: See—  
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- Hasuo, Masayoshi; Mukai, Seiichi; Urabe, Hiroshi; Yoshida, Seiji; and Nukui, Masahiro, to Mitsubishi Chemical Industries Ltd. Optical disc substrate made of a copolycarbonate. 4,680,374, Cl. 528-204.000.
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- Hatanaka, Keiji: See—  
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- Hattori, Masaichi: See—  
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- Hattori, Takemi; and Kawamura, Reiki, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Side support assembly. 4,679,855, Cl. 297-486.000.
- Hattori, Yoshifumi: See—  
Ebinuma, Ryuichi; Hattori, Yoshifumi; and Ichihashi, Hiroo, 4,680,696, Cl. 346-75.000.
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Riedel, Hans-Peter; Zurcher, Josef; and Haussler, Hubert, 4,679,586, Cl. 137-491.000.
- Hawker, Ralph L.; and Spector, George. Electrical switches. 4,680,426, Cl. 174-57.000.
- Hawkins, Ronald G., to Aluminum Company of America. Overhead conductor damping device with die cast components and method of making the same. 4,680,424, Cl. 174-42.000.
- Hayakawa, Yoichi; Kawai, Masao; Taga, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, to Aisin-Warner Limited; and Toyota Jidosha Kabushiki Kaisha. Control system for selectively switchable two/four wheel drive automatic transmission system shifting transfer transmission according to main transmission speed stage. 4,679,450, Cl. 74-752.00A.
- Hayashi, Kiyotaka: See—  
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- Hayashi, Mitsuroh: See—  
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- Hayes, John, to Tarn-Pure Limited. Water purification apparatus. 4,680,114, Cl. 210-192.000.
- Hays, Byron G., to BASF Corporation, Inmont Division. Easily flushable transparent, strong diarylide yellow pigment compositions. 4,680,057, Cl. 106-23.000.
- Hazeltine Corporation: See—  
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- Heald, Jerry D. Method and apparatus for crack detection and characterization. 4,680,470, Cl. 250-358.100.
- Heath, Robert G. Playground construction. 4,679,963, Cl. 405-36.000.
- Heck, James V.: See—  
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- Heeks, George J.: See—  
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- Heess, Gerhard: See—  
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- Hefner, Robert E., Jr., to Dow Chemical Company, The. Cyanate functional maleimide and polyamine copolymer. 4,680,378, Cl. 528-322.000.
- Heggie, William S. Engine control systems. 4,679,396, Cl. 60-414.000.
- Hehl, Karl. Injection molding machine. 4,680,002, Cl. 425-186.000.
- Hehl, Karl. Linear potentiometer for measuring travel. 4,680,570, Cl. 338-176.000.
- Heidelberger Druckmaschinen AG: See—  
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- Heile, Bernard J.; and Klos, Terry J., to Ecolab Inc. Method for forming solid detergent compositions. 4,680,134, Cl. 252-160.000.
- Heimann, Peter A.; Moran, Joseph M.; and Schutz, Ronald J., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Interferometric methods and apparatus for device fabrication. 4,680,084, Cl. 156-626.000.
- Heinze, Helmut; and Wilhelm, Fritz, to Davy McKee A.G. Process for the continuous production of high-molecular polybutyleneterephthalate. 4,680,376, Cl. 528-279.000.
- Heldenbrand, Stanley W.; and Chappuis, Clyde L., to Northern Telecom Limited. Cabinet for an electronic apparatus. 4,679,867, Cl. 312-287.000.
- Helffer, Bernard; and Scheydecker, Jacques, to Institut Textile de France. Process and installation for transfer and positioning. 4,679,785, Cl. 271-227.000.
- Helix Technology Corporation: See—  
Andeen, Bruce R., 4,679,402, Cl. 62-55.500.
- Lessard, Philip A.; Bartlett, Allen J.; and Peterson, John F., 4,679,401, Cl. 62-55.500.
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- Helleboid, Jean-Marie: See—  
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- Helvy, Fred A.; and McDonie, Arthur F., to RCA Corporation. Electron discharge device having a narrow range spectral response. 4,680,504, Cl. 313-524.000.
- Hemp, Bruce: See—  
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- Hempowitz, Gunter; and Meyer-Kretschmer, Gustav, to Uranit GmbH. Radiation probe for contactless measurement of the surface temperature of an object. 4,679,948, Cl. 374-129.000.
- Henderson, Richard C.: See—  
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- Hengartner, Urs; and Ramuz, Henri, to Hoffmann-La Roche Inc. Tetrahydronaphthalene derivatives. 4,680,310, Cl. 514-539.000.
- Henkin, Melvyn L.; and Laby, Jordan M. Hydrotherapy massage method and apparatus. 4,679,258, Cl. 4-542.000.
- Henneberger, Hans, to Siemens Aktiengesellschaft. Hearing aid. 4,680,799, Cl. 381-68.600.
- Herbert, Victor. Assay for vitamin B12 deficiency. 4,680,273, Cl. 436-92.000.
- Herbst, Kurt: See—  
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- Hercules Incorporated: See—  
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- Bither, Peter G., 4,680,223, Cl. 428-280.000.
- Roach, Donald J., 4,680,248, Cl. 430-270.000.
- Herczeg, Julius-Ludwig; Lenhard, Martin; and Fluckiger, Ernst, to Gurit-Worbla AG. Method of producing a scratch resistant coating on a sheet of thermoplastic material. 4,680,198, Cl. 427-164.000.
- Hergenroeder, Patrick T. Receptacle for collecting fluids. 4,679,590, Cl. 137-602.000.



- Herke, Donald P.: See—  
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- Herman Miller, Inc.: See—  
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- Hermann Berstorff Maschinenbau GmbH: See—  
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- Herring, Charles: Emergency exit for a personnel chamber, 4,679,365, Cl. 52-204.000.
- Herrmann, Rudolf: See—  
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- Herrmann, Ursula: See—  
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- Hess, Heinrich: See—  
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- Hesson, David P., to E.I. Du Pont de Nemours and Company: 2-phenyl-4-quinolinecarboxylic acids and pharmaceutical compositions thereof, 4,680,299, Cl. 514-311.000.
- Hester, Phillip D.; and Simpson, Richard O., to International Business Machines Corporation: Virtual memory address translation mechanism with combined hash address table and inverted page table, 4,680,700, Cl. 364-200.000.
- Hetteche, Albert; Weiss, Stefan; Trauth, Hubert; Lechtken, Peter; and Horner, Michael, to BASF Aktiengesellschaft: Stabilizers, 4,680,327, Cl. 524-110.000.
- Hetzer, Norbert, to Esselte Pendaflex Corporation: Price cassette, 4,679,339, Cl. 40-10.000.
- Hewlett-Packard Company: See—  
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- Reames, Stephen P., 4,680,755, Cl. 370-85.000.
- Hibst, Hartmut, to BASF Aktiengesellschaft: Preparation of finely divided isotropic ferrite powders having the spinel structure, 4,680,130, Cl. 252-62.600.
- Hideo, Tago: See—  
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- Hieber, Konrad; Neppi, Franz; and Schober, Konrad, to Siemens Aktiengesellschaft: Integrated semiconductor circuit including a tantalum silicide diffusion barrier, 4,680,612, Cl. 357-71.000.
- Higashizima, Harumi: See—  
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- Highland Laboratories: See—  
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- Highton, Frederick J.: See—  
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- Hijiya, Toyoto: See—  
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- Hillemann, Frank: See—  
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- Hinatase, Fumio: See—  
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- Hipkins, Edward C., Sr.; and Locotos, Frank M., to F. M. Locotos Co., Inc.: Truss bracket, 4,679,967, Cl. 405-288.000.
- Hiraiwa, Ichiro: See—  
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- Hiraizumi, Kazuo: See—  
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takaya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.
- Hirakoso, Yohei: See—  
Niki, Shoji; Takahashi, Toshiro; and Hirakoso, Yohei, 4,680,540, Cl. 324-78.00R.
- Hirano, Hiroyuki: See—  
Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Nakano, Masaki, 4,679,466, Cl. 74-863.000.
- Hirasawa, Kotaro: See—  
Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Fukunaga, Yasushi; and Hirasawa, Kotaro, 4,680,804, Cl. 382-13.000.
- Hirata, Miyoshi: See—  
Sakai, Yasuo; and Hirata, Miyoshi, 4,680,274, Cl. 436-512.000.
- Hirata, Tadashi; Ikeda, Hidekatsu; Arima, Yoshitaka; and Kashiara, Yoshihiko, to Amada Company, Limited: Shearing machine, 4,679,473, Cl. 83-157.000.
- Hiratsuka, Seiichi: See—  
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichi, 4,679,929, Cl. 355-4.000.
- Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichi, 4,680,625, Cl. 358-80.000.
- Hirose, Hujio: See—  
Morishita, Koji; Hirose, Hujio; Nakatsuka, Nobuo; and Nishimura, Masahiro, 4,679,932, Cl. 356-28.000.
- Hirose, Noboru: See—  
Watanabe, Kikuo; Kobayashi, Mitsuo; Hirose, Noboru; and Sato, Keiichi, 4,679,296, Cl. 29-568.000.
- Hirota, Satoshi; and Nagamine, Kimihiro, to Casio Computer Co., Ltd.: Printing apparatus including tab position placement control, 4,679,952, Cl. 400-279.000.
- Hirt Combustion Engineers: See—  
Hirt, John H., 4,680,004, Cl. 431-5.000.
- Hirt, John H., to Hirt Combustion Engineers: Method and apparatus for controlling gasoline vapor emissions, 4,680,004, Cl. 431-5.000.
- Hirzel, Timothy K.: See—  
Taylor, Keith M.; Horng, Liou-Liang; and Hirzel, Timothy K., 4,680,145, Cl. 260-502.00R.
- Hisamitsu, Kunio; Takemoto, Tadashi; Hijiya, Toyoto; and Takahashi, Satoji, to Ajinomoto Co., Inc.: Process for producing N-protected-L-aspartyl-L-phenylalanine methyl ester, 4,680,403, Cl. 546-247.000.
- Hischke, Marcia, to Uniforms To You & Company: Multi-size jumper dress, 4,679,256, Cl. 2-105.000.
- Hitschi, Ltd.: See—  
Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Fukunaga, Yasushi; and Hirasawa, Kotaro, 4,680,804, Cl. 382-13.000.
- Mashino, Keiichi, 4,680,530, Cl. 322-33.000.
- Mitsumaki, Hiroshi; Takano, Nobuyoshi; and Ono, Naoya, 4,680,270, Cl. 436-52.000.
- Murakami, Toshio, 4,680,624, Cl. 358-44.000.
- Murakami, Toshiyuki; Sugimoto, Norihiko; and Ogawa, Naoki, 4,680,757, Cl. 370-89.000.
- Nakamura, Shigeki; Ohnishi, Makoto; and Takahashi, Yasufumi, 4,680,556, Cl. 332-16.00R.
- Nishida, Yoshie; Hata, Seiji; and Miyakawa, Akira, 4,680,802, Cl. 382-8.000.
- Nomura, Setsuo; and Isakozawa, Shigeto, 4,680,469, Cl. 250-311.000.
- Oishi, Kanji; and Shinoda, Takashi, 4,680,737, Cl. 365-222.000.
- Okuyama, Toshiaki; Matsui, Takayuki; Fujimoto, Noboru; and Kubota, Yuzuru, 4,680,526, Cl. 318-802.000.
- Omoda, Koichiro; and Nagashima, Shigeo, 4,680,730, Cl. 364-900.000.
- Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, 4,680,718, Cl. 364-455.000.
- Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.
- Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.
- Sugimoto, Norihiko; Inada, Shunji; and Usami, Nagatoshi, 4,680,756, Cl. 370-88.000.
- Takasugi, Wasao; Shinomura, Ryuichi; and Yokozawa, Norio, 4,680,498, Cl. 310-319.000.
- Takemura, Tetsuo; and Gohara, Shinobu, 4,680,752, Cl. 370-63.000.
- Uchino, Megumi, 4,680,699, Cl. 364-200.000.
- Uemura, Kaoru; Ishitani, Tohru; and Tamura, Hifumi, 4,680,507, Cl. 315-111.810.
- Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, 4,680,499, Cl. 310-334.000.
- Watanabe, Naomitsu, 4,680,502, Cl. 313-468.000.
- Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, 4,679,611, Cl. 164-431.000.
- Hitachi Medical Corporation: See—  
Takasugi, Wasao; Shinomura, Ryuichi; and Yokozawa, Norio, 4,680,498, Cl. 310-319.000.
- Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, 4,680,499, Cl. 310-334.000.
- Hitachi Metals, Ltd.: See—  
Yano, Mitsuru; Kido, Tomoyuki; and Ochi, Yoshiyuki, 4,680,239, Cl. 428-688.000.
- Hitachi, Process Computer Engineering, Inc.: See—  
Murakami, Toshiyuki; Sugimoto, Norihiko; and Ogawa, Naoki, 4,680,757, Cl. 370-89.000.
- Hitchins, William G.: Modular building component, 4,679,366, Cl. 52-217.000.
- Hitomi, Mitsuo; Hinatase, Fumio; and Yuzuriha, Yasuhiro, to Mazda Motor Corporation: Intake system for internal combustion engine, 4,679,531, Cl. 123-52.0MB.
- Hjerten, Stellan: Coating for electrophoresis tube, 4,680,201, Cl. 427-230.000.
- Hobourn-Eaton, Ltd.: See—  
Bristow, Ian T., 4,679,995, Cl. 418-26.000.
- Hodge, Isabella A.: See—  
Tharrington, G. Robert; and Hodge, Isabella A., 4,679,700, Cl. 220-337.000.
- Hodgson, Thomas C., to Strong Plastics Limited: Laminating methods and apparatus using resilient faced rollers, 4,680,077, Cl. 156-321.000.
- Hodonsky, Joseph W., to General Motors Corporation: Hydraulic mount, 4,679,779, Cl. 267-140.100.
- Hodson, Raymond J., Jr.: See—  
Leue, William M.; Hodson, Raymond J., Jr.; Glover, Gary H.; and Adamchick, John T., 4,680,547, Cl. 324-309.000.
- Hoechst Aktiengesellschaft: See—  
Durl, Bernd; Bos, Johannes; Ong, Sienling; Raffel, Peter; and Brozat, Kurt, 4,680,033, Cl. 8-449.000.
- Lehmann, Peter; and Michel, Manfred, 4,680,244, Cl. 430-66.000.

- Pistorius, Rudolf, 4,680,147, Cl. 260-513.00R.
- Hoegerle, Karl: See—  
Seitz, Karl; Riat, Henri; and Hoegerle, Karl, 4,680,384, Cl. 534-622.000.
- Hoerig, Klaus; and Gora, Hans-Joachim, to General Motors Corporation: Motor vehicle engine mounting arrangement, 4,679,649, Cl. 180-291.000.
- Hoffmann, Birgit: See—  
Lunder, Tito-Livio; Hoffmann, Birgit; and Nielsen, Corine-Madeleine, 4,680,193, Cl. 426-597.000.
- Hoffmann-La Roche Inc.: See—  
Cassal, Jean-Marie, 4,680,290, Cl. 514-182.000.
- Hengartner, Urs; and Ramuz, Henri, 4,680,310, Cl. 514-539.000.
- Holland, George W.; Maag, Hans; and Rosen, Perry, 4,680,415, Cl. 549-214.000.
- Reiner, Roland; and Weiss, Urs, 4,680,408, Cl. 548-100.000.
- Hofman, Jan: Stabilization aid for a vehicle-or vessel-borne search unit, 4,680,521, Cl. 318-649.000.
- Hofstetter, Donald R.; and Fow, Louis F., Jr.: Method for forming drum handling rings, 4,680,068, Cl. 156-196.000.
- Hogeboom, John G.: See—  
Therault, Robert E.; and Hogeboom, John G., 4,679,302, Cl. 29-571.000.
- Hokanson, Gerard C.; Bunge, Richard H.; Hurley, Timothy R.; and French, James C., to Warner-Lambert Company: Antibiotic CL-1565 complex derivatives, 4,680,416, Cl. 549-292.000.
- Hokuetsu Industries Co., Ltd.: See—  
Tanaka, Masanori; Maehara, Atsushi; and Kanai, Junichi, 4,679,996, Cl. 418-201.000.
- Holland, George W.; Maag, Hans; and Rosen, Perry, to Hoffmann-La Roche Inc.: Intermediates for 7-fluoro dihydro PGI compounds, 4,680,415, Cl. 549-214.000.
- Hollis Automation, Inc.: See—  
Sedrick, A. Victor, Jr.; and Lowell, Charles R., 4,679,720, Cl. 228-20.000.
- Hollis, Craig E.: See—  
Hollis, Glenn E.; and Hollis, Craig E., 4,679,602, Cl. 141-19.000.
- Hollis, Glenn E.; and Hollis, Craig E.: Removable device for repeatedly pressurizing a container, 4,679,602, Cl. 141-19.000.
- Hollister, Kenneth R.: See—  
Washburn, William N.; and Hollister, Kenneth R., 4,680,356, Cl. 526-256.000.
- Holmes, Gerald E.; and Pace, Jerry E., to Century Wrecker Corporation: Wheel lift towing assembly, 4,679,978, Cl. 414-563.000.
- Holmes, Myron L.; and Smolensky, Leo A., to Combustion Engineering, Inc.: Fluidized bed reactor having integral solids separator, 4,679,511, Cl. 110-216.000.
- Holst, Svend; Jensen, Niels; and Jensen, Georg, to B & J Rocket Rasp A/S: Grinding machine for grinding or rasping of rubber items, 4,679,354, Cl. 51-76.00R.
- Holstein und Kappert GmbH: See—  
Rademacher, Friedrich; Sindermann, Siegmund; and Sushardt, Rolf, 4,679,603, Cl. 141-39.000.
- Holub, Fred F.: See—  
Betts, Joseph E.; and Holub, Fred F., 4,680,229, Cl. 428-389.000.
- Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English): See—  
Ohzono, Kohei; Hayashi, Kiyotaka; Saito, Mitsuru; Kato, Masaie; and Yoshida, Yoshihiro, 4,679,677, Cl. 192-85.0AA.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Abe, Masao; and Miura, Nobuo, 4,679,540, Cl. 123-602.000.
- Koishi, Masaru; Shinohara, Haruo; and Takayanagi, Shinji, 4,679,860, Cl. 301-9.0DN.
- Komuro, Katsusuke, 4,679,647, Cl. 180-219.000.
- Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, 4,679,382, Cl. 56-10.100.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koichi; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.
- Honer, William A.: Head supported pillow, 4,679,263, Cl. 5-437.000.
- Honeywell Inc.: See—  
Finn, Chris J.; and Youngner, Daniel W., 4,679,308, Cl. 29-576.00B.
- Kozlik, Tony J.; and Landini, Bruce J., 4,680,581, Cl. 340-825.060.
- Honeywell Information Systems Inc.: See—  
McCarthy, Daniel M., 4,680,702, Cl. 364-200.000.
- Honeywell Ltd.: See—  
Mejia, Ezequiel, 4,680,582, Cl. 340-825.170.
- Hopta, Daniel F., to Storage Technology Corporation: Output driver circuit for LSI and VLSI ECL chips with an active pulldown, 4,680,480, Cl. 307-270.000.
- Horiai, Kunio: See—  
Watanabe, Kinichiro; Horiai, Kunio; Mashiko, Tomoyuki; Kato, Hitoshi; Yamaguchi, Hiromasa; and Nishiyama, Toshihiko, 4,679,992, Cl. 417-364.000.
- Horiguchi, Toshio, to Olympus Optical Co., Ltd.: Image display apparatus, 4,680,643, Cl. 358-280.000.
- Horiuchi, Tetsuro, to Ensci Incorporated: Alumina and alkaline earth metal oxide modified zeolite glass composition, 4,680,277, Cl. 501-27.000.
- Horn, Edward R.; and Kot, Norbert J., II, to Aladdin Engineering & Mfg. Mechanical toggle clamp with means for applying uniform clamping force, 4,679,782, Cl. 269-228.000.
- Horner, Michael: See—  
Hetteche, Albert; Weiss, Stefan; Trauth, Hubert; Lechtken, Peter; and Horner, Michael, 4,680,327, Cl. 524-110.000.
- Horng, Liou-Liang: See—  
Taylor, Keith M.; Horng, Liou-Liang; and Hirzel, Timothy K., 4,680,145, Cl. 260-502.00R.
- Hornig, Klaus-Juergen; and Thiessen, Hans-Henning, to Mergenthaler Linotype GmbH: Baseline transposition and character segmenting method for printing, 4,680,578, Cl. 340-731.000.
- Horton Manufacturing Co., Inc.: See—  
Hanks, James V.; Raines, Charles D.; and Dayen, Leonid, 4,679,675, Cl. 192-67.00R.
- Hoshino, Shiro; and Fujino, Bonpei, to Tomy Kogyo Co. Inc.: Toy linkage, 4,680,022, Cl. 446-487.000.
- Hosoda, Tooru: See—  
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.
- Hosono, Masami: See—  
Narita, Yasuhide; Shirai, Noboru; Kohro, Chihaya; and Hosono, Masami, 4,679,861, Cl. 301-37.00P.
- Hotta, Tomiji: See—  
Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, 4,679,930, Cl. 355-52.000.
- Houseman, Walter R., to Custom Technical Enterprises: Projectile firing weapon with a replaceable firing mechanism actuator cassette, 4,679,487, Cl. 89-140.000.
- Houston, Mary B.: See—  
Schumacher, Robert W.; and Houston, Mary B., 4,680,189, Cl. 426-285.000.
- Hovinga, Donald G., to Schneider Metal Manufacturing Co.: Ice cube dispensing outlet, 4,679,715, Cl. 222-517.000.
- Howeth, D. Franklin: Shear blade cutting device with adjusting blade alignment compensator, 4,679,604, Cl. 144-34.00E.
- Hozelock-ASL Ltd.: See—  
Hamilton, Malcolm F., 4,679,705, Cl. 222-90.000.
- Hubbard, David W.: See—  
Cruz-Urbe, Antonio S.; Hubbard, David W.; and Raman, Gopalan, 4,680,595, Cl. 346-140.00R.
- Huber, Beat: See—  
Tschopp, Alexander; Gruenblat-Nordau, Claudy-Gabrielle; Huber, Beat; and Cogoli, Augusto, 4,680,266, Cl. 435-284.000.
- Huber, John H., to AMP Incorporated: Adhesiveless optical fiber connector, 4,679,895, Cl. 350-96.200.
- Huchette, Michel: See—  
Bussiere, Guy; Zimmermann, Marius; and Huchette, Michel, 4,680,180, Cl. 426-16.000.
- Hughes Aircraft Company: See—  
Chen, John Y.; and Henderson, Richard C., 4,679,303, Cl. 29-571.000.
- Efron, Uzi; and Soffer, Bernard H., 4,679,910, Cl. 350-335.000.
- Landecker, Peter B., 4,679,753, Cl. 244-171.000.
- Pastor, Ricardo C., 4,680,044, Cl. 65-3.110.
- Ramer, O. Glenn, 4,679,893, Cl. 350-96.140.
- Wittmann, Alois; Isaacs, Theodore M.; and Murphy, John R., 4,679,752, Cl. 244-158.00R.
- Hughes, John T., to Micropore International Limited: Tubes of microporous thermal insulation material, 4,680,070, Cl. 156-218.000.
- Hughes Tool Company: See—  
Eppink, Jay M., 4,679,638, Cl. 175-107.000.
- Leuthen, John M., 4,680,664, Cl. 361-91.000.
- Hulet, Terry V.: See—  
Giles, Grady L.; Wilson, Jesse R.; and Hulet, Terry V., 4,680,760, Cl. 371-21.000.
- Hull, Donald R.: Set of golf clubs, 4,679,791, Cl. 273-77.00A.
- Huls, David S.: See—  
Leavitt, Michael; and Huls, David S., 4,680,181, Cl. 426-36.000.
- Hunt, Oliver L.: See—  
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- Hunts, Rick E.: Hair clipper, 4,679,322, Cl. 30-133.000.
- Hurley, Timothy R.: See—  
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- Huynh, Anh N.; and Ziogas, Phoivos D., to National Distillers and Chemical Corporation: Ozonator power supply, 4,680,694, Cl. 363-136.000.
- Hwa, Chih M.: See—  
Cuisia, Dionisio G.; and Hwa, Chih M., 4,680,125, Cl. 210-697.000.
- Hwang-Change, Tsai: Retractable glare shield device for automobiles, 4,679,842, Cl. 296-97.00G.
- Hydock, Michael A.: See—  
Ornstein, Jacob L.; and Hydock, Michael A., 4,680,238, Cl. 428-617.000.
- Hydrii Company: See—  
Burton, James A., 4,679,800, Cl. 277-34.000.
- I C Gas International Limited: See—  
Fitt, Peter W., 4,679,409, Cl. 62-476.000.
- Iannella, Vincenzo: Process for preparing 2-[N-(2-pyridylcarbomoyl)-methyl]saccharin, 4,680,405, Cl. 546-270.000.
- Ichihashi, Hiroo: See—  
Ebinuma, Ryuichi; Hattori, Yoshifumi; and Ichihashi, Hiroo, 4,680,696, Cl. 346-75.000.
- Ichinohe, Shoji: See—  
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- ICI Australia Limited: See—  
Bird, Graham J.; Farquharson, Graeme J.; and Watson, Keith G., 4,680,400, Cl. 546-141.000.



- Ida, Shuichiro: See—  
Nagano, Shuji; Ida, Shuichiro; and Yoshinaka, Toshio, 4,679,449, Cl. 74-12.000.
- Ide, Fumito: See—  
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- Idemitsu Kosan Company Limited: See—  
Ishihara, Nobuhide; Kuramoto, Masahiko; and Uoi, Michitake, 4,680,353, Cl. 526-160.000.
- Takematsu, Tetsuo; Nishii, Masahiro; and Kobayashi, Izumi, 4,680,054, Cl. 71-93.000.
- Idemitsu Petrochemical Co., Ltd.: See—  
Fujii, Atsushi; Kaneda, Kazuhisa; and Tokiya, Yoshihiro, 4,680,157, Cl. 264-180.000.
- IEL Limited: See—  
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- Igaki, Tetsuo: See—  
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- Iida, Yuji, to Tokyo Electric Co., Ltd. Electronic cash register and method for defining print characters, 4,680,707, Cl. 364-405.000.
- Ikedo, Hidekatsu: See—  
Hirata, Tadashi; Ikeda, Hidekatsu; Arima, Yoshitaka; and Kashiwara, Yoshihiko, 4,679,473, Cl. 83-157.000.
- Ikeda, Mitsuhiro; and Nakao, Yasuo, to Nippon Air Brake Co., Ltd. Emergency brake command read-convert device for railway train having cars with pneumatic and cars with electrical brake control, 4,679,863, Cl. 303-3.000.
- Ikeda, Toshiya: See—  
Irikura, Tsutomu; Nishino, Keigo; Okamura, Kyuya; and Ikeda, Toshiya, 4,680,398, Cl. 546-121.000.
- Ikeda, Yoshinori; and Aoki, Takao, to Canon Kabushiki Kaisha. Image forming device for reproducing a half-tone image, 4,680,646, Cl. 358-298.000.
- Ikejiri, Masahisa: See—  
Osafune, Haruo; Kanbe, Sadao; Mori, Teichiro; and Ikejiri, Masahisa, 4,680,045, Cl. 65-17.000.
- Ikeuchi, Satoshi; and Taniguchi, Ikuo, to Fujitsu Limited. Protection switching system for carrier transmission line, 4,680,776, Cl. 375-40.000.
- Ikoma, Hideto: See—  
Shibahara, Yoshihiko; and Ikoma, Hideto, 4,680,253, Cl. 430-504.000.
- Ilk, Barbara D. Infusion package, 4,680,185, Cl. 426-83.000.
- Imai, Eiichi: See—  
Suematsu, Koshi; and Imai, Eiichi, 4,680,245, Cl. 430-110.000.
- Imai, Kaetsu, to Victor Company of Japan, Limited. Drive mechanism having torque transmitting gear assemblies, 4,680,659, Cl. 360-96.300.
- Imamura, Masanaga; and Mizuno, Isao, to Ricoh Co., Ltd. Image formation method subliming ink through a gas permeable membrane, 4,680,592, Cl. 346-1.100.
- Imanaka, Hiroshi: See—  
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsu; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.
- Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, to Fujitsu Limited. Process for producing multilayer ceramic circuit board with copper, 4,679,320, Cl. 29-848.000.
- Imaseki, Takashi: See—  
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- Immunomedics, Inc.: See—  
Sundoro, Bobby M., 4,680,338, Cl. 525-54.100.
- Imoto, Takumi: See—  
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.
- Imperial Chemical Industries Plc: See—  
Kenyon, Ronald W.; and Thorp, Derek, 4,680,417, Cl. 549-299.000.
- Lowe, Barrie M.; and Fegan, Stuart G., 4,680,170, Cl. 423-329.000.
- Robefort, Malcolm P.; and Wood, Richard, 4,680,155, Cl. 264-73.000.
- Inada, Shunji: See—  
Sugimoto, Norihiko; Inada, Shunji; and Usami, Nagatoshi, 4,680,756, Cl. 370-88.000.
- Inagaki, Hiromichi. Water-proof container, 4,679,724, Cl. 429-4.500.
- Inami, Sumiaki: See—  
Momoi, Shoji; and Inami, Sumiaki, 4,679,286, Cl. 29-33.00P.
- Inco Alloys International, Inc.: See—  
Orlando, John J., 4,679,736, Cl. 241-25.000.
- Indak Manufacturing Corp.: See—  
Raab, Andrew F.; and Cobb, Albert R., III, 4,679,588, Cl. 137-560.000.
- Inden, Masahiro; Kuwana, Kazutaka; Nakanishi, Nobuyasu; and Noguchi, Noboru, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Fluid pressure controlling solenoid valve, 4,679,589, Cl. 137-596.170.
- Indiana Mills & Manufacturing, Inc.: See—  
Anthony, James R.; and Lortz, Allan R., 4,679,852, Cl. 297-464.000.
- Indicator Controls Corporation: See—  
Martin, Marshall H., 4,680,717, Cl. 364-436.000.
- Injet Medical Products, Inc.: See—  
Parsons, James S.; and Gasaway, Jack S., 4,680,027, Cl. 604-68.000.
- Inmos Corporation: See—  
Hardee, Kim C.; Khan, Anwar U.; McEuen, Steven D.; and Wicker, David J., Jr., 4,680,762, Cl. 371-28.000.
- Inmos Limited: See—  
Edwards, Jonathan; Waller, David L.; and May, Michael D., 4,680,698, Cl. 364-200.000.
- Inoko, Kenji, to AB Tetra Pak. Accumulating commodity conveyor, 4,679,685, Cl. 198-461.000.
- Inokuchi, Toshiyuki, to Ricoh Company, Ltd. Image forming optical apparatus, 4,679,902, Cl. 350-167.000.
- Inou, Kiyoharu; Matsumura, Hideaki; and Saito, Hitoshi, to Yokogawa Hokushin Electric Corporation. DC/DC converter, 4,680,688, Cl. 363-21.000.
- Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, to Kabushiki Kaisha Toshiba. Process for preparing aluminum nitride powder, 4,680,278, Cl. 501-98.000.
- Inoue MTP Kabushiki Kaisha: See—  
Matsuda, Hiromichi, 4,680,150, Cl. 264-26.000.
- Inoue, Naohiko: See—  
Ito, Ken; Inoue, Naohiko; and Kawabe, Taketosi, 4,679,809, Cl. 280-91.000.
- Inoue, Osamu: See—  
Funada, Fumiaki; Hamada, Hiroshi; and Inoue, Osamu, 4,680,505, Cl. 313-558.000.
- Inoue, Tadashi: See—  
Aoyagi, Yoshiki; Suzuki, Masatoshi; Inoue, Tadashi; and Tsukakoshi, Kunio, 4,680,227, Cl. 428-331.000.
- Insituform Group Limited: See—  
Wood, Eric, 4,680,066, Cl. 156-156.000.
- Instance, David J. Apparatus for producing labels, 4,680,080, Cl. 156-357.000.
- Institut für Energetik - Zentralstelle für Rationelle Energieanwendung: See—  
Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, 4,680,153, Cl. 264-44.000.
- Institut National de la Sante et de la Recherche Medicale: See—  
Bach, Jean-Francois; Dardenne, Mireille; Pleau, Jean-Marie; Hamburger, Jean; Bricas, Evangelios; Martinez, Jean; Blanot, Didier; Auger, Genevieve; Lefrancier, Pierre; and Amor, Bernard, 4,680,276, Cl. 436-542.000.
- Institut Textile de France: See—  
Helffer, Bernard; and Scheydecker, Jacques, 4,679,785, Cl. 271-227.000.
- Institute Problem Modelirovani v Energetike a An USSR: See—  
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernouvanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.
- Instrumentarium Corp.: See—  
Tanttu, Jukka, 4,680,549, Cl. 324-318.000.
- Intel Corporation: See—  
Khurana, Neeraj, 4,680,635, Cl. 358-211.000.
- Interferon Sciences, Inc.: See—  
Estis, Leonard F.; Evans, Sean A.; and Testa, Douglas, 4,680,175, Cl. 424-85.000.
- Intermedics, Inc.: See—  
Baker, Ross G., Jr., 4,679,572, Cl. 128-786.000.
- International Business Machines Corporation: See—  
Chang, Phillip, 4,679,527, Cl. 118-658.000.
- Do, Phuc K.; Goodwin, Joel G.; and Krull, Nicholas J., 4,680,524, Cl. 318-696.000.
- Duforestel, Guy G.; Lechaczynski, Michel A.; Poiraud, Clement Y.; and Viallon, Paul P., 4,680,733, Cl. 364-900.000.
- Flamholz, Alexander L., 4,679,938, Cl. 356-237.000.
- Hester, Phillip D.; and Simpson, Richard O., 4,680,700, Cl. 364-200.000.
- Kriz, Thomas A., 4,680,703, Cl. 364-200.000.
- Ng, Chan Y.; Ouchi, Norman K.; Wang, David T.; and Yu, Wellington C., 4,680,653, Cl. 360-72.200.
- Shu, Nan-Chiang, 4,680,705, Cl. 364-300.000.
- Tsai, Mon Y., 4,680,539, Cl. 324-73.00R.
- International Flavors & Fragrances Inc.: See—  
Pittet, Alan O.; Muralidhara, Ranya; and Hagedorn, Myrna L., 4,680,142, Cl. 252-522.00R.
- International Hydron Corporation: See—  
Rawlings, David L.; Glick, Robert E.; and Chang, Robert, 4,680,149, Cl. 264-2.100.
- International Rolling Mill Consultants, Inc.: See—  
Ginzburg, Vladimir B.; and Schmiedberg, Winfried F., 4,680,010, Cl. 432-148.000.
- International Shoe Machine Corporation: See—  
Becka, Michael M.; and Vornberger, Walter, 4,679,269, Cl. 12-10.500.
- Interox Chemicals Limited: See—  
Williams, John, 4,680,271, Cl. 436-55.000.
- Intravascular Surgical Instruments, Inc.: See—  
Kensley, Kenneth; and Nash, John, 4,679,558, Cl. 128-328.000.
- Irikura, Tsutomu; Nishino, Keigo; Okamura, Kyuya; and Ikeda, Toshiya, to Kyorin Pharmaceutical Co., Ltd. Pyrazolo[1,5-a]pyridines and benzimidazoles, useful as antiallergic agents, 4,680,398, Cl. 546-121.000.
- Irmischer, Klaus; Radunz, Hans-Eckart; Schulze, Ernst; and Riefling, Bernhard, to Merck Patent Gesellschaft mit beschränkter Haftung. Sulfur-containing 6-ketoprostaglandins, 4,680,288, Cl. 514-63.000.
- Irving, Graeme N.: See—  
Clarke, Terence A.; Edwards, Richard B.; and Irving, Graeme N., 4,680,132, Cl. 252-108.000.

- Irwin, Lawrence: See—  
Anderson, Paul T.; and Irwin, Lawrence, 4,679,378, Cl. 53-405.000.
- Isaacs, Theodore M.: See—  
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- Isakozawa, Shigeto: See—  
Nomura, Setsuo; and Isakozawa, Shigeto, 4,680,469, Cl. 250-311.000.
- Iseki, Yuji: See—  
Nakahara, Akihiko; Takata, Kuniaki; and Iseki, Yuji, 4,680,355, Cl. 526-243.000.
- Ishida, Hiroshi: See—  
Kobari, Katsuo; and Ishida, Hiroshi, 4,680,525, Cl. 318-798.000.
- Ishihara, Nobuhide; Kuramoto, Masahiko; and Uoi, Michitake, to Idemitsu Kosan Company Limited. Process for production of styrene polymers, 4,680,353, Cl. 526-160.000.
- Ishii, Hiroshi: See—  
Yoshii, Jiro; Komatsu, Akira; and Ishii, Hiroshi, 4,680,720, Cl. 364-521.000.
- Ishii, Susumu; and Oda, Kiyoshi, to Yoshida Kogyo K. K. Automatic locking slider with a pair of pull tabs, 4,679,281, Cl. 24-422.000.
- Ishikawa, Haruyuki: See—  
Toyoda, Kenichi; Sakakibara, Shinsuke; and Ishikawa, Haruyuki, 4,680,520, Cl. 318-594.000.
- Ishikawa, Masanobu: See—  
Nishikawa, Masumi; and Ishikawa, Masanobu, 4,679,457, Cl. 74-441.000.
- Ishikawa, Tatsuo: See—  
Yuhara, Yukitomo; Okojima, Sumio; and Ishikawa, Tatsuo, 4,679,576, Cl. 132-82.00R.
- Ishitani, Tooru: See—  
Uemura, Kaoru; Ishitani, Tooru; and Tamura, Hifumi, 4,680,507, Cl. 315-111.810.
- Ishiwata, Shousuke: See—  
Kanda, Mamoru; Suzuki, Osamu; Ishiwata, Shousuke; and Hayashi, Mitsuru, 4,679,427, Cl. 73-54.000.
- Ishiwatari, Shiro, to Olympus Optical Co., Ltd. Electrophoretic apparatus, 4,680,102, Cl. 204-299.00R.
- Ishizaka, Yutaka: See—  
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneke, Koichiro; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.
- Iskandarani, Ziad: See—  
Miller, Theodore E., Jr.; and Iskandarani, Ziad, 4,679,428, Cl. 73-61.10C.
- Isono, Haruo; Kusaka, Hideo; and Hasegawa, Takeshi, to Nippon Hoso Kyokai. Viewfinder for TV camera use with means for enhancing the contrast level of the viewfinder image, 4,680,639, Cl. 358-224.000.
- Isoo, Osamu: See—  
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.
- Isoroy: See—  
Vernois, Michel; and Paugam, Francois, 4,680,219, Cl. 428-222.000.
- Isoyama, Toyoshio; Ogawa, Tetsuya; and Sugimori, Shigeru, to Chisso Corporation. Liquid crystal ester compound, 4,680,137, Cl. 252-299.620.
- Itani, Abdallah M.; Dietz, Peter W.; and Carlson, Gerald J., to General Electric Company. False triggering protection for switching device of a capacitive load pulser circuit, 4,680,532, Cl. 323-240.000.
- Itani, Abdallah M.; Carlson, Gerald J.; and Dietz, Peter W., to General Electric Company. Protection arrangement for switching device of a capacitive load pulser circuit, 4,680,533, Cl. 323-240.000.
- Itek Corporation: See—  
Wojcik, David R.; Jones, Richard J.; and Aufiero, James M., 4,680,628, Cl. 358-111.000.
- Ito, Ken; and Kawabe, Taketosi, to Nissan Motor Co., Ltd. Vehicle motion estimating system, 4,679,808, Cl. 280-91.000.
- Ito, Ken; Inoue, Naohiko; and Kawabe, Taketosi, to Nissan Motor Co., Ltd. Steering control system for wheeled vehicle, 4,679,809, Cl. 280-91.000.
- Ito, Ryoichi: See—  
Fujii, Masaki; Gotoh, Shiroh; Nakagawa, Hideaki; and Ito, Ryoichi, 4,680,318, Cl. 521-95.000.
- Ito, Takeshi, to Tokyo Shibaura Denki Kabushiki. Device for detecting a space between adjacent blocks of data recorded in a recording medium, 4,680,652, Cl. 360-72.100.
- Itoh, Katsuro: See—  
Yoshino, Teruo; and Itoh, Katsuro, 4,680,691, Cl. 363-51.000.
- Itoh, Yoshitaka: See—  
Matsuo, Nobutaka; Motoki, Masanobu; Itoh, Yoshitaka; Kanbe, Sadao; and Osafune, Haruo, 4,680,046, Cl. 65-17.000.
- Motoki, Masanobu; Matsuo, Nobutaka; Kanbe, Sadao; Osafune, Haruo; and Itoh, Yoshitaka, 4,680,048, Cl. 65-17.000.
- Itoh, Yuji; and Takahashi, Junichi, to Canon Kabushiki Kaisha. Ophthalmic photographic apparatus, 4,679,919, Cl. 351-206.000.
- Iwai, Kazuo, to Ajinomoto Co., Inc. Acceleration of lipid metabolism using vanillylamine derivatives, 4,680,313, Cl. 514-627.000.
- Iwaki, Akihiro, to Stanley Electric Co., Ltd. Lighting fixture for vehicle, 4,680,678, Cl. 362-61.000.
- Iwaki, Akihiro; and Tajima, Masayoshi, to Stanley Electric Co., Ltd. Combination vehicle lamp device, 4,680,680, Cl. 362-80.000.
- Iwamoto, Hirofumi: See—  
Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.
- Iwanaga, Hironobu: See—  
Aoki, Motohisa; and Iwanaga, Hironobu, 4,680,246, Cl. 430-133.000.
- Iwashita, Tooru: See—  
Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Tooru, 4,680,349, Cl. 526-62.000.
- Iwata, Masatoshi: See—  
Suzuki, Akio; Koitabashi, Takeo; Iwata, Masatoshi; Yamaguchi, Hisashi; and Matsuzaka, Syoji, 4,680,252, Cl. 430-364.000.
- Iwata, Shuji: See—  
Fukushima, Nobuo; and Iwata, Shuji, 4,680,629, Cl. 358-147.000.
- Iwatani, Shiro: See—  
Komurasaki, Keiichi; Iwatani, Shiro; and Nishimura, Shinji, 4,680,529, Cl. 322-28.000.
- Izotova, Lara S.: See—  
Debabov, Vladimir G.; Tsygankov, Jury D.; Chistoserov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Jury I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Jury A., 4,680,260, Cl. 435-68.000.
- Izumi, Hideki D.; and Terrell, Paul J., to Romox Incorporated. Reprogrammable cartridge memory with built-in identification circuitry and programming method, 4,680,731, Cl. 364-900.000.
- J. C. Bamford Excavators Limited: See—  
Brocklebank, Norman; and Cooper, Alan, 4,679,336, Cl. 37-103.000.
- J. M. Huber Corporation: See—  
Kunkle, Albert C.; and Maxwell, Edgar J., III, 4,680,104, Cl. 204-300.00R.
- J. T. Baker Chemical Company: See—  
Ramsden, Hugh E.; and Patterson, Joseph M., 4,680,120, Cl. 210-635.000.
- Ramsden, Hugh E.; and Patterson, Joseph M., III, 4,680,121, Cl. 210-635.000.
- Jabs, Alfred: See—  
Wohrl, Bernhard; and Jabs, Alfred, 4,679,619, Cl. 165-81.000.
- Jacarus, Gary J., to United Technologies Corporation. Method for stabilizing thick honeycomb core composite articles, 4,680,216, Cl. 428-116.000.
- Jack Walters & Sons, Corp.: See—  
Geisthardt, Alan C., 4,679,367, Cl. 52-233.000.
- Jackson, Charles L., to AMP Incorporated. Electrical terminal, 4,679,887, Cl. 439-849.000.
- Jackson, Robert W.: See—  
Kosarski, Raymond, Jr.; and Jackson, Robert W., 4,679,397, Cl. 60-562.000.
- Jacob, Neil R.; and Suiter, John R., to Smiths Industries Public Limited Company. Probe assemblies including such mounts, 4,679,431, Cl. 73-290.00R.
- Jacobs, Stephen D.; and Cerqua, Kathleen A., to University of Rochester. The Optical apparatus using liquid crystals for shaping the spatial intensity of optical beams having designated wavelengths, 4,679,911, Cl. 350-347.00E.
- Jahake, Andreas, to Siemens Aktiengesellschaft. Magnetic field device for a system for the acceleration and/or storage of electrically charged particles, 4,680,565, Cl. 335-216.000.
- James, Claude: See—  
Aloup, Jean C.; Bouchaudon, Jean; Farge, Daniel; and James, Claude, 4,680,303, Cl. 514-336.000.
- James, Thomas A.: See—  
Spratt, Kenneth, 4,679,415, Cl. 70-118.000.
- Jameson, Calvin R.; and Ramazzotti, Dario J., to Nordson Corporation. Hot melt foam adhesive system, 4,679,710, Cl. 222-190.000.
- Jannoni, Richard: See—  
Coates, Fredrica V.; Jannoni, Richard; and Orsini, Jean, 4,680,030, Cl. 604-391.000.
- Janowicz, Andrew H.; and Melby, Lester R., to Du Pont de Nemours, E. I., and Company. Cobalt (II) chelates as chain transfer agents in free radical polymerizations, 4,680,352, Cl. 526-147.000.
- Japan Steel Works, Ltd., The: See—  
Mizuguchi, Hideki; Yamaguchi, Haruo; Hanada, Seigo; and Mukuda, Nobuo, 4,679,461, Cl. 74-665.0GA.
- Japan Tobacco Inc.: See—  
Yamaguchi, Katsunori; and Takemoto, Nagaaki, 4,679,575, Cl. 131-365.000.
- Jarr, Klaus D., to Marley-Wylain Company, The. Leak detector with two stage piston chamber, 4,679,587, Cl. 137-509.000.
- Jarvis, Allan P., Jr.; Koch, George A.; and Abrams, Paul G., to Damon Biotech, Inc. Induction of immune response by immunization with encapsulated antigen-producing cells, 4,680,174, Cl. 424-85.000.
- Jasinski, Richard A.; and Mains, Donald M., to Becor Western Inc. Automatic leveling system for blast hole drills and the like, 4,679,489, Cl. 91-36.000.
- JATAB, Jan Torgny AB: See—  
Torgny, Jan, 4,679,849, Cl. 297-330.000.
- Jawalkar, Damodar G.: See—  
Mandal, Arun K.; Jawaikar, Damodar G.; and Mahajan, Satish W., 4,680,418, Cl. 549-305.000.
- Jean Greub S.A.: See—  
Lopez, Angel, 4,679,295, Cl. 29-564.800.
- Jean, Robert P. H.: See—  
Brion, Jean-Claude A.; Brunaud, Claude; Jean, Robert P. H.; and Machet, Rene H., 4,680,671, Cl. 361-329.000.



See, Trevor P., to British Petroleum Company p.l.c., The. Subsea pipeline bundle. 4,679,598, Cl. 138-103.000.

Jefferts, Keith B., to Northwest Marine Technology Inc. Method and device for tagging a macro-organism. 4,679,559, Cl. 128-330.000.

Jeffreys, Lyman W.: See—  
Sieradzki, Christopher; and Jeffreys, Lyman W., 4,679,447, Cl. 73-865.800.

Jeindl, Ferdinand, to Steirische Kettenfabriken Pengg-Walenta KG. Vehicle tire chain. 4,679,608, Cl. 152-213.00A.

Jendick, Manfred, to GerroKaiser Dosenwerk GmbH & Co KG. Method and apparatus for lubricating a moving chain. 4,679,659, Cl. 184-15.200.

Jennings, Alfred R., Jr.: See—  
Abdo, Milton K.; and Jennings, Alfred R., Jr., 4,679,629, Cl. 166-281.000.

Jennmar Corporation: See—  
Yacisin, Paul A., 4,679,966, Cl. 405-261.000.

Jensen, Borge: See—  
Skovdal, Jorgen; Santhouze, Daniel; Jensen, Borge; and Carlucci, Vito, 4,680,444, Cl. 219-222.000.

Jensen, Brian D.: See—  
Roussin, Michael A.; Fidler, Jerry D.; and Jensen, Brian D., 4,679,857, Cl. 299-37.000.

Jensen, C. Allen: See—  
Lang, Paul W.; and Gribshaw, Franklin C., 4,679,574, Cl. 131-365.000.

Jensen, Georg: See—  
Holst, Svend; Jensen, Niels; and Jensen, Georg, 4,679,354, Cl. 51-76.00R.

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Jeschke, Willi, to Heidelberger Druckmaschinen AG. Register system for in-register alignment or orientation of a flexible printing plate. 4,679,502, Cl. 101-415.100.

Jeumont-Schneider Corporation: See—  
Marchand, Patrick, 4,680,586, Cl. 340-870.260.

JGC Corporation: See—  
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.

Jilken, Ann-Christin, to Adenco Engineering AB. Profile. 4,679,371, Cl. 52-574.000.

Jindo, Tomio: See—  
Ozaki, Kiyotaka; Torii, Shuui; Jindo, Tomio; and Imaseki, Takashi, 4,679,463, Cl. 74-711.000.

Jobst, Wolfgang: See—  
Detampel, Heinz; Hillemann, Frank; Jobst, Wolfgang; and Prien, Manfred, 4,679,845, Cl. 296-192.000.

Joerns Healthcare, Inc.: See—  
Packard, Richard F.; and Cover, Kenneth R., 4,680,790, Cl. 379-432.000.

Johannessen, Jorgen M., to Jorgen Mosbaek Johannessen ApS. Device for controlling the flow in a pipe system. 4,679,595, Cl. 137-813.000.

Johansen, Kim L. Alarm device for automobiles and similar vehicles. 4,679,648, Cl. 180-272.000.

Johansson, Gert A. Clothing data marker. 4,679,340, Cl. 40-322.000.

John, Gunther, to Minnesota Mining and Manufacturing Company. Fire resistant cast cable connection. 4,680,427, Cl. 174-88.00R.

Johns Hopkins University, The: See—  
Loveless, John H., 4,679,644, Cl. 180-6.500.

Small, Thomas R., 4,679,761, Cl. 248-609.000.

Johnson, Alfred N.: See—  
Prisco, Anthony J.; and Johnson, Alfred N., 4,679,738, Cl. 241-101.200.

Johnson, Brian S., to Upjohn Company, The. Stable prostaglandin E gels utilizing colloidal silicon dioxide as a gel-forming agent. 4,680,312, Cl. 514-573.000.

Johnson, Bruce S., to Harsco Corporation. Cable tension sensing apparatus. 4,679,771, Cl. 254-273.000.

Johnson, Christopher F.; and Green, Sidney J., to Terra Tek, Inc. Pressure balanced loading piston for triaxial test cells. 4,679,441, Cl. 73-798.000.

Johnson, Clifford T.: See—  
Miller, Larry J.; Johnson, Clifford T.; and Rattlingourd, Glen D., 4,680,759, Cl. 370-112.000.

Johnson, Conner. Convertible auto restrainer seat (car set). 4,679,804, Cl. 280-30.000.

Johnson, Daniel D., to W. L. Gore & Associates, Inc. Dielectric materials. 4,680,220, Cl. 428-241.000.

Johnson, David D.: See—  
Biller, Cleveland J.; and Johnson, David D., 4,679,803, Cl. 280-600H.

Johnson, Jay K.: See—  
Gurries, Richard M.; Johnson, Jay K.; and Nering, Eric A., 4,679,268, Cl. 110-346.000.

Johnson, Michael R.: See—  
Eggle, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,680,404, Cl. 546-269.000.

Johnston Pump/General Valve, Inc.: See—  
Smith, Gordon M.; Chase, Fred G., Sr.; and Ducharme, Gerard E., 4,679,764, Cl. 251-14.000.

Jolly, Thomas A. Gun sight. 4,679,344, Cl. 42-100.000.

Jones, Douglas L.: See—  
Bryson, Charles E., III; and Jones, Douglas L., 4,680,467, Cl. 250-305.000.

Jones, James E.: See—  
Das, Surya K.; Seiner, Jerome A.; Greigiger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Boberski, William G., 4,680,204, Cl. 427-407.100.

Jones, James W.: See—  
Guzik, Nahum; Mangeym, Gennady; and Jones, James W., 4,680,516, Cl. 318-326.000.

Jones, John H.: See—  
Curry, Bill P.; Jones, John H.; Seiber, Brian L.; Price, Lynwood L.; Powell, Homer M.; and Kiech, Earl L., 4,679,939, Cl. 356-336.000.

Jones, Ralph W.: See—  
Maskasky, Joe E.; and Jones, Ralph W., 4,680,256, Cl. 430-567.000.

Jones, Richard J.: See—  
Wojcik, David R.; Jones, Richard J.; and Aufiero, James M., 4,680,628, Cl. 358-111.000.

Jorgen Mosbaek Johannessen ApS: See—  
Johannessen, Jorgen M., 4,679,595, Cl. 137-813.000.

Joslin, Paul C.: See—  
Etherington, Harry J. C.; Joslin, Paul C.; and Dunkley, Rowland A. G., 4,680,801, Cl. 382-3.000.

Josquin, Wilhelmus J. M. J.: See—  
Lohstroh, Jan; and Josquin, Wilhelmus J. M. J., 4,680,619, Cl. 357-86.000.

Jourdain, Gerard E. A.: See—  
Bouiller, Jean G.; and Jourdain, Gerard E. A., 4,679,982, Cl. 415-145.000.

Junior, Aluizio P.: See—  
Ghosh, Subir; and Junior, Aluizio P., 4,680,558, Cl. 333-21.00R.

JWG Enterprises: See—  
Waltman, John H.; Stewart, Wesley J.; and Leroux, Gerald E., 4,679,543, Cl. 126-25.00R.

Kabushiki Kaisha Daikin Seisakusho: See—  
Nagano, Tamio, 4,679,683, Cl. 192-89.00B.

Kabushiki Kaisha Daini Seikosha: See—  
Kawahara, Yukito, 4,680,580, Cl. 340-784.000.

Kabushiki Kaisha Daisei Kikai: See—  
Kawakami, Sanji, 4,679,641, Cl. 177-114.000.

Kabushiki Kaisha Komatsu Seisakusho: See—  
Kodama, Kazuo; and Morikawa, Keishi, 4,679,973, Cl. 409-200.000.

Watanabe, Kinichiro; Horiai, Kunio; Mashiko, Tomoyuki; Kato, Hitoshi; Yamaguchi, Hiromasa; and Nishiyama, Toshihiko, 4,679,992, Cl. 417-364.000.

Kabushiki Kaisha Meidensha: See—  
Nogi, Teiji; and Gondo, Toyomi, 4,680,663, Cl. 361-2.000.

Kabushiki Kaisha Sankodo: See—  
Kobayashi, Hiroshi, 4,679,671, Cl. 190-115.000.

Kabushiki Kaisha Sato: See—  
Kashiwaba, Tadao, 4,680,083, Cl. 156-510.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: See—  
Morita, Masayuki; and Hattori, Masaichi, 4,679,453, Cl. 74-128.000.

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Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,680,278, Cl. 501-98.000.

Kasahara, Akihiro; Goto, Kenya; Yamada, Akira; and Watanabe, Shoji, 4,679,903, Cl. 350-247.000.

Kobayashi, Koichi, 4,680,748, Cl. 369-77.100.

Kubota, Yousuke, 4,679,442, Cl. 73-861.120.

Miyamoto, Junichi; and Tsujimoto, Jun-ichi, 4,680,735, Cl. 365-210.000.

Morizuka, Kouhei, 4,679,305, Cl. 29-576.300.

Nakagawa, Akio; and Watanabe, Kiminori, 4,680,604, Cl. 357-23.400.

Ooi, Kazushige, 4,680,636, Cl. 358-213.180.

Sagai, Masayuki; and Nishikawa, Reiji, 4,680,197, Cl. 427-129.000.

Sakai, Takami, 4,680,692, Cl. 363-35.000.

Sasaki, Hiroshi, 4,679,565, Cl. 128-660.000.

Sogo, Toshiyuki; and Ide, Fumito, 4,679,927, Cl. 355-3.00R.

Sugiki, Tadashi, 4,680,637, Cl. 358-213.260.

Takeno, Shozo; Shimizu, Toshiro; and Saito, Takashi, 4,680,593, Cl. 346-76.00PH.

Tanaka, Yoshio; and Onodera, Toshihiro, 4,680,534, Cl. 323-290.000.

Yamaki, Bunshiro; Kikuchi, Sadatake; and Tomisawa, Yutaka, 4,680,569, Cl. 338-42.000.

Yoshii, Jiro; Komatsu, Akira; and Ishii, Hiroshi, 4,680,720, Cl. 364-521.000.

Yoshino, Tetsuo; and Itoh, Katsuro, 4,680,691, Cl. 363-51.000.

Kabushiki Kaisha Universal: See—  
Okada, Kazuo, 4,679,789, Cl. 273-1.00E.

Kackman, Gerald M.: See—  
Konicek, Lawrence R.; Case, Steven K.; and Kackman, Gerald M., 4,680,704, Cl. 364-525.000.

Kagabu, Shinzo: See—  
Shickawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,680,294, Cl. 514-256.000.

Kage, Kouzou, to NEC Corporation. Digital signal repeater including means for controlling a transmitter. 4,680,772, Cl. 375-4.000.

Kageyama, Yoshiteru, to Mitsubishi Petrochemical Company Limited. Metal powder-containing compositions. 4,680,140, Cl. 252-512.000.

Kai, Hisao; Ochiai, Kensuke; and Niisato, Takeshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Cutter for dispensing container and dispensing container provided with said cutter. 4,679,718, Cl. 225-48.000.

Kajimoto, Nobuyuki; Tamaki, Akihiro; and Nagata, Teruyuki, to Mitsui Toatsu Chemicals, Incorporated. Sulfur-containing polyurethane base lens resin. 4,680,369, Cl. 528-76.000.

Kakavas, Dorothy A., to Adams Merchandising, Inc. Display table attachment for shopping carts. 4,679,818, Cl. 280-33.99A.

Kalb, Gerald F.; and Brown, David M., to S.I.E., Inc. Shock absorber. 4,679,669, Cl. 188-375.000.

Kalriess, William: See—  
Magid, David J.; Svitla, Barbara; and Kalriess, William, 4,679,706, Cl. 222-130.000.

Kambic, Raymond V., to R. R. Brink Locking Systems, Inc. Trigger and latch bolt assembly. 4,679,416, Cl. 70-143.000.

Kamehara, Nobuo: See—  
Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, 4,679,320, Cl. 29-848.000.

Kamen, Dean L., to Baxter Travenol Laboratories, Inc. Fluid drop detection system. 4,680,462, Cl. 250-222.100.

Kamigaito, Masayuki: See—  
Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, 4,680,322, Cl. 523-416.000.

Kamihonoki, Masuo: See—  
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.

Kaminski, Ronald S.: See—  
Nowicki, Casimir W.; Lucius, Thomas A.; Kaminski, Ronald S.; and Snyder, Robert P., 4,680,000, Cl. 425-126.00R.

Kamiwada, Minoru; Saruwatari, Kazuyuki; Shimada, Kazuaki; and Higashizima, Harumi, to Matsushita Electric Industrial Co., Ltd. Water purifier apparatus. 4,680,116, Cl. 210-282.000.

Kamiyama, Koozi: See—  
Ogawa, Hiroshi; Mizuno, Chiaki; Tamai, Yasuo; and Kamiyama, Koozi, 4,680,225, Cl. 428-323.000.

Kammermeier, Anton: See—  
Moser, Ludwig M.; and Kammermeier, Anton, 4,679,650, Cl. 181-130.000.

Kamoun, Ahmed: See—  
Chaveron, Henri; Pontillon, Jean; Billon, Michel; Adenier, Herve; and Kamoun, Ahmed, 4,679,498, Cl. 99-483.000.

Kamyr AB: See—  
Ahs, Bjorn, 4,680,108, Cl. 209-273.000.

Kanai, Junichi: See—  
Tanaka, Masanori; Machara, Atsushi; and Kanai, Junichi, 4,679,996, Cl. 418-201.000.

Kanamaru, Hitoshi, to Pioneer Electronic Corporation. Disc player having pick-up tilt servo system combined with disc presence detection circuits. 4,680,744, Cl. 369-44.000.

Kanamori, Toshinori: See—  
Nobuhara, Masahiro; Kanamori, Toshinori; Yamaguchi, Kiyoshi; and Mochida, Ei, 4,680,261, Cl. 435-68.000.

Kanbe, Sadao: See—  
Matsuo, Nobutaka; Motoki, Masanobu; Itoh, Yoshitaka; Kanbe, Sadao; and Osafune, Haruo, 4,680,046, Cl. 65-17.000.

Motoki, Masanobu; Matsuo, Nobutaka; Kanbe, Sadao; Osafune, Haruo; and Itoh, Yoshitaka, 4,680,048, Cl. 65-17.000.

Osafune, Haruo; Kanbe, Sadao; Mori, Teichiro; and Ikejiri, Masahisa, 4,680,045, Cl. 65-17.000.

Kanda, Mamoru; Suzuki, Osamu; Ishiwata, Shousuke; and Hayashi, Mitsuroh, to Chichibu Cement Kabushiki Kaisha. Apparatus for measuring viscosity. 4,679,427, Cl. 73-54.000.

Kaneda, Kazuhisa: See—  
Fuji, Atsushi; Kaneda, Kazuhisa; and Tokiya, Yoshihiro, 4,680,157, Cl. 264-180.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—  
Asada, Masahiro; and Azuma, Miyuki, 4,680,381, Cl. 528-501.000.

Uku, Kyouji; and Kato, Shinji, 4,680,320, Cl. 523-313.000.

Kaneko, Hiroshi: See—  
Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Tooru, 4,680,349, Cl. 526-62.000.

Kanesaki, Taro; Utsumi, Shigeo; and Tomitaka, Kichinojo, to Diafoil Company, Limited. Polyester film for magnetic recording media. 4,680,217, Cl. 428-141.000.

Kaneshige, Noritsugu: See—  
Kobayashi, Takuma; Kitagawa, Hironobu; Kaneshige, Noritsugu; and Makimura, Osamu, 4,680,345, Cl. 525-437.000.

Kaneyuki, Kazutoshi, to Mitsubishi Denki Kabushiki Kaisha. Auxiliary device driving unit driven by a vehicle engine. 4,679,456, Cl. 74-752.00D.

Kanzaki Kokyukoki Mfg. Co., Ltd.: See—  
Yamaoka, Kojiro; Yano, Kazuhiko; and Ohtsuki, Kazuhiko, 4,679,673, Cl. 192-21.000.

Kanzaki Paper Manufacturing Co. Ltd.: See—  
Okamoto, Shigeo; and Shiozaki, Tomoharu, 4,680,597, Cl. 503-214.000.

Kapadia, Jayant K.: See—  
Fruehan, Mark T.; Fennig, Jeffrey A.; and Kapadia, Jayant K., 4,679,508, Cl. 105-341.000.

Kaplan, Murray A.; Bogardus, Joseph B.; and Lipper, Robert A., to Bristol-Myers Company. Temperature stable crystalline di(1-methyl-2-pyrrolidinone) and di(N-formylpyrrolidine) adducts of cephalosporin derivatives. 4,680,389, Cl. 540-222.000.

Karl, David: See—  
Petratos, Nickie A.; Karl, David; and Bradford, William M., 4,680,676, Cl. 361-424.000.

Karr, Steven G.: See—  
O'Donnell, Matthew; Karr, Steven G.; Barber, William D.; Wang, Jish M.; and Edelstein, William A., 4,680,551, Cl. 324-320.000.

Karwoski, Stanley G.: See—  
Mommensen, Gordon V.; Fender, Norman N.; Karwoski, Stanley G.; Scherer, William C.; and Lind, Robert J., 4,679,734, Cl. 239-692.000.

Kasahara, Akihiro; Goto, Kenya; Yamada, Akira; and Watanabe, Shoji, to Kabushiki Kaisha Toshiba. Objective lens driving device. 4,679,903, Cl. 350-247.000.

Kasai, Yoshihiko: See—  
Kimura, Katsuji; Kasai, Yoshihiko; Yokoyama, Yukio; Yamasaki, Koji; and Sato, Toshifumi, 4,680,553, Cl. 330-2.000.

Kashihara, Yoshihiko: See—  
Hirata, Tadashi; Ikeda, Hidekatsu; Arima, Yoshitaka; and Kashihara, Yoshihiko, 4,679,473, Cl. 83-157.000.

Kashiwaba, Tadao, to Kabushiki Kaisha Sato. Cutter device for a film strip on a laminate. 4,680,083, Cl. 156-510.000.

Kasper, Joseph G.: See—  
Field, Bruce F.; and Kasper, Joseph G., 4,679,271, Cl. 15-49.00C.

Katakura, Kageyoshi: See—  
Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, 4,680,499, Cl. 310-334.000.

Katayama, Kaneo; and Hashimoto, Yasuhiko, to Mitsubishi Denki Kabushiki Kaisha. Damper device for an air conditioning apparatus. 4,679,494, Cl. 98-38.600.

Kato, Hideaki; and Araki, Shigeru, to NEC Corporation. Digital video signal process apparatus for use in a video tape recorder. 4,680,791, Cl. 380-8.000.

Kato, Hitoshi: See—  
Watanabe, Kinichiro; Horiai, Kunio; Mashiko, Tomoyuki; Kato, Hitoshi; Yamaguchi, Hiromasa; and Nishiyama, Toshihiko, 4,679,992, Cl. 417-364.000.

Kato, Masaie: See—  
Ohzono, Kohei; Hayashi, Kiyotaka; Saito, Mitsuru; Kato, Masaie; and Yoshida, Yoshihiro, 4,679,677, Cl. 192-85.00A.

Kato, Shinji: See—  
Uku, Kyouji; and Kato, Shinji, 4,680,320, Cl. 523-313.000.

Katsuhiko, Kobayashi: See—  
Takashi, Shiori; Katsuhiko, Kobayashi; and Hideo, Tago, 4,679,920, Cl. 351-226.000.

Kauss, Wolfgang, to Mannesmann Rexroth GmbH. Method for depth adjustment of a tilling machine. 4,679,633, Cl. 172-1.000.

Kavoussi, James P.; and Hartford, Louise D. Scent clock bimetallic device. 4,679,943, Cl. 368-12.000.

Kawabe, Taketoshi: See—  
Ito, Ken; and Kawabe, Taketoshi, 4,679,808, Cl. 280-91.000.

Kawabe, Taketosi: See—  
Ito, Ken; Inoue, Naohiko; and Kawabe, Taketosi, 4,679,809, Cl. 280-91.000.

Kawahara, Yukito, to Kabushiki Kaisha Daini Seikosha. Active matrix-addressed liquid-crystal display device. 4,680,580, Cl. 340-784.000.

Kawai, Hidemi: See—  
Suwa, Kyoichi; Kawai, Hidemi; and Murakami, Masaichi, 4,679,942, Cl. 356-401.000.

Kawai, Masanobu. Baker's dough. 4,680,182, Cl. 426-62.000.

Kawai, Masao: See—  
Hayakawa, Yoichi; Kawai, Masao; Tago, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,679,450, Cl. 74-752.00A.

Kawai Musical Instrument Mfg. Co., Ltd.: See—  
Deutsch, Ralph, 4,679,478, Cl. 84-1.100.

Kawai, Tatsundo: See—  
Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.

Kawai, Yoshio: See—  
Sugiyama, Kazuhiro; and Kawai, Yoshio, 4,680,432, Cl. 200-5.00A.

Kawakami, Sanji, to Kabushiki Kaisha Daisei Kikai. Apparatus for feeding sprouting beans or the like in fixed quantities. 4,679,641, Cl. 177-114.000.

Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, to Canon Kabushiki Kaisha. Camera. 4,679,925, Cl. 354-173.100.

Kawamura, Reiki: See—  
Hattori, Takemi; and Kawamura, Reiki, 4,679,855, Cl. 297-486.000.

Kawanishi, Tsuneaki: See—  
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.

Kawano, Katsumi: See—  
Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, 4,680,718, Cl. 364-455.000.

Kawasaki Jukogyo Kabushiki Kaisha: See—  
Hashimoto, Isao; Kinoshita, Tosuke; Uchida, Masahiro; and Uchiyama, Susumu, 4,679,739, Cl. 241-121.000.

Nishida, Hiroshi, 4,679,522, Cl. 114-357.000.

Yazaki, Mitsuburo, 4,680,575, Cl. 340-624.000.

Kawasaki Steel Corporation: See—  
Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, 4,679,611, Cl. 164-431.000.

Kawase, Kiyotaka: See—  
Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, 4,680,322, Cl. 523-416.000.

Kawashima, Kazuyasu: See—  
Shirato, Kozo; Hiratzumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Ta-



- keya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.
- Kearney, David A., to Markem Corporation. Label applicator. 4,680,082, Cl. 156-497.000.
- Kearney & Trecker Corporation: See—
- Lohneis, Earl R.; and Woythal, Robert T., 4,679,970, Cl. 408-128.000.
- Keeton, J. Herbert. Process and apparatus for stitching excess thread chain on a sewing machine. 4,679,515, Cl. 112-262.100.
- Keiper Recaro GmbH & Co.: See—
- Putsch, Peter-Ulrich; and Cremer, Heinz P., 4,679,854, Cl. 297-486.000.
- Keklak, Ronald; Couture, Michael V.; Whitehouse, John C.; and Payne, Marshall W., to Dedicated Technologies, Inc. Trailer creep alarm. 4,680,571, Cl. 340-52.00R.
- Kelch, Robert H., to Dow Chemical Company. The Weatherable coextruded flexible films and laminated structure. 4,680,234, Cl. 428-461.000.
- Keldmann, Erick C. V., to Elpan, Aps. Ceiling or wall unit. 4,679,617, Cl. 165-36.000.
- Kelemen, Jozsef: See—
- Bezzegh, Denes; Magyar, Karoly; Kelemen, Jozsef; Zalai, Gabor; Mandi, Attila; and Egri, Janos, 4,680,315, Cl. 514-738.000.
- Keller, Jakob: See—
- Hellat, Jaan; and Keller, Jakob, 4,679,393, Cl. 60-39.450.
- Kelley Company Inc.: See—
- Fettig, Robert P.; Bushman, Matthew J.; and Miller, Glenn M., 4,679,364, Cl. 52-173.0DS.
- Kelln, Norman G., to Fisher Scientific Company. Centrifugal analyzer. 4,680,164, Cl. 422-72.000.
- Kelly, John A.: See—
- Young, Paul R.; Koutek, Mary E.; and Kelly, John A., 4,680,124, Cl. 210-697.000.
- Kelm, James S.; MacIn, Harvey M.; Vickers, Edward C.; and Wake-man, Thomas G., to General Electric Company. Variable turbine vane support. 4,679,400, Cl. 60-722.000.
- Kemeny, George A., to Westinghouse Electric Corp. Electromagnetic launcher rail temperature reduction through controlled breech current injection. 4,679,484, Cl. 89-8.000.
- Kemper, Dennis C.: See—
- Newberry, Mark A.; and Kemper, Dennis C., 4,679,599, Cl. 138-104.000.
- Kennedy, Gregory C., to Harbor Branch Oceanographic Institute Inc. Electric motor reversing control devices. 4,680,513, Cl. 318-285.000.
- Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A. Toy vehicle having simulated engine noise. 4,680,020, Cl. 446-414.000.
- Kenner Parker Toys Inc.: See—
- Baerenwald, Philip M.; and Reed, Phillip G., 4,680,019, Cl. 446-378.000.
- Kenney, Michael T.; and Rhoades, Jeffrey S. Colored floor finish. 4,680,237, Cl. 428-520.000.
- Kensley, Kenneth; and Nash, John, to Intravascular Surgical Instruments, Inc. Catheter based surgical methods and apparatus therefor. 4,679,558, Cl. 128-328.000.
- Kenyon, Ronald W.; and Thorp, Derek, to Imperial Chemical Industries Plc. 2,6-dioxo-2,6-dehydrobenzo[1,2-b:4,5-b']difurans. 4,680,417, Cl. 549-299.000.
- Kerby, Walter L.: See—
- Hanlon, Stephen P.; Kerby, Walter L.; Purdy, Edmund R.; and Strom, James, 4,679,567, Cl. 128-675.000.
- Kerkman, Russel J.; and Rowan, Timothy M., to Allen-Bradley Company. Cross coupled current regulator. 4,680,695, Cl. 363-160.000.
- Keve, Tibor; Zsador, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, to Richter Gedeon Vegyeszeti Gyar Rt. Apovincaminol derivative. 4,680,397, Cl. 546-51.000.
- Keve Corporation: See—
- Bryson, Charles E., III; and Jones, Douglas L., 4,680,467, Cl. 250-305.000.
- Key Pharmaceuticals, Inc.: See—
- Sackner, Marvin A., 4,679,555, Cl. 128-203.150.
- Khan, Anwar U.: See—
- Hardee, Kim C.; Khan, Anwar U.; McEuen, Steven D.; and Wicker, David J., Jr., 4,680,762, Cl. 371-28.000.
- Khurana, Neeraj, to Intel Corporation. Emission microscope. 4,680,635, Cl. 358-211.000.
- Kicherer, Robert: See—
- Fischer, Karl; Schreder, Felix; and Kicherer, Robert, 4,680,452, Cl. 219-449.000.
- Kido, Tomoyuki: See—
- Yano, Mitsuru; Kido, Tomoyuki; and Ochi, Yoshiyuki, 4,680,239, Cl. 428-688.000.
- Kiech, Earl L.: See—
- Curry, Bill P.; Jones, John H.; Seiber, Brian L.; Price, Lynwood L.; Powell, Homer M.; and Kiech, Earl L., 4,679,919, Cl. 356-336.000.
- Kiefer, Silvan, to Fried. Krupp Gesellschaft mit beschränkter Haftung. Instrument for measuring the cohesion force in dental cone crowns. 4,679,444, Cl. 73-827.000.
- Kielminski, William P. Pipe coupling connection sealing apparatus. 4,679,831, Cl. 285-332.200.
- Kikuchi, Koji: See—
- Takimoto, Kazutoshi; Matsumi, Takatomo; and Kikuchi, Koji, 4,679,414, Cl. 68-12.00R.
- Kikuchi, Sadatake: See—
- Yamaki, Bunshiro; Kikuchi, Sadatake; and Tomisawa, Yutaka, 4,680,569, Cl. 338-42.000.
- Kilroy, Stanley A. R., to Alpen Dairy Foods Pty. Limited. Process of preparing food products. 4,680,194, Cl. 426-602.000.
- Kim, Ho K.; and Choi, Seung E. Beverage container with enclosed cooling means. 4,679,407, Cl. 62-294.000.
- Kim Hotstart Mfg. Co., Inc.: See—
- Stein, John, 4,679,597, Cl. 138-26.000.
- Kim, Kyo S., to Gold Star Co., Ltd. Reel brake device of a videocassette recorder. 4,679,745, Cl. 242-75.400.
- Kimball, James F. Powered step assembly for vehicles. 4,679,810, Cl. 280-166.000.
- Kimberly-Clark Corporation: See—
- Thorson, Russell E.; and Marver, Douglas J., 4,680,450, Cl. 219-388.000.
- Kimura, Akihiro; Ando, Toshio; and Nishihara, Toshikazu, to Victor Company of Japan. Magnetic recording medium. 4,680,218, Cl. 428-195.000.
- Kimura, Hiroyuki: See—
- Sugai, Yoshiro; and Kimura, Hiroyuki, 4,680,793, Cl. 381-13.000.
- Kimura, Katsuji; Kasai, Yoshihiko; Yokoyama, Yukio; Yamasaki, Koji; and Sato, Toshifumi, to NEC Corporation. Intermediate frequency amplifier with signal strength detection circuit. 4,680,553, Cl. 330-2.000.
- Kimura, Tomoaki: See—
- Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, 4,679,611, Cl. 164-431.000.
- Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, to Institut für Energetik - Zentralstelle für Rationelle Energieanwendung. Process for manufacturing highly porous mineral bodies of polymorphic structure. 4,680,153, Cl. 264-44.000.
- Kindt-Larsen, Ture: See—
- Larsen, Hans O.; and Kindt-Larsen, Ture, 4,680,336, Cl. 524-548.000.
- Kings, Donald J.; and Lederman, Frederick E., to General Motors Corporation. Overrunning clutch cage with simplified manufacture. 4,679,676, Cl. 192-45.000.
- King, Paul L.; Grimes, Joseph E.; and Cochran, Richard C., to Cornell Research Foundation, Inc. Electronic keyboard system and method for reproducing selected symbolic language characters. 4,679,951, Cl. 400-110.000.
- King, Roger L.: See—
- Fimfinger, Gerald L.; King, Roger L.; and Marshall, Thomas E., 4,679,435, Cl. 73-594.000.
- King, William A.: See—
- May, William E.; McColloch, Rex, Jr.; and King, William A., 4,680,672, Cl. 361-353.000.
- King, William H., to Bourns, Inc. Multi-wire contact assembly. 4,679,886, Cl. 439-816.000.
- Kino, Eiko: See—
- Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsu; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.
- Kinoshita, Kimiaki: See—
- Obitsu, Takeo; Igaki, Tetsuo; Kinoshita, Kimiaki; Nanbu, Morio; and Sato, Shinichi, 4,680,598, Cl. 503-217.000.
- Kinoshita, Tsuke: See—
- Hashimoto, Isao; Kinoshita, Tsuke; Uchida, Masahiro; and Uchiyama, Susumu, 4,679,739, Cl. 241-121.000.
- Kinsley, Ann M.; and Mansi, William A., to Wickes Manufacturing Company. Anchoring system. 4,679,369, Cl. 52-155.000.
- Kintek, Inc.: See—
- Blackmer, David E.; and Townsend, James H., Jr., 4,680,796, Cl. 381-23.000.
- Kinugawa Rubber Ind. Co. Ltd.: See—
- Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, 4,679,778, Cl. 267-140.100.
- Kiraly, Arpad: See—
- Keve, Tibor; Zsador, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.
- Kirk, Bryan R., to Gillette Company, The. Safety razor blades. 4,679,324, Cl. 30-346.580.
- Kirsten, Rolf: See—
- Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.
- Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, to Fanuc Ltd. Method of controlling comb-cutter lathe. 4,680,719, Cl. 364-474.000.
- Kiss, Bela: See—
- Keve, Tibor; Zsador, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.
- Kissinger, Paula A.: See—
- Assini, John E.; and Kissinger, Paula A., 4,679,883, Cl. 439-607.000.
- Kitagawa, Hironobu: See—
- Kobayashi, Takuma; Kitagawa, Hironobu; Kaneshige, Noritsugu; and Makimura, Osamu, 4,680,345, Cl. 525-437.000.
- Kitamura, Hironori; and Noma, Kanji, to Nippon Foil Manufacturing Co., Ltd. Composite aluminum sheet for presensitized lithographic printing plate comprising a support having specified center line average roughness. 4,680,250, Cl. 430-302.000.

- Kitamura, Hironori: See—
- Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, 4,680,322, Cl. 523-416.000.
- Kitamura, Yoshinori: See—
- Fujimoto, Makoto; Kitamura, Yoshinori; Morimura, Atsushi; and Matsuoka, Hiroki, 4,680,623, Cl. 358-44.000.
- Kiya, Nobuyuki; and Yoshino, Motoaki, to Fanuc Ltd. Numerical control system. 4,680,697, Cl. 364-171.000.
- Kiyohara, Akio: See—
- Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Toru, 4,680,349, Cl. 526-62.000.
- Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsu; Kohsaka, Masanobu; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. Antitumor agent comprising FR-900216. 4,680,178, Cl. 424-122.000.
- Kizilbash, Akeel H. Computer composition of nastaliq script of the urdu group of languages. 4,680,710, Cl. 364-419.000.
- Klee, Jürgen: See—
- Veit, Ernst-Ludwig; and Klee, Jürgen, 4,679,723, Cl. 228-168.000.
- Kleeb, Thomas R., to Dresser Industries, Inc. Abrasion resistant refractory composition. 4,680,279, Cl. 501-124.000.
- Klein, Karl-Heinz; and Richter, Wilfried, to Robert Bosch GmbH. Method and circuit for suppression of quantizing noise ambiguities. 4,680,774, Cl. 375-26.000.
- Kleinlein, Dwight R.: See—
- Wolford, Gerald T.; Kleinlein, Dwight R.; and Stewart, Hubert F., 4,679,844, Cl. 296-136.000.
- Kleinnibbelink, Gerrit J.: See—
- Lutgendorf, Pieter H.; and Kleinnibbelink, Gerrit J., 4,680,463, Cl. 250-223.00B.
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- Cartmoeck, Frederick A.; and Knackstedt, Jack S., 4,679,337, Cl. 37-118.00R.
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- Kobayashi, Mikio, to Ricoh Company, Ltd. Input/output port including auxiliary low-power transistors. 4,680,487, Cl. 307-475.000.
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- Jarvis, Allan P., Jr.; Koch, George A.; and Abrams, Paul G., 4,680,174, Cl. 424-85.000.
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- Komin, Andrew P., 4,680,056, Cl. 106-21.000.
- Koch, Jürgen: See—
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- Narita, Yasuhide; Shirai, Noboru; Kohro, Chihaya; and Hosono, Masami, 4,679,861, Cl. 301-37.00P.
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- Koike, Mitsuhiro; and Yakoh, Nobuaki, to Mitsubishi Denki Kabushiki Kaisha. Method of detecting flaws in thick wall steel pipe with ultrasonic angle beam technique. 4,679,437, Cl. 73-622.000.
- Koishi, Masaru; Shinohara, Haruo; and Takayanagi, Shinji, to Honda Giken Kogyo Kabushiki Kaisha. Wheel assembly for vehicle. 4,679,860, Cl. 301-9.0DN.
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- Gray, Floyd L.; Schubert, Thomas F.; Bradshaw, Kenneth M.; and Kolawole, Joshua O., 4,680,545, Cl. 324-307.000.
- Kolbenschmidt AG: See—
- Creydt, Martin; Bickle, Wolfgang; and Pfestorf, Harald, 4,679,681, Cl. 192-107.00M.
- Kolbesen, Bernd: See—
- Mittlehner, Heinz; and Kolbesen, Bernd, 4,680,601, Cl. 357-15.000.
- Kolbus GmbH & Co. KG: See—
- Blidschun, Benno; and Lierke, Ernst G., 4,680,163, Cl. 422-28.000.
- Koleske, Joseph V.; Smith, Donald F.; and Weber, Robert J., to Union Carbide Corporation. Novel polymers and crosslinked compositions made therefrom. 4,680,361, Cl. 526-318.000.
- Kollmorgen Technologies Corporation: See—
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- Schultz, Roy D.; England, Thomas R.; and Altizer, C. Clark, 4,679,313, Cl. 29-596.000.
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- Komatsu, Toshiyuki: See—
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- Komatz, Dennis J., to Lucas Industries Public Limited Company. Clutch master cylinder with internal reservoir. 4,679,680, Cl. 192-85.00R.
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- Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,680,278, Cl. 501-98.000.
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- Komuro, Katsusuke, to Honda Giken Kogyo Kabushiki Kaisha. Rear seat cover for vehicles having a saddle-shaped seat. 4,679,647, Cl. 180-219.000.
- Kondo, Kenshi, to Nihon Den-Netso Keiki Co., Ltd. Apparatus for fuse-bonding articles. 4,679,721, Cl. 228-40.000.
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- Dalman, G. Conrad; and Kondoh, Hiroshi, 4,680,538, Cl. 324-58.00R.
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Kopp, Richard; Grogler, Gerhard; Hess, Heinrich; and Konig, Klaus, 4,680,367, Cl. 528-44.000.
- Konishiroku Photo Industry Co., Ltd.: See—  
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,679,929, Cl. 355-4.000.
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- Koo, Gloria C.: See—  
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- Mess, Richard C., 4,679,362, Cl. 52-125.500.
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- Kosarski, Raymond, Jr.; and Jackson, Robert W., to Allied Corporation. Hydraulic power brake apparatus, 4,679,397, Cl. 60-562.000.
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- Koster, William H.: See—  
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- Koutek, Mary E.: See—  
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- Koyamato, Hisakazu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic drum, 4,679,479, Cl. 84-1.040.
- Koziol, Walter, to Modern Home Products Corp. Threaded adjustable gas intake assembly, 4,679,544, Cl. 126-41.00R.
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- Kozlov, Yuri I.: See—  
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- Kraft, Eugene. Varying firmness mattress, 4,679,266, Cl. 5-464.000.
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- Kramer, Francis J., to Senco Products, Inc. Electronic control for a pneumatic fastener driving tool, 4,679,719, Cl. 227-5.000.
- Kramer, James H., to B. F. Goodrich Company, The. Fender protective structures, 4,679,517, Cl. 114-45.000.
- Kramer, Kenneth D.; and Olson, Rohn L., to Deere & Company. Low leakage orifice-controlled poppet valve, 4,679,765, Cl. 251-38.000.
- Krans, Peter; and Meuleman, Hermanus J., to Remeha Fabrieken B.V. Heating boiler having a vertical burner tube, 4,679,528, Cl. 122-367.00C.
- Kranz, Joachim, to BASF Aktiengesellschaft. Preparation of polyhalocopper phthalocyanines having a high color strength, 4,680,387, Cl. 540-136.000.
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- Krinoek, Jerome V., to Motorola, Inc. Fast acquisition circuit for synchronous digital receiver operating in wideband noise, 4,680,778, Cl. 375-97.000.
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- Kriz, Thomas A., to International Business Machines Corp. Data processing system with reorganization of disk storage for improved paging, 4,680,703, Cl. 364-200.000.
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Ferdows, Houshang; Krug, Martin; and Bihl, Paul R., 4,679,616, Cl. 165-43.000.
- Kruger, Robert J.; and Brown, Richard I., to Baxter Travenol Laboratories, Inc. Blood component collection systems and methods, 4,680,025, Cl. 604-6.000.
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- Krupp, Gerald L. Logic circuit tester, 4,680,542, Cl. 324-133.000.
- Krutz, Gary; and Hansen, David L. Integral rotational displacement sensor for an hydraulic motor, 4,679,488, Cl. 91-1.000.
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- Kubota, Yousuke, to Kabushiki Kaisha Toshiba. Electromagnetic flow meter, 4,679,442, Cl. 73-861.120.
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- Kuhnel, Werner; and Spielau, Paul, to Dynamit Nobel Aktiengesellschaft. Molding composition for crosslinked foam material from polyolefins and ethylene-propylene elastomer, and process for the production of the foam material, 4,680,317, Cl. 521-89.000.
- Kukes, Simon G.: See—  
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., 4,680,105, Cl. 208-251.00H.
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Habel, Paul A., Jr.; and Kulezycki, Elaine S., 4,679,678, Cl. 192-106.200.
- Kumazaki, Masayuki; Shimoe, Toshio; and Murakami, Koso, to Fujitsu Limited. Switching system having tone trunk, 4,680,758, Cl. 370-110.200.
- Kumazawa, Koichi: See—  
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- Kung, Patrick C.; and Goldstein, Gideon, to Ortho Pharmaceutical. Monoclonal antibody to human T cells, 4,680,383, Cl. 530-387.000.
- Kunkle, Albert C.; and Maxwell, Edgar J., III, to J. M. Huber Corporation. Apparatus for dewatering clay filter cake, 4,680,104, Cl. 204-300.00R.
- Kuo, Calvin, to Aurora Mechatronics Corp. Method of manipulating a calculation and device used therewith, 4,680,455, Cl. 235-146.000.
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Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, 4,679,320, Cl. 29-848.000.
- Kurihara, Toshihiko, to Pioneer Electronic Corporation. Lens driving device for an optical pickup unit with simplified construction, 4,679,904, Cl. 350-255.000.
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- Kuroda, Yasuo: See—  
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- Kyorin Pharmaceutical Co., Ltd.: See—  
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- Laboratoire L. Lafon: See—  
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- Laby, Jordan M.: See—  
Henkin, Melvyn L.; and Laby, Jordan M., 4,679,258, Cl. 4-542.000.
- Lachner, Hans: See—  
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Dawawala, Suryakant K.; and LaCoste, Bernard L., 4,679,769, Cl. 251-282.000.
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Stuart, Herbert H., 4,680,028, Cl. 604-74.000.
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Steward, John H.; and Ladouceur, Harold A., 4,679,690, Cl. 206-345.000.
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- Lambrecht, Emiel, to FMC Corporation. Cutting thermoplastic webs, 4,679,474, Cl. 83-171.000.
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- Landecker, Peter B., to Hughes Aircraft Company. Surveying satellite incorporating star-sensing attitude determination subsystem, 4,679,753, Cl. 244-171.000.
- Landini, Bruce J.: See—  
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- Lynch, Eugene F.: See—  
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- Maehara, Atsushi: See—  
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- Malsbury, Charles R.; and Lawrence, Richard R., to Rexcel, Inc. Sealing lid and container. 4,679,699, Cl. 220-307.000.
- Malwitz, Nelson E., to Sealed Air Corporation. Fire-retardant plastics with glycoside additive. 4,680,324, Cl. 524-58.000.
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- Mankedick, Robert G.: See—  
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- Manner, Reinhard: See—  
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- Jarr, Klaus D., 4,679,587, Cl. 137-509.000.
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- Marver, Douglas J.: See—  
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- Matsumoto, Osamu: See—  
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Katayama, Kaneo; and Hashimoto, Yasuhiko, 4,679,494, Cl. 98-38.600.  
Koike, Mitsuhiro; and Yakoh, Nobuaki, 4,679,437, Cl. 73-622.000.  
Komurasaki, Keiichi; Iwatani, Shiro; and Nishimura, Shinji, 4,680,529, Cl. 322-28.000.  
Mitsubishi Kinzoku Kabushiki Kaisha: See—  
Tsujimura, Osamu; Hasegawa, Ryoei; and Ohkawa, Masayuki, 4,679,968, Cl. 407-114.000.  
Mitsubishi Petrochemical Co., Ltd.: See—  
Fuji, Masaki; Gotoh, Shiro; Nakagawa, Hideaki; and Ito, Ryoei, 4,680,318, Cl. 521-95.000.  
Kageyama, Yoshiteru, 4,680,140, Cl. 252-512.000.  
Mitsubishi Rayon Company Limited: See—  
Nakamoto, Hideo; Asoai, Fumito; Fukushima, Hiroshi; and Suda, Eriko, 4,680,368, Cl. 528-49.000.  
Mitsui & Co., Ltd.: See—  
Taga, Jun, 4,680,118, Cl. 210-493.100.  
Mitsui Toatsu Chemicals, Incorporated: See—  
Kajimoto, Nobuyuki; Tamaki, Akihiro; and Nagata, Teruyuki, 4,680,369, Cl. 528-76.000.  
Mitsumaki, Hiroshi; Takano, Nobuyoshi; and Ono, Naoya, to Hitachi, Ltd. Method and apparatus for conducting flow analysis. 4,680,270, Cl. 436-52.000.  
Mitutoyo Mfg. Co., Ltd.: See—  
Takizawa, Kinji; Mizuno, Ichiro; and Sugizaki, Iwao, 4,679,326, Cl. 33-170.000.  
Miura, Nobuo: See—  
Abe, Masao; and Miura, Nobuo, 4,679,540, Cl. 123-602.000.  
Miyabayashi, Tadao: See—  
Yagi, Motoi; and Miyabayashi, Tadao, 4,680,631, Cl. 358-160.000.  
Miyahara, Junji: See—  
Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,680,473, Cl. 250-484.100.  
Miyakawa, Akira: See—  
Nishida, Yoshie; Hata, Seiji; and Miyakawa, Akira, 4,680,802, Cl. 382-8.000.  
Miyakawa, Masao. Timepiece. 4,679,945, Cl. 368-238.000.  
Miyamoto, Junichi; and Tsujimoto, Jun-ichi, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 4,680,735, Cl. 365-210.000.  
Miyamoto, Shoji: See—  
Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, 4,680,718, Cl. 364-455.000.  
Miyawaki, Motohisa, to Fuji Jukogyo Kabushiki Kaisha; and Van Doorne's Transmissie B. V. Control system for an infinitely variable transmission. 4,680,711, Cl. 364-424.100.  
Miyazaki, Benichi: See—  
Fukushima, Yasuhisa; Maruyama, Masuo; and Miyazaki, Benichi, 4,680,662, Cl. 360-133.000.  
Miyazaki, Kazuhiko: See—  
Yokouchi, Hiroshi; and Miyazaki, Kazuhiko, 4,680,491, Cl. 307-579.000.  
Miyazaki, Takao; and Yamamoto, Hideo, to Clarion Co., Ltd. Magnetic video signal recording and reproducing system. 4,680,650, Cl. 360-33.100.  
Miyazaki, Yoshiaki: See—  
Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, 4,680,413, Cl. 548-526.000.  
Mizuguchi, Hideki; Yamaguchi, Haruo; Hanada, Seigo; and Mukuda, Nobuo, to Japan Steel Works, Ltd., The Drive device for two-shaft extruding machine. 4,679,461, Cl. 74-665.0GA.  
Mizuhara, Howard, to GTE Products Corporation. Ceramic and metal brazed articles. 4,679,960, Cl. 403-272.000.  
Mizuno, Chiaki: See—  
Ogawa, Hiroshi; Mizuno, Chiaki; Tamai, Yasuo; and Kamiyama, Koozi, 4,680,225, Cl. 428-323.000.

Mizuno, Ichiro: See—  
Takizawa, Kinji; Mizuno, Ichiro; and Sugizaki, Iwao, 4,679,326, Cl. 33-170.000.  
Mizuno, Isao: See—  
Imamura, Masanaga; and Mizuno, Isao, 4,680,592, Cl. 346-1.100.  
Mizusawa, Akira; and Nakama, Daiji, to Nifco, Inc. Ball joint. 4,679,958, Cl. 403-143.000.  
Mizuta, Masaji: See—  
Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, 4,679,930, Cl. 355-52.000.  
Mizutani, Taku: See—  
Watanabe, Naoharu; Numata, Kazuo; Yamagishi, Michio; Mizutani, Taku; Omura, Sadafumi; and Yamaguchi, Hideyo, 4,680,311, Cl. 514-561.000.  
MKS Instruments, Inc.: See—  
Ewing, James H., 4,679,585, Cl. 137-486.000.  
Mobil Oil Corporation: See—  
Abdo, Milton K.; and Jennings, Alfred R., Jr., 4,679,629, Cl. 166-281.000.  
Mears, William G., 4,679,581, Cl. 137-43.000.  
Mochida, Ei: See—  
Nobuhara, Masahiro; Kanamori, Toshinori; Yamaguchi, Kiyoshi; and Mochida, Ei, 4,680,261, Cl. 435-68.000.  
Mochida Pharmaceutical Co., Ltd.: See—  
Nobuhara, Masahiro; Kanamori, Toshinori; Yamaguchi, Kiyoshi; and Mochida, Ei, 4,680,261, Cl. 435-68.000.  
Modern Home Products Corp.: See—  
Kozioi, Walter, 4,679,544, Cl. 126-41.00R.  
Moghaddassi, Magid N.: See—  
Porat, Itzhak; Grosberg, Percy; and Moghaddassi, Magid N., 4,679,784, Cl. 271-18.300.  
Mohler, Robert D.: See—  
Eppstein, Lee B.; Mohler, Robert D.; and Reuveny, Shaul, 4,680,267, Cl. 435-289.000.  
Mohri, Satoshi: See—  
Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, 4,680,718, Cl. 364-455.000.  
Molex Incorporated: See—  
Triner, Irvin R.; and Bixler, Craig A., 4,679,879, Cl. 439-425.000.  
Moller, Rudolf: See—  
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,680,436, Cl. 200-82.00E.  
Mollura, Carlos A. Airbed mattress including a regulated, controllable air reservoir therefor. 4,679,264, Cl. 5-453.000.  
Mommensen, Gordon V.; Fender, Norman N.; Karwoski, Stanley G.; Scherer, William C.; and Lind, Robert J., to Graco Inc. Robot spray gun. 4,679,734, Cl. 239-692.000.  
Momoi, Shoji; and Inami, Sumiaki, to Yamazaki Machinery Works, Ltd. Multiface machining machine tool. 4,679,286, Cl. 29-33.00P.  
Monarch Marking Systems, Inc.: See—  
Hamisch, Paul H., Jr., 4,680,081, Cl. 156-384.000.  
Vanderpool, James L.; and Bain, James M., 4,680,078, Cl. 156-352.000.  
Monastyrskaya, Galina S.: See—  
Debabov, Vladimir G.; Tsygankov, Yuri D.; Chistoserov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Yuri I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Yuri A., 4,680,260, Cl. 435-68.000.  
Monfort, Guy; Crahay, Jean; and Bragard, Adolphe, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Surface treatment of a rolling mill roll. 4,679,288, Cl. 29-121.800.  
Monsanto Company: See—  
Blyth, Randolph C.; and Ucci, Pompelio A., 4,680,212, Cl. 428-97.000.  
Taylor, Keith M.; Hornig, Liou-Liang; and Hirzel, Timothy K., 4,680,145, Cl. 260-502.00R.  
Monte, Charles. Percussive action silent electronic keyboard. 4,679,477, Cl. 84-1.100.  
Moore, David G.: See—  
Foster, Donald D.; and Moore, David G., 4,679,712, Cl. 222-384.000.  
Moore, Fergus E. Modular computer system with integral electronic bus. 4,680,674, Cl. 361-395.000.  
Moore, John, to De la Rue Giori S.A. Method and arrangement for attaching printing plates to a plate cylinder. 4,680,067, Cl. 156-165.000.  
Moran, Joseph M.: See—  
Heimann, Peter A.; Moran, Joseph M.; and Schutz, Ronald J., 4,680,084, Cl. 156-626.000.  
Morgan, Thomas R., to Allied Corporation. Removal of ammonium ion from acidic liquors. 4,680,169, Cl. 423-53.000.  
Mori, Teichiro: See—  
Osafune, Haruo; Kanbe, Sadao; Mori, Teichiro; and Ikejiri, Masahisa, 4,680,045, Cl. 65-17.000.  
Mori, Yasuki: See—  
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.  
Morijiri, Takeshi: See—  
Washizu, Shoichi; Morijiri, Takeshi; Kogure, Kazuo; and Arimitsu, Satoshi, 4,679,668, Cl. 188-353.000.

Morikawa, Keishi: See—  
Kodama, Kazuo; and Morikawa, Keishi, 4,679,973, Cl. 409-200.000.  
Morimoto, Akira: See—  
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,680,390, Cl. 540-228.000.  
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, to Taisho Pharmaceutical Co., Ltd. 6-O-methylerythromycin derivative. 4,680,386, Cl. 536-7.400.  
Morimura, Atsushi: See—  
Fujimoto, Makoto; Kitamura, Yoshinori; Morimura, Atsushi; and Matsuoka, Hiroki, 4,680,623, Cl. 358-44.000.  
Morin, Louis G., to American Cyanamid Company. Metal bonded composites and process. 4,680,093, Cl. 204-28.000.  
Morin, Louis G., to American Cyanamid Company. Electrochemical cells and electrodes therefor. 4,680,100, Cl. 204-228.000.  
Morishita, Hirosada: See—  
Shimizu, Ryuichi; Mori, Yasuki; Kawanishi, Tsuneaki; Isoo, Osamu; Morishita, Hirosada; and Hosoda, Tooru, 4,680,058, Cl. 106-23.000.  
Morishita, Koji; Hirose, Hujio; Nakatsuka, Nobuo; and Nishimura, Masahiro, to Omron Tateisi Electronics Co. Method of and apparatus for measuring moving velocity of linear object moving and vibrating. 4,679,932, Cl. 356-28.000.  
Morita, Masayuki; and Hattori, Masaichi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Apparatus for producing stepwise movement. 4,679,453, Cl. 74-128.000.  
Morita, Tatsuo, to Nissan Motor Company, Limited. Engine combustion condition detecting system and method. 4,679,536, Cl. 123-425.000.  
Moriya, Koichi: See—  
Shickawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,680,294, Cl. 514-256.000.  
Moriyama, Yoshiaki, to Pioneer Electronic Corporation. Method for recording and reproducing video format signal. 4,680,647, Cl. 358-343.000.  
Morizuka, Kouhei, to Kabushiki Kaisha Toshiba. Method of manufacturing a heterojunction bipolar transistor having self-aligned emitter and base and selective isolation regions. 4,679,305, Cl. 29-576.300.  
Morley, Robert A.; and Buick, James M., to Ferranti, plc. Projected imaged weapon training apparatus. 4,680,012, Cl. 434-22.000.  
Morris, Steven L.; and Lewis, Gary C., to Motorola, Inc. Integrated circuit packaging. 4,680,471, Cl. 250-370.000.  
Moser, Ludwig M.; and Kammermeier, Anton, to Westra Electronic GmbH. Hearing aid ear mold end piece for the auditory canal and hearing aid ear mold. 4,679,650, Cl. 181-130.000.  
Motoki, Masanobu; Matsuo, Nobutaka; Kanbe, Sadao; Osafune, Haruo; and Itoh, Yoshitaka, to Seiko Epson Kabushiki Kaisha. Method of preparing doped silica glass. 4,680,048, Cl. 65-17.000.  
Motoki, Masanobu: See—  
Matsuo, Nobutaka; Motoki, Masanobu; Itoh, Yoshitaka; Kanbe, Sadao; and Osafune, Haruo, 4,680,046, Cl. 65-17.000.  
Motorola, Inc.: See—  
Barbiaux, William J.; and Wineinger, Eugene L., 4,680,541, Cl. 324-128.000.  
Benenati, Robert L.; and Moy, Wayne K., 4,680,527, Cl. 320-2.000.  
Chiampas, George E.; Finnegan, John P.; and Villegas, Henry, 4,680,495, Cl. 310-220.000.  
Ecklund, Lawrence M., 4,680,795, Cl. 381-15.000.  
Giles, Grady L.; Wilson, Jesse R.; and Hulett, Terry V., 4,680,760, Cl. 371-21.000.  
Krinock, Jerome V., 4,680,778, Cl. 375-97.000.  
Marry, Patrick J., 4,680,787, Cl. 379-63.000.  
Morris, Steven L.; and Lewis, Gary C., 4,680,471, Cl. 250-370.000.  
Parker, Norman W., 4,680,794, Cl. 381-15.000.  
Petratos, Nickie A.; Karl, David; and Bradford, William M., 4,680,676, Cl. 361-424.000.  
Petrie, Adolore F., 4,680,667, Cl. 361-154.000.  
Thomas, Patrick K.; Hartman, Dennis C.; and Dockrey, Jasper W., 4,680,086, Cl. 156-643.000.  
Moy, Wayne K.: See—  
Benenati, Robert L.; and Moy, Wayne K., 4,680,527, Cl. 320-2.000.  
MT Motoren-und Turbinen Union München GmbH: See—  
Wohrl, Bernhard; and Jabs, Alfred, 4,679,619, Cl. 165-81.000.  
MTS Systems Corporation: See—  
Maue, Dale N.; and Lund, Richard A., 4,679,591, Cl. 137-624.130.  
Mueller, Otward M.: See—  
Edelstein, William A.; Schenck, John F.; Mueller, Otward M.; and Hayes, Cecil E., 4,680,548, Cl. 324-318.000.  
Mukai, Seiichi: See—  
Hasuo, Masayoshi; Mukai, Seiichi; Urabe, Hiroshi; Yoshida, Seiji; and Nukui, Masahiro, 4,680,374, Cl. 528-204.000.  
Mukai, Yuji: See—  
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.  
Mukuda, Nobuo: See—  
Mizuguchi, Hideki; Yamaguchi, Haruo; Hanada, Seigo; and Mukuda, Nobuo, 4,679,461, Cl. 74-665.0GA.  
Mullard, Bruce A.: See—  
Lech, Thaddeus, Jr.; and Mullard, Bruce A., 4,679,679, Cl. 192-106.200.  
Muller, Adam; and Goller, Ernst, to H. Stoll GmbH & Co. Flat-bed knitting machine having a spool table provided with movable yarn spool holders. 4,679,413, Cl. 66-125.00R.  
Muller, Johann; Trieschmann, Christa; Doskocil, Walter; and Preiner, Gerhard, to Wacker-Chemie GmbH. Method for preparing acetox-

ysiloxanes and organo(poly)siloxanes having halogen bonded to silicon. 4,680,365, Cl. 528-15.000.  
Muller, Klaus-Helmut: See—  
Diehr, Hans-Joachim; Fest, Christa; Kirschen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priensitz, Uwe; Riebel, Hans-Joachim; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.  
Muller, Peter: See—  
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,680,436, Cl. 200-82.00E.  
Multifastener Corporation: See—  
Steward, John H.; and Ladouceur, Harold A., 4,679,690, Cl. 206-345.000.  
Munek, Koichi: See—  
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koichi; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.  
Munro, Robert; and Day, Roger A., to AE PLC. Reinforced pistons. 4,679,493, Cl. 92-212.000.  
Murakami, Kakuji; Akutsu, Eiichi; and Aruga, Tamotsu, to Ricoh Company, Ltd. Recording material for ink jet printing. 4,680,235, Cl. 428-414.400.  
Murakami, Koso: See—  
Kumazaki, Masayuki; Shimoe, Toshio; and Murakami, Koso, 4,680,758, Cl. 370-110.200.  
Murakami, Masaichi: See—  
Suwa, Kyoichi; Kawai, Hidemi; and Murakami, Masaichi, 4,679,942, Cl. 356-401.000.  
Murakami, Shuzo: See—  
Furukawa, Nobuhiro; Murakami, Shuzo; and Nishioka, Masato, 4,680,240, Cl. 429-13.000.  
Murakami, Toshio, to Hitachi, Ltd. Signal processing circuit for a color video camera providing shading correction by varying the black clamping level. 4,680,624, Cl. 358-44.000.  
Murakami, Toshiyuki; Sugimoto, Norihiko; and Ogawa, Naoki, to Hitachi, Ltd.; and Hitachi, Process Computer Engineering, Inc. Method of and apparatus for storing priority levels in token-ring network system. 4,680,757, Cl. 370-89.000.  
Muralidhara, Ranya: See—  
Pittet, Alan O.; Muralidhara, Ranya; and Hagedorn, Myrna L., 4,680,142, Cl. 252-522.00R.  
Muraoka, Masami; Nakamura, Toshio; Sugie, Akihiko; Ono, Keiichi; and Yamamoto, Michihiro, to Sumitomo Chemical Company, Limited. Carbacyclin analogs. 4,680,307, Cl. 514-460.000.  
Murata Manufacturing Co., Ltd.: See—  
Yorita, Tadashi; Matsumoto, Haruo; and Nakatsuji, Itsuo, 4,680,560, Cl. 333-206.000.  
Murayama, Sadamitsu; and Tanaka, Makoto, to Teijin Limited. Chemical-resistant filter material. 4,680,221, Cl. 428-246.000.  
Murayama, Toshiaki: See—  
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, 4,679,899, Cl. 350-96.300.  
Murdock, Bruce; and Teichmer, Daniel G., to Tektronix, Inc. Touch panel. 4,680,429, Cl. 178-19.000.  
Muro, Hiroyuki: See—  
Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, 4,680,413, Cl. 548-526.000.  
Murphy, John R.: See—  
Wittmann, Alois; Isaacs, Theodore M.; and Murphy, John R., 4,679,752, Cl. 244-158.00R.  
Murphy, Richard J., to Polaroid Corporation, Patent Dept. Photographic processing composition with poly(diacetone acrylamide) oxime and styrene-butadiene latex. 4,680,247, Cl. 430-215.000.  
Murray, Charles R., to C-I-L Inc. Thermoplastic sack. 4,680,207, Cl. 428-35.000.  
Murray, James R.: See—  
Hansen, Robert E., Jr.; Murray, James R.; and Zald, Roberta L., 4,679,297, Cl. 29-568.000.  
Muskat, Irwin: See—  
Sheehy, Roger C.; and Muskat, Irwin, 4,680,186, Cl. 426-129.000.  
Sheehy, Roger C.; and Muskat, Irwin, 4,680,187, Cl. 426-129.000.  
Mussari, Fred P. Adjustable bookholder. 4,679,757, Cl. 248-463.000.  
Muto, Takashi, to Daido Metal Company Ltd. Method of producing sliding composite material. 4,680,161, Cl. 419-3.000.  
Myers, Lawrence R.; Bach, Lloyd G.; and Gaiser, Robert F., to Allied Corporation. Deceleration and pressure sensitive proportioning valve with low deceleration responsiveness. 4,679,864, Cl. 303-6.00C.  
Myers, Ronald E.; and Buhs, Ephraim, to BF Goodrich Company. The Electrodeless heterogeneous polypyrrole composite. 4,680,236, Cl. 428-515.000.  
Myers, Ronald V.: See—  
Clinton, Peter; Myers, Ronald V.; and Sinclair, David, 4,679,433, Cl. 73-304.00C.  
N.K.F. Groep B.V.: See—  
Grooten, Albertus T. M., 4,679,898, Cl. 350-96.230.  
Nabeshima, Hiroichi: See—  
Fukuda, Yutaka; Minagawa, Koji; Nabeshima, Hiroichi; Muneki, Koichi; Asano, Yoshikatsu; Aoki, Kazuo; and Ishizaka, Yutaka, 4,679,935, Cl. 356-121.000.  
Nabisco Brands: See—  
Spiel, Albert; and Spanier, Henry C., 4,680,190, Cl. 426-302.000.  
Nabisco Brands, Inc.: See—  
Simelunas, William J.; and Polifroni, Nicholas R., 4,679,496, Cl. 99-450.200.



Naem, Abdalla A.: See—  
Calder, Iain D.; Macelwee, Thomas W.; and Naem, Abdalla A., 4,680,609, Cl. 357-42.000.

Nagamine, Kimihiro: See—  
Hirota, Satoshi; and Nagamine, Kimihiro, 4,679,952, Cl. 400-279.000.

Nagano, Shuji; Ida, Shuichiro; and Yoshinaka, Toshio, to Toyota Jidosha Kabushiki Kaisha. Speed meter drive device for automobile. 4,679,449, Cl. 74-12.000.

Nagano, Tamio, to Kabushiki Kaisha Daikin Seisakusho. Clutch cover assembly. 4,679,683, Cl. 192-89.00B.

Nagasawa, Yasuo: See—  
Mikami, Toshio; and Nagasawa, Yasuo, 4,680,528, Cl. 320-32.000.

Nagashima, Shigeo: See—  
Omoda, Koichiro; and Nagashima, Shigeo, 4,680,730, Cl. 364-900.000.

Nagata, Takeo: See—  
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.

Nagata, Teruyuki: See—  
Kajimoto, Nobuyuki; Tamaki, Akihiro; and Nagata, Teruyuki, 4,680,369, Cl. 528-76.000.

Nagel, Dietmar: See—  
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,680,020, Cl. 446-414.000.

Nagy, Francis J. Shelf filing system with identification handle for file pockets. 4,679,823, Cl. 281-15.00A.

Nagy, Laszlo, to General Motors Corporation. Multiratio power transmission. 4,679,455, Cl. 74-359.000.

Nagy, Richard A.: See—  
McNeal, Norman E.; and Nagy, Richard A., 4,680,075, Cl. 156-289.000.

Naik, Appaya R.: See—  
Edge, David J.; Naik, Appaya R.; and Scott, Melvin, 4,680,143, Cl. 252-553.000.

Naito, Hiroichi, to Fuji Photo Film Co., Ltd. Method and apparatus for reproducing magnetically recorded signals with a D.C. biasing magnetic field produced by a D.C. biasing coil. 4,680,657, Cl. 360-111.000.

Nakagawa, Aki; and Watanabe, Kiminori, to Kabushiki Kaisha Toshiba. Conductivity modulated MOS transistor device. 4,680,604, Cl. 357-23.400.

Nakagawa Corporation: See—  
Nakagawa, Shigesaburo, 4,679,392, Cl. 59-35.100.

Nakagawa, Hideaki: See—  
Fuji, Masaki; Gotoh, Shiroh; Nakagawa, Hideaki; and Ito, Ryochi, 4,680,318, Cl. 521-95.000.

Nakagawa, Katsumi: See—  
Shirato, Yoshiaki; Komatsu, Toshiyuki; Seito, Shinichi; Kawai, Tatsundo; Iwamoto, Hirofumi; Nakagawa, Katsumi; and Kuroda, Yasuo, 4,680,644, Cl. 358-294.000.

Nakagawa, Shigesaburo, to Nakagawa Corporation. Process for producing a garland chain. 4,679,392, Cl. 59-35.100.

Nakahara, Akihiko; Takata, Kuniaki; and Iseki, Yuji, to Tokuyama Soda Kabushiki Kaisha. Process for preparation of fluorine containing polymer films. 4,680,355, Cl. 526-243.000.

Nakai, Masanori: See—  
Suzuki, Takeshi; Tominaga, Shigetake; and Nakai, Masanori, 4,680,331, Cl. 524-269.000.

Nakajima, Nobuyoshi: See—  
Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,680,473, Cl. 250-484.100.

Nakajima, Takeshi: See—  
Sone, Masakazu; and Nakajima, Takeshi, 4,679,953, Cl. 400-625.000.

Nakama, Daiji: See—  
Mizusawa, Akira; and Nakama, Daiji, 4,679,958, Cl. 403-143.000.

Nakamoto, Atsuhiko: See—  
Matsumura, Masahiro; Ogasawara, Kenji; Nakamoto, Atsuhiko; and Sugawa, Yoshihisa, 4,680,377, Cl. 528-322.000.

Nakamoto, Hideo; Aasai, Fumito; Fukushima, Hiroshi; and Suda, Eriko, to Mitsubishi Rayon Company Limited. Ultraviolet curable ink composition. 4,680,368, Cl. 528-49.000.

Nakamura, Kenichiro, to Tsubakimoto Chain Co. Case for driving section of linear actuator. 4,679,451, Cl. 74-606.00R.

Nakamura, Shigeki; Ohnishi, Makoto; and Takahashi, Yasufumi, to Hitachi, Ltd. Digital modulation apparatus. 4,680,556, Cl. 332-16.00R.

Nakamura, Toshio: See—  
Muraoka, Masami; Nakamura, Toshio; Sugie, Akihiko; Ono, Keiichi; and Yamamoto, Michihiro, 4,680,307, Cl. 514-460.000.

Nakamura, Yoshinori: See—  
Aoki, Daiichi; Nakamura, Yoshinori; Orimoto, Hiroyuki; and Machida, Kazumi, 4,680,208, Cl. 428-35.000.

Nakanishi, Nobuyasu: See—  
Inden, Masahiro; Kuwana, Kazutaka; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,679,589, Cl. 137-596.170.

Nakano, Masaki: See—  
Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Nakano, Masaki, 4,679,466, Cl. 74-863.000.

Nakao, Yasuo: See—  
Ikeda, Mitsuhiro; and Nakao, Yasuo, 4,679,863, Cl. 303-3.000.

Nakatani, Kazuo: See—  
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.

Nakatsuji, Itsuo: See—  
Yorita, Tadahiho; Matsumoto, Haruo; and Nakatsuji, Itsuo, 4,680,560, Cl. 333-206.000.

Nakatsuka, Katsuto: See—  
Funaki, Takashi; and Nakatsuka, Katsuto, 4,679,775, Cl. 267-64.270.

Nakatsuka, Nobuo: See—  
Morishita, Koji; Hirose, Hujio; Nakatsuka, Nobuo; and Nishimura, Masahiro, 4,679,932, Cl. 356-28.000.

Nakaya, Chitose: See—  
Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, 4,680,499, Cl. 310-334.000.

Nakayama, Hiroki: See—  
Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Ozumu, Kouji, 4,679,913, Cl. 350-423.000.

Nakayama, Kiyoharu: See—  
Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, 4,680,413, Cl. 548-526.000.

Nakazawa, Akira: See—  
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.

Nakazawa, Tamotsu, to Canon Kabushiki Kaisha. Image processing system. 4,680,641, Cl. 358-257.000.

Nalco Chemical Company: See—  
Fong, Dodd W., 4,680,339, Cl. 525-54.110.

Young, Paul R.; Koutek, Mary E.; and Kelly, John A., 4,680,124, Cl. 210-697.000.

Nanba, Keiichi; Tokui, Satoru; and Onuma, Tatsuro, to Pioneer Electronic Corporation. System for processing picture information. 4,680,634, Cl. 358-181.000.

Nanbu, Morio: See—  
Obitsu, Takeo; Igaki, Tetsuo; Kinoshita, Kimiaki; Nanbu, Morio; and Satoh, Shinichi, 4,680,598, Cl. 503-217.000.

Narishige Corporation Limited: See—  
Narishige, Eiichi; and Yoneyama, Shinji, 4,679,976, Cl. 414-4.000.

Narishige, Eiichi; and Yoneyama, Shinji, to Narishige Scientific Instrument Laboratory, Ltd.; and Narishige Corporation Limited. Manipulator usable for a glass electrode or the like. 4,679,976, Cl. 414-4.000.

Narishige Scientific Instrument Laboratory, Ltd.: See—  
Narishige, Eiichi; and Yoneyama, Shinji, 4,679,976, Cl. 414-4.000.

Narita, Yasuhide; Shirai, Noboru; Kohro, Chihaya; and Hosono, Masami. Wheel cover mounting. 4,679,861, Cl. 301-37.00P.

Narumi China Corporation: See—  
Kuroda, Toshio; and Kumazawa, Koichi, 4,680,618, Cl. 357-74.000.

Nash Engineering Company, The: See—  
Olsen, Ole B., 4,679,987, Cl. 417-54.000.

Nash, John: See—  
Kensley, Kenneth; and Nash, John, 4,679,558, Cl. 128-328.000.

Nash, Ruth E.: See—  
Davis, William N., II; and Nash, Ruth E., 4,680,728, Cl. 364-900.000.

Nathoo, Nazim S.: See—  
Schmeal, Walter R.; Nathoo, Nazim S.; and Neate, John A., 4,679,291, Cl. 29-432.000.

National Distillers and Chemical Corporation: See—  
Huynh, Anh N.; and Ziogas, Phoivos D., 4,680,694, Cl. 363-136.000.

National Research Laboratories: See—  
Maurer, Gerald L., 4,680,309, Cl. 514-499.000.

National Starch and Chemical Corporation: See—  
Davis, Irwin J., 4,680,333, Cl. 524-394.000.

Naudi, Alain, to U.S. Philips Corporation. Automatic method and apparatus for dosing samples. 4,680,716, Cl. 364-468.000.

Naylor, Geoffrey; and Lawrence, Christopher J., to Rieter-Scragg Limited. Yarn entangling air jet. 4,679,284, Cl. 28-272.000.

Naylor, Harry B., to Pasco Laboratories, Inc. Method and apparatus for preventing cross-contamination of biochemical test wells in a microtiter test plate. 4,680,269, Cl. 435-301.000.

NCR Corporation: See—  
Barnes, Lawrence C.; and Mankedick, Robert G., 4,680,622, Cl. 358-22.000.

Davis, William N., II; and Nash, Ruth E., 4,680,728, Cl. 364-900.000.

DiCenzo, Daniel A., 4,680,732, Cl. 364-900.000.

Dilella, Antonio, 4,680,803, Cl. 382-9.000.

Meguire, Patrick G.; and Pitoniak, Thomas J., 4,680,572, Cl. 340-365.00R.

Speraw, Floyd G., 4,680,425, Cl. 174-50.000.

Szlok, Nicholas J.; and Miller, Gayle W., 4,679,299, Cl. 29-571.000.

Watson, David A., 4,679,869, Cl. 439-78.000.

Neate, John A.: See—  
Schmeal, Walter R.; Nathoo, Nazim S.; and Neate, John A., 4,679,291, Cl. 29-432.000.

NEC Corporation: See—  
Kage, Kouzou, 4,680,772, Cl. 375-4.000.

Kato, Hideaki; and Araki, Shigeru, 4,680,791, Cl. 380-8.000.

Kimura, Katsuji; Kasai, Yoshihiko; Yokoyama, Yukio; Yamasaki, Koji; and Sato, Toshifumi, 4,680,553, Cl. 330-2.000.

Obara, Takashi, 4,680,482, Cl. 307-279.000.

Okumura, Koichiro; and Ohkawa, Masayoshi, 4,680,488, Cl. 307-482.000.

Shimizu, Junzoh, 4,679,306, Cl. 29-576.00W.

Shirai, Tadao, 4,680,561, Cl. 333-208.000.

Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, 4,680,792, Cl. 381-12.000.

Watanabe, Hisatsune; and Usui, Akira, 4,680,602, Cl. 357-17.000.

Nelson, James L. Dispensing and cooling apparatus. 4,679,408, Cl. 62-390.000.

Nelson, Jeffrey D.; and Scanlon, John F., to Sundstrand Corporation. Ballistic tolerant dual load path ballscrew and ballscrew actuator. 4,679,485, Cl. 89-36.020.

Nelson, John C. Retrieving images stored on windowed discs. 4,679,922, Cl. 353-25.000.

Nelson, Peter; and Unger, Stefan H., to Syntex (U.S.A.) Inc. Anti-inflammatory guanidines. 4,680,300, Cl. 514-312.000.

Nelson, Stephen J., to Upjohn Company, The. Spiroketals and process for preparing same. 4,680,419, Cl. 549-343.000.

Neppl, Franz: See—  
Hieber, Konrad; Neppl, Franz; and Schober, Konrad, 4,680,612, Cl. 357-71.000.

Nering, Eric A.: See—  
Gurries, Richard M.; Johnson, Jay K.; and Nering, Eric A., 4,679,268, Cl. 110-346.000.

Nesbitt, R. Dennis: See—  
Melvin, Terence; and Nesbitt, R. Dennis, 4,679,795, Cl. 273-235.00R.

Nestec S.A.: See—  
Ackermann, Horst W.; Masek, Petr; and Servaux, Jean, 4,679,701, Cl. 220-404.000.

Lunder, Tito-Livio; Hoffmann, Birgit; and Nielsen, Corine-Madeleine, 4,680,193, Cl. 426-597.000.

Nestor, Charles R.; Maga, Raymond A.; and Bensing, Gregory L., to General Motors Corporation. Electrical component packaging assembly. 4,679,885, Cl. 439-620.000.

Neumann, Leopold, to Analogic Corporation. Audio signal processing circuit for use in a hearing aid and method for operating same. 4,680,798, Cl. 381-68.400.

New Brunswick Scientific Company, Inc.: See—  
Epstein, Lee B.; Mohler, Robert D.; and Reuveny, Shaul, 4,680,267, Cl. 435-289.000.

New Energy Development Organization: See—  
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.

New England Digital Corporation: See—  
Alonso, Sydney A., 4,680,479, Cl. 307-265.000.

New Zealand Steel Ltd.: See—  
Ernst, Helmut; Breier, Alfred; Schwalbach, Manfred; Will, Karl-Helmut; Cameron, Alan B.; and Bates, Peter C., 4,680,009, Cl. 432-117.000.

Newberry, Mark A.; and Kemper, Dennis C., to Gates Rubber Company, The. Safety hose. 4,679,599, Cl. 138-104.000.

Newman-Evans, Richard H., to Union Carbide Corporation. Epoxy resins based on tetraglycidyl diamines. 4,680,341, Cl. 525-113.000.

Newsom, Steven S.; and McCarthy, James M., to United States of America, Navy. Acoustic prelaunch weapon communication system. 4,680,584, Cl. 340-850.000.

Ng, Chan Y.; Ouchi, Norman K.; Wang, David T.; and Yu, Wellington C., to International Business Machines Corporation. Rotating storage device track format emulation. 4,680,653, Cl. 360-72.200.

Nguyen, Tri Hue: See—  
Tan, Siv Chang; Nguyen, Tri Hue; and Benchimol, Claude, 4,680,782, Cl. 378-4.000.

Nicholson Division, Datron Systems, Inc.: See—  
Alesson, Thomas, 4,679,727, Cl. 236-56.000.

Nicholson Manufacturing Corporation: See—  
Antezana, Luis F., 4,679,475, Cl. 83-420.000.

Nielsen, Bjarne M. Protecting device for transparencies. 4,679,923, Cl. 353-120.000.

Nielsen, Corine-Madeleine: See—  
Lunder, Tito-Livio; Hoffmann, Birgit; and Nielsen, Corine-Madeleine, 4,680,193, Cl. 426-597.000.

Nielsen, Darryl M.: See—  
Harbison, Joe A.; LaGrange, Nyle D.; and Nielsen, Darryl M., 4,679,991, Cl. 417-360.000.

La Grange, Nyle D.; Nielsen, Darryl M.; and Harbison, Joe A., 4,680,437, Cl. 200-84.00R.

Nifco, Inc.: See—  
Mizusawa, Akira; and Nakama, Daiji, 4,679,958, Cl. 403-143.000.

Nihon Den-Netsu Keiki Co., Ltd.: See—  
Kondo, Kenji, 4,679,721, Cl. 228-40.000.

Nihon Tokushu Noyaku Seizo K.K.: See—  
Shickawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,680,294, Cl. 514-256.000.

Nii, Donald S.: See—  
Harriman, Charles E.; and Nii, Donald S., 4,679,989, Cl. 417-238.000.

Niisato, Takeshi: See—  
Kai, Hisao; Ochiai, Kensuke; and Niisato, Takeshi, 4,679,718, Cl. 225-48.000.

Nikaido, Mitsuhiro: See—  
Kuwahara, Hajime; Ono, Yutaka; and Nikaido, Mitsuhiro, 4,680,466, Cl. 250-231.00SE.

Niki, Shoji; Takahashi, Toshio; and Hirakoso, Yohei, to Takeda Riken Kogyo Kabushiki Kaisha. Device for measuring average frequencies. 4,680,540, Cl. 324-78.00R.

Nielsen, Ole K. Inverter-type microwave oven power supply. 4,680,506, Cl. 315-102.000.

Nimmo, John R.: See—  
Rubin, Jacob; Hammermeister, Dale P.; and Nimmo, John R., 4,679,422, Cl. 73-38.000.

Nippo Communication Industrial Co., Ltd.: See—  
Akiyama, Tadahiho; and Otsuka, Yoshio, 4,680,785, Cl. 379-57.000.

Nippon Air Brake Co., Ltd.: See—  
Ikeda, Mitsuhiro; and Nakao, Yasuo, 4,679,863, Cl. 303-3.000.

Washizu, Shoichi; Morijiri, Takeshi; Kogure, Kazuo; and Arimitsu, Satoshi, 4,679,668, Cl. 188-353.000.

Nippon Foil Manufacturing Co., Ltd.: See—  
Kitamura, Hironori; and Noma, Kanji, 4,680,250, Cl. 430-302.000.

Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, 4,680,322, Cl. 523-416.000.

Nippon Gakki Seizo Kabushiki Kaisha: See—  
Koyamato, Hisakazu, 4,679,479, Cl. 84-1.040.

Suzuki, Hideo, 4,679,480, Cl. 84-1.220.

Nippon Hoso Kyokai: See—  
Isono, Haruo; Kusaka, Hideo; and Hasegawa, Takeshi, 4,680,639, Cl. 358-224.000.

Nippon Kogaku K. K.: See—  
Suwa, Kyoichi; Kawai, Hidemi; and Murakami, Masaichi, 4,679,942, Cl. 356-401.000.

Yamada, Kenji, 4,679,921, Cl. 351-222.000.

Nippon Oil Co., Ltd.: See—  
Matsubara, Saburo; and Yagi, Shinichi, 4,680,154, Cl. 264-63.000.

Nippon Paint Co., Ltd.: See—  
Satoh, Haruhiko; Tanabe, Hisaki; and Umemoto, Hirotochi, 4,680,348, Cl. 525-528.000.

Nippon Soda Co., Ltd.: See—  
Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, 4,680,413, Cl. 548-526.000.

Nippon Telegraph & Telephone Corporation: See—  
Takeno, Shozo; Shimizu, Toshio; and Saito, Takashi, 4,680,593, Cl. 346-76.0PH.

Nippon Telegraph & Telephone Public Corporation: See—  
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, 4,679,899, Cl. 350-96.300.

Nippondenso Co., Ltd.: See—  
Tsuzuki, Yukio; Yamaoka, Masami; and Toyoshima, Shoji, 4,680,608, Cl. 357-36.000.

Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, to Dainippon Screen Mfg. Co., Ltd. One-way reducing and enlarging printer. 4,679,930, Cl. 355-52.000.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Float device for small size boat. 4,679,522, Cl. 114-357.000.

Nishida, Yoshie; Hata, Seiji; and Miyakawa, Akira, to Hitachi, Ltd. Posture judgement system in image processing. 4,680,802, Cl. 382-8.000.

Nishiguchi, Fumio; Noguchi, Masato; and Hatanaka, Keiji, to Nissan Motor Co., Ltd. Variable capacity turbocharger control device. 4,679,398, Cl. 60-602.000.

Nishihara, Toshikazu: See—  
Kimura, Akihiro; Ando, Toshio; and Nishihara, Toshikazu, 4,680,218, Cl. 428-195.000.

Nishii, Masahiro: See—  
Takematsu, Tetsuo; Nishii, Masahiro; and Kobayashi, Izumi, 4,680,054, Cl. 71-93.000.

Nishikawa, Masumi; and Ishikawa, Masanobu, to Aisin Seiki Kabushiki Kaisha. Back-lash eliminating mechanism in screw-type driving device. 4,679,457, Cl. 74-441.000.

Nishikawa, Reiji: See—  
Sagoi, Masayuki; and Nishikawa, Reiji, 4,680,197, Cl. 427-129.000.

Nishimura, Masahiro: See—  
Morishita, Koji; Hirose, Hujio; Nakatsuka, Nobuo; and Nishimura, Masahiro, 4,679,932, Cl. 356-28.000.

Nishimura, Shinji: See—  
Komurasaki, Keichi; Iwatani, Shiro; and Nishimura, Shinji, 4,680,529, Cl. 322-28.000.

Nishino, Keigo: See—  
Irikura, Tsutomu; Nishino, Keigo; Okamura, Kyuya; and Ikeda, Toshiya, 4,680,398, Cl. 546-121.000.

Nishino, Tadashi: See—  
Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, 4,679,611, Cl. 164-431.000.

Nishioka, Masato: See—  
Furukawa, Nobuhiro; Murakami, Shuzo; and Nishioka, Masato, 4,680,240, Cl. 429-13.000.

Nishiyama, Toshihiko: See—  
Watanabe, Kinichiro; Horiai, Kunio; Mashiko, Tomoyuki; Kato, Hitoshi; Yamaguchi, Hiromasa; and Nishiyama, Toshihiko, 4,679,992, Cl. 417-364.000.

Nissan Motor Co., Ltd.: See—  
Ito, Ken; and Kawabe, Taketoshi, 4,679,808, Cl. 280-91.000.

Ito, Ken; Inoue, Naohiko; and Kawabe, Taketoshi, 4,679,809, Cl. 280-91.000.

Kubo, Jun, 4,680,713, Cl. 364-426.000.

Kubo, Jun, 4,680,714, Cl. 364-426.000.

Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; Yamamuro, Sigeaki; and Nakano, Masaki, 4,679,466, Cl. 74-863.000.

Morita, Tatsuo, 4,679,536, Cl. 123-425.000.

Nishiguchi, Fumio; Noguchi, Masato; and Hatanaka, Keiji, 4,679,398, Cl. 60-602.000.

Ozaki, Kiyotaka; Torii, Shuui; Jindo, Tomio; and Imaseki, Takashi, 4,679,463, Cl. 74-711.000.

Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, 4,679,778, Cl. 267-140.100.

Nissei ASB Machine Co., Ltd.: See—  
Aoki, Daiichi; Nakamura, Yoshinori; Orimoto, Hiroyuki; and Machida, Kazumi, 4,680,208, Cl. 428-35.000.



- Nitto Boseki Co., Ltd.: See—  
Ueda, Toshio; Sato, Yoshinori; and Harada, Susumu, 4,680,360, Cl. 526-310.000.
- Nitto Electric Industrial Co., Ltd.: See—  
Wada, Shintaro; Takahashi, Hisanori; and Nomura, Yoichi, 4,679,563, Cl. 128-640.000.
- NL Petroleum Products Limited: See—  
Barr, John D.; and Wardley, Michael T., 4,679,639, Cl. 175-329.000.
- Noble, Alfred H. Space frame apparatus and a space frame employing such apparatus. 4,679,372, Cl. 52-648.000.
- Nobuhara, Masahiro; Kanamori, Toshinori; Yamaguchi, Kiyoshi; and Mochida, Ei, to Mochida Pharmaceutical Co., Ltd. Process for producing interferon. 4,680,261, Cl. 435-68.000.
- Nogi, Teiji; and Gondo, Toyomi, to Kabushiki Kaisha Meidensha. Power supply installation for dc electric railroad. 4,680,663, Cl. 361-2.000.
- Noguchi, Masato: See—  
Nishiguchi, Fumio; Noguchi, Masato; and Hatanaka, Keiji, 4,679,398, Cl. 60-602.000.
- Noguchi, Noboru: See—  
Inden, Masahiro; Kuwana, Kazutaka; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,679,589, Cl. 137-596.170.
- Noll, Hans: See—  
Flindt, Werner; and Noll, Hans, 4,679,722, Cl. 228-168.000.
- Noma, Kanji: See—  
Kitamura, Hironori; and Noma, Kanji, 4,680,250, Cl. 430-302.000.
- Nomura, Yoichi: See—  
Wada, Shintaro; Takahashi, Hisanori; and Nomura, Yoichi, 4,679,563, Cl. 128-640.000.
- Nonomura, Arthur M., to Microbio Resources, Inc. Process for producing a naturally-derived carotene/oil composition by direct extraction from algae. 4,680,314, Cl. 514-725.000.
- Nordskog, Robert A. Lightweight aircraft furniture caster assembly having a notched braking plate engaged by a brake. 4,679,662, Cl. 188-1.120.
- Nordson Corporation: See—  
Jameson, Calvin R.; and Ramazzotti, Dario J., 4,679,710, Cl. 222-190.000.
- Trevathan, Larry C., 4,679,711, Cl. 222-330.000.
- North American Philips Consumer Electronics Corp.: See—  
Collins, Floyd K.; and Hassler, George E., 4,680,501, Cl. 313-456.000.
- North American Philips Corporation: See—  
McKechie, Thomas S.; and Goldenberg, Jill F., 4,679,900, Cl. 350-126.000.
- North American Specialties Corporation: See—  
Seidler, Jack, 4,679,889, Cl. 439-876.000.
- Northern Telecom Limited: See—  
Calder, Iain D.; Macelwee, Thomas W.; and Naem, Abdalla A., 4,680,609, Cl. 357-42.000.
- Este, Grantley O., 4,680,497, Cl. 310-313.000.
- Goodwin, John C., 4,679,908, Cl. 350-320.000.
- Grover, Wayne D., 4,680,583, Cl. 340-825.520.
- Heldenbrand, Stanley W.; and Chappuis, Clyde L., 4,679,867, Cl. 312-287.000.
- Rioux, Brian A., 4,680,008, Cl. 432-72.000.
- Therault, Robert E.; and Hogeboom, John G., 4,679,302, Cl. 29-571.000.
- Northwest Marine Technology Inc.: See—  
Jefferts, Keith B., 4,679,559, Cl. 128-330.000.
- Nortrup, Kevin E.: See—  
Fitzgerald, William V.; Fernsler, Ronald E.; and Nortrup, Kevin E., 4,680,511, Cl. 315-411.000.
- Notthoff, Johannes K.: See—  
Zuleeg, Rainer; Notthoff, Johannes K.; and Troeger, Gary L., 4,679,298, Cl. 29-571.000.
- Nova Technologies, Inc.: See—  
DiMatteo, Paul; and Chubb, Charles F., 4,679,259, Cl. 5-81.00R.
- Nowicki, Casimir W.; Lucius, Thomas A.; Kaminski, Ronald S.; and Snyder, Robert P., to Owens-Illinois, Inc. Apparatus for applying labels in the molds of a plastic blow molding machine. 4,680,000, Cl. 425-126.00R.
- Nowicki, Casimir W.: See—  
Plenzler, John A.; Krall, Thomas J.; and Nowicki, Casimir W., 4,679,997, Cl. 425-126.00R.
- NSK-Warner Kabushiki Kaisha: See—  
Yamamoto, Kazuo; and Asano, Shuichi, 4,679,821, Cl. 280-808.000.
- Nukui, Masahiro: See—  
Hasuo, Masayoshi; Mukai, Seiichi; Urabe, Hiroshi; Yoshida, Seiji; and Nukui, Masahiro, 4,680,374, Cl. 528-204.000.
- Numata, Kazuo: See—  
Watanabe, Naoharu; Numata, Kazuo; Yamagishi, Michio; Mizutani, Taku; Omura, Sadafumi; and Yamaguchi, Hideyo, 4,680,311, Cl. 514-561.000.
- Nussbaumer, Manfred; and Fischer, Bruno, to Micafil AG. Methods and apparatus for the automatic production of stators for electric motors. 4,679,312, Cl. 29-596.000.
- Obara, Takashi, to NEC Corporation. Inverter for use in binary counter. 4,680,482, Cl. 307-279.000.
- Ober, Christopher K.: See—  
Hair, Michael L.; Lok, Kar P.; Ober, Christopher K.; Croucher, Melvin D.; and Wong, Raymond W., 4,680,332, Cl. 524-377.000.
- Obitsu, Takeo; Igaki, Tetsuo; Kinoshita, Kimiaki; Nanbu, Morio; and Satoh, Shinichi, to Shin Nisso Kako Co., Ltd. Chromogenic materials employing fluoran compounds. 4,680,598, Cl. 503-217.000.
- Ochi, Yoshiyuki: See—  
Yano, Mitsuru; Kido, Tomoyuki; and Ochi, Yoshiyuki, 4,680,239, Cl. 428-688.000.
- Ochiai, Kensuke: See—  
Kai, Hisao; Ochiai, Kensuke; and Niisato, Takeshi, 4,679,718, Cl. 225-48.000.
- Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, to Takeda Chemical Industries, Ltd. Esters of 7-[2-(2-aminothiazol-4-yl)-2-(syn)-methoxyiminoacetamido]-3-methyl-ceph-3-em-4-carboxylic acid. 4,680,390, Cl. 540-228.000.
- O'Connor, James E., to Phillips Petroleum Company. Reinforced plastic. 4,680,224, Cl. 428-294.000.
- Oda, Kiyoshi: See—  
Ishii, Susumu; and Oda, Kiyoshi, 4,679,281, Cl. 24-422.000.
- Odette, Philippe: See—  
Bonnenfant, Yvon; Odette, Philippe; Perne, Raymond; and Thevenot, Claude, 4,679,696, Cl. 215-252.000.
- O'Donnell, Matthew; Karr, Steven G.; Barber, William D.; Wang, Jish M.; and Edelstein, William A., to General Electric Company. Method for homogenizing a static magnetic field over an arbitrary volume. 4,680,551, Cl. 324-320.000.
- Ogarkov, Vsevolod I.: See—  
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- Ogawa, Hiromi: See—  
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- Ogawa, Tetsuo: See—  
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- Ohaus Scale Corporation: See—  
Brock, Marilyn A.; and Scheffer, Daniel G., 4,679,642, Cl. 177-164.000.
- Ohio University: See—  
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- Ohira, Hiroyuki: See—  
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- Ohkawa, Masayoshi: See—  
Okumura, Koichiro; and Ohkawa, Masayoshi, 4,680,488, Cl. 307-482.000.
- Ohkawa, Masayuki: See—  
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- Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable toy assembly. 4,680,018, Cl. 446-376.000.
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- Ohzono, Kohei; Hayashi, Kiyotaka; Saito, Mitsuru; Kato, Masae; and Yoshida, Yoshihiro, to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English). Hydraulic type starting clutch. 4,679,677, Cl. 192-85.0AA.
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- Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge. 4,680,661, Cl. 360-133.000.
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- Okada, Kazuo, to Kabushiki Kaisha Universal. Video game apparatus with automatic skill level adjustment. 4,679,789, Cl. 273-1.00E.

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- Okamura, Kyuya: See—  
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- Okamura, Masayuki, to Aisan Kogyo Kabushiki Kaisha. Throttle sensor for engine. 4,679,440, Cl. 73-118.100.
- Okii Electric Industry Co., Ltd.: See—  
Yokouchi, Hiroshi; and Miyazaki, Kazuhiko, 4,680,491, Cl. 307-579.000.
- Okin, Seth. Dental appliance for cleansing the gingival one third areas of the teeth as well as the sulcular and the embrasure regions thereof. 4,679,273, Cl. 15-167.00R.
- Okujima, Sumio: See—  
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- Okuhara, Masakuni: See—  
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- Okumura, Koichiro; and Ohkawa, Masayoshi, to NEC Corporation. MOSFET-type driving circuit with capacitive bootstrapping for driving a large capacitive load at high speed. 4,680,488, Cl. 307-482.000.
- Okuyama, Shinya: See—  
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- Oliff, James R., to Mead Corporation. The end closure structure for an end loading carton. 4,679,726, Cl. 229-138.000.
- Olsen, John H., to Flow Industries, Inc. High pressure hose fitting. 4,679,826, Cl. 285-149.000.
- Olsen, Ole B., to Nash Engineering Company. The self-priming liquid ring pump methods and apparatus. 4,679,987, Cl. 417-54.000.
- Olson, Daniel H., to Snyder Laboratories, Inc. Pressure relief valve. 4,679,596, Cl. 137-853.000.
- Olson, Kenneth C.: See—  
Bochner, Barry R.; Olson, Kenneth C.; and Pai, Rong-Chang, 4,680,262, Cl. 435-68.000.
- Olson, Rohn L.: See—  
Kramer, Kenneth D.; and Olson, Rohn L., 4,679,765, Cl. 251-38.000.
- Olver, Laurence C.: See—  
Lakhani, Amir A.; and Olver, Laurence C., 4,679,311, Cl. 29-579.000.
- Olympus Optical Co., Ltd.: See—  
Horiguchi, Toshio, 4,680,643, Cl. 358-280.000.
- Ishiwatari, Shiro, 4,680,102, Cl. 204-299.00R.
- Omoda, Koichiro; and Nagashima, Shigeo, to Hitachi, Ltd. Storage control apparatus. 4,680,730, Cl. 364-900.000.
- Omron Tateisi Electronics Co.: See—  
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- Sakamoto, Tamaki, 4,679,949, Cl. 374-183.000.
- Omura, Sadafumi: See—  
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- Ong, Sieling: See—  
Durl, Bernd; Bos, Johannes; Ong, Sieling; Raffel, Peter; and Brozat, Kurt, 4,680,033, Cl. 8-449.000.
- Ono, Keiichi: See—  
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- Ono, Naoya: See—  
Mitsumaki, Hiroshi; Takano, Nobuyoshi; and Ono, Naoya, 4,680,270, Cl. 436-52.000.
- Ono, Yutaka: See—  
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- Onodera, Toshihiro: See—  
Tanaka, Yoshio; and Onodera, Toshihiro, 4,680,534, Cl. 323-290.000.
- Onorato, Paulette I. K.; and Su, Sophia R., to GTE Laboratories Incorporated. Process for molding optical components of silicate glass to a near net shape optical precision. 4,680,049, Cl. 65-18.100.
- Onuma, Tatsuro: See—  
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- Ooi, Kazushige, to Kabushiki Kaisha Toshiba. Driver circuit for two-dimensional image sensor. 4,680,636, Cl. 358-213.180.
- Opie, Eric A.; and Clement, Thomas J., to E. R. Squibb & Sons, Inc. Electrodynamically transluminal angioplasty system. 4,679,557, Cl. 128-305.000.
- Oppenlander, Jon E.: See—  
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- Opsal, Jon: See—  
Rosenzweig, Allan; and Opsal, Jon, 4,679,946, Cl. 374-5.000.
- Optotech, Inc.: See—  
Bracht, Roger R., 4,680,594, Cl. 346-108.000.
- Oreglia, Aurelio; Botto, Paolo; and Freschi, Claudio, to W. R. Grace & Co., Cryovac Div. Easy to open package and a method of making same. 4,680,340, Cl. 525-72.000.
- Orero, Francisco O.; and Garcia, Augusto M. Flag having a support pedestal. 4,679,523, Cl. 116-173.000.
- Organon Teknika Corporation: See—  
Barone, David, 4,680,122, Cl. 210-637.000.
- Orimoto, Hiroyuki: See—  
Aoki, Daichi; Nakamura, Yoshinori; Orimoto, Hiroyuki; and Machida, Kazumi, 4,680,208, Cl. 428-35.000.
- Orlando, John J., to Inco Alloys International, Inc. Rotary mill and a method of charging the mill. 4,679,736, Cl. 241-25.000.
- Orlando, Thomas W., to Alcor, Inc. Controlled atmosphere oven. 4,680,167, Cl. 422-199.000.
- Ornstein, Jacob L.; and Hydock, Michael A., to GTE Products Corporation. Thermostatic metal. 4,680,238, Cl. 428-617.000.
- Orphall, Axel W., to Stedman Machine Co. Wedge-clamp assembly for an impact crusher. 4,679,740, Cl. 241-189.00R.
- Orr, Stephen M.: See—  
Maccaroni, Anthony J.; and Orr, Stephen M., 4,679,702, Cl. 220-90.200.
- Orsini, Jean: See—  
Coates, Fredrica V.; Jannoni, Richard; and Orsini, Jean, 4,680,030, Cl. 604-391.000.
- Orszulak, James H.: See—  
Wertz, Ronald D.; Orszulak, James H.; and Sweeney, Christopher L., 4,680,599, Cl. 340-744.000.
- Ortho Pharmaceutical: See—  
Kung, Patrick C.; and Goldstein, Gideon, 4,680,383, Cl. 530-387.000.
- Osafune, Haruo; Kanbe, Sadao; Mori, Teichiro; and Ikejiri, Masahisa, to Seiko Epson Kabushiki Kaisha. Method of preparing tubular silica glass. 4,680,045, Cl. 65-17.000.
- Osafune, Haruo: See—  
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- Motoki, Masanobu; Matsuo, Nobutaka; Kanbe, Sadao; Osafune, Haruo; and Itoh, Yoshitaka, 4,680,048, Cl. 65-17.000.
- Osato, Yasukuni: See—  
Yamada, Takeshi; Osato, Yasukuni; and Watanabe, Okosu, 4,680,449, Cl. 219-385.000.
- Osawa, Keishi: See—  
Tsuchiya, Hiroaki; Tanaka, Kazuki; and Osawa, Keishi, 4,680,669, Cl. 361-230.000.
- Osetec, Marc: See—  
Malka, Jacob H.; and Osetec, Marc, 4,680,726, Cl. 364-721.000.
- Ota, Minemasa; Matsumoto, Osamu; and Ohira, Hiroyuki, to Pioneer Electronic Corporation. Optical disk recording apparatus. 4,680,745, Cl. 369-45.000.
- Otis Elevator Company: See—  
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- Otsuka, Yoshio: See—  
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- Ott, Granville E., to Texas Instruments Incorporated. Optical system for projection display using spatial light modulator device. 4,680,579, Cl. 340-783.000.
- Otten, Henricus J. M.: See—  
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- Ou, A. Lin. Cleaning means for vehicle exhausting pipe. 4,679,395, Cl. 60-319.000.
- Ouchi, Norman K.: See—  
Ng, Chan Y.; Ouchi, Norman K.; Wang, David T.; and Yu, Wellington C., 4,680,653, Cl. 360-72.200.
- Quintel, Francis W., to Sheehan, Robert Douglas. Lawn edger. 4,679,383, Cl. 56-13.400.
- Ovchinnikov, Yuri A.: See—  
Debabov, Vladimir G.; Tsygankov, Yuri D.; Chistoserov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Yuri I.; Strongin, Alexander Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Yuri A., 4,680,260, Cl. 435-68.000.
- Overbay, Mark A., to Combustion Engineering, Inc. Hydraulic tube plug remover. 4,679,315, Cl. 29-726.000.
- Overbergh, Noel: See—  
Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., 4,680,065, Cl. 156-49.000.
- Ovonic Imaging Systems, Inc.: See—  
Vijan, Meera; McGill, John C.; and Day, Paul N., 4,680,085, Cl. 156-643.000.
- Owens-Illinois, Inc.: See—  
Nowicki, Casimir W.; Lucius, Thomas A.; Kaminski, Ronald S.; and Snyder, Robert P., 4,680,000, Cl. 425-126.00R.
- Plenzler, John A.; Krall, Thomas J.; and Nowicki, Casimir W., 4,679,997, Cl. 425-126.00R.
- Oy Wartsila AB: See—  
Eklund, Karl-Erik, 4,679,376, Cl. 53-137.000.
- Eklund, Dan, 4,679,524, Cl. 118-122.000.
- Ozaki, Kiyotaka; Torii, Shuichi; Jindo, Tomio; and Imaseki, Takashi, to Nissan Motor Co., Ltd. Limited slip differential. 4,679,463, Cl. 74-711.000.
- Ozawa, Takashi: See—  
Sato, Shigeru; and Ozawa, Takashi, 4,680,477, Cl. 250-578.000.



P.L.G. Research Limited: See—  
 Mercer, Frank B., 4,680,215, Cl. 428-107.000.  
 Pace, Jerry E.: See—  
 Holmes, Gerald E.; and Pace, Jerry E., 4,679,978, Cl. 414-563.000.  
 Packard, Richard F.; and Cover, Kenneth R., to Joerns Healthcare, Inc. Bedside control module for healthcare stations and the like. 4,680,790, Cl. 379-432.000.  
 Pai, Rong-Chang: See—  
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 Paleschuck, Maurice. Compact receptacle. 4,680,808, Cl. 383-9.000.  
 Pammer, Erich, to Siemens Aktiengesellschaft. Semiconductor component comprising bump-like, metallic lead contacts and multilayer wiring. 4,680,610, Cl. 357-68.000.  
 Pandey, Sue D.; and Buss, Waldeen C., to Chevron Research Company. Sulfur tolerance of zeolitic reforming catalysts. 4,680,260, Cl. 502-66.000.  
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 Brandenstein, Manfred; Klupfel, Norbert; Pape, Gebhard; Haas, Roland; and Schmichen, Rolf, 4,679,458, Cl. 74-458.000.  
 Parker, David H. Waterproof flashlight. 4,680,682, Cl. 362-158.000.  
 Parker Hannifin Corporation: See—  
 Stevens, Curtis E., 4,680,465, Cl. 250-229.000.  
 Parker, Norman W., to Motorola, Inc. AM stereo system with modified spectrum. 4,680,794, Cl. 381-15.000.  
 Parnoff, George K.; and Sultan, Steven L., to Andros Analyzers Incorporated. Adaptor assembly for airway tube. 4,679,573, Cl. 128-716.000.  
 Parsons, James S.; and Gasaway, Jack S., to Injet Medical Products, Inc. Needleless hypodermic injection device. 4,680,027, Cl. 604-68.000.  
 Pascal, Roger; and Dimier, Jean P., to Salomon S.A. Safety ski binding. 4,679,815, Cl. 280-618.000.  
 Pasco Laboratories, Inc.: See—  
 Naylor, Harry B., 4,680,269, Cl. 435-301.000.  
 Pasquarette, Ernest R., Jr.; Crouse, Stanley G.; Campanella, Ermen; and Borti, Franco, to Ruco Equipment Company, Inc. Highly maneuverable insulated man lifting aerial crane for use in servicing overhead high-voltage electrical transmission lines. 4,679,653, Cl. 182-2.000.  
 Pastor, Ricardo C., to Hughes Aircraft Company. Method of modifying the refractive index of fluoride glass. 4,680,044, Cl. 65-3.110.  
 Patchett, Arthur A.: See—  
 Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., 4,680,392, Cl. 540-527.000.  
 Patel, Gautam A.: See—  
 Factor, Arnold; and Patel, Gautam A., 4,680,232, Cl. 428-412.000.  
 Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexander I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., to Institute Problem Modelirovaniya v Energetike an USSR. Welder's trainer. 4,680,014, Cl. 434-234.000.  
 Patterson, Joseph M.: See—  
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 Patterson, Joseph M., III: See—  
 Ramsden, Hugh E.; and Patterson, Joseph M., III, 4,680,121, Cl. 210-635.000.  
 Paugam, Francois: See—  
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 Paul Troester Maschinenfabrik: See—  
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 Pavlath, George A., to Litton Systems, Inc. Electrically switched fiber optic directional coupler. 4,679,894, Cl. 350-96.150.  
 Pawelek, Bernd-Christian, to Teldix GmbH. Method for navigating vehicles, particularly land vehicles. 4,680,715, Cl. 364-449.000.  
 Pawlak, Joseph A.: See—  
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 Pay, Christopher C., to Crop Control Products Limited. Electrostatic spraying apparatus. 4,679,735, Cl. 239-708.000.  
 Payne, Donald W.; and Hemp, Bruce, to Payne, Donald W. Three-phase ac to dc power converter with power factor correction. 4,680,689, Cl. 363-26.000.  
 Payne, Marshall W.: See—  
 Keklak, Ronald; Couture, Michael V.; Whitehouse, John C.; and Payne, Marshall W., 4,680,571, Cl. 340-52.00R.  
 Pearce, Richard H., Jr., to American Standard Inc. Stepped capacity constant volume building air conditioning system. 4,679,411, Cl. 62-519.000.  
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 Peeters, Robert D. Loudspeaker enclosure. 4,679,651, Cl. 181-155.000.  
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 Bross, Charles F., 4,680,464, Cl. 250-223.00R.  
 Wheaton, Gregory A., 4,680,095, Cl. 204-79.000.  
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 Perkins, William O.: See—  
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Permaswage S.A.: See—  
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 Perne, Raymond: See—  
 Bonnenfant, Yvon; Odet, Philippe; Perne, Raymond; and Thevenot, Claude, 4,679,696, Cl. 215-252.000.  
 Petersen, Kurt E.: See—  
 Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,680,606, Cl. 357-26.000.  
 Peterson, Duane G. Wire fence post bracing system. 4,679,772, Cl. 256-36.000.  
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 Wales, C. Ernest; and Peterson, Mitchell F., 4,680,741, Cl. 367-189.000.  
 Peterson, Paul F., to Lockheed Corporation. Weapon dispensing system for an aircraft. 4,679,751, Cl. 244-137.400.  
 Petitimbart, Jean-Francois: See—  
 Chapsal, Paul; and Petitimbart, Jean-Francois, 4,680,686, Cl. 363-10.000.  
 Petitjean, Robert; and Eriksson, Bo G., to Tour & Andersson AB. Apparatus and method for regulating flow and temperature in a central heating installation. 4,679,729, Cl. 237-8.00R.  
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 Petrie, Adeline F., to Motorola, Inc. Solenoid driver control unit. 4,680,667, Cl. 361-154.000.  
 Pettinga, Frederic R.; and Goodman, Steve F., to Herman Miller, Inc. Rail panel mounting latch. 4,679,368, Cl. 52-36.000.  
 Peyrelongue, Jean-Pierre: See—  
 Marsault, Jean-Jacques; Peyrelongue, Jean-Pierre; Semedard, Jean-Claude; and Vallee, Gerard, 4,679,755, Cl. 248-74.100.  
 Pfeifer, Josef, to Ciba-Geigy Corporation. Homopolymers, copolymers and coated material and its use. 4,680,195, Cl. 427-44.000.  
 Pfestorf, Harald: See—  
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 Pfister, Theodor: See—  
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 Pfizer Inc.: See—  
 Egger, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,680,404, Cl. 546-269.000.  
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 pHarma-medica a.s.: See—  
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 Phillips Petroleum Company: See—  
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 DeLong, Bradley W., 4,680,041, Cl. 62-11.000.  
 Leland, John E.; Dix, James S.; and Wright, Roy F., 4,680,326, Cl. 524-106.000.  
 Meggee, Bryan A.; and Whiteside, James D., II, 4,679,579, Cl. 137-13.000.  
 Miro, Nemesio D.; Farha, Floyd E.; and Capshaw, Charles E., 4,680,351, Cl. 526-125.000.  
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 Phonocardiograph Partners: See—  
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 Photo Audio Consumer Electronics Marketing Corporation: See—  
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 Picciotto, Salvatore, to Mar-Sal Machine Co., Inc. Fence machining device. 4,679,605, Cl. 144-117.00R.  
 Pieck, Amandus L. E.: See—  
 Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., 4,680,065, Cl. 156-49.000.  
 Pietryk, Erwin; and Rauthmann, Axel, to Ford Motor Company. Water pump for window washer unit. 4,679,983, Cl. 415-152.00A.  
 Pike, Roger B.: See—  
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Robert B. Cannon, Inc.: See—  
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Robert Bosch GmbH: See—  
Fehrenbach, Siegfried; Herbst, Kurt; Schulz, Wolfgang; and Utz, Eberhard, 4,679,537, Cl. 123-447.000.  
Haberland, Siegfried, 4,679,993, Cl. 417-490.000.  
Klein, Karl-Heinz; and Richter, Wilfried, 4,680,774, Cl. 375-26.000.  
van Zanten, Anton; Heess, Gerhard; and Geering, Hans P., 4,679,866, Cl. 303-104.000.  
Roberts, Michael, to Pilkington P.E. Limited. Infra-red lenses. 4,679,891, Cl. 350-1.300.  
Robertshaw Controls Company: See—  
Geary, Frederick J., 4,680,005, Cl. 431-46.000.  
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., 4,679,583, Cl. 137-84.000.  
Robertson Engineering (Thame) Limited: See—  
Wauchope, Stirling G.; and McLean, Malcolm J., 4,679,471, Cl. 82-12.000.  
Robertson, John A., to Telesis Controls Corporation. Code reader. 4,680,457, Cl. 235-470.000.  
Robertson, John M., deceased: See—  
Haisma, Jan; van der Werf, Pieter; Robertson, John M., deceased; and de Haan, Friedrich J., administrator, 4,679,892, Cl. 350-96.120.  
Robin, Jacques: See—  
Majoie, Bernard; Bellamy, Francois; Dodey, Pierre; and Robin, Jacques, 4,680,402, Cl. 546-235.000.  
Robins, Roland K., to Viratek, Inc. Treatment of malignant tumors with 2-( $\beta$ -D-ribofuranosylthiazole-4-carboxamide related compounds. 4,680,285, Cl. 514-23.000.  
Roblin, Jean-Paul: See—  
Rodriguez, Francis; and Roblin, Jean-Paul, 4,679,824, Cl. 285-27.000.  
Rocheffort, Malcolm P.; and Wood, Richard, to Imperial Chemical Industries PLC. Method of producing shaped articles having a simulated marble appearance. 4,680,155, Cl. 264-73.000.  
Rockwell International Corporation: See—  
Fechalos, William A., 4,680,754, Cl. 370-85.000.  
Riley, Patrick J., 4,679,969, Cl. 408-87.000.  
Stetson, Scott B., 4,680,489, Cl. 307-493.000.  
White, Stanley A., 4,680,727, Cl. 364-754.000.  
Rodger, Ian Gordon: See—  
Ellis, Leslie G., 4,679,742, Cl. 241-266.000.  
Rodgers, Robert E. Universal exercise machine. 4,679,786, Cl. 272-70.000.  
Rodriguez, Francis; and Roblin, Jean-Paul, to Alstom. Fluid-tight coupling for two sections of a fluid line. 4,679,824, Cl. 285-27.000.  
Rodriguez, Marco E.: See—  
Bayer, Dean M.; McCoy, Larry J.; Thomason, Chris A.; Tranbarger, Thomas P.; and Rodriguez, Marco E., 4,679,837, Cl. 293-102.000.  
Roelofs, Darrell D.: See—  
Spieth, Robert H.; Louie, Chuen W.; Volk, John L.; Roelofs, Darrell D.; DeLorenzo, Anthony N.; Romeo, Arthur L.; and Mayer, Thomas L., 4,680,510, Cl. 315-368.000.  
Roggero, Arnaldo, to Enichem Elastomeri S.p.A. Certain alkali metal bis-phenethyl or tris-phenethyl-pyridines useful as multifunctional anionic initiators. 4,680,407, Cl. 546-348.000.  
Rohm GmbH: See—  
Liebler, Ralf; and Albrecht, Klaus, 4,680,359, Cl. 526-309.000.  
Rohr, Wolfgang: See—  
Hamprecht, Gerhard; Varwig, Juergen; and Rohr, Wolfgang, 4,680,412, Cl. 548-480.000.  
Roller, Robert A.; and Roller, Warren L. Optical viewing apparatus with two mirrors consecutively reflecting the line of sight. 4,679,916, Cl. 350-623.000.  
Roller, Warren L.: See—  
Roller, Robert A.; and Roller, Warren L., 4,679,916, Cl. 350-623.000.  
Rolls-Royce plc: See—  
Taylor, Maurice I., 4,679,394, Cl. 60-224.000.  
Woodward, Clifford S., 4,679,732, Cl. 239-265.350.  
Romeo, Arthur L.: See—  
Spieth, Robert H.; Louie, Chuen W.; Volk, John L.; Roelofs, Darrell D.; DeLorenzo, Anthony N.; Romeo, Arthur L.; and Mayer, Thomas L., 4,680,510, Cl. 315-368.000.  
Romer Labs, Inc.: See—  
Romer, Thomas R., 4,679,737, Cl. 241-29.000.  
Romer, Thomas R., to Romer Labs, Inc. Grinding sub-sampling mill and method for preparation of test sample. 4,679,737, Cl. 241-29.000.  
Romox Incorporated: See—  
Izumi, Hideki D.; and Terrell, Paul J., 4,680,731, Cl. 364-900.000.  
Rones, Harvey C. Eye and binocular vision demonstrator. 4,680,015, Cl. 434-271.000.  
Roquemore, William M.: See—  
Ganguly, Biswa; Goss, Larry P.; Roquemore, William M.; and Trump, Darryl D., 4,679,934, Cl. 356-43.000.  
Roquette Freres: See—  
Bussiere, Guy; Zimmermann, Marius; and Huchette, Michel, 4,680,180, Cl. 426-16.000.  
Rosen, Perry: See—  
Holland, George W.; Maag, Hans; and Rosen, Perry, 4,680,415, Cl. 549-214.000.  
Rosenberg, H. James, to Erie Scientific Company. Microscope slide with top and bottom marking surfaces. 4,679,914, Cl. 350-534.000.  
Rosencwaig, Allan; and Opsal, Jon, to Thermo-Wave, Inc. Evaluating both thickness and compositional variables in a thin film sample. 4,679,946, Cl. 374-5.000.  
Rosendal, Carsten. Blanking impact absorber. 4,679,664, Cl. 188-134.000.  
Rosenfeld, Jerold C.; and Pawlak, Joseph A., to Celanese Corporation. Preparation of aromatic polyester with improved stability by addition of phosphite during preparation. 4,680,371, Cl. 528-179.000.  
Rosenfeld, Jerold C., to Celanese Corporation. In-situ end-capping melt prepared aromatic polyester with phenyl benzoate. 4,680,372, Cl. 528-179.000.  
Ross, John J. Freestanding luminaire having floor-supported frame integrated with light fixture. 4,680,677, Cl. 362-33.000.  
Ross, Milton I. Encapsulated electronic circuit device, and method and apparatus for making same. 4,680,617, Cl. 357-72.000.  
Roszel, Lynn; and Tabor, Jim, to Prescolite, Inc. Dimmer circuit with input voltage compensated soft start circuit. 4,680,536, Cl. 323-321.000.  
Rottmayr, Hans: See—  
Artzt, Peter; Rottmayr, Hans; and Bauer, Wolfgang, 4,679,388, Cl. 57-263.000.  
Roussin, Michael A.; Fidler, Jerry D.; and Jensen, Brian D., to Caterpillar Inc. Mounting frame for linear impact ripper assembly. 4,679,857, Cl. 299-37.000.  
Rowan, Timothy M.: See—  
Kerkman, Russel J.; and Rowan, Timothy M., 4,680,695, Cl. 363-160.000.  
Roy, Wolfgang: See—  
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.  
Royal Champignon: See—  
Agulhon, Claude, 4,680,188, Cl. 426-281.000.  
Royal College of Surgeons of England, The: See—  
Gray, Charles R. W.; and Crawford, Neville, 4,680,177, Cl. 424-101.000.  
Rubin, Jacob; Hammermeister, Dale P.; and Nimmo, John R., to United States of America, Interior. Method and apparatus for steady-state measurement of liquid conductivity in porous media. 4,679,422, Cl. 73-38.000.



Rucki, William M., to General Electric Company. Load control circuit. 4,680,508, Cl. 315-166.000.

Ruco Equipment Company, Inc.: See—  
Pasquarrette, Ernest R., Jr.; Crouse, Stanley G.; Campanella, Ermen; and Boti, Franco, 4,679,653, Cl. 182-2.000.

Rudd, Norman. Treatment of porous structures. 4,679,380, Cl. 53-440.000.

Rudenauer, Werner; Furst, Wilhelm; and Liebl, Norbert, to Diehl GmbH & Co. Detonator securing device. 4,679,503, Cl. 102-208.000.

Rudolf, Felix, to Centre Electronique Horloger SA. Torsion type magnetic field measurement device. 4,680,544, Cl. 324-259.000.

Ruffner, Bryan J. Appliance anti-theft circuitry. 4,680,574, Cl. 340-571.000.

Ruhle, James L. Method and apparatus for coring rock. 4,679,636, Cl. 175-58.000.

Russin, Leonid P. Oscillator reciprocation control system for piston motor. 4,679,490, Cl. 91-189.00R.

Ryan, James M.; and Gilmore, Arthur H., to Falcon Jet Corporation. Auxiliary airplane seats. 4,679,749, Cl. 244-122.00R.

S. C. Johnson & Son, Inc.: See—  
Coyle, E. Michael; Reichley, Fred J.; Verbrugge, Calvin J.; and Villarreal, John G., 4,680,202, Cl. 427-389.900.

Crapser, James R.; and Malek, Edward J., 4,679,713, Cl. 222-402.130.

S. Franzen Sohne GmbH & Co.: See—  
Dueringer, Rudi, 4,679,833, Cl. 292-113.000.

S.I.E., Inc.: See—  
Kalb, Gerald F.; and Brown, David M., 4,679,669, Cl. 188-375.000.

S.N.E.C.M.A.: See—  
Guibert, Alain J. E.; Mestre, Roland R.; and Ritt, Remy P. C., 4,679,981, Cl. 415-116.000.

Saad, Michael. Lettering template. 4,679,328, Cl. 33-447.000.

Sackner, Marvin A., to Key Pharmaceuticals, Inc. Method and apparatus for intrapulmonary delivery of heparin. 4,679,555, Cl. 128-203.150.

Sadre, Ahmad: See—  
Chand, Sujett; and Sadre, Ahmad, 4,680,519, Cl. 318-568.000.

Sagara, Hiroshi: See—  
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.

Sagol, Masayuki; and Nishikawa, Reiji, to Kabushiki Kaisha Toshiba. Method of manufacturing perpendicular magnetic recording floppy disk. 4,680,197, Cl. 427-129.000.

Saha, Debabrata, to University of Michigan. The Quadrature-quadrature phase shift keying. 4,680,777, Cl. 375-53.000.

Sahni, Atam P.: See—  
Williams, Charles F.; and Sahni, Atam P., 4,680,139, Cl. 252-511.000.

Saijo, Eiji; and Wakata, Shigekazu, to Tokai Electric Wire Company Limited. Connector housing. 4,679,874, Cl. 439-595.000.

St. Clair, John S.; and Brignall, Nicolas L., to Ferranti plc. Radiation path axis directing system. 4,680,522, Cl. 318-664.000.

St. Laurent, James C. T. B.: See—  
Busch, Alfred; and St. Laurent, James C. T. B., 4,680,131, Cl. 252-102.000.

Saito, Gunji: See—  
Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, 4,679,382, Cl. 56-10.100.

Saito, Hitoshi: See—  
Inou, Kiyoharu; Matsumura, Hideaki; and Saito, Hitoshi, 4,680,688, Cl. 363-21.000.

Saito, Mitsuru: See—  
Ohzono, Kohei; Hayashi, Kiyotaka; Saito, Mitsuru; Kato, Masaie; and Yoshida, Yoshihiro, 4,679,677, Cl. 192-85.00A.

Saito, Sadaaki: See—  
Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadaaki, 4,679,611, Cl. 164-431.000.

Saito, Takashi: See—  
Takeno, Shozo; Shimizu, Toshio; and Saito, Takashi, 4,680,593, Cl. 346-76.0PH.

Sakaguchi, Masaaki: See—  
Chikamasa, Hiroshi; and Sakaguchi, Masaaki, 4,679,744, Cl. 242-67.30R.

Sakai, Takami, to Kabushiki Kaisha Toshiba. Control apparatus of AC/DC power converter. 4,680,692, Cl. 363-35.000.

Sakai, Yasuo; and Hirata, Miyoshi, to Daiichi Pure Chemicals Co., Ltd. Particles for inhibiting non-specific immunoreaction. 4,680,274, Cl. 436-512.000.

Sakai, Yasushi: See—  
Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Toru, 4,680,349, Cl. 526-62.000.

Sakakibara, Shinsuke: See—  
Toyoda, Kenichi; Sakakibara, Shinsuke; and Ishikawa, Haruyuki, 4,680,520, Cl. 318-594.000.

Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha; and Van Doorne's Transmissie B.V. System for engaging an electromagnetic clutch upon acceleration of an engine. 4,679,674, Cl. 192-0.052.

Sakakiyama, Ryuzo; and Takano, Toshio, to Fuji Jukogyo Kabushiki Kaisha. System for controlling an electromagnetic clutch for a vehicle. 4,680,712, Cl. 364-424.100.

Sakamoto, Keiji: See—  
Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, 4,680,518, Cl. 318-561.000.

Sakamoto, Tamaki, to Omron Tateisi Electronics Co. Electronic thermometer. 4,679,949, Cl. 374-183.000.

Sako, Yoichiro: See—  
Suzuki, Tadao; Sako, Yoichiro; Furukawa, Shunsuke; Furuya, Tsuneo; and Baggen, Constant P. M. J., 4,680,764, Cl. 371-40.000.

Sakurai, Yutaka: See—  
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.

Salomatina, Irina S.: See—  
Debabov, Vladimir G.; Tsygankov, Yuri D.; Chistoserdov, Andrei J.; Sverdlov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Yuri I.; Strongin, Alexandr Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Yuri A., 4,680,260, Cl. 435-68.000.

Salomon S.A.: See—  
Pascal, Roger; and Dimier, Jean P., 4,679,815, Cl. 280-618.000.

Salsgiver, James A.: See—  
Shen, Tien-Hung; and Salsgiver, James A., 4,680,062, Cl. 148-111.000.

Salzmann, Thomas N.: See—  
Christensen, Burton G.; Salzmann, Thomas N.; and Heck, James V., 4,680,292, Cl. 514-210.000.

Sameca SA: See—  
Geiser, Markus; and Vandevor, Claude, 4,679,470, Cl. 82-2.700.

Sampson, Samuel O., Jr. Wheel chair table system. 4,679,509, Cl. 108-27.000.

Samuelsson, Bjorn. Surface-forming panel. 4,679,370, Cl. 52-407.000.

Sanada, Kazuo: See—  
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, 4,679,899, Cl. 350-96.300.

Sanden Corporation: See—  
Tamura, Yasuji, 4,680,492, Cl. 310-15.000.

Yanagisawa, Masahiro, 4,679,829, Cl. 285-190.000.

Sanders, Robert K., to General Motors Corporation. Solenoid valve. 4,679,593, Cl. 137-625.650.

Sanders, Winfred J.: See—  
Menon, Govind K.; and Sanders, Winfred J., 4,680,304, Cl. 514-340.000.

Sandhu, Jaswinder S., to Raj Technology, Inc. Reciprocating method and apparatus for producing uniform ultrasonic field for use in liquid crystal based acoustical imaging. 4,679,436, Cl. 73-603.000.

Sandoz Ltd.: See—  
Hamberger, Helmut; Stephen, Adrian; Stutz, Anton; and Stutz, Peter, 4,680,291, Cl. 514-183.000.

Sannes, Tjerk: See—  
Baileul, Gilles; and Sannes, Tjerk, 4,679,317, Cl. 29-828.000.

Sanraku-Ocean Co., Ltd.: See—  
Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, 4,680,263, Cl. 435-162.000.

Santel, Hans-Joachim: See—  
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.

Santhouse, Daniel: See—  
Skovdal, Jorgen; Santhouse, Daniel; Jensen, Borge; and Carlucci, Vito, 4,680,444, Cl. 219-222.000.

Sanyo Electric Co., Ltd.: See—  
Fukatsu, Takeo; Takeuchi, Masaru; and Goto, Kazuyuki, 4,680,607, Cl. 357-30.000.

Furukawa, Nobuhiro; Murakami, Shuzo; and Nishioka, Masato, 4,680,240, Cl. 429-13.000.

Yagi, Katsumi, 4,680,768, Cl. 372-45.000.

Saotome, Shigeru: See—  
Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,680,473, Cl. 250-484.100.

Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, to Honda Giken Kogyo Kabushiki Kaisha. Riding type mower. 4,679,382, Cl. 56-10.100.

Saruwatari, Kazuyuki: See—  
Kamawada, Minoru; Saruwatari, Kazuyuki; Shimada, Kazuaki; and Higashizima, Harumi, 4,680,116, Cl. 210-282.000.

Sasaki, Hiroshi, to Kabushiki Kaisha Toshiba. Ultrasonic diagnostic apparatus using non-linear parameters of an organ. 4,679,565, Cl. 128-660.000.

Sasaki, Toshiro; Kosaka, Michitaka; Mohri, Satoshi; Kawano, Katsumi; and Miyamoto, Shoji, to Hitachi, Ltd. Method and apparatus of determining an attitude of a satellite. 4,680,718, Cl. 364-455.000.

Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased (by Satomi, Fumiko, legal representative), to Hitachi, Ltd. Apparatus for checking patterns on printed circuit boards. 4,680,627, Cl. 358-101.000.

Sato, Hideaki; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,680,257, Cl. 430-614.000.

Sato, Hideo, to Sony Corporation. Printed circuit board terminal device. 4,680,675, Cl. 361-397.000.

Sato, Keiichi: See—  
Watanabe, Kikuo; Kobayashi, Mitsuo; Hirose, Noboru; and Sato, Keiichi, 4,679,296, Cl. 29-568.000.

Sato, Kiyoshi: See—  
Mihara, Tohru; Sato, Kiyoshi; and Terauchi, Yasuo, 4,679,962, Cl. 404-126.000.

Sato, Shigeru; and Ozawa, Takashi, to Fuji Xerox Co. Ltd. Contact type document reading device with uniform line-to-line conductor capacitance. 4,680,477, Cl. 250-578.000.

Sato, Toshifumi: See—  
Kimura, Katsuji; Kasai, Yoshihiko; Yokoyama, Yukio; Yamasaki, Koji; and Sato, Toshifumi, 4,680,553, Cl. 330-2.000.

Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumu, Kouji, to Canon Kabushiki Kaisha. Vari-focal objective lens of short total length. 4,679,913, Cl. 350-423.000.

Sato, Yoshinori: See—  
Ueda, Toshio; Sato, Yoshinori; and Harada, Susumu, 4,680,360, Cl. 526-310.000.

Satoh, Haruhiko; Tanabe, Hisaki; and Umamoto, Hiroto, to Nippon Paint Co., Ltd. Epoxy resinous varnish its preparation and coating composition containing the same. 4,680,348, Cl. 525-528.000.

Satoh, Shinichi: See—  
Obitsu, Takeo; Igaki, Tetsuo; Kinoshita, Kimiaki; Nanbu, Morio; and Satoh, Shinichi, 4,680,598, Cl. 503-217.000.

Satomi, Fumiko, legal representative: See—  
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.

Satomi, Yoshikatsu, deceased: See—  
Sase, Akira; Nagata, Takeo; Fukunaga, Masao; Sakurai, Yutaka; and Satomi, Yoshikatsu, deceased, 4,680,627, Cl. 358-101.000.

Saunders, Chris H., to TRW Inc. Wired-AND FET logic gate. 4,680,484, Cl. 307-448.000.

Sayles, Delbert E., Sr. Silver sensing material for use on film. 4,680,138, Cl. 252-503.000.

Scaife, Stephen: See—  
Bank, Graham; Scaife, Stephen; and Millward, Gareth, 4,680,800, Cl. 381-194.000.

Scanlon, John F.: See—  
Nelson, Jeffrey D.; and Scanlon, John F., 4,679,485, Cl. 89-36.020.

Scelba, Stephen S., to Presto Lock, Inc. Front-programmable combination lock with movable faceplate. 4,679,419, Cl. 70-312.000.

Schachter, Friedrich. Lighter with adjustable flame. 4,680,007, Cl. 431-344.000.

Schappert, Raymond F.: See—  
Das, Surya K.; Seiner, Jerome A.; Greigger, Paul P.; Jones, James E.; Schappert, Raymond F.; and Boberski, William G., 4,680,204, Cl. 427-407.100.

Scharnowski, Gerhard: See—  
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,680,436, Cl. 200-82.00E.

Schatzler, Walter: See—  
Lux, Horst; and Schatzler, Walter, 4,679,846, Cl. 296-214.000.

Scheck, Michael: See—  
Bastanzuri, Remberto P., 4,680,088, Cl. 162-4.000.

Scheer, Martin: See—  
Lockhoff, Oswald; Stadler, Peter; Scheer, Martin; Berschauer, Friedrich; and de Jong, Anno, 4,680,287, Cl. 514-42.000.

Scheff, Lube: See—  
Pupillo, Dominic S.; and Scheff, Lube, 4,679,836, Cl. 292-216.000.

Scheffer, Daniel G.: See—  
Brock, Marilyn A.; and Scheffer, Daniel G., 4,679,642, Cl. 177-164.000.

Schegolev, Viktor A.: See—  
Paton, Boris E.; Vasiliev, Vsevolod V.; Bogdanovsky, Valentin A.; Baranov, Alexandr I.; Danilyak, Sergei N.; Schegolev, Viktor A.; Chernoivanov, Vladimir A.; Voloshin, Vitaly I.; Gavva, Viktor M.; and Bernadsky, Vsevolod N., 4,680,014, Cl. 434-234.000.

Schenck, John F.: See—  
Edelstein, William A.; Schenck, John F.; Mueller, Orward M.; and Hayes, Cecil E., 4,680,548, Cl. 324-318.000.

Schenke, Reynold A.: See—  
Schenke, Robert W.; and Schenke, Reynold A., 4,680,683, Cl. 362-190.000.

Schenke, Robert W.; and Schenke, Reynold A. Battery and bulb conversion cartridge for self-feeding candle holder. 4,680,683, Cl. 362-190.000.

Scherer, William C.: See—  
Mommson, Gordon V.; Fender, Norman N.; Karwoski, Stanley G.; Scherer, William C.; and Lind, Robert J., 4,679,734, Cl. 239-692.000.

Schering Corporation: See—  
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Blythin, David J., 4,680,298, Cl. 514-293.000.

Scheydecker, Jacques: See—  
Helffer, Bernard; and Scheydecker, Jacques, 4,679,785, Cl. 271-227.000.

Schieber, Hans; and Geitner, Otto, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Method for determining and correcting the length of a piece of knitting produced on a flat knitting machine. 4,679,412, Cl. 66-71.000.

Schierjott, Rudolf: See—  
Stasch, Harald; and Schierjott, Rudolf, 4,680,687, Cl. 363-18.000.

Schlatter, Gerald L.: See—  
Miller, Charles E.; Schlatter, Gerald L.; and Yoshida, Louis T., 4,679,947, Cl. 374-42.000.

Schlusener, Horst: See—  
Merten, Gerhard; Rafael, Werner; and Schlusener, Horst, 4,679,429, Cl. 73-168.000.

Schmeal, Walter R.; Nathoo, Nazim S.; and Neate, John A., to Shell Oil Company. Robotic stapling system for fiber placement for composite parts. 4,679,291, Cl. 29-432.000.

Schmid, Alfred, to Bucher-Guyer AG. Method and an apparatus for accelerating air or gas exchange. 4,679,601, Cl. 141-4.000.

Schmidt, Ingo: See—  
Hinzpeter, Jurgen; and Schmidt, Ingo, 4,680,158, Cl. 264-40.500.

Schmidt, Robert R.: See—  
Diehr, Hans-Joachim; Fest, Christa; Kiraten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,680,052, Cl. 71-91.000.

Schmiechen, Rolf: See—  
Brandenstein, Manfred; Klupfel, Norbert; Pape, Gebhard; Haas, Roland; and Schmiechen, Rolf, 4,679,458, Cl. 74-458.000.

Schmiedberg, Winfried F.: See—  
Ginzburg, Vladimir B.; and Schmiedberg, Winfried F., 4,680,010, Cl. 432-148.000.

Schmitt-Landsiedel, Doris; and Dorda, Gerhard, to Siemens Aktiengesellschaft. Integrated JK-flipflop circuit including hot-electron transistors. 4,680,481, Cl. 307-279.000.

Schmitt, Robert J.: See—  
Carson, Dennis W.; Schmitt, Robert J.; Seneker, Carl A.; Van Kuren, Thomas A.; and Wallace, David R., 4,680,346, Cl. 525-486.000.

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Fischer, Karl; Schreder, Felix; and Kicherer, Robert, 4,680,452, Cl. 219-449.000.

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Energy Authority. Ultrasonic liquid interface detector. 4,679,430, Cl. 73-290.00V.

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Sedam, Jason K., to Coca-Cola Company, The. Post-mix beverage dispenser apparatus having front access for loading syrup, CO<sub>2</sub> and water. 4,679,707, Cl. 222-129.100.

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Seno, Eugene T.: See—  
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Corrao, Mark; and Shaffer, David T., 4,680,568, Cl. 337-186.000.

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Hamada, Hiroshi; Funada, Fumiaki; and Matsuura, Masataka, 4,679,909, Cl. 350-333.000.

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Shell, William. Visualization of a bloodstream circulation with biodegradable microspheres. 4,680,171, Cl. 424-5.000.

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Shibata, Akira, to Chugai Denki Kogyo K.K. Method for preparing Ag-SnO system alloy electrical contact material. 4,680,162, Cl. 419-21.000.

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Shinoda, Takashi: See—  
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Shinohara, Haruo: See—  
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Shirai, Tadao, to Nec Corporation. Microwave waveguide filter having a metal plate which includes a resonant aperture therein. 4,680,561, Cl. 333-208.000.

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Shoji, Hisashi: See—  
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Hartkopf, Hans-Otto; and Zeller, Christoph, 4,680,809, Cl. 455-601.000.

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DiMarco, Bernard; and Stanford, Charles W., 4,680,564, Cl. 335-16.000.

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Skovdal, Jorgen; Santhouse, Daniel; Jensen, Borge; and Carlucci, Vito, to Clairol Incorporated. Hairsetter system for electrically heating hair rollers. 4,680,444, Cl. 219-222.000.

Skuratovsky, Eugene: See—  
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Sloan-Kettering Institute for Cancer Research: See—  
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Societe Generale des Eaux Minerales de Vittel: See—  
Bonnenfant, Yvon; Odet, Philippe; Perme, Raymond; and Thevenot, Claude, 4,679,696, Cl. 215-252.000.



- Societe Nationale d'Etude et de Construction de Moteur d'Aviation "S. N. E. C. M. A.": See—  
Bouiller, Jean G.; and Jourdain, Gerard E. A., 4,679,982, Cl. 415-145.000.
- Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux E.F.C.I.S.: See—  
Borel, Joseph, 4,679,309, Cl. 29-576.00W.
- Societe Xeram: See—  
Taverdet, Jean C., 4,680,673, Cl. 361-385.000.
- Soderhold, Jan; and Cedraeus, Hugo. Package for risk samples. 4,679,688, Cl. 206-204.000.
- Soffer, Bernard H.: See—  
Efron, Uzi; and Soffer, Bernard H., 4,679,910, Cl. 350-335.000.
- Sogo, Toshiyuki; and Ide, Fumito, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,679,927, Cl. 355-3.00R.
- Sohio Commercial Development Co.: See—  
Basol, Bulent M., 4,680,611, Cl. 357-71.000.
- Sole, Jitka, to Dow Chemical Company. The. Method for preparing colloidal size particulate. 4,680,200, Cl. 427-213.340.
- Solie, O. B.; and Pyle, Godfrey J., to Minnesota Mining and Manufacturing Company. Cushion and method. 4,679,851, Cl. 297-452.000.
- Sone, Masakazu; and Nakajima, Takeshi, to Sony Corporation. Paper feeding and ejecting device for a printing apparatus. 4,679,953, Cl. 400-625.000.
- Sony Corporation: See—  
Sato, Hideo, 4,680,675, Cl. 361-397.000.
- Sone, Masakazu; and Nakajima, Takeshi, 4,679,953, Cl. 400-625.000.
- Suma, Tetsuro; Abe, Takao; and Ogawa, Tetsuo, 4,680,763, Cl. 371-37.000.
- Suzuki, Tadao; Sako, Yoichiro; Furukawa, Shunsuke; Furuya, Tsuneo; and Baggen, Constant P. M. J., 4,680,764, Cl. 371-40.000.
- Tatami, Mitsushige, 4,680,658, Cl. 360-36.200.
- Wilkinson, James H., 4,680,766, Cl. 371-47.000.
- Soos, Gyongyver: See—  
Keve, Tibor; Zsardon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szpony, Laszlo; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.
- Sorenson, Richard W., to Carlingswitch, Inc. Rocker switch for sliding or pivoting contact lever. 4,680,435, Cl. 200-68.200.
- Sota, Kaoru: See—  
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,680,386, Cl. 536-7.400.
- Southwire Company: See—  
Chia, E. Henry; and Adams, Ronald D., 4,679,613, Cl. 164-453.000.
- Spalding & Evenflo Companies, Inc.: See—  
Melvin, Terence; and Nesbitt, R. Dennis, 4,679,795, Cl. 273-235.00R.
- Spanier, Henry C.: See—  
Spiel, Albert; and Spanier, Henry C., 4,680,190, Cl. 426-302.000.
- Sparkes, Robert G.: See—  
Agoston, Agoston; and Sparkes, Robert G., 4,680,780, Cl. 375-120.000.
- Spector, George: See—  
Hawker, Ralph L.; and Spector, George, 4,680,426, Cl. 174-57.000.
- Spectra-Physics, Inc.: See—  
Markley, Theodore J.; Cain, Gary L.; Meyers, Lawrence J.; Teach, Ted L.; and Rando, Joseph F., 4,679,937, Cl. 356-138.000.
- Speir, Donald J.: See—  
Bryant, Stephen M.; and Speir, Donald J., 4,680,589, Cl. 342-196.000.
- Spence, James F., to General Kinematics Corporation. Uniform material discharge apparatus. 4,679,708, Cl. 222-161.000.
- Speraw, Floyd G., to NCR Corporation. Cable strain relief device. 4,680,425, Cl. 174-50.000.
- Sperry Corporation: See—  
Miller, Larry J.; Johnson, Clifford T.; and Rattlingourd, Glen D., 4,680,759, Cl. 370-112.000.
- Spiel, Albert; and Spanier, Henry C., to Nabisco Brands. Date processing method. 4,680,190, Cl. 426-302.000.
- Spielau, Paul: See—  
Kuhnel, Werner; and Spielau, Paul, 4,680,317, Cl. 521-89.000.
- Spierings, Gijsbertus A. C. M.; Krol, Denise M.; and Thomas, Gary E., to U.S. Philips Corporation. Glass composition suitable for use in a fluorescent lamp and in a cathode-ray tube, fluorescent lamp and cathode-ray tube manufactured using this glass composition. 4,680,503, Cl. 313-480.000.
- Spierings, Petrus A. M. Back support mechanism and method. 4,679,848, Cl. 297-284.000.
- Spieth, Robert H.; Louie, Chuen W.; Volk, John L.; Roelofs, Darrell D.; DeLorenzo, Anthony N.; Romeo, Arthur L.; and Mayer, Thomas L., to Hazeltine Corporation. Color monitor with improved synchronization. 4,680,510, Cl. 315-368.000.
- Sporer, Timothy J.: See—  
Bonnesen, John S.; and Sporer, Timothy J., 4,680,665, Cl. 361-120.000.
- Spraggins, Mike. Modular window insert with collapsible shade. 4,679,610, Cl. 160-107.000.
- Spratt, Kenneth, to James, Thomas A. Locking mechanism for lightweight security cabinet. 4,679,415, Cl. 70-118.000.
- Spykerman, Scott A., to Prince Corporation. Visor mounting clip. 4,679,843, Cl. 296-97.00K.
- Srinivasan, Nallaswamy; Banaszewski, Sharon L.; and Acharya, Kishore C., to General Electric Company. Back projection image reconstruction apparatus and method. 4,680,709, Cl. 364-414.000.
- Srock, Rainer; Herrmann, Ursula; and v. Rotberg, Bernhard, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Reinforcing unit for a longitudinal bearer. 4,679,820, Cl. 280-781.000.
- Stadden, Richard S. Dual action Geneva cam and rotary internal combustion engine and pump utilizing same. 4,679,535, Cl. 123-245.000.
- Stadler, Hansjorg: See—  
Kriz, Helmut; and Stadler, Hansjorg, 4,679,915, Cl. 350-611.000.
- Stadler, Peter: See—  
Lockhoff, Oswald; Stadler, Peter; Scheer, Martin; Berschauer, Friedrich; and de Jong, Anno, 4,680,287, Cl. 514-42.000.
- Stafford, Rodney L.: See—  
Fry, Steven A.; and Stafford, Rodney L., 4,679,840, Cl. 296-64.000.
- Stage, Hermann. Process for degassing, dehydrating and pre-cut separation in straight-run distillation of crude fatty acids. 4,680,092, Cl. 203-22.000.
- Stanbery, Billy J., to Boeing Company. The. Two-terminal, thin film, tandem solar cells. 4,680,422, Cl. 136-249.000.
- Standard Precision, Inc.: See—  
Delmege, Dale; and Rask, Richard O., 4,679,950, Cl. 384-18.000.
- Stanford, Charles W.: See—  
DiMarco, Bernard; and Stanford, Charles W., 4,680,564, Cl. 335-16.000.
- Stanley Electric Co., Ltd.: See—  
Iwaki, Akihiro, 4,680,678, Cl. 362-61.000.
- Iwaki, Akihiro; and Tajima, Masayoshi, 4,680,680, Cl. 362-80.000.
- Stanley, Smith B.; and Alroy, Yoram A. Telescopic bed. 4,679,261, Cl. 5-183.000.
- Stasch, Harald; and Schierjott, Rudolf, to Siemens Aktiengesellschaft. Switch-mode power supply having a free-running forward converter. 4,680,687, Cl. 363-18.000.
- Stauffer Chemical Company: See—  
Greco, Carl C., 4,680,350, Cl. 526-125.000.
- Stedman Machine Co.: See—  
Orphall, Axel W., 4,679,740, Cl. 241-189.00R.
- Stein Industrie: See—  
Marsault, Jean-Jacques; Peyrelongue, Jean-Pierre; Semedard, Jean-Claude; and Vallee, Gerard, 4,679,755, Cl. 248-74.100.
- Stein, John, to Kim Hotstart Mfg. Co., Inc. Liquid pulsation dampening device. 4,679,597, Cl. 138-26.000.
- Steinhart, Jonathan E., to Tektronix, Inc. Method and apparatus for storing and updating user entered command strings for use with otherwise unassigned softkeys. 4,680,729, Cl. 364-900.000.
- Steinische Kettenfabriken Pengg-Walenta KG: See—  
Jeindl, Ferdinand, 4,679,608, Cl. 152-213.00A.
- Stemmler, Herbert: See—  
Rey, Antoine; and Stemmler, Herbert, 4,680,531, Cl. 323-206.000.
- Stephen, Adrian: See—  
Hamberger, Helmut; Stephen, Adrian; Stutz, Anton; and Stutz, Peter, 4,680,291, Cl. 514-183.000.
- Sterkin, Viktor E.: See—  
Debabov, Vladimir G.; Tsygankov, Yuri D.; Chistoserdiv, Andrei J.; Sverdllov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Yuri I.; Strongin, Alexander Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Yuri A., 4,680,260, Cl. 435-68.000.
- Stetson, Scott B., to Rockwell International Corporation. Controllable piecewise linear gain circuit. 4,680,489, Cl. 307-493.000.
- Stevens, Curtis E., to Parker Hannifin Corporation. Multi-axis force controller. 4,680,465, Cl. 250-229.000.
- Steward, John H.; and Ladouceur, Harold A., to Multifastener Corporation. Fastener orienting, tapping and collection system. 4,679,690, Cl. 206-345.000.
- Stewart, Hubert F.: See—  
Wolford, Gerald T.; Kleinlein, Dwight R.; and Stewart, Hubert F., 4,679,844, Cl. 296-136.000.
- Stewart, James P., to Lockheed Missiles & Space Company, Inc. Coupling mechanism. 4,679,961, Cl. 403-341.000.
- Stewart, Robert E., to Litton Systems, Inc. Integrated force balanced accelerometer. 4,679,434, Cl. 73-517.00B.
- Stewart Stamping Corporation: See—  
Volk, Claus, 4,679,878, Cl. 439-425.000.
- Stewart, Wesley J.: See—  
Waltman, John H.; Stewart, Wesley J.; and Leroux, Gerald E., 4,679,543, Cl. 126-25.00R.
- Stewart, William R., to Wm. R. Stewart & Sons (Hacklemakers) Limited. Opening roller assemblies for open end spinning machines. 4,679,390, Cl. 57-408.000.
- Stirtz, Ronald H. Fishing flasher. 4,679,347, Cl. 43-43.100.
- Stockburger, Hermann; and Winderlich, Hans-Georg. Method and device for identifying data supports. 4,680,807, Cl. 382-58.000.
- Stockel, Richard F.; and Dumas, Phillip E. Use of selenium-containing compounds for negating the toxic effects of gold compounds used in the treatment of rheumatoid arthritis, and a novel selenium-containing gold compound and use thereof as an anti-rheumatoid arthritis medicine. 4,680,286, Cl. 514-23.000.
- Stoll, Kurt. Limit sensing device. 4,679,452, Cl. 74-110.000.
- Stora Kopparbergs Bergslags AB: See—  
Bernhard, Ragnar, 4,680,136, Cl. 252-188.200.
- Storage Technology Corporation: See—  
Hopta, Daniel F., 4,680,480, Cl. 307-270.000.
- Storbakken, George D. Vapor lock control and fuel economizer. 4,679,539, Cl. 123-557.000.
- Stotz, Gerhard: See—  
Sedlak, Adlof; and Stotz, Gerhard, 4,679,944, Cl. 368-157.000.

- Stouffer Corporation, The: See—  
Guilbault, Joseph D., 4,679,787, Cl. 272-93.000.
- Strayer, David H.; Franz, Patrick J.; and Lynch, Eugene F., to Tektronix, Inc. Multipurpose cursor control keyswitch. 4,680,577, Cl. 340-711.000.
- Strader, Don S., to Goodyear Tire & Rubber Company. The. Belt testing device. 4,679,443, Cl. 73-826.000.
- Stratton, Andrew: See—  
Lowe, Eric; Poppe, Martin C.; and Stratton, Andrew, 4,680,590, Cl. 342-457.000.
- Straza, George C. P.: See—  
Straza, George T.; and Straza, George C. P., 4,679,792, Cl. 273-78.000.
- Straza, George T.; and Straza, George C. P. Golf putter. 4,679,792, Cl. 273-78.000.
- Strickler, Roger D., to Elliott Turbomachinery Co., Inc. Protection system for steam turbines including a superheat monitor. 4,679,399, Cl. 60-646.000.
- Strom, James: See—  
Hanlon, Stephen P.; Kerby, Walter L.; Purdy, Edmund R.; and Strom, James, 4,679,567, Cl. 128-675.000.
- Strong Plastics Limited: See—  
Hodgson, Thomas C., 4,680,077, Cl. 156-321.000.
- Strongin, Alexander Y.: See—  
Debabov, Vladimir G.; Tsygankov, Yuri D.; Chistoserdiv, Andrei J.; Sverdllov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Yuri I.; Strongin, Alexander Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Yuri A., 4,680,260, Cl. 435-68.000.
- Stuart, Herbert H., to Lact-Assist, Incorporated. Flexible breast receptor for breast pump. 4,680,028, Cl. 604-74.000.
- Stubinen Utveckling AB: See—  
Skog, Kurt, 4,679,512, Cl. 110-347.000.
- Stutz, Anton: See—  
Hamberger, Helmut; Stephen, Adrian; Stutz, Anton; and Stutz, Peter, 4,680,291, Cl. 514-183.000.
- Stutz, Peter: See—  
Hamberger, Helmut; Stephen, Adrian; Stutz, Anton; and Stutz, Peter, 4,680,291, Cl. 514-183.000.
- Su, Sophia R.: See—  
Onorato, Paulette I. K.; and Su, Sophia R., 4,680,049, Cl. 65-18.100.
- Suda, Eriko: See—  
Nakamoto, Hideo; Aasai, Fumito; Fukushima, Hiroshi; and Suda, Eriko, 4,680,368, Cl. 528-49.000.
- Sudler, Roland, to VDO Adolf Schindling AG. Motor. 4,680,514, Cl. 318-318.000.
- Sueda, Tetsuo; Tokuhara, Mitsuhiro; and Baba, Takeshi, to Canon Kabushiki Kaisha. Electrophotographic apparatus. 4,679,931, Cl. 355-56.000.
- Suematsu, Koshi; and Imai, Eiichi, to Canon Kabushiki Kaisha. Electro-photographic positively chargeable developer containing silica treated with a nitrogen containing silane coupling agent and method of developing. 4,680,245, Cl. 430-110.000.
- Suetrak U.S.A., Inc.: See—  
Ferdows, Houshang; Krug, Martin; and Bihl, Paul R., 4,679,616, Cl. 165-43.000.
- Sugai, Yoshiro; and Kimura, Hiroyuki, to Pioneer Electronic Corporation. Noise eliminating circuit. 4,680,793, Cl. 381-13.000.
- Sugawa, Yoshihisa: See—  
Matsumura, Masahiro; Ogasawara, Kenji; Nakamoto, Atsuhiko; and Sugawa, Yoshihisa, 4,680,377, Cl. 528-322.000.
- Sugawara, Katsuyuki, to Alps Electric Co., Ltd. Disk supporting device. 4,680,655, Cl. 360-97.000.
- Sugawara, Yasuyuki: See—  
Kobayashi, Toshiaki; Sanada, Kazuo; Murayama, Toshiaki; Sugawara, Yasuyuki; and Uesugi, Naoshi, 4,679,899, Cl. 350-96.300.
- Sugie, Akihiko: See—  
Muraoka, Masami; Nakamura, Toshio; Sugie, Akihiko; Ono, Keiichi; and Yamamoto, Michihiro, 4,680,307, Cl. 514-460.000.
- Sugiki, Tadashi, to Kabushiki Kaisha Toshiba. CCD area sensor with low signal level variation. 4,680,637, Cl. 358-213.260.
- Sugimori, Shigeru: See—  
Isoyama, Toyoshio; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,680,137, Cl. 252-299.620.
- Sugimoto, Norihiko; Inada, Shunji; and Usami, Nagatoshi, to Hitachi, Ltd. Multi-network system. 4,680,756, Cl. 370-88.000.
- Sugimoto, Norihiko: See—  
Murakami, Toshiyuki; Sugimoto, Norihiko; and Ogawa, Naoki, 4,680,757, Cl. 370-89.000.
- Sugita, Yoshiji: See—  
Genda, Yoshikazu; Muro, Hiroyuki; Nakayama, Kiyoharu; Miyazaki, Yoshiaki; and Sugita, Yoshiji, 4,680,413, Cl. 548-526.000.
- Sugiyama, Kazuhiro; and Kawai, Yoshio, to Casio Computer Co., Ltd. Compact electronic device. 4,680,432, Cl. 200-5.00A.
- Sugiyama, Kazuhiro; and Shimazaki, Tatsuo, to Casio Computer Co., Ltd. Sheet-like miniaturized electronic device. 4,680,724, Cl. 364-708.000.
- Sugiyasu Industries Co., Ltd.: See—  
Suzuki, Koichi, 4,679,660, Cl. 187-8.410.
- Sugizaki, Iwao: See—  
Takizawa, Kinji; Mizuno, Ichiro; and Sugizaki, Iwao, 4,679,326, Cl. 33-170.000.
- Suiter, John R.: See—  
Jacob, Neil R.; and Suiter, John R., 4,679,431, Cl. 73-290.00R.
- Sukup, Richard A.: See—  
Harris, Monty E.; and Sukup, Richard A., 4,679,624, Cl. 166-120.000.
- Sulcabrush Inc.: See—  
Florence, Max, 4,679,272, Cl. 15-106.000.
- Sullivan, Mike: See—  
Lubock, Paul; and Sullivan, Mike, 4,679,556, Cl. 128-303.00R.
- Sultan, Steven L.: See—  
Parnoff, George K.; and Sultan, Steven L., 4,679,573, Cl. 128-716.000.
- Suma, Tetsuro; Abe, Takao; and Ogawa, Tetsuo, to Sony Corporation. Digital data recording and reproducing device. 4,680,763, Cl. 371-37.000.
- Sumitomo Chemical Company, Limited: See—  
Muraoka, Masami; Nakamura, Toshio; Sugie, Akihiko; Ono, Keiichi; and Yamamoto, Michihiro, 4,680,307, Cl. 514-460.000.
- Sumitomo Rubber Industries, Ltd.: See—  
Yamada, Mikio; and Hamada, Akihiko, 4,679,794, Cl. 273-235.00R.
- Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, to E. R. Squibb & Sons, Inc. O-sulfated spiro  $\beta$ -lactam hydroxamic acids. 4,680,388, Cl. 540-203.000.
- Sundoro, Boby M., to Immunomedics, Inc. Bifunctional linker. 4,680,338, Cl. 525-54.100.
- Sundstrand Corporation: See—  
Baits, Stephen S.; and Reynolds, Richard W., 4,679,462, Cl. 74-687.000.
- Bland, Timothy J., 4,679,980, Cl. 415-24.000.
- Nelson, Jeffrey D.; and Scanlon, John F., 4,679,485, Cl. 89-36.020.
- Sundstrand Data Control, Inc.: See—  
Chisholm, John P., 4,680,587, Cl. 342-33.000.
- Superior Surgical Mfg. Co., Inc.: See—  
Belkin, Nathan L., 4,680,668, Cl. 361-220.000.
- Sushardt, Rolf: See—  
Rademacher, Friedrich; Sindermann, Siegmund; and Sushardt, Rolf, 4,679,603, Cl. 141-39.000.
- Suwa, Kyoichi; Kawai, Hidemi; and Murakami, Masaichi, to Nippon Kogaku K. K. Method of aligning a semiconductor substrate and a photomask. 4,679,942, Cl. 356-401.000.
- Suzuki, Akio; Koitabashi, Takeo; Iwata, Masatoshi; Yamaguchi, Hisashi; and Matsuzaka, Syoji, to Konishiroku Photo Industry Co., Ltd. Silver halide light-sensitive photographic material for radiographic use. 4,680,252, Cl. 430-364.000.
- Suzuki, Akira, to Fuji Seiki Machine Works, Ltd. Method for preparation of silicon wafer. 4,679,359, Cl. 51-321.000.
- Suzuki, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Tone signal generation device for changing the tone color of a stored tone wave-shape in an electronic musical instrument. 4,679,480, Cl. 84-1.220.
- Suzuki, Koichi, to Sugiyasu Industries Co., Ltd. Mechanism for automatically storing swing arms used for apparatus for lifting automobiles for repair. 4,679,660, Cl. 187-8.410.
- Suzuki, Masatoshi: See—  
Aoyagi, Yoshiki; Suzuki, Masatoshi; Inoue, Tadashi; and Tsukakoshi, Kunio, 4,680,227, Cl. 428-331.000.
- Suzuki, Masayuki: See—  
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,679,925, Cl. 354-173.100.
- Suzuki, Nobuyuki; and Shimizu, Masami, to Canon Kabushiki Kaisha. Motor driven film rewind device for camera. 4,679,926, Cl. 354-173.110.
- Suzuki, Osamu: See—  
Kanda, Mamoru; Suzuki, Osamu; Ishiwata, Shousuke; and Hayashi, Mitsuru, 4,679,427, Cl. 73-54.000.
- Suzuki, Shigeo: See—  
Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, 4,679,403, Cl. 62-114.000.
- Suzuki, Tadao; Sako, Yoichiro; Furukawa, Shunsuke; Furuya, Tsuneo; and Baggen, Constant P. M. J., to Sony Corporation. Method and apparatus for transmitting digital data. 4,680,764, Cl. 371-40.000.
- Suzuki, Takanori: See—  
Saruhashi, Kazuo; Ara, Masato; Suzuki, Takanori; Saito, Gunji; and Kojima, Atsushi, 4,679,382, Cl. 56-10.100.
- Suzuki, Takeshi; Tominaga, Shigetake; and Nakai, Masanori, to Daikin Kogyo Co., Ltd. Aqueous coating composition of fluorocarbon resin. 4,680,331, Cl. 524-269.000.
- Sverdllov, Evgeny D.: See—  
Debabov, Vladimir G.; Tsygankov, Yuri D.; Chistoserdiv, Andrei J.; Sverdllov, Evgeny D.; Izotova, Lara S.; Kostrov, Sergei V.; Sterkin, Viktor E.; Kuznetsov, Vladimir P.; Belyaev, Sergei V.; Monastyrskaya, Galina S.; Salomatina, Irina S.; Dolganov, Grigory M.; Arsenian, Sergei G.; Tsarev, Sergei A.; Kozlov, Yuri I.; Strongin, Alexander Y.; Ogarkov, Vsevolod I.; and Ovchinnikov, Yuri A., 4,680,260, Cl. 435-68.000.
- Svitila, Barbara: See—  
Magid, David J.; Svitila, Barbara; and Kalriess, William, 4,679,706, Cl. 222-130.000.
- Swanson, Hilmer I., to Harris Corporation. RF splitter circuit. 4,680,559, Cl. 333-100.000.
- Swartz, Robert G., to American Telephone and Telegraph Company, AT&T Bell Labs. Means for controlling a semiconductor device and communication system comprising the means. 4,680,810, Cl. 455-609.000.
- Sweatman, Bobby. Chalk line marking device. 4,679,325, Cl. 33-138.000.



- Sweeney, Christopher L.: See—  
Wertz, Ronald D.; Orszulik, James H.; and Sweeney, Christopher L., 4,680,599, Cl. 340-744.000.
- Swihart, William R.; and Deacon, Edwin R., to Garrett Corporation. The Actuation system for variable nozzle turbine. 4,679,984, Cl. 415-163.000.
- Syntex (U.S.A.) Inc.: See—  
Nelson, Peter; and Unger, Stefan H., 4,680,300, Cl. 514-312.000.
- Synthelabo: See—  
Manoury, Philippe; Binet, Jean; and Dewitte, Elisabeth, 4,680,296, Cl. 514-259.000.
- Szluk, Nicholas J.; and Miller, Gayle W., to NCR Corporation. Formation of self-aligned stacked CMOS structures by lift-off. 4,679,299, Cl. 29-571.000.
- Szporny, Laszlo: See—  
Keve, Tibor; Zsados, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nee Bukovecz, Margit; Szporny, Laszlo; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nee Balazs, Maria, 4,680,397, Cl. 546-51.000.
- Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, to Nissan Motor Co., Ltd.; and Kinugawa Rubber Ind. Co. Ltd. Fluid-containing power unit mounting device. 4,679,778, Cl. 267-140.100.
- Tabor, Jim: See—  
Roszel, Lynn; and Tabor, Jim, 4,680,536, Cl. 323-321.000.
- Tactile Perceptions, Inc.: See—  
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,680,606, Cl. 357-26.000.
- Tada, Nobuhiko: See—  
Hammerling, Ulrich; Koo, Gloria C.; and Tada, Nobuhiko, 4,680,258, Cl. 435-7.000.
- Taga, Jun, to Mitsui & Co., Ltd., a part interest. Pleated and sealed filter cartridge with connected film. 4,680,118, Cl. 210-493.100.
- Taga, Yutaka: See—  
Hayakawa, Yoichi; Kawai, Masao; Taga, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,679,450, Cl. 74-752.00A.
- Tahara, Akinori; Enomoto, Hiromu; and Yasuda, Yasushi, to Fujitsu Limited. Semiconductor device. 4,680,600, Cl. 357-15.000.
- Taisei Road Construction Co., Ltd.: See—  
Mihara, Tohru; Sato, Kiyoshi; and Terauchi, Yasuo, 4,679,962, Cl. 404-126.000.
- Taisho Pharmaceutical Co., Ltd.: See—  
Morimoto, Shigeo; Adachi, Takashi; Asaka, Toshifumi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,680,386, Cl. 536-7.400.
- Watanabe, Naoharu; Numata, Kazuo; Yamagishi, Michio; Mizutani, Taku; Omura, Sadafumi; and Yamaguchi, Hideyo, 4,680,311, Cl. 514-561.000.
- Tajima, Masayoshi: See—  
Iwaki, Akihiro; and Tajima, Masayoshi, 4,680,680, Cl. 362-80.000.
- Takahashi, Hisamitsu: See—  
Yamaura, Tatsuo; and Takahashi, Hisamitsu, 4,680,231, Cl. 428-407.000.
- Takahashi, Hisanori: See—  
Wada, Shintaro; Takahashi, Hisanori; and Nomura, Yoichi, 4,679,563, Cl. 128-640.000.
- Takahashi, Junichi: See—  
Itoh, Yuji; and Takahashi, Junichi, 4,679,919, Cl. 351-206.000.
- Takahashi, Satoji: See—  
Hisamitsu, Kunio; Takemoto, Tadashi; Hijiya, Toyoto; and Takahashi, Satoji, 4,680,403, Cl. 546-247.000.
- Takahashi, Toshiro: See—  
Niki, Shoji; Takahashi, Toshiro; and Hirakoso, Yohei, 4,680,540, Cl. 324-78.00R.
- Takahashi, Yasufumi: See—  
Nakamura, Shigeki; Ohnishi, Makoto; and Takahashi, Yasufumi, 4,680,556, Cl. 332-16.00R.
- Takano, Nobuyoshi: See—  
Mitsumaki, Hiroshi; Takano, Nobuyoshi; and Ono, Naoya, 4,680,270, Cl. 436-52.000.
- Takano, Toshio: See—  
Sakakiyama, Ryuzo; and Takano, Toshio, 4,680,712, Cl. 364-424.100.
- Takara Co., Ltd.: See—  
Ohno, Kouzin, 4,680,018, Cl. 446-376.000.
- Takashi, Shioiri; Katsuhiko, Kobayashi; and Hideo, Tago, to Tokyo Kogaku Kikai Kabushiki Kaisha. Automatic perimeter. 4,679,920, Cl. 351-226.000.
- Takasugi, Wasao; Shinomura, Ryuichi; and Yokozawa, Norio, to Hitachi, Ltd.; and Hitachi Medical Corporation. Input circuit in ultrasonic apparatus. 4,680,498, Cl. 310-319.000.
- Takata, Kuniaki: See—  
Nakahara, Akihiko; Takata, Kuniaki; and Iseki, Yuji, 4,680,355, Cl. 526-243.000.
- Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Information signal reproducing apparatus. 4,680,648, Cl. 360-10.200.
- Takayanagi, Shinji: See—  
Koishi, Masaru; Shinohara, Haruo; and Takayanagi, Shinji, 4,679,860, Cl. 301-9.00DN.
- Takeda Chemical Industries, Ltd.: See—  
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,680,390, Cl. 540-228.000.
- Takeda Riken Kogyo Kabushiki Kaisha: See—  
Niki, Shoji; Takahashi, Toshiro; and Hirakoso, Yohei, 4,680,540, Cl. 324-78.00R.
- Takeda, Yoshio, to Sharp Kabushiki Kaisha. Heat sensitive type adhesive connector. 4,680,226, Cl. 428-327.000.
- Takegahara, Takashi: See—  
Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, 4,680,719, Cl. 364-474.000.
- Takemae, Yoshihiro: See—  
Baba, Fumio; and Takemae, Yoshihiro, 4,680,734, Cl. 365-190.000.
- Takematsu, Tetsuo; Nishii, Masahiro; and Kobayashi, Izumi, to Idemitsu Kosan Company Limited. Triazine derivatives, a process for preparing the derivatives, and herbicides containing the derivatives as the effective component. 4,680,054, Cl. 71-93.000.
- Takemoto, Nagaaki: See—  
Yamaguchi, Katsunori; and Takemoto, Nagaaki, 4,679,575, Cl. 131-365.000.
- Takemoto, Tadashi: See—  
Hisamitsu, Kunio; Takemoto, Tadashi; Hijiya, Toyoto; and Takahashi, Satoji, 4,680,403, Cl. 546-247.000.
- Takemura, Tetsuo; and Gohara, Shinobu, to Hitachi, Ltd. Time switch in a time division switching network. 4,680,752, Cl. 370-63.000.
- Takeno, Shozo; Shimizu, Toshio; and Saito, Takashi, to Kabushiki Kaisha Toshiba; and Nippon Telegraph & Telephone Corporation. Thermal print head. 4,680,593, Cl. 346-76.0PH.
- Takeuchi, Hiroshi: See—  
Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, 4,680,499, Cl. 310-334.000.
- Takeuchi, Masaru: See—  
Fukatsu, Takeo; Takeuchi, Masaru; and Goto, Kazuyuki, 4,680,607, Cl. 357-30.000.
- Takeya, Akira: See—  
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoji; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.
- Takimoto, Kazutoshi; Matsumi, Takatomo; and Kikuchi, Koji, to Sharp Kabushiki Kaisha. Apparatus for controlling a dewatering process. 4,679,414, Cl. 68-12.00R.
- Takizawa, Hideaki: See—  
Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, 4,680,430, Cl. 178-19.000.
- Takizawa, Kioji; Mizuno, Ichiro; and Sugizaki, Iwao, to Mitutoyo Mfg. Co., Ltd. Height gauge. 4,679,326, Cl. 33-170.000.
- Talmor, Shlomo S., to Harris Corporation. Stable current source. 4,680,535, Cl. 323-312.000.
- Tam, Aloysius T., to Advanced Micro Devices, Inc. Memory with sequential mode. 4,680,738, Cl. 365-239.000.
- Tamai, Yasuo: See—  
Ogawa, Hiroshi; Mizuno, Chiaki; Tamai, Yasuo; and Kamiyama, Koozi, 4,680,225, Cl. 428-323.000.
- Tamaki, Akihiro: See—  
Kajimoto, Nobuyuki; Tamaki, Akihiro; and Nagata, Teruyuki, 4,680,369, Cl. 528-76.000.
- Tamm, Ulf S. Apparatus for measuring pulse rate, vital capacity and pulmonary peak flow. 4,679,566, Cl. 128-671.000.
- Tamura, Hiromi: See—  
Uemura, Kaoru; Ishitani, Tohru; and Tamura, Hiromi, 4,680,507, Cl. 315-111.810.
- Tamura, Yasuji, to Sanden Corporation. Audio-frequency electromechanical vibrator. 4,680,492, Cl. 310-15.000.
- Tan, Siv Chang; Nguyen, Tri Hue; and Benchimol, Claude, to Thomson-CSF. Tomodensitometry image acquisition and reconstruction process and a tomodensitometer using this process. 4,680,782, Cl. 378-4.000.
- Tanabe, Hisaki: See—  
Sato, Haruhiko; Tanabe, Hisaki; and Umemoto, Hirotochi, 4,680,348, Cl. 525-528.000.
- Tanaka, Hideo: See—  
Fujita, Shigeru; Banzai, Hideo; and Tanaka, Hideo, 4,680,151, Cl. 264-40.300.
- Tanaka, Hirokazu: See—  
Kiyoto, Sumio; Okuhara, Masakuni; Kino, Eiko; Tanaka, Hirokazu; Aoki, Hatsu; Kohsaka, Masanobu; and Imanaka, Hiroshi, 4,680,178, Cl. 424-122.000.
- Tanaka, Kazuki: See—  
Tsuchiya, Hiroaki; Tanaka, Kazuki; and Osawa, Keishi, 4,680,669, Cl. 361-230.000.
- Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, to NEC Corporation; and Clarion Co., Ltd. Demodulator comprising an indicator circuit for use in common to cancellation of a pilot signal and an indication of a reception state. 4,680,792, Cl. 381-12.000.
- Tanaka, Makoto: See—  
Murayama, Sadamitsu; and Tanaka, Makoto, 4,680,221, Cl. 428-246.000.
- Tanaka, Masaki; and Ichinohe, Shoji, to Shin-Etsu Chemical Co., Ltd. Fabric-finishing agent containing a novel organopolysiloxane. 4,680,366, Cl. 528-27.000.
- Tanaka, Masanori; Maehara, Atsushi; and Kanai, Junichi, to Hokuetsu Industries Co., Ltd. Rotary machine having screw rotor assembly. 4,679,996, Cl. 418-201.000.
- Tanaka, Minoru: See—  
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoji; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.
- Tanaka, Shoji, to Fujitsu Limited. Printed circuit board laminating apparatus. 4,680,079, Cl. 156-353.000.
- Tanaka, Yoshio; and Onodera, Toshihiro, to Kabushiki Kaisha Toshiba. Drive method for switching power converter and apparatus using this method. 4,680,534, Cl. 323-290.000.

- Tanca, Michael C., to Combustion Engineering, Inc. Two stage slagging gasifier. 4,680,035, Cl. 48-77.000.
- Taniguchi, Ikuo: See—  
Ikeuchi, Satoji; and Taniguchi, Ikuo, 4,680,776, Cl. 375-40.000.
- Taniguchi, Shin: See—  
Yamada, Koichi; Hiraiwa, Ichiro; Taniguchi, Shin; and Zengo, Toshinari, 4,680,109, Cl. 210-103.000.
- Tank, Klaus, to DeBeers Industrial Diamond Division (Proprietary). Mining machine cutter pick insert. 4,679,858, Cl. 299-91.000.
- Tansony, John R.; Langstaff, Scott A.; and Tansony, Robert W., to Markland Specialty Engineering Ltd. Apparatus for detecting an interface in fluids utilizing plural multiplexed light emitters and receivers. 4,680,475, Cl. 250-577.000.
- Tansony, Robert W.: See—  
Tansony, John R.; Langstaff, Scott A.; and Tansony, Robert W., 4,680,475, Cl. 250-577.000.
- Tanttu, Jukka, to Instrumentarium Corp. NMR coil arrangement. 4,680,549, Cl. 324-318.000.
- Taprogge Gesellschaft mbH: See—  
Eimer, Klaus; and Gebhardt, Wolfgang, 4,680,113, Cl. 210-181.000.
- Tarn-Pure Limited: See—  
Hayes, John, 4,680,114, Cl. 210-192.000.
- Tascon Medical Technology Corporation: See—  
Alonso, Manuel T., 4,680,031, Cl. 623-2.000.
- Task, Harry L.: See—  
Genco, Louis V.; and Task, Harry L., 4,679,917, Cl. 351-221.000.
- Tatami, Mitsushige, to Sony Corporation. Apparatus for correcting a time base error and for compensating dropouts included in a reproduced video signal. 4,680,658, Cl. 360-36.200.
- Taunay, Claude, to Automobiles Peugeot; and Automobiles Citroen. Counterbalancing device for hatchback lid on a road vehicle. 4,679,841, Cl. 296-76.000.
- Taverdet, Jean C., to Societe Xeram. Encapsulated housing for dissipating heat produced by electrical circuits. 4,680,673, Cl. 361-385.000.
- Taylor, Clive N. Pipe connector. 4,679,825, Cl. 285-93.000.
- Taylor, Keith M.; Horng, Liou-Liang; and Hirzel, Timothy K., to Monsanto Company. Process for producing diperoxoic acids. 4,680,145, Cl. 260-502.00R.
- Taylor, Maurice J., to Rolls-Royce plc. Gas turbine engine power plant. 4,679,394, Cl. 60-224.000.
- Taylor, William E. G.: See—  
Dunlop, Raymond B.; and Taylor, William E. G., 4,679,704, Cl. 222-56.000.
- Te-Chin Handicraft Enterprise Co., Ltd.: See—  
Gingline, Lin, 4,679,806, Cl. 280-47.380.
- Teach, Ted L.: See—  
Markley, Theodore J.; Cain, Gary L.; Meyers, Lawrence J.; Teach, Ted L.; and Rando, Joseph F., 4,679,937, Cl. 356-138.000.
- Tecumseh Products Company: See—  
Guntly, Thomas G.; and Schultz, Curtis L., 4,679,534, Cl. 123-187.50R.
- Teichner, Daniel G.: See—  
Murdoch, Bruce; and Teichner, Daniel G., 4,680,429, Cl. 178-19.000.
- Teijin Limited: See—  
Murayama, Sadamitsu; and Tanaka, Makoto, 4,680,221, Cl. 428-246.000.
- Teissier, Claude: See—  
Letournel, Michel; Helleboid, Jean-Marie; and Teissier, Claude, 4,680,496, Cl. 310-308.000.
- Tektronix, Inc.: See—  
Agoston, Agoston; and Sparkes, Robert G., 4,680,780, Cl. 375-120.000.
- Baker, Daniel G.; and Ainsworth, Kenneth M., 4,680,620, Cl. 358-10.000.
- Baker, Daniel G.; and Feisel, Margaret A., 4,680,621, Cl. 358-19.000.
- Compton, Peter M., 4,680,557, Cl. 333-1.000.
- Murdock, Bruce; and Teichner, Daniel G., 4,680,429, Cl. 178-19.000.
- Steinhart, Jonathan E., 4,680,729, Cl. 364-900.000.
- Strayer, David H.; Franz, Patrick J.; and Lynch, Eugene F., 4,680,577, Cl. 340-711.000.
- Teldix GmbH: See—  
Pawelek, Bernd-Christian, 4,680,715, Cl. 364-449.000.
- Telecomunicações Brasileiras S/A - Telebras: See—  
Ghosh, Subir; and Junior, Aluizio P., 4,680,558, Cl. 333-21.00R.
- Teledyne Industries, Inc.: See—  
Lamb, C. Paul, 4,679,592, Cl. 137-625.330.
- Telefunken Fernseh und Rundfunk GmbH: See—  
Goseberg, Walter; and Pollack, Alfred, 4,680,566, Cl. 336-181.000.
- TeleMeter Corporation: See—  
Konicek, Lawrence R.; Case, Steven K.; and Kackman, Gerald M., 4,680,704, Cl. 364-525.000.
- Telesis Controls Corporation: See—  
Robertson, John A., 4,680,457, Cl. 235-470.000.
- Tempo Sany: See—  
Caumont, Jean-Francois, 4,679,278, Cl. 19-66.00C.
- Tennant Company: See—  
Field, Bruce F.; and Kasper, Joseph G., 4,679,271, Cl. 15-49.00C.
- Terauchi, Yasuo: See—  
Mihara, Tohru; Sato, Kiyoshi; and Terauchi, Yasuo, 4,679,962, Cl. 404-126.000.
- Terra Tek, Inc.: See—  
Johnson, Christopher F.; and Green, Sidney J., 4,679,441, Cl. 73-798.000.
- Terrafix Limited: See—  
Lowe, Eric; Poppe, Martin C.; and Stratton, Andrew, 4,680,590, Cl. 342-457.000.
- Terrell, Paul J.: See—  
Izumi, Hideki D.; and Terrell, Paul J., 4,680,731, Cl. 364-900.000.
- Tesa S.A.: See—  
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- Testa, Douglas: See—  
Estis, Leonard F.; Evans, Sean A.; and Testa, Douglas, 4,680,175, Cl. 424-85.000.
- Teubel, Johannes: See—  
Kinder, Reiner; Teubel, Johannes; Schuster, Herbert; and Fanslau, Christine, 4,680,153, Cl. 264-44.000.
- Texas Instruments Incorporated: See—  
Cochran, Michael J., 4,680,701, Cl. 364-200.000.
- Fulton, Temple L.; and Perkins, William O., 4,680,753, Cl. 370-85.000.
- Ott, Granville E., 4,680,579, Cl. 340-783.000.
- Scott, Warner C., 4,680,805, Cl. 382-22.000.
- Tharrington, G. Robert; and Hodge, Isabella A. Self-closing container top. 4,679,700, Cl. 220-337.000.
- Theriat, Robert E.; and Hogeboom, John G., to Northern Telecom Limited. Double polysilicon integrated circuit process. 4,679,302, Cl. 29-571.000.
- Therma-Wave, Inc.: See—  
Rosenzweig, Allan; and Opsal, Jon, 4,679,946, Cl. 374-5.000.
- Thevenot, Claude: See—  
Bonnenfant, Yvon; Odet, Philippe; Perne, Raymond; and Thevenot, Claude, 4,679,696, Cl. 215-252.000.
- Thibodeaux, Devron P.: See—  
Weiss, Louis C.; Thibodeaux, Devron P.; and Godshall, Mary Ann, 4,680,106, Cl. 209-1.000.
- Thiele, Edith A. Restraining safety harness. 4,679,267, Cl. 5-494.000.
- Thiersault, Jean P.: See—  
Berrier, Bernard; and Thiersault, Jean P., 4,680,330, Cl. 524-230.000.
- Thiessen, Hans-Henning: See—  
Hornig, Klaus-Juergen; and Thiessen, Hans-Henning, 4,680,578, Cl. 340-731.000.
- Thilwind, William: See—  
Yoxon, Brian; and Thilwind, William, 4,680,206, Cl. 528-34.000.
- Third Domain, Inc.: See—  
Gerdes, Richard C.; and Vokac, Peter R., 4,680,633, Cl. 358-171.000.
- Thomas & Betts Corporation: See—  
Law, Joseph P., 4,679,827, Cl. 285-158.000.
- Thomas, Gary E.: See—  
Spierings, Gijbertus A. C. M.; Krol, Denise M.; and Thomas, Gary E., 4,680,503, Cl. 313-480.000.
- Thomas, Jacques B. Automatic ski tuning device. 4,679,356, Cl. 51-205.0WG.
- Thomas, Patrick K.; Hartman, Dennis C.; and Dockrey, Jas. er W., to Motorola, Inc. Dry etching of multi-layer structures. 4,680,086, Cl. 156-643.000.
- Thomason, Chris A.: See—  
Bayer, Dean M.; McCoy, Larry J.; Thomason, Chris A.; Tranbarger, Thomas P.; and Rodriguez, Marco E., 4,679,837, Cl. 293-102.000.
- Thomson-CGR: See—  
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- Thomson Components-Mostek Corp.: See—  
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- Thomson-CSF: See—  
Berger, Jean L.; Brissot, Louis; and Cazaux, Yves, 4,680,476, Cl. 250-578.000.
- Blanchard, Pierre; and Cortot, Jean P., 4,679,301, Cl. 29-571.000.
- Boit, Jean C.; and Galves, Jean P., 4,680,461, Cl. 250-213.0VT.
- Tan, Siv Chang; Nguyen, Tri Hue; and Benchimol, Claude, 4,680,782, Cl. 378-4.000.
- Thorn, John E.; and Burns, William W., to Ford Motor Company. Fuel tank filler tube restrictor assembly. 4,679,698, Cl. 220-86.00R.
- Thorp, Derek: See—  
Kenyon, Ronald W.; and Thorp, Derek, 4,680,417, Cl. 549-299.000.
- Thorsett, Eugene D.: See—  
Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., 4,680,392, Cl. 540-527.000.
- Thorson, Russell E.; and Marver, Douglas J., to Kimberly-Clark Corporation. Apparatus for controlling the heating of composite materials. 4,680,450, Cl. 219-388.000.
- Thrall Car Manufacturing Company: See—  
Blunden, Donald J., 4,679,974, Cl. 410-30.000.
- Thurman, Richard E.: See—  
Bennett, Glenn E.; Look, Raymond J.; Dola, Frank P.; Thurman, Richard E.; and Siwinski, Paul P., 4,680,423, Cl. 174-36.000.
- Tilsley, Gwilym J.: See—  
Whinray, David T.; and Tilsley, Gwilym J., 4,680,723, Cl. 364-571.000.
- Times Corporation: See—  
Sedlak, Adolf; and Stotz, Gerhard, 4,679,944, Cl. 368-157.000.
- Titus, Frank. Cyclone filter with all metal filtering candle. 4,680,038, Cl. 55-302.000.
- Tizzi, Valterio. Method of manufacturing jewelry chains from decorated helicoid members and/or links. 4,679,391, Cl. 59-20.000.
- Tokai Electric Wire Company Limited: See—  
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- Tokiya, Yoshihiro: See—  
Fujii, Atsushi; Kaneda, Kazuhisa; and Tokiya, Yoshihiro, 4,680,157, Cl. 264-180.000.
- Toko, Inc.: See—  
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- Tokuhara, Mitsuhiro: See—  
Sueda, Tetsuo; Tokuhara, Mitsuhiro; and Baba, Takeshi, 4,679,931, Cl. 355-56.000.
- Tokui, Satoru: See—  
Namba, Keiichiro; Tokui, Satoru; and Onuma, Tatsuro, 4,680,634, Cl. 358-181.000.
- Tokura, Isao: See—  
Shimano, Noriyuki; Tokura, Isao; and Yamada, Mitsuhiro, 4,680,642, Cl. 358-280.000.
- Tokuyama Soda Kabushiki Kaisha: See—  
Nakahara, Akihiko; Takata, Kuniaki; and Iseki, Yuji, 4,680,355, Cl. 526-243.000.
- Tokuyama, Yoshio, to Victor Company of Japan, Ltd. Back-space editing control circuit for rotary-head magnetic tape recording and reproducing apparatus, 4,680,649, Cl. 360-14.200.
- Tokyo Electric Co., Ltd.: See—  
Iida, Yuji, 4,680,707, Cl. 364-405.000.
- Yagi, Motoi; and Miyabayashi, Tadao, 4,680,631, Cl. 358-160.000.
- Tokyo Kogaku Kikai Kabushiki Kaisha: See—  
Takashi, Shioiri; Katsuhiko, Kobayashi; and Hideo, Tago, 4,679,920, Cl. 351-226.000.
- Tokyo Shibaura Denki Kabushiki: See—  
Ito, Takeshi, 4,680,652, Cl. 360-72.100.
- Tomasi, Jean-Pierre, to U.S. Philips Corporation. Arrangement for determining the starting instant of the leading edge of a high-frequency pulse, 4,680,722, Cl. 364-569.000.
- Tomatis, Stefano. Cheese hardening machine for pasta filata cheese, 4,679,497, Cl. 99-455.000.
- Tomcufcik, Andrew S.: See—  
Wright, William B., Jr.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., 4,680,293, Cl. 514-243.000.
- Tominaga, Shigetake: See—  
Suzuki, Takeshi; Tominaga, Shigetake; and Nakai, Masanori, 4,680,331, Cl. 524-269.000.
- Tomisawa, Yutaka: See—  
Yamaki, Bunshiro; Kikuchi, Sadatake; and Tomisawa, Yutaka, 4,680,569, Cl. 338-42.000.
- Tomitaka, Kichinojo: See—  
Kanesaki, Tateso; Utsumi, Shigeo; and Tomitaka, Kichinojo, 4,680,217, Cl. 428-141.000.
- Tomkin, Frederick J. Retaining means, 4,679,276, Cl. 15-250.420.
- Tomtec, N.V.: See—  
Anthony, Jean M., 4,679,551, Cl. 128-67.000.
- Tomy Kogyo Co. Inc.: See—  
Hoshino, Shiro; and Fujino, Bonpei, 4,680,022, Cl. 446-487.000.
- Tonon, Thomas: See—  
Delahoy, Alan E.; and Tonon, Thomas, 4,680,616, Cl. 357-59.000.
- Topfl, Werner: See—  
Kristinsson, Haukur; and Topfl, Werner, 4,680,395, Cl. 544-321.000.
- Torgny, Jan, to JATAB, Jan Torgny AB. Method and an invalid chair for conveying a person having limited ability to move without heavy lifting from a sitting to a lying position, 4,679,849, Cl. 297-330.000.
- Torigoe, Masao: See—  
Yamaura, Izumi; Fukumoto, Masami; and Torigoe, Masao, 4,679,990, Cl. 417-312.000.
- Torii, Shuui: See—  
Ozaki, Kiyotaka; Torii, Shuui; Jindo, Tomio; and Imaseki, Takashi, 4,679,463, Cl. 74-711.000.
- Tosaka, Yoichi: See—  
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,679,925, Cl. 354-173.100.
- Toshiba Kikai Kabushiki Kaisha: See—  
Fujita, Shigeru; Banzai, Hideo; and Tanaka, Hideo, 4,680,151, Cl. 264-40.300.
- Tour & Andersson AB: See—  
Petitjean, Robert; and Eriksson, Bo G., 4,679,729, Cl. 237-8.00R.
- Towart, Robertson: See—  
Wehinger, Egbert; and Towart, Robertson, 4,680,305, Cl. 514-347.000.
- Town, Allen W. Waterproof glove, 4,679,257, Cl. 2-164.000.
- Townsend, James H., Jr.: See—  
Blackmer, David E.; and Townsend, James H., Jr., 4,680,796, Cl. 381-23.000.
- Toyo Boseki Kabushiki Kaisha: See—  
Kobayashi, Takuma; Kitagawa, Hironobu; Kaneshige, Noritsugu; and Makimura, Osamu, 4,680,345, Cl. 525-437.000.
- Toyo Soda Manufacturing Co., Ltd.: See—  
Asahi, Tetsuya; Kaneko, Hiroshi; Sakai, Yasushi; Kiyohara, Akio; and Iwashita, Tooru, 4,680,349, Cl. 526-62.000.
- Toyoda, Kenichi; Sakakibara, Shinsuke; and Ishikawa, Haruyuki, to Fanuc Ltd. Zero-point return method, 4,680,520, Cl. 318-594.000.
- Toyosawa, Yukio: See—  
Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, 4,680,518, Cl. 318-561.000.
- Toyoshima, Shoji: See—  
Tsuzuki, Yukio; Yamaoka, Masami; and Toyoshima, Shoji, 4,680,608, Cl. 357-36.000.
- Toyota Jidosha Kabushiki Kaisha: See—  
Hattori, Takemi; and Kawamura, Reiki, 4,679,855, Cl. 297-486.000.
- Hayakawa, Yoichi; Kawai, Masao; Taga, Yutaka; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,679,450, Cl. 74-752.00A.
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- Uchida, Goroh, 4,679,730, Cl. 237-12.30R.
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- Trauth, Hubert: See—  
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- Trenchbond Limited: See—  
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- Treptow, Leonard A. Audio aid for the blind, 4,680,740, Cl. 367-101.000.
- Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Hydrazide containing derivatives of 2-amino-4-thiazole-acetic acid, 4,680,409, Cl. 548-194.000.
- Trevathan, Larry C., to Nordson Corporation. Multi-orifice zero cavity nozzle dispenser, 4,679,711, Cl. 222-330.000.
- Treybig, Duane S., to Dow Chemical Company. The Thermosettable polystyrylpyrazine polymers terminated with ethylenically unsaturated groups and cured products therefrom, 4,680,347, Cl. 525-519.000.
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- Triner, Irvin R.; and Bixler, Craig A., to Molex Incorporated. Plug and receptacle connector assembly, 4,679,879, Cl. 439-425.000.
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- Troeger, Gary L.: See—  
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- Trumble, Francis R.: See—  
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- Truninger, Paul. Apparatus for and method of loading elongated articles, 4,679,381, Cl. 53-447.000.
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- Trutzschler GmbH & Co. KG: See—  
Kluttermann, Jurgen, 4,679,279, Cl. 19-159.00R.
- TRW Inc.: See—  
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- Ramsey, Wayne H., 4,679,875, Cl. 439-604.000.
- Saunders, Chris H., 4,680,484, Cl. 307-448.000.
- Tsai, Mon Y., to International Business Machines Corp. General linear shift register, 4,680,539, Cl. 324-73.00R.
- Tsarev, Sergei A.: See—  
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- Tsubakimoto Chain Co.: See—  
Minami, Hideaki, 4,679,977, Cl. 414-533.000.
- Nakamura, Kenichiro, 4,679,451, Cl. 74-606.00R.
- Tsuboi, Shinichi: See—  
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- Tsuchida, Naoki: See—  
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- Tsuchiya, Hiroaki; Tanaka, Kazuki; and Osawa, Keishi, to Canon Kabushiki Kaisha. Corona discharging apparatus, 4,680,669, Cl. 361-230.000.
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- Tsujimoto, Jun-ichi: See—  
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- Tsukada, Mineharu: See—  
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- Tsuzuki, Yukio; Yamaoka, Masami; and Toyoshima, Shoji, to Nippondenso Co., Ltd. Semiconductor device, 4,680,608, Cl. 357-36.000.
- Tsygankov, Jury D.: See—  
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- Tubman, Isosif. Pressure tester cap, 4,679,424, Cl. 73-45.800.
- Tucker, Tillman J.: See—  
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- Turner, Charles W.: See—  
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- Turner, Norman L.; and Pollock, John D., to Varian Associates, Inc. Method and apparatus for improved ion dose accuracy, 4,680,474, Cl. 250-492.200.
- Tylor, Richard E.: See—  
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- Uchida, Masahiro: See—  
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- Uchino, Megumi, to Hitachi, Ltd. Terminal control apparatus for parallel execution of data editing and data transmission/reception control, 4,680,699, Cl. 364-200.000.
- Uchiyama, Susumu: See—  
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- Udagawa, Etsuro: See—  
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- Ueda, Chie: See—  
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- Ueda, Iwao, to Ueda, Iwao; and Ueda, Chie. Sewage treatment equipment with activated sludge process beds, 4,680,111, Cl. 210-150.000.
- Ueda, Masaki, to Fuji Photo Film Co., Ltd. Guide groove for a guard panel on a magnetic tape cassette, 4,680,660, Cl. 360-132.000.
- Ueda, Toshio; Sato, Yoshinori; and Harada, Susumu, to Nitto Boseki Co., Ltd. Process for producing poly(allylamine) derivatives, 4,680,360, Cl. 526-310.000.
- Uemura, Kaoru; Ishitani, Tohru; and Tamura, Hifumi, to Hitachi, Ltd. Liquid metal ion source, 4,680,507, Cl. 315-111.810.
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- Uhrey, Marc K., to Gould Inc. Quad-state control signal input circuit, 4,680,485, Cl. 307-463.000.
- Uken, William D.: See—  
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- Ulrich, Helmut; Bartscher, Peter; and Shilton, Brian, to WABCO Westinghouse Fahrzeugbremsen GmbH. Relay valve device, 4,679,865, Cl. 303-52.000.
- Ulvac Service Corporation: See—  
Shirato, Kozo; Hirazumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.
- Umemoto, Hirotoshi: See—  
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- Umemura, Shin'ichiro; Takeuchi, Hiroshi; Katakura, Kageyoshi; and Nakaya, Chitose, to Hitachi, Ltd.; and Hitachi Medical Corporation. Piezoelectric ultrasonic transducer with acoustic matching plate, 4,680,499, Cl. 310-334.000.
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- Unger, Stefan H.: See—  
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- Union Carbide Corporation: See—  
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- Newman-Evans, Richard H., 4,680,341, Cl. 525-113.000.
- Union Special Corporation: See—  
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- Unisearch Limited: See—  
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- UNISYS Corporation: See—  
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- United Kingdom Atomic Energy Authority: See—  
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- Weiss, Louis C.; Thibodeaux, Devron P.; and Godshall, Mary Ann, 4,680,106, Cl. 209-1.000.
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- Bryant, Stephen M.; and Speir, Donald J., 4,680,589, Cl. 342-196.000.
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- Genco, Louis V.; and Task, Harry L., 4,679,917, Cl. 351-221.000.
- Vogt, Russell G.; Eylon, Daniel; and Froes, Francis H., 4,680,063, Cl. 148-11.50F.
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- F'Geppert, Erwin, 4,679,459, Cl. 340-870.130.
- Gerharz, Reinhold, 4,679,936, Cl. 356-128.000.
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- Fasching, George E., 4,680,585, Cl. 340-870.130.
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- Rubin, Jacob; Hammermeister, Dale P.; and Nimmo, John R., 4,679,422, Cl. 73-38.000.
- Navy: See—  
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- U.S. Philips Corporation: See—  
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- Blanken, Pieter G.; and van der Zee, Pieter, 4,680,640, Cl. 358-243.000.
- Clasen, Rolf; and Scholz, Heinz, 4,680,047, Cl. 65-17.000.
- Dammann, Hans; and Kurz, Heinrich, 4,679,901, Cl. 350-162.200.
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- Sijbers, Peter J. M.; Otten, Henricus J. M.; and Van Der Plaats, Petrie J., 4,680,789, Cl. 379-395.000.
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- Tomasi, Jean-Pierre, 4,680,722, Cl. 364-569.000.
- Veit, Ernst-Ludwig; and Klee, Jurgen, 4,679,723, Cl. 228-168.000.
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- United States Steel Corporation: See—  
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- United Technologies Corporation: See—  
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- Univ. of Leeds Industrial Services Limited: See—  
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- Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG: See—  
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- Uoi, Michitake: See—  
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- Upjohn Company, The: See—  
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- Nelson, Stephen J., 4,680,419, Cl. 549-343.000.
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- Uranit GmbH: See—  
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- Urata, Makoto: See—  
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- Ushio Denki Kabushiki Kaisha: See—  
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- Utz, Eberhard: See—  
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- v. Rotberg, Bernhard: See—  
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- Vallee, Gerard: See—  
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- Van Doorne's Transmissie B.V.: See—  
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- van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N.V. Mowing machine. 4,679,384, Cl. 56-13.600.
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- Van Kuren, Thomas A.: See—  
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- Van Santvoort, Gerardus P. T. M.: See—  
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- van Schouwenburg, Gerrit A. Process for making a food product from cheap meat chunks. 4,680,183, Cl. 426-64.000.
- van Waalwijk van Doorn, Ernst S. C.; de Vries, Joseph D. M.; and de Vries, Franciscus J. M., to Applied Medical Technics B.V. Implantable shut-off device. 4,679,546, Cl. 128-1.00R.
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- Varano, Richard F., to Sherwood Tool, Incorporated. Container forming apparatus having in-line blander. 4,680,023, Cl. 493-75.000.
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- Vasiliev, Vsevolod V.: See—  
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- VDO Adolf Schindling AG: See—  
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- Vecco Integrated Automation Inc.: See—  
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- Veyhl Produktion KG: See—  
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- Vickers, Edward C.: See—  
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- Victor Company of Japan: See—  
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- Victor Company of Japan, Limited: See—  
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- Shibuya, Kazunori, 4,680,654, Cl. 360-96.500.
- Tokuyama, Yoshio; 4,680,649, Cl. 360-14.200.
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- Watson, David A., to NCR Corporation. Cable connector holder. 4,679,869, Cl. 439-78.000.
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- Wedco Inc.: See—  
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- Weed, Gregory C., to Du Pont de Nemours, E. I., and Company. Photopolymerizable composition containing carboxy benzotriazole. 4,680,249, Cl. 430-281.000.
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Yacisin, Paul A., to Jennmar Corporation. Roof bolt apparatus with expansion shell and coupling. 4,679,966, Cl. 405-261.000.

Yacoe, J. Craig. Polyhedral structures that approximate a sphere. 4,679,361, Cl. 52-81.000.

Yagi, Katsumi, to Sanyo Electric Co., Ltd. Semiconductor laser with a quantum well layer including a doped region. 4,680,768, Cl. 372-45.000.

Yagi, Motoi; and Miyabayashi, Tadao, to Tokyo Electric Co., Ltd. Television composite video signal processing circuit. 4,680,631, Cl. 358-160.000.

Yagi, Shinichi: See—  
Matsubara, Saburo; and Yagi, Shinichi, 4,680,154, Cl. 264-63.000.

Yagihara, Morio: See—  
Sato, Hideaki; and Yagihara, Morio, 4,680,257, Cl. 430-614.000.

Yakoh, Nobuaki: See—  
Koike, Mitsuhiro; and Yakoh, Nobuaki, 4,679,437, Cl. 73-622.000.

Yakumo Industrial Corporation: See—  
Funaki, Takashi; and Nakatsuka, Katsuto, 4,679,775, Cl. 267-64.270.

Yamada, Akira: See—  
Kasahara, Akihiro; Goto, Kenya; Yamada, Akira; and Watanabe, Shoji, 4,679,903, Cl. 350-247.000.

Yamada, Kenji, to Nippon Kogaku K. K. Apparatus for eye examination. 4,679,921, Cl. 351-222.000.

Yamada, Koichi; Hiraiwa, Ichiro; Taniguchi, Shin; and Zengo, Toshinari, to Ebara Corporation. Membrane separator. 4,680,109, Cl. 210-103.000.

Yamada, Mikio; and Hamada, Akihiko, to Sumitomo Rubber Industries, Ltd. Golf ball. 4,679,794, Cl. 273-235.00R.

Yamada, Mitsuhiro: See—  
Shimano, Noriyuki; Tokura, Isao; and Yamada, Mitsuhiro, 4,680,642, Cl. 358-280.000.

Yamada, Takashi; Arimune, Hisao; and Maeda, Takashi, to Kyocera Corporation. Magneto-optical recording element. 4,680,742, Cl. 369-13.000.

Yamada, Takeshi; Osato, Yasukuni; and Watanabe, Okosu, to Fujikura Ltd. Heater for heating heat shrinkable tube. 4,680,449, Cl. 219-385.000.

Yamada, Tomiaki; Kamihonoki, Masuo; Sagara, Hiroshi; and Umino, Hiroshi, to New Energy Development Organization; JGC Corporation; and Sanraku-Ocean Co., Ltd. Continuous alcohol manufacturing process using immobilized microorganism. 4,680,263, Cl. 435-162.000.

Yamada, Yasuyuki: See—  
Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumu, Kouji, 4,679,913, Cl. 350-423.000.

Yamagishi, Michio: See—  
Watanabe, Naoharu; Numata, Kazuo; Yamagishi, Michio; Mizutani, Taku; Omura, Sadafumi; and Yamaguchi, Hideyo, 4,680,311, Cl. 514-561.000.

Yamaguchi, Haruo: See—  
Mizuguchi, Hideki; Yamaguchi, Haruo; Hanada, Seigo; and Mukuda, Nobuo, 4,679,461, Cl. 74-665.0GA.

Yamaguchi, Hideyo: See—  
Watanabe, Naoharu; Numata, Kazuo; Yamagishi, Michio; Mizutani, Taku; Omura, Sadafumi; and Yamaguchi, Hideyo, 4,680,311, Cl. 514-561.000.

Yamaguchi, Hiromasa: See—  
Watanabe, Kinichiro; Horiai, Kunio; Mashiko, Tomoyuki; Kato, Hitoshi; Yamaguchi, Hiromasa; and Nishiyama, Toshihiko, 4,679,992, Cl. 417-364.000.

Yamaguchi, Hisashi: See—  
Suzuki, Akio; Koitabashi, Takeo; Iwata, Masatoshi; Yamaguchi, Hisashi; and Matsuzaka, Syoji, 4,680,252, Cl. 430-364.000.

Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, 4,680,430, Cl. 178-19.000.

Yamaguchi, Katsunori; and Takemoto, Nagaaki, to Japan Tobacco Inc. Cigarette. 4,679,575, Cl. 131-365.000.

Yamaguchi, Kiyoshi: See—  
Nobuhara, Masahiro; Kanamori, Toshinori; Yamaguchi, Kiyoshi; and Mochida, Ei, 4,680,261, Cl. 435-68.000.

Yamaha Hatsudoki Kabushiki Kaisha: See—  
Aoi, Kazuo; and Tsuchida, Naoki, 4,679,532, Cl. 123-90.220.

Yamaichi Electric Mfg. Co., Ltd.: See—  
Egawa, Yoshinori, 4,679,871, Cl. 439-70.000.

Yamaki, Bunshiro; Kikuchi, Sadatake; and Tomisawa, Yutaka, to Kabushiki Kaisha Toshiba. Semiconductor pressure sensor. 4,680,569, Cl. 338-42.000.

Yamamoto, Hideo: See—  
Miyazaki, Takao; and Yamamoto, Hideo, 4,680,650, Cl. 360-33.100.

Yamamoto, Kazuo; and Asano, Shuichi, to NSK-Warner Kabushiki Kaisha. Seat belt apparatus. 4,679,821, Cl. 280-808.000.

Yamamoto, Michihiro: See—  
Muraoka, Masami; Nakamura, Toshio; Sugie, Akihiko; Ono, Keiichi; and Yamamoto, Michihiro, 4,680,307, Cl. 514-460.000.

Yamamoto, Yoshio: See—  
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.

Yamamoto, Sigeaki: See—  
Kumura, Haruyoshi; Abo, Keiju; Hirano, Hiroyuki; Yamamoto, Sigeaki; and Nakano, Masaki, 4,679,466, Cl. 74-863.000.

Yamaoka, Kojiro; Yano, Kazuhiko; and Ohtsuki, Kazuhiko, to Kanzaki Kokyukoki Mfg. Co., Ltd. Marine reversing clutch assembly. 4,679,673, Cl. 192-21.000.

Yamaoka, Masami: See—  
Tsuzuki, Yukio; Yamaoka, Masami; and Toyoshima, Shoji, 4,680,608, Cl. 357-36.000.

Yamasaki, Koji: See—  
Kimura, Katsuji; Kasai, Yoshihiko; Yokoyama, Yukio; Yamasaki, Koji; and Sato, Toshifumi, 4,680,553, Cl. 330-2.000.

Yamashita, Hiroshi: See—  
Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, 4,679,930, Cl. 355-52.000.

Yamura, Izumi; Fukumoto, Masami; and Torigoe, Masao, to Matsushita Electric Industrial Co., Ltd. Electric blower. 4,679,990, Cl. 417-312.000.

Yamura, Tatsuo; and Takahashi, Hisamitsu, to Futaba Denshi Kogyo Kabushiki Kaisha. Low-velocity electron excited phosphor. 4,680,231, Cl. 428-407.000.

Yamazaki Machinery Works, Ltd.: See—  
Momoi, Shoji; and Inami, Sumiaki, 4,679,286, Cl. 29-33.00P.

Yanagisawa, Masahiro, to Sanden Corporation. Porting member with a universal coupling mechanism. 4,679,829, Cl. 285-190.000.

Yang, Tai-Her. Force immune door latch. 4,679,420, Cl. 70-422.000.

Yano, Kazuhiko: See—  
Yamaoka, Kojiro; Yano, Kazuhiko; and Ohtsuki, Kazuhiko, 4,679,673, Cl. 192-21.000.

Yano, Mitsuru; Kido, Tomoyuki; and Ochi, Yoshiyuki, to Hitachi Metals, Ltd. Exhaust device having a heat-insulating layer comprising inorganic microballoons and a refractory layer and method of manufacturing same. 4,680,239, Cl. 428-688.000.

Yasuda, Yasushi: See—  
Tahara, Akinori; Enomoto, Hiromu; and Yasuda, Yasushi, 4,680,600, Cl. 357-15.000.

Yazaki, Mitsuhiro, to Kawasaki Jukogyo Kabushiki Kaisha. Liquid level detecting device. 4,680,575, Cl. 340-624.000.

Yoda, Norio: See—  
Tabata, Toshikazu; Fujiwara, Yoshinari; Yoda, Norio; and Aikawa, Hiroshi, 4,679,778, Cl. 267-140.100.

Yokogawa Hokushin Electric Corporation: See—  
Inoue, Kiyoharu; Matsumura, Hideaki; and Saito, Hitoshi, 4,680,688, Cl. 363-21.000.

Kuwahara, Hajime; Ono, Yutaka; and Nikaido, Mitsuhiro, 4,680,466, Cl. 250-231.0SE.

Yokota, Yuzo; Noma, Kanji; Kawase, Kiyotaka; Kitamura, Hironori; and Kamigaito, Masayuki, to Nippon Foil Mfg. Co., Ltd. Composition for forming a layer of the supporting plate for use in lithography and process for producing the composition. 4,680,322, Cl. 523-416.000.

Yokouchi, Hiroshi; and Miyazaki, Kazuhiko, to Oki Electric Industry Co., Ltd. CMOS data input-output circuit. 4,680,491, Cl. 307-579.000.

Yokoyama, Hiromitsu: See—  
Imanaka, Yoshihiko; Ogawa, Hiromi; Tsukada, Mineharu; Udagawa, Etsuro; Kurihara, Kazuaki; Yokoyama, Hiromitsu; and Kamehara, Nobuo, 4,679,320, Cl. 29-848.000.

Yokoyama, Takanori: See—  
Kusunuki, Soshio; Shojima, Hiroshi; Yokoyama, Takanori; Fukunaga, Yasushi; and Hirasawa, Kotaro, 4,680,804, Cl. 382-13.000.

Yokoyama, Yukio: See—  
Kimura, Katsuji; Kasai, Yoshihiko; Yokoyama, Yukio; Yamasaki, Koji; and Sato, Toshifumi, 4,680,553, Cl. 330-2.000.

Yokozawa, Norio: See—  
Takasugi, Wasao; Shinomura, Ryuichi; and Yokozawa, Norio, 4,680,498, Cl. 310-319.000.

Yoneyama, Shinji: See—  
Narishige, Eiichi; and Yoneyama, Shinji, 4,679,976, Cl. 414-4.000.



- Yorita, Tadahiyo; Matsumoto, Haruo; and Nakatsuji, Itsuo, to Murata Manufacturing Co., Ltd. Electrical filter device. 4,680,560, Cl. 333-206.000.
- Yoshida Industry Co., Ltd.: See—  
Yuhara, Yukitomo; Okojima, Sumio, and Ishikawa, Tatsuo, 4,679,576, Cl. 132-82.00R.
- Yoshida Kogyo K. K.: See—  
Ishii, Susumu; and Oda, Kiyoshi, 4,679,281, Cl. 24-422.000.
- Yoshida, Louis T.: See—  
Miller, Charles E.; Schlatter, Gerald L.; and Yoshida, Louis T., 4,679,947, Cl. 374-42.000.
- Yoshida, Seiji: See—  
Hasuo, Masayoshi; Mukai, Seiichi; Urabe, Hiroshi; Yoshida, Seiji; and Nukui, Masahiro, 4,680,374, Cl. 528-204.000.
- Yoshida, Takashi; Kimura, Tomoaki; Nishino, Tadashi; and Saito, Sadayuki, to Hitachi, Ltd.; and Kawasaki Steel Corporation. Cooling apparatus for belt type continuous casting machine. 4,679,611, Cl. 164-431.000.
- Yoshida, Tomohiro: See—  
Nishida, Fumihiko; Shimizu, Yasumasa; Yoshida, Tomohiro; Urata, Makoto; Hotta, Tomiji; Mizuta, Masaji; and Yamashita, Hiroshi, 4,679,930, Cl. 355-52.000.
- Yoshida, Yoshihiro: See—  
Ohzono, Kohei; Hayashi, Kiyotaka; Saito, Mitsuru; Kato, Masaie; and Yoshida, Yoshihiro, 4,679,677, Cl. 192-85.0AA.
- Yoshida, Yuji; Suzuki, Shigeo; Nakatani, Kazuo; Mukai, Yuji; Nakazawa, Akira; and Imoto, Takumi, to Matsushita Electric Industrial Co., Ltd. Heat pump apparatus. 4,679,403, Cl. 62-114.000.
- Yoshigai Kikai Kinzoku Kabushiki Kaisha: See—  
Yoshigai, Toshiharu, 4,679,460, Cl. 74-489.000.
- Yoshigai, Toshiharu, to Yoshigai Kikai Kinzoku Kabushiki Kaisha. Brake lever device. 4,679,460, Cl. 74-489.000.
- Yoshii, Jiro; Komatsu, Akira; and Ishii, Hiroshi, to Kabushiki Kaisha Toshiba. Dot interpolation control system. 4,680,720, Cl. 364-521.000.
- Yoshikawa, Kazuo; Asano, Toru; Yamaguchi, Hisashi; Takizawa, Hideaki; and Andoh, Shizuo, to Fujitsu Limited. Coordinate detecting apparatus. 4,680,430, Cl. 178-19.000.
- Yoshinaka, Toshio: See—  
Nagano, Shuji; Ida, Shuichiro; and Yoshinaka, Toshio, 4,679,449, Cl. 74-12.000.
- Yoshino, Motoaki: See—  
Kiya, Nobuyuki; and Yoshino, Motoaki, 4,680,697, Cl. 364-171.000.
- Yoshino, Teruo; and Itoh, Katsuro, to Kabushiki Kaisha Toshiba. Method and system for preventing an excessive voltage build-up in a power converter system. 4,680,691, Cl. 363-51.000.
- Young, Paul R.; Koutek, Mary E.; and Kelly, John A., to Nalco Chemical Company. Polyacrylate scale inhibition. 4,680,124, Cl. 210-697.000.
- Youngner, Daniel W.: See—  
Finn, Chris J.; and Youngner, Daniel W., 4,679,308, Cl. 29-576.00B.
- Yoxon, Brian; and Thilwind, William, to Pilkington Brothers P.L.C. Sealed double glazing unit. 4,680,206, Cl. 528-34.000.
- Yu, Simon H., to B F Goodrich Company, The. Styryl terminated macromolecular monomers of polyethers. 4,680,358, Cl. 526-292.900.
- Yu, Wellington C.: See—  
Ng, Chan Y.; Ouchi, Norman K.; Wang, David T.; and Yu, Wellington C., 4,680,653, Cl. 360-72.200.
- Yuhara, Yukitomo; Okojima, Sumio; and Ishikawa, Tatsuo, to Yoshida Industry Co., Ltd. Vanity case. 4,679,576, Cl. 132-82.00R.
- Yunoki, Toru: See—  
Shirato, Kozo; Hiraizumi, Kazuo; Kawashima, Kazuyasu; Okuyama, Shinya; Kobayashi, Masashi; Tanaka, Minoru; Takeya, Akira; Yamamoto, Yoshio; Koyama, Yasuo; Shinohara, Satoshi; and Yunoki, Toru, 4,680,552, Cl. 324-439.000.
- Yuzuriha, Yasuhiro: See—  
Hitomi, Mitsuo; Hinatase, Fumio; and Yuzuriha, Yasuhiro, 4,679,531, Cl. 123-52.0MB.
- Zahler, Robert: See—  
Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, 4,680,388, Cl. 540-203.000.
- Zajer nec Balaza, Maria: See—  
Kevc, Tibor; Zsaddon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nec Bukovecz, Margit; Szporny, Laszlo; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nec Balaza, Maria, 4,680,397, Cl. 546-51.000.
- Zalai, Gabor: See—  
Bezzegh, Denes; Magyar, Karoly; Kelemen, Jozsef; Zalai, Gabor; Mandi, Attila; and Egri, Janos, 4,680,315, Cl. 514-738.000.
- Zald, Roberta L.: See—  
Hansen, Robert E., Jr.; Murray, James R.; and Zald, Roberta L., 4,679,297, Cl. 29-568.000.
- Zarlengo, Dominic A.; and Zarlengo, Phillip C. Security bar for window opening. 4,679,351, Cl. 49-57.000.
- Zarlengo, Phillip C.: See—  
Zarlengo, Dominic A.; and Zarlengo, Phillip C., 4,679,351, Cl. 49-57.000.
- Zawodni, Frank W., to Dana Corporation. Anchor pin retainer. 4,679,667, Cl. 188-341.000.
- Zeaman, Robert E.; and Meyer, David E. Odometer for golf cart. 4,680,454, Cl. 235-95.00R.
- Zeller, Christoph: See—  
Hartkopf, Hans-Otto; and Zeller, Christoph, 4,680,809, Cl. 455-601.000.
- Zemlicka, Alvin: See—  
Gray, Charles F., Jr.; Meisenburg, Gary L.; and Zemlicka, Alvin, 4,679,682, Cl. 192-21.000.
- Zengo, Toshinari: See—  
Yamada, Koichi; Hiraiwa, Ichiro; Taniguchi, Shin; and Zengo, Toshinari, 4,680,109, Cl. 210-103.000.
- Zenith Electronics Corporation: See—  
Dietch, Leonard, 4,680,196, Cl. 427-68.000.
- Ziegler, Gerhard; Gregotsch, Karl; and Herrmann, Rudolf, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Ventilating device for a generator. 4,680,493, Cl. 310-62.000.
- Zimmerman, William T.: See—  
Levitt, George; and Zimmerman, William T., 4,680,053, Cl. 71-93.000.
- Zimmermann, Marius: See—  
Bussiere, Guy; Zimmermann, Marius; and Huchette, Michel, 4,680,180, Cl. 426-16.000.
- Zinser Textilmaschinen GmbH: See—  
Wolf, Horst, 4,679,389, Cl. 57-304.000.
- Ziogas, Phoivos D.: See—  
Haynh, Anh N.; and Ziogas, Phoivos D., 4,680,694, Cl. 363-136.000.
- ZLEHIT pri BAN: See—  
Altmann, Josef; and Beran, Bohuslav, 4,680,091, Cl. 202-205.000.
- Zsaddon, Bela: See—  
Kevc, Tibor; Zsaddon, Bela; Fekete, Gyorgy; Galambos, Janos; Barta nec Bukovecz, Margit; Szporny, Laszlo; Forgacs, Lilla; Kiraly, Arpad; Soos, Gyongyver; Kiss, Bela; and Zajer nec Balaza, Maria, 4,680,397, Cl. 546-51.000.
- Zuleeg, Rainer; Notthoff, Johannes K.; and Troeger, Gary L., to McDonnell Douglas Corporation. Method of fabrication of GaAs complementary enhancement mode junction field effect transistor. 4,679,298, Cl. 29-571.000.
- Zumtobel Aktiengesellschaft: See—  
Wolber, Wolfgang, 4,680,684, Cl. 362-223.000.
- Zurcher, Josef: See—  
Riedel, Hans-Peter; Zurcher, Josef; and Haussler, Hubert, 4,679,586, Cl. 137-491.000.
- Zwicker, Roger D., to Victor Equipment Company. Gas pressure reducing regulator. 4,679,582, Cl. 137-71.000.
- Zybko, Walter C.; Wald, William; and McClure, Thomas V., to Burlington Industries, Inc. Self sticking carpet tiles. 4,680,209, Cl. 428-35.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF JULY, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Akzo N.V.: See—

Van Eenam, Donald N., Re. 32,459, Cl. 524-295.000.

DeLay, Victor A., Jr., to von dem Bussche, Carl; DeLay, Victor A., Jr.; and Maguire, Patrick T. Portable container with interlocking funnel. Re. 32,458, Cl. 220-86.00R.

Maguire, Patrick T.: See—

DeLay, Victor A., Jr., Re. 32,458, Cl. 220-86.00R.

Van Eenam, Donald N., to Akzo N.V. Viscosity modifiers for acrylamide polymers. Re. 32,459, Cl. 524-295.000.

von dem Bussche, Carl: See—  
DeLay, Victor A., Jr., Re. 32,458, Cl. 220-86.00R.

## LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Brackmann, Warren A.; and Snaird, Stanislav M., to Rothmans of Pall Mall Canada Limited. Feed mechanism for tobacco cutting machines. B1 4,369,797, 7-14-87, Cl. 131-109.300.
- Bridgeford, Douglas J., to Teepak Investments, Inc. Humidifying and shirring artificial sausage casing. B1 4,062,981, 7-14-87, Cl. 426-278.000.
- Chemische Werke Huls A.G.: See—  
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, B1 4,200,703, Cl. 525-340.000.
- Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, to Chemische Werke Huls A.G. Process for the manufacture of heat-stable, nuclear-brominated polystyrenes. B1 4,200,703, 7-14-87, Cl. 525-340.000.
- Grundmann, Raban: See—  
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, B1 4,200,703, Cl. 525-340.000.
- IJR Inc.: See—  
Inoue, Kiyoshi, B1 3,536,881, Cl. 219-69.00G.
- Inoue, Kiyoshi, to IJR Inc. Constant current density EDM system capable of automatically responding to changing machining area. B1 3,536,881, 7-14-87, Cl. 219-69.00G.
- Kimbell, Charles L. Gas detector. B1 3,464,799, 7-14-87, Cl. 422-91.000.
- Maahs, Gunther: See—  
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, B1 4,200,703, Cl. 525-340.000.
- Micro Motion, Inc.: See—  
Smith, James E., B1 4,422,338, Cl. 73-861.380.
- O'Keefe, Thomas J., to University of Missouri, The Curators of the. Method for evaluating a system for electrodeposition of metals. B1 4,146,437, 7-14-87, Cl. 204-1.00T.
- Rothmans of Pall Mall Canada Limited: See—  
Brackmann, Warren A.; and Snaird, Stanislav M., B1 4,369,797, Cl. 131-109.300.
- Smith, James E., to Micro Motion, Inc. Method and apparatus for mass flow measurement. B1 4,422,338, 7-14-87, Cl. 73-861.380.
- Snaird, Stanislav M.: See—  
Brackmann, Warren A.; and Snaird, Stanislav M., B1 4,369,797, Cl. 131-109.300.
- Tan, Khen-Sang, to Texas Instruments, Inc. On board self-calibration of analog-to-digital and digital-to-analog converters. B1 4,399,426, 7-14-87, Cl. 340-347.0CC.
- Teepak Investments, Inc.: See—  
Bridgeford, Douglas J., B1 4,062,981, Cl. 426-278.000.
- Texas Instruments, Inc.: See—  
Tan, Khen-Sang, B1 4,399,426, Cl. 340-347.0CC.
- University of Missouri, The Curators of the: See—  
O'Keefe, Thomas J., B1 4,146,437, Cl. 204-1.00T.
- Wulf, Horst-Dieter: See—  
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, B1 4,200,703, Cl. 525-340.000.

## LIST OF DESIGN PATENTEEES

Adachi, Koushirou: See—

Shibuya, Shinji; Adachi, Koushirou; and Morishita, Yasuji, 290,844, Cl. D14-109.000.

Adler, Janet F.: See—

Koester, Betty L.; and Adler, Janet F., 290,862, Cl. D21-173.000.

Appel, Mel, to Mel Appel Company, The. Crayon holder. 290,853, 7-14-87, Cl. D19-85.000.

Appel, Mel, to Mel Appel Company, The. Crayon holder. 290,854, 7-14-87, Cl. D19-85.000.

Arai, Isao: See—

Tomozawa, Hisashi; Ikeda, Hideyuki; Arai, Isao; and Saito, Shigeru, 290,818, Cl. D10-49.000.

Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, to Ghigini, Daniele. Automatic apparatus for measuring of arterial blood pressure. 290,876, 7-14-87, Cl. D24-21.000.

Babros, Ronald E.; and Cesaroni, William C., to Dart Industries Inc. Combined iron and base therefor. 290,898, 7-14-87, Cl. D32-68.000.

Badolato, Anthony; Corey, Edmund R., Jr.; and Barrera, James G., to McNeilab, Inc. Oxygenator for use in open heart. 290,875, 7-14-87, Cl. D24-8.000.

Balek, Lynn A. Auxiliary vehicle gas tank. 290,829, 7-14-87, Cl. D12-155.000.

Barrera, James G.: See—

Badolato, Anthony; Corey, Edmund R., Jr.; and Barrera, James G., 290,875, Cl. D24-8.000.

Becker, Robert B., to Helikon Furniture Co. Table. 290,796, 7-14-87, Cl. D6-480.000.

Berkley, Inc.: See—

Rumbaugh, James T., 290,868, Cl. D22-149.000.

Blanton, Joan. Portable urine specimen collector funnel. 290,880, 7-14-87, Cl. D24-54.000.

Blaylock, Keith W.: See—

Meoli, Rudolph B.; and Blaylock, Keith W., 290,886, Cl. D26-138.000.

Bonfanti, Lorenzo: See—

Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, 290,876, Cl. D24-21.000.

Bramhall, George H.: See—

Hotchkiss, Kenneth W.; Bramhall, George H.; and Popken, John A., 290,806, Cl. D8-14.000.

Brun, Serge, to Calor S.A. Electric iron. 290,899, 7-14-87, Cl. D32-70.000.

Calor S.A.: See—

Brun, Serge, 290,899, Cl. D32-70.000.

Cesaroni, William C.: See—

Babros, Ronald E.; and Cesaroni, William C., 290,898, Cl. D32-68.000.

Chasen, Lee R., to Coats &amp; Clark, Inc. Combined food peeler and slicer. 290,804, 7-14-87, Cl. D7-147.000.

Chen, Jai-Ming. Telephone. 290,839, 7-14-87, Cl. D14-53.000.

Chen, Shang C. Ceiling fan. 290,873, 7-14-87, Cl. D23-158.000.

Chesnut, M. Gaines. Cartridge case. 290,866, 7-14-87, Cl. D22-108.000.  
 Chisholm, Dell T. Combination photographic frame and clock. 290,787, 7-14-87, Cl. D6-301.000.  
 Christ, Howard N. Sail. 290,834, 7-14-87, Cl. D12-317.000.  
 Clanton, W. Porter, to Quaker Oats Company, The. Toy tire and wheel assembly. 290,861, 7-14-87, Cl. D21-141.000.  
 Clayton, Bruce A.: See—  
 Scheid, William J.; and Clayton, Bruce A., 290,842, Cl. D14-68.000.  
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Technicare, Corporation: See—  
Wagner, Kenneth E., 290,874, Cl. D24-2.000.

Thomas, Joyce K.; and Hohulin, Samuel E., to National Union Electric Corporation. Battery powered suction broom. 290,895, 7-14-87, Cl. D32-22.000.

Tomozawa, Hisashi; Ikeda, Hideyuki; Arai, Isao; and Saito, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Controller for air conditioners. 290,818, 7-14-87, Cl. D10-49.000.

Toro Company, The: See—  
Lovett, Robert H.; Kakuk, Jay J.; and Ellison, Bart T., 290,835, Cl. D13-30.000.

Toshiba Heating Appliances Co., Ltd.: See—  
Ueno, Koichi; Umehara, Nobuhiro; and Otaki, Osamu, 290,890, Cl. D32-70.000.

Townley, Stephen J. Toilet case. 290,786, 7-14-87, Cl. D3-39.000.

Toyota Jidosha Kabushiki Kaisha: See—  
Inada, Shinichi, 290,830, Cl. D12-163.000.

Triumph-Adler A.G.: See—  
Gubbe, Bernd; and Krause, Klaus D., 290,849, Cl. D18-1.000.

Trygve Liljedahl Skistavfabrikk A/S: See—  
Rustad, Jan H., 290,865, Cl. D21-230.000.

Turner, Linda L.: See—  
Miller, Karen L.; Turner, Linda L.; and Henderson, Erma L., 290,810, Cl. D9-318.000.

Two Powers Enterprise Co., Ltd.: See—  
Wang, Henry C. H., 290,852, Cl. D19-75.000.

Ueno, Koichi; Umehara, Nobuhiro; and Otaki, Osamu, to Kabushiki Kaisha Toshiba; and Toshiba Heating Appliances Co., Ltd. Electric iron. 290,890, 7-14-87, Cl. D32-70.000.

Umehara, Nobuhiro: See—  
Ueno, Koichi; Umehara, Nobuhiro; and Otaki, Osamu, 290,890, Cl. D32-70.000.

Usami, Satoru: See—  
Sano, Koichiro; Usami, Satoru; and Okuno, Tadahide, 290,884, Cl. D26-65.000.

Utsuki, Toshiyuki: See—  
Kouno, Shuichi; Utsuki, Toshiyuki; Sakae, Hideki; and Watanabe, Kenichi, 290,872, Cl. D23-155.000.

Voges, Albert J. Plant package. 290,812, 7-14-87, Cl. D9-426.000.

Wagner, Kenneth E., to Technicare, Corporation. Operator console for computerized tomography scanner system. 290,874, 7-14-87, Cl. D24-2.000.

Walters, Ralph L. Step for a vehicle. 290,833, 7-14-87, Cl. D12-203.000.

Wang, Henry C. H., to Two Powers Enterprise Co., Ltd. Desk-top organizer. 290,852, 7-14-87, Cl. D19-75.000.

Watanabe, Kenichi: See—  
Kouno, Shuichi; Utsuki, Toshiyuki; Sakae, Hideki; and Watanabe, Kenichi, 290,872, Cl. D23-155.000.

Wendell R. Brooks, Inc.: See—  
Yon, Jac H.; and Nemeth, Brad, 290,850, Cl. D18-23.000.

Westvaco Corporation: See—  
Forbes, Hampton E., Jr., 290,813, Cl. D9-433.000.

Wistrand, Eva. Baby pants. 290,780, 7-14-87, Cl. D2-10.000.

Yon, Jac H.; and Nemeth, Brad, to Wendell R. Brooks, Inc. Computer printer stand. 290,850, 7-14-87, Cl. D18-23.000.

Yonezawa, Kazuyoshi: See—  
Seiffert, Florian; and Yonezawa, Kazuyoshi, 290,887, Cl. D28-49.000.

Yoshida, Kenkichi, to Kabushiki Kaisha Buncho. Crayon. 290,851, 7-14-87, Cl. D19-41.000.

Yubisui, Takahisa; Sakaguchi, Hiroshi; Iida, Katsuhiro; Shinohara, Megumi; and Saimen, Tadahiko, to Sharp Corporation. Combined word processor-printer. 290,845, 7-14-87, Cl. D14-111.000.

Yuen, John S., to John Manufacturing Limited. Electronic currency tester. 290,817, 7-14-87, Cl. D10-46.000.

Zucker, Armand S.: See—  
Nathan, Walter; and Zucker, Armand S., 290,790, Cl. D6-408.000.

Zuliani, Alessandro, to Cosdatto SpA. Lavatory brush with stand. 290,798, 7-14-87, Cl. D6-551.000.

## CLASSIFICATION OF PATENTS

ISSUED JULY 14, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	CLASS 30	387	4,680,040	726	4,679,438	348	4,679,504	696	4,679,568
2	4,679,253	133	4,679,322	798	4,679,441	449	4,679,505	714	4,679,569
8	4,679,254	240	4,679,323	826	4,679,443			715	4,679,570
	4,679,255	346.58	4,679,324	827	4,679,444			716	4,679,571
105	4,679,256			861.12	4,679,442	136	4,679,506	764	4,679,572
164	4,679,257			861.24	4,679,445		4,679,507	786	4,679,573
				861.38	4,679,446	341	4,679,508		
				864.13	4,679,447				
				865.8	4,679,448				
				866.5	4,679,449				
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CLASS 160	107	4,679,610	CLASS 191	41	4,679,672	299	4,680,445	CLASS 248	227	4,679,785	37 P	4,679,861				
124	4,679,609	CLASS 192	0.052	4,679,674	312	4,680,446	68.1	4,679,754	CLASS 272	112	4,679,862	CLASS 303				
4	4,680,088	21	4,679,673	343	4,680,447	74.1	4,679,755	70	4,679,786	3	4,679,863	6 C	4,679,864			
198	4,680,089	385	4,680,448	93	4,679,787	285	4,679,756	235 R	4,679,794	52	4,679,865	104	4,679,866			
CLASS 164	431	4,679,611	45	4,679,675	388	4,680,450	479	4,679,758	CLASS 273	1 E	4,679,789	CLASS 307	265	4,680,479		
436	4,679,612	67 R	4,679,677	449	4,680,452	602	4,679,760	26 E	4,679,790	26 E	4,679,791	270	4,680,480			
453	4,679,614	85 R	4,679,680	86 R	Re.32,458	370	4,680,471	77 A	4,679,792	270	4,680,481	279	4,680,482			
CLASS 165	1	4,679,615	106.2	4,679,683	90.2	4,679,702	189	4,679,763	CLASS 249	235 R	4,679,794	355	4,680,483			
43	4,679,616	107 M	4,679,681	307	4,679,699	307	4,679,699	235 R	4,679,794	355	4,680,483	448	4,680,484			
56	4,679,617	CLASS 194	350	4,679,684	337	4,679,700	404	4,679,701	CLASS 250	236	4,679,796	448	4,680,485			
71	4,679,618	CLASS 198	52	4,679,703	404	4,679,701	213 VT	4,680,461	222.1	4,680,462	234	4,679,798	463	4,680,486		
81	4,679,619	CLASS 200	461	4,679,685	222.2	4,680,463	223 B	4,680,463	223 R	4,680,464	318	4,679,799	475	4,680,487		
95	4,679,620	CLASS 202	750	4,679,686	223 SE	4,680,466	305	4,680,467	231 SE	4,680,466	34	4,679,800	482	4,680,488		
145	4,679,622	CLASS 204	778	4,679,687	305	4,680,467	310	4,680,468	305	4,680,467	53	4,679,801	575	4,680,490		
154	4,679,623	CLASS 206	129.1	4,679,706	310	4,680,468	311	4,680,469	310	4,680,468	579	4,680,491	579	4,680,491		
166	4,679,624	CLASS 208	130	4,679,707	311	4,680,470	358.1	4,680,470	311	4,680,470	106	4,679,802	CLASS 310	15	4,680,492	
248	4,679,626	CLASS 210	161	4,679,708	358.1	4,680,471	370	4,680,471	358.1	4,680,471	106	4,679,802	CLASS 310	62	4,680,493	
249	4,679,627	CLASS 212	180	4,679,709	370	4,680,471	484.1	4,680,473	370	4,680,471	106	4,679,802	CLASS 310	156	4,680,494	
252	4,679,628	CLASS 214	190	4,679,710	484.1	4,680,473	492.2	4,680,474	484.1	4,680,473	106	4,679,802	CLASS 310	220	4,680,495	
270	4,679,629	CLASS 216	330	4,679,711	492.2	4,680,474	577	4,680,475	33.99 A	4,679,803	106	4,679,802	CLASS 310	308	4,680,496	
281	4,679,630	CLASS 218	384	4,679,712	577	4,680,475	578	4,680,476	33.99 R	4,679,803	106	4,679,802	CLASS 310	313 C	4,680,497	
305.1	4,679,631	CLASS 220	402.13	4,679,713	578	4,680,476	402.13	4,679,714	47.38	4,679,806	106	4,679,802	CLASS 310	339	4,680,498	
307	4,679,632	CLASS 222	449	4,679,714	402.13	4,679,714	449	4,679,714	47.38	4,679,806	106	4,679,802	CLASS 310	314	4,680,499	
345	4,679,633	CLASS 224	517	4,679,715	449	4,679,714	517	4,679,715	47.38	4,679,806	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 172	1	4,679,633	CLASS 226	109 R	4,679,716	449	4,679,714	517	4,679,715	47.38	4,679,806	106	4,679,802	CLASS 310	314	4,680,499
230	4,679,634	CLASS 228	42.06	4,679,717	129.04	4,679,766	129.04	4,679,766	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
260.5	4,679,635	CLASS 230	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 174	36	4,680,423	CLASS 232	42.06	4,679,717	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499
42	4,680,424	CLASS 234	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
50	4,680,425	CLASS 236	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
57	4,680,426	CLASS 238	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
88 R	4,680,427	CLASS 240	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
158 F	4,680,428	CLASS 242	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 175	58	4,679,636	CLASS 244	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499
61	4,679,637	CLASS 246	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
107	4,679,638	CLASS 248	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
329	4,679,639	CLASS 250	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
374	4,679,640	CLASS 252	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 177	114	4,679,641	CLASS 254	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499
164	4,679,642	CLASS 256	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
210 C	4,679,643	CLASS 258	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 178	19	4,680,429	CLASS 260	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499
69 R	4,680,431	CLASS 262	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 180	6.5	4,679,644	CLASS 264	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499
65.8	4,679,645	CLASS 266	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
165	4,679,646	CLASS 268	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
219	4,679,647	CLASS 270	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
272	4,679,648	CLASS 272	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
291	4,679,649	CLASS 274	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 181	130	4,679,650	CLASS 276	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499
155	4,679,651	CLASS 278	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 182	2	4,679,653	CLASS 280	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499
5	4,679,654	CLASS 282	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
33	4,679,655	CLASS 284	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
42	4,679,656	CLASS 286	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
113	4,679,657	CLASS 288	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
200	4,679,658	CLASS 290	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
221	4,679,658	CLASS 292	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 184	637	4,680,121	CLASS 294	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499
15.2	4,679,659	CLASS 296	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 187	8.41	4,679,660	CLASS 298	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499
20	4,679,661	CLASS 300	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
CLASS 188	1.12	4,679,662	CLASS 302	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499
82.1	4,679,663	CLASS 304	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
134	4,679,664	CLASS 306	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
218 XL	4,679,665	CLASS 308	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
290	4,679,666	CLASS 310	48	4,679,718	129.15	4,679,767	129.15	4,679,767	406 A	4,679,812	106	4,679,802	CLASS 310	314	4,680,499	
341	4,679,667	CLASS 312	48	4,679,718	129.15	4,679,767	129.15	4,679,								



## CLASSIFICATION OF PATENTS

106	4,679,884	159	4,680,016	389	4,680,306	54.1	4,680,338	185	4,680,372	141	4,680,400
134	4,679,873	197	4,680,024	460	4,680,307	54.11	4,680,339	185	4,680,373	153	4,680,401
392	4,679,881			492	4,680,308	72	4,680,340	204	4,680,374	235	4,680,402
404	4,679,880			499	4,680,309	113	4,680,341	253	4,680,375	247	4,680,403
425	4,679,877	27	4,680,277	539	4,680,310	132	4,680,342	279	4,680,376	269	4,680,404
	4,679,878	98	4,680,278	561	4,680,311	148	4,680,343	322	4,680,377	270	4,680,405
	4,679,879	124	4,680,279	573	4,680,312	176	4,680,344		4,680,378	345	4,680,406
	4,679,876			627	4,680,313	340	4,680,345	336	4,680,379	348	4,680,407
426	4,679,870			725	4,680,314	437	4,680,346	485	4,680,380		
493	4,679,868	66	4,680,280	738	4,680,315	486	4,680,347	501	4,680,381		
495	4,679,882	218	4,680,281			519	4,680,348			CLASS 548	
569	4,679,874	304	4,680,282			528	4,680,349			100	4,680,408
595	4,679,875			89	4,680,316			CLASS 530		194	4,680,409
604	4,679,883				4,680,317			317	4,680,382	231	4,680,410
607	4,679,885	214	4,680,283	95	4,680,318	62	4,680,349	387	4,680,383	430	4,680,411
620	4,679,886	217	4,680,284	406	4,680,319	125	4,680,350			480	4,680,412
816	4,679,887				4,680,320		4,680,351	622	4,680,384	526	4,680,413
849	4,679,888				4,680,321		4,680,352	695	4,680,385	544	4,680,414
876	4,679,889	17	4,680,285		4,680,322		4,680,353				
883	4,679,890	18	4,680,286	210	4,680,319	147	4,680,354	CLASS 536		CLASS 549	
884		23	4,680,287	313	4,680,320	160	4,680,355			214	4,680,415
			4,680,288	335	4,680,321	172	4,680,356	7.4	4,680,386	292	4,680,416
			4,680,289	416	4,680,322	243	4,680,357			299	4,680,417
66	4,680,017	42	4,680,290			256	4,680,358	CLASS 540		305	4,680,418
		63	4,680,291			265	4,680,359			343	4,680,419
		172	4,680,292	43	4,680,323	292.9	4,680,360	136	4,680,387	476	4,680,420
376	4,680,018	182	4,680,293	58	4,680,324	309	4,680,361	203	4,680,388		
378	4,680,019	183	4,680,294	101	4,680,325	310	4,680,362	222	4,680,389		
414	4,680,020	210	4,680,295	106	4,680,326	318	4,680,363	228	4,680,390	CLASS 585	
457	4,680,021	243	4,680,296	110	4,680,327	320	4,680,364	355	4,680,391	648	4,680,421
487	4,680,022	256	4,680,297	137	4,680,328		4,680,365	527	4,680,392		
		258	4,680,298	143	4,680,329		4,680,366			CLASS 604	
		259	4,680,299	230	4,680,330	14	4,680,367			6	4,680,025
601	4,680,809	293	4,680,300	269	4,680,331	15	4,680,368	170	4,680,393	33	4,680,026
609	4,680,810		4,680,301	295	Re. 32,459	27	4,680,369	193	4,680,394	68	4,680,027
617	4,680,811	311	4,680,302	377	4,680,332	34	4,680,370	321	4,680,395	74	4,680,028
		312	4,680,303	394	4,680,333	44	4,680,371	337	4,680,396	280	4,680,029
		321	4,680,304	501	4,680,334	49	4,680,372			391	4,680,030
153	4,679,999	327	4,680,305	548	4,680,335	76	4,680,373	51	4,680,397		
		336	4,680,306			167	4,680,374	121	4,680,398	CLASS 623	
		340	4,680,307			179	4,680,375	139	4,680,399	2	4,680,031
75	4,680,023	347	4,680,308	53	4,680,337						

## CLASSIFICATION OF DESIGNS

D2—	10	290,780	22	290,800	D11—	81	290,820	141	290,861	D25—	54	290,880
	314	290,783		290,801		89	290,821	142	290,862		55	290,881
	320	290,781		290,802		166	290,822	173	290,863	D26—	73	290,882
		290,782	43	290,803		184	290,823	177	290,864		7	290,883
D3—	7	290,784	147	290,804	D12—	110	290,824	185	290,865		110	290,885
	30.1	290,785	351	290,805		129	290,825	230	290,866		138	290,886
	39	290,786	351	290,806		147	290,826	230	290,867	D28—	49	290,887
D6—	301	290,787	30	290,807	D16—	119	290,847	149	290,868		15	290,892
	355	290,788	57	290,808		150	290,848	149	290,869	D32—	18	290,893
	380	290,789	356	290,809		155	290,849	149	290,870		22	290,894
	408	290,790	318	290,810	D18—	1	290,850	155	290,871		24	290,895
	411	290,791	349	290,811	D19—	41	290,851	158	290,872		53	290,896
		290,792	426	290,812		179	290,852	158	290,873		68	290,897
	462	290,793	433	290,813	D21—	25	290,853	158	290,874		70	290,898
		290,794	433	290,814		317	290,854	158	290,875			
	469	290,795	433	290,815	D13—	30	290,855	158	290,876			
	480	290,796	433	290,816		32	290,856	158	290,877			
	502	290,797	46	290,817	D14—	4	290,857	158	290,878			
	551	290,798	49	290,818		12	290,858	158	290,879			
D7—	13	290,799	80	290,819		53	290,859	158	290,880			

GEOGRAPHICAL INDEX  
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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Connecticut	9	Missouri	29	Utah	49
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

01 :	4,679,622	4,679,691	4,680,460	4,679,814	13 :	4,680,762	4,680,339
	4,680,043	4,679,695	4,680,465	4,679,940		4,679,263	4,680,464
	4,680,542	4,679,751	4,680,467	4,679,987		4,679,325	4,680,495
	4,680,783	4,679,752	4,680,470	4,680,006		4,679,362	4,680,506
02 :	4,680,446	4,679,753	4,680,484	4,680,021		4,679,374	4,680,541
04 :	4,679,343	4,679,764	4,680,486	4,680,023		4,679,378	4,680,559
	4,679,600	4,679,792	4,680,489	4,680,035		4,679,613	4,680,665
	4,679,702	4,679,797	4,680,516	4,680,051		4,679,710	4,680,667
	4,679,802	4,679,802	4,680,587	4,680,199		4,679,726	4,680,787
	4,679,756	4,679,813	4,680,605	4,680,216		4,679,726	4,680,787
	4,679,840	4,679,840	4,680,606	4,680,229		4,679,804	4,680,794
	4,680,454	4,679,867	4,680,611	4,680,239		4,680,795	4,680,795
	4,680,581	4,679,886	4,680,626	4,680,244		4,680,804	4,680,795
	4,680,633	4,679,893	4,680,635	4,680,257		4,680,810	4,680,795
	4,680,702	4,679,894	4,680,645	4,680,267		4,680,810	4,680,795
	4,680,770	4,679,905	4,680,651	4,680,271		4,680,810	4,680,795
06 :	4,679,258	4,679,907	4,680,653	4,680,271		4,680,810	4,680,795
	4,679,264	4,679,910	4,680,682	4,680,271		4,680,810	4,680,795
	4,679,268	4,679,928	4,680,689	4,680,271		4,680,810	4,680,795
	4,679,298	4,679,946	4,680,690	4,680,271		4,680,810	4,680,795
	4,679,303	4,679,950	4,680,705	4,680,271		4,680,810	4,680,795
	4,679,310	4,679,956	4,680,717	4,680,271		4,680,810	4,680,795
	4,679,322	4,679,960	4,680,727	4,680,271		4,680,810	4,680,795
	4,679,329	4,679,961	4,680,731	4,680,271		4,680,810	4,680,795
	4,679,330	4,679,984	4,680,738	4,680,271		4,680,810	4,680,795
	4,679,344	4,680,004	4,680,771	4,680,271		4,680,810	4,680,795
	4,679,350	4,679,422	4,680,027	4,680,271		4,680,810	4,680,795
	4,679,434	4,679,446	4,680,044	4,679,351		4,680,352	4,680,050
	4,679,477	4,679,478	4,680,075	4,679,356		4,679,356	4,679,507
	4,679,501	4,679,501	4,680,089	4,679,421		4,679,421	4,679,544
	4,679,516	4,679,516	4,680,103	4,679,527		4,679,527	4,679,558
	4,679,535	4,679,535	4,680,119	4,679,599		4,679,599	4,679,564
	4,679,545	4,679,545	4,680,129	4,679,616		4,679,616	4,679,580
	4,679,547	4,679,547	4,680,141	4,679,625		4,679,625	4,679,588
	4,679,550	4,679,550	4,680,171	4,679,628		4,679,628	4,679,588
	4,679,553	4,679,553	4,680,192	4,679,656		4,679,656	4,679,700
	4,679,556	4,679,556	4,680,233	4,679,661		4,679,661	4,679,708
	4,679,560	4,679,560	4,680,269	4,679,681		4,679,681	4,679,769

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4,679,584	4,680,428	4,680,341	37 :	4,679,293	4,680,577	4,679,638
4,679,725	4,680,440	4,680,351		4,680,087	4,680,620	4,679,640
4,679,733	4,680,441	4,680,383		4,680,238	4,680,621	4,679,669
4,680,106	4,680,568	4,680,391		4,680,275	4,680,729	4,679,786
4,680,725	4,680,592	4,680,392		4,680,515	4,680,780	4,679,800
4,680,613	4,680,777	4,680,394		4,680,523	4,679,318	4,679,807
23 : 4,679,311	4,679,260	4,680,415		4,680,524	4,679,319	4,679,831
24 : 4,679,338	4,679,271	4,680,420	39 :	4,679,275	4,679,331	4,679,964
4,679,363	4,679,308	4,680,483		4,679,283	4,679,361	4,680,042
4,679,554	4,679,505	4,680,539		4,679,316	4,679,369	4,680,086
4,679,644	4,679,562	4,680,616		4,679,375	4,679,377	4,680,105
4,679,761	4,679,591	4,680,681		4,679,378	4,679,399	4,680,127
4,679,918	4,679,675	4,680,726		4,679,400	4,679,435	4,680,128
4,679,936	4,679,734	4,680,769		4,679,443	4,679,482	4,680,167
4,680,308	4,679,757	4,680,810		4,679,492	4,679,484	4,680,191
4,680,389	4,679,880	4,679,899	35 :	4,679,517	4,679,508	4,680,328
4,680,740	4,679,884	4,679,561		4,679,525	4,679,581	4,680,347
4,680,761	4,680,126	4,679,812		4,679,590	4,679,614	4,680,357
4,680,797	4,680,134	4,680,434		4,679,596	4,679,623	4,680,378
25 : 4,679,401	4,680,148	4,679,259	36 :	4,679,658	4,679,693	4,680,396
4,679,402	4,680,230	4,679,261		4,679,676	4,679,706	4,680,421
4,679,438	4,680,375	4,679,273		4,679,687	4,679,727	4,680,471
4,679,585	4,680,427	4,679,292		4,679,698	4,679,740	4,680,536
4,679,609	4,679,314	4,679,711		4,679,711	4,679,747	4,680,579
4,679,670	4,680,704	4,679,321		4,679,777	4,679,771	4,680,674
4,679,699	4,679,839	4,679,418		4,679,780	4,679,774	4,680,700
4,679,709	Re.32,459	4,679,423		4,679,787	4,679,868	4,680,701
4,679,848	4,679,253	4,679,424		4,679,791	4,679,883	4,680,741
4,679,881	4,679,353	4,679,476		4,679,823	4,679,888	4,680,760
4,679,914	4,679,653	4,679,521		4,679,835	4,679,895	4,680,765
4,679,959	4,679,712	4,679,571		4,679,869	4,679,966	4,680,805
4,680,049	4,679,737	4,679,618		4,679,870	4,679,967	4,680,811
4,680,174	4,679,859	4,679,694		4,679,885	4,680,010	3,464,799
4,680,247	4,679,991	4,679,749		4,679,896	4,680,037	4,399,426
4,680,337	4,679,999	4,679,796		4,679,917	4,680,062	4,679,386
4,680,373	4,680,016	4,679,799		4,679,934	4,680,133	4,679,415
4,680,382	4,680,029	4,679,878		4,679,937	4,680,135	4,679,441
4,680,474	4,680,145	4,679,889		4,679,969	4,680,204	4,679,567
4,680,480	4,680,316	4,679,900		4,679,986	4,680,249	4,679,607
4,680,490	4,680,325	4,679,911		4,679,997	4,680,279	4,680,285
4,680,509	4,680,448	4,679,938		4,680,000	4,680,283	4,680,485
4,680,554	4,680,708	4,679,943		4,680,063	4,680,304	4,680,759
4,680,588	4,146,437	4,679,951		4,680,068	4,680,346	4,680,479
4,680,628	4,679,772	4,679,954		4,680,071	4,680,388	4,679,313
4,680,767	4,680,181	4,679,963		4,680,078	4,680,393	4,679,504
4,680,773	4,680,138	4,680,020		4,680,081	4,680,414	4,679,552
4,680,781	4,679,426	4,680,040		4,680,099	4,680,423	4,679,583
4,680,788	4,680,750	4,680,049		4,680,101	4,680,504	4,679,998
4,680,798	4,679,262	4,680,093		4,680,139	4,680,562	4,680,030
26 : 4,679,266	4,679,269	4,680,100		4,680,156	4,680,617	4,680,073
4,679,285	4,679,720	4,680,149		4,680,184	4,680,677	4,680,209
4,679,287	4,679,873	4,680,169		4,680,205	4,680,683	4,680,519
4,679,289	4,680,082	4,680,190		4,680,228	4,680,685	4,680,574
4,679,297	4,680,462	4,680,232		4,680,234	4,679,445	4,680,749
4,679,327	4,680,796	4,680,254	44 :	4,679,922	4,679,922	4,679,349
4,679,334	4,679,342	4,680,255		4,680,186	4,680,186	4,679,475
4,679,368	4,679,419	4,680,256		4,680,187	4,680,187	4,679,557
4,679,397	4,679,425	4,680,258		4,680,584	4,680,584	4,679,559
4,679,410	4,679,496	4,680,259		4,679,657	4,679,657	4,679,597
4,679,417	4,679,605	4,680,273		4,680,354	4,680,354	4,679,750
4,679,428	4,679,642	4,680,289		4,680,358	4,680,358	4,679,734
4,679,455	4,679,714	4,680,323		4,680,380	4,680,425	4,679,826
4,679,459	4,679,736	4,680,329		4,680,457	4,680,670	4,679,877
4,679,481	4,679,738	4,680,342		4,680,500	4,679,315	4,680,115
4,679,543	4,679,767	4,680,350	47 :	4,680,508	4,679,939	4,680,164
4,679,678	4,679,827	4,680,356		4,680,512	4,679,978	4,680,422
4,679,679	4,679,890	4,680,363		4,680,528	4,680,028	4,679,803
4,679,680	4,679,979	4,680,364		4,680,165	4,680,361	4,680,361
4,679,690	4,680,057	4,680,371		4,680,753	4,680,585	4,680,585
4,679,759	4,680,072	4,680,372		4,679,290	4,679,294	4,679,294
4,679,779	4,680,084	4,680,389	48 :	4,679,291	4,679,367	4,679,367
4,679,781	4,680,095	4,680,424		4,679,300	4,679,328	4,679,411
4,679,836	4,680,120	4,680,426		4,679,328	4,679,348	4,679,489
4,679,843	4,680,121	4,680,478		4,679,385	4,679,385	4,679,520
4,679,844	4,680,142	4,680,501		4,680,122	4,679,404	4,679,526
4,679,924	4,680,144	4,680,510		4,680,224	4,679,468	4,679,534
4,679,924	4,680,172	4,680,532		4,680,326	4,679,655	4,679,682
4,679,974	4,680,175	4,680,533		4,680,664	4,679,487	4,679,713
4,679,994	4,680,179	4,680,535		4,679,347	4,679,542	4,679,782
4,680,005	4,680,189	4,680,537	41 :	4,679,606	4,679,572	4,679,970
4,680,055	4,680,189	4,680,538		4,679,635	4,679,579	4,680,202
4,680,085	4,680,241	4,680,546		4,679,686	4,679,582	4,680,442
4,680,096	4,680,248	4,680,547		4,679,810	4,679,592	4,680,450
4,680,110	4,680,267	4,680,548		4,680,015	4,679,604	4,680,545
4,680,200	4,680,286	4,680,551		4,680,185	4,679,610	4,680,695
4,680,211	4,680,293	4,680,572		4,680,210	4,679,624	4,680,709
4,680,214	4,680,370	4,680,603		4,680,237	4,679,626	4,680,790
4,680,410	4,680,410	4,680,614		4,680,429	4,679,627	
4,680,416	4,680,333	4,680,666		4,680,537		
4,680,419	4,680,338	4,680,808				

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01 :	290,841	10 :	290,813	19 :	290,829	28 :	290,834	37 :	290,854	46 :	290,858	55 :	290,874
06 :	290,810	12 :	290,842	20 :	290,868	29 :	290,834	38 :	290,855	47 :	290,859	56 :	290,893
	290,820		290,880	24 :	290,784	30 :	290,835	39 :	290,856	48 :	290,860	57 :	290,783
	290,822	13 :	290,794	25 :	290,781	31 :	290,836	40 :	290,857	49 :	290,861	58 :	290,857
	290,825		290,795		290,782	32 :	290,837	41 :	290,858	50 :	290,862	59 :	290,788
	290,837	17 :	290,790	26 :	290,793	33 :	290,838	42 :	290,859	51 :	290,863	60 :	290,811
	290,846		290,814	27 :	290,786	34 :	290,839	43 :	290,860	52 :	290,864	61 :	290,850
	290,864		290,815		290,787	35 :	290,840	44 :	290,861	53 :	290,865	62 :	290,863
	290,886		290,816		290,835	36 :	290,841	45 :	290,862	54 :	290,866	63 :	290,797
	290,896		290,889		290,856		290,836	37 :	290,791		290,885	64 :	290,863
	290,806		290,895	28 :	290,833		290,837		290,792	50 :	290,797		290,797
	290,819		290,897	32 :	290,840		290,838		290,809	55 :	290,803		290,803
	290,866		290,862	34 :	290,853		290,840		290,883		290,832		290,832
		18 :	290,862				290,855	39 :	290,855		290,807		290,898



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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee: . . . . .	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed: . . . . .	520.00
—Corresponding prior U.S. national application filed: . . . . .	350.00
—Supplemental search fee, per additional invention . . . . .	140.00
European Patent Office as Searching Authority . . . . .	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority . . . . .	370.00
—Additional examination fee, per additional invention . . . . .	125.00
—Searching Authority not the USPTO . . . . .	570.00
—Additional examination fee, per additional invention . . . . .	190.00
International fees	
Basic fee: . . . . .	485.00
Basic Supplemental fee (for each page over 30): . . . . .	10.00
Designation fee for the first 10 national or regional offices: . . . . .	120.00
Designation fee for 11th and subsequent designations: . . . . .	No Charge
Handling fee . . . . .	150.00
Supplement to the handling fee . . . . .	150.00

## U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA . . . . .	170.00	340.00
USPTO was neither ISA nor IPEA . . . . .	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4) . . . . .	25.00	50.00
—For each independent claim in excess of 3 . . . . .	17.00	34.00
—For each claim in excess of 20 . . . . .	6.00	12.00
—For each application containing a multiple dependent claim . . . . .	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1 . . . . .	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1 . . . . .	26.00	26.00

DONALD J. QUIGG,  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks.

## Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 17, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,459,703 through 4,461,042  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

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(h), as amended effective Oct. 5, 1985, which are reproduced below:

## 37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . \$ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:  
By a small entity (§1.9(f)) . . . . . \$ 225.00  
By other than a small entity . . . . . \$ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . \$ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:  
By a small entity (§1.9(f)) . . . . . \$ 55.00  
By other than a small entity . . . . . \$ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . \$ 500.00"

## Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

## PATENTS WHICH EXPIRED MAY 3, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,381,568	06/331,041	5/3/83
4,381,572	06/219,232	5/3/83
4,381,573	06/279,882	5/3/83
4,381,588	06/226,206	5/3/83
4,381,589	06/225,901	5/3/83
4,381,607	06/263,105	5/3/83
4,381,616	06/301,386	5/3/83
4,381,617	06/220,943	5/3/83
4,381,618	06/226,065	5/3/83
4,381,645	06/222,635	5/3/83

4,381,653	06/245,843	5/3/83
4,381,667	06/258,749	5/3/83
4,381,671	06/247,883	5/3/83
4,381,685	06/352,996	5/3/83
4,381,686	06/265,423	5/3/83
4,381,688	06/296,465	5/3/83
4,381,690	06/239,449	5/3/83
4,381,712	06/252,738	5/3/83
4,381,725	06/250,584	5/3/83
4,381,726	06/322,293	5/3/83
4,381,731	06/290,715	5/3/83
4,381,739	06/269,268	5/3/83
4,381,754	06/302,211	5/3/83
4,381,758	06/285,386	5/3/83
4,381,761	06/257,206	5/3/83
4,381,768	06/264,689	5/3/83
4,381,769	06/294,973	5/3/83
4,381,776	06/254,078	5/3/83
4,381,777	06/225,181	5/3/83
4,381,778	06/267,679	5/3/83
4,381,779	06/284,055	5/3/83
4,381,788	06/238,813	5/3/83
4,381,795	06/239,234	5/3/83
4,381,834	06/265,664	5/3/83
4,381,839	06/239,318	5/3/83
4,381,850	06/312,339	5/3/83
4,381,891	06/280,691	5/3/83
4,381,906	06/309,566	5/3/83
4,381,908	06/240,708	5/3/83
4,381,917	06/348,602	5/3/83
4,381,955	06/255,081	5/3/83
4,381,982	06/367,151	5/3/83
4,381,985	06/242,312	5/3/83
4,381,988	06/285,060	5/3/83
4,381,989	06/322,771	5/3/83
4,381,996	06/326,727	5/3/83
4,381,997	06/320,374	5/3/83
4,382,000	06/352,724	5/3/83
4,382,044	06/275,259	5/3/83
4,382,073	06/224,918	5/3/83
4,382,087	06/259,791	5/3/83
4,382,088	06/295,180	5/3/83
4,382,094	06/288,178	5/3/83
4,382,096	06/286,671	5/3/83
4,382,098	06/404,276	5/3/83
4,382,107	06/265,949	5/3/83
4,382,127	06/299,210	5/3/83
4,382,133	06/260,438	5/3/83
4,382,134	06/313,732	5/3/83
4,382,156	06/249,642	5/3/83
4,382,159	06/268,364	5/3/83
4,382,161	06/228,397	5/3/83
4,382,176	06/249,590	5/3/83
4,382,186	06/224,313	5/3/83
4,382,189	06/262,051	5/3/83
4,382,190	06/226,026	5/3/83
4,382,191	06/267,803	5/3/83
4,382,193	06/242,973	5/3/83
4,382,201	06/258,226	5/3/83
4,382,220	06/284,989	5/3/83
4,382,235	06/224,260	5/3/83
4,382,255	06/311,154	5/3/83
4,382,273	06/264,287	5/3/83
4,382,280	06/221,487	5/3/83
4,382,292	06/251,571	5/3/83

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,518,686, Re. S.N. 055,726, Filed May 21, 1987, Cl. 430/512, COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING UV FILTER COMPOUNDS, Masao Sasaki, et al., Owner of Record:



*Konishiroku Photo Industry Co., Ltd., Tokyo, Japan*, Attorney or Agent: Jerry P. Voight, Ex. Gp.: 156

4,519,665, Re. S.N. 056,937, Filed May 27, 1987, Cl. 439/608, SOLDERLESS MOUNTED FILTERED CONNECTOR, Richie M. Althouse, Owner of Record: AMP, Inc., Harrisburg, Pa., Attorney or Agent: Jay L. Seitchik, et al., Ex. Gp.: 322

4,526,738, Re. S.N. 057,944, Filed June 4, 1987, Cl. 264/176F, POLYESTER FIBER AND METHOD FOR THE PRODUCTION THEREOF, Takehiko Miyoshi, et al., Owner of Record: Toray Industries, Inc., Tokyo, Japan, Attorney or Agent: Austin R. Miller, et al., Ex. Gp.: 137

4,554,973, Re. S.N. 053,985, Filed May 26, 1987, Cl. 166/192, APPARATUS FOR SEALING A WELL CASING, Clinton O. Shonrock, et al., Owner of Record: Schlumberger Technology, Houston, Tex., Attorney or Agent: E. R. Archambeau, Jr., et al., Ex. Gp.: 356

4,568,230, Re. S.N. 054,549, Filed May 27, 1987, Cl. 413/66, TWO-OUT BELT SYSTEM, Omar L. Brown, Owner of Record: Dayton Reliable Tool & Mfg. Co., Dayton, Ohio, Attorney or Agent: Joseph G. Nauman, et al., Ex. Gp.: 323

4,576,582, Re. S.N. 053,152, Filed May 21, 1987, Cl. 446/16, TOY BUBBLE BLOWING LAWN MOWER, James S. Panzarella, Owner of Record: Quaker Oats Co., Chicago, Ill., Attorney or Agent: George W. Shaw, et al., Ex. Gp.: 331

4,577,572, Re. S.N. 054,395, Filed May 26, 1987, Cl. 112/231, FULLY ROTATING HOOK FOR A LOCK STITCH SEWING MACHINE, Tokuzo Hirose, Owner of Record: Hirose Manufacturing Co., Osaka, Japan, Attorney or Agent: V. M. Creedon, et al., Ex. Gp.: 247

4,577,608, Re. S.N. 056,862, Filed June 1, 1987, Cl. 123/583, CARBURETOR SYSTEM INCLUDING AN ADJUSTABLE THROTTLE LINKAGE, Chester G. Du Bois, et al., Owner of Record: Outboard Marine Corp., Waukegan, Ill., Attorney or Agent: Bayard H. Michael, et al., Ex. Gp.: 342

4,617,733, Re. S.N. 053,250, Filed May 22, 1987, Cl. 29/874, PROCESS OF MANUFACTURING A FLEXIBLE SUBSTRATE ASSEMBLY, Thor Olson, Owner of Record: Molex, Inc., Lisle, Ill., Attorney or Agent: Louis A. Hecht, Ex. Gp.: 326

4,644,425, Re. S.N. 055,118, Filed May 28, 1987, Cl. 360/69, CONTROL APPARATUS FOR CONTROLLING, Isao Tamaki, Owner of Record: Sony Corp., Tokyo, Japan, Attorney or Agent: Lewis H. Eslinger, et al., Ex. Gp.: 235

#### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

#### No Publications This Issue.

#### Removal from Register

Pursuant to the provisions of 37 CFR §10.11(b), a letter was directed on Nov. 18, 1986, to the last post office

address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address.

Accordingly, the names of the following persons have been removed from the Register of Patent Attorneys and Patent Agents.

CAMERON WEIFFENBACH,  
Director, Office of  
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May 14, 1987.

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 Dunleavy, James Edward, Jr., 1520 University Blvd., NE., Apt. 193, Albuquerque, N. Mex. 87102  
 Durr, Frank L., Greene and Durr, 10 E. 40th St., New York, N.Y. 10016  
 Durstewitz, Gerald, Nabisco, Inc., Law Dept. East Hanover, N.J. 07936  
 Dwell, John R., Suite 702, 2300 Overlook Rd., Cleveland Hgts., Ohio 44106  
 Dziurgot, Robert F., 159 W. 53rd St., New York, N.Y. 10019

Patent and Trademark Office  
 Board of Patent Appeals and Interferences Vacancies

The Board of Patent Appeals and Interferences will be filling a number of Examiner-in-Chief vacancies over the next several months. Positions are available in chemical, electrical, and mechanical technologies. Persons interested in being considered for these vacancies are invited to submit individual applications for each of the following vacancy announcements:

PTO-87-A6-chemical technology, PTO-87-A7-electrical technology, and PTO-87-A8-mechanical technology. There is no deadline for submitting applications. However, candidates are urged to apply as soon as possible since applications will be accepted only until the positions are filled.

Excerpts from the vacancy announcements describing the duties of the position, qualification requirements, factors to be used in evaluating candidates, and necessary application materials are listed below.

**Duties:** Serves as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office. As an Examiner-in-Chief, participates in the Board's appellate and administrative responsibilities and exercises independent judgment on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner, and may be responsible for conducting interlocutory proceedings in interference and for determining questions of priority of invention and patentability between interference parties. Appeals filed in accordance with 35 USC 134 and interferences declared in accordance with 35 USC 135 involve complex legal and technical questions. The Board of Patent Appeals and Interferences has the sole power to:

- (1) hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents, for reissue of patents, and for reexamination of patents;
- (2) to declare and to conduct proceedings in interferences; and
- (3) to determine priority of invention.

Final decisions of the Board, if unfavorable to an applicant, or to a party to an interference, may be appealed to the United States Court of Appeals for the



Federal Circuit or civil action may be taken in accordance with 35 USC 145, or 35 USC 146.

**Qualification requirements:** In addition to a technical degree, candidates must possess:

- (1) A minimum of five years of comprehensive patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office;
- (2) A law degree and membership in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution;
- (3) A high degree of demonstrated competence in chemical, electrical, or mechanical technology;
- (4) A high degree of demonstrated competence and knowledge of interference law and practice;
- (5) Demonstrated ability to determine whether or not tests which are submitted in evidence are technically sufficient to prove the question at hand;
- (6) Demonstrated ability to write clearly, and to write logically developed opinions;
- (7) Demonstrated ability to use legal and technical background to evaluate testimony of witnesses;
- (8) Demonstrated ability to deal effectively with people within and outside the Patent and Trademark Office; and

- (9) Comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

**Factors which will be considered in evaluating qualified candidates:** Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals and questionnaire responses.

**Interested candidates should submit the following:**

- (1) Personal Qualifications Statement, SF-171;
- (2) Merit Program Interest Statement, CD-261 (PTO employees only);
- (3) Current supervisory appraisal on your agency's form or on CD-362 (letters of reference for outside candidates);
- (4) Annual narrative performance rating, or equivalent;
- (5) Examiner-in-Chief Questionnaires; and
- (6) Samples which evidence your writing ability.

Questions concerning this notice and requests for application materials should be directed to Ms. Suzanne Waddill, Office of Personnel, One Crystal Park, Suite 700, Arlington, Va., telephone (703) 557-3631.

Feb. 3, 1987.

DONALD W. PETERSON,  
*Deputy Assistant Secretary  
and Deputy Commissioner of  
Patents and Trademarks.*

## PATENT NOTICES

### Certificates of Correction for the Week of July 21, 1987

D. 285,688	4,621,122	4,642,654	4,650,594
4,352,877	4,622,821	4,642,754	4,650,901
4,395,414	4,626,067	4,642,799	4,650,984
4,472,429	4,626,333	4,642,883	4,651,299
4,484,307	4,627,855	4,643,174	4,651,301
4,521,936	4,628,269	4,643,182	4,651,845
4,522,548	4,629,096	4,643,209	4,651,943
4,530,672	4,629,149	4,643,300	4,652,210
4,539,900	4,629,919	4,643,433	4,652,674
4,550,096	4,629,956	4,643,546	4,652,946
4,562,233	4,630,569	4,643,591	4,653,639
4,564,665	4,631,559	4,643,963	4,653,985
4,564,842	4,631,734	4,644,287	4,654,380
4,567,990	4,632,877	4,644,403	4,654,617
4,572,869	4,633,108	4,644,701	4,654,735
4,576,262	4,633,194	4,644,936	4,655,129
4,577,343	4,633,319	4,645,197	4,655,269
4,584,942	4,633,690	4,645,288	4,655,515
4,590,595	4,633,966	4,645,982	4,655,835
4,592,554	4,634,071	4,646,105	4,655,903
4,593,394	4,634,196	4,646,234	4,655,955
4,595,067	4,635,854	4,646,247	4,656,018
4,600,067	4,636,785	4,646,614	4,656,239
4,600,723	4,636,787	4,647,233	4,656,379
4,602,375	4,636,821	4,647,323	4,657,424
4,604,142	4,637,228	4,647,456	4,658,016
4,606,002	4,637,437	4,647,571	4,658,762
4,607,044	4,637,988	4,647,581	4,659,220
4,607,891	4,639,444	4,647,628	4,659,231
4,608,336	4,639,922	4,649,176	4,660,344
4,608,379	4,641,240	4,649,449	4,660,622
4,608,412	4,641,258	4,649,529	4,660,787
4,609,264	4,641,436	4,649,766	4,661,321
4,610,730	4,641,708	4,649,851	4,661,736
4,619,319	4,642,360	4,640,435	
4,619,325	4,642,441	4,650,513	

# Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
	Anchorage Municipal Libraries	(907) 264-4481
Alaska	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arizona	Little Rock: Arkansas State Library	(501) 371-2090
Arkansas	Irvine: University of California, Irvine Library	(714) 856-7234
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
	Denver Public Library	(303) 571-2122
Colorado	Newark: University of Delaware Library	(302) 451-2965
Delaware	Washington: Howard University Libraries	(202) 636-5060
Dist. of Columbia	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Florida	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Georgia	Moscow: University of Idaho Library	(208) 885-6235
Idaho	Chicago Public Library	(312) 269-2865
Illinois	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
	Minneapolis Public Library & Information Center	(612) 372-6570
Minnesota	Kansas City: Linda Hall Library	(816) 363-4600
Missouri	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
	Albany: New York State Library	(518) 474-7040
New York	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
North Carolina	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
	Stillwater: Oklahoma State University Library	(405) 624-6546
Oklahoma	Salem: Oregon State Library	(503) 378-4239
Oregon	Philadelphia: Free Library	(215) 686-5330
Pennsylvania	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Nashville: Vanderbilt University Library	(615) 322-2775
	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

\*Collection organized by subject matter.

## PATENT EXAMINING CORPS

RENE D. TEGMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 20, 1987

### PATENT EXAMINING GROUPS

Actual Filing Date of Oldest  
New Case Awaiting Action

#### CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-06-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-06-86

#### ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	4-18-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	6-13-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-10-85

#### MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-14-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	9-25-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	1-29-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during June 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,514,784 to 3,518,700, inclusive  
Plant Patents ..... Numbers 2,970 to 2,976 inclusive



# REEXAMINATIONS

JULY 21, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,472,011 (729th)

TREATMENT OF ARTIFICIAL YARNS AND THREADS  
Ernest P. R. Scragg, Sutton Grange, England, assignor to Lex Tex Ltd., Fort Lauderdale, Fla.

Reexamination Request No. 90/000,069, Sep. 9, 1981.

Reexamination Certificate for Patent No. 3,472,011, issued Oct. 14, 1969, Ser. No. 552,342, May 23, 1966.

Continuation of Ser. No. 317,396, Oct. 2, 1963, abandoned,  
Continuation-in-part of Ser. No. 747,162, Jul. 8, 1958,  
abandoned.

Claims priority, application United Kingdom, Jul. 11, 1957,  
21962/57

Int. Cl.<sup>4</sup> D02G 1/02; D01H 13/28

U.S. Cl. 57—290

B1 3,762,220 (730th)

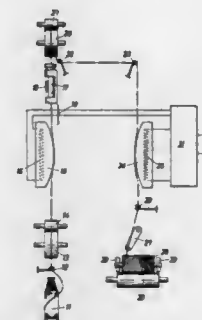
CONTINUOUS EVALUATION OF YARN CRIMP  
James A. Gusack, Williamsburg, Va.; Bernard B. Stephens,  
Anderson, S.C. and James A. Stevens, Williamsburg, Va.,  
assignors to Don Badische Company, Williamsburg, Va.

Reexamination Request No. 90/000,716, Jan. 24, 1985.

Reexamination Certificate for Patent No. 3,762,220, issued Oct. 2, 1973, Ser. No. 216,835, Jan. 10, 1972.

Int. Cl.<sup>4</sup> G01D 21/00

U.S. Cl. 73—160



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-29 are now disclaimed.

[1. A continuous process for producing a partially relaxed crimped thermoplastic synthetic yarn, comprising the steps of heating the yarn after it leaves a package, to an extent sufficient to soften the yarn; imparting a high degree of twist to the yarn while hot and soft; fixing the twist in the yarn by cooling the latter; untwisting the yarn in an untwisting zone to thereby produce a semifinished crimped yarn capable of undergoing a predetermined maximum amount of contraction and tending to contract to such maximum amount; withdrawing said semifinished crimped yarn from said untwisting zone and advancing it into a reheating zone at a predetermined speed; withdrawing the yarn from said reheating zone at a speed smaller than said predetermined speed at which said semifinished crimped yarn is advanced into said reheating zone without any tensioning of said yarn between said advancing of said semifinished crimped yarn into said reheating zone and withdrawing of said yarn from said reheating zone, so as to permit said semifinished crimped yarn to partially contract upon entering said reheating zone to a predetermined degree substantially smaller than said predetermined maximum amount and solely determined by the difference in the speeds at which it is advanced into and withdrawn from said reheating zone and to pass through said reheating zone in its thus partially contracted state; reheating in said reheating zone said semifinished crimped yarn in its partially contracted state to an extent only sufficient to partly relax the crimp of said semifinished crimped yarn while the latter is in said partially contracted state thereof and sufficient to fix the relaxation of said partially relaxed crimped yarn but without affecting the extent of partial contraction of said semifinished partially relaxed crimped yarn; and cooling said yarn so as to stabilize it in its partially contracted state with its crimp partly relaxed to obtain a finished only partially contracted yarn whose crimp is partly relaxed.]

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2-4 are cancelled.

Claim 1 is determined to be patentable as amended.

New claims 5-7 are added and determined to be patentable.

1. A continuous process for evaluation of the crimp along the length of a yarn, which process comprises the following sequential steps:

- [Causing] causing the yarn to travel at a velocity  $\omega_1$  under a constant tension sufficient to straighten but not substantially stretch the yarn, and continuously measuring velocity  $\omega_1$ ;
- [Subjecting] subjecting the traveling yarn, at a point downstream of the application of the first constant tension, to a second constant tension which is small enough to allow any crimp in the yarn to be reformed;
- [Continuously] continuously measuring the velocity  $\omega_2$  of the yarn as it travels past the point of application of the second constant tension; and
- [Continuously] continuously evaluating the crimp along the length of the yarn by means of the relationship

Crimp % =  $((\omega_1 - \omega_2) / \omega_1) 100$  [ ],  
wherein the yarn is subjected to an environment which affords the development of any latent crimp in the yarn in step b.

B1 4,142,436 (731st)

## METHOD OF PLAYING STRINGED MUSICAL INSTRUMENT

Emmett H. Chapman, 8320 Yucca Trail, Los Angeles, Calif. 90046

Reexamination Request No. 90/000,469, Nov. 18, 1983.  
Reexamination Certificate for Patent No. 4,142,436, issued Mar. 6, 1979, Ser. No. 746,027, Nov. 30, 1976.

Continuation of Ser. No. 552,080, Feb. 28, 1975, abandoned, which is a division of Ser. No. 457,396, Apr. 3, 1974, Pat. No. 3,868,880, which is a division of Ser. No. 334,859, Feb. 22, 1973, Pat. No. 3,833,751.

Int. Cl.<sup>4</sup> G10D 3/06; G10H 3/18

U.S. Cl. 84—1.16



## AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-4 are cancelled.

[1. A method of playing by a performer a musical instrument of a type comprising a fretted fingerboard with fixed frets, a plurality of tensioned strings extending in adjacent spaced relation to the fretted fingerboard, and string tensioning means, said method being the playing of the said instrument by a performer substantially exclusively by engaging the strings directly by the fingers, the engaging being by tapping by fingers of both hands substantially simultaneously the said strings and holding said strings against selected frets by fingers of both hands.]

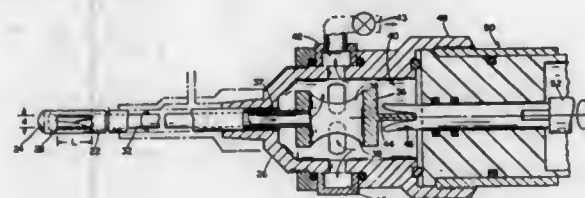
B1 4,203,444 (732nd)

## SURGICAL INSTRUMENT SUITABLE FOR CLOSED SURGERY SUCH AS OF THE KNEE

Leonard J. Bonnell, Medford; Edward H. McHugh, Southboro; Douglas D. Sjostrom, Wakefield, all of Mass., and Lanny L. Johnson, Okemos, Mich., assignors to Dyonics, Inc., Woburn, Mass.

Reexamination Request No. 90/000,650, Oct. 18, 1984.  
Reexamination Certificate for Patent No. 4,203,444, issued May 20, 1980, Ser. No. 848,982, Nov. 7, 1977.Int. Cl.<sup>4</sup> A61M 1/00; A61B 17/32

U.S. Cl. 604—22



## AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 24-55 is confirmed.

Claims 1 and 2 are determined to be patentable as amended.

Claims 3-23, dependent on an amended claim, are determined to be patentable.

New claims 56-59 are added and determined to be patentable.

1. A surgical instrument for a joint space of the body capable of performing intra-articular closed surgery through a puncture wound, such as an operation of the knee, by arthroscopy, characterized in that the instrument comprises an intra-articular shaver comprising an external stationary tube sized and constructed for insertion into said joint space through a puncture opening in the flesh of the body, said external tube having a closed distal end and defining a side-facing, axially extending shaving port on the periphery only of said external tube and an internal member with close running fit with said external tube, defining an internal, rotary blade at said shaving port, said blade during each cycle constructed to open said port to the interior of the instrument and said blade having an axially extending edge adapted to co-act in shearing action with a cooperative axial edge defined by said external tube at said port to produce a succession of discrete shavings with progressive revolutions of said blade, said internal member having radial bearing portions at both proximal and distal ends of said blade, rotatably supported by corresponding portions of said external tube and effective to maintain said blade and edge in shearing relation, a vacuum conduit for drawing fluid and articles to be shaved into said shaving port and to draw said discrete shavings through the instrument, and a drive motor adapted to rotate said blade at a shearing speed of the order of 200 rpm or below that enables degenerated cartilage and synovial tissue of the joint to enter and be severed by said blade into discrete shavings for being transported away in succession through said vacuum conduit.

## REISSUES

JULY 21, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,460

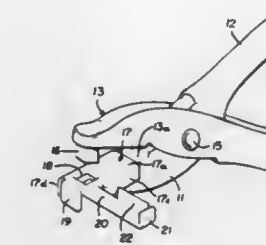
## DISKETTE PUNCH WITH ATTACHED GAGE

Archie L. Leggett, Jr., Landerhill, Fla., assignor to R &amp; L Enterprises, Inc., Philadelphia, Pa.

Original No. 4,488,358, dated Dec. 18, 1984, Ser. No. 490,330, May 2, 1983. Application for reissue Jun. 3, 1985, Ser. No. 740,396

Int. Cl.<sup>4</sup> B26F 1/32

U.S. Cl. 30—363



1. In a punch for use on a magnetic record diskette jacket which has substantially flat opposite major faces and adjoining first and second straight edges extending between said faces perpendicular to each other, said punch having:

opposed first and second jaws which are movable toward and away from each other;  
and a punch element on said first jaw projecting toward said second jaw;

the improvement which comprises a gage attached to said second jaw and presenting:

a flat wall formed with an opening positioned to receive said punch element when said first and second jaws are brought together;

a flat extension coplanar with said flat wall and located on one side of said jaws, said extension being elongated away from said opening to engage one of said faces of the diskette jacket along said first edge of the jacket;

a side lip joined to said extension and extending perpendicular to the plate of said extension and in lateral alignment with said opening along the direction of elongation of said extension to engage said first edge of the diskette jacket when said extension engages said one face of the diskette jacket;

an end lip joined to said extension away from said opening past said side lip and extending perpendicular to the plate of said extension perpendicular to the direction of elongation of said extension to engage said second edge of the diskette jacket when said side lip engages said first edge of the diskette jacket;

said side lip and said end lip when in engagement respectively with said first and second edges of the diskette jacket positioning said opening in the gage intersecting and extending inward from said first edge of the diskette jacket, whereby said punch element forms a notch in the diskette jacket extending inward from said first edge thereof when the jaws of the punch are brought together.

Re. 32,461

## MODULAR DRY-AIR EVAPORATIVE COOLER

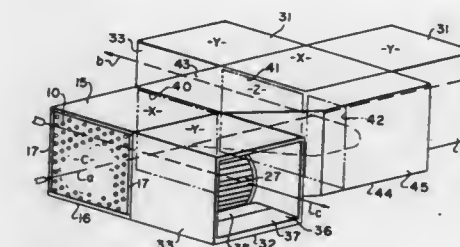
Leonard J. Di Peri, 18325 Lahay St., Northridge, Calif. 91326

Original No. 3,877,244, dated Apr. 15, 1975, Ser. No. 368,756, Jun. 11, 1973. Continuation of Ser. No. 183,107, Sep. 2, 1980, abandoned. Application for reissue Dec. 15, 1982, Ser. No. 472,225

Int. Cl.<sup>4</sup> F28D 5/00

4 Claims U.S. Cl. 62—314

20 Claims



1. A rectangular dry-air evaporative cooler [including] module consisting essentially of: a pair only of [spaced] imperforate planar side members [and a] spaced by ep core means with a pair of opposite open sides thereof extending coextensively between said side members for angularly related movement of two separate columns of air, and with opposed end headers mounted to said side members perpendicular thereto, the core means having opposite interfaces separating the spaces between said side ep members into two angularly related air passages with wetting means at one interface engaging a primary evaporative column of air and with the other interface engaging a secondary sensible cooled column of air with heat transfer between said opposite interfaces, [the remaining two pairs of opposite sides between said members being open therebetween for said angularly related movement of said separate columns of air, and both said separate columns of air being movable through said two angularly related passages coextensively between the spaced side members] wherein the core means is comprised of a multiplicity of spaced parallel rigid and self-supporting tubes of plastic material mounted at their respective ends in said end headers and defining one of said angularly related air passages through the tubes and through the opposite end headers, said end headers extending coextensively between and spacing the side members at one pair of opposite sides of the core means, said end headers and side members defining the other one of said angularly related air passages over the tubes, said cooler module comprising means including said spaced, parallel, and self-supporting tubes of plastic material for obtaining substantially the same temperature decrease as a dry-air evaporative cooler module that is other wise the same in size, shape and operation as said rectangular dry-air evaporative cooler module and including metal tubes having substantially the same length, rigidity, spacing between them, air flow through them, air flow over them, and water flow over them, as said rectangular dry-air evaporative cooler module.



Re. 32,462

## CENTRIFUGAL FLUID MACHINE

Yoichi Yoshinaga, Minorimachi; Shinjiro Ueda, Kashiwa, and Hideo Nishida, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,395,197, dated Jul. 26, 1983, Ser. No. 171,268, Jul. 22, 1980. Application for reissue Jul. 26, 1985, Ser. No. 759,440

Claims priority, application Japan, Aug. 1, 1979, 54-97273

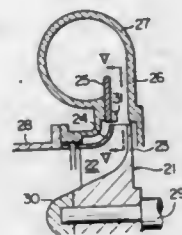
Int. Cl.<sup>4</sup> F04D 29/44, 29/68

U.S. Cl. 415—211

11 Claims

5. A centrifugal fluid machine comprising:  
an impeller having a shroud, a hub and a plurality of blades extending between said shroud and said hub, said shroud and said hub having their respective adjacent radially outer edges cooperating with each other to define therebetween an outlet;  
a vaneless diffuser located around the outlet of said impeller and including a pair of opposed, but spaced first and second annular diffuser plates respectively located adjacent to said shroud and said hub, said first and second diffuser plates having respective inner surfaces which cooperate with each other to define therebetween a diffuser channel, said diffuser channel having an inlet continuous to the outlet of said impeller and an outlet radially remote therefrom, and  
a plurality of guide vanes, provided in a circular array on the

inner surface of at least one of said first and second diffuser plates, for rectifying distorted flow from the outlet of said impeller, said guide vanes extending in said diffuser channel from close to the outlet of the impeller toward the outlet of



said diffuser channel, said guide vanes extending from the inner surface of said at least one diffuser plate toward the other diffuser plate to a location substantially equal to the value of the small flow angles widthwise of the inlet of said diffuser channel.

## PATENTS

GRANTED JUL. 21, 1987

## ERRATA

For CLASS	See PATENT NO.
450-134 .....	4,681,113
453-006 .....	4,681,128
181-229 .....	4,681,188
229-052 .....	4,681,252
269-139 .....	4,681,305
439-092 .....	4,681,382
439-135 .....	4,681,383
439-137 .....	4,681,384
439-252 .....	4,681,385
439-347 .....	4,681,386
439-347 .....	4,681,387
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439-751 .....	4,681,392
439-851 .....	4,681,393
536-053 .....	4,681,856
252-091 .....	4,681,914
544-370 .....	4,681,947
379-104 .....	4,682,169
364-523 .....	4,682,189
503-200 .....	4,682,191
503-200 .....	4,682,192
503-209 .....	4,682,193
503-215 .....	4,682,194

# PATENTS

GRANTED JULY 21, 1987

## GENERAL AND MECHANICAL

4,680,812

### ARMOR FOR PROTECTING BODY REGIONS

Adolf Weigl, Tegelweg 129, 2000 Hamburg 72, Fed. Rep. of Germany

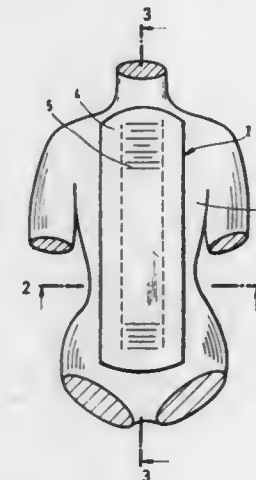
Filed Jul. 25, 1986, Ser. No. 889,511

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527691; Sep. 21, 1985, 3533816

Int. Cl.<sup>4</sup> A41D 13/00; F41H 1/02

U.S. Cl. 2—2

19 Claims



1. A body armor structure for protecting the spinal column of a human body comprising

a plurality of plates each having a width, in use, in a direction generally parallel with the adjacent surface of the body which is substantially greater than the lateral width of the spinal column; and means for interconnecting said plates in a scale-like, elongated array extending generally perpendicular to the width dimensions of said plates with adjacent ones of said plates being interconnected in an overlapping relationship such that at least the central portion of one edge of each plate lies outwardly of the adjacent edge of the next plate relative to said spinal column thereby forming a plurality of serial connections, each said means for interconnecting including

hinge means pivotally connecting said central portion of said one edge to said adjacent edge of the next plate such that said plates are relatively pivotable about an axis which is generally perpendicular to the surfaces of said plates.

4,680,813

### BODY PROTECTIVE GARMENT

Robert B. Glaeser, 108 "C" St., Martinez, Calif. 94553

Filed Mar. 12, 1985, Ser. No. 711,039

Int. Cl.<sup>4</sup> A41D 13/00

U.S. Cl. 2—2

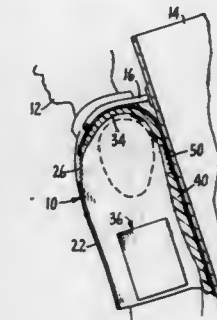
3 Claims

1. A protective garment for workers in the rigid load contact occupations, comprising:

a garment adapted to embrace the torso of such a worker when worn by that worker;

protective pad means adapted to confront the upper and rear surfaces of at least one shoulder of said worker and a substantial part of the rear surface of said worker's torso; and

woven fastener means for removably fastening said protective pad means to the parts of said garment which con-



front said surfaces when said garment is worn by said worker.

4,680,814

### SHOULDER PAD SPRING ARCH SYSTEM

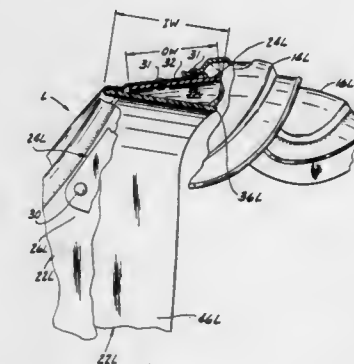
Hal D. Mitchell, and Donald R. Walker, both of Rolla, Mo., assignors to Figgle International Inc., Willoughby, Ohio

Filed Aug. 29, 1986, Ser. No. 901,727

Int. Cl.<sup>4</sup> A41D 13/00

U.S. Cl. 2—2

14 Claims



1. A spring arch system for a shoulder pad, such as a football shoulder pad, the spring arch system having an inner arch and an outer arch, the inner and outer arches being of generally inverted U-shape as viewed from the side, and the outer arch extending substantially over the inner arch from a forward portion of the inner arch to a rearward portion of the inner arch with the spacing such that the arches form a generally wedge-shaped configuration at least in the area of the top of the inverted U-shape such that impact on the outer arch causes deformation thereof relative to the inner arch so as to absorb some of the energy of the impact through such relative deformation.



4,680,815

## SOLAR POWERED HEADWEAR FAN

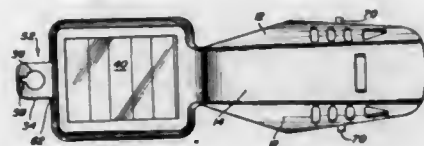
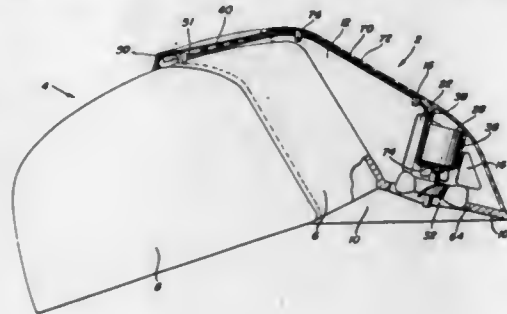
Gerald B. Hirsch; Stanley Volk; William Cirrito, and Dale Brann, all of Tucson, Ariz., assignors to Solarcraft, Inc., Tucson, Ariz.

Filed Feb. 4, 1986, Ser. No. 825,897

Int. Cl.<sup>4</sup> A61F 9/06

U.S. Cl. 2-171.3

22 Claims



1. A fan assembly comprising:  
a housing adapted for resting on an exterior surface of headwear,  
fan means mounted in said housing at one end of said housing and adapted for forcing air through an opening defined in a forward protuberance of the headwear,  
solar cell means mounted on said housing at another end of said housing opposite to and remote from said one end for powering said fan means and adapted for resting on a crown of the headwear,  
vent means defined by said housing for allowing air to be sucked into said housing and forced out of said housing when said power means drive said fan means,  
mounting means defined by said housing including hinge means for removably mounting said modular fan assembly on an exterior surface of the headwear,  
a portion of said housing occupies a substantial distance between said fan means and said solar cell means, and  
display means defined by said portion of said housing between said power means and said fan means for displaying of decorative graphic material.

4,680,816

## MULTIPLE-RING TOILET SEAT ASSEMBLY AND MOUNTING MEANS

Louie V. Colombani, 49 W. Lincoln Ave., Unit A, Woodland, Calif. 95695

Continuation of Ser. No. 651,882, Sep. 19, 1984, abandoned. This application Aug. 21, 1986, Ser. No. 898,805

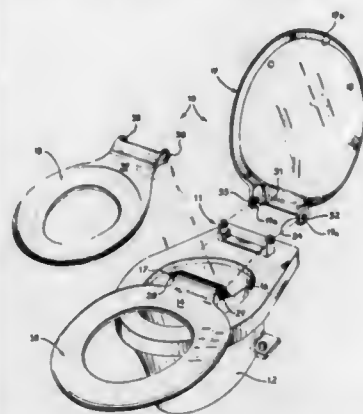
Int. Cl.<sup>4</sup> A47K 13/12

U.S. Cl. 4-240

3 Claims

2. In a toilet seat assembly having a seat portion formed to include a rearwardly extending elongate mounting portion disposed transversely thereof and having a hollow body and cylindrical end bosses disposed to protrude laterally from said hollow body, hinge pins housed in said hollow body and extending from said body coaxially of said end bosses, a mounting bracket formed and adapted to be secured to the top rear surface of a toilet bowl, said bracket including a pair of spaced apart upstanding support pillars, said pillars each including an opening therein, arcuate support shoulders formed on the confronting faces of said pillars and disposed to support said end bosses from beneath to form a pivot independently of said

pins to support the rear of said seat portion thereon, and means for readily releasably coupling said mounting portion to said



pillars to permit said seat portion to be readily removed from said pillars.

4,680,817

## COMPACT PERSONAL HYGIENE CENTER

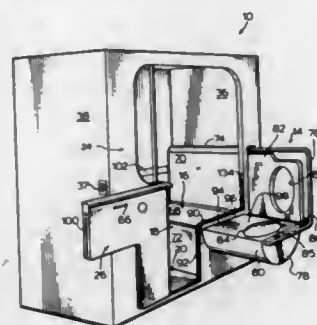
George C. Sloan, 28 Dixon Avenue, Toronto, Ontario M4L 1N3, and David J. Laine, 1868 Queen Street East, Toronto, Ontario M4L 1H2, both of Canada

Filed Jun. 30, 1986, Ser. No. 880,145

Int. Cl.<sup>4</sup> A47K 4/00; E03C 1/01

U.S. Cl. 4-663

12 Claims



1. A personal hygiene centre comprising in combination a compact arrangement of a bathtub and a toilet, said bathtub comprising a tub having a door entrance through a front wall of said tub, a seat having a back rest extending across said tub and abutting said front wall, said door entrance comprising an opening in said front wall providing unimpeded access to within said tub and onto said seat, a cavity being defined beneath said seat, means for mounting said toilet for movement into and out of a storage position within said cavity, said toilet comprising a toilet bowl and a toilet seat, means for mounting said toilet seat for movement from a raised position to a lowered position on said toilet bowl, said cavity being defined behind said back rest in addition to being defined beneath said seat, said toilet bowl being connected to said mounting means for movement with said toilet seat in said raised position into and out of a storage position within said cavity beneath said seat and behind said back rest, said mounting means being a track system to which said toilet bowl is secured, said tub having a framework to which said track system is connected, said track system providing cantilever support for said toilet in said extended use position, said door opening defining a front wall edge portion which follows generally an outline of said tub seat and back rest, a door for closing said opening and

means for sealingly engaging said door with said front wall when said tub is to contain bath water.

bers, whereby pivotal adjustment of said chassis side members varies the track of said front support castors and the width of

4,680,818

## TRANSFER DEVICE FOR MOVING RECUMBENT PERSON

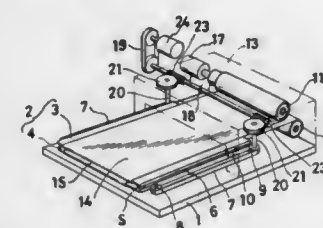
Akihiro Ooka, Suita; Kenji Okamoto, Kobe, and Koji Yamada, Suita, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,337

Int. Cl.<sup>4</sup> A61G 7/08

U.S. Cl. 5-81 R

4 Claims



1. A device for moving a recumbent person, comprising:  
a baseplate;  
a pair of rollers disposed at the proximal end of said base plate, each roller of said pair of rollers having independent drive means for rotating said roller in both forward and reverse directions;  
an insertion plate consisting of two flat plates mutually fixed one above the other with a small gap therebetween and supported on said baseplate;  
an upper belt having an upper end fixed to one of said pair of rollers and a lower end fixed to the other of said pair of rollers, said upper belt passing vertically over a front edge of the upper thin flat plate of said insertion plate and extending rearwardly from said front edge to said upper and lower ends thereof;  
a lower belt having opposite ends secured to a front portion of said base plate at a lower surface of said lower plate, said lower belt passing over a top surface of said lower plate;  
a pair of endless belts disposed on the opposite sides of said insertion plate;  
a pair of coupling members for coupling said endless belts and said insertion plate;  
pulleys supporting said endless belts; and  
drive means independent of said roller drive means for driving said endless belts, whereby said insertion plate is driven in horizontal directions with respect to said base plate by said endless belts.

4,680,819

## INVALID HOISTS

David R. James, Glenyard, England, assignor to James Industries Limited, Gloucester, England

Filed Apr. 7, 1986, Ser. No. 848,647

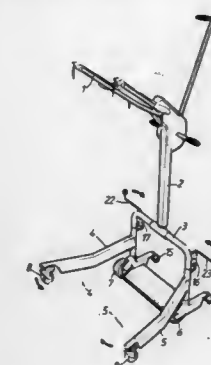
Claims priority, application United Kingdom, May 1, 1985, 8511083

Int. Cl.<sup>4</sup> A61G 7/10

U.S. Cl. 5-86

10 Claims

1. A mobile invalid hoist comprising a chassis, a lifting arm, and an upstanding support structure mounted on said chassis and from which said lifting arm projects, said chassis comprising a main chassis portion supporting the support structure, two coaxial fixed-axis support wheels mounted on said main chassis portion, two chassis side members mounted on said main chassis portion so as to project forwardly therefrom, said chassis side members being pivotally adjustable relative to said main chassis portion about respective vertical pivotal axes, and two front support castors mounted on said chassis side mem-



a front opening of the chassis between said side members without varying the track of said fixed-axis support wheels.

4,680,820

## CONVERTIBLE WATER BED

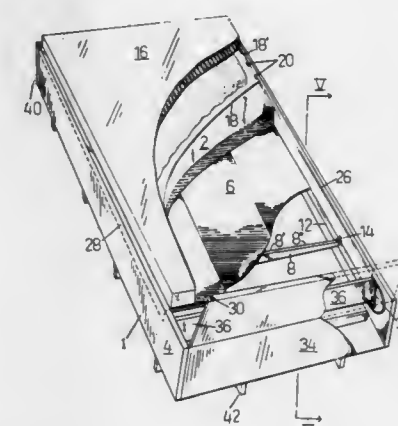
Ronald D. Bittner, 12418 Quail Woods Dr., Germantown, Md. 20874

Filed Dec. 30, 1985, Ser. No. 814,498

Int. Cl.<sup>4</sup> A47C 27/08; A47B 83/00

U.S. Cl. 5-451

11 Claims



1. A waterbed comprising:  
a bed frame;  
first mattress support means on said bed frame for supporting a water-filled mattress;  
a first water-filled mattress supported on said first mattress support means; and  
a second movable mattress movably supported on said bed frame for movement between a first storage position within said bed frame when said water-filled mattress is intended to be used and a second use position over said first mattress, so that said waterbed can be converted to a conventional bed by selectively moving said second mattress between said first and second positions.

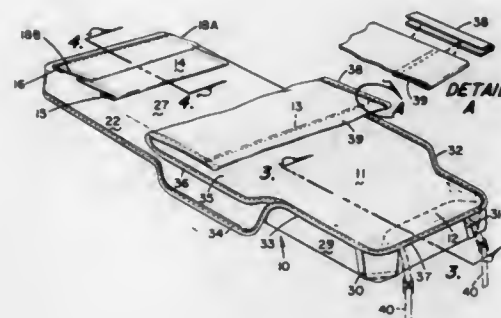
4,680,821  
SHEET BEDDING CONSTRUCTION FOR  
INSTITUTIONAL USE

Sara B. Maguire, 1952 Port provence, Newport Beach, Calif.  
92660

Filed Nov. 26, 1984, Ser. No. 674,986  
Int. Cl.<sup>4</sup> A47C 29/00; A47G 9/02

U.S. Cl. 5-413

8 Claims



1. An article of improved institutional bedding construction adapted to be used in combination with a substantially rectangularly shaped mattress having eight corners, four of the corners being on the upper portion of the mattress and the other four corners being on the bottom portion, comprising:

(a) a bottom sheet of substantially rectangularly shaped cloth material, having a head portion, an intermediate portion and a foot portion each of said head and foot portions having a pair of corners thereon, the head portion having a pair of sewn corners therein conformably mateable to the pair of corners disposed at the top of the head portion of the mattress so as to be fitted thereover, and further having along either side of the head portion of the bottom sheet a pair of edges extending below the head portion of the mattress from contact with the body of the user thereof so as to prevent soiling thereof, a further pair of elongated portions medially disposed of the bottom sheet portion and extending adjacently below the pair of edges to provide full coverage of the mattress edge to prevent soiling of the mattress by contact with the user of the article of improved institutional bedding construction, and a foot portion which is substantially coextensive with the top of the foot portion of the mattress the elongated portions being formed as a second pair of edges substantially contiguous with and between said pair of edges and the foot portion;

(b) a top sheet of cloth material substantially coextensive with the bottom sheet, the top sheet being joined along the edges of its foot portion with the edges of the foot portion of the bottom sheet to form a bag for the user's feet; and  
(c) a pair of elastic loops sewn into the bottom and side edges of the top and bottom sheets so as to be disposed in a diagonal fashion across the corners thereof for elastic engagement with the corners of the foot of the mattress to secure the bag portion of the sleeping bag in conformal engagement with the corners at the head of the mattress into more intimate engagement therewith.

4,680,822  
BEDDING INCORPORATING FAR INFRARED  
RADIATOR

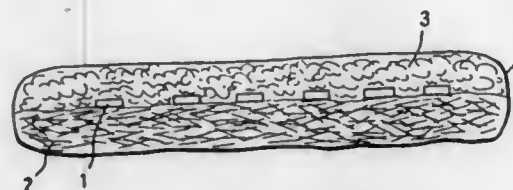
Yakio Fujino, Tokyo, and Morihiro Kabaya, Yokosuka, both of Japan, assignors to Nishikawa Sangyo Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,978

Claims priority, application Japan, Mar. 20, 1985, 60-57294  
Int. Cl.<sup>4</sup> A47C 21/04; A47G 9/00

U.S. Cl. 5-421

2 Claims



1. A bedding item comprising a far infrared wave radiating material therein, which material, when warmed up to approximately 36° C. by human body heat, radiates electromagnetic waves with a peak wavelength of from 8 to 14  $\mu$ m.

4,680,823  
METHOD OF MAKING A SELF-LOCKING BLIND  
FASTENER

Harvey P. Jeal, Stevenage, England, assignor to Avdel Limited, Hertfordshire, England

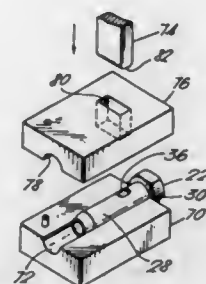
Filed Feb. 22, 1985, Ser. No. 704,207

Claims priority, application United Kingdom, Mar. 14, 1984, 8406710

Int. Cl.<sup>4</sup> B21D 53/24

U.S. Cl. 10-86 A

5 Claims



1. A method of making a self locking blind fastener having a nut including an enlarged head and a tubular shank, said tubular shank being internally threaded and having an inwardly depressed zone which extend over only a single minor circumferential sector of said shank and provide a protuberant zone of said internal threads for resisting movement of a bolt threaded in said shank, said method comprising the steps of:

supporting said shank in a nest having an aperture and a cavity, at least a portion of said cavity which is circumferentially opposite said aperture having a profile complementary to that of said shank;

providing said shank in said nest with a longitudinal bending prestress opposite that imparted on said shank by a punch pressing step; and forming a depressed zone in a punch pressing step by introducing a punch through said aperture and pressing a face of said punch against said shank by a degree sufficient to depress the material of said shank.

4,680,824  
FLEXIBLE GUN-BORE CLEANING IMPLEMENT WITH  
ROTATABLE PUSHER END

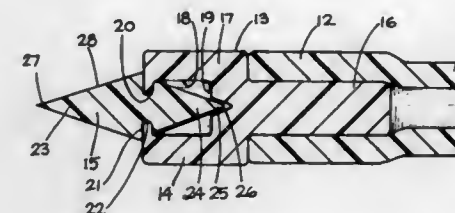
Nathan S. Lieptz, 23506 Beachwood Blvd., Beachwood, Ohio 44122

Filed Mar. 6, 1986, Ser. No. 836,728

Int. Cl.<sup>4</sup> F41C 31/00

U.S. Cl. 15-104.165

5 Claims



1. In a bore-cleaning implement for an air rifle, the combination of: a longitudinally-extending non-metallic flexible tubular body having a manual gripping means mounted at the trailing end thereof and a pusher assembly mounted on the leading end thereof, said pusher assembly having a rotatable front part adapted to engage a compressible cleaning pellet positioned in the bore of said air rifle and to push the pellet through said bore and having a rear part secured to said tubular body, said front part having an axially-elongated generally conical pellet-engaging portion at its forward end and being mounted for axial rotation relative to the longitudinal axis of said body in response to rifling-induced rotation as said cleaning pellet is pushed axially through said bore, the outer surface of said conical portion diverging from the front to the rear, whereby the trailing portion of said pellet is compacted and compressed by engagement with said conical portion to a greater extent than the leading portion of said pellet.

4,680,825  
PRESSURE-SENSING TOOTHBRUSH HOLDER

Larry White, 111 W. Clinton, Hobbs, N. Mex. 88240, and Luis Ingels, 242 S. Irwindale, Azusa, Calif. 91702

Filed Sep. 10, 1985, Ser. No. 774,450

Int. Cl.<sup>4</sup> A47B 9/04

U.S. Cl. 15-105

18 Claims



1. A device for indicating that a force being applied by a toothbrush against teeth exceeds a variable, preset value, including holding means for holding a toothbrush to allow manual application of force of the toothbrush, adjustment means for adjustably presetting the amount of force required to be applied to the toothbrush to cause pivoting motion, sensing means for sensing said pivoting motion of the toothbrush when said preset amount of force is applied to said toothbrush, and

indicator means for indicating when said sensing means said pivoting motion, wherein the improvement comprises: said holding means consisting of a single holder, said holder having a friction surface and a rib for supporting the toothbrush; and said adjustment means, sensing means and indicator means being included in said holder.

4,680,826  
FLOOR WIPER FRAME

Roland Schunter, Lorch-Waldhausen, Fed. Rep. of Germany, assignor to Floordress Reinigungsgeraete, Lorch-Waldhausen, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,132

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432685

Int. Cl.<sup>4</sup> A47L 13/258

U.S. Cl. 15-147 R

12 Claims



1. In a frame for a floor wiper comprising a flat frame shape equipped with a handle socket which frame shape is formed by two frame portions which are pivotal with respect to each other and adapted to be locked in their fully extended position by means of a holding magnet locking means, the improvement consisting of a pedal disposed on one of said two frame portions having an extension engaging the other of said two frame portions, which pedal is moveable in the direction of separation of said two frame portions whereby said holding magnet locking means is disengaged.

4,680,827  
VACUUM CLEANER

Karl Hummel, Stuttgart, Fed. Rep. of Germany, assignor to Interlava AG, Lugano, Switzerland

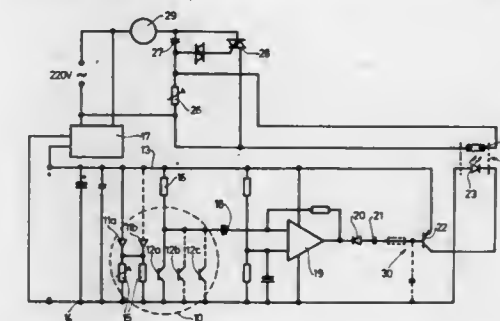
Filed Dec. 30, 1985, Ser. No. 814,545

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534621

Int. Cl.<sup>4</sup> A47L 9/28

U.S. Cl. 15-319

4 Claims



1. A vacuum cleaner comprising a housing, a blower within said housing for creating the vacuum, a motor connected to said blower for driving said blower, a control circuit connected to said motor for controlling the operation thereof in response to a control signal, a suction channel extending from said blower to the exterior of said housing to provide a path for the movement of material picked up by said vacuum cleaner, at least a light transmitter and a light receiver in said suction channel positioned so that the material will pass between said light transmitter and receiver, and sensing means connected to



said receiver and said control circuit for sensing changes in the light transmission characteristics between said transmitter and receiver due to the material passing therebetween and for producing a control signal proportional thereto; characterized in that said sensing means includes a control light transmitter at the output thereof, and a light-sensitive resistor connected in circuit with said control circuit and responsive to changes in the light produced by said control light transmitter to vary the power applied to said motor.

4,680,828

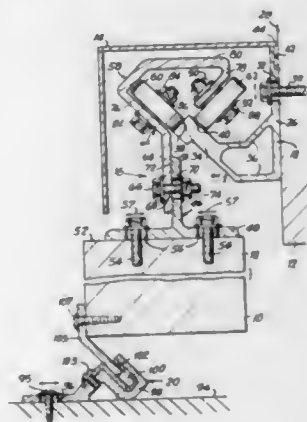
# HARDWARE FOR MOUNTING A SLIDING DOOR PANEL

Sanford L. Cook, and David Kirkup, both of Ocean, N.J., assignors to Standard-Kell Hardware Manufacturing Co., Allentown, N.J.

Continuation-in-part of Ser. No. 595,887, Apr. 2, 1984, abandoned. This application Jul. 24, 1985, Ser. No. 758,606  
Int. Cl.<sup>4</sup> E05D 15/08

U.S. Cl. 16—90

22 Claims



1. Mounting hardware for supporting a door panel for sliding movement across a door opening in a structure, the mounting hardware comprising:

an elongated track for attachment above a door opening in a structure, the track comprising first, out-ward-facing, and second running surfaces which are oriented at right angles one to the other, the running surfaces being at an angle of less than 90° to the horizontal when the track is attached to the structure;

at least two trolley assemblies each comprising a frame and a pair of trolley wheels, the frame supporting the trolley wheels for rotation about mutually perpendicular axes so that the rolling surface of each trolley wheel is in rolling contact with one of the running surfaces of the track, the trolley frame comprising an integral body having a substantially vertical, downwardly-extending dependent portion for supporting the door panel, an outward-extending portion on and extending upward from the dependent portion for supporting on its upward, inwardly-facing side, one of the trolley wheels in position to contact the first outward-facing running surface of the track, an intermediate portion fastened to the outward-extending portion and extending completely across the track, and a downward-extending portion on and extending inwardly from the intermediate portion which supports the other trolley wheel in position to contact the second running surface of the track.

4,680,829

# HOLLOW SHEET METAL UTENSIL HANDLE FASTENING ASSEMBLY

Rolf Baumgarten, Neunkirchen-Wiederstein, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG, Neunkirchen, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 806,154  
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 8436478[U]

Int. Cl.<sup>4</sup> B25G 3/26, 3/30

U.S. Cl. 16—114 A

8 Claims



1. In a handle assembly for facilitating a fastening of a hollow sheet metal handle to the side wall of a utensil, the improvement comprising a welding bolt adapted to be weldably secured to the side wall of the utensil and project outwardly therefrom, said welding bolt having a polygonal cross section and an internally threaded bore in a contact surface on said welding bolt facing away from the utensil, the axis of said bore extending transversely of the side wall of the utensil, a sheet metal shaped part and welding means for fixedly attaching said sheet metal shaped part to said sheet metal handle, said sheet metal shaped part having a means defining a recess having a shape conforming to the shape of said welding bolt and adapted to receive said welding bolt therein, said sheet metal shaped part also having at least two plates forming extensions of at least two walls of said means defining a recess, said plates extending toward the side wall of said utensil and straddling said welding bolt, said recess means having a bottom wall with an opening therethrough, a fastening screw received through said opening and threadedly engaged with said internally threaded bore, so that upon a tightening of said screw, a securement of said sheet metal handle to the side wall of said utensil will be effected, said screw effecting a drawing of said bottom wall of said recess means into engagement with said contact surface to thereby prevent said plates and said sheet metal handle from engaging the side wall of said utensil with an undue amount of force to cause deformation of the utensil wall.

4,680,830

# FURNITURE HINGE HAVING AN INTERMEDIATE MOUNTING MEMBER AND A SEPARATE DISENGAGING MECHANISM

Erich Röck, Höchst; Helmut Rupprechter, and Klaus Brüstle, both of Lauterach, all of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

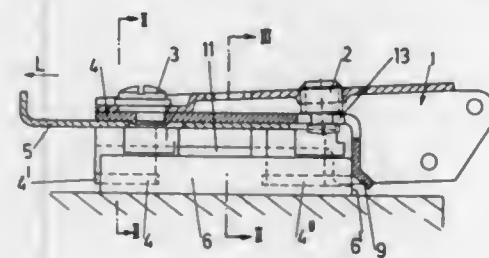
Filed Oct. 3, 1985, Ser. No. 783,638

Claims priority, application Austria, Oct. 19, 1984, 3340/84

Int. Cl.<sup>4</sup> E05D 7/06

U.S. Cl. 16—241

7 Claims



1. A furniture hinge comprising:

a mounting plate to be mounted on a wall of an article of furniture, said mounting plate having an inner side to face the furniture wall, an outer side to be directed away from the furniture wall, and opposite lateral sides having outwardly facing grooves therein;

a hinge arm having a U-shaped profile and to be connected to a door of the article of furniture;

an intermediate member for mounting said hinge arm on said mounting plate, said intermediate member being connected to said hinge arm by means of an adjustment element for adjusting the spacing between said hinge arm and said mounting plate and by means of an adjustment member for adjusting the position of said hinge arm relative to said mounting plate in a longitudinal direction parallel to said lateral sides;

said intermediate member being formed of sheet steel and having integral resilient side clamp portions, such that said hinge arm and said intermediate member may be manually pushed in a direction toward said outer side of said mounting plate and said clamp portions resiliently snap into and engage in said grooves with said intermediate member including said clamp portions embracing said mounting plate; and

separate spreading means mounted on said intermediate member for relative movement therebetween for spreading said clamp portions apart and disengaging said clamp portions from said grooves such that said intermediate member and said hinge arm may be released from said mounting plate.

4,680,831

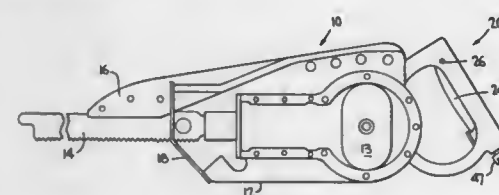
# POWER TOOL DEVICE

Timothy Hogan, 154 Kingsdale Rd., Suffolk, Va. 23434  
Filed Jul. 30, 1985, Ser. No. 760,591

Int. Cl.<sup>4</sup> A22B 5/20

U.S. Cl. 17—23

1 Claim



1. A power tool device comprising a housing, a rotary motor within the housing which is capable of driving a reciprocating type saw blade, a reciprocable saw blade operatively connected to the motor and extending from the housing, a handgrip having a contoured exterior which extends from the housing opposite from the blade, the handgrip being generally in the shape of a D with one straight portion and curved portion attached to the ends of the straight portion, the handgrip containing a snap type switch for actuating the motor and thus reciprocating the saw blade, the switch comprising first and second electrical contacts which are biased away from contacting each other, and a metallic switch housing containing the contacts, the switch housing being surrounded by electrically insulating flexible sheathing and including a planar base portion and a cover portion including a hinged dome-shaped member having an arm which under applied mechanical pressure is capable of moving the second electrical contact into electrical contact with the first contact, the second contact being of a complex shape having a bight-shaped portion and having a contact point, the second contact being mounted on the base portion of the housing such that the bight-shaped portion is biased higher relative to the base portion than the contact point, the handgrip having a switch chamber which contains the switch and has an opening on the exterior of the handgrip of sufficient size to remove the switch, the switch chamber being within the straight portion of the handgrip, a cover plate closing the opening of the switch chamber and removably attached to the handgrip by screws, the switch

chamber being formed such that its surfaces containing threaded holes for the screws are recessed a distance equal to the thickness of the cover plate such that the external surface of the cover plate is flush with the exterior of the handgrip, electrical wires extending from the switch through an aperture in the handgrip and secured thereto by a cooperating fitting and cap, and a trigger pivotally mounted by a pin within a slot in the handgrip, the trigger biased by a spring and including an actuator contacting the switch and capable of closing the electrical contacts by a mechanical pressure.

4,680,832

# MEAT TENDERIZING NEEDLE

Jacobus J. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Oct. 6, 1986, Ser. No. 915,378

Int. Cl.<sup>4</sup> A22C 9/00

U.S. Cl. 17—25

4 Claims



1. A meat tenderizing needle comprising an elongated body which is circular in cross-section, said body having a distal end and a proximal end, said distal end of said body being sharpened to provide first and second side faces which converge and meet at a first cutting edge, and a third side face which is located centrally of the width of the first side face and which is inclined so as to intersect the second side face at a point spaced from the first cutting edge to form a pair of tangs which are separated by a notch, said notch having a root edge forming a cutting edge toward which sinew in the meat which is being penetrated by the needle will be guided by the notch to be cut by the cutting edge rather than merely deflected out of the path of the needle.

4,680,833

# DRAWING APPARATUS

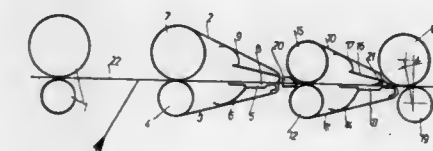
Dinko A. Bahov, Gabrovo, and Hristo A. Bahov, Stara Zagora, both of Bulgaria, assignors to NPK "Textiling Maschinostroene", Gabrovo, Bulgaria

Filed May 9, 1986, Ser. No. 861,497

Int. Cl.<sup>4</sup> D01H 5/86

U.S. Cl. 19—244

2 Claims



1. A roving and sliver drafting apparatus, comprising:  
a pair of input drafting rollers receiving a roving to be drawn between them;  
a first pair of drafting aprons each comprising an endless band passing over a respective roller disposed downstream of said input drafting rollers and receiving said roving from said input drafting rollers;  
a further pair of drafting aprons each comprising an endless band passing over a respective roller disposed downstream of said first pair of drafting aprons and receiving said roving from said first pair of drafting rollers, said

bands of said further pair of drafting rollers forming an upper and a lower band having downstream ends at which said roving emerges; and

a pair of output drafting rollers downstream of said further pair of drafting aprons and receiving the roving emerging from said downstream end, said pair of output drafting rollers including a lower drafting roller having an axis, and an upper drafting roller having an axis, said axis of said upper drafting roller being offset angularly about said axis of said lower roller toward said further pair of drafting aprons from a position in which said axes are coplanar and lie in a plane perpendicular to a drafting plane defined by said pair of input drafting rollers and said pairs of drafting aprons to cause said upper drafting roller to overhang said downstream end of said lower band.

#### 4,680,834 CABLE TIE

Guy Andre, Seyssinet-Pariset; Robert Gullin, Grenoble, and Gaetan Daloia, Echiroles, all of France, assignors to A. Raymond, Lorrach, Fed. Rep. of Germany

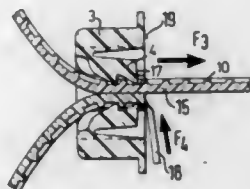
Filed Jul. 15, 1986, Ser. No. 885,777

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1985, 3525351

Int. Cl.<sup>4</sup> B65D 63/00

U.S. Cl. 24—16 PB

5 Claims



1. A cable tie comprising a tightening strap of indeterminate length having a plurality of transverse ribs on at least one longitudinal surface thereof and a separate locking piece having a housing, an orifice in the housing through which two ends of the tightening strap can pass, and locking means projecting into the orifice from opposite sides of the housing for interacting with the transverse ribs, each of said locking means having at least one engaging tooth that operates in a first locking direction for engaging a rib of one end of the strap and preventing it, when engaged with a tooth, from passing through the orifice in the opposite direction, the gap between the teeth being larger than the thickness of the strap, but smaller than double the strap thickness less the height of a rib, with at least one of said locking means being resiliently connected to the housing so that it can flex open to permit one end of the strap to pass through the orifice in said first direction but will spring back to engage its tooth with a rib of the strap to prevent it from passing back in said opposite direction.

#### 4,680,835

##### SPORT SHOE LACING DEVICE

Sheng-Chong Horng, No. 590-2, Chung Cheng Road, Tsao Tun Chen, Nan Tou, Taiwan

Filed Apr. 30, 1986, Ser. No. 857,342

Int. Cl.<sup>4</sup> A43C 7/00

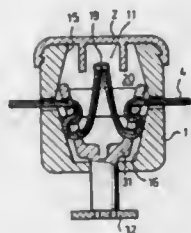
U.S. Cl. 24—117

3 Claims

1. A shoelace lacing device comprising a housing having a central hollow space contained within a rear face, front face, top face and side faces of said housing, a notch being on the rear face of housing, the front face of said housing and side faces of said housing each being provided with an oval-shaped hole, a square hole being provided at a rear end of each side face of said housing, said central hollow space being hexagonally-shaped so as to form front and rear inclined edges, respectively, the surfaces of said front inclined edges being treaded,

the top face of said housing having a fastening seat and a oval-shaped hole to clamp the shoelace;

a fastener body which is a bow-shaped element with two ends and an inner surface, one hook being at the inner surface of each end of the fastener such that each hook is exactly fixed to each of said square holes of the housing, and two parallel plates extending into the central region of the fastener body;



a Y-shaped piece comprising a base and extending from said base are elastic tips having holes along the surface of tips for the passage of lace, tiny protrusions extending from the base of the Y-shaped element such that said tiny protrusions can be engaged with a horizontal plate for pressing said Y-shaped pieces.

#### 4,680,836

##### ONE-PIECE PLASTICS FASTENER

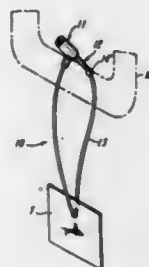
David R. Wisecup, Xenia, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Dec. 23, 1985, Ser. No. 812,539

Int. Cl.<sup>4</sup> B65D 33/34

U.S. Cl. 24—150 FP

5 Claims



1. A one-piece fastener composed of flexible, molded, plastics material, the fastener comprising a socket, a head and a flexible filament connected at its one end to the socket and at its other end to the head, the socket having a passage through, the socket having opposite first and second ends, the head being insertable into the passage from either end of the socket, the socket having flexible resilient prongs disposed in the passage for non-releasably gripping the head when inserted through the first end and adapted to releasably grip the head in the event the head could be inserted through the second end to a sufficient depth, and means on the head and contactable with the socket for limiting the depth to which the head can be inserted through the second end of the socket to prevent the head from being releasably engaged with the prongs.

#### 4,680,837

##### PLASTIC SWIVEL CONNECTOR AND MOLD THEREFOR

Leon Robinstein, 9 Fox Hill Dr., Natick, Mass. 01760

Filed Dec. 23, 1985, Ser. No. 816,101

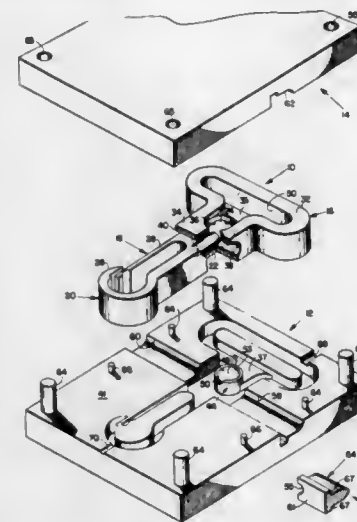
Int. Cl.<sup>4</sup> A44B 13/00

U.S. Cl. 24—237

15 Claims

1. A swivel connector comprising two major parts that are

injection molded of plastic in a one-shot injection molding process such that said major parts, within limits can't be pulled apart but are free to rotate with respect to one another, one of said major parts including a clip for releasably attaching to a ring and the other of said major parts including portions which define a other of said major parts including portions which define a loop for attachment to a strap or the like, said one major part further including a neck that extends from said clip and terminates in a head at one end of said one major part and wherein said other major part includes other portions which define an interior space in which said head and portions of said neck are formed during the injection molding process, said



interior space of said second major part opening to the exterior of said second major part along an axis in one direction to provide access for the formation of said head and along another direction, different from said one direction, to provide access for the formation of at least part of said neck where said neck and said head join, said second major part having a generally flat parallelepiped shape with a cylindrical bore extending through the largest opposed sides thereof along said axis in said one direction and a recessed slot in an edge thereof extending along said other direction, said slot and said bore being arranged so that they intersect one another to define said interior space of said second major part.

#### 4,680,838

##### DEVICE FOR DETACHABLY CONNECTING TWO ELEMENTS

Franz Astl, A-6345 Kössen, Tyrol, Austria

PCT No. PCT/AT81/00002, § 371 Date Oct. 9, 1981, § 102(e)

Date Oct. 9, 1981, PCT Pub. No. WO81/02332, PCT Pub.

Date Aug. 20, 1981

Continuation of Ser. No. 314,075, Oct. 9, 1981, abandoned. This

PCT application Feb. 12, 1981, Ser. No. 600,212

Claims priority, application Austria, Feb. 12, 1980, 749/80

Int. Cl.<sup>4</sup> A44B 18/00

U.S. Cl. 24—442

19 Claims

1. In a releasable connecting appliance:

a female part forming a hole defined by an inner surface;

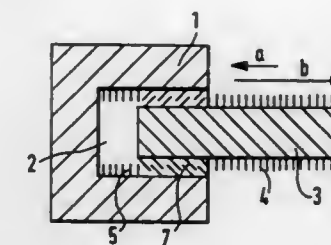
a male part defined by an outer surface adapted for movement from a disengaged position in a predetermined direction in said hole to assume an engaged position;

each of said surfaces having an area extending at least partly parallel to said direction, at least a portion of said area of each of said surfaces being uneven as to show elevations and depressions;

a layer of adjacently arranged elastic fiber elements in at least one of said surfaces, the peaks of said fiber elements forming the elevations in said at least one of said areas;

the length of said fiber elements on at least one surface being

greater than the spacing between the depressions on said at least one surface and the elevations of the other surface; said fiber elements being straight over their entire length and free of hook-like recesses on their surface for interengagement with said surface;



whereby during insertion of said male part into said female part a bending force has to be overcome to bring said fiber elements from their normal position relative to the direction of insertion to an inclined position in the direction of insertion; and said elastic fiber elements resisting a movement in the opposite direction.

#### 4,680,839

##### LINK CHAIN, ESPECIALLY A TENTERING CHAIN

Hans Cramer, Aachen, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

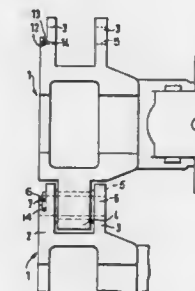
Filed Aug. 16, 1985, Ser. No. 766,898

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510856

Int. Cl.<sup>4</sup> D06C 3/02

U.S. Cl. 26—89

6 Claims



1. A link for a chain, comprising a link body, a pair of connecting lugs (2, 3) projecting from one end of said link body, a connecting tongue (4) projecting from an opposite end of said link body, a spacing between said connecting lugs for receiving a connecting tongue of a neighboring link body, axially aligned holes in said connecting lugs and in said connecting tongue, a cylindrical connecting pin having a uniform diameter throughout its length extending through said axially aligned holes, said cylindrical connection pin having an end portion projecting laterally and axially outwardly from an outer wall surface of one of said connecting lugs, said end portion of said cylindrical connecting pin having a radial through-bore (7), a two-pronged locking spring (9) having a first prong (8) extending through said through-bore, and a second prong (10) engaging said cylindrical connecting pin, said first prong (8) having a first straight prong end (15) and a second prong end (15') angled away from said second prong (10), both prong ends extending out of said radial through-bore (7), said one connecting lug having a lateral outwardly extending shoulder (14), a groove (13) in said shoulder (14) extending in parallel to said outer wall surface for receiving said first and second prong ends, a groove bottom (12) in said groove (13), said first prong (8) extending at an angle to said groove bottom, said groove



(13) having such a depth that said first straight prong end and said second angled prong end of said first prong (8) rest against said groove bottom for securely holding said locking spring in a pin locking position and for preventing any axial movement of said cylindrical connecting pin.

4,680,840

# METHOD FOR PREPOLARIZING AND CENTERING A PIEZOCERAMIC POWER SWITCHING DEVICE

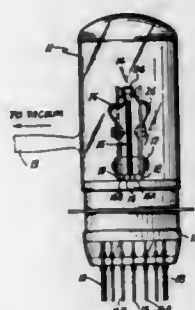
John D. Haraden, Jr., Schenectady; William P. Kornumpf, Albany, and George A. Farrall, Rexford, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.  
Division of Ser. No. 685,108, Dec. 21, 1984, abandoned. This application Mar. 14, 1986, Ser. No. 839,768

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> H01L 41/22

U.S. Cl. 29—25.35

1 Claim



1. The method of prepolarizing and centering the movable piezoceramic bender member of a piezoceramic bender-type switching device contained within a protective gastight enclosure which comprises substantially completing the fabrication assembly of all of the major components of the piezoceramic switching device into a unitary structure mounted within the protective gastight enclosure and sealed closed, applying a relatively high value prepolarization potential to the respective piezoceramic plate elements of the bender member while maintaining the plate elements near their Curie temperature to achieve dipole alignment of the dipoles of the piezoceramic material and simultaneously adjusting the relative magnitudes of the prepolarizing potential applied to the respective piezoceramic plate elements of the bender member to cause it to precisely position the movable switch contacts mounted thereon relative to fixed load current switch contacts of the switching device.

4,680,841

# ELECTRICAL HARNESS FABRICATION APPARATUS

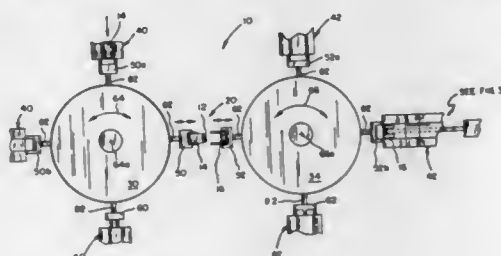
Thomas E. Schneider, Burbank; Clarence Kolanowski, La-Grange, and Richard L. Patterson, Riverside, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 17, 1985, Ser. No. 745,171

Int. Cl.<sup>4</sup> H01R 43/04

U.S. Cl. 29—33 M

16 Claims



1. In an apparatus for mass terminating a plurality of insu-

lated electrical conductors to an electrical connector having insulation displacing terminals, by inserting said conductors in corresponding terminals, said apparatus including

a termination station,  
a loading station remote from said termination station,  
a turret mounted between said loading and said termination stations for stepped rotation,  
a first connector holder mounted to said turret adapted to receive said connector,  
means at the loading station for loading said connector one-at-a-time in said first connector holder,  
means for rotating the turret so that the first connector holder is moved from the loading station to the termination station,  
means for feeding said plurality of electrical conductors to the termination station at a position immediately adjacent and aligned with said connector terminals,  
terminator means for inserting said conductors in said terminals to form a cable harness, and  
means for ejecting said cable harness from said termination station,  
the improvement comprising:  
a flat, multiconductor cable including said conductors;  
said electrical connector including two mating parts, with said cable being terminated between said two connector parts;  
said loading means being operable to load a first connector part in said first connector holder;  
a second turret mounted adjacent said termination station for selective stepped rotation;  
a second connector holder disposed on said second turret adapted to receive a second connector part;  
a second loading station remote from said termination station;  
means at the second loading station for loading said second connector part one-at-a-time in said second connector holder;  
means for rotating the second turret so that the second connector holder is moved from the second loading station to the termination station to align said first and said second connector parts in an opposed spaced-apart relationship;  
said conductor feeding means is operable to selectively advance a predetermined portion of said cable between said first and said second connector parts; and  
said termination means including means for compressing said first and second connector parts together in mating relationship to mass terminate said cable therebetween; whereby a continuous succession of mating connector parts can be terminated to a continuous length of cable to form at least one cable harness.

4,680,842

# MULTIPLE PART SIMULTANEOUS FORMING APPARATUS

William D. Moyer, Palatine, Ill., assignor to Automation Associates, Inc., Arlington Heights, Ill.

Filed Aug. 15, 1985, Ser. No. 765,844

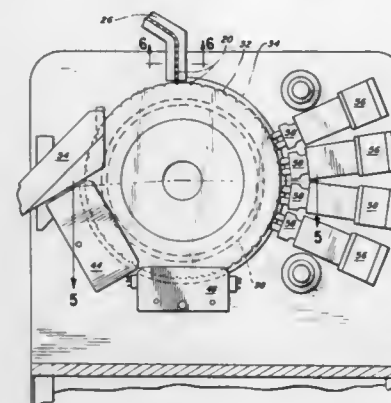
Int. Cl.<sup>4</sup> B23Q 3/00

U.S. Cl. 29—33 P

16 Claims

1. An apparatus for simultaneously working a plurality of workpieces, comprising:  
a support wheel defining a rotary axis and a periphery;  
means for rotatably indexing said support wheel in preselected angular steps about said axis;  
receiving means on said support wheel periphery for receiving one each said workpieces in similar orientation;  
retaining means for fixedly retaining said workpieces in said receiving means;  
first working means for simultaneously similarly first working a first worked portion of each of a preselected plurality of the workpieces retained in said receiving means, said

plurality corresponding in number to one of said angular steps, to define a plurality of partially worked workpieces; sensing means for simultaneously sensing the condition of the first worked portion of each of the worked workpieces and preventing further indexing of said support wheel in the event an undesirable condition of the first worked portion of any one of the workpieces is sensed;



second working means for further working the first worked portion of each of said workpieces subsequent to sensing of the condition thereof by said sensing means; and means for delivering serially the further worked workpieces from said receiving means.

4,680,843

# APPARATUS FOR ROTATING THE SHELLS OF ROLLS IN CALENDERS OR THE LIKE

Dieter Junk, Kreuztal, and Richard Rauf, Krefeld, both of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

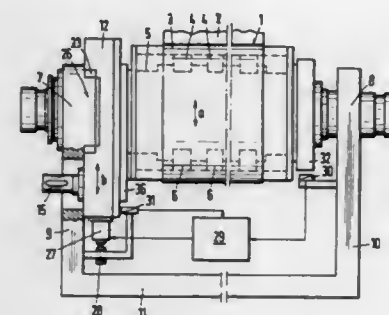
Filed Sep. 9, 1986, Ser. No. 905,671

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532843

Int. Cl.<sup>4</sup> B21B 13/02; B05C 1/08

U.S. Cl. 29—116 R

19 Claims



1. In a roll assembly the combination of an elongated carrier; a cylindrical shell spacedly surrounding and movable radially of said carrier; and drive means for rotating said shell, including a housing which is movable relative to said carrier in a substantially radial direction of said shell, a driven rotary element journaled in said housing and arranged to transmit torque to said shell, signal generating means for monitoring the radial position of said shell, and means for adjusting the position of said housing relative to said carrier in response to signals from said monitoring means.

4,680,844

# METHOD OF MANUFACTURING A ROTOR

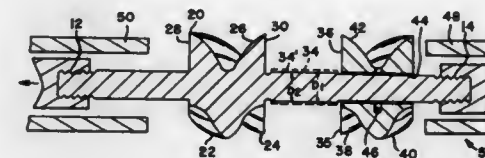
James W. Rupp, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 23, 1985, Ser. No. 812,610

Int. Cl.<sup>4</sup> B23P 15/00; B21D 39/00

U.S. Cl. 29—156.4 R

7 Claims



1. A method of manufacturing a rotor for use in an air motor comprising the step of:

placing a shaft having a first end and a second end in a fixture, said shaft having a first section with a series of spiral grooves which extend from a first face to a second face, said first and second faces being located in parallel radial planes which are substantially perpendicular to the axis of said shaft, said shaft having a second and third section located between said first section and said second end, said second section having a larger diameter than said third section;  
sliding a ring on said third section, said ring having a peripheral surface with a second series of spiral grooves that extend from a third face to a fourth face, said ring having an inner diameter that is greater than said third section but less than said second section;  
pulling on said first and second ends causing said shaft to expand axially while being radially compressed until the diameter of said second section substantially equals the inner diameter of said ring;  
pushing said ring into said second section until said third face engages said second face; and  
releasing said first and second ends to allow said shaft to axially contract and radially expand to produce a first locking connection between said inner diameter and said second section such that said first and second spiral grooves form a herringbone pattern for said rotor.

4,680,845

# METHOD OF MANUFACTURING LATERAL HEADER EXTENSIONS

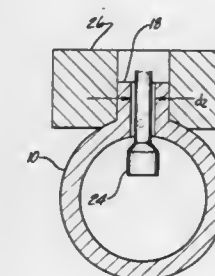
Donald E. Miller, Adrian, Mich., assignor to Brazeway, Inc., Adrian, Mich.

Filed Jan. 31, 1986, Ser. No. 824,667

Int. Cl.<sup>4</sup> B21D 53/00

U.S. Cl. 29—157 R

6 Claims



1. A method of raising a hollow lateral extension on a header tube comprising the steps of:

(a) inserting a tool of working diameter  $d_1$  through the extension and into the header tube;  
(b) mechanically deforming the extension to a reduced inner diameter  $d_2$ , which is less than  $d_1$ ; and

(c) while maintaining the outer diameter of the extension withdrawing the tool through the extension to restore the inner diameter to  $d_1$  by lengthening and reducing the wall thickness of the extension.

4,680,846

# MATERIAL SAVING METHOD FOR TRUING TRACK WHEELS

Herbert Feldewert, Erkelenz, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheldt GmbH, Erkelenz, Fed. Rep. of Germany

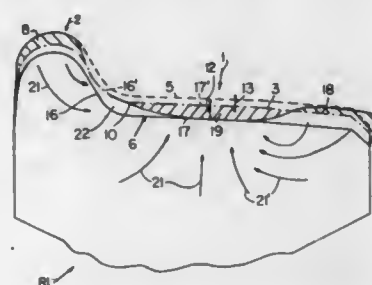
Filed May 2, 1986, Ser. No. 859,039

Claims priority, application European Pat. Off., May 17, 1985, 85106088.9

Int. Cl.<sup>4</sup> B21H 1/04

U.S. Cl. 29-168

9 Claims



1. A method for making a restored track wheel by restoring a worn track wheel having a worn peripheral profile with a tread section and with a flange section, so that the restored track wheel will have a restored peripheral profile, comprising the following steps: ascertaining on said worn peripheral profile first worn zones of lesser wear, ascertaining on said worn profile second worn zones of higher wear, subjecting only said first zones of lesser wear to a material displacing deformation for forcing material out of said first zones into said second zones for forming a partially restored profile, determining on said partially restored profile locations requiring a material removal by a truing operation for producing said restored profile, and performing a material removing truing operation on said determined locations for obtaining said restored profile, whereby the quantity of material to be removed by said truing operation is minimized.

4,680,847

# METHOD OF PRODUCING A SPRING PLATE

Friedrich Baner, Vienna, Austria, assignor to ENFO Grundlagenforschungs AG, Döttingen, Switzerland

Division of Ser. No. 664,969, Oct. 26, 1984, abandoned. This application May 5, 1986, Ser. No. 859,697

Claims priority, application Austria, Oct. 31, 1983, 3856/83

Int. Cl.<sup>4</sup> B21D 53/00

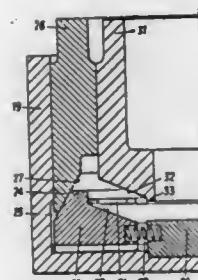
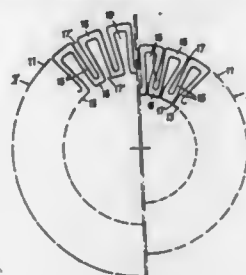
U.S. Cl. 29-173

3 Claims

1. A method of producing a spring plate which comprises the sequential steps of

- (1) providing a flat plate made of a spring-plate material, said flat plate having a predetermined thickness,
- (2) punching an annular rough plate from said flat plate, said rough plate being defined by generally radially-extending webs having inner ends and outer ends, inner bridges connecting the inner ends of alternating pairs of said webs and outer bridges connecting the outer ends of the alternating pairs of said webs whose inner ends are unconnected, the inner bridges providing an inner edge for the rough plate and the outer bridges forming an outer peripheral edge for the rough plate, said inner and outer bridges and said webs providing a meander configuration to said rough plate, said rough plate defining an imaginary plane and an imaginary center, and
- (3) deforming said rough plate by engaging the outer periph-

eral edge and radially pressing thereon toward said imaginary center and compressing said rough plate along said imaginary plane until spacings between the outer ends of



said webs and spacings between the inner ends of said webs are at least 10% less than said predetermined thickness, thus forming said spring plate.

4,680,848

# PIPE TAPPING TOOL

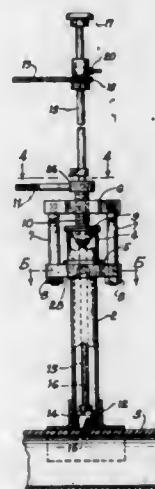
Erwin P. Goldner, 2727 Felton St., San Diego, Calif. 92104

Filed Nov. 25, 1985, Ser. No. 801,215

Int. Cl.<sup>4</sup> B23P 19/00

U.S. Cl. 29-213 R

6 Claims



1. A machine for safely cutting a hole in the wall of a pressure container within a duct having an end externally attached to said pressure container and the other end unattached and open which comprises:

- a clamp removably attached to said duct near the unattached end;
- a bracket placed outboard of said unattached end, structurally supported from said clamp;
- a hollow rod supported within said cavity and extending

from both directions, said support allowing rotation and axial motion of said rod;

a hollow shaft coaxial with said duct and rod, with an interior diameter commensurate with the exterior diameter of said rod and a threaded exterior supported by said bracket;

a seal backing plate with a threaded hole, threadably attached near one end of the exterior of said shaft proximate to said unattached end;

a conical seal attached to said backing plate, having an axial hole commensurate with the exterior diameter of said shaft, and a maximum exterior diameter larger than said unattached end, said seal being forced into said unattached end;

means attached to the end of said rod opposite said wall for cutting holes in said wall;

means to rotate and move said hollow rod axially;

said rod having a first fluid passage from the exterior of said rod to the hollow interior near said means for cutting holes, said first passage size being sufficient to vent or fill said duct to normal pressures within said container and a second fluid passage from the interior of said hollow rod to the exterior of said rod near the end of said rod opposite to said means for cutting holes, the size of said second passage size being similar to the size of said first passage; and

a means to control fluid flow in said fluid passages.

4,680,849

# APPARATUS FOR ASSEMBLING A BICYCLE FRAME

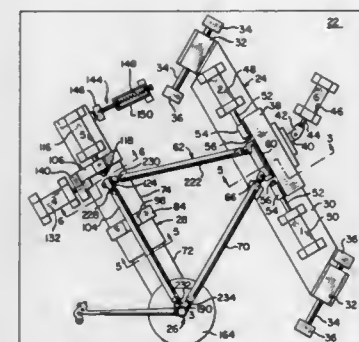
Robert L. Diekman, Dayton, Ohio, assignor to Huff Corporation, Dayton, Ohio

Filed Aug. 29, 1985, Ser. No. 770,801

Int. Cl.<sup>4</sup> B23P 19/02

U.S. Cl. 29-252

11 Claims



1. An apparatus for assembling a bicycle frame comprising:

a substantially flat base;

means for clamping a bottom bracket to said base, said clamping means defining a pivot axis oriented substantially perpendicularly to said base;

swing arm means attached to said base to pivot about said pivot axis;

means movable with said swing arm means for supporting a seat bracket on said swing arm means and displacing said seat bracket assembly along said swing arm means toward said pivot axis;

means mounted on said base for pivoting said swing arm means about said pivot axis;

carriage means displaceably mounted on said base for movement toward and away from said pivot axis and said swing arm;

means mounted on said carriage means for engaging and holding a head tube at a predetermined position on said carriage means; and

means mounted on said base for displacing said carriage means toward said pivot axis.

184-023 O.G.-87-2

4,680,850

# PROCESS FOR REMOVING THE WRAPPER FROM A FIBRE BUNDLE

Leonel Boncherie, Roeselare-Rumbeke, Belgium, assignor to Firma G.B. Boncherie, Belgium

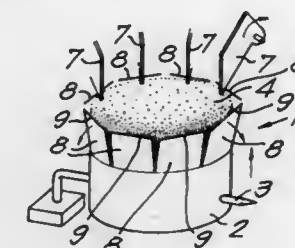
Filed Feb. 4, 1986, Ser. No. 826,952

Claims priority, application Belgium, Feb. 26, 1985, 2/60629

Int. Cl.<sup>4</sup> B23P 19/00

U.S. Cl. 29-426.3

11 Claims



1. Process for removing the wrapper from a fibre bundle, characterized thereby that it mainly consists in successively gripping the fibre bundle (1) at the wrapper (2), freeing the embraced bundle of fibres (4) over a determined length from said wrapper (2), gripping said bundle of fibres (4) at the freed part and removing said fibre bundle from said wrapper (2), and carrying said fibre bundle away to a suitable arrangement, while the empty wrapper (2) is carried away as waste.

4,680,851

# METHOD OF SETTING UP ROTARY SLITTER TOOLING

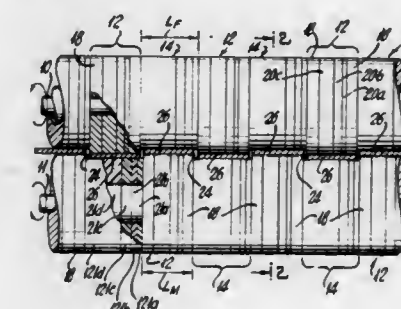
Gene A. Legg, Lumberport, W. Va., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Apr. 22, 1986, Ser. No. 855,530

Int. Cl.<sup>4</sup> B23P 19/04

U.S. Cl. 29-433

12 Claims



1. In a method of setting up tooling on two axially parallel driven rotary arbors for cutting plural parallel longitudinal slits on a web of sheet material advancing between the arbors in a direction transverse to the axes of the arbors, using a set of tooling comprising a multiplicity of circular tooling elements individually mountable on either arbor and including cutter elements and spacer elements, each tooling element of said set having a predetermined nominal axial length and an actual axial length deviating from its nominal length within a tolerance range of  $\pm t$ , where  $t$  is an absolute value of length, said method including the steps of

- (a) selecting a first group of said tooling elements from the set for mounting on a given axial portion of one of the arbors, and a second group of elements from the set for mounting on a corresponding axial portion of the other arbor in register with said given axial portion of said one arbor, such that the sum of the nominal axial lengths of the first-group elements equals the sum of the nominal axial lengths of the second-group elements plus a predeter-



- mined value K, said first group consisting of a predetermined number of elements and said second group consisting of a predetermined number of elements, and
- (b) mounting the first-group elements and the second-group elements respectively on the given portion of the one arbor and on the corresponding portion of the other arbor, the improvement which comprises
- (c) each of the tooling elements of the set being detectably identified with one of a plurality of defined, discrete, successive subranges of said tolerance range  $\pm t$ , in accordance with the sign and absolute magnitude of the deviation  $d_e$  between a measured value of actual axial length of the element and the nominal axial length of the element, said subranges being so defined that the value of  $d_e$  of any given element of the set lies within one of said subranges, and each element of the set being identified as aforesaid with that one of said subranges in which its value of  $d_e$  lies, and
- (d) the selecting step including selecting, as the elements of said first and second groups, elements identified as aforesaid with particular ones of said subranges such that the subranges with which the first-group elements are identified cumulatively balance the subranges with which the second-group elements are identified for limiting the difference D between the sum of the values  $d_e$  of the first-group elements and the sum of the values  $d_e$  of the second-group elements to a predetermined range of values of D.

4,680,852

## ROUND ELECTRICAL CABLE ADAPTING TOOL

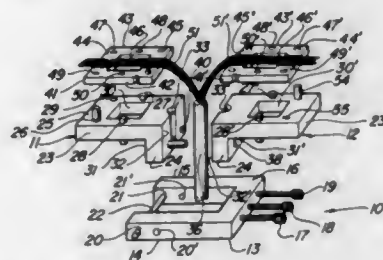
Anthony Centore, R.D. #5, Amsterdam, N.Y. 12010

Filed Jun. 26, 1986, Ser. No. 878,612

Int. Cl. H01R 43/28; B23P 19/00

U.S. Cl. 29-461

20 Claims



1. A tool effective to adapt an end of a round electrical cable having a plurality of individual conductor strands to a flat electrical cable for termination thereof comprising in combination:

- (a) clamping means to clamp and retain a round electrical cable therein,
- (b) a pair of grid frame means to support a plurality of said individual conductor strands in each frame means in a grid configuration with each grid comprising a series of closely spaced side by side parallel conductor strands,
- (c) holder means in said clamping means to support said pair of grid frame means in closely spaced parallel relationship with the conductor strands of one grid offset from and parallel to adjacent strands in the other grid,
- (d) anvil means in said clamping means, said anvil means oppositely abutting said grids and operative to press said grids towards each other to press the strands of the one grid between the strands of the other grid so that a single planar grid is defined in which all strands are coplanar,
- (e) means on said clamping means to remove said single grid from said clamping means as an integral unitary grid comprising an elongated flat section of closely spaced side by side parallel conductor strands capable of being treated as a flat electrical cable.

4,680,853

## PROCESS FOR MANUFACTURE OF HIGH POWER MOSFET WITH LATERALLY DISTRIBUTED HIGH CARRIER DENSITY BENEATH THE GATE OXIDE

Alexander Lidow, Manhattan Beach, and Thomas Herman, Redondo Beach, both of Calif., assignors to International Rectifier Corporation, El Segundo, Calif.

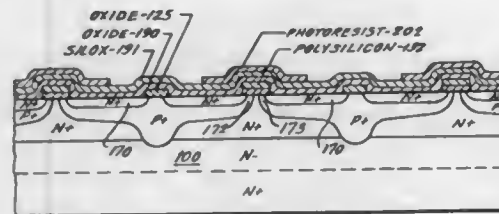
Division of Ser. No. 178,689, Aug. 18, 1980, Pat. No. 4,593,302.

This application May 30, 1986, Ser. No. 869,109

Int. Cl. H01L 21/425

U.S. Cl. 29-571

12 Claims



1. A process for fabricating a power semiconductor device, comprising the steps of:
- (a) providing a wafer having first and second layers, said first layer being of one conductivity type and having a greater resistivity than said second layer;
- (b) forming a plurality of spaced deep base regions by introducing into said first layer, through respective dopant windows, dopant of the opposite conductivity type, and thermally driving said dopant to substantially its full final depth in said first layer;
- (c) thereafter forming a common region between adjacent deep base regions by introducing a layer of dopant of said one conductivity type into said first layer and thermally driving said dopant to a depth less than said final depth of said opposite conductivity type dopant, whereby the doping concentration in said common region has a constant value laterally across the region of said first layer which contains said common region;
- (d) forming respective shallow base regions laterally around the respective lateral peripheries of said plurality of deep base regions and forming a respective source region within each of said respective shallow base regions;
- (e) providing a dielectric layer atop said common region and on adjacent portions of said shallow base and source regions;
- (f) providing a gate electrode atop said dielectric layer; and
- (g) contacting said source regions with electrically conductive material to form a source electrode.

4,680,854

## FORMING LOW RESISTIVITY HILLOCK FREE CONDUCTORS IN VLSI DEVICES

Vu Q. Ho, Kanata; Heinz J. Nentwich, Ottawa, both of Canada, and Hussein M. Naquib, Fremont, Calif., assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 24, 1985, Ser. No. 812,993

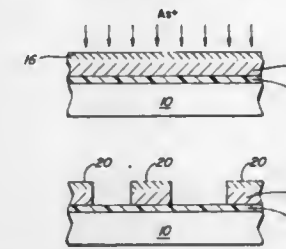
Int. Cl. H01L 21/263, 21/388

U.S. Cl. 29-576 B

6 Claims

1. In a method of semiconductor processing, fabricating a conductor by:
- depositing on a semiconductor wafer a first layer of aluminum or an aluminum-rich alloy;

depositing on the aluminum a second layer of refractory metal or refractory metal silicide; and



causing interface mixing at an interface between the two layers by implanting ions at said interface.

4,680,855

## ELECTRONIC DEVICE MANUFACTURING METHODS

Shunpei Yamazaki; Kenji Itoh, and Susumu Nagayama, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

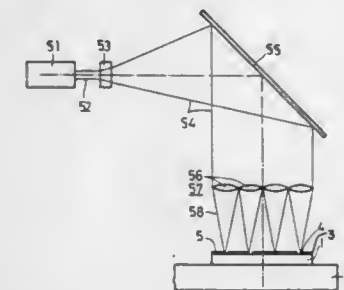
Filed Oct. 28, 1985, Ser. No. 791,733

Claims priority, application Japan, Oct. 29, 1984, 59-227498; Oct. 29, 1984, 59-227499

Int. Cl. H01L 21/302, 21/461

U.S. Cl. 29-583

18 Claims



9. A method for the manufacture of an electronic device which is provided with at least a patterned non-single-crystal semiconductor layer, comprising the steps of:
- forming a non-single-crystal semiconductor layer member; and
- exposing the non-single-crystal semiconductor layer member to irradiation by one or more linear pulsed laser beams having a wavelength of 400 nm or less and a duration of 50 nano-seconds or less and having optical energy greater than the optical band gap energy of the non-single-crystal semiconductor layer member, thereby forming the patterned non-single-crystal semiconductor layer.

4,680,856

## PROCESS FOR FORMING AN ACOUSTIC MONITORING DEVICE

Hugo Zaccarelli, Corso Roma, 35, 15059 Monleale (AL), Italy

Continuation of Ser. No. 591,714, Mar. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 313,027, Oct. 19, 1981, abandoned. This application Jan. 6, 1986, Ser. No. 816,211

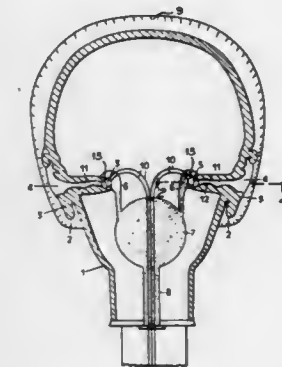
Int. Cl. H04R 31/00

U.S. Cl. 29-594

6 Claims

1. A process for forming an acoustic monitoring device shaped like a human head for sound sensing, said process comprising the steps of:
- (a) applying a first molding material to a human head to form a first mold thereof, such application being done in segments to provide said first mold in segments,
- (b) removing said first mold segments from the human head;
- (c) assembling said first mold segments to form a full head mold;

- (d) applying a second material to said full head mold to form a full head casting of the human head;
- (e) removing said full head casting from said full head mold;
- (f) applying a further molding material to said full head casting to form a second mold, such application being done in segments to provide said second mold in segments;
- (g) removing said second mold segments from said head casting;
- (h) applying to each of said second mold segments a liquid material dryable to a resilient solid material;
- (i) allowing the liquid material to dry to form a set of resilient casting segments of the human head;
- (j) providing within a human skull model a resilient member



- simulating the density, resiliency and consistency of the human brain of the human head;
- (k) forming within said human skull model a plurality of members simulating the cartilage, Eustachian tubes, nasal cavities and the oral cavity of the human head;
- (l) placing a pair of pressure-sensitive membranes within said skull model at positions simulating the auditory organs of the human head;
- (m) coupling said membranes to electrical connections by means responsive to pressure on said membranes, for generating electrical signals representing sensed pressures, including monitored acoustic pressures; and
- (n) transferring said set of resilient casting segments from said second mold segments to the exterior of said skull model to simulate the exterior of the human head.

4,680,857

## WINDING METHOD

Edward R. Lintott, London, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed May 14, 1986, Ser. No. 863,195

Claims priority, application United Kingdom, Jun. 18, 1985, 8515351

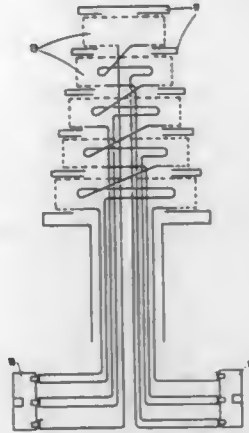
Int. Cl. H02K 15/08

U.S. Cl. 29-596

2 Claims

1. A method of winding the coils of a stator structure of an electromagnetic device of the kind in which the stator structure is of cylindrical form and defines a plurality of axially spaced pole pieces, adjacent pole pieces defining grooves therebetween, the coils being located in the grooves respectively and in use being supplied with electric current by way of a pair of coil end connections connected to a pair of supply terminals at one end of the stator structure, the method comprising laying the wire forming a first connections to a coil in a slot extending from said one end of the stator structure, winding the coil in the groove furthest from said one end of the stator structure, taking the lead out portion of the wire forming the completed coil into the next adjacent groove and winding

at least one turn before returning the wire along the slot, thereby forming a second connection, to said one end of the



stator structure, and repeating the above steps until all the grooves have coils wound therein.

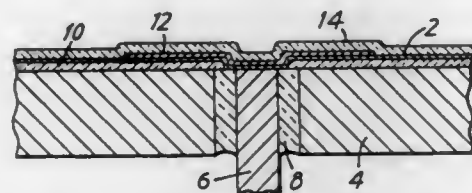
4,680,858

**METHOD OF MANUFACTURE OF STRAIN GAUGES**  
Harvey R. Johnson, Suffolk, England, assignor to Strain Measurement Devices Limited, England  
Division of Ser. No. 578,218, Feb. 8, 1984, Pat. No. 4,633,212.  
This application Jul. 17, 1986, Ser. No. 886,357  
Claims priority, application United Kingdom, Feb. 9, 1983, 8303555

Int. Cl.<sup>4</sup> H01C 17/06

U.S. Cl. 29—610 SG

7 Claims



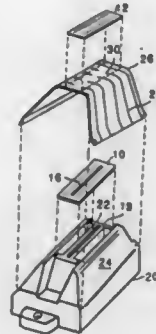
1. A method of manufacturing an electrical strain gauge comprising a metallic substrate having apertures passing through it, said method comprising the steps of;

- (i) securing conductor leads in said apertures with insulating material surrounding the leads to isolate them from the substrate,
- (ii) polishing smooth a surface of said substrate to which ends of the leads extend and thereby making said ends flush with said surface,
- (iii) depositing and bonding to said surface of the metallic substrate a layer of an electrically insulating material, said layer leaving exposed said ends of the leads,
- (iv) applying and bonding to the insulating layer a thin-film deposit to provide a strain-sensitive electrical circuit element overlying and in electrical contact with said ends of the leads,
- (v) applying a protective layer over the circuit element.

4,680,859

# **THERMAL INK JET PRINT HEAD METHOD OF MANUFACTURE**

Samuel A. Johnson, Eagle, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.  
Division of Ser. No. 860,294, Dec. 6, 1985, abandoned. This application Oct. 3, 1986, Ser. No. 915,292  
Int. Cl.<sup>4</sup> G01D 15/16; H05B 3/00; B05D 5/12; G03C 5/00  
U.S. Cl. 29—611 3 Claims



1. A process for fabricating a thermal ink jet printhead assembly which includes the steps of:

- (a) providing a thin film resistor structure having a common ink feed opening therein and a plurality of resistive heater elements spaced around the periphery of said opening,
- (b) bonding a plurality of conductive leads into electrical contact with said resistive heater elements at the surface of said thin film resistor structure,
- (c) affixing an orifice plate to the surface of said thin film resistor structure, and
- (d) bonding said thin film resistor structure to an insulating header having an ink feed opening therein of dimensions corresponding to the dimensions of said ink feed opening in said thin film resistor structure, whereby ink may be fed through both of said openings in said header and said thin film resistor structure, respectively and into reservoir cavities in said orifice plate, and ink in said reservoir cavities may be heated from energy from said resistive heater elements and caused to expand through openings in said orifice plate during and ink jet printing operation.

4,680,860

# **APPARATUS FOR DISASSEMBLING LOCKS**

John C. Detloff, Richmond, Va., assignor to A-1 Security Manufacturing Corp., Richmond, Va.  
Filed Aug. 4, 1986, Ser. No. 892,269  
Int. Cl.<sup>4</sup> B23P 19/04

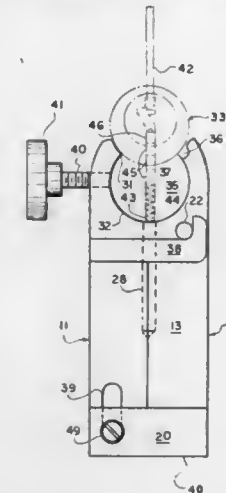
U.S. Cl. 29—804

7 Claims

1. Apparatus for holding a removable core, and receiving pin chamber components extruded therefrom, said apparatus comprising:

- (a) a lower member having a flat bottom surface, opposed parallel flat side surfaces rising perpendicularly from said bottom surface, a flat upper surface in parallel disposition to said bottom surface, forward and rear extremities, each extending between said side surfaces, a first series of parallel troughs of uniform semi-circular cross sectional configuration recessed within said upper surface and perpendicularly oriented to said forward and rear extremities, a first elongated recess of cylindric contour extending between said side surfaces adjacent said forward extremity and communicating with said first series of troughs, first pivot means disposed adjacent said rear extremity above said upper surface in perpendicular relationship to said side surfaces, and latch holding means associated with said side surfaces adjacent said forward extremity, and
- (b) an upper member having a flat bottom surface adapted to lie in abutting contact with the upper surface of said lower

member, opposed parallel flat side surfaces perpendicularly disposed to said bottom surface and disposed in coplanar relationship with the side surfaces of said lower member, forward and rear extremities adapted to lie directly above the corresponding extremities of the lower member, a second series of troughs shaped and spaced in a manner to meet with the first series of troughs to form circular cylindrical retaining chambers, a second elongated recess configured to meet with said first recess to form a core-receiving channel of cylindric contour whose



cross-section comprises a least 180 degrees of circular arc, said arc being symmetrically disposed about said retaining chambers, said channel having an elongated slot which opens upon the forward extremities of said upper and lower members, locking means adjacent the forward extremity in communication with said second elongated recess, latch means interactive with the latch holding means of the lower member, and second pivot means interactive with said first pivot means to enable the upper member to swing in a vertical path and slide in a horizontal plane with respect to said lower member.

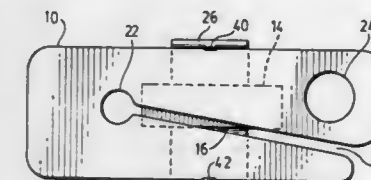
4,680,861

# **SEATBELT CUTTER**

Wilhelm K. Meurer, 65 Wynford Heights Cres., Apt. 2005, Don Mills, Ontario, M3C 1L7, Canada  
Filed Apr. 9, 1985, Ser. No. 721,454  
Int. Cl.<sup>4</sup> A47F 5/08

U.S. Cl. 30—296 A

5 Claims



1. Device for cutting and severing seatbelts and restraint harnesses to free the occupant thereof in case of emergency, said device comprising:

- a generally flat body portion having a hand grip area;
- an open ended elongated slit therein, said slit being dimensioned in both length and width so as to receive a seatbelt edgewise for cutting purposes;
- a blade having a cutting edge disposed in said elongated slit, the cutting edge thereof being disposed within the thickness of the flat body portion; said cutting edge of the blade also forming an oblique angle with the side walls of the slit;

a holder for releasably receiving said body portion therein, said holder including:

- a base having an exterior surface for the disposition of an adhesive material for the releasable attachment of said base to a surrounding support structure;
- releasable retention means to maintain said flat body portion in a stored position, such that said hand grip area is exposed from and spaced from said holder, to facilitate the gripping of said hand grip area for rapid release, said releasable retention means including a pair of arms cooperating with said holder to define a generally U-shaped in cross-section, the said arms thereof being integral with the said base and spaced apart a sufficient distance to receive the body portion as a releasable snap fit therebetween, and;
- elongate ribs protruding from said base and adapted to receive said body portion thereagainst, in a position spaced away from the interior surface of the base.

4,680,862

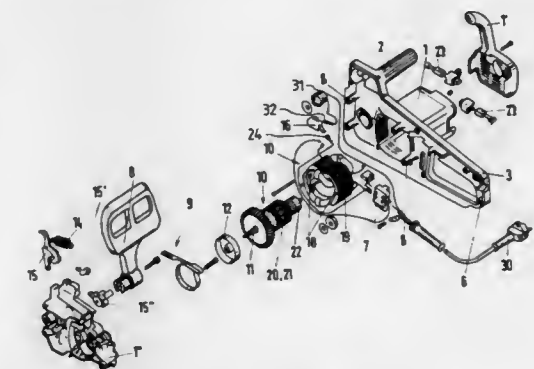
# **MOTOR-DRIVEN CHAIN SAW**

Dieter Wieland, Remseck; Abou Aly, Waiblingen, and Hartmut Riess, Weinstadt, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany  
Filed Aug. 27, 1986, Ser. No. 900,746  
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530685

Int. Cl.<sup>4</sup> B27B 17/02

U.S. Cl. 30—381

7 Claims



1. A motor-driven chain saw comprising:

- a housing;
- a guide bar mounted on said housing for accommodating a saw chain thereon;
- an electric series motor mounted in said housing for driving the saw chain, the series motor including a rotor winding and a field winding having at least two pole coils;
- current supply means for supplying current to said series motor; and,
- switching circuit means movable between a first position for connecting said rotor winding and said pole coils in series to said current supply means and a second position for disconnecting said supply means from said motor and reversing the polarity of one of said pole coils and short-circuiting said one pole coil across said rotor winding thereby developing a counter torque for braking the coasting movement of the saw chain.

4,680,863

# **HAND SAWS**

Thomas F. Duffy, Box 320, R.D. 1, Owego, N.Y. 13825  
Filed Jul. 9, 1985, Ser. No. 753,125  
Int. Cl.<sup>4</sup> B21D 39/00

U.S. Cl. 30—511

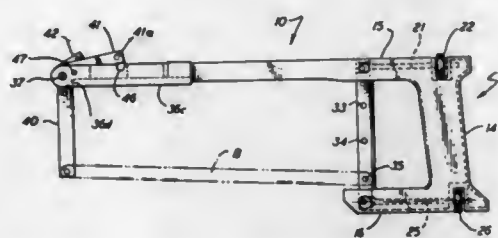
10 Claims

1. In a hand saw frame having a rigid upper frame member, hand grip means, and adjustable blade retaining means affixed



to a proximal end of said upper frame member, the improvement comprising a plurality of individual fingers of differing lengths pivotally journaled at the distal end of said upper frame member, each individual finger pivotable between a

second and third slides respectively and transducer means adapted to detect the positions of the first, second and third slides, the first and second sensing means being adapted to be arranged in positions substantially mutually symmetrical with



storage position in which it extends substantially parallel to said upper frame member and an operating position in which it extends substantially perpendicular to said upper frame member, each of said individual fingers carrying a pin to engage the end of a saw blade.

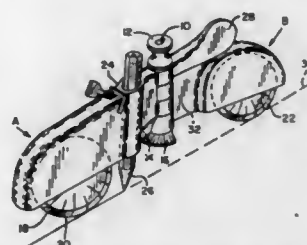
#### 4,680,864 DRAWING GUIDE

Michael S. Heagerty, 15133 Brackett Creek Rd., Bozeman, Mont. 59715

Filed Sep. 26, 1986, Ser. No. 911,887  
Int. Cl.<sup>4</sup> B43L 9/00; G01B 3/12

U.S. Cl. 33—26

10 Claims



1. A drawing guide comprising a narrow upstanding first body part having a single wheel with all but its lower portion enclosed therein, a second narrow upstanding body part having a single wheel with all but its lower portion enclosed therein, said wheels adapted to contact a surface to be marked, said second body part forming a handle to be grasped by one hand of the user, a vertical hinge pivotally interconnecting said two body parts, a marker holder in said first body part between its wheel and said hinge for holding a marker to mark said surface, and a narrow horizontally elongated guide lever on said first body part overhanging said second body part so as to be included in the user's grasp of said second body part.

#### 4,680,865

APPARATUS FOR CHECKING LINEAR DIMENSIONS  
Franco Danielli, Zola Predosa, and Sergio Solaroli, Bologna, both of Italy, assignors to Finike Italiana Marpos S.p.A., S. Marino di Bentivoglio, Italy

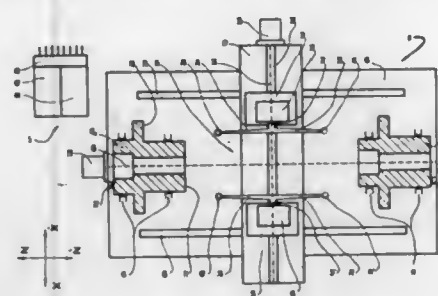
Filed Mar. 5, 1986, Ser. No. 836,416

Claims priority, application Italy, Apr. 1, 1985, 3386 A/85  
Int. Cl.<sup>4</sup> G01B 7/28

U.S. Cl. 33—143 L

16 Claims

1. An apparatus for checking dimensions of mechanical parts, comprising: support means; first and second reference means arranged in positions substantially fixed with respect to the support means, for mechanically positioning first and second mechanical parts; measuring means coupled to the support means for checking both the first and the second parts, the measuring means including a first slide movable on the support means, a second slide and a third slide, both movable on the first slide, first and second sensing means arranged on the



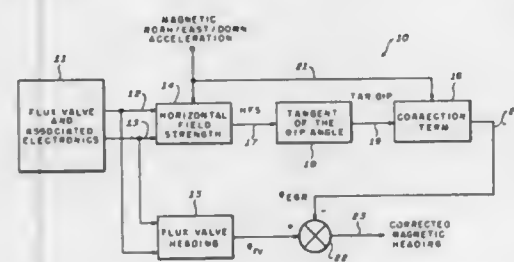
4,680,866  
MAGNETIC FLUX DETECTOR CORRECTION SYSTEM  
James S. Johnson, and Gene A. Albrecht, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 19, 1985, Ser. No. 811,066

Int. Cl.<sup>4</sup> G01C 17/38

U.S. Cl. 33—356

6 Claims



1. An aircraft heading correction system of the type utilizing a magnetic flux detector to provide a signal as a function of magnetic heading of said aircraft, said correction system comprising:

- a first means, configured to accept:
  - (a) a signal representative of north, east and down acceleration components of said aircraft,
  - (b) said signal as a function of magnetic heading of said aircraft, for providing a signal representative of horizontal field strength,
- a second means, configured to accept said signal representative of horizontal field strength, for providing said signal representative of horizontal field strength and a signal representative of the tangent of a dip angle,
- a third means, configured to accept said signal as a function of magnetic heading of said aircraft, for providing a magnetic heading signal,
- a fourth means, configured to accept:
  - (a) said signal representative of horizontal field strength,
  - (b) said signal representative of the tangent of a dip angle,
  - (c) said signal representative of north, east and down acceleration components of said aircraft, for providing a magnetic heading correction signal, and
- a fifth means, configured to accept said magnetic heading correction signal and said magnetic heading signal for providing a corrected magnetic heading signal.

#### 4,680,867

#### LEVEL WITH DUAL POINTERS

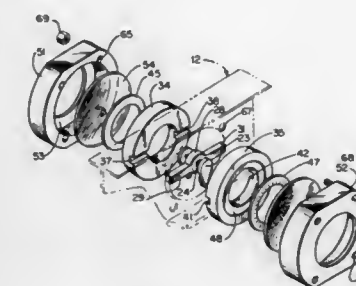
Marie C. Huffman, and Norman C. Huffman, both of Rte. 1, Box 11, both of Blanca, Colo. 81123

Filed Aug. 21, 1986, Ser. No. 898,655

Int. Cl.<sup>4</sup> G01C 9/12

U.S. Cl. 33—391

10 Claims



1. A level comprising:
  - a frame having spaced parallel straight edges and having a transverse opening between said edges,
  - a pair of depending pointers on the ends of a transverse rotary shaft disposed in said opening,
  - mounting means for supporting said shaft for free rotation in said opening, said mounting means including a central hub portion centered midway between said pointers supporting a single center bearing centered in said hub portion midway between said pointers, a pair of coaxial supports for said hub portion that separate along a parting line midway between said pointers and fastening means for releasably securing said supports to said frame with said supports extending out from opposite sides of said frame, and
  - a calibrated scale for each pointer, said scales being disposed on opposite sides of said frame, each scale including calibration lines and numeral indicators to indicate the angle of inclination of the pointer to said straight edges when the frame is between horizontal and vertical positions.

#### 4,680,868

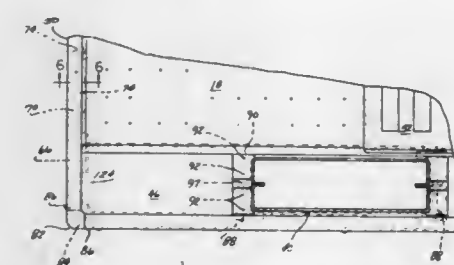
COORDINATE MEASURING MACHINE WITH COVERS  
Ladd J. Orr, and John J. Tuss, both of Englewood, Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Jul. 7, 1986, Ser. No. 882,573

Int. Cl.<sup>4</sup> G01B 5/03

U.S. Cl. 33—503

9 Claims



1. A coordinate measuring machine (10) of the type including a base (30) having generally vertically extending sides defining a base perimeter, a table (14) fixed to the top of the base (30) said table (14) having a horizontal planar surface (18), a bridge (28) mounted for guided horizontal movement on said base (30) along a first axis, said bridge (28) including a pair of vertical upstanding members (40) each having a lower portion extending alongside a respective opposite side of said base (30), said upstanding members extend above and below the level of said planar surface (18) of said table (14), an upper cross member (26) connecting the upper ends of said upstanding members

(40), a carriage (24) supported for movement on said upper cross member (26) along a second horizontal axis orthogonal to said first axis, and a probe (12) mounted for guided vertical movement on said carriage (24), the improvement comprising: vertically extending cover means; at least in part extending around the side of said base (30) and said table (14); including a pair of panels comprising side covers (42) mounted to a respective side of said base (30) spaced away from the side of said table (14) and base (30) beyond the outer lower portions of said upstanding member to establish an elongated horizontal opening (44) on said opposite sides of said table (14) and base (30), lying between said table (14) and each side cover (42) through which said upstanding members (40) move as said bridge (28) moves along said first horizontal axis.

#### 4,680,869

#### CYLINDRICAL SQUARE

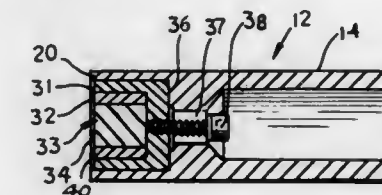
David Murkens, 724 Park Ave., Meadville, Pa. 16335

Continuation-in-part of Ser. No. 732,922, May 13, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 899,805

Int. Cl.<sup>4</sup> G01B 5/24

U.S. Cl. 33—533

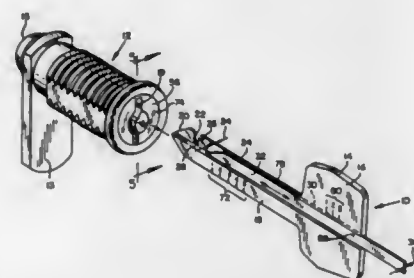
2 Claims



1. In combination, a cylindrical gauge and a horizontal surface to be checked by said cylindrical gauge and a gauge support,
  - said cylindrical gauge having a cylindrical hollow gauge body having a partition therein with a central hole through said partition having a first precision flat end and a second end,
  - said cylindrical gauge body having a precision cylindrical outside surface perpendicular to said first end surface extending from said first end to said second end,
  - said gauge support having a vertical surface and a horizontal surface,
  - an indicator support having a flat horizontal surface and a sensing element,
  - said indicator support being adapted to have its said flat surface rest on said horizontal surface,
  - said gauge support being made of magnetic material,
  - said cylindrical gauge having a cylindrical permanent magnet means in said hollow gauge body adjacent said first end,
  - said permanent magnet means comprising a first hollow cylinder made of magnetic material having a first end and a second end,
  - a second hollow cylinder made of non-magnetic material having a first end and a second end,
  - a cylindrical permanent magnet having a first end and a second end,
  - said hollow cylindrical gauge body, said first hollow cylinder, said second hollow cylinder, and said permanent magnet being disposed concentric to each other,
  - said first hollow cylinder receiving said second hollow cylinder,
  - said second hollow cylinder receiving said cylindrical permanent magnet,
  - said first end of said first hollow cylinder, said first end of said second hollow cylinder and a said end of said permanent magnet being disposed in a common plane,
  - said common plane being spaced inward of said first end of said cylindrical gauge body,

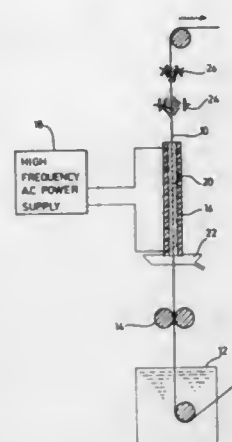
a screw extending through said central hole in said partition, means on said second end of said permanent magnet means engaging said screw whereby said magnet means is held rigidly to said partition, holding said permanent magnet means in spaced inwardly relation to a plane disposed on said first precision flat end of said cylindrical gauge body providing a space for foreign material to be received between said first end of said permanent magnet means and said vertical surface of said gauge support, said cylindrical outside surface being adapted to be held parallel to said horizontal surface by said permanent magnet means, said indicator support being adapted to be moved over said horizontal surface with said indicator sensing element in contact with the upper edge of said precision cylindrical outside surface whereby the accuracy of said angle between said horizontal surface and said vertical surface is checked by said indicator.

**4,680,870**  
**DEVICE AND METHOD FOR DECODING CYLINDER LOCKS**  
 T. Doyle McConnell, 15834 NE. Glisan, Portland, Oreg. 97230  
 Filed Oct. 14, 1986, Ser. No. 918,529  
 Int. Cl.<sup>4</sup> G01B 5/20  
 U.S. Cl. 33—540 11 Claims



1. A device for decoding a cylinder lock of the type including a plurality of tumblers movable within a cylinder of the lock by a key having the correct profile, to determine the depth of cut required on a key for each tumbler position for such a lock, comprising:
  - (a) a main body including an elongate shank adapted to fit within the keyhole of the lock and handle means attached to said shank for manipulating said shank;
  - (b) an elongate feeler adapted to slide along said shank and including means for engaging a tumbler of said lock;
  - (c) said shank and said feeler having a combined thickness small enough for said shank and said feeler to fit together within said keyhole of said lock;
  - (d) means for defining a notch in said shank for holding a single tumbler, in a normal locking position, within said notch;
  - (e) first indicia means located on said shank for showing which of said plurality of tumblers is aligned with said notch; and
  - (f) second indicia means located on said main body and said feeler for cooperatively showing the position of said feeler relative to said notch.

**4,680,871**  
**APPARATUS AND METHOD FOR DRYING AND CURING COATED SUBSTRATES**  
 David Reznik, 2151 Barbara Dr., Palo Alto, Calif. 94303  
 Filed May 17, 1985, Ser. No. 735,366  
 Int. Cl.<sup>4</sup> F26B 3/347  
 U.S. Cl. 34—1 16 Claims

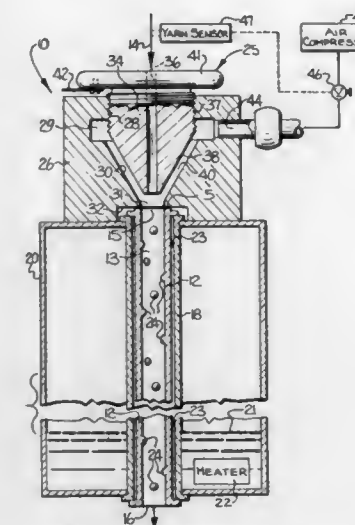


1. In an apparatus for drying and/or curing solvent containing coatings on a conductive substrate which comprises: means for inductively heating the coated substrate in a highly confined space, producing vapors; and the improvement which comprises providing means for recovery of the solvent and thereby simultaneously preventing atmospheric pollution by avoiding incineration of the vapors produced and/or venting them or the incineration products to the atmosphere, characterized by: cooling means for condensing evaporated liquids released as a result of the heating, which cooling means is disposed around the periphery of the substrate in said highly confined space; and means for removal of the resulting condensed liquids, and wherein said means for inductively heating comprises an AC electrical power supply and an induction coil coupled to the power supply and arranged in close physical proximity to the substrate to be dried and/or cured, said induction coil being arranged to define a conduit for the flow of coolant therethrough, whereby said coil, thus cooled, operates as a condenser for the evaporated liquid, thus forming at least part of said cooling means for condensing.

**4,680,872**  
**YARN HEATING APPARATUS AND METHOD**  
 Karl Bauer, Remscheid, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany  
 Filed Mar. 5, 1986, Ser. No. 836,257  
 Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507642; Apr. 25, 1985, 3514874  
 Int. Cl.<sup>4</sup> F26B 13/02  
 U.S. Cl. 34—23 15 Claims

1. A yarn heating apparatus adapted for the continuous heat treatment of a running synthetic yarn in a yarn processing machine and the like, and comprising: a yarn guide tube through which a running yarn is adapted to be conducted, with said tube closely surrounding the yarn so as to guide the yarn along a substantially straight path, and with said tube defining a yarn entry end and a yarn exit end, means for heating the yarn guide tube so as to heat the running yarn as it is conducted therethrough, and air supply means for positively introducing air at ambient temperature into said yarn guide tube adjacent the entry end thereof and so as to produce turbulence in the air as it

moves through said tube and thereby improve heat transfer between said tube and the running yarn, said air supply means including a source of pressurized air at ambient

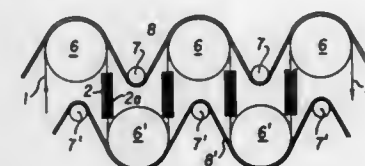


temperature, and air duct means operatively connected to said source of pressurized air and which communicates with the path of the running yarn at an inclined angle.

**4,680,873**  
**METHOD FOR CONTROLLING SHRINKAGE AND/OR STRETCHING OF A PAPER WEB IN THE DRYING SECTION OF PAPER MACHINE, IN THE FORM OF A CYLINDER DRIER AND/OR FAN DRYER, TRANSVERSELY TO THE FEED DIRECTION OF THE WEB AND ARRANGEMENTS FOR CARRYING OUT THE METHOD**

Christer Fellers, Sollentuna; Myat Htun, Vällingby, and Torbjörn Hansson, Stockholm, all of Sweden, assignors to Flakt AB, Stockholm, Sweden  
 PCT No. PCT/SE85/00068, § 371 Date Nov. 27, 1985, § 102(e)  
 Date Nov. 27, 1985, PCT Pub. No. WO85/03534, PCT Pub. Date Aug. 15, 1985

PCT Filed Feb. 11, 1985, Ser. No. 787,806  
 Claims priority, application Sweden, Feb. 9, 1984, 84-00678  
 Int. Cl.<sup>4</sup> F26B 13/08  
 U.S. Cl. 34—116 45 Claims

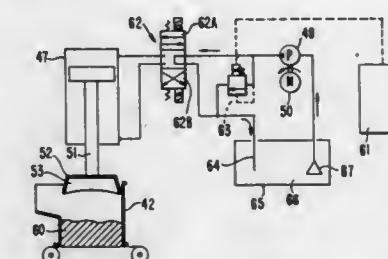


1. A method for controlling or regulating shrinkage and/or stretching of a paper web transversely to its transport direction in a drying section of a paper machine, said drying section having the form of a cylinder dryer and/or a fan dryer, characterized by subjecting the paper web to an outwardly directed force beginning at that point in the drying process where the paper web exhibits a dry solids content of at most 75%, and causing said force to act in the edge portion of the paper web.

**4,680,874**  
**DEVICE FOR EXTRACTING WATER FROM A LOAD OF WASHED ARTICLES**  
 Sholchi Hayashi; Hidetoshi Ishihara; Taketoshi Okada, and Kunio Kojima, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Churyo Engineering Co., Ltd., Aichi, both of Japan  
 Filed Jun. 3, 1986, Ser. No. 869,899

Claims priority, application Japan, Jul. 26, 1985, 60-114999[U]; Sep. 18, 1985, 60-204524; Sep. 27, 1985, 60-147910[U]

Int. Cl.<sup>4</sup> F26B 9/04  
 U.S. Cl. 34—143 4 Claims



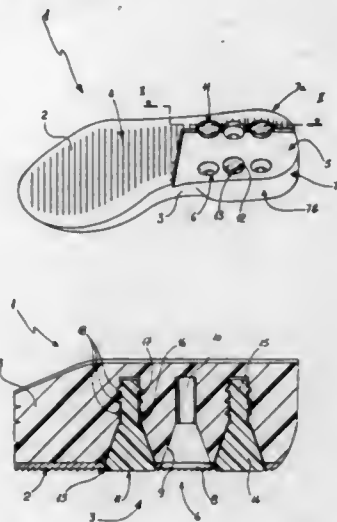
1. A device for extracting water from a load of washed articles, said device comprising: a basket in which the load is confined; fluid pressure exerting means employing fluid pressure for causing the fluid pressure to exert pressure on the load confined within said basket for extracting water therefrom; and a control system operatively connected to said fluid pressure exerting means for controlling the fluid pressure exerted by said fluid pressure exerting means on the load of washed articles confined within the basket, said control system causing said fluid pressure exerting means to initially exert a first low pressure on the load for a predetermined period of time, and said control system causing said fluid pressure exerting means to exert a second pressure on the load that is higher than said first pressure after said predetermined period of time has elapsed, said first pressure being at the most approximately 0.5 kg/cm<sup>2</sup> in order that the load of washed articles be preliminary compressed at said first low pressure during initial extraction of water from the load over said predetermined period of time to prevent damage to the articles by water and any air trapped in the load.

**4,680,875**  
**DIVERSIFIABLE COMPLIANCE SOLE STRUCTURE**  
 Diego Danieli, Caerano S. Marco, Italy, assignor to Calzaturificio F.lli Danieli S.p.A., Caerano S. Marco, Italy  
 Filed May 8, 1985, Ser. No. 731,709  
 Claims priority, application Italy, May 18, 1984, 30738/84[U]  
 Int. Cl.<sup>4</sup> A43B 13/14 10 Claims

1. A diversifiable compliance sole structure having in combination therewith a plurality of plugs, said sole structure comprising a sole, a treading surface, a sole element and a plurality of seats, said sole defining at least one bottom face and at least one top face, said treading surface being formed on said at least one bottom face of said sole, said sole element being bonded, to said at least one top face of said sole, each seat in said plurality of seats being formed in said sole structure and having at least a first substantially cylindrical zone, a second substantially conical zone, and a third substantially cylindrical zone, each plug in said plurality of plugs having a first substantially cylindrical plug zone, a second substantially conical plug zone and a third substantially cylindrical plug zone, each of said plugs being selectively, removably insertable in at least one of said seats, said first substantially cylindrical zone of said seat being



adapted for removably accommodating at least a portion of said first substantially cylindrical plug zone of at least one of said plugs, said second substantially conical zone of said seat, being adapted for interconnecting said first and third substantially cylindrical zones thereof and for selectively removably accommodating said second substantially conical plug zone of



at least one of said plugs, said third substantially cylindrical zone of said seat being adapted for selectively removably accommodating said third substantially cylindrical plug zone of at least one of said plugs, said second substantially conical plug zone of each of said plugs being adapted for interconnecting said first and third substantially cylindrical plug zones thereof.

4,680,876

## ARTICLE OF FOOTWEAR

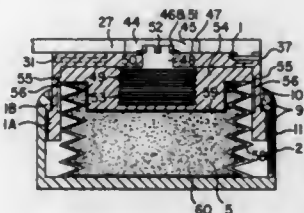
Koh K. Peng, Jalan C. 10, Taman Melawati, Setapak, Kuala Lumpur, Malaysia

Filed Nov. 21, 1984, Ser. No. 673,610

Int. Cl.<sup>4</sup> A43B 21/28, 21/26, 21/22

U.S. Cl. 36—35 B

17 Claims



1. An article of footwear comprising a ground-engaging part comprising upper and lower components, limit stop means associated with said components to define limit stop positions between which said components are capable of limited movement toward and away from one another, a spring medium between said components, a compression element movable relative to one of said components independently of the limit stop means, an adjustable member which is rotatable but not axially displaceable relative to said one component and means operatively connecting the adjustable member and the compression element whereby rotation of the adjustable member displaces the compression element toward or away from said one component thereby to vary the rate of the spring medium without altering said limit stop positions between which the components are relatively movable by, or against the action of, the spring medium.

4,680,877

## SHOE INSOLE

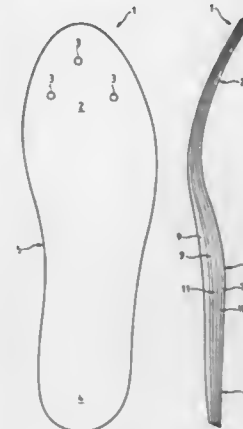
Hans Fink, Möhlin, Switzerland, assignor to Bata Schuh AG, Möhlin, Switzerland

Filed Jun. 26, 1985, Ser. No. 748,832

Claims priority, application Switzerland, Jul. 2, 1984, 3176/84 Int. Cl.<sup>4</sup> A43B 13/38, 7/06

U.S. Cl. 36—44

5 Claims



1. A shoe insole particularly for use in a sports shoe comprising a plurality of layers including a first layer of tough, wear-resistant wood material having a first specific gravity and a second layer of wood material having a second specific gravity which is lower than said first specific gravity, said second wood material being more compressible than said first wood material, and comprising at least one layer of said second wood material between two layers of said first wood material, and means for firmly interconnecting said layers.

4,680,878

## SKI BOOT

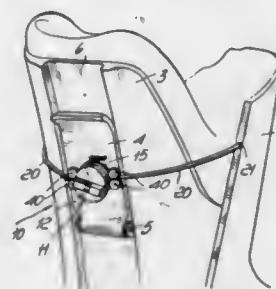
Alessandro Pozzobon, Treviso, and Giorgio Baggio, San Martino di Lupari, both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Apr. 28, 1986, Ser. No. 857,037

Claims priority, application Italy, May 6, 1985, 20575 A/85 Int. Cl.<sup>4</sup> A43B 5/04; A43C 11/00

U.S. Cl. 36—117

17 Claims



1. In a ski boot defining a longitudinal direction thereof, a widthwise direction thereof and an upwards direction thereof and having a boot shell, attached to the boot shell a first gaiter and a second gaiter opposite to said first gaiter, a gaiter closure device comprising:

a lever member having a first face on one side thereof and a second face on an opposite side thereof, an articulation area on said first gaiter, articulation means on said articulation area defining an axis of rotation extending substantially parallel to said articulation area, said lever member being articulated on said articulation area by said articulation means rotatable about said axis of

rotation from a closing position in which said lever faces said articulation area with said first face thereof to an opening position in which said lever faces said articulation area with said second face thereof, a tension adjusting mechanism having a coiler member arranged on said lever member in an intermediate position thereof and in front of said first face thereof and having a coiling axis extending transverse thereto, cable means having a first portion thereof directly in unreleasable connection with said second gaiter and a second portion thereof directly in unreleasable connection with said coiler member and guide means for said cable means, said coiler member having actuation means connected therewith to operate winding and unwinding of said cable means around said coiler thereby to tension and alternatively slacken said cable means upon actuation of said actuation means.

4,680,879

## UNDERWATER DREDGING APPARATUS AND CUTTER HEAD THEREFOR

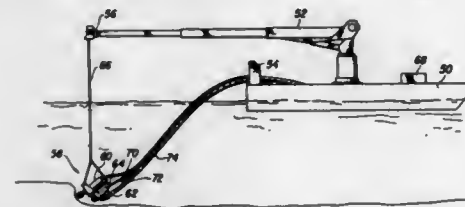
Charles E. Hill, Edwin L. Hill, and Ernest W. Hill, all of Virginia Beach, Va., assignors to PJH, Inc., Norfolk, Va.

Filed Jun. 28, 1985, Ser. No. 749,864

Int. Cl.<sup>4</sup> E02F 3/92

U.S. Cl. 37—67

11 Claims



1. A dredging apparatus for moving material from a water bottom, said apparatus comprising:

means for dislodging material at said water bottom; means for sucking said dislodged material into and propelling said dislodged material through a discharge conduit; and

means for supporting and positioning said dislodging means and said sucking and propelling means in proximity to said water bottom, said supporting means comprising boom means, pivotally mounted on a support vehicle for movement about a vertical axis, cable means attaching said dislodging means and said sucking and propelling means to a distal end of said boom means, said boom means including means for extending and retracting said distal end in a radial direction with respect to said vertical axis, whereby said dredging apparatus can remove a layer of bottom material by means of pivotal and radial movements of said boom means without repositioning said support vehicle, wherein said dislodging means comprising a submersible electric motor; cutter head means; and shaft means interconnecting said electric motor and said cutter head means, said cutter head comprising:

a support means having two ends mountable on said rotating shaft, and extending along an axis of rotation of said rotating shaft said support means including a support member extending outwardly of said support means at one end; a plurality of blade means, each of said blade means having two ends with one of said blade means ends attached to said support member outwardly of said support means and the other of said blade means ends attached directly to the other of said support means ends, wherein each of said blade means includes a mid portion between said blade means ends and said mid portion extends radially outwardly of said axis of rotation and said blade means ends attached to said support member are further from said axis

of rotation than said blade means end attachment on said support means.

4,680,880

## SNOW PLOW FOR SMALL VEHICLES

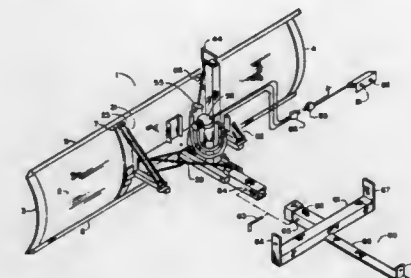
Louis Boneta, Eagle River, Ak., assignor to Moose Industries, Inc., Anchorage, Ak.

Filed Feb. 28, 1986, Ser. No. 834,372

Int. Cl.<sup>4</sup> E01H 5/06

U.S. Cl. 37—236

10 Claims



1. A snow plow comprising:

A. a blade;

B. frame means for attaching said snow plow to said vehicle;

C. a mounting yoke fixedly attached to said blade;

D. a swing arm removably attached to said mounting yoke, thereby forming an integral assembly with the blade and mounting yoke;

E. a pedestal, said pedestal having a vertical component and a horizontal component, said vertical component forming a compressed air storage tank, said horizontal component being perpendicularly connected to said vertical component and having a first set of connecting holes therein being used to removably attach said pedestal to said swing arm, and a second set of connecting holes being used to attach said pedestal to said frame means;

F. pneumatic lifting means fixedly attached to swing arm such that said lifting means act to pivotally raise or lower said swing arm, and therefore, the blade, longitudinally about the pedestal;

G. compressor means attached to said pedestal;

H. valve means connected to said pedestal to permit proper flow of air to the pneumatic lifting means;

I. control means to operate said compressor and valve means.

4,680,881

## SNOW BLOWER WITH SNOW CHANNEL OF VERTICAL SCRAPER SNOW BELTS

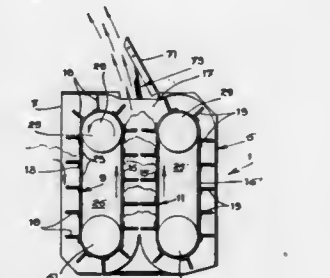
Richard Cloutier, 23, rue Langevin, Bois Briand, Quebec, Canada (J7E 4H5)

Filed May 20, 1986, Ser. No. 864,877

Int. Cl.<sup>4</sup> E01H 5/04

U.S. Cl. 37—237

12 Claims



1. A snowblower comprising:

a casing having a generally rectangular opening;  
a front and a rear endless travelling belt and means mounting said belts vertically and in parallel relationship one behind the other, on and within said casing; each belt defining a forward strand and a rearward strand with respect to said opening; said belts being spaced apart and defining a vertical channel therebetween, said rearward strand of said front belt facing said forward strand of said rear belt in said vertical channel;  
snow scraper members fixed to and projecting perpendicularly away from said belts, transversely thereof;  
means driving said belts into endless travel at equal speeds and in reverse directions with respect to one another and with said forward strand of said front belt moving downwardly, and  
wherein said snow scraper members are spaced at predetermined intervals, from one another, said intervals being selected so that said snow scraper members of one belt are aligned in pairs with said snow scraper members of the other belt when moving along said channel.

4,680,882

## IDENTIFICATION TAG

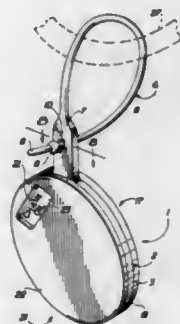
Jesse E. Watson, Jr., 710 N. Main, Homer, La. 71040

Filed Dec. 23, 1985, Ser. No. 812,768

Int. Cl.<sup>4</sup> G09F 3/20

U.S. Cl. 40—5

22 Claims



1. An identification tag for attachment to an article, comprising substantially flat base tag means; attachment means extending from said base tag means for securing said base tag means to the article; a first plurality of apertures provided in a first selected orientation in said base tag means and a second plurality of apertures provided in a second selected orientation in said base tag means; at least one indicia space provided on said base tag means; and a first cap located on one side of said base tag means and provided with a first plurality of snaps oriented in registration with said first plurality of apertures and a second cap located on the opposite side of said base tag means and provided with a second plurality of snaps oriented in registration with said second plurality of apertures, and a window in said cap means, whereby when said snaps are provided in registration with said apertures for securing said first cap and said second cap to said base tag means, said window substantially corresponds to said indicia space.

4,680,883

## SCROLL MODULE AND SIGN SYSTEM FOR INTERNALLY ILLUMINATED SIGNS

Robert C. Stadjuhar, and Cecil S. Renfro, both of Colorado Springs, Colo., assignors to Skyline Products, Inc., Colorado Springs, Colo.

Filed Jun. 18, 1985, Ser. No. 746,185

Int. Cl.<sup>4</sup> G09F 11/18

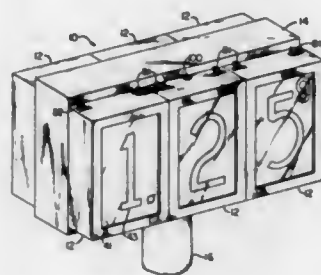
U.S. Cl. 40—471

27 Claims

1. A scrolling apparatus for displaying changeable messages

and adapted for use as an internally illuminated outdoor sign, comprising:

- a box-like framework having a front view area adapted to allow viewing of a selected message;
- a pair of rollers journaled for rotation in the interior of said framework and located at opposite sides of said view area on substantially parallel, spaced-apart axes;
- a flexible message web having opposite end edges secured to a respective roller and having end portions wound around said rollers whereby an exposed portion of the web extends between rollers across said view area and whereby rotation of the rollers causes the web to be wound from one roller to the other roller to change the exposed portion thereof;
- a flexible drive strap having a first end mounted to one of said rollers and a second end mounted to the other of said



rollers and having end portions wound around said rollers whereby rotation of the rollers causes the strap to be wound from one roller onto the other roller, the end portion of the strap on each roller being wound around its respective roller in an opposite circumferential direction than the web, said strap having a width substantially larger than its thickness whereby each end, portion thereof is wrapped and unwrapped directly about itself on its respective roller;

tensioning means on a web drive assembly defined by said rollers and said drive strap for applying a rotational tensioning force to the web whereby the exposed portion of the web is maintained taut under the force of said tensioning means; and

drive means for reversibly driving the drive assembly to wind the web from one roller to the other roller.

4,680,884

## SAFETY FIREARM MECHANISM

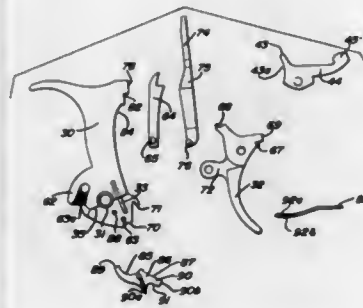
Forrest P. Smith, Jr., 35 Gilpin Ave., Hauppauge, Long Island, N.Y. 11787, and Jeffrey C. Munnell, 633 Long Ran Rd., McKeesport, Pa. 15132

Filed Jan. 14, 1986, Ser. No. 818,802

Int. Cl.<sup>4</sup> F41C 17/02

U.S. Cl. 42—66

13 Claims



1. A firearm mechanism for use with a single action firearm of the type including a spring biased pivotal hammer, a pivotal

trigger and means interconnecting the trigger and hammer for retaining the hammer in retracted position when manually cocked and releasing the hammer when the trigger is manually pulled, the improvement comprising means preventing firing of the firearm unless the trigger is manually pulled back even though the hammer may accidentally fall forward, said means including a flipper assembly connected with the hammer to prevent movement of the trigger until the hammer is retracted from its at rest position down against the frame, a transfer bar connected to the trigger and movable vertically between the hammer and a firing pin to transfer impact of the hammer to the firing pin when the transfer bar is elevated in response to movement of the trigger to a firing position, said flipper assembly preventing upward movement of the transfer bar to preclude it from being positioned between the hammer and the firing pin whereby the hammer will not impart impact to the firing pin.

4,680,886

## LEADERED FISHING LURE HOLDER WITH MEANS FOR RECEIVING LEADER AND HOOKS

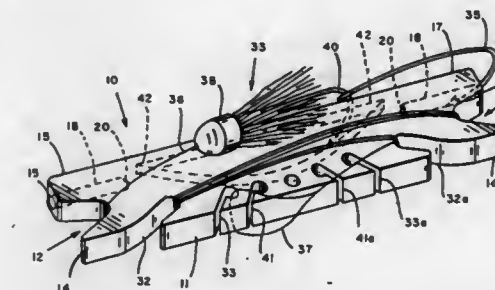
Joseph M. Caselli, Sr., 2731 NE. 14th St. Causeway, Pompano Beach, Fla. 33062

Filed Feb. 20, 1986, Ser. No. 831,486

Int. Cl.<sup>4</sup> A01K 97/06

U.S. Cl. 43—57.1

6 Claims



1. A universal holder for the safe and convenient storage of a leadered fishing lure comprising an elongate flexible leader having an end loop at one end thereof for attachment to a fishing line and having a fish-attracting lure with at least one fish hook having a pointed end at the free end thereof, said holder comprising an elongate, narrow, rigid, water-resistant body having opposed ends, a longitudinal central notch formed inwardly from each of said ends to provide extensions of said body at both sides of said central notches, at least one of said extensions being provided with at least one longitudinal bore adjacent the notch and extending inwardly from said end to a floor, said bore being designed to receive the pointed end of the fish hook adjacent said floor, said elongate body having elongate side edges, at least one said edge containing an elongate slot designed to receive and hold the pointed ends of additional hooks present on said leadered lure, said elongate slot extending uninterrupted a majority of the length of said edge, said elongate body also containing retainer means for releasably-holding the end loop of the leadered fishing lure, whereby the leadered fishing lure is attachable to said holder by first inserting the pointed end of the hook into said bore at one end of said elongate body, pressing the lure against the side of the elongate body and longitudinally wrapping the flexible leader under tension through the notch at the other end of said body and around said body and notches until the length of the elongated leader is reduced sufficiently to permit the end loop thereof to be releasably-attached to said retainer means.

4,680,887

## SUPPORT STAND FOR A MINNOW TRAP

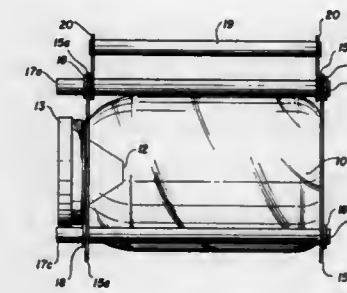
Thomas O. Bergquist, P.O. Box 121, Ceredo, W. Va. 22507

Filed Mar. 25, 1986, Ser. No. 843,676

Int. Cl.<sup>4</sup> A01K 69/00

U.S. Cl. 43—100

4 Claims



1. A minnow trap for catching minnows in a moving stream of water, comprising:

4,680,885

## FISH JIGGING DEVICE

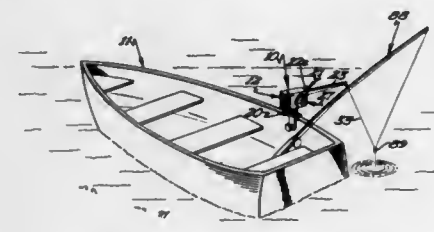
Allan D. Lindell, R.R. 1, Armstrong, Iowa 50514, and Ronald L. Roalson, 29 W. Kennebec Ave., Fairmont, Minn. 56301

Filed Oct. 17, 1986, Ser. No. 920,139

Int. Cl.<sup>4</sup> A01K 97/10

U.S. Cl. 43—19.2

9 Claims



1. A jigging machine for use in jigging a fishing line comprising:

- a housing,
- a reversible stepper motor in said housing having an output shaft, said stepper motor, when energized by a signal, rapidly rotating through a single step angle of predetermined magnitude,
- a reel mounted on said output shaft of said stepper motor and positioned exteriorly of the housing, an elongate flexible fishing line wound on said reel and having a lure or fishing bait at one end thereof,
- generally horizontally disposed guide means mounted on said housing exteriorly thereof and projecting therefrom, said fishing line engaging said guide means and depending therefrom,
- electrical circuitry connected to a source of electrical current and including a driver control circuit electrically connected with said stepper motor for controlling operation thereof,
- means producing a signal in response to rotation of said stepper motor output shaft through a predetermined angular movement thereof, and
- an inverter circuit electrically connected with said driver control circuit and said signal producing means for inverting the signal received from the latter to thereby reverse the operation of rotation of said stepper motor whereby said reel will be rotated in rapid steps and in opposite directions to impart a jigging action to the fishing line and the lure connected to the end thereof.



a jar having an enlarged main portion, a large opening at one end and small openings at the opposite end such that when the jar is arranged horizontally in a moving stream of water, the minnows can enter at the large end and water can pass through the openings at both ends, a support stand for said jar, said support stand having a pair of generally planar apertured, upright end plates, the aperture in one of said end plates receiving the end of the jar having the large opening and the other end plate engaging the said opposite end of the jar, exposing its said aperture to said small openings in said opposite end of the jar to permit water flowing through the small openings to pass therethrough, at least three generally parallel and generally horizontal support rods extending between the two end plates and attached thereto, said rods spacing the two end plates apart by a distance to receive said main portion of the jar, the support rods being spaced apart circumferentially around the jar to support said main portion of the jar so as to prevent the jar from moving laterally out from the space between the rods, the two end plates having lower portions which are lower than the level of the rods to form bottoms which rest on the ground surface, two of the support rods being lower support rods which form a lower support for the said main portion of the jar, and a third support rod located along the uppermost part of the main portion of the jar, and including a handle pivotally connected to the third support rod.

4,680,888

# HYBRID SEED PRODUCTION IN COMMON WHEAT USING CYTOPLASMIC MALE STERILITY

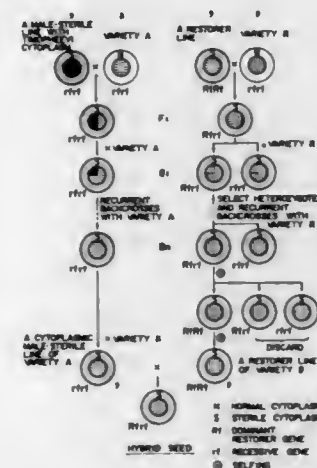
Koichiro Tsunewaki, Kyoto, and Ichiro Ohtsuka, Hiratsuka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Sep. 5, 1985, Ser. No. 772,995

Claims priority, application Japan, Sep. 18, 1984, 59-195580  
Int. Cl.<sup>4</sup> A01H 1/02

U.S. Cl. 47-58

5 Claims



1. A method of commercial hybrid wheat production which comprises growing common wheat varieties to which D<sup>2</sup>-type cytoplasm derived from Aegilops species has been introduced in a male-sterility inducing environment of not less than 14 hours daylight during the reproductive stage until male sterility is induced, producing hybrid seeds by growing in alternating blocks with a pollinator parent with a good combining ability, maintaining said male-sterile D<sup>2</sup>-type alloplasmic lines by self pollination by growing said lines in a male fertility-inducing environment of less than 14-hour day length during

the reproductive stage and harvesting after growing said hybrid.

4,680,889

# PROCESS FOR TREATING PLANTS

Danis R. Carlson, 708 119th La. N.E., Blaine, Minn. 55434  
Continuation-in-part of Ser. No. 792,617, Oct. 22, 1985, which is a continuation of Ser. No. 518,008, Jul. 28, 1983, which is a continuation of Ser. No. 286,260, Jul. 23, 1981. This application Nov. 27, 1985, Ser. No. 802,477

Int. Cl.<sup>4</sup> A01C 1/00; A01G 1/00; A01N 43/08

U.S. Cl. 47-58

14 Claims

1. A process for treating plants to increase growth rates, wherein said process comprises applying to a plant an aqueous growth stimulating solution of gibberellin and then subjecting said plant to high frequency sound waves having a frequency of between 4 to 6 kilohertz while said gibberellin solution is disposed on said plant.

4,680,890

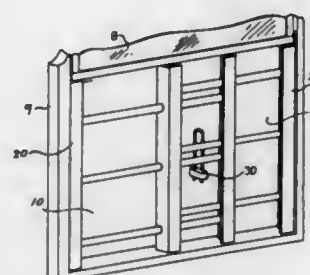
# WINDOW INTRUSION BARRIER

Isidore Jokel, 4201 Newport "H", Deerfield Beach, Fla. 33441  
Filed Apr. 21, 1986, Ser. No. 854,428

Int. Cl.<sup>4</sup> E06B 3/68

U.S. Cl. 49-55

5 Claims



1. A barrier apparatus for a vertically adjustable window, the apparatus having an adjustable length adapted for insertion into a window casement below a framed rectangular window slideably positionable within said casement, said barrier apparatus comprising:

- a first and a second gridwork panel horizontally spaced in substantially co-planar juxtaposition, said panels comprising rigid rectangular frames adapted to border and support said panels, each frame comprising horizontally disposed upper and lower borders, and inner and outer vertically oriented side borders, said inner borders facing each other, said facing side borders having vertically spaced guide holes;
- first and second horizontally directed posts affixed medially between said upper and lower horizontal borders of each panel, said posts affixed to said facing inner side borders and adapted to slideably penetrate said guide holes;
- a first elongate member containing a series of positioning apertures of uniform size, said member integrally secured to one of said horizontal posts;
- a second elongate member containing a series of positioning apertures of uniform size, said second member integrally secured to the other of said horizontal mating posts, the vertical distance between said aperture series of said first member and said aperture series of said second member being less than two inches; and
- locking means for securing said first horizontal post relative to said second post by the placement of said locking means through a co-aligned pair of positioning apertures of said first and second elongate members respectively.

4,680,891

# DOOR HYDRAULIC ARRANGEMENT

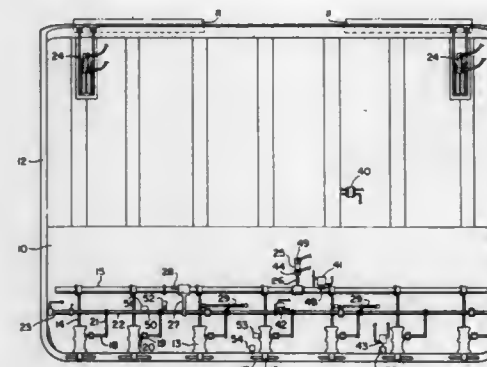
John W. Perkins, Hialeah, Fla., assignor to Monarch Aviation, Inc., Miami, Fla.

Filed Jun. 27, 1986, Ser. No. 879,803

Int. Cl.<sup>4</sup> E05F 15/00

U.S. Cl. 49-280

7 Claims



1. A hydraulically-operated mechanical arrangement for sequentially unlocking, unlatching and opening a panel covering an opening in a wall of a structure comprising

latch means for latching said panel to the opening of said structure when said panel is in a closed and latched position and for unlatching said panel when said panel is to be opened

pin means for locking said latch means when said panel is in a closed latched position and for unlocking said latch means when said panel is to be opened

hydraulic pump means for pressurizing a hydraulic fluid a hydraulic cylinder for disengaging said pin means from said latch means

a latch open sequence valve comprising a first hydraulic switch

a hydraulic cylinder for operating said latch means in an unlatching mode

a panel open sequence valve comprising a second hydraulic switch

a hydraulic cylinder for opening said panel, and hydraulic conduit connecting said sequence valves and said cylinders to said hydraulic pump means.

4,680,892

# DEVICE FOR GUIDING UPWARD AND DOWNWARD MOVEMENT OF WINDOW PANE OF AUTOMOTIVE VEHICLE DOOR

Satoru Ugawa, Hadano, Japan, and Satoshi Obuchi, deceased, late of Fukuoka, Japan (by Fukashi Obuchi, Ruriko Obuchi, legal representatives), assignors to Nissan Motor Co., Ltd., Yokohama, Japan

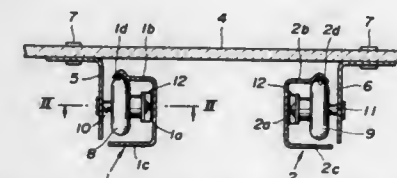
Filed Mar. 12, 1986, Ser. No. 838,815

Claims priority, application Japan, Jul. 8, 1985, 60-149811

Int. Cl.<sup>4</sup> E05D 13/00

U.S. Cl. 49-374

11 Claims



1. A device for guiding upward and downward movement of a window pane of an automotive vehicle door, comprising: a pair of parallel guide rails each of which is U-shaped in

cross-section and has a pair of parallel side walls and a connecting wall interconnecting said side walls, said guide rails being installed in the door in such a manner as to be turned at said connecting walls toward each other;

a pair of roller units movably engaged with said guide rails and movable with the window pane, each of said roller units including a first shaft and a roller rotatably carried on said first shaft, said first shaft being elongated toward and away from said connecting wall and having an end adjacent the same; and

an abutment member mounted on said end of said first shaft and disposed to provide a predetermined clearance between said connecting wall and said abutment member, said abutment member being abuttingly engageable with said connecting wall when said roller moves a predetermined amount toward said connecting wall.

4,680,893

# APPARATUS FOR POLISHING SEMICONDUCTOR WAFERS

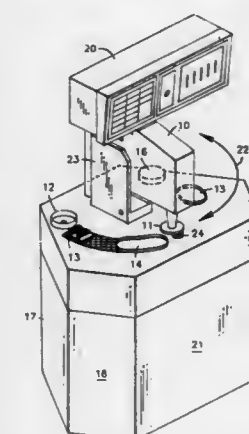
Paul W. Cronkhite, Scottsdale; Bruce C. Bosley, Mesa; James H. Jones, Phoenix, and Asit G. Patel, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 23, 1985, Ser. No. 779,339

Int. Cl.<sup>4</sup> B24B 7/04

U.S. Cl. 51-5 R

6 Claims



1. Apparatus for polishing semiconductor wafers having at least first and second turntables and a polishing arm for moving the wafers from one location to another, comprising: a wafer chuck mounted to the polishing arm for picking up a semiconductor wafer, the wafer chuck having capability to dispense water to rinse the wafer before pick up and to use a vacuum to pick up the wafer; a leveling station mounted on the apparatus to assist mounting the wafer chuck in a predetermined orientation; first and second polishing pads mounted on the first and second turntables, respectively, the first polishing pad having a predetermined shape to receive the wafer for primary polishing; and at least one high pressure water jet mounted adjacent the turntables to clean the polishing pads after a polishing operation wherein the wafer chuck is mounted on a shaft which is at a small angle from perpendicular to the turntables and the leveling station serves to assist mounting the wafer chuck perpendicular to the shaft.

4,680,894

# FIXTURE FOR HONING THIN WALL GEAR PARTS

Paul Fitzpatrick, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 25, 1983, Ser. No. 516,624

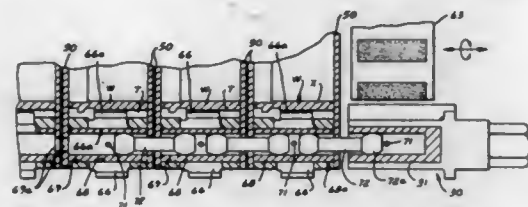
Int. Cl.<sup>4</sup> B24B 5/18

U.S. Cl. 51-50 R

9 Claims

9. A honing machine for honing multiple annular workparts

each having an internal diameter to be honed and external teeth, said machine comprising multiple workpart positioning assemblies on which a respective one of the workparts is disposed, multiple yoke means each for pivotally supporting a respective one of the workpart positioning assemblies such that the workpart positioning assemblies are in stacked relation and the internal diameter of each respective workpart thereon can align itself with a honing tool, and means for driving the workparts in rotation during honing of the internal diameter, said



means for driving the workparts including a hollow bushing rotatable on each assembly, an individual workpart driving gear mounted on the hollow bushing for rotation therewith and meshing with the teeth of the respective workpart on each assembly, a driver member extending between adjacent assemblies and interconnecting adjacent bushings therein and drivingly received in same so as to rotate said bushings and workpart driving gears thereon during honing so that the workparts can be driven in rotation during honing.

4,680,895

## BLOCK SANDER VACUUM

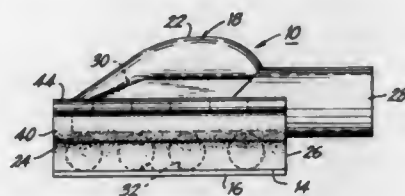
Jerome R. Roestenberg, 11 Woodpecker Ln., Levittown, N.Y. 11756

Filed Sep. 2, 1986, Ser. No. 902,852

Int. Cl.<sup>4</sup> B24B 23/00

U.S. Cl. 51—170 R

11 Claims



1. A hand-powered abrading device comprising: a substantially rigid body having a substantially planar bottom and a plurality of ports in a first lateral side thereof; abrading means on the bottom of the body; handle means on top of the body for holding the body and moving it longitudinally to abrade an object beneath the body in contact with the abrading means; passage means extending laterally and longitudinally through the body and adapted to connect the ports to a source of vacuum; and a first depending skirt connected to the body above the ports in the first lateral side and extending longitudinally along, and adjacent to, the first lateral side of the body and the ports therein; the first skirt: (a) substantially covering the ports in the first lateral side, (b) being spaced laterally away from the first lateral side and the ports therein, and (c) extending downwardly beneath the ports to at least about the bottom of the body.

4,680,896

## TOOL UNLOADING MECHANISM FOR AUTOMATIC TOOL GRINDING MACHINE

Charles T. Breitenstein, Elk Grove Village, and Allen R. Holecek, Rockton, both of Ill., assignors to Carbide International Inc., Elk Grove Village, Ill.

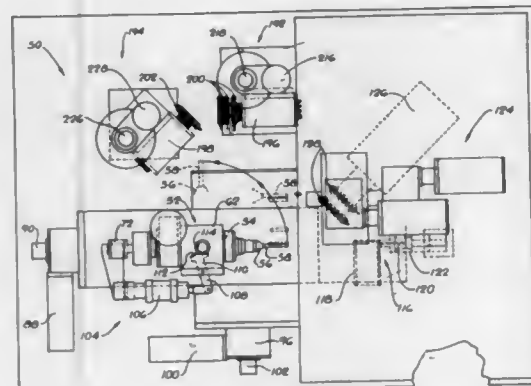
Division of Ser. No. 524,443, Aug. 18, 1983, Pat. No. 4,608,643.

This application Oct. 3, 1985, Ser. No. 784,359

Int. Cl.<sup>4</sup> B24B 47/02

U.S. Cl. 51—215 UE

2 Claims



1. An unloading mechanism for a tool grinding machine for grinding drills or other tools, said mechanism comprising a chuck for holding a tool, a turret having a plurality of angularly spaced openings for receiving successive finished tools from said chuck, a carriage for supporting said turret, means for rotatingly mounting said turret on said carriage, detent means for detaining said turret with the successive openings in an unloading position to receive the successive finished tools, power means for causing relative reciprocating movement between said carriage and said chuck to bring said unloading position into and out of alignment with said chuck, means for ejecting a tool from said chuck into the opening at said unloading position, and indexing means operative upon relative movement of said carriage and said chuck out of alignment for indexing said turret through one angular step to bring the next opening into the unloading position, said mechanism including means for supporting said carriage for reciprocating movement relative to said chuck, said power means including means for reciprocating said carriage to move said unloading position into and out of alignment with said chuck, said indexing means including a ratchet wheel on said turret, a pawl positioned for engagement by said ratchet wheel upon movement of said carriage out of said unloading position for advancing said ratchet wheel to index said turret through one angular step, a stationary pivot supporting said pawl for swinging movement, a spring biasing said pawl into the path of said ratchet wheel, and a stop limiting the swinging movement of said pawl under the biasing action of said spring.

4,680,897

## METHOD FOR MACHINING HOLES IN COMPOSITE MATERIALS

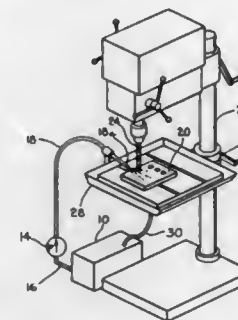
Julia G. Daniels, Madison; Frank E. Ledbetter, III, Huntsville; Johnny M. Clemons, Trinity; Benjamin G. Penn, and William T. White, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 3, 1985, Ser. No. 804,039

Int. Cl.<sup>4</sup> B24C 1/08; B23B 35/00

U.S. Cl. 51—281 R

5 Claims



1. A method for machining a hole in a composite material of the type having fiber reinforcement, comprising: providing a rotating boring tool for rotationally machining the hole in a work surface of the composite material; fixedly supporting the composite material for receipt of said rotating boring tool in said work surface; applying a liquid slurry mixture of water and between thirty and sixty percent silicon carbide powder to said work surface of the composite material; machining the hole in said work surface on said composite material with said rotating boring tool while applying said liquid slurry mixture to said work surface; said liquid slurry mixture being allowed to become interposed between said rotating boring tool and the composite material as the hole is being machined, so that said liquid slurry mixture acts as a cutting medium for enabling said rotary boring tool to provide the hole with a well-defined, substantially cylindrical interior surface.

4,680,898

## METHOD AND APPARATUS FOR CLEANING WORKPIECES

James H. Carpenter, Jr., 212 Pangborn Blvd., Hagerstown, Md. 21740

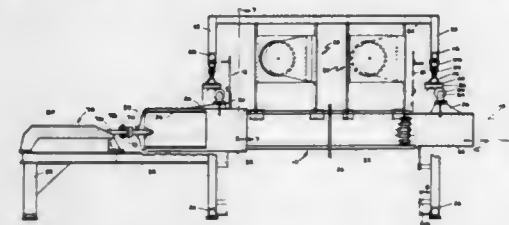
Continuation-in-part of Ser. No. 602,614, Apr. 20, 1984. This

application Apr. 1, 1985, Ser. No. 716,926

Int. Cl.<sup>4</sup> B24C 3/08

U.S. Cl. 51—419

26 Claims



1. Apparatus for cleaning workpieces by the impingement of abrasive particles, comprising: a generally horizontally oriented barrel having first and second ends, the barrel having at least one opening along its length, the barrel open at both ends to define a feed end and an exit end, the openings at the ends of the barrel

permitting workpieces to enter and exit the barrel, the opening along the length of the barrel permitting abrasive particles to be projected into the barrel; a stationary support frame for holding the barrel; means for rotating the barrel about a longitudinal axis of the barrel, the means for rotating the barrel being carried by the support frame; abrasive particle throwing means disposed adjacent the barrel for projecting abrasive particles through the opening along the length of the barrel onto workpieces passing through the barrel; and means for advancing the workpieces through the barrel, a portion of, the means for advancing the workpieces through the barrel being maintained stationary relative to the barrel, the means for advancing the workpieces engaging the barrel and oscillating the barrel such that workpieces disposed in the barrel are moved from the feed end to the exit end.

4,680,899

## PORTABLE ABRASIVE THROWING WHEEL DEVICE

James H. Carpenter, Jr., Ronald L. Mullins, and Ronald L. Smith, all of Hagerstown, Md., assignors to Pangborn Corporation, Hagerstown, Md.

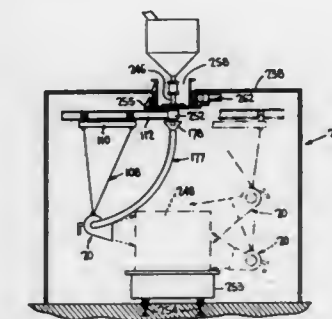
Continuation-in-part of Ser. No. 681,512, Dec. 13, 1984, Pat. No. 4,561,220, which is a continuation of Ser. No. 509,664, Jun. 30, 1983, abandoned, which is a continuation of Ser. No. 223,026, Jan. 6, 1981, abandoned. This application Dec. 20, 1985, Ser. No.

811,204

Int. Cl.<sup>4</sup> B24C 3/06

U.S. Cl. 51—427

5 Claims



1. A portable abrasive throwing wheel system secured to an overhead support means comprising a portable abrasive throwing wheel device including a drive motor, an abrasive supply, an abrasive supply line extending from said abrasive supply to said portable abrasive throwing wheel device, an overhead cantilevered boom depending from said overhead support means and having a rotary fitting permitting rotation thereabout in a horizontal plane, suspension means suspending said portable abrasive throwing wheel device from said cantilevered boom for swinging movement and including (a) a hanger means on said throwing wheel device for directly supporting the wheel, (b) a carriage means movable along said cantilevered boom, and (c) flexible support members connecting said hanger means to said carriage means, said supply line extending through said rotary fitting, and said rotary fitting providing for a 360° rotation of said cantilevered boom.

4,680,900

## DEVICE FOR ACCELERATING AN ABRASIVE

Joel Wadehul, Ketzendorfer Grund 23, D-2150 Buxtehude, and Jürgen Westphalen, Holsteinring 19, D-2359 Kisdorf, both of Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,501

Int. Cl.<sup>4</sup> B24C 5/08

U.S. Cl. 51—430

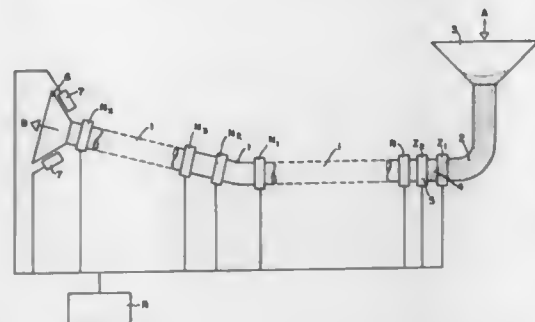
7 Claims

1. In a device for accelerating an abrasive, which comprises



magnetically influenceable particles taken from a storage supply location thereof via a magnetic field in which the particles are movable along a predetermined acceleration path in the device, for the purpose of abrasively treating a surface; said device being provided with magnet coils, which are used as accelerating elements, are disposed along the path of said abrasive through said device, and are energized or de-energized by the magnetic field as a function of the traversing of the abrasive which moves in the coil field;

the improvement wherein said device in combination therewith includes an acceleration section having an inlet end



for receiving abrasive, and an outlet end for discharging abrasive; first and second ones of said magnet coils, which are numbered in the direction of flow of abrasive through said acceleration section, are disposed near said inlet end of the latter; said first and second magnet coils being located for magnetic feed adjoining each other and also oppositely located surfaces have the same electrical polarity, and also are synchronously energized or de-energized to take the abrasive including the magnetically influenceable particles fed from the storage supply location thereof to the acceleration path in the device.

4,680,901

# PRECAST CONCRETE DOME SYSTEM

J. Herbert Armitage, Calgary, Canada, assignor to Genstar Structures Limited, Calgary, Canada

Filed Nov. 5, 1985, Ser. No. 795,247

Int. Cl.<sup>4</sup> E04B 1/32

U.S. Cl. 52—81

9 Claims



1. A domed self-supporting frameless building structure comprising a plurality of monolithic precast, elongated, concrete panels arranged in marginal edge-to-edge compressive force transmitting mutually interdependent supporting relationship with one another such that said panels are under compressive loadings along their marginal edges in both the longitudinal and lateral directions, the longitudinal edges of each of said panels coinciding with imaginary lines of longitude of a spherical or sphere-like shape; there being a plurality of circumferential courses of said panels with the panels of each said course being in end-to-end compressive force transmitting relation with the panels of the next adjacent course, a tension ring surrounding the lower extremity of the lowermost course of said panels and the lowermost ends of the panels of said lowermost course being in abutting force transmitting

relation with said ring thereby to assist in securing all of said panels together in said marginal edge to edge compressive force transmitting relationship so that the domed structure behaves as a thin shell with all of said panels being under said compressive loadings and wherein the longitudinal edges of said panels have elongated step-like recesses therein such that, in their edge-to-edge relation, an elongated U-shaped recess is defined at the joint between each adjacent pair of said panels, each said recess containing a grouting compound to fill the joints between said panels, and the ends of said panels of each course which are in said end-to-end relation with the panels of the next adjacent course having recesses therein forming lapped joints between said ends of said panels in adjacent courses such that during erection the end of each panel of a succeeding course may be supported from the end of an adjacent panel of the preceding course.

4,680,902

# UNITIZED PARTITION SYSTEM

William S. Stefnik, 955 Lake Christina Way SE., Calgary, Alberta, T2J 2R2, and Frank J. Grims, 28 Deerwood Road SE., Calgary, Alberta, T2J 6E1, all of Canada

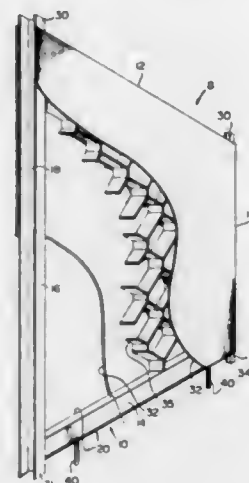
Filed Aug. 16, 1985, Ser. No. 766,430

Claims priority, application Canada, Aug. 24, 1984, 461795

Int. Cl.<sup>4</sup> E04G 21/14; E04B 2/82

U.S. Cl. 52—126.4

5 Claims



1. A non-progressive system for the construction of partition walls comprising:

(a) a floor channel adapted to be secured to a building floor;

(b) a ceiling channel adapted to be connected to a building ceiling;

(c) a series of rectangular panel assemblies each including: a rectangular frame having top, bottom and side edges, a pair of rectangular panels secured to opposite sides of said frame, and a pair of adjustable support members associated with the bottom side of the frame and in contact with the floor channel; and wherein the side edges of the frame form extensions extending beyond the top and bottom edges thereof and include longitudinal recessed channels and wherein, in use, the top of each said extension is spaced from said ceiling channel; and,

(d) for installation between each pair of said panel assemblies an elongated spline extending into said ceiling channel and including first and second lateral extensions adapted to connect two adjacent panel assemblies, said spline adapted to be moved laterally from a first position in which said lateral extensions are contained entirely within the said recessed channel of one panel assembly to a second position wherein the first and second lateral extensions extend respectively into the adjacent recessed channels of said

pair of adjacent panel assemblies, said spline being longer than the length of the frame side edge member.

4,680,903

# DOOR SHOE ASSEMBLY

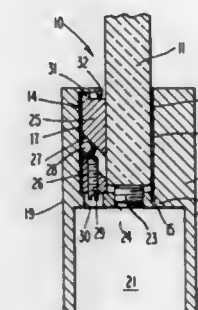
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Filed May 14, 1986, Ser. No. 862,994

Int. Cl.<sup>4</sup> E04C 2/38

U.S. Cl. 52—127.8

20 Claims



1. A metal frame and glass panel structure comprising:
  - (a) a metal shoe having a channel therein, said channel having at least one smooth side surface and an opposite side surface spaced apart from said smooth side surface;
  - (b) a glass panel positioned within said channel against said smooth side surface and spaced apart from said opposite side surface; and
  - (c) a plurality of independent expandable pressure units disposed within said channel for retaining said glass panel in said channel, each of said pressure units comprising:
    - (1) a pressure block disposed within said channel between said glass panel and said opposite side surface; and
    - (2) adjustable pressure generating means within said block for laterally expanding said pressure unit to simultaneously create pressure on said opposite side surface and an even pressure on said glass panel, whereby said glass panel is forced against said smooth side surface to secure said glass panel within said channel.

4,680,904

# MOBILE HOME SKIRTING SYSTEM

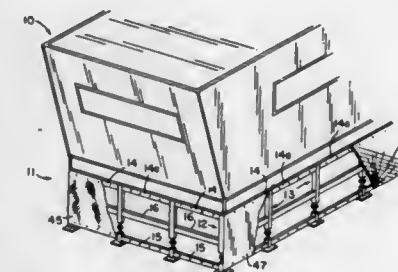
Don R. Stoecker, Georgetown Lake, Anaconda, Mont. 59711

Filed Nov. 17, 1986, Ser. No. 931,354

Int. Cl.<sup>4</sup> B60R 27/00; E02D 27/00

U.S. Cl. 52—169.12

5 Claims



1. Apparatus for enclosing the underside of a mobile home comprising:

a corner post disposed under each exterior corner of said mobile home, each of said corner posts comprising a main housing having four planar sides, a first side having a pair of openings therein spaced apart by a predetermined distance and a second side, perpendicular to said first side, said second side also having a pair of openings spaced

apart by said predetermined distance and a base member adapted to contact the ground, a threaded member threadably engaging a bottom portion of said main housing and a top portion of said base member, said threaded member having right-hand external threads on one end thereof and left-hand external threads on the other end thereof and central means thereon for selectively rotating said threaded member to selectively lengthen or shorten the effective distance between said main housing and said base member, and square tubular extension means extending from first and second sides of said base member thereof; an intermediate post disposed between each of said corner posts, each of said intermediate posts comprising an elongated housing having the top end in abutment with a bottom portion of said mobile home, a base housing adapted to contact the ground and an extension rod threadably engaged on the top thereof with the bottom of said elongated housing and the bottom thereof threadably engaged with the top of said base housing, one end of said extension rod having right hand external threads thereon and the other end having left hand external threads thereon and means attached to said extension rod for rotating said extension rod to selectively shorten or lengthen the effective distance between said elongated housing and said base housing, said elongated housing having a pair of spaced holes therein on each of a first and a second side thereof, said first and second sides of said elongated housing being parallel to each other, and said base housing having a square tubular extension means extending from each of first and second parallel sides thereof, said square tubular extension means being aligned with each other and having a common longitudinal axis; top horizontally disposed link means for interconnecting adjacent corner posts and intermediate posts, the end of said top horizontally disposed link means having extensions thereon for extending into said openings in said main housings of said corner posts and holes in said elongated housing in said intermediate posts; bottom horizontally disposed link means for interconnecting with adjacent base members of said corner posts and base housings of said intermediate posts, said bottom horizontally disposed link means being telescopically connected on the ends thereof to the square tubular extensions on said base members of said corner posts and said base housing of said intermediate posts;

intermediate horizontally disposed link means for interconnecting with adjacent main housings of said corner posts and elongated housing of said intermediate posts, said intermediate horizontally disposed link means having extensions thereon for selectively extending into said openings in said main housing of said corner posts and said holes in the elongated housing in said intermediate posts, said intermediate horizontally disposed link means being below said top horizontally disposed link means and below said bottom horizontally disposed link means; a covering for extending around the entire mobile home; means for selectively attaching or detaching the top of said covering to said top horizontally disposed link means; and means for selectively attaching or detaching said covering to the bottom horizontally disposed link means whereby the mobile home can be sealed thereunder from outside air.

4,680,905

RAFTER WITH INTERNAL DRAINAGE FEATURE AND SLOPED GLAZING SYSTEM INCORPORATING SAME  
James A. Rockar, Tarentum, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 26, 1985, Ser. No. 768,985

Int. Cl.<sup>4</sup> E04B 7/18

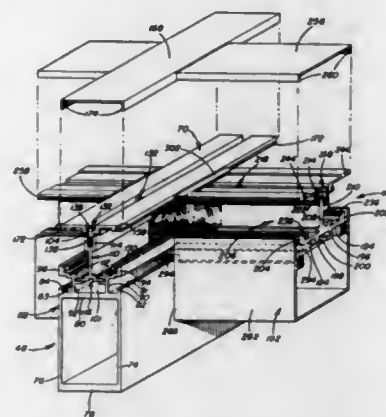
U.S. Cl. 52—200

1 Claim

1. A sloped curtainwall system for a building or the like, comprising:  
at least one panel having an inner surface facing the building

interior and an opposite outer surface with the outer surface having vertical and horizontal marginal edges and the inner surface having vertical and horizontal marginal edges;

a plurality of elongated rafters;  
a plurality of purlins;  
means for interconnecting said rafters and purlins to provide a grid having at least one opening for receiving said panel;  
at least one of said rafters having:  
an enclosed chamber extending along its length;  
a first bearing and sealing means engaging outer vertical marginal edge of said panel;  
a second bearing and sealing means engaging inner vertical marginal edges of said panel;  
said first and second bearing and sealing means engaging said panel minimizes movement of moisture, air, dust and the like from the building exterior to the building interior around the vertical marginal edges of said panel; and  
said first and second bearing and sealing means defining a vertical pocket in fluid communication with said enclosed chamber and including a vertical condensation gutter for receiving and collecting moisture from the interior surface portion of the curtainwall system;  
at least one of said purlins having a horizontal pocket defined by means for engaging and outer horizontal marginal edge portions of said panel and at least one of said



purlins having a horizontal condensation gutter for receiving and collecting moisture from the interior surface portions of the curtainwall system;  
means for providing fluid communication between said enclosed chamber and horizontal pocket of said at least one of said purlins to move moisture from the horizontal pocket to said enclosed chamber;  
means for providing fluid communication between said horizontal and vertical condensation gutters, said fluid providing means located in close proximity to rafter-purlin crossing;  
sill means interconnecting adjacent ones of said rafter and sealing off bottom edge portions of said rafters, said sill means having an opening in fluid communication with said chamber and a condensation gutter in fluid communication with said vertical condensation gutter;  
means interconnecting said vertical pocket or said horizontal pocket and exterior of the curtainwall system for pressure equalization;  
a first trim cover element secured to said first bearing and sealing means of said at least one of said rafters;  
a second trim cover element secured to outer portion of said means for engaging inner and outer horizontal marginal edge portions of said panel; and  
wherein said means interconnection said vertical pocket or said horizontal pocket and exterior of the curtainwall system for pressure equalization includes a first hole in said first or said second cover element and a second hole in first bearing and sealing means or in said outer portion

of said means for engaging inner and outer horizontal marginal edge portions of said panel, said first and second holes being offset from one another and check valves in said first or second holes.

4,680,906

#### COUPLER DEVICE FOR STRESSING CABLES, IN PRESTRESSED CONCRETE SLIDING CABLE STRUCTURES

Cesare Prevedini, Milan, Italy, assignor to Ponteggi Est S.p.A., Italy

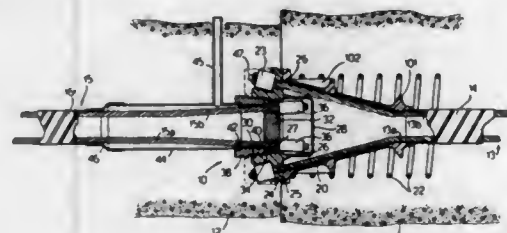
Filed Jun. 5, 1985, Ser. No. 741,348

Claims priority, application Italy, Jun. 5, 1984, 22084/84[U]

Int. Cl.<sup>4</sup> E04C 5/12

U.S. Cl. 52-223 L

3 Claims



1. A coupler device for sliding cable prestressed concrete structures for anchoring the leading strand ends of a prestress cable of a previously cast beam section and the trailing strand ends of a prestress cable of a subsequently cast beam section, which device comprises a first element including seats for receiving grips carried by the leading strand ends and a casing defining an internal space for enclosing the trailing strand ends, a second element including seats for receiving grips carried by the trailing strand ends, means for clamping the first and second elements together, the seats carried by the grips of the trailing strand ends being enclosed within a space defined by the axes of the seats for the grips for the leading strand ends, and the first element including a through hole between an outer surface thereof and the internal space defined by the casing for venting air during injection of cement grout.

4,680,907

#### CONSTRUCTION MATERIAL

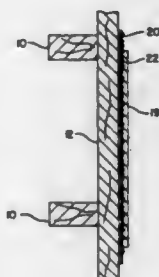
Richard D. Williams, 9725 NE. Shaver St., Portland, Oreg. 97220

Filed Oct. 28, 1985, Ser. No. 791,999

Int. Cl.<sup>4</sup> E04C 1/40

U.S. Cl. 52-309.17

7 Claims



1. A construction material comprising: a wood based moisture damageable structural substrate adapted to be fastened to a building as part of the building frame, a water impervious epoxy thinly layered directly over one surface of the substrate and firmly bonded thereto, a sand overlayer partially embedded into the epoxy layer to substantially cover the epoxy surface and present an epoxy free sand surface as the exposed

securing surface, and a cement based decorative facing material adhered to the sand surface.

4,680,909

#### ROOFING SYSTEM

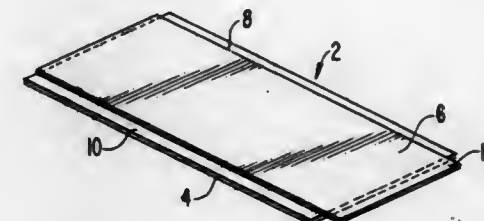
Victor M. Stewart, Redmond, Wash., assignor to Industrial Research Development, Inc., Redmond, Wash.

Filed Sep. 11, 1984, Ser. No. 649,309

Int. Cl.<sup>4</sup> E04B 7/00; E04C 1/40; E04D 1/00

U.S. Cl. 52-409

2 Claims



4,680,908

#### REFRACTORY ANCHOR

Michael S. Crowley, Chicago Heights, Ill., assignor to Amoco Corporation, Chicago, Ill.

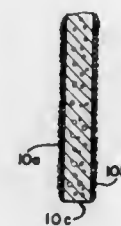
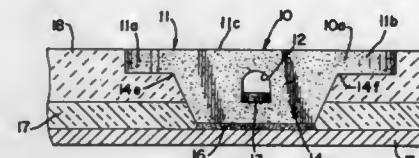
Continuation-in-part of Ser. No. 656,033, Sep. 28, 1984, Pat. No. 4,581,867, which is a continuation-in-part of Ser. No. 331,181, Dec. 16, 1981, Pat. No. 4,479,337, which is a continuation of Ser. No. 140,174, Apr. 14, 1980, abandoned. This application Feb. 28, 1985, Ser. No. 706,641

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> E04B 1/24; E04C 2/04

U.S. Cl. 52-378

19 Claims



1. A refractory anchor for minimizing erosion and increasing the useful life of refractory linings in reactors and other vessels, comprising:

an overhead elongated crossbar having opposite ends and a substantially flat intermediate portion defining a plane positioned between and connecting said opposite ends, at least one of said opposite ends having an arcuate portion curving in a direction away from said plane, said arcuate portion defining a curved baffle for arcuately deflecting and substantially blocking gases flowing along the refractory lining adjacent said refractory anchor;  
a substantially planar base extending generally downwardly from said flat intermediate portion of said crossbar for reinforcing said refractory lining, said planar base lying in substantially the same plane and being positioned substantially in coplanar relationship with said flat intermediate portion of said crossbar, said planar base having flared sides diverging generally upwardly towards said crossbar, said sides intersecting said opposite ends, respectively, of said crossbar at obtuse angles of inclination and cooperating with said ends of said crossbar to define pockets for receiving said refractory lining; and  
said crossbar and said base having an outer layer and a core, said outer layer and said core comprising a metal and a corrosion resistant material, and said outer layer having a greater concentration of said corrosion resistant material than said core.

4,680,910

#### HOLLOW-LOUVERED CEILINGS

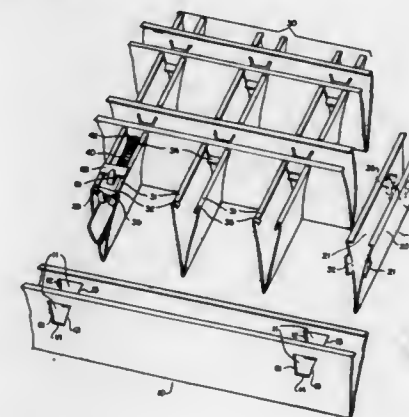
William E. Perk, 3419 E. 65th St., Cleveland, Ohio 44127

Filed Sep. 20, 1985, Ser. No. 778,369

Int. Cl.<sup>4</sup> E04B 5/52; E04C 2/42

U.S. Cl. 52-499

2 Claims



1. In a louvered ceiling comprising panels of channel-shaped louver members suspended from channel-shaped runners, the improvement comprising

a channel-shaped runner having a first sidewall and having an opening in said first sidewall;  
a channel-shaped louver member having second and third sidewalls with ends abutting said first sidewall, such that said opening in said first sidewall lies between said two abutting ends of said second and third sidewalls;  
extension means carried by said channel-shaped louver member, said extension means being spring-movable and extending into said opening in said first sidewall;  
said extension means being insertable into and removable from said opening.



from said opening in said first sidewall without deformation of said first sidewall and said extension means being concealed within said runner or said louver member, or within both, after said louvered ceiling is installed; and said extension means comprising a spring and a plunger member carried within said channel-shaped louver member, said spring tending to urge said plunger member in a direction parallel to said channel-shaped louver member and toward the interior of said channel-shaped runner.

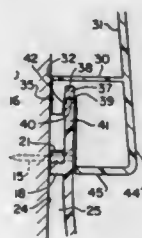
4,680,911

## DECORATIVE WALL COVERING

Richard A. Davis, 1251 NW, 165th St., Miami, Fla. 33169, and Wilfrid E. Davis, 800 E. Northwest Hwy., Palatine, Ill. 60067  
Filed May 21, 1986, Ser. No. 865,284  
Int. Cl.<sup>4</sup> E04D 1/26, 1/34

U.S. Cl. 52—521

6 Claims



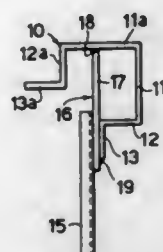
1. A panel adapted to cover and to be sealingly engaged against a wall comprising top and bottom horizontal edge regions and left and right vertical edge regions

sealing means along said top and bottom horizontal edge regions and along the left and right vertical edge regions for sealing the peripheral edges of said panel against said wall, said top horizontal edge region being sealed when said panel is fastened along its top region to said wall, said bottom horizontal edge region being sealed when the bottom horizontal region of said panel is interlockingly connected to the top horizontal region of a second panel positioned below said panel, one of said side vertical edge regions being sealed when said panel is overlappingly positioned over a side vertical edge region of a third panel positioned at the side of said panel, and the other of said side vertical edge regions being sealed when a side vertical edge region of a fourth panel is overlappingly positioned at the side of said panel, said bottom horizontal edge region sealing means comprising a flange member along the bottom length of said panel and extending substantially horizontally outward from a back surface of said panel thereby forming a straight and flat planar sealing surface, said flange member including a plurality of tab members attached to and spaced along the length of said flange member and extending in a vertical direction away from said top horizontal edge region forming a slot between said tab members and the back of said panel, said slots being positioned to engage the top horizontal region of said second panel and to sealingly position said flange member against said wall, each of said slots including a ramped, generally vertical, surface tapering in a direction from a top of said slot away from the back surface of said panel, whereby the lowering of said panel onto the top of said second panel causes the bottom horizontal sealing surface to progressively move toward and into sealing contact with said wall, each of said slots including a horizontal ledge along the surface of said slot opposite to the ramped surface whereby said panel is properly positioned horizontally with said second panel upon engagement of the top horizontal edge surface of said second panel with said plurality of ledges.

4,680,912  
STRUCTURE FOR METAL CONSTRUCTIONS IN GENERAL, IN PARTICULAR FOR TRESTLEWORK CONSTRUCTIONS, ACCOMPLISHED BY MEANS OF SECTION BARS AND JOINTING ELEMENTS  
Antonio Pantalone, Via Carpaccio, 4, Milan, Italy  
Filed Mar. 28, 1986, Ser. No. 845,558  
Claims priority, application Italy, Apr. 5, 1985, 20270 A/85  
Int. Cl.<sup>4</sup> E04C 3/30

U.S. Cl. 52—721

27 Claims



1. Structure for metal constructions in general and in particular for trestlework constructions comprising at least one angle iron having a pair of generally equal length legs, each leg being extended at a free end thereof by a first extension length positioned at right angles relative to its associated leg and projecting therefrom in the same general direction, a second extension length of each leg positioned at right angles relative to its associated first extension length in such a direction as to depart from each other, said first and second extension lengths having each one a width substantially equal to half the width of a leg of the angle iron, a jointing element constituted by at least one plate, and means for fastening said one plate to said angle iron at an inner surface of one of its legs and to an inner surface of the second extension length of said second leg.

4,680,913

## PROCESS FOR PRODUCING AIRTIGHT SEALING OF BUILDINGS

Pierre Geisen, Strasbourg; Jean-Claude Reillaudoux, Souffelweyersheim, and Bernard Ducret, Schwindratzheim, all of France, assignors to Soprema S.A., Strasbourg-Neubof, France

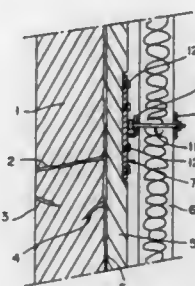
Filed Jan. 20, 1984, Ser. No. 572,409

Claims priority, application France, Sep. 29, 1983, 83 15687

Int. Cl.<sup>4</sup> E04B 1/66

U.S. Cl. 52—746

9 Claims



1. In a process for producing airtight sealing of buildings with the aid of a manufactured sheet of constant thickness, and with the aid of perforated mounting plates, said manufactured sheet including a reinforcement of organic fibers covered in a mass of bituminous binder, the steps comprising causing said manufactured sheet to adhere fully on a zone to be treated, said zone including a substrate, so as to produce a continuous dressing, and whatever the nature and shape of said substrate,

attaching an insulation over said dressing without perforating said sheet, by applying said perforated mounting plates by hot pressing into a surface zone of said dressing, so that said perforated mounting plates serve, after cooling, as points of support for said insulation, and selecting said bituminous mass from the group consisting of oxidized bituminous binders, bitumens modified with thermoplastic polymers of the styrene-butadiene-styrene type, and bitumens modified with plastic polymers of the atactic polypropylene type.

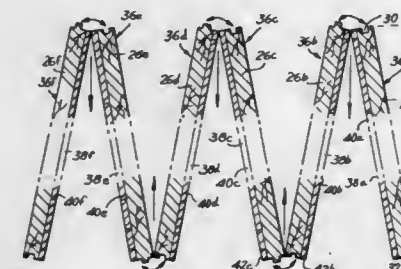
4,680,914

## METHOD OF INSTALLING MARBLE PANELS

Neil Migliore, 234 New York Ave., Huntington, N.Y. 11743  
Continuation-in-part of Ser. No. 763,524, Aug. 8, 1985, Pat. No. 4,640,076, and a continuation-in-part of Ser. No. 766,270, Aug. 16, 1985, Pat. No. 4,601,147. This application Feb. 21, 1986, Ser. No. 832,049  
Int. Cl.<sup>4</sup> E04G 21/00

U.S. Cl. 52—747

6 Claims



1. A method of installing marble panels on a flat wall, comprising the steps of:

cutting a slab of marble having a front face and opposite ends, into a plurality of thin marble layers;  
attaching a backing panel to each marble layer to form a plurality of marble panels;  
installing marble layers which represent successive cuts from said slab of marble adjacent to each other on said flat wall with adjacent side edges thereof which correspond to the same end of said slab of marble being in abutting relation, to form a continuous pattern of said flat wall.

4,680,915

## TAPERED SURFACE PANEL RETAINER

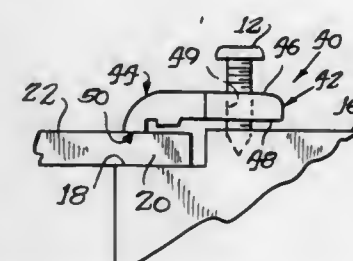
Earl D. Bush, Downers Grove, Ill., assignor to Handy Button Machine Company, Melrose Park, Ill.

Filed Jun. 30, 1986, Ser. No. 879,925

Int. Cl.<sup>4</sup> E06B 3/62

U.S. Cl. 52—766

5 Claims



1. A panel retainer comprising: a one-piece integrally formed member, formed from a resilient, elastically bendable material, and having a fastener-receiving portion and a panel-gripping portion; said fastener-receiving portion comprising a body portion having a top surface and a substantially flat bottom surface spaced from said top surface, said body defining a through aperture for receiving a fastener to secure the

retainer to a given surface; and said panel-gripping portion comprising a further body portion projecting from said first body portion and having means defining thereupon a substantially flat tapered, panel-engaging surface portion diverging from said first body portion bottom flat surface in the direction of a panel to be retained thereby for engagement therewith; said gripping portion being flexible in the area where it joins with said fastener-receiving portion to permit resilient, elastic bending thereof for engagement of said flat tapered surface in a substantially flat surface-to-surface engagement with said panel.

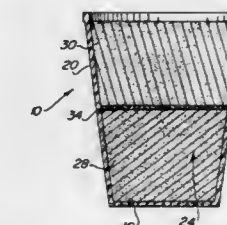
4,680,916

## STAGED DETERGENT/FABRIC TREATING PREPARATION FOR USE IN WASHING MACHINES

Martin E. Ginn, 9327 N. Kostner, Skokie, Ill. 60076  
Division of Ser. No. 689,455, Jan. 7, 1985, Pat. No. 4,588,080.  
This application Mar. 7, 1986, Ser. No. 837,217  
Int. Cl.<sup>4</sup> B65B 63/08

U.S. Cl. 53—440

4 Claims



1. The method of preparing a composite multi-layer plug including as physically distinct elements a fabric washing agent and a fabric conditioner, and in which said washing agent and said conditioner are bonded to one another to constitute a unitary assembly,

said plug functioning in a tub of a washing machine and being operative to delay dissolution release of the fabric conditioner until a substantial portion of the washing agent has dissolved in and has dispersed throughout the washing solution during a wash cycle of a washing operation, said method including the steps of: preparing a concentrated fabric treating composition as a heated, fluidized slurry, introducing said slurry into a water-impervious, water-insoluble cup-like receptacle to define a base layer therein, cooling said slurry to form a solid pellet-like disc bonded contiguously to a floor and to a circumscribing bounding wall of said receptacle, preparing a heated concentrated detergent mixture in a fluidized form, adding said mixture to said container intimately to overlie said disc, cooling said detergent mixture to effect an intimate bond with a top surface of said disc to form a multi-layer plug, and to establish a fluid-tight seal of said plug to a circumscribing wall of said receptacle, and retaining said plug within aid container for ultimate introduction of said plug and said container into a tub of a washing machine.

4,680,917

**PROCESS FOR PROVIDING FILLED CONTAINERS**

Thomas P. Hambleton, Pine Bush, N.Y.; Erick Guevara, Huntingdon Valley, Pa., and Peter Rychiger, Steffisburg, Switzerland, assignors to International Paper Company, New York, N.Y.

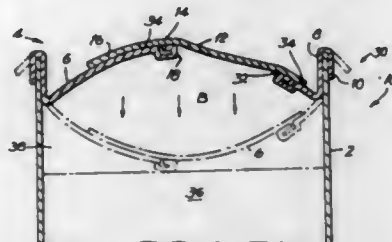
Division of Ser. No. 642,054, Aug. 17, 1984, Pat. No. 4,557,398. This application Mar. 18, 1985, Ser. No. 713,364

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> B65B 63/08

U.S. Cl. 53—440

3 Claims



1. A process for providing a filled container comprising the steps of:

filling an open top end closed bottom end container with a hot-fill material in its heated condition to a predetermined level in said container;

providing a top end closure structure which includes a flexible central member having an outwardly dished center section and at least one opening structure having an opening therein disposed in said central member, and a removable flexible closure member disposed over said opening structure which is in a first sealing relationship with a portion of said opening structure and a second sealing relationship with a top surface of said central member; sealing said top end closure structure on said open top end of said container with sealing means, said sealing means being disposed from a peripheral edge of said central member;

cooling the hot-fill material to ambient temperature in said container; and

dishing inwardly the center section of said flexible central member of said end closure structure during said cooling step so there is substantially atmospheric pressure or slight vacuum pressure within said sealed container after the hot-fill material has cooled to ambient temperature to prevent stress on at least one of said first and second sealing relationships associated with sealing the opening in the opening structure with said removable thin flexible closure member, said inward dishing step being facilitated by said flexible central member and said thin flexible closure which readily flex during the cooling process.

4,680,918

**PACKAGING WITH COHESIVE COATED MATERIALS**

Robert C. Lovell, 725 N. Glendale Ave., Glendale, Calif. 91206

Filed Jun. 6, 1986, Ser. No. 872,201

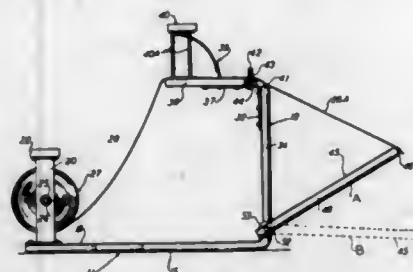
Int. Cl.<sup>4</sup> B65B 11/48

U.S. Cl. 53—466

4 Claims

1. A process for folding cohesive sheet material about an object to form a sealed package using a framework with a material supply reel and a mandrel and a crimp frame pivotably movable with respect to said mandrel, and a paper cutoff movable transversely of mandrel, including the steps of loading the reel with cohesive material in roll form, threading said material over a platform and the mandrel to contact with an upraised crimp frame, securing the advance edge of the material to the top bar of the crimp frame manually, pivoting the crimp frame away from the mandrel sufficiently to define a material sleeve for both obverse and reverse sides of the object being packaged, depositing the object against the material near the middle of the material web formed by extending the frame

from the mandrel with the material edge still held manually to the frame, returning the loaded crimp frame with the material edge still held manually to an upright position adjacent the cohesive material-draped mandrel to contact both sides of the



object with material, pressing the crimp frame past the mandrel to compress the material between the mandrel and the frame and bond the two folded edges of the material together at two sides and an end, and then manipulate the cutter transversely to sever the package thus formed from the material supply.

4,680,919

**ARTICLE DELIVERY TRANSFERRING DEVICE IN A COLLECTIVE PACKING MACHINE**

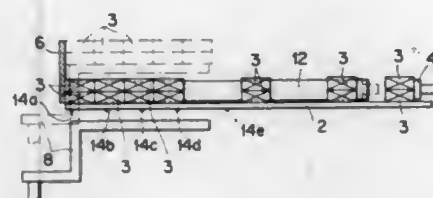
Shigemitsu Hiram, 9-34, Komagome 4 chome, Toshima-ku, Tokyo 170; Satoru Aida, 106-6, Nishinaka, Sanjo-shi, Niigata 955, and Hideo Soyama, 2-A-13, Takasu-cho 1 chome, Kamoshi, Niigata 959-13, all of Japan

Continuation of Ser. No. 634,385, Jul. 25, 1984, abandoned. This application Aug. 14, 1986, Ser. No. 896,330

Claims priority, application Japan, Jul. 28, 1983, 58-138608 Int. Cl.<sup>4</sup> B65B 57/10

U.S. Cl. 53—499

3 Claims



1. In an article delivery transferring device of a collective packing machine comprising a main packing machine and an auxiliary packing machine each having an individual driving source, wherein articles from the main packing machine in continuous operation are delivered and transferred to the auxiliary packing machine in batch sequence, the improvement comprising a grasping belt means arranged along an article conveying path between the main packing machine and the auxiliary packing machine, said belt means being arranged for grasping and directing said articles along said path and means for driving said grasping belts at a belt traveling speed corresponding to the operational speed of the main packing machine, and article detecting sensor means for detecting passage of a predetermined number (n) of articles along the article conveying path, said article detecting sensor means comprising a predetermined number (n) of sensors corresponding to said predetermined number (n) of articles and arranged along the article conveying path, and wherein the nth sensor is placed a predetermined distance upstream from the transferring device and along the article conveying path which predetermined distance is sufficient to provide early indication as to the passage of the nth article towards the transferring device prior to said nth article reaching a stationary transfer position in abutting end to end contact with the (n-1)th article, said nth

sensor generating a signal upon sensing said nth article for starting the auxiliary packing machine to provide continuous high speed synchronous operation of both the auxiliary packing machine and the main packing machine.

4,680,920

**DEVICE FOR MOVING NUCLEAR FUEL ELEMENT SHEATHS AT A FIXED FILLING STATION**

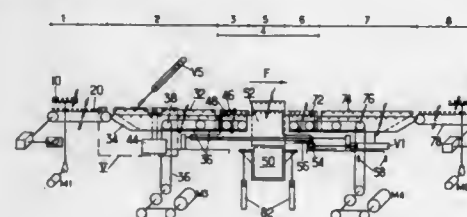
Bernard Veré, Brie et Angonnes - Eybens, and Paul Mathevon, Bollene, both of France, assignors to Societe Cogema, Framatome et Uranium Pechiney, Villaconblay, France

Filed Dec. 28, 1984, Ser. No. 687,228

Claims priority, application France, Dec. 30, 1983, 83 21125 Int. Cl.<sup>4</sup> B65B 1/08

U.S. Cl. 53—525

6 Claims



1. A device for transferring nuclear fuel element sheaths at a filling station, comprising:

a first station for storage of a predetermined plurality of empty sheaths each having a closed end and an open end, said empty sheaths being in spaced relation to each other with a first predetermined mutual spacing;

a second station for storage of a predetermined plurality of filled sheaths as a horizontal layer of said plurality of filled sheaths, said filled sheaths being in spaced relation to each other with said first predetermined mutual spacing;

sheath-loading means located between said first and second stations on a transfer path of said sheaths along a predetermined direction and comprising filling means;

first conveyor means for simultaneously engaging said plurality of empty sheaths and moving them as a whole toward said loading means;

first pitch change means associated with said first conveyor means for repeatedly bringing part of a plurality of empty sheaths to a loading location confronting said sheath-loading means, comprising a first unit for increasing the mutual spacing between adjacent sheaths to a second predetermined spacing and presenting the sheaths of said plurality successively one by one at a weighing station and a second unit for decreasing the spacing of the sheaths again to a third predetermined spacing for presentation to a vibrating table machine of said sheath loading means, for simultaneous filling of said part of the plurality of said empty sheaths with said filling means;

second pitch change means for repeatedly removing said part of the plurality of sheaths after filling said empty sheaths from said loading location and returning said sheaths to said first predetermined mutual spacing;

second conveyor means associated with said second pitch change means for moving said plurality of sheaths from said second pitch change means to said second station, and control means for synchronized actuation of said conveyor means and pitch change means.

4,680,921

**SAFETY STIRRUP FOR HORSE-RIDING**

Michel Bezin, 42bis, Boulevard Victor Hugo, F-58000 Nevers, France

Filed Apr. 11, 1986, Ser. No. 850,543

Claims priority, application France, Apr. 12, 1985, 85 05513 Int. Cl.<sup>4</sup> B68C 3/00

U.S. Cl. 54—49

11 Claims



1. A safety stirrup for horse-riding comprising a stirrup head having an eye and being attached to a corresponding stirrup-leather by means of a coupling device comprising a retaining element engaged in the eye of said stirrup head and a resilient member for maintaining said stirrup head applied against said retaining element while permitting disengagement of said retaining element in the event of an abnormal pivotal motion between said stirrup and said stirrup-leather, wherein said safety stirrup is distinguished by the following features:

(a) said coupling device comprises a resilient clamp having two jaws normally located in planes substantially parallel to the general plane of said stirrup, said two jaws being sized, shaped, and positioned to clamp the top portion of said stirrup head and being provided with bottom retaining noses engaged in the eye of said stirrup head and adjacently opposite one another;

(b) the top portion of said stirrup head has the shape of a cam so designed as to be capable of causing incipient separation of said two jaws in the event of rotation of said cam about its own axis up to an angle of the order of 30° to 45° approximately, the lower end of said cam being such as to form a wedge corner which is capable of engaging between the bottom retaining noses of said two jaws in order to increase their relative spacing and thus to permit escape of said stirrup; and

(c) the cam which constitutes the top portion of said stirrup head has a flat bottom face which bears on the bottom retaining noses of said two jaws as well as two flat faces perpendicular to said bottom face and parallel to the general plane of said stirrup, said two jaws being normally applied against said two flat faces.

4,680,922

**MOWER**

William T. Arnold, Sutton West, Canada, assignor to Brouwer Turf Equipment Limited, Keswick, Canada

Division of Ser. No. 685,502, Dec. 24, 1984, Pat. No. 4,644,737.

This application Apr. 30, 1986, Ser. No. 857,281

Int. Cl.<sup>4</sup> A01D 35/24

U.S. Cl. 56—7

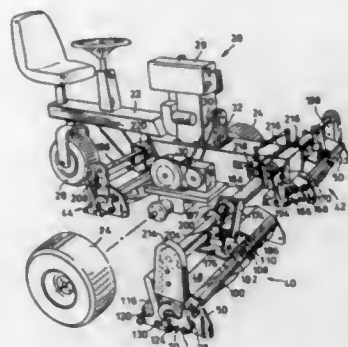
7 Claims

1. A mower comprising:

(a) a frame,  
(b) a reel mounted in said frame for rotation therein,  
(c) a bed knife mounted on said frame and located behind said reel to cut grass between said reel and said bed knife,  
(d) a first upstanding support adjacent one end of said mower and extending above said frame,  
(e) a second upstanding support adjacent the center of said mower and extending above said frame,



- (f) means rigidly connecting said upstanding supports together and coupling said supports to said frame,  
 (g) a drive shaft extending across the top of said mower and through said supports,

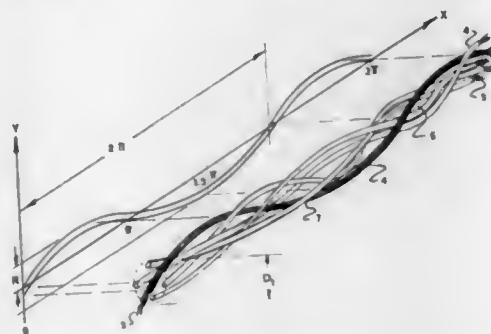


- (h) a pulley connected to said drive shaft adjacent said first support, a pulley connected to said reel and drive belt means connected between said pulleys, and  
 (i) drive means connected to said drive shaft adjacent the center of said mower for rotating said drive shaft.

4,680,923

## COMPOSITE TWINE STRUCTURE

Charles E. Kaempen, 3202 Larkstone Dr., Orange, Calif. 92669  
 Filed Mar. 27, 1985, Ser. No. 716,565  
 Int. Cl.<sup>4</sup> D02G 3/44; B32B 5/02, 5/08; F16S 5/00  
 U.S. Cl. 57-251 26 Claims

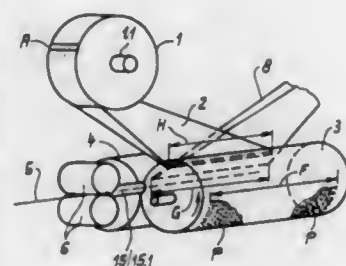


1. A composite twine structure disposed on a longitudinal axis thereof comprising  
 a multiple of compacted continuous filament strands each composed of a multiple of individual continuous filament reinforcements, each of said filament strands extending at least generally in the direction of said axis to exhibit a center-pull helical frequency and configuration defined by a multiple of revolutions about said axis and about at least one other of said filament strands, each of said filament strands having helices that are spaced relative to the helices of the other filament strands in the direction of said axis, and  
 hardenable adhesive means impregnating said filament strands and forming a hardened bonding matrix for rigidly maintaining said filament strands as said composite twine structure.

4,680,924  
 METHOD OF STARTING SPINNING OF A YARN IN A FRICTION SPINNING DEVICE  
 Emil Briner, and Richard Hieronymi, both of Winterthur, Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Oct. 24, 1986, Ser. No. 922,683  
 Claims priority, application Switzerland, Oct. 31, 1985, 04685/85

Int. Cl.<sup>4</sup> D01H 15/02, 7/885 12 Claims  
 U.S. Cl. 57-263



1. A method for starting or recommencing spinning of a yarn in a friction spinning device in which freely floating fibers are delivered through a fiber transport passage to a friction spinning surface of a friction spinning means and are forwarded on said friction spinning surface to a yarn formation position from which a spun yarn is withdrawn by yarn withdrawal means, said method comprising the steps of:  
 forwarding said freely floating fibers to said yarn formation position and twisting said freely floating fibers to form a rotating twisted fiber structure of substantially predetermined size;  
 forwarding said rotating twisted fiber structure by a first airstream towards said yarn withdrawal means; and  
 subsequently catching said rotating twisted fiber structure, and spun yarn adjoining thereon, by a yarn take-up means arranged subsequent to said yarn withdrawal means.

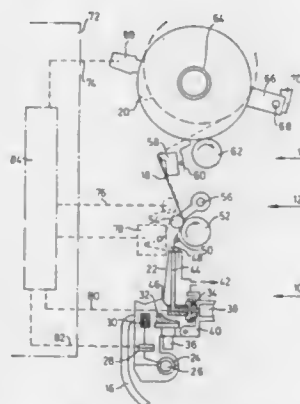
4,680,925

## OPEN-END YARN PIECER

Jürg Bischofberger, Elsau, and André Lattion, Seuzach, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 18, 1984, Ser. No. 611,709  
 Claims priority, application United Kingdom, May 20, 1983, 8313993

Int. Cl.<sup>4</sup> D01H 15/02 18 Claims  
 U.S. Cl. 57-263



1. In combination,  
 a spinning machine having a plurality of spinning stations,

- each said station including a spinning unit for spinning a yarn therein, feed means for feeding sliver to said spinning unit and a pair of nip rolls for withdrawing a yarn from said spinning unit; and  
 a travelling piecing apparatus movable along said machine for selective positioning with a respective spinning station, said apparatus including first means for separating said nip rolls of a selected station, second means for forming a yarn reserve in a seed yarn for back-feeding into said spinning unit of a selected station, control means to actuate said feed means of a selected station to feed sliver to said spinning unit thereof, said second means to release a yarn reserve for back-feeding to said spinning unit and said first means to re-engage said nip rolls for withdrawing of the seed yarn with the newly spun yarn pieced thereto, and timing means in said control means to time initiation of the re-engagement of said nip rolls from a predetermined timing reference.

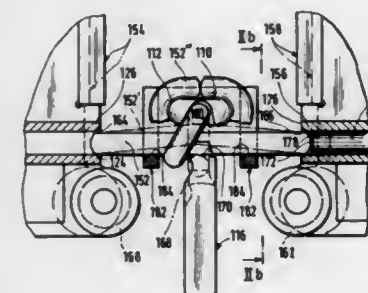
4,680,926

## PROCESS AND APPARATUS FOR THE PRODUCTION OF OVAL CHAIN LINKS FROM ROUND WIRE

Gerhard Lange, Reutlingen, Fed. Rep. of Germany, assignor to WAFIOS Maschinenfabrik GmbH & Co. Kommanditgesellschaft, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 795,915  
 Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440907

Int. Cl.<sup>4</sup> B21L 1/02 9 Claims  
 U.S. Cl. 59-27



1. A process for the production of oval chain links from pieces of wire of a given uniform length, comprising the steps of:  
 providing a single bending station having a cylindrical bending mandrel having a longitudinal axis and an annular groove extending round this axis in a vertical plane;  
 guiding a straight piece of wire, with its axis crossing at right angles with the longitudinal axis of said mandrel, in its longitudinal direction alongside of the mandrel at a free distance from said mandrel at the level of the groove;  
 first bending the piece of wire at the mandrel into a V-shaped piece with the arms of the V at an obtuse angle; moving the middle of the piece of wire, forming the back of the link, perpendicularly to the mandrel axis and to the straight wire piece axis into a recess on the mandrel at its feed side and at the level of the said groove; and  
 bending the piece of wire which has thus been subjected to its initial bending into a C shape around the mandrel; and, finally bending said piece of wire into an O shape by bending said piece of wire into the groove outside the mandrel recess until the longitudinal axis of the piece of wire follows the course of the groove, further comprising:  
 preventing the trailing free end of the piece of wire and the leading free end of said piece of wire from moving to any significant extent in a direction perpendicular to the longitudinal direction and direction of feed both of the straight piece of wire during the initial bending of the piece of wire and the simultaneous movement inwards of its middle into the mandrel recess by applying two parallel reactive forces on said free wire piece ends, respectively, in a

- direction opposite to the wire piece middle moving direction thereby preventing the free ends of the piece of wire from moving in the middle moving direction during the movement of the middle of the piece of wire towards the mandrel.

4,680,927

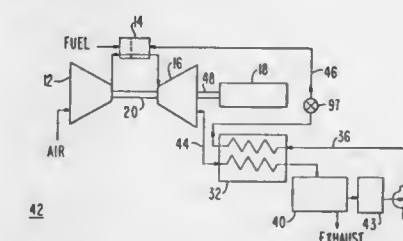
## CONTROL SYSTEM FOR CHENG DUAL-FLUID CYCLE ENGINE SYSTEM

Dah Y. Cheng, Los Altos Hills, Calif., assignor to International Power Technology, Inc., Palo Alto, Calif.

Continuation of Ser. No. 476,456, Mar. 18, 1983, Pat. No. 4,549,397, which is a continuation of Ser. No. 273,269, Jan. 21, 1981, Pat. No. 4,417,438, which is a division of Ser. No. 59,591, Jul. 23, 1979, Pat. No. 4,297,841. This application Jul. 25, 1985, Ser. No. 758,683

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.  
 Int. Cl.<sup>4</sup> F02C 7/00

U.S. Cl. 60-39.3 2 Claims



1. In a dual-fluid heat engine, which can be operated to produce co-generated process steam having:  
 a chamber;  
 a compressor means for introducing a first gaseous working fluid comprising air into said chamber, said compressor means having a predetermined pressure ratio (CPR);  
 means for introducing a second liquid-vapor working fluid comprising water in the form of a vapor within said chamber at a defined water/air working fluid ratio (XMIX);  
 means for heating said water vapor and air in said chamber at a defined specific heat input rate (SHIR);  
 turbine means responsive to the mixture of said first and second working fluids for converting the energy associated with the mixture to mechanical energy, the temperature of said mixture entering said turbine means defining the turbine inlet temperature (TIT) and having a design maximum turbine inlet temperature (TITmax);  
 counterflow heat exchanger means for transferring residual thermal energy from said exhausted mixture of first and second working fluids to said incoming working fluid water to thereby preheat the same to water vapor prior to its introduction within said chamber;  
 means for diverting water vapor from said chamber, if desired, for co-generated process steam; and wherein the improvement comprises:  
 means for operating the engine under partial load conditions such that when substantially no co-generated process steam is required, the engine control path follows a locus of peak efficiency points resulting in declining TIT as the load decreases, and such that XMIX and SHIR are selected so that for a given value of TIT, XMIX is at or near XMIX peak, where XMIX peak occurs when the following conditions are both met simultaneously:  
 (i) the temperature of the water vapor is substantially maximized; and  
 (ii) the effective temperature of said exhausted mixture of the first and second working fluids is substantially minimized; and  
 means for operating the engine to produce co-generated process steam by following a control path which reduces

the steam flow rate to said chamber as process steam increases.

4,680,928

# WARM-UP PROMOTION DEVICE FOR AUTOMATIC TRANSMISSION

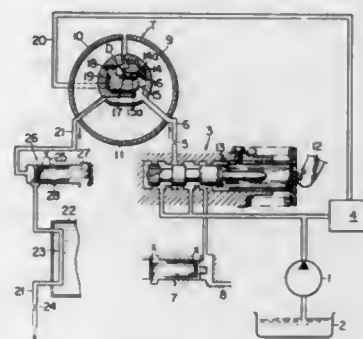
Masao Nishikawa, Tokyo, and Takashi Aoki, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,036

Claims priority, application Japan, Jul. 3, 1982, 57-115680  
Int. Cl.<sup>4</sup> F16D 31/00

U.S. Cl. 60—329

2 Claims



1. In an automatic transmission having a torque converter, an inlet passage connecting between an oil inlet of said torque converter and an outlet of a hydraulic pump driven by an engine, and an outlet passage connecting between an oil outlet of said torque converter and an oil tank, said outlet passage being independent and separate from said inlet passage and being provided at an intermediate portion thereof with an oil cooler,

a warm-up promotion device for the automatic transmission, comprising: a by-pass passage branched from said outlet passage at a portion upstream of said oil cooler and leading to said oil tank while bypassing the oil cooler; and a by-pass valve associated with said by-pass passage and adapted to open said by-pass passage during warming up of said automatic transmission; wherein said by-pass valve is a pressure-response type valve which is adapted to open said by-pass passage in response to a pressure rise in said outlet passage caused by an increase in the viscosity of the oil discharged from said torque converter, thereby allowing the oil to be returned to the tank while bypassing the oil cooler.

4,680,929

# SWIVELLING WORKING VEHICLE

Akihiko Mouri, Sakai, and Kazushige Ikeda, Osaka, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Dec. 14, 1983, Ser. No. 561,440

Claims priority, application Japan, Apr. 4, 1983, 58-49852[U]; Jul. 21, 1983, 58-134987

Int. Cl.<sup>4</sup> F16D 31/00

U.S. Cl. 60—368

5 Claims

1. A working vehicle capable of swivelling comprising: a swivel base (2) having a working implement (6), a hydraulic motor (3) for swivelling the swivel base, an actuator valve (10) for controlling the hydraulic motor in opposite directions and stopping the hydraulic motor, an angle sensor (18) for detecting an angle of the swivel base relative to the vehicle body, a setting adjuster (19) for setting a stopping position ( $\theta$ ) of the swivel base relative to the vehicle body, detector means (17) for detecting operating conditions of the actuator valve, said actuator valve including flow control valve means for

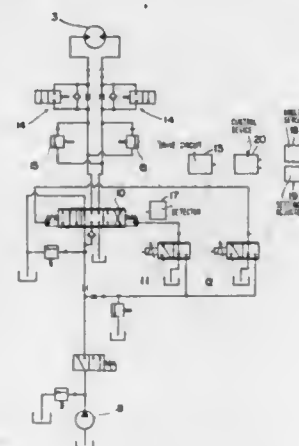
controlling flow rate of hydraulic oil supplied to the hydraulic motor,

forward and reverse braking valves (14) which prevent a momental rotation of said swivel base when in a stationary position,

forward and reverse relief valves (15) for cushioning said swivel base during stopping, and

control means (20) adapted to receive signals from the angle sensor, the setting adjuster and the detector means and to transmit signals to the actuator valve and to the flow control valve to swivel the swivel base at a predetermined speed,

said control means having a first swivel speed computing function to provide a first speed accelerated with swivelling of the swivel base,



a second swivel speed computing function to provide a second speed decelerated as the swivel base approaches a stopping position,

a third swivel speed computing function to provide a third, predetermined constant speed as a maximum permissible speed over an entire swivel range of the swivel base,

a swivel speed setting function to set the slowest swivel speed at an angular position of the speeds provided by the first to third computing functions to be the swivel speed for that angular position, and

an overrun correcting function to provide a correcting swivel speed for returning to the stopping position when an overrun of the swivelling is detected.

4,680,930

# HYDRAULIC CONTROL CIRCUIT AND VALVE ASSEMBLY

William W. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 5, 1983, Ser. No. 558,050

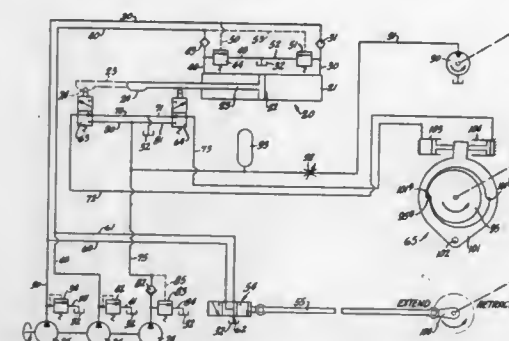
Int. Cl.<sup>4</sup> F15B 15/18

U.S. Cl. 60—375

30 Claims

1. A hydraulic power and control system for operating a hydraulic reciprocating mechanism comprising: hydraulic fluid supply means; fluid direction control means for selectively directing hydraulic fluid from said supply means to said reciprocating mechanism to reciprocate a member of said mechanism between a first position and a second position; said fluid direction control means having a first position directing hydraulic fluid to move said member in one direction and a second position directing hydraulic fluid to move said member in the other direction; reversing means for shifting said fluid direction control means between its first and second positions; a continuous torque hydraulic motor operatively connected to said reversing means; an escapement releasably coupled with said motor to restrain said motor from operating said reversing means while said member is intermediate said first and second positions; and means for releasing said motor from said escape-

ment responsive to arrival of said member at said first and at said second positions allowing said motor to operate said re-



versing means and shift said fluid direction control means between said first position and said second position.

4,680,931

# CONSTANT SPEED CONTROL FOR POSITIVE DISPLACEMENT VARIABLE STROKE HYDRAULIC MOTOR

Harvey C. Jacobs, 9710 Harvard St., Bellflower, Calif. 90706

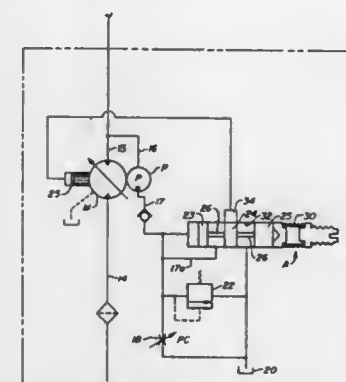
Continuation of Ser. No. 132,044, Mar. 30, 1980, abandoned.

This application Mar. 24, 1983, Ser. No. 476,819

Int. Cl.<sup>4</sup> F16D 31/02

U.S. Cl. 60—447

4 Claims



1. A control mechanism for at least one positive displacement variable stroke motor connected across a pressure drop in a hydraulic line supplied with fluid under pressure by a prime mover, said control mechanism comprising:

a positive displacement pump connected to the shaft of said motor, said positive displacement pump having a fluid circuit independent of said pressure drop and connection to said prime mover with a discharge across an orifice to provide a control pressure between said pump and said orifice varying responsive to the speed of said motor;

a fluid amplifier for amplifying the control pressure, said fluid amplifier having an output; and

means for varying the stroke of said motor communicated to said fluid amplifier responsive to the output of said fluid amplifier.

4,680,932

# APPARATUS FOR SUPERCHARGING AN INTERNAL COMBUSTION ENGINE

Oskar Schatz, Tellhohe 14, D-8031 Stockdorf, Fed. Rep. of Germany

Continuation of Ser. No. 609,928, May 14, 1984, abandoned.

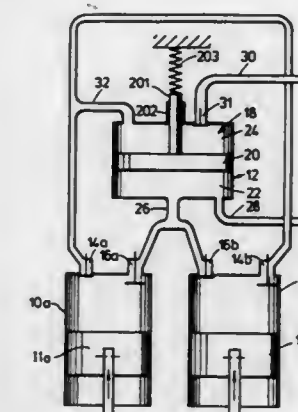
This application Apr. 28, 1986, Ser. No. 856,797

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318093; May 18, 1983, 3318094

Int. Cl.<sup>4</sup> F02B 37/00

U.S. Cl. 60—605

2 Claims



1. The combination of an internal combustion engine and a positive displacement supercharger, said engine of the type having at least two cylinders having a reciprocating piston movable between top dead center and bottom dead center positions comprising:

said positive displacement supercharger having a housing defining a chamber and a single movable piston therein dividing said chamber into an exhaust gas chamber and an air charging chamber, said exhaust gas chamber and said air charging chambers communicating with both of said engine cylinders such that in a first operational occurrence of said supercharger, exhaust gases in said exhaust gas chamber from the first of said cylinders bias said supercharger piston to compress air in said air charging chamber such that air is directed to the second of said cylinders when said piston of said second cylinder is moving between said top dead center and said bottom dead center position and in a second operational occurrence of said supercharger, exhaust gases in said exhaust gas chamber from said second of said cylinders bias said supercharger piston to compress air in said charging chamber such that air is directed to said first cylinder when said piston of said first cylinder is moving between said top dead center and said bottom dead center positions, said first and second operational occurrences alternating during operation of said supercharger, and said exhaust gas biasing being timed to provide compressed air to said cylinders at a point where said piston cylinders are near said bottom dead center position.

4,680,933

# CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE WITH AN EXHAUST GAS TURBOCHARGER

Hanns-Günther Bozung, Neuss, and Joachim Nachtigal, Hetzles, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 7, 1985, Ser. No. 785,283

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 3437872

Int. Cl.<sup>4</sup> F02B 33/44

U.S. Cl. 60—608

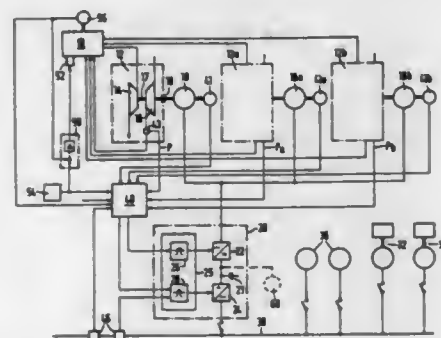
18 Claims

1. A control device for an internal combustion engine with an exhaust gas turbocharger having an exhaust turbine and



a compressor both mounted on a common shaft, which can be driven by an electric motor, said turbine transferring the electric motor from motor operation to generator operation in the event of excess power in the exhaust gases so as to furnish electrical energy from the electric motor to an electric accumulator, or an independent load, via a static converter, comprising:

- (a) a plurality of sensors that detect the instantaneous values of (a) the actual rotary speed of the turbocharger, (b) the actual voltage of the electric accumulator, (c) the actual frequency of the electric accumulator, and (d) the actual charging air pressure of the compressor; and
- (b) a computer controller which (a) receives as control data the detected values from the plurality of sensors, a control input received by a controller of the internal combustion engine, and engine output data, and (b) computes and supplies from the control data received and from stored values, in particular, from a charging air pressure characteristic or from an input characteristic to the electric motor as a function of the output of the internal combustion engine, control signals for the static converter by



which, in the motor-operating mode of the electric motor, the internal combustion engine accelerates as quickly as possible at combustion air ratios optimal for low-smoke combustion, and by which, in the generator-operating mode of the electric motor, a maximum yield of electrical energy from the excess exhaust gas energy can be fed to the electric accumulator or to the independent load, the transferring of the electric motor from motor operation to generator operation and vice versa being controlled as a function of a charging air pressure value preset in the computer controller and the computer controller being usable in conjunction with an exhaust gas turbocharger which, due to optimized exhaust gas turbine and compressor blade design, is of such high efficiency that it is not necessary to utilize the entire amount of exhaust gas available for generating the amount of charging air required in the upper load range of the internal combustion engine, with the charging air pressure required for an optimum combustion air ratio, and that the exhaust gas energy attainable without increased fuel intake can be utilized for conversion into electrical energy.

4,680,934

#### BOILER FOR A TORPEDO AND SYSTEM INCLUDING THE SAME

Keith E. Short, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

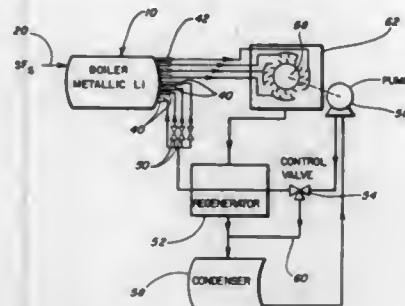
Filed Aug. 4, 1986, Ser. No. 892,178  
Int. Cl.<sup>4</sup> F01K 13/02

U.S. Cl. 60—652

12 Claims

1. A boiler for use in a torpedo or the like and comprising: a housing containing a fuel which, when oxidized, will generate heat, said housing having an interior wall defining a chamber;
- at least one oxidant inlet in said housing and extending to said chamber;
- a plurality of working fluid conduits each having an inlet

and an outlet exterior of said housing and a heat exchange section within said chamber, each said heat exchange section comprising a plural convolution coil, the individ-



ual convolutions of each conduit being interleaved with the individual convolutions of the other conduits; and means for controlling the flow of working fluid through at least some of said conduits independently of the others.

4,680,935

#### CRYOGENIC CONTAINER

Takashi Murai, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

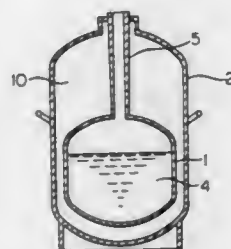
Filed May 30, 1986, Ser. No. 868,438

Claims priority, application Japan, May 31, 1985, 60-82739[U]

Int. Cl.<sup>4</sup> F17C 1/00

U.S. Cl. 62—45

5 Claims



1. A cryogenic container comprising: an inner tank containing a cryogen;
- an outer tank housing said inner tank and having an insulating medium between said inner tank and said outer tank; and
- a pipe connecting the inside of said inner tank and the outside of said outer tank, said pipe providing the main support of the weight of said inner tank and cryogen contained therein;
- the cryogen within said inner tank generating a temperature gradient in said connecting pipe in the longitudinal direction thereof which provides a progressively increasing strength of material from which said connecting pipe is formed as the temperature of the material lowers from an outer portion near the outer tank to a portion connected to said inner tank;
- said pipe having a smaller heat-conducting cross-sectional area at the portion connected to said inner tank than the cross-sectional area at the outer portion to reduce heat conduction along said pipe;
- said smaller heat-conducting cross-sectional area of said pipe providing a strength sufficient to support the weight of the inner tank and anything contained therein, including cryogen.

4,680,936

#### CRYOGENIC MAGNET SYSTEMS

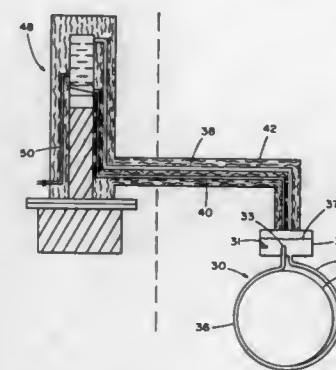
Raymond E. Sarwinski; John R. Purcell, both of San Diego; Judson W. Parker, Escondido, and Sibley C. Burnett, San Diego, all of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Dec. 24, 1985, Ser. No. 813,175

Int. Cl.<sup>4</sup> F25B 19/00

U.S. Cl. 62—45

2 Claims



1. A cryogenic superconducting magnet system for use in magnetic resonance imaging (MRI) devices, said system comprising:

- an evacuated container,
- a first tank mounted within said evacuated container and thermally insulated therefrom,
- boiling liquid helium disposed in said first tank and exhausted to the outside of said container,
- a cryogenic superconducting magnet disposed in said first tank,
- a metallic heat radiation shield disposed in said evacuated container and substantially surrounding said first tank, said shield being thermally insulated from both said container and said first tank, and
- a neon refrigeration system external to said shield for cooling said shield, said neon refrigeration system including neon refrigerant, a second tank for containing said neon refrigerant in its liquid state, at least one thermal siphon for circulating said neon refrigerant by convection from said second tank to said shield, the boiling of said neon refrigerant at said shield acting to circulate said neon refrigerant in said thermal siphon and cool said shield, a mechanical cryocooler remote from said container for condensing said neon refrigerant from the gaseous to the liquid state, and thermally insulated transfer means for transferring said neon refrigerant in its gaseous state from said second tank to said cryocooler and said neon refrigerant in its liquid state from said cryocooler to said second tank.

4,680,937

#### AUTOMATIC FUEL TANK ANTI B.L.E.V.E. SAFETY APPARATUS AND SYSTEM

Colin G. Young, 1368 Glen Rutley Circle, Mississauga, Canada (L4X 1Z6)

Filed Mar. 3, 1986, Ser. No. 835,761

Claims priority, application Australia, Mar. 5, 1985, PG9562  
Int. Cl.<sup>4</sup> F17C 13/00

U.S. Cl. 62—54

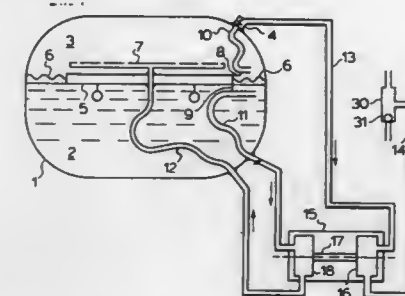
7 Claims

1. An automatic safety apparatus for use in a closed vessel for containing both liquified and vapourized gas of a liquifiable gas having a boiling point below the ambient temperature at atmospheric pressure, wherein the vessel has an interior and at least one pressure relief valve comprising: a pumping means for pumping the liquified gas;
- first connecting means between the pumping means and the at least one relief valve to provide gaseous communication

between the pumping means and the at least one relief valve;

spraying means to be positioned in the portion of the interior of the vessel containing the vapourized gas and adapted to spray upwardly onto the vessel;

a second connecting means for fluid passage between the pumping means and the spraying means;



wherein the pumping means is caused to pump the liquified gas through the second connecting means to the spraying means by movement of the vapourized gas which passes through the pumping means either before or after passing through the relief valve.

4,680,938

#### AIR DRYING SYSTEM FOR PNEUMATIC CIRCUITS

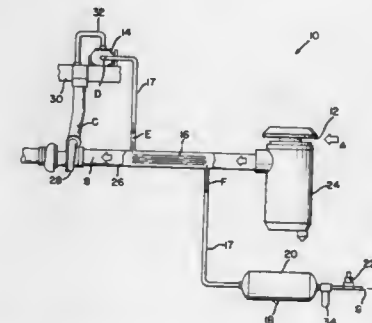
Douglas A. Caley, King County, Wash., assignor to Paccar Inc., Bellevue, Wash.

Filed May 8, 1985, Ser. No. 732,227

Int. Cl.<sup>4</sup> F25D 17/06

U.S. Cl. 62—93

10 Claims



8. An air drying system for use in a vehicle having an internal combustion engine and air serviced devices including air brakes, which are part of a pneumatic circuit operating at a working pressure substantially above normal atmospheric pressure and having portions exposed to ambient conditions wherein the engine draws engine intake air approximately at ambient temperature comprising:

- means for compressing a small portion of the drawn engine intake air to a high pressure, substantially greater than the working pressure of the pneumatic circuit;
- means for transferring sufficient heat energy from the highly compressed air to the engine intake air to cool the highly compressed air below the dew point thereof and approximately to ambient temperature to condense water out of the highly compressed air;
- means connected to the heat energy transferring means for removing the condensed water from the system; and
- means for expanding the cooled, highly compressed air to the working pressure of the pneumatic circuit to suppress the dew point thereof substantially below ambient temperature.

4,680,939

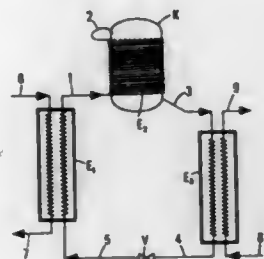
**PROCESS FOR PRODUCING HEAT AND/OR COLD BY MEANS OF A COMPRESSION ENGINE OPERATING WITH A MIXED WORKING FLUID**  
 Alexandre Rojey, Garches, and Claude Ramet, Nanterre, both of France, assignors to Institut Français du Pétrole, Rueil-Malmaison, France

Filed May 28, 1985, Ser. No. 738,218

Claims priority, application France, May 28, 1984, 84 08633  
 Int. Cl.<sup>4</sup> F25B 9/00

U.S. Cl. 62—114

11 Claims



1. In a process for the extraction of heat from a first fluid to cool the fluid and for the addition of heat to a second fluid to heat the second fluid, wherein the process utilizes a working fluid; a compressor for compressing the working fluid; the compressor being in a hermetic container and having a suction zone and a discharge zone; a first heat exchanger for thermally contacting the first fluid with the working fluid to cool the first fluid and to add heat to the working fluid for vaporizing the working fluid; a second heat exchanger for thermally contacting the second fluid with the working fluid to heat the second fluid by removing the heat from the working fluid for condensing the working fluid, and an expansion valve for cooling the working fluid, the improvement comprising the steps of:

- composing the working fluid of at least two non-azeotropic components;
- passing the condensed working fluid through the first heat exchanger to partially vaporize said condensed working fluid and to produce a liquid-vapor mixture;
- thermally contacting the liquid-vapor mixture of step (b) with the hermetic container surround the compressor at a point in proximity with the suction zone and circulating the mixture in a sealed path around the container while progressively flowing the mixture nearer to the discharge zone and discontinuing contact of the mixture with the container at a location relatively near the discharge zone to extract heat from the compressor and to continue vaporization of the liquid-vapor mixture to produce a finally vaporized mixture;
- compressing the finally vaporized mixture of step (c) while extracting heat from the compressor as recited in step (c) to produce a compressed mixture;
- thermally contacting the second fluid with the compressed vaporized mixture in the second heat exchanger to heat the second fluid and condense the compressed mixture so as to produce a condensed mixture;
- expanding the condensed mixture, and
- performing step (b)-(f) cyclically using the working fluid mixture of step (a).

4,680,940

**ADAPTIVE DEFROST CONTROL AND METHOD**  
 Eldon D. Vaughn, 1845 W. Skywood St., Brea, Calif. 92621  
 Filed Jun. 20, 1979, Ser. No. 50,352  
 Int. Cl.<sup>4</sup> F25D 21/06

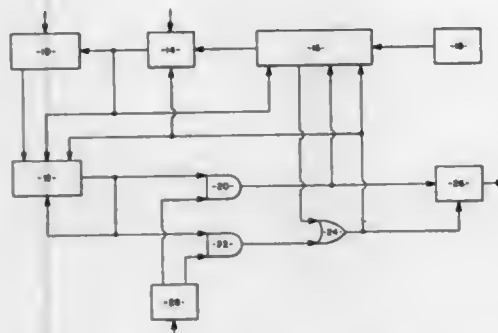
U.S. Cl. 62—155

3 Claims

1. A control mechanism for use with a refrigeration circuit having at least one heat exchanger upon which frost may

accumulate, said frost being removed by supplying heat energy to melt the frost during a defrost cycle which comprises a defrost time accumulator to ascertain the elapsed time during a defrost cycle,

timing means for controlling the time interval between defrost cycles including a clock which emits periodic pulses and a counter for initiating a defrost cycle when a predetermined number of pulses have been emitted by the clock, and



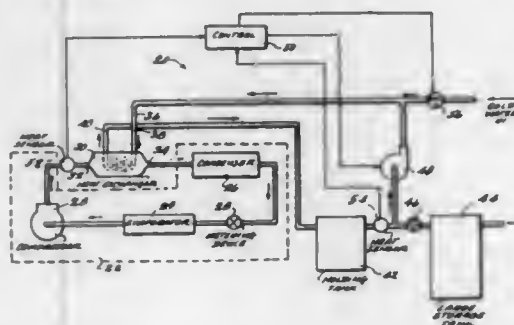
rate of control means for adjusting the timing means to vary the time interval between defrost cycles as a function of the elapsed time of the previous defrost cycle ascertained by the defrost time accumulator, said rate control means being connected to the defrost time accumulator and acting based upon the length of the previous defrost cycle stored in the accumulator to vary the pulse emission rate of the clock.

4,680,941

**WASTE HEATING RECOVERY SYSTEM**  
 Elvet M. Richardson, 18 Marshall St., Irvington, N.J. 07111, and Teik P. Sim, 144-45 Charter Rd., Jamaica, N.Y. 11435  
 Filed May 21, 1986, Ser. No. 863,404  
 Int. Cl.<sup>4</sup> F25B 39/04

U.S. Cl. 62—184

2 Claims



1. An apparatus for recovering waste heat from a refrigeration system having a compressor, condenser and evaporator coupled together for circulating a refrigerant comprising:

- heat exchanger means adapted to be connected to said system between said compressor and condenser and having an inlet for receiving said refrigerant from said compressor and an outlet for supplying said refrigerant to said condenser and a water line passing therethrough to which heat is transferred from said refrigerant, said water line being adapted to be connected at one end to a source of cold water;
- a holding tank connected to the other end of said water line for receiving an inlet water to which heat has been transferred and storing said water and having an outlet;
- means connected to said holding tank outlet and adapted to be connected to a water storage tank having a capacity

greater than the capacity of said holding tank by means of one way valve means so that heated water flows from said holding tank to said storage tank when the pressure in said storage tank drops below the pressure in said holding tank upon removal of water from said storage tank; and pump means connected between said holding tank outlet and connected to said heat exchanger means inlet by said water line for circulating heated water from said holding tank;

means for sensing the temperature of said refrigerant prior to passage through said heat exchanger;

means for sensing the temperature of said heated water prior to passage through said pump means;

solenoid valve means connected between said water line and said source of cold water; and

a central control unit means for causing said pump means to circulate water when either the temperature sensed by said refrigerant temperature sensing means is above a predetermined value, or the temperature sensed by said water temperature sensing means is below a predetermined value, and for opening said solenoid valve means when said pump means is not operating to circulate water.

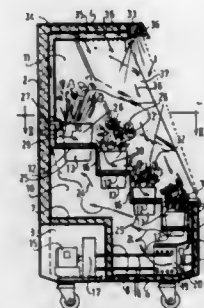
4,680,942

**CABINET FOR CUT-OFF FLOWERS**  
 Herman Kooy, 46, Stommeerkade, EK Aalsmeer, Netherlands  
 Division of Ser. No. 600,386, Apr. 16, 1984, Pat. No. 4,608,776, which is a division of Ser. No. 403,050, Jul. 29, 1982, Pat. No. 4,458,501. This application May 14, 1986; Ser. No. 863,006  
 Claims priority, application Netherlands, Jun. 16, 1982, 8202449

Int. Cl.<sup>4</sup> A47F 3/04

U.S. Cl. 62—256

11 Claims



1. Apparatus for preserving cut flowers while on display comprising:

- cabinet means including an upper portion spaced from a lower portion thereof to define a generally vertically extending viewing and access opening therebetween, said cabinet means having a display space and separate cooling space therein;
- flower container means within said cabinet and having a body of water therein and an open upper end for receiving cut flowers with the stems thereof immersed in said water and the blooms thereof disposed in said display space;
- cooling means for cooling air in said cooling space;
- circulating means for forcibly recirculating air through said cooling space into said display space and thence back into said cooling space for cooling the flower blooms without subjecting the blooms to an intolerable draft of cooled air; and
- means for supporting said flower container means within the cabinet so that the lower portion of the flower container means is below said display space and is in communication with cooled air in said cooling space to cool the water in the container means and thereby provide considerable cooling of the flowers having the stems thereof immersed in said water, the upper open end of the container means

being in communication with the cooled air in said display space.

4,680,943

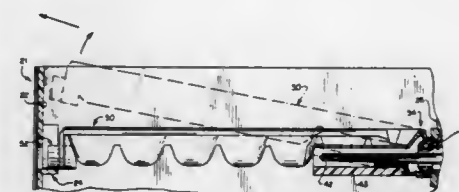
ICE MAKER

Harold S. Mawby, Belding, and Duane H. Harris, Gowen, both of Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Division of Ser. No. 722,135, Apr. 11, 1985. This application Apr. 24, 1986, Ser. No. 855,489  
 Int. Cl.<sup>4</sup> F25C 1/24

U.S. Cl. 62—300

2 Claims



1. An automatic ice cube maker for use in the freezer compartment of a domestic refrigerator comprising:

- a housing member having a generally open top and bottom defined by a front wall, a rear wall, and a pair of opposed sidewalls;
- a compartmented ice tray having a top side constituted by a plurality of ice cube shaped pockets for receiving water to be frozen, the ice tray being horizontally mounted within the walls of the housing for rotary movement between an upright ice making position and an inverted ice dumping position, said ice tray being rotatable on a horizontal axis extending between said front and back walls of the housing;
- an electrically energized drive means connected to the ice tray for moving the ice tray between its upright and inverted positions;
- a control circuit for energizing the drive means; and
- ice tray mounting means including a driven means constituted by an integral rearward portion of the ice tray, a drive shaft rotatably driven by the drive means, the drive shaft being rotatably mounted on a rear wall portion of the housing, one end of the drive shaft being engageable with the integral rearward portion of the ice tray, wherein rotation of the drive shaft applies a rotating force to the rearward portion of the ice tray, an integral front portion of the ice tray providing a cylindrical projection rotatably supported by a portion of the said front wall of the housing, said front portion of the ice tray being movable by the user out of engagement with said supporting portion of the housing front wall wherein the said rearward portion of the ice tray can then be manually disengaged from the said one end of the drive shaft to permit removal and cleaning of the ice tray at a location outside the said freezer compartment, said supporting portion being constituted by a U-shaped flange extending horizontally from the front wall of the housing, the U-shaped flange having a shelflike base portion, and a pair of generally identical, parallel, upwardly extending leg portions spaced from each other along a major portion of the lengths by a distance slightly greater than the diameter of the said cylindrical projection, wherein said projection can move downwardly from the open top of said U-shaped flange between the spaced leg portions so as to rest on and be rotatably supported by the shelf-like base portion, said U-shaped flange including detent means for retaining the cylindrical projection in position on the said shelflike base portion, said detent means being constituted by a reduced width area of the vertical channel formed between said spaced leg portions, the distance between said leg portions at said reduced width area being slightly less than the



diameter of said cylindrical projection, said cylindrical projection being snapped downwardly past said reduced width area so as to rest on and be rotatably supported by the shelflike base portion of the flange.

4,680,944

# APPARATUS FOR THE PREPARATION OF ICE CREAM, MILKSHAKES, SORBET, FROZEN DESSERTS AND THE LIKE FROM A PUMPABLE STARTING MIXTURE

Waldemar Menzel, Kulmbach-Burghaig, Fed. Rep. of Germany, assignor to Lamen GmbH Nahrungsmittel- und Maschinenfabrik, Kulmbach, Fed. Rep. of Germany

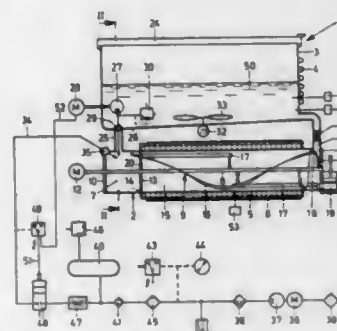
Filed Dec. 5, 1986, Ser. No. 938,728

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544802

Int. Cl.<sup>4</sup> A23G 9/12

U.S. Cl. 62—342

4 Claims



1. Apparatus for the preparation of ice cream, milkshakes, sorbet, frozen desserts, and the like, from a pumpable starting mixture, comprising:

- a storage container for the starting mixture;
- a supply conduit communicating with said storage container;
- a cylinder for cooling or freezing, said cylinder communicating with said storage container via said supply conduit;
- a rotatably drivable stirring and scraping mechanism disposed in said cylinder;
- an inlet chamber located on one end of said cylinder, said supply conduit discharging into said inlet chamber;
- a discharge valve located on the other end of said cylinder;
- a heater for pasteurizing the starting mixture, said heater surrounding only said cylinder;
- a thermostat for limiting the wall temperature of said cylinder;
- means for transporting the starting mixture from said inlet chamber to said discharge valve; and
- a connecting conduit having a valve therein, said connecting conduit being disposed between said cylinder, at the end thereof adjacent said discharge valve, and said storage container.

4,680,945

# COOLING CHAMBER FOR PROCESSING SPECIMENS FOR MICROSCOPIC AND ELECTRON-MICROSCOPIC INVESTIGATIONS

Dietrich Hoffmeister, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heldenheim, Fed. Rep. of Germany

Filed May 14, 1986, Ser. No. 863,194

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517518

Int. Cl.<sup>4</sup> F25B 19/00

U.S. Cl. 62—514 R

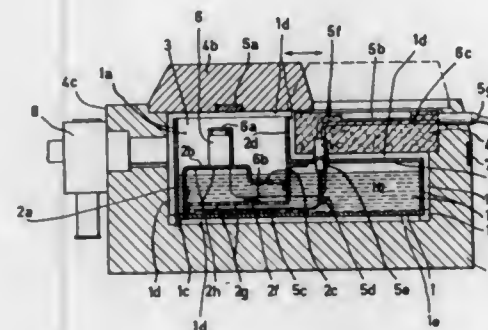
10 Claims

1. A cooling chamber for processing a specimen for microscopic and electron-microscopic investigations comprising:

an insulating vessel having an inner wall surface defining a receiving cavity;

coolant vessel means for holding a coolant therein disposed in said cavity and having an outer wall surface adjacent said inner wall surface;

a working chamber for processing the specimen, said working chamber being arranged above said coolant vessel means and having a base defining an apertured interface between the interior of said coolant vessel means and said chamber so as to permit vaporous coolant to pass from



said coolant vessel means into said working chamber thereby filling the latter;

a plurality of spacers arranged at preselected locations between said wall surfaces for supporting said coolant vessel means in spaced relationship to said inner wall surface so as to cause said wall surfaces to conjointly define a space therebetween for thermally insulating said coolant vessel from said insulating vessel; and,

coolant supply means for supplying vaporized coolant to said work chamber.

4,680,946

# FLAT-BED KNITTING MACHINE HAVING A SPOOL TABLE

Adam Müller, and Ernst Goller, both of Reutlingen, Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

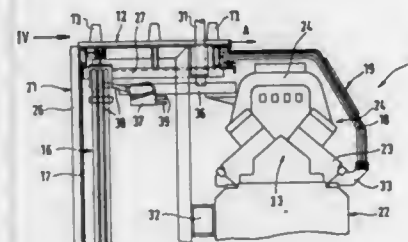
Filed Jul. 29, 1986, Ser. No. 890,264

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528695

Int. Cl.<sup>4</sup> D04B 7/26

U.S. Cl. 66—64

23 Claims



1. A flat-bed knitting machine, comprising:

- a needle bed apparatus;
- a carriage apparatus;
- an operating panel including control cables therefore;
- a protective cover;
- a trailing cable device; and
- a spool table disposed in the rear area of the machine above the needle bed apparatus and the carriage apparatus, said spool table having a plurality of yarn spool holders disposed thereon, wherein:

the spool table comprises one or more interconnected extruded profile elements each having a top and bottom

region with the top region having integrated securing means defined therein for detachably securing the yarn spool holders, and with the bottom region having guide recesses extending along the longitudinal extent of the spool table for receiving at least one of the protective cover, the operating panel and the trailing cable device.

4,680,947

# INTERCHANGEABLE KNITTING NEEDLE SYSTEM

Cornelius M. Phipps, Sr., and Cornelius M. Phipps, Jr., both of Glen Ellyn, Ill., assignors to Plastic Specialties, Inc., Glen Ellyn, Ill.

Continuation-in-part of Ser. No. 736,867, May 22, 1985, abandoned. This application Jun. 26, 1986, Ser. No. 879,206

Int. Cl.<sup>4</sup> D04B 35/02

U.S. Cl. 66—117

25 Claims



1. An interchangeable knitting needle system comprising at least one knitting needle having a tip, a shaft extending therefrom and terminating at a tip-opposite base, said tip-opposite base associating with cable connector means, said connector means comprising a two-member coupling assembly including a coupling member having an insert pin end integrally formed with a needle shaft and extending inwardly from said base and an engageable threaded stem portion extending outwardly from the base, and a connecting member including a barrel portion having an axial threaded bore at one end thereof, the axial bore being thread-engageable with the stem portion of the coupling member and extending from the opposite end of the barrel portion, said connecting member having a coupling stem means capable of engageable insertion at the end of a hollow flexible cable; and, at least one hollow flexible cable capable of receiving looped knitted material thereon upon the engagement at one end thereof with said coupling stem means of said connecting member, said cable connector means and flexible cable being capable of repetitive engagements and disengagements.

4,680,948

# DRYER MOUNTING BRACKET ASSEMBLY

Raymond W. Rummel, Webster City, and Anthony A. Crystal, Stratford, both of Iowa, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jan. 10, 1985, Ser. No. 690,314

Int. Cl.<sup>4</sup> D06F 37/20

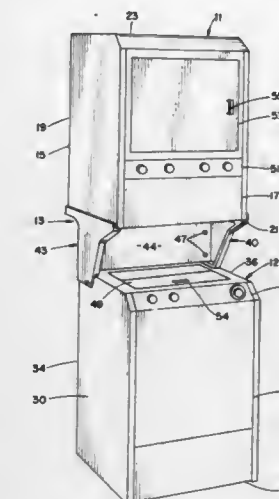
U.S. Cl. 68—3 R

20 Claims

1. A bracket assembly to provide for vertical mounting of a top appliance having a base and two vertical side surfaces and a bottom appliance having a top horizontal surface and two vertical side surfaces and a vertical back surface, comprising two mounting brackets each having:

- a lower flange having a bottom side which defines a lower mounting surface to engage the top horizontal surface of the bottom appliance;
- a lower leg extending integrally downward from the lower flange and forming a lower inside face to engage the adjacent side surface of the bottom appliance, said lower inside face being substantially perpendicular to said lower mounting surface and joining the lower mounting surface to form a lower horizontal angle;
- a back rib extending integrally downward from the lower flange and forming a back inside face to engage the vertical back surface of the bottom appliance, said back inside face being substantially perpendicular to the lower inside face of the leg and joining said lower inside face to form a lower vertical angle;

an upper flange having a top side which defines an upper mounting surface to engage the base of the top appliance; an upper leg extending integrally upward from the upper flange and having an inside face to engage the adjacent vertical side surface of the top appliance, said upper face



being substantially perpendicular to said upper mounting surface and joining the upper mounting surface to form an upper horizontal angle; and

supporting means joining the upper flange to the lower flange in a spaced parallel relationship and being capable of supporting the top appliance.

4,680,949

# LOCKING DEVICE FOR ARTICLES SUCH AS SAILBOARDS

Leo J. Stewart, 123 Pine Street, Hudson, Quebec, Canada

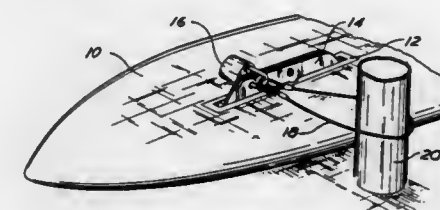
Filed Apr. 22, 1986, Ser. No. 854,841

Claims priority, application Canada, Feb. 24, 1986, 502520

Int. Cl.<sup>4</sup> E05B 73/00

U.S. Cl. 70—14

26 Claims



1. A locking device for the securing against unauthorized removal of an article of manufacture of the type having an elongated groove therein said groove having an elongated re-entrant channel in at least one elongated side wall of the groove for receiving one or more locking pins therein, said groove also having a widened section therein defining an entry/exitway leading into said elongated re-entrant channel from the exterior of said article, said locking device comprising a pair of relatively movable rigid members, at least one of said members having a locking pin therein and said at least one member and said locking pin therein being adapted to enter into said groove via said entry/exitway with said locking pin projecting outwardly from said at least one member in a direction relative to said at least one member as to enable said locking pin to project into and to engage in said re-entrant channel in said elongated side wall of said groove when said at least one member is disposed within said groove, and the other of said members adapted to be locked in a selected position

with respect to said one member, such that said at least one member can be securely retained within said groove.

4,680,950

**METHOD OF AND AN APPARATUS FOR FORMING TENSION SPRINGS WITH GERMAN TYPE HOOKS**  
Yozo Ohdai, Kasugai; Norifumi Abiru, Owariasahi, and Eiichi Ohbayashi, Kuwana, all of Japan, assignors to Asahi-Seiki Manufacturing Co., Ltd., Japan

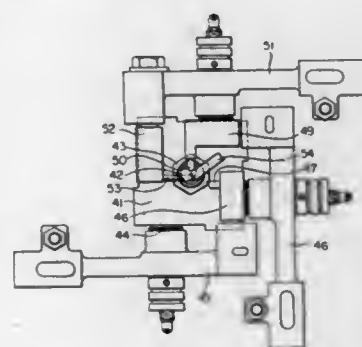
Filed Mar. 28, 1986, Ser. No. 845,550

Claims priority, application Japan, Apr. 3, 1985, 60-70616

Int. Cl.<sup>4</sup> B21F 35/02

U.S. Cl. 72-130

3 Claims



2. A method of forming German type hooks on a tension spring, in which a first hook, a body coil and a second hook are successively formed to provide a tension spring by means of forming tools provided on ends of rocker arms controllably swung about axes perpendicular to and offset from a central axis of a wire guide and relative to a length of wire stock advanced in front of said wire guide by means of a pair of feed rolls, said method comprising the steps of: forming a first hook with a contiguous linear portion thereon, temporarily suspending the feeding of the wire stock advancing a second forming tool and forming approximately a one fourth of an initial turn of the body coil contiguous to said linear portion after the first hook and its contiguous linear portion are formed; advancing a third forming tool and twisting a coil portion having said one fourth of an initial turn to thereby displace a starting point of a body coil to a position offset from a forming plane of a body coil while interposing said coil portion between the third forming tool and a stationary abutment tool; advancing a first forming tool and bending the linear portion of said first hook by more than 90 degrees toward said forming plane of the body coil at a point where said coil portion is interposed between the third forming tool and the abutment tool; withdrawing all of said tools from said formed first hook to effect turning of the linear portion thereof 90 degrees relative to said starting point of said body coil due to the influence of a torsional righting moment created by the twist induced in the wire stock extending from a point where it is interposed between said feed rolls, and a spring back force induced after the bending by more than 90 degrees, to form a German type hook which extends substantially perpendicular to the surface of the body coil advancing a second forming tool into contact with said wire stock while continuously feeding said stock to form a body coil; and then forming a second German type hook on an opposite end of said body coil.

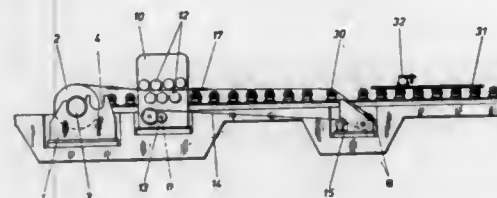
# 4,680,951 METHOD FOR DRESSING HOT ROLLED STRIP COILS, ESPECIALLY COILBOX COILS

Reiner Brach, Mülheim, Fed. Rep. of Germany, assignor to Reiner Brach Import-Export, Mülheim, Fed. Rep. of Germany  
Filed Jun. 27, 1985, Ser. No. 749,399

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423760; Aug. 1, 1984, 3428349; Apr. 17, 1985, 3513831  
Int. Cl.<sup>4</sup> B21D 3/04

U.S. Cl. 72-160

14 Claims



1. A method of dressing coils of thick hot rolled strips, especially a coilbox coil; said method comprising the steps of: placing said coil in a coil support frame and rotatably supporting said coil about its axis in said coil support frame such that said coil support frame takes up traction forces which act upon said hot strip; securing a traction means of a traction device to the end of said hot strip at the beginning of said coil; at least partially uncoiling said hot strip from said coil by means of said traction means without necessity for any additional drive and energy expenditure for this purpose and without any appendages being secured thereto; introducing the thus uncoiled beginning of said hot strip into a roller truing machine until there is grasping of said hot strip by the truing rolls of said roller truing machine and accompanied by drawing of said hot strip into the roller truing machine; and providing said roller truing machine with a drive mechanism; extending said traction means through said roller truing machine from the inlet side to the outlet side thereof between said truing rolls thereof; and drawing said traction means through said roller truing machine with the aid of said drive mechanism, whereby the beginning of said hot strip is unwound from said coil and drawing of said strip proceeds into said roller truing machine.

4,680,952

# PROCESS AND APPARATUS FOR THE PRODUCTION OF STRANDS FOR BOWDEN CABLES

Karl Burghoff, Oberursel; Werner Schiller, Erzhausen; Wilhelm Albrecht, Vaihingen; Herbert Harsch, Waiblingen-Bickenfeld, and Heinz-Georg Burghoff, Reichenbach, all of Fed. Rep. of Germany, assignors to Max Kammerer GmbH, Fed. Rep. of Germany

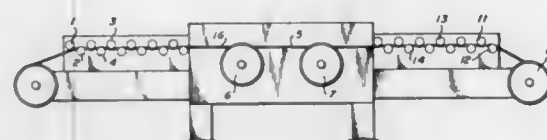
Filed Feb. 19, 1985, Ser. No. 702,634

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405693

Int. Cl.<sup>4</sup> B21D 1/02; B21C 19/00

U.S. Cl. 72-161

11 Claims



1. Process for treatment of strands for Bowden cables comprising: dressing a plurality of twisted wire strands between a first set of reversing rollers; stretching said dressed strands; and

dressing said stretched strands between a second set of reversing rollers.

4,680,953

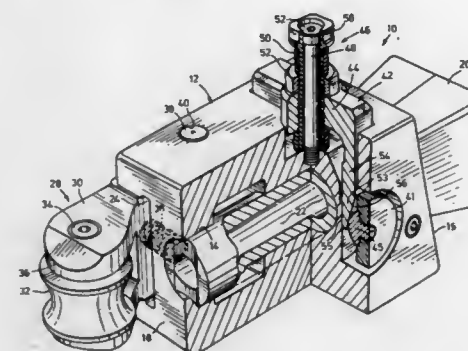
**ROLLER ENTRY GUIDE RELATING TO A ROD MILL**  
Mario Fabris, Grimsby, Canada, assignor to Fabris Industrial Manufacturing Limited, Winona, Canada

Filed Oct. 9, 1985, Ser. No. 785,719

Int. Cl.<sup>4</sup> B21B 39/16

U.S. Cl. 72-250

6 Claims



1. A roller entry guide to guide material along a longitudinal axis, said guide comprising:

- a body;
- a pair of generally parallel roller assemblies pivotally mounted on said body for rotation about a vertical axis, each of said roller assemblies being located on an opposite side of said longitudinal axis to define a passageway for material moving along said axis and including at least one roller rotatably attached thereto;
- a yoke acting between the roller assemblies and said body, said yoke having a central portion with a pair of legs, one of said legs being disposed at each end of said central portion, said legs having tapered portions at the ends thereof which are operable on respective roller assemblies said legs being supported by said body; and
- adjustment means operable on said yoke to raise or lower said yoke to induce conjoint rotation of said roller assemblies about a vertical axis, thereby causing said rollers to move simultaneously and to equal and opposite distances towards or away from said longitudinal axis.

4,680,954

# GRIPPING DEVICES IN IDLING STAGE AREAS OF A TRANSFER PRESS

Sieghard Mueller, Ottenbach; Hermann Braun, Eisingen; Helmut Dumschat, Donzdorf, and Hans-Joergen Trautwein, Goppingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

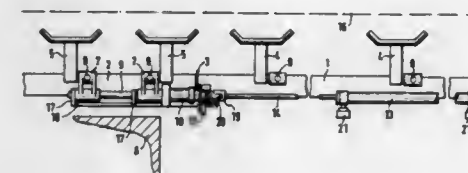
Filed Mar. 3, 1986, Ser. No. 835,277

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1985, 3510697

Int. Cl.<sup>4</sup> B21D 43/05

U.S. Cl. 72-405

3 Claims



1. A transfer press for transferring workpieces to successive

workstations, and having idling stage areas between workstations, comprising:

- gripper rail means for transmitting a transfer movement in a longitudinal direction onto the workpieces, said gripper rail means being subdivided at a separating area into interchangeable gripper rail partial sections and gripper rail partial sections, said interchangeable gripper rail partial sections having first gripper means fixed thereto for gripping the workpieces;
- gripper arm mounting means on said gripper rail means and displaceable in said longitudinal direction into the idling stage area of the transfer press;
- adjusting means on said gripper rail means for movably adjusting the gripper arm mounting means in said longitudinal direction over said separating area;
- second gripper means for gripping the workpieces pivotally supported on the gripper arm mounting means for pivoting about an axis extending in said longitudinal direction;
- rotary adjusting drive means secured to the gripper arm mounting means, for pivoting the gripper means about said axis;
- said adjusting means moving, at the same time, said gripper arm mounting means, said rotary adjusting drive means and said second gripper means over said separating area back and forth between said interchangeable gripper rail partial section and gripper rail partial section.

4,680,955

# DIE EXCHANGE DEVICE

Katsuyoshi Sakamoto, Isehara, Japan, assignor to Amada Company, Limited, Japan

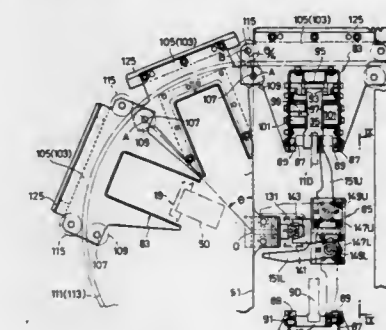
Filed Apr. 4, 1985, Ser. No. 720,014

Claims priority, application Japan, Apr. 7, 1984, 59-51091[U]; Apr. 9, 1984, 59-69189

Int. Cl.<sup>4</sup> B21J 13/08

U.S. Cl. 72-462

6 Claims



1. A die exchange device comprising:

- a frame having first and second side plates disposed in said frame, each of said side plates having an inside surface;
- a first annular guide rail mounted on the inside surface of said first side plate;
- a second annular guide rail mounted on the inside surface of said second side plates and spaced a distance apart from first annular guide rail;
- a first number of link members supported on said first annular guide rail and pivotally linked to one another to form a ring along said first annular guide rail, said first number of link members having an inner side with respect to said first annular guide rail;
- a second number of link members supported on said second annular guide rail and pivotally linked to one another to form a ring along said second annular guide rail, said second number of link members having an inner side with respect to said second annular guide rail;
- a rack attached to each of said first and second number of link members;
- a first pinion member supported on said first side plate



adapted to engage said racks on said first number of link members;  
 a second pinion member supported on said second side plate adapted to engage said racks on said second number of link members;  
 means supported on said frame for rotating said first and second pinion members to drive said first and second link members around said first and second guide rails, respectively; and  
 a number of die holders, each having a length substantially equal to the distance between said first and second annular guide rails, each of said die holders being mounted on the inner side of one of said first link members with respect to said first annular guide rail and on the inner side of one of said second link members with respect to said second annular guide rail.

4,680,956

# RESPIRATORY ANALYZER CALIBRATION APPARATUS WITH CONTROLLED RESPIRATORY GAS EXCHANGE SIMULATION

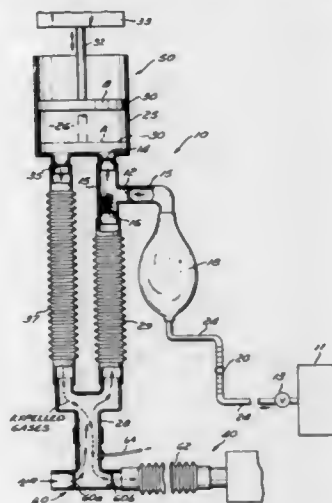
Andrew R. Huszczuk, Long Beach, Calif., assignor to Research and Education Institute, Inc. Harbor-UCLA Medical Center, Torrance, Calif.

Division of Ser. No. 552,615, Nov. 17, 1983, abandoned. This application Mar. 24, 1986, Ser. No. 842,924

Int. Cl.<sup>4</sup> G01N 33/497; G01D 25/00

U.S. Cl. 73-1 G

11 Claims



1. Apparatus for simulating the respiratory cycle of a biological subject which comprises:

- a piston chamber;
- a piston slidably movable within said piston chamber;
- power means for moving said piston within said piston chamber in a reciprocal forward and backward cycle of movement, each complete cycle of movement of said piston corresponding to an inhalation phase and an exhalation phase of a single respiratory cycle;
- a first container means adapted to contain calibration gas;
- a first conduit means;
- a first valve means for introducing, via said first conduit means, a known volume of said calibration gas to said piston chamber from said first container means during said inhalation phase of each of said cycle of piston movement;
- a second conduit means;
- a second valve means for introducing, via said second conduit means, a known volume of air to said piston chamber for admixture with said calibration gas, in said piston chamber during said inhalation phase of each said cycle of piston movement, both said calibration gas and air introduced into said piston chamber during said inhalation phase, simulating inhalation and a given metabolic rate;
- a third valve means for expelling said admixed air and cali-

bration gases from said piston chamber during said exhalation phase of said cycle of piston movement, said expelling of said gases simulating exhalation and a predetermined metabolic rate; and  
 a third conduit means for communicating said expelled gases, resulting from a series of complete cycles of movement of said piston, into a respiratory analysis system for calibration and adjustment of said respiratory analysis system with reference to the known compositions and volumes of gas expelled from said piston chamber.

4,680,957

# NON-INVASIVE, IN-LINE CONSISTENCY MEASUREMENT OF A NON-NEWTONIAN FLUID

Stephen C. Dodd, Thorndale, Pa., assignor to The Davey Company, Jersey City, N.J.

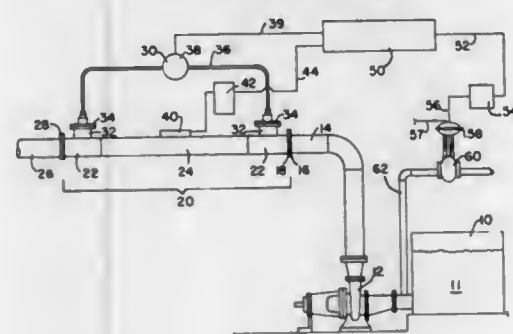
Filed May 2, 1985, Ser. No. 729,687

Int. Cl.<sup>4</sup> G01N 11/08

U.S. Cl. 73-55

20 Claims

## MICROFICHE APPENDIX INCLUDED (1 Microfiche, 18 Pages)



18. An apparatus for controlling the consistency of a liquid comprised of at least two components and which simulates a non-Newtonian fluid when flowing in a substantially laminar condition through a conduit of a given cross-sectional configuration, comprising:

- (a) means for flowing said liquid in a substantially laminar condition through the conduit of a given cross-sectional configuration,
- (b) means for measuring the bulk velocity of said fluid as it flows through said conduit,
- (c) means for measuring any change in the pressure of the fluid in said conduit as said fluid flows between two points spaced a distance L from each other,
- (d) means for adjusting the level of a component in the liquid to thereby control the consistency of the liquid in response to the formula:

$$C = \left( \frac{\Delta P}{2aL} \right)^{\frac{1}{n}} \frac{R^{\frac{n+1}{n}}}{\langle V_z \rangle^{\frac{n+1}{n}}} \left( \frac{n}{3n+1} \right)^{\frac{n}{n+1}}$$

where C=consistency (%).

4,680,958

# APPARATUS FOR FAST DETERMINATION OF THE RHEOLOGICAL PROPERTIES OF THERMOPLASTICS

Jean-Jacques Ruelle, Saint-Remy Geest; Giacomo d'Andrea, Brussels, and Léopold Asselberghs, Merchtem, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium

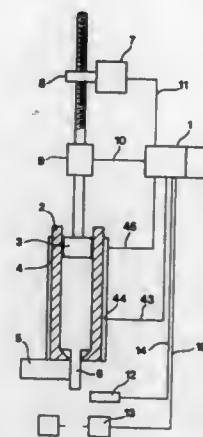
Filed Jul. 17, 1986, Ser. No. 886,439

Claims priority, application France, Jul. 18, 1985, 85 11146

Int. Cl.<sup>4</sup> G01N 11/08

U.S. Cl. 73-56

12 Claims



1. Apparatus for the rapid determination of the rheological properties of a thermoplastic, comprising:

- a control and monitoring unit (1)
- a cylinder (2) intended to receive a determined measured quantity of the thermoplastic to be evaluated, and equipped with a thermostated jacketing (4) for the thermal conditioning, during at least 300 seconds and at a predetermined temperature, of the measured quantity of thermoplastic to be evaluated
- a plunger (3) capable of sliding in the cylinder (2) so as to be applied to the measured quantity of thermoplastic
- an exchanger system (5) enabling the cylinder to be equipped with a capillary die (6) suitable for the rheological measurement to be carried out a stepping-control motor (7) ensuring a monitored travel of the plunger (3) in the cylinder (2) to expel the thermoplastic through the capillary die (6), and
- a force-sensor (9) arranged between the motor (7) and the plunger (3), yielding a signal as a function of the force applied to the plunger (3), characterized in that said apparatus additionally comprises an electronic microprocessor system monitoring the stepping-control motor (7) so that at the end of the thermal conditioning the plunger (3) is situated at a distance from the capillary die (6) which permits the measurement to be carried out and acts over a period of time ranging from 10 to 180 seconds on the measured quantity of thermoplastic to be evaluated in accordance with a parameter of speed of travel or of applied force specified by the type of rheological measurement to be carried out.

4,680,959

# EMULATION SYSTEM FOR A MOTOR VEHICLE DRIVETRAIN

Kenneth J. Henry, Southfield, and Allan J. Kotwicki, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1986, Ser. No. 854,942

Int. Cl.<sup>4</sup> G01M 15/00

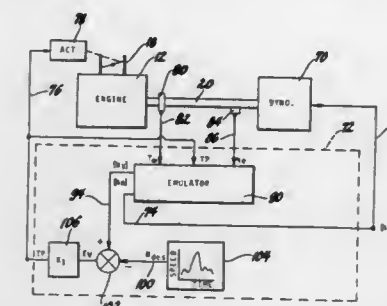
U.S. Cl. 73-117

3 Claims

1. In a motor vehicle engine testing arrangement including a motor vehicle engine and an electric dynamometer coupled to the output shaft of such engine and adapted to regulate the engine speed in accordance with a speed control signal applied

thereto, a method of operating the dynamometer so as to emulate the combined effect of a motor vehicle and conventional motor vehicle drivetrain elements including a fluidic torque converter and a shiftable ratio automatic transmission, such method comprising the steps of:

- defining first and second differential equations relating the ability of the drivetrain input torque to accelerate the engine inertia, and the ability of the drivetrain output torque to overcome the road load and accelerate the vehicle inertia;
- modeling the combined operation of a fluidic torque converter and a shiftable ratio automatic transmission, and coupling the first and second differential equations therewith such that the drivetrain input torque is determined as



a function of measured engine output torque and the load that would be imposed on the engine by the torque converter and the drivetrain output torque is determined as a function of the transmission output torque and the road load of the vehicle;

periodically integrating the first and second differential equations forward in time assuming substantially constant engine output torque during the integration period to thereby predict the engine speed that would occur were the engine driving a motor vehicle through the defined drivetrain elements in opposition to the road load; and generating a speed control signal for the dynamometer in accordance with the predicted engine speed to thereby load the engine as though it were actually installed in a motor vehicle with the modeled drivetrain elements.

4,680,960

# MICROWAVE AND LUMINOUS PROBE

Teruo Yamanaka, 1756-2, Aza Hosoguchishita, Oaza Hirabari, Tempaku-cho, Tempaku-ku, Nagoya-shi, Aichi-ken; Takao Sugimoto, 4-148, Takabata, Nakagawa-ku, Nagoya-shi, Aichi-ken, and Kizo Hayakawa, 41-2, Higashiyashiki, Takayokosukamachi, Tokai-shi, Aichi-ken, all of Japan

Filed Aug. 14, 1985, Ser. No. 765,541

Claims priority, application Japan, Aug. 20, 1984, 59-173072

Int. Cl.<sup>4</sup> G01M 15/00

U.S. Cl. 73-117.3

20 Claims

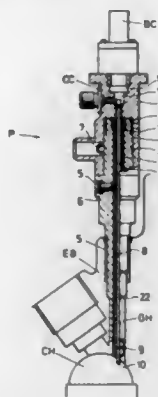
1. A microwave and luminous probe for detecting the piston position and the light emitted by combustion in a combustion chamber of an internal combustion engine, said microwave and luminous probe comprising:

- (a) a probe body having an inner wall;
- (b) a coaxial portion having first and second ends, said first end thereof inserted into said combustion chamber, said coaxial portion including a tubular outer conductor, an inner conductor disposed coaxially with said outer conductor, and a transparent insulator interposed between said outer and inner conductors;
- (c) dipole antenna means located at said first end of said coaxial portion;
- (d) a see-through hole having a predetermined diameter, dimensioned so as to cut off microwave transmission, formed on said inner wall of said probe body and disposed

coaxially with said coaxial portion at said second end of said coaxial portion to lead the light emitted by combustion in said combustion chamber and received at said first end of said coaxial portion to a photosensor which detects said light;

(e) a coaxial impedance transformer provided between said see-through hole and connected to said coaxial portion at the second end of said coaxial portion for obtaining matching in impedance;

(f) a coaxial microwave connector fitted and inserted into a bore formed in said probe at a right angle to said see-



through hole and in communication with a side wall of said see-through hole;

(g) a bent coaxial portion provided within said see-through hole connected to both said coaxial microwave connector and to said impedance transformer;

whereby the microwave propagated through said coaxial portion is transmitted from said dipole antenna means, while the microwave reflected from said combustion chamber is received by said dipole antenna means, and the light emitted by combustion in said combustion chamber is received by said transparent insulator.

4,680,961

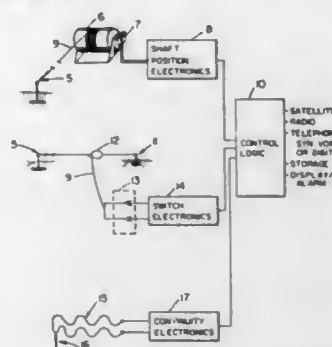
**SYSTEM AND METHOD FOR ICE MOVEMENT DETECTION IN DETERMINATION OF ICE BREAKUP**  
R. J. Grauman, G. W. Sponagle, and T. W. Rachuk, all of Wellsdale Research Limited, 6912 - 82 Avenue, Edmonton, Alberta T6B 0E7, Canada

Filed Jan. 27, 1986, Ser. No. 823,038

Int. Cl.<sup>4</sup> G01W 1/00

U.S. Cl. 73—170 R

14 Claims



7. A system for detecting ice movement automatically in a frozen river or the like, comprising ice movement detection means connected with the ice at a selected location of potential ice movement as an indication of ice breakup, said detection means including means for causing a detectable electrical signal upon predetermined movement of the ice, means for detecting said electrical signal, and means for transmitting information concerning said electrical signal to a monitoring station.

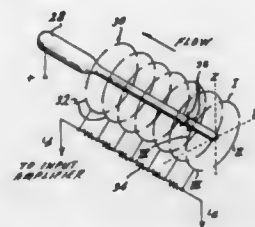
# **4,680,962** **FLUID FLOW RATE AND DIRECTION MEASURING APPARATUS**

Enoch J. Durbin, 246 Western Way, Princeton, N.J. 08540  
Filed Jan. 20, 1984, Ser. No. 572,433

Int. Cl.<sup>4</sup> G01F 1/56

U.S. Cl. 73—189

37 Claims



1. Fluid flow meter apparatus for measuring the flow rate and direction of fluids passing therethrough, comprising:

(a) Fluid ionizing means having a first polarity when energized, in the path of fluid flow located on a first axis and including a substantially point source of ionizing potential;

(b) Ion collecting means having a second polarity, when energized, located in the path of fluid flow, radially displaced from said ionizing means, said ion collecting means including open structure conductive means having an axis parallel to said first axis to permit fluid to flow therethrough from any direction without essentially altering said fluid flow rate or direction, said ionizing means, when energized in the presence of a fluid, generating a plurality of ions from the fluid stream thereabout in a deflectable distribution, said plurality of ions migrating radially toward said ion collecting means and impinging thereon under a potential gradient created between said energizing ionizing means and said collecting means; and

(c) Means responsive to the impingement of ions on said ion collecting means, for measuring the displacement of the area of impingement of ions effected by fluid flow, whereby the magnitude and direction of the displacement of the areas of impingement of said migrating ions in the presence of a fluid flow, relative to the areas of impingement of said migrating ions in the presence of a reference flow, is representative of the direction and rate of fluid flow relative to said first axis and axes mutually orthogonal thereto.

4,680,963

**SEMICONDUCTOR FLOW VELOCITY SENSOR**  
Osamu Tabata, Hazime Inagaki, and Tomoyuki Kitano, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

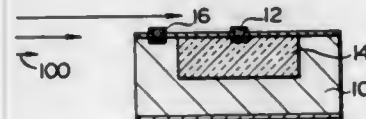
Filed Jan. 21, 1986, Ser. No. 320,703

Claims priority, application Japan, Jan. 24, 1985, 60-12064

Int. Cl.<sup>4</sup> G01F 1/68

U.S. Cl. 73—204

11 Claims



1. A semiconductor flow velocity sensor comprising:  
a semiconductor substrate;  
a thermal insulation means which is formed by selectively making a portion of said semiconductor substrate porous

and oxidizing said portion to form an oxidized porous silicon layer in such a manner that the surface of said thermal insulation means is exposed substantially flush with the surface of said semiconductor substrate;  
an electrically energized heating unit formed of a part of the inner portion of said thermal insulation means, which has selectively been left when forming said thermal insulation means, in such a manner that the surface of said electrically energized heating unit is exposed substantially flush with the surface of said semiconductor substrate; and  
peripheral sensor circuit means provided on said semiconductor substrate at the portion at which the heat transfer from said electrically energized heating unit is prevented by said thermal insulation means;  
said surface of said semiconductor substrate which is provided with said electrically energized heating unit and said thermal insulation means being made substantially flat, thereby enabling stable detection of flow velocity over a long period of time without disturbing the flow of a fluid while being protected against contamination.

4,680,964

# **HEAT-WIRE TYPE AIRFLOW QUANTITY MEASURING APPARATUS**

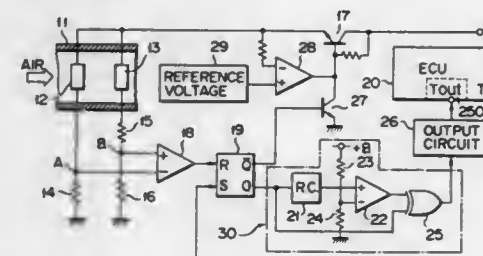
Yoshihisa Sato, Nagoya; Masumi Kinugawa, Okazaki; Susumu Akiyama, Kariya; Toshitaka Yamada, Nagoya; Taki Mizuno, Toyota; Atsushi Suzuki, Ooba, and Kengo Sugiura, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan  
Filed Jun. 16, 1986, Ser. No. 874,854

Claims priority, application Japan, Jun. 18, 1985, 60-130865; Sep. 4, 1985, 60-195324; Sep. 12, 1985, 60-202393

Int. Cl.<sup>4</sup> G01F 1/68; G01M 19/00

U.S. Cl. 73—204

17 Claims



1. A heat-wire type airflow quantity measuring apparatus, comprising:

heat generating means arranged in an airflow to be measured for producing heat in response to heating power applied thereto, the resistance of said heat generating means varying with changes in temperature;

first signal generating means for periodically generating pulse-shaped start signals;

heating power supplying means for supplying said heating power to said heat generating means in response to the start signals;

temperature detecting means for producing a detection signal when the temperature of said heat generating means attains a specified temperature;

heating power cut-off means for cutting off the heating power supplied to said heat generating means in response to said detection signal;

second signal generating means for generating a pulse-shaped time signal representative of the time of supply of heating power to said heat generating means and which rises in correspondence with the start signal and is cut off by said cut-off means;

third signal generating means for generating a pair of first and second pulses corresponding to the rise and fall of the pulse-shaped time signal; and

output means for generating an airflow quantity measurement signal representative of the interval between said pair of first and second pulses generated by said third signal generating means.

4,680,965

# **PROCESS FOR CONTINUOUS DENSITY MEASUREMENT**

Heinz Weltmann, Rosenfeld, and Alfred Keller, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, assignors to Weltmann & Konrad GmbH & Co. KG, Leinfelden-Echterdingen, Fed. Rep. of Germany

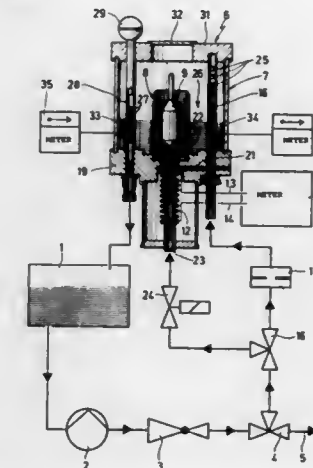
Filed Nov. 14, 1985, Ser. No. 798,129

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443511

Int. Cl.<sup>4</sup> G01N 9/12

U.S. Cl. 73—445

3 Claims



1. Apparatus for the continuous measurement of the density of a slowly flowing liquid, comprising an external vessel (7), a measuring vessel (8) inside the external vessel, the liquid to be measured flowing slowly through said measuring vessel and from there into said external vessel, an aerometer body (9) swimming in the liquid in said measuring vessel, a partition wall (22) between said measuring vessel and said aerometer body surrounding said aerometer body in an all around contactless manner, a first conduit (21) for supplying said slowly flowing liquid to be measured into said measuring vessel and to said aerometer body swimming therein, a second conduit (23) having a larger cross-section than the first conduit for also supplying liquid to be measured into said measuring vessel and to said aerometer body, said first and second conduits being connected to a common source (1) of said liquid to be measured, said second conduit including a valve (24) causing, when opened, a strong current of liquid to be measured to flow at a rapid rate via the second conduit into said measuring vessel and in the area between the aerometer body and the partition wall, said strong current when flowing past the aerometer body pulling off foreign matter adhering to the same.

4,680,966

# **APPARATUS FOR EXAMINING AN OBJECT BY ULTRASONIC ECHOGRAPHY**

Jean-Marie Nicolas, Saint-Maur, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,222

Claims priority, application France, Jun. 15, 1984, 84 09411

Int. Cl.<sup>4</sup> G01N 29/00

U.S. Cl. 73—597

10 Claims

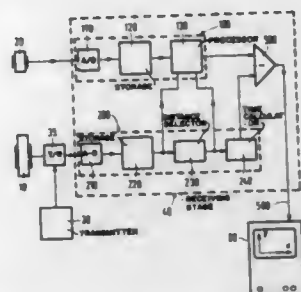
1. In apparatus for examining an object by ultrasonic echography which comprises:

a first ultrasonic transducer;  
a second ultrasonic transducer;  
transmitter means connected to the first transducer which cause repeated transmission of ultrasonic waves into a region of the object to be examined;  
receiver means which include first channel means connected to process echo signals which are reflected to the second transducer from the region; and  
means connected for storing and/or visualizing information



supplied by the receiver means, the improvement wherein:

the first transducer also functions as a receiving transducer and the receiver means further comprise second channel means connected to receive output signals from the first transducer which functions to compute a theoretical traveling time for ultrasonic signals which propagate from the first transducer into the region and are reflected to the second transducer;



wherein the first channel means further comprises means which calculate the actual traveling time of signals which propagate from the first transducer to the second transducer; and further comprising

a first subtractor having inputs connected to receive the outputs of the first channel means and the second channel means respectively and having an output connected to the means for storing and/or visualizing information supplied by the receiver means.

4,680,967

#### ULTRASONIC ANGLE TEST PROBE HAVING AT LEAST TWO TRANSDUCERS

Manfred Rost, Wesseling, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Incorporated, Lewistown, Pa.

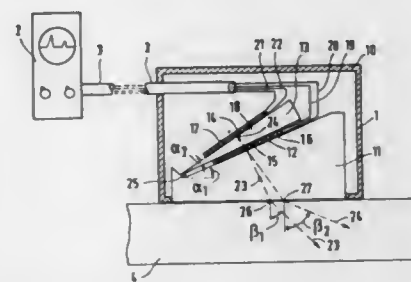
Filed May 12, 1986, Ser. No. 862,140

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3534002

Int. Cl.<sup>4</sup> G01N 29/04

U.S. Cl. 73-628

2 Claims



1. An ultrasonic angle test probe including at least two ultrasonic transducers for respectively generating and receiving ultrasonic waves propagating at different angles of propagation in a workpiece to which the probe is acoustically coupled, the first ultrasonic transducer being disposed on a first wedge-shaped coupling element, the improvement comprising: the second ultrasonic transducer disposed on a second wedge-shaped coupling element, and said second coupling element being disposed on said first coupling element, whereby ultrasonic waves generated and received by said second transducer travel through said first transducer along their path to and from the workpiece to which said probe is coupled.

4,680,968

#### MECHANICAL VIBRATOR

Dieter Sodelkat, Balerbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

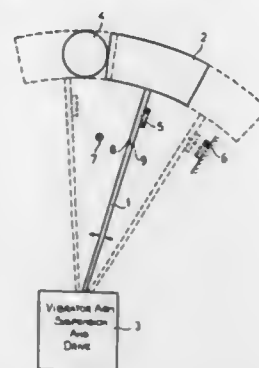
Filed Nov. 15, 1985, Ser. No. 798,478

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442811

Int. Cl.<sup>4</sup> G01H 9/00

U.S. Cl. 73-651

9 Claims



1. In a mechanical vibrator for resonance operation with a beam chopper comprising:  
a mechanically stiff vibrator arm representing a fixed mass, a spring having a fixed spring constant attached to and acting upon said vibrator arm wherein the vibrator arm and the spring comprise a mass/spring system having a resonance frequency,  
drive means for vibrating said vibrator arm with an amplitude waveform having a first half-wave and second half-wave, said drive means including positive feedback circuit control means for self excitation at the resonance frequency of the mass/spring system, and  
measuring device means for determining the velocity or the position of the vibrator arm,  
the improvement comprising:  
means for influencing the ratio of the time of the first and second half waves and/or the vibration frequency of the vibrator arm, said means comprising at least one first magnetic system located on the vibrator arm and at least one second magnetic system located off the vibrator arm which is in operational connection with the first magnetic system.

4,680,969

#### ULTRASONIC PROBE JIG

Yasuo Hama, and Shigetake Takaku, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

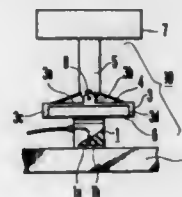
Filed Aug. 1, 1986, Ser. No. 892,338

Claims priority, application Japan, Sep. 6, 1985, 60-195812

Int. Cl.<sup>4</sup> G01N 29/04

U.S. Cl. 73-661

8 Claims



1. An ultrasonic probe jig comprising:  
a leaf spring member brought into contact with an upper surface of an ultrasonic probe to be located on an object to be examined;  
a support member for supporting a peripheral portion of said leaf spring member;

a mounting mechanism for pivotally mounting a support rod coupled to a control device on said support member; and a regulating member one end of which is mounted to said support rod and the other end of which is engaged with said support member, said regulating member being adapted to regulate pivotal movement of said support member.

4,680,970

#### APPARATUS FOR MEASURING PRESSURE

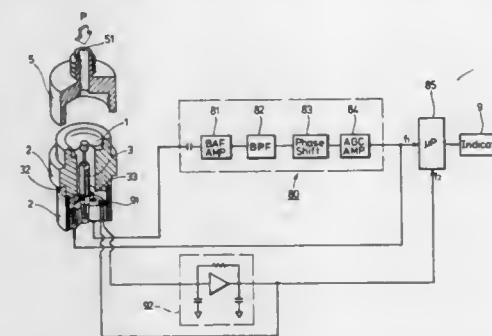
Toshitsugu Ueda; Fusao Kohsaka; Daisuke Yamazaki, and Hideo Akazawa, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Jan. 31, 1986, Ser. No. 825,082

Int. Cl.<sup>4</sup> G01L 11/00

U.S. Cl. 73-702

7 Claims



1. A pressure measuring apparatus comprising a diaphragm to which pressure to be measured is applied; and a resilient vibrator linked to said diaphragm and driven by a force produced by said diaphragm in response to said pressure, wherein said diaphragm comprises a peripheral circumferential portion, a central fixing portion, and a non-planar intermediate portion therebetween, with said fixing portion having an edge part secured to said vibrator at a non-perpendicular angle, wherein said peripheral portion and said fixing portion comprise rising edge portions of predetermined dimensions, said rising edge portions being attached parallel to said vibrator.

4,680,971

#### DUAL DIAPHRAGM DIFFERENTIAL PRESSURE TRANSDUCER

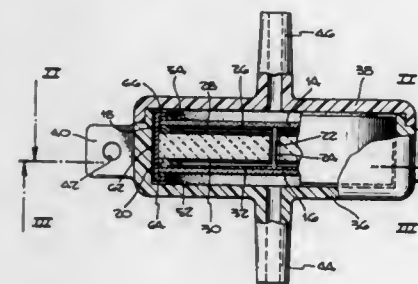
Fred Kavli, Malibu, and Kyong Park, Chatsworth, both of Calif., assignors to Kavlico Corporation, Moorpark, Calif.

Filed Nov. 19, 1985, Ser. No. 799,447

Int. Cl.<sup>4</sup> G01L 7/08, 9/12, 13/02; H01G 7/00

U.S. Cl. 73-718

25 Claims



1. A corrosion proof pressure transducer assembly for measuring the pressure difference between two fluids, comprising:  
a central circular insulating base member having a central opening and two spaced flat sides;  
first and second thin circular, flat insulating diaphragms having substantially zero mechanical hysteresis, and each having a diameter substantially equal to that of said base member;  
means for mounting said diaphragms, one on each side of

said base member and spaced apart from said base member by between 0.0005 and 0.010 inch;

a coupling member having substantially the same coefficient of thermal expansion as said insulating base member, mechanically interconnecting the centers of said pair of diaphragms and extending through the central opening in said base member;

facing conductive means in the form of conductive surfaces on the inner surface of one of at least one of said ceramic diaphragms and the adjacent surface of said base member, for forming a variable capacitor having a capacitance which varies as the diaphragms flex;  
housing means having first and second input ports for applying fluid pressures from two different sources directly to the outer surfaces of said first and second diaphragms, respectively; and

resilient means mounted near the peripheries of said first and second diaphragms directing and limiting the fluid path from each of said input ports to the associated diaphragm; whereby the capacitance between said two conductive surfaces is a function of the difference in the fluid pressures applied to said two diaphragms, and said conductive surfaces are isolated from any possible corrosion from the fluids being measured.

4,680,972

#### PRESSURE TRANSDUCER

William Wareham, Marion, Mass., assignor to Dynisco, Inc., Norwood, Mass.

Filed Jan. 7, 1985, Ser. No. 689,385

Int. Cl.<sup>4</sup> G01L 7/04, 9/04

U.S. Cl. 73-730

35 Claims



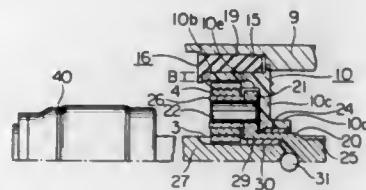
1. A pressure transducer comprising;  
an elongated frame having an elongated passage there-through,  
a capillary tube extending through the frame passage and terminating at one end adjacent one end of the frame,  
a coupler at said one end of the frame and defining with the frame a chamber in communication with the capillary tube,  
a sensing member disposed about the capillary tube at the other end of the frame and including means defining an annular sensing chamber in fluid communication with the capillary tube, and means defining a recess in the sensing member forming a relatively thin wall adjacent said annular sensing chamber,  
and means for sensing pressure at said wall,  
said capillary tube having a passage therethrough extending substantially transverse to the axis thereof and for permitting fluid communication between the capillary tube and said annular sensing chamber.





an open end and a plurality of longitudinally-extending ribs formed on an outer surface of said first cylindrical portion, said ribs extending for a distance less than the longitudinal length of said first cylindrical portion of said ring gear so as to provide an unribbed portion about said open end;

- a second output shaft rotatably connected to said planet gear said second output shaft is rotated by the planetary movement of said planet gear about said sun gear;
- a hollow frame having a cylindrical inner surface which receives said ring gear, said frame having a plurality of longitudinally-extending inward projections formed on the inner surface of said frame, said inward projections being disposed about the inner surface so that each of said



inward projections engages a corresponding one of said ribs, a plurality of longitudinally extending cavities formed between the outer surface of the first cylindrical portion of said ring gear and the inner surface of said frame and respectively between the plurality of engaging ribs and inward projections;

an annular elastic reinforcing member secured in a press fit over the first cylindrical portion of said ring gear in said unribbed portion; and

a plurality of longitudinally-extending elastic shock absorbing members respectively received in said cavities, each of said shock absorbing members having a shape and size which is substantially equal to and associated with one of said cavities formed between said frame and said ring gear.

4,680,980

## DRIVE MECHANISM

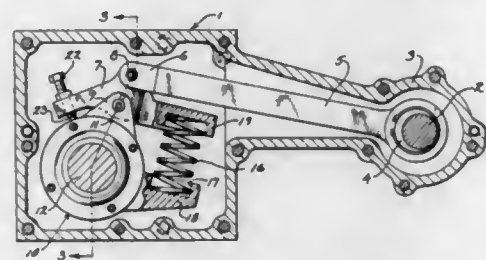
George E. Olson, Arlington Heights, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Oct. 3, 1985, Ser. No. 783,774

Int. Cl. F16H 29/00

U.S. Cl. 74-125

10 Claims



1. A drive mechanism, comprising a supporting structure, an oscillating member mounted to move in an oscillating path of travel relative to said supporting structure, drive means to impart oscillatory movement to said oscillating member, a rotatable output member, first overrunning clutch means associated with the output member, said first clutch means being constructed and arranged so that rotation of said first clutch means in a first direction causes said first clutch means to engage the output member to thereby rotate said output member in said first direction, said first clutch means being freely rotatable relative to said output member in a second direction, and means interconnecting the oscillating member and said clutch means for transmitting oscillatory motion to said clutch

means to alternately move said clutch means in said first and second directions, resilient means interconnecting said oscillating member and said first clutch means, said resilient means constructed and arranged to be compressed by oscillatory movement of said oscillating member in said first direction during conditions when said output member encounters a predetermined excessive load to thereby provide overload protection for said mechanism, one end of said resilient means being engaged with said first clutch means, and said mechanism includes a seat on said oscillating member, the opposite end of said resilient means being engaged with said seat, and means for mounting said seat for pivotal movement relative to said oscillating member.

4,680,981

## RACK AND PINION GEAR AND A METHOD OF ASSEMBLING SUCH A GEAR

Philip A. Downing, Bristol, United Kingdom, assignor to TRW Cam Gears Limited, Hertfordshire, Great Britain

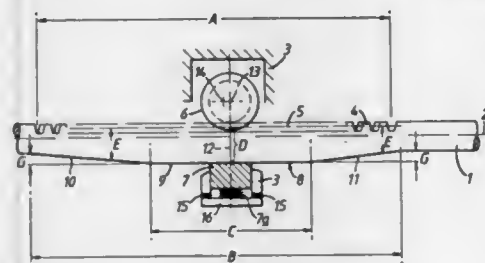
Filed Feb. 22, 1985, Ser. No. 704,420

Claims priority, application United Kingdom, Feb. 27, 1984, 8405076

Int. Cl. B62D 3/12

U.S. Cl. 74-422

5 Claims



1. A rack and pinion gear assembly comprising:  
a housing;  
a rack bar having rack gear teeth and a longitudinally extending axis and being longitudinally displaceable in said housing;  
a pinion having gear teeth and rotatably mounted in said housing and having its gear teeth in engagement with the gear teeth of said rack bar so that rotation of said pinion effects longitudinal displacement of said rack bar;  
support means located between said rack bar and said housing on the side of said rack bar remote from said pinion, said rack bar having a bearing surface on said remote side of said rack bar, said support means engaging said bearing surface and resiliently biasing said rack bar to urge the gear teeth thereof into engagement with the gear teeth of said pinion, and said support means including means for adjusting the biasing force applied to said rack bar;  
said gear teeth of said rack bar forming a longitudinally extending array of coplanar teeth thereon, the operative length of said array of coplanar teeth corresponding to at least three revolutions of said pinion, said bearing surface being substantially co-extensive longitudinally with said operative length and comprising a central bearing region which is substantially parallel to the longitudinally extending axis of said rack bar and two end bearing regions extending longitudinally from opposite ends of said central bearing region;  
said central bearing region extending longitudinally for a distance which corresponds at least to the displacement of said rack bar caused by one revolution of said pinion and which is not greater than the displacement of said rack bar caused by one and a half revolutions of said pinion, said central bearing region extending longitudinally substantially symmetrically relative to a line perpendicular to the longitudinal axis of said rack bar and which passes through the central bearing region.

through the mid-length position of said operative length; and  
the distance between said longitudinally extending axis of said rack bar and said bearing surface in a direction transverse to said longitudinally extending axis being greater in the central bearing region than in the end bearing regions.

4,680,982

## CIRCULATING-BALL DRIVE

Richard Wilke, Am Weissenfeld 4, D-5830 Schwelm, and Helmut Korthaus, Fernblick 3, D-5600 Wuppertal 2, both of Fed. Rep. of Germany

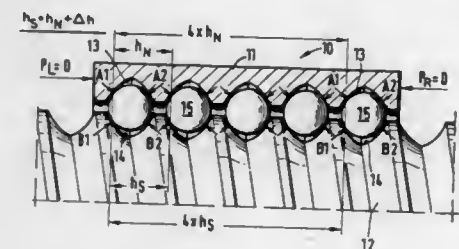
Filed Mar. 11, 1983, Ser. No. 474,228

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3209086

Int. Cl. F16H 1/18, 1/20

U.S. Cl. 74-424.8 R

4 Claims



1. A circulating-ball drive comprising a spindle, a unitary one-piece nut coaxially surrounding said spindle along part of the length thereof, and a set of identical bearing balls interposed between said spindle and said nut, said spindle having a single outer helical groove of uniform cross-section with a multiplicity of turns, said nut having a single inner helical groove of uniform cross-section with a plurality of turns confronting respective turns of said outer groove and forming part of at least one closed track for the recirculation of bearing balls confined between the confronting turns, each of said turns having a profile with two symmetrical flanks engaging the confined bearing balls along a helical contact line whereby each confined ball is exclusively in two-point continuous contact with each of said spindle and said nut over the full length of a path for each ball in contact with both said spindle and said nut, the turns of said outer groove having a constant pitch over the length thereof exceeding by a small fraction the pitch of the turns of said inner groove which is constant over the length thereof in an unstressed state of said nut over the full length of said nut, with resulting uniform elastic axial deformation of said nut upon assembly so that under all operating conditions said grooves engage each ball with four-point contact exclusively during the travel of each ball over the length of said spindle.

4,680,983

## TRANSMISSION DIRECTION SELECTION SYSTEM

David J. Brown, Stockport, United Kingdom, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Dec. 10, 1985, Ser. No. 807,137

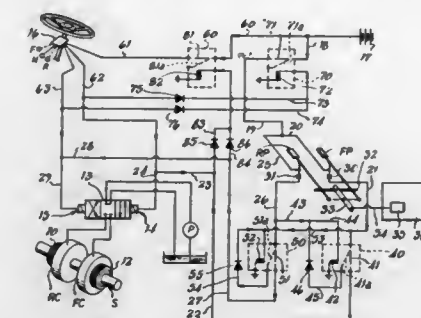
Int. Cl. B60K 20/00, 20/10

U.S. Cl. 74-474

8 Claims

1. A drive direction selection system for a vehicle transmission, the selection system comprising a source of electrical power, a first circuit for supplying an electrical signal from the source to a forward drive direction engagement means, a second circuit for supplying an electrical signal from the source to a reverse drive direction engagement means, forward and reverse direction selector switches in the first and second circuits respectively controlled by forward and reverse direction selection pedals respectively, said drive direction selector switches both being movable between an open condition and a closed condition by moving the associated pedal between a

raised and a depressed position respectively, first interlock means arranged to break the first circuit on depressing the reverse selection pedal to close reverse selector switch and to maintain the first circuit broken until both switches are again



simultaneously in their open condition, and second interlock means arranged to break the second circuit on depressing the forward selection pedal to close the forward selector switch and to maintain the second circuit broken until both switches are again simultaneously in their open condition.

4,680,984

## TORSIONAL VIBRATION DAMPER

Werner Wühling, Kraiburg/Inn, and Günther Ziegler, Walkraiburg, both of Fed. Rep. of Germany, assignors to SGF Snddeutsche Gelenkscheibenfabrik GmbH & Co. KG, Waldkraiburg, Fed. Rep. of Germany

PCT No. PCT/EP85/00238, § 371 Date Jan. 6, 1986, § 102(e) Date Jan. 6, 1986, PCT Pub. No. WO85/05663, PCT Pub. Date Dec. 19, 1985

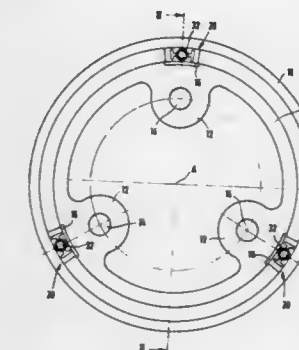
PCT Filed May 20, 1985, Ser. No. 823,483

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420570

Int. Cl. F16F 15/12

U.S. Cl. 74-574

7 Claims



1. A torsional vibrator damper comprising:  
a support which includes fastening means for mounting said support to a shaft flange or the like,  
a flywheel positioned coaxially around said support and radially spaced therefrom, and  
a plurality of elastomeric spring elements disposed between said support and said flywheel and circumferentially spaced apart from each other, each of said spring elements being connected to an outer surface of said support and an inner surface of said flywheel, each of said spring elements including a cavity therein formed of a pair of opposed, rolling curves of elastomeric material and having a rigid rolling body within said cavity and in contact with said rolling curves and supported therein under radial bias, with said rolling curves converging in a circumferential

direction at both sides of an associated rolling body and being formed by a layer of the elastomeric material which becomes progressively thicker in circumferential direction toward both sides of said rolling element, with said rolling curves terminating at each end in a T-shaped slot.

4,680,985

# CONTINUOUSLY VARIABLE TRANSMISSION WITH EPICYCLIC CONSTANT MESH GEARING

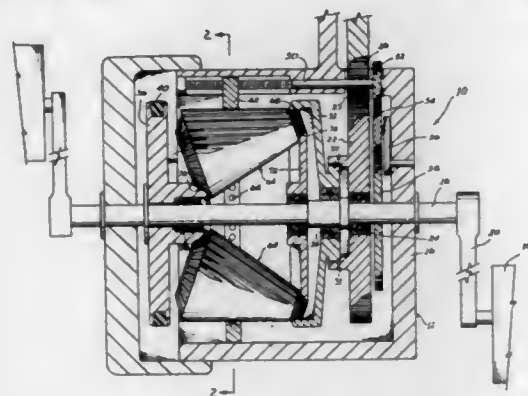
Thomas F. Troester, 16561 Barryknoll Way, Granger, Ind. 46530

Continuation-in-part of Ser. No. 652,497, Sep. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 367,299, Apr. 12, 1982, abandoned. This application Oct. 23, 1985, Ser. No. 790,427

Int. Cl. F16H 3/50

U.S. Cl. 74-785

2 Claims



1. A continuously variable transmission comprising a housing, an input shaft, said input shaft journaled in said housing, a nonrotatable ring gear mounted in said housing, means for shifting said ring gear axially relative to said input shaft, an output gear, a gear cone having an outer conical surface including teeth meshing with said ring gear and a base, said cone including teeth adjacent to the base of said conical surface in mesh with said output gear, and means for connecting said cone to said input shaft whereby rotation of the input shaft is converted into rotation of said output gear and said ring gear is shiftable axially to vary the ratio of rotation of said input shaft and said output gear, said means connecting said cone to said input shaft including a first input gear rotatably mounted on the input shaft and in mesh with one end of the cone, idler means rotatably mounted on said input shaft for supporting said cone one end in meshing contact with said first input gear whereby rotation of said input shaft causes rotation of said cone, said means connecting said cone to said input shaft including means for providing an alternate power source of rotation of said cone, said alternate rotative source means including a second input gear mounted on said input shaft and adapted to rotate in response to said alternative power source, reduction gear means for connecting said first and second input gears, clutch means mounting said first input gear on said input shaft for making the first input gear nonresponsive to rotation of the input shaft when said second input gear causes the first input gear to rotate at a higher speed of rotation than the input shaft.

4,680,986  
DRIVE UNIT, PARTICULARLY FOR SHORT-HAUL VEHICLES  
Ernst Elmer, Herbrechtingen, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Fed. Rep. of Germany  
PCT No. PCT/EP85/00148, § 371 Date Dec. 31, 1985, § 102(c) Date Dec. 31, 1985, PCT Pub. No. WO85/05600, PCT Pub. Date Dec. 19, 1985

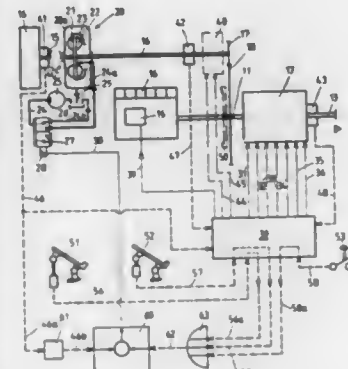
PCT Filed Apr. 2, 1985, Ser. No. 822,413

Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3419958

Int. Cl. B60K 41/28, 9/04

U.S. Cl. 74-866

22 Claims



1. A drive unit for a vehicle, comprising:

an input shaft intended to be driven by an engine, an output shaft and a transmission disposed between the input shaft and the output shaft and effective for setting a transmission ratio therebetween, the input shaft coupling the engine and the transmission to one another and the output shaft being effective for applying rotational energy from the transmission to the vehicle;

a flywheel accumulator;

a slippable coupling for coupling the input shaft and the flywheel accumulator to one another, the slippable coupling comprising a first coupling half and a second coupling half and having a speed ratio which is infinitely adjustable within a speed ratio range extending between a lower and an upper limit;

the drive unit being of the type which permits rotational energy to flow from the flywheel accumulator to the output shaft when the vehicle is in an acceleration mode and from the output shaft to the flywheel accumulator when the vehicle is in a braking mode; and

a control device for controlling the transmission such that whenever the slippable coupling approaches one of its speed ratio limits, the transmission ratio is adjusted such that the speed ratio of the coupling remains within its speed ratio range; the control device further comprising means for controlling the transmission such that the speed of rotation of that coupling half of the first and second coupling halves which is situated first in the direction of energy flow rotates at a greater speed than the other of the two coupling halves which is located downstream along the energy flow direction.

# CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION

Yoshihiko Morimoto, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

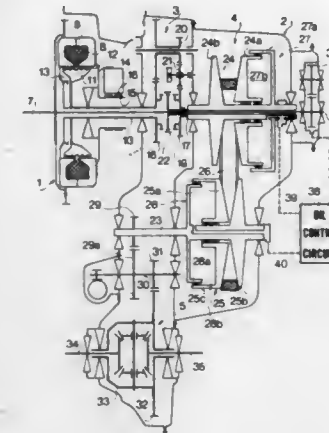
Filed Nov. 8, 1985, Ser. No. 796,475

Claims priority, application Japan, Nov. 16, 1984, 59-241957

Int. Cl. B60K 41/16

U.S. Cl. 74-866

10 Claims



1. In a system for controlling an infinitely variable transmission for transmitting the power of an internal combustion engine through a clutch for driving a motor vehicle, the transmission comprising a drive pulley having a hydraulically shiftable disc and a hydraulic cylinder for shifting the disc, a driven pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc of the driven pulley, and a belt engaged with both pulleys, the system including a pressure oil circuit having a pump for supplying pressurized oil, and a transmission ratio control valve having a spool for controlling the pressurized oil so as to move the disc of the drive pulley to change the actual transmission ratio of the transmission, the improvement in the system comprising:

first means for moving the spool of the transmission ratio control valve;

second means responsive to disengagement of the clutch, when speed of the vehicle is below a predetermined speed, for producing a coasting signal;

third means responsive to the coasting signal for producing a drive pulley speed set signal;

fourth means responsive to the drive pulley speed set signal for producing a shifting signal representing a quantity of shifting the spool of the transmission ratio control valve in upshifting direction, and

fifth means responsive to the shifting signal for shifting the spool of the transmission ratio control valve in the upshifting direction via said first means thereby decreasing the drive pulley speed.

4,680,988

# CONTROL FOR SHOCK-FREE SHIFT IN AN AUTOMATIC TRANSMISSION

Yasushi Mori, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 21, 1985, Ser. No. 800,394

Claims priority, application Japan, Nov. 22, 1984, 59-245879; Dec. 5, 1984, 59-255813; Dec. 5, 1984, 59-255814

Int. Cl. B60K 41/18

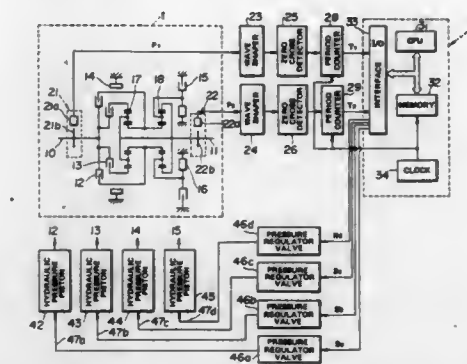
U.S. Cl. 74-866

14 Claims

1. A device for controlling a motor vehicle installed with an engine and an automatic transmission during a shift in gear position in the automatic transmission, the automatic transmission having an input shaft drivingly connected to the engine and an output shaft, comprising:

means for detecting an actual value in a speed ratio of a

revolution speed of the input shaft to that of the output shaft during a transient period involving a shift in gear position in the automatic transmission and generating an actual speed ratio indicative signal indicative of said actual value in said speed ratio; and



means for effecting a closed loop control of said shift in gear position based on said actual speed ratio indicative signal during the transient period.

4,680,989

# HYDRAULIC SHIFT CONTROL DEVICE FOR AN AUTOMATIC TRANSMISSION HAVING TWO GEAR RATIOS

Jan Sykora, and Jan Wangler, both of Prague, Czechoslovakia, assignors to PRAGA-Zavody Klementa Gottwald, narodni podnik, Prague, Czechoslovakia

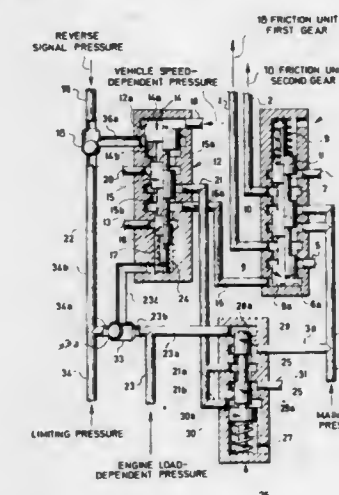
Filed Dec. 30, 1985, Ser. No. 814,642

Claims priority, application Czechoslovakia, Dec. 28, 1984, 10512-84; Nov. 5, 1985, 7939-85

Int. Cl. B60K 41/06

U.S. Cl. 74-867

2 Claims



1. In a hydraulic shift control device for an automatic vehicle transmission having two gear ratios shiftable between each other by selectively actuating fluid operated first and second friction engaging means according to the vehicle speed, engine load condition and operator's commands, the hydraulic shift control device comprising:

a shift valve having a spool shiftable between initial first and alternate second position, said spool in initial first position connecting a main input pressure with the second friction engaging means while discharging actuating pressure from the first friction engaging means and in alternate



second position connecting the main input pressure circuit with the first friction engaging means, while discharging actuating pressure from the second friction engaging means, said shift spool shiftable from the initial first position to the alternate second position by action of a modulated pressure, the modulated pressure being of inverse proportion to an engine load-dependent pressure, said modulated pressure supplied to the shift valve from a single valve in a modulated pressure line,

a modulator valve modulating the main input pressure to produce the modulated pressure, the main input pressure being modulated by the action of the engine load-dependent pressure introduced to the modulator valve from an engine load-dependent pressure circuit, the modulator valve being connected by a modulator pressure conduit with the signal valve,

the signal valve, having a spool provided with three circumferential lands of different diameters, the first one an outer land of largest diameter, the second one an inner land of middle diameter and the third one an outer land of smallest diameter, said spool shiftable between an initial first position and an alternate second position by a vehicle speed-dependent pressure acting on the terminal work face of the first land, said spool being urged back into the initial first position by a spring and by the engine load-dependent pressure or by a spring and an operator-actuated limiting pressure, acting on the terminal work face of the third land, said signal valve spool, in the initial first position allowing a modulated pressure to pass from the modulator valve to the shift valve through the groove created between the second land and the third land while preventing drainage of the modulated pressure line connecting said signal valve and said shift valve, and in the second, alternate position draining the modulated pressure line connecting said signal valve and said shift valve while blocking input of the modulated pressure to a signal valve from the modulator valve, a limiting pressure circuit actuable by a vehicle operator, and

a pilot shuttle valve including

- (1) a first inlet of the engine load-dependent pressure from an engine load-dependent pressure circuit,
  - (2) a second inlet of limiting pressure from the limiting pressure circuit actuable by the vehicle operator,
  - (3) an output to the signal valve;
- said pilot shuttle valve allowing to the higher of two said engine load-dependent pressure and limiting pressure, respectively, to pass to the signal valve while preventing the lower of said pressures, the engine load-dependent pressure and limiting pressure respectively, to pass through the pilot shuttle valve.

4,680,990

**SYSTEM FOR CONTROLLING THE TRANSMISSION RATIO OF AN INFINITELY VARIABLE TRANSMISSION**  
Masaaki Otagami, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan and Van Doorne's Transmissie B. V., Tilburg, Netherlands

Filed Apr. 12, 1985, Ser. No. 722,961

Claims priority, application Japan, Apr. 19, 1984, 59-79746  
Int. Cl.<sup>4</sup> B60K 41/16

U.S. Cl. 74-868

3 Claims

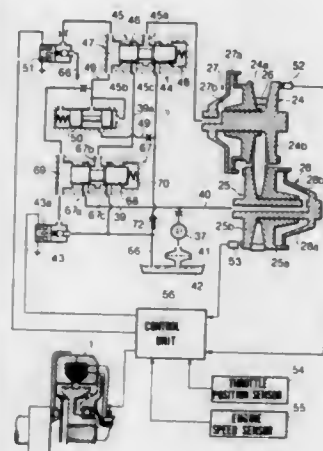
1. In a system for controlling the transmission ratio of an infinitely variable transmission for an engine mounted on a vehicle, the engine having a throttle valve and an electromagnetic clutch having a coil for transmitting the power of the engine to the transmission, said transmission comprising a primary pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc, a secondary pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc of the secondary pulley, and a belt engaged with both pulleys, the improvement comprising;

a hydraulic circuit having a transmission ratio control valve having an end chamber and a spool moved by control oil supplied to the end chamber for selectively shifting the

disc of the primary pulley in the downshift direction and upshift direction, respectively, first passages including a supply passage for supplying oil to the hydraulic cylinder of the primary pulley passing through the transmission ratio control valve and a first drain passage for draining the oil in the hydraulic cylinder of the primary pulley passing through the transmission ratio control valve, a control oil passage for supplying a part of drain oil in the first drain passage as the control oil to the end chamber, and a second drain passage for draining the oil in the end chamber;

said hydraulic circuit including

means comprising a regulator valve provided in the control oil passage for keeping the pressure of the control oil in the control oil passage constant;



first means for detecting conditions of transient acceleration of the vehicle for producing a first signal;

second means responsive to said first signal for producing a control signal representing variation rate of the transient;

said hydraulic circuit including third means including a solenoid operated valve provided in the second drain passage and a solenoid responsive to the control signal for operating the solenoid operated valve to control the amount of oil in the end chamber for shifting said spool of said transmission ratio control valve in the downshift direction, and

clutch control means responsive to the control signal for decreasing clutch current passing through the coil of the electromagnetic clutch so as to increase speed of the engine for a period.

4,680,991

**SYSTEM FOR CONTROLLING THE TRANSMISSION RATIO IN AN INFINITELY VARIABLE TRANSMISSION**  
Motohisa Miyawaki, Chofu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 693,706

Claims priority, application Japan, Jan. 30, 1984, 59-14741  
Int. Cl.<sup>4</sup> B60K 41/16

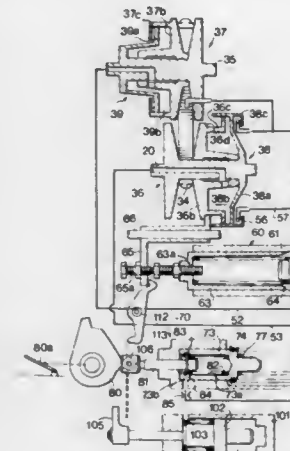
U.S. Cl. 74-868

8 Claims

1. In a control system for an infinitely variable transmission for a vehicle powered by an internal combustion engine, the transmission comprising a drive pulley having a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley having a hydraulically shiftable disc and a second hydraulic cylinder for operating the disc of the driven pulley, and a belt engaged with both pulleys, the transmission defining a transmission ratio, a hydraulic circuit having a pump for supplying oil, a detecting means for producing a first signal dependent on engine speed, a transmission ratio control valve having a shiftable first spool responsive to the first signal for controlling the oil and for shifting the disc of the drive pulley

to change the transmission ratio, and a pressure regulator valve having a second spool responsive to the transmission ratio for increasing line pressure of the hydraulic circuit with an increase of the transmission ratio, wherein the improvement comprises:

- a plunger coaxial with the spool of the transmission ratio control valve and axially movable provided;
- a spring provided between the first spool and the plunger;
- first means for shifting the plunger in dependency on depression of an accelerator pedal of the vehicle, thereby via said spring shifting the first spool in opposition to the force dependent on the first signal;
- said manual selecting means for applying the line pressure to the actuator for releasing the actuator from the plunger;



an actuator for shifting the plunger against the force dependent on the first signal;

manual selecting means for operating the actuator for shifting the plunger against the force dependent on the first signal;

second means responsive to the movement of the disc of the drive pulley from a predetermined transmission ratio in a transmission ratio increasing direction for disabling the actuator; and

said manual selecting means for operating the actuator, whereby when the actuator operates, the first spool is shifted at a predetermined engine speed, so that the transmission ratio begins to increase and the load on the spring is reduced after the predetermined transmission ratio by the operation of the second means.

4,680,992

**DOWNSHIFT TIMING AND ENGINE BRAKE CONTROL FOR AUTOMATIC TRANSMISSION**  
Koichi Hayasaka, Fujisawa, and Kazuhiko Sugano, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 5, 1986, Ser. No. 893,243

Claims priority, application Japan, Aug. 5, 1985, 60-171154; Aug. 6, 1985, 60-171865; Aug. 6, 1985, 60-171869; Sep. 6, 1985, 60-197078

Int. Cl.<sup>4</sup> B60K 41/18, 41/16

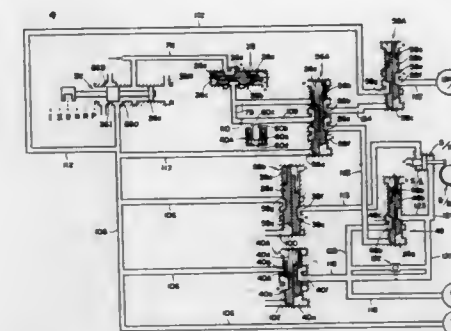
U.S. Cl. 74-869

7 Claims

1. A control for an automatic transmission for an automotive vehicle having an engine, the transmission being adapted for shifting between different speed ratios and having a plurality of friction elements to effect shifting between speed ratios, the plurality of friction elements including an engine brake effecting friction element, the control comprising:

- a fluid source;
- means communicating with said fluid source for generating

- a line pressure which is variable with opening degree of a throttle of the engine;
- a timing valve;
- a control valve for the engine brake effecting friction element;
- electromagnetic means for generating a control pressure;
- a shuttle valve communicating with said timing valve, said



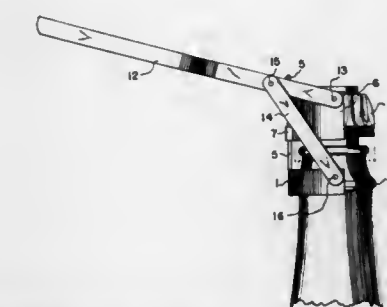
control valve, and said electromagnetic means, said shuttle valve having a valve spool movable responsive to said line pressure between a first position where said control valve is under the control of said control pressure and said timing valve is not under the control of said control pressure, and a second position where said control valve is not under the control of said control pressure and said timing valve is under the control of said control pressure.

4,680,993

**CHAMPAGNE BOTTLE OPENER**Jack M. Feliz, 2110 Southridge Dr., Palm Springs, Calif. 92264  
Filed Jan. 20, 1986, Ser. No. 876,785Int. Cl.<sup>4</sup> B67B 7/02

U.S. Cl. 81-3.37

3 Claims



1. In a champagne bottle opener, the combination of:
  - a. a flanged yoke-shaped platform having vertically spaced upper and lower flanges engageable to the flanged neck of a champagne bottle;
  - b. a flanged yoke-shaped cork extractor and retainer having vertically spaced upper and lower flanges engageable to the external top and bottom flanges of the cork, said extractor and retainer and said platform having interengageable guide means for maintaining said extractor and retainer in a horizontal plane while moving vertically in relation to said platform; and
  - c. a single lever actuating means pivotally connected to said extractor and retainer and connected by a pivoted link to said platform, for moving said extractor and retainer vertically in relation to said platform;
  - d. with said platform and said extractor and retainer being laterally slideable into extracting position onto the corked bottle and with said cork being extracted by a single one-handed downward motion of said single lever.

4,680,994

## SOCKET WRENCH WITH REVERSING RATCHET

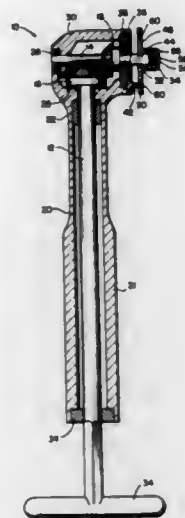
Robert P. Singleton, Birmingham, Ala., assignor to Sidewinder Products Corporation, Birmingham, Ala.

Continuation-in-part of Ser. No. 746,673, Jun. 20, 1985, Pat. No. 4,620,459. This application Sep. 3, 1985, Ser. No. 771,625

Int. Cl.<sup>4</sup> B25B 13/46, 17/00

U.S. Cl. 81—57.29

4 Claims



1. A socket wrench with reversing ratchet comprising: an elongated casing; a gear shaft mounted coaxially within said casing; a bevel gear mounted on one end of said gear shaft; a T-shaped handle member mounted on the other end of said gear shaft, said gear shaft being formed as an integral unit with the bevel gear so that rotation of said handle member results in direct rotation of said bevel gear, said gear shaft being in the form of a single straight continuous shaft from the bevel gear on said one end of the gear shaft to the T-shaped handle on said other end of the gear shaft; a pinion shaft mounted in said casing adjacent said bevel gear and extending perpendicular to said gear shaft; a bevel pinion mounted on one end of said pinion shaft in engagement with said bevel gear; a drive shaft mounted on said bevel pinion so as to be coaxial with said pinion shaft and extending outwardly from said casing; a pair of bushings mounted in said casing, with one end of said pinion shaft and one end of said drive shaft each being mounted in a respective one of said bushings; a planar cap member mounted on said casing, said cap member acting to secure the bushing in which said drive shaft is mounted; a drive stud mounted on said drive shaft for engagement with a workpiece; a ratchet wheel having a plurality of teeth around the circumference thereof, said ratchet wheel being mounted on said drive shaft and rotatable therewith; and means for releasably engaging said ratchet wheel to prevent rotation of said drive shaft, said engaging means including a pawl member mounted on said casing, said pawl member being free to move in a direction along its longitudinal axis and with means for biasing said pawl into engagement with said ratchet wheel, the plane of said longitudinal axis being coincident with the plane of said ratchet wheel, said pawl being mounted in a pawl casing having a pair of notches formed therein and so positioned relative to each other that said pawl may be received in either of said pair of notches upon being rotated about its longitudinal axis through an angle of 180 degrees, said pawl casing having a center notch corresponding to an angle of rotation of said pawl about its longitudinal axis by an angle of 90 degrees from either of said pair of notches, said pair of notches being positioned closer to said ratchet wheel than said center notch so that said biasing means allows said pawl to engage the ratchet wheel when positioned in either of said pair of notches while allowing said ratchet wheel to rotate free of engagement with the pawl when said pawl is in the center notch.

4,680,995

## SCREWDRIVER

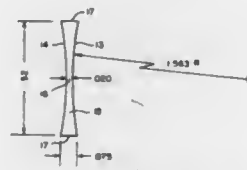
Philip R. LaRue, Meyersdale, Pa., assignor to Napfa, Inc., Meyersdale, Pa.

Filed Feb. 24, 1986, Ser. No. 833,083

Int. Cl.<sup>4</sup> B25F 1/00

U.S. Cl. 81—437

5 Claims



1. In a screwdriver bit having a shaft and driving faces disposed on opposite sides thereof said faces extending the entire width of the bit lengthwise of the bit edge, the improvement in which said oppositely disposed driving faces are concave-out arcuate faces having a radius of curvature of about 1.56 inches progressively decreasing in depth along said bit from said bit edge so as to form a bit edge having at its center a thickness of about 0.02 inches and at its ends a thickness of about 0.075 inches, whereby a single said bit is adapted to drive and to remove slotted-head screws having slots of different widths.

4,680,996

## SCREWDRIVER

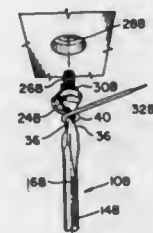
Peter N. Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570

Filed Apr. 18, 1986, Ser. No. 853,437

Int. Cl.<sup>4</sup> B25B 23/10

U.S. Cl. 81—456

4 Claims



1. Improvements in a screwdriver of the type having a handle and a shank having a longitudinal axis extending forwardly of said handle and terminating at the distal end of said shank in a screw-turning blade having a plane generally parallel to said longitudinal axis of said shank and a screw engaging edge at its end, said improvements comprising along the length of said blade a rotational turn in said blade to offset the portion of said blade distally of said turn from the plane of the blade portion adjacent said shaft, and said rotated blade having in the distal portion a pair of arcuate cutouts, to thereby allow the sighting of the screw engaging edge by the user down the longitudinal axis of said shank during use of said screwdriver; and for engaging a coil of wire for holding a fastener on said blade.

4,680,997

## VIDEO TAPE CASSETTE TOOL

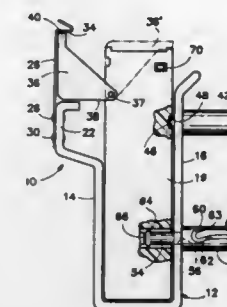
LaVon F. Hancock, 5561 SE. Pueblo St., Hillsboro, Oreg. 97123

Filed Mar. 14, 1986, Ser. No. 839,558

Int. Cl.<sup>4</sup> B25B 3/00

U.S. Cl. 81—487

16 Claims



1. A hand tool for holding a video tape cassette of the type having a tape shield held closed by spring tension, said hand tool comprising:

means for clamping a video tape cassette into said hand tool; and  
means affixed to said clamping means for holding a tape shield of the cassette in an open position against the spring tension.

4,680,998

## TORIC LENSES, METHOD AND APPARATUS FOR MAKING SAME

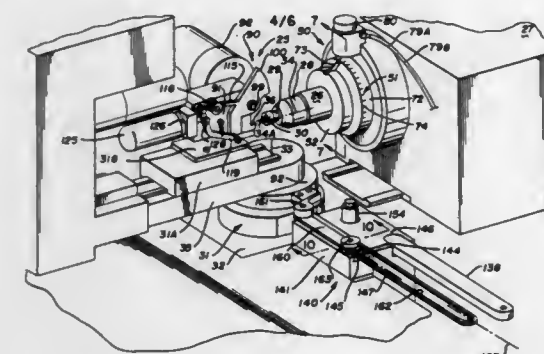
Buford W. Council, Jr., Ruskin, Fla., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 28, 1984, Ser. No. 645,147

Int. Cl.<sup>4</sup> B23B 1/00, 5/40

U.S. Cl. 82—1 C

17 Claims



1. A method for generating a toric surface comprising the steps of:

mounting a lens blank onto which a toric surface is to be imparted on the spindle of a lathe;  
rotating said spindle;  
providing a cutting tool to shape the blank mounted on said spindle; moving said cutting tool through an arcuate path transversely of said spindle;  
oscillating said cutting tool so that it moves through a range to cut a curve of first selected radius at the innermost incursion of its oscillation and at least a curve of second selected radius at its outermost retraction; and,  
effecting synchronization of the tool oscillations with respect to rotation of the spindle to orient the curve of said second selected radius orthogonally to the curve of said first selected radius.

4,680,999

## REPLACEABLE TOOL

Sadao Kojima; Hitooshi Abe; Fumio Ishizaki, all of Utsunomiya; Atsui Otani, and Hidefumi Shirotori, both of Tokyo, all of Japan, assignors to Kyoritsu Seiki Corporation and Hitachi Seiki Co., Ltd., both of Tokyo, Japan

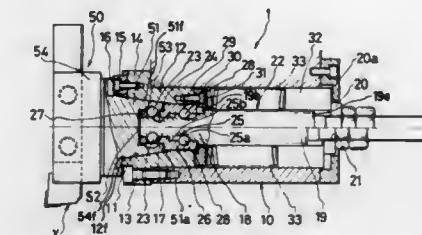
Filed Jul. 5, 1985, Ser. No. 751,829

Claims priority, application Japan, Jul. 11, 1984, 59-142177; Jul. 11, 1984, 59-142178; Mar. 19, 1985, 60-53341

Int. Cl.<sup>4</sup> B23B 29/00, 31/10

U.S. Cl. 82—36 B

6 Claims



1. A replaceable tool comprising:

a tool holder having a head portion with a first end face, and a taper shank including a first taper face extending from said first end face, said taper shank having a locking bore formed in an end portion thereof on the side of a support means for said tool holder, said locking bore being formed with a circumferential fitting groove;  
a taper sleeve including a second end face and a second taper face, for holding said first end face and said taper shank of said tool holder and said second end face and said second taper face of said taper sleeve abutting against each other, respectively;  
locking balls;  
a cylindrical draw collar slidably fitted in said locking bore in said taper shank, said draw collar being provided with through-apertures for receiving therein said locking balls engageable also in said circumferential fitting groove;  
a draw rod slidably fitted in said cylindrical draw collar and having a locking part for fitting said locking balls into said fitting groove to lock said tool holder and an escape groove into which said locking balls can enter in a locking-released condition of said tool holder;  
means provided to said taper sleeve for preloading said draw collar in the direction of pulling said tool holder; and  
means provided to said taper sleeve for preloading said locking part to align it with said through-apertures in position, said circumferential fitting groove having a sectional configuration in said draw collar against which said locking balls abut.

4,681,000

## FOOD PREPARATION PROCESS

Karen A. Wolters, Lake Sara, Knolls Subdivision, R.R. 2, Box 311-A, Effingham, Ill. 62401

Filed Jan. 23, 1985, Ser. No. 693,755

Int. Cl.<sup>4</sup> B26D 9/00

U.S. Cl. 83—862

19 Claims

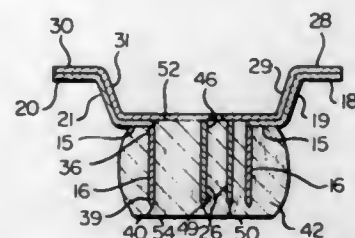
1. A method for cutting a food material, having a predetermined depth defined by a proximal surface and a remote surface, into a desired, continuous, closed configuration, said method comprising the steps of:

(a) selecting a food material having said predetermined depth;  
(b) cutting said desired configuration into said food material by inserting therein at the proximal surface blade means having a cutting edge defining at least the exterior outline of said desired, continuous, closed configuration;  
(c) maintaining said cutting edge of the inserted blade means spaced from the remote end of the food material;  
(d) removing said blade means from the food material while



leaving said cut configuration substantially intact in the food material;

(e) preventing the removal from said food material of said desired cut configuration when the blade means is removed by avoiding excessive compression of the food material when the blade means is inserted in the food material;



(f) slicing said food material, at an angle transverse to the direction of insertion of the blade means, into one or more slices each containing the desired configuration; and

(g) separating said cut configuration in said substantially intact condition from the remainder of its slice.

4,681,001

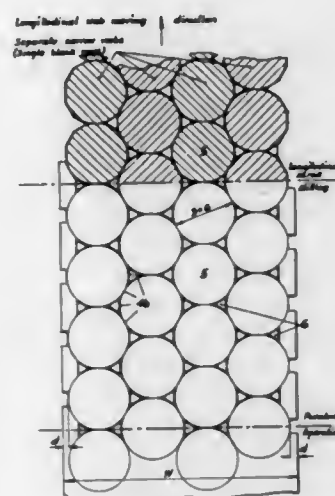
**METHOD OF MAKING SCROLL STRIP BLANKS**  
Werner H. Uehlinger, Arlesheim, Switzerland, and Jozef T. Franek, Chorleywood, Great Britain, assignors to KM-Engineering AG, Basel, Switzerland

Filed Jul. 1, 1985, Ser. No. 751,040

Int. Cl.<sup>4</sup> B23D 25/12; B26D 1/62

U.S. Cl. 83—37

54 Claims



1. A method for the processing of coiled metallic material, which may be coated or laminated for further processing, comprising the steps of uncoiling said web and continuously cutting said web as it is being uncoiled such that said web is cut along a plurality of longitudinal scroll lines, each scroll line being formed from a plurality of straight scroll line sections, whereby said scroll lines divide said web into a plurality of strips from which polygonally-shaped blanks can be made, wherein each scroll line is wave-shaped, the scroll lines of each pair of adjacent scroll lines being symmetrical to each other about a longitudinal axis of said web, whereby said scroll lines form strips having wave-shaped longitudinal edges, the strips of each pair of adjacent strips being offset longitudinally relative to each other, some of said scroll line sections being parallel to a longitudinal axis of said web and some of said scroll line sections being non-parallel to a longitudinal axis of said web,

each of said parallel and non-parallel scroll line sections being tangent to one of a plurality of imaginary circles, each circle having a center which is coincident with the center of a polygonal blank to be made from a corresponding one of said strips, some of said parallel scroll line sections forming valleys in a corresponding one of said scroll lines and some of said parallel scroll line sections forming peaks in a corresponding one of said scroll lines, and removing polygonally-shaped pieces of material from said web at locations which correspond to said valleys, whereby each strip has polygonally-shaped cutouts where said polygonally-shaped pieces are removed from said web.

4,681,002

# CONVEYOR SYSTEM FOR CONVEYING VENEER SHEETS WITH SPACINGS THEREBETWEEN

Takashi Nakaya, Obbu, Japan, assignor to Melnan Machinery Works, Inc., Alchi, Japan

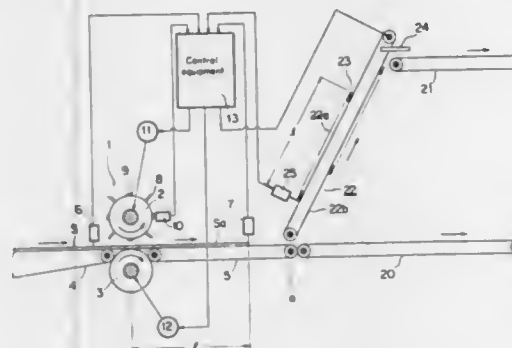
Division of Ser. No. 703,542, Feb. 20, 1985, abandoned. This application May 15, 1986, Ser. No. 867,427

Claims priority, application Japan, Feb. 22, 1984, 59-25147[U]

Int. Cl.<sup>4</sup> B65G 47/86

U.S. Cl. 83—71

2 Claims



1. A conveyor system for conveying veneer sheets with spacings therebetween comprising:  
supply conveyor means for supplying a one-piece veneer sheet in a predetermined direction;  
rotary cutter means, operably connected to said supply conveyor means and receivable of said one-piece veneer sheet, for cutting said one-piece veneer sheet into a plurality of veneer sheets of predetermined length measured in said predetermined direction, said plurality of veneer sheets each having a pair of sides transverse to said predetermined direction;  
delivery conveyor means, operably connected to said rotary cutter means and receivable of said veneer sheets of predetermined length, for conveying said plurality of veneer sheets in said predetermined direction in side-by-side relation;  
lower conveyor means, receivable of veneer sheets of predetermined length conveyed by said delivery conveyor means, for conveying said received sheets in said predetermined direction in spaced part relation;  
upper conveyor means for conveying veneer sheets of said predetermined length in said predetermined direction in spaced apart relation, said upper conveyor means disposed above said lower conveyor means;  
stick-and-carry conveyor means, disposed prior to said lower conveyor means and between said delivery conveyor means and said upper conveyor means, for picking up every other veneer sheet of said plurality of veneer sheets of predetermined length conveyed by said delivery conveyor means in side-by-side relation and conveying said picked up veneer sheet to said upper conveyor means, said stick-and-carry conveyor means comprising a rotat-

ing endless belt having a circumferential length equal to an even number times said predetermined length of each veneer, said belt having on the circumferential periphery thereof alternate sticking and non-sticking areas, each said area having a circumferential length substantially equal to said predetermined length of said veneer sheets, said sticking areas, upon rotation of said belt, registering with and detachably engaging every other veneer sheet of predetermined length conveyed by said delivery conveyor means to pick up said detachably engaged veneer sheet from said delivery conveyor means and transport said picked up veneer sheet to said upper conveyor means;  
separation means, operably engaging picked up veneer sheets conveyed by said stick-and-carry conveyor means, for detaching said picked up veneer sheets from said stick-and-carry conveyor means and guiding said detached veneer sheets to said upper conveyor means;  
first sensor means provided on an upstream side of said rotary cutter means for detecting the delivery of veneer sheets;  
second sensor means for sensing the rotating condition of said rotary cutter means;  
third sensor means provided on a downstream side of said rotary cutter means for sensing a downstream side of a new sheet of veneer having said predetermined length;  
fourth sensor means for detecting the rotating condition of said stick-and-carry conveyor; and  
control means, operably connected to said first, second, third and fourth sensor means and to said rotary cutting means and said stick-and-carry conveyor means, for controlling operation of said rotary cutting means and said stick-and-carry conveyor means.

4,681,003

# MECHANISM FOR DEPOSITION OF SHEET METAL

Oskar Bernath, Umiken, Switzerland, assignor to Georg Fischer Aktiengesellschaft Brugg, Brugg, Switzerland

Continuation of Ser. No. 603,635, Apr. 25, 1984, abandoned.

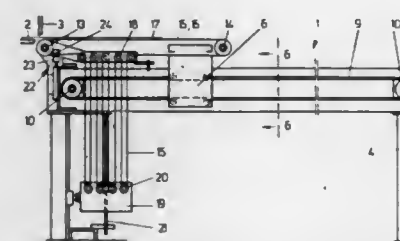
This application Feb. 19, 1986, Ser. No. 831,107

Claims priority, application Switzerland, Apr. 26, 1983, 2222/83

Int. Cl.<sup>4</sup> B26D 7/06

U.S. Cl. 83—80

11 Claims



1. Apparatus for cutting planar workpieces and for depositing said cut workpieces in a stack comprising:  
means for feeding said workpieces;  
means for cutting said workpieces;  
belt means defining a generally horizontal support surface receiving said workpieces from said feeding means;  
first and second support roller means having said belt means extending thereabout with said belt means arranged to define said horizontal support surface on one side thereof between said first and second support roller means;  
a fixed support frame having said first support roller means mounted thereon;  
sled means mounting said second support roller means on said frame means for reciprocal movement relative to said first support roller means to expand and contract the length of said support surface;  
tensioning means connected with said belt means for applying to said belt means a tensioning force holding said belt means taut about said first and second roller means;  
clamp means engaging said belt means to prevent relative

movement of said belt means about said first support roller means at least during movement of said second support roller means relative to said first support roller means in one direction; and  
sensing means for sensing the position of said workpieces on said belt means;  
said apparatus operating in response to said sensing means for controlling operation of said cutting means, said sled means and said clamp means to effect cutting of said workpieces to a predetermined length and deposition of said cut workpieces in said stack by reversed movement of said sled means and simultaneous actuation of said clamp means.

4,681,004

# APPARATUS AND METHOD FOR FORMING DIE-CUT ARTICLES FROM SHEET MATERIAL

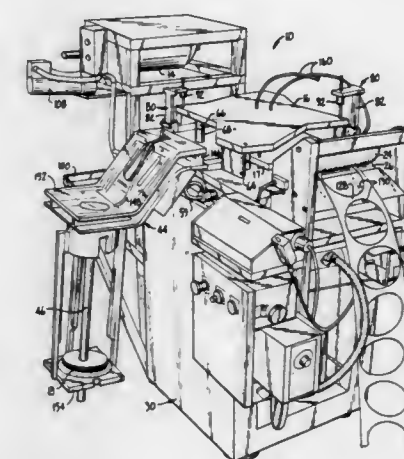
Kurt Waldner, 12260 Saraglen Dr., Saratoga, Calif. 95170

Filed Oct. 1, 1984, Ser. No. 656,612

Int. Cl.<sup>4</sup> B26D 7/18

U.S. Cl. 83—98

12 Claims



1. Apparatus for die-cutting articles from sheet material comprising:  
a support having an upper end;  
a lower die plate mounted on the support near the upper end thereof;  
an upper die plate having a die thereon and guide means for shiftably mounting the upper die plate on the support for vertical movement toward and away from the lower die plate, said upper die plate normally being spaced above the lower die plate to present a path between the die plates for a strip of sheet material movable relative to the support;  
quick release latch means carried by the support for engaging and removably holding the upper die plate on the support, said latch means including a shock absorber for damping the vibrations of the upper die plate;  
means coupled with the upper die plate for biasing the same upwardly relative to said support;  
magnetically actuated means coupled with the upper die plate for shifting the same downwardly relative to the support to die-cut the strip of material between the die plates to form an article;  
fluid pressure means coupled with the die plates for causing a die-cut article to be urged transversely of said path and away from the die when the upper die plate is shifted upwardly relative to the lower die plate;  
chute means coupled with the support for receiving the articles; and  
control means carried by the support for controlling the operation of the shifting means, the advancing means and the causing means.

4,681,005

**TWIN ARBOR RESAW WITH A FENCE HAVING A CONTINUOUS ROTATABLE BELT**  
Edward J. Baranski, 558 Woodlawn Road East, Guelph, Ontario N1E 1C2, Canada

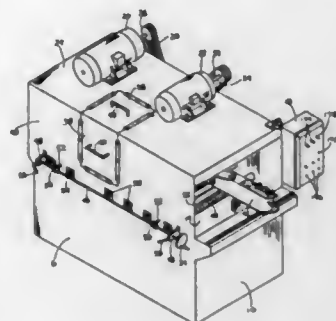
Filed Jun. 13, 1985, Ser. No. 744,335

Claims priority, application Canada, Jun. 13, 1984, 456533

Int. Cl.<sup>4</sup> B27B 7/04, 25/02, 27/02

U.S. Cl. 83—404.4

27 Claims



1. A resaw for splitting wood comprising:

- a housing having two sides, a front and a rear with an entrance for said wood being located at said front and an exit for said wood being located at said rear;
- twin arbors located between said entrance and said exit, each arbor having at least one saw blade mounted thereon, one arbor being positioned so that its blade or blades cuts the lower portion of wood being split, the other arbor being positioned so that its blade or blades cuts the upper portion of wood being split, each blade on one arbor having a corresponding blade on the other arbor, the arbors being offset from one another from front to rear so that a cutting area of the two arbors overlaps slightly;
- a workbed for said wood is located between said entrance and said exit, said workbed being formed from a series of elongated rollers, said rollers being rotatably mounted from side to side along said housing, adjacent rollers being spaced apart from one another from said entrance to said exit with a larger space being located between those rollers that are adjacent to a front and rear of said arbors, said rollers being rotatable in an appropriate direction to force wood being split towards said exit, said elongated rollers being connected to a suitable power source to cause said rollers to rotate;
- an adjustable fence extending along said workbed and slightly beyond said entrance and said exit, said fence having a continuous belt mounted on a side adjacent to said blades, said belt being rotatable in an appropriate direction so that said belt can force wood being split towards said exit when the resaw is in use, said fence being adjustable towards or away from said arbors;
- at least two side pressure rollers mounted in a spaced relationship to said adjustable fence on a side adjacent to said blades, said pressure rollers being automatically adjustable so that they can exert pressure towards said fence on any wood, within a predetermined size range, located between said rollers and said fence, said rollers being rotatable in an appropriate direction so that wood being split can be forced towards said exit when the resaw is in use; and
- at least one power source to drive the arbors, the adjustable fence and the two side pressure rollers.

4,681,006

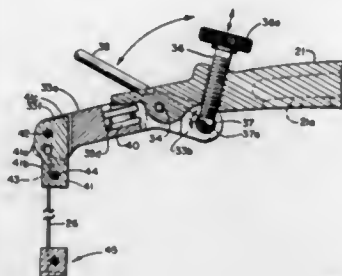
**BLADE TENSIONING DEVICE FOR SCROLL SAW**  
David Miller, Tupelo, Miss., assignor to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Jul. 19, 1985, Ser. No. 757,004

Int. Cl.<sup>4</sup> B23D 49/04, 51/14

U.S. Cl. 83—782

11 Claims



1. In a scroll saw having upper and lower reciprocable arms terminating in upper and lower ends having a saw blade connected therebetween, releasable blade tensioning means including a blade support member having a central portion pivotally mounted to an end of one of said arms, a first end extending generally along said one arm and a second end connectable to said saw blade, said blade support member being pivotable between a blade tensioning position and a blade tension releasing position, the improvement comprising manually operable cam means mounted on one of said first end and said one arm and engageable with separate manually adjustable means mounted on the other, and being constructed and arranged to hold said first end and said one arm apart in one position to move said blade support member to said blade tensioning position, and to permit said blade support member to move to said blade tension releasing position in another position thereof, and said manually adjustable means mounted on the other of said first end and said one arm being engageable with said manually operable cam means to adjust the tension on the saw blade, said manually operable cam means being rotatable between said positions.

4,681,007

**SOUND GENERATOR FOR ELECTRONIC MUSICAL INSTRUMENT**

Masataka Nikaide, Hirakata, and Sakurako Matsuda, Joyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

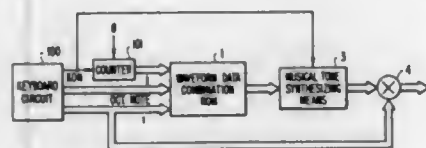
Filed Jun. 18, 1985, Ser. No. 746,119

Claims priority, application Japan, Jun. 20, 1984, 59-127062

Int. Cl.<sup>4</sup> G10H 1/46, 7/00

U.S. Cl. 84—1.1

26 Claims



1. A sound generator for an electronic musical instrument, comprising:

- a keyboard;
- a memory means for storing a plurality of waveform data combinations each of which represents a waveform obtained from a natural sound;
- a selection means for decoding a keyboard information from said keyboard into an address signal for said memory means so as to thereby select one of said plurality of waveform data combinations, said keyboard information including at least a touch information which represents at

least one of a depressing speed and a depressing strength of a key of said keyboard;  
a tone generating means for generating a tone from an output of said memory means; and  
a loudness control means for controlling loudness level of the generated tone in response to said touch information.

4,681,008

**tone INFORMATION PROCESSING DEVICE FOR AN ELECTRONIC MUSICAL INSTRUMENT**

Shigenori Morikawa; Kohtaro Hanzawa; Hiroyuki Sasaki, and Hiroshi Morokuma, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

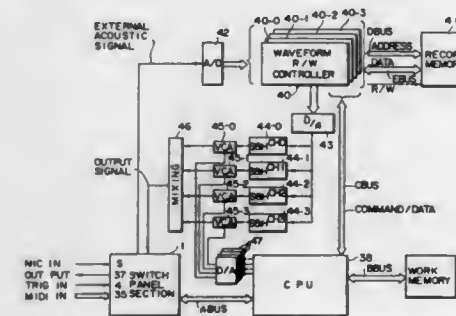
Filed Jul. 29, 1985, Ser. No. 760,290

Claims priority, application Japan, Aug. 9, 1984, 59-167120

Int. Cl.<sup>4</sup> G10H 7/00

U.S. Cl. 84—1.28

30 Claims



1. A tone information processing device for an electronic musical instrument, comprising:

- analog-to-digital converting means for converting at least one analog external sound waveform signal into a digital waveform signal which represents a waveform corresponding to the waveform of said external sound waveform signal;
- memory means for recording said digital waveform signal as outputted from said analog-to-digital converting means;
- reading means for reading out said digital waveform signal recorded in said memory means at a rate corresponding to a designated tone frequency of a particular note;
- digital-to-analog converting means for converting the digital waveform signal read out from said memory means into an analog sound signal which has the waveform determined by said digital waveform signal;
- note frequency designating means coupled to said reading means for designating a pitch of the sound produced based on the analog sound signal derived from said digital-to-analog converting means; and
- determining means coupled to said memory means and said reading means for determining start and end addresses of reading of said digital waveform signal recorded in said memory means in relation to the waveform of said digital waveform signal.

4,681,009

**NECK APPARATUS FOR STRINGED MUSICAL INSTRUMENTS**

James T. Mouradian, 40 Church St., Winchester, Mass. 01890

Filed Aug. 18, 1986, Ser. No. 897,616

Int. Cl.<sup>4</sup> G10D 3/00

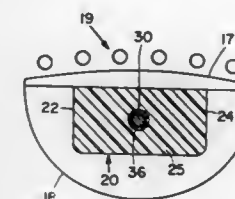
U.S. Cl. 84—293

23 Claims

1. An improved neck apparatus for stringed musical instruments comprising:

- an elongate base;
- a longitudinal channel disposed in said base;
- an acoustically inert filler disposed in and intimately bonded

to the inside surface of at least a portion of said channel; and



at least one elongate rod assembly suspended in said filler in said channel.

4,681,010

**MULTIDIRECTIONALLY ADJUSTABLE VIBRATO DEVICE**

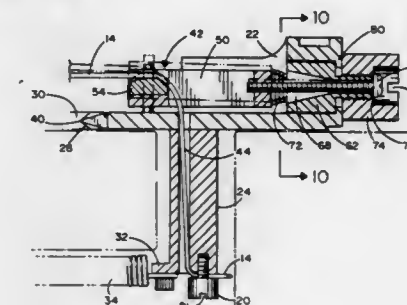
Trevor A. Wilkinson, 1075 State St., A201, Redlands, Calif. 92373

Filed Sep. 16, 1986, Ser. No. 907,892

Int. Cl.<sup>4</sup> G10D 3/04

U.S. Cl. 84—298

6 Claims



1. A vibrato device for guitars, comprising:

- a bridge;
- a plurality of string-supporting saddles mounted on said bridge for limited omnidirectional movement with respect thereto;
- a plurality of slotted spacing blocks slidably movable transversely with respect to said bridge;
- a plurality of clamp screws; and
- a plurality of pivot screws;
- said clamp screws cooperating with said spacing blocks to selectively clamp said spacing blocks to said bridge;
- each of said pivot screws passing axially through one of said clamp screws and through said slot in one of said spacing blocks to engage one of said saddles;
- said slot being so shaped as to prevent transverse movement of said pivot screw therein but allowing free vertical movement thereof; and
- said saddle being axially movable by rotating said pivot screw, the head of said pivot screw being biased against a vertical interior surface of said clamp screw;
- whereby said saddle is pivotally vertically movable about the head of said pivot screw.



4,681,011

## TREMOLO ARM MOUNTING FOR STRINGED INSTRUMENT

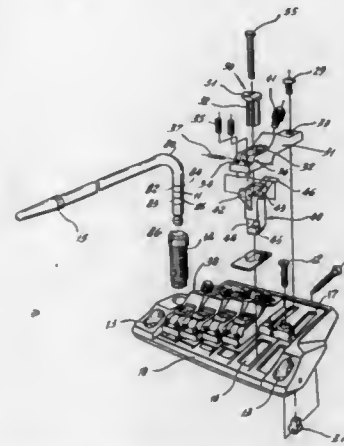
Masao Hoshino, deceased, late of Owari Asahi, and by Yoshihiro Hoshino, legal representative, Nagoya, both of Japan, assignors to Hoshino Gakki Co., Ltd., Japan  
Filed Jun. 5, 1985, Ser. No. 741,445

Claims priority, application Japan, Jun. 7, 1984, 59-084740

Int. Cl.<sup>4</sup> G10D 3/12

U.S. Cl. 84—313

11 Claims



1. A tremolo plate for a stringed musical instrument having a plurality of strings secured to the tremolo plate;
- a tremolo arm having a handle section and a downward extension, the downward extension being connected to the tremolo plate, the handle section being movable by the instrumentalist;
- a bearing sleeve mounted to the tremolo plate for receiving the downward extension of the tremolo arm, rigidifying means at the downward extension of said tremolo arm in the sleeve to rigidify the connection of the tremolo arm at the bearing sleeve for preventing shaking of the arm; the rigidifying means comprising a compressible member on the downward extension in the sleeve for engaging both the downward extension and the sleeve around it.

4,681,012

## DRUMMER'S GLOVE

Michael J. Stelma, 20624 Hunt Club, Harper Woods, Mich. 48225, and Paul R. Dehem, 4662 Yorkshire, Detroit, Mich. 48224

Filed Aug. 18, 1986, Ser. No. 897,510

Int. Cl.<sup>4</sup> G10D 13/06; A41D 19/00

U.S. Cl. 84—422 S

2 Claims



1. In combination, a percussion surface in the form of a cymbal, acoustical or synthesized drum to be struck in a timed

or rhythmic sequence, and a finger appliance for a percussionist which comprises a dense, hard plate having a rounded contour at the edges and the digital end to be aligned on the palm side of one or more fingers of the percussionist extending from the tip of the finger to the region adjacent the palm, and means to secure each said plate firmly to the finger in a manner to prevent articulation of the finger joints.

2. A method of producing percussion sounds by performing on percussion instruments in the form of a cymbal, acoustical or synthesized drums in a musical ensemble which comprises:
  - (a) providing a surface of a percussion instrument,
  - (b) providing an accessory on the palm side of one or more fingers of a hand of a percussion player in the form of a dense, stiff, hard plate extending from the finger tip to a region adjacent the palm in a manner to prevent articulation of the finger joints, and
  - (c) utilizing said accessory to strike the surface of a percussion instrument in rhythmic patterns to provide accompaniment for a musical performance.

4,681,013

## ROTARY LAUNCHER SYSTEM FOR AN AIRCRAFT

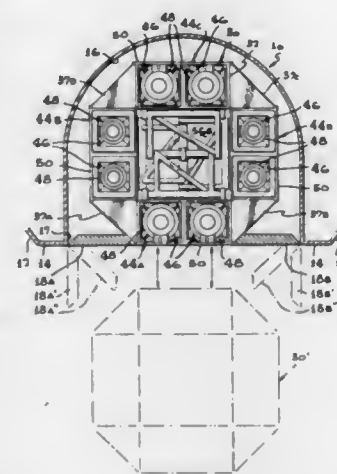
Harold C. Farley, Thousand Oaks, and Robert G. Boles, North Hollywood, both of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Nov. 18, 1985, Ser. No. 799,089

Int. Cl.<sup>4</sup> F41F 3/06

U.S. Cl. 89—1.815

6 Claims



1. A rotary launcher system for an aircraft having a weapon bay, said weapon bay having an opening in communication with the exterior of the aircraft, the system comprising:
  - a plurality of doors mounted on said aircraft movable from an open position to a closed position sealing off a portion of the opening and forming a portion of the external contour of the aircraft over the opening; and
  - a rotary launcher comprising:
    - a frame member rotatively mounted within the weapon bay;
    - a plurality of weapon mounting assemblies mounted to said frame member at discrete locations thereabout and sequentially alignable with the opening upon rotation of said frame member, said weapon mounting assemblies adapted to mount at least one missile; and
    - barrier means mounted to said frame member cooperating with said plurality of doors for sealing off the weapon bay from the exterior of the aircraft when any of said plurality of assemblies is aligned with the opening.

4,681,014

## MISSILE AZIMUTH ALIGNMENT SYSTEM

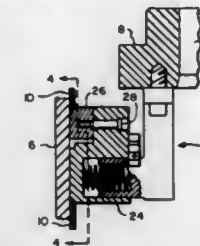
Richard D. Gassler, Campbell, and Bettadapur N. Sridhar, Cupertino, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 23, 1986, Ser. No. 888,608

Int. Cl.<sup>4</sup> F41F 3/04

U.S. Cl. 89—1.816

7 Claims



1. A missile azimuth alignment system for preventing axial rotation of a missile while being loaded into a launching tube and for thereafter permitting shock-induced translations of the missile on a resilient missile support assembly comprising:
  - an azimuth alignment track having a first end and a second end and comprising a pair of parallel metallic rails having a slot formed therebetween;
  - a track follower block having a first slider shoe retainable in said slot of said track;
  - a pivot follower block pivotally affixed to said track follower block and having a second slider shoe retainable in said slot of said track; and
  - a missile support assembly follower block pivotally affixed to said pivot follower block;
 said slot in said track being widened at said second end thereof to release said second slider shoe from said track and permit translation of said missile support assembly follower block with respect to said track.

4,681,015

## RAIL GUN BARREL WITH AXIALLY PRESTRESSED INSULATORS

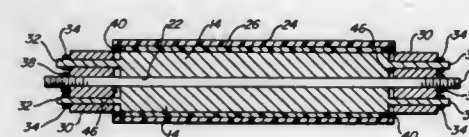
Richard L. Creedon, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Jul. 17, 1985, Ser. No. 756,038

Int. Cl.<sup>4</sup> F41F 1/02

U.S. Cl. 89—8

5 Claims



1. A rail gun barrel defining an elongated bore, said barrel comprising:
  - a pair of elongated, generally parallel conductive rails extending along opposite sides of said bore and being symmetrical about a longitudinal axis of the bore;
  - a pair of elongated insulators disposed generally coextensively with said rails and circumferentially between them;
  - a pressure medium disposed about said rails and insulators;
  - an elongated tube generally coextensive with said rails and said insulators and containing said rails and insulators and said pressure medium;
  - said insulators being axially prestressed in compression;
  - said rails being axially prestressed in tension;
  - said rails and insulators being radially prestressed in compression.

4,681,016

## RAIL GUN BARREL WITH GAS CONTAINMENT MEANS

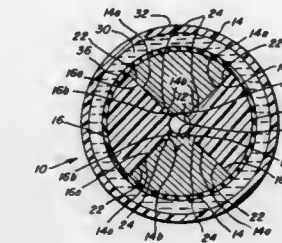
Richard L. Creedon, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed May 2, 1984, Ser. No. 606,209

Int. Cl.<sup>4</sup> F41F 1/02

U.S. Cl. 89—8

3 Claims



1. A rail gun barrel assembly defining an elongated central bore for firing of a projectile, comprising:
  - structural containment means;
  - a pair of elongated rails supported by said structural containment means; and
  - a pair of elongated insulators supported by said structural containment means;
 said rails and insulators being cooperative to define an elongated central bore and being supported alternately about the circumference of the bore so that said rails do not contact one another;
 each said rail having a pair of opposite side surfaces, and each said insulator having a pair of opposite side surfaces, each of said side surfaces of each of said insulators being in contact with a respective one of the side surfaces of a respective one of said rails to define an interface therebetween;
 said rails and insulators defining means to limit radial penetration of gas into said interfaces comprising four elongated gas containment channels extending generally parallel to said elongated central bore and spaced therefrom, a respective one of said gas containment channels being located at each said interface, each said channel providing a predetermined volume to permit expansion of gas penetrating said interfaces so as to reduce the pressure of said gas and prevent it from penetrating said interfaces beyond said channels.

4,681,017

## PRACTICE AMMUNITION SYSTEM

Nikolaus H. J. Fischer, Troisdorf; Christoph Mathy, Ockenfels, and Rainer Schöffel, Odenthal, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jul. 24, 1985, Ser. No. 758,441

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, 3427165

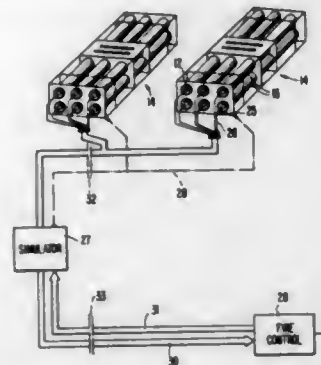
Int. Cl.<sup>4</sup> F41F 3/055, 27/00

U.S. Cl. 89—29

16 Claims

1. A practice ammunition system for a rocket launcher having guide means for receiving an original rocket, the original rocket including an ignition means which, prior to launch, performs a data exchange via at least one data line with an external fire control unit for the rocket launcher, the practice ammunition system comprising a practice rocket having a rocket engine and an igniter for igniting the rocket engine thereof, the practice rocket being insertable in the guide means of the rocket launcher, simulator means external to the practice rocket arranged for connection with the practice rocket and the fire control unit, the external simulator means, after connection with the practice rocket and the fire control unit,

simulating functions of the ignition means of the original rocket for performing a data exchange with the fire control



unit and for enabling launching of the practice rocket from the rocket launcher.

4,681,018

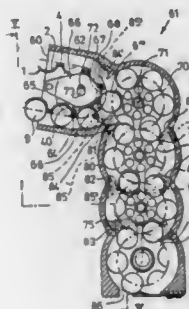
## CARTRIDGE FEED MECHANISM

Rudi Beckmann, Röttenberg, Fed. Rep. of Germany, assignor to Heckler & Koch GmbH, Fed. Rep. of Germany  
Division of Ser. No. 552,674, Nov. 17, 1983, abandoned. This application Jun. 13, 1986, Ser. No. 873,813

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243746; Nov. 26, 1982, 3243744; Nov. 26, 1982, 3243745  
Int. Cl. F41D 10/04

U.S. Cl. 89—33.04

6 Claims



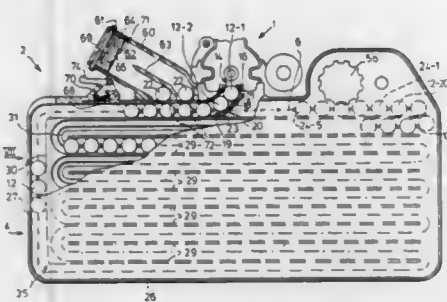
1. A cartridge feed mechanism for feeding cartridges so that each cartridge moves in a direction transverse to its longitudinal direction, comprising at least two neighboring star wheels driven at equal circumferential speeds and in opposite directions, said star wheels having cup-shaped peripheral recesses forming common retaining means for a cartridge in the area of the smallest radial distance between said star wheel, guides to prevent the cartridges from sliding off the peripheral recesses, said guides being spaced from the axes of the star wheels to permit the transportation of the cartridges in both directions of movement of said star wheels, drive means coupled with the star wheels for selectively driving the star wheels in alternative directions of movement, and said guides including reversible guide elements for directing the cartridges into the peripheral recesses of the next following star wheels, and said guide elements provided on both sides of a plane extending to the axes of said two neighboring star wheels, and provided substantially in the area of a tangential plane associated with said two star wheels and extending perpendicularly to said plane through said star wheel axes.

4,681,019  
MAGAZINE FOR AUTOMATIC WEAPONS  
Rudolf Brandl, Dorahan-Weiden, and Heinz Matt, Oberndorf, both of Fed. Rep. of Germany, assignors to Heckler & Koch GmbH, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,598  
Int. Cl. F41D 10/32

U.S. Cl. 89—33.04

3 Claims



1. A magazine for use with an automatic firearm having means for receiving cartridges for firing, said magazine comprising an endless chain having cartridge carrying pockets for conveying cartridges toward a delivery opening when the chain is driven in one direction, a housing defining a path for said chain and the cartridges carried therein, said housing having a top wall defining said delivery opening so that cartridges can move upwardly to be received by said firearm receiving means, an auxiliary cartridge magazine for storing additional cartridges outside said path, said auxiliary magazine having a discharge end adjacent an auxiliary opening in said top wall, a movable closure below said discharge end to prevent additional cartridges from dropping into pockets of said chain without cartridges, and manually operable means for reversing said chain direction and moving said closure to permit an additional cartridge to drop into a pocket of said chain by gravity when no cartridge is present in that pocket of said chain that is present below said auxiliary opening.

4,681,020

## CONTROL FOR A DETENT FOR A SLIDE FOR AUTOMATIC FIREARMS, ESPECIALLY FOR AUTOMATIC PISTOLS

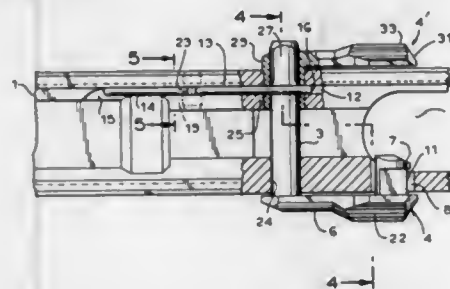
Vaclav Polanecky, Nivnice, Czechoslovakia, assignor to Agrozet, koncernovy podnik, Uhersky Brod, Czechoslovakia  
Filed Sep. 28, 1984, Ser. No. 656,038

Claims priority, application Czechoslovakia, Sep. 30, 1983, 7153-83

Int. Cl. F41D 11/06; F41C 17/08

U.S. Cl. 89—138

5 Claims



1. In an automatic firearm such as the automatic pistol, said firearm having a frame, a slide on the frame, a selectively operable detent for retaining the slide in retracted position on the frame, an oscillatable cross pin upon which the detent is mounted, a first frame control lever for the detent disposed upon a first side of the firearm, the control lever being fixedly

connected to said oscillatable cross pin, said oscillatable cross pin having a circumferentially disposed transverse groove within the frame of the firearm, and an elongated spring within the frame of the firearm extending generally longitudinally thereof and having a portion seated in said transverse groove in said oscillatable cross pin so as to prevent the axial escape of said oscillatable cross pin from the frame of the firearm, the improvement comprising

a collar slid on and removably attached to the end of said oscillatable cross pin remote from the first control lever, said collar being provided with a transverse slot disposed radially outwardly of said transverse groove in said oscillatable cross pin, the said portion of the spring seated in said transverse groove in said oscillatable cross pin passing through said transverse slot in the collar, and a second control lever fixedly connected to the collar and lying outwardly of the other, second side of the firearm.

4,681,021

## DRIVING APPARATUS

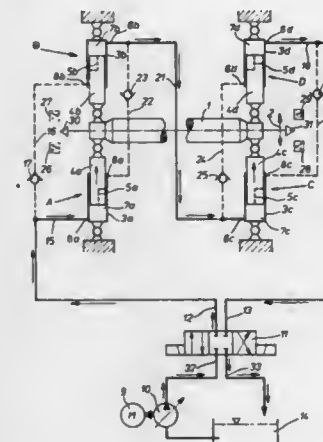
Otto Heinemann, Ennigerloh, and Heinz-Herbert Schmits, Rheda-Wiedenbrück, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany  
Filed May 7, 1986, Ser. No. 860,444

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519565

Int. Cl. F01L 15/00; F15B 15/22

U.S. Cl. 91—178

4 Claims



1. In driving apparatus for producing to-and-fro movements of a driven machine part and including:

- four single acting rams which form two groups each of which has two rams acting in opposite directions,
  - first and second pressure medium connections connected via a control valve operable alternately to connect said pressure medium connections to a pressure medium supply and a pressure medium discharge and,
  - a plurality of non-return valves,
- the improvement wherein:
- the four rams are formed by cylinders in each of which is a piston having a scavenging bore, each of the cylinders having a cylinder chamber connection and each also having, in a part of the cylinder covered by the associated piston, a scavenging duct connection, so that when a certain piston position is reached the scavenging bore connects the cylinder chamber to the scavenging duct connections,
  - the first pressure medium connection is connected directly to the cylinder chamber connection of a first cylinder, and via a first non-return valve to the scavenging duct connection of a second cylinder which acts in the opposite direction to the first cylinder;
  - the second pressure medium connection is connected via

a second non-return valve to the scavenging duct connection of a third cylinder which works parallel to the first cylinder, and is directly connected to the cylinder chamber connection of a fourth cylinder which works in the opposite direction to the third cylinder;

- the cylinder chamber connections of the second and third cylinders are connected to one another via a connecting pipe to which the scavenging duct connection of the first cylinder is connected via a third non-return valve, and the scavenging valve connection of the fourth cylinder is connected via a fourth non-return valve; and
- the four non-return valves are connected to the respective cylinders in such manner that the second and third non-return valves are penetrable when the first pressure medium connection is under pressure and the scavenging bores in the pistons of the first and third cylinders have reached the appertaining scavenging duct connections, while the first and fourth non-return valves are penetrable when the second pressure medium connection is under pressure and the scavenging bores in the pistons of the second and fourth cylinders have reached the appertaining scavenging duct connections.

4,681,022

## TWO-CYLINDER VISCOUS LIQUID PUMP WITH PIPE SWITCH

Friedrich Schwing, Gelsenkirchen, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Fed. Rep. of Germany

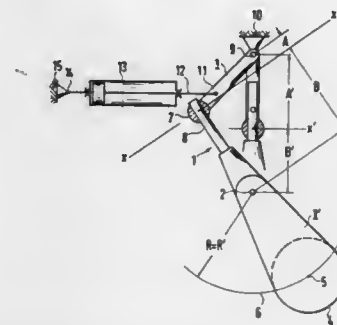
Filed Sep. 23, 1985, Ser. No. 779,162

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435052; Jul. 5, 1985, 3524033

Int. Cl. F04B 7/00

U.S. Cl. 91—471

7 Claims



1. In a viscous liquid pump having a pair of pumping cylinders and a swing pipe alternately connecting one pumping cylinder with a conveyor pipe and exposing the other pumping cylinder, a drive mechanism for moving the swing pipe about a pivot point in an arcuate path of travel at varying speeds along said path, said drive mechanism comprising:

hydraulic motive power means; and linkage means comprising a first lever extending from the swing pipe and a second lever (3) having one end pivotally mounted and the other end coupled to said first lever for applying force to said first lever to move the swing pipe along the arcuate path of travel, said hydraulic motive power means being coupled to said second lever, said linkage means having a first linkage distance (B) extending from the pivot point of the swing pipe to the point of force application on said first lever and measured normal to the direction of force application, said linkage means having a second linkage distance (A) between said first and second ends of said second lever and measured normal to the direction of force application, said linkage means being formed such that the ratio of the second and first linkage distances (A/B) when said swing pipe is in the center of



the arcuate path of travel is greater than the corresponding ratio (A/B) when the swing pipe is at the ends of the path of travel, thereby to provide greater speed to the swing pipe in the center of the path of travel than at the ends.

4,681,023

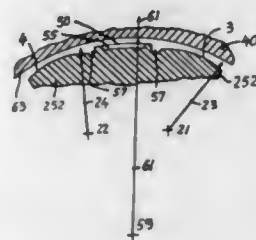
# SLIDE BEARING PORTIONS ON OUTER FACES OF PISTON SHOES

Karl Eickmann, 2420 Isabiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 530,178, Sep. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 122,914, Feb. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 954,555, Oct. 25, 1978, abandoned. This application Sep. 30, 1985, Ser. No. 782,633  
Int. Cl. F01B 13/06

U.S. Cl. 91-488

3 Claims



1. An improvement on outer slide faces of piston shoes in radial piston fluid flow facilitating devices, such as pumps, motors, compressors, transmissions, wherein said slide faces are the radial end faces of the piston shoes and are sliding along at least one respective guide face(s) of the piston stroke actuator of the device, while said guide face(s) is (are) of cylindrical configuration of a first radius around a first axis and thereby an annular guide face, said outer faces are at least partially substantially complementary configured respective to portions of said annular guide face and wherein said slide faces of said piston shoes are interrupted by recesses which form fluid pressure pockets which are filled with an interior fluid from fluid containing cylinders through passages to constitute with their surrounding sealing lands hydrostatic bearing portions and said improvement comprising a curvature, wherein said slide faces form medial portions which contain said hydrostatic bearings and are substantially part-cylindrical with said first radius around said first axis, wherein said slide faces and piston shoes have a pair of extensions at opposite ends of said medial portions in the direction of the movements of said piston shoes, wherein separating recesses are provided between said sealing lands of said hydrostatic bearings and said extensions, wherein said extensions form bearing face portions with front face portions and rear face portions and gaps between said bearing face portions and respective portions of said guide face with front gap portions and rear gap portions, wherein said front end portions and front gap portions are in the front direction of the movement of the shoe while said rear end portions and rear gap portions are rearward respectively to said front face portions and said front gap portions; wherein said front face portions and said rear face portions form inclined face portions on both peripheral ends of said front and rear face portions to form hydrodynamic bearing face portions for multidirectional movements of said piston shoes, whereby each of said front and rear face portions draws an exterior fluid into said front gap portions of said front and rear face portions at forwardly directed movements of said piston shoes and into said rear gap portions of said front and rear face portions at rearwardly directed movements of said piston shoes; wherein said front face portions and said rear face portions form substantially equally sized and configured but oppo-

sitely directed curved face portions with bearing face radii around first and second bearing face axes which are distanced in opposite directions from the vertical medial plane through the respective piston shoe, which are substantially equally distanced from the respective portion of said guide face and which are parallel to said first axis but distanced therefrom, and, wherein said bearing face radii are considerably shorter than said first radius around said first axis to form part cylindrical face portions to constitute said front and rear face portions, whereby said front and rear face portions form narrow gap portions substantially in the middle between the front end and rear end of the respective face portion while each front end and rear end of the respective face portion forms thereover a wider gap to form hydrodynamic pressure field bearing face portions before and behind said middle and said narrow gap to draw in fluid through the respective wider gap of the respective end of the respective face portion of said front and rear face portions when said piston shoes move in one of the forward and rearward directions along said guide face, whereby said front and rear face portions form hydrodynamic pressure fields before said medial narrow gaps at forward movements of said piston shoes and hydrodynamic pressure fields rearwards of said narrow gaps at rearwards directed movements of said piston shoes.

4,681,024

# COMBINATION HEATER-LIGHT-VENTILATOR UNIT

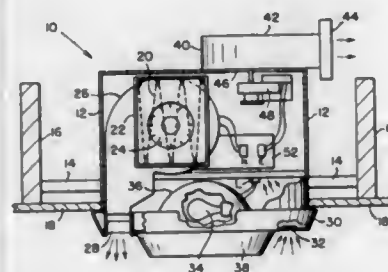
Charles W. Ivey, Hope Mills, N.C., assignor to Fasco Industries, Inc., Boca Raton, Fla.

Filed Jul. 29, 1986, Ser. No. 890,417

Int. Cl. F24F 13/00

U.S. Cl. 98-34.6

6 Claims



1. A combination heater-light-ventilator unit, comprising: a cylindrical housing having a top member and an upright cylindrical wall supporting said top member, said housing supporting a heating subsystem, a lighting subsystem, and a ventilating subsystem, said heating subsystem including a heater and a heat blower disposed within said housing, said heat blower adapted to discharge downward from said unit through a heat discharge outlet, said lighting subsystem including a light source and a reflector disposed within said housing to direct light downward therefrom, said ventilating subsystem including a vent blower mounted atop said housing, said vent blower communicating on its inlet side with the interior of said housing and adapted to discharge to a remote location through a vent discharge outlet, and an annular grille mounted on the bottom of said cylindrical housing, said annular grille including a first arcuate portion thereof forming said heat discharge outlet of said heating subsystem, and a second arcuate portion thereof having ports permitting free passage of air from below to within said housing, said annular grille further supporting a light diffuser below said lamp.

4,681,025

# CHIMNEY STACK HAVING ERODABLE LINER WITH ELECTRICAL GENERATING CAPACITY

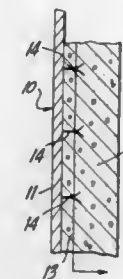
John J. Carty, 2 Model Ct., Rocky Point, N.Y. 11778

Filed Apr. 22, 1986, Ser. No. 854,505

Int. Cl. F23J 13/02

U.S. Cl. 98-58

5 Claims



1. A new and improved chimney stack capable of conveying hot gases generated in conjunction with industrial application to a height within the atmosphere sufficient to meet current pollution standards that is capable of being monitored to detect the degree of erosion occurring to it prior to sustaining structural damage, said chimney stack comprising: (a) an outer structural support member capable of providing a stable structure capable of conveying hot gases into the elevated portions of the atmosphere; (b) an inner liner subject to erosion by said hot gases structurally affixed to said outer structural support member thereby insulating said outer structural support member from contact with said hot gases passing through said chimney stack; (c) electrical wiring embedded within said inner liner and arranged as part of an electrical circuit whose conductivity is monitored so as to detect the erosion of said inner liner; (d) monitoring circuitry incorporating said electrical wiring capable of detecting changes in the electrical conductivity of said circuitry thereby detecting the degree of erosion of said inner liner;

directed normal to said axis line and having at least one discharge duct at one transverse side and at least one suction duct at the other transverse side thereof; at least one intermediate air curtain compartment disposed at each axial outer side of said spray coating chamber and having at least a pair of discharge ducts directed toward each other and normal to said axis line; the region of the spray coating chamber starting from said paint spray chamber, passing through said intermediate air curtain compartment and said outermost air curtain compartment and up to the outlet opening constituting a passage for transferring the works to be painted; each discharge duct in each air curtain compartment being spaced apart at a distance from the two side walls and rear wall surrounding said duct such that the air in said compartment can freely flow in the channels defined between said duct and said side walls and said rear wall; whereby the air in the paint spray chamber can be returned to the discharge duct or ducts of each air curtain compartment and circulated after having been separated into air and paint particles by a separating means.

4,681,027

# RAPID COOKING APPARATUS FOR EGG FRYING UTENSIL

Jon F. Meamber, P.O. Box 885, Yreka, Calif. 96097

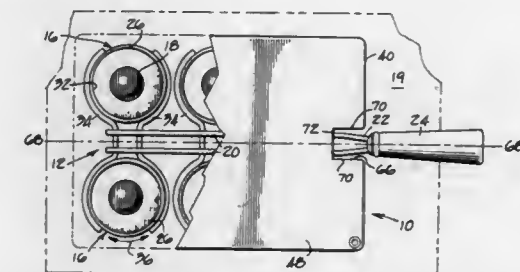
Continuation of Ser. No. 899,611, Apr. 24, 1978, abandoned.

This application Jun. 3, 1980, Ser. No. 155,917

Int. Cl. A47J 29/00

U.S. Cl. 99-422

7 Claims



1. In combination with a griddle and a portable egg frying utensil including a plurality of egg confining tubes for resting at an arbitrary location on said griddle, said tubes having upper surfaces that lie substantially in a common plane when said tubes rest on said griddle, and a first handle connected to said egg-confining tubes for carrying said utensil, said first handle extending upwardly beyond said common plane and having a predetermined width at a position in said common plane, the improvement comprising:

a bilaterally symmetric self-contained plate separable from said utensil, said plate having an upper surface and a thermally conductive lower surface, the lower surface having a first flat portion adapted to seat on said tubes to permit said plate to assume a first, superimposed position, and a second flat portion for contacting said griddle when said plate is removed from said utensil to permit said plate to assume a second, griddle-contacting position so that said griddle conductively heats said plate; a second handle attached to said plate in a bilaterally symmetric manner and extending upwardly from said upper surface to permit a user to easily manipulate said plate between said first and said second positions; said plate having portions defining a notch centrally located along an edge thereof, said notch having a dimension parallel to said edge that is slightly greater than said predetermined width, said notch being positioned along said edge to partially surround said first handle proximate said common plane when said first portion of said lower sur-

4,681,026

# SPRAY COATING CHAMBER FREE FROM PAINTING MIST LEAKAGE

Akira Sato, Ibaragi, and Fumio Maki, Kitakyushu, both of Japan, assignors to Parker Arrester Co., Ltd., Tokyo, Japan

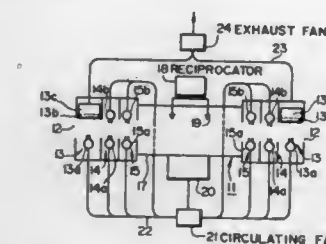
Filed Jul. 8, 1986, Ser. No. 883,410

Claims priority, application Japan, Jul. 30, 1985, 60-166901

Int. Cl. B05B 15/12

U.S. Cl. 98-115.2

4 Claims



1. A spray coating chamber system free from leakage of paint mist floating within a pair spray chamber, which comprises, a paint spray chamber at the axially middle part of the chamber system and a plurality of air curtain compartments disposed at each axial outer side of said paint spray chamber, wherein said plurality of air curtain compartments comprises: a pair of outermost air curtain compartments one of each being disposed at each outermost axial end and each being



face is seated along said tubes and to restrict motion of said plate in a direction parallel to said edge;  
said notch and said first handle portion being structured and co-functioning to enable said user to quickly position said plate in said first position on said tubes upon grasping said second handle and removing said plate from said griddle; and  
said plate in said first position being formed to give off heat downwardly onto eggs positioned within said tubes to cook them partially from above and greatly reduce the cooking time thereof.

4,681,028

**APPARATUS FOR THE PREPARATION OF HOT BEVERAGES, PARTICULARLY A COFFEE MACHINE**  
Arthur Schmed, Oberdürnten, and Hans-Peter Frei, Oetwil am See, both of Switzerland, assignors to Gesamat AG, Ballwil, Switzerland

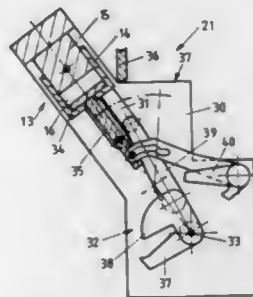
Filed Feb. 26, 1985, Ser. No. 705,519

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3407030

Int. Cl.<sup>4</sup> A47J 31/00

U.S. Cl. 99—289 R

11 Claims



1. An apparatus for the preparation of hot beverages, particularly of coffee, comprising a housing, in the interior of the housing of the apparatus being provided, fixedly mounted, a fresh water inlet or a fresh water reservoir, a heating element for heating the fresh water, means for transporting the heated fresh water under pressure, and exchangeably mounted, a plug-in module incorporating a brewing chamber including an associated closure element and a beverage outlet, a means for pushing out and for removing leached-out beverage powder and a first driving means for driving said closure element associated with said brewing chamber, a second driving means for driving said means for pushing out and removing the leached-out beverage powder and clutch means including a driving member connected to said driving means and a driven member mounted to said plug-in module and operatively connected to said first and second driving means cooperating with said driving member and said driven member to be non-positively connected to each other if said plug-in module is inserted into said housing of the apparatus.

4,681,029

**APPARATUS FOR TREATING SOYBEANS**

Helmut Bartsch, Ravensburg, and Gerd Florin, Vorberg, both of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss Limited, Zürich, Switzerland

Continuation-in-part of Ser. No. 312,660, Oct. 19, 1981, Pat. No. 4,556,573. This application Oct. 28, 1985, Ser. No. 792,129

Claims priority, application Switzerland, Nov. 4, 1980, 8186/80

Int. Cl.<sup>4</sup> A23L 1/20

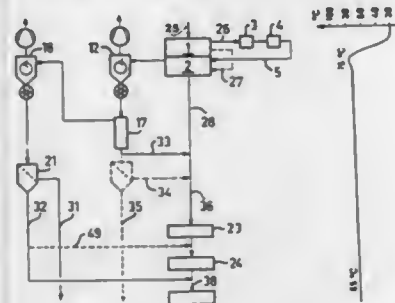
U.S. Cl. 99—483

16 Claims

1. An apparatus for the continuous preparatory treatment of soybeans in order to recover soybean oil and soybean meal, comprising:

a fluidized bed for applying to the soybeans composed of

hulls and seeds contained in such hulls a substantially homogeneous heat treatment for a relatively brief amount of time insufficient for substantial heat diffusion to the seeds, so as to essentially apply heat only to the hulls and the outer surface of the seeds, in order to render the hulls brittle and to cause them to loosen from the seeds;  
a corrugated roll mill arranged after said fluidized bed;  
means for feeding the substantially homogeneously heat treated soybeans from the fluidized bed to said corrugated roll mill without any intermediate cooling thereof;



said corrugated roll mill subjecting the substantially homogeneously heat treated soybeans while in a heated condition to forces in order to split the soybeans, so that there are substantially formed split seeds and split hulls;  
a separate impacting device arranged after the corrugated roll mill; and  
means for delivering soybeans from said corrugated roll mill without any intermediate cooling to said separate impacting device where the split soybeans composed of the split seeds and split hulls are subjected to an impacting action in order to separate a predominant part of the split hulls from their related split seeds.

4,681,030

**APPARATUS FOR PREPARING FROZEN DRINKS**

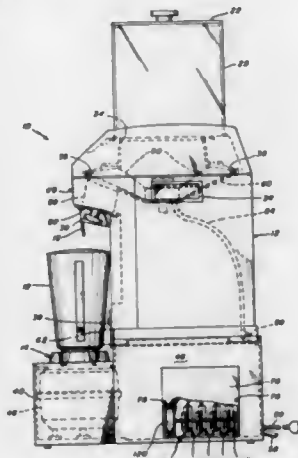
John M. Herbert, 351 Normandy Dr., Norwood, Mass. 02062

Filed Feb. 20, 1986, Ser. No. 831,656

Int. Cl.<sup>4</sup> A23G 9/00; B01F 15/06

U.S. Cl. 99—484

8 Claims



1. An apparatus for preparing frozen drinks comprising in combination:  
means for preparing and delivering finely-divided ice, a blender having a blender cup for receiving said ice, and timing control means connected to said ice preparation means and to said blender for automatically controlling the commencement and amount of ice delivery, and the commencement and duration of blending during operation of the apparatus.

4,681,031

**VEGETABLE AND FRUIT JUICE EXTRACTING MACHINE**

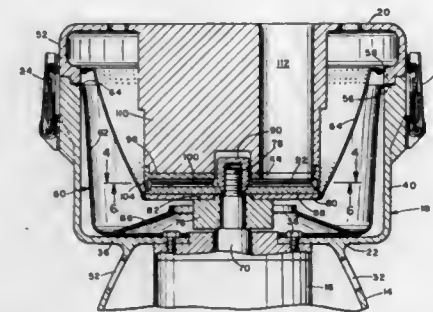
John Austad, 3330 State St., San Diego, Calif. 92103

Filed May 1, 1986, Ser. No. 858,371

Int. Cl.<sup>4</sup> A23N 1/00

U.S. Cl. 99—511

9 Claims



1. Apparatus for extracting juice from vegetable or fruit stock material comprising:  
an extractor housing comprising:  
a base housing;  
an upper housing having a cylindrical outer wall having an open top end and a bottom end closed by a circular floor having a central aperture therein, said upper housing being joined to the base adjacent the circular floor, with the top end of the outer wall having a step formed therein along an inner edge with a sloping bottom which makes a predetermined angle toward the circular floor;  
pulp discharge means extending outward from the cylindrical outer wall of the upper housing for forming a pulp discharge chute; and  
apertured cover means having an interlocking wall positioned about its periphery configured to coincide with the upper housing outer wall, and having a step formed therein which is complementary to the step in the cylindrical outer wall;  
a motor secured within the base housing having a rotatable shaft with a threaded end extending through the central aperture of the circular floor, the motor having a casing which extends through the central aperture a predetermined distance above the circular floor to prevent liquid penetration into the motor;  
juice collection means positioned within the upper housing having an annular bottom so that the motor shaft extends therethrough and a collector side wall extending parallel to the cylindrical outer wall, said collection means side wall terminating in a rim which flares out from the collector side wall at a predetermined angle coincident with the predetermined angle of the outer wall step bottom, said juice collection means being positioned within the housing so that the flared rim rests in the outer wall step and is contacted by the cover interlocking wall so as to provide a substantially liquid tight seal;  
spacer means positioned about said motor shaft between said motor housing and the threaded end, said spacer means having a surface extending above the annular bottom of the juice collection means;  
screen basket means suspended interior of the collection means resting on the spacer means and having an aperture through which the threaded end of the motor shaft extends, operatively coupled to the motor shaft for spinning, having a conic shaped porous wall extending upward from a substantially flat support plate, said porous wall having openings of predetermined size for allowing the passage of juice therethrough but not pulp; a lower blade assembly positioned adjacent to the support plate inside the screen basket having a central aperture through which the threaded motor shaft extends and coupled to the motor shaft, comprising a circular cutter plate machined to have at least 8 vertically extending ridges from one side which form cutter blades, with said cutter blades extend-

ing outward along the surface of said plate from a center position;  
a threaded nut disposed on the threaded end of said motor shaft having a beveled lower edge for engaging a beveled inner edge on the central aperture of said lower blade assembly when tightened so as to clamp said blade assembly and screen basket in place on said motor shaft;  
a generally cylindrical plug extending down from the cover having a bottom surface substantially parallel to and spaced apart from the lower blade assembly, said plug having means for transferring the vegetables or fruit to a space between the plug and the lower blade assembly; and  
an upper cutter bar assembly secured to the bottom of the plug and spaced apart from the lower blade assembly by a distance predetermined by the vegetable or fruit to be processed and the preselected size of the openings in the porous wall, said upper cutter bar assembly being a circular plate having a plurality of raised ridges thereon.

4,681,032

**BUNDLING DEVICE**

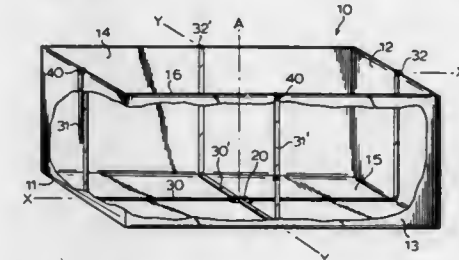
Eve C. McDermott, 200 E. 84th St., New York, N.Y. 10028

Filed Apr. 15, 1985, Ser. No. 723,619

Int. Cl.<sup>4</sup> B65B 13/00

U.S. Cl. 100—34

47 Claims



1. A bundling device which comprises:

(a) an assembly of individual, serially dispensable, flexible, elongated ties having a first terminal portion at one end thereof, a middle portion, and a second terminal portion at the other end thereof and having a length sufficient to encompass a stack of articles to be bundled, said assembly of ties being adapted to accept successive stacks of articles formed directly thereon; and  
(b) means for maintaining the assembly of ties in a predetermined position relative to a stack of articles directly thereon, said means comprising a cartridge having an upper side and an underside, said cartridge having means on its upper side for retaining a quantity of said ties and surface engaging means associated with its underside for its attachment to a surface.

4,681,033

**DRIVE SYSTEM FOR BELT PRESS**

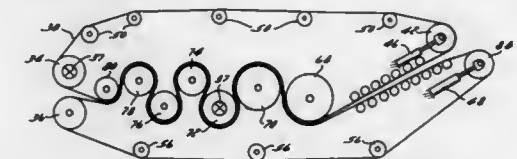
Robert E. Crandall, Greendale; Kenneth F. Kosulic, Mukwonago; Thomas C. Rooney, Waukesha, and Larry C. Smith, New Berlin, all of Wis., assignors to Rexnord Inc., Brookfield, Wis.

Division of Ser. No. 680,614, Dec. 11, 1986, Pat. No. 4,622,894. This application Jul. 23, 1986, Ser. No. 871,948

Int. Cl.<sup>4</sup> B30B 5/06

U.S. Cl. 100—118

5 Claims



1. In a belt press, such as for use in dewatering a non-plastic slurry, which includes a frame having a receiving end and a discharge end, a pair of endless foraminous belts disposed in



generally horizontally-flattened loops one above the other and supported on laterally-extending rolls mounted on the frame, and a series of laterally-extending pressure rolls also mounted on the frame and forming a dewatering section, said dewatering pressure rolls comprised of larger-diameter pressure rolls comprising a first low pressure section, and relatively smaller-diameter pressure rolls comprising a second high pressure section wherein the non-plastic slurry is deposited upon one of the belts, that belt becoming the loaded belt, and adjacent spans of the belt loops are adapted to sandwich the slurry between them and travel together from the receiving end to the discharge end of the press along a serpentine path over and under the low and high pressure dewatering rollers to effect gradually progressive dewatering of the slurry, the improvement comprising:

- a first power-driven roll situated at the discharge end of the dewatering section in direct driving engagement with the loaded belt;
- at least one additional power-driven roll situated within the high pressure dewatering section in direct driving engagement with the loaded belt, said drive rolls being effective in combination to pull the loaded belt through the high and low pressure dewatering sections with a uniform gradual increase in the tension in the loaded belt as it moves through said dewatering section; and
- wherein the non-loaded belt is driven only by frictional engagement with the loaded belt through the progressively-thickened non-plastic slurry.

4,681,034

#### PROCESS FOR PRINTING A SUBSTRATE BY THE HOT-TRANSFER PRINTING METHOD

Herbert Schulze, Wilhelmstr. 33, 6208 Bad Schwalbach 3; Wolfgang Köhler, Westring 55, Weiterstadt 2, and Kurt Schlessmann, Pfarrstr. 20, 6054 Obertshausen, all of Fed. Rep. of Germany

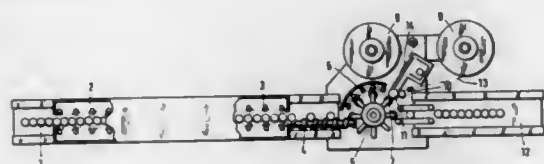
Continuation of Ser. No. 759,509, Jul. 26, 1985, abandoned, which is a continuation of Ser. No. 591,032, Mar. 19, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,469

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310120

Int. Cl.<sup>4</sup> B41M 3/00, 1/30, 1/40

U.S. Cl. 101—211

13 Claims



1. In a process for printing a substrate having a synthetic-resin surface which has an affinity for printing inks, said printing being a laser-induced hot transfer printing method, the process comprising the steps of laying onto the synthetic resin surface a transfer medium printed on a face surface with a dye image formed of dyes which are sublimable under the conditions of the process and transferrable into said synthetic resin, with the printed face surface facing the synthetic resin surface, transferring the dyes into the synthetic resin surface by first heating and then laser-light sublimating said dyes, including preheating said surface of the substrate to a temperature below the sublimation temperature of the dyes, and impinging a laser beam substantially uniformly for a treatment time of 0.01 second to 0.1 second over the unprinted back of the preheated transfer medium, the laser beam being of a wavelength in the range 2500 to 15,000 nm and of an intensity sufficient to cause the dyes to sublime of more than 80 percent above 220° C. and penetrate sufficiently substantially into the synthetic resin of the substrate in an abrasion resistant manner.

4,681,035

#### ROTARY OFFSET PRINTING MACHINE SYSTEM

Ingo Kobler, Anhausen, and Josef Plantsch, Augsburg, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

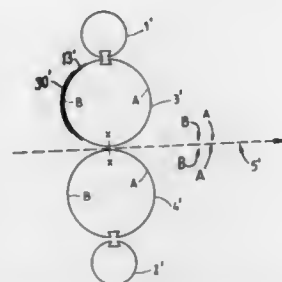
Filed Mar. 10, 1986, Ser. No. 838,143

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509044; Mar. 14, 1985, 3509045

Int. Cl.<sup>4</sup> B41F 5/22

U.S. Cl. 101—217

12 Claims



1. Rotary offset printing machine system having a plate cylinder (1, 2);
- a rubber blanket cylinder (3, 4) in circumferential engagement with the plate cylinder;
- a rubber blanket (30) applied over the circumference of the blanket cylinder;
- and a blanket underlay (13) located between the rubber blanket and the surface of the rubber blanket cylinder (3, 4),

comprising, in accordance with the invention, non-invasive means with respect to the blanket cylinder for eliminating, or at least alleviating, the effects of bending or oscillations of the rubber blanket cylinder including regions formed in the rubber blanket underlay (6, 7, 8, 9, 5', 6', 11') of greater and lesser thickness, in which the arrangement of the respective regions of greater and lesser thickness, with respect to the position of said regions on the underlay, and the extent of said regions on the underlay, in longitudinal direction thereof, which will be circumferential direction when placed about the rubber blanket cylinder, is associated with a bending characteristic of an individual machine system operating at a predetermined speed such that the effects of bending and bending oscillations of the rubber blanket cylinder (3, 4) are effectively compensated with respect to printed copy material (5) by maintaining essentially uniform printing pressure against the copy material and counteracting bending of the respective rubber blanket cylinder by compensatory change in thickness of the underlay.

4,681,036

#### DELAY STARTERS

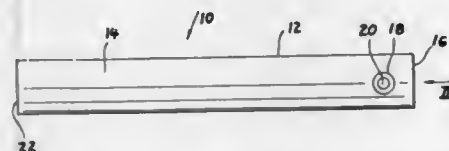
Jan H. A. Grobler, Wellington, South Africa, assignor to Biotech (PTY) Ltd., South Africa

Filed Jan. 7, 1986, Ser. No. 816,854

Int. Cl.<sup>4</sup> C06C 5/06; F42B 3/10

U.S. Cl. 102—275.3

5 Claims



1. A delay starter device, said device comprising an elongated cylindrical member of non-explosive material; a slow

combustible non-explosive material provided in the cylindrical member; and a hollow tube of highly combustible non-explosive material, provided in at least one position in the cylindrical member and being adapted to receive a fuse cord inserted thereto, for igniting by the slow combustible material and for, in turn, providing ignition of a fuse cord when in contact therewith.

4,681,037

#### TANGED CHARGE HOLDER

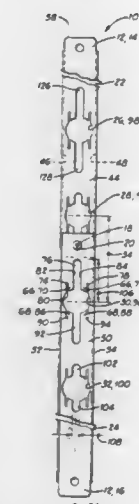
John A. Regalbuto, Fort Worth, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Filed Jan. 3, 1986, Ser. No. 816,172

Int. Cl.<sup>4</sup> F42B 1/02

U.S. Cl. 102—310

14 Claims



1. A shaped charge carrier assembly apparatus, comprising: at least one shaped charge including an outer case having an outer surface and a first shoulder extending radially outward from said outer surface; and
- a carrier having at least one opening therethrough large enough to receive said outer surface of said case, and having at least a first pair of resilient tab means extending into said opening for frictionally engaging said outer surface of said case and for thereby holding said shaped charge in place relative to said carrier, said shoulder of said shaped charge abutting said carrier, said pair of resilient tab means including first and second resilient tabs defined by a first three spaced slots, said slots each having an open end communicating with said opening of said carrier, and a middle one of said slots being located between and defining adjacent sides of said first and second tabs.

4,681,038

#### AMMUNITION CARTRIDGE CASE

William J. Washburn, San Clemente, Calif., assignor to Aerojet-General Corporation, La Jolla, Calif.

Filed Feb. 3, 1986, Ser. No. 825,122

Int. Cl.<sup>4</sup> F42B 5/26

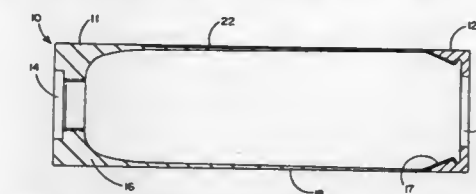
U.S. Cl. 102—464

10 Claims

1. A cartridge case for use with telescoped ammunition and of the type containing a propellant charge for propelling a projectile through a bore of a gun barrel upon ignition of the charge in a gun system wherein the cartridge case is pushed through and ejected from the gun chamber after the projectile has been fired, the case comprising:

- a hollow circular cylinder formed from a continuous wall surface and having at least one elongated recess in said

wall surface, said recess being longer than half the length of said cylinder and terminating short of the ends of said



cylinder to cause a split of said wall surface along said recess in response to said ignition.

4,681,039

#### DEVICE FOR CONNECTION BETWEEN A TRACTION CABLE AND A BICYCLE WITH AUTOMATIC AND MANUAL DISENGAGEMENT

Jean Perrin, 14, Boulevard Henri Ruel, -94120- Fontenay-sous-Bois, France

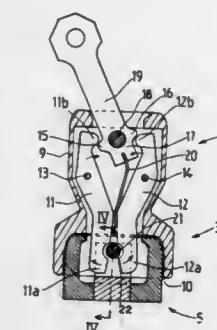
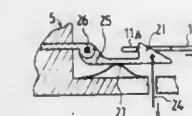
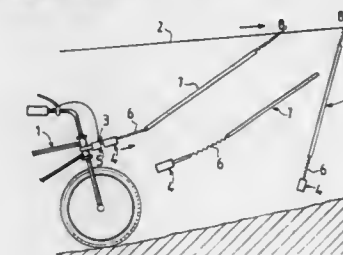
Filed Nov. 21, 1985, Ser. No. 799,792

Claims priority, application France, Nov. 23, 1984, 84 17879

Int. Cl.<sup>4</sup> B61B 12/02

U.S. Cl. 104—193

22 Claims



1. An apparatus for connecting a traction cable to a vehicle, wherein said traction cable is adapted to properly pull said vehicle along a normal path with respect to said cable, said apparatus comprising:

- (a) a towing device connected to said traction cable;
- (b) a towed device connected to said vehicle; and
- (c) a safety device for coupling said towing and towed devices and comprising:
  - means for manually disconnecting said towed and towing devices; and
  - means for automatically disconnecting said towed and towing devices in response to at least one of the follow-

ing conditions: deviation of said vehicle from said normal path, and falling of said vehicle to the ground.

4,681,040

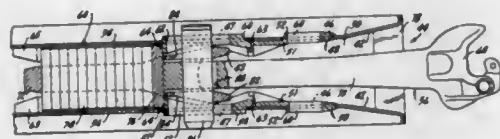
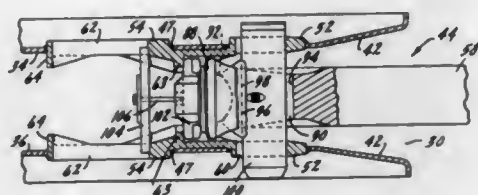
# RAILROAD CAR WITH UNIVERSAL COUPLING CAPABILITY

Rene H. Brodeur, Wilmette, and Boris S. Terlecky, Woodridge, both of Ill., assigns to Trailer Train Company, Chicago, Ill. Division of Ser. No. 597,642, Apr. 6, 1984, Pat. No. 4,589,558. This application Feb. 7, 1986, Ser. No. 827,080

Int. Cl.<sup>4</sup> B61G 9/22, 5/04

U.S. Cl. 105—3

8 Claims



1. A railroad car including a centersill, having parallel side-walls and single axle trucks connected thereto at opposite ends thereof to support the car upon rails, said centersill defining at least one coupler pocket open at an end of said car, and including a coupler arrangement having opposing sill side frames secured to each said sidewall in oppositely facing cooperating relation, each said sill side frame being generally longitudinally elongate in the direction of the longitudinal extent of said centersill and including a frontal draft key slot nearest the end of said car, a rearward draft key slot, inwardly directed stops intermediate said frontal draft key slot and rearward draft key slot and generally aligned with and facing the inwardly directed stop of the opposing sill side frame.

4,681,041

# LIGHTWEIGHT CENTER BEAM RAILROAD CAR

William H. Harris, Michigan City, Ind.; James P. Klag, Crestwood, and Joseph W. Lam, Chicago, both of Ill., assigns to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Nov. 27, 1985, Ser. No. 802,428

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> B61D 3/08, 17/00

U.S. Cl. 105—355

9 Claims



1. A freight carrying railroad car having a predetermined length comprising:  
a body supported at each end by wheel-containing truck means;  
the body having a vertical center beam extending longitudinally the length of the car between bulkheads at each end of the car;  
the center beam comprising a center sill, a top sill parallel to and spaced above the center sill, and a plurality of vertical spaced apart columns rigidly connected at their lower

ends to the center sill and at their upper ends to the top sill;  
at each end of the car, a vertical plate extending from the center sill to the top sill, and from the respective bulkhead at that end inwardly along the center sill;  
each vertical plate being joined to the center sill, top sill, bulkhead and a plurality of said columns such that opposed facing ends of said vertical plates are spaced from each other a distance of at least about 60% of the length of said car between the bulkheads; and  
between the facing end of each of the vertical plates and the car length center, at least one bracing bar extending diagonally downwardly, toward the car length center, from the top sill to the center sill, so that when the car is subjected to impact loads the bars on one side of the car longitudinal center are placed in tension and the bars on the other side of the car center are placed in compression.

4,681,042

# ADJUSTABLE TABLE TOP ASSEMBLY

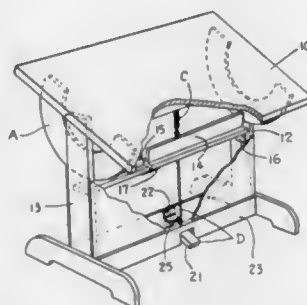
Fred E. Roberts, 1322 Fourth Ave., Conway, S.C. 29526

Filed Feb. 20, 1981, Ser. No. 236,637

Int. Cl.<sup>4</sup> A47F 5/12

U.S. Cl. 108—6

1 Claim



1. In a drafting table and the like, means adjusting the angular position of a pivotally adjustable flat top carried by an upright support comprising:  
a pair of spaced oppositely disposed downwardly extending arcuate brackets carried by said top;  
an elongated member carried for pivotal movement beneath said top into position wherein end portions thereof are in abutting relation to respective downwardly extending brackets immobilizing said top against pivotal movement;  
said elongated member including a pair of links aligned in end-to-end relation substantially horizontally and pivoted intermediate opposed portions;  
a spring connected to said elongated member maintaining same in said position immobilizing said top; and  
foot pedal operated means which when pressed overcomes the force of the spring releasing said top for pivotal adjustment.

4,681,043

# MODULAR MACHINE TABLE FOR PRODUCTION PLANTS

Walter Sticht, Karl-Heinrich-Waggener-Strasse 8, A-4800 Attang-Puchheim, Austria

Filed Jan. 28, 1985, Ser. No. 695,842

Claims priority, application Austria, Feb. 6, 1984, 366/84

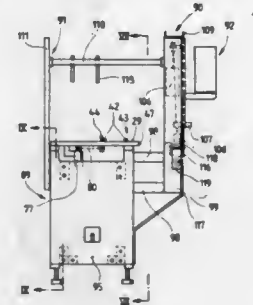
Int. Cl.<sup>4</sup> A47B 3/06

U.S. Cl. 108—153

9 Claims

1. A modular machine table for a production plant, comprising:  
(a) two vertically extending plate-shaped support elements having upper end faces extending in a horizontal plane,  
(1) the plate-shaped support elements being comprised of

- a web and two end flanges defining a vertically extending recess to impart a channel-shaped cross section to the support elements,
- (b) a plurality of transverse struts interconnecting the two support elements in at least two horizontal planes extending parallel to the plane wherein the end faces of the support elements extend,
- (c) a self-supporting table plate supported on, and connected to, the end faces of the support elements,



- (d) releasable coupling devices connecting the transverse struts and the table plate to the support elements, and for connecting adjacent ones of the machine tables to each other, and
- (e) the web having bores receiving the releasable coupling devices for connecting the transverse struts to the support elements and the flanges having bores receiving the releasable coupling devices for connecting the adjacent machine tables to each other, the bores being positioned symmetrically with respect to a vertical center line of the web.

4,681,044

# ACCESS DOOR SYSTEM

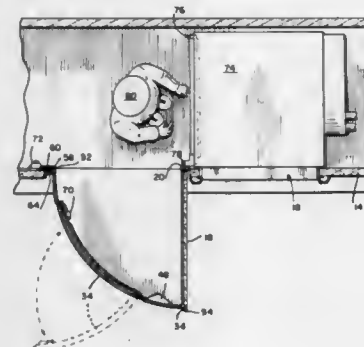
Ernest R. Dallman, 9200 Fanchon Dr., Zionsville, Ind. 46077

Filed Dec. 27, 1985, Ser. No. 814,191

Int. Cl.<sup>4</sup> G07G 5/00

U.S. Cl. 109—24.1

16 Claims



1. An access system for access to an automatic teller machine enclosure defining an interior space and having a planar front surface defining a plane and containing an automatic teller machine that includes a panel that must rotate outwardly through said plane to a position substantially perpendicular to said plane, the system comprising:

- a first door pivotable from a closed position to an open position having a hinged edge and an opening edge and having a first vertical height that lies in said plane when said first door is in the closed position;
- an arcuate shaped wall having a first edge attached to said opening edge of said first door and having a vertical height substantially equal to said first vertical height; said

wall extending along an arcuate path for substantially 90° and terminating at a second edge;  
said first door and said wall cooperating when said first door is opened substantially 90° to provide a chamber substantially outside said enclosure and adjacent said plane defined by said front surface that is in direct communication with said interior space to permit said panel to rotate outwardly through said plane into said chamber to a position substantially perpendicular to said plane without interference;  
a second door formed in said arcuate shaped wall and movable from a closed position to an open position to permit entry into said chamber when said chamber is substantially outside said booth;  
a bottom wall attached to said exterior door and to said arcuate wall to provide a floor for said chamber capable of supporting an operator; and  
means for alternately securing said first door in the closed position and in the open position.

4,681,045

# TREATMENT OF FLUE GAS CONTAINING NOXIOUS GASES

Miro Dvirka, Garden City, N.Y.; George J. Psihos, Edina, Minn., and Joseph J. Cosulich, Syosset, N.Y., assigns to William F. Cosulich Associates, P.C., Woodbury, N.Y.

Filed Jul. 21, 1986, Ser. No. 888,394

Int. Cl.<sup>4</sup> F23J 11/00, 15/00

U.S. Cl. 110—345

100 Claims

1. A method of reducing the noxious gases such as chlorides including hydrogen chloride and chlorine from the flue gases derived from the incineration of solid waste materials in a furnace with a combustion chamber and a combustion zone to substantially reduce the formation of dioxins for a cleaner effluent gas to the atmosphere, comprising:  
introducing sodium bicarbonate into said flue gas of a furnace incinerating said waste materials,  
positioning introduction of sodium bicarbonate for at least one location along the path of said flue gas at a temperature below about 1564° F. but not below about 518° F.,  
heating said sodium bicarbonate in said flue gas for a time sufficient to drive off the water and carbon dioxide from said sodium bicarbonate,  
forming sodium carbonate particles during said heating of said sodium bicarbonate, said sodium carbonate having a higher porosity to produce a greater reaction area on the surface of said particles,  
contacting said porous sodium carbonate with chlorides in said flue gases for a sufficient time and temperature to react and produce sodium chloride and thereby prevent their formation of dioxins, and  
separating said sodium chloride from said flue gas to produce a cleaner gas for exit to the atmosphere.

4,681,046

# METHOD OF UTILIZING DISTILLATION RESIDUES OF PHTHALIC ACID ANHYDRIDE OR MALEIC ACID ANHYDRIDE

Helmut Scharf, Schermbeck, and Wilfried Krix, Bottrop, both of Fed. Rep. of Germany, assigns to Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 873,549

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524919

Int. Cl.<sup>4</sup> F23G 5/02

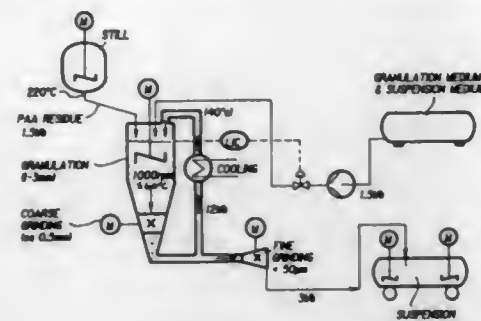
U.S. Cl. 110—346

11 Claims

1. A method for utilizing distillation residues of phthalic anhydride or maleic anhydride, which comprises:  
(a) cooling hot, liquid distillation residues of said phthalic anhydride or maleic anhydride, while flowing as a stream in a first organic liquid;  
(b) comminuting said distillation residues solidifying in said



first organic liquid by means of a cutting edge rotating at high rpm to produce a granulate;  
(c) suspending said granulate in a second organic liquid; and



(d) incinerating the suspension or converting the suspension into synthesis gas.

4,681,047

# STRUCTURE OF AN UPPER HOOK PROVIDED WITH A HOLE AND USED IN SEWING MACHINES FOR MAKING OVEREDGE STITCHES

Franco Marchesi, Pavia, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

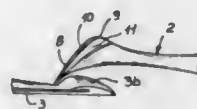
Filed Mar. 6, 1985, Ser. No. 708,837

Claims priority, application Italy, Jul. 31, 1984, 22763 B/84

Int. Cl.<sup>4</sup> D05B 57/06

U.S. Cl. 112-162

5 Claims



1. Structure of an upper hook provided with a hole and used in sewing machines having a needle and a lower hook for making whipstitches in particular on medium-lightweight fabrics, comprising a tip curved in the direction of the lower hook and a bulge adjoining the said curved tip and facing the stitches already formed, and wherein the blade of the said upper hook has a broken-line profile, in a substantially vertical plane, which defines a shoulder for stopping and guiding the thread of the lower hook, which shoulder is located substantially in a middle position on the blade of the said upper hook.

4,681,048

# SEWING MACHINE AND METHOD FOR CONTROLLING THE MOTION OF A WORKHOLDER

Erich Willenbacher, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,359

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509526

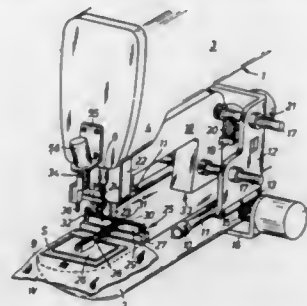
Int. Cl.<sup>4</sup> D05B 21/00, 27/22

U.S. Cl. 112-262.3

8 Claims

3. A method of effecting the sewing of a seam with a needle sewing into a stitch hole which seam is to be directed along at

least two seam lines which are arranged along axes which are at an angle to each other, comprising using a first sensor to locate the edge of the workpiece to be sewn and, in response to the location sensed positioning a workholder in respect to the needle so that the needle will be positioned to begin an initial seam, starting the needle while advancing the workpiece in respect to the needle to form a first seam but before the first seam is finished, sensing where a second seam is to begin and forming the remaining first seam with a required spacing of stitches to bring the end of the stitch formation to the corner at



which the second seam is to be begun, and including locating the first sensor to locate an edge of the seam area, beginning the sewing by sewing through the stitch hole which is located by the first sensor and wherein a computer is used to program the entire seam formation which has an input for determining seam spacing, and wherein a secondary sensor is provided, at the location of the second of the formed seams after the first seam which senses the location at which the second of the formed seams will end on the second formed seam and revises the speed of the sewing machine so that the stitch will end at the end of the second seam.

4,681,049

# CURVED, UNIFORMLY BIASED STRUCTURAL FIBER FORMS

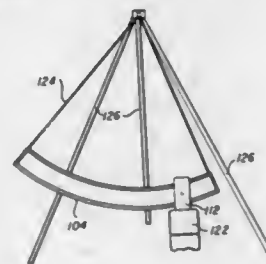
Frederick Vees, Eden Prairie, and Todd Drummond, Hopkins, both of Minn., assignors to Xerxon Company, Minneapolis, Minn.

Filed Dec. 2, 1985, Ser. No. 803,226

Int. Cl.<sup>4</sup> D05B 1/00

U.S. Cl. 112-262.3

5 Claims



1. A process for making a dry fiber form of desired curved shape comprising the steps of:  
attaching a dry structural fabric comprised of a plurality of plies of structural yarns, wherein the yarns of at least one ply are biased with respect to the axis of said fabric, to a form bearing an opening defining said desired shape in such fashion to completely occlude said opening by bending said fabric about said opening;  
sewing a plurality of first courses of holding thread within that opening parallel to the curvature of said opening from end to end of said opening;  
removing said sewn fabric from said form and sewing a plurality of second courses of holding threads along the edges of said fabric parallel to said first threads;

trimming the excess of said fabric to said desired shape.

4,681,050

# BOBBIN IN RUN-OUT DETECTOR, AND A BOBBIN CHANGING MECHANISM INCORPORATING THE DETECTOR

Nikolaos Kosmas, 14 Anne Street, McKinnon, Victoria, Australia

PCT No. PCT/AU84/00023, § 371 Date Oct. 23, 1984, § 102(e)

Date Oct. 23, 1984, PCT Pub. No. WO84/03310, PCT Pub.

Date Aug. 30, 1984

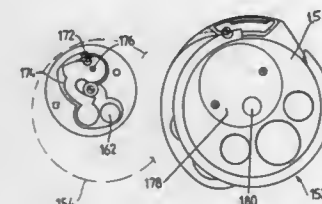
PCT Filed Feb. 22, 1984, Ser. No. 672,258

Claims priority, application Australia, Feb. 23, 1983, PF 8163/83

Int. Cl.<sup>4</sup> D05B 45/00, 59/04

U.S. Cl. 112-278

20 Claims



1. A lockstitch sewing machine having a bobbin and a stationary base, said bobbin being mounted within the base, said base including a peripheral wall which surrounds the bobbin, and means for defining a thread guide path from the bobbin and a run-out detector for sensing when the bobbin is empty, said detector comprising hook means carried by the base and engaged with the thread extending from the bobbin along said thread guide path such that the hook means is displaced from a first position by the bobbin thread when under tension; bias means for returning the hook means to its first position as a result of loss in thread tension; means for transmitting an energy beam; means for receiving the energy beam; and means for influencing the energy beam, said influencing means being linked to the hook means and movable relative to the path of said energy beam upon movement of the hook means to its first position consequent on loss of thread tension, said beam receiving means being responsive to such influence of the beam to provide a signal indicative of a run-out condition.

4,681,051

# GUIDE DEVICE FOR THE WORKPIECE OF A SEWING MACHINE

Otto Kirch, Mehlingen, and Erich Willenbacher, Kaiserslautern, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Jun. 2, 1986, Ser. No. 870,248

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 8516184[U]

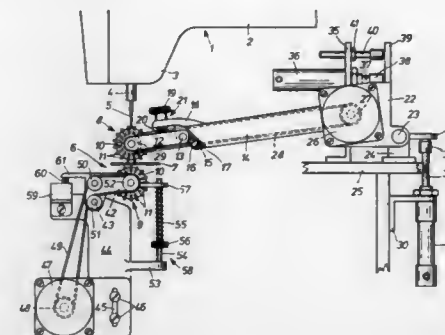
Int. Cl.<sup>4</sup> D05B 27/10

U.S. Cl. 112-306

8 Claims

1. A guide device for sewing work moving in a sewing direction on a sewing machine having an arm extending in a longitudinal direction which is crosswise to the sewing direction, comprising at least one driven guide wheel rotating in a plane extending crosswise to the sewing direction and parallel to the longitudinal direction said wheel being moveable between an operating position in engagement with a sewing work and an inactive position spaced from the sewing work, and a support which is fixed at least when said guide wheel is in said operating position, a low-mass rocker for rotatably carrying said guide wheel, said rocker being movably connected to said

support for movement between said operating and inactive positions, and spring means engaged between said support and



said rocker for urging said rocker to move said guide wheel toward said operating position.

4,681,052

# INHAUL BOOM END FOR SAILBOARD BOOM ASSEMBLY

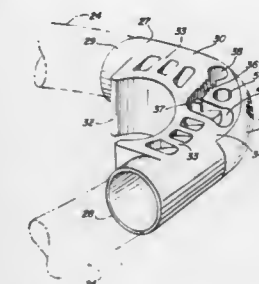
Heinz F. Nedoluha, Salzburg, Austria, assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Dec. 19, 1985, Ser. No. 811,023

Int. Cl.<sup>4</sup> B63B 15/00

U.S. Cl. 114-98

13 Claims



1. An inhaul boom end part for a sailboard boom assembly having a pair of booms, the inhaul boom end part being generally V-shaped and having top and bottom surfaces and a pair of diverging tubular portions for attaching the inhaul boom end part to the booms, an arcuate surface between the tubular portions for engaging a mast of a sailboard, means for securing one end of a line for attaching the inhaul boom end part to the mast, said top surface having a slot therein and a jam cleat positioned in said slot and formed integrally with the inhaul boom end part for securing the other end of the line.

4,681,053

# VESSEL SUCH A SHIP, BOAT AND THE LIKE PROVIDED WITH STABILIZING MEANS

Kemal Botka, 372 Central Park West, New York, N.Y. 10025

Continuation-in-part of Ser. No. 792,831, Oct. 25, 1985. This

application Jul. 11, 1986, Ser. No. 884,289

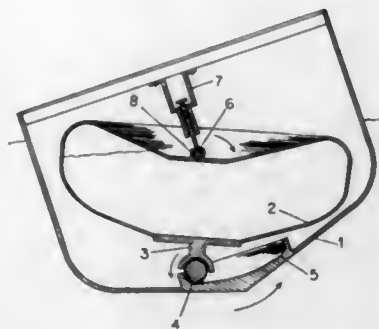
Int. Cl.<sup>4</sup> B63B 39/02

U.S. Cl. 114-122

6 Claims

1. A vessel, such as a ship, a boat and the like, comprising a hull having an inner hollow; a movable body located in said inner hollow of said hull; and means for guiding said movable body in said inner hollow of said hull and formed so that when said hull turns about any horizontal axis in a first direction under the action of waves, wind and the like, said movable body urges to turn said hull back about the same any horizontal axis in a second direction which is opposite to said first direction so as to stabilize the ship, said guiding means including a

spherical body, a guiding member with a guiding surface on which the spherical body can roll, and a holding member provided with a spherical receptacle and arranged to movably



hold said spherical body, said hull and said movable body forming two elements, said guiding member being connected with one of said elements, while said holding member is connected with the other of said elements.

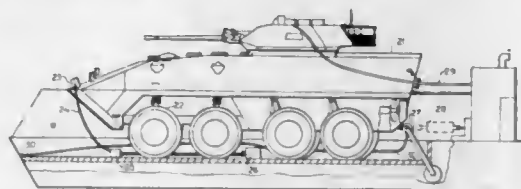
4,681,054

# MARINE VESSEL AND METHOD FOR TRANSPORTING A VEHICLE

Mark S. Rice, Washington, D.C., and Paul D. Hunt, Alexandria, Va., assignors to CACI, Inc. - Federal, Arlington, Va.  
Filed Aug. 28, 1985, Ser. No. 770,218  
Int. Cl.<sup>4</sup> B63B 39/00

U.S. Cl. 114-124

5 Claims



1. A method for transitioning the hydrodynamic hump of a marine vessel having a planing hull to obtain maximum speed with minimum power, the hydrodynamic hump being the hump in the drag versus speed relationship exhibited by the marine vessel as the marine vessel transitions from displacement to planing performance, said method comprising the steps of:

positioning movable ballast means at a predetermined aft first position in the vessel to obtain a first vessel trim angle at a predetermined vessel water speed less than the hump speed of the vessel;

shifting said ballast means forwardly in the vessel to change the longitudinal center of gravity of the vessel in dependence on the vessel water speed as the vessel water speed approaches the hump speed of the vessel so as to obtain a second vessel trim angle for passage of the vessel through the hump speed to the running speed of the vessel.

4,681,055

# ADAPTER SYSTEM FOR MARINE AUTO PILOT

John F. Cyr, 41 Kindred Ave., Stuart, Fla. 33494  
Continuation-in-part of Ser. No. 445,245, Dec. 20, 1982, abandoned. This application Dec. 5, 1985, Ser. No. 804,870  
Int. Cl.<sup>4</sup> B63H 25/04

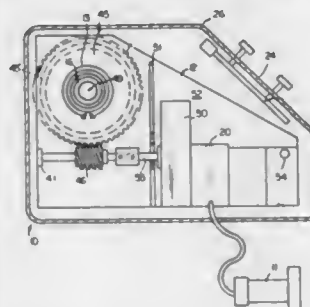
U.S. Cl. 114-144 E

7 Claims

1. A system for enabling selective manual or autopilot control of a craft, for use with an autopilot device providing error signals to maintain a craft's heading in a pre-selected direction, the system is adapted for mounting between the steering wheel

of the craft and the steering wheel shaft thereof, the system comprising:

- (a) a system housing connectable between said steering wheel and said steering wheel shaft;
- (b) a servo mechanism in said housing electro-mechanically communicating with said autopilot device, said servo mechanism having a mechanical output;
- (c) a servo interface in said housing, connected to said mechanical output of said servo mechanism, said servo interface connected to a first gear;
- (d) an adapter in said housing connected between said steering wheel and said wheel shaft, said adapter configured for ease of installation of said autopilot device between said steering wheel and said steering wheel shaft without



need for specialized hardware, said adapter connected to a second gear; and

- (e) means for selective mechanical co-action of said adapter and said servo output, said co-action means providing both an autopilot control of said steering wheel shaft and, alternatively, providing normal manual control of said steering wheel shaft, said co-action means further comprising means for selectively coupling and decoupling of the mechanical output of said servo mechanism to and from said adapter, said coupling and decoupling including radial displacement means to non-frictionally engage or disengage, respectively, said first gear from said second gear, said second gear being stationary relative to said first gear.

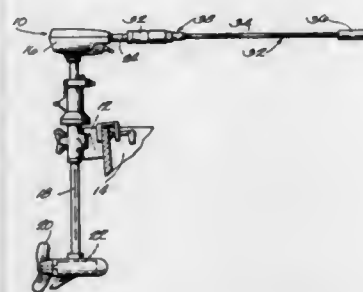
4,681,056

# OUTBOARD MOTOR EXTENSION HANDLE ASSEMBLY

Dennis J. Friedle, Lake Villa; Richard P. Kolb, Gages Lake, and Gaylord M. Borst, Highland Park, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.  
Filed Oct. 4, 1985, Ser. No. 784,171  
Int. Cl.<sup>4</sup> B63H 21/26

U.S. Cl. 114-146

28 Claims



1. A marine propulsion device comprising a propulsion unit adapted to be pivotally mounted on a boat for pivotal movement relative to the boat about a generally vertical steering axis, said propulsion unit including a rotatably mounted propeller, and a powerhead drivingly connected to said propeller, a steering handle connected to said propulsion unit and extend-

ing generally horizontally therefrom for causing pivotal steering movement of said propulsion unit in response to lateral movement of said steering handle, and an extension handle assembly removably attached to said steering handle and including an extension handle, a coupling member including a main portion connected to said extension handle and a plurality of fingers spaced around said steering handle and having respective inner ends pivotally connected to said main portion, and respective outer ends movable outwardly from said steering handle, and cylindrical sleeve means having a fixed inner diameter, surrounding said coupling member, and being slidable longitudinally of said coupling member between a first position in surrounding relation to said main body and clear of said fingers and a second position longitudinally spaced from said first position and in surrounding relation to said fingers with said outer ends thereof located radially inwardly such that said fingers grasp said steering handle.

4,681,057

# PUMPING SYSTEM FOR SHIPS

David Girag, 355 W. Windsor Rd., Glendale, Calif. 91204

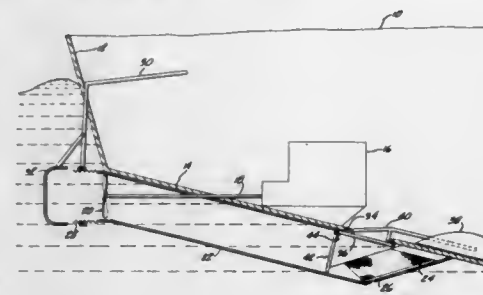
Filed Mar. 12, 1985, Ser. No. 710,913

Int. Cl.<sup>4</sup> B63B 13/00

U.S. Cl. 114-183 R

3 Claims U.S. Cl. 114-293

23 Claims



1. A pumping system for a boat having a hull and a submerged propeller for propulsion, comprising a tube surrounding the propeller and extending forwardly beneath the hull; an opening through the hull in communication with the interior of said tube forwardly of the propeller; and a door pivotally mounted relative to the hull within said tube, said door alternatively controlling communication through said opening and communication through said tube forwardly of said opening.

4,681,058

# SMALL WATERCRAFT WITH ASYMMETRICAL BOW PORTION

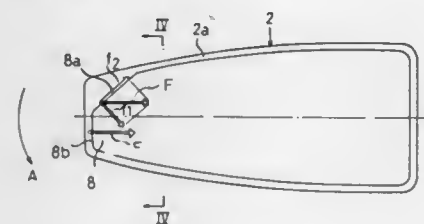
Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Aug. 27, 1985, Ser. No. 769,711

Claims priority, application Japan, Aug. 28, 1984, 59-179012  
Int. Cl.<sup>4</sup> B63B 1/00

U.S. Cl. 114-271

1 Claim



1. A small watercraft comprising a hull having a fore section and rear section, an engine for propelling the watercraft and auxiliary machinery of heavy weight supported at the fore

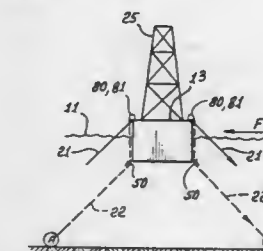
section of the hull, said watercraft being steered by a rider on the rear section of the hull, and wherein said fore section comprises a bow portion which sinks below the water surface when said small watercraft floats on the water without the rider, but does not sink below the water surface when said small watercraft floats on the water with the rider, only said bow portion having an outer surface whose form is arranged asymmetrical with respect to the center line of said hull, whereby when the rider is not on the rear section of the small watercraft, it will automatically be propelled by said engine in a circle.

4,681,059

# ROLL RESTRAINT OF ANCHORED VESSEL

William A. Hunsucker, 3741 Prestwick Dr., Los Angeles, Calif. 90027

Continuation of Ser. No. 537,430, Sep. 29, 1983, Pat. No. 4,531,471, which is a continuation of Ser. No. 396,633, Jul. 9, 1982, abandoned. This application Jun. 6, 1985, Ser. No. 742,222  
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.  
Int. Cl.<sup>4</sup> B63B 21/50



1. In combination with a floating vessel having a longitudinal axis and a transverse axis, and an upper portion, including a deck with heavy equipment mounted thereon,

(a) means for anchoring the vessel at a selected site on a body of water, such that the location and orientation of said vessel is kept approximately constant for adverse weather conditions which produce wind and wave forces which act on said vessel parallel to the transverse axis of the vessel,

(b) said means including anchor lines effectively attached to the vessel and also extending away from the vessel to transfer loading to the vessel at upper and lower locations associated with the vessel and acting in cooperation such that during said adverse weather conditions rolling and tilting of said vessel are minimized and said vessel is maintained approximately upright, each anchor line extending separately and individually to an individual anchor.

4,681,060

# KAYAK FRAME SECTION AND METHOD

William E. Masters, 313 Dogwood La., Easley, S.C. 29640  
Filed Oct. 7, 1985, Ser. No. 784,728  
Int. Cl.<sup>4</sup> B63B 35/72

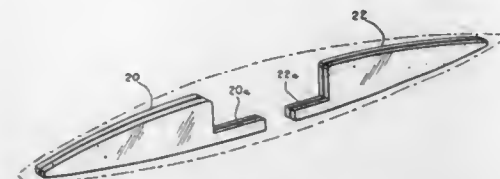
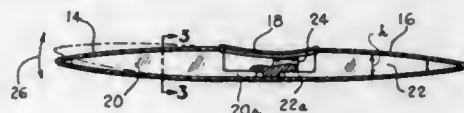
U.S. Cl. 114-347

20 Claims

1. A method of constructing a frame section for a high performance kayak having a flexible hull constructed from a flexible skin enclosure wherein bending moments in a pitch direction are effectively resisted without significantly increasing its weight, said kayak being of the type having longitudinal frame sections located internally in the bow and stern portions of the flexible hull enclosure, said method comprising the inclusion in said frame sections of a generally rigid thin web member which effectively resists bending moments in a pitch direction, and including on each side of said thin web member a generally resilient lightweight foam block affixed to said web member which effectively reduces lateral buckling and warp-



ing of said thin web member under bending moments while providing a composite frame section which is within pre-



scribed weight limitations to maintain the performance of the bull.

4,681,061

**BUTTON INDICATOR AND SWITCH ASSEMBLY**

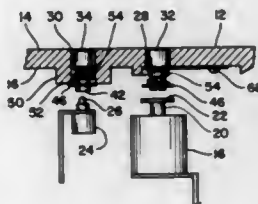
Robert F. Dvorak, Mount Vernon; Charles E. Netolicky, Cedar Rapids, and Neil R. Palmer, Swisher, all of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Apr. 5, 1985, Ser. No. 720,209

Int. Cl.<sup>4</sup> G08B 5/02

U.S. Cl. 116—279

3 Claims



1. A trip indicator and reset assembly for a circuit breaker having a trip indicating solenoid with a plunger movable between a trip position and a reset position comprising:

- a cover for said circuit breaker having a top surface and a bottom surface and a hole in axial alignment with said plunger;
- a button separable from said plunger having a head portion and a reduced diameter base portion, said head portion being shaped and dimensioned to pass through said hole and having a collar portion adjacent said base portion;
- a leaf spring having a mounting portion secured to said bottom surface of said cover and having an extending leaf portion, said leaf portion including an opening in registration with said hole, said opening shaped and dimensioned to permit passage of said base portion of said button while preventing passage of said head portion of said button; a retaining ring secured to said base portion of said button; and a coil spring encircling said base portion of said button intermediate said leaf spring member and said retaining ring, said coil spring biasing said button toward a position having said collar portion engaged with said leaf spring, said leaf spring resiliently positioning said button at an initial position within said hole while permitting said button to be moved to a first position indicating a trip condition in response to said plunger moving to said trip position and also permitting said button to be moved in an opposite direction past said initial position to a second position to move said plunger to said reset position, said leaf spring resiliently biasing said button towards said

initial position in response to said button being moved between said initial position and said second position.

4,681,062

**COATING APPARATUS**

Norio Shibata; Hideo Takeda; Tsunehiko Sato, and Yasunori Tanaka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

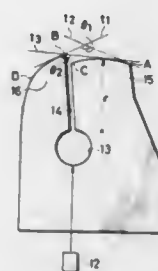
Filed May 14, 1985, Ser. No. 733,817

Claims priority, application Japan, May 14, 1984, 59-94657

Int. Cl.<sup>4</sup> B05L 5/02

U.S. Cl. 118—410

8 Claims



1. A coating apparatus of the extruder type which applies a coating solution onto the surface of a flexible support running continuously along rear edge and doctor edge surfaces by continuous extrusion of the coating solution from a frontmost end of a single slot, the improvement wherein said rear edge surface is curved and said doctor edge surface is smoothly curved in an arcuate fashion having a constant radius, and an exit end at a point B of a slot at a rear edge surface in a cross section of said coating apparatus is located at a position that satisfies the relation  $\theta_1 < \theta_2 < 180^\circ$ , where  $\theta_1$  is an angle formed by a tangential line drawn to said rear edge surface at said point B and a tangential line drawn to said doctor edge surface at a point A at a downstream end of said doctor edge surface in a cross section of said coating apparatus, all of said apparatus being contained within an interior of said angle  $\theta_1$ , and  $\theta_2$  is an angle formed by said tangential line drawn to said rear edge surface at said point B and a tangential line drawn from said point B to said doctor edge surface, all of said apparatus being contained within an interior of said angle  $\theta_2$ .

4,681,063

**HIGH SPEED AUTOMATED INJECTION SYSTEM FOR AVIAN EMBRYOS**

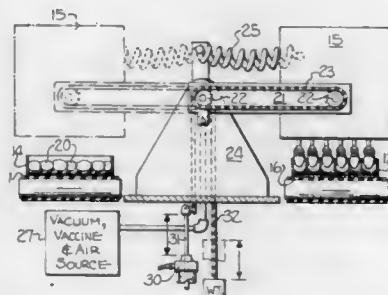
John H. Hebrank, Durham, N.C., assignor to Embrex Inc., Raleigh, N.C.

Filed Jul. 2, 1986, Ser. No. 881,121

Int. Cl.<sup>4</sup> B65G 59/04

U.S. Cl. 119—1

27 Claims



1. A device for simultaneously injecting a plurality of eggs of varying sizes with fluid substances, said device comprising:

suction means for simultaneously engaging and lifting a plurality of individual eggs from their respective upwardly facing portions; and injection means cooperating with said suction means for injecting the eggs while the eggs are engaged by said suction means.

4,681,064

**MOBILE FAN FOR POULTRY FARMING**

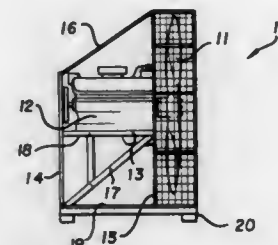
William E. Lilliston, Sr., Salisbury, Md., and William E. Lilliston, Jr., 1311A Middle Neck Dr., Salisbury, Md. 21801, assignors to William E. Lilliston, Jr., Salisbury, Md.

Filed Aug. 26, 1985, Ser. No. 769,118

Int. Cl.<sup>4</sup> A01K 31/18

U.S. Cl. 119—21

2 Claims



1. A method of rearing poultry in poultry houses which includes the steps of:

- a. assembling a gasoline engine driven mobile fan constructed and arranged to be moved bodily from place to place and from time to time;
- b. cooling the poultry houses with said mobile fan just before the catch-out process begins;
- c. ventilating the said poultry houses with said mobile fan during the catch-out process;
- d. cooling the poultry with said mobile fan while holding the poultry for further processing; and
- e. simultaneously protecting said poultry and the poultry workers against respiratory illnesses by reducing the moisture content of poultry manure in said poultry houses and dispersing the odors therefrom.

4,681,065

**MULTIBED FLUIDIZED BED BOILER**

Jörgen Bergkvist, Finspong, Sweden, assignor to ASEA STAL Aktiebolag, Finspong, Sweden

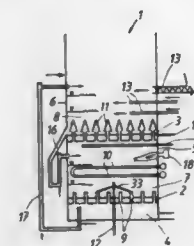
Filed Jun. 26, 1986, Ser. No. 879,052

Claims priority, application Sweden, Jun. 28, 1985, 8503222; Jan. 24, 1986, 8600311

Int. Cl.<sup>4</sup> B09B 3/00

U.S. Cl. 122—4 D

18 Claims



1. A method of operating a multibed fluid bed boiler having at least two fluidizable beds arranged one after the other, in which conventional fuel is supplied to the first bed and in which the combustion of this fuel takes place in the first bed and in at least the immediately following bed, comprising the steps of supplying an alternative fuel to the second bed in order to be burnt there, thus obtaining a simplified fuel feed to the

second bed as well as increased protection against clogging of nozzles supplying gas from the first bed to the second bed, and feeding flue gas from a following bed into the combustion space above the first bed for increasing the temperature and the fall of pressure across the nozzles supplying gas to the second bed in the event of low or no combustion in the first bed.

4,681,066

**BOILER FOR BOILING MASH OR WORT**

Martin Widhopf, Freising-Pulling, Fed. Rep. of Germany, assignor to Anton Steinecker Maschinenfabrik GmbH, Freising, Fed. Rep. of Germany

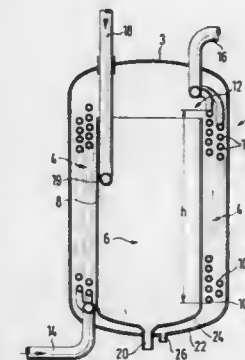
Filed Dec. 11, 1985, Ser. No. 807,667

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1985, 3501805

Int. Cl.<sup>4</sup> F22B 5/00

U.S. Cl. 122—234

4 Claims



1. A boiler for boiling mash or wort comprising an elongated upright cylindrical boiler body closed at the top and bottom, an internal cylindrical partition open at the top and extending around the interior of and spaced from the periphery of the boiler body dividing said body into an inner precipitation section and a surrounding outer heat exchange section, helical pipe conduit circling around the outer periphery of the internal partition in the heat exchange section of the boiler and extending over substantially the full height of the boiler with said partition being in coaxial relationship with said helical pipe conduit and the boiler body and extending over substantially the full height of said helical conduit, a supply conduit in the bottom of the boiler for supplying mash or wort to be heated to said helical conduit and a discharge conduit in the top of the boiler for discharging heated mash or wort from said helical conduit and means for supplying heated mash or wort to and for withdrawing precipitated mash or wort from said precipitation section of said boiler.

4,681,067

**LIQUID-COOLED ENGINE OF THE VERTICAL SHAFT TYPE**

Shinichi Tamba, Kakogawa; Miyake Hitomi, Kobe; Fukui Noboru, Kakogawa, and Akio Miguchi, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Jun. 11, 1986, Ser. No. 872,833

Claims priority, application Japan, Jun. 12, 1985, 60-127834; Jun. 13, 1985, 60-128911

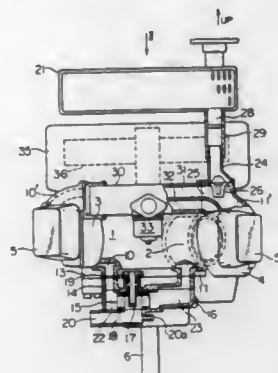
Int. Cl.<sup>4</sup> F01P 3/02

U.S. Cl. 123—41.1

4 Claims

1. In a liquid-cooled engine of the vertical shaft type including a radiator and a row of left and right side cylinders arranged in the V-shape as viewed from the above, wherein cooling water jackets of each of said left and right side cylinders are connected to each other at the highest end of cooling water jackets at the sides of cylinder heads of each of said

cylinders through a communicating passage, while a thermostat chamber is provided at the highest end of one of said cooling water jackets in said cylinder heads which is located



lower than the other cylinder head, said communicating passage being at its one end connected to said thermostat chamber.

4,681,068

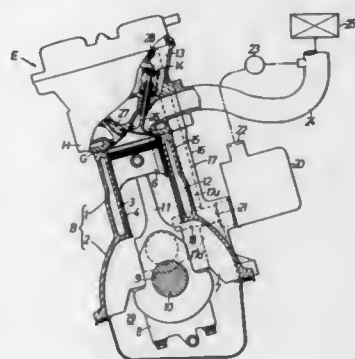
# BLOW-BY GAS PROCESSING ARRANGEMENT FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINES

Nobuo Anno, and Takeo Arai, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Dec. 12, 1985, Ser. No. 807,993

Claims priority, application Japan, Dec. 14, 1984, 59-263896  
Int. Cl.<sup>4</sup> F02M 25/06

U.S. Cl. 123-41.86

8 Claims



1. A blow-by gas processing arrangement for an internal combustion engine, comprising:

- a cylinder block having a chamber for collecting a blow-by gas, a blow-by gas passage communicating with said chamber, and a plurality of spaced journal walls for supporting a crankshaft;
- a relatively large oil mist separating passage defined in said cylinder block and laterally extending into one of said journal walls beyond said blow-by gas passage, said oil mist separating passage communicating with said blow-by gas passage for preliminarily separating an oil mist from the blow-by gas supplied from said chamber;
- an oil separator communicating with said oil mist separating passage for separating an oil mist from the blow-by gas supplied from said oil mist separating passage; and a PCV valve connected to said oil mist separator; and an intake manifold connected to said PCV valve.

4,681,069

# OVERHEAD CAMSHAFT ENGINE

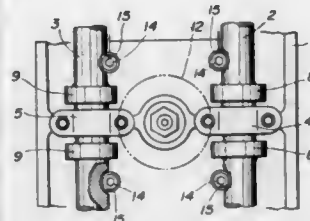
Masayuki Honma, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 18, 1985, Ser. No. 777,426

Claims priority, application Japan, Sep. 21, 1984, 59-198137  
Int. Cl.<sup>4</sup> F01L 1/46

U.S. Cl. 123-90.27

5 Claims



1. An overhead camshaft engine comprising:

- a cylinder block;
  - a cylinder head;
  - a fastening member for fastening said cylinder head to said cylinder block;
  - a valve reciprocally mounted in said cylinder head; and
  - a camshaft rotatably mounted over said cylinder head to control reciprocation of said valve;
- said camshaft being so arranged, with respect to a plan view, as to lap in part over said fastening member and formed with a peripheral cut at a portion where it laps over said fastening member to facilitate insertion and removal of said fastening member.

4,681,070

# SUCTION GAS HEATER CONTROL DEVICE FOR ENGINES

Norimitsu Kurihara, Wako; Masaaki Ozaki, Utsunomiya; Hiroshi Goto, Asaka, and Masahiko Asakura, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

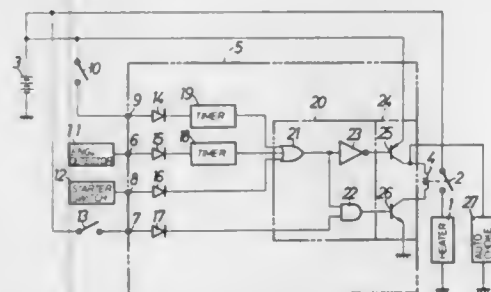
Filed May 28, 1985, Ser. No. 738,327

Claims priority, application Japan, May 28, 1984, 59-107940; May 28, 1984, 59-107941

Int. Cl.<sup>4</sup> F02M 31/12

U.S. Cl. 123-179 H

5 Claims



1. A suction gas heater control device for an engine comprising first detector means for detecting when the engine has attained a complete firing, and for providing a signal in response thereto; a first timer means coupled to an output of said first detector means for continuously providing, upon receipt of said signal, a first operating signal for a period of time which starts with the beginning of inputting of said signal from the first detector means and ends after a first predetermined period of time has elapsed from the stopping of inputting of said signal; second detector means for detecting engine temperature and for providing a second operating signal when the engine

temperature is lower than a predetermined level; and a judgement circuit means coupled to said first timer means and said second detector means for providing a signal for operating a suction gas heater when the first and second operating signals are applied thereto.

4,681,071

# METHOD AND APPARATUS FOR STARTING A DIESEL ENGINE AT A SUBFREEZING TEMPERATURE

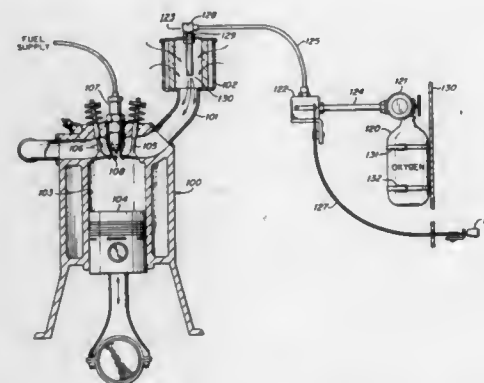
Robert J. Smith, 6N091 Denker Rd., St. Charles, Ill. 60174

Filed Dec. 5, 1985, Ser. No. 805,511

Int. Cl.<sup>4</sup> F02N 17/08

U.S. Cl. 123-180 R

22 Claims



1. Method of starting a glow-plug assisted diesel engine at a subfreezing temperature, said diesel engine having an intake manifold, comprising the steps of:

- delivering a flow of concentrated oxygen at a predetermined rate and a predetermined pressure to said intake manifold; and
- directing said concentrated oxygen flow directly into said intake manifold to fill said manifold with a predetermined amount of oxygen higher than the amount of oxygen in air available to said diesel engine for drawing said predetermined amount of oxygen into said diesel engine during an intake stroke of said diesel engine.

4,681,072

# METHOD AND APPARATUS FOR DISPOSAL OF TOXIC WASTES BY COMBUSTION

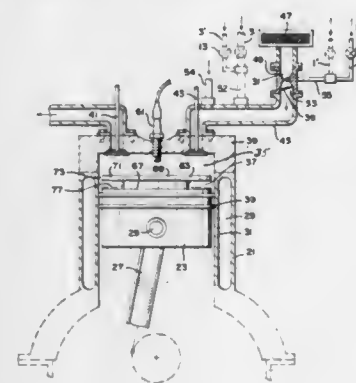
Andrew A. Pouring, Edgewater, Md., assignor to Sonex Research, Inc., Annapolis, Md.

Filed Nov. 25, 1985, Ser. No. 802,189

Int. Cl.<sup>4</sup> F02B 23/00

U.S. Cl. 123-193 P

13 Claims



1. A method for disposing of halogenated hydrocarbon

compounds in a piston type internal combustion engine which comprises:

- (a) introducing a mixture comprised of at least one halogenated hydrocarbon compound and a sufficient amount of air to provide an oxidizable vapor phase mixture into a combustion chamber of a piston type internal combustion engine, said combustion chamber having a variable volume primary chamber and a fixed volume secondary chamber, said fixed volume secondary chamber communicating with said variable volume primary chamber through a passageway therebetween and said fixed volume secondary chamber containing a source of carbon therein;
- (b) compressing and heating said vapor phase mixture by reducing the volume of said variable volume primary chamber;
- (c) igniting and burning the vapor phase mixture in said combustion chamber; and
- (d) discharging the combustion reaction products from said combustion chamber.

4,681,073

# FUEL INJECTION CONTROL VALVE

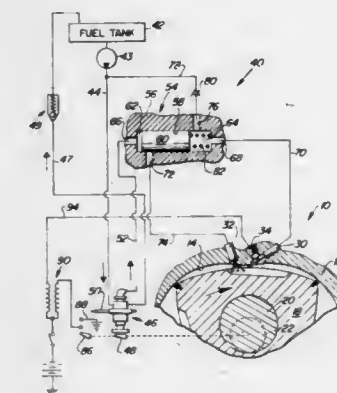
Bernard B. Poore, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Feb. 5, 1986, Ser. No. 826,458

Int. Cl.<sup>4</sup> F02B 53/10; F02M 45/02

U.S. Cl. 123-206

2 Claims



1. In a rotary combustion engine having first and second fuel injection nozzles, a fuel supply system comprising:

- a fuel tank;
- a supply pump with an inlet communicating with the fuel tank;
- an engine driven fuel injector pump; and
- a fuel supply valve comprising:
  - a housing defining a valve bore therein, a first inlet communicating the valve bore with the injector pump, a second inlet communicating the valve bore with the supply pump, a first outlet communicating the valve bore with the first nozzle and a second outlet communicating the valve bore with the second nozzle; and
  - a valve member movable in the valve bore and cooperating with a wall of the bore to define a first chamber communicated with the first outlet and a second chamber communicated with the second outlet, the valve member being movable in response to fluid pressure in the first chamber from a first position wherein communication between the first inlet and first outlet is closed to a second position wherein communication between the first inlet and first outlet is open, the valve member forcing fuel from the second chamber to the second nozzle via the second outlet as it moves from its first to its second position, the first inlet and the second outlet extending axially from opposite ends of the valve bore, and the first outlet and the second outlet extending axially from opposite ends of the valve bore.



inlet extending radially in the valve housing; and a resilient member biased to urge the valve member to its first position.

4,681,074

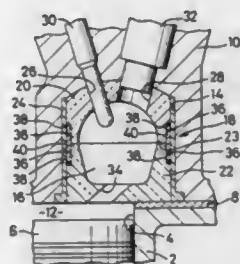
# STRUCTURE OF DIVIDED COMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINE

Yutaka Ogawa, Takayuki Ogasawara, and Shigeru Hanzawa, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan  
Filed Jun. 20, 1986, Ser. No. 876,419

Claims priority, application Japan, Jun. 24, 1985, 60-95515[U]  
Int. Cl.<sup>4</sup> F02B 19/16

U.S. Cl. 123-271

21 Claims



1. A structure defining a divided combustion chamber of an internal combustion engine, comprising an upper ceramic member, and a lower ceramic member having a transfer passage which communicates with a main combustion chamber of the engine, said upper and lower ceramic members meeting with each other at an interface to form therein said divided combustion chamber such that the divided combustion chamber communicates with said main combustion chamber through said transfer passage, wherein the improvement comprises:

said upper and lower ceramic members having cutouts formed respectively in outer surfaces thereof, said cutouts cooperating to constitute at least one external recess which extends across said interface so as to bridge adjacent portions of said upper and lower ceramic members; an expansion member fitted in each of said at least one external recess, and formed of a heat resistant material which has a larger coefficient of thermal expansion than said upper and lower ceramic members, said expansion member thermally expanding relative to said upper and lower ceramic members at an operating temperature of said engine, and thereby keeping said upper and lower ceramic members in spaced-apart relation with each other, with a predetermined amount of air gap at said interface during an operation of said engine.

4,681,075

# IDLING SPEED FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Akihiro Yamato, Shiki, Yuzuru Kolke, and Kyoze Futa, both of Utsunomiya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,749

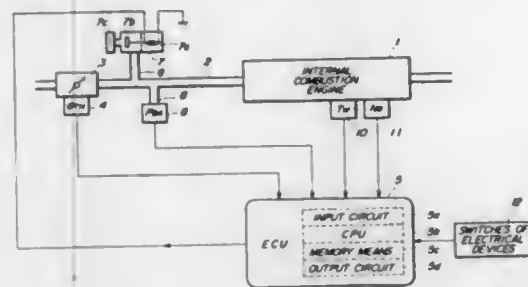
Claims priority, application Japan, Oct. 15, 1984, 59-214216  
Int. Cl.<sup>4</sup> F02D 41/16

U.S. Cl. 123-339

12 Claims

1. A method of controlling the operating amount of a control valve for regulating the quantity of supplementary air being supplied to an internal combustion engine, in a feedback manner responsive to the difference between a desired idling speed and an actual engine speed, while said engine is in a predetermined idling region, said engine having an intake passage, a throttle valve arranged in said intake passage, and an air passage having one end communicating with said intake passage at a location downstream of said throttle valve and another end with the atmosphere, respectively, said control

valve being arranged in said air passage, said supplementary air being supplied to said engine through said air passage and said intake passage, the method comprising the steps of: (a) detecting a temperature of said engine; (b) detecting the decreasing rate of the rotational speed of said engine when said engine is decelerating with said throttle valve fully closed in a predetermined decelerating region immediately preceding said prede-



termined idling region; (c) correcting a basic value of the operating amount of said control valve based upon the detected temperature of said engine and the detected decreasing rate of the rotational speed of said engine; and (d) starting the feedback control by applying said basic value of the operating amount of said control valve thus corrected as an initial value thereof, when said engine is further decelerated into said predetermined idling region.

4,681,076

# ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hans-Martin Müller, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

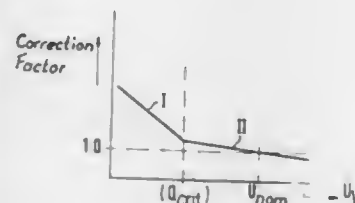
Filed Dec. 13, 1985, Ser. No. 809,012

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445414

Int. Cl.<sup>4</sup> F02D 41/04

U.S. Cl. 123-488

5 Claims



1. An electronically controlled fuel injection system for an internal combustion engine comprising:  
at least one solenoid valve for metering fuel to the engine;  
an electrically-operated fuel pump for pumping fuel to said solenoid valve;  
supply voltage means for supplying a supply voltage to said solenoid valve and said fuel pump;  
signal generating means for generating fuel injection signals in dependence upon operating characteristic quantities such as load and rotational speed, said fuel injection signals being determinative of the duration of injection;  
said signal generating means including means for effecting a correction of said fuel injection signals with reference to the dependency of said solenoid valve on said supply voltage;  
a pressure regulator for regulating the pressure of the fuel pumped by said pump to said solenoid valve when said pressure is above a predetermined value; and  
said signal generating means further including means for

generating a correction signal related to the quantity of fuel pumped by said fuel pump with respect to the supply voltage, the reaction of said pressure regulator when the pressure of said fuel drops below said predetermined value, and the pressure of the fuel at said solenoid valve as a further correction of said fuel injection signals as a function of said supply voltage so as to adjust said duration of injection to ensure that the quantity of fuel metered to the engine is adequate to maintain the required amount of fuel according to said operating characteristic quantities.

4,681,077

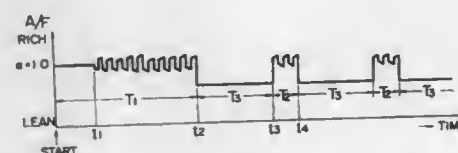
# AIR-FUEL RATIO CONTROLLING METHOD AND APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Haruhiko Kobayashi, Ibaraki, and Tadahiko Otani, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Jan. 18, 1985, Ser. No. 692,572

Claims priority, application Japan, Jan. 20, 1984, 59-7202  
Int. Cl.<sup>4</sup> F02D 41/14

U.S. Cl. 123-489

2 Claims



1. In a method of controlling an air-fuel ratio for an engine having a plurality of first sensors for detecting an operating condition of the engine; a second sensor for detecting a condition of exhaust gas produced by the combustion of the fuel in a combustion chamber; arithmetic means for determining a control value for attaining a desired air-fuel ratio of a fuel-air mixture to be supplied to the combustion chamber of the basis of the outputs of the first sensors and the second sensor; a drive circuit for producing a control signal in response to the output of the arithmetic means; and air-fuel ratio control means for controlling an air-fuel ratio of the mixture in accordance with the output of the drive circuit;

said method comprising:

a first step of detecting the outputs of said first and second sensors;  
a second step for determining a first control value for attaining such a first air-fuel ratio of the mixture that assures a desired air-fuel ratio in said combustion chamber, based on the outputs of said first and second sensors, and for applying data representing the determined first control value to said drive circuit;

a third step for determining a second control value for attaining a second air-fuel ratio of the mixture which is lean by a predetermined ratio than the first air-fuel ratio, and for applying data representing the second control value to said drive circuit, wherein said second step and third step are executed alternately in a manner that said first and second steps are repeated for a first predetermined period and thereafter said first and third steps are repeated for a second predetermined period;

wherein said arithmetic means determines a fuel injection period for one suction stroke of the combustion chamber as said first control value on the basis of said first and second sensors, said air-fuel ratio control means is fuel injection valve means for injecting fuel for the fuel injection period represented by the output of said drive circuit in response thereto, said second sensor is a  $\lambda$  sensor, said second step determines such a first basic fuel injection period on the basis of the output of said second sensor that assures a stoichiometric air-fuel ratio of the mixture in the combustion chamber, and corrects the first basic fuel injection period on the basis of the outputs of said second sensors, and apply data representing the corrected first

basic fuel injection period as the first control value to said drive circuit, and said third step determines such a second basic fuel injection period on the basis of the outputs of said first sensors that assures an air-fuel ratio of the mixture to be lean by said predetermined ratio than said first air-fuel ratio, and corrects the second basic fuel injection period on the basis of output of said first sensors, and apply data representing the corrected second basic fuel injection period as the second control value to said drive circuit, said first predetermined period being shorter than said second predetermined period;

wherein said third step determines an average value of the first basic fuel injection periods obtained in said second steps performed in said first predetermined ratio; and wherein only said first and second steps are performed until a predetermined time elapses after the start of the engine, after the warming up operation of the engine ends.

4,681,078

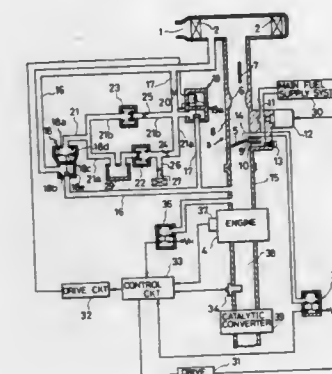
# AIR-FUEL RATIO CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kunio Noguchi, Wako; Atsushi Totsumi, Hoya; Koji Kajita, Niiza, and Takefumi Hosaka, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed May 22, 1985, Ser. No. 736,735

Claims priority, application Japan, May 25, 1984, 59-106216  
Int. Cl.<sup>4</sup> F02M 7/00

U.S. Cl. 123-490

2 Claims



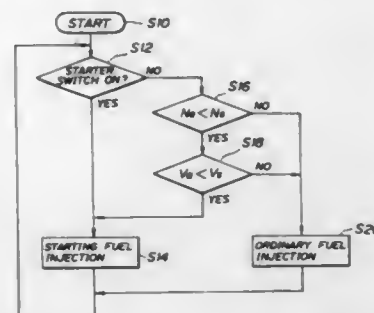
1. An air-fuel ratio control system which is operative to control the air intake side secondary air supply for an internal combustion engine having a fuel supply system including a carburetor with a slow speed fuel supply circuit which opens into an intake passage at a position near a throttle valve in the engine when said throttle valve is substantially fully closed, said control system including a feedback control means in which air intake side secondary air is supplied to the carburetor, on the downstream side of the throttle valve, in response to a result of a detection of an air-fuel ratio by means of an oxygen concentration sensor which senses the oxygen concentration of an exhaust gas of the engine, said control system further including control means for actuating said feedback control means to perform an air-fuel ratio control of air intake side secondary air supply and for substantially eliminating the operation of said slow speed fuel supply circuit of the fuel supply system in response to the result of the detection of the air-fuel ratio, under a high load operating condition of the engine in which the magnitude of the vacuum in said intake passage on the downstream side of the throttle valve is low.

4,681,079

**METHOD OF CONTROLLING FUEL INJECTION**  
 Keisuke Kaneta, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan  
 Filed Dec. 23, 1985, Ser. No. 812,153  
 Claims priority, application Japan, Jan. 25, 1985, 60-11095  
 Int. Cl.<sup>4</sup> F02D 41/06

U.S. Cl. 123-491

3 Claims



1. A method of fuel injection control for an internal combustion engine in a vehicle, comprising the steps of: performing starting fuel injection during starting of the engine; and

thereafter monitoring the rotating speed of the engine and the velocity of the vehicle, and:

A. performing starting fuel injection when the engine speed is less than predetermined speed and the vehicle velocity is simultaneously less than a first predetermined velocity, and then continuing to perform starting fuel injection so long as the engine speed is less than said predetermined speed and said vehicle velocity is simultaneously less than a second predetermined velocity slightly greater than said first predetermined velocity;

B. performing fuel injection in an ordinary manner whenever the engine speed is greater than or equal to said predetermined speed; and

C. performing fuel injection in an ordinary manner when the vehicle velocity is greater than or equal to said second predetermined velocity, and then continuing to perform fuel injection in an ordinary manner so long as the vehicle velocity is greater than or equal to said first predetermined velocity.

4,681,080

**DEVICE FOR THE TEMPORARY INTERRUPTION OF THE PRESSURE BUILD-UP IN A FUEL INJECTION PUMP**

Bruno Schuboff, Graz, Austria, assignor to A V L Gesellschaft für Verbrennungskraftmaschinen und Messtechnik mbH Prof. Dr. Dr. h.c. Hans List, Graz, Austria

Filed Nov. 21, 1985, Ser. No. 800,405

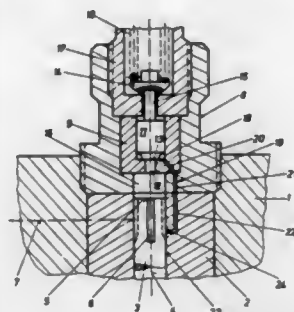
Claims priority, application Austria, Nov. 23, 1984, 3721/84  
 Int. Cl.<sup>4</sup> F02M 45/10

U.S. Cl. 123-506

2 Claims

1. A device for the temporary interruption of the pressure build-up in a fuel injection pump for internal combustion engines, said pump comprising a pump plunger, a cylinder wall and a hollow guiding part having a wall at one end defining a pressure chamber together with said plunger and said cylinder wall, said guiding part wall having an inlet port in communication with said pressure chamber, a stop at an opposite end of said guiding part, a pressure relief body received within said guiding part for limited sliding movement between said stop and said guiding part wall, a spring acting against said body for imparting a pre-loading force to said body against the pressure of the fuel entering from said pressure chamber through said inlet port, said body having a reduced end at said one end of said guiding part, said reduced end defining an expansion space together with said guiding part which is accessible after a given pressure level is reached, a separate by-pass line in said

guiding part leading from said expansion space for depressurizing said space, a by-pass opening in said cylinder wall leading from said by-pass line, said by-pass opening being intermit-



tently covered by said plunger, and said plunger having control edges cooperating with said by-pass opening which is left open by said edges in an injection-free phase.

4,681,081

**SPLIT VAPOR/LIQUID FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES**

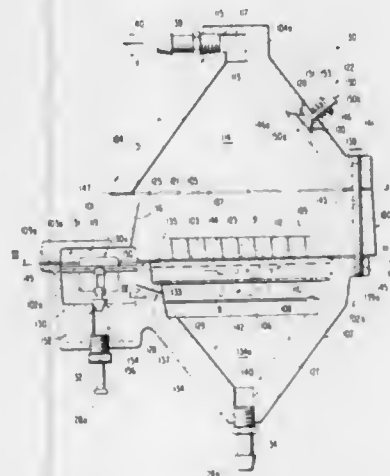
Theodore T. LaPan, 2687 Kings Mill Dr., P.O. Box 792, Marlon, Ohio 43302

Filed May 6, 1986, Ser. No. 860,388

Int. Cl.<sup>4</sup> F02M 17/22

U.S. Cl. 123-522

11 Claims



1. A split vapor/liquid fuel supply system for an internal combustion engine having: an intake manifold leading to at least one combustion chamber, a fuel tank holding a liquid hydrocarbon fuel supply, a carburetor connected to the fuel supply for feeding fuel to the engine, air supply means for supplying engine intake air to the carburetor for mixing with the fuel, the improvement comprising: a partial fuel vaporizer connected intermediate of the fuel tank and the carburetor, the partial fuel vaporizer including a housing defining a lower liquid fuel chamber, an upper vapor expansion chamber and a heat transfer plate separating said chambers and having small diameter holes therethrough, means for maintaining liquid hydrocarbon fuel within said liquid fuel chamber at a level beneath said perforated heat transfer plate, means for permitting ambient air to enter said liquid fuel chamber beneath the level of said liquid fuel therein for percolation therethrough, means connecting the vapor expansion chamber to the air supply means of the carburetor, upstream of the carburetor

whereby light hydrocarbon fuel components in vapor form are created by vacuum pressure within the vapor expansion chamber causing air to enter the liquid fuel chamber and percolate therethrough and to expand bubbles of air passing through the heat transfer plate bearing fuel in vapor form for mixing with the main intake air stream prior to its passage through the carburetor to provide an increased time factor of air/fuel mixing with the result being less liquid fuel needed by the engine, an increase in the speed of the flame front within the combustion chamber, an increase in portions of the fuel burned during the power stroke of the engine and less fuel waste during the engine exhaust stroke.

4,681,082

**IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE**

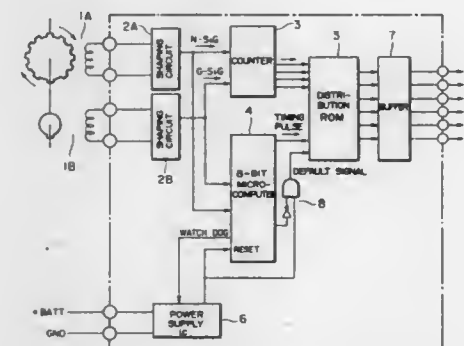
Nobuyoshi Onogi, and Mamoru Shimamoto, both of Nagoya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan  
 Filed Apr. 24, 1985, Ser. No. 726,464

Claims priority, application Japan, May 2, 1984, 59-88891

Int. Cl.<sup>4</sup> F02P 1/00

U.S. Cl. 123-643

3 Claims



1. An ignition control system for an internal combustion engine, comprising:

means for detecting engine operating conditions to produce operating condition signals indicative thereof at predetermined intervals of engine crank angle;

means for computing engine ignition timing in response to the operating condition signals to produce an ignition timing deciding signal;

means for selectively distributing an ignition timing signal to engine cylinders in response to the operating condition signals and the ignition timing deciding signal, including counter means for counting the predetermined interval signals to produce count output signals, and read-only memory means, having address input terminals and output terminals, for: (1) receiving the count output signals and the ignition timing deciding signal, (2) having data present at locations therein corresponding to the signals, (3) reading out a cylinder data corresponding to the received count output signal, and (4) distributing the ignition timing signal through one of the output terminals thereof to a corresponding one of the cylinders, which one cylinder corresponds to the read out cylinder data;

reference position sensor means for generating a reference position signal at a specific angular position per every two revolutions of the engine; and

angular position sensor means for generating angular signals, equal in number to an integral multiple of a number of the cylinders, per every two revolutions of the engine, wherein said counter means is cleared by said reference position signal to count angular signals of said angular position sensor means

wherein said read-only memory means includes data which produces the ignition timing signal through one of the output terminals for the distribution to the corresponding

cylinder in response to the ignition timing deciding signal for said computing means, and includes data which stops the produced ignition timing signal after a given number of the counting operations of said counter means.

4,681,083

**PORTABLE COOKING, TOASTING, ROASTING, AND CARBONADO HEATING DEVICE**

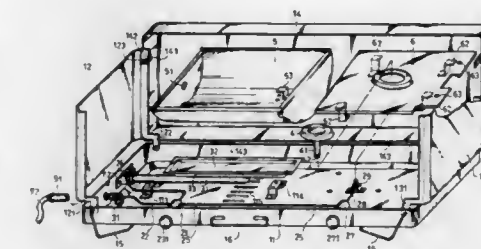
Brandon Shu, Taipei, Taiwan, assignor to High Brandon Incorporated, Taipei, Taiwan

Filed Jul. 7, 1986, Ser. No. 882,395

Int. Cl.<sup>4</sup> F24C 1/16

U.S. Cl. 126-9 R

1 Claim



1. A portable device for cooking, toasting, roasting, and carbonado heating, comprising:

an oven body having a bottom wall, two opposing side walls, a front wall, and a back wall, said bottom wall having a plurality of vent holes therethrough;

an intake duct connected into one of the side walls of the oven body;

a three-way throttle control valve means installed in the front wall of the oven body;

a fuel guide duct connected between the intake duct and the control valve means;

a mixing valve fixed into one of the side walls of the oven body;

a first pipe extending from the control valve means to the mixing valve;

a first burner secured to the bottom wall of the oven body;

a second pipe extending from the control valve means to the burner;

a relatively flat facing plate provided around the burner;

a semicylindrical toasting tank fitted to the bottom wall of the oven body and having top edges;

a tubular burner secured at one end to the mixing valve and extending into the toasting tank;

a pan fitted inside the toasting tank and extending over the tubular burner;

a grill centrally sunk in the toasting tank and resting on the top edges of said toasting tank;

an oblong gridwork extending over both the grill and the facing plate;

two siding plates arranged above the two opposing side walls of the oven body;

a cover hinged to the back wall of the oven body;

fastener means, secured to both the two siding plates and the cover, for retaining the siding plates and the cover in a joined upstanding position;

a handle means, fixed to the front wall of the oven body, for carrying the portable device; and

snap fastener means, secured in and extending from the front wall to the back wall of the oven body, for serving as legs for the portable device in an open condition when the two siding plates and the cover are in the upstanding position and for serving as securement means for retaining the portable device in a closed condition when the two siding plates and the cover are collapsed out of their upstanding position.



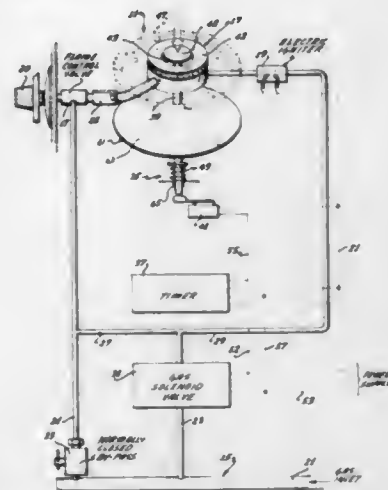
4,681,084

**BURNER CONTROL SYSTEM**

Leonard Grech, Capistrano Beach, Calif., assignor to George Catsouras, Laguna Niguel, Calif., a part interest  
Continuation-in-part of Ser. No. 738,253, May 28, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 913,073  
Int. Cl.<sup>4</sup> F24C 3/12

U.S. Cl. 126—52

18 Claims



1. A burner control system for use with a gas stove having at least one burner and a gas supply conduit for supplying gas to the burner, said burner control system comprising:

a solenoid valve in said conduit for controlling the main flow of gas to the burner, said solenoid valve having an open position in which it permits gas flow therethrough to the burner and a second position in which it reduces gas flow therethrough the burner;

sensing means for providing a first signal when a utensil is on the burner and a second signal when no utensil is on the burner;

said sensing means including a switch having first and second states for providing said first and second signals, respectively, and an actuator rod extending between the burner and the switch, said switch being normally in said second state and said actuator rod being engageable and movable by a utensil on the burner to move said switch to said first state to provide said first signal;

circuit means responsive to the first signal to move the solenoid valve to the open position whereby gas can be supplied to the burner and responsive to said second signal to move the solenoid valve to the second position whereby gas flow through the solenoid valve to the burner is reduced;

said switch being below said burner;

a shield mounted on the actuator rod for movement therewith and interposed between the switch and the burner; and

mounting means located entirely beneath said shield and slidably cooperating with the actuator rod for mounting the actuator rod for movement.

9. A burner control system for use with a gas stove having at least one burner and a gas supply conduit for supplying gas to the burner, said burner control system comprising:

a solenoid valve in said conduit for controlling the main flow of gas to the burner, said solenoid valve having an open position in which it permits gas flow therethrough to the burner and a second position in which it reduces gas flow therethrough the burner;

sensing means for providing a first signal when a utensil is on the burner and a second signal when no utensil is on the burner;

said sensing means including a switch having first and second states for providing said first and second signals, respectively, and an actuator rod extending between the

burner and the switch, said switch being normally in said second state and said actuator rod being engageable and movable by a utensil on the burner to move said switch to said first state to provide said first signal;

circuit means responsive to the first signal to move the solenoid valve to the open position whereby gas can be supplied to the burner and responsive to said second signal to move the solenoid valve to the second position whereby gas flow through the solenoid valve to the burner is reduced;

said switch being below said burner;

a shield assembly including a first shield interposed between the burner and the switch for shielding the switch from the burner;

said actuator rod extending through said first shield and being movable with respect to the first shield to move said switch; and

said shield assembly including a second shield interposed between the burner and the first shield for shielding regions of the actuator rod and the first shield.

13. A gas stove comprising:

at least one burner;

a gas supply conduit for supplying gas to the burner;

a manually operable gas valve for controlling the flow of gas through the supply conduit to the burner;

a solenoid valve for controlling the flow of gas to the burner, said solenoid valve having an open position in which it permits gas flow therethrough to the burner and a closed position in which it substantially prevents gas flow therethrough to the burner;

sensing means for providing a first signal when a utensil is on the burner and a second signal when no utensil is on the burner;

circuit means responsive to said first signal to move the solenoid valve to the open position whereby gas can be supplied to the burner and responsive to said second signal to move the solenoid valve to the closed position whereby gas flow through the solenoid valve to the burner is substantially prevented; and

time delay means responsive to said second signal for moving the solenoid valve to said closed position a predetermined time after the utensil is removed from the burner.

4,681,085

**HIGH CONDENSING RECUPERATIVE FURNACE**

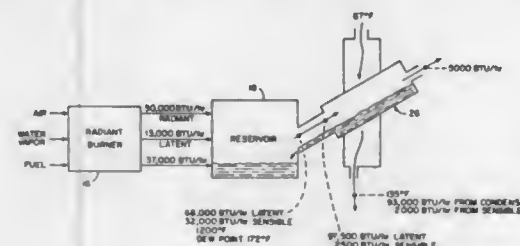
Lawrence G. Clawson, Dover, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 761,636, Aug. 1, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 900,260

Int. Cl.<sup>4</sup> F24H 3/02

U.S. Cl. 126—110 R

3 Claims



1. A method for heating fluid in a furnace comprising the steps of:

(a) providing a recuperative heat exchanger having at least one conduit which is generally continuously upwardly directed from an inlet end to an outlet end;

(b) locating a burner proximate said inlet end for introducing hot combustion gases into said inlet;

(c) locating reservoir means under said inlet and adjacent said burner;

(d) providing means for contacting said heat exchanger with a fluid to be heated;

(e) operating said contacting means; and

(f) operating said burner at a given heat output level where said fluid cools said hot combustion products such that a substantial majority of the water vapor in said combustion products condenses within said heat exchanger, wherein a steady state cycle of condensation and evaporation is maintained where condensate flows back downward said at least one conduit into said reservoir at the same said heat output from said burner re-evaporates condensate in said reservoir means and in said at least one conduit for subsequent condensing in said at least one conduit.

4,681,086

**VIEWING INSTRUMENT FOR CHIMNEY**

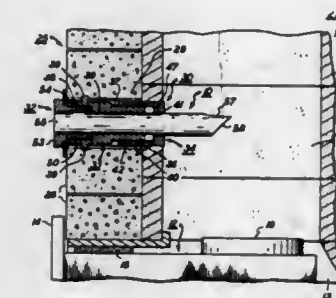
Frederic D. Van Patten, RD 1, Stock Rd., Hannibal, N.Y. 13074  
Division of Ser. No. 747,870, Jun. 24, 1985, Pat. No. 4,612,508.

This application Jun. 2, 1986, Ser. No. 869,330

Int. Cl.<sup>4</sup> F24B 1/18

U.S. Cl. 126—120

8 Claims



1. Apparatus for visually monitoring the vent of a chimney while the chimney is drawing exhaust gases through a flue entrance that includes

a hollow barrel unit sealed within a horizontal receiving opening passing through a wall of the chimney above the flue entrance, said barrel unit further having an adjusting means for changing the axial length of the unit whereby the barrel unit can be fitted to the chimney wall, mounting means removably joined to the outer end of said barrel unit to provide an airtight seal therebetween, an elongated quartz rod contained within the mounting means that passes through the barrel unit into the chimney vent,

said rod having an upper light entrance face horizontally disposed at the free end thereof for receiving light from the chimney vent, a reflecting surface immediately below the light entrance face for directing entering light axially along the rod and a light exit face perpendicular to the axis of the rod which is located outside the chimney.

4,681,087

**WOODKILN COMBUSTION DEVICE**

John G. Meeker, Deans Bridge Rd., Somers, N.Y. 10589

Filed May 1, 1986, Ser. No. 858,419

Int. Cl.<sup>4</sup> F24C 15/30

U.S. Cl. 126—126

17 Claims

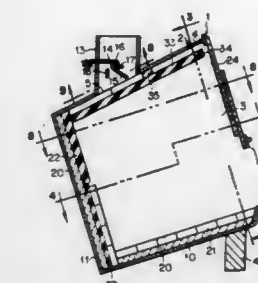
1. A wood burning device comprising:

(a) top, back, side and bottom members and front edge members connected together to define a box and a combustion chamber therein, having an open front and said bottom member providing means for supporting fuel to be burned in the combustion chamber;

(b) ceramic glass front connected to the front edge members, said front having

(1) an upper part fixed to the front edge member to close the top front of the box, and

(2) a lower part mounted for sliding movement between a closed position closing the bottom front of the box to one or more open positions overlying the upper part to provide an access opening in the lower front of the box



(c) means for supporting the box with the front facing upwardly at an acute angle to the horizontal;

(d) an air induction means for supplying air into said combustion chamber and associated with one of said members; and

(e) an exhaust opening on the top member of the box for exhausting the interior of the combustion chamber.

4,681,088

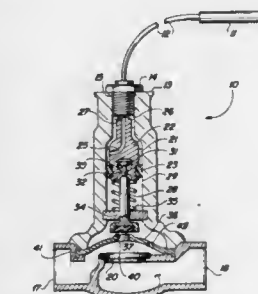
**FREEZE PROTECTION VALVE FOR SOLAR HEATERS**  
Charles J. Cromer, 460 Indian Creek Dr., Cocoa Beach, Fla. 32931

Filed Mar. 24, 1986, Ser. No. 843,206

Int. Cl.<sup>4</sup> F24J 2/40; F16K 31/44

U.S. Cl. 126—420

3 Claims



1. A solar heater freeze protection valve apparatus comprising in combination:

a valve housing;

a remote sensor operatively connected to the valve housing from a remote position, the remote sensor including a bulb containing a liquid adapted to compress and expand with the temperature adjacent the bulb;

a piston located in the valve body and slidable therein responsive to expansion and contraction of the liquid in the remote sensor;

a first valve element located in the valve housing and attached to the valve piston for movement therewith;

a second valve element located in the valve housing and attached to the housing;

a first valve seat in said second valve element forming an opening therethrough;

a second valve seat positioned in a water passageway to allow the flow of fluid therethrough when the second valve element is in an open position and to cut off the flow of fluid therethrough when the second valve element is in a closed position, whereby liquid in a solar heater can flow at predetermined temperature readings; and

said second valve element being biased in one direction and having a second opening therethrough to increase the pressure therebehind when said first valve element closes on the first valve seat and the second valve element closes on the second valve seat.

4,681,089

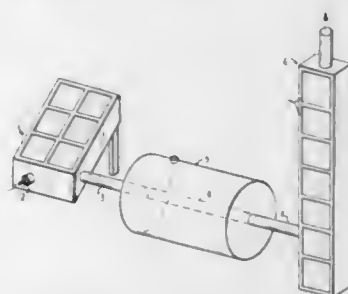
### CONVECTION POWERED SOLAR HEATER FOR WATER TANKS

Louis R. O'Hare, 7425 N. Mona Lisa Rd. #156, Tucson, Ariz. 85741

Filed Apr. 6, 1981, Ser. No. 250,943  
Int. Cl.<sup>4</sup> F23J 3/02

U.S. Cl. 126-434

9 Claims



#### 1. A passive solar water tank heater comprising:

- (1) a solar air heater in the form of a black box solar collector having an inlet port to receive ambient air as well as exit ducting by which it is placed in fluid flow communication with
- (2) a heat exchanging means in the form of a pipe extending through water in a water tank thereby conducting to the water heat from air circulating in the pipe, which air is being drawn through said heat exchanging means by an energetic draft from
- (3) a draft production means comprising a solar heated black box collector in the form of a column having an air exit port on top and an air inlet duct on the bottom, with said top port being so elevated in height over the lower inlet duct as to cause to form within said collector a column of upward convecting air and thereby to produce a low pressure area within at its base, and said draft producing means both of such a vertical length as to provide an air column sufficiently long and energetic as to produce a draft at its base sufficient to draw even hot air some distance downward and of sufficient energy as to be capable of drawing a current of air through the heat exchanging means from the solar air heater means to thereby provide an open cycle air circulation in which the heat exchanging means is intermediate in a serial series fluid flow communication between the solar air heater and the draft production means and in which the heated air heated in the solar air heater is drawn into thermal communication with the heat exchanging means to heat the water and in which said draft production means, in the form of a black box collector, is a long rectangular black box collector disposed with its length extending vertically in such a manner that air entering the inlet duct at its base is heated by solar energy and rises upward in a convection column to exit through the exit port on the top.

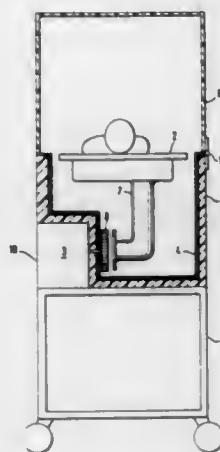
4,681,090  
**INCUBATOR FOR PREMATURES AND NEWBORNS**  
Joachim Koch, Hollenbek, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Feb. 3, 1986, Ser. No. 825,328  
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1985, 3503418

Int. Cl.<sup>4</sup> A61G 11/00

U.S. Cl. 128-1 B

3 Claims



1. An incubator for premature and newborn infants comprising:
  - a base wall and mutually adjacent side walls extending upwardly from said base wall;
  - a transparent hood mounted on said side walls to conjointly define a compartment with said base wall and said side walls for accommodating the infant therein;
  - at least a portion of said base wall being configured to define an enclosure outside of said compartment;
  - conditioning means mounted in said enclosure for conditioning the air supplied to said compartment;
  - a removable insert liner complementally configured to the inside surface of said base wall and said side walls and extending over the surface of said walls inside of said compartment so as to separate said walls and said enclosure from the air within said compartment; and,
  - a support for the infant removably mounted in said housing so as to facilitate removal of said insert liner.

4,681,091

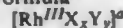
**COMBINATION MODALITY CANCER THERAPY**  
Donald H. Picker, 310 Woodside Ave., Narberth, Pa. 19380, and Paul C. Hydes, 13 Woodlands Grove, Caversham, Reading, Berkshire, RG4 0NB, United Kingdom  
Continuation-in-part of Ser. No. 637,556, Aug. 3, 1984, abandoned. This application Nov. 27, 1985, Ser. No. 802,232

Int. Cl.<sup>4</sup> A61B 19/00

U.S. Cl. 128-1 R

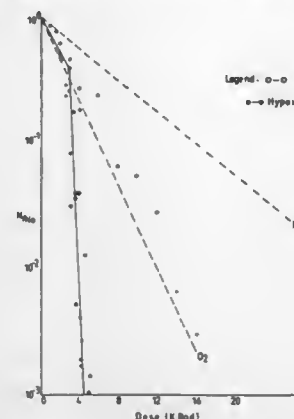
4 Claims

1. A pharmaceutical composition comprising an effective amount of a coordination compound having the general empirical formula



in which X is at least one anionic ligand, Y is at least one neutral ligand, with the proviso that at least one of X and Y is a nitrogen donor ligand, x is an integer from 1 to 6, y is an

integer from 1 to 5 or may be equal to zero, and a is a positive or negative integer from -3 to +3 or may be equal to zero, in



association with a pharmaceutically-acceptable carrier, diluent or excipient therefor.

4,681,092

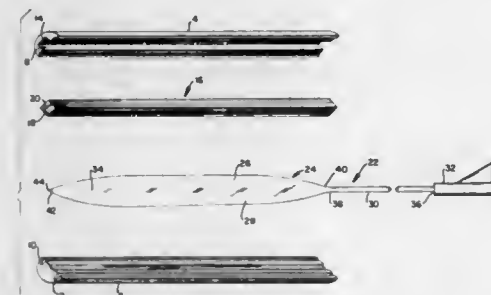
**BALLOON CATHETER WRAPPING APPARATUS**  
George E. S. Cho, Natick, and Stephen B. Kessler, Gloucester, both of Mass., assignors to Kontron Inc., Everett, Mass.

Filed May 21, 1985, Ser. No. 736,598

Int. Cl.<sup>4</sup> A61B 19/00; A61M 25/00

U.S. Cl. 128-1 D

36 Claims



1. An apparatus for wrapping a balloon catheter having a balloon membrane attached to a catheter tube comprising:
  - (a) a housing having a channel to receive at least a portion of the balloon membrane of the balloon catheter; and
  - (b) displaceable clutching means, at least a portion of which being located and positioned in the channel and functioning as follows: (i) during wrapping, engaging and being displaced by the balloon membrane to exert predetermined pressure on the balloon membrane to aid in the wrapping of the balloon membrane as the wrapping apparatus is rotated relative to the balloon catheter yet, and (ii) after wrapping, permitting relatively free rotation of the balloon membrane within the channel.

4,681,093

### ENDOSCOPE

Kimizo Ono, and Akira Nishimura, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan  
Filed Dec. 12, 1983, Ser. No. 560,104

Claims priority, application Japan, Dec. 13, 1982, 57-188287[U]; Dec. 13, 1982, 57-188288[U]; Jan. 19, 1983, 58-7966[U]

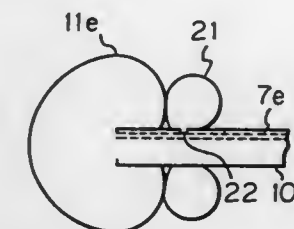
Int. Cl.<sup>4</sup> A61B 1/06

U.S. Cl. 128-6

17 Claims

1. An endoscope for image-observing or measuring an area filled with an opaque liquid comprising:

an image fiber;  
a lens positioned at the leading end of said image fiber;  
a light guide arranged in parallel to said image fiber;  
a transparent fluid transport passage arranged in parallel to said image fiber and light guide and having an outlet at the leading end thereof;  
a sheath enclosing said image fiber, lens, light guide and transparent fluid transport passage;  
means for providing a field of vision at the leading end of said endoscope by a transparent fluid from said outlet of said transparent fluid transport passage; and  
stabilizing means provided on the leading end portion of said sheath for stabilizing said field of vision formed by said field of vision providing means



said field of vision providing means including a transparent balloon provided at the leading end of said endoscope encircling said lens, the leading end of said light guide and the outlet of said transparent fluid transport passage and being inflatable by the transparent fluid from said opening; said stabilizing means including a substantially cylindrical balloon support means formed of a resilient material and provided at the leading end of said endoscope so as to encircle the joint portion of said balloon, said balloon support means in response to inflation of said balloon, being gradually expanded in a direction from a trailing end toward a leading end thereof for supporting the balloon joint portion when said balloon is inflated.

4,681,094

### BALLOON LARYNGOSCOPE

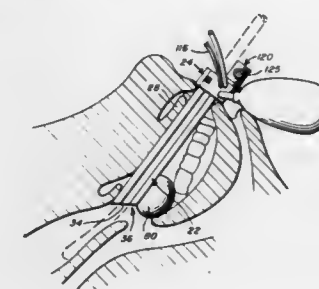
Michael A. Rulnick, Chevy Chase, Md., assignor to American Medical and Emergency Research Corporation, Chevy Chase, Md.

Filed Nov. 27, 1985, Ser. No. 802,356

Int. Cl.<sup>4</sup> A61B 1/26

U.S. Cl. 128-10

34 Claims



1. A laryngoscope comprising a blade unit, said blade unit including a distal leading end and a proximal handling end, an elongate tubular passageway defined through said blade unit for selective reception of an endotracheal tube therethrough, said tubular passageway opening through said distal and proximal ends, said blade unit having opposed first and second longitudinal outer surfaces respectively engageable with the tongue and mouth roof of a patient, said second surface includ-



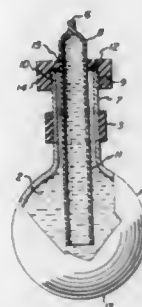
ing an inflatable positioning balloon along a portion thereof rearward from said distal end, and means for selectively inflating said balloon for outward expansion of said balloon into pressure engagement against a mouth roof thereby providing a fulcrum for movement of the first surface toward and against an opposed tongue and for simultaneous establishment of an airway and visual path to the trachea while precluding significant dental contact forces.

4,681,095

**PORTABLE DEVICE FOR SKIN MASSAGE BY COLD**  
Raymond Bostemps, 5 Rue Edouard DeValle, Paris, France  
Continuation of Ser. No. 681,235, Dec. 13, 1984, abandoned.  
This application Jan. 9, 1986, Ser. No. 873,833  
Claims priority, application France, Dec. 19, 1983, 83 20273  
Int. Cl.<sup>4</sup> A61H 7/00

U.S. Cl. 128—24.1

5 Claims



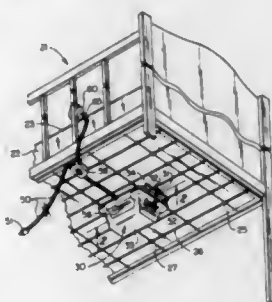
1. A skin massager comprising:  
a glass flask having upper and lower integral portions, said lower portion being substantially spherical and terminating in an upper portion said upper portion being cylindrical; said flask being substantially completely filled with a liquid capable of being maintained as a liquid at  $-20^{\circ}\text{C}.$ ; an annular insulating collar coaxially disposed about a portion of said upper portion; and  
closure means including a flexible teat affixed to said upper portion;  
said teat being completely filled with said liquid during use and having a soft tip for massaging the skin.

4,681,096

**METHOD AND APPARATUS FOR THERAPEUTIC MOTION AND SOUND TREATMENT OF INFANTS**  
Armando A. Cuervo, 737 Autumn Branch Rd., Westerville, Ohio 43081  
Continuation-in-part of Ser. No. 553,317, Nov. 18, 1983, abandoned, and a continuation-in-part of Ser. No. 712,561, Mar. 15, 1985, abandoned. This application Apr. 4, 1986, Ser. No. 848,454  
Int. Cl.<sup>4</sup> A61H 1/00

U.S. Cl. 128—33

11 Claims



1. An apparatus for soothing and pacifying, specifically an

infant suffering from colic, said apparatus adapted to be supported on a support means such as an infants crib, and comprising in combination:

- a means for imparting a rhythmic cyclic motion of displacement to the support means, the frequency of displacement being between about twenty-five and about forty-three cycles per second and the amplitude of the displacement between being about one hundredth and about one eighth of an inch; and
- a means for, selectively and simultaneously with the means of step a, imparting a steady and unpulsed sound within the hearing range of the infant, and means for controlling the sound range within an intensity range of between about sixty decibels and about eighty decibels within a frequency range of between about two hundred Hertz and about four thousand Hertz.

4,681,097

**ORTHOPEDIC BRACE**

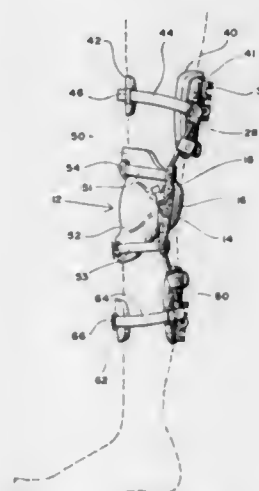
Timothy T. Pansiera, 1335 NE. 28th St., Pompano Beach, Fla. 33064

Filed Jan. 23, 1986, Ser. No. 824,284

Int. Cl.<sup>4</sup> A61F 5/01

U.S. Cl. 128—77

3 Claims



1. An orthopedic brace, comprising:  
(a) a U-shaped upper frame proportioned to a posterior, proximal area of a body limb, said upper frame comprising means for selectably changing the transverse width thereof, such frame having a major axis;  
(b) an upper pad position adjustment element press-fittably rotatably attachable to said transverse width changing means, in more than one position relative to the major axis of said upper frame;  
(c) a proximal posterior pad support secured to said upper pad position adjustment element;  
(d) a proximal posterior pad detachably attachable to said proximal posterior pad support;  
(e) a proximal anterior pad;  
(f) strap means for mechanically joining said anterior proximal pad and said posterior pad supports, said strap means further comprising means for adjusting the direction and pressure of said posterior pad upon the upper area of the limb of the user;  
(g) a U-shaped lower frame proportioned to a posterior distal area of the limb, said lower frame comprising means for selectably changing the transverse width thereof, said frame having a major axis;  
(h) a lower pad position adjustment element press-fittably rotatably attachable to said transverse width-changing

means in more than one position relative to the major axis of said lower frame;

- a distal posterior pad support secured to said lower pad position adjustment element;
- a distal posterior pad detachably attachable to said distal posterior pad support;
- a distal anterior pad;
- strap means for mechanically joining said anterior distal anterior pad and said distal pad support, said strap means further including means for adjusting the pressure of said anterior and posterior distal pads upon the lower area of the limb of the user;
- a hinge means for selectably changing and locking the position of said upper frame and its attendant elements relative to said lower frame and its attendant elements; and
- anterior joint pad and straps therefore joining said new pad to said U-shaped frames above and below said hinge means.

4,681,098

**SYSTEM, APPARATUS AND METHOD FOR GATHERING PHYSIOLOGICAL DATA**

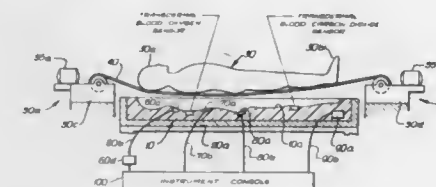
Arnold St. J. Lee, 2008 Cotner Ave., Los Angeles, Calif. 90025

Filed Oct. 11, 1985, Ser. No. 786,746

Int. Cl.<sup>4</sup> A61B 5/00

U.S. Cl. 128—630

11 Claims



1. A system for accurately reproducibly positioning sensors for gathering physiological data from a subject's body, the system comprising:  
steady means for stationing in a reproducible position the subject's body;  
sensor means affixed to the steady means for taking physiological data from contact with the subject's body; and  
transfer means affixed to the steady means for transferring the subject's body into and out of stationing within the steady means, and into and out of contact with the sensor means.

4,681,099

**BREATH-SYNCHRONIZED CONCENTRATED-OXYGEN SUPPLIER**

Toru Sato; Naoto Okazaki, both of Yonago, and Katsumasa Fujii, Okayama, all of Japan, assignors to Tottori University, Tottori, Japan

Filed Nov. 13, 1985, Ser. No. 797,654

Claims priority, application Japan, Nov. 30, 1984, 59-253495

Int. Cl.<sup>4</sup> A61M 16/00

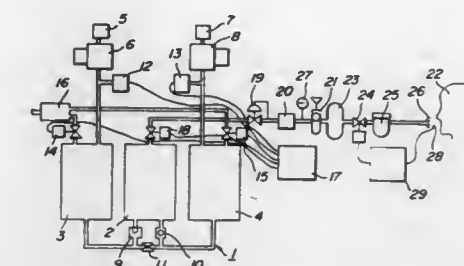
U.S. Cl. 128—204.23

4 Claims

1. A breath-synchronized concentrated-oxygen supplier, comprising  
an oxygen concentrator producing and storing oxygen-enriched gas;  
a buffer tank having an inlet connected to said oxygen concentrator and an outlet, said buffer tank temporarily storing the oxygen-enriched gas from the oxygen concentrator;  
a valve mounted in said outlet of said buffer tank so as to control flow of the oxygen-enriched gas from the buffer tank, patient connection means connected to said outlet and adapted to be connected to a respiratory system of a

living body and having a gas flow path that is open to the atmosphere;

- sensor means for sensing the respiration of the living body and adapted to generate an output signal indicative of the inhalation phase and the exhalation phase of the respiration;
- an input means on which a ratio between the entire length of the inhalation phase and a specific end portion thereof is set; and
- regulator means responsive to said sensor means and input means and adapted to detect the duration of each inhala-



tion phase in succession based on the output signal from said sensor means and to open said valve at the beginning of each inhalation phase, as well as to maintain the open time of said valve based on a period determined by a combination of averaging the preceding inhalation phase durations and said ratio set on the input means; whereby oxygen-enriched gas is supplied to said living body during each inhalation phase except said specific end portion thereof, and said buffer tank acts to make the initial flow rate of the oxygen-enriched gas higher than the steady flow rate thereof in each inhalation phase.

4,681,100

**MULTINOZZLE GENERATOR FOR HIGH FREQUENCY NOZZLE VENTILATION OF LUNGS**

Ondrej Brychta, Trencin, and Vladimir Zabrodsky, Prague, both of Czechoslovakia, assignors to Konstruktiva Trencin, narodny podnik, Trencin, Czechoslovakia

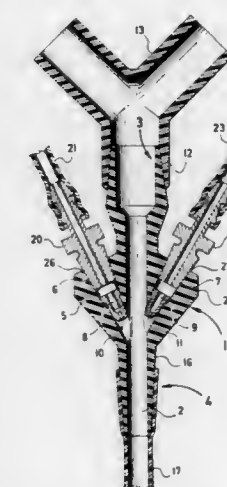
Filed Dec. 30, 1985, Ser. No. 814,643

Claims priority, application Czechoslovakia, Dec. 28, 1984, 10492-84

Int. Cl.<sup>4</sup> A61M 16/00

U.S. Cl. 128—204.25

9 Claims



1. An improved multinozzle generator for high frequency nozzle ventilation of lungs, the improvement comprising a connecting element comprising a body with a cylindrical

bore therethrough having a nominal internal diameter and having first connection means at one end of said cylindrical bore adapted to be operatively mounted to a device used for treatment of lungs, such as a bronchoscope, and second connection means at the opposite end of said cylindrical bore adapted to be mounted to a tube, such as an intubation tube, introduced into air passages of a patient, at least two feeding inlet openings provided in said body, nozzles with nozzle outlet openings of different internal diameter operatively mounted in said inlet openings and terminating at said cylindrical bore, the axes of the nozzle outlet openings intersecting with the axis of the cylindrical bore at an angle ranging from 10 to 30 angular degrees.

4,681,101

## ANESTHETIC DEVICE

Norton J. Bicoll, 728 Preston Forest, Dallas, Tex. 75230

Filed Aug. 20, 1985, Ser. No. 767,521

Int. Cl.<sup>4</sup> A61B 17/00, 17/34

U.S. Cl. 128—303 R

2 Claims



1. A device for temporarily anesthetizing localized regions of living tissue comprising:

- a first substantially flat smooth body having a first substantially circular aperture passing transversely therethrough, the largest diameter of said first aperture being approximately one millimeter and the diameter of said first body being approximately two to approximately four times the diameter of said first aperture;
- a first elongated shank supporting said first substantially flat smooth body;
- a second substantially flat smooth body having a second substantially circular aperture passing transversely therethrough, the largest diameter of said second aperture being approximately one millimeter and the diameter of said second body being approximately two to approximately four times the diameter of said second aperture;
- a second elongated shank supporting said second substantially flat smooth body; and
- an elongated handle interconnecting said first shank and said second shank with the central axis of said first aperture aligned substantially 90° from the axis of said elongated handle and the central axis of said second aperture aligned substantially parallel with the axis of said handle.

4,681,102

## APPARATUS AND METHOD FOR INSERTION OF AN INTRA-OCULAR LENS

Michael T. Bartell, 2867 Mill Rd., Doylestown, Pa. 18901

Filed Sep. 11, 1985, Ser. No. 774,720

Int. Cl.<sup>4</sup> A61F 2/16; A61B 17/00

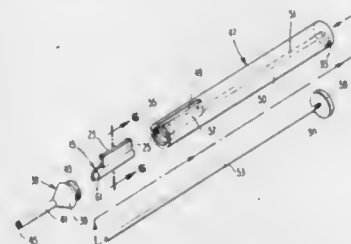
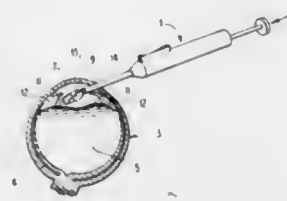
U.S. Cl. 128—303 R

36 Claims

1. Apparatus for inserting an intra-ocular lens into an eye, comprising:

- a load chamber constructed of a flexible material, the

load chamber having a pair of generally semi-cylindrical portions, both of the semi-cylindrical portions being connected to a flange, the load chamber being foldable, wherein the load chamber, in its folded position, defines a lumen for passage of the intra-ocular lens therethrough, (b) an insertion cone adapted to abut the load chamber, the insertion cone having a distal end adapted for insertion into a small incision in the eye, the insertion cone having a threaded portion at its proximal end, and



- an injector portion, adapted to engage the threaded portion of the insertion cone, the injector portion comprising a generally cylindrical body having a central lumen therethrough, and having a slot, near its distal end, for engagement with the flanges of the folded load chamber, wherein the injector portion fits over the load chamber and onto the insertion cone, the injector portion including plunger means adapted for insertion through the lumen, the plunger means being of sufficient length to advance the lens through the load chamber, through the insertion cone, and into the eye.

4,681,103

## ULTRASOUND GUIDED SURGICAL INSTRUMENT GUIDE AND METHOD

James C. Boner, Los Gatos; Mitchell S. Berger, San Francisco, and Marc Fine, Santa Rosa, all of Calif., assignors to Diasonics, Inc., Milpitas, Calif.

Filed Mar. 11, 1985, Ser. No. 710,068

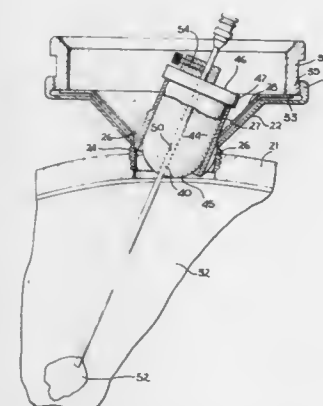
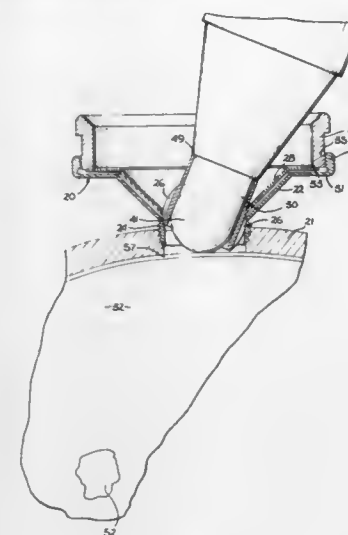
Int. Cl.<sup>4</sup> A61B 8/12

U.S. Cl. 128—303 B

4 Claims

1. An ultrasound guided instrument guide comprising:
- an adaptor housing having a central portion, said adaptor housing having a hole through said central portion thereof for providing access of an ultrasound probe disposed therein to a volume therebelow, said adaptor housing having a lower threaded portion for screwing said adaptor housing in a burr hole in a skull and an upper threaded portion;
  - a probe socket disposed in said hole in said adaptor housing, said probe socket with passage therethrough for holding an ultrasound probe by its tip portion, said probe socket comprising a spherical member and a neck member attached thereto;
  - a clamp ring disposed over said probe socket;
  - a locking ring disposed over said clamp ring, said locking ring being threaded to mate with said upper threaded portion of said adaptor housing such that the tightening of said lock ring with respect to said adaptor housing applies

pressure to said clamp ring thereby locking said probe socket in position; and



an instrument holder formed in the shape of said ultrasound probe tip and having a hole disposed through its longitudinal axis adapted to hold said instrument therein.

4,681,104

## APPARATUS FOR FOCUSING AN INTRAVASCULAR LASER CATHETER

William Edelman, Seal Beach, Calif., assignor to Shiley Inc., Irvine, Calif.

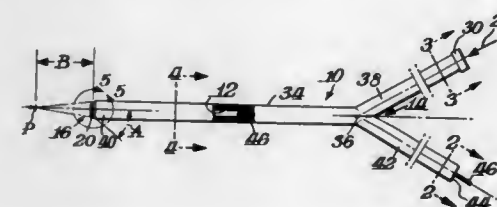
Continuation of Ser. No. 582,675, Feb. 23, 1984, abandoned.

This application Mar. 20, 1986, Ser. No. 842,070

Int. Cl.<sup>4</sup> A61N 5/06

U.S. Cl. 128—303.1

9 Claims



1. Apparatus for directing laser energy comprising:
- a plurality of optical fibers having proximal ends adapted to receive a source of laser energy and having distal ends which transmit the laser energy;

said apparatus having a central axis and having a point on the central axis;

- said distal ends of the fibers arranged into a parallel annular array about the point on the central axis;
- said fibers having a surface beveled at a common angle on the distal ends thereof; and
- said beveled surfaces being oriented away from the central axis and perpendicular to a plane formed by the central axis and the center of the distal end of the respective fiber, whereby the laser energy associated with the apparatus is transmitted from each fiber toward the central axis to converge substantially at a common focal point.

4,681,105

## MICROSURGICAL TOOL

Eugen Tritt, Jestetten, Fed. Rep. of Germany, assignor to S+T Marketing AG, Neuhausen a. Rheinfell, Switzerland

Filed Apr. 18, 1983, Ser. No. 486,219

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 3214318

Int. Cl.<sup>4</sup> A61B 17/39

U.S. Cl. 128—303.17

8 Claims



1. A microsurgical tool comprising:

- a first metallic arm member having a first end region and a second metallic arm member having a second end region, a metallic connection member fixing together said first arm member and said second arm member at the end regions of said first and second arm members for providing a mechanically rigid connection between said two arm members,
- electrically insulating means intermediate said connection member and at least one of said arm members for electrically insulating the metallic arm members from each other,
- said insulating means including at least one of said arm members being provided with an insulating covering layer circumscribing and extending at least over one of said end regions and consisting of an oxide protection coating applied to the surface of said at least one arm member by plasma coating,
- said metallic connection member being in contact with at least one of said end regions of said arm members via at least said oxide protection coating, and
- a pressure equalization layer between the oxide protection coating and said metallic connection member.



4,681,106

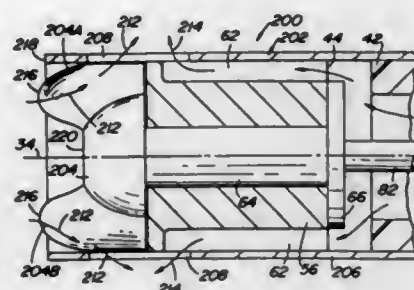
## CATHETER BASED SURGICAL METHODS AND APPARATUS THEREFOR

Kenneth Kensey, Hinsdale, Ill., and John Nash, Downingtown, Pa., assignors to Intravascular Surgical Instruments, Inc., Frazer, Pa.

Division of Ser. No. 765,034, Aug. 12, 1985. This application  
Sep. 22, 1986, Ser. No. 909,652  
Int. Cl.<sup>4</sup> A61F 17/32

U.S. Cl. 128—305

3 Claims



1. An in situ method of rendering valves in a section of vein inoperative by utilizing an elongated, small diameter, flexible catheter having a longitudinal axis and a distal end at which a working head is located, said working head being arranged for high speed rotary movement with respect to said axis by associated drive means, said drive means being arranged to freely effect the movement of said working head even if said catheter is bent through any arc up to a minimum radius of curvature and without resulting in excessive vibration which could interfere with said method, said method comprising inserting said catheter into said vein from a remote location, causing said drive means to rotate said working head at said high rate of speed and advancing said catheter into said vein along said axis as said working head is rotating, whereupon mechanical action of said moving working head renders said valves inoperative.

4,681,107

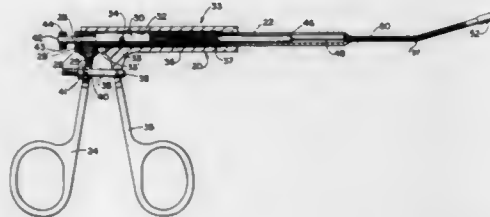
## DEVICE FOR HOLDING AN ANEURYSM CLIP

George Kees, Jr., Alexandria, Ky., assignor to Kees Surgical Specialty Co., Wilder, Ky.

Filed Dec. 31, 1985, Ser. No. 815,388  
Int. Cl.<sup>4</sup> A61B 17/12

U.S. Cl. 128—325

5 Claims



1. A holder for an aneurysm clip which comprises a tubular clip opening fitting, a clip holding tool, means for drawing the clip holding tool through the tubular clip opening fitting, the clip holding tool having arms engageable with the aneurysm clip to hold the aneurysm clip, portions of the arms being engageable with the clip opening fitting to cause the arms of the clip holding tool to close to clip holding position when the clip holding tool is drawn into the tubular clip opening fitting, means on the tubular clip opening fitting engageable with the aneurysm clip for causing opening of the aneurysm clip in correlation to advance of the clip holding tool along the tubular clip opening fitting and adjustable stop means for selecting the limit of advance of the clip holding tool along the clip opening fitting as corresponds to the desired opening of a

selected aneurysm clip held by the clip holding tool, whereby the holder may be adapted to hold a selected aneurysm clip in a pre-selected open attitude.

4,681,108

## CIRCULAR MECHANICAL ANASTOMOTIC GUN

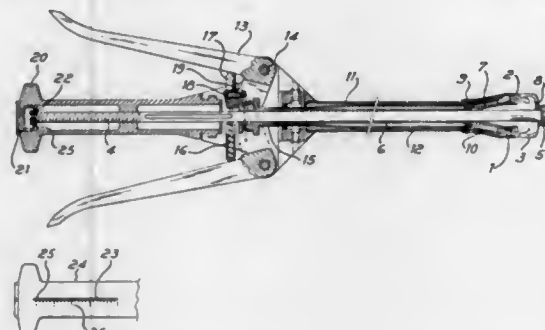
Riccardo Rosati, Via Livorno, 4, Milano, and Carlo Rebuffat, Via Galilei, 17, Trento, both of Italy

Filed Feb. 13, 1985, Ser. No. 701,150

Claims priority, application Italy, Feb. 16, 1984, 19653 A/84  
Int. Cl.<sup>4</sup> A61B 17/04

U.S. Cl. 128—334 R

4 Claims



4. A circular mechanical anastomotic gun suitable for the insertion of a three-element device to effect compression anastomosis of hollow organs, comprising:

a central slide carrying at an end thereof blocking means for carrying an outer element of said device; three tubular bodies coaxial with the central slide, which carry at their ends a circular blade, an inner and an intermediate element of said device, respectively; means for moving driving means coaxial with the central slide, said driving means being in engagement simultaneously with the inner tubular body carrying the circular blade and the intermediate tubular body carrying the inner element of said device; means disconnecting the engagement between said driving means and the intermediate tubular body after the intermediate tubular body has moved a prescribed distance with the inner element against the intermediate element, said driving means continuing to move only the inner tubular body so that the circular blade advances, cutting the outer element circumferentially outside said blocking means.

4,681,109

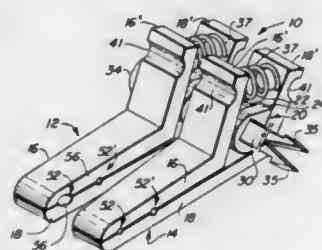
## SURGICAL INSTRUMENTATION FOR BLOOD VESSELS

Juan Arroyo, 12200 SW. 93 St., Miami, Fla. 33186

Continuation-in-part of Ser. No. 791,498, Oct. 25, 1985, which is a continuation-in-part of Ser. No. 743,940, Jun. 12, 1985, Pat. No. 4,630,608. This application Jun. 19, 1986, Ser. No. 876,109  
Int. Cl.<sup>4</sup> A61B 17/08, 17/00

U.S. Cl. 128—335

47 Claims



1. A surgical instrumentation assembly of the type primarily designed for the positioning of open ends of blood vessel sec-

tions in aligned relation to one another, said assembly comprising:

- a clamp assembly including at least one clamp each comprising two substantially elongated arms movably secured to one another,
- a fulcrum structure mounted on said one clamp and disposed intermediate opposite ends of said two arms and interconnected thereto and structured to define a pivotal connection between said two arms,
- said one clamp structured to include a positioning means at least partially mounted on each of said two arms adjacent a first of said opposite ends thereof and structured for holding and positioning a vessel section,
- said positioning means of each clamp including at least one gripping structure defined by a gripping surface integrally formed on an inner surface of each arm, said gripping surfaces of each clamp disposed in aligned relation to one another and cooperatively configured to engage an exterior surface of the respective blood vessel sections associated with each clamp,
- securement means interconnected between two of said clamps and disposed and structured for placement of said two clamps in spaced, adjacent and communicating relation to one another,
- said positioning means of said one clamp structured and disposed in substantially aligned relation to one another of said clamps when interconnected by said securement means and said gripping surfaces of each clamp structure terminating in an outer end and an inner end disposed on opposite longitudinal sides of said respective clamp structure, and
- whereby open attachable ends of the vessel sections on each one clamp are oriented to extend outwardly from said inner end of each positioning means into engageable relation with one another.

4,681,110

## CATHETER ARRANGEMENT HAVING A BLOOD VESSEL LINER, AND METHOD OF USING IT

Dominik M. Wiktor, 4 Culin Dr., Cranford, N.J. 07016

Filed Dec. 2, 1985, Ser. No. 803,304

Int. Cl.<sup>4</sup> A61M 27/00

U.S. Cl. 128—343

15 Claims



1. A catheter arrangement comprising:  
a main flexible tubing for insertion into a blood vessel,  
a resilient liner within the tubing, the liner being maintained in a radially compressed condition by the tubing and having a tendency to spring radially outwardly, and the liner being an open weave tube of criss-crossed strands,

the tube being devoid of any obstruction to free passage of liquid and solids through the openings in the weave, and means for producing relative movement between the liner and tubing, while the tubing is located within a blood vessel, so that the liner escapes from the tubing and expands against the blood vessel wall.

4,681,111

## ANALOG AND DIGITAL TELEMETRY SYSTEM FOR AN IMPLANTABLE DEVICE

Sergiu Silviu, Pasadena, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.

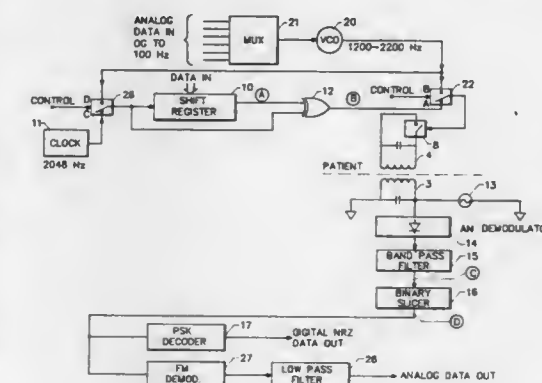
Filed Apr. 5, 1985, Ser. No. 720,556

Claims priority, application PCT. Int'l Appl., Mar. 27, 1986, PCT/US86/00645

Int. Cl.<sup>4</sup> A61B 5/00

U.S. Cl. 128—419 PT

10 Claims



1. A system for simultaneously transmitting digital and analog information from an implanted device to an external device, said system comprising:

frequency modulation means within said implanted device for generating a carrier signal and frequency modulating said carrier signal with analog information;  
shift register means within said implanted device for holding digital data, said shift register means including means for serially clocking the digital data out of said shift register means in response to a clock signal;  
means for applying said frequency modulated carrier signal from said frequency modulation means to said shift register means, said frequency modulated carrier signal comprising the clock signal that is used to serially clock the digital data out of said shift register means; and  
transmitting means within said implanted device for serially transmitting to said external device the digital data clocked out of said shift register means by said frequency modulated carrier signal, whereby both said digital data and the analog information, used to modulate said frequency modulated carrier signal, are contained in the signal transmitted by said transmitting means.

4,681,112

## MEDICAL INSTRUMENT INCLUDING ELECTRODES ADAPTED FOR RIGHT AND LEFT-HANDED USE

Paul W. Jones, Issaquah, and Casey M. Bardue, Seattle, both of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 689,741, Jan. 8, 1985. This application Oct. 1, 1986, Ser. No. 914,004

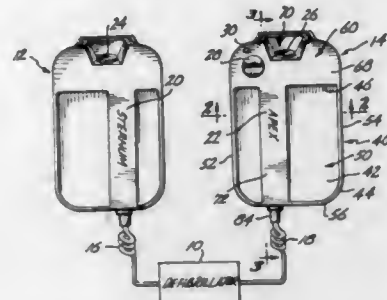
Int. Cl.<sup>4</sup> A61N 1/00

U.S. Cl. 128—419 D

9 Claims

1. A medical instrument comprising first and second electrodes and means for applying an electric shock to a patient through the electrodes, each electrode comprising:

an elongated member adapted for gripping by the fingers of an operator's hand;  
 an actuator positioned adjacent one end of the elongated member;  
 an electrode element responsively connected to the actuator, the electrode element including means for receiving and transferring electrical energy; and  
 blocking means positioned adjacent one side of the elongated member;



the blocking means of the first electrode including means to hinder the operator from gripping the elongated member with the operator's right hand and simultaneously positioning the thumb of the right hand adjacent the actuator, the blocking means of the second electrode including means to hinder the operator from gripping the elongated member with the operator's left hand and simultaneously positioning the thumb of the left hand adjacent the actuator, whereby the first and second electrodes are adapted for left and right-handed use, respectively.

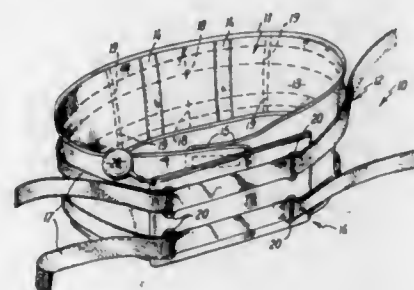
#### 4,681,113 CORSET

Carl W. Coplans, Cape Town, South Africa, assignor to Seton Products Limited, Oldham, England  
 Filed Sep. 3, 1985, Ser. No. 771,648  
 Claims priority, application South Africa, Sep. 3, 1984, 84/6881

Int. Cl.<sup>4</sup> A41D 27/12; A41C 1/00

U.S. Cl. 450—134

17 Claims



1. A corset comprising a first, inner, band-like structure made from resiliently extensible material and adapted to encircle waists of different girths, a second, outer, band-like structure of inelastic flexible material capable of securement around a wearer's waist in overlying disposition relative to the first band and adaptable to waists of different girths, and an inflatable bag supported by one of said structures in a use position overlying the wearer's abdomen.

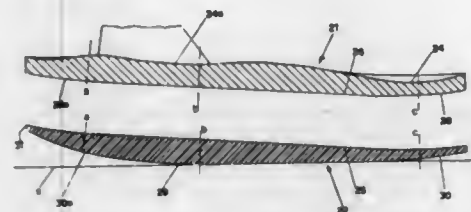
#### 4,681,114 WOODEN-SHOE TO TREAT HYPERLORDOSIS AND LIPODYSTROPHIA LOCATED IN THE THIGHS AND GLUTEI

Alberto Lodispoto, Rome, Italy, assignor to Luigi Minonzo and Giovanni Verzilli, both of Rome, Italy, a part interest to each  
 Filed Jan. 7, 1985, Ser. No. 689,576  
 Claims priority, application European Pat. Off., Dec. 14, 1984, 84830340.0

Int. Cl.<sup>4</sup> A61F 5/14

U.S. Cl. 128—581

11 Claims



1. A wooden-shoe or sandal for treating hyperlordosis and lipodystrophia in the thighs and glutei, which comprises a rigid wooden top member having an upper surface with a generally orthopedic shape for supporting the sole of the foot of the user, and a bottom member forming the sole of the wooden-shoe, said shoe having an opposed heel and tip; the lower surface of said bottom member having a short, slightly upwardly and rearwardly curved back portion, a substantially flat middle portion extending forwardly from said back portion and terminating at the point corresponding to the location on the shoe of the metatarsal arch of the foot of the user, and a front end portion extending forwardly from said middle portion to said tip, said front end portion being sharply curved upwardly and forwardly to provide a gradually increasing rise with respect to the ground from said termination of said middle portion to said tip; said top member providing said upper surface with a rear surface portion correspondingly positioned at the slightly upwardly and rearwardly curved back portion of said bottom member lower surface for supporting the heel of the foot, a front surface portion correspondingly positioned at said front end portion of said bottom member lower surface for supporting the front of the foot and a middle surface portion extending forwardly from said rear surface portion to said front surface portion, said front surface portion being higher than said rear surface portion.

#### 4,681,115 ELECTROCHEMICAL MEASURING CELL HAVING AN ANCILLARY ELECTRODE

Uvo Hülscher, Stockelsdorf, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany  
 Continuation-in-part of Ser. No. 771,995, Sep. 3, 1985, Pat. No. 4,624,261. This application May 22, 1986, Ser. No. 866,578  
 Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3432950

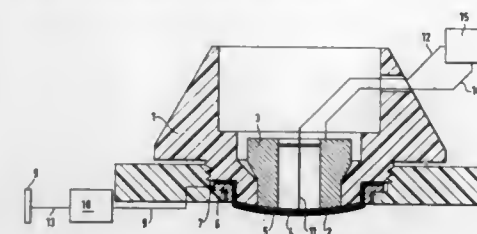
Int. Cl.<sup>4</sup> A61B 5/04; G01N 27/52

U.S. Cl. 128—635

6 Claims

1. An electrochemical measuring cell comprising:  
 an electrolyte;  
 a measuring electrode disposed in said electrolyte;  
 a counter electrode also disposed in said electrolyte;  
 a housing for holding said electrolyte;  
 a diffusion membrane for separating said electrolyte from

the ambient and having a smooth outer surface facing away from said electrolyte; and,



an electrically-conductive, gas-permeable coating of silver applied to said outer surface for sensing an external electrical potential.

#### 4,681,116 ANTIMONY ELECTRODE ASSEMBLY AND METHOD OF MANUFACTURE, AND USE THEREOF

Bert Settler, 723 Queenston Street, Winnipeg, Manitoba, Canada R3N 0X8

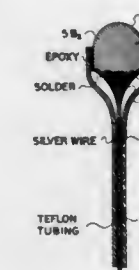
Filed Nov. 12, 1985, Ser. No. 796,704

Claims priority, application United Kingdom, Nov. 12, 1984, 8428543

Int. Cl.<sup>4</sup> A61B 5/00

U.S. Cl. 128—635

5 Claims



1. An antimony electrode for pH measurement comprising in combination a relatively short length of antimony rod having an inner end and an outer or distal end secured by the inner end thereof, as by soldering to one end of a flexible conducting wire, the distal end of said rod being convex and substantially hemispherical and having a highly polished surface approaching a single, one plane crystal face, a relatively hard epoxy resin covering at least part of the length of said rod but with the distal end remaining exposed, a flexible plastic tube surrounding said rod the junction of said rod with said conducting wire and at least part of said conducting wire, with said distal end of said rod remaining exposed and a sealant between said portion of said plastic tube adjacent said distal end of said rod and said distal end of said rod thereby providing a sealing relationship of said plastic tube around said rod to prevent ingress of contaminants.

#### 4,681,117 INTRACARDIAC CATHETER AND A METHOD FOR DETECTING MYOCARDIAL ISCHEMIA

Richard F. Brodman, 3388 Wayne Ave., and Sharon B. Siegel, 3450 Wayne Ave., both of Bronx, N.Y. 10467

Continuation-in-part of Ser. No. 466,512, Feb. 15, 1983, abandoned. This application May 27, 1986, Ser. No. 868,893

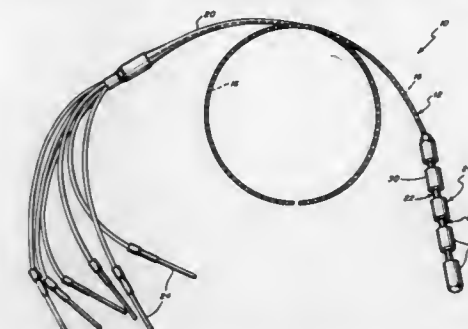
Int. Cl.<sup>4</sup> A61B 5/04

U.S. Cl. 128—642

10 Claims

1. An intracardiac catheter for transmitting electric currents from the heart of a living subject to a monitor comprising: and electric lead including at least one electric conductor having first and second ends, an electrically insulating sheath covering a substantial portion of the conductor, sensing means connected to the first end of the conductor capable of detecting electric currents inside and emanating from major areas of the

heart wall or all of the heart wall, and means connected to the second end of the conductor to connect the electric lead to the monitor; and means secured to the electric lead for preventing the sensing means from coming into direct contact with the endocardium of the heart for preventing the sensing means



from causing a current of injury, said electric lead, sensing means and means preventing the sensing means from coming into contact with the endocardium being sized to pass transvenously or transarterially into a ventricle of the heart.

#### 4,681,118 WATERPROOF ELECTRODE ASSEMBLY WITH TRANSMITTER FOR RECORDING ELECTROCARDIOGRAM

Toshio Asai, Uchinadamachi; Yasuhiro Nakaya, Kanazawashi, and Yasuaki Onodera, Saitamaken, all of Japan, assignors to Fukuda Denshi Co., Ltd., Tokyo, Japan

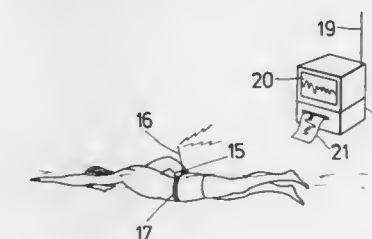
Filed Jun. 10, 1985, Ser. No. 742,823

Claims priority, application Japan, Jun. 11, 1984, 59-120380  
 The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> A61B 5/04

U.S. Cl. 128—643

1 Claim



1. Apparatus for recording an electrocardiogram comprising a waterproof electrode assembly, said electrode assembly having a plurality of electrodes, and each of said electrodes comprising:

- a cup-shaped suction disc constructed from a waterproof, elastic material, said disc having a concave side, a convex side and a through-hole at the center thereof;
- an electrode plate having an outer peripheral edge hermetically sealed to the concave surface of said suction disc and closing said through-hole;
- a lead wire extending from said electrode plate past the convex surface of said suction disc;
- elastic sealing means for hermetically sealing together the outer peripheral edge of said electrode plate and the portions of the concave surface of said suction disc in contact with said peripheral edge of said electrode plate;
- elastic sealing means hermetically sealing the lead wire at the convex surface of the suction disc;
- an annular, body-surface adherent strip surrounding said electrode plate and bonded to the concave surface of the suction disc; and
- a wireless transmitter connected to said electrode.



# 4,681,119 METHOD OF PRODUCTION AND USE OF MICROBUBBLE PRECURSORS

Julia S. Rasor, Cupertino, and Ernest G. Tickner, Gilroy, both of Calif., assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany  
Division of Ser. No. 530,301, Sep. 8, 1983, which is a continuation-in-part of Ser. No. 322,138, Nov. 17, 1981, Pat. No. 4,442,843, which is a continuation-in-part of Ser. No. 207,741, Nov. 17, 1980, abandoned. This application Apr. 22, 1986, Ser. No. 854,622

Int. Cl.<sup>4</sup> A61B 10/00

U.S. Cl. 128—660

16 Claims

1. In a method for altering the transmission characteristics of a liquid-filled region of the body other than the cardiovascular system to an electromagnetic or elastic wave transmitted there-through by dispersing in the liquid an amount of microbubbles effective to substantially alter such transmission characteristics of the liquid in the area thereof containing the microbubbles, wherein the microbubbles are formed by dissolving in the liquid a solid which is particulate, is substantially free of microbubbles, and consists predominantly of particles which have a plurality of gas-filled voids communicating with the surface of the particles and a plurality of nuclei for microbubble formation and the ratio of the mass of the particles to the volume of gas in the voids is sufficient to render the liquid in which the particulate material is dissolved supersaturated with respect to the gas in the voids in the area of the liquid surrounding the microbubbles, the improvement wherein the liquid is sterile water or sterile aqueous galactose solution and the solid is galactose.

# 4,681,120 ULTRASONIC DIAGNOSING APPARATUS

Yataka Kunii, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

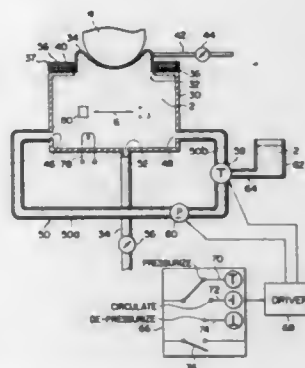
Filed Jan. 29, 1985, Ser. No. 696,055

Claims priority, application Japan, Feb. 3, 1984, 59-17092

Int. Cl.<sup>4</sup> A61B 10/00

U.S. Cl. 128—660

12 Claims



1. An ultrasonic imaging apparatus for providing an image of a patient's breast comprising:  
an impervious receptacle means for containing a liquid acoustic coupling medium, said receptacle means including a port means for accepting and discharging the liquid medium and an opening sized to accept the patient's breast, said port means including two inlet/outlet ports;  
an ultrasonic-wave transmitting, impervious, flexible membrane attached to said receptacle means and covering said opening, said membrane serving to provide a flexible surface upon which the patient's breast is to be laid;  
fixing means for fixing said membrane to said receptacle means in a liquid tight manner;  
an ultrasonic probe means fixed within said receptacle means for transmitting ultrasonic beams into the patient's breast

and receiving echos of the ultrasonic beams reflected from the patient's breast through the coupling medium and said membrane;

tank means for containing the medium;  
pump means for feeding the medium from the tank into the receptacle means and discharging the medium from the receptacle means into said tank means; and  
adjustment means for closely fitting the membrane against the region of the patient's breast to be imaged and selectively varying the distance between the patient's breast and said probe means by selectively introducing or discharging the liquid medium through said port means and thereby adjusting the pressure of the liquid medium exerted against said flexible membrane; said adjustment means including a pipe connected at each end to the inlet/outlet ports of said port means and a three-way cock attached to the pipe, said tank means being in communication with said three-way cock and said pump being attached to the pipe, said three-way cock adapted to be shifted from a first mode in which the medium in the tank means is fed into the receptacle means by the pump to increase the pressure of the medium in the receptacle means, a second mode in which the medium in the receptacle means is circulated through the pipe by the pump, and a third mode in which the medium in the receptacle means is discharged into the tank to decrease the pressure of the medium in the receptacle means.

# 4,681,121 PROCESS FOR MEASURING SENSORY QUALITIES AND APPARATUS THEREFOR

Gerd Kobal, Marquardsenstrasse 9, 8520 Erlangen, Fed. Rep. of Germany

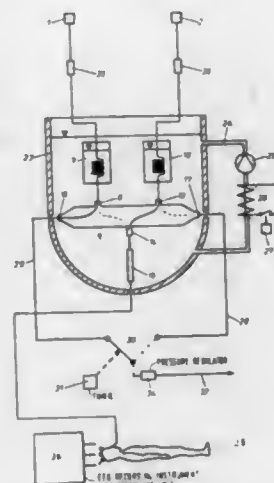
Filed Jan. 15, 1986, Ser. No. 819,174

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501095

Int. Cl.<sup>4</sup> A61M 17/00

U.S. Cl. 128—731

7 Claims



1. Method for measuring sensory qualities such as for measuring analgesia while monitoring anaesthesia on a patient, the method comprising the steps of:  
passing stimulating pulses of vaporous or gaseous substances by means of a stimulating device over the nasal mucosa for triggering a specific stimulus;  
said stimulating pulses being connected in series in a neutral vaporous or gaseous flow by means of a switching device thereby generating a continuous sequence of pulses with rapid changeover between the neutral vaporous or gaseous flow and the interpolated stimulating pulses, said flow being kept constant with respect to the flow characteristics thereof;

deriving stimulus correlated electrical signals from the electro-encephalogram of the patient by means of a recording instrument; and,  
analyzing and storing said electrical signals as measured quantities in an assessment unit, said electrical signals being analyzed in an assessment window having a width corresponding to a predetermined number of said stimulating pulses and said assessment window being displaceable over the number of signals stored in said assessment unit.

# 4,681,122 STEREOTAXIC CATHETER FOR MICROWAVE THERMOTHERAPY

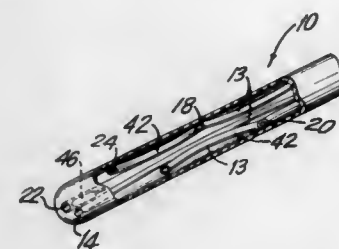
Arthur Winters, Short Hills, and Casper S. Molee, Bloomfield, both of N.J., assignors to Victory Engineering Corp., N.J.

Filed Sep. 23, 1985, Ser. No. 779,285

Int. Cl.<sup>4</sup> A61B 5/02

U.S. Cl. 128—736

5 Claims



1. Apparatus for microwave thermotherapy comprising:  
a catheter;  
said catheter being insertable into living tissue;  
at least first and second lumens extending along a substantial axial distance within said catheter;  
said first and second lumens each including a proximal end and a distal end;  
said distal end of each of said first and second lumens being sealed;  
said proximal end of each of said first and second lumens including means for permitting the passage of electrical conductors therethrough;  
a microwave antenna positionable within said first lumen, and effective, when said catheter is inserted into living tissue, and said microwave antenna is energized with microwave energy, for increasing a first temperature of a portion of said living tissue in a vicinity of said catheter; and  
a temperature sensor positionable within said second lumen and effective for measuring a second temperature within said second lumen related to said first temperature, whereby said microwave energy may be controllable to maintain said first temperature within predetermined limits.

4,681,123  
CHORION BIOPSY INSTRUMENT  
Konstantin L. Valtchev, 43 Cosmic Drive, Don Mills, Toronto, Ontario, Canada

Filed Oct. 31, 1986, Ser. No. 925,729

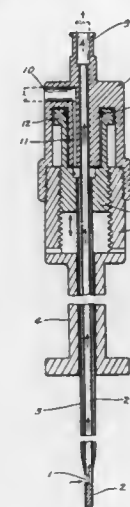
Int. Cl.<sup>4</sup> A61B 10/00

U.S. Cl. 128—753

4 Claims

1. A chorion biopsy instrument comprising:  
a housing;  
a first elongated tube operably attached to said housing, said first tube having a first passageway therein, said first tube being closed at one end thereof and having an opening in one side thereof adjacent to said one end, said opening being in fluid communication with said first passageway;

means attached to said housing for fluidly connecting a vacuum producing device to said first passageway;  
a second elongated tube telescopically disposed over said first tube, said second tube having a large enough internal diameter to form a second passageway between the inside of the second tube and exterior of the first tube;  
means attached to one end of the second tube for fluidly sealing to some extent against the exterior of the first tube;  
means connected to said housing in fluid communication with said second passageway for connection to a reservoir of culture medium; and  
positioning means operably attached to said housing and to said first and second tubes for reciprocally moving one of



said first and second tubes with respect to the other between a first relative position wherein said opening in the side of the first tube is covered by said second tube and is therefore in fluid communication with said second passageway and a second position wherein said second tube does not cover said opening in the first tube whereby the first and second tubes can be inserted into the uterine cavity through the cervical canal while in the first position thereof, a chorion tissue culture can be taken while moving the tubes to the second relative position thereof and a culture medium can be pulled through the second passageway by suction from action of the vacuum producing device to carry the chorion tissue through the opening in the first passageway to the syringe for testing.

# 4,681,124 APPARATUS FOR MANIPULATING PARTICLES OF TOBACCO OR FILTER MATERIAL

Alfred Hinzmann, Weams; Peter Preisner, Quinton, and Erich Presser, Richmond, all of Va., assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed May 2, 1985, Ser. No. 729,540

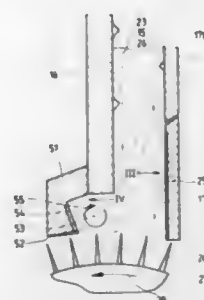
Int. Cl.<sup>4</sup> A24C 5/39

U.S. Cl. 131—109.1

37 Claims

1. Apparatus for manipulating fibrous material, particularly for manipulating particles of tobacco in the distributor of a cigarette maker, comprising an at least substantially upright duct defining an elongated passage having an inlet at the upper end and an outlet at the lower end thereof, said duct comprising parallel first and second walls which are disposed opposite each other and flank said passage; means for supplying fibrous material into said inlet so that the material advances in said passage in a first direction toward said outlet; and drive means for imparting to one of said walls and to a portion of the other

of said walls an oscillatory movement in a second direction substantially at right angles to said first direction and in the



general planes of said walls to thus promote the distribution of fibrous material across said passage.

4,681,125

## MOUTHPIECE FOR TOBACCO SMOKE ARTICLE

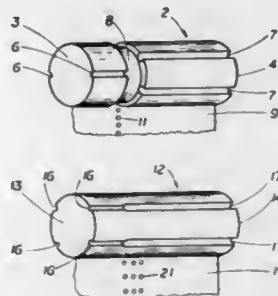
Robert R. Johnson, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Mar. 6, 1985, Ser. No. 708,630

Int. Cl.<sup>4</sup> A24D 3/04

U.S. Cl. 131—336

7 Claims



1. An improved tobacco smoke article comprising: a smoke impervious plug member having an upstream tobacco smoke inlet end, adjacent to a tobacco rod, and a downstream mouth outlet end; longitudinally extending groove means along the periphery of said plug member extending from said smoke inlet end to said mouth outlet end substantially parallel the longitudinal axis of said plug member, said groove means having a smaller cross-sectional area adjacent said smoke inlet end than adjacent said mouth outlet end of said plug member; apertured tipping material enveloping said plug member with the apertures therein in communication with said groove means; said plug member being blocked adjacent said inlet end so as to be impervious to smoke flow so that said longitudinally extending groove means forms the passage for smoke flow from said smoke inlet end to said mouth outlet end of said plug member.

7. An improved cigarette comprising: a generally cylindrical smoke impervious plug member having an upstream tobacco smoke inlet end, adjacent to a tobacco rod, and a downstream mouth outlet end and an overall length in the range of approximately 14 to approximately 35 mm; a first set of longitudinally extending grooves consisting of a pair of opposed spaced substantially parallel peripheral grooves longitudinally extending in the peripheral wall of said plug member from said smoke inlet end of said plug member toward said mouth outlet end of said plug member with the grooves thereof having cross-sectional areas corresponding to aerodynamic groove diameters of approximately 0.4 to approximately 0.6 mm; a second set of grooves consisting of four equally spaced substantially parallel peripheral grooves longitudinally extending in the peripheral wall of said plug member from said mouth outlet end of said plug member toward said smoke inlet end of said plug member

with the grooves thereof having cross-sectional areas corresponding to aerodynamic groove diameters in the range of approximately 0.5 to approximately 1.2 mm, said second set of longitudinally extending grooves being approximately three to four times the length of said first set of longitudinally extending grooves with the grooves of said first and second sets being peripherally offset from each other; an annular peripheral groove in said plug member intermediate said first and second sets of longitudinally extending peripheral grooves to communicably connect the groove sets of said plug member; a tipping paper wrap enveloping said plug member, said tipping paper wrap having a row of spaced ventilating apertures positioned to communicate with said annular peripheral groove in said plug member; said plug member being blocked adjacent said smoke inlet and mouth outlet ends so as to be impervious to smoke flow so that said groove sets form the passage for smoke flow from said smoke inlet end to said mouth outlet end of said plug member.

4,681,126

## PROCESS FOR MANUFACTURING RECONSTITUTED TOBACCO

David G. Strubel, Jeffersonton, and Robert A. Sanford, Prospect, both of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

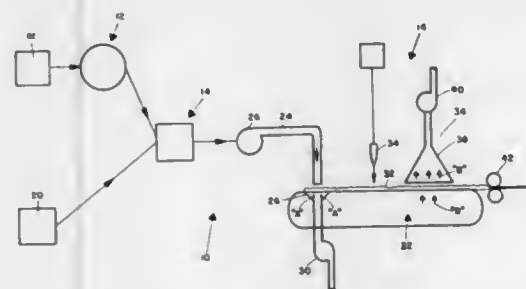
Continuation of Ser. No. 612,166, May 21, 1984, abandoned.

This application Jul. 28, 1986, Ser. No. 889,669

Int. Cl.<sup>4</sup> A24B 3/14

U.S. Cl. 131—370

18 Claims



1. A method for manufacturing reconstituted tobacco of tobacco stems and tobacco fines comprising:

- treating the stem parts of tobacco is essentially a dry form to reduce the stem to substantially fibrous form;
- mixing the fibrous stem with fine lamina tobacco;
- conveying the mixture in an air stream and subsequently depositing the mixture of fibrous stem and fine lamina tobacco on a moving wire mesh continuous belt;
- passing said air stream through the tobacco mixture on the wire mesh belt for homogenizing the fibrous stem and fine tobacco lamina throughout the mixture and causing intertwining of the fibrous stems and forming a continuous non-woven felt sheet of fibrous stem and fine lamina tobacco;
- applying a binder to the non-woven felt sheet of fibrous stem and fine lamina tobacco as the felt sheet continues to move on the wire mesh belt;
- drying the binder; and,
- removing said non-woven felt sheet of fibrous stem and fine lamina tobacco from the wire mesh belt in such a form for use in the manufacture of tobacco smoking articles.

4,681,127

## RIGID MAKE UP COMPACT WITH A FLEXIBLE INNER SHELL FRAME

Jean-Louis H. Gueret, Paris, France, assignor to "L'Oreal", Paris, France

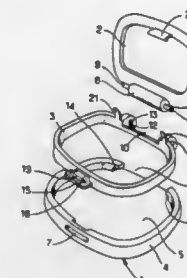
Filed May 21, 1984, Ser. No. 612,724

Claims priority, application France, May 27, 1983, 83 08806; U.S. Cl. 453—6 Mar. 5, 1984, 84 03364

Int. Cl.<sup>4</sup> A45D 33/00

U.S. Cl. 132—82 R

32 Claims



1. A compact which is intended to enclose at least one make-up product of a solid consistency, and which comprises:

- first and second main elements made of a relatively rigid material, one of said main elements constituting a base of the compact and the other said main element constituting a lid of the compact;
- fastener means comprising at least two members having parts of complementary shape, in order to secure the two main elements to each other to keep them applied against each other in the closed position of the compact;
- means movably mounting at least one of said members relative to said base of the compact in order to allow the manipulation of the fastener means for actuating closing and opening of the compact;
- a shell frame made of a relatively flexible material being mounted in said first main element of the compact;
- hinge means mounting said first and second main elements of the compact for relative movement between the closed position and an open position of the compact;
- means defining a passage in said first main element and movably receiving one of said members of the fastener means;
- a resiliently deformable zone on said shell frame; and
- means mounting the other said member of the fastener means on said lid of the compact;

wherein said means movably mounting said one member of the fastener means connects said one member to said resiliently deformable zone; said one member of the fastener means is accessible from outside the compact, in said closed position, by means of said passage arranged in said base; whereby manipulation of the said one member of the fastener means so as to actuate opening of the compact deforms said resiliently deformable zone of the shell frame so as to release the said one member from the other member of the fastener means;

said hinge means comprising first and second hinge elements, said first hinge element being carried by said shell frame and said second hinge element being carried by said second main element of the compact;

said other of said members of said fastener means including a catch extending from said lid toward said base, said one of said members including a catch member on said shell frame, said shell frame further including ramp means disposed so that upon said manipulation of said one member of said fastener means, said ramp means will engage said catch and move said catch and said lid in a direction away from said base.

184-023 O.G.—87-5

4,681,128

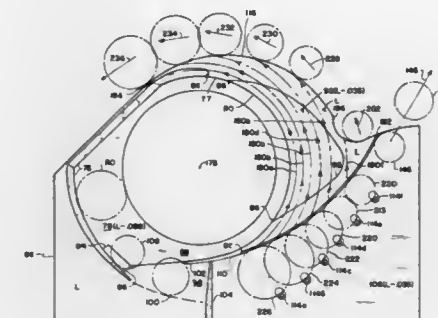
## COIN SORTER

Victor G. Ristvedt, Rte. 8, Box 8904, and Mark E. Ristvedt, 1000 Woodland Ct., both of Manchester, Tenn. 37355

Filed Jun. 23, 1986, Ser. No. 877,205

Int. Cl.<sup>4</sup> G07D 3/16

5 Claims



1. A coin sorter for mixing denominations of coins, coins of a different diameter, comprising:

- a rotatable resilient disc;
- means for rotating said disc;
- a stationary sorter plate spaced from said disc, said sorter plate having a central opening through which coins may be placed on said disc, said sorter plate being characterized by:
  - a first surface closer to said disc than the thickness of the thinnest coin to be sorted,
  - second surfaces less close to said disc than said first surfaces,
  - a first guide edge formed at a junction region between said first surface and a said second surface comprising a first inwardly facing edge against which a sequential line of coins is formable, and
  - a second guide edge at a second junction region between a said first surface and a said second surface comprising a second, and tapered, edge formed circumferentially beyond said first guide edge, in the direction of rotation of said disc, and said second guide edge extending outwardly, coins being rotated by said disc under a said second surface region to said second guide edge and then being moved outward along said second guide edge as a result of the rotation of said disc; and
- sorting means for engaging coins riding along said second guide edge and pressing a discrete diameter of coin against said second guide edge, and by virtue of said taper of said second edge, causing said last-named coin to ride under said second guide edge and being engaged by a said first surface region and rotated under a said first surface region, and said last-named first surface region having an outer edge which is positioned to be intercepted by coins rotated under said first surface from said second edge at a discrete location for each diameter of coin; whereby coins of a discrete size are released from said sorter at different positions around said sorter.



4,681,129

## APPARATUS FOR UNIFORMLY DISTRIBUTING A TWO-PHASE MIXTURE

Heinz Juzi, Andelfingen, and Marco L. Bernasconi, Lustmühle, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

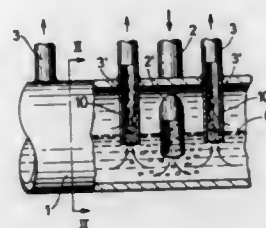
Filed Aug. 19, 1985, Ser. No. 766,931

Claims priority, application Switzerland, Aug. 24, 1984, 4046/84

Int. Cl.<sup>4</sup> B67D 5/54

U.S. Cl. 137—154

15 Claims



1. An apparatus for uniformly distributing a two-phase mixture comprising:
  - a receptacle;
  - at least one supply line communicating with said receptacle to deliver a two-phase mixture of liquid and gas therein with an interphase level forming between the phases; and
  - at least one discharge line communicating with said receptacle to discharge a uniform mixture of the two-phase mixture therefrom, said discharge line extending into said receptacle and having at least one inlet orifice within said receptacle extending through said interphase level for passage of the uniform mixture of the two-phase mixture into said discharge line, said orifice having a vertically disposed component and being of a horizontal width at a lowest level thereof at least equal to the horizontal width of the remainder of said orifice said orifice being wetted by the liquid phase at least at the lowest operating interphase level.

4,681,130

## COMBINED PRESSURE REGULATED AND CHECK VALVE

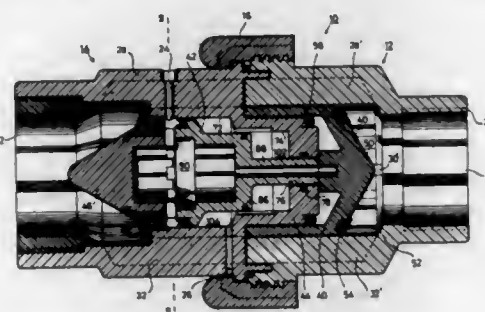
Elhanan Tabor, Carmiel, Israel, assignor to "AR-KAL" Plastics Products (1973), Beit-Zera, Israel

Filed Sep. 11, 1986, Ser. No. 906,162

Int. Cl.<sup>4</sup> F16K 31/122

U.S. Cl. 137—220

2 Claims



1. A combined pressure-regulated and check fluid flow valve comprising an inlet port, an outlet port, and pressure-control means for actuating the valve, characterized by:
  - an inlet port section and an outlet port section, coupled to each other to form a valve housing configured as a uniform extension of a pipeline to which the valve is adapted to be connected;
  - a freely-reciprocable, generally cup-shaped valve member

- and associated valve seat provided at the inlet port section for closing the valve against the incoming fluid flow;
- a first, freely-reciprocable differential piston member provided downstream of the valve member, and having first, second and third piston portions of gradually decreasing cross-sections, the third portion being extended to project into the hollow of and to abut against an inner portion of the valve member;
- a first fixed cylinder member having first, second, and third inner cylinder portions for slidably supporting the first piston member portions, respectively, and an outer cylinder portion for the cup-shaped portion of the valve member;
- a second, freely-reciprocable piston member provided downstream of the first piston member and comprising an extended portion upstream thereof adapted to abut against the said first piston member;
- a second, fixed cylinder member slidably supporting the second piston member;
- first passage means for introducing the actuating control pressure into the said first cylinder downstream of the first piston portion; and
- second passage means for relieving pressurized fluid from the first cylinder downstream of the second piston portion.

4,681,131

## LIQUID CLOSING DEVICE

José I. Uriarte, 20 General Alava, Vitoria, Spain

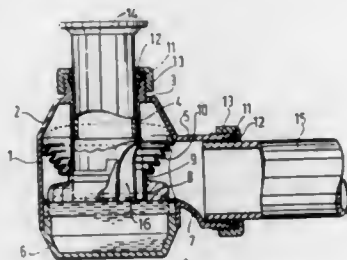
Filed Jan. 30, 1986, Ser. No. 824,283

Claims priority, application European Pat. Off., Feb. 1, 1985, 85200127.0

Int. Cl.<sup>4</sup> E03C 1/28

U.S. Cl. 137—247.35

19 Claims



13. A drain device comprising the combination of:
  - a drain body having a circumscribing side wall, a bottom wall, an open top and a drain passage intersecting said side wall above the level of said bottom wall so as to define a liquid retention space therebelow;
  - vertically extending pipe means connected with said body for closing said open top thereof and defining a space within said body between the body and the pipe means and which space is in communication with said drain passage, said pipe means having a lower end portion presenting an outer guide surface portion and extending downwardly in said space to a level above said level of the bottom wall;
  - float means slidably guided on said guide surface portion of the pipe means for liquid-buoyed vertical movement thereon above and below the bottom level of said drain passage while effecting a circumferential seal with liquid buoying the float means which is in surrounding relation to said outer surface of the pipe means; and
  - flexible membrane means connected with said float means for defining an isolated space around said pipe means upwardly from said float means and for allowing said vertical movement of said float means.

4,681,132

## CHECK VALVE WITH PRESET CRACKING PRESSURE

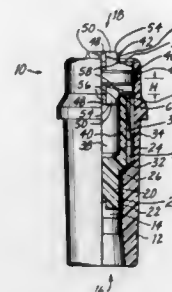
George E. Lardner, North Seminole, Fla., assignor to Halkey-Roberts Corporation, St. Petersburg, Fla.

Filed May 23, 1986, Ser. No. 867,319

Int. Cl.<sup>4</sup> F16K 15/14

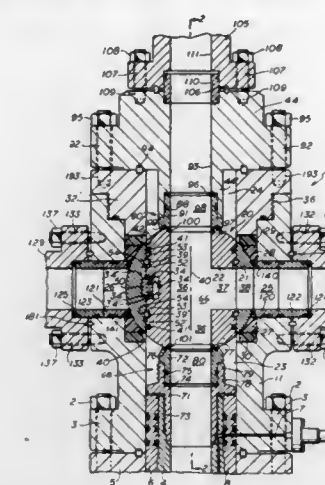
U.S. Cl. 137—271

7 Claims



1. A check valve, comprising in combination:
  - a valve body having a central axial passageway there-through defining an input and an output and having valve seat means therein;
  - valve element reciprocally positioned within said axial passageway, said valve element having valve seat means in sealingly engagable position with said valve seat means of said valve body when said valve element is urged forwardly toward said input and having a resilient rearward portion; and
  - a plug positioned within said output of said axial passageway to entrain said valve element within said axial passageway, the distance between said plug and said valve seat means of said axial passageway being appreciably shorter than the distance between the valve seat means of said valve element and said plug, whereby said valve element is urged forwardly to resiliently seal both said valve seat means together thereby defining a cracking pressure necessary to unseat the valve seat means of said valve element and said axial passageway.

the insert cavity of the outer part and having a head passage communicating with a base passage, the head passage



being along said central axis and the base passage being aligned with the perpendicular passage of the outer part.

4,681,134

## VALVE LOCK

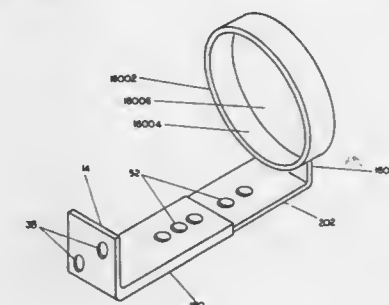
Raymond L. Paris, Sr., 3007 Bud Ct., Rte. 8, Joliet, Ill. 60436

Filed Jul. 23, 1986, Ser. No. 888,591

Int. Cl.<sup>4</sup> F16K 35/00

U.S. Cl. 137—385

9 Claims



1. A valve lock for the outlet valve of a tank truck comprising a rigid elongated member to bear against a portion of said outlet valve when its operator mechanism is attempted to be moved from a valve closed position to a valve open position when said valve lock is in its operative position, including said outlet valve and said operator mechanism thereof movable between a valve closed position and a valve open position, said valve lock including an upstream end for positioning at an upstream portion of said outlet valve when in its operative position and a downstream end for positioning at a downstream portion of said outlet valve when in its operative position, anchor means to anchor said rigid elongated member of said valve lock at said upstream end relative to said outlet valve to restrain movement of said upstream end of said rigid elongated member when so anchored, lock means to prevent movement of said valve operator mechanism of said outlet valve from its said valve closed position to a valve open position at said downstream end relative to said outlet valve when said lock means is operatively connected to said valve operator mechanism, said rigid elongated member having a bearing side edge extending between said upstream end of said valve lock and said downstream end of said valve lock, said bearing side edge being in abutting relationship with said outlet valve and facing in a first direction toward said outlet valve when said

4,681,133

## ROTATABLE BALL VALVE APPARATUS AND METHOD

Harry Weston, West Sussex, United Kingdom, assignor to Hydril Company, Los Angeles, Calif.

Filed Nov. 4, 1983, Ser. No. 549,256

Claims priority, application United Kingdom, Nov. 5, 1982, 8231601; Nov. 11, 1982, 8232226; Dec. 20, 1982, 8236158; May 20, 1983, 8313970

Int. Cl.<sup>4</sup> F16K 11/087, 51/00

U.S. Cl. 137—315

47 Claims

1. A safety valve comprising,
  - a housing having at least one lateral outlet, an upper passage and a lower passage, each of the outlet and upper and lower passages being open to a chamber in the housing, and
  - a rotatable ball having
  - an outer part with means for seating it within the chamber, said outer part having an insert cavity along a central axis of the outer part, the insert cavity having an inner diameter substantially the same as or less than that of the upper passage, said outer part having a perpendicular passage extending from the insert cavity to the exterior of the outer part, and
  - a removable inner part disposed in said insert cavity and having an outer diameter substantially the same as that of

upstream end of said valve lock is anchored and said downstream end of said valve lock is connected to said valve operator mechanism by said lock means, a portion of said valve operator mechanism being movable when not connected to said valve lock toward said first direction to begin movement of said valve operator mechanism from its said valve closed position to its said valve open position, said downstream end of said valve lock being connected to said portion of said valve operator mechanism which is movable toward said first direction whereby said bearing side edge abutting against said outlet valve restrains said downstream end of said valve lock and said portion of said valve operator mechanism connected thereto from movement toward said first direction until disconnected from said valve lock.

#### 4,681,135 TIME-DELAY VALVE

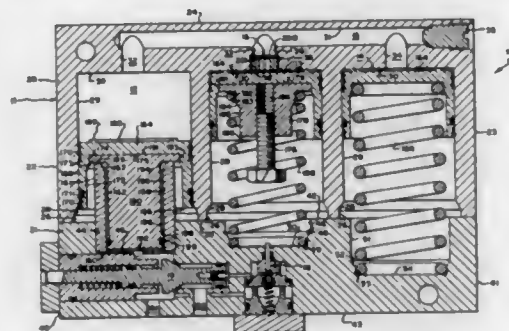
Alfred J. Tillman, Temple Terrace, Fla., assignor to Moog, Inc., East Aurora, N.Y.

Filed Apr. 18, 1986, Ser. No. 854,403

Int. Cl.<sup>4</sup> G05D 16/00

U.S. Cl. 137—489.5

17 Claims



1. A time-delay valve adapted to be associated with a source of pressurized first fluid, comprising:

- a body having an inlet, an outlet, a first passageway communicating said inlet and outlet, said first passageway including a main passageway portion communicating said inlet with said outlet and including a pilot passageway portion communicating said inlet with said main passageway portion, a first seat surrounding said pilot passageway portion, a first chamber, and a connecting passageway communicating with said first chamber, said first chamber having a first wall portion movable relative to said body so as to vary the volume of said first chamber, said first wall portion being biased toward a position at which the volume of said first chamber will be at a minimum, said inlet being adapted to selectively receive first fluid from said source;
- a second fluid occupying said first chamber and said connecting passageway;
- a restricted orifice arranged in said connecting passageway so as to impede a flow of second fluid into said first chamber;
- pressurizing means for causing second fluid to flow through said restricted orifice and enter said first chamber when said first fluid is admitted to said inlet;
- a first valve element mounted for movement toward and away from said first seat, said first valve element being biased to move toward said seat to normally close said pilot passageway portion;
- a second seat surrounding said main passageway portion; and
- a second valve element mounted in said main passageway for movement toward and away from said second seat, said second valve element being biased to move toward said second seat to normally close said main passageway portion; and
- a member mounted for movement with said first wall portion

tion, and arranged to selectively engage said first valve element, said member being movable from a first position to a second position between which said member will not displace said first valve element off said first seat, and being further movable beyond said second position after which said member will displace said first valve element off said first seat;

whereby, said first fluid will not flow through said first passageway until said member has moved beyond said second position and has displaced said first valve element off said first seat.

#### 4,681,136 GAS FLOW PULSATION DAMPENER AND PRESSURE DIFFERENTIAL CONTROL

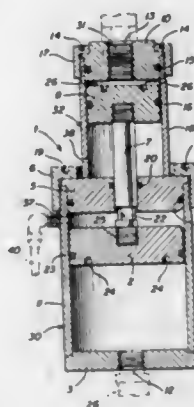
Richard J. Sequeira, 941 Karen Dr., and Frank R. Valadez, 1011 Phillips Rd., both of Yuba City, Calif. 95991

Filed Feb. 7, 1986, Ser. No. 827,053

Int. Cl.<sup>4</sup> F16K 31/365

U.S. Cl. 137—494

5 Claims



1. In combination with an expansible sleeve-type gas flow control valve, a pressure differential control device comprising a primary piston and cylinder assembly having one end of the primary cylinder filled with hydraulic fluid and being in flow communication with the exterior of a resilient sleeve of the valve for supplying control pressure thereto, the other end of the primary cylinder being in gas flow communication with the outlet of the valve so as to relate the control pressure proportionately to the outlet pressure of the valve thereby controlling differential pressure as between the valve inlet and outlet, said primary piston being mechanically linked by a piston rod to a smaller diameter secondary piston in a secondary cylinder, the rod end of the secondary cylinder being ported to atmosphere and the other end of the secondary cylinder being filled with hydraulic fluid and in communication with an accumulator so as to provide pulsation dampening of the valve.

#### 4,681,137 REACTION INJECTION MOLDING PRESSURE DEVELOPING AND BALANCING CIRCUIT

James R. James, Clarksville, Ind., assignor to Accuratio System Inc., Clarksville, Ind.

Continuation of Ser. No. 281,401, Jul. 8, 1981, abandoned. This application May 7, 1986, Ser. No. 861,634

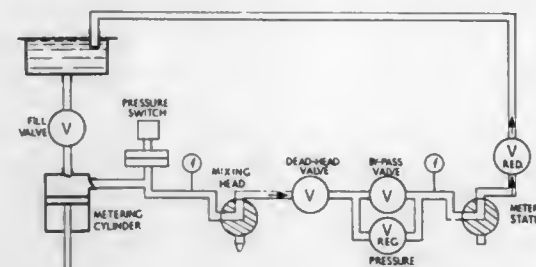
Int. Cl.<sup>4</sup> B29C 45/00

U.S. Cl. 137—568

7 Claims

1. Pressure developing and balancing circuit means for reaction injection molding comprising a reactant liquid reservoir, means for highly pressurizing reactant liquid supplied from said reservoir, mixing head means, pressure balance cylinder means, pressure regulating counterbalance valve means, accumulator means, circuit means for conducting said reactant liquid through relatively unrestricted passages to and past said

mixing head means and to one end of said pressure balance cylinder means, displaceable pressure transmitting means within said pressure balance cylinder means for separating liquids at the respective ends of said cylinder means, circuit means for conducting a non-reactant liquid from the other end of said pressure balance cylinder means to said accumulator means through regulating valve means restrictions in said



counterbalance valve means responsive to upstream pressure for maintaining a high pressure in said other end of the pressure balance cylinder whereby an upstream regulated high pressure head may be maintained on said reactant liquid at said one end of said pressure balance cylinder means and back through said unrestricted passages at said mixing head without said reactant liquid passing through a restrictive valve.

#### 4,681,138 VALVULAR DEVICE FOR THE INFLATION OF BALLOONS, PARTICULARLY BALLOONS SUPPORTED BY TUBULAR SHAFTS

Giovanni Giuliani, San Michele, Italy, assignor to VECA S.r.l., San Michele Alessandria, Italy

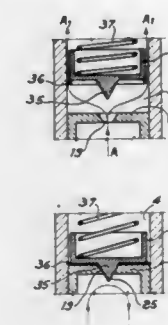
Filed Jul. 25, 1985, Ser. No. 759,122

Claims priority, application Italy, Aug. 1, 1984, 22180 A/84; Dec. 21, 1984, 24236 A/84; Dec. 21, 1984, 24222 B/84; Feb. 8, 1985, 20760 B/85; Apr. 11, 1985, 21408 B/85; Apr. 11, 1985, 20305 A/85

Int. Cl.<sup>4</sup> F16K 15/20; A63H 27/10

U.S. Cl. 137—516.29

12 Claims



1. A device for inflating a balloon, wherein a fluid is introduced into the balloon to reach the desired inflation pressure, the balloon having a neck, the balloon being supported by tubular shafts, one shaft extending to the exterior and the other into the interior of the balloon, and a one-way containment system for the inflation fluid, which comprises a one-way valve, mounted in or at one end of the tubular shaft which extends to the exterior of the balloon and inserted into the neck of the balloon; a said valve having an external shape which deforms the neck of the balloon elastically and assures maintenance of said inflation pressure, while allowing sliding inside said neck, and an inner shape which allows the insertion of said shafts, and the installation of the one-way containment system for the inflation fluid in the central section, said valve comprising an upper part and a lower part, said lower part having ribs

to seal the neck of the balloon, the upper part forming the one-way valve, said shaft which extends to the exterior of the balloon being press-fitted against the lower part, said shaft which extends into the interior of said balloon being press-fitted against said upper part and wherein said upper part and lower part of said valve form a cylindrical cavity enclosed by two bases, the base farther from the balloon having a first central axial hole and the base closer to the balloon being provided with a second central axial hole, said bases being spaced by a distance less than the diameter thereof, said one way containment system comprising a sealing element freely slidable in said cavity and having a diameter less than the diameter of each of said bases and greater than the sum of the radius of either of said bases and the diameter of said first central hole.

#### 4,681,139 ELASTOMER BALL CHECK VALVE

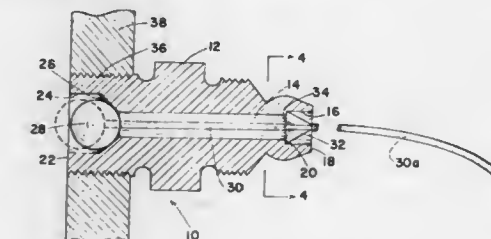
Ralph A. Falconer, Novato, Calif., assignor to Jandy Industries, Novato, Calif.

Filed Apr. 7, 1986, Ser. No. 848,763

Int. Cl.<sup>4</sup> F16K 15/04

U.S. Cl. 137—537

7 Claims



1. A check valve comprising:  
a valve body having a flow passageway therethrough;  
a valve seating surface on said body at and around one end of said flow passageway;  
a retaining surface on said body around the other end of said flow passageway;  
a valve stem of an elastomeric material;  
a valve plug fixed on one end of said stem engagable around said seating surface; and  
lateral extensions of said elastomeric material integral with said stem engagable with said retaining surface;  
said lateral extensions being in the general form of right triangles with inwardly tapering surfaces directed toward the other end of said stem to enable insertion of said other end and said lateral extensions into said flow passageway. the elastomeric material of said lateral extensions enabling distortion of said lateral extensions for passageway thereof through said passageway;  
said lateral extensions having radial surfaces seating against said retaining surface.

#### 4,681,140 TUB-SHOWER DIVERter APPARATUS

Dennis J. Hayman, Plano, Tex., assignor to United States Brass Corporation, Fort Worth, Tex.

Filed Nov. 26, 1986, Ser. No. 935,511

Int. Cl.<sup>4</sup> F16K 7/12, 11/20

U.S. Cl. 137—597

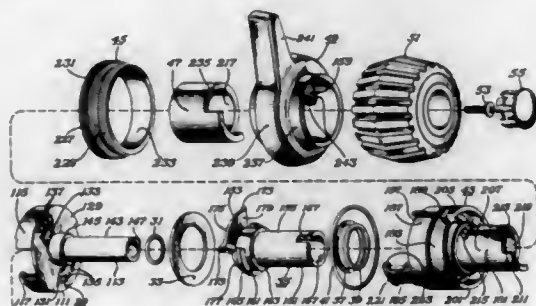
9 Claims

1. A tub-shower diverter comprising:  
a. a diverter chamber, diverter seal means, and diverter cam means;  
i. said diverter chamber comprising a planar annular surface pierced by first opening means that communicates with an inlet water supply, and by second and third opening means that communicate respectively with a tub outlet and a shower outlet, and with said first open-



ing means being spaced radially from said second and third opening means;

- ii. said diverter seal means being disposed within said diverter chamber and being an elastomeric washer sized to overlay said second and third opening means, but not said first opening means;
- iii. said diverter cam means comprising a cam portion and a stem portion, with said cam portion disposed within said diverter chamber and underlying a portion of said elastomeric washer to prevent that portion from engaging said planar annular surface, with rotation of said



stem portion permitting selection of the portion of said elastomeric washer that will not be engaged with said planar annular surface;

iv. means for controlling the rotational position of said stem portion;

whereby, pressure of water admitted to said diverter chamber from said inlet supply will force said elastomeric washer into sealing engagement with said planar annular surface except where prevented by said cam portion, so that either one or both of said second or third opening means may be selectively sealed.

4,681,141

# **LIGHT-DETECTOR, HAND-CONTROLLED FAUCET WITH WATER TEMPERATURE REGULATOR**

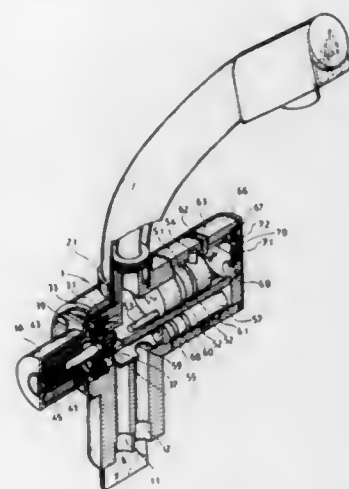
Wen-Ching Wang, Room 10-12, No. 2, Fu Hsin N. Rd., Taipei, Taiwan

Filed Feb. 3, 1986, Ser. No. 825,434

Int. Cl.<sup>4</sup> F16K 11/07, 31/11, 31/528

U.S. Cl. 137-607

5 Claims



1. A light-detector, hand-controlled faucet with water temperature regulator comprising in combination:

- (a) a cross-type manifold having an end which can be connected to a source of water, said source including a pipe

for supplying hot water and a pipe for supplying cool water;

said manifold also having a tubular transverse portion for mounting in it a respective cylindrical valve control post, said tubular transverse portion including a first walled selector slot, said tubular transverse portion including a water outlet, and said water outlet including a circular pipe coupling, and said tubular transverse portion including a valve aperture including a tubular projection and a circular, walled valve-connecting opening;

said manifold having a water temperature control section for mounting in it a respective cylindrical water temperature control post, said water temperature control section having a first end adapted to communicate with the hot water pipe and the cool water pipe, and said water temperature control section including a second walled slot at the end thereof which is opposite from said end adapted to communicate with the hot water pipe and the cool water pipe;

said manifold having a mixed water outlet positioned in communication at the hot water pipe; and

said manifold having an electric wire conduit extending from the space between said circular pipe coupling and said water outlet to the respective lateral end surface near said circular valve-connecting opening of the transverse section of said manifold;

(b) a circular tie ring with a circular protuberance around its center and a tubular water pressure pipe at its peripheral surface, said circular tie ring being adapted to be operatively seated in said circular valve-connecting opening of said manifold;

(c) a pliable valve sleeve, said pliable valve seat being adapted to be operatively seated in said circular valve-connecting opening of said manifold, said pliable valve sleeve having an outer diameter in conformity with the inner wall of said valve-connecting opening of said cross-type manifold, said pliable valve sleeve having a shoulder as extension of its peripheral surface, and said pliable valve sleeve having a valve cover with an outer diameter just equal to that of said valve-connecting opening of said cross-type manifold and with a connection hole at the center of said valve cover, and a hole in said shoulder for communication with said tubular water pressure pipe of said tie ring;

(d) a valve extender adapted to be seated at least in said pliable valve sleeve, said valve extender having a conical head, a neck with an outer diameter in conformity with that of the connecting hole in said shoulder of said pliable valve sleeve, a cylindrical portion, a disc-shaped recess in its bottom, and a tubular water pressure balance duct extending along its center;

(e) an annular connection cover adapted to be seated in said valve-connecting opening of said cross-type manifold, said annular connection cover having a stop hole for communication with said tubular water pressure pipe of said circular tie ring;

(f) a metal extending pin with magnetic properties;

(g) a pliable cylindrical stop head operatively connected at one end of said metal extending pin;

(h) an extending pin container comprising a dish-shaped portion and a tubular extension, for containing said extending pin;

(i) a compression spring, operatively mounted in said tubular extension of said extending pin container;

(j) an induction coil for mounting in it said extending pin container and said compression spring in said induction coil, said induction coil being adapted to be operatively connected to said cross-type manifold;

(k) a cylindrical valve control post which is adapted to be operatively disposed in and which corresponds in diameter to said tubular transverse portion of said cross-type manifold, said cylindrical valve control post having two leak-proof rings mounted at its central portion, said cylindrical valve control post having at its front end a pin adapted to be aligned with the center of said valve aper-

ture in said tubular transverse portion of said cross-type manifold, and said cylindrical valve control post having a cylindrical selector element corresponding in size to said first selector slot in said tubular transverse portion of said cross-type manifold;

(l) a valve control ring having a first groove at its inner wall for cooperating with said cylindrical selector element of said cylindrical valve control post;

(m) a cylindrical water temperature control post adapted to be operatively mounted in and having a diameter in conformity with said water temperature control section in said cross-type manifold, said control post having a hollow rear tubular section, a water outlet at said rear end, and a water inlet in the central portion of said hollow rear tubular section at a position in conformity with the cool water pipe, said cylindrical water temperature control post having two leak-proof rings mounted at its central portion, and said cylindrical water temperature control post having beneath its forward end a cylindrical selector duct corresponding in size to said second selector slot of said water temperature control section of said cross-type manifold;

(n) a ring with a projecting block at its inner circumference corresponding to said first selector slot for cooperating therewith;

(o) a temperature control ring having an oblique groove in its inner wall for cooperating with and corresponding in size to said second walled slot of said water temperature control section of said cross-type manifold, and said temperature control ring also having a plurality of openings along its inner wall;

(p) a circular temperature setting disc adapted to be connected at said temperature control ring and having a mounting block, at least one rectangular opening, and a pin hole in said block above said opening, and said temperature setting disc having a central round hole, and two screw holes below said central hole;

(q) a temperature setting pin adapted to be mounted in and corresponding in diameter to said pin hole in said block of said temperature setting disc;

(r) a compression spring for said circular temperature setting disc and adapted to be positioned beneath said block of said circular temperature setting disc;

(s) a disc-shaped cover having four equidistant retainer blocks arranged about at one side about its center;

wherein said valve extender neck is inserted in said pliable valve sleeve, and clamped by said circular tie ring at one side and said annular connection cover at the other side, with said water pressure pipe of said circular tie ring passing through said hole in said shoulder of said pliable valve sleeve and said stop hole of said annular connection cover, and said valve extender neck is fixed in said stop hole of said annular connection cover;

wherein said selector element of said cylindrical valve control post is located within said first groove in said valve control ring, with said valve control post and said valve control ring being connected to said cross-type manifold in such a way that said cylindrical selector element is cooperatively mounted in said first selector slot, and said pin of said valve control post is positioned at the center of said valve aperture of said transverse portion of said cross-type manifold;

wherein said cylindrical selector duct of said cylindrical water temperature control post is located within said oblique groove of said temperature control ring in such a way that said cylindrical selector duct is operatively disposed in said second selector slot of said water temperature control section of said cross-type manifold, for regulating outgoing water temperature by selectively matching said water inlet of said cylindrical water temperature control post with the cool and hot water pipes, and permitting flowing of cool and hot water alone;

wherein said valve control ring cooperatively engages said

water temperature control post, and said valve control ring is operatively connected on said cross-type manifold; wherein the valve composed of said valve extender, said pliable valve sleeve, said annular connection cover, and said circular tie ring, is operatively connected to the valve-connecting opening of said cross-type manifold; and wherein said induction coil is secured at said cross-type manifold in such a way that said metal extending pin is operatively actuating with respect to said water pressure balance duct of said valve extender.

4,681,142

# **SELF-COMPENSATING SOLENOID VALVE**

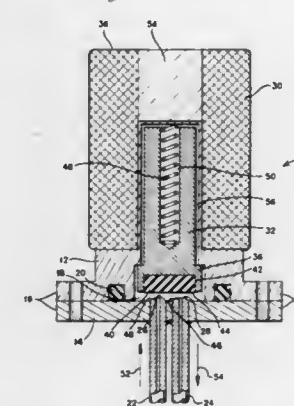
Fritz H. Woeller, Boulder Creek, and Yutaka Matsumoto, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 7, 1985, Ser. No. 795,945

Int. Cl.<sup>4</sup> F16K 31/02

U.S. Cl. 137-614.18

5 Claims



1. A solenoid valve comprising a valve body, a valve chamber in said valve body, first and second fluid passages providing an inlet to said valve chamber and an outlet from said valve chamber, both of said first and second passages being configured to serve bi-directionally and symmetrically as either the inlet or the outlet, resilient means for sealing said first and second passages, a solenoid coil positioned alongside said valve chamber, a movable core positioned within said solenoid coil, said core extending into said valve chamber and being connected to said resilient sealing means, said first and second passages terminating in coplanar ends of the same configuration facing said resilient sealing means so that movement of said core within said solenoid coil moves said resilient sealing means into and out of simultaneous, separate sealing engagement with said first and second passages, and means positioned halfway along said resilient sealing means between the ends of said first and second passages for biasing said resilient sealing means in a given direction with respect to said first and second passages, said core being positioned within said solenoid coil with sufficient clearance and said valve chamber being configured to allow spontaneous alignment of said sealing means with respect to the ends of said first and second passages to make hermetic contact between said sealing means and the one of said first and second passages serving as the outlet by pivoting said core within said solenoid coil.



4,681,143

**ELECTROMAGNETIC DIRECTIONAL CONTROL VALVE**

Hiroki Sato, Aichi; Yukitomo Sanada, Okazaki; Yuji Yokoya, Toyota; Kazuo Masaki, Chiryu; Kiyohara Nakagawa, Kariya, and Syuui Murata, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Nippon Denso Kabushiki Kaisha, both of Japan

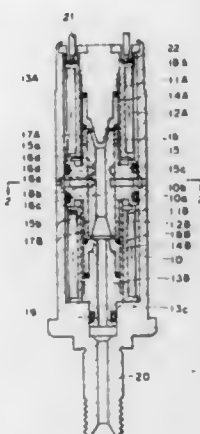
Filed Dec. 24, 1985, Ser. No. 813,144

Claims priority, application Japan, Dec. 27, 1984, 59-273966; Apr. 23, 1985, 60-87095

Int. Cl.<sup>4</sup> F16K 31/06

U.S. Cl. 137—625.37

18 Claims



1. An electromagnetic directional control valve for changing over flow paths of fluid between a first flow path and a second flow path, comprising:

- a tubular case having at least one radial hole therethrough; first and second electromagnetic means fixed in said case and spaced axially from each other;
- a tubular core fixed in said case and disposed between said first and second electromagnetic means;
- a plunger disposed in said core and operable to move from a neutral position in a first axial direction in response to activation of said first electromagnetic means and from said neutral position in a second axial direction in response to activation of said second electromagnetic means;
- a first stopper member bearing against said core and movable together with said plunger at times when said plunger is moved in said first axial direction upon activation of said first electromagnetic means;
- a second stopper member bearing against said core and movable together with said plunger at times when said plunger is moved in said second axial direction upon activation of said second electromagnetic means;
- valve means movable with said plunger among three valve positions for selectively blocking said hole, connecting said hole to said first flow path, and connecting said hole to said second flow path; and

first and second means engaging said first and second stopper members for biasing said plunger toward the neutral position;

said plunger being selectively stopped at said neutral position by said first and second biasing means, at a first stop position against said first biasing means at times when said plunger is moved in said first axial direction upon activation of said first electromagnetic means, and at a second stop position against said second biasing means at times when said plunger is moved in said second axial direction upon activation of said second electromagnetic means, said valve means being in one of said three valve positions at times when said plunger is stopped at each of said neutral position, first stop position, and second stop position.

4,681,144

**AUTOMATIC FUELING APPARATUS AND METHOD**

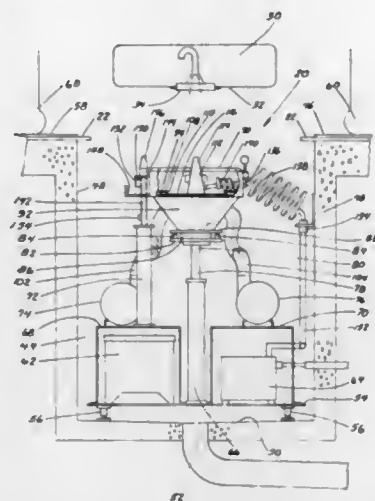
Ronald F. Horvath, and Barbara L. Horvath, both of 4325 Kennedy Dr., Apt. 204, Racine, Wis. 53404

Filed Feb. 4, 1986, Ser. No. 825,574

Int. Cl.<sup>4</sup> B65B 3/04

U.S. Cl. 141—1

29 Claims



20. A method for automatic fueling, without manual intervention of a stationary ground-supported vehicle through an inlet on an exposed vehicle tank bottom by means of below-ground apparatus beneath the vehicle comprising:

- sensing the vertical position of the tank;
- lifting a vertically-movable frame from a retracted below-ground position to an intermediate vertical position fixed by the sensing step, said frame carrying an upwardly-facing nozzle member which is not engaged with the inlet when the frame is in the retracted and intermediate positions;
- positioning the nozzle member on the frame in vertical alignment with said inlet; and
- further lifting the frame until the nozzle member engages the inlet, thereby allowing fueling to proceed.

4,681,145

**APPARATUS FOR REMOVING TREE STUMPS**

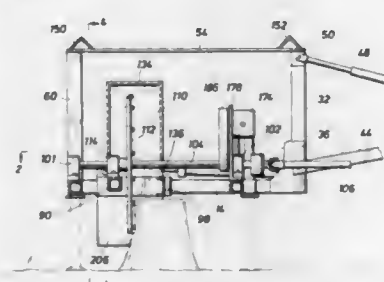
Norman N. York, 61671 Finrock, Pasadena, Tex. 77506

Continuation-in-part of Ser. No. 758,167, Jul. 22, 1985, Pat. No. 4,621,668, which is a continuation-in-part of Ser. No. 581,917, Feb. 21, 1984, Pat. No. 4,530,385. This application Nov. 10, 1986, Ser. No. 928,989

Int. Cl.<sup>4</sup> B27L 1/00

U.S. Cl. 144—2 N

17 Claims



1. Tractor supported and operated stump removal apparatus, comprising:

- (a) a frame structure adapted to be supported, raised, and lowered by a hitch structure of the tractor;
- (b) slide means being positioned for guided reciprocal movement on said frame structure;
- (c) hydraulic means for imparting linear reciprocal movement to said slide means, said hydraulic means being independent of tractor hydraulics;
- (d) a non-circular drive shaft being mounted for rotary movement on said frame structure and adapted to be driven by the power take-off of the tractor; and
- (e) a rotary cutter element being rotatably mounted on said slide means and movable along with said slide means, said rotary cutter element having means providing sliding, non-rotatable relation with said drive shaft, whereby said cutter element is rotated by said drive shaft and is capable of simultaneous linear movement.

4,681,146

**METHOD AND APPARATUS FOR PRODUCING ENGINEERED WOOD FLAKES, WAFERS OR STRANDS**

Frank F. Liska, and Frank T. Liska, both of, 1403 - 1770 Davie Street, Vancouver, B.C., Canada (V6G 1W4)

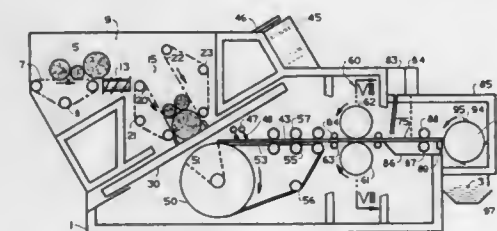
Filed Apr. 29, 1985, Ser. No. 728,482

Claims priority, application Canada, May 22, 1984, 454792

Int. Cl.<sup>4</sup> B27L 5/02, 7/00

U.S. Cl. 144—369

10 Claims



1. A method for producing square or rectangular wood flakes from logs of predetermined length, said flakes being square or elongated in the direction of the wood fibers and having clean cut faces and edges, said flakes being of generally uniform predetermined thickness, uniform predetermined width and uniform predetermined length, the edges parallel to the wood fibers forming right, obtuse or acute angles with the face of said flakes and the edges transverse to the wood fibers forming right, obtuse or acute angles with the face of said flakes, the method comprising:

- aligning said logs on a log infeed chain conveyor with the fibers of said logs extending transverse to the feed motion, feeding said logs into a log infeed pocket,
- confining said logs tightly in said pocket with three sets of log feeding chains, said chains preventing rolling and lengthwise shifting of said logs and imparting feeding motion to said chains, said chains all moving at the same speed,
- presenting the bottom logs confined in said log infeed pocket to the top of a rotary veneer slicing tool containing at least one slicing blade with doublesurfaced nosebars for successive slicing of veneer sheets,
- imparting a continual rotary slicing motion to said slicing tool and producing relative feed motion between said log feeding chains and said slicing tool,
- compressing the wood fiber of the bottom logs fed by said log feeding chains against the top of said slicing tool, the degree of compression varying gradually from a high compression at the center of rotation of said slicing tool to a low compression at the circumference of said slicing tool,
- slicing a veneer sheet from the bottom log during each pass of the slicing blade under said pile of logs, said slicing blade being substantially parallel to the direction of the wood fiber of the log being sliced and the slicing motion

direction being substantially transverse to the wood fiber of said logs during the veneer slicing process,

compressing the veneer during slicing from said bottom logs, the degree of compression varying gradually, from a high compression at the center of rotation of said slicing tool to a low compression at the circumference of said slicing tool,

letting the veneers sliced from said logs pass through a recess in the slicing tool and drop onto a rotary veneer assembly drum rotating against the direction of the slicing motion of said slicing tool, towards the veneer strip cutting apparatus, said drum communicating with a source of suction, said veneers being directed by jets of pressurized air and held temporarily on the surface of said veneer assembly drum by the suction in said drum and the pressure exerted by the jets of pressurized air,

imparting motion to said veneer sheets in the direction of the veneer strip cutting apparatus, the wood fiber of said veneer sheets extending parallel to the logs being sliced, parallel to the axis of said veneer assembly drum and transverse to the direction of veneer motion,

transferring said veneer sheets from the veneer assembly drum to a veneer strip cutting apparatus on a set of belts running at a speed corresponding to the circumferential speed of said veneer assembly drum,

holding down the veneer sheets on said set of belts during the transfer to the veneer strip cutting apparatus;

feeding said veneer sheets into a veneer strip cutting apparatus at a speed corresponding to the circumferential speed of said veneer assembly drum,

cutting said veneer sheets transverse to the wood fiber into at least a single veneer strip

continually moving said veneer strips through an edge sealing treatment apparatus at a speed corresponding to the circumferential speed of said veneer assembly drum,

further, continually moving said veneer strips at the speed corresponding to the circumferential speed of said veneer assembly drum through a moisture content and wood mass measuring apparatus towards a rotary flake cutting tool,

imparting cutting motion to said rotary flake cutting tool for successive cutting of the flakes by a plurality of circumferentially distributed cutting blades, the cutting direction extending substantially downwardly, transverse to the direction of travel of said veneer strips, parallel to the fiber of wood.

7. Apparatus for producing square or rectangular flakes from wood logs of predetermined length, said flakes being square in shape like wafers or elongated in the direction of wood fiber like strands, comprising:

- a rotary substantially disk shaped veneer slicing tool provided with at least one but preferably several slicing blades with corresponding doublesurfaced nosebars,
- means for imparting rotation to said slicing tool,
- log infeed pocket disposed above said slicing tool and having means for holding tightly a pile or a single file stack of wood logs and means for presenting the bottommost logs to the top side of said veneer slicing tool, fiber of said logs being extended substantially transversally to the direction of rotation of said rotary veneer slicing tool,
- means for conveying and aligning said wood logs before entering said log infeed pocket,
- means for producing relative feed motion between said holding means and said rotary veneer slicing tool for causing the latter to slice successive veneer sheets from the bottom of said wood logs and to drop said veneers onto the surface of the hollow rotary veneer assembly drum disposed under said veneer slicing tool and having the axis of said drum extended substantially parallel to the direction of wood fiber of said logs,
- means for guiding sliced veneer sheets with jets of pressurized air towards the surface of said veneer assembly drum, said means for guiding being disposed under said veneer slicing tool, above said veneer assembly drum,



means for exerting temporary suction pressure to the surface of said veneers dropped onto the surface of said veneer assembly drum, said suction pressure acting in the direction towards the axis of said veneer assembly drum, means for cancelling of said negative pressure, separating veneers from the surface of said veneer assembly drum and conveying the veneer sheets towards the veneer strip cutting apparatus, means for imparting acceleration and conveying motion to said veneers towards said veneer strip cutting apparatus, said motion so correlated to the circumferential speed of said veneer slicing tool as to allow said veneers to follow each other in close succession or in an overlapping mode, veneer strip cutting apparatus containing rotary veneer strip cutting tools with multiplicity of shearing cutting blades, cutting direction being transversal to wood fiber of said veneers, means for imparting rotation to said rotary veneer strip cutting tools, moisture content and wood mass measuring apparatus, flake cutting apparatus containing rotary flake cutting tool with a plurality of circumferentially distributed cutting edges extending substantially parallel to the axis of said flake cutting tool, mounted to perform cutting motion substantially transversally to the motion of advancing veneer strips and substantially parallel to the wood fiber of said veneer strips, means for imparting cutting motion to said flake cutting tool, cutting being substantially in downward direction.

4,681,147

## SAFETY DEVICE AND TIRE CONSTRUCTION FOR VEHICLES OR OTHER CONTRIVANCES

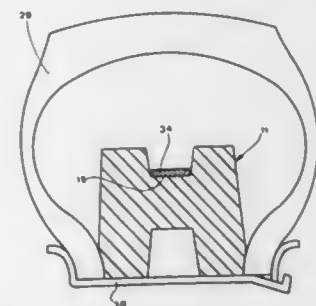
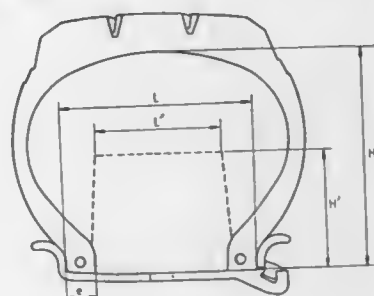
Benolt Hugel, Paris, France, assignor to Hutchinson S.A., Paris, France

Continuation of Ser. No. 528,797, Sep. 2, 1983, abandoned. This application Nov. 26, 1985, Ser. No. 801,515

Claims priority, application France, Sep. 2, 1982, 82 14998 Int. Cl.<sup>4</sup> B60C 17/04, 17/10

U.S. Cl. 152-158

4 Claims



1. A safety device and a tubeless tire construction comprising:

- (a) a tubeless tire which is supported by a rim having a width equal to L, said tubeless tire having:
  - (i) a tread;
  - (ii) two side walls;
  - (iii) two beads, the thickness of each of which is equal to e;
  - (iv) an internal height H; and
  - (v) a weight P;
- (b) a toric safety ring made of elastomer or plastomer, said toric safety ring having:
  - (i) a rigidity R;
  - (ii) a SHORE A hardness d;
  - (iii) a weight P';
  - (iv) a height H';
  - (v) a lower portion and an upper portion; and
  - (vi) a width L' at the top of the upper portion, the cross-section of said toric safety ring having a symmetrical configuration with respect to a longitudinal median plane of said tubeless tire;
- (c) reinforcement means comprising at least one bead core made of elastomer or plastomer of greater hardness than the body of the safety device, said reinforcement means being circumferentially embedded in the lower portion of said toric safety ring; and
- (d) a predetermined amount of lubricant interposed between said toric safety ring and said tubeless tire, wherein the dimensional relationships between said toric safety ring and said tubeless tire are calculated so as to ensure a sufficient internal contact width between said tubeless tire and the upper portion of the safety device to limit the shifting of said tubeless tire in the case of a flat and to give the device a height calculated, with respect to the internal height of said tubeless tire, to avoid a considerable collapse of said tubeless tire and the risk of losing the tread from said tubeless tire, particularly in that:

(e) the width L' is such that:

$$L - 3e \leq L' \leq L - e;$$

(f) the height H' is such that:

$$\frac{H}{2} + 5\% \leq H' \leq \frac{H}{2} + 20\%;$$

(g) the rigidity R is such that:

$$750 \text{ Kg/cm} \leq R \leq 1050 \text{ Kg/cm};$$

(h) the weight of the safety device is between 60% and 70% of the weight of said tubeless tire; and

(i) the SHORE A hardness d is such that:

$$70 \leq d \leq 80.$$

4,681,148

## TIRE DEFLATION MECHANISM

Oscar C. Decker, Jr., 409 Lufberry, Selfridge ANGB, Mich. 48045, and Eugene Kleemann, 17390 Juliana, East Detroit, Mich. 48021

Filed Jul. 27, 1983, Ser. No. 517,601

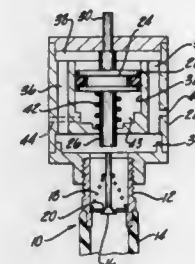
Int. Cl.<sup>4</sup> B60C 23/04; F16K 15/20

U.S. Cl. 152-431

2 Claims

1. In association with a road vehicle having a plurality of wheels equipped with pneumatic tires, each tire having a hollow stem containing a depressible check valve therein for tire-inflation purposes: the improvement comprising a deflator mountable on a stem of each tire on the vehicle, the deflators being collectively used to lower the tire pressures to predetermined low values when it is desired to operate the vehicle on soft terrain; each deflator comprising a hollow body mountable on the associated stem; internal wall structure within the hollow body defining a cylindrical chamber (32); differential area

plunger means (24) within the hollow body located to align with the aforementioned check valve when the hollow body is in its mounted position; said plunger means comprising a piston (28) slidably disposed in said cylindrical chamber, a manually depressible pin (30) extending from one face of the piston outwardly through the hollow body, and a rod (26) extending from the other face of the piston through a wall of the cylindrical chamber and toward the aforementioned check valve: the cross sectional area of the piston being greater than the cross sectional area of the rod; spring means within the cylindrical chamber acting to move the plunger means away from the check valve; and a plurality of air passages (36) within the hollow body operable to transmit pressurized air from the check valve to the cylindrical chamber and thence to said one



face of the piston; said air passages being spaced radially outward from the cylindrical chamber without going through the plunger means, whereby said one face of the piston is undiminished in area by reason of the passages; said one face of the piston having sufficient area that when the air pressure has a value higher than the predetermined low value the air pressure forces on said one piston face are effective to bias the plunger means to a position wherein the rod holds the check valve open; said spring means being sized so that when the air pressure drops to a predetermined low value the spring means is effective to substantially balance the air pressure forces on the plunger means, whereby the plunger means then offers minimal resistance to movement of the check valve to its closed position.

4,681,149

## WINDOW BLINDS FOR VEHICLES

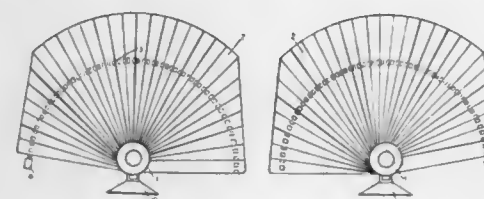
Siu Tung-Chow, New Territories, Hong Kong, assignor to Tai Cheong Blinds Company Ltd., Kwai Chung, Hong Kong

Filed Sep. 19, 1985, Ser. No. 777,493

Int. Cl.<sup>4</sup> B60J 3/00

U.S. Cl. 160-134

7 Claims



1. A window-blind for use in vehicles comprising:

- (a) means for removably attaching said window-blind to a window of said vehicle;
- (b) a plurality of elongated slats, each of said slats having one end pivotally connected to said attaching means, said plurality of slats being stacked one on top of another when said window-blind is in a closed position, and being opened into a fan-shape when said window-blind is in an open position; and
- (c) a connecting tape for connecting adjacent slats to each other and for retaining said window-blind in said fan-

shape when said window-blind is in an open position, wherein each slat comprises six apertures, said apertures being spaced across the width of each slat such that a sixth aperture is positioned adjacent to one elongated edge of each slat and five apertures are positioned in a group adjacent a second elongated edge of each slat, wherein said connecting tape is wound through said apertures such that said tape is inserted from a first side of each slat through said sixth aperture to a second side of each slat, through a fifth aperture back to said first side, thereafter passing over a fourth and a third and a second aperture along said first side, through a first aperture back to said second side, through said second aperture back to said first side, through said third aperture back to said second side, through said fourth aperture back to said first side, and through said fifth aperture, adjacent to itself, back to said second side, and then to a first side of an adjacent slat.

4,681,150

## METHOD OF MANUFACTURING STAMPED KNITTING NEEDLES

Masao Fukuhara, Wakayama, Japan, assignor to Fukuhara Needle Company, Ltd., Wakayama, Japan

Division of Ser. No. 850,603, Apr. 11, 1986, Pat. No. 4,625,527.

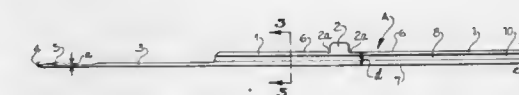
This application Jul. 25, 1986, Ser. No. 889,177

Claims priority, application Japan, Apr. 12, 1985, 60-79116

Int. Cl.<sup>4</sup> B21G 1/06

U.S. Cl. 163-5

5 Claims



1. A method of manufacturing stamped knitting needles comprising an elongate shank having flat opposite sides and outer and inner edge portions, a hook on one end of said shank, butt means extending outwardly from one edge of said shank, and at least one elongate groove extending longitudinally along at least one of said opposite sides of said elongate shank, said method including the steps of forming a continuous strip of sheet material of a predetermined width and thickness, forming a continuous elongate groove along the entire length of at least one side of said strip material and spaced inwardly from one edge thereof to thereby form the groove extending longitudinally along the needle shank, and stamping successive needle blanks from said strip material and along at least said one edge of said strip material so that the edge of the strip material forms the back of the needle and the groove extends longitudinally along the shank of the needle.

4,681,151

## METHOD FOR PRODUCTION OF FIBER-REINFORCED METAL COMPOSITE MATERIAL

Yoshihiro Koya, Yamato, and Toshiaki Katayama, Yokohama, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Sep. 26, 1986, Ser. No. 911,878

Claims priority, application Japan, Oct. 22, 1985, 60-235695

Int. Cl.<sup>4</sup> B22D 19/14

U.S. Cl. 164-76.1

3 Claims

1. A method for production of fiber-reinforced metal composite material, characterized by the steps of: impregnating a bundle of fibers with water; then compressing and freezing said water-impregnated fiber bundle to form a high density fiber shaped body; subsequently thawing and drying said high density fiber shaped body, while maintaining its shape as compressed; and thereafter pouring molten metal into said fiber shape body.

4,681,152

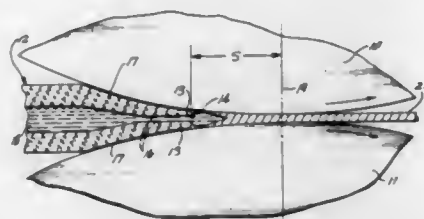
## CONTINUOUS CASTING ALUMINUM ALLOY

John E. Flowers, Riverside; Christopher A. Romanowski, Lake Arrowhead, and Dennis M. Smith, Crestline, all of Calif., assignors to Hunter Engineering Company, Inc., Riverside, Calif.

Filed Oct. 4, 1985, Ser. No. 783,957  
Int. Cl.<sup>4</sup> B22D 11/06, 11/10

U.S. Cl. 164—477

4 Claims



1. A method for casting an aluminum alloy comprising the steps of continuously introducing molten aluminum alloy through an insulating tip to the nip of rotating rolls and continuously withdrawing a cast sheet from between the rolls and characterized by the steps of, prior to introducing the molten aluminum alloy to the nip:

- sparging a chlorine containing gas from a sparging source into the molten aluminum alloy;
- coalescing droplets of chlorides in the molten alloy by passing the molten alloy downstream from the sparging source through a plurality of parallel passages having a width in the range of from 0.5 to 5 millimeters and a length in the range of from five to fifty millimeters; and
- filtering any oxide particles from the molten alloy downstream from the passages.

4,681,153

## AUTOMOTIVE AIR CONDITIONING SYSTEM WITH INDEPENDENT TEMPERATURE CONTROL FOR DUAL AIR FLOWS

Noriaki Uchida, Yokohama, Japan, assignor to Nissan Shatai Company, Limited, Kanagawa, Japan

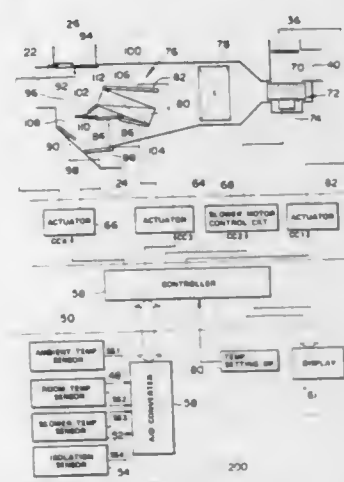
Filed Apr. 25, 1984, Ser. No. 603,903

Claims priority, application Japan, May 31, 1983, 58-81265[U]

Int. Cl.<sup>4</sup> B60H 3/00; B61D 27/00; F25B 29/00

U.S. Cl. 165—31

14 Claims



1. An automotive air conditioning system, comprising:  
means for cooling inlet air;  
means for heating inlet air;

- an upper air mix chamber;
- a lower air mix chamber;
- a first air passage connecting an outlet of said cooling means to said upper air mix chamber for delivering cool air from said cooling means to said upper air mix chamber; said first air passage facing an inlet of said heating means;
- a second air passage connecting said cooling means to said lower air mix chamber for delivering cool air from said cooling means to said lower air mix chamber;
- a third air passage connecting an outlet of said heating means to said lower air mix chamber for delivering hot air from said heating means to said lower chamber;
- a first control means associated with said inlet of said means for heating air for controlling the proportion of said cool air to be delivered through said first passage and to be delivered into said means for heating air;
- a second control means associated with said second air passage for controlling the proportion of cool air to be delivered to said lower air mix chamber through said second air passage;

one-way air flow means communicating with said third air passage and including a shutter door for establishing one-way air flow from said third air passage to said upper air mix chamber and for blocking air flow from said upper air mix chamber to said third air passage;

a third control means associated with said outlet of said means for heating air for controlling the delivery of said hot air to said upper air mix chamber through said one-way air flow means and the delivery of hot air to said lower air mix chamber through said third air passage;

at least one upper air outlet communicating with said upper air mix chamber and adapted to discharge air in said upper air mix chamber to a vehicle compartment; and

at least one lower air outlet communicating with said lower air mix chamber and adapted to discharge air in said lower air mix chamber to said vehicle compartment.

4,681,154

## HEAT ACCUMULATING MATERIAL ENCLOSING CONTAINER AND HEAT ACCUMULATING APPARATUS

Naomichi Yano; Hajime Ito, and Shigeru Tanaka, all of Osaka, Japan, assignors to Kubota, Ltd., Osaka, Japan

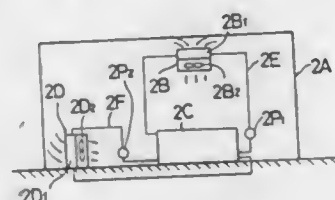
Division of Ser. No. 416,658, Sep. 10, 1982, Pat. No. 4,565,242.  
This application Mar. 12, 1985, Ser. No. 710,884

Claims priority, application Japan, Mar. 13, 1981, 56-36131; Aug. 24, 1981, 56-125525; Aug. 24, 1981, 56-133163; PCT Int'l Appl., Mar. 8, 1982, PCT/00063

Int. Cl.<sup>4</sup> F28D 21/00

U.S. Cl. 165—47

8 Claims



1. A solar heat accumulating greenhouse system, comprising:
- greenhouse space defining means enclosing a greenhouse space comprising a major volume of air for exchanging heat;
- a first heat transfer fluid medium circulating system provided in said greenhouse space and comprising piping means for circulating a first heat transfer fluid medium; heat exchange means provided in an uppermost portion of said greenhouse space and coupled to said first heat transfer fluid medium circulating system for exchanging heat

between said first heat transfer fluid medium and said major volume of air circulated within said greenhouse space, and

heat accumulating means coupled to said first heat transfer fluid medium circulating system for exchanging heat between said first heat transfer fluid medium and said heat accumulating means for accumulating heat,

said heat accumulating means comprising:

- heat insulating tank means coupled to said first heat transfer fluid medium circulating system for defining a heat insulated space for allowing a flow therethrough of said first heat transfer fluid medium;
- heat accumulating capsule means containing a phase transforming heat accumulating medium and provided in said heat insulating tank means in contact with said first heat transfer fluid medium for accumulating heat, and
- flow path defining means provided in said heat insulating tank means for defining a flow path generally extending in a horizontal direction and for causing a change in the flow direction of said first heat transfer fluid medium in upward and downward directions,

said flow path defining means comprising

partitioning means for partitioning the space in said heat insulating tank means into a plurality of compartments disposed in succession along the upstream to downstream direction of said flow of said first heat transfer fluid medium, and

passage means for directing said flow of said first heat transfer fluid medium from the lower portion of an upstream compartment to the upper portion of the next adjacent downstream compartment; and wherein

a portion of said piping means for flow of said first heat transfer fluid medium into said heat accumulating means is coupled to an upper portion of an upstream compartment, and a portion of said piping means for flow of said first heat transfer fluid medium out of said heat accumulating means is connected to a lower portion of a downstream compartment,

said heat accumulating capsule means is adapted to extend through said partitioning means into a plurality of compartments and each said partitioning means is split into upper and lower partitioning means elements at a position where a heat accumulating capsule means extends therethrough.

4,681,155

LIGHTWEIGHT, COMPACT HEAT EXCHANGER  
Theodore A. Kreda, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed May 1, 1986, Ser. No. 858,481

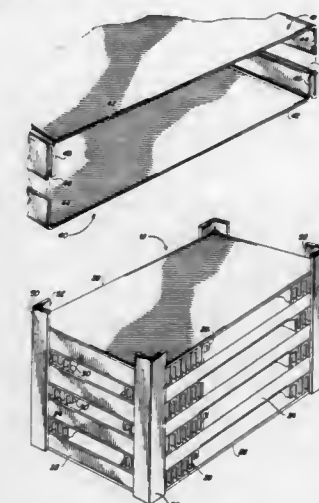
Int. Cl.<sup>4</sup> F28F 3/00

U.S. Cl. 165—76

8 Claims

5. A heat exchanger comprising:
- a plurality of tubes defining a plurality of first flow paths;
  - a plurality of pairs of generally C-shaped bars spacing said plurality of tubes apart from adjacent tubes, said bars extending generally perpendicular to said plurality of tubes and each pair of bars defining a plurality of second flow paths;
  - an extended surface heat transfer element between each pair of bars;
  - an integral lanced tab formed at each end of said bars, each tab folded over itself toward the heat exchanger center and capturing a portion of said extended surface heat transfer element between itself and said bar;
  - side plates on each side of said heat exchanger, said side plate spaced from one of said tubes by a pair of bars;
  - means for securing said tubes, bars, extended surface heat transfer elements and side plates together; and

manifold means, sealingly attached to said tube ends for distributing a working fluid into said plurality of first flow



paths at one end of said tubes and for selecting said working fluid at the opposite end of said tubes.

4,681,156

## COOLING APPARATUS FOR A GAS TRANSMISSION SYSTEM

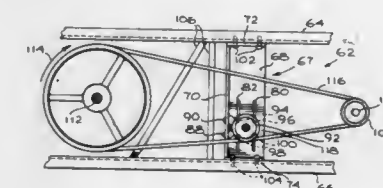
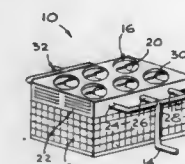
Paul A. Leonard, 3829 Lees Ave., Long Beach, Calif. 90808

Filed Sep. 10, 1986, Ser. No. 906,270

Int. Cl.<sup>4</sup> F28F 13/12

U.S. Cl. 165—124

5 Claims



1. Improved cooling apparatus for a gas transmission system, including:

- input means for receiving a medium to be cooled;
- output means for transmitting said medium after it is cooled; and
- cooling means intercoupling said input means and said output means, said cooling means including radiator means having an input end and an output end, said input end of said radiator means being connected to said input means and said output end of said radiator means being connected to said output means;
- said cooling means including, in addition, fan means positioned to cooperate with said radiator means for producing a flow of cooling air across said radiator means;
- said fan means including a rotatable fan having a desired direction of rotation, a drive-motor for driving said fan in said desired direction and belt means intercoupling said drive-motor and said rotatable fan for rotation of said fan;
- said belt means including a belt having, alternatively, a taut state and a slack state, and adjustable belt-tensioning



means including a frame and being mechanically coupled to said belt for tensioning said belt between said taut state and said slack state, said adjustable belt-tensioning means including a sheave in rotating contact with said belt, a shaft having first and second ends, carrying said sheave at the first end thereof, and positioned in said frame substantially parallel to the plane of said belt and spaced from said belt an adjustable distance corresponding to the condition desired for said belt between said taut state and said slack state;

a sprag-clutch having a first race fixedly connected to said frame and a unidirectionally rotatable second race coupled to said second end of said shaft, said second race having a direction of rotation relative to said first race which corresponds to said desired direction of rotation of said fan.

4,681,157

## CROSSFLOW HEAT EXCHANGER

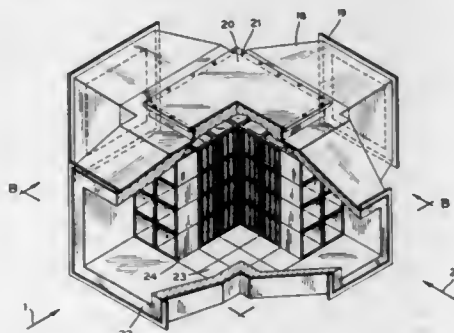
Hans-Dieter Schwarz; Friedrich W. Pietzarka; Werner Lichten-thaler, and Ludwig Muhlhaus, all of Dortmund, Fed. Rep. of Germany, assignors to Uhde GmbH, Fed. Rep. of Germany  
Filed Sep. 27, 1985, Ser. No. 781,141

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435911

Int. Cl.<sup>4</sup> F28F 9/22; F28D 7/02

U.S. Cl. 165-145

5 Claims



1. A crossflow heat exchanger, comprising:
  - (a) a body with two gas inlet and two gas outlet nozzles,
  - (b) at least one installation cover on the upper side of the body,
  - (c) a block consisting of a number of ceramic heat-exchange elements mounted completely accurately in a cuboid form with gas ducts layered above one another at right angles to one another, four external side surfaces having gas-duct openings, and the bottom and top surfaces being free of openings,
  - (d) thermal insulation between the body and the block of ceramic heat-exchange elements,
  - (e) elevations and recesses on all peripheral edges of each said side surface of each heat-exchange element, whereby opposing heat-exchange elements fit into one another and the side surfaces are not in contact in the gas-duct area, so that a flat hollow chamber is produced between adjacent heat-exchange elements,
  - (f) a sealing-strip is fitted between each opposing elevation and recess, and
  - (g) at least one recess or elevation on the bottom and top surfaces of each heat-exchange element, the elements locking positively into one another as said recesses and elevations cooperate with one another.

4,681,158

## CASING ALIGNMENT TOOL

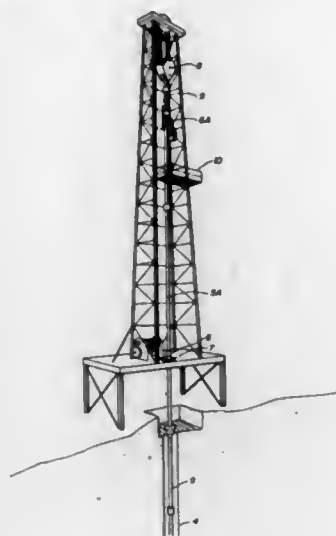
Harold P. Pennison, New Orleans, La., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 433,307, Oct. 7, 1982, abandoned. This application Mar. 13, 1986, Ser. No. 839,470

Int. Cl.<sup>4</sup> E21B 19/00

U.S. Cl. 166-77.5

1 Claim



1. A casing alignment tool for aligning one section of casing within a derrick of a drilling rig positioned over a wellbore with another section of casing extending from said wellbore, said tool comprising:

a frame mounted in said derrick at a point adjacent the upper portion of said one section of casing;

a head assembly pivotably mounted to said frame, said head assembly comprising:

a yoke member having a recess in one end to receive said one section of casing;

means for pivotably connecting the other end of said yoke to said frame for movement about a horizontal axis;

means for rotating said yoke about said horizontal axis between a retracted position substantially parallel to have the vertical axis of said derrick and an operable position substantially perpendicular to the vertical axis of said derrick;

a plurality of roller means rotatably mounted on said yoke and extending into said recess whereby said roller means will engage said one section of casing when said casing is received in said recess;

a pair of roller arm assemblies being pivotably mounted on said yoke at respective sides of said recess;

means for moving each of said roller arm assemblies between an open position where said recess is free to receive said one section of casing and a closed position when said one section of casing will be held in said recess; each of said means for moving said roller arm assemblies comprising:

a power cylinder mounted on said yoke;

a rod operated by said power cylinder; and

a plurality of spaced holes in said one end of each respective roller arm assembly whereby said respective rod can be selectively connected to one of said holes to thereby adjust said head assembly to receive casing having different diameters;

roller means rotatably mounted on each roller arm assembly and positioned to extend into said recess to engage said one section of casing when said roller arm assemblies are in a closed position, said plurality of roller means on said yoke and said roller arm assemblies positioned so that the centerpoint of a circle passing through the axes of said

roller means when said arm assemblies are in a closed position will be on the centerline of said wellbore; and wherein said means for pivotably connecting the other end of said yoke to said frame further includes:

a plurality of holes in said frame whereby one of said holes is aligned with a hole in said yoke to thereby adjustably position the centerpoint of said roller means with said centerline of said wellbore.

4,681,159

## SETTING TOOL FOR A WELL TOOL

Roger P. Allwin, and Mark Budke, both of Bryan, Tex., assignors to MWL Tool Company, Midland, Tex.

Filed Dec. 18, 1985, Ser. No. 810,100

Int. Cl.<sup>4</sup> E21B 23/00

U.S. Cl. 166-124

9 Claims



1. A setting tool for use in a well bore with a well tool requiring a longitudinal motion for operation including, telescopically mounted upper and lower tubular members, said upper tubular member being adapted for coupling to a tubing string, said lower tubular member being longitudinally movable from a first upper position to a second lower position with respect to said upper tubular member,

a first outer releasable interconnecting nut means for threadably interconnecting said upper tubular member to a well tool, said first releasable interconnecting nut means being slidably but non-rotatively mounted on said upper tubular member for permitting relative longitudinal motion between said upper tubular member and said first interconnecting nut means and for permitting co-rotation of said upper tubular member and said first nut means for releasing said first nut means from a well tool,

a second outer releasable interconnecting nut means for threadably interconnecting said upper tubular member to a well tool, said second releasable interconnecting nut means being arranged for non-rotative releasable interconnection to a well tool for permitting upper tubular member to be releasable from interconnection with said second interconnecting nut means upon rotation of said upper tubular member relative to a well tool,

said lower tubular member having an internal valve seat adapted for sealingly receiving a sealing means dropped through a tubing string so that hydraulic pressure can be applied for moving said lower tubular member between said first and second positions,

said upper and lower tubular members being arranged so that said upper tubular member has a downwardly facing surface which is engagable with an upwardly facing surface on said lower member so that upon release from the threaded interconnection of said second interconnecting nut means, said upper tubular member can engage said

lower member for longitudinally moving said lower tubular member conjunctively with said upper tubular member.

4,681,160

## APPARATUS FOR SECURING A MEASUREMENT-WHILE-DRILLING (MWD) INSTRUMENT WITHIN A PIPE

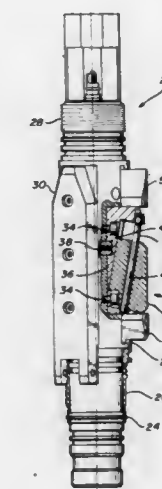
Douglas H. Fineberg, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 12, 1985, Ser. No. 797,275

Int. Cl.<sup>4</sup> E21B 23/00, 23/04

U.S. Cl. 166-212

8 Claims



1. Apparatus for mounting an instrument within a tubular member comprising:

an elongated body member for attachment to said instrument;

a plurality of fixed contact pad members mounted to said body member; and

a pressure responsive slidable contact pad member mounted to said body member, said pressure responsive contact pad member responsive to a pressure increase within the annulus of said tubular member, said pressure responsive contact pad member comprising a base member rigidly mounted to said body member said base member having an inclined plane surface and a generally wedge shaped contact pad member slidably retained within said base member for translational movement along said inclined plane surface for radial displacement of said wedged shaped contact pad member.

4,681,161

## WELL SCREEN CENTRALIZER AND METHOD FOR CONSTRUCTING CENTRALIZER AND FOR JOINING OF WELL SCREENS

Bryant A. Arterbury, and James E. Spangler, both of Houston, Tex., assignors to Howard Smith Screen Company, Houston, Tex.

Filed Mar. 17, 1986, Ser. No. 839,955

Int. Cl.<sup>4</sup> E21B 17/10; E03B 3/18

U.S. Cl. 166-227

6 Claims

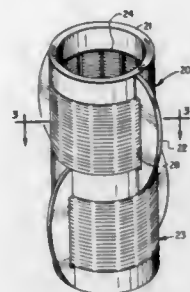
1. A well screen centralizer with a longitudinal flowpath therethrough connectable in a well screen to become a part thereof, comprising:

a. a body comprising:

(i) a plurality of ring members axially aligned and spaced apart;

(ii) a plurality of circumferentially spaced, longitudinally

- extending centralizer blades connecting adjacent ring members together, said blades being structurally rigid and unyielding in response to radially directed forces applied to said blades; and,
- b. well screen insert means filling the spaces between adjacent ring members.
5. A method of constructing a well screen centralizer comprising the steps of:



- a. aligning a plurality of ring members in axial relation, connecting adjacent ring members together with circumferentially spaced, longitudinally extending centralizer blades; and
- b. securing well screen inserts between adjacent ring members.

4,681,162

# BOREHOLE DRILL PIPE CONTINUOUS SIDE ENTRY OR EXIT APPARATUS AND METHOD

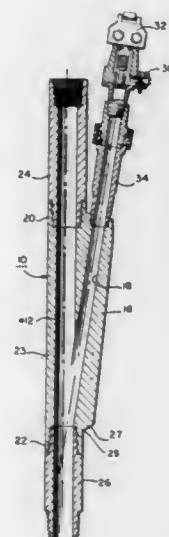
Harper Boyd, Lake Charles, La., assignor to Boyd's Bit Service, Inc., Lake Charles, La.

Filed Feb. 19, 1986, Ser. No. 830,824

Int. Cl.<sup>4</sup> E21B 17/00, 19/08

U.S. Cl. 166—242

1 Claim



1. A side entry sub for use in combination with a hydraulic pressure pack-off assembly for freeing a stuck drill pipe of a drill pipe string without disassembly of a top drive drilling motor assembly which comprises:

- a main body section;
- a main passage through said main body section off-center with respect to the center line of said main body section and of the same diameter as the inside diameter of said drill pipe; said main passage having upper and lower ends, said upper and lower ends provided with internal female pipe threads,
- a side entry passage in said main body section which inter-

cepts said main passage and extends in the same direction as said main passage at an angle of about 6½ degrees relative to said main passage and of a smaller diameter than said main passage, said side entry passage having an outer end with internal female pipe threads,

a short pipe section having a length of from about 17 inches to about 20 inches secured to each pipe threaded end of said main passage in said main body section in which said short pipe section includes pipe threads on the outer surface of each end to assume a greater amount of wear during use than said main body section and which is replaceable when worn, and

an adapter having male pipe threads on its outer end surfaces secured to said side entry passage and to which said hydraulic pressure pack-off assembly is secured.

4,681,163

# SAND CONTROL SYSTEM

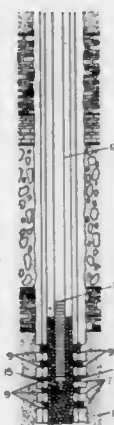
John P. Guldry, Sugar Land, and Lee Roy C. Gavranovic, Guy, both of Tex., assignors to Well Improvement Specialists, Inc., Houston, Tex.

Filed Nov. 12, 1985, Ser. No. 797,109

Int. Cl.<sup>4</sup> E21B 43/04, 43/10

U.S. Cl. 166—278

6 Claims



1. A method for controlling sands in a wellbore, the method comprising the steps of

introducing an amount of particles into the wellbore, introducing a tubular string into the particles and moving the string downwardly in the particles, the tubular string having swivel means for rotatably connecting an entry tool to the string, the swivel means connected between the string and the entry tool, the swivel means having a diameter no greater than the diameter of the string, the entry tool mounted to the swivel means for relative rotation therewith, the tool having auger means thereon for facilitating the introduction of the string into the particles.

4. A tool for facilitating the introduction of a tubular string into an accumulation of particles in a wellbore having perforations for production, the tool comprising

body means,

rotative connection means for rotatably connecting the body means to the string for relative rotation therewith, the rotative connection means connected between the string and the body means and having a diameter no greater than the diameter of the string, and

auger means connected to the body means for augering into the particles and for facilitating the movement of particles into the perforations.

4,681,164

# METHOD OF TREATING WELLS WITH AQUEOUS FOAM

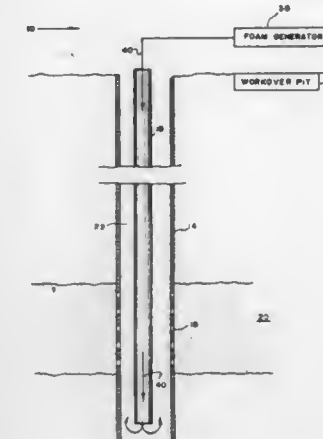
Ronald R. Stacks, 4200 Crestgate, Midland, Tex. 79707

Filed May 30, 1986, Ser. No. 869,018

Int. Cl.<sup>4</sup> E21B 37/08, 43/25, 43/27

U.S. Cl. 166—304

8 Claims



1. A method of treating a hydrocarbon producing well utilizing foam injection, comprising the steps of:
- circulating the foam up the well to remove substantially all fluids and loose solids from the well;
- dissolving substantially all liquid and solid hydrocarbons left in the well at a formation level;
- circulating a mixture of foam and mineral acid up the well to remove ferrous salts and calcium carbonate;
- removing calcium sulfate from the well by injecting a calcium sulfate converter to cover the face of the well at the formation level;
- removing the converted calcium sulfate by a flow of foam which comprises a mixture of 0.5–2% of solvent, 0.25–2% of corrosion inhibitor and 96–99.25% of water; and
- circulating a mixture of foam, mineral acid and iron chelator up the well to remove substantially all residue left in the well.

4,681,165

# AQUEOUS CHEMICAL WASH COMPOSITIONS

Charles E. Bannister, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Mar. 1, 1984, Ser. No. 585,061

Int. Cl.<sup>4</sup> E21B 33/05; C09K 7/02

U.S. Cl. 166—312

16 Claims

1. An aqueous, substantially unfoamed chemical wash composition having properties making it suitable for use as a pre-flush in well cementing operations and/or for removal of drilling mud from a borehole at a temperature of from about 150° F. to about 270° F., said wash

- a. being predominately composed of water,
- b. containing an active surfactant component comprising a combination of (1) from about 0.1 to about 1.5 weight percent (total weight basis) of a water soluble anionic surfactant; (2) from about 0.1 to about 1.5 weight percent (total weight basis) of a nonionic surfactant; and (3) from about 0.05 to about 0.54 weight percent (total weight basis) of at least one water soluble amphoteric surfactant, and
- c. having dispersed therein a heterogeneous mixture of distinct particles comprising both a first particulate oil soluble resin which is friable and a second particulate oil soluble resin which is pliable and wherein the size of said friable resin particles ranges from about 0.5 to about 300 microns and the size of said pliable resin particles ranges from about 0.05 to about 30 microns, the amount of said

friable-pliable resin mixture being sufficient to impart effective fluid loss control to said chemical wash composition.

4,681,166

# INTERNAL NONROTATING TIE-BACK CONNECTOR

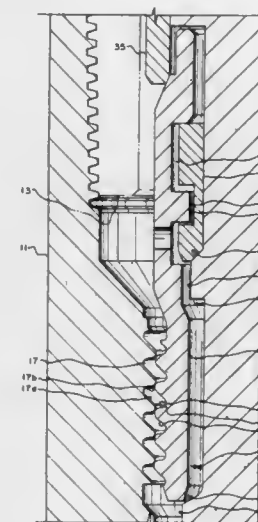
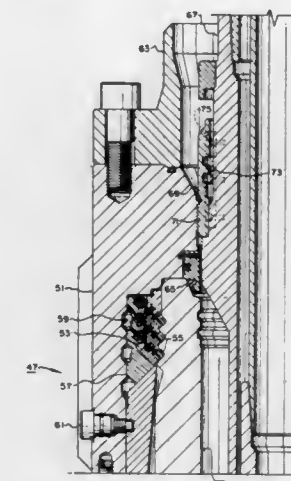
Glen H. Cuiper, Spring, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Aug. 18, 1986, Ser. No. 897,431

Int. Cl.<sup>4</sup> E21B 33/038

U.S. Cl. 166—345

3 Claims



1. A tie-back connection apparatus for securing the lower end of an inner conduit into an outer conduit of a subsea wellhead, the inner conduit extending upwardly from the wellhead and being held in tension, the apparatus comprising in combination:

a set of threads formed on an inner wall of the outer conduit; an annular latch carried by the inner conduit, the latch having a set of threads on its exterior for engaging the threads in the outer conduit, the threads of the latch being resiliently contractible in a radial direction; means on the inner conduit for allowing the latch threads to deflect inwardly to slidably ratchet past the outer conduit threads while the inner conduit is in a lower position relative to the latch and as the inner conduit is lowered without rotation into the outer conduit;



means for preventing the latch threads from deflecting inwardly when the inner conduit is subsequently moved upwardly relative to the latch to an upper position, for securing the inner conduit to the outer conduit against upward movement; and

retaining means cooperating with the latch and the inner conduit for preventing after the inner conduit has moved to the upper position subsequent downward movement of the inner conduit relative to the latch and outer conduit, and for transmitting a downward load on the inner conduit through the retaining means to the latch, and through the threads of the latch to the outer conduit;

the engaging threads allowing removal of the inner conduit from the outer conduit by rotation of the inner conduit.

4,681,167

# APPARATUS AND METHOD FOR AUTOMATICALLY AND PERIODICALLY INTRODUCING A FLUID INTO A PRODUCING OIL WELL

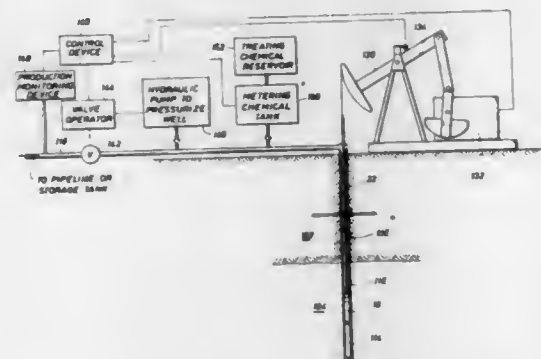
Paul B. Soderberg, Houston, Tex., assignor to Soderberg Research & Development, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 618,469, Jun. 8, 1984. This application May 17, 1985, Ser. No. 735,382

Int. Cl.<sup>4</sup> E21B 43/00, 37/06, 34/10, 34/14

U.S. Cl. 166—371

17 Claims



1. A method for periodically and automatically introducing a fluid into a producing well through a tubing drain valve in a string of production tubing, comprising:

disabling temporarily, automatically and at periodic time intervals a string of sucker rods disposed within said string of production tubing between a surface-located means for operating said sucker rods and a downhole pump so that a mechanical actuator on said string of sucker rods is stopped in a predetermined position on one side of a lever means of said tubing drain valve;

opening said tubing drain valve by pressurizing the interior of said production tubing to a pressure sufficient to actuate said tubing drain valve to its opened position;

introducing a fluid into said production tubing in response to the opening of said tubing drain valve;

conveying said introduced fluid into said producing well through said tubing drain valve;

enabling said string of sucker rods; and

closing said tubing drain valve by moving said lever means on said valve with said mechanical actuator as a result of the enablement of said string of sucker rods.

14. An apparatus useful for periodically and automatically introducing a fluid into a producing well through a tubing drain valve located in a production string, comprising:

a string of production tubing suitable for suspension in a producing well;

surface and downhole pumps connected by a string of sucker rods for lifting well fluids through said production tubing;

a tubing drain valve within said production string, said tubing drain valve actuated to its opened position by

increased pressure within said production tubing and actuated to its closed position by movement of a lever means of said valve;

means in communication with the interior of said production tubing for pressurizing said production tubing to a pressure sufficient to open said tubing drain valve;

means in communication with the interior of said production tubing for introducing a fluid into said production tubing; an actuator means disposed on said string of sucker rods for mechanically closing said tubing drain valve by cooperation with said lever means on said valve; and

means for controlling automatically the operation of the above components at periodic time intervals for automatically conveying a fluid into said production tubing and through said tubing drain valve.

4,681,168

# METHOD AND APPARATUS FOR RUNNING LONG TOOLS INTO AND OUT OF A PRESSURIZED ENCLOSURE

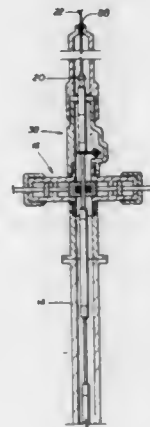
James W. Kisling, III, Kingwood, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Oct. 30, 1985, Ser. No. 792,755

Int. Cl.<sup>4</sup> E21B 23/00

U.S. Cl. 166—381

5 Claims



1. An apparatus for inserting and withdrawing an elongated tool, formed by a plurality of uniform sections of a first diameter joined by connectors of a second smaller diameter, into and out of a producing well closed by a blowout preventer, said apparatus comprising:

a housing secured by one end to an upper end of said blowout preventer and defining a through bore forming an axial extension of a bore of said blowout preventer,

a cavity opening inwardly into the bore of said housing,

a plate mounted by a first side in said cavity movable between a first position extending from said cavity substantially blocking said bore and a second position lying within said cavity substantially freeing said bore of any obstruction;

a slot extending from a second side of said plate opposite said first side radially across at least the center of said plate, said slot being wider than said second diameter and narrower than said first diameter; and

a pressure tight container adapted to be secured to the other end of said housing whereby tool segments, formed by a section and a connector, are assembled on said housing, enclosed in said container and, by opening said blowout preventer and moving said plate from the first to the second position, sequentially lowered into said well with said plate returning to said first position to engage said connector thereby holding said tool, and said tool is withdrawn from said well by reversing the process.

4,681,169

# APPARATUS AND METHOD FOR SUPPLYING ELECTRIC POWER TO CABLE SUSPENDED SUBMERGIBLE PUMPS

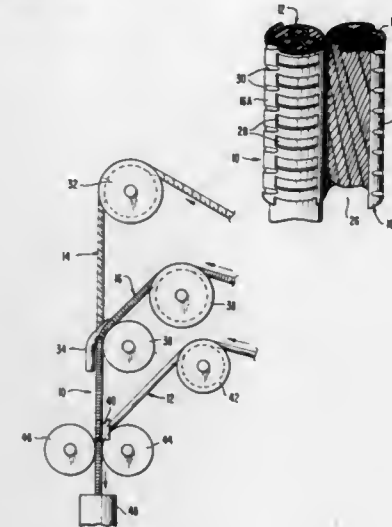
Earl B. Brookbank, III, Bartlesville, Okla., assignor to TRW, Inc., Cleveland, Ohio

Filed Jul. 2, 1986, Ser. No. 881,245

Int. Cl.<sup>4</sup> E21B 41/00, 19/00; H02G 1/00; H01B 7/18

U.S. Cl. 166—385

7 Claims



1. A method of supporting and electrically energizing equipment in a well, that comprises providing a continuous length of electrical power cable, providing a continuous length of support cable, providing a continuous length of cable carrier, feeding said continuous lengths toward the well, continuously joining said cable carrier with said power cable and with said support cable to form a unitary assembly as said lengths are advanced toward said well, and feeding said unitary assembly into said well.

5. A cable assembly comprising a continuous length of electrical power cable, a continuous length of support cable, and a continuous length of cable carrier substantially coextensive longitudinally with said cables, said cable carrier comprising two laterally displaced resilient clamping sections open at opposite sides of the carrier, one of said sections resiliently embracing one of said cables and the other of said sections resiliently embracing the other of said cables.

4,681,170

# ROCK DRILLS FOR DRILLING CONTINUOUSLY ARRAYED BORES

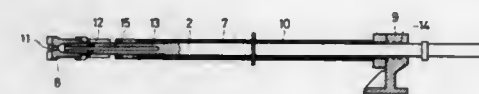
Toshio Ohl, Takasaki, Japan, assignor to Furukawa Co., Ltd., Tokyo and Okumura Corporation, Osaka, both of, Japan

Filed Aug. 5, 1985, Ser. No. 762,528

Int. Cl.<sup>4</sup> E21C 3/00

U.S. Cl. 173—50

2 Claims



1. A rock drill for drilling a plurality of arrayed continuous bores comprising:

a plurality of rods positioned for drilling a plurality of arrayed continuous bores;

a rotating means for imparting rotation to said rods;

a single percussion member for imparting percussive force to said plurality of rods; and

a rod guide which the plurality of rods are passed through

and held within including a plurality of cylindrical tubular members integrally combined, each one thereof corresponding to one of the plurality of rods, wherein each of said plurality of rods is passed through its corresponding tubular member so as to hold and guide the plurality of rods for substantially their entire length and to provide a fluid passage for flushing fluid formed between an outer surface of each of the plurality of rod members and an inner surface of the corresponding tubular member.

4,681,171

# ONE-PERSON BATTERING RAM

Gene A. Kee, 49 Harmon St., and Mark Hanna, 50 Sterling St., both of, West Lynn, Mass. 01905

Filed Jul. 12, 1985, Ser. No. 754,476

Int. Cl.<sup>4</sup> B25D 9/00; A63B 59/00

U.S. Cl. 173—90

5 Claims



2. A battering ram suitable for use by one person in battering an object, the battering ram comprising:

(a) a substantially solid body having a longitudinal axis, a length along such axis, and first and second opposing ends through which such axis passes, having a weight in excess of ten pounds but insufficient to prevent its being carried by one person;

(b) a first handle attached to the body proximate to the location of the center of gravity of the body along its longitudinal axis, to allow the user to hold the body and to swing it along its longitudinal axis with sufficient ease to generate momentum for battering the object, wherein the handle projects radially outwardly from the body a distance substantially less than the length of the body,

the first handle including a cable threaded through spaced holes in the tube in such a way as to cause a loop of such cable to protrude outwardly from the tube, the portion of such cable within the tube being embedded in concrete;

(c) a second handle attached to the body at the second end thereof; and

(d) a contact face, disposed at the first end of the body, for making physical contact with the object, the contact face having sufficient compressive strength and resilience as not to crack or shatter upon repeated heavy blows against the object.

4,681,172

# CUSHIONING DEVICE FOR USE WITH A PNEUMATIC IMPACT TOOL OR THE LIKE

Toshio Mikiya, Minoru Kaneko, and Yasuo Kazama, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,228

Claims priority, application Japan, Oct. 12, 1984, 59-212476

Int. Cl.<sup>4</sup> B25D 17/24

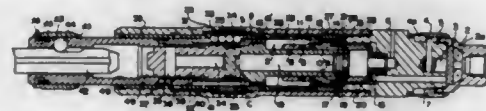
U.S. Cl. 173—139

3 Claims

1. A cushioning device for a pneumatic impact tool or the like having an impact means such as a chisel and a housing means provided with first exhaust hole means opening to the atmosphere, said device comprising:

a rear cylinder closed at its front and rear ends and having air inlet port means and air port means in communication with the interior of the cylinder;

- a front cylinder interconnected concentrically with the rear cylinder and closed at its rear end by the closed front end of the rear cylinder, said rear and front cylinders being axially slidably mounted in said housing means;
- a piston mounted in the front cylinder for reciprocal sliding movement between the front closed end of the rear cylinder and said impact means;
- a first outer cylindrical sleeve mounted over and coaxially with the rear cylinder and within the housing means, the sleeve including an air outlet port means opening to said air space and communicable with said air port means;
- a second outer cylindrical sleeve mounted over and coaxially with the front cylinder, the second outer cylindrical sleeve having second exhaust hole means communicable with said first exhaust hole means; and
- an air space defined at least in part by the end face of one of the rear cylinder and the front cylinder, a first outer cylindrical sleeve mounted over the rear cylinder, and a second cylindrical sleeve interposed between said cylinders and said housing means, said first outer cylindrical sleeve



having air outlet port means opening to said air space and communicable with said air port means, said second cylindrical sleeve having second exhaust hole means communicable with said first exhaust hole means;

said first and second exhaust holes, said air inlet port means and said air outlet port means being arranged such that as the rear and front cylinders are moved backward due to reaction forces exerted on the piston when the impact means strikes a workpiece to reduce the volume of the air space, the air in the air space is initially discharged through the second and first exhaust hole means to the atmosphere until the second exhaust hole means is closed by the front cylinder whereafter the air pressure in the space is increased to cushion the rearward movement of the cylinders and such that continued rearward movement of the cylinders brings the air inlet port means into alignment with the air outlet port means to permit the air in the space to escape through the aligned port means into the interior of the rear cylinder so that the air in the space continues to perform the cushioning function in a self-controlled manner.

4,681,173

#### METHOD AND APPARATUS FOR DRILLING A GROUP OF SUBSEA WELLS

Brennan C. Disber, and Steven H. Tate, both of Morgan City, La., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 19, 1985, Ser. No. 756,544

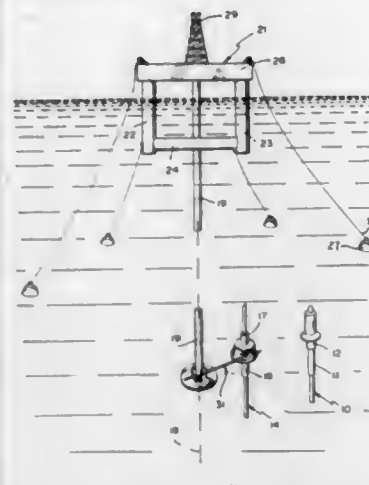
Int. Cl.<sup>4</sup> E21B 7/128

U.S. Cl. 175—7

3 Claims

1. The combination with a first well drilled into the floor of an offshore body of water and having a first drill pipe (16) protruding upwardly therefrom, of a pipe guide for commencing a second well into said ocean floor at a predetermined distance and direction from said first well and comprising:
  - a clamping head (32) adapted for removable engagement with said first drill pipe (16) and operable to be selectively rotatably adjusted or fastened on said drill pipe;
  - a drill pipe sleeve guide having a skirt at the lower end thereof for resting on the ocean floor, and defining a vertical opening for slidably registering a second drill pipe to position the latter for entry into the ocean floor at said predetermined distance from said first well;
  - a spacer bar (39) depending from said drill pipe sleeve guide

- (36) and extending outwardly therefrom in a direction normal to said vertical opening,
- a spacer bar clamp (58) including at least two clamp members which depend from a side of said clamping head and define therebetween a generally horizontal passage for slidably receiving said spacer bar,



said spacer bar clamp (58) being operable to fixedly engage a segment of said spacer bar (39) when said drill pipe sleeve is positioned said predetermined distance from said first well whereby to fixedly establish said predetermined distance and direction.

4,681,174

#### DIAMOND CROWN BIT

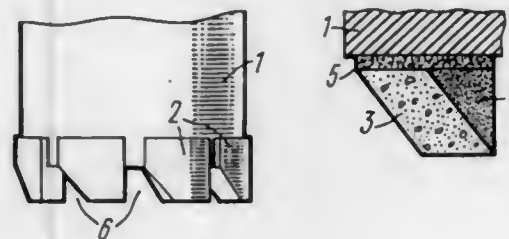
Marat T. Aubakirov; Esengali L. Limanov; Askar K. Syzdykov; Ravil S. Abdrazakov; Murat G. Tleuov, all of Alma-Ata; Vladimir S. Khazhuer, Terek; Ruslan D. Buzdov, Nalchik, and Vladislav K. Khashirov, Terek, all of U.S.S.R., assignors to Kazakhsky Politechnichesky Institute imeni V.I. Lenina, Alma-Ata, U.S.S.R.

Filed Jan. 16, 1986, Ser. No. 819,522

Int. Cl.<sup>4</sup> E21B 10/48

U.S. Cl. 175—330

1 Claim



1. A diamond crown bit, comprising:
  - a body;
  - a matrix secured on one of the end faces of said body;
  - mud discharge ports subdividing said matrix into sections separated from one another;
  - each said sector consisting of:
    - a weld-on layer on said one end face of said body whereby said sectors are held to said body;
    - a diamond-impregnated layer shaped as a parallelepiped and held to said weld-on layer to have its front and rear faces inclined; and
    - an insert shaped as a triangular prism having side face rigidly held to the weld-on layer and its face face rigidly held to the inclined rear face of the diamond-impregnated layer.

4,681,175

#### AUTO-COUPLING TOOL FOR DRILL-PIPES

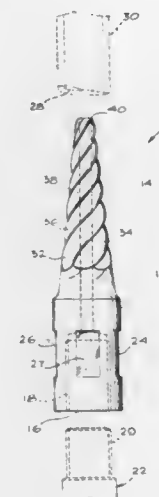
Bruce Bocking, 550 E. Foothill Blvd., Glendora, Calif. 91740; Joe A. Cervantes, Jr., 265 Kirkwall Rd., Azusa, Calif. 91702; Douglas H. Green, 16740 Bygrove, Covina, Calif. 91722; Bruce W. La Sota, 1425 S. Almansor, Alhambra, Calif. 91801; David H. Marshall, 1621 Bramhall, Glendora, Calif. 91740; Bernard Rodriguez, 3828 Baldwin Park Blvd., Baldwin Park, Calif. 91706, and Glen Van Gorden, 308 E. Shorb St., Alhambra, Calif. 91801

Filed Oct. 5, 1984, Ser. No. 658,044

Int. Cl.<sup>4</sup> E21B 7/20

U.S. Cl. 175—393

1 Claim



1. A tool for use in installing utility pipes in the ground, including:

- a unitary body;
- said unitary body having a coupling portion and a bit portion;
- said coupling portion having a hollow region therein, said hollow region bearing threads on the inner wall thereof, said threads being sized and shaped to receive the male threads on a first utility-pipe section;
- said bit portion being rigid and being coaxial with said coupling portion, and said bit portion being tapered, and having its narrow end remote from said coupling portion and bearing, on the outer surface thereof, in coaxial relationship with said bit portion, a plurality of intertwined, spirally-disposed, sharp ridges for engaging the inner wall of a second utility-pipe section to cause such second utility-pipe section to rotate in unison with said first utility-pipe section;
- said bore-pipe coupling tool including, in addition, an axial passageway extending from said hollow region of said coupling portion through the entire length of said bit portion, whereby debris accumulating around narrow end of said tool may be flushed out by the introduction of water under pressure into said axial passageway in said bit portion, thus facilitating the movement of the tool through the ground;
- said coupling portion bearing opposed flat outer surfaces thereon.

4,681,176

#### PRODUCT HANDLING AND WEIGHING APPARATUS

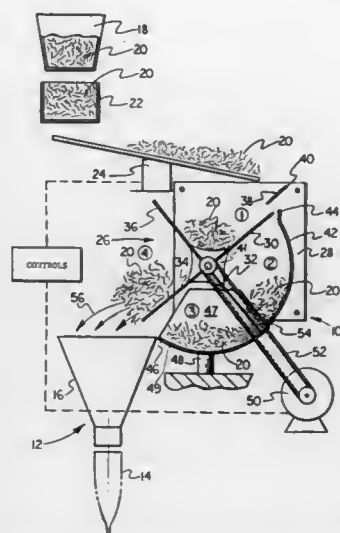
Michael J. Moran, Raleigh, and Tadeusz Kemnitz, Durham, both of N.C., assignors to 501 USM Corporation, Farmington, Conn.

Filed Aug. 1, 1986, Ser. No. 892,669

Int. Cl.<sup>4</sup> G01G 13/24, 19/00

U.S. Cl. 177—114

7 Claims



1. A product handling and weighing apparatus comprising:
  - a weighing bucket having a smooth concave bottom and upstanding side walls;
  - a paddle wheel having spaced interconnected vanes forming product pockets therebetween; and
  - a concave backing member adjacent said weighing bucket and coacting with said vanes to form a holding pocket for the product prior to entry into the weighing bucket.

4,681,177

#### METHOD AND APPARATUS FOR TENSIONING FRICTIONALLY DRIVEN, GROUND ENGAGING BELTS

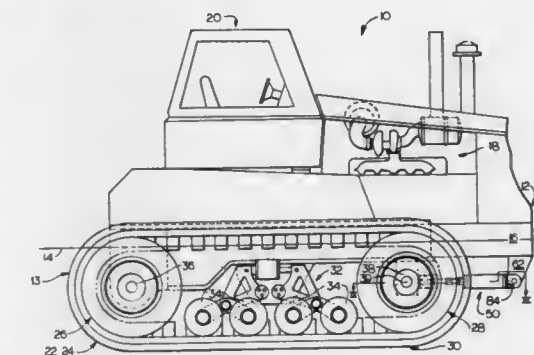
David G. Zborowski, Bettendorf, Iowa, assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 9, 1985, Ser. No. 806,918

Int. Cl.<sup>4</sup> B62D 55/30

U.S. Cl. 180—9.56

21 Claims



1. A belt laying work vehicle comprising:
  - a main frame having a longitudinal axis;
  - a laterally extending rigid axle having an axis of rotation;
  - a pair of longitudinally separated wheel structures disposed on each lateral side of and in supporting relation to said main frame, a first wheel structure of each pair being



mounted on opposite ends of said axle and constrained to rotate about the axis of rotation;  
an endless, inextensible elastomeric belt entrained about each pair of wheel structures;  
means for oscillatably mounting said axle on the main frame about an oscillation axis parallel to said longitudinal axis; and  
tensioning means for biasingly pulling said axle away from each pair's other wheel structure.

4,681,178

## VEHICULAR AIR INTAKE SCOOP

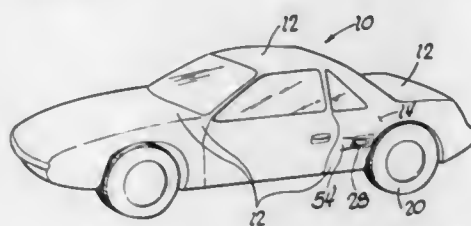
Robert R. Brown, Mt. Clemens, Mich., assignor to Colt Industries Inc., New York, N.Y.

Filed Nov. 4, 1985, Ser. No. 794,831

Int. Cl.<sup>4</sup> B60K 13/02

U.S. Cl. 180—68.3

13 Claims



1. An air scoop for use in combination with a vehicle having vehicular body panel means and an engine with air intake port means formed in said body panel means and communicating with the air induction means of said engine, said air scoop means comprising first and second side wall means upper wall means and rearward end wall means, wherein said first and second side wall means said upper wall means and said rearward end wall means are interconnected, wherein said air scoop means comprises an open forward end and a rearward discharge end, wherein when said air scoop means is operatively secured to said body panel means said first and second side wall means and said rearward end wall means effectively encompass said air intake port means therebetween, said air scoop means further comprising internal passage means for the flow of air from said open forward end to said rearward discharge end, wherein at least a portion of said internal passage means is of a curvilinear configuration as to curvingly direct the flow of air toward said air intake port means, wherein said curvilinear configuration of said internal passage means is defined at least in part by the interior surface of said upper wall means, wherein said interior surface of said upper wall means comprises a plurality of adjacently situated arcuate surfaces each for curvingly directing said flow of air toward said air intake port means, wherein said plurality of arcuate surfaces are discrete from each other and are operatively interconnected by integrally formed transitional interior surface portions, and wherein said plurality of arcuate surfaces are staggered with respect to each other as to be progressively further rearwardly of said air scoop means.

4,681,179

## COOLING SYSTEM FOR USE IN CAB-OVER TYPE VEHICLES

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 29, 1984, Ser. No. 676,426

Claims priority, application Japan, Nov. 30, 1983, 58-226398 The portion of this patent subsequent to Oct. 29, 2002, has been disclaimed.

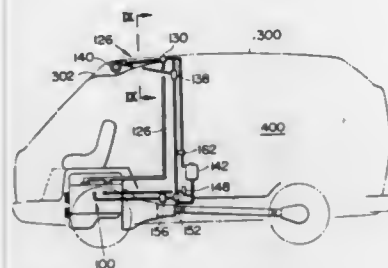
Int. Cl.<sup>4</sup> B60K 11/04

U.S. Cl. 180—68.4

13 Claims

1. In a cab-over type vehicle having:  
a roof;

an engine compartment;  
an engine disposed in said engine compartment;  
a cooling system for said engine comprising:  
a coolant jacket formed about said engine;  
a radiator, said radiator being disposed on said roof and communicating with said coolant jacket via a vapor transfer conduit;  
a return conduit leading from said radiator to said coolant jacket;  
a pump for pumping liquid coolant from said radiator to said coolant jacket via said return conduit;



a liquid coolant reservoir;  
a valve interposed between said reservoir and said coolant jacket, said valve controlling fluid communication between said coolant jacket and said reservoir;  
a control circuit, said control circuit conditioning said valve in a manner which permits fluid communication between said reservoir and said coolant jacket when said engine is stopped and which selectively cuts off said fluid communication when the engine is running.

4,681,180

## POWER TRANSMISSION SYSTEM FOR REAR WHEELS OF A MOTOR VEHICLE

Fusami Oyama, Ohmachi, and Akira Takahashi, Ohta, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

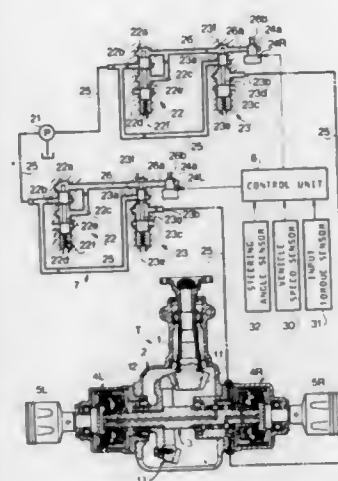
Filed Oct. 10, 1986, Ser. No. 917,653

Claims priority, application Japan, Oct. 18, 1985, 60-234226

Int. Cl.<sup>4</sup> B60K 17/16

U.S. Cl. 180—76

6 Claims



1. A power transmission system for a motor vehicle comprising:  
a rear drive shaft connected to a propeller shaft of the motor vehicle;  
final reduction gear means operatively connected to the rear drive shaft;

a pair of oil hydraulic clutches for transmitting output of the final reduction gear to rear wheels of the motor vehicle respectively;  
hydraulic circuit means including passage means for applying pressurized oil to said clutches and control valve means for controlling pressure of the oil applied to each of the clutches;  
sensing means for sensing driving conditions of the vehicle at cornering and for producing signals representing sensed conditions;  
control unit responsive to the signals for operating said control valve means whereby controlling transmitting torque capacity of each clutch at cornering.

4,681,181

## ELECTRIC POWER STEERING SYSTEM FOR VEHICLES

Yasuo Shimizu, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

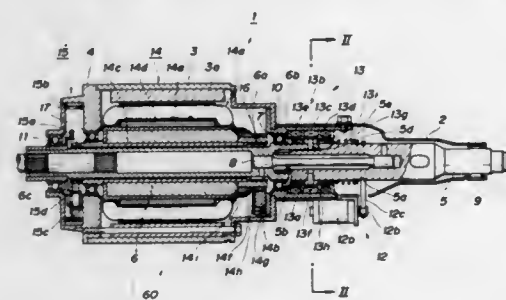
Filed Jul. 23, 1986, Ser. No. 887,304

Claims priority, application Japan, Aug. 6, 1985, 60-173470

Int. Cl.<sup>4</sup> B62D 5/04

U.S. Cl. 180—79.1

10 Claims



1. An electric power steering system (60) for vehicles having an electromagnetic servo device (1) including an input shaft (5) operatively connected to a steering wheel, an output shaft (6) operatively connected to a steered wheel, an electric motor (14) for operatively supplying auxiliary torque to said output shaft (6), steering torque detecting means (32) for detecting steering torque (Ts) acting on said input shaft (5), vehicle speed detecting means (50) for detecting the speed (V) of the vehicle, and drive control means (30, 40) which receives an output signal (S<sub>1</sub>, S<sub>2</sub>) from said steering torque detecting means (32) and an output signal (S<sub>3</sub>) from said vehicle speed detecting means (50) and feeds said electric motor (14) with a motor drive signal (Va) in accordance with said output signals (S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub>), wherein:

said drive control means (30, 40) comprises:

first determining means (109, 110) for determining a component (D(F)) of said motor drive signal (Va) that corresponds to the load due to friction elements of said electromagnetic servo device (1) and a component of said motor drive signal (Va) that corresponds to the load from the road surface side, depending on said output signal (S<sub>1</sub>, S<sub>2</sub>) from said steering torque detecting means (32);

second determining means (113) for determining a vehicle speed factor (K(V)), depending on said output signal (S<sub>3</sub>) from said vehicle speed detecting means (50);

multiplying means (114) for multiplying said road surface side load component (D(L)) by said vehicle speed factor (K(V)) to obtain a corrected road surface side load component (D'(L)); and

adding and outputting means (115, 128, 40) for adding said frictional load component (D(F)) and said corrected road surface side load component (D'(L)) to determine the magnitude of said motor drive signal (Va) and outputting said motor drive signal (Va) to said electric motor (14).

4,681,182

## ELECTRIC POWER STEERING APPARATUS

Yoshio Suzuki, Takeshi Obe, and Ichiro Koike, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

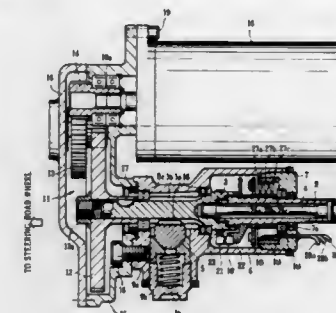
Filed Mar. 14, 1986, Ser. No. 839,684

Claims priority, application Japan, Apr. 11, 1985, 60-77449; Apr. 19, 1985, 60-82140; Apr. 19, 1985, 60-82141; Apr. 19, 1985, 60-82142

Int. Cl.<sup>4</sup> B62D 5/04

U.S. Cl. 180—79.1

5 Claims



1. An electric power steering apparatus comprising:

(a) steering shaft means including a torsion bar to join an input shaft on the side of a steering wheel and an output shaft on the side of a steering road wheel in a manner that they can be rotationally displaced relative to each other,  
(b) sensor means of a non-contact type provided in association with said input and output shafts to sense a relative rotational displacement based on a torsion of said torsion bar, and

(c) electric motor means provided around a steering gear body within which said steering shaft means is disposed, said electric motor means being driven responding to a signal from said non-contact type sensor means to render a steering assistance to an output shafting leading to said steering road wheel, wherein said steering gear body is formed with an annular cavity opened on the side of said input shaft, said cavity extending to the axial end of said output shaft joined through said torsion bar around said input and output shafts, said cavity being adapted to accommodate therewithin said non-contact type sensor means, a printed circuitboard provided around said input shaft close to said non-contact type sensor means and having a circuit for processing a signal from said non-contact type sensor means, a slip ring for taking out an output signal provided in association with said input shaft, a signal take-out unit provided on the side of said steering gear body and having a wiper slidably in contact with said slip ring, and a lead wire outgoing toward the outside penetrating through a cap member closing said cavity within said steering gear body.

4,681,183

## ELECTRICALLY OPERATED POWER STEERING DEVICE

Saichiro Oshita, Ohta, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,902

Claims priority, application Japan, Oct. 8, 1984, 59-212279

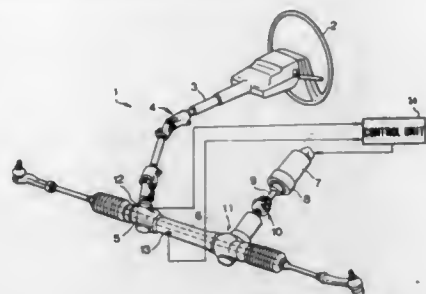
Int. Cl.<sup>4</sup> B62D 5/04

U.S. Cl. 180—79.1

4 Claims

1. An electrically operated power steering device for a vehicle having a steering wheel, comprising  
a first pinion operatively connected to said steering wheel,  
a second pinion,  
an electric motor operatively connected to said second pinion,  
a rack shaft engaging with said first and second pinions, the rack shaft being moved by rotation of the steering wheel

and the electric motor and operatively connected to wheels of the vehicle so as to steer the vehicle wheels, torsional torque sensor means adjacent the first pinion for measuring torsional torque thereof, steering angle sensor adjacent the rack shaft for measuring angular displacement of the vehicle wheels, and means for controlling the electric motor in dependency on said torsional torque and on said angular displacement, and wherein said means for controlling comprises



an assistance torque designator providing an assistance signal in dependency on the torsional torque, a restoring torque designator providing a restoration signal in dependency on said angular displacement, means for adding said signals together, and means for driving the electric motor by discrimination of the sign of the sum of said signals and by duty ratio control dependent on the absolute value of the sum of said signals under feedback control.

4,681,184

#### HYDRAULIC REACTION FORCE APPARATUS FOR POWER STEERING SYSTEM

Yoshio Suzuki; Hirotetu Sonoda, and Hideo Yabe, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

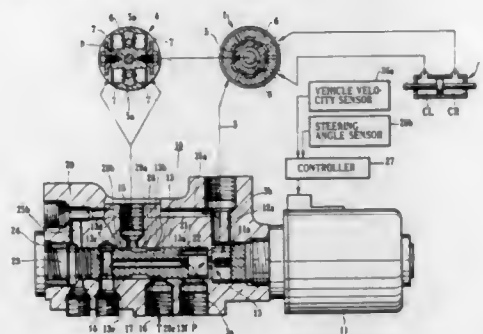
Filed Dec. 24, 1985, Ser. No. 813,031

Claims priority, application Japan, Dec. 27, 1984, 59-274006

Int. Cl.<sup>4</sup> B62D 5/08

U.S. Cl. 180—141

5 Claims



1. A hydraulic reaction force apparatus for a power steering system of a vehicle, comprising:
  - a pump;
  - a power cylinder for supplying an auxiliary steering force to a steering wheel;
  - a control valve for switching a hydraulic path from said pump to said power cylinder in accordance with a steering direction of said steering wheel;
  - a solenoid driven in response to a variable current, said current corresponding to operation conditions of the vehicle;
  - a first variable orifice arranged between said pump and said

control valve, said first variable orifice having a first opening, said first opening being controlled by said solenoid in accordance with said operation conditions of said vehicle;

- a hydraulic reaction force chamber, said hydraulic reaction force chamber being disposed between an input member rotated by said steering wheel and an output member interlocked with the wheels of the vehicle, said reaction force chamber supplying, as a reaction force, a pressure corresponding to a hydraulic pressure applied to said power cylinder thereby restricting rotation of said input member; and
- a spool valve disposed between said pump and said hydraulic reaction force chamber, said spool valve having a spool, said spool being moveable in accordance with a pressure difference between upstream and downstream pressures of said first variable orifice, said spool valve also having a supply port coupled to said pump, a reaction port coupled to said hydraulic reaction force chamber, a tank port coupled to a tank and a second variable orifice controlled by said spool, said second variable orifice having a second opening which is adapted to be changed as said spool moves in accordance with said pressure difference, thereby connecting said reaction port to said supply port and said tank port and controlling a magnitude of said hydraulic reaction force.

4,681,185

#### APPARATUS FOR THE AUTOMATIC ENGAGEMENT AND DISENGAGEMENT OF DRIVE ELEMENTS OF A MOTOR VEHICLE

Rudolf Hoernig, Esslingen-St., Bernhard; Peter Herges, Stuttgart; Bernd Knoff, Esslingen; Karl-Helz Richter, Kernen; Karl-Helz Buechle, Sachsenheim, and Henning Wallentowitz, Aichwald, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

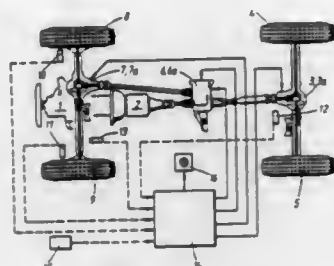
Filed Feb. 11, 1986, Ser. No. 828,275

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505455

Int. Cl.<sup>4</sup> B60K 23/08

U.S. Cl. 180—247

32 Claims



1. Apparatus for the automatic engagement and disengagement of drive components of a motor vehicle with a drive axle, particularly the drive means of at least one additional axle, and the locks for auxiliary gear and differential gear, comprising:
  - sensory means for sensing the rotary speeds of the wheels of said motor vehicle and the steering angle of said vehicle;
  - control means for receiving at least one input from said sensory means, deriving at least one signal from said at least one input, comparing said at least one signal with at least one reference value stored in said control means, and for controlling the selection of a plurality of switching stages during operation of said vehicle in response to said comparison of said signal and said at least one reference value;
  - said switching stages being various combinations of engagement of said at least one additional axle and said locks for auxiliary gear and differential gear.

4,681,186

#### ESCAPE CHUTE

Thomas Leisman, West Linn, Oreg., and Jon Huston, Denver, Colo., assignors to Dynavac, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 660,344, Oct. 12, 1984, abandoned. This application Oct. 15, 1985, Ser. No. 787,258

Int. Cl.<sup>4</sup> A62B 1/20

U.S. Cl. 182—47

18 Claims



1. An escape device comprising a tubular escape chute having:
  - an upper end and a lower end,
  - zipper means extending generally longitudinally along at least a portion of said chute, and
  - a friction-creating panel which extends over a major portion of the chute's longitudinal length, circumferentially less than the full circumference of the chute, and generally continuously from a portion generally adjacent to said upper end of said tubular escape chute to a portion generally adjacent to said lower end of said tubular escape chute, whereby entry into said chute or egress therefrom may be accomplished intermediate the upper end and lower end, and an individual descending in said chute and contacting said panel will have his or her rate of descent retarded.

4,681,187

#### COLLAPSIBLE SAWHORSE

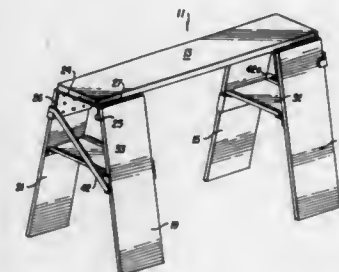
David M. Brown, 178 Cheney St., Newport, N.H. 03782

Filed Jul. 8, 1986, Ser. No. 883,405

Int. Cl.<sup>4</sup> B27B 21/00; F16M 11/00

U.S. Cl. 182—129

6 Claims



1. A collapsible sawhorse comprising
  - a bench;
  - two legs depending from said bench on either side thereof;
  - hinge means for connecting said legs to said bench;
  - an arm pivotally mounted to one of said legs at opposite

sides of said bench, said arms having angularly extending fingers at their terminal ends;

female means mounted on the legs opposite said one of said legs for mating with said fingers when said sawhorse is in an upright position;

a tool shelf extending below said bench; and

hinge means securing said tool shelf between said legs; whereby said fingers may be removed from said female means and pivoted, permitting said legs to hinge relative to said bench so that said legs, said arms and said bench can be collapsed to a position substantially adjacent to each other.

4,681,188

#### INTAKE SILENCER

Takanobu Tasaki, Tokyo, and Akira Nagashima, Kawasaki, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

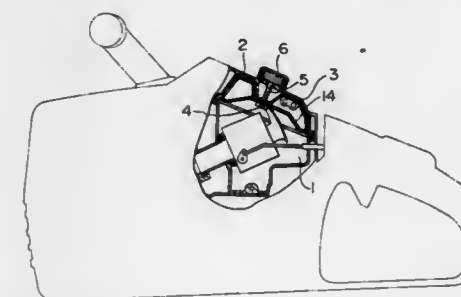
Filed May 28, 1986, Ser. No. 869,455

Claims priority, application Japan, Jun. 5, 1985, 60-83969[U]

Int. Cl.<sup>4</sup> F02M 35/00

U.S. Cl. 181—229

3 Claims



1. An intake silencer comprising a cup-shaped body made of elastic material, said cup-shaped body covering an air filter element provided at an air inlet of a carburetor chamber of an internal combustion engine, a plurality of intake passages passing through side walls of said body, and means defining a circumferential groove provided along an edge of an opening portion of said body facing said air filter element for receiving an edge of said air filter element.

4,681,189

#### DRY SUMP LUBRICATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

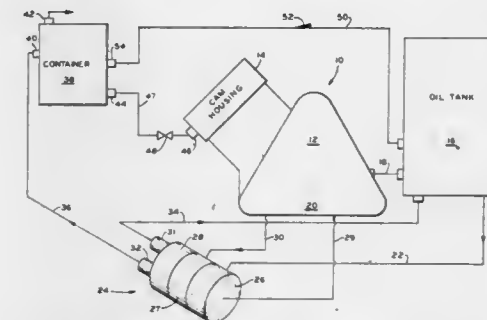
Steven Kristloff, 4790 W. 16th St., Indianapolis, Ind. 46224

Filed Dec. 4, 1985, Ser. No. 804,673

Int. Cl.<sup>4</sup> F01M 11/00

U.S. Cl. 184—6.13

12 Claims



1. A method for lubricating an internal combustion engine having a crankcase including an oil sump, an oil tank in fluid flow communication with said crankcase, a container, and a one way valve, the method comprising:



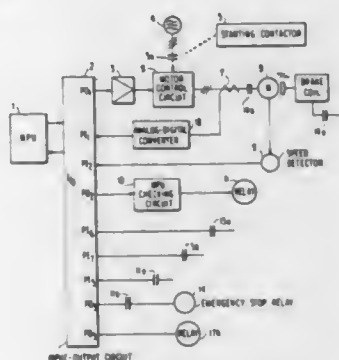
equalizing the pressure between the engine and the sump pumping oil from said crankcase sump;  
separating entrained air from said pumped oil;  
conducting said oil, from which air has been separated, to said oil tank;  
conducting said separated air to said container and separating entrained oil particles from said separated air;  
venting said container to the atmosphere; and  
preventing pressure buildup in said oil tank and engine by providing a one way valve for relieving pressure in said engine and oil tank.

4,681,190

**APPARATUS FOR CONTROLLING AN ELEVATOR**  
Ishii Toshiaki, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Jan. 14, 1986, Ser. No. 818,636  
Claims priority, application Japan, Jan. 14, 1985, 60-4226  
Int. Cl. G05B 15/00

U.S. Cl. 187-101

11 Claims



1. An elevator control system having a control circuit means for receiving input signals indicative of malfunctions within the elevator control system and for issuing a control signal to cause an elevator to travel in response to a command signal when no malfunctions exist, and comprising:

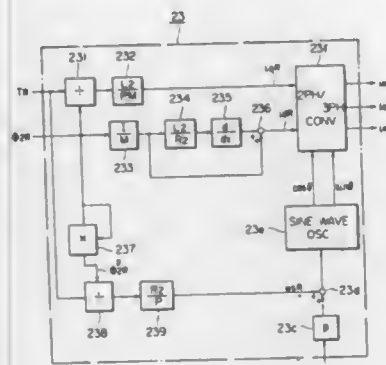
starting switch means operable to energize said control circuit means;  
checking circuit means, responsive to each operation of said starting switch means, for automatically detecting whether the energized control circuit means is operating in a normal or abnormal mode and for generating a first signal indicative of the abnormal mode;  
emergency stop means, responsive to said first signal, for preventing travel of the elevator; and  
monitoring circuit means, also responsive to the operation of said starting switch means, for automatically detecting whether said checking circuit means is operating in a normal or abnormal mode and for preventing the issuance of said control signal and travel of said elevator if an abnormal mode of said checking circuit means is detected;  
said control circuit means, after energization thereof by the operation of said starting switch means, automatically applying to said checking circuit means an artificial signal indicative of an abnormal mode of said control circuit, and said monitoring circuit means detecting a normal mode of said checking circuit means if said checking circuit means detects an abnormal mode of said control circuit means within a predetermined time after the application of said artificial signal.

4,681,191

**SPEED CONTROL APPARATUS FOR ELEVATOR**  
Hiroyuki Ikejima, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan  
Filed May 13, 1985, Ser. No. 733,472  
Claims priority, application Japan, May 17, 1984, 59-99495  
Int. Cl. B66B 1/30

U.S. Cl. 187-119

9 Claims



1. In a drive system for an elevator cage wherein D.C. is inverted into A.C. of variable voltage and variable frequency by a current control-type inverter including an induction motor for driving the cage having field windings supplied with VVVF A.C. primary currents producing a field of intensity determined by the primary currents, a speed control apparatus for said induction motor comprising:

converter means for determining primary current commands on the basis of a torque component current command derived from a torque command and a field component current command derived from a magnetic flux command,  
circuit means for deriving primary currents supplied to the induction motor based on the primary current commands, and  
means for generating an intensified field component current command before a time of start of movement of the cage and a reduced field component current command after the time of start of movement of the cage, and for supplying the intensified and reduced field component current commands to said converter means to produce an intensified field of the induction motor before the time of start of movement of the cage and a reduced field of the induction motor after the time of start of movement of the cage so as to reduce starting shocks due to an unbalanced load in the cage.

4,681,192

**DUAL-WHEEL CASTERS WITH POSITIVE LOCK MECHANISM**  
Michael J. James, Charlton Kings, England, assignor to Global Castors Limited, Cheltenham, England  
Filed Oct. 18, 1984, Ser. No. 662,063  
Claims priority, application United Kingdom, Oct. 27, 1983, 8328767

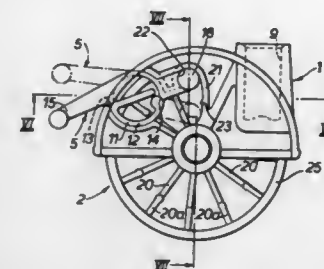
U.S. Cl. 188-1.12

Int. Cl. B60B 33/00

6 Claims

1. A twin-wheel caster comprising a body having a bearing recess molded therein, two wheels rotatably mounted on opposite sides of said body for rotation about a common axis, and a locking lever mounted in said bearing recess for rocking movement about an axis disposed parallel to said wheel rotation axis, said recess being open at outer and inner side apertures which are opposed laterally of said rocking movement axis and through which opposite inner and outer ends of said lever respectively project, said outer end of the lever projecting as

an operating member for external operation of the lever and said inner end of the lever projecting for engagement as a locking member with said wheels of the caster, said lever having an intermediate mounting portion which takes a pivotal bearing in said bearing recess and which is resiliently compressible to a size such that it can be fitted into said recess



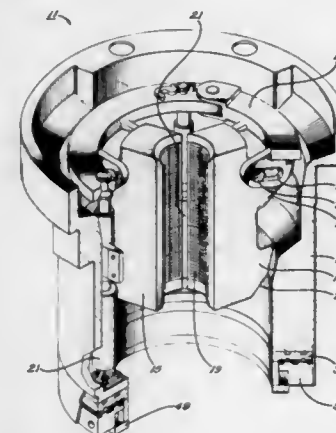
through said outer side aperture by lengthwise insertion of said lever into said body laterally of said rocking movement axis and through said apertures, and said intermediate portion of the lever when uncompressed being larger laterally of said rocking movement axis than the corresponding dimension of either one of said apertures so that said intermediate portion is retained captive within the bearing recess.

4,681,193

**ROTARY POWER SLIPS**  
William E. Crowe, Round Rock, Tex., assignor to Hughes Tool Company, Houston, Tex.  
Continuation-in-part of Ser. No. 578,907, Feb. 10, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 830,895  
Int. Cl. B65H 59/10

U.S. Cl. 188-67

7 Claims



1. Rotary power slips, for use in the rotary table of an earth drilling rig, comprising:

a body;  
slip means carried on the body for gripping and releasing pipe in a pipe opening in a rotary table;  
a stationary air transfer ring supported by the body, and having a primary fluid conduit for connection to a stationary fluid source on the drilling rig, and having a transverse upper surface with at least two concentric grooves;  
an annular seal ring secured to the body and having a transverse lower surface and an air passageway;  
expansive means including an expansive ring having inner and outer edges mounted in the grooves on the upper surface of the air transfer ring and cooperative with the lower surface of the seal ring for forming an annular expansive fluid duct to conduct fluid between the primary fluid conduit and the air passageway;  
a fluid cylinder mounted on the body and fluidly connected

to a secondary fluid conduit through the body to the air passageway for raising and lowering the slip means in response to fluid flow through the primary fluid conduit, the air passageway, and the secondary fluid conduit; and a retainer ring in each of the grooves on the upper surface of the air transfer ring, compressed against one of the edges of the expansive ring for locking the expansive ring in place.

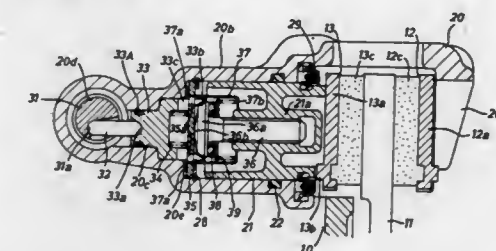
4,681,194

**DISC BRAKE ASSEMBLY WITH PARKING BRAKE MECHANISM**  
Matsuhisa Tsuruta, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan  
Filed Mar. 28, 1986, Ser. No. 845,469  
Claims priority, application Japan, Mar. 28, 1985, 60-045539[U]

U.S. Cl. 188-71.9

Int. Cl. F16D 55/16, 65/56

9 Claims



1. A disc brake assembly equipped with a parking brake mechanism, said disc brake assembly including a caliper member having a cylinder body and a reaction portion straddling a portion of a rotary brake disc, and a piston axially slidably disposed in a fluid-tight manner within a cylindrical bore of said cylinder body to be actuated by hydraulic fluid under pressure supplied into said cylinder body, said parking brake mechanism comprising:

a cam shaft rotatably mounted within a lateral bore formed in a bottom wall of said cylinder body and being formed with a cam groove;  
a plunger axially slidably disposed in a fluid-tight manner within an axial bore formed in the bottom wall of said cylinder body coaxially with said cylindrical bore and having an outer end opposed to said cam groove and a cylindrical inner end portion formed with an annular tapered surface and a pair of radial slots;  
a toggle having one end engaged with said cam groove and another end engaged with the outer end of said plunger;  
a support plate fixed in place within said cylindrical bore and having an intermediate portion axially slidably engaged with the radial slots of said plunger to restrict rotation of said plunger;  
a spring interposed between said plunger and said support plate to bias said plunger toward said cam shaft;  
an adjusting bolt threaded into a nut portion integral with said piston and having a head portion engageable at its center with said support plate and at its outer periphery with the annular tapered surface of said plunger for frictional engagement therewith;  
a retainer member arranged in surrounding relationship with the head portion of said adjusting bolt and fixed to said support plate; and  
a thrust bearing coupled with the head portion of said adjusting bolt and resiliently retained by a support portion of said retainer member to permit rotation of said adjusting bolt.

4,681,195

**CARRY BAG CONVERTIBLE TO A MAT**

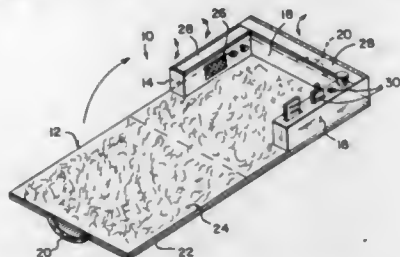
Carl J. Trahan; Mary C. Trahan, both of 1309 Dreddy Dr., Port Neches, Tex. 77651, and George Spector, 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Mar. 14, 1986, Ser. No. 839,628

Int. Cl.<sup>4</sup> A45C 9/00, 15/00; A47C 9/10, 17/82

U.S. Cl. 190—2

3 Claims



1. A combination carry bag and mat comprising:
  - (a) a rectangular foldable panel having a water proof bottom sheet and a water absorbent top sheet of a predetermined length and width;
  - (b) three relatively rigid built-in compartments formed in a C-shaped configuration around edges of said panel at front end thereof, said compartments hold various items including a radio so that when said panel is in an unfolded flat position a person can lie upon said panel to utilize it as said mat for access to said compartments; and
  - (c) a pair of handles, each of said handles affixed to a short edge of said panel so that when said panel is in a folded position a person can grip said handles to utilize it as said carry bag, wherein said bottom sheet is fabricated out of plastic material and said top sheet is fabricated out of towel-like material, wherein two of said compartments at side and front of said panel include hinged lids in which said radio is built into said side hinged lid compartment.

4,681,196

**CONTROL CIRCUIT FOR BRAKE BOOSTER VEHICULAR HILL HOLDER SYSTEM**

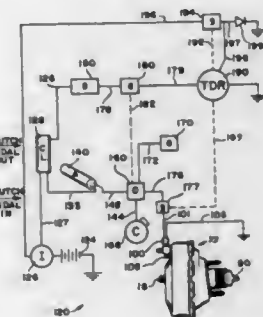
Keith H. Fulmer, Mishawaka, Ind.; Arthur K. Peebles, Niles, Mich., and Hugh D. Steininger, South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 20, 1984, Ser. No. 642,619

Int. Cl.<sup>4</sup> B60K 41/24, 5/00; F15B 7/00; B60T 8/58

U.S. Cl. 192—3 H

31 Claims



1. A braking assistance servo motor system operable to maintain the braking of a vehicle when the brake pedal is released toward an inactive braking position, comprising a brake booster having a first chamber, a working chamber, first valve means responsive to the brake pedal, output means for operatively actuating brakes of the vehicle, and second valve means operatively connected with the booster, and control circuit means for sensing vehicular parameters and operatively connected to said second valve means, said brake booster operating responsively to said brake pedal by utilizing a pres-

sure differential between the chambers to displace the output means and actuate the brakes, the control circuit means sensing the parameters of vehicular attitude, clutch position, and vehicular speed to actuate responsively thereto the second valve means and provide fluid pressure to said brake booster and maintain the displacement of the output means and actuation of the brakes after the brake pedal has been released, said control circuit means including a clutch pedal position mechanism, transmission gear switch, a second switch responsive to vehicle speed sensor means, a time-delay relay, third and fourth switches responsive to the time-delay relay, and a connection between the fourth switch and time-delay relay, the control circuit means rendering inoperative the second valve means when the vehicle speed sensor means is inoperative by effecting a signal through the clutch pedal position mechanism, transmission gear switch, second switch which is actuated by a lack of signaling from the speed sensor means, and time-delay relay which is actuated by the signal and operates the third switch to prevent actuation of the second valve means and fourth switch to permit continued energization of said time-delay relay through the connection.

4,681,197

**ELECTROMAGNETIC CLUTCHES AND BRAKES**

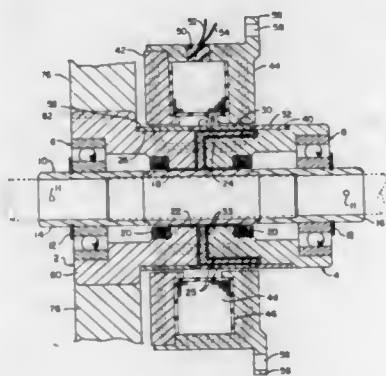
Jeffrey C. Pedu, Lake Placid, N.Y., assignor to Placid Industries, Inc., Lake Placid, N.Y.

Filed Sep. 19, 1984, Ser. No. 652,345

Int. Cl.<sup>4</sup> F16D 37/02

U.S. Cl. 192—21.5

19 Claims



1. A magnetic particle device comprising:
  - first and second magnetic pole members;
  - a shaft;
  - means rotatably mounting said first and second pole members to said shaft;
  - a disk connected to said shaft and extending into a first gap formed between confronting faces of said first and second pole members, said first and second faces being close to but spaced from said disk;
  - at least one annular flange attached to said disk, said flange extending parallel to the axis of said shaft;
  - a coupling assembly connecting said first and second pole members so that said first and second pole members and said coupling assembly form a unitary structure, and said coupling assembly comprising at least first and second non-magnetic sleeve members and a magnetic sleeve member connected to and extending between said first and second non-magnetic sleeve members;
  - a groove in at least one of said pole members for accommodating said at least one annular flange, said at least one annular flange extending into said groove in radial spaced relation with said one pole member and said coupling assembly;
  - particles of a magnetic material disposed in said first gap and said groove on both sides of said disk and said flange;
  - means for establishing a magnetic field whose magnetic flux

4,681,199

**APPARATUS FOR TRANSMITTING TORQUE IN MOTOR VEHICLES**

Paul Maucher, Sasbach, and Oswald Friedmann, Lichtenau, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Buhl, Fed. Rep. of Germany

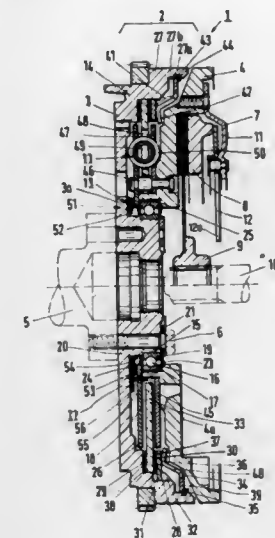
Filed Apr. 4, 1986, Ser. No. 848,730

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512372; May 10, 1985, 3516907; Sep. 7, 1985, 3532005

Int. Cl.<sup>4</sup> F16D 13/69, 47/02, 43/14

U.S. Cl. 192—70.23

57 Claims

**4,681,198  
INTEGRAL ACCELERATOR-BRAKE CONTROL FOR MOTORCYCLES**

Miguel-Angel Costa Mas, San Joaquín, 19, Jalon (Alicante), Spain

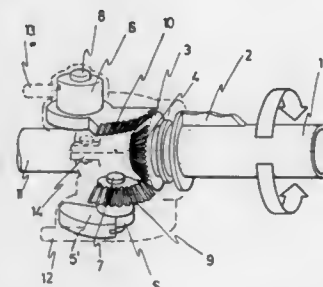
Filed Apr. 18, 1985, Ser. No. 725,018

Claims priority, application Spain, Apr. 23, 1984, 278,973

Int. Cl.<sup>4</sup> B60K 41/20; G05G 9/02

U.S. Cl. 192—3 S

2 Claims



1. Integral accelerator-brake control arrangement for a motorcycle comprising

handle bar support means, a handle grip rotatable back and forth on the support means about an integrally formed handle axis and having a conical end including a handle grip toothed sector containing teeth along approximately one-third of the perimeter of the conical end, the remainder of said perimeter being substantially smooth, and

two substantially diametrically opposite cylinders located tangentially to the conical end of the handle grip and rotatable back and forth on the support means about corresponding axes of rotation substantially perpendicular to the handle axis, one of the cylinders being an accelerator cable cylinder adapted for mounting connection of an accelerator operating cable thereto and being provided with an accelerator toothed sector, and the other cylinder being a brake cable cylinder adapted for mounting connection of a brake operating cable thereto and being provided with a brake toothed sector,

the accelerator toothed sector and brake toothed sector being arranged in substantially diametrically opposite spaced relation to each other and in tangential relation to the handle grip conical end toothed sector, such that upon rotation of the handle grip in one direction the conical end toothed sector meshes individually only with the accelerator toothed sector for individually controlling accelerating operation, and alternatively upon rotation of the handle grip in an opposite direction the conical end toothed sector meshes individually only with the brake toothed sector for alternatively individually controlling braking operation.

1. Apparatus for transmitting rotary motion between the output element of the internal combustion engine and the input element of the change-speed transmission in a motor vehicle, comprising a first flywheel connectable to and arranged to receive torque from the output element in the drive direction; a second flywheel rotatable relative to the first flywheel and connectable with the input element to rotate the latter in the drive direction and to be rotated by the input element in the coast direction; at least one slip clutch operating between said flywheels to transmit torque in either of said directions; and means for regulating the magnitude of said torque in at least one of said directions.

4,681,200

**FRICTION CLUTCH**

Karl Keck, Lentersheim, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Buhl, Fed. Rep. of Germany

Continuation of Ser. No. 722,194, Apr. 11, 1985, abandoned, which is a continuation of Ser. No. 410,486, Aug. 23, 1982, abandoned. This application Jul. 2, 1986, Ser. No. 881,589

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136711

Int. Cl.<sup>4</sup> F16D 13/44, 25/08

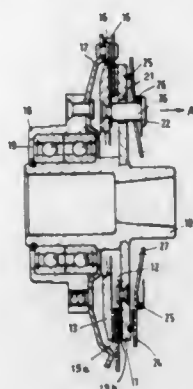
U.S. Cl. 192—70.27

22 Claims

1. A friction clutch for the transmission of driving torque in machines with a pronounced degree of irregularity of torque transmission, particularly a compressor clutch, comprising a first component including an axially fixed first plate having a first side and a second side, a pressure plate located at said first side and movable axially between engaged and disengaged positions, and means for coupling said plates for joint rotation including a first set of axially stressed leaf springs; a second component including an axially movable clutch disc disposed between said plates, a further member and a second set of axially stressed leaf springs for centering and non-rotatably coupling said clutch disc with said further member; means for moving said pressure plate between said positions including at



least one motion transmitting element axially movably extending through said first plate and connected to said pressure plate and means for pulling said motion transmitting element in a direction to move said pressure plate to the engaged position including a prestressed diaphragm spring at the second side of said first plate, said motion transmitting element being rigid



with said pressure plate and having an end portion remote from said pressure plate and outwardly adjacent to the second side of said first plate; retaining means provided in the region of said end portion of said motion transmitting element, said diaphragm spring being tiltable relative to said retaining means; and a seat for said diaphragm spring.

#### 4,681,201 CLUTCH DISC

Hiroshi Teramae, Neyagawa, and Yoshinari Yoshimura, Higashi, both of Japan, assignors to Kabushiki Kaisha Daikin Selsakusho, Osaka, Japan

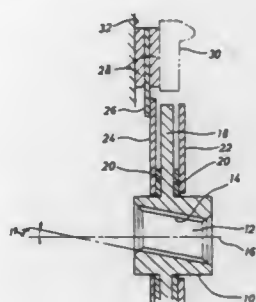
Filed Oct. 8, 1985, Ser. No. 785,437

Claims priority, application Japan, Oct. 12, 1984, 59-154794[U]; Oct. 19, 1984, 59-158786[U]

Int. Cl.<sup>4</sup> F16D 3/14

U.S. Cl. 192—106.2

7 Claims



1. A clutch disc having a flanged hub spline with a spline hole fitted onto a main drive shaft having a center axis, characterized by that the clutch disc is equipped with a forced inclining mechanism for forcibly inclining the axis of the spline of said hub relative to the center axis of the main drive shaft when the facing surface of said clutch disc is pressed against a flywheel, and for the keeping the spline hole of said spline hub parallel to said center axis of said main drive shaft when said facing surface of said clutch disc is out of pressed contact with said flywheel.

#### 4,681,202 APPARATUS FOR THE SAFETY STOPPAGE OF MECHANICALLY MOVED TOOLS, PARTICULARLY AUTOMATIC WELDING GUNS

Wilhelm Dinse, Königstraße 12, D-2000 Hamburg 70, Fed. Rep. of Germany

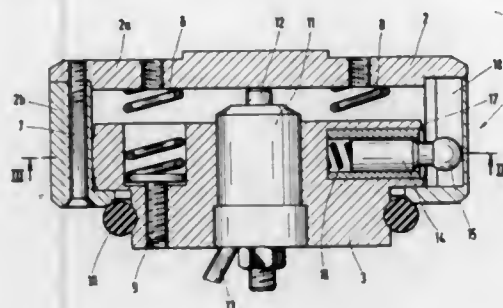
Filed Jun. 3, 1986, Ser. No. 869,886

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520562

Int. Cl.<sup>4</sup> F16D 3/06

U.S. Cl. 192—129 A

6 Claims



1. An apparatus for safety stoppage of a mechanically moved tool, comprising:

- (a) an assembly casing having longitudinal and transverse axes and inner walls said inner walls including first and second transverse walls and a longitudinal wall therebetween the longitudinal inner wall having a longitudinal slot formed therein;
- (b) a swashplate having a first swashplate portion positioned in the longitudinal direction within the inner walls of the assembly casing, the first swashplate portion having spherical side walls facing the longitudinal inner wall of said assembly casing, and a second swashplate portion extending from the first swashplate portion outside the assembly casing and operatively connectable to the mechanically moved tool;
- (c) a spring element positioned between said swashplate and first transverse inner wall of said assembly casing for biasing said swashplate and assembly casing apart in the longitudinal direction; with said swashplate and second transverse wall adapted to abut to prevent longitudinal separation of said swashplate and assembly casing
- (d) a switch operated by relative longitudinal movement between the swashplate and the assembly casing; and
- (e) a spring-loaded bolt positioned in a transverse direction in the first swashplate portion and extending from the spherical side wall of said first swashplate portion, said bolt having a head positioned in said longitudinal slot of said assembly casing inner side wall for longitudinal movement therein upon longitudinal movement of said swashplate relative to said assembly casing.

#### 4,681,203 MULTI-TRACK GRAVITY CONVEYOR

Andrew T. Kornylak, Hamilton, Ohio, assignor to Omniquest, Inc., Hamilton, Ohio

Filed Nov. 22, 1985, Ser. No. 800,973

Int. Cl.<sup>4</sup> B65G 13/00

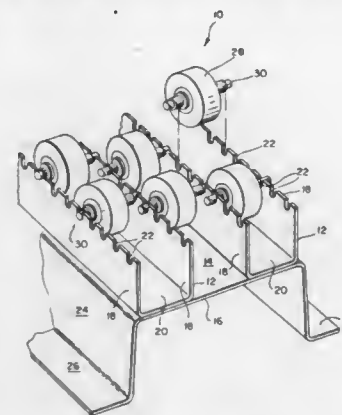
U.S. Cl. 193—35 R

60 Claims

1. An undriven gravity roller conveyor, comprising:
- a plurality of rollers mounted on axles, with each of said rollers being mounted on a different one of said axles;
  - a section providing a base and a plurality of discrete elongate channel members extending from said base in a laterally spaced apart, parallel relation forming a plurality of rows, each of said channel members having integral therewith a plurality of opposite side walls extending along the length of said rows and a connecting side rigidly joining and

maintaining said opposite side walls in a fixed spaced apart relation with the separation between said opposite side walls being equal to the separation between neighboring channel members;

said plurality of opposite side walls in each of said channel members having a plurality of slots formed therein alignable in parallel columns with the corresponding slots in at least the closest of the opposite side walls of a neighboring channel member, said parallel columns being substantially perpendicular to the length of said rows, said slots being open substantially identical and equidistantly spaced on both sides and along an unjoined edge of each of said



opposite side walls in each of said channel members, the spacing between successive slots along said unjoined edge of each side wall being less than the exterior diameter of said rollers within said section; and

said axles being disposable within said slots, both between said plurality of opposite side walls in each of said channel members and between adjacent side walls of neighboring pairs of said channel members with the axles of rollers in any two neighboring rows being disposable in different ones of said columns, whereby the separation between axles of rollers in said any two neighboring rows may be less than one-half of the exterior diameter of said rollers.

#### 4,681,204 DEVICE FOR COUNTING AND SORTING COINS BELONGING TO A SET OF COINS

Gert Zimmermann, Berlin, Fed. Rep. of Germany, assignor to F. Zimmermann & Co., Fed. Rep. of Germany

PCT No. PCT/DE85/00171, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO85/05478, PCT Pub. Date Dec. 5, 1985

PCT Filed May 17, 1985, Ser. No. 836,170

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3419589

Int. Cl.<sup>4</sup> G07D 3/02, 5/10

U.S. Cl. 194—317

21 Claims

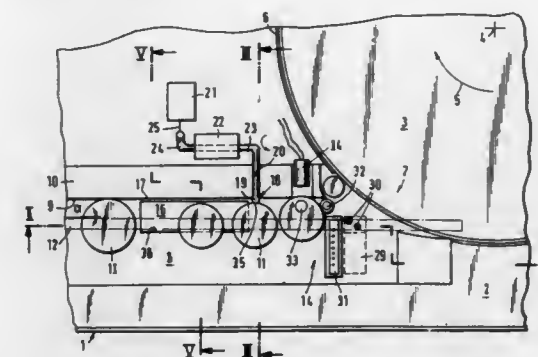
1. A device for counting and sorting coins belonging to a set of coins as well as coin-like objects not in the set of coins, comprising:

- a horizontal coin plate (3) for receiving coins of the set and coin-like objects not of the set;
- a horizontal guideway (8) extending tangentially from said coin plate and having a feed side for admitting coins at said coin plate;
- means defining a guiding edge (9) extending along said guide way;
- a conveyor belt (12) mounted for movement above said guide way for conveying coins and coin-like objects in a feed direction along a feed path on said guide way from said feed side and for feeding coins and coin-like objects along said guiding rail;
- coin identification means (14) disposed adjacent said guide

way and near said feed side for identifying coins and coin-like objects on said guide way;

said guide way having a sort-out opening (16a) therein downstream of said feed side in said feed direction, said sort-out opening being defined by a guiding ledge (17) extending along said guiding edge (9) with a selected width, and an outer edge (38) extending along said guiding edge, the distance between said guiding edge and said outer edge being smaller than the diameter of a smallest coin in the set of coins;

a diversion element (18) mounted for movement between an inactive position away from said path to an active position



in said path, said diversion element having a front edge (35) which is spaced from said guiding edge (9) by at least said selected width of said guiding ledge (17) in said active position, said diversion element being disposed between said identification means and said sort-out opening in said feed direction, said diversion element being operatively connected to said identification means for movement into its active position when said identification means identifies a coin-like object not in the set for deflecting the coin-like object away from said guiding edge, so that the coin-like object drops into said sort-out opening as the coin-like object is moved along said path by said conveyor belt.

#### 4,681,205 DISPLACEABLE INCLINED HOIST

Dieter Hoffmann, Lübeck, and Reinhard Trümper, Ratekau, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel AG, Fed. Rep. of Germany

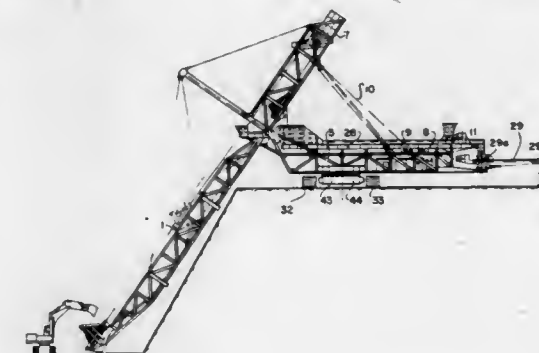
Filed Aug. 19, 1985, Ser. No. 767,134

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1984, 3430642

Int. Cl.<sup>4</sup> B65G 41/00; E02F 7/02; E21C 47/04

U.S. Cl. 198—307.1

18 Claims



1. A displaceable inclined hoist comprising:  
a displaceable support;  
an inclined support pivotally mounted to said displaceable

support for rotation about a horizontal axis and in a vertical plane;

drive means connected between said displaceable and inclined support for pivoting said inclined support on said displaceable support;

two pairs of tracks connected to said inclined support and extending therealong, said two pairs of tracks having different gauges and each having a middle portion and opposite end portions, said two pairs of tracks lying in a common plane at each of their opposite ends and being disposed one above the other in said middle portions, the upper one of said pair of tracks having a wider gauge than the lower one of said two pairs of tracks;

a conveyor car mounted for riding on each of said two pairs of tracks, said two pairs of tracks being spaced apart in said middle portions thereof by an amount sufficient to permit clearance for one of said conveyor cars riding on a lower one of said two pairs of tracks; and

windlass means connected to said conveyor cars and carried by said inclined support for moving said conveyor cars upwardly and downwardly on said two pairs of tracks respectively.

4,681,206

## CURVILINEAR ESCALATOR

Kazuhiko Sugita, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

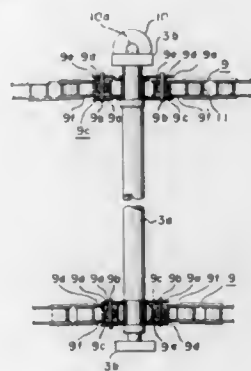
Continuation of Ser. No. 580,957, Feb. 16, 1984, abandoned.

This application Aug. 9, 1985, Ser. No. 763,893

Claims priority, application Japan, Mar. 11, 1983, 58-34941[U]

Int. Cl.<sup>4</sup> B66B 21/06; B65G 17/42  
U.S. Cl. 198—328

2 Claims



## 1. A curvilinear escalator which comprises:

- a main frame having a substantially arcuate shape in the horizontal plane of projection and disposed in an inclined condition, said main frame having a forwarding way formed on the top surface side thereof, a turning section at each distal end part of the main frame in the longitudinal direction thereof, and a return way on the bottom surface side thereof to thereby construct an endless conveying path confined to said arcuate shape;
- a plurality of steps continuously disposed in said conveying path and guided therealong, each is said steps being in a sector shape in plan view, each of said steps having a step shaft disposed in the breadthwise direction;
- a pair of step chains disposed at both sides of said steps on the edge part in the breadthwise direction thereof and provided along said conveying path and being driven by a sprocket wheel, each step chain being constructed of joint pieces and link member, said joint pieces being engaged with an end part of said step shaft, said link members having one end part connected with one end part of one of

said joint pieces, so as to connect said adjacent joint pieces, said link members including rollers;

- a spherical joint including a pin, a first bushing having a curved exterior surface and mounted on said pin, a second bushing having an interior surface matching the exterior surface of said first bushing and an exterior cylindrical surface; said cylindrical surface having the same configuration as said rollers and having the same pitch as said rollers so as to be engageable by said sprocket wheel in the same manner as said rollers; whereby said interior surface of said second bushing and said exterior surface of said first bushing form a sliding surface of said joint;
- said spherical joint being placed at the connection between said joint piece and said link member so as to allow said link members to be disposed at an angle to said joint members, thus reducing the force exerted on said step chains.

4,681,207

## ESCALATOR

Shigeru Goto, Ichinomiya; Masaru Asano, Kohnan; Matsubiko Ishida, Inazawa, and Shosaku Inoue, Misato, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,662

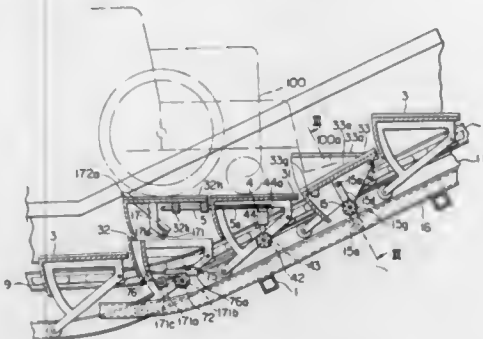
Claims priority, application Japan, Apr. 19, 1984, 59-78983

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> B65G 9/12

U.S. Cl. 198—333

5 Claims



## 1. An escalator comprising:

- a main frame disposed in a sloped position and defining therein a circulating loop path having a load-bearing run including an upper and lower horizontal portion and an intermediate sloped portion, a return run, an upper turn-around portion, and a lower turn-around portion;
- a plurality of first steps having treads and serially disposed along said circulating loop path for circulating movement therealong, said first steps moving horizontally with said treads maintained horizontally when said first steps are in said upper and lower horizontal portions, and said first steps moving upwardly and downwardly along said sloped portion with said treads maintained horizontally when said first steps are in said intermediate sloped portion;
- a second step disposed between said first steps for circulating movement together with said first steps and having forks mounted thereon, a forward and backward moving mechanism for said forks, said forks normally being in a retracted position and capable of moving to a projecting position when said mechanism is actuated, said mechanism having an inputting means for moving said forks between the retracted and projecting positions;
- a third step disposed between said first and said second steps on the lower side of said second steps for circulating movement together with said first and second steps and having mounted thereon a vertically movable step which nor-

ally is in a lowered position and said forks are normally in the retracted position;

- a first drive mechanism disposed on said main frame at each of the lower and upper horizontal portions of said load-bearing run, said first drive mechanism being normally in a retracted position and, when actuated, engageable with said inputting means when said second step is stopped at either horizontal portion of said load-bearing run for moving said forks into or out of said projecting position;
- a second drive mechanism disposed on said main frame at each of the lower and upper horizontal portions of said load-bearing run, said second drive mechanism being normally in a retracted position and being brought into engagement with said inputting means of a movement mechanism of said third step when said third step is stopped at either horizontal portion of said load-bearing run to actuate said movement mechanism to pull out or to insert an engaging rod from or into an engaging hole;
- a fourth step disposed between said first and said second steps on the upper side of said second step for circulating movement together with said first and second steps and having mounted thereon and inclinable portion, a movable mechanism for said inclinable portion, said inclinable portion normally being maintained horizontally and being changeable to a sloped position when said movable mechanism is actuated;
- said movable mechanism of said fourth step including an inputting member normally maintained in a retracted position and capable of moving into a forward position when actuated;
- a forward drive mechanism mounted on said main frame at each of the lower and upper horizontal portions of said load-bearing run, a displacement mechanism for said forward drive mechanism, said forward drive mechanism normally being maintained in a retracted position and, when actuated, engageable with said movable mechanism of said fourth step when said fourth step is stopped at either horizontal portion of said load-bearing run for moving said inputting member of said movable mechanism of said fourth step forward; and
- an actuator rail mounted on said main frame along said load-bearing run, said actuator rail being engageable with said inputting member of said movable mechanism of said fourth step when said inputting member is in the forward position for displacing said inputting member of said movable mechanism of the fourth step in said sloped portion of said load-bearing run to incline the inclinable portion of said fourth step.

4,681,208

## METHOD AND APPARATUS FOR PRESENTING AN ARTICLE TO A WORK STATION

Robert V. Harringer, Joliet; Robert O. Rada, Brookfield, and Edward J. Vesely, Woodridge, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Aug. 5, 1985, Ser. No. 762,654

Int. Cl.<sup>4</sup> B65G 43/08

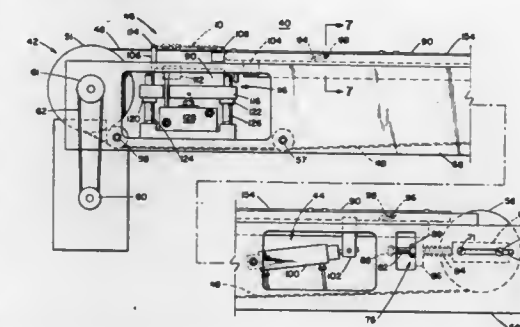
U.S. Cl. 198—341

9 Claims

1. A method of moving articles to a work station comprising the steps of:
  - positioning the articles contiguous to each other on a conveyor system in a first plane;
  - driving the conveyor system so that a first one of the articles is moved past, and detected by, a first and then a second sensor;
  - generating a first signal in response to the detection of the first article by the second sensor and generating a second signal in response to the detection of a second article, adjacent to said first article, by the first sensor;
  - raising a pair of rails positioned beneath the second and subsequent articles in response to the first and second signals to raise the second and subsequent articles upward and away from the first article and out of engagement

with the conveyor system to a second plane above the first plane of the conveyor system;

elevating the first article in response to the first signal to a work station located above the second plane of the raised second article; and



after the first article is elevated, lowering the pair of rails to lower the second and subsequent articles into engagement with the conveyor system, where the pair of rails is raised to separate the second and subsequent articles from the first article before the first article is elevated.

4,681,209

## MACHINE FOR POSITIONING CONTAINERS

Jaime S. Marti, Emancipacion #8,10,1A, Barcelona, Spain

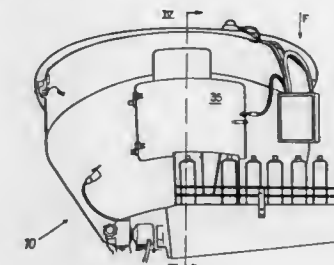
Filed Apr. 9, 1984, Ser. No. 598,416

Claims priority, application Spain, Apr. 8, 1983, 52,1347

Int. Cl.<sup>4</sup> B65G 47/24

U.S. Cl. 198—392

9 Claims



## 1. A machine for orienting containers such as plastic bottles, the machine comprising:

- a hopper;
- a first disc in said hopper;
- means to rotatably mount said disc for rotation about an axis inclined to the vertical;
- means for feeding containers onto the disc;
- a plurality of detachable container holding elements removably mounted at the periphery of the disc and defining peripheral recesses between said elements for receiving individual containers and moving said containers from a low level to a high level upon rotation of the first disc;
- a plurality of passageway means extending downwardly below said first disc, each passageway means being aligned below one of said corresponding peripheral recesses and having a configuration to receive and orientate containers falling into said passageway means into an upright position;
- means for preventing containers from falling into said passageway means, except at a drop zone at a higher level of the disc for allowing containers to fall into said passageway means at said higher level;
- means for receiving the uprightly orientated containers from the lower ends of the passageway means;



means to detachably connect said holding elements to said disc so that said holding elements can be interchanged with other holding elements; and  
means for detachably mounting said passageway means around the periphery of said first disc to facilitate interchangeability thereof with other passageway means to enable the machine to handle containers of different shapes and sizes.

4,681,210

# APPARATUS FOR FEEDING BARS THROUGH A BENDING OR LIKE PROCESSING STATION

Toshiyuki Miki, Sagami-hara; Kunio Tomioka, Kawasaki; Masao Nakajima, Matsuo, and Terushige Sakurai, Komatsu, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho and Aoki Corporation, both of Tokyo, Japan

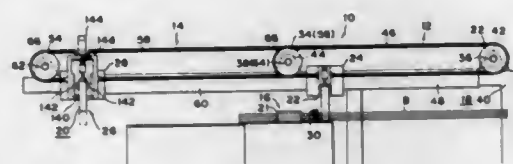
Filed Aug. 21, 1985, Ser. No. 767,991

Claims priority, application Japan, Aug. 23, 1984, 59-174026; Aug. 23, 1984, 59-126971[U]; Aug. 23, 1984, 59-126973[U]

Int. Cl.<sup>4</sup> B65G 25/00

U.S. Cl. 198—468.2

7 Claims



1. Apparatus for feeding a bar or a plurality of bars along a predetermined path extending through a processing station such as a bar bending station, comprising:

- a first conveyor extending between a loading end of the predetermined path and the processing station;
- a first gripper assembly mounted to the first conveyor thereby to be reciprocally transported between the loading end and the processing station, the first gripper assembly being capable of releasably gripping a bar or a plurality of bars in a vertical pile for transporting same from the loading end to and through the processing station where the bar is processed;
- a second conveyor arranged collinearly with the first conveyor and extending between the processing station and an unloading end of the predetermined path;
- a carriage mounted to the second conveyor thereby to be reciprocally transported between the processing station and the unloading end;
- a second gripper assembly mounted to the carriage on the second conveyor for up and down motion relative to the carriage, the second gripper assembly being also capable of releasably gripping a bar or a plurality of bars in a vertical pile for transporting same through the processing station in coaction with the first gripper assembly and further for transporting the processed bar or bars away from the processing station to the unloading end;
- lift means for moving the second gripper assembly up and down on the carriage, the second gripper assembly gripping the processed bar or bars while being lowered and being subsequently raised with the processed bar or bars preparatory to transportation thereof to the unloading end;

wherein each of the first and second gripper assemblies includes,

- a pair of gripping jaws pivotable relative to each other;
- a plurality of interchangeable sets of gripping teeth for gripping bars of different diameters, each set being comprised of at least one pair of gripping teeth to be replaceably mounted one to each gripping jaw in opposed relation to each other for engaging a bar or bars therebetween; and
- means for pivoting one of the gripping jaws toward and away from the other for the engagement and disengagement

ment of the bar between and from the opposed gripping teeth; and  
wherein the pair of gripping jaws of each gripper assembly have a pair of undercut grooves formed in their opposed faces for slidably engaging a selected set of a pair or pairs of gripping teeth, each pair of gripping teeth partly protruding from the undercut grooves for gripping a bar or bars therebetween, and wherein the apparatus further comprises means for retaining the gripping teeth engaged in the undercut grooves.

4,681,211

TRANSPORT DEVICE FOR PIECE GOODS OR THE LIKE  
Rudolf Lödige, Paderborn; Bernhard Leonhard, Warburg-Scherfede, and Volker Stille, Bannatal, all of Fed. Rep. of Germany, assignors to Dipl.-Ing. A. Lödige GmbH, Paderborn, Fed. Rep. of Germany

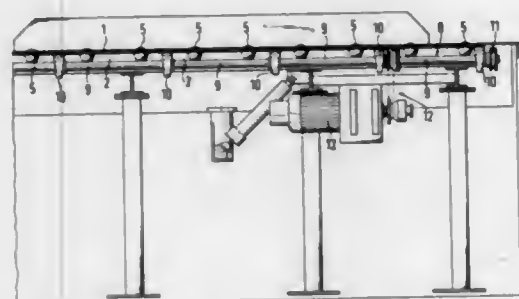
Filed Oct. 25, 1985, Ser. No. 791,361

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3439966

Int. Cl.<sup>4</sup> B65G 13/06

U.S. Cl. 198—789

1 Claim



1. A transport device for piece goods or the like, having rolling members (5) for directly supporting the piece goods and arranged partly below a plate member comprising a plate or plate segments (1) which supplement each other in plate-like manner, and rolling drive devices below said rolling members (5) which are guided in holes (3) in the plate or plate segments (1), the rolling members (5) having their top portions protruding above the top side (6) of the plate or plate segments (1) and being arranged in linear rows (7) transverse to the direction of transport, characterized in that said rolling drive devices are cylindrical shafts (8), one of which is mounted centrally below each row (7) of rolling members (5) and parallel thereto and supports the rolling members (5) of the corresponding row (7) in direct rolling frictional engagement therewith, characterized in that the shafts (8) extend over the entire length of the corresponding row (7) of rolling members (5) and the transport device further comprises support elements (10) which multiply support the shafts (8) and which lie one behind the other in axial direction, and further characterized in that the transport device comprises shaft sections (9) lying between the support elements (10) and two rolling members (5) are supported in each case on the shaft sections (9).

4,681,212

# ACCUMULATING CONVEYOR

Jack E. Miller, St. Clair Shores, Mich., assignor to Harry Major Machine & Tool Co., Fraser, Mich.

Continuation-in-part of Ser. No. 761,584, Aug. 1, 1985, Pat. No. 4,598,818. This application Apr. 11, 1986, Ser. No. 850,260

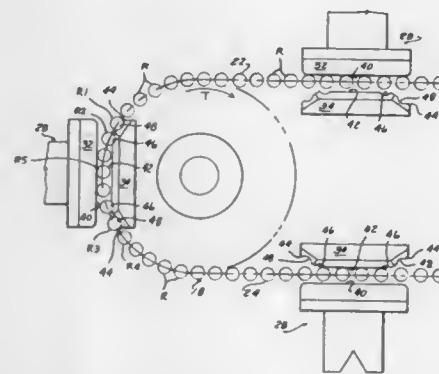
Int. Cl.<sup>4</sup> B65G 17/00

U.S. Cl. 198—803.2

2 Claims

1. For use in combination with an accumulating conveyor comprising a pair of like end sprocket means of like radius mounted for rotation about spaced, parallel, horizontal axes, an endless multiple-strand roller chain, at least one strand of said

chain being operatively trained in tension about said end sprocket means, means for supporting and guiding said one strand of said chain along horizontal upper and lower runs extending between said sprocket means, a second strand of said chain being supported by said one strand laterally clear of said sprocket means and said means for supporting and guiding, and drive means for driving said chain in continuous movement along an endless path; an article carrier adapted to be mounted on said second strand of said chain, said carrier including mounting means mounted on the carrier and engaged with said second strand to support the carrier upon said second strand and operable to frictionally couple the carrier to said chain when the carrier is on the upper or lower run of the chain; said carrier including a frame and said mounting means comprising a rigid outer support plate and a rigid inner support plate fixedly mounted on said frame to be respectively located at the outer and inner side of the endless path of movement of said second strand, said support plates having opposed chain engaging edges including opposed straight edge sections extending a fixed, spaced, relationship to each other and spaced from each other by a distance greater than the diameter of the rollers of said chain, the straight edge section of said outer support plate having a length sufficient to span a plurality of rollers of said chain to stably support said carrier upon said second strand of



said chain when said carrier is located on said upper run and the straight edge section of said inner plate having a length sufficient to span a plurality of rollers of said chain to stably support said carrier upon said second strand when said carrier is located on said lower run, said chain engaging edge of said inner plate terminating at opposite ends in beveled edge sections inclined from the straight edge section inwardly of said endless path at an obtuse included angle, the straight edge section of said inner plate terminating at each end in means defining a concave curved first recess formed to define a chain roller receiving seat, the length of said straight edge section of said inner plate being related to the radius of said sprocket means and the pitch of said chain such that during transit of said plates around the curved portions of said endless path defined by said end sprocket means two non-adjacent rollers of said second strand are respectively seated in said first recesses and the straight edge section of said outer plate being spaced from the straight edge section of said inner plate by a fixed distance such that during transit of said plate around said curved portions of said endless plate, the straight edge of said outer plate tangentially engages a roller of said second strand intermediate said two rollers to positively retain said two rollers seated within said first recesses to couple said carrier to said claim.

4,681,213

# GRIPPER ASSEMBLY

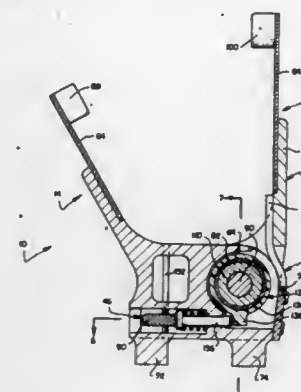
Michael E. Winiasz, Lorain, Ohio, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Oct. 23, 1985, Ser. No. 790,431

Int. Cl.<sup>4</sup> B65G 47/86

U.S. Cl. 198—803.9

11 Claims



1. A gripper assembly for clamping articles, said gripper assembly comprising a first clamp member, a first surface area connected with said first clamp member, a second clamp member rotatable relative to the first clamp member from a fully open position to any one of a plurality of closed positions to enable articles of different sizes to be gripped between said clamp members, a second surface area connected with said second clamp member, and releasable retainer means operable between an engaged condition preventing rotation of said second clamp member from any one of the plurality of closed positions to the fully open position and a release condition in which said second clamp member is rotatable from any one of the plurality of closed positions to the fully open position, said retainer means including a coil spring having a plurality of turns, said turns of said coil spring including inner side surface means for gripping said first and second surface areas when said retainer means is in the engaged condition to prevent rotation of said second clamp member toward the fully open position, said inner side surface means of said coil spring and one of said surface areas being rotatable relative to each other when said retainer means is in the release condition to enable said second clamp member to rotate toward the fully open position.

4,681,214

# TUBULAR CONVEYOR

Ladislav S. Karpisek, 86 Woodfield Boulevard, Caringbah 2229, New South Wales, Australia

PCT No. PCT/AU85/00071, § 371 Date Dec. 6, 1985, § 102(e) Date Dec. 6, 1985, PCT Pub. No. WO85/04639, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 4, 1985, Ser. No. 810,330

Claims priority, application Australia, Apr. 12, 1984, PG4534; Apr. 4, 1985, 40963/85

Int. Cl.<sup>4</sup> B65G 15/08

U.S. Cl. 198—819

5 Claims

1. A conveyor comprising two pulleys spaced apart vertically with an endless belt extending around the pulleys and therebetween to provide a down run of belt and an up run of belt, the belt being made of a resilient material and having a tubular form and longitudinal slit, the peripheral surface of the lower pulley having a laterally extending concave profile with a radius of curvature which is substantially the same as the radius of curvature of the exterior of the belt, the peripheral surface of the upper pulley having a laterally extending convex profile, a feed means to feed material into the down run of belt adjacent the lower pulley and a discharge station to discharge

material from the up run of belt adjacent the upper pulley, the belt being in the tubular form from the feed means around the lower pulley to the discharge station, a retaining means embracing the up run of the belt from adjacent the lower pulley to the discharge station for maintaining the belt closed with the edges of the slit in abutting contact, the belt being opened laterally outward by the convex profile of the upper pulley as the belt leaves the retaining means to allow material to gravita-



tionally discharge from the belt at the discharge station, the belt remaining open around the upper pulley and along the down run of belt to adjacent the feed means where the belt is returned to the tubular form by the convave profile of the lower pulley, the feed means being located at an elevation above the point where a line at the angle of repose of the material to be conveyed is tangent to the inner surface of the belt as it passes onto the lower pulley.

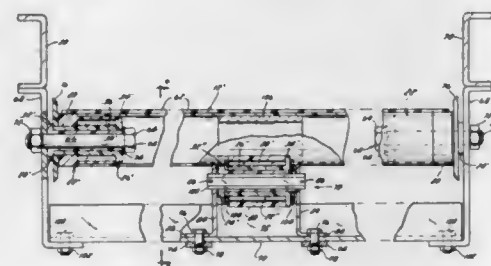
4,681,215

#### CONVEYOR ROLLER AND BEARING ASSEMBLY WITH EXTERNAL SUPPORT

Donald E. Martin, Waukesha, Wis., assignor to Rexnord Inc., Brookfield, Wis.  
Continuation-in-part of Ser. No. 706,698, Feb. 28, 1985, Pat. No. 4,577,747. This application Dec. 20, 1985, Ser. No. 811,612  
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.  
Int. Cl.<sup>4</sup> B65G 39/10

U.S. Cl. 198—843

9 Claims



1. A conveyor roller and bearing arrangement adapted for rotary movement between spaced, side support frame members comprising:

- a tubular roller having open ends;
- a bearing assembly mounted in each end of said roller;
- a stub axle at each end of said roller extending through said bearing assembly and said frame member; and
- means located between said frame members for supporting said roller externally thereof and including at least one guide roller engageable with the lower portion of said roller, said roller being provided internally with a reinforcing stiffener in the area where said guide roller is engageable with said roller, said bearing assemblies and

said stub axes cooperable with said means for supporting said roller to reduce the bending movement of said roller under load.

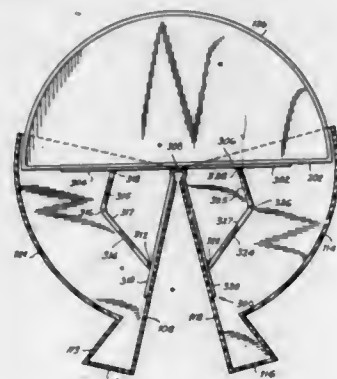
4,681,216

#### DISPLAY CASE FOR FRAGRANCE BOTTLES, JEWELRY, OR THE LIKE, AND HINGE USED THEREIN

Philip P. Simkins, New York, N.Y., assignor to Steven W. Hewlett, Mt. Kisco, N.Y., a part interest  
Filed Jun. 10, 1986, Ser. No. 872,670  
Int. Cl.<sup>4</sup> B65D 79/00

U.S. Cl. 206—45.13

7 Claims



1. A container capable of being moved from an open position to a closed position, comprising:

- an enclosure member comprising a first section and a second section, the first section and the second section being connected to each other at a common hinge point and being movable with respect to each other from an open position to a closed position and in a closed position defining a first cavity;
- a tray member being arranged and constructed so that it is disposed within the first cavity when the first section and the second sections are in their closed position, and the tray member being exposed for access when the first section and the second section are in their open position; and
- hinge means for connecting and allowing movement among the first section, the second section, and the tray member, the hinge means being arranged and constructed so that the first section and the second section may be pivoted about the common hinge point, whereby the hinge means comprises a first elongated member attached to the tray member, a second elongated member attached to the first section, a third elongated member attached to the second section, with the second and third elongated members being pivotably connected to the first elongated member at substantially the same position along its longitudinal length, first support means connecting a first portion of the first elongated member and the second elongated member, second support means connecting a second portion of the first elongated member and the third elongated member, and when the container is in the open position the first support means and the second support means restrict pivotal movement of the tray member with respect to the first section and the second section.

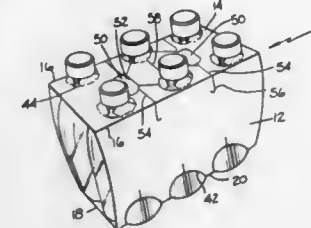
4,681,217

#### WRAP-AROUND CARRIER WITH IMPROVED HANDLE

Kenneth J. Hernandez, Monroe, La., assignor to Manville Corporation, Denver, Colo.  
Filed Oct. 16, 1986, Ser. No. 919,735  
Int. Cl.<sup>4</sup> B65D 5/46

U.S. Cl. 206—141

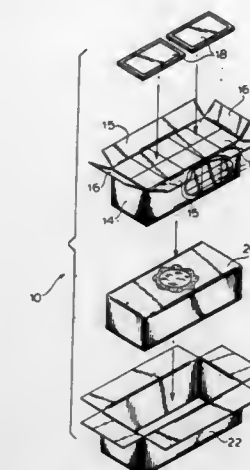
11 Claims



1. A wrap-around article carrier, comprising:

- a top panel;
- a bottom panel;
- side panels integral with and foldably connected to the top and bottom panels;
- the top panel containing two tabs in the central portion thereof, the tabs being connected to the top panel along fold lines extending transversely of the folds connecting the side panels to the top panel;
- the tabs being spaced from each other a distance enabling the thumb and finger of a user to push the tabs down, pivoting them out of the plane of the top panel about their fold lines;
- the top panel also containing two slits extending across the width of the top panel and terminating in the side panels, the portion of the top panel between the slits comprising the handle portion of the carrier;
- the central portion of each slit including the outer boundaries of one of the tabs; and
- the handle portion containing a score line intermediate the slits and extending transversely of the folds connecting the side panels to the top panel, the portions of the handle between the slits and the score line folding upwardly about the score line when the carrier is lifted by the handle portion.

moisture on the surfaces of said slides to react with the glass in a chemical reaction which increases the surface



lubricity of said slides without causing visual deterioration of said slides.

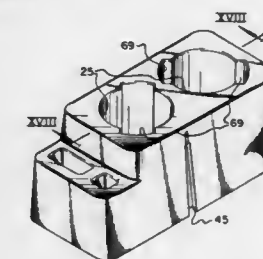
4,681,219

#### ACCESSORY FOR BASS FISHING BOAT

Doyle Kitchens, 120 Meandering Way, Del Rio, Tex. 78840  
Continuation-in-part of Ser. No. 691,381, Jan. 14, 1985. This application Nov. 1, 1985, Ser. No. 794,146  
Int. Cl.<sup>4</sup> B65D 85/00

U.S. Cl. 206—315.11

20 Claims



1. An accessory for holding containers and hand tools on a boat used for recreational purposes, comprising:

- a. a main body having a top wall and a plurality of side walls coupled to said top wall, said main body further comprising:
  - i. at least one cylindrical cavity disposed within said top wall, said cylindrical cavity having a side wall and a bottom wall, said cylindrical cavity being of sufficient diameter and depth to contain a cylindrical container such as might be utilized on said boat;
  - ii. at least one cavity disposed within said top wall, said cavity having side walls and a bottom wall, said cavity being of sufficient size and shape to contain hand tools such as might be utilized on said boat for fishing purposes;
  - iii. a narrow wedge-shaped slot in one of said main body side walls, said slot beginning at the bottom edge of said main body side wall and traversing upward toward said top wall in a tapered manner;
- b. a mounting bracket further comprising:
  - i. a mounting plate with apertures suitable for receiving fasteners to affix said mounting bracket to the interior of said boat;
  - ii. a mounting web coupled to said mounting plate, wherein said web is shaped and sized to matingly engage with said slot;
  - iii. means for retaining said web within said slot.

4,681,218

#### MOISTURE-CONTROLLED GLASS MICROSCOPE SLIDE PACKAGE

Edward L. Williams, Oxnard, Calif., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.  
Filed Mar. 15, 1982, Ser. No. 358,147  
Int. Cl.<sup>4</sup> B65D 81/26

U.S. Cl. 206—204

12 Claims

1. A package of moisture-controlled glass microscope slides comprising:

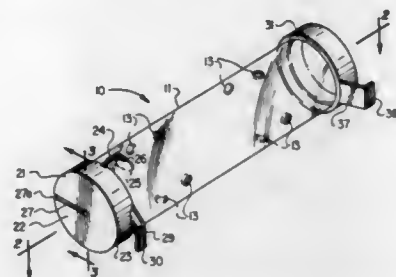
- a container; a plurality of flat, thin glass microscope slides inside said container stacked in face-to-face arrangement;
- a moisture barrier sealed around said container; and
- a desiccant inside the space sealed by said moisture barrier for removing substantially all the moisture from the slides over a prolonged period of time at a rate which permits



4,681,220

**CONTAINER FOR AN OFFSHORE FISHING LURE**  
Robert G. Beneke, 11620 Wander La., Dallas, Tex. 75230  
Filed Jan. 31, 1986, Ser. No. 824,379  
Int. Cl.<sup>4</sup> A01K 93/00  
U.S. Cl. 206—315.11

7 Claims



1. A container for an offshore fishing lure and leader secured thereto, said container comprising:  
an elongated cylinder sized and proportioned to contain said lure there within and said leader outside thereof in securement thereto;  
first and second end pieces fitted on the ends of said cylinder;  
said first end piece being sized and proportioned to frictionally and removably fit on one end of said cylinder to selectively substantially close said end and contain said lure within said cylinder;  
said first end piece having a face and a generally depending cylindrical skirt sized to engage said cylinder in frictional securement thereto;  
said first end piece having a slot through said face and said skirt thereof for admitting passage of said leader on said offshore fishing lure;  
means for securing said leader to said container with said lure container therein;  
said leader securing means comprising a first half-cleat projecting from said first end piece at a side thereof, and a second, oppositely disposed half-cleat projecting from said second end piece at a side thereof, each said half-cleat including a horn and said horns of said oppositely disposed half-cleats extending axially outwardly from said cylinder in opposite directions when said first end piece is fitted on said cylinder; and means for maintaining said oppositely disposed half-cleats in substantially arcuate alignment with each other when said first end piece is substantially closing said one end of said cylinder for facilitating alignment and wrapped securement of said leader around said half-cleats.

4,681,221

**HOLDER FOR PLASTIC LEADED CHIP CARRIER**  
John J. Chickanosky, Grand Isle; Jack W. Courtney, Underhill, both of Vt., and Robert H. Murphy, Merrimac, N.H., assignors to International Business Machines Corporation, Armonk, N.Y.

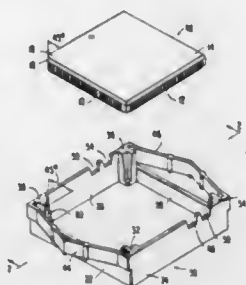
Filed Oct. 30, 1986, Ser. No. 925,353  
Int. Cl.<sup>4</sup> B65D 73/02

U.S. Cl. 206—328

8 Claims

1. A single-piece substantially rectangular molded plastic holder for a substantially rectangular integrated circuit module having external leads extending along the bottom of the module, said holder comprising:  
four vertical side walls forming a substantially rectangular, vertically-extending cavity for receiving a module inserted in the cavity from the top of the holder, said four side walls forming four corresponding internal corners of said holder;  
and inwardly extending supporting means, in each of said corners, for supporting a corresponding one of the four corners of an inserted module so that the bottom surface

of the module is above the bottom edges of said side walls and so that the leads are accessible through the bottom of the holder; and  
flexible, snap-acting bistable retaining arm means for clamping a module in said holder;  
each of said retaining arm means being formed integrally with said holder and having opposite arm ends fixed at opposite points along a line parallel to a respective one of a first pair of opposing side walls;



said retaining arm means having an outwardly-extending first stable position in which the cavity is open for the insertion or removal of a module, and an inwardly-extending second stable position in which the cavity is closed; the vertical height of an operative portion of the module-receiving cavity being defined by the vertical distance between said supporting means and lower edges of said retaining arm means.

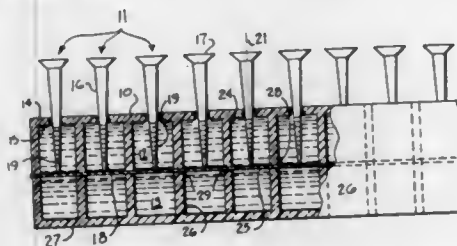
4,681,222

**ORIENTED ARRAY OF SELF-LOCKING FASTENERS**  
Raymond L. Longhenry, HCR 55700 Saber St., Homer, Ak. 99603

Filed Dec. 24, 1985, Ser. No. 813,263  
Int. Cl.<sup>4</sup> B65D 85/24

U.S. Cl. 206—347

1 Claim



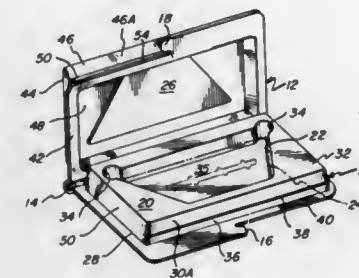
1. An assembly of self-locking fasteners comprising:  
(a) a semi-rigid holding panel having upper and lower flat surfaces,  
(b) a multitude of elongated fasteners, each having a shaft portion terminating in head and bottom extremities, said fasteners being removably held by said panel in a manner such that the long axis of each fastener is perpendicular to the panel and the head extremity is above said upper flat surface, said fasteners being uniformly spaced apart in an array having straight lines, and  
(c) at least one air-impermeable compartment associated with each fastener below said lower flat surface and containing a liquid bonding agent having a viscosity within the range of about 4 poises and 80 poises, measured at 25 degrees C., and capable of curing to solid form, the shaft portion of said fastener being immersed in said bonding agent.

4,681,223

**KNIFE BLADE PACKAGE AND CONTAINER THEREFOR**  
C. Kenard Roberts, Clinton, Conn., assignor to The Stanley Works, New Britain, Conn.  
Filed Feb. 4, 1986, Ser. No. 825,905  
Int. Cl.<sup>4</sup> A45C 11/26

U.S. Cl. 206—354

7 Claims



1. A self-hinging one-piece container integrally formed from synthetic plastic material for knife blades and the like and comprising:

(a) a base element having a peripheral flange and a pedestal portion including a peripheral wall extending upwardly from said flange and spaced inwardly from its side margins, a support wall extending transversely across the upper end of said peripheral wall and an article-receiving recess in said support wall spaced inwardly from the peripheral wall and extending over the greater portion of the area thereof, said recess being defined by a base wall extending substantially in the plane of said flange and a sidewall extending between said base wall and the peripheral portion of said support wall lying in the plane of the upper end of said peripheral wall, said recess being configured and dimensioned to seat snugly a multiplicity of knife blades or the like; (b) a cover element including a peripheral flange overlying said peripheral flange of said base element and a pedestal portion overlying said pedestal portion of said base element, said cover element pedestal portion including a peripheral wall extending upwardly from said flange and inwardly from its margins along the outer surface of said peripheral wall of said base element, a top wall extending transversely of the upper end of said peripheral wall of said cover element and overlying said support wall of said base element, and a depending boss spaced inwardly from the peripheral margins of said top wall and extending below the plane of said support wall and into said recess to retain the knife blades and the like stored within the confines of said recess;  
(c) a hinge element extending between adjacent margins of said flanges of said base and cover elements to provide a self-hinging connection therebetween; and  
(d) releasable engagement means on said cover and base elements, said container being of elongated, generally rectangular configuration with said hinge element extending along the margins of said flanges along one of the elongated sides, said releasable engagement means being disposed along the flange on the other elongated side, said releasable engagement means including resiliently deflectable overlying finger portions on said flanges deflectable to engage the finger portion of said cover element below said finger portions of said base element.

4,681,224

**FLORIST'S IMPLEMENT**  
Ludwig C. Niemann, 1543-D Coleman Rd., Knoxville, Tenn. 37909, assignor to Gerald R. McCully, Tucson, Ariz. and Ludwig C. Niemann, Knoxville, Tenn.  
Filed Dec. 4, 1986, Ser. No. 938,158  
Int. Cl.<sup>4</sup> B65D 85/50

7 Claims



1. An implement for temporarily stabilizing a container comprising:

(A) first and second square sheets;  
1. each said square sheet having upper and lower faces;  
2. each said square sheet having first, second, third and fourth equal length edges;  
a. all said edges of said first and second sheets being the same length;  
b. said first and third edges of each said sheet being parallel to one another;  
c. said second and fourth edges of each said sheet being parallel to one another;  
d. adjacent edges of each said sheet joining at right angles;  
(B) means hingedly connecting said fourth edge of said first sheet with one edge of said second sheet such that said second sheet may be folded beneath said first sheet to bring said lower face of said second sheet into juxtaposition with said lower face of said first sheet;  
(C) a grid of scores in said upper face of said first sheet, said grid of scores comprising:  
1. a first series of a predetermined odd number of equally spaced scores arranged parallel to said first and third edges of said first sheet, the center one of said first series of scores passing through the center of said upper face of said first sheet, said center one of said first series of scores being a heavy score;  
2. a second series of said predetermined odd number of equally spaced scores arranged parallel to said second and fourth edges of said first sheet, the center one of said second series of scores passing through the center of said upper face of said first sheet;  
such that said upper face of said first sheet is divided by said first and second series of scores into an array of square areas, a central group of four of which square areas have respective corners meeting at the center of said upper face of said first sheet; and  
(D) first, second, third and fourth heavy scores in said upper face of said first sheet, said heavy scores extending, respectively, across diagonal dimensions of said central group of four square areas to define a diamond shaped area having its center at the center of said upper face of said first sheet.

4,681,225

## GLASS AND BOTTLE TOTE

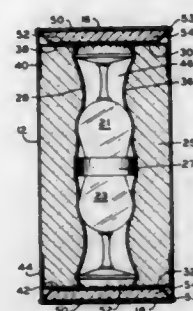
Lorenz M. Schuster, 2163 Iglehart Ave., St. Paul, Minn. 55104

Filed Jan. 16, 1986, Ser. No. 874,515

Int. Cl.<sup>4</sup> B65D 85/44

U.S. Cl. 206-426

7 Claims



1. A carrying case for delicate articles such as glasses or bottles comprising, an elongated container body having a first end and a second end, said container body being formed from a self-supporting body of foam rubber which itself serves as a supporting structure for the case having an elongated tubular opening extending from said first end to said second end and communicating with each end through an opening therein, said tubular opening being somewhat smaller in diameter than the size of a typical article to be contained therein whereby each segment along a longitudinal axis of the foam rubber body will be forced in sequence to stretch outwardly over the article as the article is introduced through one of said openings and portions of the foam rubber body thereby extending centrally into depressions, if any, in the delicate articles thereby at least in part conforming to the surface contours thereof, a slippery liner contained within a longitudinally extending opening, said liner being capable of extending outwardly as the article is inserted and being slippery enough to allow the article to slide through the enclosing foam rubber body as segments thereof sequentially expand and contract thus conforming to its surface as the article is inserted, and a compressible and collapsible cover at each end of the carrying case extending across the opening at each end thereof and each cover including a releasable closure means for opening the cover to facilitate insertion and removal of articles into the elongated passage.

4,681,226

## RECORDING BOX

Roger Pretre, 22, Rue de Sevres, Boulogne 92100, France

Filed Jan. 17, 1986, Ser. No. 819,593

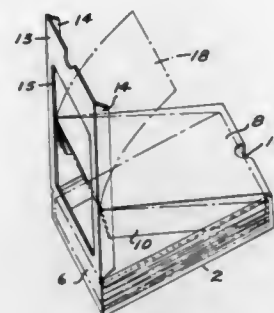
Int. Cl.<sup>4</sup> B65D 85/67

U.S. Cl. 206-449

5 Claims

1. A recording box fabricated from a folded unitary blank for containing and dispensing fanfolded sheets, comprising: a box having a bottom panel, first and second upstanding, lengthwise extending side panels connected to said bottom panel at respective first lengthwise fold lines, and first and second upstanding end panels connected to said bottom panel at respective first widthwise fold lines, said first and second end panels spaced a selected lengthwise dimension from one another; an intermediate partition connected to one of said end panels along a second widthwise fold line and having means for positionally maintaining said intermediate partition superposed above and substantially parallel to said bottom panel, said intermediate partition having a length less than the lengthwise spacing dimension between said first and second end panels to define a slot between the other of

said end panels and the remote end of said intermediate partition; and a top panel connected to the other of said end panels along a respective fold line and having means for positionally maintaining said top panel superposed above and substantially parallel to said intermediate partition to define a sheet passage therebetween, said top panel having a cut-out formed therein;



wherein a supply of edge-to-edge connected sheets is contained within the box between said bottom panel and the intermediate partition with the sheets passed through the slot and the sheet passage to provide access to a sheet through the cut-out, the intermediate partition functioning as a sheet support surface.

4,681,227

## CASSETTE FOR STIMULABLE PHOSPHOR SHEET

Kaoru Tamura, and Shumpelta Torii, both of Kanagawa, Japan,

assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 4, 1985, Ser. No. 719,847

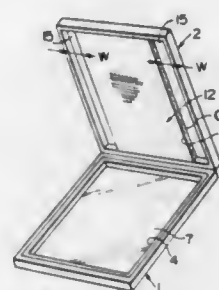
Claims priority, application Japan, Apr. 4, 1984, 59-67290;

Apr. 4, 1984, 59-67291

Int. Cl.<sup>4</sup> B65D 81/30

U.S. Cl. 206-455

6 Claims



1. A cassette for removably housing a stimutable phosphor sheet for storing a radiation image therein, said cassette comprising a lining member secured to the inner surface of a rear cover of said cassette, said lining member comprising a cushioning material layer and a resin material layer, the surface of said resin sheet facing said phosphor sheet being embossed, whereby said phosphor sheet may be smoothly inserted into said cassette and said sheet will not stick to the inner surface of said rear cover upon opening said cassette for removal of said sheet.

4,681,228

## PACKAGE FILLED WITH A WATER-SOLUBLE TOXIC PULVERULENT OR GRANULAR PRODUCT

Peter R. Kerry, Burpham, and Jeffrey L. Lewis, Farnham, both

of Great Britain, assignors to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Jan. 13, 1986, Ser. No. 818,492

Claims priority, application Netherlands, Jan. 14, 1985,

8500076

Int. Cl.<sup>4</sup> B65B 11/58, 47/00; B65D 85/82

U.S. Cl. 206-484

20 Claims



1. A package for a water-soluble pulverulent or granular product comprising an inner container for said product formed from a flexible tube of a water-soluble film having two ends, each of said ends being closed by a transverse joint located near each end, and each of said ends being provided with an end strip, characterized as an extension of the flexible tube from said transverse joint to said end, one of said end strips having a perforated tear line therein intermediate the transverse joint and said end; an outer container surrounding said inner container with product, said outer container being formed from a flexible tube of a water-resistant material having two ends, each of which is closed by a transverse joint placed near said end; and wherein each end of said inner container is attached to the outer container at each transverse joint of said outer container.

13. A device for the manufacture of a package of a water-soluble pulverulent or granular product comprising a first filling pipe, means for providing a metered supply of product to said first filling pipe, means for placing around said first filling pipe a first continuous flexible tube of film, first sealing means for making a transverse joint across said first tube to form a package while leaving a first end strip, filling means to deposit a measured quantity of said product in said package, means for closing said package by making a transverse joint in said first tube above said product while leaving a second end strip in said first tube, and perforating means for making a tear line in the second end strip; and a second filling pipe for receiving the filled and closed first tube, means for placing a second continuous tube of film around the second filling pipe, and sealing means for forming a transverse joint across both the first and second tube at each end of the first tube.

19. A method of manufacturing a filled package in which a water-soluble pulverulent or granular product is contained in a closed water-soluble inner container placed inside and attached to a closed water-resistant outer container comprising the steps of:

- (a) forming around a filling tube a first continuous flexible tube of water-soluble film,
- (b) forming a transverse joint across the tube below the filling tube to form a first closure in the first tube,
- (c) filling the first tube with a metered amount of the product;
- (d) forming a second transverse joint to seal said first tube and to provide an end strip therein;
- (e) perforating the end strip to form a tear line therein;

- (f) forming a second continuous flexible tube of water-insoluble film around the first tube; and
- (g) forming first and second transverse joints across the first and second tubes to provide closures to the second tube, while at the same time attaching the ends of the first tube to the second tube.

4,681,229

## NOTE SORTING AND COUNTING APPARATUS

Sadaaki Uesaka; Toshio Numata, and Kazunori Umezaki, all of

Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha,

Japan

Filed Nov. 20, 1984, Ser. No. 673,314

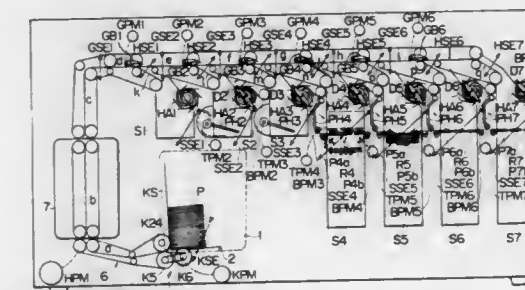
Claims priority, application Japan, Dec. 12, 1983, 58-233899;

Dec. 12, 1983, 58-233900; Dec. 12, 1983, 58-233901

Int. Cl.<sup>4</sup> B07C 5/34; G06M 7/06

U.S. Cl. 209-534

12 Claims



1. A note sorting and counting apparatus comprising: ejecting means for ejecting notes one by one from a stack of notes; identifying means for identifying the notes ejected by said ejecting means, the identification in connection with each note being at least as to whether the note is obverse or reverse and as to the denomination of the note; sorting means for sorting the notes successively ejected by said ejecting means into groups comprising obverse notes of the respective denominations and a group comprising reverse notes, in accordance with the result of the identification made by said identifying means; a plurality of containers, one container allotted to each of the respective groups; said sorting means directing each note to the container allotted to the group to which the particular note belongs; some individual containers of said plurality of containers including a retaining section for receiving and retaining the notes directed to the particular individual container and allowing the notes retained therein to be taken out, a storage section, and transfer means for transferring notes from the retaining section to the storage section, each of said individual containers being provided with a sensor for detecting notes in the retaining section; mode switch means for selecting the operation mode of the apparatus from a plurality of operation modes, one of the operation modes being a batch processing mode in which notes are sorted and counted into batches each consisting of a predetermined number of notes; an approval key for commanding transfer of notes from the retaining sections to the respective storage sections of said individual containers; and control means for controlling operation of said ejecting means when the batch processing mode is selected in such a manner that when a second predetermined number of notes is sensed by one of said sensors said ejecting means is stopped, and when said one of said sensors senses that notes in the associated individual container retaining section have been taken out, said ejecting means is re-started, and for causing operation of said transfer means to transfer notes from the retaining sections into the storage sections



in response to the actuation of said approval key when the batch processing mode is not selected.

4,681,230

## TUBE TRANSFER DEVICE

Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

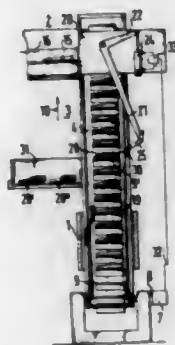
Filed Apr. 18, 1985, Ser. No. 725,015

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414680

Int. Cl.<sup>4</sup> B07C 5/36; B65H 67/06

U.S. Cl. 209—615

13 Claims



1. Tube transfer device for discarding unusable cylindrical and conical tubes and misoriented conical tubes and for transferring empty cylindrical tubes and properly oriented conical tubes from a tube feeding device to a tube receiving device, comprising an elevator advancing tubes in a given transport direction from the tube feeding device to the tube receiving device in intermittent steps with pauses between the steps, said elevator having receiver elements for individual tubes, a feeler element movable back and forth transverse to said given transport direction at an operating height during said pauses, said feeler element passing over empty cylindrical tubes and empty conical tubes oriented in a given direction and pushing unusable cylindrical and conical tubes and conical tubes oriented opposite to said given direction out of said receiver elements, and a receiver device adjacent said elevator for receiving the pushed-out tubes from said receiver elements, said feeler operating in a given direction, and said feeler being formed of a plurality of pivotally supported thin plates ending at a point and forming an acute angle in said given operating direction toward a tube disposed in one of said receiver elements.

4,681,231

## ARTICLE SELECTING AND CONVEYING SYSTEM

Yutaka Ueda, Nara, and Masaharu Kiriake, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 2, 1983, Ser. No. 557,068

Claims priority, application Japan, Dec. 8, 1982, 57-186217[U]; May 25, 1983, 58-93262

Int. Cl.<sup>4</sup> B07C 5/36

U.S. Cl. 209—656

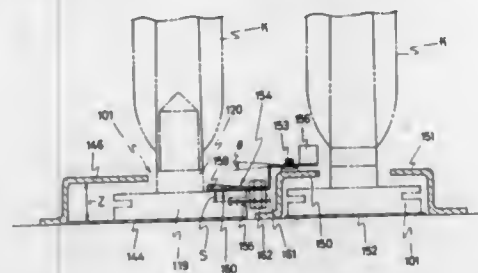
8 Claims

1. An article selecting and conveying apparatus for selecting different kinds of articles comprising a conveying passage and a carrier which is transferred on the conveying passage and supports an article thereon, said carrier being formed with a discrimination means for discriminating the kind of article placed on said carrier,

wherein said articles are cops and said apparatus is provided in a system which comprises a plurality of spinning frames, an automatic winder divided into a plurality of winding sections for winding up different kinds of cops at each winding section, a cop supplying passage communicating the spinning frame to the winder and conveying said carriers on which different kinds of cops fed from the

spinning frames are placed on, and an ejecting passage for conveying carriers ejected from the winder to the spinning frame,

said conveying passage being formed in the cop supplying passage and comprising a belt conveyor and guide members for guiding said carriers; said discrimination means comprising one or more discriminating grooves formed in the carrier at predetermined positions corresponding to the kind of articles placed on said carrier; and a discriminating member positioned to allow passage of at least one



of said grooves therearound to thereby discriminate said carrier based upon the position of said grooves, and wherein there is further disposed in said conveying passage a guide and distribution device for guiding the carrier, which has been discriminated by said discriminating member, to a conveying passage especially for said carrier so that each of said carriers are selected and distributed to the conveying passage therefor in dependence upon the presence of the discriminating groove corresponding to said discriminating member.

4,681,232

## PERIODICAL HANGING SYSTEM AND APPARATUS

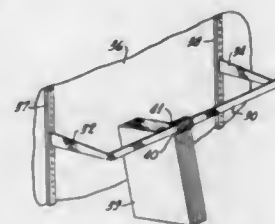
Gerard M. Du Corday, 10871 Thorley Rd., Santa Ana, Calif. 92705

Filed Nov. 23, 1984, Ser. No. 674,288

Int. Cl.<sup>4</sup> A47F 5/00

U.S. Cl. 211—46

30 Claims



1. A hanger for periodicals, such as magazines, journals, and the like, having a spine, said spine having a top, a bottom, and inner and outer sides, said hanger comprising

an elongated hanger member having first and second hanger member ends adapted to extend along one of said spine sides in close proximity to said spine, with said hanger member ends respectively adjacent said top and bottom of said spine,

a spine carrier element connected to said hanger member at said second hanger member end,

said spine carrier element having a first leg extending outwardly from said hanger member and adapted to extend beneath the bottom of said periodical spine to thereby support the periodical on said first leg,

said spine carrier element having a second leg extending upwardly from an outer part of said first leg and adapted to extend along the other side of said spine to

thereby retain the bottom of said spine upon said spine carrier element,

a spine retainer element at said first hanger member end and extending downwardly therefrom,

means for connecting said spine retainer element to said first hanger member end,

said spine retainer element being adapted to extend along said other side of said spine to hold the top of said spine at said spine carrier, and

suspension means on said hanger member at said first hanger member end for suspending said hanger and a periodical supported thereon from a single point,

said second leg of said spine carrier element comprising an elongated retaining strip connected to said first leg of said spine carrier element and extending along said elongated hanger member for substantially the full length of said hanger member,

said retaining strip having an upper end comprising a portion of said spine retainer element,

said elongated hanger member having a closure member fixed to an upper end thereof and projecting outwardly therefrom,

said closure member and the upper portion of said retaining strip collectively defining said spine retainer element, the upper end of said retaining strip being detachably connected to said closure member.

4,681,233

## PEGBOARD MOUNTED TOOL HOLDER

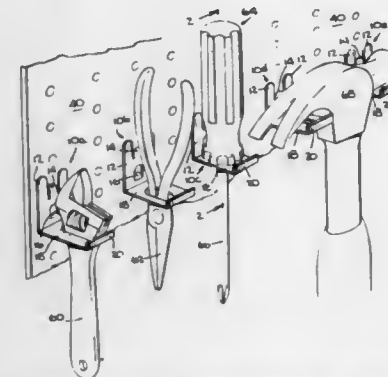
Howard Roth, 206 Devoe Ave., Yonkers, N.Y. 10705

Filed Apr. 21, 1986, Ser. No. 854,300

Int. Cl.<sup>4</sup> A47F 5/08

U.S. Cl. 211—70.6

18 Claims



1. A holder of unitary construction for holding tools on a pegboard mounting surface, comprising:

a vertical leg having two tabs extending upwardly away from said vertical leg of said holder and substantially parallel to one another to engage and secure said holder to a mounting surface behind said holder by means of an interference fit;

a horizontal leg, extending substantially perpendicular outwardly from said vertical leg, having a hole therein; and a lip extending upward from said horizontal leg.

4,681,234

## WRENCH RACK

Mark S. Wisniewski, 38 Milk St., Blackstone, Mass. 01504

Filed Mar. 12, 1986, Ser. No. 838,905

Int. Cl.<sup>4</sup> A47F 7/00

U.S. Cl. 211—70.6

6 Claims

1. The combination comprising

a wrench rack, and

T-shaped wrenches supported by said rack,

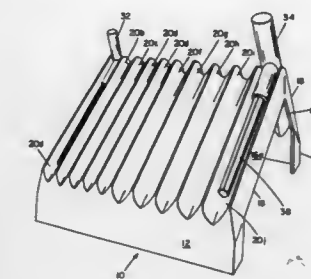
said wrenches having shanks and handles perpendicular to said shanks,

said combination comprising

a front portion extending upwardly and rearwardly,

a back portion extending downwardly and rearwardly,

a multiplicity of grooves extending upwardly in said front portion and then downwardly in said back portion, said grooves intersecting at the top of said rack at an angle of 90°,



said grooves being open along their lengths to facilitate access to them,

said grooves in said front portion being sufficiently long, and said front portion being positioned, to accommodate said shanks of said wrenches therein,

said grooves in said back portion being sufficiently long, and said back portion being positioned, to accommodate said handles of said wrenches.

4,681,235

## ELASTIC ARTICULATION OF A CENTRAL BUFFER COUPLING FOR RAIL VEHICLES

Hilmar Forster, Wolfenbittel, and Harald Lindner, Salzgitter, both of Fed. Rep. of Germany, assignors to Scharfenbergkupplung GmbH, Fed. Rep. of Germany

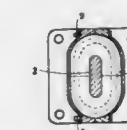
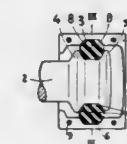
Filed Dec. 17, 1984, Ser. No. 682,017

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345381; Jun. 7, 1984, 3421166

Int. Cl.<sup>4</sup> B61G 9/06

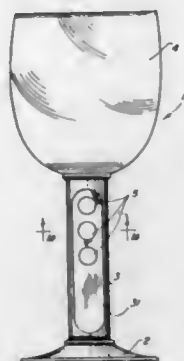
U.S. Cl. 213—50

1 Claim



1. An elastic articulation of a central buffer coupling for rail vehicles, comprising a housing adapted to be secured on the vehicle, a drawbar traversing said housing, at least one oval ring of resilient material prestressed normal to the axis of said coupling arranged between said housing and said drawbar, said drawbar as well as the inside of said housing having peripheral cams directed toward each other, said housing and said drawbar having oval crosssections with their axes disposed vertically, said rings being held spaced by said cams, and wherein said housing, said ring as well as said drawbar have a major axis of their cross-section disposed in the vertical in their installed position.

**4,681,236**  
**DRINKING GLASS HAVING A PRESS-MOLDED STEM AND A BASE (OR PEDESTAL)**  
 Emil Ilk, Industriezeile 24, A-5280 Braunau am Inn, Austria  
 Filed Oct. 22, 1985, Ser. No. 790,273  
 Int. Cl.<sup>4</sup> A47G 19/22; C03B 11/00  
 U.S. Cl. 215—99.5



1. A drinking glass comprising:

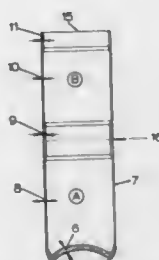
- a bowl;
- a base;
- a press-molded stem intermediate the bowl and the base and integrally formed therewith, and having a maximum thickness substantially greater than a maximum thickness of the bowl and of the base; and
- said stem including means defining at least one stress-relieving passageway extending therethrough in a generally transverse, horizontal direction.

**4,681,237**  
**METHOD FOR THE MANUFACTURE OF METAL PACKAGING CANS, AND A SEMI-PRODUCT IN THE MANUFACTURE OF SUCH CANS**  
 Leo Hartman, Beverwijk, Netherlands, assignor to Hoogovens Groep B.V., IJmuiden, Netherlands  
 Filed Mar. 23, 1984, Ser. No. 592,786  
 Claims priority, application Netherlands, Mar. 28, 1983, 8301069

Int. Cl.<sup>4</sup> B65D 6/34

U.S. Cl. 220—70

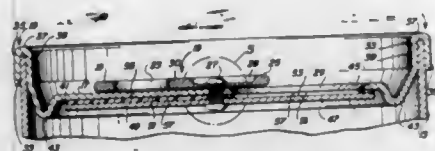
3 Claims



2. Semi-product in the manufacture of steel metal packaging cans, consisting of a seamless tube having at one end a bottom formed in one piece with the tube, the tube and bottom being obtained by deep-drawing and subsequent ironing of the tube over at least part of its length, said tube being of a length such that it constitutes, connected to each other, a cylindrical body and bottom of a two piece can and at least one cylindrical body of a three-piece can, wherein the wall-thickness of the tube is, adjacent the end remote from the bottom and at the or each location, of connection of two of said can bodies, greater than at other regions (excluding the bottom), the regions of greater

thickness being suitable for the formation of flanged connections of top and, as appropriate, bottom walls of the cans.

**4,681,238**  
**RE-CLOSURE DEVICE FOR POP TOP CONTAINERS**  
 Ruben G. Sanchez, 9234 S. Heather Dr., Tempe, Ariz. 85284  
 Filed Oct. 3, 1986, Ser. No. 914,829  
 Int. Cl.<sup>4</sup> B65D 17/50, 41/02  
 U.S. Cl. 220—260 14 Claims



1. A resealable beverage container having an interior for containing beverages, a top lid, a lid opening for egressing liquid from within the interior of the container, and a conventional pop top means including a tab lever member, said resealable beverage container comprising:

an original sealing member operatively disposed within the interior of said container flush beneath said lid opening for forming an air-tight seal between the interior of said container and said lid opening;

a resealing member operatively disposed within the interior of said container and integral with said original sealing member and connected thereto for rotation therewith; a rivet means for operatively coupling a conventional pop top tab member lever onto the lid of the container, said rivet means being operatively coupled to the junction of said first and second integrally connected original sealing and resealing members and to an intermediate portion of said tab member;

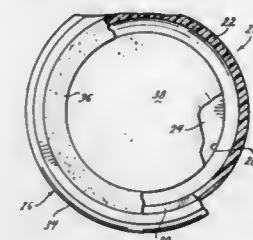
one end of said tab member being responsive to a lifting force applied to the opposite end portion thereof for pivoting said tab member lever about said rivet means and forcing said original sealing member out of sealing engagement with said lid opening and bending same down into the interior of said container; and

at least said resealing member being responsive to the rotation of said tab member lever in a first direction after said lid opening is unsealed for sliding said sealing member along the inner surface of the lid of said container and repositioning same immediately beneath said lid opening for sealing said lid opening in a liquid-tight manner to prevent the escape of carbonated gases therefrom thereby preventing the remaining beverage within the interior of said container from going flat, said resealing member being responsive to the rotation of said tab member lever in the opposite direction for opening and unsealing said sealing member and uncovering said lid opening to permit the beverage remaining therein to be poured therefrom.

**4,681,239**  
**HOLDER FOR CONTAINER FOR LIQUID**  
 Michael C. Manns, and Terry E. Roberts, both of Festus, Mo., assignors to Roman Products, Inc., De Soto, Mo.  
 Filed Aug. 7, 1986, Ser. No. 894,379  
 Int. Cl.<sup>4</sup> B65D 23/08, 81/38; A47J 41/00  
 U.S. Cl. 220—408 3 Claims

1. An insulating holder, for releasably holding a container for liquid, which comprises an elongated, annular, side wall and a bottom that coact to define an elongated, generally-cylindrical recess which has an inner diameter that is larger than the diameter of said container, an axial dimension that is shorter than the axial dimension of said container, and an open end through which the container is insertable into said recess, an annular sealing member of a resiliently-compressible cellular material disposed upon said side wall at an upper end portion thereof for sealing against a confronting portion of the

container, a sump recess formed in the bottom wall of the container, said sump recess having a peripheral wall of a lesser diameter than the inner diameter of the side wall of the holder and opening into the generally cylindrical recess, a pad of resiliently compressible cellular material, a lower end of said pad being disposed in said sump recess and an upper portion thereof projecting upwardly from the sump recess into the

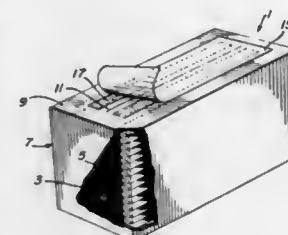


generally cylindrical recess, and a water-resistant cement applied about the periphery of said pad in a manner securing the pad to the peripheral wall of the sump recess, said cement serving as a means for stiffening the pad sufficiently to enable the pad to hold the bottom of the container above, and out of engagement with, the bottom of the holder, thereby enabling condensate traveling down the container to be effectively absorbed by the pad and collected in said sump recess.

**4,681,240**  
**TOWELLING PACKAGE**  
 James A. Wyant, 321 Lanthier Ave. #409, Pointe Claire, Quebec, Canada H9S 5K6  
 Filed Dec. 12, 1985, Ser. No. 808,072  
 Int. Cl.<sup>4</sup> A47K 10/24

U.S. Cl. 221—48

2 Claims



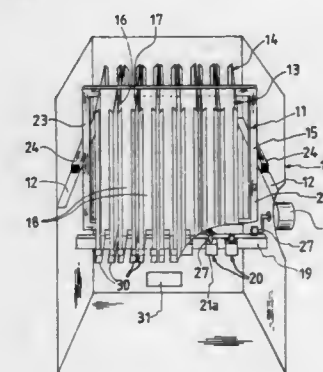
1. A dispensing package for paper towels, comprising:

- a stack of interleaved paper towels;
- a wrapper enclosing the stack of towels and having a substantially flat top;
- a towel dispensing slit extending in an approximate straight line in the approximate center of the top of the wrapper for use in manually removing the towels from within the wrapper one at a time;

two tacky adhesive layer strips on the outer surface of the top of the wrapper extending substantially parallel to the slit and for the same length as the slit, the adhesive layer strips located one on each side of the slit in a position to leave a narrow space on the outer surface of the top of the wrapper between the slit and each of the adhesive layer strips, one of the two adhesive layer strips releasably retaining a towel that is pulled part way out of the wrapper by a previously dispensed towel and that falls over the top of the wrapper thereby preventing the towel from falling back within the wrapper, the adhesive layer strips positioned relative to the slit to retain the towel by its fallen-over, horizontal portion rather than by any vertical portion of the towel extending down within the wrapper, and a removable cover sheet extending over the slit and the two adhesive layer strips, initially releasably held to the outer surface of the top of the wrapper by the two

adhesive layer strips to cover the slit and protect the two adhesive layer strips.

**4,681,241**  
**VENDING MACHINE**  
 Lars Olofsson, and Martin Hospers, both of Gothenburg, Sweden, assignors to AB Betjanten, Sweden  
 PCT No. PCT/SE84/00069, § 371 Date Oct. 22, 1984, § 102(e) Date Oct. 22, 1984, PCT Pub. No. WO84/03425, PCT Pub. Date Sep. 13, 1984  
 PCT Filed Feb. 28, 1984, Ser. No. 675,836  
 Claims priority, application Sweden, Mar. 2, 1983, 8301149  
 Int. Cl.<sup>4</sup> B65G 59/00, 3/44  
 U.S. Cl. 221—124 6 Claims



6. A hopper for insertion in the casing of a vending machine provided with tilting means and feeding-out means, and comprising:

- (A) a generally rectangular carrier frame defined by top, bottom, and side members;
- (B) a number of goods receiving pockets mounted back to back in said carrier frame;
- (C) said carrier frame at each of its side members having a transversely fitted, elongate support member for tilting engagement with said casing, said frame further offering a contact surface for said tilting mechanism;
- (D) each of said hopper pockets is provided with side walls which are resilient transversely to the vertical extension of the pocket, and each being continued by portions of a front wall, said portions define a vertical slot running along the front wall.

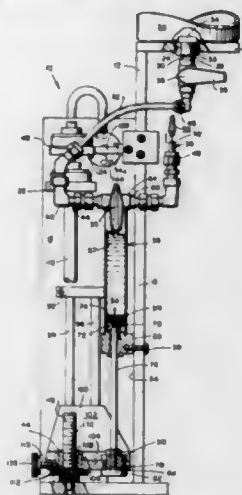
**4,681,242**  
**SOLVENT PUMP**  
 Robert Sirkin, Fullerton, Calif., assignor to Charles Wyle Engineering Corporation, Torrance, Calif.  
 Filed Sep. 5, 1985, Ser. No. 773,001  
 Int. Cl.<sup>4</sup> B67D 5/22; G01F 11/00  
 U.S. Cl. 222—41 1 Claim

1. A solvent pump comprising:

- a. a mainframe member;
- b. said mainframe member comprising a base plate, a first side plate member, a second side plate member, a top plate member and a clutch mounting plate member;
- c. said first side plate member being supported on said base plate and extending perpendicularly thereto;
- d. the top of said first side plate member supporting said top plate member such that the top plate member is disposed perpendicularly to the first side plate member and generally parallel to said base plate;
- e. said second side plate member being supported on said base plate, extending perpendicularly thereto and further adjoining and running perpendicular to said first side plate member;
- f. said clutch mounting plate member supported on said second side plate member at a distance below the top of



- the second side plate member such that the clutch mounting plate member is disposed generally perpendicular to the second side plate member and extending generally parallel to said base plate;
- g. said top plate member containing a slotted opening;
  - h. a solvent reservoir resting on top of said top plate member and connected thereto by means of a first hollow coupling member inserted through the slotted opening in the top plate member;
  - i. said first hollow coupling member comprising a first valve assembly;
  - j. a second hollow coupling member having two ends, connected at one of its ends to one end of said first hollow coupling member by means of tubing;
  - k. said second hollow coupling member comprising a threaded pipe assembly and a three way valve assembly;
  - l. said second hollow coupling member having a solvent ejection nozzle fixed to its other end;
  - m. a hollow solvent cylinder disposed generally parallel to and set a short distance apart from said first side plate member;
  - n. said hollow solvent cylinder comprising an internal chamber;
  - o. said hollow solvent cylinder attached to said second hollow coupling member adjacent said three way valve assembly such that an internal channel provides a passage-



- way from the three way valve assembly to the internal chamber of the hollow solvent cylinder;
- p. a piston located within the internal chamber of said hollow solvent cylinder;
  - q. said piston comprising a head portion which in turn comprises a circumferential groove housing a sealing ring and an extension portion;
  - r. a piston rod connected at its upper end to said extension portion of the piston and connected to a rod end coupling member at its lower end;
  - s. said rod end coupling member being a generally H-shaped member with an upper face to which said piston rod is connected, a lower face, and a recessed mid-portion;
  - t. a first stationary rod and a second stationary rod disposed generally parallel to each other and generally parallel to said second side plate member;
  - u. said first and second stationary rods attached to said second side plate member;
  - v. a movable slide member movably attached to said first and second stationary rods;
  - w. said movable slide member affixed to an angle bracket member which comprises a vertical portion attached to the movable slide member and a horizontal portion extending perpendicularly thereto;
  - x. the horizontal portion of said angle bracket member containing a transverse opening;
  - y. a T-shaped lead nut having a horizontal portion and a

- vertical portion, said T-shaped lead nut being movably inserted through the transverse opening in the horizontal portion of said angle bracket member;
- z. the horizontal portion of the T-shaped lead nut pressing against the surface of the horizontal portion of said angle bracket while the vertical portion of the T-shaped lead nut extends through the transverse opening;
- aa. the vertical portion of said T-shaped lead nut containing an internally threaded shaft;
- bb. securing means capable of causing said T-shaped lead nut to become attached to and move with said angle bracket member when tightened and permitting the T-shaped lead nut to move independently of the angle bracket member when loosened;
- cc. said angle bracket member being joined to said rod end coupling member such that the horizontal portion of said angle bracket abuts the recessed mid-portion of the rod end coupling member and is sandwiched between the upper face and the lower face of the rod end coupling member;
- dd. said clutch mounting plate member containing a transverse opening;
- ee. a threaded rod disposed generally parallel to said first and second side plate members, connected into the internal shaft of said T-shaped lead nut at its lower end and extending through the transverse opening in said clutch mounting plate at its upper end;
- ff. a first one-way clutch attached adjacent the upper portion of said threaded rod and movably supported by said clutch mounting plate member;
- gg. a second one-way clutch attached at the upper portion of said threaded rod;
- hh. said first one-way clutch and said second one-way clutch permitting the threaded rod to rotate in the same direction;
- ii. a movable lever arm assembly attached to the lower extremity of said second one-way clutch;
- jj. said movable lever arm assembly comprising a base portion attached to said rod and to said second one-way clutch and an arm portion extending generally parallel to the base plate and toward said first side plate member;
- kk. a slotted opening in said first side plate member which permits the arm portion of said movable lever arm assembly to pass therethrough and to move in a transverse direction within the first side plate member;
- ll. a spring support member attached to said first side plate member;
- mm. a return spring attached to the tip of the arm portion of the movable lever arm assembly at one end and attached to and supported by the spring support member at its opposite end;
- nn. a stop block attached to the arm portion of the movable lever arm assembly at a location adjacent the internal face of the first side plate member;
- oo. a first adjustable arm stopping means supported on said second side plate member and extending toward said stop block;
- pp. a second adjustable arm stopping means supported on said spring support member and extending towards said stop block such that the stop block is located between the first and second adjustable arm stopping means;
- qq. an air cylinder attached to the internal face of said second side plate member at a location aligned with the arm portion of the movable lever arm assembly;
- rr. said air cylinder comprising a movable tip aligned with and set a short distance from the arm portion of said movable lever arm assembly;
- ss. a directional air valve located adjacent the outer face of said second side plate member and connected to said air cylinder by air intake and air exhaust tubing members;
- tt. a solvent pump start means connected to said directional air valve;
- uu. a signalling means comprising upper and lower exterior

- surfaces and an activating switch fixed to said lower surface of said signalling means, located on the outer face of said second side plate member at a location between said base plate and said clutch mounting plate member;
- vv. said second side plate member further comprising an elongated vertically disposed internal slot extending from adjacent said base plate to adjacent the activating switch on said signalling means; and
- ww. a switch activating member attached to said slide member movably supported by said stationary rods, extending through said elongated vertically disposed internal slot and aligned with said activating switch;
- xx. whereby when said solvent reservoir is filled with solvent, said first valve assembly is rotated to the open position so that solvent may flow through said first hollow coupling member to said second hollow coupling member and said three way valve assembly is opened to permit solvent to flow from said second hollow coupling member to the internal chamber of said hollow solvent cylinder, said T-shaped nut is permitted to move independently of said angle bracket member and is screwed downwardly on said threaded rod until it is adjacent said base plate, thereby permitting said angle bracket member to be moved downwardly to adjacent said base plate which action causes said rod end coupling member to move with the angle bracket member thereby moving said piston rod in a downward direction and causes said piston to move downwardly inside said hollow solvent cylinder until said piston is at the bottom of the internal chamber, the downward movement of the piston creating a suction effect to permit the internal chamber to be filled with solvent, said first valve being thereafter closed and said three way valve assembly being adjusted so that solvent may flow from said internal chamber to said solvent ejection nozzle, activating said solvent pump start means which causes said directional air valve to force air into said air cylinder on the air intake cycle which in turn causes said movable tip to move toward and push the arm portion of said movable lever arm assembly to thereby cause the arm portion to move by a predetermined amount based upon the settings of said first and second adjustable arm stopping means, which movement further causes rotation to said second one-way clutch which in turn causes said threaded shaft to rotate by a given amount which in turn causes said T-shaped nut to rotate on said threaded rod by the same amount which in turn causes said angle bracket member to move which in turn causes said rod end coupling member to move which in turn causes said piston to move and displace a selected amount of solvent from the internal chamber which solvent then exits the chamber and is ejected through the solvent ejection nozzle, the air pressure then being removed from said air cylinder on the exhaust cycle to thereby permit said return spring to return the movable lever arm assembly to its original position while the threaded rod remains stationary due to the action of the other one way clutch, and wherein the cycle is caused to be repeated over again in repetitive fashion until the switch button activator member has been moved by a sufficient distance to activate the signalling means.

4,681,243  
**CARTRIDGE WITH PLUG OPENING MECHANISM**  
 Mitsuo Takasugi, Yokohama, Japan, assignor to Colpo Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1985, Ser. No. 708,058  
 Claims priority, application Japan, Mar. 7, 1984, 59-43511;  
 Mar. 7, 1984, 59-43512

Int. Cl.<sup>4</sup> B67B 7/24  
 U.S. Cl. 222—83

5 Claims  
 1. A cartridge containing a dispensable material and having a dispensing end with a plug opening mechanism, comprising: a plug member mounted on the dispensing end of the car-

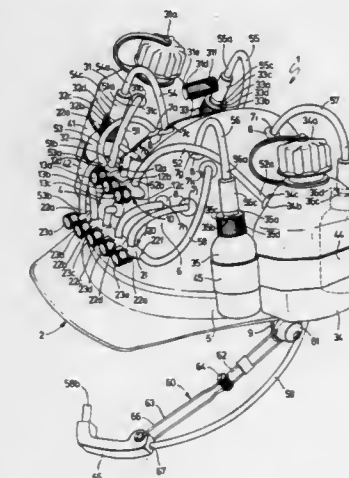
- tridge, and having an annular male connecting region at its upper portion;
- a hollow nozzle member having a lower end and an upper apertured end, said lower end having a seat portion formed as double annular walls and including a threaded female screw on the inner side of the outer wall of the double annular walls, said seat portion being secured to the plug member by mounting said female screw on the male connecting region; and



- a drill holding member extending within the hollow portion of the nozzle, said drill holding member having an upper end portion for closing the aperture at the upper end of the nozzle, and further having, at a lower end portion thereof, an annular collar having a plurality of spaced, radially extending notches, said collar supporting a downwardly depending drill.

4,681,244  
**PORTABLE BAR**  
 John D. Geddie, 832 Walnut St., Charlotte, Mich. 48813  
 Filed Apr. 30, 1986, Ser. No. 857,264  
 Int. Cl.<sup>4</sup> B67D 1/00  
 U.S. Cl. 222—144.5

2 Claims

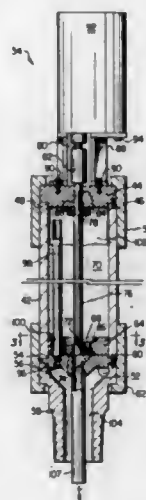


- 1. A portable bar comprising a hat adapted to receive a plurality of drink containers and a plurality of valves detachably mounted thereon; a first drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said container being adapted to receive a tube inserted therein; a second drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said container being adapted to receive a tube inserted therein; a third drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said cap being adapted to receive a tube inserted therethrough; a fourth drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said cap being adapted to receive a tube inserted



therethrough; a fifth drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said cap being adapted to receive a tube inserted therethrough; a sixth drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said cap being adapted to receive a tube inserted therethrough; a first gang valve coupled to the hat by suitable attachment means, the said gang valve having a first mixing chamber, the said first mixing chamber having extending therefrom a first port, a second port, a third port, and a fourth port wherein the first port is provided with a first valve adapted to be controlled by a knob and the said second port is provided with a second valve adapted to be controlled by a knob and the said third port is provided with a third valve adapted to be controlled by a knob, and wherein each of the said ports communicates with the said first mixing chamber and is adapted to convey a drink into or out of the said first mixing chamber and wherein the said first, third and fourth ports is each adapted to receive a tube detachably coupled thereto, and wherein the said second port is adapted to vent the said first mixing chamber to the atmosphere; a second gang valve coupled to the hat by suitable attachment means, the said gang valve having a second mixing chamber, the said second mixing chamber having extending therefrom a fifth port, a sixth port, a seventh port, an eighth port, a ninth port and a tenth port wherein the said fifth port is provided with a fourth valve adapted to be controlled by a knob and the said sixth port is provided with a fifth valve adapted to be controlled by a knob and the said seventh port is provided with a sixth valve adapted to be controlled by a knob and the said eighth port is provided with a seventh valve adapted to be controlled by a knob and the said ninth port is provided with an eighth valve adapted to be controlled by a knob, and wherein each of the said ports communicates with the said second mixing chamber and is adapted to convey a drink into or out of the said second mixing chamber and wherein each of the said ports is adapted to receive a tube detachably coupled thereto; a first tube having two ends wherein the first end is inserted into the first drink container and wherein the second end is coupled to the first port; a second tube having two ends wherein the first end is inserted into the fourth drink container and wherein the second end is coupled to the third port; a third tube having two ends wherein the first end is coupled to the fourth port and wherein the second end of the third tube is coupled to the fifth port; a fourth tube having two ends wherein the first end is inserted into the third drink container and wherein the second end is coupled to the sixth port, the said tube being provided with a check valve inserted therein adapted to prevent drink from flowing into the third drink container; a fifth tube having two ends wherein the first end is inserted into the fourth drink container and wherein the second end of the fifth tube is coupled to the seventh port, the said tube being provided with a check valve inserted therein adapted to prevent drink from flowing into the fourth drink container; a sixth tube having two ends wherein the first end is inserted into the fifth drink container and wherein the second end of the sixth tube is coupled to the eighth port, the said tube being provided with a check valve inserted therein adapted to prevent drink from flowing into the fifth drink container; a seventh tube having two ends wherein the first end is inserted into the sixth drink container and wherein the second end of the seventh tube is coupled to the ninth port, the said tube being provided with a check valve inserted therein adapted to prevent drink from flowing into the sixth drink container; an eighth tube having two ends wherein the first end is coupled to the tenth port and wherein the said tube is routed to the front of the hat and is adapted to be supported by an articulated boom; and a bracket attached to and depending from the hat and having pivotally coupled thereto an articulated boom adapted to support the said eighth tube.

**4,681,245**  
**METHOD AND APPARATUS FOR DISPENSING OIL WELL PROPPANT ADDITIVE**  
 Robert D. Harvey, Rte. 3, Box 177AA, Kilgore, Tex. 75662  
 Filed Mar. 25, 1985, Ser. No. 715,671  
 Int. Cl.<sup>4</sup> G01F 11/24  
 U.S. Cl. 222-643 8 Claims



1. Sealed apparatus for accurately dispensing an additive into a pressurized stream of well proppant, the apparatus comprising:
  - a sealed housing connected to the stream, and including a chamber for containing the additive in a position between said chamber and the pressurized stream;
  - a stationary auger ring sealed to the interior of said chamber; movable additive dispensing means disposed internal to said apparatus between said chamber and the pressurized stream, and movable within said auger ring from a first position in which the flow of additive is shut off and the chamber is sealed from the pressurized stream, to a second position in which said chamber is in communication with said pressurized stream so that the additive in said chamber can be dispensed into the stream, said dispensing means forming the bottom of said container upon which the additive rests;
  - drive means for moving said dispensing means;
  - a pressure equalizing conduit disposed within said sealed housing extending from said additive chamber through said auger ring and in communication with the stream of well proppant, said pressure equalizing conduit equalizing the fluid pressure existing in the pressurized stream with the fluid pressure existing in said chamber.

**4,681,246**  
**SKI HOLDING DEVICE**  
 Denny Andersson, Vistavägen 163, 122 43 Enskede, Sweden  
 Filed Nov. 21, 1985, Ser. No. 800,210  
 Claims priority, application Sweden, Nov. 21, 1984, 8405866  
 Int. Cl.<sup>4</sup> A45F 5/00 5 Claims

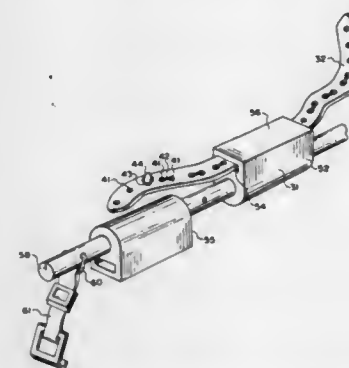
1. A ski holding device to be utilized for carrying skis, especially skis for downhill running, characterized in that the ski holding device comprises an upwardly open box (2;21;28), with a bottom wall portion, front and rear walls and side walls, to be placed on the outside of a boot, which box has a horizontal interior cross-section, which is essentially rectangular and as to the width and, respectively, length exceeds the thickness and, respectively, width of the blunt ends of a pair of skis, into which box the blunt ends of a pair of skis are intended to be slipped down and supported by said bottom wall portion

(8;22;32); the interior of said bottom wall portion including a ridge (9), intermediate and spaced away from said front and rear walls of said box and extending transverse to the side walls of said box, said ridge constituting a pivot abutment upon which an intermediate surface portion of said blunt (rear) ends of the pair of skis are intended to rest; and said bottom wall



portion include apertures (10,11), one located in each of the spaces between said ridge and said front and rear walls of the box and thus being front and rear apertures respectively, each said aperture having a size enabling associated rear corner portions of the blunt ends of a pair of skis, placed in said box, to project down into and through an associated front or rear aperture.

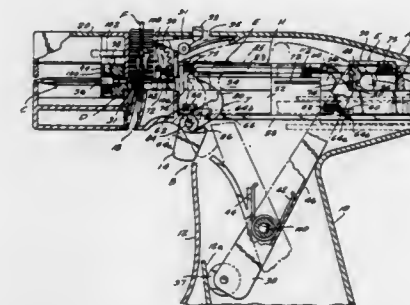
**4,681,247**  
**LOAD SUPPORT PEDESTAL**  
 Gildo G. Prosen, 7071 Belden St., San Diego, Calif. 92117  
 Continuation of Ser. No. 655,628, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 459,323, Jan. 20, 1983, Pat. No. 4,483,471. This application Mar. 26, 1986, Ser. No. 843,837  
 The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.  
 Int. Cl.<sup>4</sup> B60R 9/00 10 Claims



1. A load carrying system adapted for attachment to a vehicle by straps under tension, having a support member with a transverse opening slidably receiving an intermediate load-bearing tube, said support member having side and end walls, a base and a top opposite said base, the improvement comprising, in combination:
  - said intermediate load bearing tube having a round cross-section, and engaging at least two of said load support members;
  - said intermediate load bearing tube adapted for carriage of a load borne thereon;
  - said bases of said load support members engaging a body panel of said vehicle;
  - said load support member having an elastomeric body in which there is a transverse opening of circular section,

said transverse opening rotatably engaging said intermediate tube and said elastomeric body, said load support member incorporating a base of a width equal to a dimension of the distance from the center of said transverse opening to the point at which said load supporting surface intersects with the side walls of said load support member, said load supporting member having end walls adjacent to said side walls and a semi-cylindrical top surface joining said side walls and surrounding said transverse opening said tube engaging at least one additional load supporting member adapted to directly support loads borne by the system, having a transverse opening slidably and rotatably engaging the intermediate load bearing tube, having side and end walls, a base and a top opposite said base, said load support member having at least one rectangular section slot of width equivalent to the diameter of said transverse opening, in an elastomeric body.

**4,681,248**  
**TAG DISPENSING AND ATTACHING METHOD AND APPARATUS**  
 Daniel Duchin, Wantagh, N.Y., assignor to Monarch Marking Systems, Inc., Dayton, Ohio  
 Division of Ser. No. 654,062, Sep. 25, 1984, Pat. No. 4,610,384, which is a continuation-in-part of Ser. No. 553,080, Nov. 18, 1983, Pat. No. 4,610,385. This application Feb. 14, 1986, Ser. No. 829,245  
 Int. Cl.<sup>4</sup> B31F 7/00 7 Claims



1. Apparatus for feeding tags and attaching same to an article by means of a fastener comprising a hand-held tag attacher comprising a manually actuatable actuator, a needle for dispensing fasteners, means, adapted when actuated, for mounting said needle for movement between retracted and extended positions, means, adapted when actuated, for feeding a tag into alignment with said needle, and means for operably mechanically connecting said tag feed means, said needle mounting means, and said actuator, said connecting means comprising means responsive to a single actuation of said actuator to feed a fastener into said needle, to actuate said tag feed means to move a tag into alignment with said needle and to actuate said needle mounting means to move said needle from said retracted position to said extended position.

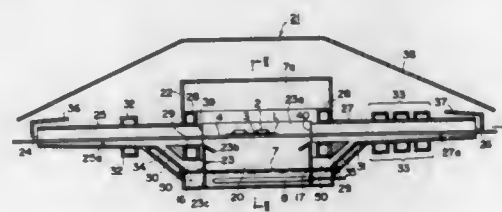
**4,681,249**  
**VAPOR PHASE SOLDERING APPARATUS**  
 Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Tokyo, Japan  
 Filed Jun. 5, 1986, Ser. No. 870,897  
 Claims priority, application Japan, Jun. 8, 1985, 60-123517; Jun. 8, 1985, 60-123518; Oct. 28, 1985, 60-239348; Jan. 20, 1986, 61-7876  
 Int. Cl.<sup>4</sup> B23K 1/12 6 Claims

1. An apparatus for soldering printed circuit boards having



electric components mounted thereon with solder preforms, comprising:

- a closed vessel for containing a heat transfer liquid having a boiling point higher than the melting of the the solder preforms;
- vertical partition means provided within said vessel for dividing the inside space of said vessel into an inner, heating chamber defined by said partition means and an outer, cooling chamber defined between said partition means and said vessel;
- an opening provided in a lower portion of said partition means so that the heat transfer liquid in said cooling chamber may enter said heating chamber therethrough;
- front and rear apertures provided in upper portions of said partition means to allow the passage of the printed circuit boards therethrough;
- heating means provided in said heating chamber to heat the heat transfer liquid in said heating chamber to a temperature higher than the boiling point of the heat transfer liquid;
- cooling means provided within said cooling chamber for condensing vapors of the heat transfer liquid in said cooling chamber;



- entrance conduit means having an entrance port for printed circuit boards at its one end and connected to said vessel at its the other end;
  - exit conduit means having an exit port for printed circuit boards at its one end and connected to said vessel at its the other end; and
  - conveying means adapted for conveying printed circuit boards successively through said entrance port, entrance conduit means, cooling chamber, front aperture, heating chamber, rear aperture, cooling chamber, exit conduit means and exit port,
- whereby said heating means heat the heat transfer liquid in said heating chamber to vaporize same and to form saturated vapors of said heat transfer liquid within said heating chamber, the printed circuit boards conveyed by said conveying means through said heating chamber being brought into contact with said saturated vapors so that the solder preforms can melt, and the vapors of said heat transfer liquid which escaped from said heating chamber to said cooling chamber through said front and rear apertures are cooled and condensed by said cooling means in said cooling chamber for recovery.

4,681,250

## VAPOR PHASE PROCESSING MACHINE

Gerard G. Derrico, Maynard, Mass., assignor to Dynapert-HTC Corporation, Concord, Mass.

Filed Jul. 30, 1986, Ser. No. 891,932

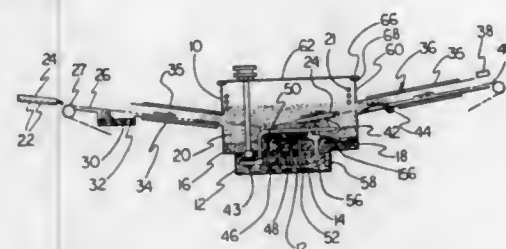
Int. Cl.<sup>4</sup> H05K 3/34; B23K 1/08

U.S. Cl. 228—37

4 Claims

1. A machine for soldering a work product comprising means for conveying work product through the machine, applicator means for directing an extended liquid stream of solder against the conveyed work product, means for pivotally supporting said applicator means for rotation about a horizontal axis and for directing liquid to said applicator means, a manifold assembly for delivering liquid to said pivotally supporting means including

a tubular manifold, and conduit means for delivering liquid from said tubular manifold to said applicator supporting means, and means for pivotally supporting said manifold assembly for rotation about an axis parallel to the axis of said applicator means, and means for rotating said applicator means about its axis including a bell crank,



means for supporting said bell crank on said manifold assembly supporting means for rotation about the axis of said manifold assembly, a link member, means for pivotally connecting one end of said link member to said bell crank and the other end of said link to said applicator means with the points of interconnection defining with the axes of rotation of said applicator means and said tubular manifold a parallelogram so that rotation of said bell crank will rotate said applicator means, and means for rotating said bell crank.

4,681,251

## METHOD OF JOINING NI-BASE HEAT RESISTING ALLOYS

Shuichi Komatsu, Yokohama; Kazumi Shimotori, Kawasaki; Hiromitsu Takeda, Tokyo, and Masako Nakahashi, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

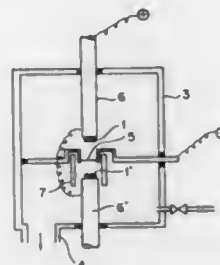
Continuation of Ser. No. 386,031, Jun. 7, 1982. This application Oct. 2, 1985, Ser. No. 782,163

Claims priority, application Japan, Jun. 9, 1981, 56-87429; Jun. 9, 1981, 56-87430

Int. Cl.<sup>4</sup> B23K 1/04, 20/24

U.S. Cl. 228—208

5 Claims



1. A method for joining at least two parts which present facing surfaces, said parts comprising a constructional member which is comprised of a Ni-base heat-resisting alloy, comprising the steps of:

(a) forming, by deposition under reduced pressure, a layer consisting essentially of aluminum on at least said facing surfaces of said parts to be joined, wherein said deposition is effected by means of a sputtering method that uses an aluminum filler film separating said parts as an anode and said constructional member as cathode;

- (b) bringing said facing surfaces of said parts into contact with each other;
- (c) subjecting said parts to a first heating, such that said layer is liquified; and thereafter
- (d) subjecting said parts to a second heating, such that aluminum from said layer diffuses into said Ni-base heat-resisting alloy to form a joint between said parts comprising a  $\gamma$ -Ni<sub>3</sub>Al phase dispersion, said joint containing substantially no  $\beta$ -NiAl phase.

4,681,252

## CARRYING HANDLE FOR CAN CARTON

Erwin Doerr, Dunwoody, and Prentice J. Wood, Hapeville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

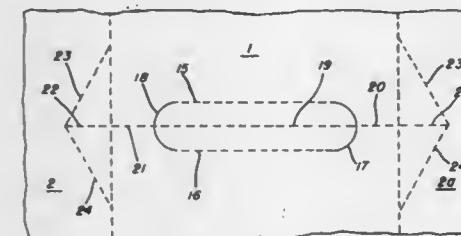
Filed May 15, 1986, Ser. No. 863,467

The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> B65D 5/46

U.S. Cl. 229—52 B

7 Claims



1. A carrying handle for a carton for packaging a plurality of articles such as cylindrical cans arranged in at least one tier of cans whose axes are horizontal and having interconnected top, bottom and side walls and end closure panels, said handle comprising a transverse flap formed in said top wall approximately midway between two adjacent cans and having a pair of spaced transverse generally parallel side edges along at least one of which said flap is severable and the other of which is arranged to function as a flap fold line and the ends of said flap being defined by a pair of end slits arranged to interconnect adjacent ends of said side edges respectively, said flap being folded inwardly along said flap fold line to position the entire area of said flap in flat face contacting relation with the inner surface of said top wall and to form a finger receiving aperture in said top wall and to reinforce said top wall and a stress relieving slit formed in each side wall and intersecting the junction between each side wall and the top wall at a point of intersection aligned longitudinally with a part of said transverse flap intermediate its side edges, each stress relieving slit extending from the respective point of intersection to a point on one of said end slits intermediate said side edges.

4,681,253

## EFFICIENCY PHOTO-GRAM WITH STAND-UP DISPLAY

Jonathan A. Engelhardt, Box 90361, San Diego, Calif. 92109

Filed Jul. 11, 1985, Ser. No. 753,917

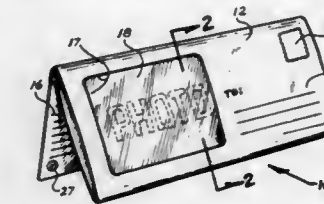
Int. Cl.<sup>4</sup> B65D 27/04

U.S. Cl. 229—92.8

7 Claims

1. A photo-mailer assembly comprising a unitary sheet of card stock having two generally parallel score lines which divide the sheet into upper, central, and lower panels of substantially equal size, said assembly further comprising inner and outer surfaces, a lateral direction parallel to the score lines and a longitudinal direction perpendicular to the score lines, said central panel including a laterally offset aperture for displaying a photograph, the inner surface of said upper panel including a laterally offset strip of adhesive for securing a photograph thereto in alignment with said aperture, the inner surface of said upper panel including adhesive for securing the inner surfaces of said upper and central panels together in a

face-to-face relationship, the inner surface of said lower panel including adhesive for securing the inner surface of said lower panel and the outer surface of said upper panel in face-to-face relationship, the outer surface of said central panel including



indicia for indicating the location of a recipient address and stamp for sending the assembly through the mail, both surfaces of said assembly being gloss-coated to facilitate detachment of the panels when they are secured in a face-to-face relationship.

4,681,254

## DEVICE FOR THERMOSTATIC VALVES, PARTICULARLY FOR THE TEMPERATURE REDUCTION OF THERMOSTAT-CONTROLLED RADIATORS

Gerd Kammerer, St. Georgen, Fed. Rep. of Germany, assignor to Dieter Grasslin Feinwerktechnik, Fed. Rep. of Germany

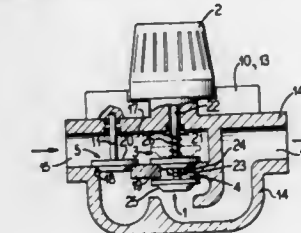
Filed Dec. 2, 1983, Ser. No. 557,630

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244603

Int. Cl.<sup>4</sup> F24F 11/00

U.S. Cl. 236—42

4 Claims



1. A thermostatic valve system for controlling the feed of heating agent to a radiator heating means comprising a valve box through which heating agent flows to the radiator, said valve box having a principal flow path defined by a first valve seat opening and a parallel bypass flow path defined by a second valve seat opening, a thermostat control, a first thermostatic valve adjustably seated at said first opening in connection with said thermostat control, a second thermostatic valve adjustably seated at said second opening in connection with said thermostat control, a switch control means, and a further valve adjustably seated at said first opening for opening and closing said first opening in response to said switch control means, wherein said first thermostatic valve and said further valve are respectively disposed on opposed sides of said first opening and are disposed for coaxial movement relative to said first opening.

4,681,255

## CABLE DRIVEN SPA THERMOSTAT CONTROLLER

Kerry P. Drost, 11 Sacramento, Irvine, Calif. 92714

Filed Jan. 21, 1986, Ser. No. 820,633

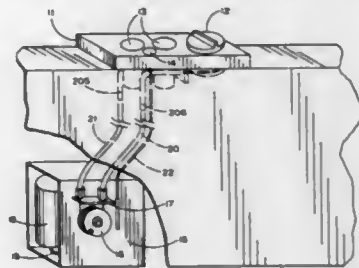
Int. Cl.<sup>4</sup> G05D 23/00

U.S. Cl. 236—51

5 Claims

1. A temperature controlling apparatus for use in conjunction with spas, comprising thermostat means mounted adjacent a water heating apparatus,

temperature selecting means mounted remote from said thermostat means and adjacent to a side of a spa, and cable drive means connected between said thermostat means and said temperature selecting means such that said thermostat means is selectively driven by said temperature selecting means via said cable drive means, said cable drive means includes at least first and second sheaves and elongated cable means extending between said first and second sheaves to provide mutual rotational motion of said sheaves, each of said first and second sheaves includes a pair of grooves therein for receiving said elongated cable means,



said elongated cable means includes a pair of separate driving cables, each of said separate driving cables is associated with a different one of said pair of grooves in said first and second sheaves, said first sheave is coupled to said thermostat means, said second sheave is coupled to said temperature selecting means, and fiber optic cable means extending from said water heating means to said temperature selecting means.

4,681,256

## THERMOSTATIC STEAM TRAPS

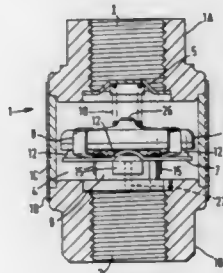
Keith Dewhurst, Stroud, England, assignor to Spirax Sarco Limited, England

Filed Apr. 24, 1986, Ser. No. 855,280

Int. Cl.<sup>4</sup> F16T 1/02

U.S. Cl. 236—56

6 Claims



1. A thermostatic steam trap comprising:
  - a passageway for fluid flow;
  - two connections constituting opposite ends of the passageway;
  - a valve that opens and closes the trap having a valve seat disposed in the passageway; and
  - a temperature-responsive element carrying a movable part of the valve that co-operates with the valve seat to open and close the trap;
- either of the connections comprising an inlet to the trap for the fluid flow with the other being an outlet from the trap for this flow, the trap thus being selectively connectable in a steam flow line either
- (A) with the passageway permanently open to the steam line and the valve opening and closing the passageway down-

stream of the element to atmosphere to discharge condensate from the trap at a temperature close to saturated steam temperature, or

- (B) with the passageway permanently open to atmosphere and the valve disposed upstream of the element to discharge condensate from the trap at a temperature significantly below steam temperature;

wherein:

the temperature-response element comprises

- a housing,
- a multi-diaphragm arrangement within the housing,
- an interior void in said arrangement, defined by the diaphragms of the arrangement and opening from the housing through an aperture in the housing, and
- volatile fluid filling the interior of the housing outside the multi-diaphragm arrangement, said movable part of said valve being carried by a movable one of the diaphragms, being disposed in the interior void, and projecting through said aperture to seat on fixed part of said valve seat to close the valve;

and wherein:

- the temperature-responsive element further comprises
- a spring arrangement that embraces the outside of the housing,
- acts between the housing and said movable part of the valve,
- opposes movement of said movable part of the valve out of the housing, and
- biases the valve into open condition.

4,681,257

## HOT-WATER-FURNACE SUPPLEMENTAL HEATER

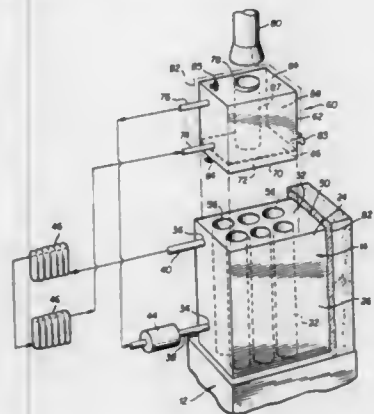
Reginald R. Turner, 1400 Kilmer Ln., Norfolk, Va. 23502

Filed Aug. 12, 1986, Ser. No. 895,638

Int. Cl.<sup>4</sup> F24D 3/00

U.S. Cl. 237—56

10 Claims



1. A hot-water-furnace, supplemental water heater to be used with a furnace of the type having essentially parallel, vertically-oriented, multiple heating tubes surrounded by water for conveying combustion materials from a firebox to an exit area adjacent said multiple heating tubes to thereby heat said water, said hot-water furnace forming a flat support wall at said exit area, said supplemental water heater comprising:
  - a housing having a top wall and a sidewall but an essentially open bottom, a bottom edge of said sidewall defining an opening which is sufficiently large to encompass adjacent ends of said multiple furnace heating tubes and defining a planar shape for resting on said hot-water-furnace flat support wall to support said supplemental water heater and to form a seal with said flat support wall for containing combustion materials, said top wall having a top-wall opening therein;
  - a false-bottom wall substantially spaced from said bottom edge of said sidewall and being sealingly attached to said

sidewall, said false-bottom wall having a false-bottom opening therein;

- a supplemental heating tube extending between said false-bottom opening and said top-wall opening whose ends are respectively sealingly attached to said false-bottom wall and said top wall, whereby said housing, said false-bottom wall and said supplemental heating tube form a supplemental water heating cavity surrounding said supplemental heating tube, said supplemental heating tube having at its upper end a means for attaching a chimney thereto; and
- water inlet and outlet means communicating with said supplemental water heating cavity for respectively conveying water to and from said cavity;

whereby said supplemental water heater can be placed on a housing of a hot water furnace, replacing a furnace manifold, with said bottom edge of said sidewall sealing with said furnace housing and encompassing said adjacent ends of said multiple heating tubes so as to capture combustion materials exiting in a manifold space defined by said sidewall below said false-bottom wall, said false-bottom wall and said furnace housing and thereby directing said combustion materials into said supplemental heating tube for heating water in said supplemental water heating cavity.

4,681,258

## PRODUCING DIRECTED SPRAY

Walter N. Jenkins, and Gordon I. Davies, both of Swansea, Wales, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 603,368, Apr. 24, 1984, abandoned.

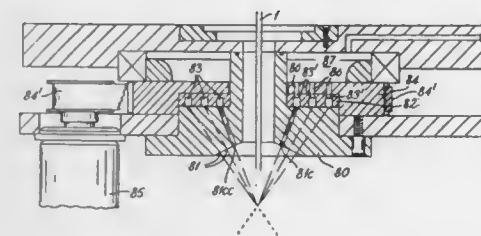
This application Jun. 9, 1986, Ser. No. 871,923

Claims priority, application United Kingdom, Apr. 25, 1983, 8311167

Int. Cl.<sup>4</sup> B05C 5/00

U.S. Cl. 239—66

5 Claims



1. An arrangement for evenly coating a surface with a spray, comprising means for forming an unsupported supply path of liquid, a gas supply, a plurality of atomizing gas nozzles each disposed at a different location and all directed at the same point, being a point in the supply path along which the liquid will flow, control means between the gas supply and said nozzles for imparting a varying direction to the spray, the control means repetitiously varying the flow of gas through the nozzles in a predetermined sequence of at least three flow patterns said patterns being associated with an arrangement of said nozzles, said arrangement comprising respectively at least one pair of said nozzles for each said pattern, each nozzle of a pair being disposed in mirror image to the other nozzle of the pair about a fixed vertical mirror plane including the supply path, the said control means comprising, facing said gas supply, a continuously driven rotating disc, and, in sliding contact with said rotating disc, a static aperture timer disc, said rotating disc having windows which register in sequence with respective apertures in said timer disc, said apertures feeding respective said nozzles.

4,681,259

## ROTARY DRIVE SPRINKLER

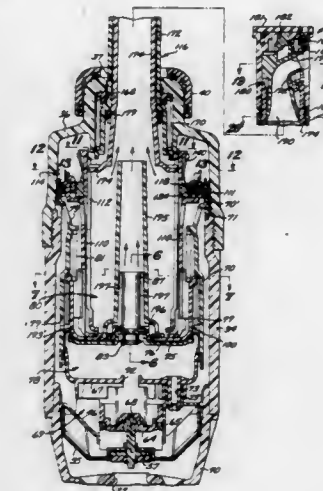
Edward M. Troup, deceased, late of Mt. Baldy (by Cathryn H. Troup, legal representative); Giles A. Kendall, Azusa; Joseph U. Han, Glendora; Christopher M. Morales, Temple City, and Calvin A. Gongwer, Glendora, all of Calif., assignors to Anthony Manufacturing Corp., Azusa, Calif.

Filed Dec. 19, 1985, Ser. No. 811,931

Int. Cl.<sup>4</sup> B05B 3/04

U.S. Cl. 239—206

71 Claims



1. A rotary drive sprinkler comprising:
  - a sprinkler housing having a lower water inlet for inflow of water from a water supply at line pressure into said housing;
  - a pressure reduction assembly including means for dividing water inflow into said housing into a first flow portion substantially at line pressure and a second flow portion, and a reduction valve for reducing the pressure of said second flow portion to a predetermined reference pressure;
  - a piston drive assembly including a reciprocal drive piston and a piston spring for urging said drive piston in one direction, said piston drive assembly further including means for applying said first and second flow portions to opposite sides of said drive piston thereby subjecting said drive piston to a pressure differential to displace said drive piston in a second direction against said piston spring, and relief valve means for relieving the pressure differential across said drive piston at the end of a predetermined stroke in said second direction to permit said piston spring to return said drive piston through said stroke in said one direction;
  - a drive element rotatably supported within said housing;
  - motion conversion means coupled between said drive piston and said drive element for rotatably oscillating said drive element in response to reciprocation of said drive piston;
  - a driven element rotatably supported within said drive element;
  - a reversible one-way clutch assembly coupled between said drive and driven elements for rotatably driving said driven element in a selected direction in small rotational steps in response to oscillatory rotation of said drive element;
  - a pop-up stem assembly supported within said housing for movement between a normal retracted position substantially within said housing to an elevated spraying position with an upper end thereof elevated above said housing upon supply of water into said housing through said inlet, said stem assembly being rotatably driven by said driven element; and
  - a spray head on said stem assembly and including a spray



nozzle for outward projection of an irrigation water stream from said housing.

4,681,260

# **TWO PIECE VARIABLE STATOR FOR SPRINKLER NOZZLE FLOW CONTROL**

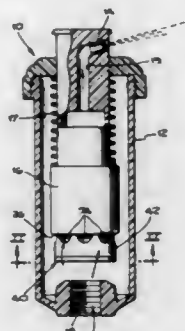
Wilson V. Cochran, Riverside, Calif., assignor to The Toro Company, Minneapolis, Minn.

Filed Feb. 11, 1986, Ser. No. 828,728

Int. Cl.<sup>4</sup> B05B 3/04, 15/10, 1/34; F16K 15/14

U.S. Cl. 239—240

8 Claims



8. In a sprinkler having a head mounting a nozzle for dispersing fluid through said head and out of said nozzle and impeller means associated with said head operatively engaging said nozzle for rotating said nozzle in response to said fluid passing through said head, the improvement comprising:

- means for controlling the velocity of fluid flowing to the impeller means including
  - a housing for mounting within the path of fluid flow toward said head, said housing including
  - a base portion having at least one aperture therein for passing therethrough at least a portion of the fluid flowing toward said head to the impeller means;
  - a sidewall portion having at least one aperture therein for selectively passing fluid there through to bypass the impeller means; and
  - flexible barrier means overlying said at least one sidewall aperture for selectively opening said sidewall aperture in response to an increase in fluid pressure about said second aperture.

4,681,261

# **HEAT RESISTANT SHORT NOZZLE**

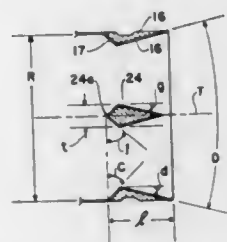
Dallas G. Wetzler, and Ralph R. Conley, both of Florissant, Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 1, 1985, Ser. No. 782,629

Int. Cl.<sup>4</sup> B63H 11/10, 11/00; D01H 9/10

U.S. Cl. 239—265.19

5 Claims



1. An exhaust nozzle for an engine which generates thrust by expulsion of gaseous products of fuel combustion, comprising:
  - (a) a substantially annular wall structure defining an inlet and an outlet and a compression region near said inlet and an

expansion region near said outlet for passage of said gaseous products along a central thrust axis defined through said nozzle from said inlet to said outlet;

- (b) said annular wall structure having a contoured annular inner surface between an inlet plane defined at said inlet and an outlet plane defined at said outlet, said surface defining within said compression region near said inlet plane a first radially inwardly convergent annular ramp of first preselected length and first preselected angle of convergence relative to said axis, and within said expansion region near said outlet plane a second radially outwardly divergent annular ramp of second preselected length and second preselected angle of divergence relative to said axis, said first preselected length and angle differing respectively from said second preselected length and angle, said first and second ramps joining along said contour between said inlet plane and said outlet plane to define a nozzle throat of preselected inside diameter separating said compression region from said expansion region;
- (c) a transverse web member disposed at said nozzle throat and extending diametrically of said annular wall structure and defining two substantially symmetrical passageways extending through said nozzle between said inlet and outlet planes, said web member having a leading edge intersecting said axis and lying substantially in and diametrically of said inlet plane and a trailing edge intersecting said axis and lying substantially in and diametrically of said outlet plane, said web member further having a double wedge shaped cross section symmetric with respect to a plane containing said axis and having maximum thickness at said nozzle throat, the surface of said web member defining a first pair of radially divergent ramps along said leading edge and extending from said inlet plane to said nozzle throat and a second pair of radially convergent ramps along said trailing edge and extending from said nozzle throat to said outlet plane.

4,681,262

# **CAP CONNECTING PROPELLANT CONTAINER WITH MATERIAL CONTAINER**

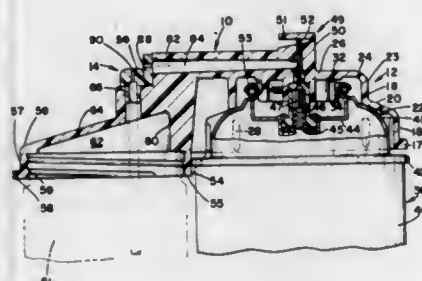
Fritz A. Sprute, Chagrin Falls, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Sep. 27, 1985, Ser. No. 781,067

Int. Cl.<sup>4</sup> B05B 7/30

U.S. Cl. 239—306

13 Claims



1. A spray device comprising an aerosol container adapted to hold the pressurized propellant, the aerosol container having a body and a dome at one end of the body and a receiving means on the dome;
  - the receiving means including an annular inwardly projecting annular lip and a recess therebelow, an opening in the dome whereby fluid may pass from the aerosol container and a spring-biased valve in the dome of the aerosol container;
- a spray head adapted for use with the aerosol container including a first cap adapted to interfit with a portion of the dome including means for gripping the receiving means, the means for gripping including generally arcuately shaped resilient sections dimensioned so that they

cam against and engage the annular lip of the receiving means when the cap is placed on the aerosol container; and

- a second cap including a bridge portion operatively connected to the first cap, the bridge including a channel therein connecting the opening in the first cap with a bore in the second cap whereby the means for gripping on the first cap interacts with the second cap to place a portion there between in compression or tension when a force is exerted on the spray head which attempts to rotate it relative to the longitudinal axis of the container, the resistance of the cap to the compression or tension causing it to hold it against substantial forces from being misaligned or removed from the aerosol container.

4,681,263

# **LOW PROFILE SPRINKLER HEAD**

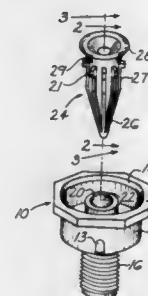
Haggie I. Cockman, P.O. Box 1600, Sanford, Fla. 32771

Filed Jul. 29, 1985, Ser. No. 759,697

Int. Cl.<sup>4</sup> A62C 31/02; B05B 1/26

U.S. Cl. 239—391

7 Claims



1. A low profile sprinkler head comprising:
  - a body portion having a circular cup-like base portion;
  - a male, externally threaded coupling member extending downward from said base portion for coupling to a water supply, said coupling member having an axial bore therethrough; and
  - an interchangeable nozzle head having an upper deflector portion, a straight cylindrical portion and a tapered conical portion extending downward from said upper portion for insertion into said axial bore, said straight cylindrical portion of said nozzle head thereby forming a tight friction fit in said bore, said straight and tapered portions having a plurality of water flow passages in at least a portion of the circumferences thereof.

4,681,264

# **ENHANCING LIQUID JET EROSION**

Virgil E. Johnson, Jr., Gaithersburg, Md., assignor to Hydraulics, Incorporated, Laurel, Md.

Division of Ser. No. 324,251, Nov. 25, 1981, Pat. No. 4,474,251, which is a continuation-in-part of Ser. No. 287,870, Jul. 29, 1981, abandoned, which is a continuation-in-part of Ser. No. 215,829, Dec. 12, 1980, Pat. No. 4,389,071. This application Jul. 27, 1984, Ser. No. 635,190

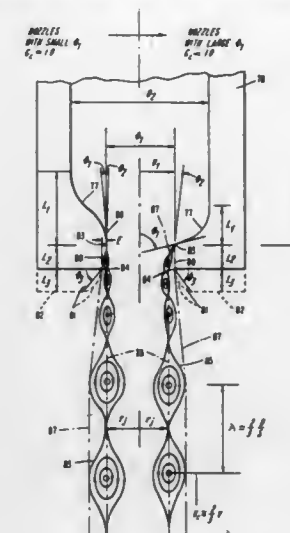
Int. Cl.<sup>4</sup> B05B 1/08

U.S. Cl. 239—589.1

20 Claims

1. Apparatus for producing a pulsed liquid jet exiting through an exit nozzle for eroding a solid surface, comprising:
  - (a) means for forming a high velocity liquid jet;
  - (b) acoustic-hydrodynamic oscillator means for oscillating the velocity of the jet at a Strouhal number within the range of from about 0.2 to about 1.2; and
  - (c) means for amplifying the jet velocity oscillations, said

means for amplifying said oscillations including said exit nozzle, wherein the internal contour of said exit nozzle is



adapted to provide feedback of the velocity oscillations in the jet to said oscillator means.

4,681,265

# **SWATH-CONTROLLING VARIABLE CHUTE AND CHUTE-ACTIVATED DAMPER FOR A BROADCAST SPREADER**

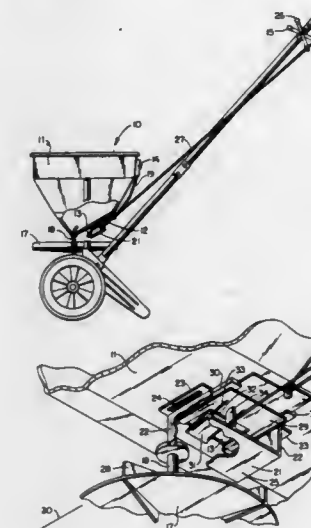
James D. Brabb, London, and Dennis L. Simpson, Marysville, both of Ohio, assignors to White Castle System, Inc., Columbus, Ohio

Filed Oct. 18, 1985, Ser. No. 788,874

Int. Cl.<sup>4</sup> A01C 17/00

U.S. Cl. 239—665

1 Claim



1. In a broadcast spreader for distributing granular or pelletized material and including a hopper having a discharge port, a shutter disposed below the discharge port and movable between a closed position and a plurality of open positions relative to said discharge port, shutter control means for selectively shifting the shutter between said closed and open positions, and a rotary impeller spaced below said shutter for receiving material passing from the hopper through the discharge port and for casting said material outwardly from the

spreader in a generally fan-shaped distribution pattern, that improvement which comprises:

- (a) a nonrotating material-directing chute slidably and externally disposed relative to the hopper for linear movement between a plurality of chute positions ranging from relatively greatest to least interposition between the discharge port and the impeller, said chute being variably disposed between the discharge port and the impeller so as to direct material onto a variable area of the impeller, at least one of said chute positions causing said impeller to distribute the material in a first distribution pattern and another of said chute positions causing a second distribution pattern;
- (b) chute control means for selectively shifting said chute between said chute positions during operation of said spreader and independently of the shutter control means;
- (c) a material-receiving drop area on the rotary impeller, said drop area having a generally fixed radially inner boundary and a variable radially outer boundary whose position on said rotary impeller is determined by said chute position;
- (d) a damper disposed between the shutter and said chute and provided with a valve plate that is movable between relatively closed and opened conditions, said valve plate providing in the relatively closed condition a greater obstruction to the flow of material from the discharge port to the chute than in the relatively opened condition; and
- (e) means provided on the chute for engaging the valve plate and urging it into the relatively closed condition as said chute reaches the position of greatest interposition between the discharge port and the impeller.

4,681,266

#### METHOD OF PARTICULATING AGGLOMERATED CATALYST MATERIALS

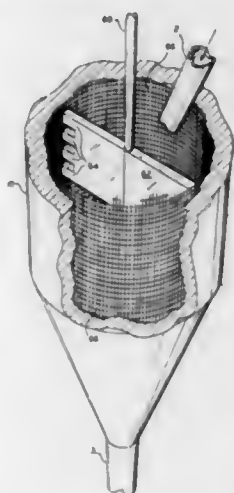
Ronald G. Mason; Emory W. Pitzer; Max P. McDaniel, all of Bartlesville, Okla.; David L. Rogers, Houston, Tex., and James W. Waterman, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 21, 1986, Ser. No. 820,344

Int. Cl.<sup>4</sup> B02C 19/12, 23/24

U.S. Cl. 241—18

23 Claims



1. A method for producing particles having a controlled particle size, from agglomerated catalyst material which comprises:

- (a) introducing said agglomerated catalyst material into a beater mill comprising:
  - a cylindrical housing,
  - a cylindrical screen having an inner and outer surface positioned within said housing concentric thereto,
  - a shaft having an axis of rotation aligned colinearly with the

- axis of said cylindrical housing, and positioned in the center of said housing,
- at least one rotor having a plurality of blades thereon rotatably mounted on said shaft, wherein said blades extend outwardly into close proximity with the inner surface of the cylindrical screen,
- inlet means for introducing air into said beater mill, and inlet means for introducing said agglomerated catalyst material into said beater mill;
- (b) breaking said agglomerated catalyst material into smaller size particles by rotating said shaft and said plurality of blades; while
- (c) concurrently passing a sufficient volume of air through said beater mill to remove sufficient volatile material from said agglomerated catalyst material to render said agglomerated catalyst material non-sticky as said agglomerated catalyst material passes through said cylindrical screen; and thereafter
- (d) recovering said particles having a controlled particle size distribution.

4,681,267

#### METHOD OF REGENERATING OLD CASTING SAND

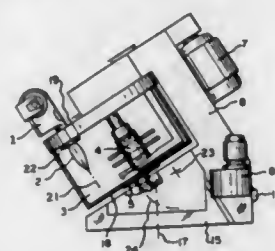
Dieter S. Leidel, R.R. No. 5, Barrier, Ontario L4M 4S7, Canada; Hubert Elrich, Sandweg 16, 6969 Hardheim, Fed. Rep. of Germany; Paul Elrich, Bahnhofstrasse 11, 6969 Hardheim, Fed. Rep. of Germany, and Walter Elrich, Spessartweg 18, 6969 Hardheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 497,482, May 23, 1983, abandoned. This application Apr. 5, 1985, Ser. No. 720,129  
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309379

Int. Cl.<sup>4</sup> B02C 19/18

U.S. Cl. 241—23

1 Claim



1. A method of regenerating old casting sand comprised essentially of sand grains encased within a clay binder subject to thermal embrittlement, comprising the steps of:

- providing a container having a cylindrical side wall and a bottom wall supported for rotation about a first axis that is inclined relative to a vertically extending plane, the container having upper and lower regions with each region having the bottom wall as one of its boundaries, a nonrotatable cover for closing said container, and an L-shaped stripping member secured to said cover to extend within the container adjacent said cylindrical side wall into said upper region and then along said bottom wall towards said lower region;
- positioning a crushing tool within said container for rotation about a second axis of rotation arranged parallel to the first axis, with the crushing tool being positioned intermediate said upper and lower regions;
- introducing old casting sand into said container;
- rotating said container about said first axis and rotating said crushing tool about said second axis thereby generating substantial turbulence of said old casting sand within said container;
- directing a hot gas into said lower region along a further axis that is disposed parallel to said first and second axes, passing the turbulent old casting sand through said hot gas, thereby heating said binder of said turbulent old casting sand passing therethrough to a temperature at

which thermal embrittlement thereof occurs, thereby embrittling said binder, and then immediately impinging said old casting sand on said crushing tool, thereby separating portions of said binder embrittled by passage through said hot gas from said sand grains prior to the heating of said sand grains to said temperature; removing the separated portions of said embrittled binder from said container by a vacuum applied adjacent said crushing tool.

4,681,268

#### AUTOGENOUS GRINDING METHOD

Ole E. Marklund, Boliden; Carl-Gustaf Elmlid, Skelleftea; Ulf P. Marklund, Vilhelmina, and Michael C. Borell, Skelleftea, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

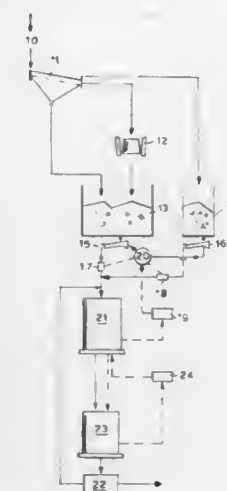
PCT No. PCT/SE82/00392, § 3/1 Date Jul. 5, 1983, § 102(e) Date Jul. 5, 1983, PCT Pub. No. WO83/01914, PCT Pub. Date Jun. 9, 1983

Continuation of Ser. No. 755,228, Jul. 15, 1985, abandoned, which is a continuation of Ser. No. 525,044, Jul. 5, 1983, abandoned. This PCT application Nov. 22, 1982, Ser. No. 843,793

Claims priority, application Sweden, Nov. 27, 1981, 8107096  
Int. Cl.<sup>4</sup> B02C 23/08

U.S. Cl. 241—24

6 Claims



1. In a process for comminuting ore containing a mixture of coarse particulate material together with the fine fractions which occur naturally upon crushing wherein the ore is comminuted in a primary grinding mill to form an intermediate product, and said intermediate product is further comminuted in a secondary grinding mill, and wherein said coarse particulate material is comminuted in said primary mill by autogenous grinding, the improvement comprising:

- (A) fractionating said coarse particulate ore prior to comminution in the primary grinding mill into three fractions to recover a coarse particle size fraction, an intermediate particle size fraction and a fine particle size fraction wherein

- (i) said fine particle size fraction consists essentially of the portion of said coarse particulate material having a particle size not greater than the intersection of two tangents to the particle size distribution curve obtained by autogenous grinding of said coarse particulate material without fractionation, which particle size distribution curve is characterized by a first segment which is a downwardly sloping portion representing relatively coarser material and a second segment which is a nearly horizontal portion extending generally between the maximum particle size which will be broken up by impact and the particle size which results from said impact, there being in each of said segments a point of

inflection, and said tangents are tangent to the particle size distribution curve at the points of inflection in said first and second segments of said curve,

- (ii) said coarse fraction consists essentially of the particles in said coarse particulate material of which the weight of the smallest particle in the coarse fraction is at least 20 times the weight of the heaviest particles in said fine fraction, and
  - (iii) said intermediate particle size fraction consists essentially of the coarse particulate material not recovered as either fine or coarse fractions
- (B) comminuting the intermediate size fraction recovered from said fractionation step so that the coarsest particle size of the comminuted intermediate fraction is not greater than the coarsest particle of the fine particle size fraction; and
- (C) combining said comminuted intermediate fraction, said fine particle size fraction and said coarse particle size fraction as a feed to the primary autogenous grinding mill.

4,681,269

#### CONSTRUCTION OF BEARING FOR CONE CRUSHER

Kazuaki Arakawa, Osaka, Japan, assignor to Kurimoto Ltd., Japan

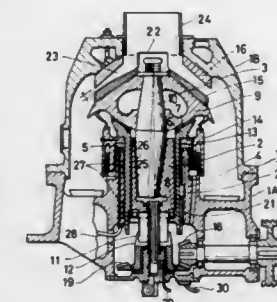
Continuation of Ser. No. 721,624, Apr. 10, 1985, abandoned.

This application Oct. 24, 1986, Ser. No. 924,184

Claims priority, application Japan, Dec. 28, 1984, 59-279645  
Int. Cl.<sup>4</sup> B02C 2/04

U.S. Cl. 241—101.2

8 Claims



1. A cone crusher comprising a frame defining a sleeve having an upper end an eccentric situated for rotation within the frame, and a lower end, a cylindrical socket situated for reciprocal movement within the sleeve, said eccentric extending into and being supported by the socket, a crushing head situated to gyrate relative to the eccentric, means for producing hydraulic pressure for reciprocating the eccentric and crushing head, and bearing construction including bearing means situated at the upper end of said socket for supporting the crushing head, and further bearing means situated at the lower end of said socket for supporting the eccentric.

4,681,270

#### MANUFACTURED REFINING ELEMENT

David P. Oberhofer, Bayside, Wis., assignor to Sullivan Corporation, Waukesha, Wis.

Filed Nov. 8, 1985, Ser. No. 796,231

Int. Cl.<sup>4</sup> B02C 7/12

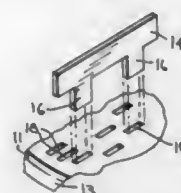
U.S. Cl. 241—298

9 Claims

1. A manufactured refining element comprising:
- a base having formed therein a plurality of slots,
  - a plurality of refining bars, each bar having at least one tongue wherein the tongue of each refining bar is received in one of the slots in mating engagement and extends from a topside of the base, through the base, to an underside of



the base and the slots are arranged to hold the refining bars in a predetermined pattern; and



securing means connected to each tongue or the underside of the base for holding.

4,681,271

## YARN END FINDING APPARATUS

Isamu Matsui, Kyoto; Hiroshi Uchida, Oumihachiman; Hiroo Ootoshima, Shiga; Yasuhiko Kubota, and Tetsuji Masai, both of Nagaokakyo, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

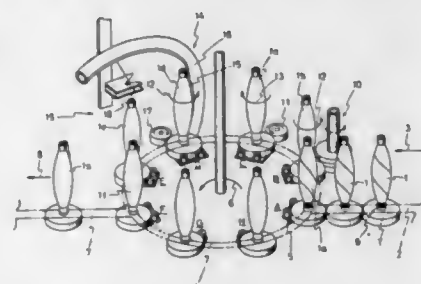
Filed Jan. 23, 1986, Ser. No. 821,698

Claims priority, application Japan, Jan. 23, 1985, 60-10565

Int. Cl.<sup>4</sup> B65H 54/00

U.S. Cl. 242-18 R

17 Claims



1. An apparatus for finding an end of a yarn on a spinning bobbin fitted uprightly on a tray, comprising:
  - a cutter mechanism for releasing and cutting a yarn end on the bobbin,
  - a yarn end pick-up mechanism located adjacent said cutter mechanism for picking up an end of the cut yarn from a layer of the yarn,
  - a yarn end inserting mechanism located adjacent said yarn end pick-up mechanism for cutting the yarn end picked up from the yarn layer to a particular length and for inserting the yarn into a center hole of the bobbin, and
  - delivery means for delivering said spinning bobbin fitted uprightly on said tray in sequence to each of said cutter mechanism, said yarn end pick-up mechanism and said yarn end inserting mechanism, whereby the end of the yarn is found while the bobbin is held integrally on a tray.

4,681,272

## ARRANGEMENT FOR POSITIVE SUPPLY OF ELASTOMER FILAMENTS IN TEXTILE MACHINES

Heinz Brunner, Albstadt, and Stefan Seeger, Jungingen, both of Fed. Rep. of Germany, assignors to SIPRA Patententwicklung- und Beteiligungsgesellschaft mbH, Albstadt, Fed. Rep. of Germany

Filed Apr. 16, 1986, Ser. No. 853,337

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515104

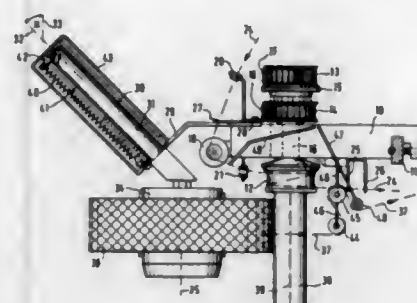
Int. Cl.<sup>4</sup> B65H 49/18, 49/20, 49/34, 51/20

U.S. Cl. 242-47.01

11 Claims

1. An arrangement for positively supplying elastomer fibers in a textile machine, comprising drive means; a yarn spool for an elastomeric filament; a freely rotatable spool holder for said

yarn spool; a drive roller arranged so that said yarn spool abuts against said drive roller over a predetermined abutment length said drive roller drivable by said drive means and having a length which is greater than said predetermined abutment length, said drive roller having an axis extending in a predeter-



mined plane; and a support which supports said spool holder and is longitudinally displaceable along a line such that said line or its projection extends in said plane of said axis of said drive roller and at an acute angle relative to said axis of said drive roller.

4,681,273

## APPARATUS FOR DRIVING TAPES

Toshinobu Futagawa, 3-3-23, Nishishinjuku, Shinjuku-ku, Tokyo, Japan

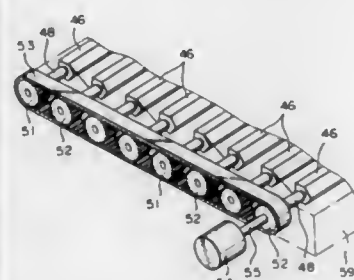
Filed Feb. 11, 1985, Ser. No. 700,310

Claims priority, application Japan, Feb. 16, 1984, 59-27842; Feb. 16, 1984, 59-27844

Int. Cl.<sup>4</sup> G11B 3/30, 23/12

U.S. Cl. 242-55

4 Claims



1. Apparatus for driving tape of the kind for recording information thereon, comprising

- (i) a first roller mounted to rotate about a first axis, the first roller having a plurality of flat faces forming a regular equilateral polygon on which the tape is wound,
- (ii) a second roller mounted to rotate about a second axis parallel to the first axis, the second roller having a plurality of flat faces forming a regular equilateral polygon that is congruent with the polygon of the first roller,
- (iii) an information recording tape extending between the first and second rollers without any intervening tape guide means, the tape having one end wound on the first roller with one face of the tape on the inside and the tape having its other end wound on the second roller with the opposite face of the tape on the inside, and
- (iv) drive means for causing the rollers to simultaneously rotate in opposite directions whereby upon rotation of the first and second rollers, corresponding flat faces of the polygons of those rollers are brought simultaneously into a plane that is parallel to the plane connecting the axes of the first and second rollers.

4,681,274

## METHOD AND DEVICE FOR ATTACHING A WEB OF MATERIAL ROLLING TO THE BEGINNING OF A WOUND FRESH WEB

Karl Thievessen, Grevenbroich, and Peter Weiss, Neuss, both of Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

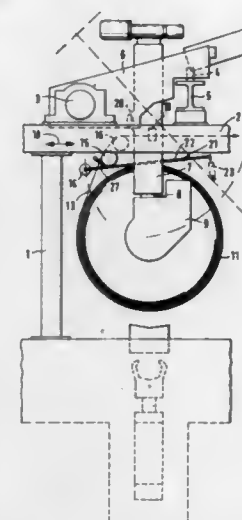
Filed Oct. 31, 1985, Ser. No. 793,522

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440107; Apr. 23, 1985, 8511986[U]

Int. Cl.<sup>4</sup> B65H 19/18, 19/12

U.S. Cl. 242-58.3

9 Claims



1. A device for attaching the end of an off-running first web to the beginning of another web, comprising: means for mounting a first reel having a first web for unwinding and for mounting a replacement reel with a second web upon removal of the first reel; means receptive of the first web for forming a web path during unwinding wherein the web path forming means includes means for extending the length of the web path when not unwinding to reserve a portion of the first web; means for cutting the first web upstream of the reserved portion when not unwinding; and transfer means for moving the reserved portion of the first web into contact with the outer surface of the second web on the replacement reel while the replacement reel is stationary with no relative longitudinal movement between the first and second webs.

4,681,275

## TRAVERSING MECHANISM CONTROL

Art Honezareako, Wayne, N.J., assignor to Progressive Machine Co., Inc., Patterson, N.J.

Filed Oct. 22, 1985, Ser. No. 790,068

Int. Cl.<sup>4</sup> B65H 54/10, 54/32

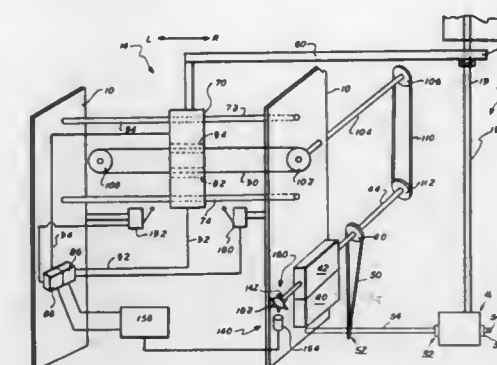
U.S. Cl. 242-67.1 R

10 Claims

1. A control for a traversing mechanism, including a traversing carriage, that is moved in a reciprocatory manner and includes clutch means selectively operated to clutch the traversing carriage to either a first portion of a drive member to be moved in a first direction thereby or to a second portion of the drive member to be moved in a second direction thereby, the traversing carriage in its reciprocatory movements serving to guide a ribbon of material in reciprocatory traverse movement as the material is being wound into a package configuration by a continuously rotating spindle, comprising:
  - (a) sensor means responsive to the rotation of the spindle to provide indications of incremental rotation thereof;
  - (b) two stage counter means cooperating with said sensor means to receive said indications of incremental rotation of the spindle therefrom and coacting with the traversing carriage clutch means to activate and deactivate same;
  - (c) said two stage counter means cooperating with the clutch

means following receipt by said counter means from said sensor means of a first predetermined count to de-clutch the clutch means so that the traversing carriage is not clutched to its drive members, and there is a dwell of predetermined rotational duration;

- (d) said two stage counter means cooperating with the clutch means following receipt by said counter means



from said sensor means of a second predetermined count to actuate the clutch means to clutch the traversing carriage to its drive member for movement thereby in either said first or said second direction thereof;

- (e) said two stage counter and said sensor means so cooperating to successively provide said dwells and to clutch said traversing carriage to its drive member for alternating movement in said first and said second directions.

4,681,276

## FISHING REEL

Jun Sato, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

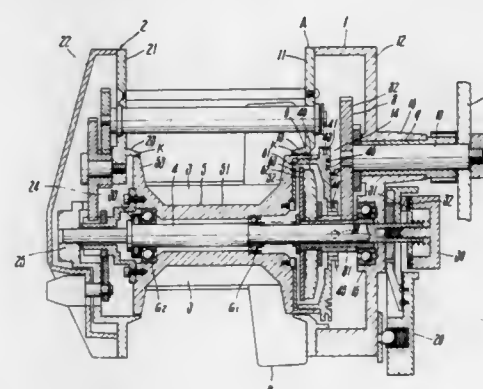
Filed Mar. 25, 1985, Ser. No. 715,393

Claims priority, application Japan, Mar. 28, 1984, 59-45739[U]; Oct. 31, 1984, 59-165943[U]

Int. Cl.<sup>4</sup> A01K 89/02

U.S. Cl. 242-84.1 R

4 Claims



1. A fishing reel, comprising:
  - a spool having a pair of flanges,
  - a reel body having an annular inner surface opposite an outer periphery of one said flange and forming a chamber in continuation of said annular inner surface, said spool being rotatably supported to said reel body,
  - a drag mechanism disposed in said chamber and having a drag disc opposite to the one said flange of said spool,
  - a cylindrical member having an extension (i) extending axially outwardly from the outer periphery of the one said flange of said spool, (ii) enclosing a periphery of said drag

- mechanism, and (iii) having an opening at an utmost end of said extension,
- a cover for covering said opening at the utmost end of said extension of said cylindrical member,
  - a guide means for guiding water toward a bottom of said reel body, which water enters into said chamber through a gap between the outer periphery of the one said flange and the annular inner surface of said reel body, said guide means comprising at least one annular projection (i) disposed axially adjacent said utmost end of said extension of said cylindrical member, (ii) disposed on a radial outer side of said cover, and (iii) projecting radially outwardly with respect to the outer periphery of said cylindrical member, and
  - a drain located at the bottom of said reel body for draining to a region exterior to said reel body water entering into said chamber.

4,681,277

## WELDING WIRE DISPENSER

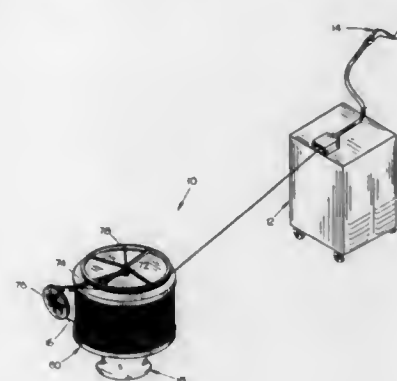
Delmar D. Kosch, Columbus, Nebr., assignor to Weldmatic Patents, Inc., Columbus, Nebr.

Filed Dec. 29, 1986, Ser. No. 947,422

Int. Cl.<sup>4</sup> B65H 49/18, 57/18, 59/04

U.S. Cl. 242—156.2

6 Claims



1. A welding wire dispenser for dispensing wire to a wire feeder,
  - a support means having a first brake portion thereon,
  - a vertically disposed shaft means rotatably mounted on said support means and extending upwardly therefrom,
  - said shaft means being vertically movable between first and second positions with respect to said support means,
  - means mounting said shaft means on said support means whereby rotation of said shaft means in one direction will cause said shaft means to vertically move upwardly relative to said support means and whereby rotation of said shaft means in an opposite direction to said one direction will cause said shaft means to move downwardly relative to said support means,
  - a coil support means rotatably mounted on said shaft means above said support means and vertically movable with said shaft means,
  - said coil support means having a second brake portion thereon adapted to frictionally engage said first brake portion to limit the rotation of said coil support means when said brake portions are in frictional engagement with each other when said shaft means is in its said first position, said coil support means adapted to support a coil of welding wire thereon,
  - a brake arm operatively secured to the upper end of said shaft and extending laterally relative to said coil support means,
  - a first pulley rotatably mounted on the outer end of said

brake arm adapted to have the welding wire on the coil extending therearound,

an accumulator pulley freely operatively rotatably mounted on said shaft means above the coil and adapted to receive the welding wire thereon after the welding wire has passed around said first pulley,

said brake arm adapted to rotate said shaft when the welding wire is pulled towards the wire feeder,

said shaft vertically moving upwardly from its said first position towards its said second position so that said brake portions will not be in frictional engagement with each other so that said coil support means may freely rotate when the welding wire is pulled toward the wire feeder,

said accumulator pulley permitting wire to be pulled therefrom towards said wire feeder prior to the disengagement of said brake portions.

4,681,278

## GUIDE FOR RESTORING AND REMOVING A TAPE LEADER BLOCK TO AND FROM A TAPE CASSETTE

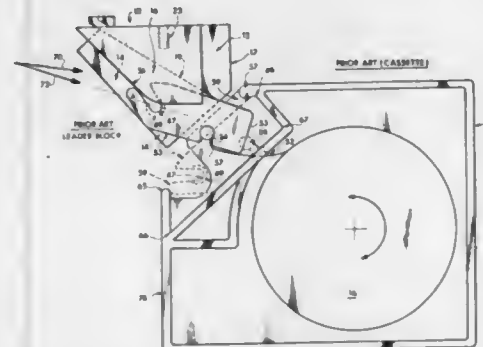
David E. Smith, Lafayette, Colo., assignor to Aspen Peripherals, Longmont, Colo.

Continuation-in-part of Ser. No. 872,951, Jun. 11, 1986. This application Aug. 14, 1986, Ser. No. 896,673

Int. Cl.<sup>4</sup> G03B 1/04; G11B 15/32, 23/107

U.S. Cl. 242—195

3 Claims



1. A tripartite wedge guide for aiding the restoration of a leader block into a leader block housing in a tape cassette, said guide comprising:
  - a first wedge having its wedging surface in a substantially vertical plane which rises as it approaches the leader block housing of the cassette;
  - a second wedge attached to a lower region of, and substantially perpendicular to, the vertical plane of the first wedge such that the second wedge rises as it approaches the leader block housing; and
  - a third wedge attached to an upper region of, and substantially perpendicular to, the vertical plane of the first wedge such that the third wedge descends as it approaches the leader block housing and thereby partially defines a window region between said first, second and third wedges through which the leader block passes in order to at least partially restore the leader block to a substantially horizontal orientation and to aim the leader block into the interior of the leader block housing.

4,681,279

## SCREEN ROLL MEANS

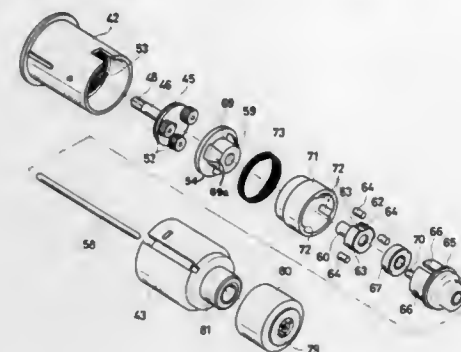
Daijiro Nakamura, Ono, Japan, assignor to SM Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 740,212, Jan. 3, 1985, abandoned. This application May 12, 1986, Ser. No. 862,202

Int. Cl.<sup>4</sup> B65H 75/43; E06B 9/20

U.S. Cl. 242—107.3

1 Claim



1. A roll up screen device, comprising
  - a circular cylindrical hollow shaft (13);
  - a screen (12) which is wound up on the outer periphery of said shaft (13) to a desired length and locked thereat in one condition and rolled out to a desired length and locked thereat in another condition;
  - spring means (21) disposed in the hollow of said shaft (13) toward one end thereof and wound up by said screen being rolled out to provide resilient force for winding up said screen on said shaft; and
  - contained within hollow of said shaft (13) toward another end thereof, in combination,
    - a gear case (42) tightly fit within said shaft (13) and having gear teeth (53) within the inner peripheral surface thereof;
    - a housing (43) connected to said gear case (42) and integrally movable therewith;
    - a gear carrier (45) comprising a shaft (48) for attachment to an external fixture (51) and three planetary gear shafts (55);
    - three planetary gears (52) rotatably held on said planetary gear shafts (55) and aligned with the gear teeth within said gear case (42), a solar gear (54) disposed aligned within and between said three planetary gears (52) and connected to a cylindrical portion (59), said cylindrical portion (59) comprising a circular cylinder of selected radius and three fins (69a) of larger radius extending radially outwardly from said circular cylinder with three spaces (69) between the fins having the selected radius;
    - a first one way clutch (61) disposed within said circular cylinder of said cylindrical portion;
    - a magnetic cam (62) having three grooves (63) spaced equally apart around the periphery thereof;
    - a first shaft (60) attached to said cam (62) and disposed within said first one way clutch for one way rotation of said cam;
    - three magnetizable rollers (64) disposed about the outer periphery of said cam (62);
    - a roll holder (65) comprising a cylindrical ring with three grooves (66) therein spaced apart at the same circumferential locations as the grooves in the cam (62), said rollers (64) being held within said grooves (66) of the holder (65), three projections (70) extending from said cylindrical ring and into said three spaces (69) between said fins (69a) of the cylindrical portion (59) for movement in the spaces between the fins;
    - a feed magnet (67) connected to said roll holder and positioned adjacent said cam (62) to cause movement of said cam in a one way direction of said first one way clutch;
    - a second one way clutch (76) connected to said roll holder and movable therewith;
    - a lock ring 71 having a third one way clutch 73 thereon and

disposed between said case (42) and said roll holder (65), said lock ring having on its inner peripheral surface three protrusions (72), whereby in an unlocked state said rollers (64) are in said grooves (66) of said holder (65) and in said grooves of said cam (62) and said rollers are not in contact with said protrusions (72), and in a locked state said rollers (64) are in said grooves (66) of said holder and outside of said grooves (63) of said cam (62) and in contact with said protrusions (72), and whereby said third one way clutch (73) enables one way rotation of the case (42) in a locked state and two way rotation of said case (42) in an unlocked state;

- a cylindrical third magnet (81) connected to said housing (43);
- a cylindrical magnetizable yoke (82) surrounding said third magnet (81) and connected to said housing (43) and movable therewith;
- a cylindrical aluminum rotor (80) disposed between said third magnet (81) and said yoke (82); and
- a shaft (75) connected to said rotor (80) and disposed in said second one way clutch (76) to enable said rotor (82) and shaft to move in only one direction, whereby during pulling out operation when said spring is being wound up said third one way clutch (76) prevents said rotor (80) from moving relative to said third magnet (81) and said yoke (82), and during rolling up operation driven by said spring (21) said rotor rotates by force of said spring (21) against the effects of the magnetic field between said third magnet (81) and said magnetizable yoke (82) to cause braking of movement of said holder (65) in relation to said shaft (13); and wherein movement of shaft (13) in the unwinding direction and then in the winding direction, which causes each projection (70) to travel from a left side of one fin (69a) to the ring side of an adjacent fin (69a), moves said cam (62) so that rollers (64) come outside grooves (63) to contact the protrusions (72) to lock the shaft (13) against winding rotation.

4,681,280

## MAGNETIC-TAPE CASSETTE WITH STRETCHED LINER ARRANGEMENT

Jozef M. Duurland, Leusden; Sinnighe J. Bos, Glanerbrug, and Hendrik K. Kreeft, Dinxperlo, all of Netherlands, assignors to Polygram International Holding B.V., Baarn, Netherlands

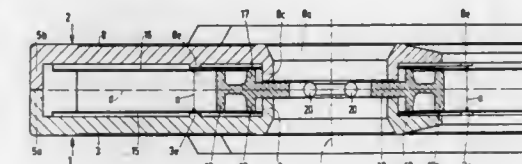
Filed Mar. 26, 1986, Ser. No. 844,053

Claims priority, application Netherlands, Mar. 27, 1985, 8500888

Int. Cl.<sup>4</sup> G11B 23/087

U.S. Cl. 242—199

8 Claims



1. A magnetic tape cassette comprising:
  - a housing having two parallel main walls having respective inner sides facing each other, and means for interconnecting said main walls to hold them in fixed relationship with respect to each other, each main wall having two openings bounded by circular cylindrical centering rims extending inwardly relative to the respective main wall, said openings and rims in one main wall being coaxial with respective openings and rims formed in the other main wall,
  - two reel hub sets disposed between said main walls, each reel hub having two respective axial ends and a given outer diameter, and being arranged to be rotatable about a respective axis of rotation extending substantially perpen-



dicularly to the main walls and substantially coaxially with respect to a respective pair of said coaxially aligned openings,

a length of magnetic tape having a given width, wound in a number of turns around and extending between said reel hubs, and

two liner foils, each having a given thickness and being positioned against a respective inner side of a respective main wall, each said foil being arranged to bear elastically against said turns of magnetic tape and against the respective axial ends of said reel hubs,

characterized in that each reel hub comprises a respective axially extending outer ring having a given length, and a respective axially extending inner ring having an axial length greater than said given length, said rings having respective axial ends arranged such that said liner foils are positioned and bear against said respective axial ends of both said inner rings and said outer rings, and

the inner side of each main wall comprises two inwardly extending flat supporting rings, each supporting ring being concentric with a respective centering rim and having an inner diameter larger than said outer diameter of the respective reel hub; respective supporting rings on each of said main walls being opposite each other and spaced a distance, perpendicularly to said main walls, larger than the sum of said given width and said thicknesses of said two liner foils.

4,681,281

**RECORDING AND/OR REPRODUCING APPARATUS**  
Petrus J. J. Aarts, Perchtoldsdorf, and Alois Huber, Vienna, both of Austria, assignors to U.S. Philips Corporation, New York, N.Y.

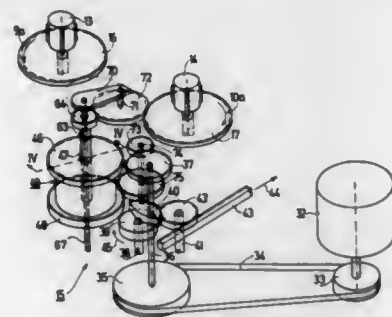
Filed Feb. 21, 1986, Ser. No. 832,288

Claims priority, application Austria, Feb. 27, 1985, 581/85

Int. Cl.<sup>4</sup> G03B 1/04; G11B 15/32

U.S. Cl. 242—200

3 Claims



1. A record and/or reproducing apparatus for a record carrier in the form of a tape comprises

two rotatable winding spindles for driving two winding hubs which are coaxially mounted on respective spindles, said hubs taking up the tape in conformity with a direction of transport selected from two possible directions of transport,

a drive mechanism for driving the winding spindles, said mechanism comprising a first drive wheel which can be driven in one of two directions of rotation, and a second drive wheel which is rotatable relative to and coaxial with the first drive wheel,

a coupling device for rotation of the second drive wheel by the first drive wheel, said coupling device comprising first and second friction couplings to drive one of the two winding spindles depending upon the direction of transport, said first friction coupling being capable of transmitting more torque than the second friction coupling, said device further comprising an idler wheel arranged coaxially between the first and second drive wheels so as to be rotatable relative to said drive wheels, the first drive wheel being coupled to the idler wheel by the first friction

coupling, the second drive wheel being coupled to the idler wheel by the second friction coupling, said device further comprising a unidirectional coupling having means for rigidly coupling the second drive wheel to the idler wheel for one of the two directions of rotation of the first drive wheel, whereby the second friction coupling is bypassed.

4,681,282

**DEVICE FOR THE DETECTION AND ELIMINATION OF UNWANTED IMAGES CREATED BY THE PYRAMIDAL IR DOME**

Pierre Marche, Boulogne, France, assignor to U.S. Philips Corporation, New York, N.Y.

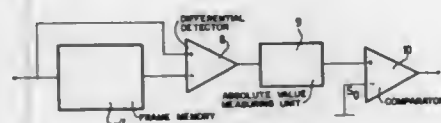
Filed Aug. 28, 1985, Ser. No. 770,339

Claims priority, application France, Aug. 28, 1984, 84 13285

Int. Cl.<sup>4</sup> F41G 7/26

U.S. Cl. 244—3.16

1 Claim



1. An electronic device for the detection and elimination of unwanted images created by a pyramidal IR dome of an infrared auto-director for a missile which is not roll-stabilized, a signal collected in the focal plane of an objective of the auto-director and originating either, in the case of a first type, in a source located in the field of the said objective and whose radiation is transmitted through the IR dome or, in the case of a second type, in a source external to the said field and whose radiation after transmission through a facet of the IR dome is reflected by an opposite facet, characterized in that, the analysis of the scene delimited by the field of the objective having as its result a succession of frames of period T, the levels of the points of the field of rank N—1 preceding any frame of rank N are stored in a frame memory, the levels of two points corresponding to the same geographical localization of the scene, one on the frame N at an instant t, the other on the frame N—1 at an instant t—T, being transmitted respectively to a non-inverting input and to an inverting input of a differential detector whose output is connected via an absolute-value measuring unit to an input of a comparator to whose other input is applied a threshold level with a positive value, the level emerging from the said unit indicating the occurrence of an unwanted image if the value is greater than the said threshold value, the signal at the output of the comparator being used to inhibit the taking into consideration of the said unwanted image.

4,681,283

**APPARATUS FOR CORRECTING THE FLIGHT PATH OF A MISSILE**

Walter Kranz, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 13, 1985, Ser. No. 765,332

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1984, 3429798

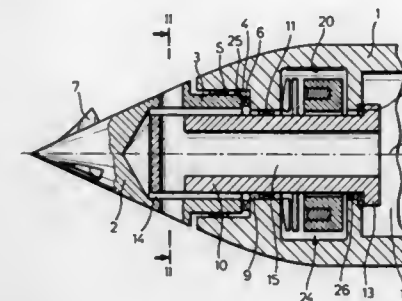
Int. Cl.<sup>4</sup> F42B 15/033

U.S. Cl. 244—3.22

15 Claims

1. An apparatus for correcting the flight path of a missile, such as a high speed projectile, comprising a missile body having a central axis and an outer circumferential surface, a flow means distributor rotatably mounted in said missile body and having at least one outlet opening for the flow means distributor for effecting a transverse force on said missile body, at least one blow-out opening in the circumferential surface of said missile body alignable with said outlet opening, and a

braking means acting between said distributor and said missile body, wherein the improvement comprises that said missile body includes a missile part rotatable independently of said distributor and said missile part being stable with respect to



load, means for rotating said distributor, and said at least one said outlet opening and said at least one blow-out opening being at least partially alignable in a controlled manner by said means for rotating said distributor and by said braking means.

4,681,284

**LANDING GEAR HAVING TANDEM WHEELS AND INDEPENDENT SHOCK ABSORBERS**

Jacques Veaux, La Liberté, and Michel Derrien, Parc de Clagny, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

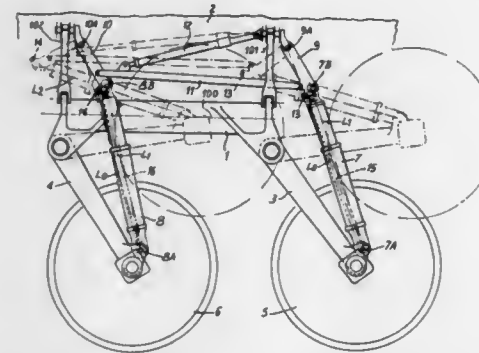
Filed May 6, 1985, Ser. No. 730,790

Claims priority, application France, May 15, 1984, 84 07488

Int. Cl.<sup>4</sup> B64C 25/14

U.S. Cl. 244—102 R

5 Claims



1. A retractable landing gear having at least two wheels mounted in tandem in a single plane, for an aircraft having a fuselage, said landing gear being retractable into said fuselage, in a maximum retraction condition, wherein:

said landing gear comprises a longitudinal beam solidly fixed parallel to said fuselage;

a wheel lever for each said wheel, said wheel lever having top and bottom ends which is hinged by its top end to said beam, respectively to the opposite ends of said beam; and a rocking arm for each said wheel and having a lower end; a respective shock absorber for each said wheel hinged at its bottom end to the bottom end of said wheel lever, the opposite end of said shock absorber being hinged to a lower end of said rocking arm which has a pivotal connection with said fuselage at a point on its upper end, both said rocking arms being connected by a parallelogram-shaped hinge constituted by a connecting rod parallel to said fuselage;

an actuator having one end hinged to said fuselage and its other end hinged to either said rocking arm or to said connecting rod; and each of said rocking arms having a lateral extension near or

at its lower end and a telescopic strut articulated with said extension and with said bottom end of said shock absorber to cause said shock absorber to shorten to a maximum retraction condition when said landing gear is retracted by said actuator into said fuselage.

4,681,285

**NOSE WHEEL WATER SPRAY DEFLECTOR ENABLING WHEEL AND TIRE CHANGES WITHOUT DEFLECTOR REMOVAL**

Fredrick E. Bowdy, Seattle; Rudi K. H. Glasenapp, and Glen E. Ridgway, both of Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

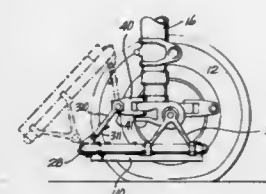
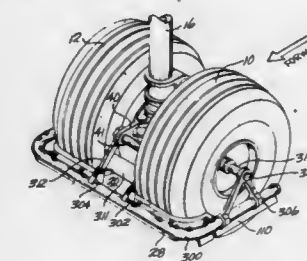
Continuation of Ser. No. 499,623, May 31, 1983, abandoned.

This application May 6, 1985, Ser. No. 730,607

Int. Cl.<sup>4</sup> B64C 25/00

U.S. Cl. 244—103 R

2 Claims



1. In combination with the landing strut and axle supporting a pair of nose gear wheels of an aircraft, a nose wheel water spray deflector having a leading edge extending forward of said nose gear wheels and beyond the outer sidewall surface portions of said pair of nose gear wheels, said nose wheel water spray deflector having aftwardly extending side leg portions and a central surface portion extending aftwardly between said pair of nose gear wheels, said aftwardly extending side leg portions having downturned side edge portions; said deflector mounted by a U-shaped support tube attached to the deflector upper surface along the leading edge and

left and right sides, said U-shaped support tube connected by two forward support members to the tow fitting of said nose landing gear and by a left and right support member on the side legs of the U-shaped support tube to the left and right wheel axle stubs, respectively;

characterized by a mounted flexible pad being mounted onto said deflector plate bottom and extending past said deflector plate in the direction of said wheels and tires to form a most possible close but controlled gap therebetween, accommodating tire flexibility; and,

said left and right support members being connected to each axle by attachment means including the combination of a spherical bearing, a bolt through said bearing, a barrel nut, and an adapter, said two forward support members are pivotally connected to the tow fitting to provide pivoting of said deflector around the towing pin, further characterized by direct wheel/tire accessibility and wheel/tire removal after removal of only said bolts (316) and subsequently pivoting of said deflector about said tow pin, out of the way of the peripheral extent of the tires.

4,681,286

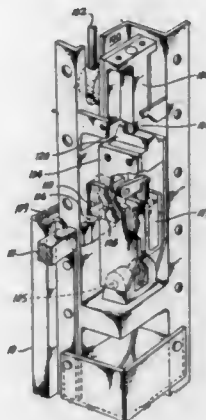
**DOOR ANTI-HIJACKING LATCH/LOCK MECHANISM WITH PNEUMATIC DECOMPRESSION OVERRIDE**

Royce F. Church, Lynnwood; Donald B. McCaffrey, Edmonds, and Leo W. Plude, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 444,245, Sep. 30, 1982, Pat. No. 4,522,359. This application Nov. 28, 1984, Ser. No. 677,102  
Int. Cl.<sup>4</sup> B64C 1/14; B64D 11/00

U.S. Cl. 244—129.5

6 Claims



1. An aircraft door anti-hijacking latch lock mechanism having means for providing pneumatic decompression override, said device cooperating solely with a lockable conventional door latch, said latch lock mechanism having an engaged mode only in response to application of electrical power and locked with a key, said latch lock mechanism further operative in a release mode in response to either electrical switch activation on a pilot panel, loss of electrical power, key actuation from outside the control cabin of the aircraft, rotation of the conventional door latch from the control cabin, or decompression;

wherein said means for providing pneumatic decompression override comprises shear rivets for isolation of a spring loaded piston during retraction of said spring loaded piston, said shear rivets further operative by shearing after providing isolation, thereby enabling aircraft door opening.

4,681,287

**SPIRAL WIRE AND A METHOD OF MANUFACTURING SUCH A WIRE**

Axel Cedercreutz, Tampere, and Ari Salminen, Suoranta, both of Finland, assignors to Tamfelt Oy AB, Tampere, Finland

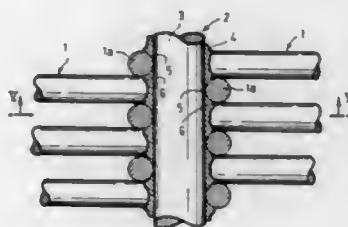
Filed Sep. 6, 1985, Ser. No. 773,190

Claims priority, application Finland, Oct. 1, 1985, 850113

Int. Cl.<sup>4</sup> B21F 27/00

U.S. Cl. 245—6

6 Claims



1. Spiral wire, comprising:

adjacent spirals positioned in pairs with their loops intermeshing to form transverse rows of loops; and initially straight link threads of uniform cross-section passed through the rows of loops, whereby the loops of adjacent

spirals are pressed against said link threads alternately from opposite sides, characterized in that in the spiral wire each link thread after said pressing comprises a straight core thread of uniform cross-section provided with a surface coating, in which grooves are formed only in said surface coating at the points of contact of the link threads and the loops.

4,681,288

**FIXING COMPONENT**

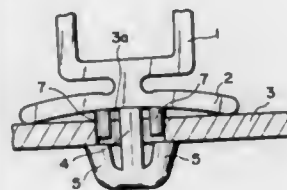
Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1985, Ser. No. 772,459

Int. Cl.<sup>4</sup> B65D 67/02

U.S. Cl. 248—71

4 Claims



1. A fixing component comprising a holder portion having a shape suitable for holding other components, a web-like resilient seat portion connected to said holder portion and curved toward the surface of an apertured circuit board to form an arch and provided with opposite free ends for contacting said surface of said circuit board, a column portion projecting from the center of said seat portion through a hole in said circuit board, and a pair of resilient wing portions having free ends and diverging from a free end of said column portion toward the outside of said hole in said circuit board, wherein a pair of extensions are provided on said arch-shaped resilient seat portion and are biased into engagement with an inner peripheral surface of said hole by said resilient seat portion upon flexing thereof and connection of said fixing component to said circuit board.

4,681,289

**SIDE MOUNTING BRACKET FOR DRAWER SLIDE**

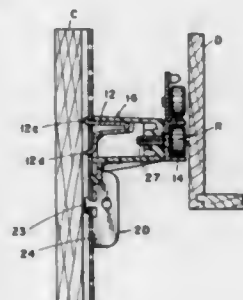
Robert L. Gronlund, Lewisburg, and John Stewart, Sellingsgrove, both of Pa., assignors to Knap &amp; Vogt Manufacturing Company, Grand Rapids, Mich.

Filed Mar. 31, 1986, Ser. No. 846,218

Int. Cl.<sup>4</sup> A47B 88/00

U.S. Cl. 248—224.4

11 Claims



9. A mounting device combination for support of an article on a standard slotted pilaster strip comprising:

a polymeric fastener shell member and a V-clip support interfitting therewith;

4,681,291

**BOOK HOLDER**

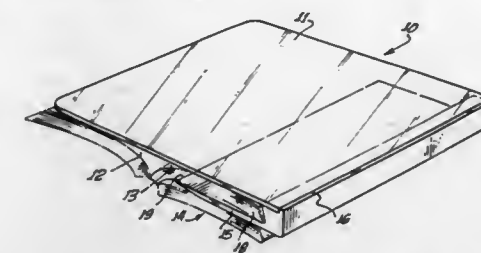
Wilfred E. Holladay, 18536 Mescal, Rowland Heights, Calif. 91748

Filed Jun. 26, 1986, Ser. No. 879,017

Int. Cl.<sup>4</sup> A47B 97/04

U.S. Cl. 248—444.1

5 Claims



4,681,290

**APPARATUS AND METHOD OF SHORING MASONRY, STONE, CONCRETE AND OTHER MATERIALS OVER OPENINGS IN BUILDINGS**

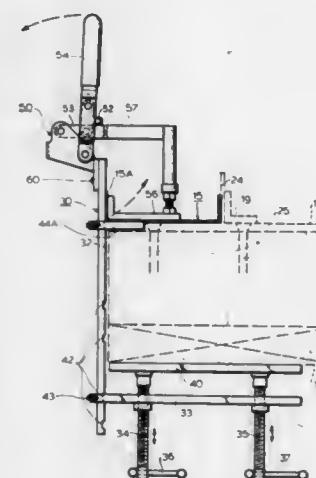
Donald A. Crosbie, 11662 Luau Ln., Cypress, Calif. 90630

Filed Nov. 28, 1984, Ser. No. 675,885

Int. Cl.<sup>4</sup> E04G 21/04

U.S. Cl. 248—225.31

11 Claims



1. A hanger for use during construction for supporting a masonry or ornamental lintel for window or lintel openings in a building framework having an exterior and an interior including a support lintel and columns and still defining the window or lintel opening and designed for an exterior of masonry veneer comprising:

a generally elongated body member adapted for upright hanging on a building framework from the interior thereof and extending downward from above into the window or lintel opening in the framework;

means for temporarily securing said elongated body member to the framework above said window or lintel opening;

support means for a masonry or ornamental lintel during installation comprising a first generally horizontally extending member cantilevered into the window opening

means securing said first generally horizontally extending member to said elongated body member;

a second generally horizontal member for supporting either the masonry or an ornamental lintel or a plank-like form for supporting brick or other masonry while being laid at the top of the opening; and

means for adjusting the spacing between said first and second generally horizontal members to provide precise positioning of the masonry or ornamental lintel.

1. A book holder affixed to a book for holding said book in an open and readable position on a surface comprising:

an open book having left and right hand open halves, a closed width and an open width equal to about twice the closed width, a height and a thickness;

a book holder having a transparent face sheet made from a rigid and transparent sheet, said face sheet having a height about equal to the height of said book and a width about equal to the open width of the book, said book holder having a page holding sheet made from a rigid material and affixed along one edge to one edge of said transparent face sheet and extending in a parallel manner thereunder and spaced therefrom a distance of less than one-half of the thickness of the book and having a width of less than the face sheet, said transparent face sheet extending over the open pages of the book and the pages of only one of said left or right hand open halves being inserted between the transparent face sheet and the page holding sheet.

4,681,292

**PNEUMATIC SEAT SUPPORT WITH LINKAGE AND HORIZONTAL SHOCK ABSORBERS**

Scipio Thomas, 4444 N. Division, Davenport, Iowa 52806

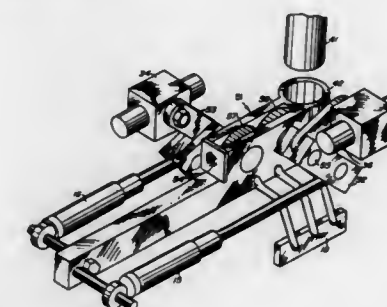
Continuation of Ser. No. 691,290, Jan. 14, 1985, Pat. No.

4,632,355. This application Jan. 25, 1986, Ser. No. 880,351

Int. Cl.<sup>4</sup> F16M 13/00

U.S. Cl. 248—584

3 Claims



1. A pneumatic support for a seat comprising:

a seat frame to which a seat is to be attached for support, a main frame of said support to be connected to a vehicle, guiding means connected between said seat frame and said main frame to retain said seat frame substantially horizontal while permitting in a vertical direction free reciprocal travel of said seat frame relative to said main frame,

a linkage comprising first and second levers and gear means, said gear means having first and second shafts for said first and second levers respectively, each of said first and second levers having first and second ends and an interme-



diate pivotal point, said intermediate pivotal point of each of said levers being connected to the respective one of said first and second shafts, said gear means restraining said first and second levers to rotate in unison to maintain said first ends of said first and second levers at an even height, pivotal means for coupling said seat frame at respective spaced points to said first ends of said first and second levers,

a first pneumatic shock absorber positioned substantially horizontal and connected between said main frame and said second end of said first lever, and  
an elongated spring means positioned substantially horizontal and connected between said main frame and said second end of said second lever, said first pneumatic shock absorber and said elongated spring means cooperating to provide resilient support at a desired height for said seat.

4,681,293

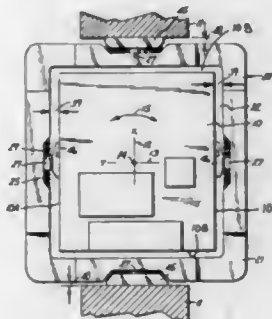
# ISOLATING MOUNT FOR EXTERNAL VIBRATION SENSITIVE SENSOR

Gerald R. Cucci, Minneapolis, and Thomas P. Peterson, Minnetonka, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 761,342, Jul. 31, 1985, abandoned, which is a continuation of Ser. No. 320,211, Nov. 12, 1981, abandoned. This application Mar. 24, 1986, Ser. No. 842,758  
Int. Cl.<sup>4</sup> F16M 13/00

U.S. Cl. 248-603

3 Claims



1. In combination an isolation assembly and a sensor having X and Y axes defining a plane and a Z axis perpendicular to said plane, said sensor being sensitive to rotational movement about the Z axis, and which sensor is to be vibration isolated comprising a sensor body, a frame surrounding said sensor body, and a plurality of first isolator beam sections supporting said sensor body in at least two diametrically opposed locations, said first beam sections being attached to said frame and to said sensor body, said first beam sections being subjected to compression when the sensor is subjected to forces tending to rotate it about its Z axis, and being subjected to shear when the sensor is subjected to forces tending to move it in direction along the X, Y or Z axes, said isolator beam sections each comprising a molded assembly of a plurality of generally parallel thin shims and layers of elastomeric material substantially filling the space between said shims extending alternately along the length of the beam section, one end of each beam section being attached to the frame and the other end of each beam section being attached to the sensor, each beam section comprising a greater spacing between said shims adjacent the center portions of each beam section than adjacent the ends thereof, so the layers of elastomeric material are thicker in direction along the length of the beam section in the center portion of the beam section.

4,681,294

# RESILIENT SUSPENSION FOR CONDUITS

Peter Soltyslak, Berlin, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

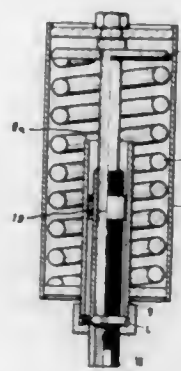
Filed Aug. 24, 1984, Ser. No. 643,678

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3332098

Int. Cl.<sup>4</sup> F16L 3/00

U.S. Cl. 248-613

2 Claims



1. A resilient suspension for tubular conduits comprising:  
a tubular casing having a bottom;  
a first sleeve extending into the casing as well as from the bottom out of the casing, and being mounted to said bottom;  
a compression spring in said casing receiving said sleeve and bearing with one end against the said bottom;  
a tension rod having a spring disk affixed thereto, the spring disk being situated in said casing, said compression spring with its other end bearing against said spring disk;  
said first sleeve to the extent it extends into that casing having an axial dimension slightly larger than the axial dimension of said spring when fully compressed;  
a ring-shaped stop means threaded onto the tension rod thereby abutting a portion of the first sleeve that extends from the bottom of the casing for limiting, through such abutment a displacement of the tension rod commensurate to decompression of said spring, for preventing complete decompression of the spring; and  
a supplemental sleeve provided for threading onto the portion of the first sleeve that extends from the bottom of the casing, gripping around the ring for holding the ring against the first sleeve, to thereby lock the tension rod against the casing.

4,681,295

# TRICURVE OPTICAL MASTER MOLD AND METHOD OF MAKING

Henry Haardt, Henryville, Pa., and John Magdon, Phillipsburg, N.J., assignors to International Hydron Corporation, Woodbury, N.Y.

Continuation of Ser. No. 498,348, May 26, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 759,918

Int. Cl.<sup>4</sup> B27D 11/00

U.S. Cl. 249-135

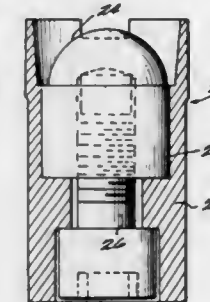
6 Claims

1. A metal master mold for injection molding a plastic replica mold comprising the following distinct spherical zones as a molding portion:  
a central spherical surface having a radius  $A_1$  and an edge;  
a first annular zone  $A_2$  concentric with said spherical surface and having an inner edge contiguous with said spherical surface edge and an outer edge; and  
a second annular zone  $A_3$  concentric with said first annular zone outer edge;

the molding portion being polished to blend the spherical zones into each other at the  $A_1/A_2$  and  $A_2/A_3$  junctions.  
2. A process for making the optical surface of a metal master mold for injection molding a plastic replica mold for molding hydrogel contact lenses having the following distinct spherical zones;

a central spherical zone  $A_1$  having an edge,  
a first annular zone  $A_2$  concentric with said spherical surface and having an inner edge contiguous with said spherical surface edge and an outer edge; and  
a second annular zone  $A_3$  concentric with said first annular zone having an inner edge contiguous with said first annular portion outer edge, said process comprising the successive steps of:

(1) selecting a cylindrical metal blank and determining its optical center;



(2) calculating an  $A_1$  radius to determine the correction or power of the resulting lens, an  $A_2$  radius to define the first annular zone and to determine the nominal center thickness of the lens, and an  $A_3$  radius to define the second annular zone;  
(3) cutting an  $A_1$  radius in the metal blank to establish a predetermined central reference starting point;  
(4) cutting an  $A_2$  radius in the metal blank until the desired optical zone and nominal center lens thickness are obtained;  
(5) cutting an  $A_1$  radius in the metal blank to blend the  $A_1$  radius with the  $A_2$  radius at predetermined coordinates;  
(6) cutting an  $A_3$  radius to a predetermined diameter defining the outer circumference and tapered shape of the lens; and  
(7) polishing the cut metal master to assure all three curves to blend into each other at the  $A_1/A_2$  and  $A_2/A_3$  junctions.

4,681,296

# VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Harvey J. Shopsky, Latrobe, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 794,742, Nov. 4, 1985, Pat. No. 4,651,968. This application Jun. 4, 1986, Ser. No. 870,362

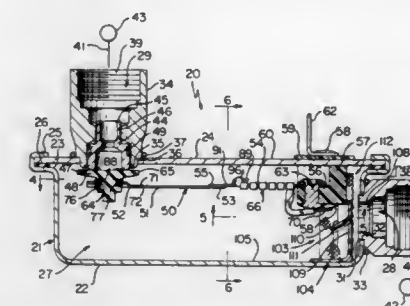
Int. Cl.<sup>4</sup> G05D 23/19

U.S. Cl. 251-11

10 Claims

1. In a valve construction comprising a housing means provided with a chamber therein and with an inlet leading to said chamber and an outlet leading from said chamber, a valve seat carried by said housing means and leading to said outlet, a movable bimetallic lever means carried by said housing means and having an operating bimetallic part and an ambient temperature compensating bimetallic part, and a valve member carried by said bimetallic lever means for opening and closing said valve seat under the control of said operating part of said bimetallic lever means, the improvement comprising deflector means carried by said housing means in said chamber thereof and having opening means therethrough that is aligned with said inlet for receiving a fluid flow from said inlet and for

directing said fluid flow from said inlet away from said operating part of said bimetallic lever means and toward said ambient



temperature compensating part when fluid flows through said chamber from said inlet through said outlet.

4,681,297

# ADJUSTABLE PRESSURE REGULATING SOLENOID VALVE

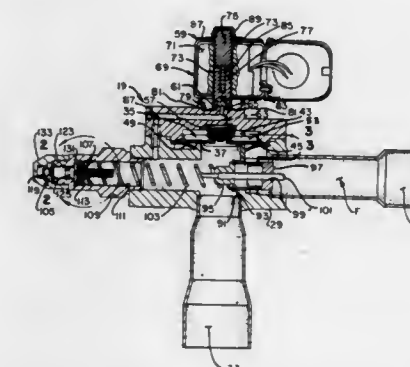
Deany W. Mertz, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 1, 1985, Ser. No. 729,305

Int. Cl.<sup>4</sup> F16K 31/12

U.S. Cl. 251-45

10 Claims



1. A pressure regulating valve comprising a valve body having a flow path therethrough, the latter having an inlet and an outlet, said valve body having a main valve seat within said flow path and a main valve member mounted within said valve body for movement between an open position in which said main valve member is clear of said main valve seat for the primary flow of fluid between said inlet and said outlet and a closed position in which said main valve member engages said main valve seat so as to block the primary flow of said fluid, and means for permitting a secondary flow of fluid from said inlet to said outlet when said main valve member is in its closed position and when the pressure differential between said inlet and said outlet exceeds a predetermined value said flow and pressure differential means comprising a secondary valve seat in communication with said flow path upstream and downstream from said main valve seat, and a secondary valve member movable between a closed position in which it sealingly engages said secondary valve seat thereby to block the flow of fluid between said inlet and said outlet via said secondary valve seat, and an open position in which said secondary valve member is clear of said secondary valve seat thereby to permit said secondary flow of said fluid between said inlet and said outlet via said secondary valve seat.

4,681,298

## SLIDABLE ELECTRIC VALVE DEVICE HAVING A SPRING

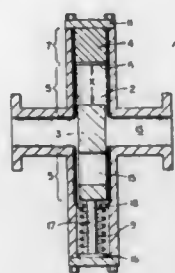
James A. Bodine, Walnut Creek; Judson S. Kuehn, San Rafael, and William H. Silcox, San Francisco, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed May 14, 1986, Ser. No. 863,205

Int. Cl.<sup>4</sup> F16K 31/06

U.S. Cl. 251-129.1

2 Claims



1. An electric valve for use in remote locations, such as the sea floor, in which a large volume of high pressure, high temperature, caustic flow is encountered, comprising:

a valve body that is capable of withstanding high pressure which has a cylindrical passage that is closed at both ends, and a pair of in-line, cylindrical passages that are open at both ends, the open passages and the closed passage are spaced at 90° relative to the other with a common intersection in the center of the closed passage;

a slidable, ferrous core, located in the closed passage having an aperture for fluid passage, located transverse to the longitudinal axis of the core, that will allow communication and fluid flow with the open passages across the valve when it is slidably aligned with the open passages to a first position;

a rod, fixedly attached at one end to the core and at the other end to a rod plate that fits within the closed cylinder;

an orifice plate, fixedly attached to the walls of the closed passage on the side of the core that is attached to the rod;

a spring, located around the rod between the orifice plate and the rod plate, the spring compresses when the core is moved to a first position, the spring being used to move the core to a second position;

main, high power windings, wrapped adjacently around the interior of the closed passage in a stacked, linear relationship for moving the slidable ferrous core along the closed passage to compress the spring when energized by a D.C. current, so that once the slidable ferrous core is moved to a first position, the core aperture aligns with the open passages to allow fluid flow therethrough;

lower power windings, wrapped around the interior of the closed passage in a stacked, linear relationship above the main windings;

a ferrous plug, located in the closed passage within the area of the low power windings, so that when the low power windings are energized by a D.C. current the ferrous plug will become an electromagnet to hold the slidable, ferrous core in the first position, and once the core is held in the first position the main windings may be deenergized;

a dielectric buffer, located between the ferrous plug and the slidable, ferrous core to separate and cushion the ferrous plug from the slidable core; and

flowline means connected to said valve body, at the open cylindrical passages, for receiving fluid flow through the valve body, the flowline means adapted to be operably connected to a subsea production system which carries caustic, high volume fluid flow that is under high temperature and pressure.

4,681,299

## MOTORCYCLE JACK

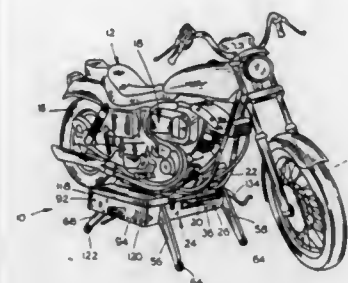
Louie P. Slebert, P.O. Box 654, Henderson, Nebr. 68371

Filed Dec. 4, 1985, Ser. No. 804,501

Int. Cl.<sup>4</sup> B60P 1/48

U.S. Cl. 254-8 R

10 Claims



1. A motorcycle jack comprising

a frame having longitudinally spaced apart forward and rearward ends and transversely spaced apart right and left sides,

a part of front and rear cross shafts extended transversely across said frame and rotatably supported thereon in longitudinally spaced apart relation,

a part of front legs having upper end portions mounted on said front cross shaft for rotation therewith, said front legs extending generally radially from said front cross shaft in generally parallel relation to one another,

a part of rear legs having upper end portions mounted on said rear cross shaft for rotation therewith, said rear legs extending generally radially from said rear cross shaft in generally parallel relation to one another,

means interconnecting at least one front leg and at least one rear leg so that said interconnected front and rear legs are constrained to pivotal movement in unison but in opposite directions, and

power means operatively connected to said interconnected legs for pivotally moving said interconnected legs relative to said frame whereby said frame is raised in response to pivotal movement of the lower ends of said interconnected legs toward one another and lowered in response to pivotal movement of the lower ends of said interconnected legs away from one another,

said cross shafts being formed of a resilient material capable of substantially complete recovery from limited torsional bending,

one front leg being rigidly linked to the rear leg on the same side of the frame, said rigid link having opposite ends pivotally connected to said interconnected front leg and rear leg at positions above and below the pivot axes thereof.

4,681,300

## APPARATUS FOR REMOVING MANHOLE COVERS AND THE LIKE

Folke N. Drugge, 54 Lillsvangen, 126 57 Hagersten, Sweden

Filed Mar. 29, 1985, Ser. No. 717,520

Claims priority, application Sweden, Mar. 30, 1984, 8401754

Int. Cl.<sup>4</sup> B66F 3/00

U.S. Cl. 254-131

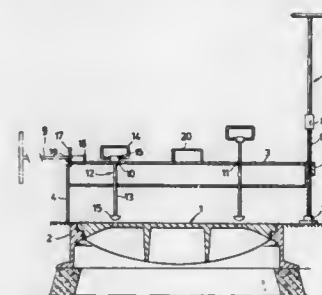
7 Claims

1. An apparatus for removing a manhole cover from a manhole, comprising:

a beam member having a first end and a second end; means cooperating with said beam member for grabbing the manhole cover, said grabbing means including at least one grab element having a rod portion passing through said beam member intermediate said first and second ends and a catch portion at one end of said rod portion, said catch portion being adapted to detachably connect to the manhole cover;

means connected to said beam member for supporting said first end of said beam member a predetermined distance above a fulcrum position on a surface outside the perimeter of the manhole cover when the manhole cover is within the manhole;

raising means threadably connected to said beam member for adjustably supporting said second end of said beam member a variable distance above a pivot position on the surface outside the perimeter of the manhole cover when the manhole cover is within the manhole, said pivot position being substantially diametrically opposite said fulcrum position with respect to the manhole cover, whereby the manhole cover is raised from the manhole when the said catch portion of said grabbing means is connected to the manhole cover, said raising means including shoe means for pivotally supporting said beam member at said pivot position, a threaded collar member mounted on said beam member proximate said second end, and a screw spindle threadably engaged with said



threaded collar member and having one end pivotally connected to said shoe means; and

lifting means for lifting said first end of said beam member to a position above said predetermined distance above said fulcrum position and for pivoting said beam member about said pivot position, said lifting means including a spanner-shaped lever having a socket portion at one end thereof and a yoke member and guide means mounted on said beam member proximate said first end for receiving said socket portion of said lever, whereby the manhole cover connected to said catch portion of said grabbing means is pivotable to a position beside the manhole by lifting said lever and pivoting said lever about said pivot position when said lever is received by said yoke member and guide means, said socket portion of said lever being removable from said yoke member and guide means and engageable with the end of said screw spindle opposite said shoe means so that rotation of said lever and socket portion rotates said screw spindle.

4,681,301

## ARRANGEMENT FOR LIFTING AND LOWERING OR FOR PULLING LOADS

Johannes Rinlo, Herne, Fed. Rep. of Germany, assignor to N.V.

Sky Climber Europe S.A., naamloze vennootschap, Belgium

Filed Jan. 3, 1986, Ser. No. 816,070

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501877; Nov. 19, 1985, 3540906

Int. Cl.<sup>4</sup> B66D 1/00, 1/30

U.S. Cl. 254-333

13 Claims

1. An arrangement for moving a load, such as by lifting, lowering or pulling, having a flexible wire rope attached thereto, comprising:

(a) a housing having a rope inlet and a rope outlet;

(b) a first sheave half mounted in the housing so as to rotate about a central axis;

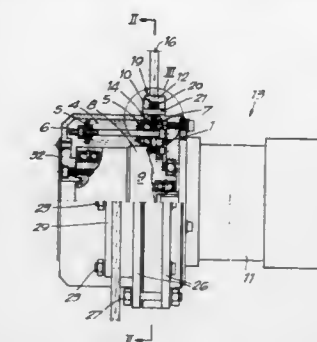
(c) a second sheave half mounted within the housing so as to rotate with the first sheave half;

(d) drive means to rotate the first and second sheave halves about the central axis;

(e) spring means to bias the second sheave half toward the first sheave half;

(f) a rope gripping groove defined by the first and second sheave halves to grip the wire rope such that rotation of the first and second sheave halves causes the wire rope to move along its length;

(g) a plurality of rope-supporting rollers attached to the housing such that the rollers are located adjacent to the



periphery of the first and second sheave halves so as to keep the wire rope from jumping out of the rope gripping groove, and are disposed around a major portion of the circumference of the first and second sheave halves;

(h) an axle attached to the housing and rotatably supporting each rope supporting roller; and,

(i) spring means acting between the housing and each rope supporting roller so as to bias the roller to a position above the rope gripping groove.

4,681,302

## ENERGY ABSORBING BARRIER

Marion L. Thompson, 53 Woodlyn La., Bradbury, Calif. 91010

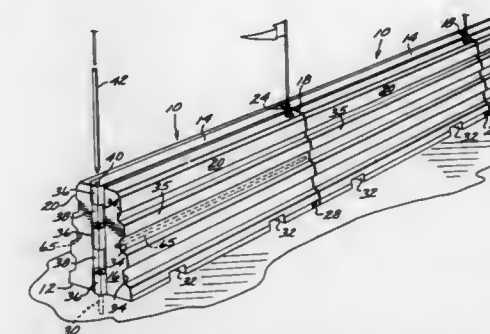
Continuation-in-part of Ser. No. 557,595, Dec. 2, 1983,

abandoned. This application Feb. 21, 1985, Ser. No. 703,662

Int. Cl.<sup>4</sup> E01F 15/00

U.S. Cl. 256-13.1

50 Claims



1. An energy absorbing barrier for dissipating kinetic energy upon impact by a moving vehicle, said barrier comprising:

an elongate container having walls, including a pair of longitudinally directed side walls, defining an interior chamber having a fill opening for admitting fluent material into said chamber, said container being configured and constructed of a material having a rigidity sufficient for said container to retain its shape both when said chamber is empty and when it is filled with said fluent material whereby said barrier is adapted to serve both as a self-supporting lightweight barrier and as a heavier barrier, respectively, said material further having a resilience sufficient to deform upon impact by a vehicle and recover its shape after said impact whereby an impacted one of said longitudinally directed side walls is adapted to progressively deform



along its length as the impacting vehicle travels along said length, thereby progressively slowing said vehicle.

4,681,303

**SHOCK-ABSORBENT CONNECTOR**

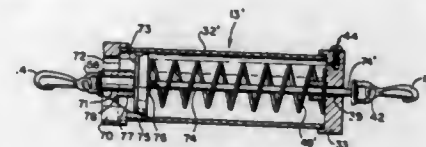
Vincent R. Grassano, 41 Ridge Rd., Media, Pa. 19063

Continuation-in-part of Ser. No. 678,711, Dec. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 473,045, Mar. 7, 1983, Pat. No. 4,488,511. This application Aug. 26, 1985, Ser. No. 769,252

Int. Cl.<sup>4</sup> F16F 3/07

U.S. Cl. 267—8 R

16 Claims



1. In a line connector having a clamping means at each end for joining two objects together, a device for absorbing shock resulting from sudden pull on the connector comprising

- (a) a hollow cylinder including a piston disposed slidably therein,
- (b) a cylinder end cap,
- (c) a piston rod connected to the piston and extending through the end cap outwardly of the cylinder,
- (d) fastening means for attaching the connector to the cylinder externally of the cylinder, whereby force from the pull on the connector is transmitted to the piston to cause the piston to advance in the cylinder toward the end cap,
- (e) air conduit means in the end cap connecting the interior of the cylinder to the ambient atmosphere and
- (f) an adjustable valve located in the air conduit means,
- (g) said valve being operative to regulate discharge of air from the cylinder as the piston advances toward the end cap to control selectively compression of air within the cylinder, between the piston and the end cap, upon advancement of the piston, said compressed air within the cylinder functioning as resilient means yieldingly resisting the advance of the piston.

4,681,304

**DEFLECTION JOUNCE BUMPER FOR STRUT SUSPENSION**

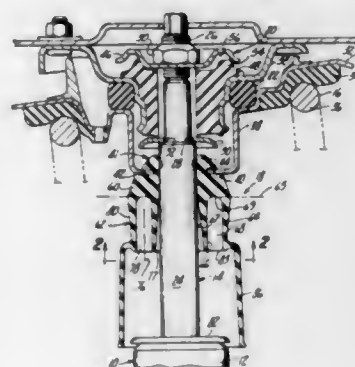
Morris Hassan, Trenton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Mar. 21, 1986, Ser. No. 842,589

Int. Cl.<sup>4</sup> F16F 1/36

U.S. Cl. 267—8 R

4 Claims



1. A suspension system for a vehicle including sprung and unsprung masses, said masses being separated by a spring bumper, said masses being located by a rod means so that distortion

of the spring bumper occurs principally by axial compression, said bumper comprising an integral generally cylindrical body of elastic material such as rubber having opposed upper and lower end faces, said bumper having a solid upper hub portion closely encircling said rod means and a lower impact portion, said lower impact portion including a cylindrical outer wall section and a cylindrical inner wall section, said wall sections being concentrically disposed about said rod means and defining an intermediate cylindrical downwardly opening channel of predetermined radial extent and axial depth, said wall sections being integrally connected by a plurality of axially extending uniformly spaced paired bridging segments, each said pair of segments in the form of a pair of mirror image arcuate segments symmetrically disposed about a vertically extending column axis, each said pair of segments defining with adjacent interconnecting portion of said inner and outer walls an axial column blind bore with said pair of segments having their center of curvature on their associated column bore axis, such that upon said bumper being impacted said inner and outer wall sections together with said column-like arcuate bridging segments stretching to absorb impact energy thereby providing initially high dampening load displacement resistance.

4,681,305

**PORTABLE WORK DEVICE**

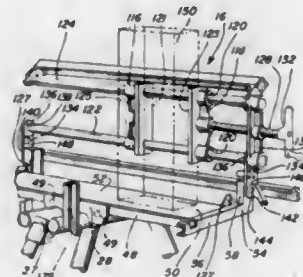
Robert Green, 1222 W. Grand Ave., Chicago, Ill. 60622

Filed Aug. 2, 1985, Ser. No. 762,050

Int. Cl.<sup>4</sup> B25B 1/02

U.S. Cl. 269—139

7 Claims



1. A vise assembly for use with a portable work device of the type having a table with a substantially planar, horizontally disposed primary work surface and a base for supporting the table in an elevated, working position, said vise assembly comprising:

- a secondary work table with a secondary, upwardly facing surface for supporting a workpiece;
- first and second jaw members;
- means mounting the jaw members including an elongate guide bar along the length of which each of the jaw members is adjustably adapted for translatable movement towards and away from each other in a first direction so that a range of workpiece size can be held firmly, capatively between the jaw members;
- the guide bar being connected to arm means pivotally mounting the guide bar and jaw members to the secondary table so that the guide bar and jaw members are pivotable together relative to the secondary work surface about a first axis extending substantially in said first direction;
- means for selectively fixing the arm means relative to the secondary work table; and
- means for pivotally mounting the jaw members to the arm means for pivoting movement of the jaw members together about a second axis that is spaced from and substantially parallel to the first axis,
- whereby the jaw members can be reoriented and moved vertically relative to the secondary work surface with the secondary work surface in a horizontal situation and used to selectively hold a tool and workpiece in desired rela-

tionship to said secondary work surface to facilitate the performance of work operations in conjunction with the primary work surface.

4,681,306

**TWO CHAMBER ENGINE MOUNT WITH HYDRAULIC DAMPING**

Manfred Hofmann, Hünfelden; Hans Müller, Höhr-Grenzhausen, and Ralf Waldecker, Neuwied, all of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

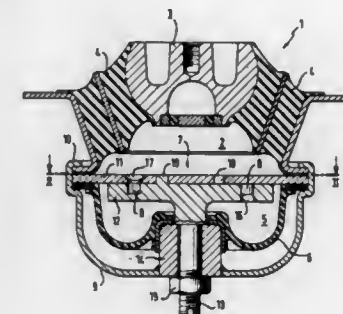
Filed Mar. 25, 1985, Ser. No. 715,530

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410781

Int. Cl.<sup>4</sup> F16F 9/10; B60K 5/12

U.S. Cl. 267—140.1

4 Claims



1. Two chamber engine mount with hydraulic damping, comprising rubber-elastic peripheral walls including a lower wall, a solid protective support housing disposed outside at least one of said walls, an orifice plate disposed between said walls defining upper and lower fluid-filled chambers above and below said orifice plate, said orifice plate being substantially horizontally divided into an upper plate half being stationary and a lower plate half being rotatable and having a central axis, said orifice plate having an orifice canal formed at least partly in said lower plate half interconnecting said chambers and having a given open length and cross section, a bushing passing through said support housing, and a centrally disposed pin integral with said lower plate half and extending outwardly fluid-tightly through said lower wall and said bushing for rotating said lower plate half about said central axis relative to said upper plate half, varying at least one of said length and cross section of said canal, said lower plate half having a lower surface having an outlet opening formed therein and an upper surface having said orifice canal gradually arcuately spirally rising therein starting from vicinity of said outlet opening and ending level with said upper surface, said upper plate half having an upper surface and a lower surface having an arcuate, inclined ramp-shaped projection formed thereon matching said orifice canal and having a flat end blending into an inlet opening passing through said upper plate half.

4,681,307

**SOCKET CONSTRUCTION FOR TORSION MEMBER**

George H. Leonard, Darien, Conn., assignor to Airpot Corporation, Norwalk, Conn.

Filed Aug. 29, 1985, Ser. No. 770,614

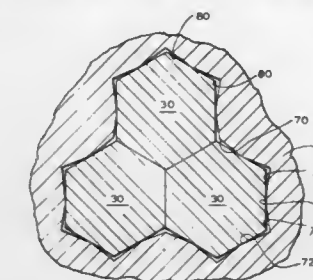
Int. Cl.<sup>4</sup> F16F 1/16

U.S. Cl. 267—154

14 Claims

1. In a variable tension device comprising an elongated torsion member and a socket member having a body with an aperture of significant depth extending to a mouth and defined by walls at least some of which are shaped and oriented to engage sides of said torsion member when a portion of said torsion member is received within said aperture with another portion of said torsion member extending out beyond the mouth of said aperture, thereby to non-rotatably engage said torsion member in said socket member, said wall-side engage-

ment producing the rotative stress between said torsion member and socket member when said other portion of said torsion member is twisted; the improvement which comprises said torsion member sides and said socket aperture walls engaging one another, when said torsion member is in an initial twist condition, at a first location relatively remote from the mouth of said aperture, said torsion member sides and aperture walls diverging from one another to a limited degree from said first location toward the mouth of said aperture, whereby said torsion member sides and aperture walls do not engage at locations closer to said aperture mouth than said first location



when said torsion member is in its said initial twist condition, the degree of the divergence from one another of said torsion member sides relative to said aperture walls being such that as said torsion member is further twisted from said initial twist position, at least some of said torsion member sides engage the aperture walls corresponding thereto at second locations closer to the mouth of said aperture than said first location while continuing such engagement essentially at said first location and at points between said first and second locations, thereby to progressively increase the area of engagement as said torsion member is increasingly twisted.

4,681,308

**DIAGNOSTIC PATIENT SUPPORT APPARATUS**

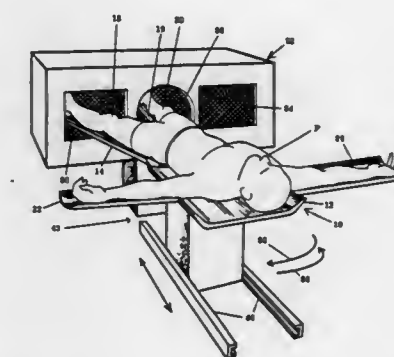
Paul Rice, Corp. 300 Foster St., Littleton, Mass. 01466

Continuation of Ser. No. 755,667, Jul. 16, 1985, abandoned. This application Jul. 24, 1986, Ser. No. 890,803

Int. Cl.<sup>4</sup> A61G 13/00

U.S. Cl. 269—322

9 Claims



1. A diagnostic patient support apparatus comprising: a base; and a table top structure rotatably mounted on said base at a central axis point corresponding to about the center of the chest area of a patient the table top including a central section for supporting the patient's torso, discrete leg extension sections connected to said central section and diverging therefrom at an acute angle for supporting the patient's respective legs, at least one arm extension section connected to said central section and extending therefrom

at about a right angle for supporting at least one of the patient's arms;  
wherein the axes of said leg extension and said arm extension sections intersect at about the central axis point on said table top structure;  
said base including wheel means mounted in a track means travelling toward and away from a diagnostic machine for moving said apparatus solely along the travel of said track means toward and away from said diagnostic machine.

4,681,309

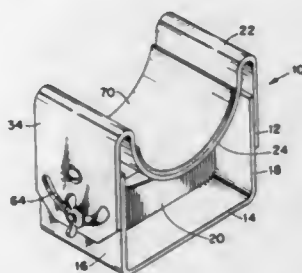
## SURGICAL PREP BLOCK AND SURGICAL ASSIST BLOCK

Paula Lechner, 19 D'Arcy La., Asheville, N.C. 28804  
Filed May 12, 1986, Ser. No. 862,293

Int. Cl.<sup>4</sup> A61G 13/00

U.S. Cl. 269—328

5 Claims



1. A surgical prep block or surgical assist block for supporting extremities, namely an individual leg, arm, hand, or foot comprising:

- a stand having a base and a pair of opposing sides extending upwardly from said base;
- an extremity support platform having a smooth substantially unbroken surface, said surface being configured as a deep inwardly projecting curve for receiving the extremity;
- and a pair of opposing sides extending downwardly from said surface;
- each of said upwardly extending sides being attached to a corresponding downwardly extending side;
- swivel means connected to the places where said sides are attached to each other, whereby said support platform will rotate with respect to said stand; said swivel means includes a hole in each of said sides at their respective place of attachment; said holes in each respective upward extending side aligning with said hole in each respective downward extending side;
- a pair of rods, each extending through each pair of aligned holes;
- a locking means for maintaining said support platform in a fixed position; said locking means includes a curved slot in at least one side in either the upwardly or downwardly extending sides;
- clamping means attached through said slot and to the other side, which is attached to said at least one side.

4,681,310

## SORTING APPARATUS

Thomas F. Cooper, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 23, 1985, Ser. No. 779,010

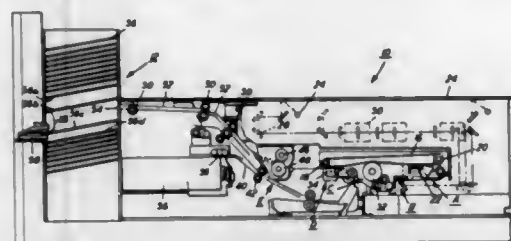
Int. Cl.<sup>4</sup> B42C 1/12

U.S. Cl. 270—53

12 Claims

1. An apparatus for sorting sheets, including:
- a plurality of movable trays shiftable relative to one another;
  - means for supporting one edge of said plurality of trays with the remaining edges thereof extending freely from said supporting means;
  - means for moving successive trays from one side of a sheet inlet region to the other side thereof with said plurality of

trays shifting relative to one another to provide a first wide entry region between adjacent trays at the sheet inlet region and a second wide entry region having one side thereof adjacent one side of the first wide entry region at a sheet securing region; and



means, positioned at the second wide entry region, for periodically attaching substantially permanently the sheets in the trays located thereat to one another.

4,681,311

## INTERMITTENTLY PROTRUDING FEEDER FOR PAPERBOARD BLANKS

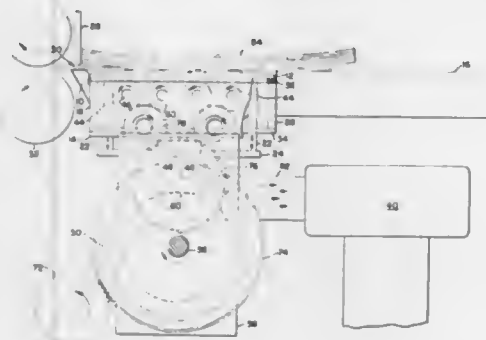
Louis M. Sardella, Towson, Md., assignor to Wm. C. Staley Machinery Corporation, Hunt Valley, Md.

Continuation of Ser. No. 550,285, Nov. 9, 1983, Pat. No. 4,614,335, which is a continuation of Ser. No. 144,129, Apr. 28, 1980, abandoned. This application Jun. 23, 1986, Ser. No. 877,582

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.  
Int. Cl.<sup>4</sup> B65H 3/64

U.S. Cl. 271—11

7 Claims



1. Apparatus for feeding corrugated blanks one by one from the bottom of a stack of blanks without slippage and so that the leading edge of the blank being fed always enters the nip of nip rolls at the same point in the machine cycle with precision suitable for printing and slotting, said apparatus comprising

- a. nip rolls;
- b. stack supporting structure including a forward portion;
- c. transport means supported under said forward portion of stack supporting structure, said transport means comprising continuous high coefficient of friction surface adapted to be circulated;
- d. reciprocating means for changing the relative vertical relationship of said high coefficient of friction surface and said forward portion of said stack supporting structure so as to alternately provide an active position where high coefficient of friction surface extends above the top of said stack supporting forward portion and a passive position where high coefficient of friction surface does not extend above the top of said stack supporting structure forward portion;
- e. suction means for urging a blank downwardly into en-

agement with high coefficient of friction surface in the active position;

f. transmission means comprising input shaft means which is adapted to be rotated and output shaft means which is adapted to be rotated, said input and output shaft means being operatively connected so that the output shaft means undergoes controlled acceleration during an initial period of each revolution of said input shaft means and is stationary during a last portion of each revolution of said input shaft means;

g. means operatively connecting the output shaft means of the transmission means and the transport means so that during the operation of the apparatus said high coefficient of friction surface is circulated and undergoes controlled acceleration followed by net deceleration to zero velocity; the apparatus being such that the active position is effected directly before said high coefficient of friction surface undergoes controlled acceleration and the passive position is effected at the conclusion of the controlled acceleration; whereby high coefficient of friction surface of said transport means engages and grips the lowermost blank by static friction and moves and accelerates that blank to the nip rolls without slippage occurring and so that each blank enters the nip rolls in register whereupon the blank is disengaged from the transport means.

4,681,312

## SHEET STACKER

Raymond A. Harvey, St. Albans, England, assignor to Xerox Corporation, Stamford, Conn.

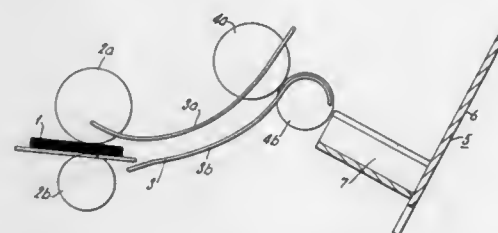
Filed Apr. 21, 1986, Ser. No. 854,365

Claims priority, application United Kingdom, Apr. 23, 1985, 8510274

Int. Cl.<sup>4</sup> B65H 31/02, 31/34

U.S. Cl. 271—207

9 Claims



1. A sheet stacker comprising co-acting driven output rollers associated with means for directing sheets in an upwardly inclined direction, and an output tray for receiving sheets exiting the output rollers, said output tray comprising a support face inclined upwardly in the direction of sheet travel at an angle greater than that imparted to sheets by the output means such that the leading edges of the sheets contact the support face before the trail edges exit the output rollers, the output tray further comprising base edge support means arranged such that after exiting the output rollers the sheets slide under their own weight trail edge first down the support face of the output tray until they abut said base edge support means, characterised in that the base edge support means in the plane of the support face is arranged in a downwardly inclined direction and comprises at the lower end thereof a corner registration stop, and in that a fulcrum is provided at the upper end of the base edge support means, the fulcrum being arranged such that when the sheets slide down the support face their trail edges abut the fulcrum intermediate their edges remote from the registration corner stop and the centre of the sheets, whereby the sheets rotate under their own weight about said fulcrum until their trail edges abut the base edge support means, the inclination of the base edge support means being such that the sheets slide on their trail edges down the base

edge support means until the edges of the sheets facing the corner registration stop abut said stop.

4,681,313

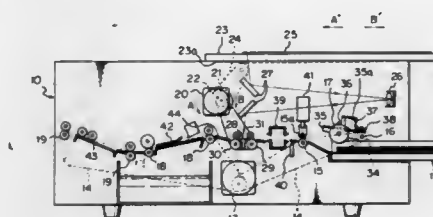
## PHOTOSENSITIVE PAPER CONVEYING DEVICE OF A COPYING MACHINE

Yasuyuki Yokovama; Kiyooki Nakamura, both of Hachioji; Hiroshi Goi, Tachikawa, and Koichi Fujio, Yokohama, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan  
Filed Nov. 15, 1985, Ser. No. 798,597

Claims priority, application Japan, Nov. 29, 1984, 59-250395  
Int. Cl.<sup>4</sup> B65H 5/06

U.S. Cl. 271—273

6 Claims



1. A photosensitive paper conveying device of a copying machine comprising:

- a body;
- an original carrier movably mounted on said body;
- a photosensitive paper receiving member attached to said body;
- an image-forming station forming an image on a photosensitive paper;
- photosensitive paper conveying means located downstream of said photosensitive paper receiving member, conveying a photosensitive paper from said photosensitive paper receiving member to said image-forming station;
- said photosensitive paper conveying means including a first pair of rollers located apart from said image-forming station and between said photosensitive paper receiving member and said image-forming station, holding therebetween and conveying a photosensitive paper, and including a second and a third pairs of rollers positioned adjacent to and upstream and downstream of said image-forming station, respectively, holding therebetween and conveying a photosensitive paper, said second and third rollers rotating at the same circumferential speed and operating synchronously with the movement of said original carrier during formation of an image on said photosensitive paper; and
- said first rollers being provided with release means, and the photosensitive paper held by said first rollers being released before said photosensitive paper passes said image-forming station.

4,681,314

## OSCILLATING DEVICE HAVING IMPROVED SUPPORT LEGS

Robert C. Swengel, Sr., York, Pa., assignor to Donsco Incorporated, Wrightsville, Pa.

Continuation-in-part of Ser. No. 629,334, Jul. 10, 1984, Pat. No. 4,575,071. This application Apr. 22, 1985, Ser. No. 726,226

Int. Cl.<sup>4</sup> A63G 17/00

U.S. Cl. 272—52

11 Claims

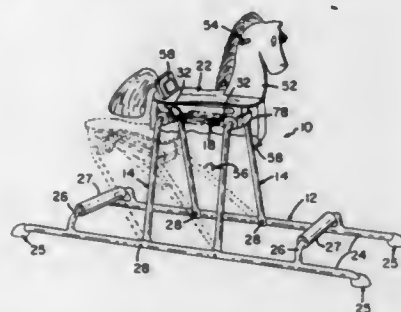
1. An oscillating device, comprising:
- a base;
  - a pair of front and rear leg assemblies with each pair pivotally mounted on parallel axes at lower ends thereof to said base and extending upwardly therefrom, said leg assemblies each including a pair(s) of leg members and a pair of mounting members, each said leg member(s) being pivotally mounted at the lower end(s) thereof to said base, each



said mounting member(s) being an inverted L-shaped bearing support member having the end of the leg portion secured to the upper end of said leg member with the free end portions of the base of the inverted L-shaped bearing support members of the front leg members opposing the free end portions of the support members of the rear leg members (having first sections secured to upper ends of said leg members and second sections extending substantially normal with respect to said first section);

a pair of support-bearing means having one secured between the bases of the front support members and one secured between the bases of the rear support members (said first sections of opposed mounting-members);

a pair of mounting bearing means having one secured between the free end portions of the front support members

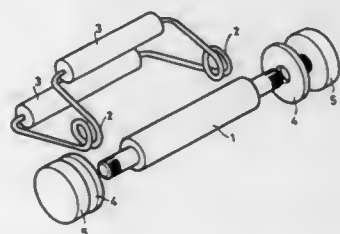


and one secured between the free end portions of the rear support members (energy-storing means secured between said second sections of opposed mounting members);

body support means having oppositely opening bearing-receiving means in which said support-bearing means are respectively disposed; and

energy storing means mounted onto and extending between said opposed mounting bearing (energy-stored support) means to maintain said support-bearing means within said bearing-receiving means, to maintain said body support means centered in a normally vertical position of rest and to move said body support means back toward said centered normally vertical position when said body support means is moved to each side of said vertical position during oscillatory movement thereof.

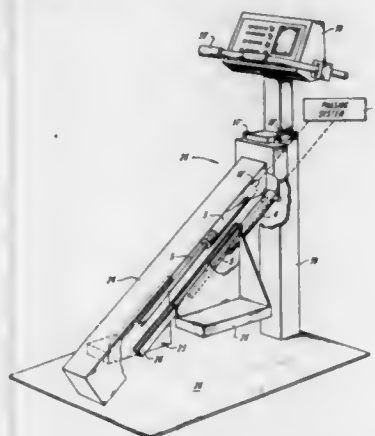
**4,681,315**  
**DUMBBELL WITH DOUBLE COVER HAND PROTECTOR AND GRASPING TRAINING FUNCTION**  
 Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan  
 Filed Jun. 26, 1985, Ser. No. 748,848  
 Int. Cl.<sup>4</sup> A63B 11/08  
 U.S. Cl. 272-122



1. An exercising device comprised, in combination, of: an elongated weight bar having reduced portions at each end thereof, thereby defining an annular shoulder on the weight bar, each of said reduced end portions being threaded; a resilient torsion spring member having first and second torsion springs, said torsion springs being positioned substantially parallel to one another for receiving a respective said reduced end portion of the bar therethrough, such that each of said

springs is received against a respective annular shoulder, said first and second torsion springs each having a pair of spring legs extending therefrom, said spring member further having a pair of rod members, each of said rod members being positioned between, and integrally formed with, a respective spring leg of each torsion spring, said rod members being further positioned on substantially parallel axes to one another; and at least two weight members, each having a threaded aperture formed therein for engaging a respective threaded portion of the weight bar, thereby securing the respective weight member to the bar.

**4,681,316**  
**PHASING SYSTEM FOR EXERCISE STAIR**  
 Richard J. DeCloux, 1485 Belmont St., Manchester, N.H. 03104  
 Filed Aug. 2, 1984, Ser. No. 636,907  
 Int. Cl.<sup>4</sup> A63B 21/00, 23/04  
 U.S. Cl. 272-130



1. An exercise system having linearly reciprocating steps comprising:

a pair of stair steps;

a frame;

a pair of hydraulic cylinders, each having a piston coupled to a respective stair step, and respectively mounted to said frame such that the pistons linearly reciprocate in response to pressure applied to the respective steps;

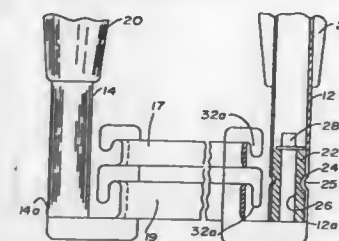
intercylinder fluid coupling means including intercylinder fluid coupling passages for fluid coupling each side of each of the cylinders together on corresponding sides of their pistons so that the movement of one piston by its associated step moves the other piston in the reverse direction by action of the fluid moving in the intercylinder fluid coupling means;

bypass means including at least one bi-directional fluid coupling passage and valve means therein, for selectively coupling when the valve means is in an open position, the fluid on one side of at least one of the pistons to the fluid on the other side of said at least one piston;

said bypass means operative with the valve means in an open position, to permit fluid coupling through the bi-directional fluid coupling passage to allow adjustment of relative piston position and range of motion; and said bypass means further operative with

said valve means in a closed position to block fluid coupling through the bi-directional fluid coupling passage during exercise use.

**4,681,317**  
**GOLF EXERCISE DEVICE**  
 John R. Brandell, 427 Shore Line Rd., Barrington, Ill. 60015  
 Filed May 10, 1985, Ser. No. 733,592  
 Int. Cl.<sup>4</sup> A63B 21/02  
 U.S. Cl. 272-137



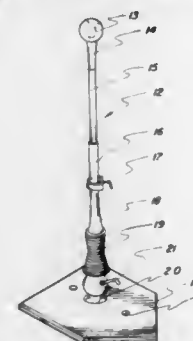
1. An exercising device comprising:

a pair of elongated tubular handle members each having an end portion and a gripping portion extending substantially the length of said elongated tubular handle members opposite said end portions, with each of said end portions providing a tubular shaft,

wherein at least one of said end portions of said pair of tubular handle members includes a sleeve-bearing mounted within said tubular shaft to provide an axis of rotation thereon and a spinner member rotatably secured on said sleeve-bearing, with said spinner member including a shaft portion rotatably secured to said sleeve-bearing and a hook portion positioned outside the outer surface of the tubular handle member, and

resilient means secured to one of said end portions and to said hook portion of said spinner member and interconnecting together said ends of said pair of handle members, with said resilient means applying a variable resistance against the reactive universal movement of the pair of handle members with respect to each other.

**4,681,318**  
**BALL HITTING PRACTICE DEVICE**  
 William C. Lay, St. George, Utah, assignor to Grand Slam, Inc., Midvale, Utah  
 Filed Jun. 17, 1986, Ser. No. 875,065  
 Int. Cl.<sup>4</sup> A63B 69/36  
 U.S. Cl. 273-26 R



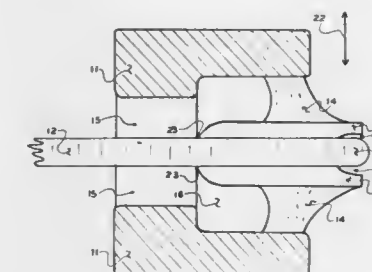
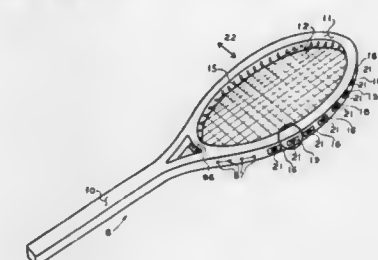
1. An adjustable ball hitting practice device comprising in combination;

a. a planar base adapted to being secured to a solid surface, and

b. a vertical pedestal fixedly attached to the top surface of said base, said pedestal comprising a first vertically extending resilient member having a ball fixedly attached to one end thereof and having its other end fitting into the upper end of a second vertically extending resilient tubular member in telescopic manner so as to permit said first resilient member to be adjusted up and down, locking means to secure said first resilient member in a desired position, an elongated coil spring having one of its ends fixedly attached to the bottom end of said second resilient member permitting the entire vertical pedestal to bend

when the ball is hit, pivoting means fixedly attached to the other end of the coil spring and to the surface of the planar base, said pivoting means permitting said vertical pedestal to be inclined to the side, front or back and then fixedly located in a desired position by locking means.

**4,681,319**  
**RACKET HAVING UNIQUE STRING MOUNT**  
 Gene Zilinskas, 17536 Lemay St., Vay Nays, Calif. 91406  
 Continuation-in-part of Ser. No. 948,691, Oct. 5, 1978, abandoned, and a continuation-in-part of Ser. No. 1,941, Jan. 8, 1979, abandoned. This application Sep. 18, 1981, Ser. No. 303,361  
 Int. Cl.<sup>4</sup> A63B 49/02  
 U.S. Cl. 273-73 D



1. A compliant system comprising:

a string for interacting with an object;

transverse compliance means for providing transverse compliance of said string in response to interaction with an object, wherein said transverse compliance means includes

(a) a string support rail for providing transverse motion of said string,

(b) a pin for attaching said string support rail to a frame structure, and

(c) elastic material for providing transverse compliance of said string in response to the transverse motion; and

a frame structure for mounting said transverse compliance means.

**4,681,320**  
**TOP AND BOARD THEREFOR**  
 Edmund Hildebrandt, 6 Cedar St., Clinton, Mass. 01510  
 Filed Mar. 28, 1986, Ser. No. 845,548  
 Int. Cl.<sup>4</sup> A63B 67/14, 9/16  
 U.S. Cl. 273-109

3 Claims

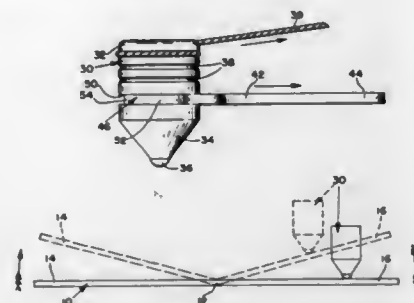
1. A toy spinning top and a supporting game board for the top, comprising

a top having a cylindrical body with a downwardly tapering portion terminating in a spinning point, means to spin the top,

a diagram on the game board indicating a proposed path for the top,

the game board being manipulatable to incline it to a selective inclination relative to the horizontal with the top spinning thereon,

said game board being bare and plain and lacking (handles or) edge fences, whereby the top is more easily spun thereon with a single cord wrapped thereon with respect to the cylindrical portion of the top (.), the game board being foldable on a diametric line, so that the



top may be energized with the entire game board co-planar and horizontal, and the folded parts of the board may be placed at selectively variable angles while the top spins on either part.

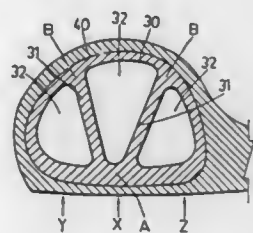
#### 4,681,321 GOLF CLUB HEAD

Chin-Chi Chen, 92, Tung Hsing Rd., Tung Hsing Tsun, Tali, and Yung-Shing Lin, 4, Lane 485, Sec. 2, Chung Shan Rd., Tan Tzu, both of Taichung Hsian, Taiwan

Filed Jan. 29, 1986, Ser. No. 823,753  
Int. Cl. A63B 53/04

U.S. Cl. 273-167 H

4 Claims



1. In a golf club head having a neck portion by which the golf club head may be attached to a shaft for use as a golf club, and in which the golf club head includes a molded synthetic plastic resin outer body member having an upwardly convexly arcuate top wall, a fan-shaped, generally flat, front hitting plane wall, a rearwardly convex arcuate rear wall and a generally flat bottom plate, all merging into one another at respective margins, with the neck extending upwards from the top wall near one end of the front hitting plane wall,

the improvement wherein:

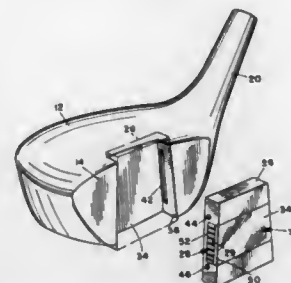
said golf club head comprises a hollow inner body having an outer surface, and said outer body member completely envelops said inner body and is intimately in contact with said outer surface throughout substantially all of said inner body; and

said inner body further includes at least two generally vertical internal partition walls which integrally extend from said bottom plate to said top wall and from said front hitting plane wall to said rear wall and divide said inner body, internally thereof into at least three separate compartments, with said partition walls being disposed to perform, in use, as respective force bridges.

4,681,322  
GOLF CLUB HEAD  
George T. Straza, and George C. P. Straza, both of P.O. Box 1292, Rancho Santa Fe, Calif. 92067  
Filed Sep. 18, 1985, Ser. No. 777,219  
Int. Cl. A63B 53/04

U.S. Cl. 273-173

11 Claims

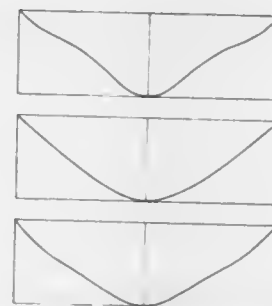


7. An insert for a golf club head, comprising: an insert member shaped to fit in a channel in the front face of a golf club head, the member having a front, ball striking face for lying flush with the front face of a golf club head, and interlocking means for securing the member to a golf club head; the insert member having a cut out in its front face; a cellular, honeycomb structure secured within the cut out; the honeycomb structure comprising a plurality of adjoining, elongated, open cells orientated perpendicular to the front face of the insert member; and resilient material filling the cut-out around the cells to form a front face flush with the front face of the insert member.

4,681,323  
GOLF BALL  
Yasuhide Alaki, Saitama; Masayuki Ohtake, Yokohama, and Keisuke Ihara, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan  
Filed Feb. 7, 1985, Ser. No. 699,438  
Claims priority, application Japan, Feb. 7, 1984, 59-20419  
Int. Cl. A63B 37/14, 37/02

U.S. Cl. 273-232

10 Claims

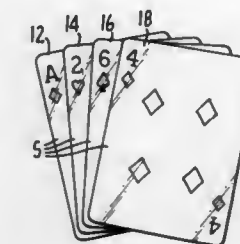


1. A golf ball having a plurality of recessed dimples on the surface thereof, wherein said dimples have a shape wherein the value of the spatial volume of each dimple below a plane defined by an edge of the dimple divided by the volume of a cylinder wherein the bottom of said cylinder is defined by said plane and the height is determined by the maximum depth of the dimple from said plane, is within the range from 0.35 to 0.43, wherein the maximum diameter of the dimple is within the range of 2-4 mm and the maximum depth of the dimple is within the range of 0.1-0.4 mm, said dimples representing at least 90 percent of the total number of dimples on said golf ball.

4,681,324  
HOLOGRAPHIC GAME CARDS  
Razmik Karabed, 287 Tradewinds Dr., San Jose, Calif. 95123, and Raphael Mehrbians, 544 Marine World Pkwy., Redwood City, Calif. 94065  
Filed Jan. 9, 1986, Ser. No. 817,414  
Int. Cl. A63F 1/02

U.S. Cl. 273-295

9 Claims

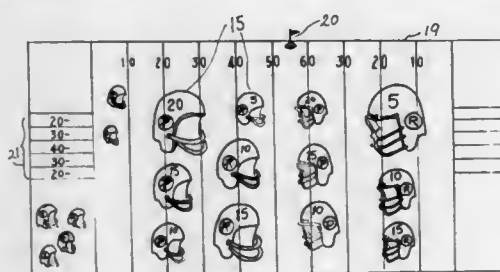


9. A game piece having:  
(a) a game piece front surface which bears indicia related to a game activity or value;  
(b) a holographic member forming a first holographic image disposed on at least a portion of said front surface and constituting at least a part of said indicia;  
(c) said holographic member constituting means affording a substantially unimpeded view of the image in a relatively narrow and limited range of direction with respect to said front surface and to be substantially indistinguishable at directions outside of said narrow and limited range.

4,681,325  
GAME TOY  
Sang K. Sheem, 2616 Starling Ct., Pleasanton, Calif. 94566  
Filed Apr. 11, 1985, Ser. No. 722,230  
Int. Cl. A63J 3/00

U.S. Cl. 273-345

17 Claims



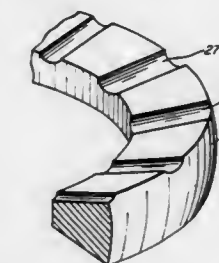
1. Apparatus for playing a football dart game comprising:  
a game board for receiving darts, said game board being designed to be recognizable as a simulated football field with the lines and yardage markers that typify the football field;  
a plurality of offensive targets arranged on said game board, each offensive target containing identifications representing at least one of various play options available to be used by an offensive team in a football game; and  
a plurality of defensive targets arranged on said game board, each defensive target containing identifications representing at least one of various defensive play options available as the corresponding defensive countermeasures against the offensive play options of said offensive targets, and to be used by a defensive team;  
each of said offensive and defensive targets being an individually distinct target and with a corresponding defensive target marked to counteract an offensive play option

being provided for each offensive target marked to indicate an offensive play option in the game of football; wherein said offensive targets are positioned on one side of the 50 yard line of said football field and said defensive targets are positioned on the other side of said 50 yard line; so that two players or groups of players may play said football dart game in an interactive sequence of alternate dart throws by the two players or groups of players representing the offensive and defensive teams respectively.

4,681,326  
GAS LUBRICATED PISTON RING ASSEMBLY  
Isoroku Kubo, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.  
Filed Jun. 10, 1985, Ser. No. 742,910  
Int. Cl. F16J 9/08, 9/12

U.S. Cl. 277-27

6 Claims



1. A piston ring assembly comprising:  
a piston member,  
an annular groove in said piston member positioned proximate to the lower end of said piston member,  
a circumferentially extending ring positioned in said annular groove adapted for sealing engagement with said cylinder wall, said ring being dimensioned to provide a clearance between said annular groove and the bottom and the radially inward surfaces of said ring and having gas flow means on the upper surface thereof whereby upon downward movement of the said piston member gas is permitted to flow up and around said ring so as to be trapped in the axial space between said piston and said cylinder wall above said ring to thereby form a gas bearing for the piston.

4,681,327  
COMPOUND SEAL WITH PRESSURE EQUALIZATION APERTURE

Guy d'Agostino, Vitry; André Dhainaut, Dammarie les Lys; Daniel G. A. Kettler, Chartrettes, and Henry R. Leclerc, Jovisy sur Orge, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A.", France

Filed Nov. 25, 1986, Ser. No. 934,831

Claims priority, application France, Nov. 25, 1985, 85 17745  
Int. Cl. F16J 15/10

U.S. Cl. 277-29

17 Claims

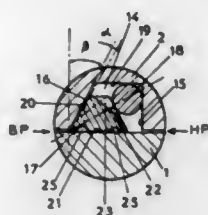
1. A compound seal for effecting a seal between a shaft element having a longitudinal axis and a sleeve element wherein one of the elements is movable with respect to the other of the elements and defines a high pressure zone and a low pressure zone comprising:

(a) an annular groove defined by one of the elements, the groove having a low pressure side, a bottom and a high pressure side;  
(b) a sealing member disposed in the annular groove, the sealing member having a first sealing side bearing against the low pressure side of the annular groove, a second sealing side bearing against the other of the elements and



at least a third side extending substantially perpendicular to a bisector of an angle subtended by the first and second sides;

(c) an annular clamping member bearing against the bottom and the high pressure side of the groove, and against the third side of the sealing member so as to exert a force on the sealing member in substantially the direction of the



bisector so as to urge the first and second sides in sealing contact with the low pressure side and the other of the elements, respectively; and,  
(d) at least one aperture defined by the sealing member and extending in a generally radial direction on either side of the clamping member so as to allow equalization of pressure on either side of the clamping member.

4,681,328

## MAGNETIC LIQUID SHAFT SEAL

Klaus Ritter, Hirschberg; Klaus Michaelson, Hassloch, and Gunther Mair, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

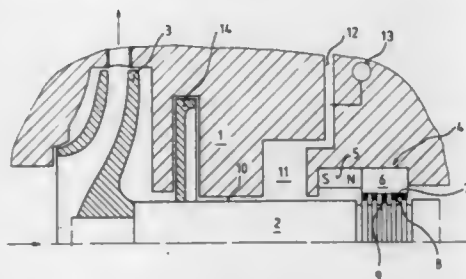
Filed Nov. 6, 1986, Ser. No. 927,367

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539777

Int. Cl.<sup>4</sup> F16J 15/40

U.S. Cl. 277—80

4 Claims



1. A shaft seal which contains a magnetic liquid, for pump shafts or the like, comprising a permanent magnet which surrounds the shaft, is a distance away from the latter, is fastened in the bearing housing of the shaft and has one or more pole pieces which, together with the shaft surface, form an air gap in which the magnetic liquid is held by the magnetic field and which is sealed as a result, wherein a volume of inert gas which surrounds the shaft is present between the magnetic liquid seal and the shaft channel to the medium.

4,681,329

## HIGH VACUUM GATE VALVE HAVING IMPROVED METAL VACUUM SEAL JOINT

Jose L. Contín, Orinda, Calif., assignor to MDC Vacuum Products Corporation, Hayward, Calif.

Filed Jul. 2, 1986, Ser. No. 881,074

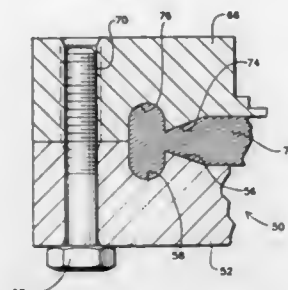
Int. Cl.<sup>4</sup> F16J 15/08

U.S. Cl. 277—167.5

4 Claims

1. A flange for providing a high vacuum generally rectangular joint in combination with a second flange of mirrored geometry and a metal gasket compressed and swaged therebetween

to achieve a high vacuum seal at the joint, the flange comprising a substantially planar face, a generally rectangular, continuously formed trough defined in said face, said trough being substantially semicircular in cross section, and a raised

4,681,330  
HAND TRUCK

Rintaro Misawa, Tokorozawa, Japan, assignor to Sunwa Sharyo Manufacturing Co., Ltd., Tokyo, Japan

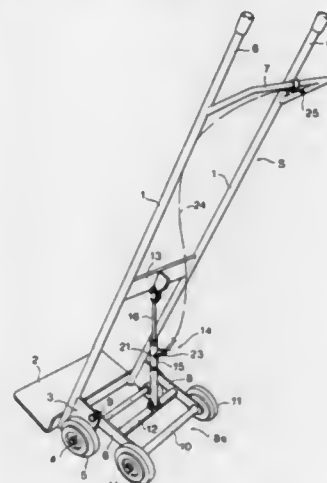
Filed Dec. 11, 1985, Ser. No. 807,571

Claims priority, application Japan, Dec. 14, 1984, 59-189580[U]

Int. Cl.<sup>4</sup> B62B 1/08

U.S. Cl. 280—47.2

5 Claims



1. A hand truck comprising:

- a load supporting frame having a handle at an upper end portion thereof;
- a load supporting platform provided on a lower portion of the load supporting frame;
- a pair of main wheels provided on a lower portion of the load supporting frame;
- an auxiliary frame pivotally mounted on a lower portion of the load supporting frame;
- a pair of auxiliary wheels provided on a trailing end of the auxiliary frame;
- extensible cylinder means provided between the load supporting frame and the auxiliary frame so as to keep the load supporting frame at a desired position, the cylinder means including a cylinder and a rod slidably mounted in the cylinder, one of said cylinder and rod being pivotally connected at a lower end thereof to the auxiliary frame at

a location inboard of said trailing end, and a spring wound on the rod and secured to the cylinder at both ends thereof so as to lock the rod by contraction thereof, the other of said cylinder and rod being pivotally connected to the load supporting frame at a connection position lower than a half of the length of the load supporting frame; and operating means for operating the cylinder means, said operating means including a wire for expanding the spring to release the rod, and a lever provided on the handle for pulling the wire to release the rod.

4,681,331

## PERAMBULATOR

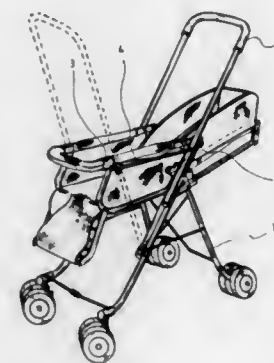
Dieter Gläser, Dachau, Fed. Rep. of Germany, assignor to Peg Perego Pines S.p.A., Milan, Italy

Filed Oct. 9, 1984, Ser. No. 658,794

Int. Cl.<sup>4</sup> B62B 7/06

U.S. Cl. 280—47.36

6 Claims



1. A baby carriage comprising:

- a frame;
- a seat coupled to the frame adapted to receive a child;
- a push bar assembly pivotally connected to both sides of said frame and adapted to be locked at a forward position and a rearward position;
- two stop members (3) for limiting the pivotal movement of said push bar assembly provided on each side of same frame (1); and
- a manually operable elongated locking element (4) adapted in its rest position to prevent said push bar assembly from being pivoted from one position to the other and longitudinally interposed at an intermediate location between said two positions,
- said locking element (4) being coupled to a center portion of a guide rod (5) connecting said stop members (3) and having end portions projecting into the pivoting path of said push bar assembly (2),
- said locking element (4) being of U shaped configuration between said end portions
- each of said end portions of said locking element (4) being adapted to be alternately displaced transversely towards said guide rod (5) for the release of said push bar assembly (2).

4,681,332

## MOBILE VEHICLE FOR TRAINING SKATERS

Don Malone, Martin, Tenn., assignor to University of Tennessee Research Corporation, Knoxville, Tenn.

Filed May 21, 1986, Ser. No. 865,535

Int. Cl.<sup>4</sup> A63C 3/04

U.S. Cl. 280—87.02 R

15 Claims

- 1. A mobile vehicle for training skaters comprising
- a narrow straddlebar extending forwardly and upwardly;
- a front leg attached to the front of said straddlebar extending downwardly and forwardly;
- a rear leg attached to the rear of said straddlebar extending downwardly and rearwardly for a considerable distance,

said straddlebar being substantially the only structural support said front leg and said rear leg;

- a horizontal, transversely extending basebar having a left and right outermost end attached to the bottom end of said front leg;
- a horizontal, transversely extending basebar having a left and right outermost end attached to the lower end of said rear leg;



- a swiveling wheel attached near said left and right outermost ends of said horizontally extending basebars;
- a bicycle-like seat mounted above the top of said rear leg at an elevation adjacent to rear of said straddlebar; and
- a handlebar attached and fixed against swiveling above the top portion of said front leg.

4,681,333

## WIND PROPELLED LAND VEHICLE

Anthony Rouge, Boysenstrasse 1, D-3200 Hildesheim, and Joachim Schulze, Harsum-Asel, both of Fed. Rep. of Germany, assignors to Anthony Rouge, Hildesheim, Fed. Rep. of Germany

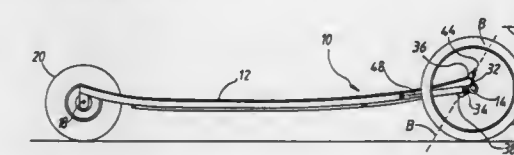
Filed Oct. 26, 1984, Ser. No. 665,309

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338946; Oct. 27, 1983, 8330835[U]; Dec. 21, 1983, 3346905; Dec. 21, 1983, 8337165[U]

Int. Cl.<sup>4</sup> A63C 17/04

U.S. Cl. 280—87.04 A

11 Claims



1. A wind propelled land vehicle, comprising:

- (a) a footboard having first and second ends and upper and lower surfaces;
- (b) a front axle disposed at the first end of said footboard;
- (c) a rear axle disposed at and fixedly mounted to the second end of said footboard;
- (d) steering means for said vehicle including a steering head mounted centrally on said front axle, said steering head comprising two spaced bushes aligned along an axis inclined to the direction of movement of said vehicle, a first one of said bushes being disposed on said axis below and to the rear of a second one of said bushes, a sleeve mounted to said footboard and having an inclined axis coinciding with the axis of said bushes, and a steering pivot pin connecting said two bushes axially with said sleeve, said first bush being disposed below said lower surface of said footboard and said second bush being disposed above said upper surface of said footboard;
- (e) spaced motion apart means mounted on said front axle for permitting movement of said vehicle over a surface, said spaced apart motion means being symmetrically located with respect to the longitudinal axis of said footboard;

- (f) single means mounted on said rear axle for permitting movement of said vehicle over a surface; and  
 (g) steering damper means comprising spaced apart shock absorbers mounted symmetrically with respect to said steering head and connecting said front axle to said foot-board in an articulated manner.

4,681,334

## BOAT LAUNCHING APPARATUS

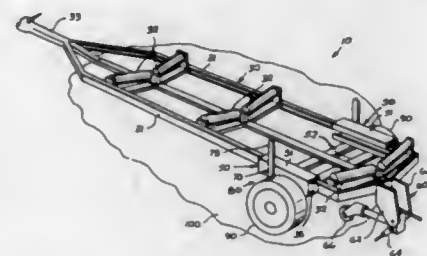
William D. O'Brien, Jr., 4483 Francis Ct., Lilburn, Ga. 30247

Filed Jul. 7, 1986, Ser. No. 881,949

Int. Cl. A60P 3/10

U.S. Cl. 280-414.1

6 Claims



1. A trailer assembly for transporting, launching and loading boats comprising, in combination, a carriage assembly for carrying a boat, and a transport assembly for supporting said carriage assembly;

said carriage assembly having first and second, laterally spaced longitudinal frame members extending from the front to the rear of said carriage assembly, the front ends of said longitudinal frame members having means for directly connecting said carriage assembly to a towing vehicle, said first and second frame members extending through first and second elongated housing members respectively, said housing members being affixed to said transport assembly and adapted to permit free longitudinal movement of said frame members relative to said transport assembly in a single plane;

said transport assembly comprising first and second transport wheels mounted to said first and second housing members respectively, and locking means mounted on at least one of said housing members and adapted to engage at least one of said longitudinal frame members to prevent relative movement between said carriage assembly and said transport assembly, said locking means including means for disengaging said locking means from said longitudinal frame member to permit free longitudinal movement of said carriage assembly relative to said transport assembly;

said transport assembly further including braking means for locking said transport wheels; and

a load bearing wheel assembly comprising a pair of laterally spaced plates affixed to the rear end of said carriage assembly, a support shaft having one end pivotally mounted between said plates so as to be movable between an operating position wherein the support shaft is perpendicular to said carriage assembly and a transport position wherein said support shaft is substantially parallel to said carriage assembly, a detent shaft mounted between said plates for holding said support shaft in either of said positions and means for releasing said detent shaft to permit movement of said support shaft between the two positions, and a load bearing wheel rotatably mounted to the other end of said support shaft, said load bearing wheel assembly including means to adjust said load bearing wheel up or down when said support shaft is in the operating position for causing said load bearing wheel to contact the ground, thereby supporting the rear end of said carriage assembly.

4,681,335

## CENTER PIVOT HITCH ASSEMBLY

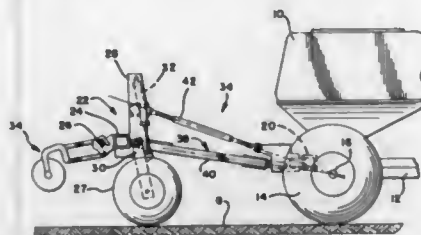
Donald L. Ledermann, Darien, and Ronald L. Otten, Naperville, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 6, 1986, Ser. No. 836,730

Int. Cl. A01B 59/042; B60D 1/00

U.S. Cl. 280-446 R

3 Claims



1. An agricultural implement hitch assembly and stabilization arrangement, comprising:

a tool bar adapted to receive associated ground-working tools, said tool bar being provided with means for effecting vertical movement of the tool bar between raised and lowered positions;

a wheeled implement including a pair of laterally spaced wheels defining a transverse wheel axis;

frame means rigidly connected to and extending forwardly of said tool bar;

means pivotally connecting a forward end portion of said frame means to a backside of said wheeled implement whereby said tool bar is laterally pivotable relative to said wheeled implement, said frame means including first lower linking means and second upper linking means arranged in non-parallel relation, said second upper linking means being positioned to direct an overhung load created on said tool bar in said raised position thereof substantially along said transverse axis of said wheeled implement; and

hydraulic stabilization means extending between and connected with said wheeled implement and said frame means, said stabilization means comprising extensible hydraulic fluid actuator means, and means for controlling fluid flow into and from said actuator means for selectively (1) fixing the effective length of said actuator means to maintain said tool bar in a fixed, generally perpendicular disposition relative to the longitudinal axis of said wheeled implement, and (2) controlling said actuator means to stabilize movement of said tool bar relative to said wheeled implement;

wherein in said raised position of said tool bar, said upper and lower linking means of said frame means are arranged in forwardly converging relation to each other, with the upper and lower linking means respectively defining lines of action which intersect generally at said transverse wheel axis of said wheeled implement.

4,681,336

## VARIABLE LENGTH LINK FOR A THREE-POINT HITCH

Robert Kryscyk, Ketsch, Fed. Rep. of Germany, assignor to Deere &amp; Company, Moline, Ill.

Filed Mar. 28, 1986, Ser. No. 845,716

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512428

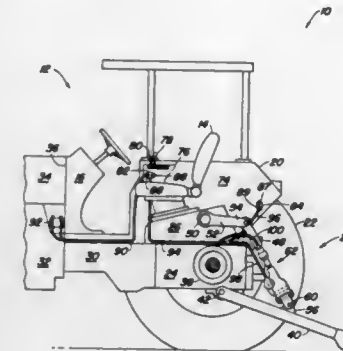
Int. Cl. B60D 1/14

U.S. Cl. 280-482

7 Claims

1. A variable length link for a vehicle power lift system adapted to connect a working implement to the vehicle, the link comprising: first and second spaced apart anchor elements defining the ends of the link, the first anchor element having a portion with a threaded opening, a spindle having one end rotatably connected to the second anchor element and a

threaded portion engaged in the threaded opening of the first anchor element, a motor carried by the second anchor element and having a power output, and means interconnecting the motor and spindle for increasing the power of the motor output and rotating the spindle whereby the threaded engagement between the spindle and first anchor element causes the spindle



4,681,337

## SAFETY SKI HARNESS

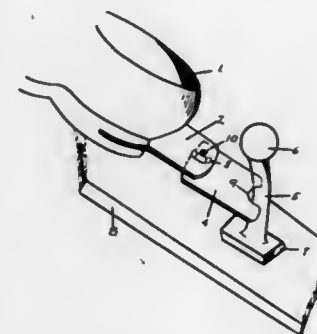
John D'Arcy Bolton, 5 Shiloh Cir., Irvine, Calif. 92714

Filed Apr. 25, 1986, Ser. No. 855,926

Int. Cl. A63C 9/08

U.S. Cl. 280-615

1 Claim



1. A boot binding device for removably holding a ski boot to a ski that permits vertical movement of the ski boot and restrains lateral movement of the boot and that releases the boot in an accidental fall comprising:

a curved ski rod fixed to the ski and curved to follow the arc traced by the ski boot heel as it moves vertically with the toe of the boot fixed about a pivotal point,

a rod plate having a cut away groove at one end to accommodate said ski rod,

a boot plate fixed at one end to said ski boot and connected to said rod plate by a pivot pin that extends through holes in the plates at their other ends, said pivot pin having an adjustment means to adjust the bias of the two plates towards each other and thus adjust the extent of lateral retention of the boot,

in the event of a fall the two plates pivot about the pivot pin to release the boot from the lateral retention of the ski rod.

4,681,338

## SAFETY SKI BINDING

Engelbert Spitaler, Nendorf, Austria, assignor to TMC Corporation, Baar, Switzerland

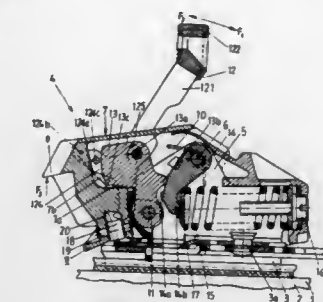
Filed Jul. 15, 1985, Ser. No. 755,177

Claims priority, application Austria, Jul. 13, 1984, 2267/84

Int. Cl. A63C 9/08

U.S. Cl. 280-628

10 Claims



1. In a safety ski binding having a sole holder which can be pivoted about a transverse axis between a downhill skiing position and an open position relative to a base member, which is releasably held in its downhill skiing position by a resilient locking member which acts onto the sole holder through a locking mechanism, and which is supported on the base member, wherein the locking mechanism includes a control surface which is constructed on a rear region of the sole holder and includes a locking lever which is supported on the base member for movement about a swivel axis, the locking lever pivotally supporting a two-arm release lever on a portion thereof which extends above the swivel axis, a first arm of the release lever being a load arm which grips under a portion of the sole holder and a second arm thereof being a force arm which is constructed as an operating lever, and wherein movement of the release lever in a release direction counteracts, through compression of the resilient locking member, the resilient force acting on the locking mechanism so that the sole holder can be swung upwardly from its downhill skiing position to its open position substantially free of resistance from the locking mechanism, the improvement comprising wherein the release lever has an extension which can engage the sole holder and which, when the sole holder is in its open position and the release lever is moved in a closing direction, engages the sole holder and moves the sole holder to its downhill skiing position.

4,681,339

## SKI BINDING PART, IN PARTICULAR A FRONT JAW

Alois Himmetsberger; Radko Pavlovic; Heinz Wittmann, all of Vienna; Hubert Wuerthner, Hainburg; Tibor Szasz, Vienna;

Kurt Liedl, Petronell, and Roland Erdei, Pottendorf, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Continuation of Ser. No. 726,522, Apr. 24, 1985, abandoned.

This application Sep. 22, 1986, Ser. No. 910,317

Claims priority, application Austria, Apr. 27, 1984, 1419/84

Int. Cl. A63C 9/22

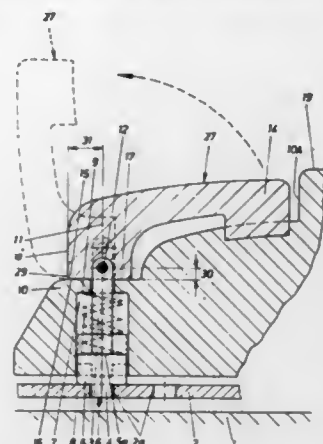
U.S. Cl. 280-633

17 Claims

1. In a front jaw of a ski binding having a guide rail adapted to be fastened to an upper side of a ski and having support means thereon for supporting a jaw unit for movement in a longitudinal direction of said ski, said jaw unit having a housing and a locking means for locking said jaw unit in predetermined adjusted positions on said guide rail, said locking means including a locking part which is movably held on said jaw unit and a resilient means for continually urging said locking part into a form-locking selective engagement with a complementary locking recess on said guide rail, said front jaw having an operating member and means for operatively connecting said operating member to said locking part for effecting a disengagement of said locking part from said complementary



locking recess, the improvement comprising wherein said housing has means defining a recessed portion therein, wherein said operating member is connected to said locking part at a support point and is provided with first and second surfaces defining an angle therebetween, each surface being spaced a different distance from said support point, said first surface engaging said housing when said locking part is engaged in said locking recess, said second surface engaging said housing when said locking part is out of engagement with said locking



recess, wherein at least one of said first and second surfaces is urged into engagement with said housing by said resilient means whereby when said second surface engages said housing, said resilient means will hold said second surface in engagement with said housing and thereby hold said locking part out of engagement with said locking recess to thereby render said front jaw free to move along the length of said ski, and wherein said operating member is received in said recessed portion in said housing when said first surface engages said housing,

4,681,340

## CHILD'S FOLDING PUSHCHAIR

Henri Pasquini, Cholet, France, assignor to Ampafrance, S.A.,  
Boulogne-Billancourt, France

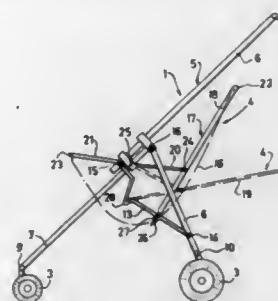
Filed Jul. 29, 1985, Ser. No. 759,732

Claims priority, application France, Aug. 6, 1984, 84 12419

Int. Cl.<sup>4</sup> B62B 7/06

U.S. Cl. 280—642

10 Claims



1. A child's folding pushchair, comprising two lateral frame assemblies transversely connected to each other by means of at least one bracing crossbar, each lateral frame assembly having a first element formed of a main supporting arm whose lower front portion supports a second element of said assembly formed by a front strut carrying at least one front wheel or the like, a third element of said assembly formed by a rear strut carrying at least one rear wheel or the like, the first and second elements being slidably coupled to each other and the third

element being pivotally attached at its upper end to one of said first and second elements, and a fourth element of said assembly formed by a stiffening link-rod the ends of which are pivotally connected to the third element and to the other one of said first and second elements respectively, and a seat unit carried by each lateral frame assembly, the lateral frame assemblies being foldably collapsible by relative retraction of said first and second elements in sliding relationship and by causing the third element to rotate towards said first and second elements due to the drawing action of said fourth element, wherein the seat unit comprises a frame provided on each lateral side with a seat-back lateral chassis member pivotally supported on one of said third and fourth elements and pivotally connected to an end of a connecting-rod having another end pivotally connected to one of said first and second elements, whereby for folding of the pushchair, when said first and second elements relatively retract in sliding motion and said third element is rotatable towards said first and second elements under the drawing action applied by said fourth element, said seat-back lateral chassis member and said connecting-rod also move to the folded position.

4,681,341

## COLLAPSIBLE GOLF CART WITH ONE-STEP FOLDING OPERATION

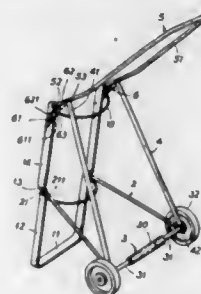
Winston Lai, P.O. Box 10160, Taipei, Taiwan

Filed Jul. 14, 1986, Ser. No. 885,603

Int. Cl.<sup>4</sup> B62B 1/26

U.S. Cl. 280—646

5 Claims



1. A collapsible golf cart comprising: a generally U-shaped supporting frame adapted for receiving and fastening a golf bag thereon, said frame having a base plate, two side arms extending upwardly from the sides of said base plate, an inclined-surface portion extending upwardly and outwardly from the upper end of each said side arm, and an upper arm extending upwardly from the upper end of each said inclined-surface portion;

a generally U-shaped handle having two arms with open ends, each open end being pivotally secured to a respective one of said upper arms by first pin means;

a pair of radial-movement legs, each leg having an upper end with an inclined-surface plate pivotally connected to a respective one of said inclined-surface portions by screw means for permitting sliding engagement of said inclined-surface plate with said inclined-surface portion and a lower end with an opening extending therethrough;

a pair of actuating links, each link having an upper end pivotally connected by second pin means to a respective arm of said handle at a location adjacent said first pin means and a lower end with an opening extending therethrough;

a wheel supporting shaft including a central sleeve, a pair of telescopic shafts, and a wheel rotatably mounted on an outer portion of each shaft, the inner portion of each shaft, being telescopically received within a respective end of said central sleeve, each said shaft having its outer portion pivotally received within the opening at the lower end of each said radial-movement leg and said actuating link; whereby when said cart is in a collapsed position, upon the

raising of said handle about a fulcrum of said first pin means, said actuating links are pulled outwardly by said handle for moving the lower ends of said radial-movement legs rearwardly and outwardly while their upper ends pivot about the axis of said screw means, thereby resulting in the extension of each wheel and its respective telescopic shaft in an outwardly transverse direction for increasing the stability of the cart.

4,681,342

## WHEEL SUSPENSION

Hans-Jürgen Göerich, Sersheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

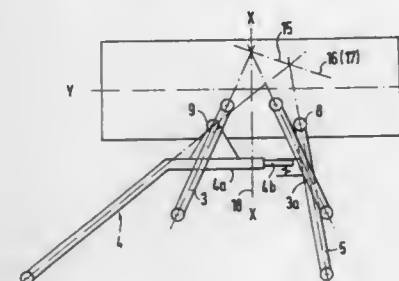
Filed Apr. 24, 1986, Ser. No. 855,358

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514788

Int. Cl.<sup>4</sup> B60G 3/18

U.S. Cl. 280—690

11 Claims



1. A wheel suspension for a motor vehicle, comprising a double cross-guide member structure including two upper and two lower guide arms, said double cross-guide member structure being pivotally connected at a wheel carrier and forming an elastokinematic axis of rotation with an ideal wheel steering pole which—in relation to the driving direction—is located to the rear of the axis of rotation of the wheel and outside of the track, the wheel being adjustable in case of forces acting on the same, a forwardly disposed lower guide arm of the wheel suspension—in relation to the driving direction—being retained at the wheel carrier in front of the axis of rotation of the wheel within a joint means and being supported at its rearward end on a control bearing support means arranged to the rear of the wheel axis of rotation and yielding in the vehicle transverse direction.

4,681,343

## REAR AXLE ASSEMBLY FOR SUSPENSION OF MOTOR VEHICLES

Patrick Gallet, Les Ulis, and Henri Galles, Aulnay sur Mauldre, both of France, assignors to Regie Nationale Des Usines Renault, Boulogne Billancourt, France

Filed Jan. 24, 1986, Ser. No. 821,970

Claims priority, application France, Apr. 19, 1985, 85 05975

Int. Cl.<sup>4</sup> B60G 11/46, 3/00

U.S. Cl. 280—699

4 Claims

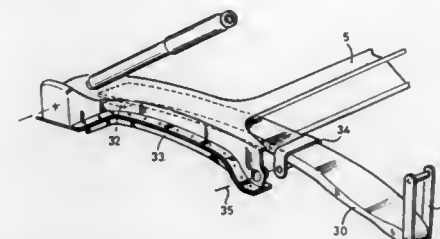
1. A vehicle suspension comprising:

a box section trailing arm having box section surfaces, said arm further including an open end pivoted to a body of said vehicle about a fixed axis, as well as an end opposite said open end and including means for attachment of a road wheel thereto;

a leaf spring having one end connected to said vehicle body by a shackle and having another end fitting through said open end and into said box section of said trailing arm;

a clevis fixed to a mid portion of said leaf spring and pivoted about said axis, said clevis being positioned to rest against a crossmember of said body, whereby said another end of

said leaf spring is pressed towards a lower interior surface of said box section; and



pad means positioned between said another end of said leaf spring and said lower surface of said box section.

4,681,344

## SAFETY HOLD-DOWN BAR SYSTEM

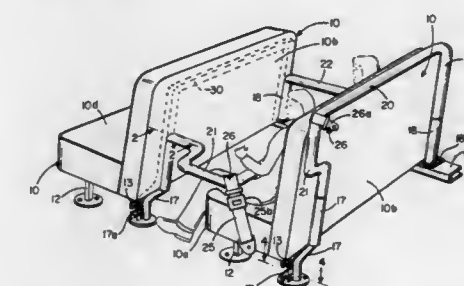
Howard J. Majerus, Rte. 2, Osakis, Minn. 56360

Filed Sep. 27, 1985, Ser. No. 781,041

Int. Cl.<sup>4</sup> B60R 21/00

U.S. Cl. 280—751

4 Claims



1. A safety hold-down bar system for restraining passengers in combination with a multiple seat bus, said system comprising:

a multiple seat bus having side windows and a central aisle with rows of seats on both sides of the aisle and a driver's seat in the front of the bus with a rear view mirror positioned to permit the driver view the inner aisle ends of the seats;

a pair of upstanding support struts mounted in fixed relation adjacent the back of each seat disposed forwardly of the seat in which the passengers are to be restrained;

a continuous, substantially U-shaped restraining bar unit extending substantially the full width of the seat from the window to the aisle end thereof and pivotally mounted on said struts for swinging movement from upstanding, substantially vertical, inoperative position downwardly into restraining operative position in engagement with the lap of each seated passenger, and

releasable means located at the aisle end of the bar unit within view from the driver's seat for anchoring the U-shaped bar in downward restraining position.

4,681,345

## PASSIVE AUTOMOBILE SEAT BELT REMINDING DEVICE

Willson C. Swartout, 31 Phoenix Ave., Newark, Del. 19711

Filed Jul. 23, 1986, Ser. No. 888,477

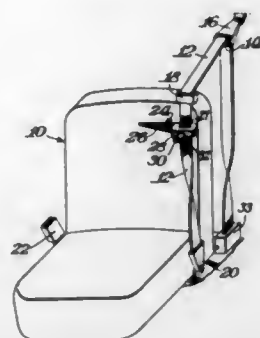
Int. Cl.<sup>4</sup> B60R 21/10

U.S. Cl. 280—801

1 Claim

1. A device which passively reminds persons seated in an automotive vehicle seat to fasten his or her seat belt, the device comprising seat belt clip means for an otherwise conventional seat belt employed in conjunction with said seat, the clip means having a projection extending therefrom such that, when the

seat belt is disengaged, said clip means is positioned so that said projection extends into the space normally occupied by a user of said seat, and when the seat belt is properly engaged, said clip means is positioned so that the projection is stowed unob-



trusively out of the way of the user and vehicle controls, thereby causing discomfort to said user of said seat as a result of said projection prodding said user until the user properly engages the seat belt.

4,681,346

**AUTOMATICALLY FASTENING SEATBELT ASSEMBLY**  
Noritada Yoshitsugu, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

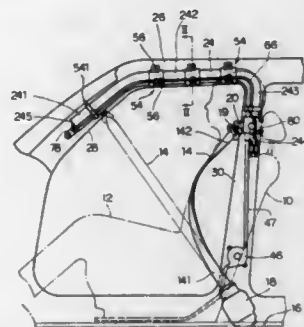
Filed Dec. 3, 1985, Ser. No. 804,081

Claims priority, application Japan, Dec. 12, 1984, 59-188253(U); Jan. 16, 1985, 60-3860(U)

Int. Cl.<sup>4</sup> B60R 21/00

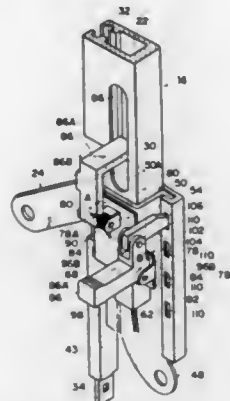
U.S. Cl. 280—804

31 Claims



1. A seatbelt assembly for automatically fastening a restraining webbing around an occupant in a vehicle, comprising:  
a guide rail having a longitudinal guide groove formed therein;  
a slider displaceable along said longitudinal guide groove;  
an anchor plate pivotally mounted to said slider, the restraining webbing being attached to said anchor plate;  
adjusting means for adjusting a normal position of said anchor plate in relation to said slider, thereby permitting adjustment of the position of the restraining webbing relative to the size of the occupant; and  
rotation preventing means for preventing said anchor plate from rotating beyond a predetermined angle relative to said slider.

4,681,347  
**AUTOMATIC SEATBELT APPARATUS**  
Keiichi Tamura; Yuji Nishimura, and Takashi Kawaharazaki, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan  
Filed Sep. 3, 1986, Ser. No. 903,246  
Claims priority, application Japan, Sep. 4, 1985, 60-135251(U)  
Int. Cl.<sup>4</sup> B60R 22/06  
U.S. Cl. 280—804 21 Claims



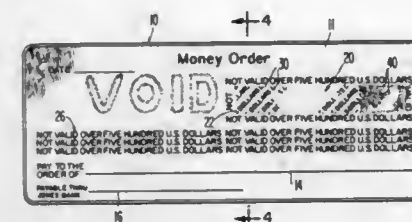
1. An automatic seatbelt apparatus which is capable of automatically applying, or canceling the application of, a webbing around an occupant of a vehicle, comprising:  
(a) a guide rail disposed in the vicinity of the roof of a vehicle such as to extend in the longitudinal direction of the vehicle;  
(b) a slider by which one end of said webbing is retained and which is capable of moving along said guide rail;  
(c) a flexible elongated member for moving said slider along the guide rail toward the front or rear of the vehicle between a webbing-application position and a webbing application-canceling position;  
(d) a driving means for driving said flexible elongated member by imparting a driving force to the same such as to move said slider;  
(e) a flexible guide member disposed between said driving means and said guide rail and accommodating a part of said flexible elongated member;  
(f) a detecting means which moves in response to the bending of said guide member and is adapted to stop said driving means when said slider reaches said webbing-application position; and  
(g) a lock means for selectively securing said detecting means at a plurality of predetermined positions in response to the bending of said guide member, whereby said webbing-application position can be altered even if the occupant is in a webbing-applied state.

4,681,348

**FINANCIAL DOCUMENT PROTECTION**  
William H. Mowry, Jr., Ionia, N.Y., assignor to The Standard Register Co., Dayton, Ohio  
Filed May 31, 1985, Ser. No. 739,848  
Int. Cl.<sup>4</sup> B42D 15/00; G09F 3/03  
U.S. Cl. 283—58 6 Claims

1. A financial document protected against alteration, comprising:  
a substrate,  
a first area, extending across a portion of the surface of said substrate, for indicia specifying the amount of said financial document, said first area having at least one line of indicia indicating a maximum amount, and  
a second area on said substrate for indicia specifying the amount of said financial document, said second area hav-

ing associated therewith indicia specifying the maximum amount of said financial document and further including a



plurality of diagonal variable spaced lines of indicia which indicate currency.

4,681,349

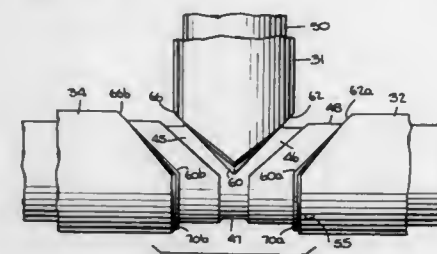
**PLASTIC LINED WELDED METAL COMPONENT AND METHOD OF MANUFACTURE**  
Irving D. Press, West Orange, and John Krieg, Morristown, both of N.J., assignors to Unidynamics Corporation, New York, N.Y.

Filed Jan. 3, 1986, Ser. No. 870,025

Int. Cl.<sup>4</sup> F16L 13/02

U.S. Cl. 285—55

25 Claims



1. A method for fabricating a plastic-lined weldment in which metal housing members are assembled about a preformed plastic liner and the joints between the housing members are welded, comprising in combination the steps of selecting a one piece preformed plastic liner having grooves in its outer surface which grooves are located for underlying the joints to be welded coextensive with said joints, assembling about said selected liner said housing members with the joints located over said grooves, at least one of said housing members having path-defining surfaces for establishing communication between said grooves and the surrounding atmosphere when said housing members are assembled about said liner, and thereafter welding said joints.

4,681,350

**QUICK COUPLING CONNECTION FOR HOSES**  
Giorgio Gaita, Correggio Emilia, Italy, assignor to G.F. S.r.l., Correggio Emilia, Italy

Filed Dec. 11, 1985, Ser. No. 807,698

Claims priority, application Italy, Aug. 2, 1985, 34836/85(U)

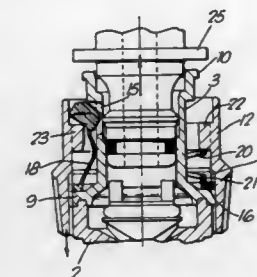
Int. Cl.<sup>4</sup> F16L 37/00

U.S. Cl. 285—315

1 Claim

1. In a quick coupling connection of the type comprising a male element with an outer engagement groove; a receiving portion in the form of a female element to axially receive the male element and provided with two diametrically opposing apertures; an axially slidable collar which embraces the receiving portion of the female element; and interposed between said female element and collar, two teeth, which are inserted into the apertures of the female teeth radially outwardly into engagement with an inner surface of the collar, and wherein the elastic means comprise, two identical annular elements interposed between said strips and in the form of an ellipse with its major axis orthogonal to the axis of the coupling, said annular elements each curving about its major axis, said strips and

annular elements being connected to a common circular base ring resting on a widened part of the receiving portion, respective projections on the inner surface of the collar against which said elliptical elastic elements press, and protuberances on said

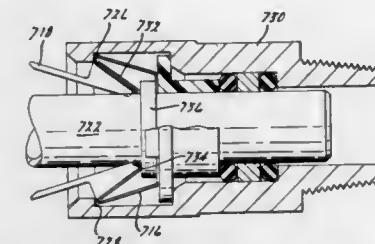


4,681,351

**SWIVELABLE QUICK CONNECTOR ASSEMBLY**  
Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.  
Continuation-in-part of Ser. No. 360,201, Mar. 22, 1982, Pat. No. 4,601,497, which is a continuation-in-part of Ser. No. 201,711, Oct. 29, 1980, Pat. No. 4,423,892. This application Sep. 16, 1985, Ser. No. 776,644  
Int. Cl.<sup>4</sup> F16L 37/12

U.S. Cl. 285—319

12 Claims



1. A retainer element for securing a conduit in a connector, the retainer element comprising:  
a body, said body having a collar means, said collar having an aperture therethrough for passage of said conduit, at least two deflectable legs projecting from said body, and clasp means secured to said legs for securing said conduit in said retainer element and in said connector, said clasp means includes a latch, said latch having a catch for securing said clasp on said leg of said body.

4,681,352

**JOINT FOR A PIPE PROVIDED WITH A FLARED END**  
Göran Sundholm, Kauniainen, Finland, assignor to GS-Hydro Oy, Vantaa, Finland  
PCT No. PCT/FI85/00031, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO86/00383, PCT Pub. Date Jan. 16, 1986

PCT Filed Mar. 29, 1985, Ser. No. 843,691

Claims priority, application Finland, Jun. 18, 1984, 842455  
Int. Cl.<sup>4</sup> F16L 25/00

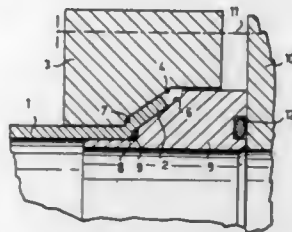
U.S. Cl. 285—334.1

6 Claims

1. A joint for a pipe having a flared end comprising a tightening flange provided with an internal supporting surface for making contact with an outside of the flare, an insert piece having an external supporting surface for making contact with the inside of said flare, said internal supporting surface of the



tightening flange having in the radially inner end thereof a substantially rounded shoulder for initiating contact with the outside of the flare at least in the transition area between said flare and the axial portion of the pipe when the tightening



flange is tightened, the external supporting surface of the insert piece is provided in the radially inner end thereof with a notch for receiving the pipe material deformed by said shoulder of the tightening flange, a sealing ring being fitted in said notch of the insert piece.

4,681,353

### V-COUPLING FOR INSTALLATION IN NARROW ANNULAR SPACES

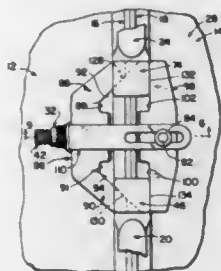
Horace P. Halling, Laurel, Md., assignor to Pressure Science Incorporated, Beltsville, Md.

Filed Jul. 17, 1984, Ser. No. 631,795

Int. Cl.<sup>4</sup> F16L 23/00

U.S. Cl. 285—411

11 Claims



1. A device for coupling a first peripheral flange on a first annular member and a second peripheral flange on a second annular member, these flanges being coaxial, the combination comprising:

at least first and second arcuate coupling members, each arcuate coupling member having an inner surface including a recess for receiving portions of the first and second peripheral flanges therein, and having first and second ends;

pivot means, coupled to the first ends of said first and second arcuate coupling members, for pivotally coupling said first ends together; and

tightening means, coupled to the second ends of said first and second arcuate coupling members, for coupling said second ends together and for radially inwardly moving said first and second arcuate coupling members into intimate contact with said first and second flanges,

said tightening means comprising:

a rotatable member, said rotatable member being oriented in an axial direction parallel to the axis of the coupled coaxial flanges,

first and second tightening members engaging said first and second arcuate coupling members,

connecting means for connecting said first tightening member to said second tightening member, and

retaining means, coupled to said first and second tightening members, for retaining said first tightening member in proximity to said second tightening member,

said retaining means including a U-shaped member engaging

said first tightening member and a pin coupled to said second tightening member and to said U-shaped member.

4,681,354

### WINDOW GRILL LATCH

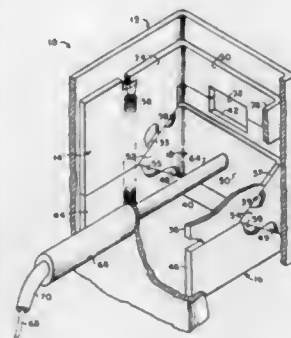
David R. Warwick, 51 Silverwood Dr., Lafayette, Calif. 94549

Filed Nov. 25, 1986, Ser. No. 935,529

Int. Cl.<sup>4</sup> E05C 1/12

U.S. Cl. 292—37

5 Claims



1. A grill latch comprising means defining a latch guide housing having means defining a bolt receiving opening therein, an upper latch member disposed in said latch guide housing comprising an upper bolt receiving face plate disposed proximate said bolt receiving opening in said latch guide housing, a pair of upper side panels attached to each side of said upper bolt receiving face plate and adapted to slidably engage opposite sides of said latch guide housing, a lower latch member disposed in said latch guide housing comprising a lower bolt receiving face plate disposed proximate said bolt receiving opening in said latch guide housing, a pair of lower side panels attached to each side of said lower bolt receiving face plate and adapted to slidably engage opposite sides of said latch guide housing, means for moving said upper and lower latch members toward and away from each other comprising means, slidably engaging said upper side members proximate the bottom thereof and slidably engaging said lower side members proximate the top thereof, for moving said upper and lower latch members toward and away from each other.

4,681,355

### SECURITY SEAL FOR USE WITH STRANDED CABLE

Terrence Bramm, Angola, Ind., and Richard S. Guller, Newton, N.J., assignors to Trans-Guard Industries, Inc., Angola, Ind.

Filed Oct. 22, 1985, Ser. No. 790,061

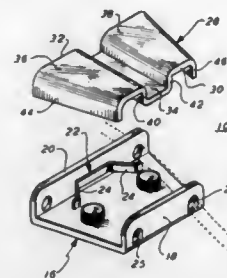
Int. Cl.<sup>4</sup> B65D 33/34

U.S. Cl. 292—323

6 Claims

4. A security seal housing formed of upper and lower plates which are superimposed and fastened together, said plates being generally trapezoidal in plan shape with top, bottom, and side edges, the top edges being shorter than the bottom edges, one plate having a groove formed therein extending between the top and bottom edges, said groove having side walls and a bottom, the bottom being fastened to the other plate, said plates having cooperating flanges at the top, bottom, and sides which close the space between the edges of the plates, the flanges at the top and bottom each having spaced apertures to

receive a shackle, the side walls of the groove and the flanges at the side edges of the plate forming channels between the



plates that extend between the flanges at the top and bottom and increase in width from the top to the bottom thereof.

4,681,356

### CONICAL CABLE LOCK

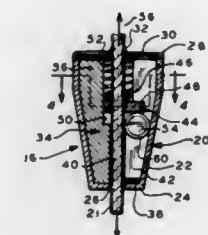
Terrence N. Bramm, Angola, Ind., assignor to Trans-Guard Industries, Inc., Angola, Ind.

Continuation of Ser. No. 490,341, May 2, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 772,191

Int. Cl.<sup>4</sup> B65D 33/34

U.S. Cl. 292—327

6 Claims



1. A lock for a line, said lock being of the type that is slidable in a first direction onto said line but locks against motion over the line in the opposite direction, comprising

a lock body having an axial opening with said line receivable therethrough, said body further defining three slots radiating outwardly from said opening, each slot having an outer wall inclined inwardly toward the opening in said first direction;

three disks, one disk in each of said slots, each of said disks having a bevelled outed periphery; said disks each having threads around the outer periphery; and means for biasing said disks toward said first direction in said slots.

4,681,357

### AUTOMOTIVE DOOR HANDLE CONTAINER

Isamu Uemura, Yokosuka, and Kazumasa Yamamoto, Chofu, both of Japan, assignors to Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1984, Ser. No. 677,534

Int. Cl.<sup>4</sup> E05B 5/00

U.S. Cl. 292—336.3

1 Claim

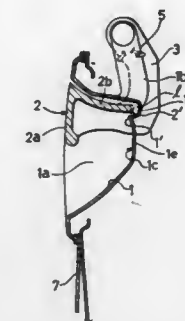
1. A door handle assembly comprising:

a door panel means, a handle recess defined by said door panel means, said handle recess including an outwardly projecting projection, a door handle pivotally mounted outside of said handle recess and said door handle being located in said handle recess and mounted on said door panel means for pivotable movement from said handle recess, said handle recess defining an open space for a hand of an operator to reach into said handle recess and pull outwardly on said door handle,

said door handle including a first end flush mounted with an

exterior surface of said door panel means and including a second end located opposite to said first end, said second end of said handle extending transverse to said first flush end,

first and second bottom wall portions separated by said projection, said second bottom wall portion extending further inwardly into said handle recess than said first bottom wall portion to define a gap between itself and a



terminal portion of said second end of said handle, said terminal portion being spaced from said outwardly projecting projection and extending into said handle recess substantially the same distance as said first bottom wall portion to thereby prevent the hand of the operator from being positioned between said second end and said door panel means when said door handle is in said handle recess in a position of rest.

4,681,358

### CONTAINER OPENING TECHNOLOGY

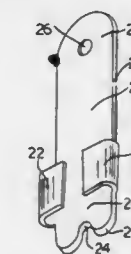
Thomas T. Smith, 1731 10th St., S., Fargo, N. Dak. 58103

Filed Oct. 31, 1980, Ser. No. 202,672

Int. Cl.<sup>4</sup> B67B 7/44

U.S. Cl. 294—15

11 Claims



1. A device for opening a non-detachable, component opening system of a container of the type having a scored section at its top and an empaling tab having a fastener for fastening the empaling tab in a fulcrum alignment to the scored section, said device comprising:

(a) a unitary body member having an upper surface, a lower surface, a thin leading end portion, a trailing handle portion, and oppositely facing side edges, said thin leading end portion being for sliding beneath the empaling tab of the opening system, and said trailing handle portion for grasping by a user of said device, said thin leading end portion further having a centrally disposed indented portion for receiving and abutting the empaling tab fastener, and

(b) a rigid tab restraining means for securely engaging at least a portion of the top surface of an empaling tab during the opening of a container having a non-detachable, component opening system, said restraining means projecting generally upward from said body member upper surface

at generally said oppositely facing side edges and further projecting spacially parallel to at least a portion of the upper surface of said body member, whereby, the placement of said device with said leading end portion placed beneath an empaling tab, with said centrally disposed indented portion of said leading end portion abutting against the empaling tab fastener, and with said tab restraining means positioned above an empaling tab allows a user of said device to grasp and lift said trailing handle portion and, to thereby, easily separate and push downward the scored section of an opening system to gain access to a container.

4,681,359

**BELT GRIPPING DEVICE**

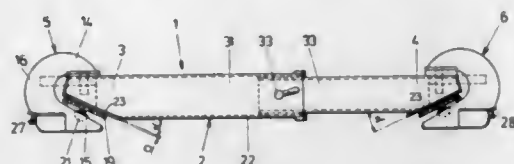
Hermann Stolz, Mühlheim, Fed. Rep. of Germany, assignor to MATO Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG., Offenbach, Fed. Rep. of Germany  
Filed Apr. 24, 1986, Ser. No. 855,903

Claims priority, application Fed. Rep. of Germany, May 6, 1985, 3516161

Int. Cl.<sup>4</sup> B25B 25/00; B66F 19/00

U.S. Cl. 294—81.21

12 Claims



1. An apparatus for pulling an end of a conveyor belt having a given belt width, longitudinal belt edges, and a central zone between said belt edges, into a desired position, comprising cross bar means extending across said belt width, said cross bar means having at least two bar elements adjustable axially in their position relative to each other for adjusting said cross bar means to a desired length relative to said given belt width, and means for securing said bar elements to each other in an adjusted position, a clamping device (5, 6) for clamping each belt edge outside said central zone, means (9) for journaling each clamping device to an outer end of said cross bar means, each clamping device comprising a first clamping element having a clamping surface (23) for contacting one belt surface zone along said belt edges, and a second clamping element (19) having a further clamping surface (20) for contacting an opposite belt surface zone along said belt edges, whereby a contact by said apparatus of said conveyor belt end and of said central belt zone is substantially avoided.

4,681,360

**COMBINATION ACCESS BOX AND BED LINER FOR VEHICLES**

Richard E. Peters, and Larry J. Parlette, both of 3345 SE. 22nd Ave., Portland, Ore. 97202

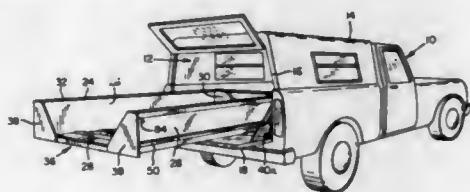
Continuation of Ser. No. 788,473, Oct. 17, 1985, abandoned.

This application Nov. 12, 1986, Ser. No. 930,061

Int. Cl.<sup>4</sup> B60R 5/04

U.S. Cl. 296—37.6

3 Claims



1. In combination, a vehicle having a covered cargo area with forward and

rearward ends and defined by a floor and side walls and a rear opening closed by a closure door, an access box comprising an open top container having a bottom wall, side walls, and a front wall, said container having an open rearward end, triangular corner webs at said open rearward end secured between said side walls and said bottom wall for reinforcing said side walls at said open rearward end, a pair of laterally spaced, longitudinal support members secured to the floor of said vehicle cargo area, longitudinal rail means and engaging rollers on said container and support members respectively supporting said box above said floor for longitudinal movement between a forward loaded position a plurality of intermediate positions and a rearward access position, said rail means and rollers providing self support of said box in said intermediate positions as well as in said rearward access position at a point such that articles in the front thereof can be reached from a point beyond the rear of said vehicle cargo area, said longitudinal rail means and rollers providing cantilevered and straight line, self-support of said box in said rearward access position and in alignment with its line of travel, one of said support members having a vertical extension along its length with a top edge and a plurality of latch recesses in said top edge, a spring pressed, vertically operating latch on said container arranged for engagement with said latch recesses for automatic engagement therewith, vertical guide means on said container providing stable vertical movement for said latch, and rotatable manually operable control means operating said latch to allow the latch to automatically engage said stops or to cause said latch to bypass said stops, a rearwardmost one of said latch recesses holding said container in its rearward access position and a forwardmost one of said latch recesses holding said container in a selected forward loaded position wherein said closure door of the vehicle forms a closure for said open rearward end of said container.

4,681,361

**STORAGE POD**

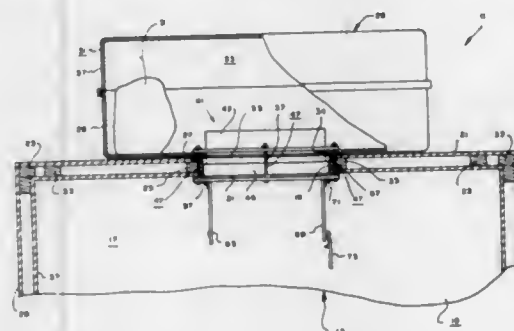
Sue H. Jolley, and William H. Jolley, both of 106 Prospect Dr., Water Valley, Miss. 38965

Filed Jul. 17, 1986, Ser. No. 886,422

Int. Cl.<sup>4</sup> B60R 5/00

U.S. Cl. 296—37.7

9 Claims



1. A storage pod for a vehicle said vehicle having a body with a substantially hollow interior and having an access opening through said body into said interior, said pod comprising: (a) a storage compartment having a body with a substantially hollow interior and having an access opening through said body thereof into said interior thereof; and (b) access/attachment means for attaching said body of said storage compartment to said body of said vehicle with

said access opening through said body of said storage compartment substantially aligned with said access opening through said body of said vehicle for allowing access into said interior of said body of said storage compartment from said interior of said body of said vehicle; said access/attachment means including a first access/attachment member located within said interior of said body of said storage compartment, a second access/attachment member located within said interior of said body of said vehicle, and securing means for securing said first and second access/attachment members to one another in such a manner so as to substantially align said access opening through said body of said storage compartment with said access opening through said body of said vehicle; said first access/attachment member including a sleeve member for extending into said access opening through said body of said storage compartment, said second access/attachment member including a sleeve member for extending into said access opening through said body of said vehicle.

4,681,362

**TOP FOR MOTORCYCLES AND SNOWMOBILES**

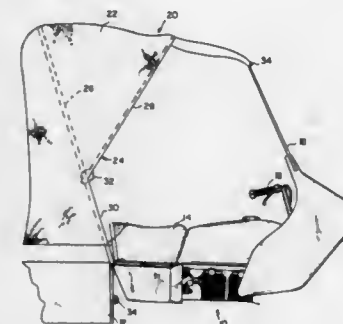
Jimmie Taylor, 7002 Industrial Ave., Flint, Mich. 48505

Filed Mar. 10, 1986, Ser. No. 837,834

Int. Cl.<sup>4</sup> B60J 7/00

U.S. Cl. 296—78.1

4 Claims



1. A removable top for vehicles including a body and a windshield, comprising: a first loop connectable at its bottom to the vehicle body and a second loop connected to said first loop and inclined in a forward direction said loops comprising tubular metal members; and a canopy further connected over said loops and having its forward end connected to said windshield of said vehicle, said canopy having in its rear end symmetrically arranged vented openings including a pair of upper laterally spaced vented openings and a lower vented opening.

4,681,363

**VISOR SYSTEM**

Ronald L. Hemmeke, and Scott A. Spykerman, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Nov. 7, 1985, Ser. No. 796,090

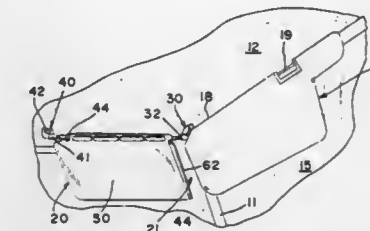
Int. Cl.<sup>4</sup> B60J 3/02

U.S. Cl. 296—97 G

13 Claims

1. A visor system for selectively providing simultaneous sun blocking protection for the windshield and a side window of a vehicle comprising: a pair of brackets adapted to be mounted in spaced relationship above a vehicle window; a first visor pivotally coupled to one of said brackets for movement of said visor in a generally horizontal direction to selectively provide sun blocking for either the adjacent side window or the windshield; and a second visor substantially shorter than said first visor; and means for mounting said second visor between said brackets with the end edge of said second visor nearest said side

window being spaced inwardly from said one bracket for permitting said second visor to be pivoted between a raised, stored position adjacent the vehicle roof and a lowered, use position adjacent the vehicle window, said second visor including housing means and an extension panel located adjacent said edge and slidably mounted to said housing means for sliding movement toward said side



window along an axis parallel to the longitudinal axis of said second visor between a stored position at least partially within said housing and use positions extended from said housing, whereby said second visor before the extension panel is extended can be pivoted downwardly after which said extension panel can be extended at least as long as said first visor.

4,681,364

**SLIDING ROOF FOR VEHICLES HAVING A WIND DEFLECTOR**

Horst Bienert, Gauting, and Georg Kohlpaintner, Martinsried, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

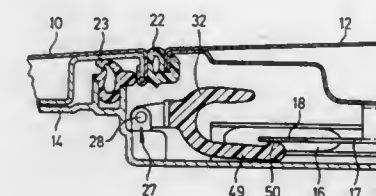
Filed Apr. 28, 1986, Ser. No. 856,362

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515066

Int. Cl.<sup>4</sup> B60J 7/22

U.S. Cl. 296—217

12 Claims



1. Sliding roof for vehicles of the type having a cover which, in a closed position, covers a roof opening of a fixed roof surface and is mounted for rearward sliding movement, and also having a wind deflector that is pivotably mounted, in the area of a front edge of the roof opening, so as to be upwardly tiltable into an extended position by rearward sliding of the cover, and downwardly tiltable, from said extended position, by an actuating device into a retracted position when the cover is slid forward, wherein, in addition to elements of the actuating device, two locking elements are bilaterally attached to the wind deflector in a manner preventing pivotal movement therebetween and against which, in the foremost sliding position of the cover, there is contact by respective hold down clamping elements which are mounted so as to be displaceable together with the cover.



4,681,365

# MULTIDIRECTIONALLY RESILIENTLY RELEASING OTTOMAN FOR MOTION CHAIR

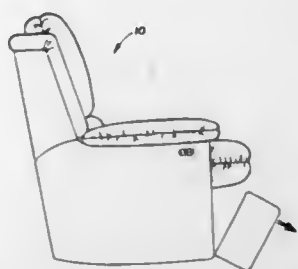
James J. Pine, Tupelo, Miss., assignor to Action Industries, Inc., Tupelo, Miss.

Continuation-in-part of Ser. No. 857,323, Apr. 30, 1986. This application Jun. 18, 1986, Ser. No. 875,481

Int. Cl.<sup>4</sup> A47C 1/02

U.S. Cl. 297—85

16 Claims



1. Apparatus for providing a motion chair with a resiliently releasing capability for a transversally elongated ottoman which is movable between a raised, thrust position in which the ottoman is generally horizontal, and a retracted, stowed position in which the ottoman normally is generally vertical, for which purpose the ottoman is mounted to a seat frame of the motion chair by a mechanism which includes left and right side linkages, each of which, towards its front, has a set of pantograph links including an upper pantograph link having a front end and a lower pantograph link having a front end, said apparatus comprising:

a generally vertical plane front end link for each side linkage, each of these front end links being elongated in a direction which is adapted to be generally vertically-oriented when the ottoman is in its retracted, stowed position;

said front end links, with respect to such vertical orientation, each having:

an upper transversally extending horizontal axis pivot means for pivotally connecting with said front end of said upper pantograph link of the respective said side linkage,

a lower transversally extending horizontal axis pivot means for pivotally connecting with said front end of said lower pantograph link of the respective said side linkage, and

adjacent but displaced from said lower transversally extending horizontal axis pivot means, a further transversally extending horizontal axis pivot means;

a pair of ottoman mounting brackets, each having a vertical plane flange means, each of these brackets being elongated in a direction which is adapted to be generally vertically oriented when the ottoman is in its retracted, stowed position;

securement means on said ottoman mounting brackets adapted for mounting said ottoman thereto;

each said vertical plane flange means, effectively below said securement means, relative to said vertical direction of orientation of said vertical plane flange means, being pivotally connected to a respective said front end link by a respective said further transversally extending horizontal axis pivot means; and

resilient means tending to maintain each said vertical plane flange means aligned with the respective said front end link as to said direction of elongation of each, but permitting the respective vertical plane flange means to pivot forwardly about the respective said further transversally extending horizontal axis pivot means against a restoration force provided by said resilient means, so that the ottoman may pivot forward to accommodate and release an obstruction to its being brought to its retracted, stowed position,

then be automatically pivoted rearward by the resilient means when the obstruction has been cleared;

each said vertical plane flange means comprising two inter-pivoted elements, namely a laterally outer vertical plane flange element and an intermediate link element which are pivotally joined to one another at an additional transverse horizontal axis pivot joint located near upper ends of these two elements;

each said resilient means being mounted between an anchoring means effectively based on the respective said laterally outer vertical plane flange element near the upper end of such element and an anchoring means provided said intermediate link near a lower end of such element;

each said further transversally extending horizontal axis pivot means pivotally connecting the respective said intermediate link element near said lower end thereof to a respective said front end link for pivotally connecting each said vertical plane flange means, effectively below said securement means, to a respective front end link, whereby the respective laterally outer vertical plane flange elements are permitted to pivot forwardly about the respective said additional transversally extending horizontal axis pivot means against a restoration force provided by said resilient means, so that the ottoman may pivot forward to accommodate and release an obstruction to its being brought to its retracted, stowed position, then be automatically pivoted rearward by the resilient means when the obstruction has been cleared.

4,681,366

# VANITY MIRROR OR VEHICLE ACCESSORY ASSEMBLY AND MOUNTING APPARATUS THEREFOR

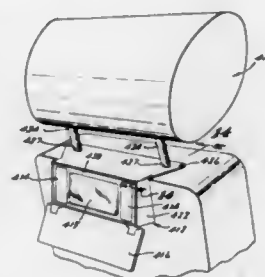
Mark Lobanoff, Troy, Mich., assignor to Irvin Industries, Inc., Rochester Hills, Mich.

Continuation-in-part of Ser. No. 746,676, Jun. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 627,280, Jul. 2, 1984, abandoned. This application Nov. 6, 1985, Ser. No. 795,520

Int. Cl.<sup>4</sup> A47C 7/62

U.S. Cl. 297—191

44 Claims



1. In a seat for a vehicle, including a seat having front and rear sides, a head restraint, and head restraint mounting means for interconnecting said head restraint with said seat, the improvement comprising: a mirror housing including a mirror; and a mirror housing mounting means coupled with said mirror housing for mounting said mirror housing on the rear of said seat assembly, said mirror housing mounting means including means for coupling with, and being retained by, the head restraint mounting means in order to retain and support said mirror housing on the rear side of the seat the head restraint mounting means including at least one mounting arm supportingly interconnecting the head restraint with the seat, said mirror housing mounting means including at least one opening extending therethrough for receiving said mounting arm extending therethrough in order to connect said mirror housing with said mounting arm and to retain said mirror housing on the seat assembly.

4,681,367

# AUXILIARY SEAT

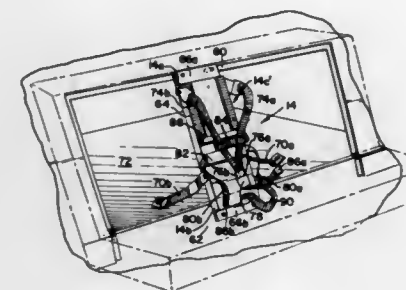
Richard E. Timmers, 1210 E. County Rd. B, Maplewood, Minn. 55109

Continuation-in-part of Ser. No. 506,522, Jun. 21, 1983. This application Aug. 21, 1985, Ser. No. 768,040

Int. Cl.<sup>4</sup> A47C 15/00

U.S. Cl. 297—232

1 Claim



1. A safety seat suitable for permanent mounting as an integral part of an automobile bench seat, the bench seat having a bench seat frame, the automobile having a trunk floor, comprising:

(a) a main frame, the main frame comprising: (1) a central body portion, the central body portion being longitudinally ribbed; (2) a perforated top flange, the top flange being integrally formed with the central body portion; (3) a perforated bottom flange, the bottom flange being integrally formed with the central body portion at an end opposite the top flange;

(b) a first set of mounting bolts, the mounting bolts passing sequentially through the perforations of the top flange and mating perforations within the bench seat frame, the bolts thereafter being secured by nuts;

(c) a second set of mounting bolts, the mounting bolts passing sequentially through the perforations of the bottom flange and mating perforations within the bench seat frame, the bolts thereafter being secured by nuts;

(d) a seat base;

(e) a seat back having a top end, a bottom end, a left side, a right side, a front side and a back side, the bottom end of the seat back being connected to the back end of the seat base such that the seat back and the seat base define an approximately L-shaped form, the seat back being adjacent and parallel to the main frame and connected thereto;

(f) an armrest having a back portion and an inner side, the armrest being connected at the inner side of the back portion to one of the left and right sides of the seat back;

(g) a seat belt having a first and a second portion, each portion having a first and a second end, the first and second portions being securely fastened at the second ends to the main frame, and the seat belt further comprising means to releasably fasten the first ends of the first and second portions together; and

(h) a pair of straps, each strap being fastened to the central body portion at one end, the strap being fastened to the trunk floor at an opposite end, the strap thereby preventing twisting when the bench seat frame is subjected to side loads.

4,681,368

# CHILD RESTRAINT BASSINET

Robert B. Heath, and Colin M. Nagel, both of Lonsdale, Australia, assignors to Safe-N-Sound Pty. Limited, South Australia, Australia

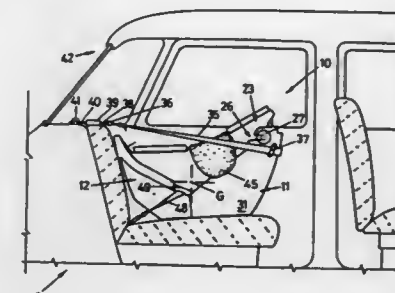
Filed Oct. 16, 1985, Ser. No. 788,069

Claims priority, application Australia, Oct. 19, 1984, PG7727

Int. Cl.<sup>4</sup> A47D 7/04; B60R 21/10

U.S. Cl. 297—250

10 Claims



1. A child restraint bassinet assembly comprising a support base having a rear end for abutting a vehicle seat back and a forward end facing in the direction of motion of the vehicle, a bassinet, hinge means between the bassinet and the support base, an inertia responsive trigger latch engageable between the base and bassinet which normally inhibits swivelling movement of the bassinet, but, upon actuation, releases the bassinet for downward hinging movement with respect to the base, and a finger latch cooperating with the base and bassinet to either retain the bassinet within the base or release it from the base, a tether strap assembly which includes a base strap, means retaining the base strap to an upper portion of the forward end of the base, and anchor means for securing the base strap to a vehicle at a point above the rear end of the base and thereby retaining the bassinet assembly in the vehicle, with its centre of gravity 'G' wholly below the base strap, the anchor means comprising an anchor stud for securing to the vehicle above the rear end of the base, an anchor strap secured to the base strap, and an anchor member on the anchor strap for securing the anchor strap to the anchor stud.

4,681,369

# RECLINABLE VEHICLE SEATS

Leslie J. Simpson, Amersham, England, assignor to Flight Equipment and Engineering Limited, Buckinghamshire, England

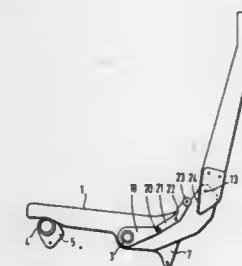
Filed Dec. 10, 1985, Ser. No. 807,475

Claims priority, application United Kingdom, Dec. 19, 1984, 8432094

Int. Cl.<sup>4</sup> A47C 1/032

U.S. Cl. 297—316

6 Claims



1. A reclinable seat for use in a vehicle comprising a bottom part having front and rear edges,

a support means, said support means defining an axis of rotation for said bottom part,  
 a back support part,  
 means providing a pivotal connection between the back support part and the bottom part adjacent to the rear edge thereof enabling the back support part to be tilted rearwardly from its normal position relative to the bottom part,  
 mounting means on the bottom part for mounting said bottom part on said support means so as to be rotatable about said axis between a normal, substantially horizontal position and reclining positions wherein it slopes downwardly from its front edge towards its rear edge,  
 first locating means connected between the bottom part and the support means for determining the degree to which said bottom part is rotated about said support means and for defining a maximum reclining position of said bottom part,  
 second locating means connected between the back support part and the bottom part for determining the degree to which said back support part is pivoted about said pivotal connection and for defining a maximum rearward tilted position of the back support part relative to the bottom part,  
 first control means for controlling the operation of said first locating means,  
 second control means for controlling the operation of said second locating means,  
 operating means accessible to an occupant of the seat for operating said first and second control means, and  
 limiting means for limiting the rearward tilting of the back support part when the bottom part is in a reclining position, the limiting means being influenced by the positioning of the bottom part about said axis so as to reduce the permitted maximum rearward tilt of the back support part relative to the bottom part progressively with increasing recline of the bottom part.

4,681,370

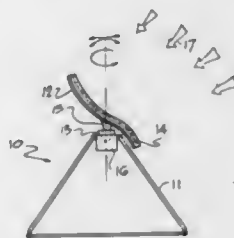
## ADJUSTABLE HEADREST FOR SUNBATERS

David W. Vancil, 21031 Parthenia St., Canoga Park, Calif. 91304

Filed Feb. 19, 1987, Ser. No. 16,630  
Int. Cl.<sup>4</sup> A47C 7/36

U.S. Cl. 297—405

1 Claim



1. A sunbather's headrest comprising:  
 a base;  
 a platform for supporting the head of a user;  
 means carried on said base for movably mounting said platform on said base;  
 said base includes a broad lower portion and an apex upper portion;  
 said mounting means secured to said apex upper portion;  
 said mounting means includes a block fixed to said apex upper portion having an enlarged hole therein;  
 said platform having a post carried on its underside having an enlarged terminating end adapted to be insertably received into said block hole;  
 retaining means carried on said block for detachably connecting with said base;

said base comprising a pair of triangular end pieces joined at their apex upper portions by said mounting block; and  
 said lower portions joined together by detachable brace members.

4,681,371

## AUXILIARY DUMPING APPARATUS FOR VEHICLES

Daniel F. Leonard, 612 J Ave., National City, Calif. 92050

Filed Aug. 16, 1985, Ser. No. 766,141

Int. Cl.<sup>4</sup> B60P 1/64

U.S. Cl. 298—1 A

7 Claims



1. In combination with the bed of a pick-up, trailer or the like which is flanked by lateral walls terminated at their rear ends by a pair of tail-gate jamb elements forming two vertical post-mounting channels, an auxiliary dumping apparatus comprising:

- a framework consisting essentially of a pair of longitudinal tracks laid against said bed, a plurality of cross-members placed and dimensioned to keep said tracks in a parallel and spaced-apart relationship, one of said cross-members comprising one arm orthogonally and coplanarly located with respect to the longitudinal tracks along the rear edge of the bed between said jamb elements, a pair of upright members extending from the respective ends of said orthogonal arm alongside and commensurate with said jamb members, a pair of L-shaped fingers respectively secured to the upper ends of said upright members and shaped and dimensioned for engagement into the two post-mounting channels, and a pair of extensions at the respective ends of said orthogonal arm, said extensions projecting into the corners formed by the inner sides of said jamb elements and said lateral walls;
- a tiltable bin slidingly mounted on said tracks;
- means for locking said bin over the bed;
- means for moving the bin longitudinally along said tracks until the center of gravity of the bin is off said bed; and
- pivoting means transversally mounted at the rear end of said tracks for tilting the bin beyond the back end of the bed.

4,681,372

## DEEP SEA MINING APPARATUS

William L. McClure, 204 40th St., Virginia Beach, Va. 23451

Filed Feb. 11, 1986, Ser. No. 828,265

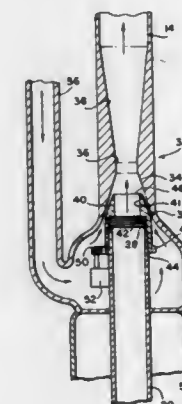
Int. Cl.<sup>4</sup> E02F 3/88, 7/00

U.S. Cl. 299—8

16 Claims

1. Undersea mining apparatus for recovering particulate matter on the ocean floor, said apparatus comprising:
- (a) conduit means for conveying particulate material in the form of nodules from the sea floor to a surface vessel, said conduit means having an inlet end adapted to be positioned adjacent the ocean floor and an outlet end spaced from said inlet end and defining a discharge opening to discharge collected nodules into a surface vessel;
  - (b) pump means for providing a source of water under pressure;
  - (c) collecting means connected to said inlet end of said conduit means for collecting nodules and for conveying collected nodules to said conduit means;
  - (d) lifting means in communication with said pump means and connected to said conduit means for providing a lifting jet of pressurized water to cause said nodules to travel through said conduit means, said lifting means including a submerged lifting chamber surrounding said conduit at a desired height of said conduit means above

the sea floor and in communication with said pump means, said conduit means including a lift pipe extending from a point adjacent the ocean floor to said lifting chamber and a dredge pipe extending from said lifting chamber to a surface vessel, said lift pipe communicating with said lifting chamber and having an inlet opening adjacent the ocean floor and extending from the ocean floor and connected to said collecting means, said lift pipe having a parallel wall cylindrical outlet extending within said lifting chamber and defined by a first diameter substantially equal to the lift pipe diameter to define a substantially continuous cylindrical flow passage, said dredge pipe having an inlet within said lifting chamber and adjacent said lifting pipe outlet, said dredge pipe having an outlet positioned to discharge collected material into a surface vessel, said dredge pipe having a venturi including a converging section, a throat section defined by a second diameter smaller than said first diameter and a diverging section, each in axial alignment to provide an axially-symmetric converging-diverging venturi, said lift pipe opening extending into said converging section of said venturi



and defining therewith an annulus area therebetween, said annulus area communicating with said lifting chamber to permit pressurized water to pass through said annulus area and into said venturi to provide a pumping effect to lift the nodules through said conduit means to a surface vessel, said lift pipe outlet and said dredge pipe inlet being movable relative to each other to permit varying said annulus area to achieve a desired lifting effect, and moving means for moving one of said lift pipe outlet and said venturi relative to the other for varying said annulus area, wherein said lift pipe outlet is defined by an axially movable collar that is movable into and out of the converging section of the venturi to vary the annulus area, said collar having an internal thread formed on an inner surface thereof and engageable with an external thread formed on an outer surface of said lift pipe, said collar including an external ring gear formed on an outer surface thereof, and said moving means including a drive means and a drive gear rotatably driven by said drive means, said drive gear engageable with said ring gear to rotate said collar to move it axially toward and away from said venturi.

4,681,373

## WHEEL SLIP CONTROL SYSTEM

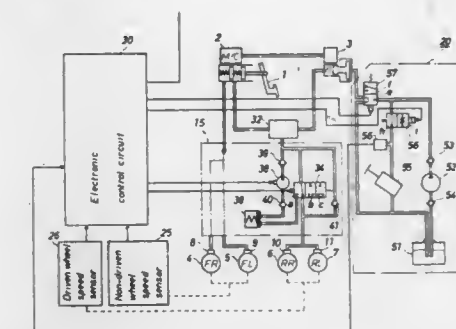
Yoshihisa Nomura; Masakazu Ishikawa, both of Toyota; Akira Shirai, Toyooka; Takahiro Nogami, Toyota; Kazumasa Nakamura, and Kaoru Ohashi, both of Okazaki, all of Japan, assigns to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan  
Filed Sep. 11, 1985, Ser. No. 775,005

Claims priority, application Japan, Sep. 21, 1984, 59-199216; May 8, 1985, 60-68438[U]

Int. Cl.<sup>4</sup> B60T 8/08

U.S. Cl. 303—106

9 Claims



1. A wheel slip control system comprising:  
 brake slip detection means for providing brake slip signals representative of a slip condition of a driven wheel during braking of a vehicle;  
 acceleration slip detection means for providing acceleration slip signals representative of a slip condition of said driven wheel during acceleration of said vehicle;  
 a first pressure source for producing a first pressure;  
 a second pressure source for producing a second pressure;  
 pressure control means responsive to said acceleration of said vehicle for controlling said second pressure of said second pressure source;  
 pressure source selection means for receiving said first and second pressures and for outputting selectively one of said first and second pressures, depending upon a measured differential therebetween;  
 control means responsive to said brake slip signals and said acceleration slip signals for providing anti-skid control signals and traction control signals; and  
 hydraulic actuator means for receiving said selectively outputted first and second pressures from said pressure source selection means for use as a hydraulic braking pressure, and for responding to said anti-skid control signals and said traction control signals to control a speed of said driven wheel within a predetermined range, thereby preventing said driven wheel from slipping.

4,681,374

## WHEEL SLIP CONTROL SYSTEM

Kazumasa Nakamura, Okazaki; Ikuya Kobayashi; Takahiro Nogami, both of Toyota; Akira Shirai, Toyooka; Kaoru Ohashi, Okazaki, and Yoshihisa Nomura, Toyota, all of Japan, assigns to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan  
Filed Oct. 23, 1985, Ser. No. 790,453

Claims priority, application Japan, Oct. 30, 1984, 59-228537

Int. Cl.<sup>4</sup> B60T 3/08

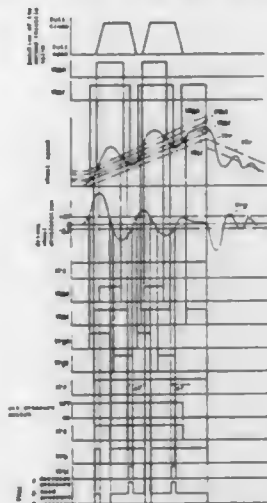
U.S. Cl. 303—106

9 Claims

1. A wheel slip control system for a vehicle comprising:  
 pressure source selection means, responsive to a first pressure of a first pressure source and a second pressure of a second pressure source, for measuring a difference between said first and second pressures, and for selecting one of said first and second pressure sources in response to said measured pressure difference;  
 brake slip detection means for sensing a state of slippage of a wheel during a braking operation of the vehicle, and for



providing a brake slip signal representative of the state of slipping;  
 acceleration slip detection means for further sensing said state slipping of said wheel during an accelerating operation of the vehicle, and for providing an acceleration slip signal representative of said state of slipping;  
 first and second throttle valves, said first throttle valve connected to an acceleration increasing structure, and said first and second throttle valves located in an air intake path;  
 control means, responsive to said brake slip signal, for providing a first adjustment signal responsive to said acceleration slip signal for providing said first adjustment signal to



cause the driven wheel speed to be within a first predetermined range, and responsive to said acceleration slip signal for providing a second adjustment signal to a driving means for driving said second throttle valve to cause the driven wheel speed to be within a second predetermined range; and

slip control means connected to said pressure source selection means responsive to said first adjustment signal from said control means for adjusting the pressure from said pressure source selection means, and responsive to said first adjustment signal from said control means for adjusting the second pressure to said pressure source selection means, thereby suppressing a slippage of wheels.

4,681,375

#### HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to Alfred Teves, Frankfurt, Fed. Rep. of Germany

Filed Apr. 11, 1985, Ser. No. 722,719

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413626

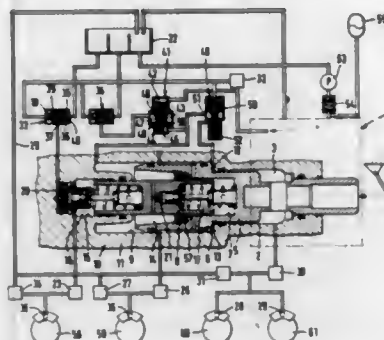
Int. Cl.<sup>4</sup> B60T 8/02, 13/14

U.S. Cl. 303—114

13 Claims

1. A hydraulic brake system for automotive vehicles which is provided with a hydraulic power booster having a pressure chamber (3) therein and with a master cylinder operable by the power booster, the booster piston being designed as stepped piston with a pedal-close portion of smaller diameter and with a pedal-remote portion of larger diameter, wherein, together with a housing, the annular surface of the booster piston at the piston step encloses an annular space of variable volume, wherein the annular space is communicating with an unpressurized supply reservoir, which communication can be interrupted, wherein in a pedal-remote pocket bore of the booster piston a master cylinder piston is guided in a sealed manner which confines a working chamber, and wherein an annular chamber confined by the pedal-remote annular surface of the booster piston is pressurizable by the pressure of an auxiliary

pressure source, a hydraulic communication being establishable between the annular chamber and the working chamber by way of a non-return valve which opens towards the working chamber, wherein a double-seat valve (41) is arranged



between the annular chamber (14) and the unpressurized supply reservoir (22), said double-seat valve (41) temporarily adopting a closed position at the beginning of the braking operation.

4,681,376

#### APPARATUS FOR TENSIONING A TRACK CHAIN OF A TRACKLAYING VEHICLE

Peter Riml, Mieming, Austria, assignor to Liebherr-Werk Telfs Ges m.b.H., Telfs, Austria

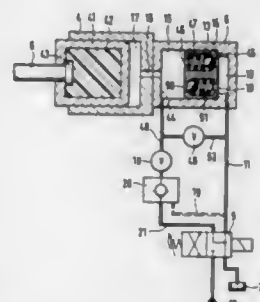
Filed Mar. 5, 1986, Ser. No. 836,384

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507805

Int. Cl.<sup>4</sup> B62D 55/30

U.S. Cl. 305—10

10 Claims



1. Apparatus for tensioning a track chain of a tracklaying vehicle such as a bulldozer, crawler loader, or excavator, said apparatus comprising: a tracklaying undercarriage including a frame and a track chain carried on said frame; drive chain sprocket means rotatably carried on said frame for driving said track chain; reversing chain sprocket means with which said track chain is engaged; a hydraulic cylinder for biasing said reversing chain sprocket, which is rotatably mounted in a bearing that is displaceable in a vertical center plane that passes through the track chain, and hydraulic cylinder biasing said reversing chain sprocket to selectively tension and release the tension in the track chain and including a first cylinder chamber and a second cylinder chamber in fluid communication with said first cylinder chamber, a floating piston slidably received in said second cylinder chamber and including a check valve for connecting two parts of said second chamber which are disposed on opposite sides of the piston and for preventing backflow from said first cylinder chamber, the piston being displaceable in said second cylinder chamber between forward and rear stop means at respective ends thereof to an extent which corresponds to a volume of hydrau-

lic liquid which is to be displaced in order to relax a previously tensioned chain to an optimum chain tension, said second cylinder chamber connected adjacent to the rear stop means to a supply conduit and adjacent the front stop means to a return conduit for returning fluid under a pressure corresponding to the pressure applied to tension the track chain, and valve means for connecting said supply conduit to a fluid reservoir when the piston has been moved into engagement with the forward stop means.

4,681,377

#### FLEXIBLE BELT FOR ENDLESS TRACKS MADE FROM A PLURALITY OF SEGMENTS

Howard S. Atkin, Sutton Coldfield, and Geoffrey A. Forth, Hartford, both of England, assignors to Dunlop Limited, England

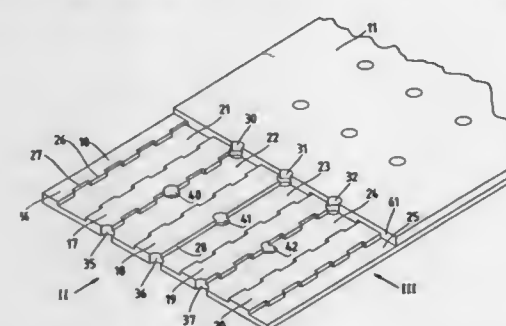
Filed Jul. 2, 1985, Ser. No. 753,046

Claims priority, application United Kingdom, Jul. 17, 1984, 8418190

Int. Cl.<sup>4</sup> B62D 55/24

U.S. Cl. 305—35 EB

9 Claims



1. A flexible belt comprising a plurality of belt segments arranged in series in the direction of the length of the belt, each segment having a face shaped to interlock with the face of an adjacent segment when placed in face-to-face relationship with respective faces of successive adjacent segments overlapping along the length of the belt; clamping means arranged to press said overlapping faces of respective adjacent segments towards one another to secure said adjacent segments together, each of the overlapping faces being provided with traction-transmitting formations arranged to interlock with corresponding traction-transmitting formations provided on the other of the overlapping faces so as to key the overlapping faces together. Said traction-transmitting formations comprising a series of ribs and intervening grooves extending longitudinally of each belt segment, the sides of the ribs having a pattern which interlocks with that of an adjacent segment.

4,681,378

#### MODULAR CABLE MANAGEMENT SYSTEM FOR RELATED ELECTRONICS EQUIPMENT

Nat Hellman, III, Beverly Hills, Calif., assignor to Microcomputer Accessories, Inc., Los Angeles, Calif.

PCT No. PCT/US85/00180, § 371 Date May 20, 1986, § 102(e) Date May 20, 1986, PCT Pub. No. WO86/04494, PCT Pub. Date Aug. 14, 1986

PCT Filed Feb. 4, 1985, Ser. No. 866,399

Int. Cl.<sup>4</sup> A47B 87/02

U.S. Cl. 312—108

12 Claims

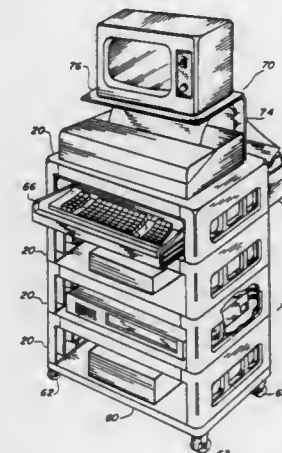
1. An electronic equipment cable management system module comprising:

- (a) a top panel having a flat upper surface with a slot centrally located therein, auxiliary mounting holes extending therethrough, reinforcing members on the underside and a channel formed in the rear;
- (b) a pair of opposed side panels each having a top, bottom, and two ends with both ends having an integral vertical cable recess with cap engaging means at each end, also the

side panels having attachment means at the upper ends thereof for connecting to opposite sides of said top panel, forming a channel shaped modular structure that comprises a raised surface upon which electronic equipment may be mounted;

(c) a rear channel cover having a plurality of breakaway tabs integral therewith resiliently fastened to said channel formed in the rear defining a rear channel cover enclosed raceway for receiving cabling from said electronic equipment, allowing egress of cables at selected locations by removal of selected tabs;

(d) a plurality of side cable recess covers in "U" shape having both ends open contiguously joined with said side panel recess forming an open ended passageway with the side panel recesses at the rear end in communication with the rear channel cover enclosed raceway;



(e) at least two top corner caps frictionally connected to said top panel at the end opposite the rear end, with the corner caps having means for superimposing the interface of said top and side panels cosmetically enveloping the juncture;

(f) a plurality of removable bottom corner caps, each having a resilient foot disposed thereunto frictionally connecting the bottom corner caps to the bottom corners of said side panels, said removable bottom corner caps providing a resilient base allowing said module to rest upon a flat surface without slipping; and,

(g) said channel shaped modular structure allowing electronic equipment to be disposed upon the panel, such as a computer printer with space between the sides allowing storage for paper, said panel slot providing access for paper to be fed into printers having bottom loading capabilities.

4,681,379

#### SLIDING SHUTTER DOOR SECTIONAL WARDROBE

Bruno Pillinini, Via Paschini 11, 33028 Tolmezzo (UD), Italy

Continuation of Ser. No. 669,686, Nov. 9, 1984, abandoned. This application Dec. 11, 1986, Ser. No. 941,558

Int. Cl.<sup>4</sup> E06B 9/14

U.S. Cl. 312—297

8 Claims



1. A sliding shutter door sectional wardrobe, particularly for floor-to-ceiling building wardrobes and for built-in wardrobes, comprising:

a guide floor frame to which is attached an upward disposed sliding shutter door track-way;  
 a guide ceiling frame to which is attached a downward disposed sliding shutter door track-way;  
 guide frame supporting means to connect and support rigidly said guide floor and ceiling frames;  
 at least one sliding shutter door comprising a plurality of rolling hinged lath means, said sliding door disposed between said floor and ceiling trackways, to close the composite wardrobe frontally and laterally; wherein said sliding shutter door comprises an interior hinged lath connection consisting of a plurality of exterior laths and corresponding opposed glued interior counterlaths enclosing between the opposed glued surfaces a connecting flexible sheet to provide the hinging function and wherein each counterlath comprises a reinforcing straightening profile means mounted thereon, each said reinforcing profile means being of tubular configuration with side flanges which cover the lateral edges of each counterlath to encase each counterlath.

4,681,380

## METHOD FOR PROVIDING WALL STORAGE

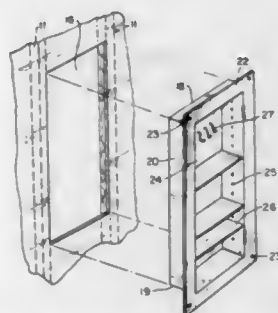
Bruce Carlin, 9 D Childs Rd., Bernardsville, N.J. 07924

Filed Nov. 4, 1985, Ser. No. 794,828

Int. Cl.<sup>4</sup> A47B 67/02

U.S. Cl. 312-242

2 Claims



1. An apparatus for providing a pantry storage compartment in the cavity of a wall, said cavity defined by the space between adjacent studs in said wall and the depth of said studs comprising:

- (a) a unitary plastic cabinet fittable within said cavity between said studs and extending to the depth of said studs in said wall having fixed or adjustable shelves and a rim portion extending outwardly around said cabinet and across a portion of the width of said studs, said rim portion having holes for mounting said cabinet to said studs; and
- (b) a template for outlining said cavity between said studs against the wall to permit cutting of said wall to expose said cavity.

4,681,381

## REMOVABLE DRAWER SLIDE AND INTERLOCK WITH DRAWER

Douglas Sevey, Waterloo, Iowa, assignor to Waterloo Industries, Inc., Waterloo, Iowa

Filed Oct. 16, 1986, Ser. No. 919,686

Int. Cl.<sup>4</sup> A47B 88/00

U.S. Cl. 312-333

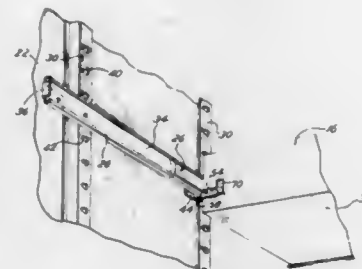
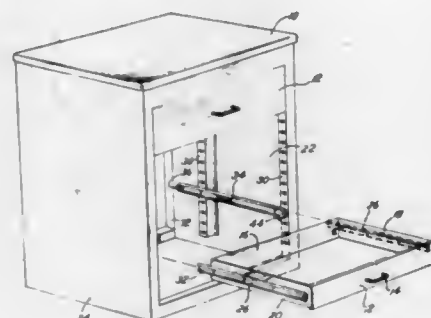
7 Claims

1. A drawer and interlocking drawer mechanism, comprising, in combination:

- a drawer;
- a pair of slides with one slide attached to each side of the drawer;
- a pair of slide receivers mateable with the slides, each slide receiver having a pair of guide pins adapted to support the slide receiver;
- a plurality of slide receiver supports each having a plurality

of openings mateable with the guide pins such that when the guide pins are inserted into one of the openings in each support, the slide receivers are supported by the slide receiver supports;

a pair of slide locks rotatably mounted on each slide receiver and adapted to rotatably move between a lock position against one of the slide receiver supports and an open position away from the same support, each slide lock having a drawer catch; and



a pair of drawer stops, each rotatably mounted on the drawer and adapted to rotate between a catch position where the drawer stop will catch the drawer catch at one point during movement of a slide in the slide receiver and a release position where the drawer stop will never catch the drawer catch during movement of the slides in the slide receivers, whereby the slide receivers are releasably held in fixed position by the slide locks, and the drawer may be removed from the slide receivers by rotating the drawer stops to the release position and withdrawing the drawer from the slide.

4,681,382

## ELECTRICAL CONNECTOR FOR TRANSMISSION CABLE

Joseph L. Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1985, Ser. No. 811,965

Int. Cl.<sup>4</sup> H01R 4/66

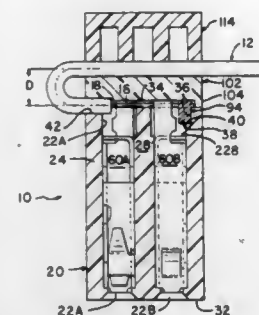
U.S. Cl. 439-92

18 Claims

1. An electrical connector for electrical transmission cable means having signal conductor means and ground conductor means, comprising:

- a housing means having at least one row of terminal-receiving passageways extending from a mating face to a termination face;
- contact terminals disposed in said terminal-receiving passageways, each said terminal having a contact section means proximate said housing mating face and a conductor-connecting section proximate said housing termination face;
- a ground bus secured in a bus-receiving channel of said housing means in interference fit therein along said housing termination face parallel to said at least one row of

terminal-receiving passageways, said ground bus having means for connecting with ground conductor means; means for grounding said ground bus; and



cable-securing means to secure and provide strain relief for an end portion of the transmission cable means and protect the terminations following termination of the signal conductor means to respective said contact terminals and of the ground conductor means to said ground bus.

4,681,383

## RESILIENT SEALING DEVICE FOR TELEPHONE SUBSCRIBER TERMINALS

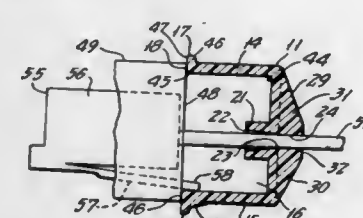
Peter Hung, Wheatley Heights, and Paul V. De Luca, Plandome Manor, both of N.Y., assignors to Porta Systems Corp., Syoset, N.Y.

Filed Apr. 25, 1986, Ser. No. 856,022

Int. Cl.<sup>4</sup> H01R 13/44

U.S. Cl. 439-135

3 Claims



1. An improved resilient sealing device for closing an opening in an exposed surface of a plug body which accommodates a jack body, the jack body having a laterally extending manually engageable release lever comprising: a moulded body having a principal axis of resilient material including a transversely extending outer wall element and a plurality of side wall members extending longitudinally from said outer wall element to define a generally rectangular void; said side wall elements terminating in a continuous free edge having a laterally extending continuous sealing flange thereon; said outer wall element having an inner planar surface, and a cross section which varies in thickness to be most thick at the geometric center thereof, and having a continuous through ovate bore extending from said inner planar surface to an oppositely disposed outer surface thereof for selectively clamping a surface of a flattened cable interconnecting with said plug body; whereby, upon the engagement of said jack body within said plug body, said device may be moved along said cable to create a compressive force at said laterally extending flange resulting in a sealing action.

184-023 O.G.-87-8

4,681,384

## ELECTRIC SOCKETS

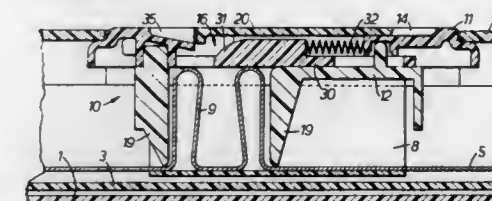
John Newman, Buckinghamshire, England, assignor to Rotaflex PLC, London, England

Filed May 7, 1985, Ser. No. 731,316

Int. Cl.<sup>4</sup> H01R 13/44

U.S. Cl. 439-137

13 Claims



1. An electric socket outlet comprising a fascia member including a recessed front face portion, a plurality of openings in said recessed portion for the pins of an electric plug to enter and pass into cooperation with respective socket contacts, and an outer shutter mounted on said recessed portion so as to lie at the most substantially flush with the front face of the fascia member, said shutter being slidable between closed and open positions, in said closed position the shutter covering said pin openings and the socket outlet presenting a substantially solid appearance in front view, and in said open position the openings being exposed for entry of the plug pins, and a guide groove in the front face of the fascia member for guiding a plug pin into abutment with the outer shutter for moving the shutter from the closed to the open position.

4,681,385

## ELECTRICAL CONNECTOR SYSTEM

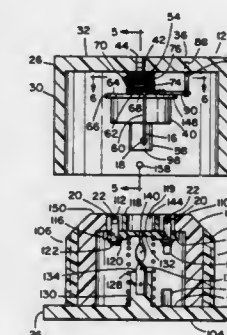
Kurt J. Kruger, Huntington, and Lester Miller, Danbury, both of Conn., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Apr. 11, 1986, Ser. No. 851,408

Int. Cl.<sup>4</sup> H01R 4/48

U.S. Cl. 439-252

20 Claims



1. An electrical connector system comprising:  
 a plug assembly having a pair of electrical plug terminal means each spaced an equal distance from the axis of said plug assembly;  
 a socket assembly having a pair of electrical socket terminal means each spaced an equal distance from the axis of said socket assembly, said plug terminal means and said socket terminal means being engagable one with respect to the other to form an electrical connection therebetween when said plug assembly and said socket assembly are joined in axial alignment, virtually independent of the rotational position therebetween;  
 a coil spring to urge said plug terminal means and said socket terminal means towards each other to insure a secure electrical contact therebetween when the assemblies are joined; and



shielding means on one of said socket assembly and said plug assembly to prevent access to said plug terminal means and said socket terminal means when said plug assembly and said socket assembly are joined in axial alignment.

4,681,386

# INTEGRAL CONNECTOR HAVING PLASTIC SPRING-CLIPS

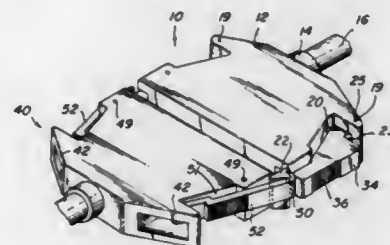
Edward Boulanger, Hamden, Conn., assignor to Lance Wire and Cable, Inc.

Filed Jan. 22, 1986, Ser. No. 820,741

Int. Cl.<sup>4</sup> H01R 13/627

U.S. Cl. 439—347

4 Claims



1. An electrical connector for connection to a panel having an opening therethrough or to a second connector comprising, a plastic housing for reception of a multi-wired cable at the rear end thereof and a multi-contact plug at the front end thereof; said housing having first and second side walls between said front end and said rear end; a first pair of front flanges extending outwardly from said side walls adjacent said front end; a second pair of rear flanges extending outwardly from said side walls adjacent said rear end; a first plastic spring clip along said first side wall and having a forward end extending forwardly of said housing and having a rear portion; a second plastic spring clip along said second side wall and having a forward end extending forwardly of said housing and having a rear portion; said rear flanges having first and second openings respectively receiving said rear portions of said spring clips; means pivotally supporting said spring clips on said rear flanges; means integral with said spring clips for biasing said forward ends away from one another; and first and second shoulders respectively formed on the forward ends of said spring clips and extending outwardly therefrom, said first and second shoulders formed with outwardly tapering surfaces and with recesses rearwardly of said tapered surfaces.

4,681,387

# LATCH CONNECTOR

Albert W. Paddock, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 21, 1986, Ser. No. 933,430

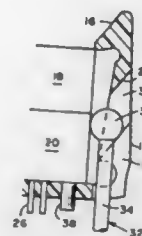
Int. Cl.<sup>4</sup> H01R 13/633

U.S. Cl. 439—347

3 Claims

1. A latch connector for releasably securing a pair of electrical connectors together comprising:
  - a. a latch connector body including a base portion having holes therein for receiving pin conductors of a first of said pair of connectors therethrough;
  - b. a pair of upstanding end latch portions extending from said base portion and having hook portions at the distal ends thereof for engagement with the second of said pair of connectors for retention of said connectors in secured relation;
  - c. said end latch portions having a groove therethrough

extending from said base portion and terminating intermediate said base portion and said hook portion, and, an angled circular opening extending transversely through said end latch portions and in communication with said groove; and



- d. unlatching means disposed in each of said angled circular openings and cooperating with said upstanding end latch portions to effect disconnection of said latch connector from said second of said pair of electrical connectors, by flexing said end latch portions for release of said hook portions from said second of said pair of connectors.

4,681,388

# CORD CLAMPING MECHANISM

Akira Nakazawa; Shigeru Kikuta; Kihachiro Koike; Kensaku Matsuoka, and Yoshimitsu Nishino, all of Tokyo, Japan, assignors to Hirose Elec. Co., Ltd.; NEC Corporation and Japan Aviation Elec., all of Tokyo, Japan

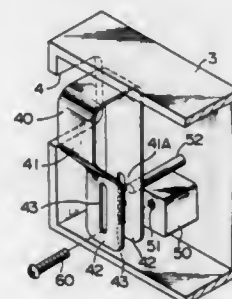
Filed Apr. 4, 1986, Ser. No. 848,315

Claims priority, application Japan, Apr. 4, 1985, 60-50183[U]

Int. Cl.<sup>4</sup> H01R 13/58

U.S. Cl. 439—449

3 Claims



1. A cord clamping mechanism comprising a cord clamp, a clamp mounting base for mounting the cord clamp, said cord clamp having a ring-shaped portion for passing a cord to be clamped, and a pair of legs extending from both ends of the ring-shaped portion for clamping the cord passed through the ring-shaped portion when the legs are closed, said legs being formed with openings for passing a clamping screw for closing the clamp and mounting fixedly on the base, said base being formed with a threaded opening for receiving the screw, and a guiding projection to be inserted into the opening at a position near the ring-shaped portion between the screw and the ring-shaped portion when the clamp is mounted on said base.

4,681,389

# LOCK PIN FOR MOUNTING BOARD-MOUNT TYPE CONNECTOR ON BOARD

Akira Nakazawa; Shigeru Kikuta; Kihachiro Koike; Kensaku Matsuoka, and Yoshimitsu Nishino, all of Tokyo, Japan, assignors to Hirose Elec. Co., Ltd.; NEC Corporation and Japan Aviation Elec., all of Tokyo, Japan

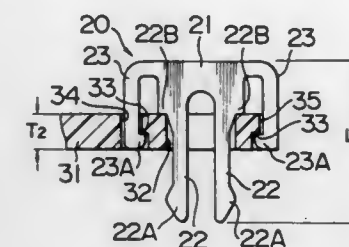
Filed Apr. 4, 1986, Ser. No. 848,314

Claims priority, application Japan, Apr. 4, 1985, 60-50182[U]

Int. Cl.<sup>4</sup> H02B 1/02

U.S. Cl. 439—557

3 Claims



1. A lock pin for mounting a board-mount type connector on a board, wherein the board-mount type connector includes one member having an upper surface and a lower surface and a lock pin mounting opening passing through from the upper surface to the lower surface, the one member further having shoulders formed at the periphery of the lock pin mounting opening and below the upper surface, the board having a lock pin inserting opening formed therein correspondingly to the lock pin mounting opening of one member, the lock pin comprising:

an unitary piece of elastic material, said elastic material having an upper lateral arm, a pair of spaced long central legs respectively extending downwardly from the center of said upper lateral arm, and a pair of spaced short outside legs respectively extending downwardly from the upper lateral arm along the outside of said central legs, said central legs being respectively formed at the roots thereof with shoulders to be engaged with the periphery of the lock pin mounting opening at the upper surface of the one member and at the lower ends thereof with side projections to be engaged with the periphery of said lock pin inserting opening of the board, said outside legs being respectively formed at the lower ends thereof with side projections extending therefrom for engaging a lower surface of said shoulders of the one member, whereby said lock pin can be held fixedly with the one member with the central legs being projected from the lower surface side of the one member over a considerable length by inserting the lower ends of said central legs into said lock pin mounting opening from the upper surface side of the one member so that said shoulders at the roots of said central legs are respectively engaged with the upper surface of the one member and said side projections of said outside legs are respectively engaged with said shoulders of the one member, and then the lower ends of said central legs thus projected are adapted to be inserted into said lock pin inserting opening of the board.

4,681,390

# NON-RADIATING COAXIAL OUTLET

Robert D. Hayward, Phoenix, Ariz., assignor to Gilbert Engineering Company, Inc., Del.

Filed Jul. 21, 1986, Ser. No. 887,439

Int. Cl.<sup>4</sup> H01R 17/18

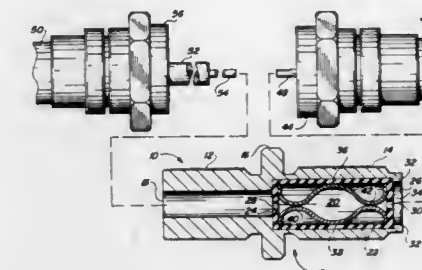
U.S. Cl. 439—578

14 Claims

1. A non-radiating coaxial cable coupler for connecting a terminal device to a system, said system and said device being coupled to first and second coaxial cables, respectively, each

said first and second coaxial cables having concentric inner and outer conductors, said coupler comprising:

- a. first and second longitudinally aligned coaxial sections;
- b. said first section adapted for coupling to the first coaxial cable and having a first cavity therein;
- c. insulating means positioned within said first cavity;
- d. contact means disposed within said insulating means for detachably receiving and contacting the inner conductors of the first and second coaxial cables; and



- e. said second section adapted for coupling to said second coaxial cable and having a second cavity therein, said second cavity being dimensioned and configured to act as a waveguide having a cutoff wavelength substantially below the wavelength spectrum of said system; whereby there is substantially no electromagnetic radiation from or into said coupler when said second cable is not coupled thereto.

4,681,391

# ELECTRIC CONNECTOR

Jean C. Bouley, Dole, France, assignor to Allied Corporation, Morris Township, Morris County, N.J.

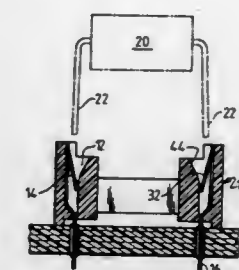
Filed Dec. 6, 1985, Ser. No. 805,665

Claims priority, application France, Dec. 19, 1984, 84 19441

Int. Cl.<sup>4</sup> H01R 33/76

U.S. Cl. 439—444

8 Claims



1. In an electrical connector particularly for use in mounting an electronic component having two parallel rows of terminals to a support, such as a printed circuit board, said connector comprising an insulating block having two rows of cavities, each cavity containing a contact element introduced through an opening provided at the top of said cavity, said contact element including a leg projecting through a substantially sealed passage at the bottom of said cavity for connection with said support, the improvement comprising said contact element comprises a substantially flat web portion pressing against a substantially flat first wall of said cavity adjacent to an external longitudinally extending face of said insulating block, the central portion of said web portion being cut out and bent to form a substantially flat contact tab extending out of the plane of said web portion, said tab being resiliently urged to engage a lower portion of a second wall of said cavity opposite to said first wall in the absence of a mating terminal being received in said cavity, said lower portion being substantially

flat, said tab being adapted to cooperate with a male contact element which is inserted into said cavity, said tab being in the form of a rectangle extending generally along the length of said web portion which is also rectangular, an upper side of said rectangle of said tab forming an articulation with the top of said web portion and a side of said tab opposite to said upper side of said rectangle of said tab forming a rectilinear free end adapted to cooperate with said male contact element, said web portion being connected to said leg by two bent portions such that said leg is offset from said web portion such that said leg extends substantially as an extension of said lower portion of said second wall and being substantially in alignment with said free end of said tab, whereby said leg is aligned with said male contact element.

4,681,392

# SWAGED COMPLIANT CONNECTOR PINS FOR PRINTED CIRCUIT BOARDS

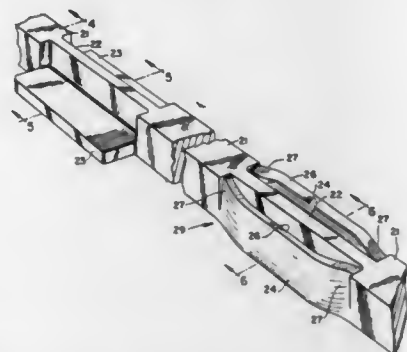
Robert S. Terita, Trumbull, Conn., assignor to Bead Chain Manufacturing Company, Bridgeport, Conn.

Filed Apr. 21, 1986, Ser. No. 853,890

Int. Cl.<sup>4</sup> H01R 13/428

U.S. Cl. 439—751

8 Claims



1. A compliant connector pin for interfering force fit insertion in a plated through hole of a printed circuit board, formed entirely from original wire stock in coining and forming operations producing substantially no scrap, comprising

an elongated segment of wire stock with chamfered wire-wrap ends, having its original maximum wire stock diameter selected to be less than the internal diameter of each said through hole,

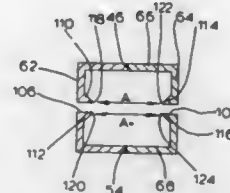
a stamped board-engaging portion formed at an intermediate point between said chamfered ends of said segment, with an extended cross-section having a maximum dimension exceeding the internal diameter of each said through hole, said board-engaging portion being formed with a central web extending substantially across the full width of the wire stock, and with a pair of lateral wing flanges of substantially uniform thickness between about 44% and about 78% of the thickness between of the central web and extending cantilever-fashion in two opposite directions from a first side of said central web, said central web remaining substantially undeformed during and after the stamping of said wing flanges,

each of said wing flanges being smoothly curved toward the other, opposite side of the web, whereby the stamped board-engaging portion of said elongated segment is formed with a cross-section in the shape of the Greek letter epsilon.

4,681,393  
ELECTRICAL CONNECTOR ASSEMBLY  
Minoru Fukushima, Yokohama, and Shinsuke Kunishi, Yamato, both of Japan, assignors to Molex Incorporated, Lisle, Ill.  
Filed Sep. 9, 1985, Ser. No. 773,952  
Claims priority, application Japan, Oct. 11, 1984, 59-213235  
Int. Cl.<sup>4</sup> H01R 13/11

U.S. Cl. 439—851

13 Claims



1. An electrical connector assembly including  
a female terminal having a body with a mating end and a circuit-connecting end, the body defining a terminal-receiving opening in said mating end and a terminal-receiving passageway inwardly extending from said opening, and  
a male terminal telescopically receivable in said terminal-receiving passageway to electrically engage said body of said female terminal,

the improvement comprising:  
said body of said female terminal including an elongated generally hollow sleeve defining said passageway, with first and second spaced-apart longitudinally extending opposed slits forming first and second laterally opposed pivotally moveable sidewalls having normally abutting edges immediately adjacent said slits, said first slit extending along the entire length of the sleeve, said second slit extending from the mating end along a portion of the length of the sleeve, and a bight portion adjacent said second slit joining said two sidewalls, said bight portion extending the remaining length of the sleeve and biasing said mating edges in abutting engagement, whereby said sidewalls are adapted to be spread apart at the slits upon exertion of internal forces against the sleeve; and  
a pair of generally opposed inwardly extending rigid terminal-engaging projections formed on said two sidewalls, each having first and second end portions extending into said terminal receiving passageway and located adjacent said first and second slits, respectively, said first end portions having a closer spacing therebetween than said second end portions to impart a greater spreading displacement to said mating edges adjacent said first slit when said male terminal is inserted between said projections, resulting in substantially uniform electrical contact pressures against said male terminal.

the improvement comprising:  
said body of said female terminal including an elongated generally hollow sleeve defining said passageway, with first and second spaced-apart longitudinally extending opposed slits forming first and second laterally opposed pivotally moveable sidewalls having normally abutting edges immediately adjacent said slits, said first slit extending along the entire length of the sleeve, said second slit extending from the mating end along a portion of the length of the sleeve, and a bight portion adjacent said second slit joining said two sidewalls, said bight portion extending the remaining length of the sleeve and biasing said mating edges in abutting engagement, whereby said sidewalls are adapted to be spread apart at the slits upon exertion of internal forces against the sleeve; and  
a pair of generally opposed inwardly extending rigid terminal-engaging projections formed on said two sidewalls, each having first and second end portions extending into said terminal receiving passageway and located adjacent said first and second slits, respectively, said first end portions having a closer spacing therebetween than said second end portions to impart a greater spreading displacement to said mating edges adjacent said first slit when said male terminal is inserted between said projections, resulting in substantially uniform electrical contact pressures against said male terminal.

the improvement comprising:  
said body of said female terminal including an elongated generally hollow sleeve defining said passageway, with first and second spaced-apart longitudinally extending opposed slits forming first and second laterally opposed pivotally moveable sidewalls having normally abutting edges immediately adjacent said slits, said first slit extending along the entire length of the sleeve, said second slit extending from the mating end along a portion of the length of the sleeve, and a bight portion adjacent said second slit joining said two sidewalls, said bight portion extending the remaining length of the sleeve and biasing said mating edges in abutting engagement, whereby said sidewalls are adapted to be spread apart at the slits upon exertion of internal forces against the sleeve; and  
a pair of generally opposed inwardly extending rigid terminal-engaging projections formed on said two sidewalls, each having first and second end portions extending into said terminal receiving passageway and located adjacent said first and second slits, respectively, said first end portions having a closer spacing therebetween than said second end portions to impart a greater spreading displacement to said mating edges adjacent said first slit when said male terminal is inserted between said projections, resulting in substantially uniform electrical contact pressures against said male terminal.

the improvement comprising:  
said body of said female terminal including an elongated generally hollow sleeve defining said passageway, with first and second spaced-apart longitudinally extending opposed slits forming first and second laterally opposed pivotally moveable sidewalls having normally abutting edges immediately adjacent said slits, said first slit extending along the entire length of the sleeve, said second slit extending from the mating end along a portion of the length of the sleeve, and a bight portion adjacent said second slit joining said two sidewalls, said bight portion extending the remaining length of the sleeve and biasing said mating edges in abutting engagement, whereby said sidewalls are adapted to be spread apart at the slits upon exertion of internal forces against the sleeve; and  
a pair of generally opposed inwardly extending rigid terminal-engaging projections formed on said two sidewalls, each having first and second end portions extending into said terminal receiving passageway and located adjacent said first and second slits, respectively, said first end portions having a closer spacing therebetween than said second end portions to impart a greater spreading displacement to said mating edges adjacent said first slit when said male terminal is inserted between said projections, resulting in substantially uniform electrical contact pressures against said male terminal.

4,681,394  
LIGHT BEAM SCANNING SYSTEM  
Masaru Noguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Feb. 27, 1986, Ser. No. 833,621  
Claims priority, application Japan, Mar. 1, 1985, 60-40685  
Int. Cl.<sup>4</sup> G02B 26/10

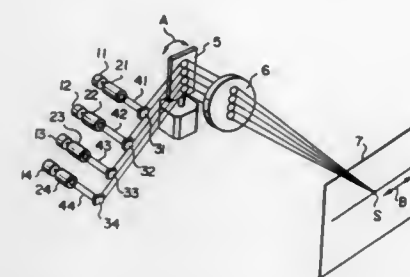
U.S. Cl. 350—6.6

2 Claims

1. A light beam scanning system in which laser beams emitted by a plurality of semiconductor lasers are combined into a single laser beam and the single laser beam is caused to sweep a surface-to-be-scanned, characterized in that the oscillation wavelengths of the semiconductor lasers are selected so that

the oscillation wavelengths  $\lambda_i$  and  $\lambda_j$  of any two of the semiconductor lasers satisfy the formula

$$|\lambda_i - \lambda_j| \geq \lambda_i \lambda_j M / c$$



wherein M and c respectively represent the picture element frequency and the velocity of light.

4,681,395  
TIME-DOMAIN INTENSITY NORMALIZATION FOR FIBER OPTIC SENSING

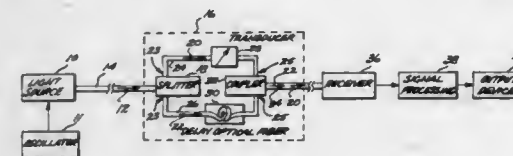
Thomas A. Lindsay, Brier, and Randall E. Morton, Redmond, both of Wash., assignors to Eldec Corporation, Lynnwood, Wash.

Filed Feb. 22, 1985, Ser. No. 704,324

Int. Cl.<sup>4</sup> G02B 6/28; G02F 1/015

U.S. Cl. 350—96.16

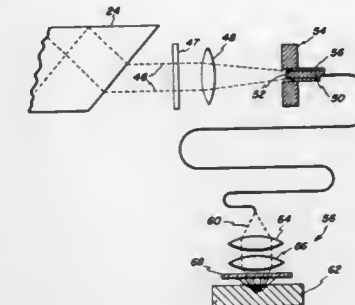
22 Claims



1. A fiber optic sensing system comprising:  
(a) a source for producing an optical signal of any selected intensity;  
(b) a receiver;  
(c) an optical waveguide element interconnected between the source and the receiver, the optical waveguide element providing a single path for propagation of the optical signal between the source and the receiver;  
(d) a sensor unit connected to the optical waveguide element between the source and the receiver, the sensor unit including two branch optical waveguides, each branch optical waveguide having an input end and an output end, the branch optical waveguides being coupled in common to the optical waveguide element at both their input and output ends, the branch optical waveguides being configured and arranged so that a component of the optical signal propagates through each branch optical waveguide;  
(e) delay means coupled to one of the branch optical waveguides between its input end and its output end for delaying the propagation of the component of the optical signal that is associated with the branch optical waveguide to which the delay means is connected; and  
(f) transducer means associated with one of the branch optical waveguides between its input end and its output end for varying the intensity of the component of the optical signal that is associated with the branch optical waveguide to which the transducer means is connected.

4,681,396  
HIGH POWER LASER ENERGY DELIVERY SYSTEM  
Marshall G. Jones, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
Filed Oct. 9, 1984, Ser. No. 659,125  
Int. Cl.<sup>4</sup> G02B 6/32; H01S 3/30; B23K 9/00  
U.S. Cl. 350—96.18

3 Claims



1. An improved high power laser energy delivery system comprising:

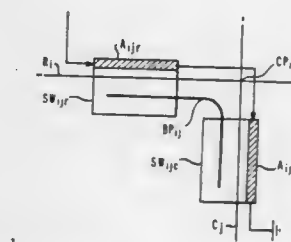
a solid-state total-internal-reflection face-pumped laser for producing a near infrared or visible wavelength laser beam which has an average power output level greater than 400 watts and a beam divergence less than one milliradian;

a single fiber optic serving as a light guide and having a diameter less than 600 micrometers and a given numerical aperture;

at least one focusing lens having a given focal length and which focuses said laser beam on one end of said fiber optic to a spot having a size smaller than the fiber diameter, where spot size is proportional to the product of lens focal length and laser beam divergence, and with a beam cone angle less than twice said numerical aperture so that laser energy entering said fiber is transmitted by total internal reflection to emerge at the other end; and  
an optical system coupled to the other end of said fiber to focus the emerging laser beam onto material to be processed.

4,681,397  
OPTICAL SWITCHING ARRANGEMENT  
Vipul Bhatt, Lincoln Park, N.J., assignor to AMP Incorporated, Harrisburg, Pa.  
Filed Jun. 28, 1985, Ser. No. 750,722  
Int. Cl.<sup>4</sup> G02B 6/36  
U.S. Cl. 350—96.20

8 Claims



1. Optical apparatus adapted for switching information from a first to a second waveguide, said apparatus comprising first and second sleeve switches, said first sleeve switch comprising said first waveguide and a third waveguide in spaced apart first positions at which only negligible coupling occurs therebetween, said second sleeve switch comprising said second waveguide and said third waveguide in spaced apart first positions at which only negligible coupling occurs therebetween, each of



said first and second sleeve switches including actuator means for moving the respective waveguides to second relatively close positions at which significant coupling occurs between said respective waveguides, said respective waveguides being adapted to permit information coupling therebetween.

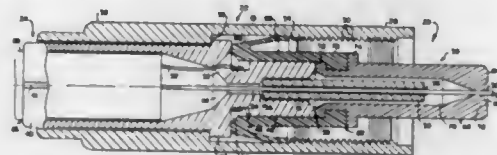
4,681,398

# FIBER OPTIC CONNECTOR AND METHOD OF ASSEMBLY

James R. Bailey, Chicago, and Eric L. Long, Northbrook, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.  
Continuation of Ser. No. 455,400, Jan. 3, 1983, abandoned. This application Dec. 17, 1985, Ser. No. 808,687  
Int. Cl.<sup>4</sup> G02B 6/36

U.S. Cl. 350—96,20

23 Claims



1. A fiber optic connector assembly comprising: tubular means for supporting an axially disposed optical fiber end portion having a substantially flat end surface; and apertured wall means disposed transversely of said tubular means and secured thereto for receiving said optical fiber end portion and supporting said end surface of the optical fiber end portion in fixed spaced relationship with respect to said wall means, said wall means including rigid surface means curved concavely in the radial direction with respect to said optical fiber end portion for reflecting light relative to said end surface of the optical fiber end portion.

4,681,399

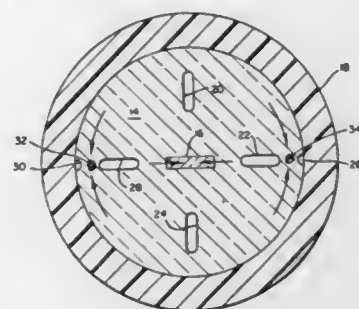
STRESSED CORE OPTICAL FIBER AND METHOD  
John W. Hicks, Jr., Northboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 1, 1984, Ser. No. 656,534

Int. Cl.<sup>4</sup> G02B 6/16

U.S. Cl. 350—96,30

28 Claims



1. An optical waveguide comprising: an elongated substrate having a central longitudinal axis and fabricated from an optical energy transmitting material having a nominal index of refraction; and means for applying a compressive stress to at least one longitudinally extending cross-sectional zone of said substrate displaced from said central axis to raise the index of refraction of said zone with respect to material surrounding said zone to propagate light energy in said zone, wherein one of said substrate and said means for applying a compressive stress comprises a stressed member longitudinally extending and enclosed within the other of said substrate and said means for applying a compressive stress.

4,681,400

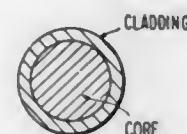
# PLASTIC OPTICAL FIBERS

Yoshinobu Ueba, and Shinichi Miyake, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan  
Continuation of Ser. No. 411,381, Aug. 25, 1982. This application Jul. 26, 1985, Ser. No. 758,849

Claims priority, application Japan, Aug. 25, 1981, 56-133678  
Int. Cl.<sup>4</sup> B29D 11/00; D02G 3/00; C08F 120/18

U.S. Cl. 350—96,34

8 Claims



1. A plastic optical fiber comprising a core of a copolymer of phenyl methacrylate and methyl methacrylate produced by bulk polymerization and a cladding of a copolymer of vinylidene fluoride and a fluoroolefin provided on said core, wherein the copolymer of said cladding has a melting point of at least 120° C. and a fluoroolefin content of at least 3 mol%.

4,681,401

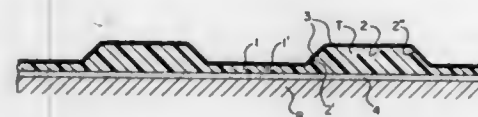
# SHEET MATERIAL MARKER SURFACE FOR ROADWAYS AND THE LIKE

Charles W. Wyckoff, 85 Pine St., Needham, Mass. 02192  
Continuation of Ser. No. 694,479, Jan. 23, 1985, abandoned, which is a continuation of Ser. No. 351,037, Feb. 22, 1982, abandoned. This application Sep. 23, 1985, Ser. No. 779,297

Int. Cl.<sup>4</sup> G02B 5/124

U.S. Cl. 350—105

9 Claims



9. For use with a roadway surface and the like, a direction-indicating surface marker strip comprising plastic material adapted to be secured to said roadway surface, said strip being intermittently deformed upward to provide successive wedges of substantially trapezoidal shape in longitudinal vertical section, each wedge having a top surface bounded by inclined front and rear surfaces, each top surface having a substantially horizontal surface area that is substantially greater than the area of each inclined surface, successive wedges of said strip being separated by substantially horizontal surfaces each having an area substantially greater than that of each inclined surface, each inclined surface forming an angle with respect to vertical that is substantially within the range of 0 degree to 45 degrees, the height of each wedge being a small fraction of the longitudinal dimension of the top surface of the wedge, each of said inclined surfaces being provided with a surface layer of retroreflecting beads, said layer of retroreflective beads having at least a top row thereof which is visible at night to a motorist hundreds of feet away by retroreflection of vehicle headlights, the configuration, dimensions, and spacing of the wedges being selected to reduce substantially the obscuring of the marker strip by shadows of the wedges in sunlight, so that the marker strip is clearly visible to a motorist during the day as well as at night, and whereby the marker strip has a long effective life even when subjected to abrasion and dirt.

4,681,402

# RAINBOW PROJECTOR

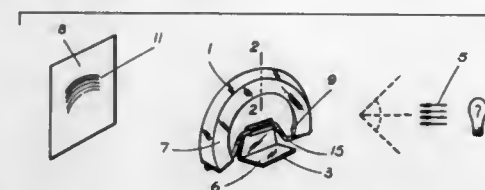
Carlton R. Tiffany, 225 Hill Rd., Douglassville, Pa. 19518

Filed Oct. 2, 1985, Ser. No. 783,091

Int. Cl.<sup>4</sup> G02B 5/04; F21V 3/00, 5/00

U.S. Cl. 350—286

5 Claims



1. A means for projecting a secondary rainbow of natural configuration comprising a generally arcuate prism means of at least about 180° of arc bearing a primary and secondary refractive surface wherein such surfaces meet along that single interior edge of said prism closest to the center of the arc of the prism and said primary and secondary surfaces form an active range angle from about 25° to about 75°, such that when a light source positioned at an effective angular range of less than about 30° from perpendicular relative to a plane through the interior edge of the prism, a secondary rainbow of natural configuration will be projected from the secondary refractive surface, said projecting means further comprising an orienting means attached thereto while maintaining generally full transmittability of light in the effective angular range from the primary refractive surface through the secondary refractive surface to projection material, wherein the orienting means is further comprised of a positioning means and a base means wherein the positioning means is a bar affixed at each end of said arcuate prism and said positioning bar is rotably orientable upon said base means.

4,681,403

# DISPLAY DEVICE WITH MICROMECHANICAL LEAF SPRING SWITCHES

Ties S. Te Velde, and Joannes L. M. Van de Venne, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

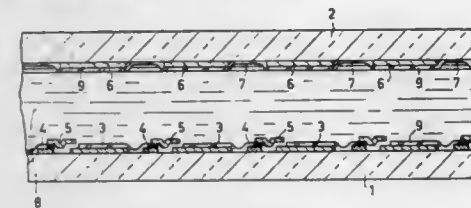
Continuation of Ser. No. 396,534, Jul. 8, 1982, abandoned. This application Jun. 19, 1986, Ser. No. 877,696

Claims priority, application Netherlands, Jul. 16, 1981, 8103377

Int. Cl.<sup>4</sup> G02F 1/01, 1/133

U.S. Cl. 350—334

35 Claims



1. A display device comprising two separated supporting plates; an electro-optical medium disposed between said supporting plates, wherein said electro-optical medium includes one of a liquid crystal, an electrophoretic suspension, or an electrochromic material; a plurality of picture electrodes formed in rows and columns on facing surfaces of said supporting plates to form a system of picture elements; a system of column electrodes disposed with said picture electrodes on one of said supporting plates; a system of row electrodes disposed below said picture electrodes on a second of said supporting plates; an insulating layer disposed between said picture electrodes and said row electrodes wherein each of said picture electrodes includes an aperture at an area over a row electrode, said row electrode being free of said insulating layer at said aperture; switching means including at least one electrostatically controllable micromechanical leaf spring

being disposed in each of said apertures for providing connection between said picture electrode and said row electrode, said micromechanical leaf spring only being a metal free of any insulating layer; and an electrically conductive covering hood extending over said aperture to protect said leaf spring from said electro-optical medium.

4,681,404

# LIQUID CRYSTAL DEVICE AND DRIVING METHOD THEREFOR

Shinjiro Okada, Kawasaki, and Junichiro Kanbe, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

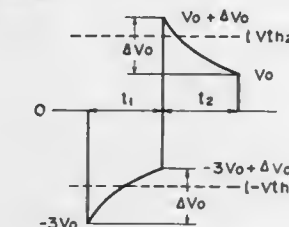
Filed Sep. 24, 1985, Ser. No. 779,651

Claims priority, application Japan, Oct. 4, 1984, 59-209255

Int. Cl.<sup>4</sup> G02F 1/133

U.S. Cl. 350—350 S

31 Claims



1. A liquid crystal device comprising a plurality of picture elements arranged in a plurality of rows; each picture element comprising a pair of oppositely spaced electrodes and a ferroelectric liquid crystal disposed between the electrodes and showing a first stable state and a second stable state depending on an electric field applied;

said liquid crystal device being driven by sequentially orienting the ferroelectric liquid crystal at selected picture elements on a selected row to the first or second stable state to write in the picture elements row by row; said ferroelectric liquid crystal having a volume resistivity of  $1 \times 10^9 \Omega \cdot \text{cm}$  or larger.

4,681,405

# METHOD AND LENS FOR PRODUCING A WIDE ANGLE IMAGE

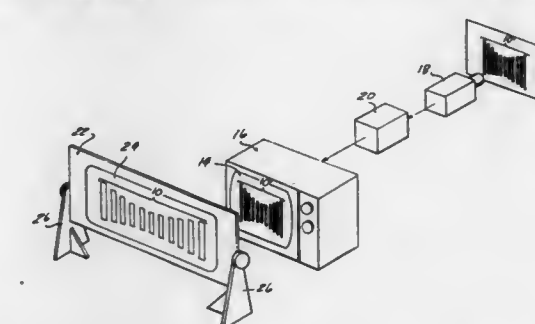
Thomas K. Balogh, 1940 Golfview, Apt. 202, Troy, Mich. 48064, and John M. Balogh, 5129 Kolmar, Chicago, Ill. 60648

Filed Oct. 1, 1984, Ser. No. 656,588

Int. Cl.<sup>4</sup> G02B 13/08, 3/08, 21/60

U.S. Cl. 350—420

10 Claims



1. A method of creating an image of a horizontally disposed field of visual features including the steps of: forming a record of said field which record comprises a representation of said features compressed along the horizontal axis of said field; forming a viewable but width distorted image of said horizontal axis compressed record by displaying said record on a television screen; viewing the width distorted image through a lens positioned before said television screen displaying said viewable but distorted image, which lens is configured to create an ex-

panded width corrected viewable image of said television screen display, which expansion is only along the horizontal axis and which expansion corresponds to the degree of compression carried out in said step of forming said record, whereby said expanded image corresponds substantially exactly to said field of visual features:

4,681,406

## ZOOM LENS ASSEMBLY

Hideshi Naito, Yoshiro Kodaka, both of Tokyo, and Yoshiharu Shiokama, Kawasaki, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

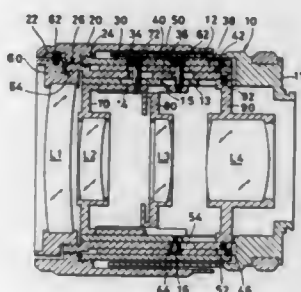
Filed Jan. 17, 1985, Ser. No. 692,195

Claims priority, application Japan, Jan. 20, 1984, 59-8126

Int. Cl.<sup>4</sup> G02B 7/10

U.S. Cl. 350-429

10 Claims



8. A zoom lens assembly comprising:

- (a) an optical system including first, second and third lens units arranged in that order as viewed from the object side;
- (b) a stationary cylindrical housing member;
- (c) an operation member movable relative to said housing member, said operation member being moved axially along the optical axis for zooming and being rotated about the optical axis for focusing;
- (d) first, second and third lens holding members for holding said first, second and third lens units, respectively, said lens holding members being movable in the direction along the optical axis independently of each other and relative to said housing member;
- (e) first interlocking means for connecting said first holding member with said operation member to move said first holding member in the direction along the optical axis during the time that said operation member is rotated about the optical axis;
- (f) a cam member mounted axially movable along the optical axis and rotatable about the optical axis relative to said housing member, said cam member being disposed between said operation member and each of said second and third lens holding members and having a cam connection means so formed that when said cam member is rotated about the optical axis, said second and third lens holding members are moved individually in the direction along the optical axis by said cam member and when said cam member is axially moved, said second and third lens holding members are moved together with said cam member in the direction along the optical axis; and
- (g) second interlocking means for connecting said cam member with said operation member to rotate said cam member about the optical axis while moving said cam member in the direction along the optical axis during the time that said operation member is moved in the direction along the optical axis and to move said cam member in the direction along the optical axis during the time that said operation member is rotated about the optical axis.

4,681,407

TWO-GLASS PHOTOGRAPHIC OBJECTIVE  
COLOR-CORRECTED AT FOUR WAVELENGTHS

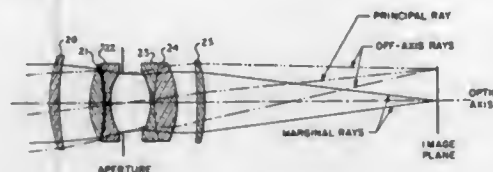
Romeo I. Mercado, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 2, 1985, Ser. No. 803,173

Int. Cl.<sup>4</sup> G02B 9/36

U.S. Cl. 350-471

6 Claims



1. An optical objective comprising six lens elements positioned coaxially with respect to each other along an optic axis, said six lens elements being made from only two different optical materials, at least one of said lens elements being made from a first one of said optical materials, at least one other of said lens elements being made from a second one of said optical materials, said lens elements coating with each other so that paraxial marginal rays passing through said objective are brought to a common focus on a common focus on said optic axis at four discrete wavelengths.

4,681,408

ADJUSTABLE MOUNT FOR LARGE MIRRORS

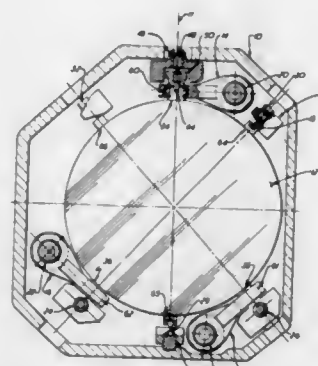
Anees Ahmad, Bethel, and Richard Huse, Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 28, 1986, Ser. No. 856,881

Int. Cl.<sup>4</sup> G02B 7/18

U.S. Cl. 350-609

6 Claims



1. A mirror mounting apparatus comprising:

- a mirror;
- a housing;
- three individual tangent bars having a first end and a second end;
- each of said three individual tangent bars having the first end thereof rotatably mounted to said housing through a first spherical bearing and the second end thereof rotatably mounted to said mirror through a second spherical bearing;
- the first spherical bearing having an axis perpendicular to the plane of said mirror; and
- the second spherical bearing having an axis perpendicular to both the axis of said first spherical bearing and to a line tangent to the point of contact on said outer circumference of said mirror of said tangent bar.

4,681,409

## OUTSIDE REAR VIEW MIRROR

Masao Enomoto, Hatano, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

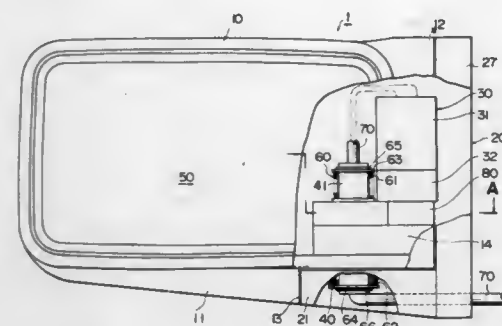
Filed Dec. 14, 1984, Ser. No. 681,655

Claims priority, application Japan, Dec. 17, 1983, 58-237187; Dec. 17, 1983, 58-237188; Apr. 13, 1984, 59-53491[U]; Jun. 15, 1984, 59-89215[U]

Int. Cl.<sup>4</sup> G02B 5/08, 7/18; B60R 1/06

U.S. Cl. 350-637

20 Claims



1. An outside rear view mirror, comprising:

- a base;
  - a spindle having a longitudinal axis and secured to said base;
  - a mirror housing provided with a mirror and rotatably secured to said spindle;
  - a drive motor attached to said mirror housing and communicating with a power supply; and
  - gear means for mechanically engaging said drive motor with said spindle, said gear means including at least two gears, a first gear of the at least two gears being rigidly secured to an output shaft of said drive motor and a second gear of the at least two gears being secured to said spindle and engageable with said first gear so that rotation of said housing around said axis of said spindle occurs when said drive motor is activated by said power supply;
- means for absorbing an impact of an external force applied to said mirror housing in a direction non-coincident with said longitudinal axis of said spindle, said absorbing means including means for releasing said spindle for rotation for permitting rotation of said gear means as a unit relative to said base when said external force exceeds a certain predetermined level.

4,681,410

## FOLDABLE EYEGLASSES

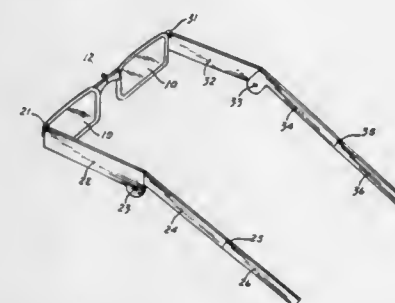
Al W. Paulsen, 706 W. 8th, Gillette, Wyo. 82716

Filed Jun. 14, 1985, Ser. No. 744,533

Int. Cl.<sup>4</sup> G02C 5/08, 5/14

U.S. Cl. 351-63

2 Claims



1. Foldable eyeglasses comprising:

- (a) A pair of lenses connected by a hinged bridge allowing the lenses to open to a position suitable for use as reading

glasses, and to close to a position such that the front surfaces of the lenses fold together;

- (b) Temples hingedly connected to the frames of said lenses, each temple comprising a number of foldable segments connected by hinges so that in the folded position the segments stack vertically to form one exterior face of the folded assembly, with the lenses entirely covered and folded between the exterior faces.

4,681,411

## EYEGLASS NOSEPIECE HOLDER

Lorenzo Taddei, Mantova, Italy, assignor to Comet - Construzione Occhiali Metallo S.p.A., Volta Mantovana MN, Italy

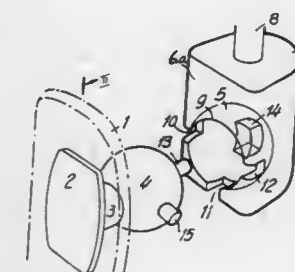
Filed Oct. 8, 1985, Ser. No. 785,634

Claims priority, application Italy, Oct. 19, 1984, 18119 A/84

Int. Cl.<sup>4</sup> G02C 5/12, 1/00

U.S. Cl. 351-137

7 Claims



1. An eyeglass nosepiece holder comprising a ball-socket connection for removably connecting a nosepiece to an eyeglass frame,

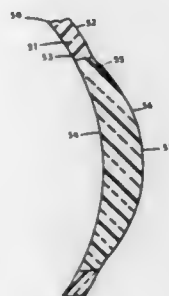
- said ball-socket connection including:
- a ball element having an outer substantially spherical shape defining a ball element diameter and an outer surface area, first and second pin elements projecting from said outer substantially spherical shape of said ball element and being rigid with said ball element, said first and second pin elements having respectively first and second pin element cross dimensions and said second pin element defining a second pin element rotation axis,
- a socket body made of elastically deformable material and having an outer delimitation wall,
- an internal recess in said socket body for accommodating therein said ball element, said internal recess having an introduction mouth formed in said outer delimitation wall of said socket body and an internal partially cut away spherical shape defining a recess diameter substantially equal to said ball element diameter, said introduction mouth having a width smaller than said ball element diameter and said internal partially cut away spherical shape having an inner surface area greater than half of said outer substantially spherical shape of said ball element,
- a notch formation extending from said recess within said socket body and having lateral delimitation walls defining a notch formation cross dimension greater than said first pin element cross section, said notch formation accommodating said first pin element and said lateral delimitation walls defining a lateral stop for said first pin element, and
- a first lateral cutout extending from said introduction mouth of said internal recess in said socket body and from said outer delimitation wall of said socket body to said internal recess, said first lateral cutout having a bottom delimitation wall opposed to said introduction mouth and two lateral delimiting walls, said lateral delimiting walls fittingly accommodating said second pin element cross dimension, thereby said socket body made of elastically deformable material together with at least said first lateral cutout



defining a snap engagement member for said ball element, and said notch formation allowing a limited movement of said first pin element within said notch formation and a limited rotation of said ball element with said internal recess with said second pin element sliding along said first lateral cutout and rotating around said second pin element rotation axis.

the opposed ends of the support to the headband for pivoting the support and with it the optical device about a pivot axis between a first position relative to the headband and a second position relative to the headband, and means for automatically locking the support in at least one of the first and second positions when moved thereto, the locking means including

**4,681,412**  
**CONTACT LENS CONTAINING LIGHT SENSITIVE MATERIAL**  
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840  
Filed Oct. 1, 1984, Ser. No. 656,313  
Int. Cl.<sup>4</sup> G02C 7/04, 7/10  
U.S. Cl. 351-162 7 Claims



1. A protective and corrective eye lens for use against the eye of a person comprising:

- a contact lens base defining a unitary molding of substantially circular configuration formed of a clear plastic resin and having a rear surface which is configured and adapted to be disposed in conformance with the central portion of the front of the eye of a person wearing said contact lens;
- said contact lens having a circular central portion forming a part of said unitary molding with said lens base, which central portion is operable to receive and transmit therethrough ambient light directed at a person wearing said lens, said central portion of said lens being located so as to pass the light it receives through the cornea and pupil of the eye to the lens of the eye when said contact lens is operatively disposed against the eye of said person;
- said contact lens including said circular central portion thereof being shaped to correct aberrations in the vision of the person wearing said lens;
- said circular central portion of said lens containing a light sensitive material in composition with said clear plastic resin, which light sensitive material is operable to change in its light transmissivity when subjected to ambient light such as sunlight passed through said lens when said lens is operatively worn by a person, whereby the amount of light passing through said central portion of said lens into the eye of the wearer of said lens will be less than the light received by said central portion of said lens.

**4,681,413**  
**HEADBAND WITH OPTICAL DEVICE ADJUSTABLY COUPLED THERETO**

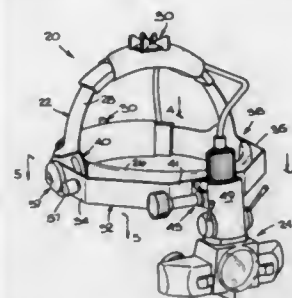
Otto H. Schmidt; Helmut A. Heine, both of Herrsching, and Helmut Rosenbusch, Weillhelm, all of Fed. Rep. of Germany, assignors to Propper Manufacturing Co., Inc., Long Island City, N.Y. and Heine Optotechnik GmbH & Co. KG, Herrsching, Fed. Rep. of Germany  
Filed Feb. 5, 1985, Ser. No. 698,362  
Int. Cl.<sup>4</sup> A61B 3/10

U.S. Cl. 351-205

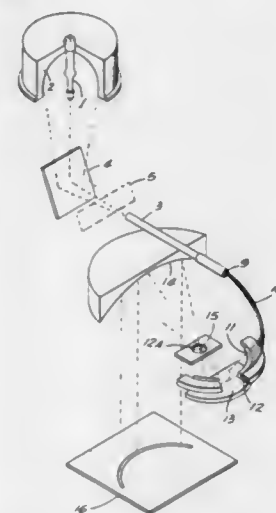
33 Claims

1. Head-worn apparatus comprising a headband, a medical optical device, a moveable bow-like support having opposed ends each of which is coupled to the headband and a central region to which the optical device is coupled, means coupling

means coupled to a first end of the support and pivotable with respect to the headband about the pivot axis and means fixed with respect to the headband disposed adjacent the first end of the support, the means pivotable with respect to the headband and the means fixed with respect to the headband cooperating to engage each other and automatically lock the support in the respective position when moved thereto.

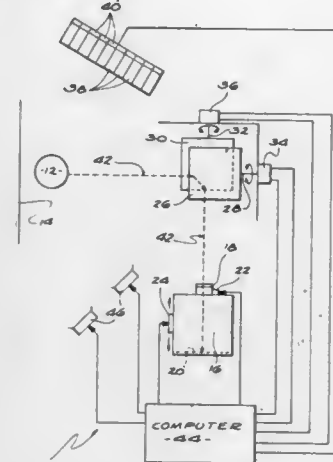


**4,681,414**  
**CONDENSER SYSTEM**  
Ronald S. Hershel, 4828 Springhill Rd., Albany, Oreg. 97321  
Continuation-in-part of Ser. No. 502,486, Jun. 9, 1983, abandoned. This application Jun. 6, 1984, Ser. No. 618,056  
Int. Cl.<sup>4</sup> G03B 21/00  
U.S. Cl. 353-102 45 Claims



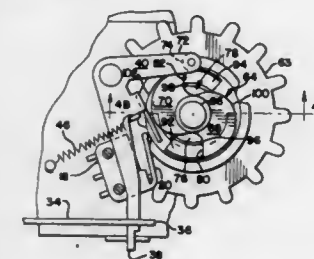
1. A condenser system comprising means for homogenizing light with substantially no change in light cone angle, and substantially no absorption or reflection losses of light; means for channeling light emerging from said homogenizing means into an arc of light spots of substantially equal intensity, said arc having a predetermined radius, width and direction; means for magnifying the width of said arc, for reducing proportionately the cone angle of said arc in the direction of its width to produce circularly symmetric light distribution in the aperture of said condenser; and means for transferring the arc from the magnifying means to an image plane, for focusing the arc at the image plane, and for homogenizing the light along the length of the arc at the image plane.

**4,681,415**  
**MULTIPLE IMAGE PHOTOGRAPHY SYSTEM**  
Rafael Beer, 207 S. Catalina #4, Los Angeles, Calif. 90004, and Tyrone Christiansen, 5617 Hollywood Boulevard, No. 102, Hollywood, Calif. 90028  
Filed Nov. 1, 1985, Ser. No. 794,944  
Int. Cl.<sup>4</sup> G03B 1/00, 15/00  
U.S. Cl. 354-120 10 Claims



10. An apparatus for generating multiple or continuously displaced images on a photograph film, comprising:  
a camera having a lens through which optical images may be focused onto the photographic film, the lens defining an optical axis;  
a first mirror rotatable around an axis substantially orthogonal to the optical axis of said lens for adjustably reflecting optical images into said lens;  
means for controlling the angular position of said first mirror;  
a second mirror rotatable around an axis substantially parallel to the optical axis of said lens for adjustably reflecting optical images of an object to be photographed onto said first mirror;  
means for controlling the angular position of said second mirror; and  
means for exposing the photographic film in accordance with programmed instructions, whereby positionally varying multiple optical images may be projected onto the photographic film for sequentially exposing different parts of the photographic film with the image.

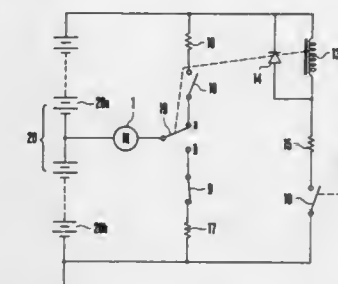
**4,681,416**  
**CAMERA SHUTTER COCKING MECHANISM**  
Klaus Raschke, Schaumburg, Ill., assignor to W. Haking Enterprises Limited, Hong Kong  
Filed Feb. 10, 1986, Ser. No. 826,971  
Int. Cl.<sup>4</sup> G03B 17/42  
U.S. Cl. 354-173.1 12 Claims



1. In a camera having a shutter release system, an electric motor drive system coupled to advance a film and actuate a shutter-cocking system from a released to a cocked condition

with each one-frame advance of said film, said shutter-cocking system restoring said shutter release system to a cocked condition responsively to movement of a movable cocking member coupled to be driven by said motor drive system from a released to a shutter-cocking position against the opposing force of at least one energizing spring, said opposing force increasing with the movement of said cocking member from said released to said shutter-cocking position, the improvement comprising: camming means rotatably driven by said motor drive system and having at least one cam lobe with a contour of varying radius from the axis of rotation thereof; cam follower means coupled to said cocking member and urged to engagingly follow said cam lobe so as to move said cocking member from said released to said shutter-cocking position against said increasing opposing force, said lobe contour being configured to maintain the load of said shutter cocking system on said motor drive system generally constant throughout film advance.

**4,681,417**  
**CAMERA WITH MOTOR-DRIVEN DIAPHRAGM DEVICE**  
Masahisa Fujino, Tokyo; Hidehiko Fukahori, Kanagawa, and Toshihiko Satoh, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan  
Continuation of Ser. No. 777,008, Sep. 17, 1985, abandoned, which is a continuation of Ser. No. 617,798, Jun. 6, 1984, abandoned. This application Sep. 16, 1986, Ser. No. 910,277  
Claims priority, application Japan, Jun. 13, 1983, 58-105220  
Int. Cl.<sup>4</sup> G03B 7/00, 9/08  
U.S. Cl. 354-234.1 6 Claims



5. A camera having a drive member arranged to move in response to rotation of an electric motor and diaphragm drive means responsive to one direction of rotation of said motor which moves said drive member in a first direction so that a diaphragm is driven by said movement in an aperture opening direction, and responsive to the direction opposite to said first direction of rotation of said motor which moves said drive member in said opposite direction so that said diaphragm is driven by said movement to move in the aperture closing direction, comprising:

detecting means for detecting a maximum aperture opening state of said diaphragm, said detecting means not detecting the maximum aperture opening state of said diaphragm at a position where the size of the aperture opening of said diaphragm reaches a maximum value by the movement of said drive member in the first direction, said detecting means detecting the maximum aperture opening state of said diaphragm only when said drive member further slightly moves in the same direction from the position where the size of the aperture opening of said diaphragm reaches the maximum value; and  
motor control means for stopping said electric motor when the maximum opening state of said diaphragm is detected by the detecting means.

4,681,418  
CAMERA

Takanori Kodaira, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

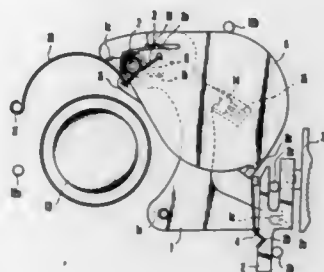
Filed Aug. 13, 1985, Ser. No. 765,330

Claims priority, application Japan, Aug. 23, 1984, 59-175773; Aug. 23, 1984, 59-175774

Int. Cl.<sup>4</sup> G03B 17/02

U.S. Cl. 354-288

37 Claims



## 1. A camera comprising:

- a protective cover arranged to open and close a front surface of a photo-taking optical system;
- an auxiliary optical system arranged to move into and out of an optical path of said photo-taking optical system, said auxiliary optical system being arranged to be operable independently of said protective cover;
- operation means arranged to be shiftable between first, second and third states thereof; and
- driving means arranged to drive said protective cover to open and close in response to a shift of said operation means between said first and second states thereof and to insert and extract said auxiliary optical system into and out of said optical path in response to a shift of said operation means between said second and third states while having said protective cover kept at a predetermined open position thereof.

## 4,681,419

## AUTOMATIC FOCUSING DEVICE

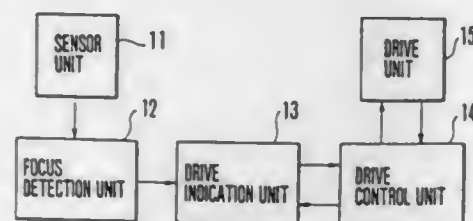
Shinji Sakai, Tokyo, and Takashi Kawabata, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Division of Ser. No. 448,742, Dec. 10, 1982, abandoned. This application Dec. 18, 1985, Ser. No. 810,416

Claims priority, application Japan, Dec. 18, 1981, 56-205787; Dec. 18, 1981, 56-205788; Dec. 18, 1981, 56-205790

Int. Cl.<sup>4</sup> G03B 3/10

U.S. Cl. 354-402

6 Claims



## 1. A camera system capable of using a variable focal length lens and having an automatic focusing function, comprising:

- focus detection means for detecting light coming through a lens and generating a difference signal corresponding to an existing deviation of a real image plane on which an image of an object is being really formed relative to a predetermined focal plane;
- driving means for driving lenses;
- a signal forming circuit for generating a signal which

indicates an amount of shifting of an image plane against an amount of shifting of a lens when the lens is driven by said driving means, said signal from said signal forming circuit varying depending on a zoom state used on the lens, and said signal forming circuit being provided at the lens;

- detection means for detecting the shifting of the lens; and
- a stopping circuit for accumulating the signal of said signal forming circuit every time said detection means detects that the lens shifts by a unit shifting amount and at the same time stopping the driving of the lens by said driving means when an amount of said accumulation of signal develops a prescribed relationship with said difference signal.

## 4,681,420

## LIGHT MEASURING DEVICE

Yasuo Suda; Kiyoshi Aiyfuku; Akio Sunouchi, and Nobuyuki Suzuki, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 662,257, Oct. 18, 1984, abandoned.

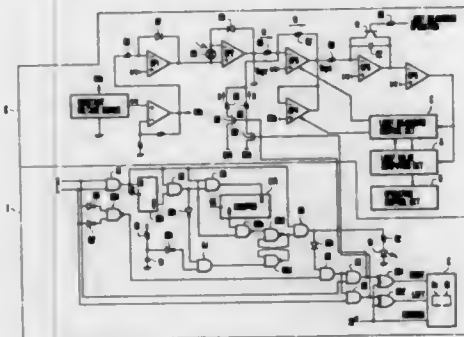
This application Mar. 12, 1986, Ser. No. 839,802

Claims priority, application Japan, Oct. 21, 1983, 58-197336

Int. Cl.<sup>4</sup> G03B 3/00

U.S. Cl. 354-409

25 Claims



## 8. A light measuring device comprising:

- display means including a plurality of display elements arranged on an optical path of light measurement, said display elements being capable of being activated and deactivated;
- light measuring means including a light measuring element for measuring a light value;
- correcting means responsive to a plurality of activations or deactivations of said display elements of said display means for correcting a light measuring value of said light measuring means to perform plural kinds of corrections in corresponding to amounts of change in said light measuring value by said light measuring means at said plurality of activations of said display elements; and
- said display elements of said display means including means for displaying measured distance information.

12. A light measuring device according to claim 8, wherein said display element includes means for selectively presenting "near focus", "in focus" and "far focus" display.

## 4,681,421

## DOUBLE-FACE FLEXIBLE PRINTED CIRCUIT BOARD

Akira Yamada, Tokyo, and Go Tokura, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Continuation of Ser. No. 656,172, Sep. 28, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 839,801

Claims priority, application Japan, Oct. 6, 1983, 58-187271

Int. Cl.<sup>4</sup> G03B 7/00

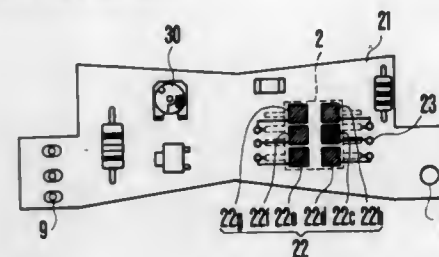
U.S. Cl. 354-485

11 Claims

- A double-face flexible printed circuit board to be placed

within a space between an internal mechanism and an outer cover of a camera, comprising:

- one side of said printed circuit board having an electrical circuit element of a flat packaged shape disposed therein on a given area; and



another side of said printed circuit board, opposite to said one side, having a pad area of a checking circuit pattern arranged thereon directly opposite the given area.

## 4,681,422

## PAPER SUPPLY DEVICE FOR AN ELECTROSTATIC PHOTOGRAPHIC PRINTER

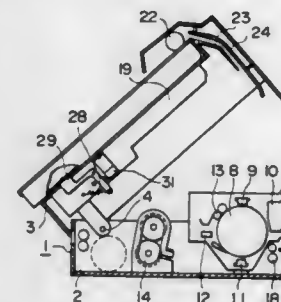
Harutaro Oba; Yasuhiko Ozawa; Yasuyoshi Yamaguchi, all of Shizuoka, and Osamu Mimoto, Kanagawa, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan Filed Oct. 25, 1985, Ser. No. 791,433

Claims priority, application Japan, Nov. 1, 1984, 59-230773; Nov. 8, 1984, 59-236494; Nov. 12, 1984, 59-237968

Int. Cl.<sup>4</sup> G03G 15/00

U.S. Cl. 355-3 R

5 Claims



## 1. An electrostatic photographic printer comprising:

- a housing, said housing including a base and a cover which are connected for pivotal motion in a vertical plane relative to each other;
- a picture image forming means provided at a lower part of said housing, said picture image forming means including at least one photosensitive member on which an electrostatic latent image is to be formed, a toner supplying means, a transfer means, and a fixing means;
- a paper supply cassette provided at an upper part of said cover;
- a paper supply roller provided at said upper part of said cover for rotation to draw out individual sheets of paper disposed in said paper supply cassette;
- a driving means connected to drive said paper supply roller; and
- a paper guide for guiding paper from said paper supply roller to said picture image forming means, said paper guide including a first guide plate provided along an inner face of said base and a second guide plate provided along an inner face of said cover in an opposing relationship to said first guide plate, said first and second guide plates being sized, shaped, and positioned so that, when said cover is pivoted away from said base, said second guide

plate is widely separated from said first guide plate, facilitating the removal of jammed paper.

## 4,681,423

## COPYING MACHINE HAVING A CONTROL PROCESS TO REDUCE COPYING TIME

Masaru Nishijima, Hirakata, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

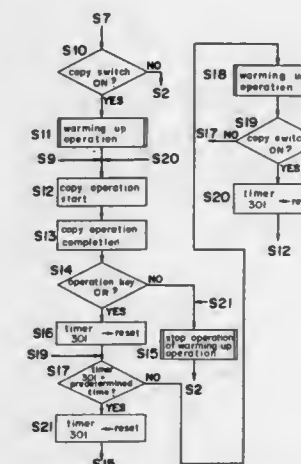
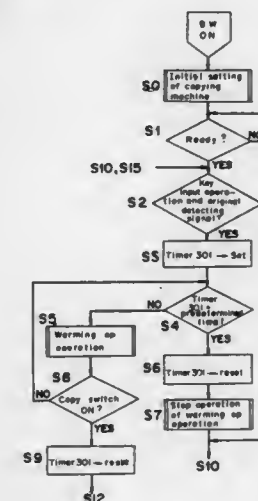
Filed Sep. 12, 1985, Ser. No. 775,307

Claims priority, application Japan, Sep. 14, 1984, 59-193437; Sep. 14, 1984, 59-193438; Sep. 17, 1984, 59-195239

Int. Cl.<sup>4</sup> G03G 15/12

U.S. Cl. 355-14 R

6 Claims



2. An electrophotographic copying machine for making at least one copy of an original located on an original platform, said copying machine comprising means for performing a warming up operation of necessary devices including a photo-receptor drum and fixing device provided in the copying machine, means for performing copying operation in accordance with an operation of a copy switch and control means for performing the said warming up operation in accordance with an order signal generated before the operation of the copy switch, said order signal of the warming up operation is a signal outputted from any one of the keys for setting various information for copying.



4,681,424

## COMPENSATION FOR FINE LINE PRINTS

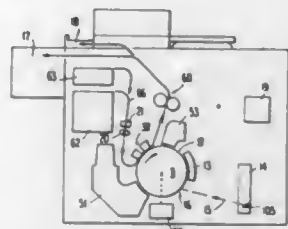
Sherwood Kantor, Boulder; Garry J. Selby, Longmont, and Larry L. Wolfe, Broomfield, all of Colo., assignors to IBM Corporation, Armonk, N.Y.

Filed May 20, 1986, Ser. No. 864,985

Int. Cl.<sup>4</sup> G03G 15/00

U.S. Cl. 355—14 R

11 Claims



1. An apparatus for modifying print data in an electro-photo-graphic printer to compensate for environmental variations which would otherwise result in print quality variations comprising:

- means for developing a series of clock pulses of varying phase displacement;
- selector means responsive to at least some of said clock pulses and an addressing input for selecting and outputting selected of said pulses;
- means responsive to a signal representing said environmental variations for developing an addressing input for said selector means; and
- logic means responsive to said print data and to said selected pulses for producing modified print data signals.

4,681,425

## IMAGE FORMING APPARATUS

Yasufumi Tanimoto, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

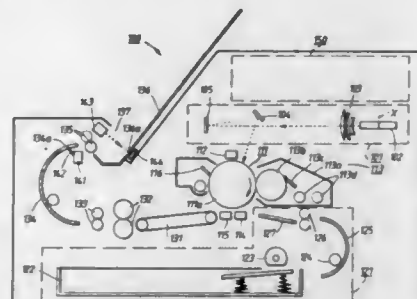
Filed Oct. 16, 1986, Ser. No. 919,697

Claims priority, application Japan, Oct. 24, 1985, 60-239221

Int. Cl.<sup>4</sup> G03G 15/00, 15/01

U.S. Cl. 355—14 CU

7 Claims



1. In an image forming apparatus including a main body having a paper delivery opening, an image forming means in the main body for forming an image on the paper and a receiving tray provided at the paper delivery opening to receive the paper delivered from the paper delivery opening, the improvement comprising:

- delivery paper detecting means provided near the paper delivery opening for detecting the passage of the paper delivered and outputting a first signal representing the passage of the paper;
- paper presence detecting means for detecting the presence of the paper delivered on the receiving tray and outputting a second signal representing the presence of the paper;
- count means for counting the number of the paper delivered on the receiving tray upon the first and second signals and

outputting a third signal representing the number of the paper delivered;

memory means for storing a delivery quantity limit value and outputting a fourth signal representing the number of the paper corresponding to the delivery quantity limit value;

comparing means for comparing the third signal with the fourth signal and outputting the coincidence signal when the two signals coincide; and

operation halt means for halting the image forming means in response to the coincidence signal from the comparing means.

4,681,426

## BRUSH END SEALS FOR BLADE CLEANER HOUSING

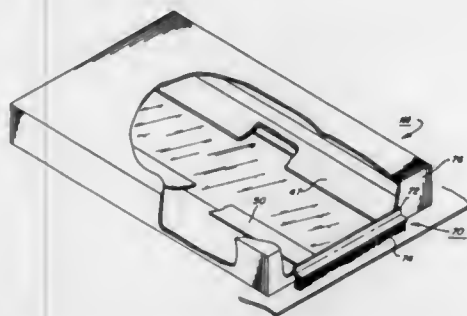
Lloyd F. Bean, Rochester; Richard L. Forbes, II, Pittsford; Joseph A. Swift, Ontario, and Bruce E. Thorp, Walworth, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 19, 1986, Ser. No. 864,694

Int. Cl.<sup>4</sup> G03G 15/08

U.S. Cl. 355—15

12 Claims



1. In an electrostatic reproducing apparatus comprising a charge retentive surface movable through an endless path, a cleaner apparatus for removing and collecting residual toner from said charge retentive surface comprising an enclosed cleaner housing including a residual toner sump, a cleaning blade and means to support the blade edge in cleaning engagement with the charge retentive surface and end seals at each end of said charge retentive surface, said end seals comprising a dense fibrous brush of resiliently flexible fibers fixed to a backing, said fibers being oriented in compression interference sealing contact with said charge retentive surface and in sealing engagement with the ends of said cleaning blade to provide a physical containment wall for bulk toner in the cleaner housing and a seal between the wall and the charge retentive surface.

4,681,427

## ELECTRONIC PRINTING METHOD

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 730,828, May 6, 1985, Pat. No. 4,610,536. This application Apr. 23, 1986, Ser. No. 854,926

Int. Cl.<sup>4</sup> H04N 1/46; G03B 33/12

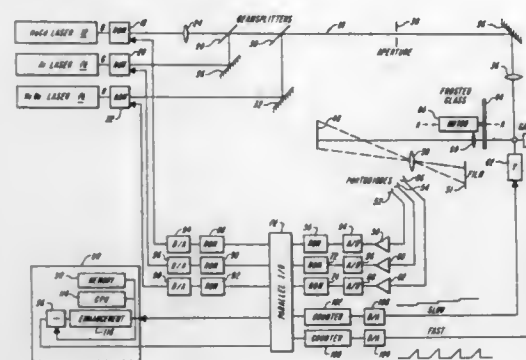
U.S. Cl. 355—32

8 Claims

1. A method for electronically printing copies of original pictorials, said method comprising the steps of:

- coarsely scanning the original pictorial for luminance information to establish its tonal properties;
- imaging the original pictorial on high-contrast copy material with a well-corrected copy lens;
- comparing the original's tonal properties with the sensitometric properties of the high-contrast copy material to generate a correction function for enhancing the tonal

properties of the copy compared with those of the original; and



exposing the copy material by coarsely scanning the original with a light source whose intensity is modulated in accordance with said correction function.

4,681,428

## APPARATUS FOR PRODUCING INTERLEAVED COPY SHEETS

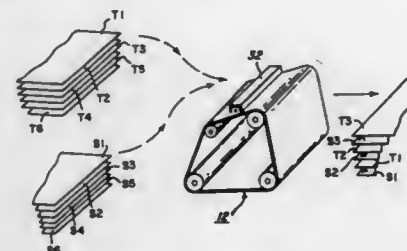
James M. Devoy, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 11, 1986, Ser. No. 850,643

Int. Cl.<sup>4</sup> G03G 15/00

U.S. Cl. 355—3 SH

9 Claims



1. In apparatus including (1) means for selectively presenting copy sheets of either a first characteristic or a second characteristic to an image receiving position and (2) means for sequentially copying a set of originals onto copy sheets presented at the image receiving position; the improvement comprising: first and second supplies of copy sheets of the first and second characteristics, respectively; and control means for (1) causing the presenting means to alternately present copy sheets from said first and second supplies to the image receiving position, and (2) causing the copying means to produce copies of successive originals of the set onto successive copy sheets presented to the image receiving position from said first supply.

4,681,429

## FILM LAMINA HANDLING

Harry A. H. Spence-Bate, Morley, Australia, and Timothy B. Smith, Wickens Manor, England, assignors to Joyce Florence Spence-Bate, Morley, Australia

Filed Apr. 11, 1986, Ser. No. 850,668

Claims priority, application Australia, Apr. 12, 1985, PH0110

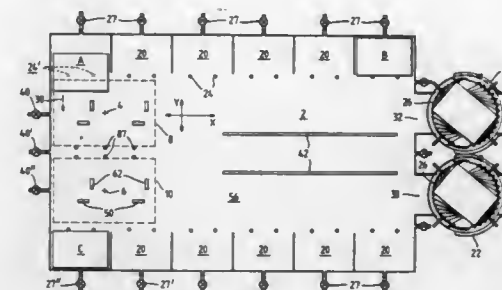
Int. Cl.<sup>4</sup> G03B 27/60

U.S. Cl. 355—73

9 Claims

1. In a film lamina storage and handling device having at least one treatment position where the film is treated, the device comprising upper and lower plates defining a transfer area therebetween at least partially enclosing the treatment position, means for maintaining a cushion of gas between the plates and within a periphery of the plates to support a lamina

in a plurality of X and Y positions relative to the treatment position and means for moving the lamina relative to the treatment position the improvement wherein said lamina moving means comprises:



inlet means for supplying gas to said transfer area at a particular pressure and a plurality of controllable outlets selectively communicable with a pressure, outwardly of the periphery, lower than said particular pressure so as to move said lamina with said gas according to a pressure differential.

4,681,430

## METHOD FOR FOCUSING PROJECTION PRINTER

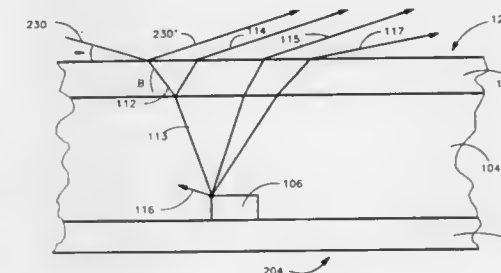
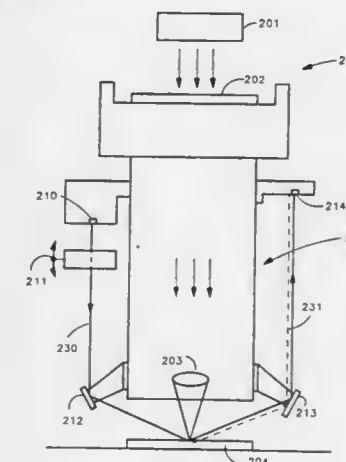
Atul Goel; Keith G. Bartlett, both of Ft. Collins, Colo., and W. R. Trutna, Atherton, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 27, 1986, Ser. No. 900,662

Int. Cl.<sup>4</sup> G03B 27/32

U.S. Cl. 355—77

4 Claims



1. An improved method for automatically focusing an image through a lens onto a surface having reflective and refractive properties, the focusing method of the type wherein an optical transmitter transmits an optical signal toward the surface and

where the optical signal is reflected off the surface to an optical receiver, the optical receiver generating an electronic signal employed to focus the lens, the improvement comprising: selecting a dye which strongly absorbs light at the wavelength of the optical signal; and dissolving the dye in the surface.

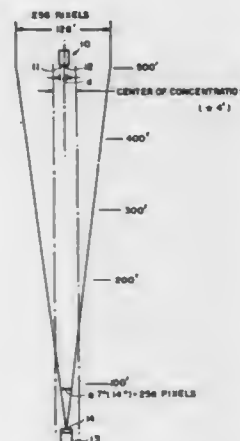
4,681,431

# OPTICAL RANGING ANTI-COLLISION TECHNIQUE AND SYSTEM

John C. Sims, deceased, late of Sudbury, Mass. (by Lucille Sims, executrix), and Charles J. Mando, Jr., Sudbury, Mass., assignors to Sineco, Inc., Sudbury, Mass.  
Filed Feb. 27, 1985, Ser. No. 706,193  
Int. Cl.<sup>4</sup> G01C 3/08; G01P 3/36

U.S. Cl. 356—4

9 Claims



1. A system for avoiding collision between a first vehicle and a second vehicle each capable of moving along the same general path, said system comprising at least one means mounted on said first vehicle for emitting optical pulse signals; detection means mounted on said second vehicle including optical scanning means, the scanning operation thereof defining a substantially triangular field of scan, said scanning means being responsive during its scanning operation to the optical pulse signals emitted by said at least one emitting means for providing output scanned information; means responsive to said output scanned information for determining the range between said first and second vehicles, means responsive to changes in said range determination as a function of time for determining the closing speed between said vehicles, and alarm means responsive at least to said closing speed determination for permitting evasive action to be taken by said second vehicle when said closing speed exceeds a selected value to avoid collision with said first vehicle.

4,681,432

# PHOTO-ELECTRIC CONVERTING DEVICE

Takashi Kawabata; Yuichi Sato; Tokunichi Tsunekawa, and Susumu Matsumura, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,242

Claims priority, application Japan, Apr. 1, 1983, 58-57208; Jul. 12, 1983, 58-126332; Jul. 12, 1983, 58-126333

Int. Cl.<sup>4</sup> G01C 3/08; G03B 3/00, 3/18; H01J 40/14

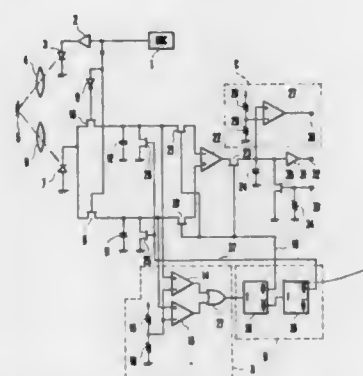
U.S. Cl. 356—4

4 Claims

1. An information signal processing device for a focus detection device for intermittently projecting a light bundle to an object from light projecting means and detecting light re-

flected from the object at a time of the light projection, thereby detecting a focusing state or a distance state, comprising:

- a light receiving part for receiving light from the object;
- first storing means for storing an output of the light receiving part at a time of light projection by the light projecting means;
- second storing means for storing an output of the light receiving part at a time no light projection is performed by the light projecting means;
- detecting means for producing an output when a stored value of either said first storing means or said second storing means reaches a predetermined level;
- third storing means for forming a signal corresponding to a difference signal between the stored values of the first storing means and of the second storing means in response to the output of said detecting means, and for storing said



signal corresponding to the difference signal every time the detecting means produces said output; and (f) initialization means for shifting the stored values of said first and second storing means to their initial state for a short period of time in response to the output of said detecting means, whereby said first and second storing means store the output of the light receiving part from an initial stage until said output from the detecting means is produced, and repeat said storing operation every time said output from the detecting means is produced, and at the same time every time the detecting means produces an output, the difference signal of the values stored by said first and second storing means is stored by said third storing means, thus such information as corresponding to the light reflected from the object due to said light projection is obtained as a stored value of said third storing means.

4,681,433

# METHOD AND APPARATUS FOR MEASURING RELATIVE POSITION

Heinz Aeschlimann, Aarau, Switzerland, assignor to Kern & Co. AG., Aarau, Switzerland

Continuation-in-part of Ser. No. 57,194, Jul. 13, 1979,

abandoned. This application Feb. 2, 1981, Ser. No. 230,685  
Claims priority, application Switzerland, Jul. 20, 1978, 7819/78

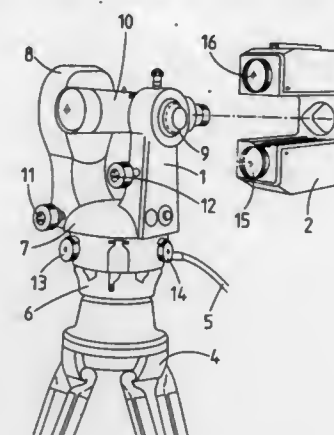
Int. Cl.<sup>4</sup> G01C 3/08; G01B 11/26

U.S. Cl. 356—5

6 Claims

1. A surveying apparatus for measuring the relative position of a first point and at least one second point with
- means (15) at the first point for directional transmission to the second point of modulated electromagnetic waves with a wavelength between 100  $\mu$ m and 0.1  $\mu$ m;
  - means (15') at the second points to beam back to the first point said modulated waves;
  - means (2) at the first point to obtain from the transmitted and returned waves the distance to the second point;

- means (2) for transmission, by means of modulated electromagnetic waves, of signals representing distance between the points, wherein the improvement comprises:
- means (3, 17) at each second point for digitally storing measured numerical values of said distance and combining these values with additional numerical or alphanumerical information concerning respectively each second point;
- means for separate transmission of signals representing distance or directional information between the points by



means of electromagnetic waves with a wavelength between 5 m and 15 m; and

- a separate data storage means coordinated with each of the second points, this storage means being activated for storage of the signals representing distance or directional information and transmitted separately, by reception of said waves serving for distance measurement and being directed from the first point to the second point corresponding to the respective storage means.

4,681,434

# DUAL SPECTRA OPTICAL PYROMETER HAVING A SERIAL ARRAY OF PHOTODETECTORS

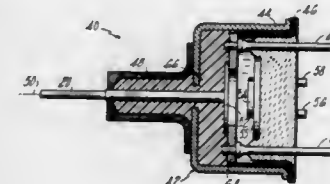
Dean A. Kepple, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 14, 1985, Ser. No. 798,213

Int. Cl.<sup>4</sup> G01J 5/18

U.S. Cl. 356—45

3 Claims



1. A dual spectra optical pyrometer having a serial array photodetector module for measuring the temperature of a remote target, comprising:

optical guide means for receiving from the target an optical beam having a spectral width and having an emitted component from the target and a reflected component from a fireball having a temperature, housing means adapted to receive said optical guide, first photodetector means contained within said housing means absorbing from said target optical beam a first optical component having a spectral width selected to be a portion of the target beam spectral width and passing therethrough an optical beam remainder, said first detec-

tor means providing an electrical signal equivalent of said first optical component, second photodetector means contained within said housing means receiving said optical beam remainder and providing a second electrical signal equivalent thereof, signal processing means receiving said first and second detector signals and further receiving signals indicative of said first component spectral width and an estimate of said fireball equivalent black body temperature, said signal processing means generating from said first photodetector signal a temperature signal indicative of an equivalent black body temperature, generating from said second photodetector signal a temperature signal indicative of an equivalent black body temperature, generating from the difference of said first temperature signal and said second temperature signal a temperature correction signal in dependence on said estimated fireball equivalent black body temperature signal and said first component spectral width signal, providing a corrected temperature signal from the difference between said first temperature signal and said temperature correction signal.

4,681,435

# CONTACT PATTERN OBSERVATION APPARATUS

Kazuhisa Kubota, and Shigekazu Yasuda, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

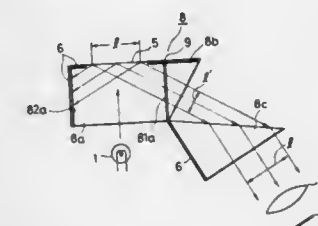
Filed Mar. 30, 1984, Ser. No. 595,339

Claims priority, application Japan, Mar. 31, 1983, 58-47435[U]

Int. Cl.<sup>4</sup> G06K 9/20

U.S. Cl. 356—71

3 Claims



1. An object contact pattern observation apparatus comprising:

a transparent body comprising a prism, including a rectangular prism piece and a first triangular prism piece, said rectangular prism piece and said first triangular piece having respective mutually parallel planar surfaces extending substantially coextensively and being separated by an air gap, said air gap being provided to prevent ambient light entering said rectangular prism piece through a substantially planar detection portion from being transmitted into said first triangular prism piece; said rectangular prism piece additionally having a first surface and a second surface and said substantially planar detection portion being located on said first surface, a light absorbing portion located where light totally reflected at said detection portion is introduced to said light absorbing portion with said light absorbing portion including said second surface of said rectangular prism piece; a source for radiating light through said rectangular prism piece to said detection portion to form a visible contact image of a contact pattern of an object placed in substantial contact with said detection portion, said visible contact image appearing to be superimposed on said light absorbing portion and being transmitted from said rectangular prism piece to said first triangular prism piece and said image emerging from said first triangular prism piece in a reduced size with respect



to the actual area of the substantial contact between the object and said detection portion; and  
a second triangular prism piece for receiving and restoring said visible contact image to the size of the actual area of the substantial contact between the object and said detection portion said restored image emerging from said second triangular prism piece for observation.

4,681,436

**FEMTOSECOND LASER PULSE MEASURING SYSTEM**  
Neng H. Ching, 5 Yasmar Avenue Haberfield 2045; Ralph G. Marson, 37 Mittabah Road Hornsby 2077, both of Sydney NSW; Michael J. Norman, Ursula College ANU, Canberra City 2601 ACT, and John L. Hughes, 38 Basedow Street, Torrens, Canberra ACT 2607, all of Australia

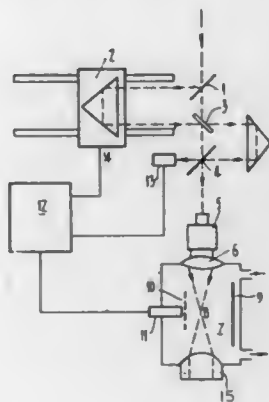
Filed Feb. 28, 1985, Ser. No. 706,590

Claims priority, application Australia, Feb. 28, 1984, PG3822

Int. Cl.<sup>4</sup> G01J 1/04, 1/42

U.S. Cl. 356—121

15 Claims



1. Apparatus for measuring the profile of a single laser pulse to an accuracy of a femtosecond, in the pulse duration range of one nanosecond to one femtosecond, comprising:  
means for diverting a portion of said single pulse;  
means for splitting the diverted portion into N split portions, N being an integer greater than one;  
means for splitting each of said N portions into first and second components;  
means for independently delaying each of said first and second components of each of said N portions, and for adjusting the delayed first and second components of each of said N portions so that the delayed first and second components of said N portions are overlapped to varying degrees;  
means for expanding the delayed first and second components of each of said N portions;  
means for focusing the expanded first and second components of each of said N portions;  
interaction chamber means containing a low pressure gas, for ionizing said gas with the focused first and second components of each of said N portions, said interaction chamber means having exit window means through which the first and second components of each of said N portions exit;  
ion detector means, coupled to said interaction chamber means, for detecting the ions produced by the focused first and second components of each of said N portions and outputting electrical signals corresponding respectively thereto;  
processing means for receiving the electrical signals from said ion detector means;  
energy detector means for receiving the first and second components of each of said N portions exiting said exit window means of said interaction chamber means, and for

providing output signals corresponding to a pulse duration and a total energy of each of said N portions; and  
monitor means for receiving said output signals and providing a display of the envelope and duration of said single laser pulse.

4,681,437

**LASER SCHLIEREN CRYSTAL MONITOR**

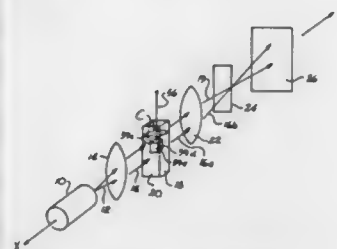
Robert B. Owen, and Mary H. Johnston, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 28, 1985, Ser. No. 706,565

Int. Cl.<sup>4</sup> G01N 21/41

U.S. Cl. 356—129

10 Claims



1. A method for monitoring the state of a crystal to determine whether or not the crystal is growing or dissolving in a solution comprising the steps of:  
emitting a light beam from a light source;  
collimating said emitted light beam into a first collimated light beam of parallel light rays;  
passing said first collimated light beam through said solution in which said crystal is undergoing a change of state so that a first number of the parallel rays in said first collimated beam are deflected in the form of a deflected light beam according to the density gradient of the solution surrounding said crystal;  
passing a remaining number of said parallel rays of said collimated beam through said solution in the form of a second collimated beam;  
focusing said deflected beam and said second collimated beam at a desired focal point;  
disposing a knife edge at said focal point of said focused, deflected beam and said second collimated beam;  
passing said second collimated beam past said knife edge to project an image of said crystal upon a screen;  
passing a portion of said deflected beam past said knife edge to project a band onto said screen at one end of said crystal image which indicates the growth or dissolution state of said crystal surface being monitored.

4,681,438

**AUTOMATIC COMPENSATOR FOR COMPENSATING COLLIMATION ERROR DUE TO TWO-DIRECTIONAL INCLINATION IN SURVEYING INSTRUMENTS**

Kenji Kaneko, Higashiyama, Japan, assignor to Asahi Precision Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1985, Ser. No. 807,470

Claims priority, application Japan, Dec. 18, 1984, 59-191865[U]

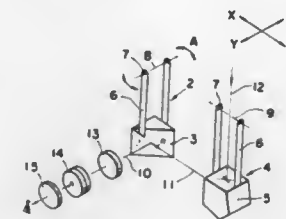
Int. Cl.<sup>4</sup> G01C 1/06

U.S. Cl. 356—143

4 Claims

1. An automatic compensator for compensating a collimation error due to a two-directional inclination in surveying instruments comprising:  
a first pendulum suspended in the instrument body interior;  
a second pendulum also suspended in the instrument body interior and ahead and sidewise of said first pendulum for swinging in directions perpendicular to said first pendulum;

a first reflector mounted on said first pendulum at the lower end thereof and having a reflecting surface for reflecting light incident in the direction of a collimation axis parallel to the axis of swinging of said first pendulum in a direction of a substantially horizontal collimation axis lying in the plane of swinging of said first pendulum; and



a second reflector mounted on said second pendulum at the lower end thereof and being a double reflecting surface reflector for reflecting light incident in the direction of a collimation axis lying in the plane of swinging of said first pendulum in the direction of a vertical collimation axis.

4,681,439

**PIPE LAYING METHOD AND APPARATUS**

Jack W. Shoemaker, 9430 Woodsboro Pike, Walkersville, Md. 21793

Filed Oct. 28, 1985, Ser. No. 791,871

Int. Cl.<sup>4</sup> G01B 11/26

U.S. Cl. 356—154

12 Claims



1. An apparatus in combination with an adjustable laser beam generating device and a representative section of pipe, wherein the apparatus is used to establish a visual reference for the operator of excavating equipment of the amount of additional excavation needed to meet the grade requirements for laying a pipe string wherein the apparatus comprises:

- a centerline target unit comprising a stationary target element surrounded by a rigid housing member having a plurality of spaced leg members wherein at least one of the plurality of leg members is provided with an axially extendible element, whereby the stationary target unit may be releasably received within representative sections of pipe having diameters within a given range; and,
- a grade checker unit comprising an elongated generally rectangular open framework element, having an adjustable target element mounted for relative movement with respect thereto, and a generally horizontally disposed foot portion on the bottom surface of the framework element; wherein the vertical sides of said framework member are provided with indicia representative of length, whereby the relative distance between the adjustable target element and the bottom of the framework member may be accurately determined.

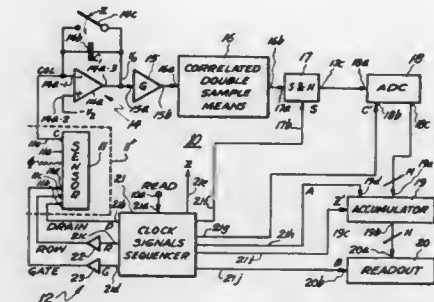
**4,681,440**  
**HIGH-SENSITIVITY CID**  
**PHOTOMETER/RADIOMETER**  
Hubert K. Burke, Scotia, and Gerald J. Michon, Waterford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 18, 1985, Ser. No. 799,068

Int. Cl.<sup>4</sup> G01J 1/44; H01L 27/14

U.S. Cl. 356—218

26 Claims



1. Apparatus for sensing at least the amplitude of incident optical radiation, comprising:  
a charge-injection device (CID) sensor having a single pixel, including (1) a drain potential well delimiting a photon-responsive area from which charge carriers, formed responsive to impinging photons of said optical radiation, can be collected, (2) a column potential well in which said carriers are collected, (3) a row potential well, and (4) a gate electrode positioned between said drain well and said column and row wells for respectively connecting and disconnecting said drain well and said column potential well responsive to respective first and second states of a gate signal to respectively allow and prevent removal of said charge carriers to said drain well from at least said column well;  
means for reducing the operating temperature of said CID sensor;  
sequencer means for first permanently removing charge carriers from said column and row potential wells at least via said drain well, in a charge removal time interval at the commencement of each of at least one optical radiation sensing time interval, and for then causing, for a predetermined number, on the order of 10,000, of cycles in each sensing time interval, charge carriers present in said column and row wells during each of said cycles to repeatedly and non-destructively move between said column and row wells in a predetermined manner; and  
means for converting a charge current, resulting from each of said charge carrier movement cycles, to a human-viewable display of the amplitude of said optical radiation incident upon said sensor, with a sensitivity of at least 10E-14 Watts/cm<sup>2</sup>, and comprising:  
(a) charge amplifier means for converting the charge current to the amplitude of a signal representative of the total charge then in said sensor pixel;  
(b) correlated double sampling means for providing an output signal in which is cancelled from the amplitude thereof contributions by portions of the total charge in said pixel not responsive to photons of said incident optical radiation; and  
(c) means for accumulating the amplitude of the correlated double sampling means output signal to provide, responsive to the completion of said predetermined number of charge movement cycles, said amplitude display.

4,681,441

## LIGHT MEASURING DEVICE

Masanori Uchidoi, Tokyo, and Nobuyuki Suzuki, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

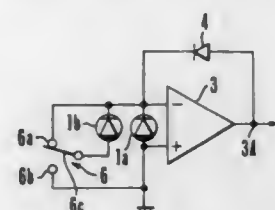
Continuation of Ser. No. 529,966, Sep. 7, 1983, abandoned. This application Feb. 24, 1986, Ser. No. 834,492

Claims priority, application Japan, Sep. 8, 1982, 57-157161

Int. Cl.<sup>4</sup> G01J 1/44

U.S. Cl. 356-222

15 Claims



1. A light measuring device having a plurality of light sensitive elements and being arranged to selectively detect the outputs of said light sensitive elements, comprising: means for short-circuiting both terminals of the light sensitive element which is not required for detection in a light measuring mode selected out of different light measuring modes.

4,681,442

## METHOD FOR SURFACE TESTING

Dietmar Wagner, Gärtringen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

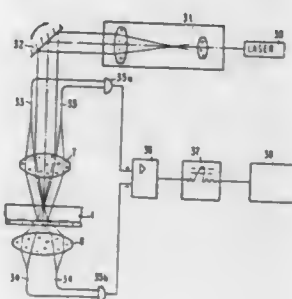
Filed Mar. 18, 1985, Ser. No. 713,077

Claims priority, application European Pat. Off., May 14, 1984, 84105425.7

Int. Cl.<sup>4</sup> G01N 2/88

U.S. Cl. 356-237

8 Claims



1. A method of testing surfaces of transparent objects for the presence of defects thereon comprising the steps of: impinging light on a surface of an object to be tested at an angle to the surface, said light being partially reflected as a first light beam by the surface, and partially transmitted as a second light beam through the object, and partially scattered by defects on the surface, said scattered light being both partially reflected as a third light beam and partially transmitted as a fourth light beam through the object, collecting and recording the second and fourth light beams, and processing the recorded second and fourth light beams and the recorded first and third light beams and detecting the differences therebetween to locate the defects on the surface.

4,681,443

## OPTICAL DETECTOR CELL

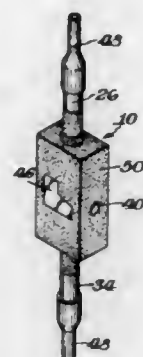
David T. Bach; Roger A. Gruenke, both of Wilmington, Del., and Herman W. Levin, Philadelphia, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 8, 1985, Ser. No. 731,780

Int. Cl.<sup>4</sup> G01N 1/10

U.S. Cl. 356-246

12 Claims



1. In an optical detector cell for effecting measurements on a liquid, the cell having a measuring chamber for holding the liquid, a first access port for the chamber, a first pair of entrance and exit optical walls lying along a first optical path through the chamber for accommodating the passage of radiation through the chamber, a second pair of optical walls lying along a second optical path transverse to the first path, the improvement for also effecting nephelometric and fluorescence measurements on a liquid in the cell wherein the chamber:

is L-shaped with the first optical path lying along the horizontal leg of the L and the exit optical wall is adjacent the upright leg of the L, a second pair of walls are sized to permit the passage of radiation through substantially all of the L-shaped chamber, the exit one of first pair of walls being sized to permit the passage of radiation from substantially all of the vertical leg of the L, whereby the fluorescent volume of the chamber capable of passing through the first exit wall is larger than the volume of the chamber lying on the first optical path.

4,681,444

## AUTOMATIC WAVELENGTH CALIBRATION APPARATUS

Alan C. Ferber, Hillside, Ill., and Morteza M. Chamran, deceased, late of Elmhurst, Ill. (by Delores M. Chamran, legal representative), assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 14, 1984, Ser. No. 651,187

Int. Cl.<sup>4</sup> G01N 21/64; G01J 3/10

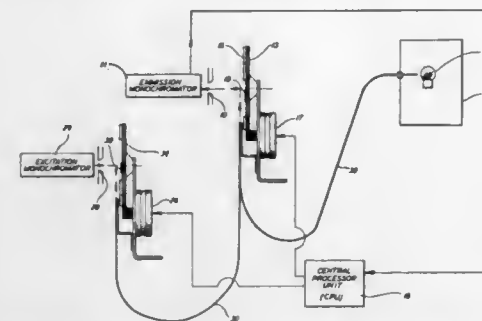
U.S. Cl. 356-318

28 Claims

16. An automatic wavelength calibration subassembly in a spectrophotometer comprising a monochromator with inlet and outlet slits and wavelength drive means, an emission line source for emitting a reference line of known wavelength, an optic fiber assembly for selectively conducting radiation from said line source to the inlet slit of said monochromator, selectively operable filter means for filtering radiation entering said inlet slit of said monochromator, said filter means having a plurality of filter elements each being selectively positionable adjacent said inlet slit and a selectively positionable reflector means for alternately reflecting radiation from said outlet end of said optic fiber assembly to said inlet slit of said monochromator during wavelength calibration, photometric detector means at said outlet slit, and computer means for controlling

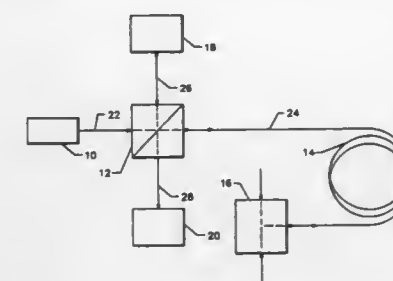
said monochromator including means for controlling said wavelength drive means through a series of scans to center said

beam propagates back through the coil to the first end; and



wavelength drive means at the peak of said reference line to calibrate said monochromator with said reference line.

a detector for measuring the phase difference between the reflected beam and the second beam.



4,681,445

## INTERFEROMETER

Charles V. Perkins, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 16, 1985, Ser. No. 755,631

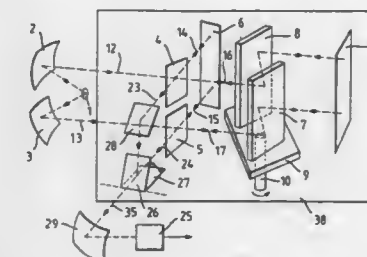
Claims priority, application United Kingdom, Jul. 18, 1984, 8418308; Feb. 27, 1985, 8505069

Int. Cl.<sup>4</sup> G01J 3/45

U.S. Cl. 356-346

20 Claims U.S. Cl. 356-351

2 Claims



1. An interferometer comprising a radiation source, a plurality of beam splitters, each of said plurality of beam splitters functioning in a different part of the spectrum of said radiation source, radiation directing means for guiding an input beam of radiation from said radiation source through one of said beam splitters to produce two subbeams which traverse separated paths before returning to said one beam splitter to form a recombined beam, and means for varying the difference in path length of said two subbeam paths, characterised in that said plurality of beam splitters are in fixed locations, and in that said radiation directing means is effective to pass said recombined beam from said one of said beam splitters to an output.

4,681,446

## PHASE CONJUGATE FIBER GYROSCOPE

Pochi A. Yeh, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 11, 1984, Ser. No. 619,255

Int. Cl.<sup>4</sup> G01C 19/64; G01B 9/02

U.S. Cl. 356-350

12 Claims

1. An optical fiber rotation sensor, comprising: an optical fiber coil; a source of coherent electromagnetic energy; a beam splitter for dividing the energy into a first beam coupled into a first end of the coil, such that the first beam propagates through the coil from the first end to a second end of the coil, and a second beam; a scalar phase conjugate reflector for reflecting the first beam at the second end of the coil such that the reflected

1. Interferometer apparatus for simultaneously deriving optical properties respectively representative of the spatial relationship between two observed moving objects having a time varying spatial relationship and determining the spatial relationship of the observed moving objects with respect to each other, comprising:

- (1) means for producing a beam of radiation having two components each having a characteristic frequency and polarization;
- (2) means for directing one component of said beam upon said two moving objects whose spatial relationship is to be determined and for directing the other component of said beam upon a reference surface to derive individual optical reflections of said two moving objects and an optical reflection from said reference surface;
- (3) means for interacting said individual optical reflections of said two moving objects with the optical reflection from said reference surface and forming two separate identical optical images having the same beat frequencies;
- (4) means for directing at least a portion of one of said identical optical images containing an image of one of said objects into a first optical path and for directing at least a portion of the other of said identical optical images containing an image of the other of said objects into a second optical path;
- (5) means for converting a phase shift between the beat frequencies of said optical images in said first optical path and said second optical path into electrical signals;



- (6) means for electrically combining said electrical signals to derive a voltage representative of the phase difference between the beat frequencies of said optical images; and  
(7) means utilizing said voltage to provide an indication of the spatial relationship between said two movable objects.

4,681,448

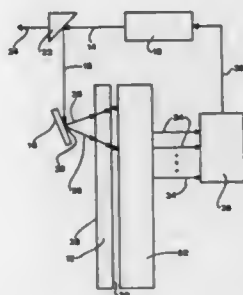
# METHOD AND APPARATUS FOR STABILIZING ANGLE OF ACCEPTANCE OF MULTIPLE-BEAM INTERFEROMETER MEANS IN OPTICAL MEASURING SYSTEM

Ronald D. Wertz, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Mar. 25, 1985, Ser. No. 715,825  
Int. Cl.<sup>4</sup> G01B 9/02

U.S. Cl. 356—352

13 Claims



1. In an optical measuring assembly which includes optical radiation emitting means for providing radiation of a first wavelength and a multiple-beam interferometer means, an apparatus for stabilizing the operative angle of acceptance of the interferometer means about a desired value therefor, comprising:

- a means for detecting deviations of said operative angle of acceptance from said desired value therefor, said detecting means including said multiple-beam interferometer means which substantially limits transmission of radiation emitted from said emitting means to that radiation encountering said multiple-beam interferometer means at substantially a particular angle of incidence; and
- a means, operatively associated with said detecting means, for varying the wavelength of optical radiation emitted by said emitting means from said first wavelength to a second wavelength, said second wavelength having a value such that said operative angle of acceptance is stabilized about said desired value therefor.

4,681,449

# HIGH SPEED TESTING OF ELECTRONIC CIRCUITS BY ELECTRO-OPTIC SAMPLING

David M. Bloom, and Brian H. Kolner, both of Menlo Park, Calif., assignors to Stanford University, Stanford, Calif.

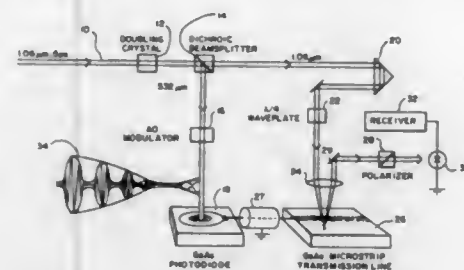
Filed Sep. 7, 1984, Ser. No. 648,456  
Int. Cl.<sup>4</sup> G01J 4/00

U.S. Cl. 356—364

20 Claims

1. A method of testing an electronic circuit including a transmission line on a substrate of semiconductor material exhibiting linear electro-optic effect comprising the steps of generating an electrical signal, transmitting said electrical signal to said transmission line, applying a circularly polarized optical wave perpendicular to said transmission line whereby a longitudinal electrical field component from said transmission line created by said electrical signal and parallel to said optical wave distorts the polarization of said polarized optical wave, receiving a reflection of said polarized optical wave,

passing said reflection of said polarized optical wave through an analyzer/discriminator, and



measuring said reflection of said polarized optical wave after passing through said analyzer/discriminator.

4,681,450

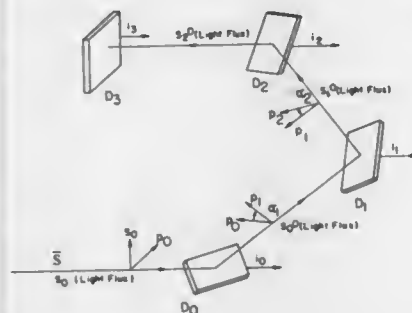
# PHOTODETECTOR ARRANGEMENT FOR MEASURING THE STATE OF POLARIZATION OF LIGHT

Rasheed M. A. Azzam, New Orleans, La., assignor to Research Corporation, New York, N.Y.

Filed Jun. 21, 1985, Ser. No. 747,611  
Int. Cl.<sup>4</sup> G01J 4/04

U.S. Cl. 356—367

10 Claims



1. A photopolarimeter for measuring the state of polarization of a light beam, comprising:

- a. a first photodetector, having a partially specularly reflecting surface on which the light beam is incident at an oblique angle with a first plane of incidence and is partially reflected therefrom, said first photodetector producing a first electrical output signal having a magnitude proportional to the radiation absorbed by the first photodetector;
- b. a second photodetector, having a partially specularly reflecting surface on which the light beam partially reflected from the first photodetector is incident at an oblique angle with a second plane of incidence, different from said first plane of incidence, and is partially reflected therefrom, said second photodetector producing a second electrical output signal having a magnitude proportional to the radiation absorbed by the second photodetector;
- c. a third photodetector, having a partially specularly reflecting surface on which the light beam partially reflected from the second photodetector is incident at an oblique angle with a third plane of incidence, different from said second plane of incidence, and is partially reflected therefrom, said third photodetector producing a third electrical output signal having a magnitude proportional to the radiation absorbed by the third photodetector; and
- d. a fourth photodetector having a substantially totally light absorptive surface on which the light beam partially reflected from the third photodetector is incident, said fourth photodetector producing a fourth electrical output

signal having a magnitude proportional to the radiation absorbed by the fourth photodetector.

4,681,451

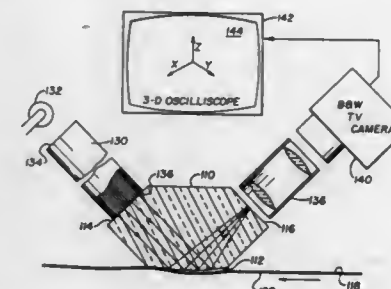
# OPTICAL PROXIMITY IMAGING METHOD AND APPARATUS

John M. Guerra, and William T. Plummer, both of Concord, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 28, 1986, Ser. No. 834,532  
Int. Cl.<sup>4</sup> G01B 11/14

U.S. Cl. 356—373

20 Claims



10. Apparatus for displaying variations in proximity between a given surface of a transmissive body and another surface, said apparatus comprising:

- an optically transmissive body having a reflecting surface and a pair of angularly disposed planar surfaces between which said reflecting surface is located with one of said planar surfaces being a light energy entrance surface and the other a light energy exit surface, said planar surface being oriented so that light energy introduced at said planar entrance surface is normally reflected totally from the interior of said reflecting surface to said planar exit surface so that a light pattern of variable intensity emerges from said planar exit surface due to the frustration of total internal reflection from said reflecting surface as said reflecting surface is brought sufficiently proximate another surface;

means for displaying an observable image of said light pattern such that variations in the density of the image of the said light pattern represent proximity variations between said other surface and said reflecting surface; and  
means for resolving variations of gray scale density in said image of said light pattern to obtain the variations of proximity between said reflecting surface and said other surface.

4,681,452

# CONTROL SYSTEM FOR AUTOMATIC ELECTRONIC-PART MOUNTER

Kenichi Watanabe, Chiba, Japan, assignor to Hitachi, Ltd., Tokyo and Hitachi Kelyo Engineering Co., Ltd., Narashino, both of Japan

Filed Nov. 4, 1985, Ser. No. 794,379

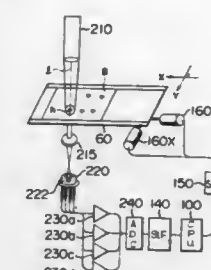
Claims priority, application Japan, Nov. 5, 1984, 59-231287  
Int. Cl.<sup>4</sup> G01B 11/14; G06F 15/46

U.S. Cl. 356—375

24 Claims

1. In an automatic electronic part mounter using a sensor for detecting the position of part-mounting sections on a circuit board, the improvement comprising memory means for storing data for correction of the part-mounting section positions,

produced by said sensor, wherein, a process of obtaining said data for subsequent process of mounting the part are each



4,681,453

# OPTOELECTRONIC COMPARISON APPARATUS FOR STRUCTURES ON PLANE SURFACES OR FOR PLANAR STRUCTURES

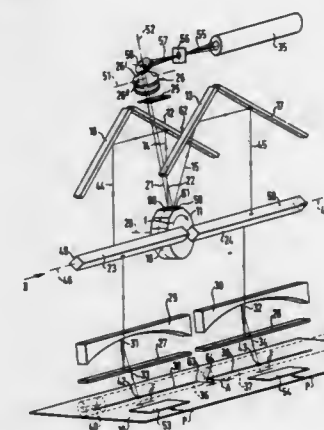
Erwin Sick, Icking, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Dec. 11, 1985, Ser. No. 807,618

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446354

Int. Cl.<sup>4</sup> G01N 21/88; H05K 3/22; G01R 31/28  
U.S. Cl. 356—394

17 Claims



1. Optoelectronic comparison apparatus for structures on plane surfaces or for planar structures, the apparatus comprising a light source for generating an operational light beam which is split into first and second component beams by an optical displacement device for laterally displacing part of a beam, said component beams impinging on a cyclical light deflecting device displaced in a direction from its axis of rotation, and are directed, after reflection at the light deflecting device, onto first and second points lying on a scanning surface, which scanning surface includes the plane surfaces or planar structures to be compared, wherein the first and second light points form, as a result of the cyclical movement of the light deflecting device, first and second spaced apart, non-overlapping scanning lines, a photoelectric light receiving device for converting light originating from the scanning lines into electrical signals which are representative of the light intensity instantaneously leaving the points, the incident component beams of light impinging obliquely to the axis of rotation onto mirror surfaces of the light deflecting device, first and second mutually crossed, plane, first strip mirrors arranged directly alongside one another in the direction of the light reflected from the light deflecting device, the incident compo-

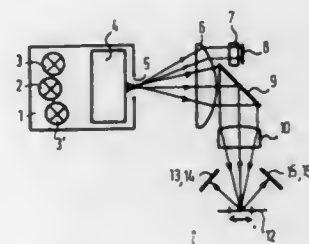
nent light beams just passing laterally past the first strip mirrors, each receiving only one of the emergent light beams, and deflecting the same into substantially opposite directions where, in each case, further, plane, second strip mirrors are provided which reflect the light to the scanning surface substantially parallel to the emergent light beams entering the first strip mirrors.

means to detect a difference between said second light source signals during said first and said second measurements, respectively.

**4,681,454**  
**DEVICE FOR DETECTING DIFFERENCES IN COLOR**  
Johannes Breemer, Delft, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Netherlands  
Filed Jan. 29, 1985, Ser. No. 695,950  
Claims priority, application Netherlands, Feb. 7, 1984, 8400380

Int. Cl.<sup>4</sup> G01J 3/50  
U.S. Cl. 356—402

9 Claims



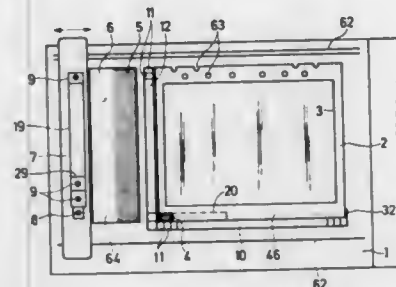
1. A device for detecting differences in color of a material to be inspected, which comprises:  
means for illuminating said material including a first light source emitting light of a first color and a second light source emitting light of a second color;  
means for measuring amounts of light reflected by said material;  
electronic switching means for alternately energizing at a first rate said first and second light source;  
electronic control means responsive to said measured amounts of reflected first light source light and reflected second light source light for controlling intensity of said second light source whereby measured amounts of reflected first and second light source lights, respectively, have a predetermined ratio;  
means for providing second light source signals representing amount of light emitted by said second light source during a measurement;  
an optical system for delivering to first and second spaced-apart measuring regions simultaneously a constant portion of said light source being energized, said reflected light measuring means making a first measurement at said first measuring region and subsequently making a second measurement at said second measuring region, said second light source signals providing means comprising means for providing said second light source signals during said first and said second measurements, respectively; and

**4,681,455**  
**METHOD OF DETERMINING THE AREA COVERAGE OF A PRINTED ORIGINAL OR PRINTING PLATE FOR PRINTING PRESSES**

Willi Jeschke, Heidelberg; Helmut Kipphan, Schwetzingen, and Gerhard Löffler, Walldorf, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany  
Continuation of Ser. No. 499,212, May 31, 1983, abandoned.  
This application Dec. 4, 1985, Ser. No. 805,573  
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3309443; May 29, 1982, 3220361  
Int. Cl.<sup>4</sup> G01B 11/28

U.S. Cl. 356—445

6 Claims

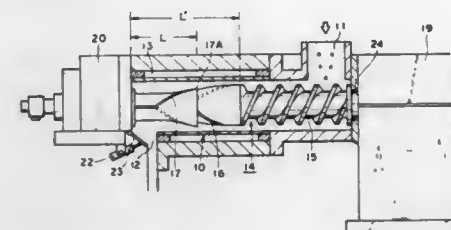


1. Method of determining area coverage of an original print or printing plate for printing presses by means of a measuring device equipped with a plurality of sensors with which each sensor, respectively, is calibrated with the aid of at least one calibration strip separate from the printing plate yet formed of the same material as that of the printing plate, the calibration strip having a respective minimum and maximum area coverage and having substantially similar surface conditions as those of the printing plate, which comprises performing a further correction calibration specific to the original print and printing plate, respectively, as well as an adjustment by identical correction values of all of the plurality of sensors by means of at least one of the sensors in the measuring device.

**4,681,456**  
Patent Not Issued For This Number

**4,681,457**  
**CONTINUOUS MIXER**  
Taiji Orimo; Tsugushi Fukui, and Shinichi Fukumizu, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan  
Filed Sep. 20, 1985, Ser. No. 778,227  
Claims priority, application Japan, May 14, 1985, 60-103192; May 20, 1985, 60-107999  
Int. Cl.<sup>4</sup> B01F 7/08  
U.S. Cl. 366—84

8 Claims

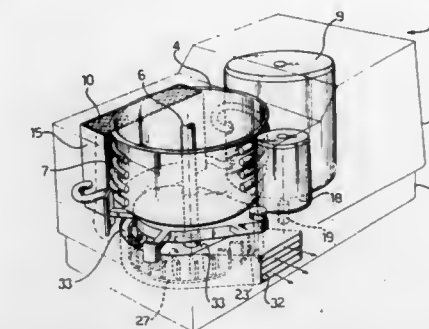


1. A two-shaft continuous mixer, comprising:  
an axially horizontally extending mixing portion having a material supply portion on a first end in an axial direction and a discharge portion on a second end in said axial direction;  
first and second rotors each of which comprises a feed screw portion and a mixing blade portion composed of a helical feed blade and a helical return blade, said feed blade and said return blade being disposed in said axial direction and first and second shafts respectively of said first and second rotors being arranged within said mixing portion with said feed screw portion position on a side of said material supply portion so that said first and second shafts are disposed parallel to each other, are disengaged from one another and are rotatable in different directions, such that a terminating end of the feed blade in the mixing blade portion and a beginning end of the return blade are deviated in phase in a circumferential direction on a plane traversing the rotor shaft, wherein an axial length from the discharge end in each rotor to an apex position at which the terminating and beginning ends of said blades are positioned on the plane is 1.3 to 1.6 times the inside diameter of the mixing portion, and wherein said first and second shafts are disposed symmetrically in the mixing portion; and  
driving means for rotating the first and second rotors at a uniform speed.

**4,681,458**  
**APPARATUS FOR PREPARING ICE CREAM AND THE LIKE**  
Alfredo Cavalli, Via Galileo Galilei, 9, 20060 Pessano con Bornago (Milan), Italy  
Filed Mar. 27, 1986, Ser. No. 844,799  
Claims priority, application Italy, Apr. 2, 1985, 21308/85[U]  
Int. Cl.<sup>4</sup> A23G 9/00

U.S. Cl. 366—149  
1. An apparatus for preparing ice cream and other frozen products, comprising:  
a sealed cabinet having an inlet port and an outlet port;  
a substantially cylindrical ice cream freezing vessel supported in said cabinet;  
a paddle means rotatably mounted on a drive shaft extending into said freezing vessel;

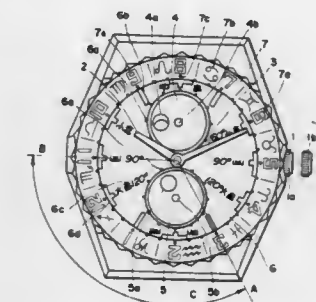
a motor mounted in said cabinet for rotating said drive shaft paddle means; and  
a refrigeration system mounted in said cabinet including an evaporation surrounding said freezing vessel and in thermal contact therewith, a condenser ducted with a substan-



tially parallelepipedic shroud vertically mounted so as to be adjacent said inlet port, a blower rotatably mounted to said drive shaft below said freezing vessel for drawing air from outside cabinet through said inlet port upwardly across said condenser and out from said cabinet through said outlet port.

**4,681,459**  
**APPARATUS FOR DISPLAYING ASTROLOGICAL INFORMATION**  
Takatoshi Nabeyama, Tachikawa, and Eiichi Sakita, Higashikurume, both of, assignors to Citizen Watch Co., Ltd., Tokyo, Japan  
PCT No. PCT/JP85/00665, § 371 Date Jun. 17, 1986, § 102(e)  
Date Jun. 17, 1986, PCT Pub. No. WO86/03604, PCT Pub. Date Jun. 19, 1986  
PCT Filed Dec. 4, 1985, Ser. No. 881,034  
Int. Cl.<sup>4</sup> G04B 19/26; A63F 1/00  
U.S. Cl. 368—16

4 Claims



1. An apparatus for displaying astrological information comprising:  
a first display means for displaying information which represents the direction of the sun throughout of the year with respect to a center axis of a watch display surface and is put at regular intervals on the circumference of a circle enclosing said center axis;  
a second display means for displaying information which represents the angle difference of directions between the present moon and the sun on a birthday, that is, an aspect, or a fortune corresponding to said aspect is put on the circumference of a circle enclosing said center axis, said



second display means capable of rotating around said center axis relatively to said first display means; and auxiliary setting means engaging an hour wheel, including train wheels rotating at a predetermined speed, and capable of setting the direction of at least one of the moon and the sun to desired directions by operating a crown.

4,681,460

## WORLD TIME WATCH

Katsuo Nishimura, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

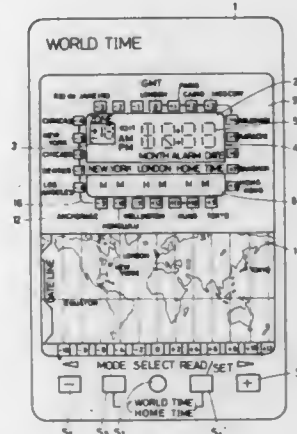
Filed Sep. 12, 1986, Ser. No. 906,331

Claims priority, application Japan, Sep. 13, 1985, 60-202793; Oct. 15, 1985, 60-229171

Int. Cl.<sup>4</sup> G04B 19/22

U.S. Cl. 368—21

5 Claims



1. A world time watch comprising:  
a liquid crystal display device including a time zone display and a time display  
the time zone display being provided to display the time difference between a selected place and the Greenwich Mean Time;  
the time display being provided to display the time of the place corresponding to the time difference displayed in the time zone display;  
a printed place name list including a plurality of place names and a plurality of numbers each of which represents the time difference of a corresponding place; and  
a printed world map.

4,681,461

## ELECTRONIC WATCH WITH OPERATING CONTROLS IN THE BACK COVER OF THE CASE

Paul Gogniat, Bienne, Switzerland, assignor to Montres Rado S.A., Switzerland

Filed Oct. 16, 1986, Ser. No. 919,394

Claims priority, application Switzerland, Oct. 31, 1985, 04692/85

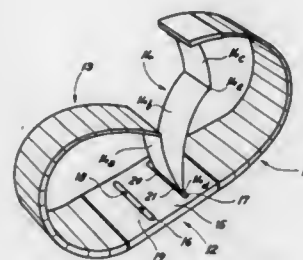
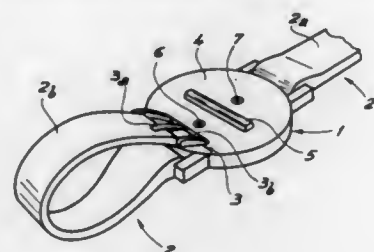
Int. Cl.<sup>4</sup> G04C 17/00, 9/00

U.S. Cl. 368—69

17 Claims

1. An electronic watch including a case having a back cover and at least one control mechanism fixed to said back cover, said back cover having positioning means which determine at least approximately the location at which means external to the case must be placed in order to actuate said control mechanism, and a bracelet having a fastening element, said control mechanism being selected and placed in the back cover in a

manner such that at least a portion of said fastening element may be employed as external actuating means therefor and said



positioning means being adapted to accommodate the form and dimensions of said portion of said fastening element.

4,681,462

## RECORDING DEVICES

Benjamin Lloyd, 24 Woodbank Drive, Bury, Lancashire, BL8 1DR, Great Britain

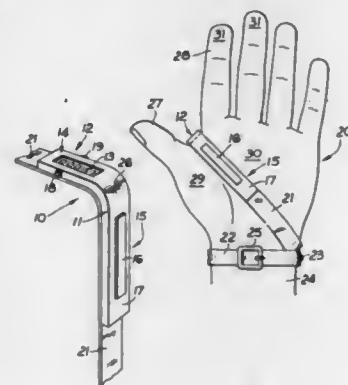
Filed Jun. 24, 1985, Ser. No. 748,158

Claims priority, application United Kingdom, Jun. 28, 1984, 8416511

Int. Cl.<sup>4</sup> G04C 17/00; A44C 5/00

U.S. Cl. 368—69

4 Claims



1. In combination with a recording device having a display for displaying information: securing means for securing the recording device to either hand of a user, and an actuator for actuating the recording device and controlling the display, the securing means being so adapted that the actuator is positionable on the palm side of the user's hand enabling it to be actuated by one or more digits of the same hand, and the display is positionable on the backside of the hand, the recording device being adapted to fit between the forefinger and thumb of the user's hand by being flexible in a central region between the display and actuator.

4,681,463

## DIFFERENTIAL TIMER

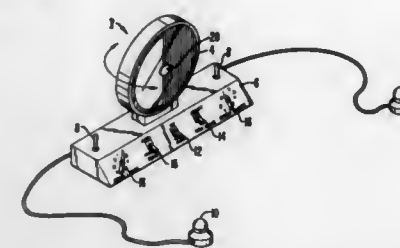
Kurt J. Bendit, 3927 19th St., San Francisco, Calif. 94114

Filed Sep. 12, 1986, Ser. No. 906,856

Int. Cl.<sup>4</sup> G04F 3/00

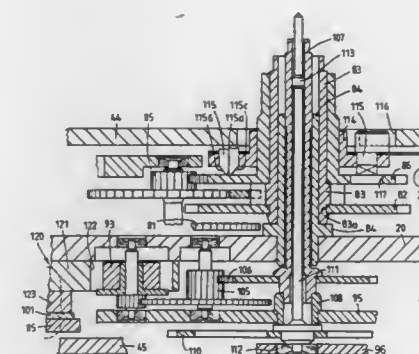
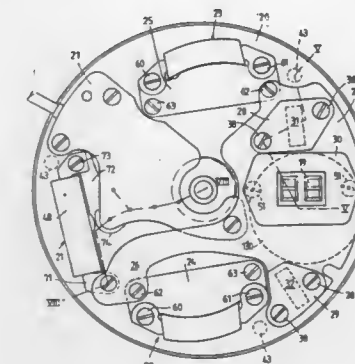
U.S. Cl. 368—96

7 Claims



1. A device for indicating differential time during game play comprising:  
a reversible motor;  
means for allocating a time interval between a first move and a second move;  
means for selecting between said first and said second move; and  
means for displaying said time interval in proportion to said first move and said second move.

the baseplate, the outer surface of said tube guiding at least one display wheel train member driven by one of said motors and



the internal surface of said tube guiding at least one display wheel train member driven by another of said motors.

4,681,465

## ALARM SIGNALLING ELECTRONIC TIMEPIECE WITH TIMER FUNCTION

Norihiko Nakamura, Tokyo; Hideki Morishima, Yokohama, and Yoshito Yamaguchi, Saitama, all of Japan, assignors to Rhythm Watch Co. Ltd., Tokyo, Japan

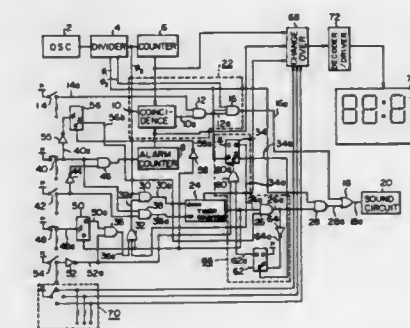
Filed May 18, 1984, Ser. No. 611,891

Claims priority, application Japan, May 23, 1983, 58-90994; May 25, 1983, 58-93206

Int. Cl.<sup>4</sup> G04B 23/10

U.S. Cl. 368—246

3 Claims



1. An alarm signalling electronic timepiece with a timer function comprising:  
an oscillator which generates an oscillating signal;

4,681,464

## TIMEPIECE MOVEMENT INCLUDING A PLURALITY OF STEPPING MOTORS AND AN ELECTRONIC TIME BASE

Claude Ray, Montezillon, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Switzerland

Filed Dec. 4, 1984, Ser. No. 677,969

Claims priority, application Switzerland, Dec. 6, 1983, 6515/83

Int. Cl.<sup>4</sup> G04C 3/14; G04F 8/00

U.S. Cl. 368—157

20 Claims

1. A timepiece movement comprising a frame means, at least two stepping motors, an electronic time base, electronic drive signal forming means controlled by the time base and electrical conducting means transmitting drive signals to said motors, said frame means exhibiting two opposed support surfaces each bearing at least one of said motors with said frame means being between said motors, said electrical conducting means being at least partially constituted by tracks formed on first surfaces of two insulating substrates fixed to said frame means, each of said first surfaces being spaced from and facing a respective one of said support surfaces, said support surfaces being located on the two opposed faces of a baseplate constituting a principal element of the frame means, a guide tube secured in a hole in

- a frequency divider which divides the oscillating signal from said oscillator to produce a clock signal;
- a counter which counts up in response to the clock signal from said frequency divider;
- an alarming hour counter in which an alarm set hour is memorized;
- an alarm signalling circuit which generates an alarm signal upon detecting the identity of the counted values of said counter and said alarming hour counter;
- a first alarm circuit which generates a first alarm intermittent signal in response to the alarm signal from said alarm circuit;
- a sound circuit which generates alarm sound in response to the first alarm signal sent from said first alarm circuit;
- a timer counter for presetting a preset value corresponding to the preset time and counting the clock signal from said frequency divider, and for supplying the first alarm signal to said sound circuit when the counting value reaches to the preset value;
- a second alarm circuit which supplies a second alarm signal which is different from said first alarm signal to said sound circuit in response to the alarm signal sent from said timer counter;
- a timer switch;
- a gate circuit which supplies said clock signal from said frequency divider to said timer counter upon on-operation of said timer switch;
- a display change-over switch;
- a display change-over circuit to which the count signals from said counter, alarm counter, and timer counter are supplied and which outputs alternatively any one of these count signals in response to the operation of said display change-over switch;
- a display circuit which displays the count signal from said display change-over circuit;
- a timer start circuit which outputs a timer start signal to the timer counter when a change of the alarm signal from the alarm circuit is detected and for holding the gate circuit opened until the output of the alarm signal from said timer counter stops;
- a timer control switch; and
- a timer starting circuit which determines whether to supply the signal from the timer start switch to said gate circuit while stopping the output of the timer start signal from said timer start circuit or to supply the timer start signal from said timer start circuit to the gate circuit while stopping the signal from said timer start switch in response to the operation of the timer control switch.

4,681,466

## METHOD FOR DETERMINING QUALITY OF REDUCED QUALITY STEAM

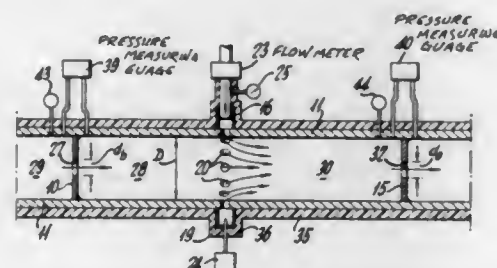
Sze-Foo Chien, Houston; Clifford L. Redus, Katy, and Peter L. Sigwardt, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 31, 1986, Ser. No. 824,812

Int. Cl. G01F 1/34; G01N 25/60

U.S. Cl. 374-42

5 Claims



1. In a steam flow line for supplying reduced quality steam to

an injection well or the like, a method for determining the quality of said reduced quality steam, comprising:

flowing a supply of quality steam through an aperture in a first flow restriction, and measuring the pressure drop thereacross,

reducing the quality of said steam by mixing a known measured quantity of water with the steam through a peripheral plurality of orifices in said flow line, at a predetermined point downstream of said first restriction,

flowing said reduced quality steam mixture through a second flow restriction, and measuring the pressure drop thereacross, and

determining the quality of the steam at said second restriction as a function of at least the pressure characteristic of the steam at said first and second restrictions and continuously injecting said quantity of water which is mixed with the steam downstream of the first flow restriction to maintain the reduced quality steam at the second restriction.

4,681,467

## IMPACT PRINTING APPLICATIONS

John P. Karidis, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

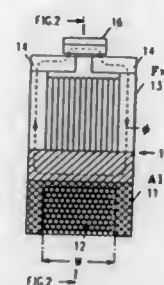
Continuation of Ser. No. 726,206, Apr. 23, 1985, abandoned.

This application Jul. 25, 1986, Ser. No. 887,983

Int. Cl. B41J 3/10

U.S. Cl. 400-124

25 Claims



1. A print actuator comprising:
- a stator having a centersection and having at least one slot defined by a plurality of vertically extending poles at a periphery and made from a ferromagnetic material;
- a coil disposed about a central portion of said stator centersection, having its axis approximating the axis of said stator, constrained by said vertically extending poles of said stator;
- an armature disposed perpendicular to the axis of said coil and extending across said slot between said poles; and wherein a magnetic flux path extends vertically through one of said poles, transversely through the width of said armature in a direction parallel to the axis of said coil, and vertically through the other of said extending poles.

4,681,468

## THERMAL PRINTING APPARATUS

Fredrik L. N. Kallin, Kitchener, and Edward R. Evans, St. Clements, both of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 23, 1982, Ser. No. 452,858

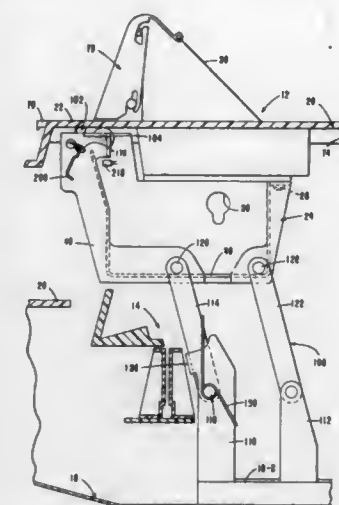
Int. Cl. B41J 11/26

U.S. Cl. 400-120

12 Claims

1. A printing apparatus comprising:
- a support body;
- a printer;
- said support body having a first area for storing media to be supplied to said printer and a second area for receiving media from said printer;

mounting means for mounting said printer on said support body to enable said printer to be moved as a unit with said support body; and



moving means coupled to said support body to enable said support body to be moved from a home position to an accessing position located above said home position where the accessing of media in said support body is facilitated.

4,681,469

## QUIET IMPACT PRINTER

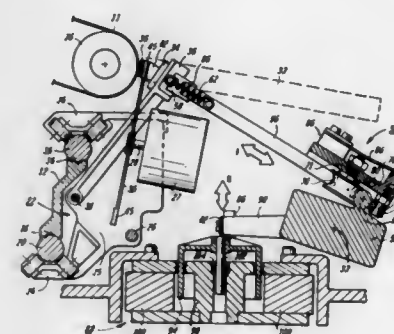
Andrew Gabor, Alamo, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1985, Ser. No. 751,169

Int. Cl. B41J 9/36

U.S. Cl. 400-157.2

8 Claims



1. An impact printer comprising a platen for supporting an image receptor, a print element having character portions disposed thereon, a print element selector for moving said print element to position a selected character portion at a printing position, a marking ribbon positionable between said print element and said platen and an impact mechanism for delivering a printing force to drive said selected character portion to deform said platen by means of a print tip, said character element and said print tip being supported upon a carriage mounted upon said printer for reciprocating movement in a path substantially parallel to the axis of said platen, said impact mechanism being characterized by comprising:

means for moving said print tip including a prime mover and a force multiplier coupling said prime mover and said print tip for imparting to said print tip a force so that said print tip has an effective mass of at least 0.5 pounds and a velocity no greater than 16 inches per second at the location where said character portion initially deforms said

platen, and said means for moving applies kinetic energy to move said print tip in a self levelling manner to the point at which said character portion initially deforms said platen.

4,681,470

## BIDIRECTIONAL SERIAL PRINTER

Yoshinori Nakajima, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

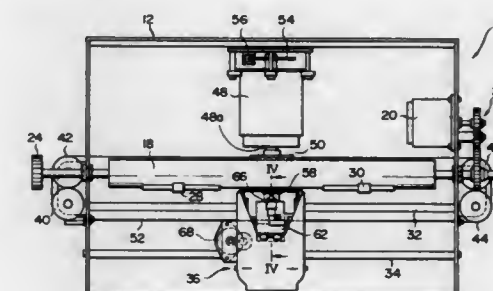
Filed Dec. 30, 1983, Ser. No. 567,037

Claims priority, application Japan, Jan. 11, 1983, 58-1790

Int. Cl. B41J 19/30

U.S. Cl. 400-323

6 Claims



1. A printer in which input data are once stored in predetermined addresses of a buffer memory and then sequentially read therefrom to be printed out on a sheet, comprising:
- data discriminator means for determining whether the input data is predetermined data; and
- data sequence changing means for changing a sequence of the input data stored in the buffer memory such that an order of the input data is reversed in response to a result of the determination by said data discriminator means;
- the carriage return code discriminator circuit being constructed to reproduce a back signal if not producing the back signal when the input data is the carriage return data and, if producing, stop delivery of the back signal and deliver a back mode signal.

4,681,471

## KIT COMPRISING MULTICOLORED FLUID DISPENSER MARKERS TOGETHER WITH ERADICATING FLUID DISPENSER, STAMPS AND STAMP PAD

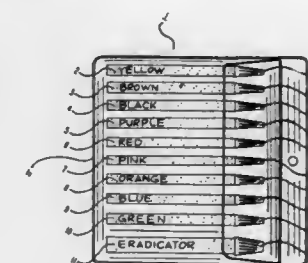
Leon Hayduchok, Trenton, N.J., and Leopold Strauss, Forest Hills, N.Y., assignors to All-Mark Corporation, Inc., Trenton, N.J.

Continuation-in-part of Ser. No. 519,921, Aug. 3, 1983, abandoned. This application Jul. 31, 1984, Ser. No. 636,080

Int. Cl. B43K 27/00

U.S. Cl. 401-34

33 Claims



1. A coloring kit which comprises in combination:



means comprising a plurality of devices capable of producing a series of rainbow-colored marks or imprints, including at least each of the primary colors red, yellow and blue, each of said devices including a reservoir of a different colored water-based fluid consisting essentially of a common carrier solution composed essentially of 70-100% deionized water and from 0-30% glycols; a non-ionic wetting agent in concentrations of from about 0.125 to 0.25% by weight of said carrier solution; an antioxidant in concentration of from about 0-7% by weight of said carrier solution, and predetermined dye-stuffs in concentrations from about 0.125 to 3.25% by weight of said carrier solution;

marking or stamping means operable in collaboration with each said reservoir of colored water-based fluid to produce a discernible colored mark on a smooth substrate;

means comprising a single eradicator fluid formulated to eradicate any and all of the colors of said rainbow-colored marks or imprints produced by said marking devices, said eradicator means comprising a reservoir of a water-based eradicator fluid consisting essentially of about 65-95% of said common carrier solution, about 5-35% reducing agent and about 0.125 to 0.25% wetting agent;

marking or stamping means operable in collaboration with said reservoir of said eradicator to produce an imprint of eradicator fluid on said smooth substrate;

wherein said eradicator fluid is so formulated that upon application to said discernible colored marks said eradicator will remove the color therefrom without removing the color from or substantially staining the substrate.

32. The method of providing a kit comprising a plurality of reservoirs of water-based coloring fluid for different color markings and a reservoir of eradicating fluid which operates to eradicate the colored marks of each of said coloring dispensers, which comprises the steps of:

- mixing 70 to 100 weight percent water with 0 to 30 weight percent glycol to form a Solution A; combining said Solution A with a wetting agent in the amount of from 0.125 to 0.25 weight percent of Solution A thereby forming a common carrier solution;
- for each of said coloring fluids:
- dissolving a quantity of each of a plurality of appropriately colored dyestuffs in said common carrier solution to form a plurality of colored mixtures and adding a portion of antioxidant to each of said mixtures; and
- for said eradicating fluid:
- dissolving a quantity of reducing agent in said Solution A in a ratio of from 5 to 35 parts of reducing agent for 95 to 65 parts of Solution A, and adding a wetting agent to said mixture in the amount of from 0.125 to 0.25 weight percent of Solution A.

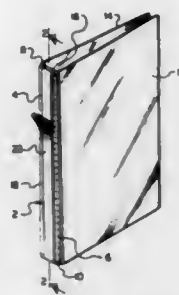
4,681,472

## SELF-LOADING BINDER

Paul E. Rable, 924 Oakmound St., Newbury Park, Calif. 91320  
Filed May 2, 1986, Ser. No. 859,005

Int. Cl.<sup>4</sup> B42F 1/00, 1/06; B65H 23/00; B42D 19/00  
U.S. Cl. 402-3

10 Claims



1. An improved system for labeling the spine of bound works in combination with a bound material, said bound works com-

prising a spine with a pair of generally parallel longitudinal edges and a pair of generally parallel transverse edges, and front and back covers attached to the longitudinal edges of the spine, and wherein the improvement comprises:

- a transparent cover means attached to the spine adjacent to its longitudinal edges and separated from the spine therebetween, whereby a space is formed between the transparent cover and the spine of the bound work; and
- an elongated leader having a lesser width than the space along the spine and adapted to be positioned in that said space between the transparent cover and the spine, said leader when so positioned extending at each end of the spine, one end of the leader being adapted to be removably attached to a label and the other end being adapted to be grasped manually to pull the leader for positioning the removably attached label inside the said space, and thereby permit the viewing of the label placed therein.

4,681,473

## LOOSE-LEAF BINDER FOR STACKS OF SHEETS

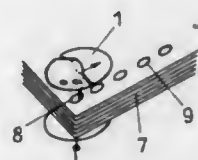
Lothar Jakob, Holteigasse 8, A-1210 Vienna, Austria

Filed Mar. 28, 1986, Ser. No. 845,467

Claims priority, application Austria, Apr. 5, 1985, 1047/85  
Int. Cl.<sup>4</sup> B42F 13/04

U.S. Cl. 402-15

8 Claims



1. Binding means for a stack of sheets, comprising an elongated connecting element adapted to be passed through the perforations of a stack of perforated sheets, and further comprising a clamping means for the connecting element formed of a generally circular plate member having a first slot extending from a mouth at the edge of the plate member in an approximately normal direction relative to said edge to approximately the center of the plate member and adapted to receive the connecting element therethrough, said plate member having a second slot extending from a mouth at the edge of the plate member at a location opposite the mouth of said first slot at an acute angle ( $\alpha$ ) relative to a tangent line to said edge at said location, to form an acute-angled portion delimited by the second slot and the edge of the plate member, said acute-angled portion being obliquely upwardly bent with respect to one side of the surface of the plate member, and wherein the edge of the plate member is chamfered from said second slot to said first slot along the acute-angled portion of said plate member.

4,681,474

## ARRANGEMENT FOR HOLDING AND FILING DOCUMENTS, PAPERS AND THE LIKE

Olle Wiberg, Storråta, Sweden, assignor to Esselte Almanacks-förlag AB, Solna, Sweden

Filed Dec. 6, 1985, Ser. No. 806,271

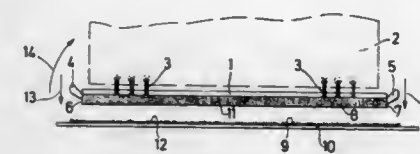
Claims priority, application Sweden, Dec. 18, 1984, 8406435  
Int. Cl.<sup>4</sup> B42F 13/00; B42D 3/00

U.S. Cl. 402-75

11 Claims

1. A system calendar folder for use with a plurality of ring mechanisms, each ring mechanism accommodating a plurality of sheets of paper having dimensions substantially smaller than conventional A4 sized sheets, said folder comprising:
  - a folder having front and back side piece cover portions joined together at a common inner edge and open at respective outer edges thereof;
  - said folder having sheet retaining means attached to the inside of said folder adjacent said common inner edge;

the improvement wherein said sheet retaining means includes means for detachably supporting one of a plurality of ring mechanisms having rings on one side for co-action with hole-punched paper sheets, said supporting means including a hook and loop fastener having a first part and a second part, said first part being attached to said ring



mechanism on the side thereof opposite said rings, and said second part of said hook and loop fastener being attached directly to said folder along said common edge, said fastener parts being arranged to cooperate with one another to detachably connect each ring mechanism to said supporting means to solely support said ring mechanism in said folder.

4,681,475

## BALL JOINT SOCKET

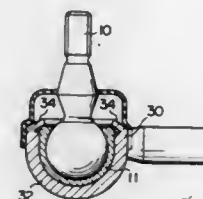
Kiyoharu Kanegawa, Hamamatsu, Japan, assignor to Rhythm Motor Parts Mfg. Co., Ltd., Japan

Filed Mar. 26, 1986, Ser. No. 844,200

Int. Cl.<sup>4</sup> F16C 11/00

U.S. Cl. 403-40

3 Claims



1. A ball joint socket of a ball joint of a motor vehicle comprising a bearing holding said ball joint and a ball shell integral with a caulking portion smaller in thickness than said ball shell, wherein

said caulking portion is bent to engage said bearing so that said ball joint is prevented from escaping from said ball joint socket and that an annular interstice is formed between an inner surface of said caulking portion and an outer peripheral surface of an upper end of said bearing radially outside of the point of engagement of said caulking portion with said bearing.

4,681,476

## FLEX-LOCK DOVETAIL MOUNTING APPARATUS FOR RADIO TRANSCEIVERS AND ACCESSORIES

Nicholas Mischenko, Mt. Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1986, Ser. No. 858,427

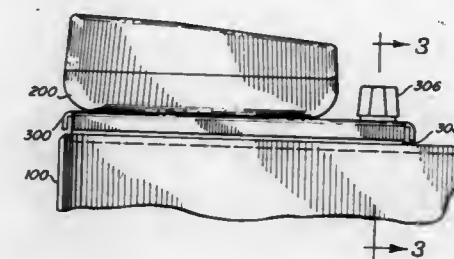
Int. Cl.<sup>4</sup> F16B 1/00

U.S. Cl. 403-42

10 Claims

1. Improved dovetail mounting apparatus attachable to an accessory for mounting the accessory on a housing having on one side thereof at least two channels producing a dovetail, comprising:
  - a top plate having a hole therein;
  - a slide plate attached to said top plate, said slide plate having at one end a cut-out portion producing a gap between said cut-out portion and said top plate, said cut-out portion having a hole opposite the hole in the top plate, and said cut-out portion having at least two rails producing a dove-

tail and each adapted to insert into a corresponding one of said channels; and  
means coupled to said top plate and said cut-out portion of said slide plate for flexing said cut-out portion toward said top plate, said flexing means including a first member and



a second member mechanically coupleable to said first member, said first member being disposed in the hole in said top plate and said cut-out portion of said slide plate and being coupled to said second member for flexing said cut-out portion toward said top plate thereby locking said rails in position in said channels.

4,681,477

## INVISIBLE CONNECTION FOR FACED PARTS, IN PARTICULAR FOR FURNITURE

Walter Fischer, Rationalstrasse 4, D-4520 Melle 7, Fed. Rep. of Germany

Continuation of Ser. No. 589,631, Mar. 14, 1984, abandoned.

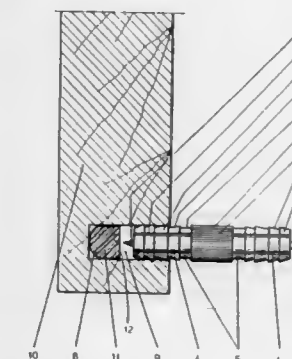
This application Nov. 5, 1986, Ser. No. 928,648

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3309953; May 7, 1983, 3316855; Jun. 3, 1983, 3320184; Oct. 21, 1983, 3338224; Nov. 15, 1983, 3341312; Nov. 25, 1983, 33424547

Int. Cl.<sup>4</sup> F16B 12/04, 13/02

U.S. Cl. 403-298

13 Claims



1. An invisible connection for faced parts, in particular for articles of furniture of wood or material similar to wood, involving the use of adhesive and a cylindrically shaped connecting member having two end faces, in which connection said adhesive is introduced in fluid form or in the form of a paste into cylindrical boreholes in the parts to be connected and said connecting member is driven or pressed at each of its two ends into the boreholes, said connecting member having a form which is symmetrical relative to a vertical central axis, at least one longitudinally extending groove, and at least one annular notch being provided on the outer surface of said member and each of said two end faces of said connecting member being formed with a point, wherein said adhesive is hermetically enclosed in a substantially cylindrically shaped sheath having a peripheral angled-out part at an end face thereof with a covering thereon, said sheath with said enclosed adhesive being of a size such that it may be introduced as an

independent component into the borehole, said covering projecting over the cylindrical wall of the sheath so as to form a clamping element for clamping the sheath in the borehole, said sheath being pierced by the point on the end face of said connecting member and crushed, within the borehole, by said connecting member when said connecting member is driven or pressed into the borehole.

4,681,478

# COUPLING FOR ROTATABLY CONNECTING A REEL WITH A DRIVE SHAFT

Peter Kunz, Lörrach-Hauning, Fed. Rep. of Germany, assignor to Ludwig Boschert GmbH & Co. KG, Lörrach-Hauning, Fed. Rep. of Germany

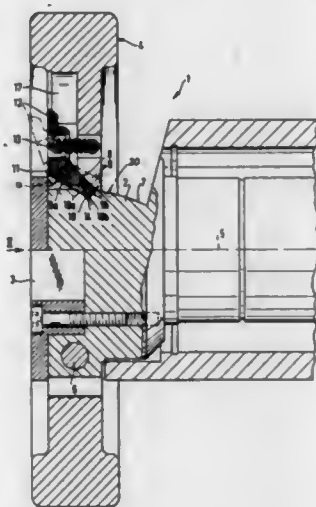
Filed Mar. 14, 1986, Ser. No. 839,727.

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509108

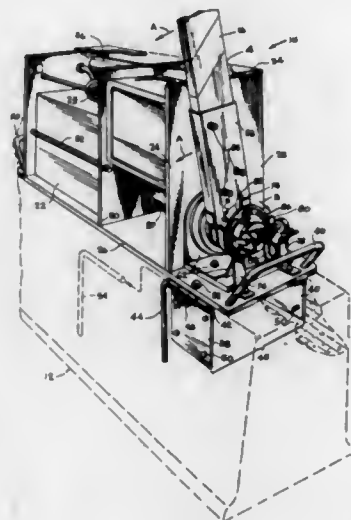
Int. Cl.<sup>4</sup> F16D 1/00

U.S. Cl. 403—341

30 Claims



means for moving said gate arm into open and closed positions, allowing the control of traffic, and means for removably mounting said gate arm on an existing road structure, said means for removably mounting said



gate arm including a base and a pair of side plates, said base having opposing side edges, each releasably attached to a side plate by a hinge-like joint, said base supporting said gate arm and said means for moving said gate arm.

4,681,480

# METHOD FOR FORMING ROADWAY-MARKING MEANS WHEREBY INDIVIDUAL RETROREFLECTING ELEMENTS ARE GATHERED AND GROUPED TOGETHER

Ludwig Elgenmann, Via Dufour 3, CH 6900 Lugano, Switzerland

Filed Jul. 22, 1986, Ser. No. 888,314

Claims priority, application Switzerland, Jul. 23, 1985, 3199/85

Int. Cl.<sup>4</sup> E01F 9/08

U.S. Cl. 404—14

2 Claims



1. A method for laying down of asymmetrical retroreflecting elements having flat sides and rounded sides upon roadway surface markings, comprising:

- moving said retroreflecting elements downwardly upon a vibrating inclined plane towards a depositing point such that a very high percentage of said elements is oriented with their rounded sides pointed upwardly and their flat sides against the inclined plane;
- during said moving downwardly, shifting and grouping the retroreflecting elements closer together, so as to provide the maximum number of mutual contacts between the individual retroreflecting elements; and
- sequentially of said shifting and grouping, laying down a pre-established number of transversely extending rows that have been grouped together.

4,681,479

# PORTABLE TRAFFIC CONTROL GATE

Richard H. Wagner, 1679 Elm St., and George J. Wagner, 5498 Windflower Dr., both of Livermore, Calif. 94550

Filed Jan. 22, 1986, Ser. No. 821,480

Int. Cl.<sup>4</sup> E01F 13/00

U.S. Cl. 404—6

20 Claims

1. A portable traffic control gate comprising, a gate arm horizontally disposable for closing passage of traffic on a road,

4,681,481

# DECORATIVE, FUNCTIONAL ELEMENT FOR CONSTRUCTION AND THE LIKE

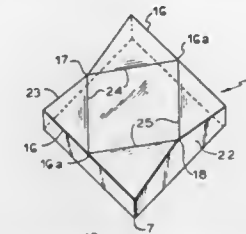
Janusz J. Kapusta, 1060 Ocean Ave., Apartment D5, Brooklyn, N.Y. 11226

Filed May 29, 1985, Ser. No. 738,843

Int. Cl.<sup>4</sup> E01C 5/00

U.S. Cl. 404—34

12 Claims



1. As an article of manufacture, a surface covering for a wall, a floor, a ceiling, a partition and the like comprising a three-dimensional body having a rectangular base and further defined by:

- a zero plane through the body parallel to the base;
- a minus elevation point with respect to the zero plane;
- a plus elevation point with respect to the zero plane; said minus and plus elevation points equidistant in plus and minus elevation from said zero plane;
- a pair of first midpoints on said zero plane equidistant from two opposite edges of said body, one midpoint at one edge and midpoint at the other edge;
- a pair of second midpoints, one midpoint at said minus elevation point and the other midpoint located at the plus elevation point equidistant from two other opposite edges of said zero plane; each of the midpoints of the second pair of midpoints being equidistant from the zero plane; all of said midpoints located on a plane that intersects said zero plane at the first pair of midpoints, said body having a rear face extending from said base to said plus elevation point defining with the plus elevation point and zero plane a triangle, said body having a front face which includes the minus elevation point and two mirror image triangles, said body having two rectangular side faces which extend from the base to the zero plane.

4,681,482

# ROLLABLE TEMPORARY ROADWAY AND APPARATUS FOR ROLLING UP AN INSTALLED TEMPORARY ROADWAY

Bernhard Arciszewski, Bottrop-Kirchhellen, and Hans-Norbert Wiedeck, Düsseldorf, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

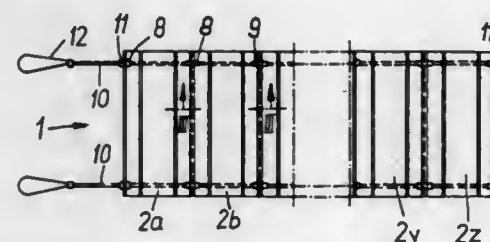
Filed Apr. 4, 1986, Ser. No. 848,386

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512589

Int. Cl.<sup>4</sup> E01C 5/16, 9/08

U.S. Cl. 404—35

14 Claims



1. A temporary roadway having first and second ends, the roadway additionally having a rolled state and an unrolled

state wherein the roadway extends along a line between the first and second ends, comprising:

- a plurality of supporting elements which are disposed beside one another in the direction of the line when the roadway is in its unrolled state;
- a plurality of hinge means, disposed transverse to the line when the roadway is in its unrolled state, for articulatedly connecting said supporting elements to one another, each hinge means including a bead affixed to a respective supporting element adjacent said bead, said claw having a recess which is engaged by said bead; and
- at least one cable which has loops and which is fastened to supporting elements at both ends of the roadway, each loop separately surrounding a respective hinge means.

4,681,483

# CASTING OF STRUCTURAL WALLS

Paul Camilleri, Nerang, Australia, assignor to S.W.R. (Australia) Pty. Ltd., Nerang, Australia

PCT No. PCT/AU85/00050, § 371 Date Nov. 12, 1985, § 102(e) Date Nov. 12, 1985, PCT Pub. No. WO85/04210, PCT Pub. Date Sep. 26, 1985

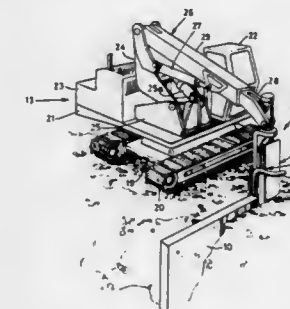
PCT Filed Mar. 12, 1985, Ser. No. 802,009

Claims priority, application Australia, Mar. 12, 1984, PG4019

Int. Cl.<sup>4</sup> E02D 5/20

U.S. Cl. 405—267

11 Claims



1. A method for the continuous casting of a structural concrete wall including the steps of:

- mounting a work head on the distal end of an extendable boom mounted on the chassis of a moving vehicle, said work head being mounted for movement about three axes relative to the boom,
- excavating a trench using an excavator mounted on said work head,
- temporarily supporting the sides of the trench with moving formwork immediately following the excavator,
- pumping concrete under pressure into the formwork to fill the trench and stabilize the sides of the trench, and
- allowing the concrete to set to form the structural wall.

4,681,484

# METHOD OF AND APPARATUS FOR CONVEYING POWDERED OR GRANULAR MATERIAL

Hans R. Egger, Küsnacht, Switzerland, assignor to Intradyne Maschinen AG, Winterthur, Switzerland

Filed Jan. 16, 1985, Ser. No. 692,102

Claims priority, application Switzerland, Jan. 17, 1984, 194/84

Int. Cl.<sup>4</sup> B65G 53/46

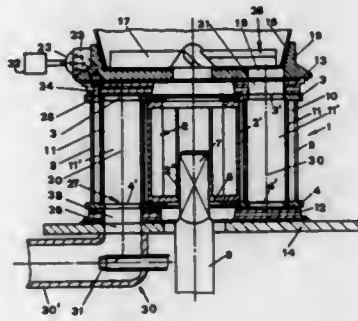
U.S. Cl. 406—63

10 Claims

6. An apparatus for conveying powdered or granular material comprising: a vertically disposed rotor including a plurality of conveying chambers symmetrically arranged about an axis of the



rotor and parallel thereto, said conveying chambers having air-permeable walls;  
means disposed above said rotor for charging each of said chambers with a material at a first location through an opening defined in each of said conveying chambers;  
means disposed below said rotor for discharging said material from each of said chambers at a second location, spaced from said first location;  
means for rotating said rotor so that said chambers are conveyed along an arced path at least from said first location to said second location;



means for sealing said opening of each said chamber while said chambers are conveyed from said first location to said second location;  
means for producing an air flow;  
means for delivering said air flow to said material in said chambers while they are conveyed and said openings are sealed;  
a conveying line for conveying material discharged at said second location; and  
an injector nozzle for injecting air from a compressed air source into said conveying line.

4,681,485

# END MILL CUTTING TOOL AND INDEXABLE INSERT THEREFOR

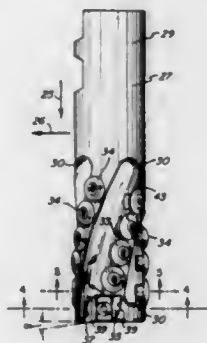
Rob Koelwijn, Milford, Conn., assignor to GTE Valeron Corporation, Oak Park, Mich.

Filed Feb. 25, 1986, Ser. No. 833,372

Int. Cl.<sup>4</sup> B23C 5/02, 5/20

U.S. Cl. 407—42

9 Claims



6. A helical end mill cutter, comprising:  
a rotary body having an outer periphery, and slots formed in its outer periphery alternately extending fully to the distal end of said body, each of said slots receiving in staggered sequence therealong rotatable cutting inserts circular in plan, providing a plurality of indexable cutting edges in said slot, each insert tiltable about the longitudinal axis of said cutter body enabling a cutting edge thereof to be disposed at a positive axial and positive radial rake, said

circular insert cutting edges formed from opposed frusto-conical surfaces; and  
a curved rhomboidal rotatable on-edge cutting insert positioned to said fully extending slots' distal end, said curved rhomboidal insert having alternately opposed substantially planar and curved cutting edges disposed about a center, said cutting edges formed from opposed frusto-conical surfaces, said cutting edges characterized by radii of curvature displaced from said center, colinear therewith substantially along an insert diagonal, said insert further positioned on said body having a portion of one of said curved cutting edges being disposed in said fully extending slot, with a cutting edge corner extending below the bottom plane of said cutter body, said curved rhomboidal insert further disposed at a positive axial rake and positive radial rake on said cutter body such that said radial rake proceeds from neutral to positive along said cutting edge upon entering a workpiece.

4,681,486

# TRIANGULAR CUTTING TOOL INSERT HAVING CUTTING EDGES WITH RECESSES

Alan A. Hale, Berkhamsted, England, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1986, Ser. No. 897,241

Claims priority, application United Kingdom, Aug. 21, 1985, 8520901

Int. Cl.<sup>4</sup> B23B 27/22

U.S. Cl. 407—114

13 Claims



1. An indexable, positive rake insert for a cutting tool comprising:  
a body having two spaced-apart substantially parallel side faces, the first side face having a surface larger than the second side face, the faces being substantially triangular; three contiguous edge faces of equal length extending between the side faces, each edge face having one or more recesses which extend transversely or substantially transversely across the whole edge face from the first side face to the second side face, the recesses being spaced apart to leave a plurality of coplanar lands, the number of recesses on any two adjacent edge faces being the same;  
three cutting edges formed where each edge face intersects the first side face, the recesses at the cutting edges having a width which is the same as half the width or less than half the width, of the intervening lands at the cutting edge, the lands on at least one side being positioned such that a complete cutting edge is formed with the lands on at least one other side.

4,681,487

# INSERT FOR CHIP REMOVING MACHINING

Lars T. Pettersson, Gävle, Sweden, assignor to Santrade Limited, Lucerne, Sweden

Filed Jun. 30, 1986, Ser. No. 880,017

Claims priority, application Sweden, Jul. 3, 1985, 8503305

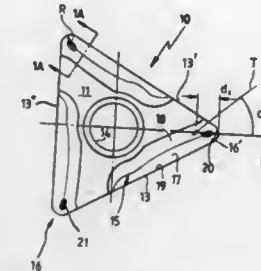
Int. Cl.<sup>4</sup> B23B 27/22

U.S. Cl. 407—114

10 Claims

1. Insert for chip removing machining, preferably for turning, comprising a mainly polygonal body of hard, wear resistant material, which has an upper face and a lower face ar-

ranged in separate mainly parallel planes and a plurality of side faces connecting said faces, at least one chip breaker asymmetrically arranged in at least one of the lower or upper faces, at least one rounded-off nose portion at the intersection of two side faces, said portion being provided with a cutting edge, said chip breaker consisting of an outer part and an inner part, said outer part forming a cutting edge at the intersection with a first side face, characterized in that the end surface of the inner part



deviates from the main direction of the inner part in the vicinity of the nose portion such that the distance between the end surface and an associated cutting edge or its extension line in a plane P parallel with the lower face increases with diminishing distance to a second side face and in that the cutting edge, the nose portion and the cutting edge of the nose portion are arranged at a distance from the associated upper or lower face, said cutting edges lying in a common plane mainly parallel with the plane P.

4,681,488

# CUTTING INSERT

Lars O. Markusson, Sandviken, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

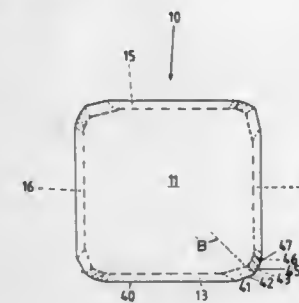
Filed Jun. 30, 1986, Ser. No. 880,062

Claims priority, application Sweden, Jul. 3, 1985, 8503304

Int. Cl.<sup>4</sup> B23B 27/16; B23C 5/20

U.S. Cl. 407—114

9 Claims



1. A cutting insert for chip forming machining having a polygonal basic shape, comprising two mainly parallel faces and edge surfaces joining them, lines of intersection between two of said edge surfaces and at least one of said faces forming main cutting edges and a plurality of chamfers being formed at the transition between two of said edge surfaces in a corner portion of the insert, a first of said chamfers forming a minor cutting edge at its line of intersection with said face, said corner portion having a bisector, characterized in that the transition between the minor cutting edge and the associated main cutting edge in the corner portion of the insert comprises at least two straight cutting edges which form an obtuse internal angle with each other, said main cutting edge being essentially longer than the associated minor cutting edge, the major part of said minor cutting edge being placed at one side of said bisector and the major part of the cutting edges of the second chamfers along intersection lines with said face being arranged at the opposite side of said bisector and in that the main cutting

edge extends from a cutting edge of a second chamfer to a minor cutting edge at an adjacent corner portion and in that at least two maximum four second chamfers are formed between the first chamfer and the associated edge surface.

4,681,489

# PROCESS OF FORMING OPENINGS

Wolfgang Millauer, and Dieter Raab, both of Munich, Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

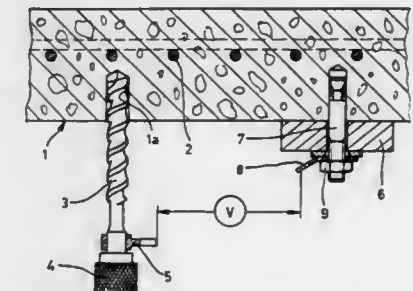
Filed Nov. 27, 1985, Ser. No. 802,757

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443591

Int. Cl.<sup>4</sup> H02G 1/12

U.S. Cl. 408—1 R

7 Claims



1. Process of forming openings in reinforced concrete incorporating steel reinforcing members, employing a drilling or chipping bit inserted into a hand-held drilling device for forming the opening, wherein the improvement comprises the steps of placing a non-ferrous metallic electrode into electrically conducting contact with the surface of the reinforced concrete in spaced relation from the reinforcing members, placing the electrode in electrical contact with the drilling or chipping bit, measuring the voltage developed between the electrode and the drilling or chipping bit due to the formation of a galvanic cell using the reinforced concrete as an electrolyte, and while drilling into the reinforced concrete with the drilling device utilizing the voltage change occurring upon contact of the drilling or chipping bit with a steel reinforcing member in the reinforced concrete for controlling the operation of the drilling device.

4,681,490

# RETRACTION APPARATUS FOR AUTOMATIC FEED DRILLS OR THE LIKE

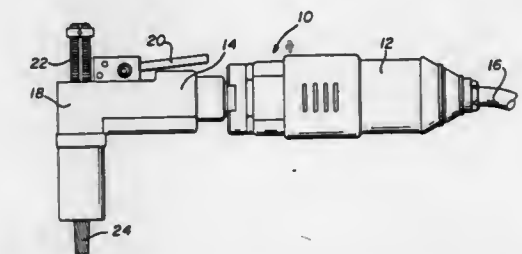
Robert A. Pennison, Bellville, and Richard E. Eckman, Houston, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 547,702, Oct. 31, 1983, Pat. No. 4,592,681. This application Mar. 27, 1986, Ser. No. 848,180

Int. Cl.<sup>4</sup> B23B 45/04

U.S. Cl. 408—10

10 Claims



1. Improved retraction apparatus for automatic feed drills

including a housing, a rotatable tool spindle located for reciprocating movement in the housing, and driving means located in said housing operably connected with said spindle for rotating and reciprocating said spindle in feeding and retraction movements, said driving means including a spindle rotation gear engaged with said spindle to rotate said spindle and slidable thereon, a spindle feed gear engaged with said spindle to cause the reciprocating movement of said spindle, a main drive gear driven by said drive means and engaged with said spindle rotation gear to cause rotation thereof, and a feed gear engaging said spindle feed gear movable into and out of engagement with said main drive gear, said feed gear, when driven by said main drive gear, causing rotation of said spindle feed gear to move said spindle in feeding movement, and, when not driven by said main drive gear, moving said spindle in retraction movement, the improvement comprising shift means connected to said feed gear and engageable with said spindle for moving said feed gear out of driving engagement with said main drive gear.

4,681,491

## MILLING MACHINE

Gottfried Blaimschlein, Steyr, Austria, assignor to GFM Gesellschaft, Steyr, Austria

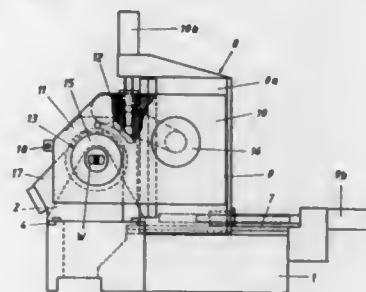
Filed Oct. 18, 1984, Ser. No. 662,352

Claims priority, application European Pat. Off., Nov. 15, 1983, 83890211.2

Int. Cl.<sup>4</sup> B23C 3/06

U.S. Cl. 409—200

12 Claims



1. A milling machine comprising a plurality of internally cutting inserted-tooth cutters for machining an elongate workpiece to form a plurality of axially spaced portions which are circular in cross section, which comprises

- a machine bed;
- spaced apart gripping means mounted on the machine bed and adapted to grip the elongate workpiece at both ends thereof with the axis of the workpiece in a predetermined position;
- two milling units spaced apart along the workpiece axis, each milling unit being movable in a plane normal to the axis of the gripped workpiece and adapted to perform a feed movement in said plane for the machining of the workpiece, each milling unit comprising
  - a rotatably mounted tool drum holding at least one of said inserted-tooth cutters inside the drum;
  - drive means for rotating the tool drums;
  - feed drive means for imparting said feed movement to the milling units, the feed drive means comprising
    - a common milling slide mounted on the machine bed, the milling units being mounted on the common milling slide, and the milling slide including means defining a free space between the milling units, and
    - a back rest mounted on the machine bed between the milling units and received in the free space during the feed movement, the back rest supporting the gripped workpiece.

4,681,492

## HIGH-SPEED SPINDLE

Junzo Hasegawa, Susumu Kawabata, and Nobuharu Mimura, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

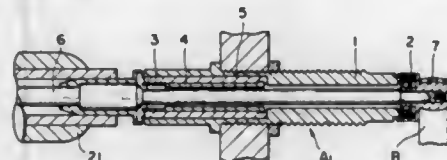
Filed Mar. 25, 1986, Ser. No. 843,759

Claims priority, application Japan, Apr. 2, 1985, 60-69581

Int. Cl.<sup>4</sup> B23Q 1/08

U.S. Cl. 409—231

31 Claims



1. A high-speed spindle which is rotatable at high speed without producing any substantial vibration or noise, said spindle comprising:

- a holding member defining a casing;
- a spindle shaft adapted to support a rotor rotatably;
- a neck bearing disposed radially of said spindle shaft for supporting said spindle shaft rotatably, said bearing being located between one end of said spindle shaft on which said rotor is supported and the other end thereof;
- damping means including a damping sleeve disposed radially symmetrically between said holding member and said neck bearing and said spindle shaft, said damping sleeve being secured to said neck bearing at one end thereof and being longer than said neck bearing, and a buffer disposed radially symmetrically between said damping sleeve and said holding member;
- an end bearing secured to the end of said holding member remote from said rotor for supporting said spindle shaft at said other end thereof; and
- means for transmitting power from a source of power to said spindle shaft, provided on said end bearing side of said damping means.

4,681,493

## MEANS FOR MAINTAINING AXIAL STRESS ON A DOWEL ASSEMBLY

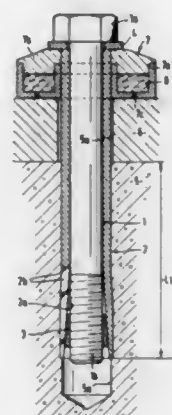
Helmut Vollmer, Balzers, Liechtenstein; Heinz Kousek, Feldkirch, and Elmar Maier, Tisis, both of Austria, assignors to Hilti Aktiengesellschaft

Filed May 7, 1985, Ser. No. 731,555

Int. Cl.<sup>4</sup> F16B 31/04

U.S. Cl. 411—8

10 Claims



1. In a dowel to be anchored in a borehole or the like in a receiving material, such as concrete, masonry or the like, where the dowel assembly is axially elongated includes an

abutment arranged to be spaced exteriorly of the receiving material for applying an axial load on said dowel assembly relative to the receiving material, wherein the improvement comprises a container arranged to be positioned between said abutment and the exterior of the receiving material, said container formed so that it is expandable only in the axial direction of said dowel assembly, said container defining an interior receiving space, an hydraulic mass capable of expanding when exposed to a reaction liquid located within said receiving space so that said container can expand in the axial direction of the dowel assembly for applying a pressing force on said abutment relative to the receiving material, said container comprises a first part and a second part and said receiving space located at least in one of said parts, and said first and second parts being displaceable in the axial direction of said dowel assembly when said hydraulic mass expands.

4,681,494

## DRIVE NUT BLEND FASTENER WITH CAP NUT

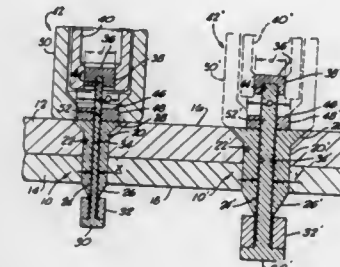
John D. Pratt, Rancho Cucamonga, and Victor Belanger, Huntington Beach, both of Calif., assignors to Monogram Industries, Inc., Culver City, Calif.

Filed Oct. 4, 1985, Ser. No. 784,348

Int. Cl.<sup>4</sup> F16B 13/06

U.S. Cl. 411—54

7 Claims



1. A blind fastener for mounting in aligned openings through two workpieces to connect them together in overlapping outer and inner relation and adapted to be set by wrench means, the fastener comprising:

- an internally threaded, generally tubular fastener body received within the openings in the workpieces having,
  - an inner end projecting inwardly beyond the inner workpiece, and
  - an enlarged body head for engagement with the outer surface of the outer workpiece,
- an externally threaded cylindrical stem passing in threaded engagement through said fastener body, turning motion of said stem relative to said fastener body in one direction moving said stem in an axially outward direction through said fastener body, said stem having an enlarged stem head spaced from the inner end of said fastener body,
- a deformable sleeve around said stem in contact with said stem head, movement of said stem outwardly through said fastener body deforming said sleeve to a fully set condition in overlying contact with the inner surface of the inner workpiece,
- a drive nut separate from said fastener body for threaded mounting on said stem in abutment with said body head restraining said fastener body from turning in the workpieces, said drive nut having an outer surface for engagement by the wrench means; and
- a cap nut fixedly mounted on the outer end of said stem, said cap nut having an outer surface for engagement by the wrench means, said drive nut and said cap nut being adapted for concurrent engagement by the wrench means for holding said drive nut against rotation and turning said cap nut to turn said stem relative to said fastener body in said one direction.

4,681,495

## DEVICE AND PROCESS FOR FIXING TWO PARTS WITH A CAPTIVE SCREW

Gérard Crespin, Villeurbanne, and Jean Coussau, Paris, both of France, assignors to Framatome & Cie, Courbevoie, France

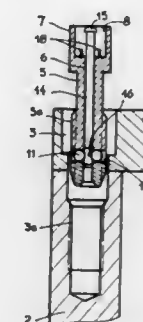
Filed Oct. 29, 1984, Ser. No. 666,022

Claims priority, application France, Oct. 23, 1983, 83 17279

Int. Cl.<sup>4</sup> F16B 39/22

U.S. Cl. 411—298

4 Claims



1. Device for permanently fixing two parts (1, 2) together, comprising a captive screw engaged over a part of its length (3a) in a threaded hole (3) machined in one of the two parts (1, 2) and a means (11) for locking said screw in said threaded hole (3), which locking means is movable inside said screw, in which said screw (5) comprises over its entire length and along its axis a bore (6) communicating with at least one radially directed hole (10) opening out on an outer side surface of a threaded part (5a) of said screw (5) and enclosing said locking means (11), said locking means being movable in said hole (10) and having a size in the radial direction substantially equal to the maximum thickness of a tubular wall of said screw (5) in its threaded part (5a), and a maneuvering rod (14) engaged without substantial clearance in said bore (6) and comprising, at one of its ends outside said bore, a head (15) having a diameter larger than the diameter of said bore (6) and, at its other end, a part having a reduced diameter (16) facing the hole (10) enclosing said locking means (11) when said maneuvering rod (14) is in a first, out-of-service position, locking of said screw (5) being obtained by axial movement of said maneuvering rod (14) inside said bore into a locking position, said axial movement bringing a part of said rod (14) having an unreduced diameter in contact with said locking means (11), which is thereby moved radially so as to distort by compression at least one thread of said threaded hole (3), said screw (5) additionally comprising distortable parts (18) in the region of said head (15) of said maneuvering rod (14) for crimping said rod (14) in its locking position on said screw.

4,681,496

## REUSABLE AND ADJUSTABLE FASTENER FOR USE WITH POWER TOOL APPLICATOR

Gabriel V. Fasolino, 1829 NE. Stanton St., Portland, Ore. 97212

Continuation of Ser. No. 625,622, Jun. 28, 1984, abandoned.

This application May 1, 1986, Ser. No. 858,356

Int. Cl.<sup>4</sup> F16B 19/00, 35/02

U.S. Cl. 411—361

2 Claims

1. A fastener for clamping a pair of members together comprising:

- an elongated substantially straight shank having opposite ends,
- first shank means at one end of said shank having circumferential grooves arranged for anchoring engagement with a power tool,
- second shank means adjacent said first shank means having substantially circumferential grooves,
- a collar arranged to be placed on said second shank means



and also arranged to be swaged into axial locking and non-rotative engagement with said grooves of said second shank means by the power tool, said collar serving as a first abutment for one member to be clamped against another member, a severable area between said first and second shank means by means of which said first shank means can be separated from said second shank means by the power tool, third shank means at the end of said second shank means which is opposite from said first shank means,



screw threads on said third shank means, a nut arranged for threaded engagement with said third shank means forming a removable and adjustable abutment which when in place cooperates with said collar to clamp a pair of members together from opposite sides in preloaded condition, anti-loosening means operative on said nut, and at least two flattened surfaces on said collar serving as a wrench engaging portion for holding said shank against rotation when said nut is adjusted or removed.

4,681,497

## ENCAPSULATED FASTENER

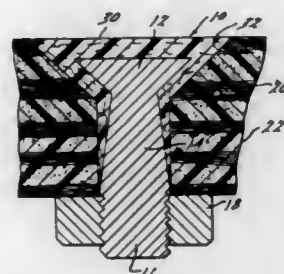
Imre Berecz, El Toro, Calif., assignor to Microdot Inc., Darien, Conn.

Filed May 29, 1985, Ser. No. 739,027

Int. Cl.<sup>4</sup> A47G 3/00; B64C 1/12

U.S. Cl. 411—377

1 Claim



1. An encapsulated fastener for introduction through an aperture in a workpiece having conductive fibers therein, said fastener comprising a metal bolt having a head portion at one end, a threaded portion at the other end, and a shank between said head and end portions, and a plastic cap encapsulating the head portion of said bolt having a plurality of resin encapsulated electrically conductive fibers therein, said electrically conductive fibers being substantially electrically isolated from said metal bolt by the plastic resin of said cap, the radially outer periphery of said plastic cap being abraded to enhance electrical connection between the conductive fibers thereof and the conductive fibers of said workpiece intersecting the periphery of the aperture in said workpiece whereby electrical continuity

is provided by the cap on said bolt across the aperture in said workpiece.

4,681,498

## CLIP FASTENER FOR CORNER JOINTING SECTION PROFILE ELEMENTS

Giuseppe Raffoni, Via Domenico Bolognesi 24, Forlì, Italy

Filed Mar. 10, 1986, Ser. No. 837,895

Claims priority, application Italy, Mar. 12, 1985, 14714/85[U]

Int. Cl.<sup>4</sup> F16B 15/00

U.S. Cl. 411—461

4 Claims



1. A clip fastener for corner jointing section profile elements comprising two mutually substantially perpendicular walls, forming one corner, and two ribs protruding substantially perpendicularly with respect to said walls, said walls and said ribs defining a cutting edge and an opposite edge have a substantially W-shaped profile, wherein according to the improvement each of said ribs comprises an intermediate portion and opposed end portions, said opposed end portions having said cutting and opposite edges located at a greater distance from said corner than said intermediate portion.

4,681,499

## CONTROLLED EXPANSION PROTRUDING-HEAD RIVET DESIGN AND METHOD OF INSTALLING SAME

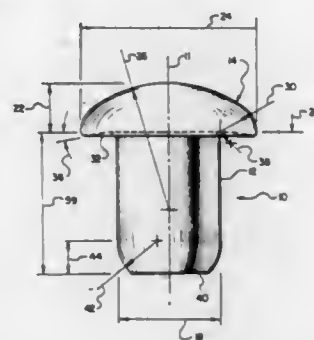
Kenneth P. Sparling, Burbank; Angelo Incardona, Researca; Garth D. Kikendall, Glendale; David G. Richardson, Burbank; Ronald E. Wood, Sepulveda, and Leon Bakow, Sherman Oaks, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Oct. 4, 1984, Ser. No. 657,700

Int. Cl.<sup>4</sup> F16B 19/06

U.S. Cl. 411—507

4 Claims



1. A protruding-head rivet for joining two or more structural elements together, the rivet having a shank portion with a minimum and maximum diameter, the rivet providing a controlled expansion of the hole when the hole has a minimum diameter equal to the maximum shank diameter and a maximum diameter 1.05 times the minimum shank diameter, the rivet comprising:

a protruding-head portion having the following dimensions:  
a head diameter of between 1.642 times the minimum

shank diameter and 1.706 times the maximum shank diameter;  
a center-head spherical radius of between 1.320 times the minimum shank diameter and 1.406 times the maximum shank diameter;  
a spherical outer-head radius of between 0.321 times the minimum shank diameter and 0.353 times the maximum shank diameter, said spherical outer radius blending with said center head spherical radius;  
a head height of between 0.455 times the minimum shank diameter and 0.479 times the maximum shank diameter; and  
an underhead downward angle of between 5 and 6 degrees measured from the intersection of said shank and said head.

4,681,500

## DELIVERY UNIT FOR BOOKBINDING MACHINES

Horst Rathert, Minden; Gerhard Grannemann, Petershagen, and Ulrich Erdboris, Rahden, all of Fed. Rep. of Germany, assignors to Kolbus GmbH & Co. KG, Fed. Rep. of Germany

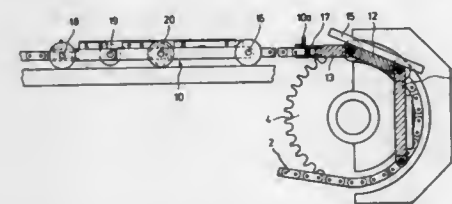
Filed Mar. 7, 1986, Ser. No. 837,704

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508236

Int. Cl.<sup>4</sup> B42B 5/00; B65G 47/31

U.S. Cl. 412—33

20 Claims



1. Conveyor apparatus for transferring moving workpieces from a first level to a second level which is vertically displaced from the level, said conveyor apparatus comprising:

drive means, said drive means including a continuous band which passes over fixed position rotatable members which change the direction of said band, said band and rotating members defining plural linear path segments, a pair of said path segments being respectively commensurate with said first and second levels, a third of said path segments being intermediate the path segments of said pair and being inclined; and

a plurality of spatially displaced carrier plate defining means coupled to said band from movement therewith while supporting workpieces, said plate defining means each including:

a plurality of plate segments;  
means pivotally interconnecting said plate segments; in series;  
means engaging said interconnected plate segments to prevent load induced deflection thereof during movement along said linear path segments whereby said plate segments form a substantially flat support surface for a workpiece;

means pivotally connecting a first of said plate segments to said band, said first plate segment being the leading plate segment in the direction of travel of said carrier plate defining means; and

means connecting a second of said plate segments to said band, said second plate segment being the trailing plate segment in the direction of travel of said carrier plate defining means, said second plate segment connecting means permitting relative longitudinal movement between at least said second plate segment and said band.

4,681,501

## ARTICLE TRANSFER APPARATUS

Samuel H. Edwards, and James A. Edwards, both of Aden Road, Enfield, Middlesex EN3 7SX, United Kingdom

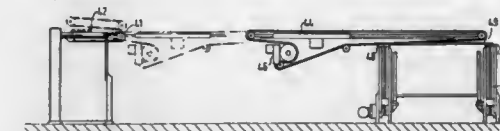
Continuation-in-part of Ser. No. 796,218, Nov. 8, 1985, abandoned, which is a continuation of Ser. No. 538,814, Oct. 5, 1983, abandoned. This application Aug. 28, 1986, Ser. No. 885,183

Claims priority, application United Kingdom, Oct. 12, 1982, 8229050; Aug. 2, 1983, 8320779

Int. Cl.<sup>4</sup> B65G 57/18

U.S. Cl. 414—42

1 Claim



1. An apparatus for transferring articles from a first station having a roller conveyor to a second station comprising:

a plurality of first conveyors located between the rollers of said roller conveyor of said first station;  
a plurality of second conveyors that can move from a first position wherein said plurality of second conveyors can receive articles to be transferred from said plurality of first conveyors to a second position located above said second station, said second station containing an item into which said articles can be stacked, each of said plurality of second conveyors being associated with motor means; and  
a plurality of pairs of support members, each pair of support members, in use, having a spacer supported therebetween, said support members, in use, being moved upwardly so that the spacer associated therewith comes into contact with said articles, and in which, once said articles have lifted above the level of said plurality of second conveyors, said plurality of second conveyors are moved in the reverse direction to their original position, said support members thereafter being moved downwardly so that said spacer and articles move downwardly therewith, whereby, when said spacer contacts said item or a layer of articles already stacked, movement of said support members is stopped, said support members then moving downwardly thereafter so that the spacer associated therewith becomes disengaged therefrom and said articles are correctly stacked, said support members thereafter being moved upwardly and inwardly to their original position for the next set of articles to be supplied from said plurality of second conveyors.

4,681,502

## CONVEYING APPARATUS FOR THE PROCESSING OF PRINTED ITEMS

Helmut Staufner, Alte Schifffahrt 4, 7300 Esslingen-Mettingen, Fed. Rep. of Germany

Filed Aug. 13, 1985, Ser. No. 765,369

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430255; Apr. 26, 1985, 3515068

Int. Cl.<sup>4</sup> B65G 59/04

U.S. Cl. 414—121

12 Claims

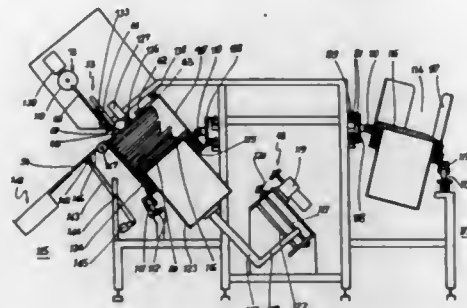
1. In a device for separating stacked objects, particularly flat objects such as bound publications having a binding or spine along one portion thereof, using a plurality of receptacle-like object holders that move between a loading station and a separating station, an arrangement including

means defining a generally vertical rotational axis such that the loading station and separating station are locating at opposing positions relative to said axis,  
means including at least two opposing receptacle-like object holders cooperatively arranged to be capable of a relative rotational movement around said axis alternately between

the loading station and the separating station whereby at a given point one of said holders is in the separating station at the same time that the other said holder is in the loading station, and further to be capable while undergoing such rotational movement and/or while changing stations of also executing a relative radial sliding motion with respect to said axis in the course of which said opposing holders first move toward one another and then away from one another,

each said holder having a holder floor on which the objects can be placed in stacked form and also having a removal side,

a floor lifting device associated with each said holder which moves in coordination with a change of station for the graduated raising and lowering of the respective holder floor,



a suction device above a corresponding said holder whenever said holder is in the separating station and which suction device moves up and down for removing the top object on the stack thereat at any given time, and an inclined slide plate on the removal side of said holder whenever said holder is in the separating station, the holder floors of said holders at least during the time they are in the separating station being inclined from the vertical towards the removal side and towards said slide plate, and

the lifting devices associated with respective ones of said holder floors being separated therefrom and arranged for actuating independently of one another and independently of the position of the associated holder at any given time, whereby said holders can be completely unloaded each time they are in the separating station.

4,681,503

#### METHOD AND DEVICE FOR UNLOADING BULK MATERIAL FROM A LARGE CONTAINER

Günther Nolte, Moers, Fed. Rep. of Germany, assignor to Conrad Scholtz AG, Hamburg, Fed. Rep. of Germany  
PCT No. PCT/EP84/00409, § 371 Date Aug. 28, 1985, § 102(e)  
Date Aug. 28, 1985, PCT Pub. No. WO85/03279, PCT Pub. Date Aug. 1, 1985

PCT Filed Dec. 18, 1984, Ser. No. 774,599

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402649

Int. Cl.<sup>4</sup> B65G 63/00

U.S. Cl. 414-144

10 Claims

1. A conveying device for unloading bulk material from a large container, particularly a ship, comprising:

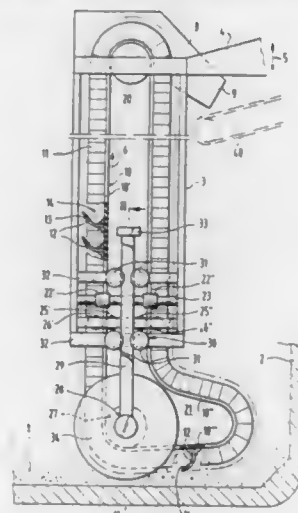
an elongate framework adapted to be attached to a crane mechanism to extend therefrom and define a generally vertically-extending portion for being progressively lowered by the crane mechanism into the container as the bulk material is unloaded therefrom;

a flexible conveyor belt comprising rubber-like material and having inner and outer sides of predetermined width and defining conveying and returning legs and including a plurality of flexible transversely-aligned entraining cleat means comprising rubber-like material and mounted on said outer side and spaced-apart from each other in the

longitudinal direction of said conveyor belt and having an angled scoop-like cross-section for defining with said conveyor belt conveying compartments for conveying the bulk material, said endless conveyor belt having an effective length longer than said framework and being positioned within said framework along the length thereof to extend outwardly therefrom at its lower extremity in a free loop formed by the intrinsic weight of said conveyor belt without external tensioning and supporting means;

a driving roll for receiving said inner side of said conveyor belt therearound and driving said conveyor belt in the direction of the angled scoop-like cross-section of said cleat means while allowing the lower extremity of said conveyor belt below said framework to travel freely in the loop formed by its intrinsic weight;

guide means carried by the lower extremity of said framework for receiving said conveying and returning legs of said conveyor belt and for guiding and maintaining said legs in a desired plane and lateral alignment, each of the



guide means being located on either side of a plane defining a center of said vertically-extending portion of said framework; and

delimiting drum means carried by said framework for generally vertical movement under its own weight and engaging said inner side of the lower extremity of said conveyor belt forming the loop for maintaining said conveying leg of said conveyor belt as it starts its upward path of travel in a path of travel defining generally a rectilinear extension of the path of travel of said conveying leg within said framework the drum means being located within the plane defining the center of said vertically-extending portion of said framework;

whereby, the loop of said conveyor belt below said framework is deformed and shortened from said delimiting drum means back to said returning leg to form a rectilinear portion at the bottom of the loop under the back pressure of the bulk material during the unloading operation to enhance such unloading operation.

4,681,504

#### STORAGE AND INVENTORY CONTROL SYSTEM FOR KEYS

James A. Welch, Sr., 2132 Danshire Dr., Tallahassee, Fla. 32308  
Filed Jul. 11, 1985, Ser. No. 753,967

Int. Cl.<sup>4</sup> B65G 1/06

U.S. Cl. 414-268

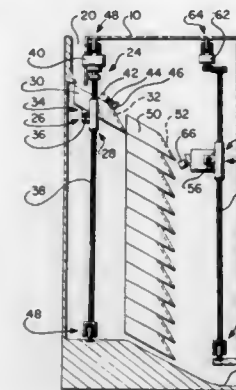
3 Claims

1. A storage and inventory control assembly for a plurality of individual keys, wherein each individual key has a distinct purpose, said assembly comprising:

a plurality of inclined storage receptacles, each receptacle adapted and constructed to hold at least one individual key, each receptacle is provided with an openable gate which holds a key in the receptacle when the gate is closed and release a key from the receptacle when the gate is opened;

a positioning means for receiving individual keys and placing a key in a selected storage receptacle;

a withdrawal means for withdrawing an individual key from one of the storage receptacles, the withdrawal means having an opening element for opening the opening gate and releasing the key from the selected storage receptacle; whereby a control means controls the operation of the positioning means and the withdrawal means, the control



means directs the positioning means to deposit a key in a selected storage receptacle and also directs the withdrawal means to withdraw a key from a selected storage receptacle, the control means comprises a microprocessor that is electrically coupled to the positioning means and the withdrawal means, the microprocessor is provided with a storage means for storing operational instructions and subroutines, and usage data about the use of individual keys, an input means is used for inputting into the microprocessor a user identification code, identifying the user, a use code identifying how an individual key is used, and a display means is provided displaying key usage data stored in the microprocessor including how an individual key is used, who used an individual key, and an individual key's current location.

4,681,505

#### STOCKER IN REEL SUPPLY APPARATUS

Hideki Kobayashi, Tokyo; Yutaka Okumoto, Musashino, and Mikio Komori, Matsudo, all of Japan, assignors to Japan Tobacco Company, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,357

Claims priority, application Japan, Feb. 15, 1984, 59-025154  
Int. Cl.<sup>4</sup> B65H 19/30

U.S. Cl. 414-744 R

3 Claims

1. A stocker in a reel supply apparatus for delivering a loaded reel having an open core cylinder of a predetermined diameter onto a movable carrier running on a track, said stocker comprising:

a stationary base positioned along said track;  
a motor fixedly mounted on said stationary base;  
a revolvable cylindrical body having a vertical axis, said cylindrical body revolvable about said vertical axis, said cylindrical body having a first stop position and a second stop position, said first stop position and said second stop position being angularly displaced from one another by 180 degrees;

support means, fixedly mounted to said stationary base, for supporting said cylindrical body for rotation about said vertical axis;

gear transmission means, operably connected to said motor

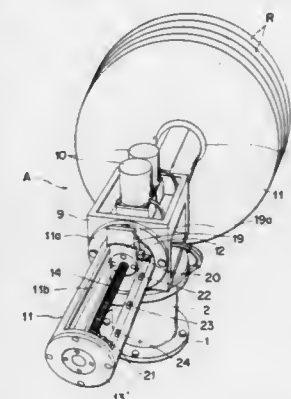
and to said cylindrical body, for revolving said cylindrical body about said vertical axis in response to operation of said motor;

sensor means for detecting said first stop position and said second stop position;

locking means for locking said cylindrical body at said first and second stop positions, said locking means operable in response to sensing of said first and second stop position by said sensor means;

a gear box mounted on top of said cylindrical body;

a pair of reel support arms fixedly attached to said gear box to extend horizontally on opposite sides thereof, said support arms having a diameter substantially corresponding to the predetermined diameter of the open core cylinder of the reel to allow the insertion thereof into said core cylinder for snugly, slidably receiving the reel thereon and holding the reel thereon at a right angle thereto, said pair of reel support arms extending perpendicular to said track at said first stop position and said second stop position, each reel support arm comprising a pair of elongated



arc sections, said pair of elongated arc sections defining a pair of diametrically opposed gaps therebetween, each reel support arm having an inner end adjacent said gear box and an outer end remote from said gear box, each reel support arm having a pair of shaft supporting plates, each shaft supporting plate mounted at a respective end of said reel support arm;

pusher means, disposed on said reel support arms, for movement therealong to push the reels outwardly stepwise one-by-one, said pusher means comprising a rotatable threaded shaft journaled in each pair of said shaft supporting plates and a pusher member threadingly engaging said rotatable threaded shaft and extending through said gaps of said reel support arm at right angles with said reel support arms; and

a drive motor, provided at said inner end of said rotatable threaded shaft, for rotating said threaded shaft by a predetermined amount to push each reel outward in a stepwise manner by a distance corresponding to a reel thickness, whereby said reels are moved along said reel support arms while maintaining a right angle with said reel support arm.

4,681,506

#### TABLE FEED APPARATUS

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,810

Claims priority, application Japan, Jun. 21, 1985, 60-133999  
Int. Cl.<sup>4</sup> B65G 25/00

U.S. Cl. 414-749

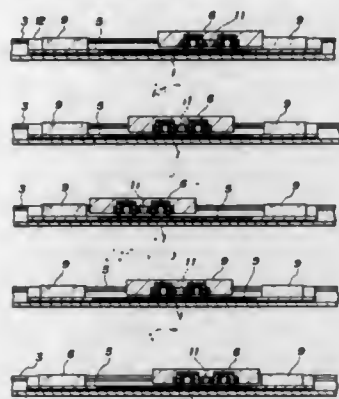
8 Claims

1. A table feed apparatus comprising:  
fixed bed;

a first movable table mounted through first linear bearing



means on said bed for movement in a direction relative to said bed;  
 a second movable table mounted through second linear bearing means on said bed in a vertically spaced relation with said first movable table for movement in the same direction in which said first movable table is movable relative to said bed;  
 first brake means attached to said first movable table for selectively placing said first movable table into a fixed or movable relation to said bed;



second brake means attached to said second movable table for selectively placing said second movable table into a fixed or movable relation to said bed; and  
 a linear motor disposed between said first and second movable tables for driving said first and second movable tables to move relative to each other when one of said first and second movable tables is fixed to said bed by the associated one of said first and second brake means while the other table is freely movable.

4,681,507

# METHOD OF AUTOMATICALLY DE-BAGGING CAN ENDS AND LIKE ARTICLES

Wallace W. Mojden, Hinsdale, and Robert E. Darr, Chicago, both of Ill., assignors to Fleetwood Systems, Inc., Country-side, Ill.

Division of Ser. No. 541,362, Oct. 12, 1983, Pat. No. 4,580,938.

This application Jan. 28, 1986, Ser. No. 823,348

Int. Cl.<sup>4</sup> B65B 69/00

U.S. Cl. 414—786

9 Claims



1. A method of de-bagging a stack of articles such as a stack of can ends contained in a bag, comprising the steps of, orient-

ing the bag and contained articles, in a vertical position, producing relative movement between the articles and the bag bottom to create a space between the bag bottom and the articles, at least partially slitting the bag at the space and below the lowermost article, and removing the slit bag from the stack of articles.

4,681,508

# SUPERCAVITATION CENTRIFUGAL PUMP

Choong W. Kim, 756-173, Bupyeong-dong, Buk-ku, Incheon, Rep. of Korea

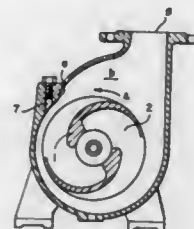
Continuation of Ser. No. 671,303, Nov. 14, 1984, abandoned.

This application Nov. 28, 1986, Ser. No. 935,593

Int. Cl.<sup>4</sup> F04D 7/04, 29/22

U.S. Cl. 415—116

3 Claims



1. A supercavitation centrifugal pump comprising:  
 an impeller casing defining an impeller chamber, a discharge port and a suction port operatively connected to said impeller casing,  
 a water inlet means disposed within said impeller casing for the introduction of water into the impeller chamber, and  
 impeller means disposed to move eccentrically within the impeller chamber to a location in close proximity to the impeller casing, said impeller means being provided with at least one blade which contains a deep recess which extends substantially radially from the blade shaft towards the periphery of the blade and further extends substantially perpendicular to said radial extension whereby the pump is free from abrasion caused by solid matters in the fluid, said water inlet means being positioned within said impeller casing at a location in the vicinity of the narrow space between the impeller casing and the end portions of the blades for facilitating the conveyance through said centrifugal pump.

4,681,509

# VARIABLE INLET FAN ASSEMBLY

Robert J. Davis, Birmingham, Mich., assignor to American Davidson, Inc., Hyde Park, Mass.

Continuation of Ser. No. 633,571, Jul. 23, 1984, abandoned. This

application Apr. 28, 1986, Ser. No. 859,199

Int. Cl.<sup>4</sup> F04D 29/46, 29/68

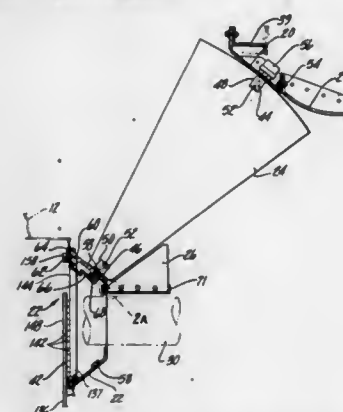
U.S. Cl. 415—161

23 Claims

1. A variable inlet vane assembly for use with force draft and induction draft systems having fans mounted upon shafts, said variable inlet vane assembly comprising:

- a mounting base;
- a hollow frusto-conical hub having an inner and an outer face, said hub of smaller diameter than said mounting base and supported in spaced relationship from said base by a plurality of supports;
- a plurality of variable inlet vanes, said vanes pivotally supported by said mounting base and said hub;
- said hub and said mounting base defining the throat of the passageway for air passing through said variable inlet vanes with said variable inlet vanes extending longitudinally substantially entirely across said passageway from said mounting base to said hub;
- linkage means to pivot said variable inlet vanes, said linkage means carried along the inner face of said hub;

- actuating means carried by said hub and connected to said linkage means for actuation of said linkage means, said actuating means comprising a continuous ring-like section received within said hub and supported upon said inner face of said hub;
- self-lubricating annular sliding bearing means interposed between said actuating means and said hub;
- bearing retaining means functioning to maintain said sliding bearing means in a fixed position; and
- a plurality of dorsal vanes, said dorsal vanes being downstream and in close relationship to said variable inlet vanes and mounted stationarily thereto to control back eddies of air at low vane closures;



whereby said variable inlet vane assembly is mounted in close proximity to a fan and acts to preswirl incoming air in the direction of rotation of the fan impellers to reduce the work load upon said fan for moving a given volume of air; the sliding bearing means and ring-like actuating means supported upon the inner face of the hub allows for a shorter axial length for the linkage means between the actuating means and the variable inlet vanes, and the hub defines the inner boundary of the air passage thereby allowing for larger inlet vanes for any sized variable inlet vane assembly to present greater control over preswirl of the incoming air, thereby improving the efficiency of the system; and said linkage means is located outside said air flow and is of minimum length and simpler in construction thereby reducing corrosion and maintenance problems due to airborne particulate contaminants and complexity of structure.

4,681,510

# PUMP FOR SATURATED LIQUID

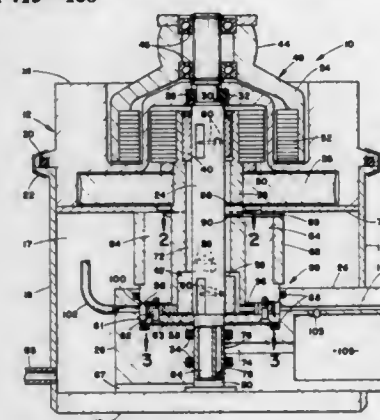
Paul F. Swenson, Jr., Shaker Heights, and Charles E. Heinrich, Mentor, both of Ohio, assignors to TRD Corporation, Cleveland, Ohio

Filed Jan. 2, 1986, Ser. No. 815,572

Int. Cl.<sup>4</sup> F04D 25/08

U.S. Cl. 415—168

4 Claims



1. A pump especially suited for pumping saturated liquids comprising:

- a first member defining a generally cylindrical inner wall;

- a second member mounted for rotation on said first member and defining a generally cylindrical outer wall radially spaced from said inner wall to form an elongated annular chamber;
- means for driving said second member for rotation relative to said first member;
- a rotary pump impeller mounted closely adjacent an end of said annular chamber, said pump impeller being mounted for rotation with said second member;
- means for supplying liquid through said inner wall to said annular chamber at a location axially spaced from said impeller; and,
- vapor discharge means carried by said second member and extending through said annular chamber and terminating in an inlet end located adjacent the inner wall at a position axially spaced from said inlet in a direction opposite said impeller.

4,681,511

# LOW VIBRATION HELICOPTER ROTOR

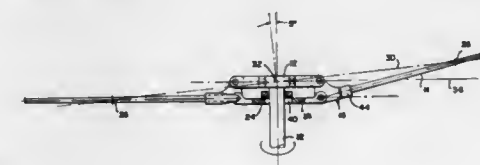
Edward W. Glatfelter, Newton Square, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1985, Ser. No. 782,238

Int. Cl.<sup>4</sup> B64C 27/43

U.S. Cl. 416—131

10 Claims



1. A helicopter rotor, comprising:  
 a rotor hub having a geometrical center lying on a horizontal axis;  
 at least two rotor blades, each defining a longitudinal axis;  
 a pitch housing for each rotor blade, each rotor blade being mounted to its respective pitch housing;  
 mounting means associated with each pitch housing and its respective rotor blade for mounting the associated pitch housing to the rotor hub and defining thereby a flap hinge for said respective rotor blade; and  
 separating means connected to and extending between two diametrically opposed pitch housings mounted on the rotor hub, such that the rotor hub, the diametrically opposed pitch housings and the associated connected separating means form a four-bar linkage with the center of gravity of the diametrically opposed blades lying in a straight line which intersects the rotor hub geometrical center at all cyclic conditions.

4,681,512

# SELF-FAIRING WINDMILL VANE

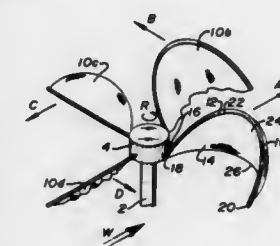
Maxwell K. Barnard, 1933 San Juan, Port Townsend, Wash. 98368

Filed Jun. 6, 1986, Ser. No. 871,243

Int. Cl.<sup>4</sup> F03D 3/06

U.S. Cl. 416—132 B

19 Claims



1. A windmill vane for use in a windmill having a shaft

disposed for rotation by the wind in a selected direction around the longitudinal axis of the shaft, said vane comprising:

- (a) a rigid, generally open, generally planar frame standing out from and fixedly carried by the shaft, the frame having a central portion and first and second ends, the frame being oriented in a plane with the central portion of the frame leading the ends thereof relative to the instantaneous direction of movement of the frame around the shaft, such plane being inclined at an angle of about forty-five degrees (45°) relative to such instantaneous direction of movement; and
- (b) a sail comprising a light weight, resilient substantially wind resistant material, the sail extending continuously between
  - (i) a head edge attached along the frame, and
  - (ii) a foot edge extending continuously between the ends of the frame and being otherwise unattached thereto; the orientation of the frame and the length of the foot edge of the sail being such that the sail is full when moving with the wind and streams behind the frame and has minimal drag when moving across and against the wind.

4,681,513

## TWO-STAGE PUMP ASSEMBLY

Toshinori Saito, and Makoto Takeuchi, both of Tokyo, Japan, assignors to Jeol Ltd., Tokyo, Japan

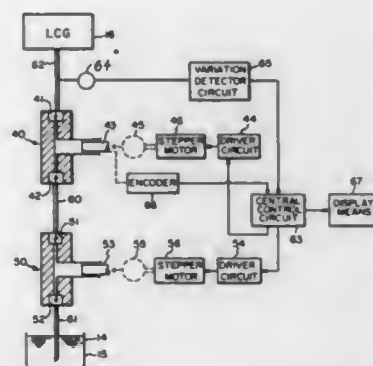
Filed Jan. 28, 1986, Ser. No. 823,341

Claims priority, application Japan, Feb. 1, 1985, 60-18437; Feb. 1, 1985, 60-13150[U]

Int. Cl.<sup>4</sup> F04B 41/06, 49/06, 3/00

U.S. Cl. 417-2

5 Claims



1. In a two-stage pump assembly having two pumps A and B and a control means for controlling the operation of each pump in such a way that the pump assembly delivers fluid, each of the two pumps having a cylinder constituting a chamber, a plunger fitted in the cylinder and making reciprocating motion to vary the capacity of the chamber, and one-way valves disposed at the suction port and at the discharge port, respectively, of the chamber, the improvement comprising:

- (A) the suction port of the pump A is connected to the discharge port of the pump B, and the discharge port of the pump A and the suction port of the pump B act as the discharge port and the suction port, respectively, of the whole pump assembly;
- (B) said means for controlling causing the suction stroke of the pump B (period  $T_{b1}$ ) to start simultaneously with the discharge stroke of the pump A (period  $T_{a1}$ ), and the discharge of the pump B (period  $T_{b3}$ ) to start simultaneously with the suction stroke of the pump A (period  $T_{a3}$ );
- (C) said means for controlling causing a compression stroke in pump B during a period of  $T_{b2}$  between the suction stroke and the discharge of the pump B;

(D) the periods being so set as to satisfy the following reactions:

$$T_{a1} = T_{b1} + T_{b2}, T_{a3} = T_{b3}, T_{a1} > T_{a3}, T_{b1} > T_{b3};$$

and,

- (E) wherein said means for controlling each pump comprises
  - (i) two stepper motors each having a rotating output shaft and the capability of causing rotation of the shaft in either direction,
  - (ii) cams fixed to each rotating shaft for bearing upon followers attached to the exposed ends of each plunger respectively, and
  - (iii) said stepper motors being controlled to rotate back and forth within an angular range controlled according to the desired flow rate.

4,681,514

## RADIAL PISTON PUMP HAVING SEALING DISC

Klaus Gries, Kupferzell; Siegfried Mayer, Vaihingen/Enz, and Dieter Weigle, Bad Urach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

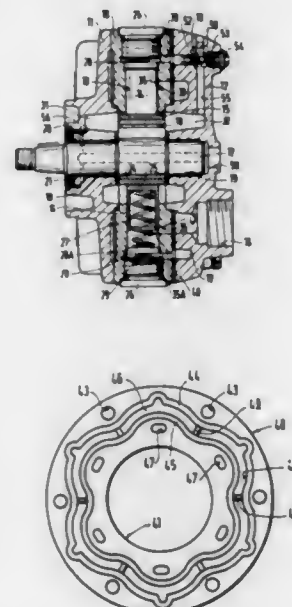
Filed Feb. 18, 1986, Ser. No. 830,681

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513164

Int. Cl.<sup>4</sup> F04B 49/00, 1/04

U.S. Cl. 417-213

12 Claims



1. In a radial piston pump comprising a housing formed with a plurality of radially extending bores receiving a plurality of radial pistons; a drive shaft; an eccentric arranged on said shaft, said pistons having inner faces supported on said eccentric; two end covers supporting said shaft at two ends thereof and closing said housing, each bore having an outlet passage; a plurality of outlet valves each positioned in a respective bore and connected to a respective outlet passage, each outlet valve including a valve body, a spring loading said valve body in a closing direction, and a valve seat; and an annular suction passage formed in one of said end covers and connected to said bores, the improvement comprising a sealing disc positioned between one of said end covers and a side of said housing facing said one end cover, said sealing disc having at least one substantially annular and sealed through passage (42, 46, 47) connecting said outlet passages to said bores, and a plurality of suction throttling through passages (47) each connected to said annular suction passage and to a respective one of said bores,

whereby an amount of a pressure medium sucked through said throttling passages in said sealing disc and thus a pressure medium flow through the pump can be limited.

4,681,515

## WALKING BEAM PUMP HAVING ADJUSTABLE CRANK PIN

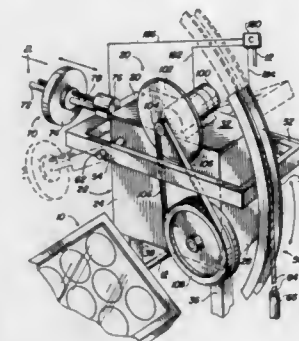
James C. Allen, 102 W. 8th St., Safford, Ariz. 85548

Continuation-in-part of Ser. No. 704,948, Feb. 25, 1985, abandoned. This application Jul. 9, 1986, Ser. No. 883,578

Int. Cl.<sup>4</sup> F04B 49/00, 35, 04; F16H 35/08

U.S. Cl. 417-218

27 Claims



1. Variable capacity pump apparatus having an upstroke and a downstroke, comprising, in combination:

- input electrical means;
- drive motor means powered by the input electrical means;
- bull gear means rotationally driven by the drive motor means;
- a pivoting shaft;
- walking beam means rigidly secured to the pivoting shaft and pivotally movable therewith and adapted to be connected to a pump for providing pumping strokes for pumping a liquid;
- link means rigidly connected to the pivoting shaft and movable to pivot the pivoting shaft;
- crank pin means, including a crank pin, secured to the bull gear means and connected to the link means to pivot the link means in response to rotation of the bull gear means, and the location of the crank pin defines a pivot arm for the link means, the pivoting shaft, and the walking beam means; and
- electrical controller means for varying the pumping capacity of the walking beam means in response to the input electrical means.

8. Variable stroke pump apparatus, comprising, in combination:

- output drive motor means;
- bull gear means driven by the output drive motor means and having an axis of rotation;
- a pivoting shaft;
- walking beam means rigidly secured to the pivoting shaft and pivotally movable therewith and adapted to be connected to a pump for providing pumping strokes for pumping a liquid;
- link means rigidly connected to the pivoting shaft and movable to pivot the pivoting shaft;
- crank pin means movable relative to the axis of rotation of the bull gear means and movably connected to the link means to pivot the link means in response to rotation of the bull gear means and movable relative to the link means for providing a variable pivot arm for pivoting the link means, the pivoting shaft, and the walking beam means; and
- controller means for moving the crank pin means toward and away from the axis of rotation of the bull gear means to vary the length of the pivot arm of the link means and the length of stroke of the walking beam means.

4,681,516

## LEAKAGE PREVENTING LIQUID SUPPLY PUMP

John G. O'Hara, Shoreview; Frederick A. Powers, Maple Grove, and Steven E. Peter, Richfield, all of Minn., assignors to Graco Inc., Minneapolis, Minn.

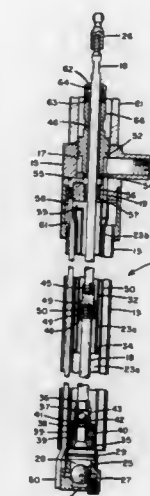
Continuation of Ser. No. 735,581, May 20, 1985, abandoned.

This application Nov. 3, 1986, Ser. No. 926,084

Int. Cl.<sup>4</sup> F04B 19/04

U.S. Cl. 417-259

2 Claims



1. A reciprocable liquid supply pump for pumping thermo-setting liquids and the like and adapted for driving connection through a predetermined stroke to a reciprocable motor through a connecting rod projecting from a housing casting at an upper end of said pump, comprising

- (a) a liquid outlet in said housing casting approximate the upper end of said pump and a downwardly projecting pump outer cylinder attached to said housing and having an upper interior portion in a liquid flow communication with said outlet;
- (b) an inner cylinder attached to said housing casting and concentrically positioned inside the upper end of said pump cylinder, and having an upper interior portion isolated from liquid flow communication with said outlet, and having a lower interior portion in liquid flow communication with said outlet;
- (c) an outer cylinder housing concentrically positioned about said pump outer cylinder and attached at an upper end to said housing casting, said outer cylinder housing extending downwardly and terminating in an opening about said pump outer cylinder;
- (d) a first chamber and passage in said housing casting, said first chamber and passage providing liquid flow communication between the interior of said inner cylinder and the interior of said outer cylinder housing;
- (e) a lower piston attached to said connecting rod and slidably positioned in said pump outer cylinder;
- (f) an upper piston attached to said connecting rod and slidably positioned in said inner cylinder between the upper interior portion and the lower interior portion of said inner cylinder;
- (g) a seal in said housing casting above said first chamber and about said connecting rod, and a second chamber above said seal; and
- (h) a bleed tube attached to said housing casting and having an upper opening in flow communication with said second chamber and a lower opening projecting downwardly to at least said outer cylinder housing lower opening.



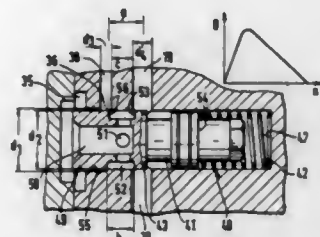
4,681,517

## HYDRAULIC PUMP

René Schulz, Neu-Anspach; Heinz Teubler, and Peter Breuer, both of Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Vickers Systems GmbH, Fed. Rep. of Germany  
Filed Apr. 21, 1986, Ser. No. 854,132  
Int. Cl.<sup>4</sup> F04B 49/00

U.S. Cl. 417—300

7 Claims U.S. Cl. 417—395



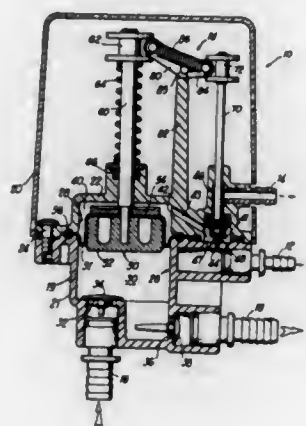
1. A hydraulic pump arrangement comprising a hydraulic pump, said hydraulic pump having a housing (1, 2) which includes a rotor cavity and a valve bore (55), and a rotor (7) which is driven at varying speeds (n), said housing including an inlet passage system (16, 17, 18, 19, 20) having inlet ports (20) and a relief-duct (19), and outlet ports (33) connected to a pressure chamber (35), said housing and said rotor forming at least one displacement region (11, 12) to which lead said inlet ports and outlet ports, a flow control valve (40), an output passage system (36, 37, 38, 39) including a valve output duct (38), a metering orifice (36) and an external pump outlet (37), said pressure chamber (35) and said inlet passage system (16, 17, 18, 19, 20) communicating with each other by way of said control valve (40), which bypasses an excess delivery flow into said relief duct (19) of said inlet passage system and outputs a controlled output flow (Q) to said output passage system, said flow control valve (40) including a spool (41) guided in said valve bore (55) of said housing and having a first higher pressure spool face (53) and a second lower pressure spool face (54), a valve spring (42) acting on said second spool face, said metering orifice (63) being connected to said first and second faces (53, 54) so as to transmit a pressure drop of said controlled output flow (Q) at said orifice (36) to said spool (41), the improvement wherein said spool has an extension portion (49) and a hollow space (50) in it, said spool extension (49) also having an outer annular chamber (52) limited by said first spool face (53) and a third spool face (56) which define an annular chamber width (b), and communicating with said pressure chamber (35), said valve output duct (38) having an end extending generally radially in the direction of the flow control valve (40) and being at an axial spacing (c) from said relief duct (19) as considered in the direction of movement of said spool (41) which is less than said width (b) of said annular chamber (52), said end of said output duct (38) forming said metering orifice (36) in cooperation with said third spool face (56), whose position reduces the effective width of said metering orifice (36) with increasing pump speed (n), thus producing a generally falling output flow-pump speed characteristic through said hollow space (50) in said spool (41).

4,681,518

## SINGLE-ACTING, GAS OPERATED PUMP

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.  
Continuation-in-part of Ser. No. 702,515, Feb. 19, 1985, abandoned. This application Dec. 20, 1985, Ser. No. 811,863  
Int. Cl.<sup>4</sup> F04B 43/06

37 Claims



1. A method for pumping a liquid with a single-acting, gas operated pump comprising the steps of:
  - (a) providing a pump body including a main chamber therein separated by a reciprocable piston means into a gas driving chamber and a liquid pumping chamber;
  - (b) feeding liquid one way into and out of said liquid chamber;
  - (c) alternately reciprocating a control valve for feeding driving gas into said driving chamber and exhausting gas therefrom to cause said piston means to reciprocate and to alternately pump liquid out of said liquid chamber and to draw liquid thereinto, respectively;
  - (d) biasing said piston means toward said gas driving chamber;
  - (e) snap-moving said single control valve from one of its two end positions to the other with a snap-acting spring mechanism coupled between said piston means and said control valve, in response to reciprocating movement of said piston means;
  - (f) wherein said biasing step comprises positioning a coil compression spring in said liquid chamber; and
  - (g) including forming said pump body from only an upper body and a lower body connected together and forming said main chamber between said upper and lower bodies and forming a control valve chamber separate from said main chamber and between said upper and lower bodies, providing said gas passageway between said control valve chamber and said main chamber in said upper body and providing a single integral sealing element between said upper and lower bodies consisting of a flexible diaphragm separating said main chamber into said gas driving chamber and said liquid pumping chamber and an O-ring integral with said diaphragm for sealing said control valve chamber.

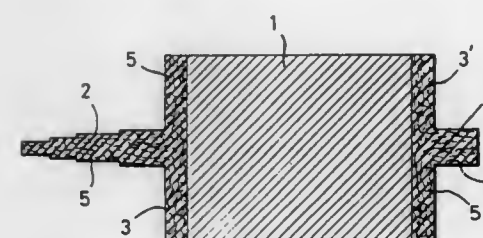
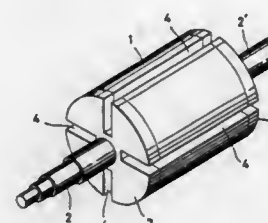
4,681,519

## ROTOR FOR ROTARY FLUID PUMP

Hiroshi Sakamaki, Tochigi; Susumu Sogishita, and Yukio Horikoshi, both of Saitama, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan  
Filed May 16, 1984, Ser. No. 610,664  
Claims priority, application Japan, May 20, 1983, 58-88928  
Int. Cl.<sup>4</sup> F04C 29/00

U.S. Cl. 418—152

6 Claims



1. A rotor for a rotary fluid pump, comprising: a central portion formed of metal; and two opposite end portions including shaft means, said end portions and said shaft means being comprised of a fiber-reinforced metal matrix composite wherein said metal of said central portion is the metal matrix of said composite and the metal of said central portion is continuous with the metal matrix of said composite.

4,681,520

## WINDSHIELD REPAIR ASSEMBLY

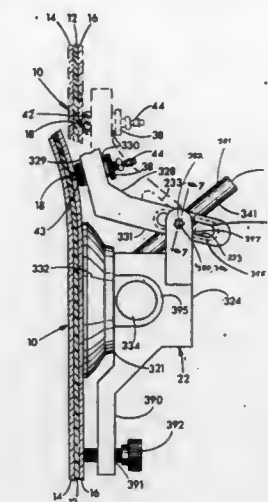
Robert R. Birkhauser, III, Madison, Wis., assignor to Auto Glass Specialists, Inc., Madison, Wis.  
Continuation-in-part of Ser. No. 569,753, Jan. 10, 1984, Pat. No. 4,597,727, which is a continuation-in-part of Ser. No. 470,440, Feb. 28, 1983, abandoned. This application Jun. 30, 1986, Ser. No. 880,060  
Int. Cl.<sup>4</sup> B29C 31/04

U.S. Cl. 425—12

11 Claims

1. A repair assembly for use in repairing windshield breaks, comprising:
  - (a) a suction cup base;
  - (b) a neck having a first section with a circular opening, and also having a second section formed at an angle to the first section which second section has a lengthwise slit;
  - (c) means for pivotally connecting the neck to the suction cup base through the lengthwise slit of the second section of the neck;
  - (d) means for adjusting and locking the position of the neck in relationship to the suction cup base; and
  - (e) a screw having a lengthwise cylindrical opening and adapted to be positioned in the circular opening of the first section of the neck, wherein the suction cup base may be attached to a windshield near a windshield break and the

screw may be positioned over the windshield break and substantially perpendicular to the windshield by selective



moving and pivoting of the neck and selective adjustment and locking of the adjusting and locking means.

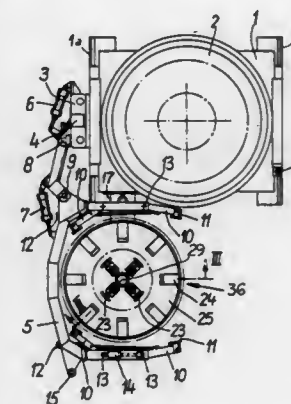
4,681,521

## FEEDING AND POSITIONING APPARATUS FOR A HEATING PRESS

Klaus Grotkasten, Hamburg, Fed. Rep. of Germany, assignor to Fried. Krupp G.m.b.H., Essen, Fed. Rep. of Germany  
Filed Nov. 22, 1985, Ser. No. 801,083  
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1984, 3443947  
Int. Cl.<sup>4</sup> B29C 35/02

U.S. Cl. 425—36

14 Claims



1. A feeding and positioning apparatus for transporting a tire blank to a tire-heating press, comprising: a stand for holding the tire blank prior to its transport to the press, said stand including a stationary horizontal platform and support means movable in a horizontal direction relative to said platform; aligning means cooperating with said support means for centering the tire blank with respect to a bead thereof, said aligning means extending vertically within the tire blank and having means movable in a radial direction against the bead of the tire blank; and gripping means for transporting the centered tire blank from the stand to the press, said support means including a base disk surrounding said platform, a plurality of supports arranged about the circumference of said disk for supporting the tire blank along its lateral edge and ball bearings

for allowing said disk to be horizontally moved with respect to said platform.

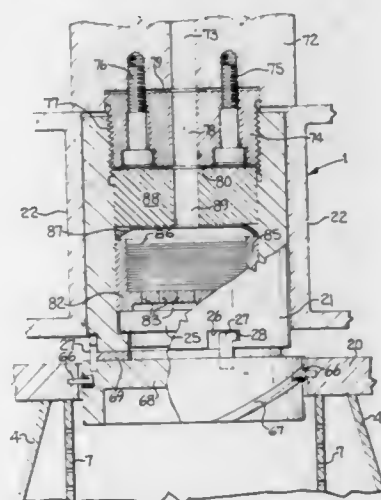
#### 4,681,522 MELT SPINNING APPARATUS

Erich Lenk, Remscheid, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany  
Filed Aug. 20, 1985, Ser. No. 767,480  
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430847

Int. Cl.<sup>4</sup> B29C 47/30

U.S. Cl. 425—72 S

16 Claims



1. A melt spinning apparatus for extruding and spinning a thermoplastic material to form a plurality of filaments, and comprising

- a spinneret comprising a melt supply block and a nozzle assembly, said nozzle assembly including a tubular casing threadedly mounted to said melt supply block so as to define a central axis and such that said casing may be readily assembled to and disassembled from said block by rotation of said casing about said central axis, and with said tubular casing having an open outlet end disposed coaxially about said central axis,
- a spinning tube disposed in coaxial alignment with said outlet end of said tubular casing of said nozzle assembly,
- means mounting said spinning tube so that at least the portion thereof adjacent said outlet end of said tubular casing is axially movable between an operative position in contact with said outlet end and an axially withdrawn position, and
- casing assembly means mounted to the end of said spinning tube adjacent said outlet end for rotation about said central axis and including means for engaging said outlet end of said casing so as to impart rotation thereto upon rotation of said casing assembly means to thereby facilitate threaded assembly and disassembly of said tubular casing with respect to said melt supply block.

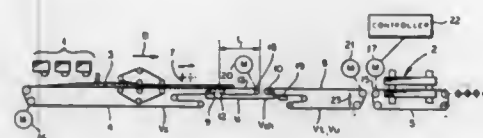
#### 4,681,523 CONVEYOR FOR PARTICLEBOARD-MAKING APPARATUS

Werner Thelen, Kempen, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany  
Filed Aug. 21, 1985, Ser. No. 767,956  
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431126

Int. Cl.<sup>4</sup> B27N 3/16; D29C 43/48

U.S. Cl. 425—168

5 Claims



1. A transfer conveyor for use in combination with:  
an upstream conveyor normally moving continuously in a longitudinal transport direction at a predetermined relatively slow speed and having relative to the direction a downstream end displaceable in the direction;  
means for forming a continuous particulate band on the upstream conveyor;  
cutter means for longitudinally subdividing the band into a longitudinal succession of mats; and  
press means downstream in the direction from the upstream conveyor for receiving the mats and pressing them into hard panels;

the transfer conveyor comprising:

- a downstream conveyor having an upstream end spaced downstream from the downstream end of the upstream conveyor and a downstream end at the press;
- an intermediate endless-belt conveyor independent of the upstream and downstream conveyors, extending between the upstream end of the downstream conveyor and the downstream end of the upstream conveyor, and having upstream and downstream ends fixed relative to each other and respectively confronting the downstream and upstream ends of the upstream and downstream conveyors;
- a carriage displaceable in the direction and carrying the intermediate conveyor, the downstream end of the upstream conveyor, and the upstream end of the downstream conveyor, both ends of the intermediate conveyor as well as the downstream end of the upstream conveyor and the upstream end of the downstream conveyor being fixed on the carriage;

drive means for operating the upstream conveyor generally only at the relatively slow transport speed in the direction, for operating the downstream conveyor generally always at a substantially higher transport speed in the direction, and for operating the intermediate conveyor either at the relatively slow speed or at the higher speed of the downstream conveyor without changing the length of the intermediate conveyor between its ends; and

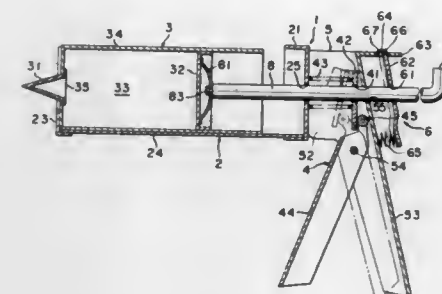
control and drive means connected to the carriage, to the cutter means, and to the drive means for reciprocating the carriage in the direction synchronously with the operation of the cutter means and for operating the intermediate conveyor at the slow speed when a mat is bridging it and the upstream conveyor and for operating it at the higher speed when a mat is bridging it and the downstream conveyor.

#### 4,681,524 EXTRUSION DEVICE

Shigeru Ikeda, Yuki, and Naomi Okamura, Kuki, both of Japan, assignors to Cemedine Co., Ltd., Tokyo, Japan  
Filed Sep. 9, 1985, Ser. No. 773,548  
Claims priority, application Japan, Sep. 8, 1984, 188644  
Int. Cl.<sup>4</sup> B29C 47/00

U.S. Cl. 425—376 R

17 Claims



1. An extrusion device for extruding viscous material, said extrusion device comprising:

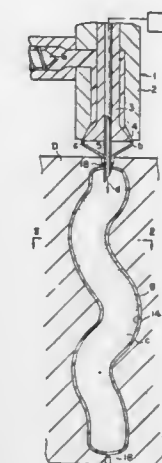
- (a) a main body adapted to receive a tubular container containing viscous material and having a nozzle at the distal end and a slidable bottom at the proximal end;
- (b) a push rod supported by said main body so as to be slidable in the axial direction of said main body, whereby, in use, viscous material in a tubular container received in said main body is extruded from the nozzle at the distal end of the tubular container when the slidable bottom at the proximal end of the tubular container is pushed toward the distal end of said main body by said push rod; and
- (c) a push rod control means comprising:
  - (i) a supporting plate projecting from said main body at least generally parallel to the axial direction of said push rod, said supporting plate having an aperture therethrough;
  - (ii) a control piece having a first end, a second end, and a control opening therethrough intermediate its first and second ends, said control opening receiving said push rod, the first end of said control piece being received in said aperture in said supporting plate and being both axially movable relative to said push rod and said main body and pivotably movable relative to said push rod and said main body; and
  - (iii) a first spring member interposed between said main body and the second end of said control piece, said first spring member urging said control piece to pivot into an inclined position relative to the axis of said push rod, in which inclined position opposed portions of the periphery of said control opening frictionally engage said push rod, which frictional engagement is maintained when said push rod and said control piece are moved axially relative to said main body until contact of said control piece with the periphery of said aperture causes said control piece to pivot relative to said push rod so as to release the frictional engagement between said push rod and the opposed portions of the periphery of said control opening.

4,681,525  
APPARATUS FOR MOLDING PLASTIC PRODUCTS  
Shoji Shimizu, Ohta, Japan, assignor to Excell Corporation, Tokyo, Japan  
Division of Ser. No. 494,693, May 18, 1983, Pat. No. 4,550,008, which is a continuation-in-part of Ser. No. 273,396, Jun. 15, 1981, abandoned. This application Sep. 23, 1985, Ser. No. 778,663

Int. Cl.<sup>4</sup> B29C 17/07, 17/12

U.S. Cl. 425—527

6 Claims



1. Apparatus for producing simultaneously a plurality of sheet-type plastic products out of a single parison by means of blow molding, comprising:

- a nozzle for discharging a parison with an intended diameter;
- means for supplying a parison material to said nozzle;
- means for supplying a pressurized gas into the interior of said parison, the pressure level of said pressurized gas being adjustable at different levels;
- means for supplying a separating agent into the interior of said parison thereby forming a thin film of separating agent along the inside surface of said parison; and
- a plurality of mold sections which may be assembled to define a mold cavity for said parison, each of said mold sections having a predetermined molding surface and being so structured that a flash-forming recess is defined along a joint line between two adjacent mold sections, when assembled, for forming a flash having a film of separating agent sandwiched therein and extending from an inside surface of said parison into said flash beyond an edge of each corresponding product, said edge being defined during subsequent flash removal.

4,681,526  
APPARATUS FOR MOLDING THERMOPLASTIC PIPES  
Manfred A. A. Lupke, 92 Elgin St., Thornhill, Ont., Canada L3T 1W6

Filed Apr. 9, 1986, Ser. No. 849,850

Int. Cl.<sup>4</sup> B29C 51/24

U.S. Cl. 425—532

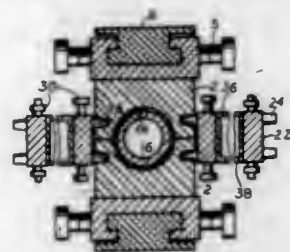
4 Claims

1. In an apparatus for molding externally ribbed and corrugated thermoplastic pipes, including:

- a pipe die for extruding a parison of a thermoplastic material;
- moldblock halves circulating in an endless path containing a straight forward run wherein the halves cooperate with each other in the directions of their circulation and perpendicularly to the latter, to form a travelling mold for the thermoplastic pipe, a return run and two semi-circumferential guide tracks for transferring the halves between said runs;
- a means for withstanding the hydraulic pressure of molding acting to separate the halves in the straight forward run in said perpendicular direction;



the improvement, wherein in order to avoid high loads and wear in said forward run, said means is (represented by) two endless series of circulating yokes having shanks for engagement along said travelling mold with complimen-



tary recesses made in the halves, and the shanks being engageable with both molds of each cooperating pair of mold halves in recesses therein to hold the mold halves together.

4,681,527

# APPARATUS FOR THE INJECTION MOLDING OF DISC RECORDS

Henri Amory, Chambourcy, and Jean-Michel Prost, Orgeval, both of France, assignors to Pathe Marconi EMI SA, Boulogne Billancourt, France

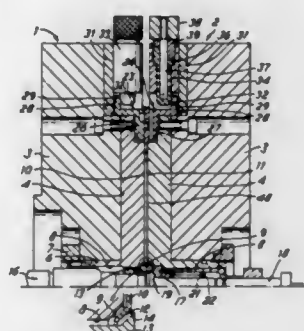
Filed May 6, 1985, Ser. No. 730,514

Claims priority, application France, May 4, 1984, 84 06930

Int. Cl.<sup>4</sup> B29C 45/34

U.S. Cl. 425—546

10 Claims



1. Apparatus for the injection moulding of disc records, said apparatus including a first half-mould associated with a first matrix and a first fixing sleeve, and a second half-mould associated with a second matrix and a second fixing sleeve, each matrix being clamped to its associated half-mould by means of its associated fixing sleeve such that a substantially disc-shaped moulding cavity having a circular periphery is formed between facing surfaces of the first and second matrices, an annular air passage being provided adjacent to the periphery of the disc-shaped moulding cavity for permitting escape of air from the moulding cavity during a moulding operation, means releasably mounting said first and second fixing sleeves around said first and second half-moulds respectively, said first and second fixing sleeves being provided with first and second flanges respectively, said flanges extending inwardly into a peripheral annular space between the matrices, the first and second flanges supporting the first and second matrices against the first and second half-moulds respectively, the first flange being provided with an inner annular blade, the annular blade having a substantially constant thickness and an inner edge defining a moulding surface at the periphery of the disc shaped moulding cavity, the annular blade lying radially within the second flange, one or more portions of either the first or the second flange having a thickness which is greater than the thickness of the annular blade, said one or more portions lying in an annulus situated radially outside the inner edge of the

annular blade such that the disc shaped moulding cavity has a width which is substantially defined by the thickness of said one or more portions and the annular air passage has a width which is substantially defined by the difference between the thickness of said one or more portions and the thickness of the annular blade.

4,681,528

# VALVE NOZZLE FOR INJECTION MOLDING

Yoshio Maruyama, Kyoto, and Shoshi Kabashima, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

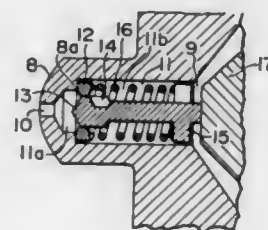
Filed Jun. 13, 1986, Ser. No. 874,058

Claims priority, application Japan, Jun. 18, 1985, 60-132215

Int. Cl.<sup>4</sup> B29C 45/23

U.S. Cl. 425—562

2 Claims



1. An injection molding valve nozzle for supplying melted and pressurized resin into a metallic mold comprising:

- a nozzle head including a resin inlet at a rear end, a resin injection outlet for discharge resin into said mold at a front end and a resin flow passage between said inlet and outlet;
- a gate for separating said resin flow passage into a front passage and a rear passage;
- a spool slidably mounted for movement towards and away from said outlet and including at least one groove extending axially along the outer surface of said spool for opening and closing a flow port in said gate upon movement of said spool towards and away from said outlet, a spring disposed in said resin flow passage for biasing said spool in a direction away from said outlet, said spool being movable by forces applied thereto by said spring and by resin pressure existing in said first and second passages, said groove being arranged on said spool such that it does not move to a position to open said flow port until resin pressure in said rear passage attains a predetermined value, said spring biasing said spool to a position where said groove no longer opens said flow port when a pressure difference which exists between said front and rear passages is reduced to below a predetermined value.

4,681,529

# AUTOMATIC ELECTRONIC IGNITION SYSTEM

William Home, 9-3 FL, No. 374, Sec. 2, Pa Teh Road, Taipei, Taiwan

Filed May 28, 1986, Ser. No. 867,682

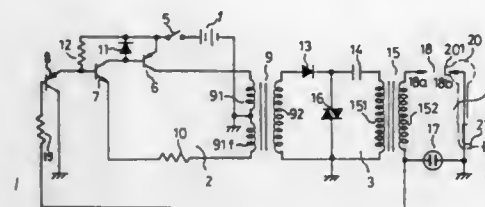
Int. Cl.<sup>4</sup> F23N 5/00

U.S. Cl. 431—74

2 Claims

1. An automatic electronic ignition system circuit, comprising an oscillatory circuit, a charging circuit and a sparking device, and characterized in that the ignition system circuit has a trigger disposed between a first transformer and a second transformer and being in parallel therewith to control the charging circuit, a neon lamp disposed across two electrodes of said sparking device, one of the sparking electrodes being disposed on a metal outlet, said outlet having gas nozzles and being supplied gas via a gas pipe, said gas nozzles facing the other sparking electrode with a suitable gap therebetween such that the flames being caused by the sparking device between the sparking electrodes are used as a control switch to control

the ignition system so as to automatically produce sparks and ignite the gas when the flames for some reason go out and also



includes means such that the sparking action is automatically stopped when a flame exists.

4,681,530

# GAS CONTROL DEVICE FOR CONTROLLING THE FUEL GAS AND OXIDIZING AGENT SUPPLY TO A BURNER IN AN ATOMIC ABSORPTION SPECTROMETER

Bernhard Huber, Überlingen, Fed. Rep. of Germany, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

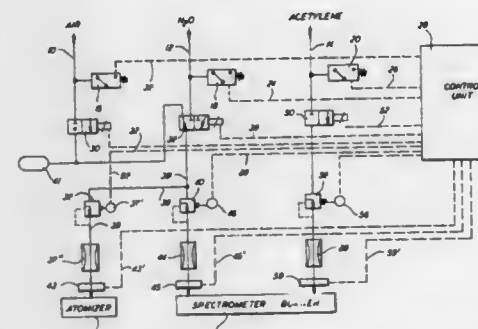
Filed May 16, 1986, Ser. No. 863,770

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1985, 3529547

Int. Cl.<sup>4</sup> F23N 1/02

U.S. Cl. 431—89

11 Claims



1. A gas control device for controlling the fuel gas and oxidizing agent supply to a burner (99) in an atomic absorption spectrometer, comprising:

- (a) a fuel gas line (14) for supplying fuel gas to said burner (99);
- (b) an oxidizing agent supply line (10, 12) for supplying an oxidizing agent to said burner (99);
- (c) a first restrictor (58) and a first pressure regulator (54) connected upstream of said first restrictor for said fuel gas line;
- (d) a second restrictor (44) and a second pressure regulator (40) connected upstream of said second restrictor for said oxidizing agent line;
- (e) first (56) and second (46) servomotors for reproducibly adjusting the pressure settings of said pressure regulators, respectively;
- (f) a control unit (28), by means of which the servomotors are controllable in a reproducible manner; and
- (g) first (59) and second (45) flowmeters connected to control unit 28, wherein said first flowmeter (59) is connected downstream of said first restrictor (58) and said second flowmeter (45) is connected downstream of said second restrictor (44), for providing said control unit with a measure of the rate of flow of said fuel gas and said oxidizing agent.

4,681,531

# PROCESS AND EQUIPMENT FOR THE THERMIC CONVERSION OF THE COMPONENTS OF GAS CURRENTS CONTAMINATING THE ENVIRONMENT

Zoltán Nagy, Budapest; György Hupka, Veszprém; Ottó Szalay, Veszprém, and Attila Kovács, Veszprém, all of Hungary, assignors to Magyar Ásványolaj és Földgáz Kísérleti, Veszprém, Hungary

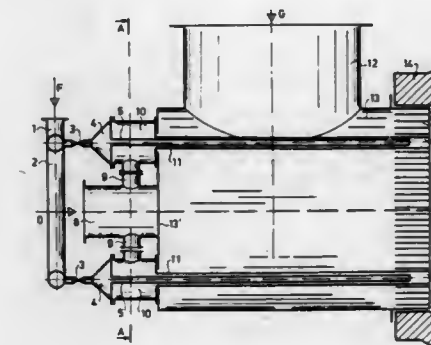
Filed Sep. 7, 1984, Ser. No. 648,535

Claims priority, application Hungary, Sep. 23, 1983, 3294

Int. Cl.<sup>4</sup> F23C 5/08

U.S. Cl. 431—181

4 Claims



1. An apparatus for the thermic conversion of contaminants of a gas stream, which comprises:

- (a) an inlet chamber,
- (b) a resolving chamber axially aligned with, in fluid communication with and connected to one end of said inlet chamber,
- (c) a contaminant-laden gas inlet stud means in fluid communication with said inlet chamber, for delivering a contaminant-laden gas whereby said contaminant-laden gas will flow in parallel to the axis of said inlet chamber from said inlet chamber to said resolving chamber,
- (d) a bottom plate for closing the other end of said inlet chamber opposite the one end thereof connected to said resolving chamber,
- (e) means for delivering an oxidizing gas and a heating medium to the end of the inlet chamber connected to said resolving chamber including a plurality of pairs of co-axially arranged pipe elements uniformly distributed throughout said inlet chamber,
- (f) each of said pairs of co-axially arranged pipe elements being arranged parallel to the axis of said inlet chamber,
- (g) one of said pipe elements of each of said pairs of co-axially arranged pipe elements being arranged to transport and deliver said oxidizing gas to the end of the inlet chamber connected to said resolving chamber,
- (h) the other of said pipe elements of each of said pairs of co-axially arranged pipe elements being arranged to transport and deliver said heating medium to the end of the inlet chamber connected to said resolving chamber,
- (i) each of the pipe elements of each of said pairs of co-axially arranged pipe elements being arranged and configured relative to one another to define a mixing space closely adjacent to the end of the inlet chamber connected to said resolving chamber whereby said oxidizing gas is mixed with said heating medium,
- (j) the end of each of said pairs of co-axially arranged pipe elements defining a burner immediately adjacent said resolving chamber for burning said mixed oxidizing gas and heating medium whereby said burners provide a plurality of uniformly distributed combustion flames at the connection of said inlet chamber and said resolving chamber,
- (k) whereby said contaminant-laden gas flows parallel to the axis of the inlet chamber through said uniformly distrib-

uted flames from the inlet chamber to said resolving chamber, whereby said contaminant-laden gas is subjected to an accelerated and optimally highly elevated temperature combustion.

4,681,532

**BOILER FURNACE AIR REGISTER**

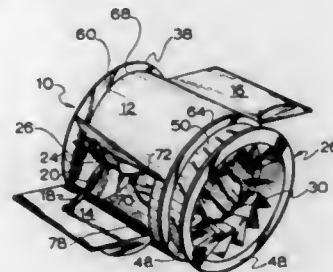
Landy Chung, 5144 Cliff Dr., Ashtabula, Ohio 44004

Filed May 2, 1985, Ser. No. 729,690

Int. Cl.<sup>4</sup> F23M 9/00

U.S. Cl. 431-183

39 Claims



1. The method of delivering combustion air to an industrial heating flame comprising the steps of:

- (1) directing a pair of streams of air toward each other to form a single rotating stream of air;
- (2) compressing said streams of air within radially decreasing hollow frustoconical confines;
- (3) imparting spiral rotation with an axial thrust to said single stream of air toward said flame; and
- (4) expanding said stream of air into a cylindrical envelope about said heating flame.

4,681,533

**VAPOR BURNER FOR LIQUID FUEL**

Jorgen H. Petersen, and Peter J. M. Clausen, both of Nordborg, Denmark, assignors to Danfoos A/S, Nordborg, Denmark

Continuation of Ser. No. 550,318, Nov. 11, 1983, abandoned.

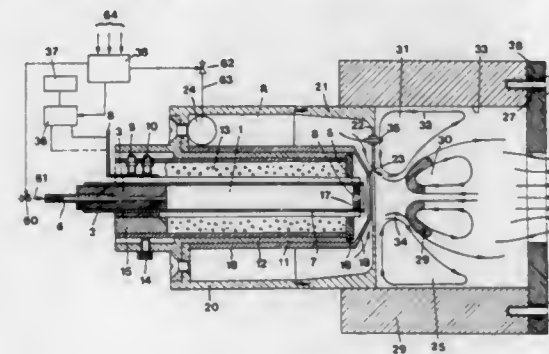
This application Jul. 26, 1985, Ser. No. 759,356

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243398

Int. Cl.<sup>4</sup> F23D 11/44

U.S. Cl. 431-208

24 Claims



1. A vapour burner, comprising, elongated supply means for supplying and discharging fuel in a gasified form, said supply means including a tubular member having a front outlet through which gasified fuel is discharged, an air supply passage system surrounding said tubular member, said air supply system having an inlet through which air is supplied tangentially relative to said tubular member to produce a rotating and axially moving column of air surrounding said tubular member, means for defining a combustion chamber that has a radially

outer periphery and a rear end, the means defining the combustion chamber including an axially elongated cylindrical shaped burner tube having a rear end portion axially adjacent to the tubular member outlet and radially spaced therefrom and a front end portion axially forwardly remote from the tubular member outlet, the burner tube being of a substantially larger diameter than the tubular member and defining the radial outer periphery of a combustion chamber, and an annular closure wall defining the rear end of the combustion chamber and having a central opening forming an inlet to the combustion chamber, the annular closure wall extending between the air supply passage system and the burner tube rear end portion, and in cooperation with the air supply system forming a mouth through which air supplied at the air system inlet passes to the combustion chamber inlet, said air supply system including guide means inclined relative to and cooperable with said closure wall for radially converging said rotating column of air in a forward direction adjacent to said mouth to pass through the combustion chamber inlet, said guide means including a conical front guide wall that is spaced from the closure wall and in cooperation with the closure wall form an annular gap through which the column of air moves to and through the combustion chamber inlet and into the combustion chamber as a conical jet, said conical wall having a front opening through which fuel from the supply means passes toward the combustion chamber and a rear end of a greater inner diameter than the diameter of its front opening.

4,681,534

**CANDLE HOLDER WITH DRAIN HOLES**

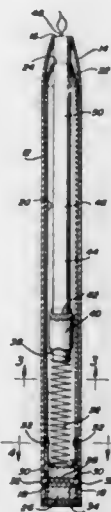
Robert W. Schenke, P.O. Box 271, and Reynold A. Schenke, P.O. Box 59, both of Paradise, Pa. 17562

Filed May 21, 1986, Ser. No. 865,470

Int. Cl.<sup>4</sup> F23D 3/16

U.S. Cl. 431-290

5 Claims



1. A lifetime candle including, in combination, a permanent candle holder and a consumable candle for use with the holder, said holder including an elongated upstanding outer tubular member including an upwardly tapering upper end defining an upper end opening of a diameter slightly smaller than the diameter of said candle and an open lower end, an inner tubular member including upper and lower ends and removably mounted in said outer tubular member through the lower end thereof closing the latter and in which said candle is slidably received, spring bias means in said inner tubular member yieldingly upwardly biasing said candle therein to a position with the upper end of said candle projecting upwardly from the upper end of said inner tubular member and abuttingly en-

gaged with the inner surfaces of said outer tubular member upper end disposed about said opening and the wick of said candle projecting upwardly through said opening, said lower end of said inner tubular member including permanently mounted plug means closing the lower end of said inner tubular member, said inner tubular member lower end including drain opening means formed therein for draining hot water and other candle wax dissolving liquid from said inner tubular member lower end after said liquid is introduced into the upper end of said inner tubular member for dissolving and flushing away solidified wax previously collected within said inner tubular member.

4,681,535

**PREHEATING MECHANISM FOR SOURCE METAL FOR MELT**

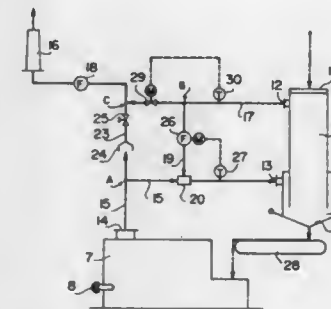
Osamu Kobari, Funabashi, and Takashi Kida, Yachiyo, both of Japan, assignors to Toho Development Engineering Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1986, Ser. No. 856,924

Int. Cl.<sup>4</sup> F27D 19/00

U.S. Cl. 432-48

11 Claims



1. A preheating mechanism for preheating a source metal for melt in a combination of independent combustion and preheating devices, comprising: a high-temperature gas conduit for connecting said combustion device and said preheating device; a low-temperature gas conduit for connecting said preheating device and an exhaust gas chimney; a branch pipe branched from said low-temperature gas conduit at a branch portion and connected to said high-temperature gas conduit at a coupling portion; a short-cut gas conduit for connecting a portion of said high-temperature gas conduit at a combustion device side from said coupling portion to a portion of said low-temperature gas conduit at an exhaust gas chimney side from said branch portion; diluting means arranged in said short-cut gas conduit; first gas flow control means arranged in said branch pipe; and a first temperature sensor arranged between said preheating device and said coupling portion between said high-temperature gas conduit and said branch pipe, said first gas flow control means being adapted to control a gas flow in said branch pipe in response to a signal from said first temperature sensor.

4,681,536

**CHARGING SLUICE FOR ANNEALING OVEN**

Rudolf Jansen, Monschau, Fed. Rep. of Germany, assignor to Otto Junker GmbH, Simmerath, Fed. Rep. of Germany

Filed Aug. 14, 1985, Ser. No. 765,874

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430205

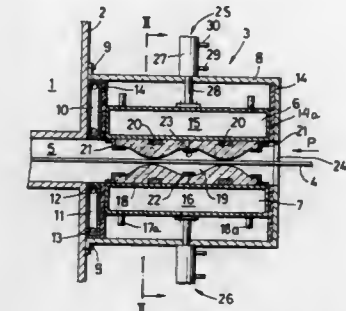
Int. Cl.<sup>4</sup> F27B 9/28; F26B 25/12

U.S. Cl. 432-59

9 Claims

1. In an annealing oven having an interior and an inlet opening and provided with a transporting sluice arrangement for sealing the interior of the oven from outside air and continually feeding a material to be annealed, particularly a metallic tape into the interior of the oven, wherein a buffer atmosphere is main-

tained, the transporting sluice arrangement comprising a housing attached to the annealing oven; a sealing device positioned in said housing before the inlet opening of the oven, said sealing device including two sealing members spaced from each other to form a space through which said material is continually transported, said sealing members being adjustable relative to each other in the direction



normal to the direction of transportation of said material, said sealing members being thin-wall hollow plates, each plate having at a side facing said material a coating of ceramic felt; and means for adjusting the position of each plate, said means including two pneumatic cylinders each connected to the assigned plate to move the latter in the direction normal to the direction of transportation.

4,681,537

**METHOD AND APPARATUS FOR CONTINUOUSLY CHARGING A STEELMAKING FURNACE**

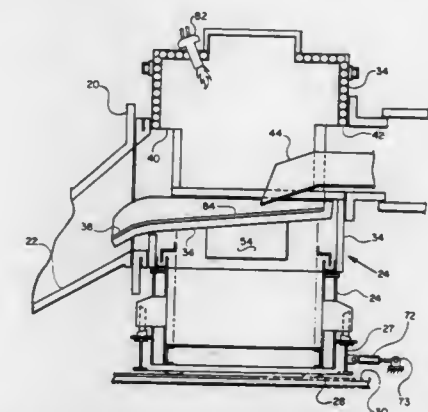
John A. Vallomy, Matthews, N.C., assignor to Intersteel Technology, Inc., Matthews, N.C.

Filed May 29, 1986, Ser. No. 868,380

Int. Cl.<sup>4</sup> F27D 1/18

U.S. Cl. 432-242

19 Claims



1. Apparatus for charging a melting furnace from a charging conveyor, the melting furnace having a charging opening in its sidewall, said charging apparatus comprising: a support frame; an upstanding housing mounted on said support frame; a pivotally mounted receiving pan mounted on said support frame, and having a discharge chute on one side thereof, said discharge chute adapted to extend into the charging opening in the furnace sidewall; said housing having a first opening in its sidewall for receiving material conveying means, and a second opening in its sidewall for receiving said discharge chute; and means for moving said apparatus into the charging opening of said furnace and to a position remote therefrom.



4,681,538

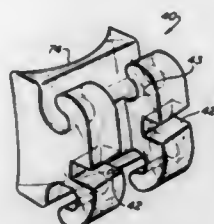
## CRYSTALLINE ALUMINA COMPOSITES

Robert D. DeLuca, Pennington, and Robin M. Forbes-Jones, Titusville, both of N.J., assignors to Johnson & Johnson Dental Products, Company, East Windsor, N.J.  
Division of Ser. No. 602,874, Apr. 23, 1984, Pat. No. 4,595,598.  
This application Dec. 9, 1985, Ser. No. 806,712

Int. Cl.<sup>4</sup> A61C 7/00

U.S. Cl. 433—9

5 Claims



1. A method for applying orthodontic brackets to the teeth of a patient which comprises the steps of:

- providing a crystalline alumina orthodontic bracket comprising a base member including a tooth contacting surface and a body member extending from said base member, said body member including walls defining an arch-wire groove;
- coating said tooth contacting surface with a thin adherent coating of a siliceous material which consists essentially of silica or a glass containing at least 50 mol percent silica; and
- bonding said bracket to the surface of a tooth with an adhesive having an affinity to said thin adherent coating of siliceous material.

4,681,539

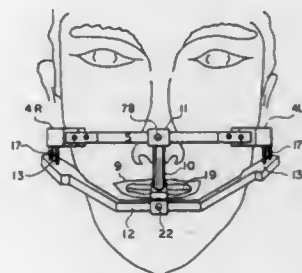
## DENTAL ARTICULATOR AND METHOD

Florian J. Knap, 3000 Mount Hill Dr., Midlothian, Va. 23113  
Filed Sep. 6, 1985, Ser. No. 773,035

Int. Cl.<sup>4</sup> A61C 19/04

U.S. Cl. 433—73

10 Claims



1. Apparatus for forming a recording of the condylar motion of a dental patient and utilizing said recording for reconstructive purposes as part of a dental articulator, said apparatus comprising:

- a maxillary recording assembly adapted to fit the patient's upper jaw and having: (1) a first rigid U-shaped bow having a straight forward bar and two extremities positioned at equal distances rearwardly of said forward bar, (2) box-like downwardly opening receptacles removably attached to said rearward extremities, and (3) an upper bite plate pendantly attached to said forward bar and displaced rearwardly therefrom, said upper bite plate having a lower abutment surface and an upper surface having a tooth receiving trough,
- a mandibular recording assembly adapted to fit the patient's lower jaw while aligned below said maxillary recording assembly and having: (1) a second rigid U-shaped

bow having a straight forward bar and extremities provided with posts perpendicularly adjustable with respect to said bow, (2) a smooth ball affixed to the uppermost extremity of each post and adapted to vertically enter the receptacles of said maxillary recording assembly, and (3) a lower bite plate attached to said forward bar and extending rearwardly therefrom, said lower bite plate having an upper abutment surface and a lower surface having a tooth receiving trough, the relative positioning of said bite plates within said assemblies being such as to permit sliding contact between said abutment surfaces,

(c) an upper articulator member comprised of a rigid plate having a center zone, and equal left and right side arms radiating from said center zone in a straight line path and terminating in distal extremities having means for attachment of the receptacles of said maxillary recording assembly, and

(d) a lower articulator member comprised of: (1) a floor plate having rear and forward extremities, (2) a cross bar positioned above the plate and parallel thereto adjacent said rear extremity, and (3) means for adjustably positioning paired posts above said cross bar, said posts having smooth balls attached to their uppermost extremities, whereby

(e) the maxillary and mandibular recording assemblies interact to produce a solid recording confined within said receptacles, and said receptacles can be attached to said upper articulator member in a manner such that said upper articulator member is pivotably supported by vertical interaction with the smooth balls associated with the cross bar of said lower articulator member.

4,681,540

## DENTAL HANDPIECE ARRANGEMENT

Hermann Landgraf; Werner Schuss, both of Heppenheim, and Rainer-Karl Worschischek, Lorsch, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

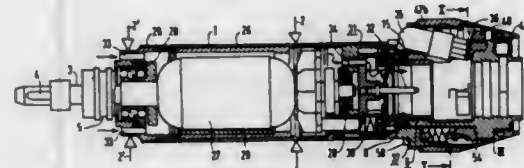
Filed Oct. 17, 1985, Ser. No. 788,727

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3441024

Int. Cl.<sup>4</sup> A61C 1/08

U.S. Cl. 433—126

19 Claims



1. In a dental handpiece arrangement having a drive motor with a drive shaft, a grip piece having a head housing with chuck means to hold and rotate a tool and a drive train extending in the grip piece to connect the drive shaft to the chuck means, the improvements comprising the drive motor being received in a cylindrical motor cartridge with the drive shaft extending out of a cylindrical coupling element at one end of the cartridge, said coupling element having a smaller diameter than the diameter of the cartridge, said cartridge having a tubular heel of a smaller diameter than the major portion of the cartridge at the other end for releasable connection with a pin member of a supply hose containing electrical leads and water and air lines, said motor cartridge having at least two cylindrical bearing surfaces axially spaced therealong for telescopically receiving internal bearing surfaces of a cylindrical sleeve which may be part of an adapter or part of a grip piece with an integral sleeve, said cylindrical sleeve having a coupling element cooperating with the cylindrical coupling element to form a latch means for securing the sleeve on the motor cartridge and allowing rotation of the sleeve thereon; and a

sleeve-shaped coupling member being received on the tubular heel for rotation thereon, said sleeve-shaped coupling member having means forming fluid coupling means for air and water discharging from the pin member and having fluid channels extending from the fluid coupling means to sockets for receiving ends of fluid conduits disposed in the cylindrical sleeve to form a fluid connection therewith so that the fluid is coupled through the coupling member, the sleeve member and into passages of the grip piece for discharge adjacent the chuck means and the coupling member and the sleeve member having coacting parallel extending surfaces to form a plug-like connection between the sleeve member and the coupling member as the sleeve member is telescopically received on the motor cartridge whereby the motor cartridge of the handpiece arrangement provides flexibility to receive both a grip piece which is mounted on an adapter having a cylindrical sleeve and a grip piece with an integral cylindrical sleeve.

4,681,541

## DENTAL BUR WITH ENHANCED DURABILITY

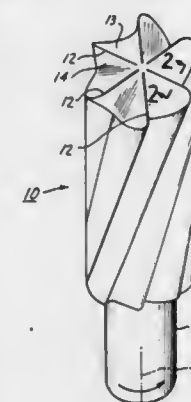
Alvin A. Snaper, 2800 Cameo Cir., Las Vegas, Nev. 89107

Filed Jul. 5, 1985, Ser. No. 752,378

Int. Cl.<sup>4</sup> A61C 3/02

U.S. Cl. 433—165

16 Claims



1. A dental bur having a substrate which includes surfaces provided as a pair which form an edge to cut dental tooth material which edge is sufficiently hard, and a layer deposited on said edge surfaces and surfaces adjacent to said edge surfaces said layer being formed of a material selected from the groups consisting of nitrides and carbides of titanium and tungsten, said layer being deposited on said edge surfaces and adjacent surfaces by vacuum deposition, arc deposition or cathode sputtering to produce a layer of thickness controlled to be insufficiently thick to form an unsuitably dull edge.

4,681,542

## RETENTION SYSTEM FOR DENTAL PROSTHESIS

Lloyd Baum, 25742 Hinckley St., Loma Linda, Calif. 92354

Filed Feb. 18, 1986, Ser. No. 829,921

Int. Cl.<sup>4</sup> A61C 13/12, 5/08

U.S. Cl. 433—172

4 Claims

1. An improved telescope retainer for dental prostheses comprising:

- a coping affixed at a lower end to an abutment tooth, said coping having a coping axis and an upwardly tapering outer axial surface;
- a groove in said axial surface encompassing said coping in a plane generally transverse to said coping axis;
- an O-ring of elastomeric material stretched about said coping and elastically retained in said groove, said O-ring having a cross-sectional diameter substantially greater than the depth of said groove such that an outer portion of said ring projects from said axial coping surface; and
- a prosthesis having a retainer cavity including a retainer

surface closely telescopically mateable onto said axial coping surface, there being a complementary groove in said retainer surface shaped to closely match and receive



said outer portion of the O-ring, said O-ring thus making a resilient retentive interference fit between said prosthesis and said coping.

4,681,543

## RAPID DENTURE TECHNIQUE

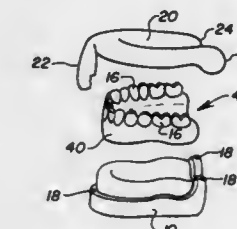
Enrique A. Monroy, Hialeah, Fla., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Feb. 14, 1986, Ser. No. 829,746

Int. Cl.<sup>4</sup> A61C 13/10

U.S. Cl. 433—196

17 Claims



5. For use in the fabrication of artificial dentures, a custom-formed matrix adapted to be shaped from an elongated form of pliable light-curable plastic dental material shaped complementarily to the disposition of a set of artificial teeth set in wax on a dental model, the outer ends of said form being shaped for engagement with said model at the rear end thereof, and a support member of the same material as said elongated form affixed to said form mid-way of the ends thereof and extending transversely thereto, the free end of said support member being adapted to engage the front end of said model whereby in cooperation with said outer ends of said form a minimum of a three point support of said matrix upon a dental model is provided, said matrix being adapted to be impressed upon exposed incisal and occlusal surfaces of a set of artificial teeth mounted upon a model for releasable connection of said teeth to said matrix for support of said teeth independently of said model when desired and said formed matrix being rendered rigid when light-cured with said teeth releasably connected thereto.

9. A technique for rapidly producing a finished dental prosthesis upon which at least one artificial tooth is mounted in life-like position; said technique comprising the steps of:

- forming a denture base member in a configuration having a tooth receiving area;

- b. applying a temporary set-up material to the denture base member tooth receiving area;
- c. setting up at least one artificial tooth having a biting end and receiving area end upon said temporary set-up material in life-like position with the biting end of the tooth exposed and the receiving area end of said tooth engaged toward said tooth receiving area;
- d. forming a matrix of pliable material into complementary shape of said life-like position;
- e. impressing said matrix against the exposed biting end of said tooth to effect a releaseable connection of said tooth to said matrix;
- f. providing positioning means for positioning the matrix relative to the denture base member;
- g. curing said matrix to render the same rigid and manually maneuverable;
- h. removing said tooth releaseably connected with the matrix and exposing the receiving area end of said tooth;
- i. shaping pliable denture material to the tooth receiving area of the denture base;
- j. impressing the exposed receiving area end of said tooth while it is connected releaseably with the matrix on said shaped denture material;
- k. curing said shaped denture material with said tooth impressed thereon; and
- l. separating the matrix from said tooth.

4,681,544

## ORAL PACK RETENTION SYSTEM

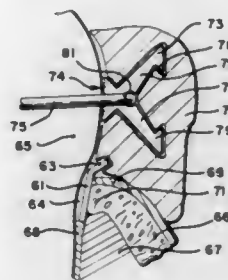
Albert J. Anthony, 45 Central St., West Boylston, Mass. 01583  
Continuation-in-part of Ser. No. 457,762, Jan. 13, 1983, Pat. No. 4,533,326, Ser. No. 458,298, Jan. 17, 1983, Pat. No. 4,464,114, and Ser. No. 291,445, Aug. 10, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 762,932

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> A61C 5/00

U.S. Cl. 433—215

11 Claims



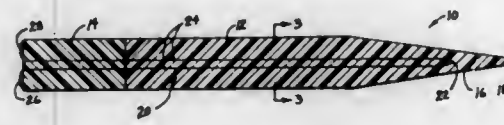
1. An oral pack retention system for use in covering a location in the mouth which is adjacent a tooth, comprising:
- (a) medication delivery means adapted to be placed at said location for delivering medication to the location,
- (b) a mass of pack material adapted to be placed against said medication delivery means and said tooth for retaining the medication delivery means in position with respect to the location, and
- (c) connecting means for connecting said mass of pack material to said tooth so that said mass of pack material remains in said medication delivery means retaining position.

4,681,545  
METHOD FOR RAPID OBTURATION OF ROOT CANALS

Robert E. Lapcevic, 12451 Curry Ct., Saratoga, Calif. 95070  
Continuation of Ser. No. 511,373, Jul. 5, 1983, abandoned. This application Jun. 23, 1986, Ser. No. 880,931  
Int. Cl.<sup>4</sup> A61C 5/02

U.S. Cl. 433—224

15 Claims



1. An improved filling point for sealing a prepared root canal cavity, said filling point having a length in the range from 10 to 30 mm and including an axial electrically resistive heating element which is fixedly imbedded within the filling point, whereby after sealing said root canal cavity with said filling point, said resistive heating element remains fixedly part of said filling point.

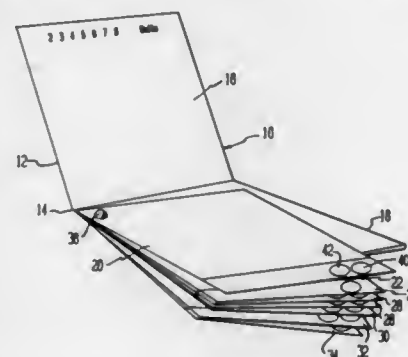
4,681,546

## PERSONAL COLOR ANALYSIS METHOD

Charlavan Hart, 325 E. Pipeline, Bedford, Tex. 76021  
Filed Jul. 20, 1984, Ser. No. 632,944  
Int. Cl.<sup>4</sup> G09B 19/00

U.S. Cl. 434—99

16 Claims



1. The method of coordinating the colors of an individual's wardrobe which comprises:
- (a) color-spectrum analyzing the skin tones of an individual to determine the distribution and concentration of at least one preselected primary color of the colors in the individual's skin;
- (b) categorizing the colors of wearing apparel and accessories into at least two classes of color tones based on the concentration of the preselected primary color in these colors; and
- (c) selecting the class of wearing apparel and accessories for the individual having the concentration of the preselected color tones most closely matching the concentration of that preselected primary color in the individual's skin.

4,681,547

## CERVICAL EXAM TEACHING METHOD

Marie Herron, 2300 Webster, #502, San Francisco, Calif. 94115  
Filed Dec. 6, 1985, Ser. No. 805,615  
Int. Cl.<sup>4</sup> G09B 23/30

U.S. Cl. 434—273

5 Claims

1. A method of teaching cervical examination for the detection of preterm labor, the steps of the method comprising: providing a multiplicity of models of the human female cervix;

arranging said models in a plurality or rows so that the models in each row differ from one another in at least one cervical characteristic selected from a preselected set of cervical characteristics which change during the course of preterm labor, wherein the progression of said models in

the operation of said selectively operable control means by the person reading the visually readable data of the record member read by said reading means.

4,681,548

## PRINTED CIRCUIT BOARD EDGE CONNECTION ARRANGEMENTS

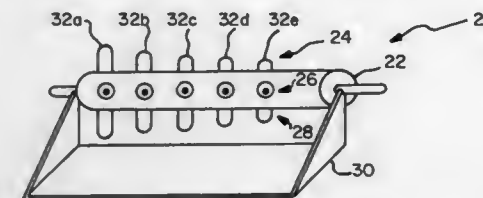
Olav Peterson, Ontario, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 14, 1982, Ser. No. 398,248

Int. Cl.<sup>4</sup> H01R 13/53

U.S. Cl. 439—181

6 Claims



each row simulates the change in a different cervical characteristic or set of cervical characteristics during preterm labor; and

repetitively touching the models in each said row to learn the feeling of each said cervical characteristic during preterm labor.

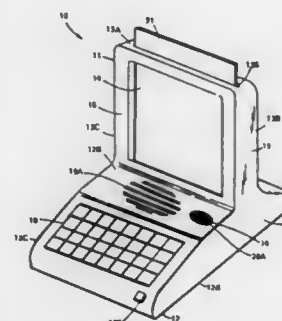
4,681,548

## AUDIO VISUAL APPARATUS AND METHOD

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540  
Filed Feb. 5, 1986, Ser. No. 826,312  
Int. Cl.<sup>4</sup> G09B 7/06

U.S. Cl. 434—311

20 Claims



1. An interactive information system comprising:
- (a) a support,
- (b) means for supporting and predeterminedly positioning a record member on said support, which record member contains visually readable indicia and a machine readable code recording extending parallel to an edge of said record member,
- (c) means supported by said support for automatically reading the code recording of a record member which is predeterminedly positioned on said support and generating electrical signals indicative of information defined by said code read,
- (d) electronic computing means supported by said support for receiving and performing computing functions with respect to electrical signals received from said reading means when reading the machine readable recording of a record member,
- (e) selectively operable control means operable by a person visually reading the indicia of a record member after it has been read by said reading means and supported by said support for controlling the operation of said electronic computing means in accordance with the signals generated by said reading means when it reads the machine readable recordings of a record member supported by said support, and
- (f) means supported by said support and controlled by said electronic computing means for intelligibly indicating the results of the operations of said electronic computing means on the data received from said reading means and

1. A printed circuit board edge connection arrangement comprising a printed circuit board having first and second edge connection pads and a connector for removably receiving the board, the connector including a first contact for making a first electrical connection to the first pad, and a second for making a second electrical connection to the second pad, when the board is received in the connector, wherein the second pad does not extend as far towards the connection edge of the printed circuit board as the first pad, whereby the first contact makes the first electrical connection to the first pad on insertion of the board into the connector before the second contact makes the second electrical connection to the second pad, and the first contact breaks the first electrical connection to the first pad on removal of the board from the connector after the second contact breaks the second electrical connection to the second pad, and current-limiting means, connected between the first and second pads or between the first and second contacts, via which the first electrical connection is connected in parallel with the second electrical connection when the board is received in the connector, whereby arcing between the second contact and the second pad, on insertion of the board into and removal of the board from the connector, is avoided.

4,681,550

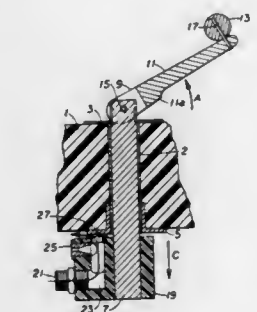
## AQUATIC RIDE

Dean B. Koenig, 3297 Marilyn Ct., Pleasanton, Calif. 94566  
Filed Oct. 11, 1985, Ser. No. 786,581

Int. Cl.<sup>4</sup> B63H 11/107, 11/113

U.S. Cl. 440—40

19 Claims



4. An aquatic ride for use in swimming pools or the like of the type having a high water pressure source and line to power



a pool cleaning apparatus associated therewith, comprising in combination:

- a means for supporting a person in the pool,
- a water outlet means on said supporting means operatively and removably connected to the high pressure line, and
- valve means interposed between said outlet means and the high water pressure source whereby said supporting means is guided by controlling pressure water through said outlet means, said high pressure line, outlet means and valve means are united to a housing having a passageway, wherein said housing passage way is substantially L shaped, a first outlet disposed at a vertical top most extremity of one leg of said L shaped passage way adapted to bar against a bearing surface of a bottom face of said support means, and a second outlet parallel to but horizontally offset from a horizontal other leg of said L shaped passageway which connects to the high pressure line.

4,681,551

## AQUATIC DEVICE

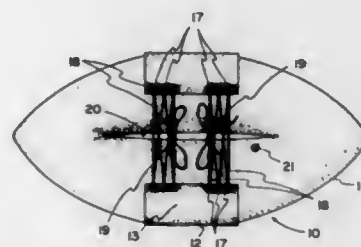
Richard S. Morris, 817 Orleans Pl., Raleigh, N.C. 27609

Filed Nov. 4, 1985, Ser. No. 798,247

Int. Cl.<sup>4</sup> A63C 15/02

U.S. Cl. 441-76

4 Claims



1. A water-walking apparatus comprising: a donut-shaped tube; cinch means for compressing said donut-shaped tube into a double-ended, canoe-like configuration, said cinch means including an elongated band extending around said tube, the opposite ends of said band including adjustable attachment means for drawing one end of said band towards the other end to compress said tube; and a plurality of downwardly projecting, angularly disposed propulsion means secured to said cinch means to allow said water-walking apparatus to move more readily in one direction than in the opposite direction whereby an improved water-walking apparatus is provided.

4,681,552

## COMBINED LIFE VEST DEVICE AND BUOYANCY COMPENSATOR

William L. Courtney, 3000 Steiner St., San Francisco, Calif. 94123

Filed Jun. 20, 1985, Ser. No. 747,005

Int. Cl.<sup>4</sup> B63C 9/16, 9/18

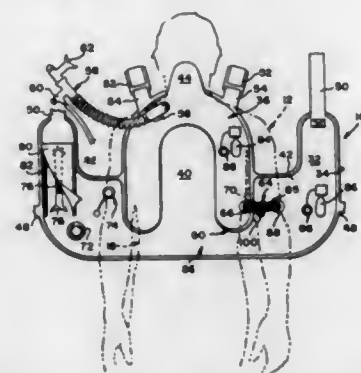
U.S. Cl. 441-92

22 Claims

1. A combined life vest device and buoyancy compensator for use by divers along with scuba gear including a compressed air tank to provide an under water source of air, backpack means for mounting the tank on the diver and quick release means for securing the back pack means to the diver and permitting the diver to rapidly free himself of both the backpack and the tank, comprising

- a garment adapted for fitting about the torso of the diver, buoyancy compensator means comprising a first air-tight chamber formed in the garment closely adjacent the location of the air tank on the diver,
- means for permitting the diver to selectively regulate pressure within the buoyancy compensator chamber,
- a second air-tight chamber formed in the garment to generally surround a portion of the diver's torso, and

means for selectively inflating the second chamber, whereby the diver is able to regulate pressure within the first buoyancy compensator chamber during a dive, the location of the buoyancy compensator being arranged closely adjacent the tank to maintain the diver's underwater center of gravity while also being in a position to avoid restricting movement of the diver, the second chamber being inflated only as necessary or desired by the diver, the first and second air-tight chambers being of complementary nested configuration,



the second air-tight chamber being of a W configuration including an elongated central element arranged to extend along the diver's back and elongated lateral elements arranged to be generally adjacent the front of the diver's torso, the first air-tight chamber being of an inverted U configuration to nest about the elongated central element of the second air-tight chamber in order to be closely adjacent the air tank on the diver.

4,681,553

## AERODYNAMIC THROWING IMPLEMENT

Michael R. Rodarte, 12371 Nutwood St., Garden Grove, Calif. 92640

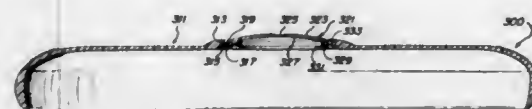
Continuation-in-part of Ser. No. 493,031, May 9, 1983, Pat. No. 4,516,946. This application Feb. 28, 1985, Ser. No. 707,019

The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> A63H 27/00

U.S. Cl. 446-46

7 Claims



1. A hand-launchable gyroscopic flight disc comprising: a disc-shaped body having a centrally located aperture and a shoulder on its top surface about said aperture; a center dome surface member having a generally convex top surface, a convex bottom surface and a circumferential periphery with respect to the disc axis; and means for peripherally and freely rotatably coupling said center dome to said disc-shaped body within said aperture and radially interior to said shoulder, said coupling means including a first bearing journal about said aperture and radially interior to said shoulder, a second bearing journal about said circumferential periphery of said center dome for cooperating with said first journal to provide a ball-bearing race, and ball bearings disposed within said ball-bearing race; said center dome, said coupling means and said shoulder being mutually configured so as to provide a generally continuous aerodynamic contour with respect to said top surface; and

said center dome and said coupling means being mutually configured so as to be generally flush with the bottom surface of said disc body and to provide an axial cavity with respect to the bottom surface of said disc.

4,681,554

## TOY DEVICE WHICH CAN BE OPENED AND POSITIONED AT ANY DESIRED ANGLE

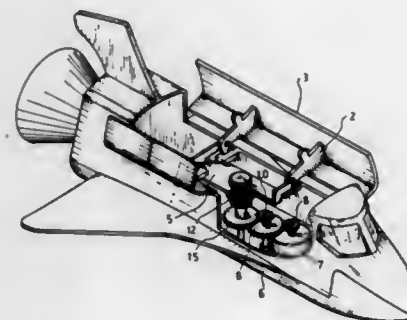
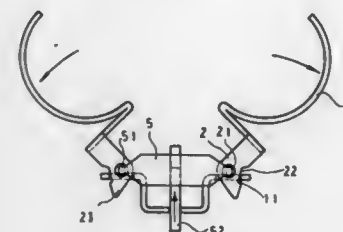
Chang Hsien-Yang, Fl. 2, No. 2-2, Lane 762, Ding Chou Rd., Taipei, Taiwan

Filed Dec. 30, 1985, Ser. No. 814,380

Int. Cl.<sup>4</sup> A63H 27/20, 31/02

U.S. Cl. 446-231

2 Claims



1. A toy device able to be opened and positioned at any angle desired comprising:

- a fixed member having two ends, of which the both ends are furnished with notches to receive a transmission member in each of said notches;
- transmission members, each of which is mounted in a respective one of said notches in a vertically movable manner, each of said transmission members is also furnished with a round hole, and also furnished at one side with a notch, and each of said transmission members has a pointed end in a lower portion;

two movable members, each of which is formed into a semi-circular shape, and being fixedly connected with a top portion of a respective one of said transmission members; and the slanting movement of said transmission members can control said movable members to open outwards;

an actuation means, said actuation means comprising a guide plate;

a control member having two ends, of which the both ends are furnished with lugs respectively for hooking into the round holes of said transmission members respectively so as to connect together with said transmission members; and in the center bottom of said control member, there is mounted a guide plate which is able to be driven to move up and down so as to actuate said transmission members to move up and down simultaneously; and

upon said guide plate being driven to move upwards said control member actuates said transmission members to move upwards; said transmission members move upwards until said notch on respective ones of said transmission member is engaged with said notch on said fixed member, and then said transmission members slantingly move out-

wards and actuate simultaneously said movable member to open at an angle; and said movable member will fully be opened at an angle of 180° with respect to the other one of said movable members; wherein said movable member will be fully open upon a respective lower edge of said notches of said transmission members being retained by the edge of the notch on said fixed member; and said movable member may be positioned at a given angle desired by controlling said guide plate at a position corresponding to the angle desired.

4,681,555

## PUPPET OR DOLL HAVING STRUCTURE PROVIDED BY STUFFING

Edna C. Natiw, 15718 Levan, Livonia, Mich. 48154

Filed Apr. 25, 1986, Ser. No. 855,744

Int. Cl.<sup>4</sup> A63H 3/14

U.S. Cl. 446-327

13 Claims



9. A somewhat flexible, soft-bodied doll having a body, a head affixed to said body, a pair of arms affixed to said body, a sleeve enclosing each of said arms, and a pair of legs affixed to said body; said body, head and sleeves possessing interior surfaces, and said arms possessing exterior surfaces, which surfaces together define a substantially continuous cavity in said doll, said cavity being dimensioned to receive the hand of a wearer therein; such that said head, arms and legs are rigidified solely by stuffing therein; and wherein the portions of said cavity defined by said arms and sleeves are disposed posteriorly of said arms.

4,681,556

## ASSEMBLY OF COMPOSITE SHAFT AND YOKE MEMBER OF A HOOKES UNIVERSAL JOINT

Bertram J. Palmer, Barton Under Needwood, Great Britain, assignor to BRD Company Limited, Walsall, England

PCT No. PCT/GB84/00073, § 371 Date Oct. 29, 1984, § 102(e)

Date Oct. 29, 1984, PCT Pub. No. WO84/03544, PCT Pub.

Date Sep. 13, 1984

PCT Filed Mar. 8, 1984, Ser. No. 668,727

Claims priority, application United Kingdom, Mar. 9, 1983, 8306543

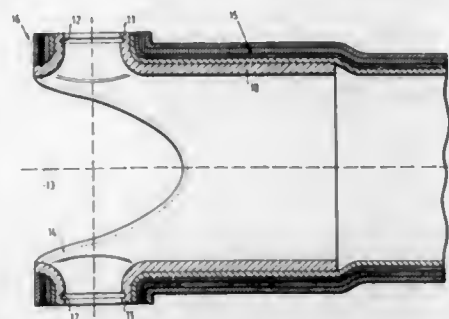
Int. Cl.<sup>4</sup> F16C 7/00, 1/02

U.S. Cl. 464-181

6 Claims

1. An assembly of a shaft of composite, fibre reinforced resin material and a yoke member of a Hookes universal joint, the yoke member comprising a sheet metal element having a spigot portion extending axially of the shaft and two diametrically opposed tubular portions extending transversely thereof and adapted to form or receive bearing elements of the joint, the

shaft including fibres wound around said spigot portion and fibres wound around said tubular portions, at least some of said



fibres extending continuously around said spigot portion and at least one of said tubular portions.

4,681,557

## HOLDER FOR BICYCLE CHAINS

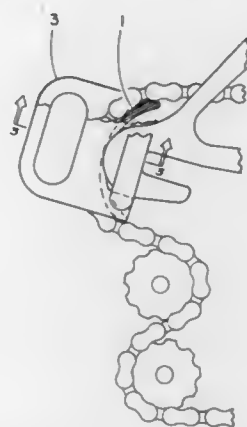
Tom V. Hillman, 528 Temple Hills Dr., Laguna Beach, Calif. 92651

Filed May 30, 1986, Ser. No. 868,613

Int. Cl.<sup>4</sup> F16H 7/24

U.S. Cl. 474-119

2 Claims



1. An article of manufacture for retaining a bicycle drive chain to a bicycle dropout with or without a bicycle rear wheel in place comprising, an outwardly curved channel shaped chain retainer, and an elongated box shaped dropout receiver, wherein said chain retainer and said dropout receiver are attached side by side at their respective ends and said box shape forms a recess which is in the same direction as the concave underside of said chain retainer.

4,681,558

## REINFORCED POLYMERIC COMPONENT AND METHOD OF MANUFACTURE

Doyle W. Rausch, Niles, Mich., assignor to National Standard Company, Niles, Mich.

Filed Apr. 18, 1985, Ser. No. 724,604

Int. Cl.<sup>4</sup> F16G 5/10

U.S. Cl. 474-205

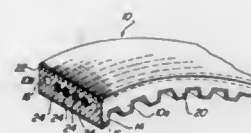
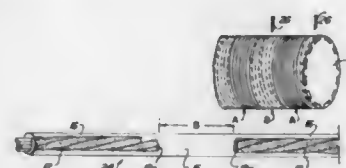
84 Claims

1. A reinforced polymeric belt construction comprising: a gear-tooth engaging portion, a reinforcing material portion positioned about said gear-tooth engaging portion, said reinforcing material portion being comprised of a continuous length of a reinforcing member and a continuous length of a carrier member having a length greater than said reinforcing member, with said reinforcing member having a Young's modulus value greater than said carrier member, and wherein said reinforcing material portion includes a plurality of spiral wraps

of said reinforcing member with at least a portion of one wrap on each side of the wraps of said reinforcing member being comprised of said carrier member, and a layer of covering material positioned about said reinforced material portion.

50. A method of manufacturing a cylindrical reinforced polymer component comprising the steps of:

forming a cylinder of polymeric matrix material;  
winding spirally on said cylinder of polymeric matrix material in reinforcing filament material comprised of a plural-



ity of discontinuous lengths of a reinforcing member portion and a continuous length of a carrier member portion operatively connected to said reinforcing member portion to provide a predetermined number of windings having said reinforcing member portion and said carrier member portion therein extending around said cylinder and a predetermined number of windings having said carrier member portion extending around said cylinder; and applying a cover layer over said wound cylinder material to provide a cylindrical reinforced polymer component.

4,681,559

## PLURAL VALVE THREE STAGE PRESSURE RELIEF SYSTEM

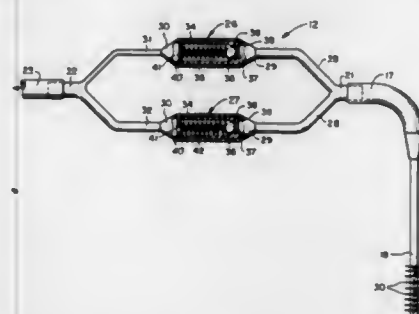
Michael D. Hooven, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Dec. 23, 1985, Ser. No. 812,781

Int. Cl.<sup>4</sup> A61M 27/00

U.S. Cl. 604-9

19 Claims



1. A valve for controlling the passage of body fluids from a first location in the body to a second location, comprising: catheter means for removing a fluid from said first body location;  
drain means for discharging said fluid to said second location;  
first and second fluid passages in parallel fluid flow communication between said catheter means and said drain means;  
said first fluid passage having a first valve means for regulating fluid flow through said first fluid passage, wherein said

first valve means opens at a first predetermined pressure, said first fluid passage also having fluid flow restrictor means for resisting sudden increases in flow rate through said valve; and

said second fluid passage having a second valve means for regulating fluid flow through said second fluid passage wherein said second valve means opens at a second predetermined pressure greater than said first predetermined pressure.

4,681,560

## SUBCUTANEOUS INFUSION RESERVOIR AND PUMP SYSTEM

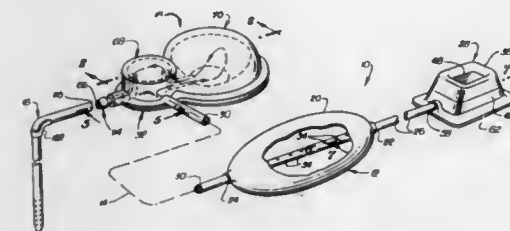
Rudolf R. Schulte, Santa Barbara; Gary P. East, and Alfons Heindl, both of Goleta, all of Calif., assignors to Pudenz-Schulte Medical Research Corp., Santa Barbara, Calif.

Continuation-in-part of Ser. No. 590,349, Mar. 16, 1984, Pat. No. 4,588,394. This application Apr. 11, 1986, Ser. No. 850,943

Int. Cl.<sup>4</sup> A61M 5/00

U.S. Cl. 604-9

20 Claims



1. A subcutaneous infusion reservoir and pump system, comprising:

means for receiving medication into said system by injection;  
a reservoir for storing medication injected into said receiving means, said reservoir including a reservoir inlet in fluid communication with said receiving means, and a reservoir outlet;

a normally closed valve capable of being opened to fluid flow therethrough by percutaneous manual manipulation and having a valve inlet in fluid communication with said reservoir outlet, a valve outlet, a resiliently flexible housing, a rigid floor plate underlying said housing to form an inlet chamber therebetween in fluid communication with said valve inlet, an outlet chamber within said housing, said outlet chamber overlying said inlet chamber, a valve passageway situated directly between said inlet and outlet chambers, said valve passageway permitting fluid flow between said inlet and outlet chambers, a valve diaphragm situated within said inlet chamber and resiliently biased to cover said valve passageway, said valve diaphragm normally forming a seal with a portion of said valve surrounding said valve passageway to prevent the flow of fluid through said normally closed valve unless forceably displaced, and a diaphragm displacement finger extending downwardly from the ceiling of said outlet chamber, said diaphragm displacement finger being situated and configured to displace said valve diaphragm and open said normally closed valve to fluid flow therethrough when moved downwardly through said valve passageway;

a pump having a pump inlet in fluid communication with said valve outlet, a pump outlet and a resilient crown defining at least a portion of said pumping chamber, said pump being manually actuable by the selective application of percutaneous pressure to depress said crown;

means for occluding said pump outlet when said normally closed valve is opened to fluid flow therethrough, said means for occluding including an occluder wall overlying the top portion of said housing of said normally closed valve, said occluder wall defining, in connection with the adjacent portion of said housing, a fluid exit passageway in communication with said pump outlet, said occluder wall preventing the flow of fluid through said fluid exit pas-

sageway when pressed against the adjacent portion of said housing; and

a catheter for directing medication to a specific location within the body, said catheter having a catheter inlet in fluid communication with said pump outlet.

4,681,561

## ULTRASONIC DECOUPLING SLEEVE

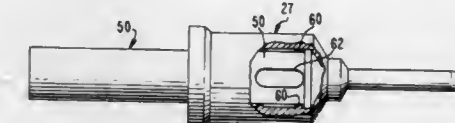
Larry L. Hood, Laguna Hills, and Maurice M. Imonti, Dana Point, both of Calif., assignors to CooperVision, Inc., Palo Alto, Calif.

Filed Jan. 24, 1986, Ser. No. 822,277

Int. Cl.<sup>4</sup> A61F 2/32

U.S. Cl. 604-22

27 Claims



1. In a surgical instrument having an ultrasonically actuated surgical tool coupled to a source for ultrasonically vibrating the tool and a cap member defining a fluid conduit for flowing fluid to a surgical site for said tool, a portion of said tool extending in said conduit, the improvement comprising, in combination therewith, an impeding means located in said fluid conduit intermediate said tool portion and said cap member for impeding transmission of ultrasonic energy through a fluid in said fluid conduit,

said impeding means comprising a decoupling sleeve located within said cap member about a portion of said surgical tool and within said fluid conduit for flowing irrigation fluid to said surgical site, and

said decoupling sleeve including an axially-extending body portion positioned about an axially-extending portion of said surgical tool and defining at least an opening in a wall of said body portion for permitting fluid transfer from a position within said conduit exterior to said wall to a position interior to said wall within said sleeve.

4,681,562

## METHOD AND APPARATUS FOR ASPIRATING SECRETED FLUIDS FROM A WOUND

Walter Beck, Obere Häslbachstr. 87, CH-8700 Küsnacht; Siegfried Berger, Wernau, and Margrit Werner, Lion-Feuchtwanger-Str. 69, 6500 Mainz-Hechtsheim, all of Fed. Rep. of Germany, assignors to Walter Beck and Margrit Werner, both of, Fed. Rep. of Germany

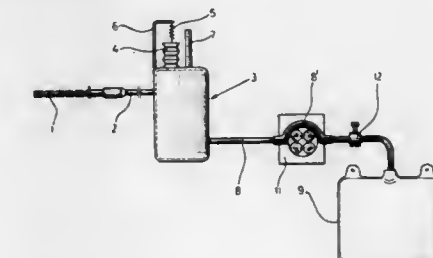
Filed Nov. 18, 1985, Ser. No. 798,845

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1984, 3441891

Int. Cl.<sup>4</sup> A61M 31/00

U.S. Cl. 604-54

10 Claims



1. A method for aspirating secreted fluids from a wound comprising the steps of:



providing a drain connected to a first container by a first tube to form a closed system;  
 providing a second container connected to said first container by a second tube;  
 providing a tube pump and tube clamp on said second tube; inserting said drain into the wound and closing said wound; evacuating said first container by operating said tube pump to achieve a negative pressure in said first container; closing said tube clamp and stopping the operation of said tube pump;  
 maintaining a negative pressure in said container;  
 periodically regenerating the negative pressure in said first container as the secreted fluids flow into said first container to a predetermined value while maintaining said system closed during the regeneration phase, wherein at least a portion of the content of the first container is aspirated and pumped into said second container during the regeneration phase, and wherein the content of said first container aspirated therefrom is led through said second tube into said second container, said second tube being subjected to the effect of said operating tube pump and said tube clamp being open whereby said collection takes place in a closed system.

4,681,563

## FLOW CONTROL SYSTEM

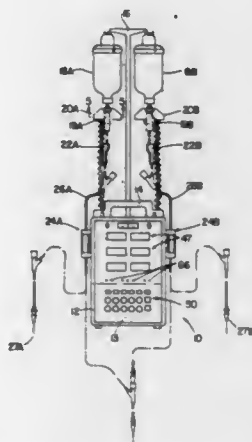
Clinton Deckert, and Larry L. Wilson, both of Poway, Calif., assigns to Centaur Sciences, Inc., Stamford, Conn.

Filed Apr. 26, 1985, Ser. No. 727,840

Int. Cl.<sup>4</sup> A61F 2/00

U.S. Cl. 604—67

8 Claims



1. A flow sensor for detecting the drop rate in an associated drip chamber of an infusion system comprising:  
 infrared light emitting means to generate an infrared light path;  
 sensor means interposed in said light path to detect the level of light passing therein and continuously generate a first signal indicative thereof;  
 pulsing means to periodically energize said light emitting means to produce a series of energized and non-energized states;  
 difference means to determine the difference between said first signal when said light emitting means is energized and said first signal when said light emitting means is not energized and generate a second signal indicative thereof;  
 reference means to establish a reference level for said second signal;  
 detection means to detect a pre-established deviation of a second signal from said reference level and produce a third signal indicative thereof; and  
 output means to produce an output pulse in accordance with said third signal.

4,681,564  
 CATHETER ASSEMBLY HAVING BALLOON  
 EXTENDED FLOW PATH

Michael D. Landreanu, Mai Kai Apt. #29, 300 Samfor Ave., Shreveport, La. 71103

Filed Oct. 21, 1985, Ser. No. 789,821

Int. Cl.<sup>4</sup> A61M 29/02, 31/00

U.S. Cl. 604—97

7 Claims



1. A catheter assembly for insertion through a surgical opening into an interior body space for enabling a fluid to be introduced into said body space and for enabling unwanted flowable material to be drained from said body space including fluid after the same has been introduced therein, said catheter assembly comprising

an elongated flexible tubular structure having an exterior end section, an opposite interior end section operable to be inserted within a body space and three separate fluid passages extending within said exterior and interior end sections,

a balloon structure carried by the interior end section of said tubular structure in communication with a first of said three separate passages,

a second of said three separate passages having inlet opening means communicating therewith at the exterior end section of said tubular structure through which fluid is introduced and outlet opening means communicating therewith at the interior end section of said tubular structure through which fluid introduced through said inlet opening means is introduced into said body space,

a third of said three separate passages having drain opening means communicating therewith at the interior end section of said tubular structure through which fluid and/or unwanted flowable material in the body space can pass and discharge opening means communicating therewith at the exterior end section of said tubular structure through which fluid and/or flowable material passing through said drain opening means is discharged,

said first passage having inflation opening means communicating therewith at the exterior end section of said tubular structure through which inflating fluid is received for passage into said balloon structure to inflate the same after the interior end section of said tubular structure has been inserted into said body space so as to cause fluid passing into the body space through said outlet opening means to follow a more extensive flow path within said body space in order to reach said drain opening means and said drain opening means to be maintained substantially operationally free of obstruction by tissue defining said body space than is the case when said balloon structure is deflated within said body space immediately following insertion therein or just prior to withdrawal therefrom,

said balloon structure being configured so that in the inflated condition thereof within said body space the inflated surfaces thereof include outer portions facing toward the walls defining the body space and inner portions defining flow paths directed inwardly from the walls defining the body space,

the interior end section of the tubular structure defining the second passage communicating with said outlet opening means being carried by the outer surface portions of said balloon structure so that the fluid passing therethrough enters the body space adjacent the walls thereof and is confined to flow therealong until reaching an inwardly

directed flow path defined by said balloon structure inner portions,  
 the interior end section of said tubular structure defining the third passage leading from said drain opening means being disposed at the central interior of said balloon structure so that said drain opening means receives fluid after passing along the inwardly directed flow paths defined by the inner surface portions of said balloon structure.

4,681,565

METHOD AND APPARATUS FOR AUTOMATICALLY  
 TREATING ANIMALS, PREFERABLY BIRDS, SUCH AS  
 YOUNG CHICKS, YOUNG GUINEAFOWLS, YOUNG  
 TURKEYS

Albert J. A. Gourlandt, Les Grésillons, 78950 Gambais, France

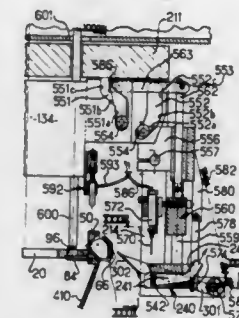
Filed Dec. 26, 1984, Ser. No. 686,246

Claims priority, application United Kingdom, Dec. 30, 1983, 8334631

Int. Cl.<sup>4</sup> A61M 5/00

U.S. Cl. 604—115

5 Claims



1. Apparatus for automatically treating animals such as birds at a high speed, comprising:

a frame,  
 a spindle mounted on said frame,  
 drive means for rotating said spindle,  
 a table mounted on said spindle and provided with a plurality of spaced-apart bird supports, each bird support comprising means for supporting the bird immobilized in the neck area,

movable support means freely mounted on said spindle for moving with respect to said frame from a non-operative position to an operative position,

means for administering a substance to said animals, said means being linked to said movable support means and comprising,

a syringe,  
 a suction device comprising a perforated nozzle provided with a perforated surface means for surrounding and extending vertically along the neck area retained in the bird support for the purpose of drawing back a predetermined area of the neck skin before an injection is made by said syringe, and

a safety device for preventing administration of the substance when no animal is held in a said bird support, said safety device comprising a feeling member attached to said movable support means and a stop member means for blocking entrance of said feeling member through an opening in said table when no animal is retained in said bird support.

4,681,566  
 INFUSION DEVICE

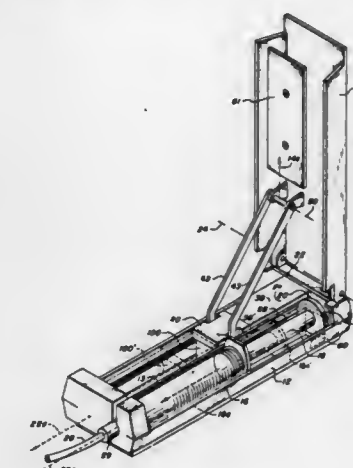
Paul V. Fenton, Jr., Marblehead, Mass.; Robert L. Miller, New Providence, N.J., and Ernest M. Santin, Salem, Mass., assignors to Strato Medical Corporation, Beverly, Mass.

Filed Nov. 30, 1984, Ser. No. 676,728

Int. Cl.<sup>4</sup> A61M 5/00

U.S. Cl. 604—135

11 Claims



1. An infusion device adapted for coupling to a syringe having an elongated tubular wall extending along a tube axis with fluid dispensing opening at one end and having an internal plunger adapted for motion along said tube axis, said device comprising spring driving means for driving said plunger over a predetermined range of motion along said tube axis in response to an applied force, means for generating at least two substantially constant, spring generated forces, means for selectively coupling said force generating means, including means for generating said applied force and for applying said applied force to said spring driving means by selectively coupling one or more of said spring-generated forces to said spring driving means, said spring-driving means being operative when said syringe is coupled to said device in an operating position, and being inoperative otherwise.

4,681,567

## SYRINGE WITH SAFETY SHEATH

Edwin J. Masters, 142 Autumn, Sikeston, Mo. 63801, and Paul L. Ebaugh, 1553 Lexington, Cape Girardeau, Mo. 63701

Filed Apr. 3, 1986, Ser. No. 847,757

Int. Cl.<sup>4</sup> A61M 5/32

U.S. Cl. 604—198

22 Claims



1. An improved syringe of the type comprising a barrel having a needle extending from the lower end, the improvement comprising:

at least one knob extending outwardly from the barrel near the lower end;  
 a sheath slideably mounted on the barrel and slideable between a retracted position over the barrel in which the sheath does not obstruct access to the needle and an extended position at least partly over the needle in which the sheath obstructs access to the needle;  
 at least one longitudinal slot means in the sheath for receiving the knob, the slot means having means for releasably retaining the sheath in its retracted position, said releasable retaining means being releasable upon downward pressure applied to the sheath, the slot means further having means for lockingly engaging the knob to lockingly engage the sheath in the extended position.

4,681,568

# VALVE APPARATUS FOR PHOTOACTIVATION PATIENT TREATMENT SYSTEM

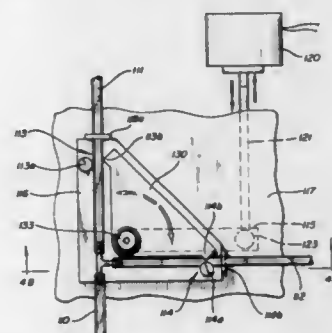
Vernon H. Troutner, St. Petersburg, Fla., assignor to McNeilab, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 665,827, Oct. 29, 1984, Pat. No. 4,596,547. This application Feb. 27, 1986, Ser. No. 834,303

Int. Cl.<sup>4</sup> A61M 5/005

U.S. Cl. 604—250

7 Claims



1. Apparatus for controlling the flow of fluids through a flexible tube for use in a photoactivatable agent patient treatment system comprising:

- actuator means for supplying force in response to a signal;
- clamping means movably mounted on a work surface;
- post means mounted on said work surface adjacent to said clamping means whereby flow through said flexible tube, placed therebetween, may be reduced by movement of said clamping means toward said post means thereby compressing said flexible tube;
- motion translator means, associated with said clamping means through a manually disengagement rotation clamp means, for moving said clamping means in response to force supplied by said actuator means, wherein the manually disengageable rotation clamp means comprises,
  - an outer collar and an inner collar rotatable therein, wherein the inner collar is fixedly associated with said motion translator means and said outer collar is fixedly associated with said clamping means;
  - at least one locking element means associated with said inner collar and not said outer collar when said locking element means is in a first position, said locking element means associated with said inner and outer collar when in a second position wherein said locking element means is received by said outer collar, said association in said second position acting to prevent rotation of said inner collar in said outer collar;
  - manually engageable locator means for moving said locking element means from said first position to said second position; and
  - resilient biasing means for urging said locator means to move said locking element means to said second position.

tion whereby force supplied by said actuator means through said motion translator means is transferred to said clamping means and wherein movement of said locator means against said resilient biasing means allows said locking element means to move from said second position to said first position upon manual movement of said clamping means; and

- actuator bar means having one end connected to said actuator means and the other end associated with said motion translator means for communicating said actuator means supplied force to said motion translator means.

4,681,569

# IV RATE METER

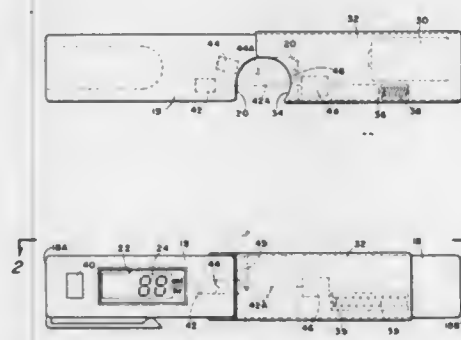
Stephen J. Coble, 11001 Leolang Ave., and Edward J. Arkans, 8835 Mulberry Dr., both of Sanland, Calif. 91040

Filed Mar. 22, 1985, Ser. No. 715,162

Int. Cl.<sup>4</sup> A61M 5/165

U.S. Cl. 604—253

3 Claims



1. A rate meter for use with an IV fluid administration system which includes a vertical transparent cylindrical drip chamber, comprising:

- an elongated housing formed of a base portion having a first end and a second end and a moveable portion, the base portion having a notch therein intermediate said housing ends and of depth less than the thickness of said housing base portion, one surface area of the notch being configured to engage a portion of the external surface of a drip chamber, the moveable portion being slideable between an open and a closed position, the housing moveable portion being of generally thin tubular configuration substantially surrounding said base portion and slideable on said housing base portion between said notch and said first end, the housing base and moveable portions providing a member of generally uniform cross-sectional configuration throughout the length thereof except for the notch therein when said moveable portion is slid to said open position, that is, towards said base portion first end to receive a cylindrical drip chamber therein, the moveable portion having an end surface configured to engage a portion of the external surface of a cylindrical drip chamber, whereby a drip chamber may be received in said notch when said moveable portion is in the open position; resilient means biasing said moveable portion towards the closed position whereby a cylindrical drip chamber received in said notch is engaged by said moveable portion to removeably attach said housing to a cylindrical drip chamber; and
- means within said housing for detecting drops of IV fluid passing through said drip chamber and for displaying the rate of fluid flow.

4,681,570

# PERITONEAL CATHETER

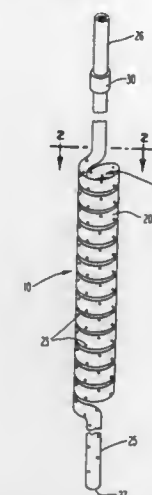
Michael J. Dalton, 9432 Monticello Ave., Evanston, Ill. 60203

Filed Dec. 26, 1985, Ser. No. 813,418

Int. Cl.<sup>4</sup> A61M 27/00

U.S. Cl. 604—282

10 Claims



1. A body-implantable catheter especially suited for percutaneous communication with the peritoneal cavity which comprises

- a flexible, elongated tube with perforations in the wall thereof to pass fluid to or from the lumen of said tube, and protrusions within said lumen to prevent collapse of said tube under a negative pressure gradient; together with means acting on said tube for urging at least a central portion of said tube into a tightly wound cylindrical helix configuration with closely spaced windings, providing a secondary fluid channel enclosed by said helix; whereby pressure in said tube, impelling said helix to unwind, tends to free said perforations from occluding organic deposits, and said secondary fluid channel, created upon restoration of the tightly wound helix, serves as a sump for spent fluid.

4,681,571

# SUCTION CANISTER WITH DISPOSABLE LINER AND CHECK VALVE

John R. Nehring, East Greenwich, R.I., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Apr. 23, 1981, Ser. No. 256,711

Int. Cl.<sup>4</sup> A61M 1/00

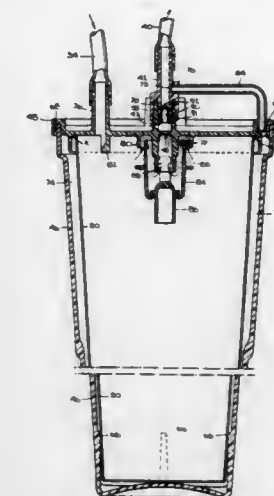
U.S. Cl. 604—320

7 Claims

1. A medical suction canister for receiving fluid from a patient during a fluid suctioning procedure under the force of vacuum created by a vacuum source, said canister comprising:

- a housing;
- a flexible liner disposed within the housing, a void space being formed between the outside of the liner and the inside of the housing;
- fluid path means for conducting fluid from the patient to the inside of the liner;
- vacuum path means for applying suction (i) to the inside of the liner to cause fluid from the patient to flow into the liner and (ii) to the void space to remove gas therefrom; and
- check valve means located in the vacuum path means (i) for expanding the flexible liner when suction is initially applied by the vacuum path means to the inside of the liner and to void space and (ii) for keeping the flexible liner expanded during the suctioning procedure, said check

valve means oriented to permit gas to leave the inside of the liner and flow to the vacuum source and to block the



reverse flow of gas from the vacuum source void space into the liner.

4,681,572

# FEMALE URINARY INCONTINENCE DEVICE

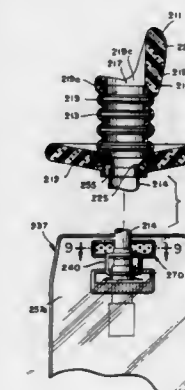
Joseph S. Tokarz, Schaumburg, and Marvin E. Jensen, Niles, both of Ill., assignors to Hollister Incorporated, Libertyville, Ill.

Continuation-in-part of Ser. No. 417,140, Sep. 13, 1982, abandoned. This application Jul. 27, 1983, Ser. No. 516,931

Int. Cl.<sup>4</sup> A61F 5/44

U.S. Cl. 604—329

18 Claims



1. A female urinary incontinence device comprising an external pad of flexible, resilient material for externally contacting the labia majora of a wearer, said pad having an opening therethrough; a periurethral cup molded of soft compressible material and having an upper opening defined by smoothly-rounded contact surfaces adapted to engage the periurethral floor and vaginal introitus of a wearer; said compressible material having a durometer within the range of about 1 to 30 on the Shore A scale; said cup also having a lower opening; compressible tubular elastic bellows means extending between said lower opening of said cup and said opening of said pad for urging said cup into engagement with said periurethral floor and vaginal introitus when said pad is held against the labia majora and said bellows means is in a state of partial compression; conduit means extending into said opening of said pad and joined to, and in fluid communication with, the lower end of said bellows; said conduit means including a wall having a vent port extending therethrough with said port located immedi-



ately adjacent said external pad and the lower end of said bellows; and one-way valve means at said port for allowing air to enter said bellows and cup, as liquid travels away from said bellows through said conduit means, while at the same time preventing the escape of liquid through said port.

4,681,573

## FEMININE URINARY DEVICE

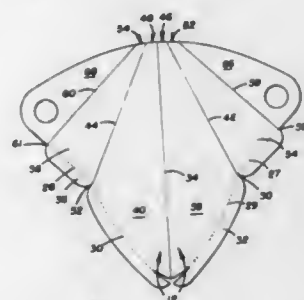
Lore H. McGovern, Nashua, N.H., and Alix A. Moore, Santa Anna, Calif., assignors to Apex Corporation, San Mateo, Calif.

Filed Oct. 29, 1985, Ser. No. 792,517

Int. Cl.<sup>4</sup> A61F 5/44

U.S. Cl. 604—329

5 Claims



1. A collapsible, disposable urinary device for a standing female erected substantially from a curvilinear creased or scored blank of a plaitable or foldable at least temporarily fluid resistant material into an oblique conical like form for surrounding and channeling but not otherwise interrupting the urine-stream of said female and for directing said stream through open space a comfortable distance away from the front of said female; said form comprising during use:

a bottom having a bottom edge and two substantially identical bottom walls continuous with and extending upwardly and outwardly from both sides of said bottom edge, said bottom walls each having a downwardly, forwardly slanting upper edge, a front edge and a rear edge, said rear edge and said upper edge of each bottom wall converging at an apex with each said rear edge sloping diagonally downwardly and backwardly from said apex and each said rear edge having an outwardly extending flap with a front and rear portion, said rear portion being partially detached from said rear edge;

a top having two substantially identical top walls, each top wall being integral with said upper edge of said bottom wall, each said top wall having a downwardly forwardly slanting top edge, a front edge and a rear edge with said rear edge and said top edge converging at an apex and each said rear edge having an outwardly extending flap with a front and rear portion, each said top wall beginning at the corresponding bottom wall apex and being continuous with the upper edge of said bottom wall, said top walls extending upwardly and inwardly from said upper edges of said bottom walls with said top wall top edges converging towards a vertical plane which intersects said bottom edge;

two substantially identical handles, each handle beginning at the corresponding apex of a top wall and being continuous with the upper edge of said top wall, said handles being substantially congruently joined substantially within said vertical plane;

a front discharge opening formed substantially by the front edges of the top and bottom walls; and

a diagonally, downwardly, backwardly slanting rear opening formed substantially by the rear edges of the top and bottom walls said rear opening shaped so as to surround the labia major of said female.

4,681,574

## OSTOMY APPLIANCE WITH FLEXIBLE MEMBRANE CONNECTOR

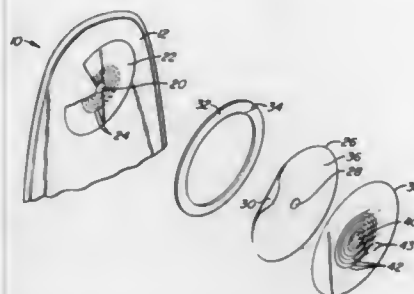
Dianne Eastman, Kensington, Calif., assignor to Dianne Eastman Revocable Trust, Kensington, Calif.

Continuation-in-part of Ser. No. 531,518, Sep. 12, 1983. This application Feb. 7, 1986, Ser. No. 827,795

Int. Cl.<sup>4</sup> A61F 5/44

U.S. Cl. 604—344

9 Claims



1. An ostomy appliance comprising:

a bag having an opening for receiving material from a stoma, a thin, flexible membrane having a bag side and a skin side, the membrane having an inner portion connected to the bag circumscribing the opening and an outer portion which is adapted to be supported on the user's skin with the bag side exposed to the air,

adhesive means on the skin side of the membrane for attaching the membrane to the peristomal area of the user, said outer portion of said membrane with said adhesive means thereon adapted to transmit weight from the ostomy appliance to the skin of the user, and

a cover sheet overlying the adhesive means on the skin side of the membrane, the cover sheet being removable to expose the underlying adhesive means for attachment of the membrane and the bag to the peristomal area, said membrane and adhesive layer having:

a combined thickness of less than about ten thousandths of an inch,

a combined elasticity coefficient of less than about 1.6 pounds per inch at 20% elongation, and

a combined water vapor permeability greater than about 300 grams per square meter per 24 hours at 40° C. and 80% relative humidity.

4,681,575

## METHOD OF CHEMICAL DEODORIZATION OF ARTICLES AND SOLUTIONS USED IN MEDICAL AND BIOLOGICAL PROCEDURES

Lewis Knox, 6587 Hlawatha, Chicago, Ill. 60646

Filed Jan. 23, 1984, Ser. No. 573,014

Int. Cl.<sup>4</sup> A61F 13/16, 2/60, 2/66

U.S. Cl. 604—359

10 Claims

1. The method of deodorizing fluid and solid media and devices, instruments, appliance, articles and solutions used in connection with analytical, investigative, diagnostic and therapeutic, biological and medical procedures, said method being operative to eliminate odors derived from urine and from fecal matter and residues discharged during the carrying out of medical procedures including procedures using endoscopes and other exploratory and surgical apparatus, and urological, proctoscopic, and colonoscopic procedures, said method eliminating the odors through reaction of a chemical deodorant with odor-producing groups and moieties of metabolically-produced odoriferous chemicals present in urine and fecal matter discharged during spills and "accidents" in sick rooms and during the conducting of medical procedures, said method comprising the steps of preparing an aqueous composition containing 2, 4-pentanedione as a chemical

deodorant, and applying said composition to a substance to be deodorized.

4,681,576

## WETNESS INDICATING HOT-METAL ADHESIVES

Herman Colon, Monsey, N.Y., and Albert Maletsky, Franklin Lakes, N.J., assignors to Malcolm Nicol & Co., Lyndhurst, N.J.

Filed Mar. 17, 1986, Ser. No. 839,943

Int. Cl.<sup>4</sup> A61F 13/16, 13/18, 13/20; C08J 23/00

U.S. Cl. 604—361

14 Claims

1. A wetness indicating hot-melt adhesive composition comprising:

(A) 20 to 70 wt.% of total polymer components, said polymer components comprising 35 to 100 wt.% of water sensitive polymer selected from vinyl pyrrolidone homopolymer, vinyl pyrrolidone/vinyl acetate copolymer or a mixture thereof, any balance comprising at least one polymer selected from the group consisting of ethylene/vinyl acetate copolymer, ethylene/acrylic acid copolymer and polyamide,

(B) 27 to 60 wt.% of organic acid selected from the group of (a) at least one free monobasic saturated or unsaturated fatty acid having an acid number above 137, and wherein the proportion of said free monobasic saturated or unsaturated fatty acid to said total polymer components in the composition is such that the pH of the composition, when moist is within a range of 3 to 7; (b) 15 to 50 wt.% of the fatty acid in combination with 10 to 55 wt.% of at least one other organic acid having an acid number above 130;

(C) 0 to 30 wt.% of a water soluble wax;

(D) a wetness indicating agent capable of causing the composition to change color in response to the presence of moisture in the composition and within said pH range of 3 to 7 in a relatively rapid time compared to that of broadly similar prior art, and in an amount effective to provide the composition with a readily visible color when wet which is distinct from the color of the dry composition.

4,681,577

## DISPOSABLE URINARY AND FECAL WASTE CONTAINMENT PRODUCT

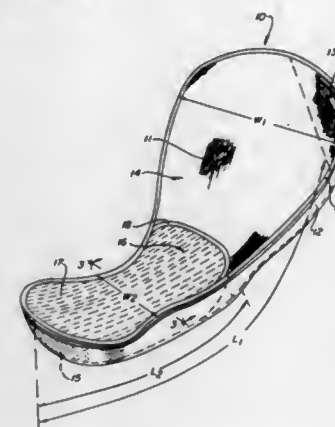
Beth A. Stern, Yardley, Pa., and Dennis C. Holtman, Flemington, N.J., assignors to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 535,192, Sep. 23, 1983, abandoned. This application Jun. 19, 1985, Ser. No. 746,612

Int. Cl.<sup>4</sup> A61F 13/16

U.S. Cl. 604—378

19 Claims



1. A disposable urinary and fecal waste containment product comprising a liquid-impermeable substantially flexible shell having a depth of at least about 0.25 inch; having a front uri-

nary portion and a rear fecal portion; said front portion being narrower and having an area less than 70% of the area of said rear portion, said front urinary portion having a first superstructure placed in and substantially filling said front portion of said shell and an absorbent medium in contact with at least a portion of said superstructure; said superstructure being a corrugated fibrous web comprising hydrophobic wet resilient, dry resilient fibers, which is non-collapsible when wet and capable of maintaining a void volume when wetted; and said rear portion having a second superstructure placed in and substantially filling said rear portion of said shell said superstructure being non-collapsible when wet and capable of maintaining a void volume when wetted said second superstructure being comprised of a fibrous web, open cell foam, a fibrous pile structure, sliver knit, malivlies, split corrugated web tufted yarn, dimensioned needle punch or mixtures thereof; said second superstructure being secured in said rear portion of said shell.

4,681,578

## PANTILINER WITH VENTILATION AREAS

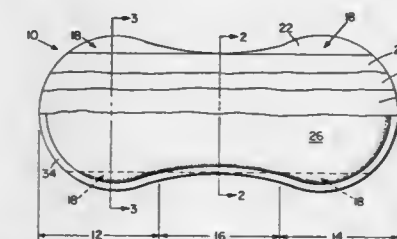
Arthur B. Anderson, and Sherry L. Brandt, both of Hamilton, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 8, 1985, Ser. No. 709,618

Int. Cl.<sup>4</sup> A61F 13/16

U.S. Cl. 604—385 R

28 Claims



1. An absorbent article having two end regions, a middle region, and at least one ventilation area positioned adjacent at least one of said end regions wherein body liquids are retained, said absorbent article comprising

a core having a garment-facing side and a body-facing side; a relatively vapor pervious outer layer disposed adjacent said garment facing layer of said core and

a relatively impervious barrier layer interposed between said core and said outer layer, said barrier layer being substantially liquid, vapor and air impermeable; wherein said barrier layer is substantially longitudinally coterminous with said absorbent; article and is of a relatively smaller transverse width than at least one of said end regions so as to form said ventilation area.

4,681,579

## ABSORBENT ARTICLE HAVING RESERVOIRS

John W. Toussant, and Ted L. Blaney, both of West Chester, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed Oct. 11, 1985, Ser. No. 786,900

Int. Cl.<sup>4</sup> A61F 13/16

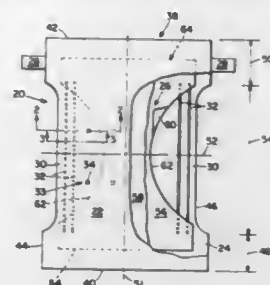
U.S. Cl. 604—385 R

5 Claims

1. A disposable absorbent article having a front waist region, a crotch region and a back waist region, said absorbent article comprising:

a liquid pervious topsheet; a liquid impervious backsheet associated with said topsheet; an absorbent core having side edges, said absorbent core disposed between said topsheet and said backsheet; a flexible side flap extending outwardly from and along each side edge of said absorbent core in at least the crotch region;

an elastic member secured to each of said side flaps;  
a securing means for securing portions of said side flaps to said topsheet; and  
a reservoir formed by a portion of each of said side flaps arranged in a multiplicity of layers, a first layer being formed by an inwardly longitudinally extending fold in



said side flap and a second layer formed by an outwardly longitudinally extending fold, a portion of said first layer being secured to said topsheet by said securing means, the remaining portions of said first fold being unsecured, and a portion of said second layer being secured to a portion of said first layer.

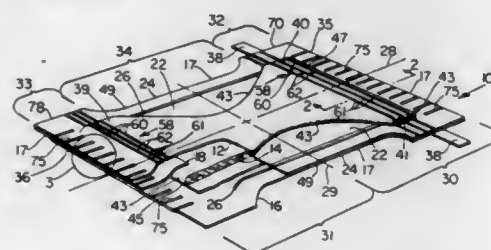
4,681,580

**DISPOSABLE DIAPERS WITH UNITARY WAISTSHIELD AND ELASTICALLY EXPANSIBLE WAISTBANDS**  
George S. Reising, Batavia, and Jerry L. Dragoo, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 29, 1985, Ser. No. 717,749  
Int. Cl.<sup>4</sup> A61F 13/16

U.S. Cl. 604—385 A

6 Claims



1. A disposable diaper having at least one elastically expansile waistband extending across at least a portion of at least one lateral edge of said diaper, said diaper comprising:

- (a) A fluid permeable topsheet;
- (b) A liquid impermeable backsheet;
- (c) An absorbent core interposed between said topsheet and said backsheet; and
- (d) At least one unitary waistshield and elastically expansile waistband member having an inward portion and an outward portion, said member extending along at least a portion of said at least one lateral edge of said diaper, said inward portion of said member interposed between said topsheet and said absorbent core, said outward portion of said member interposed between said topsheet and said backsheet and being affixed thereto,

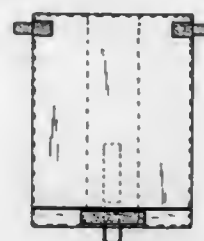
wherein said at least one elastically expansile waistband comprises said outward portion of said unitary waistshield and elastically expansile waistband member.

# 4,681,581 ADJUSTABLE SIZE DIAPER AND FOLDING METHOD THEREFOR

Fredrica V. Coates, 1608 Dublin Rd., Charlottesville, Va. 22903  
Filed Dec. 5, 1983, Ser. No. 558,273  
Int. Cl.<sup>4</sup> A61F 13/16

U.S. Cl. 604—391

29 Claims



1. A baby or adult diaper that is adjustable in size, comprising:
- an absorbent material having an inner surface adapted to contact the skin of the user when worn, and an outer surface;
  - attachment tabs formed of a first type of filamentary attachment material extending from opposite sides of said diaper material at one end of the diaper; and
  - an elongated bar of a complementary type of filamentary attachment material located centrally between said sides on the inner surface of said diaper material adjacent and parallel to an opposite end of the diaper, said bar having a length from about one half to about three fourths the full width of the diaper material;
  - a portion of the diaper material carrying the bar being adapted to be front folded onto the outer surface of the diaper material and positioned longitudinally on the diaper material to establish a proper diaper length for the user;
  - a central, longitudinally extending first fastener means on the outer surface of the diaper material;
  - a second fastener means on the outer surface of the diaper material opposite the bar and adapted to be coupled to said longitudinal fastener means,
  - said attachment tabs being adapted to be coupled to said bar to secure the diaper to the user.

4,681,582

**DRUG ADMINISTERING APPARATUS**  
Yuichi Yamamoto, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

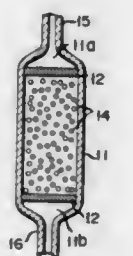
Filed Jun. 11, 1985, Ser. No. 743,412

Claims priority, application Japan, Jun. 13, 1984, 59-121463/1

Int. Cl.<sup>4</sup> A61K 9/22

U.S. Cl. 604—890

17 Claims



1. A drug administering apparatus comprising:
- a container with body fluid inlet and outlet ports which communicate with each other;
  - a liposome agent entrapping a drug therein; and

an insoluble substance fixed inside said container and having said liposome agent such that said liposome agent can be brought into contact with the body fluid flowing in said container;  
said insoluble substance comprising a polymeric substance having a hydrophilic group and having been crosslinked to have a three-dimensional network structure;  
said liposome agent being held between lattices of said network structure;  
whereby said drug entrapped in said liposome agent is released into the body fluid flowing in said container.

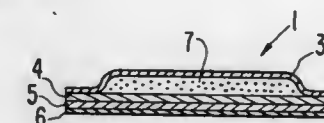
# 4,681,584 TRANSDERMAL DELIVERY SYSTEM FOR DELIVERING NITROGLYCERIN AT HIGH TRANSDERMAL FLUXES

Robert M. Gale, Los Altos, and Randall G. Berggren, Livermore, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 730,714, May 3, 1985, Pat. No. 4,615,699. This application Jun. 2, 1986, Ser. No. 869,548  
Int. Cl.<sup>4</sup> A61K 9/00

U.S. Cl. 604—897

7 Claims



1. A method of treating angina pectoris or congestive heart failure which comprises transdermally administering nitroglycerine to a patient suffering from the condition, said nitroglycerine being administered at a rate of at least about 40 mcg/cm<sup>2</sup>hr for an extended period of time.

4,681,583

# SYSTEM FOR DISPERSING DRUG IN BIOLOGICAL ENVIRONMENT

John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 451,329, Dec. 20, 1982, Pat. No. 4,578,075. This application Feb. 24, 1986, Ser. No. 832,192  
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> A61J 3/00

U.S. Cl. 604—892

7 Claims



1. A delivery system for delivering a beneficial agent, the delivery system comprising:

- (a) a wall that surrounds and forms an internal space, the wall comprising at least in part a pH sensitive composition comprising means for changing its physical and chemical integrity in an environment having a pH of 1.0 to 3.5 inclusive for releasing dosage forms in the internal space into an environment of use;
- (b) a plurality of individual dosage forms in the internal space, the dosage forms comprising at least one of a size selected from 0.5 mm to 10 mm, the dosage forms comprising:
  - (1) a wall that surrounds and forms an internal compartment, the wall comprising a composition that is permeable to the passage of an external fluid and impermeable to the passage of a beneficial agent;
  - (2) a beneficial agent in the compartment; and
  - (3) at least one passageway in the wall of the dosage form, said passageway formed when the dosage form is in use by at least one of (a) eroding a passageway forming composition from the wall, (b) leaching a passageway forming composition from the wall, and (c) by bursting a passageway in the wall for delivering the beneficial agent through said passageway from the dosage form.

4,681,585

# INTRAOCULAR IMPLANT

Reizo Sayano, Montebello, Calif., and Eugene P. Goldberg, Tampa, Fla., assignors to Intermedics Intraocular, Inc., Pasadena, Calif.

Continuation of Ser. No. 598,861, Apr. 11, 1984, abandoned.  
This application Mar. 13, 1986, Ser. No. 839,084

Int. Cl.<sup>4</sup> A61F 1/16

U.S. Cl. 623—6

13 Claims



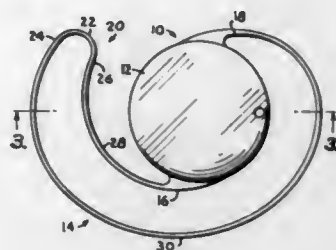
1. An intraocular implant consisting essentially of an optic lens and haptic for fixation of said lens in the posterior or anterior chamber of the eye, said implant having thermal stability sufficient to render said implant autoclave sterilizable, said implant being chemically stable when sterilized with high energy radiation, said optical lens consisting essentially of a solid thermoplastic polymer which is substantially transparent to visible light, is biocompatible, has a glass transition temperature of at least 120° C. and is thermally stable at a temperature of at least 120° C., and has a notched Izod impact strength at about one-eighth inch thickness of about at least one foot pound per inch, said thermoplastic polymer having repeating units of aromatic groups linked together by one or more linkages selected from the group consisting of ether, ester, sulfone, carbonyl and imide.



4,681,586  
**INTRAOCULAR LENS HAVING UNITARY INTEGRAL HAPTIC MEANS**  
 Randall L. Woods, 1704 Nicklaus, Clinton, Mo. 64735  
 Filed Aug. 22, 1986, Ser. No. 899,309  
 Int. Cl.<sup>4</sup> A61F 2/16

U.S. Cl. 623—6

6 Claims



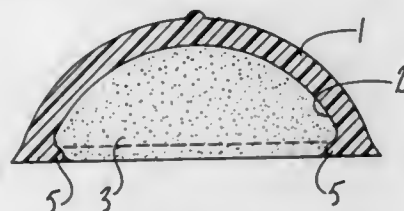
1. An implantable intraocular lens, comprising:  
 an optic presenting a peripheral edge;  
 a single, unitary, resilient eye fixation haptic having a pair of ends; and  
 means mounting said haptic to said optic for defining an elongated, continuous, arcuate, outwardly extending fixation stretch intermediate said ends, and first and second locations adjacent said optic periphery and in generally opposed relationship to one another where said haptic begins to diverge outwardly from the peripheral edge and assume a radius substantially greater than the radius of said optic,  
 said fixation stretch presenting a terminal, smoothly U-shaped bight, and first and second, spaced apart, arcuate legs respectively leading from said bight to a corresponding location, said first leg being substantially longer than said second leg, said legs being substantially parallel to one another throughout a majority of the length of said second leg,  
 said first leg extending around at least 180° and less than 360° of the periphery of said optic from said first location, said fixation stretch terminating short of a full 360° extension around said optic periphery.

4,681,587  
**MASTOPROSTHESIS**  
 Tertulin Eberl, Penzberg, Fed. Rep. of Germany, and Georg Weber-Unger, Kufstein, Austria, assignors to Anita-Spezialmiederfabrik Dr. Helbig & Co., Kufstein, Austria  
 Continuation of Ser. No. 600,483, Apr. 16, 1984, abandoned.  
 This application Nov. 4, 1985, Ser. No. 794,702  
 Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 8311438[U]

U.S. Cl. 623—7

Int. Cl.<sup>4</sup> A61F 2/12

10 Claims



6. A mastoprostheses for wearing within a brassiere by a person having mastectomy scar tissue located rearwardly of said brassiere, said mastoprostheses comprising,  
 a body consisting of an inner solid core of a soft synthetic material resembling in its consistency and specific weight the natural breast tissue and an outer film covering said core completely, said body having a front surface which is contoured to conform to the shape of a female breast and

a rear surface defining a cavity which is contoured to conform substantially to the contour of said front surface, said cavity having a rearwardly presented opening;  
 a single one piece pad member inserted into said cavity, said pad member being lighter in specific weight than said body, and having a front surface and a rear surface, said front surface of said pad member facing and substantially conforming to said rear surface of said body;  
 said rearwardly presented opening of said cavity being sufficiently large to permit said pad member to be inserted into and removed from said cavity;  
 said solid core being formed of silicon and said outer film being of polyurethane,  
 said body and pad member being releasably attached to one another;  
 said rearwardly presented opening of said cavity being substantially free of said silicone of said body so as to minimize interference of said silicone of said body with said scar tissue and so as to expose substantially said entire rear surface of said pad member rearwardly toward said scar tissue of said person through said rearwardly facing opening of said cavity.

4,681,588  
**BIOMATERIAL**  
 Vettivetpillai Ketharanathan, 35 Degraes Street, Parkville, Victoria, Australia  
 PCT No. PCT/AU84/00206, § 371 Date Jun. 17, 1985, § 102(e)  
 Date Jan. 17, 1985, PCT Pub. No. WO85/01651, PCT Pub. Date Apr. 25, 1985  
 PCT Filed Oct. 17, 1984, Ser. No. 760,745  
 Claims priority, application Australia, Oct. 20, 1983, PG1955  
 Int. Cl.<sup>4</sup> A61F 2/02, 2/06; A61B 19/00; A61L 17/00  
 U.S. Cl. 623—11 12 Claims



1. A biomaterial comprising a sheet of animal parietal pleura which has been subjected to glutaraldehyde tanning.

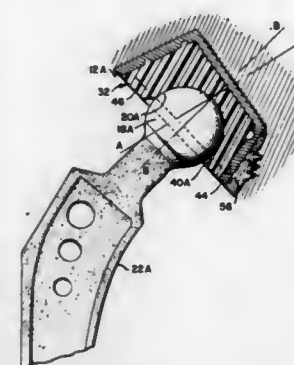
4,681,589  
**ADJUSTABLE ACETABULAR CUP PROSTHESIS AS PART OF A TOTAL CUP REPLACEMENT SYSTEM**  
 Raymond G. Tronzo, 255 Clarke Ave., Palm Beach, Fla. 33480  
 Filed Jun. 1, 1984, Ser. No. 616,100  
 Int. Cl.<sup>4</sup> A61F 2/34

U.S. Cl. 623—22

5 Claims

1. An acetabular cup for use with a femoral ball in a total hip joint prosthesis comprising:  
 a hollow shell having a shape of truncated cone, said cone tapering from an open face front and to a closed rear face and said shell having a central longitudinal cone axis therethrough wherein said rear face is substantially perpendicular to said cone axis and said front face subtends an acute angle with respect to the rear face; and thereby providing constant dynamic bony contact which prevents loosening of said shell in the joint; and  
 a bearing member having an outer surface complimentary to inner surface of said shell so as to be engageable therewith when inserted through said open face; said bearing mem-

ber having a socket formed therein for receiving said femoral ball, said socket defined by an axis therethrough being angularly displaced from said cone axis wherein the socket is disposed eccentrically with respect to the cone



axis whereby, when the cup is rotated about its longitudinal axis, the bearing member is moved through an angular arc to permit said bearing member to be placed in an optimum position for receiving said femoral ball.

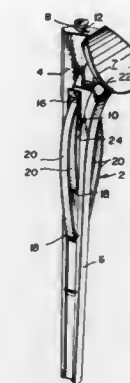
4,681,590  
**FEMORAL STEM PROSTHESIS**  
 John Tansey, 6019 Foxhall Farm Rd., Baltimore, Md. 21228  
 Filed Jun. 18, 1986, Ser. No. 875,628  
 Int. Cl.<sup>4</sup> A61F 2/32

U.S. Cl. 623—23

14 Claims

1. A femoral stem prosthesis comprising:  
 (a) an elongated stem portion adapted to be inserted into the

intramedullary canal of the femur and firmly attached to surrounding walls thereof;  
 (b) anchoring means associated with the stem, said anchoring means comprising at least one elongated resilient member which has a first end in operative engagement with the actuating means, and a second end attached to the stem;



(c) actuating means for causing outward bowing of the anchoring means into firm engagement with the surrounding walls of the canal, said actuating means comprising an actuator screw threadably mounted within a bore formed in the stem, a plunger slidably received within the bore with one end of the plunger in axial engagement with the actuator screw, and the other end of the plunger provided with a retaining collar adapted to receive the said first end of said at least one elongated resilient member.

# CHEMICAL

4,681,591

## PROCESS FOR PRODUCING AN ELECTROMAGNETIC RADIATION-SHIELDING, METALLIZED POLYESTER FIBER TEXTILE MATERIAL

Shinpei Okayasu, Ishikawa; Shinichi Uchikoshi, Kaga, and Atsuo Nobatake, Kanazawa, all of Japan, assignors to Takase Dyeing & Printing Works, Ltd., Osaka, Japan  
Continuation of Ser. No. 686,252, Dec. 26, 1984, abandoned.

This application May 22, 1986, Ser. No. 868,163

Claims priority, application Japan, Aug. 20, 1984, 59-171420  
Int. Cl.<sup>4</sup> D06M 5/02, 11/00

U.S. Cl. 8—115.68

4 Claims

1. A process for metallizing a textile material having a high surface or sheet resistivity of  $10^{-2}$  to 10 ohms and containing polyester fibers to produce a material to shield electronic devices from electromagnetic radiation interference, comprising the steps of:

pre-treating a textile material containing at least 15% by weight of polyester fibers with an aqueous solution of a caustic alkali to an extent that the weight of the polyester fibers is decreased by at least 10% based on the original weight of the polyester fibers for activating the surface of the polyester fibers to increase the amount of a metal coating which can be plated onto the polyester fibers for enhancing the bonding strength of the polyester fiber surfaces to the metal coating;

activation-treating the pre-treated textile material with a tin (II)-containing compound and with a palladium-containing compound;

non-electrolytically plating the activation-treated textile material in a plating liquid containing a compound of an electroconductive metal to be plated, an alkali and/or ammonia, and hydrazine as a reducing agent to form a plated metal coating thereon, said hydrazine being used as a reducing agent in the non-electrolytical plating liquid, the resultant metal coating having a high purity and an enhanced crystallinity of the metal crystals such that the resultant metallized textile material exhibits an enhanced electroconductivity; and

said electroconductive metal being selected from the group consisting of nickel, cobalt, chromium, and alloys of at least two of the above-mentioned metals, said pretreating step being effective for activating the surface of the polyester fibers for promoting the formation of the plated metal coating.

4,681,592

## PERACID AND BLEACH ACTIVATOR COMPOUNDS AND USE THEREOF IN CLEANING COMPOSITIONS

Frederick E. Hardy, Newcastle upon Tyne, and Barry T. Ingram, Whitley Bay, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 21, 1985, Ser. No. 747,468

Claims priority, application United Kingdom, Jun. 21, 1984, 8415909

Int. Cl.<sup>4</sup> D06L 3/06; C07C 69/00

U.S. Cl. 8—111

22 Claims

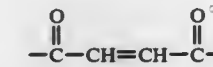
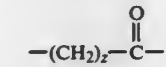
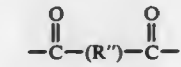
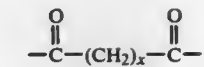
1. Peracids of the formula:



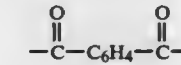
wherein

R is hydrocarbyl, selected from the group consisting of optionally substituted, linear and branched  $C_6$ - $C_{20}$  alkyl and alkenyl and  $C_6$ - $C_{20}$  alkyl-substituted aryl; or alkoxy-substituted hydrocarbyl;

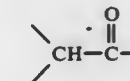
X is selected from the group consisting of O,  $SO_2$ ,  $N(R')$ ,  $P(R')$ ,  $(R')P \rightarrow O$  and  $(R')N \rightarrow O$ ; m is either 1 or 2; and wherein for m=1, A is selected from the group consisting of



and



where x is an integer from 0 to 4; z is an integer from 0 to 2; (R') is alkyl and R'' is branched-chained alkylene and wherein for m=2, A is



12. A method of cleaning fabrics or surfaces comprising contacting said fabrics or surfaces with a peracid according to claim 1.

4,681,593

## PROCESS AND COMPOSITIONS FOR PROTECTING KERATINOUS MATERIAL FROM ATTACK BY PESTS THAT FEED ON KERATIN, AND NOVEL ESTERS

Saleem Farooq, Arisdorf, Switzerland; Dieter Reinehr, Kandern, Fed. Rep. of Germany, and Werner Schmid, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 6, 1986, Ser. No. 816,462

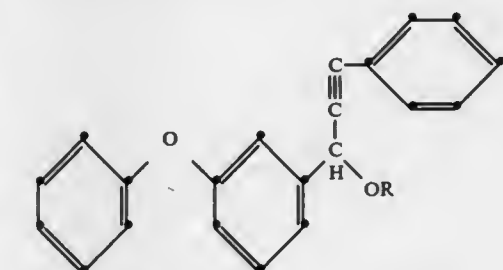
Claims priority, application Switzerland, Jan. 14, 1985, 150/85

Int. Cl.<sup>4</sup> D06M 3/02; C07C 69/74

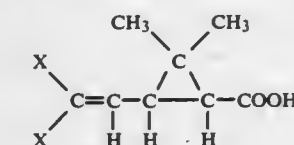
U.S. Cl. 8—128 R

8 Claims

1. A process for providing keratinous material with a protective finish against attack by insects that feed on keratin, which process comprises treating the material to be protected with an ester of the formula



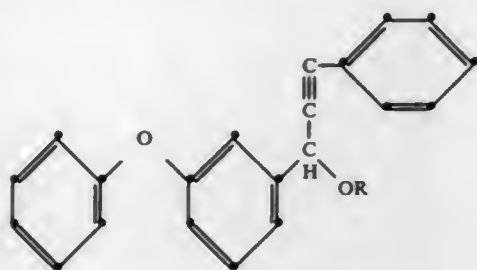
wherein R is the radical of an acid of the formula



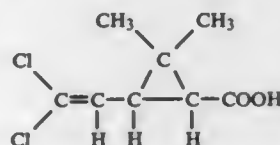


in which X is a C<sub>1</sub>-C<sub>4</sub>alkyl group or halogen or one of the two substituents X is a phenyl group, or R is the radical of 4-chlorophenylisopropylacetic acid.

4. An ester of the formula



wherein R is the radical of an acid of the formula



or of 4-chlorophenylisopropylacetic acid.

4,681,594

# PROCESS FOR DISPERSE DYEING DRY-SPUN ATACTIC POLYVINYL CHLORIDE-BASED FILAMENTS AND FIBRES BEFORE DRAWING

Pierre Chion, Bar-le-Duc, and Jacques Menault, Charbonnières-les-Bains, both of France, assignors to Rhovyl, Neuilly-sur-Seine, France

Filed Mar. 11, 1986, Ser. No. 838,352

Claims priority, application France, Mar. 26, 1985, 85 04619  
Int. Cl.<sup>4</sup> D06B 3/04; D06P 1/16

U.S. Cl. 8-489

5 Claims

1. In a process for continuously dyeing filaments based on atactic polyvinyl chloride, which are obtained by dry spinning, drawn in at least one step, oiled and shrunk, the improvement comprising impregnating the undrawn filaments in an impregnating bath containing a dyestuff maintained at a temperature of between 60° and 90° C. and containing at least one plas-tosoluble dye, while the filaments have a density of between 1.3 and 1.4 g/cm<sup>3</sup>, fixing continuously in the presence of steam, under pressure at a temperature of between 100° and 120° C. for 2 to 20 seconds, and thereafter maintaining the filaments under tension between 0.065 g/dtex and 0.0150 g/dtex while they are fixed in the presence of steam, under pressure, at a temperature of between 100° and 130° C. for 1 to 20 seconds.

4,681,595

# PROCESS FOR DISPERSE DYEING DRY-SPUN ATACTIC POLYVINYL CHLORIDE-BASED FILAMENTS AND FIBRES AFTER DRAWING THE WET TOW

Pierre Chion, Bar-le-Duc, and Jacques Menault, Charbonnières-les-Bains, both of France, assignors to Rhovyl, Neuilly-sur-Seine, France

Filed Mar. 25, 1986, Ser. No. 843,603

Claims priority, application France, Mar. 26, 1985, 85 04618  
Int. Cl.<sup>4</sup> D06B 3/04; D06P 1/16; D01F 6/10

U.S. Cl. 8-489

2 Claims

1. In a process for continuously dyeing filaments based on atactic polyvinyl chloride, which filaments are obtained by dry spinning, then drawing in at least one phase, oiled, and shrunk in an aqueous medium, the improvement comprising impregnating the filaments, after drawing, with a dyestuff maintained at a temperature of between 60° and 90° C. and containing at least one plas-tosoluble dye, the filaments having, at the time of the impregnation, a density of between 1.3 and 1.4 g/cm<sup>3</sup>, with

the filaments formed into a tow then containing from about 10 to about 30% by weight of water, the filaments being subjected to a stress of 0.05 to 0.35 g/tex of the time of the impregnation, and thereafter stabilizing the filaments under tension, in the presence of steam, under pressure, at a temperature of between 100° and 130° C. for 2 to 20 seconds.

4,681,596

# PROCESS FOR DYEING NATURAL OR SYNTHETIC POLYAMIDE FIBRE MATERIALS WITH 1:1 METAL COMPLEX DYES OR MIXTURES OF DYES WITH FLUORIDE, FLUOROSILICATE OR FLUOROBORATE

Gerhard Back, Lörrach, Fed. Rep. of Germany, and Walter Mosimann, Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 737,112, May 23, 1985, Pat. No. 4,623,358. This application May 9, 1986, Ser. No. 861,378

Claims priority, application Switzerland, May 30, 1984, 2667/84; May 24, 1985, 2219/85

Int. Cl.<sup>4</sup> C09B 45/02, 67/24; D06P 1/67, 3/06

U.S. Cl. 8-620

25 Claims

1. A process for dyeing natural or synthetic polyamide fibre material from an aqueous liquor with mixtures of dyes, in the presence of an alkali metal salt or an ammonium salt and optionally in the presence of an assistant, which process comprises dyeing said fibre material with a mixture containing at least one 1:1 metal complex dye which contains sulfo groups and at least one metal-free dye which contains sulfo groups, in the presence of an alkali metal or ammonium fluoride, an alkali metal or ammonium fluorosilicate, an alkali metal or ammonium fluoroborate, an alkali metal or ammonium fluorozirconate or an alkali metal or ammonium fluorosulfonate, at a pH value in the range from 3 to 7.

4,681,597

# METHOD FOR AGGLOMERATING POWDERED COAL BY COMPACTION

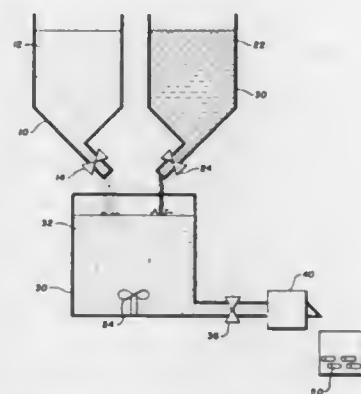
Larry D. Byrne, and Barbara J. Byrne, both of R.R. 1, Belle Fourche, S. Dak. 57717

Filed Jun. 15, 1981, Ser. No. 273,603

Int. Cl.<sup>4</sup> C10L 5/10

U.S. Cl. 44-15 R

10 Claims



1. A method for preparing a powdered carboniferous composition and forming this composition into solid product shapes suitable for handling, transporting and burning, comprising the steps of:

(a) mixing (1) powdered carboniferous material with (2) an amount of surfactant effective for wetting the powdered carboniferous material with water but for which no appreciable binding occurs between the surfactant and carboniferous material upon compaction and (3) an amount of water effective to bring the moisture content of the resul-

tant mixture within the range of about 32 to 35% by weight;

(b) working the mixture to obtain a homogeneous composition comprising a uniform dispersion of the water, surfactant, and powdered carboniferous material; and  
(c) compacting the resultant homogeneous composition into the desired solid product shape by extruding the homogeneous composition through a ring pelletizing extruder.

4,681,598

# METHOD OF REMOVING PYRITIC SULFUR FROM COAL

Thomas M. Godbold, and William R. Baker, both of Nashville, Tenn., assignors to Vanderbilt University, Nashville, Tenn.

Filed Dec. 16, 1985, Ser. No. 809,922

Int. Cl.<sup>4</sup> C10L 9/08

U.S. Cl. 44-1 SR

9 Claims

1. The method of removing sulfur from coal, comprising:  
(a) subjecting subdivided pyritic sulfur-containing coal to heat decomposition with evolution of gas containing sulfur compounds;  
(b) progressively increasing the temperature of said decomposition from a temperature range below 375° C. to a temperature range above 550° C.;  
(c) separately collecting gas evolved within the temperature range from 375° to 550° C. which separately collected gas contains at least 60% by weight of the total decomposable pyritic sulfur in not over 40% by volume of the total evolvable gas; and  
(d) continuing said heating at temperatures above 550° C. without combining the thus-evolved gas with said separately collected gas.

4,681,599

# GASSIFICATION OF CARBON CONTAINING WASTE, REFUSE OR THE LIKE

Bernt Obkircher, Aufham, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

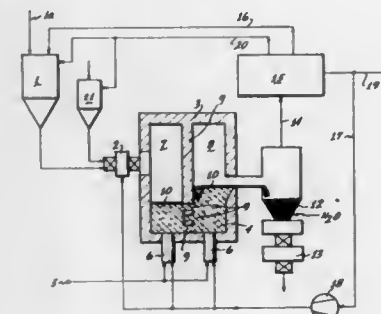
Filed Sep. 16, 1985, Ser. No. 776,214

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1985, 3434004

Int. Cl.<sup>4</sup> C10J 3/48, 3/78

U.S. Cl. 48-92

15 Claims



1. An apparatus for the gassification of carbon containing refuse, or waste or the like, comprising:

reactor means including a top and bottom, and a first reaction chamber, and a second reaction chamber located next to each other, there being a vertical partition means between said reaction chambers extending from the reactor top down to the reactor bottom, said partition having in its lower part a plurality of relatively small openings which increase in total cross-sectional area in a downward direction the chambers containing a liquid bath having a temperature in excess of 1000 degrees centigrade;

means for introducing waste etc. into the upper portion of the first chamber for dropping into the liquid bath;  
means for introducing from a lower level of at least one of said chambers an oxidizing medium, the liquid bath level in the second chamber is and remains above said openings, said reactor constructed so that developed pressure in the first chamber forces liquid in the first chamber into a lower level than the level in said second chamber so as to obtain a liquid level difference in the two chambers; and  
means for extracting slag and gas from the second chamber.

4,681,600

# CUTTING TOOL FABRICATION PROCESS

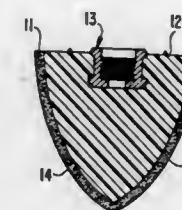
Lawrence J. Rhoades; William D. Jenkins, both of Pittsburgh, and David D. Pertle, Irwin, all of Pa., assignors to Extrude Hone Corporation, Irwin, Pa.

Continuation of Ser. No. 647,532, Sep. 5, 1984. This application Sep. 16, 1985, Ser. No. 776,652

Int. Cl.<sup>4</sup> B24D 3/00

U.S. Cl. 51-293

13 Claims



1. A method of making an abrasive tool having working surfaces comprising the steps of sequentially;

A. forming a negative image of the tool in a mold,  
B. placing a coating composition in the mold at regions that will become the working surfaces of the final tool,  
C. introducing into the mold a particulate abrasive and a first substrate which is flowable and settable, the abrasive and first substrate being provided,  
i. in proportional amounts wherein the first substrate at least partially impregnates the interstices of the particulate abrasive, and  
ii. in total amounts wherein the mixture of the first substrate and the particulate abrasive incompletely fills the mold,  
D. applying sufficient centrifugal force and/or vibratory action to the mold to cause,  
i. the first substrate to at least partially impregnate said interstices, and conform the first substrate-abrasive mixture to the shape of the mold, thus forming a first substrateabrasive shell, and  
ii. the abrasive to migrate through the first substrate into the coating composition, thus causing abrasive particles to be partially within said first substrate and partially within said coating composition,  
E. at least partially filling the mold with a second substrate whereby forming in situ a support for said shell in non-working regions of the final abrasive tool, whereby each abrasive grain is partially bound on a working surface of the tool by the binding composition and partially by the first substrate.

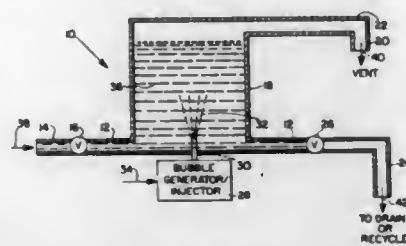
# 4,681,601 BUBBLE INJECTION DISSOLVED GAS MEASUREMENT METHOD AND APPARATUS

Donald A. Foster, Lakeville, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1983, Ser. No. 566,230  
Int. Cl.<sup>4</sup> B01D 19/00

U.S. Cl. 55—18

12 Claims



1. Apparatus for rapidly and accurately measuring the percentage of dissolved gas in a liquid, said apparatus comprising: means for sampling a portion of said liquid; means for generating a multiplicity of gas bubbles of equal diameter and of the same type as the dissolved gas and for introducing said bubbles into said liquid sample; and means for determining the length of time gas bubbles survive within said liquid sample from the time of initial introduction of a bubble until it is absorbed by said liquid sample to thereby determine the percentage of dissolved gas in said liquid.

8. Apparatus for measuring the percentage of dissolved gas in a liquid, said apparatus comprising: a conduit having an inlet and an outlet; means for directing a sample of said liquid through said conduit at a constant flow rate; means for injecting a stream of gas bubbles of given size and of the same type of gas as the dissolved gas into said sample at a given point along said conduit; and means downstream of said point of injection for determining the termination point of said stream of bubbles along said conduit and for providing a measure of the length between said injection point and termination point whereby in accordance with said constant flow rate the survival time of said bubbles and consequently the percentage of dissolved gas can be determined.

# 4,681,602 INTEGRATED SYSTEM FOR GENERATING INERT GAS AND BREATHING GAS ON AIRCRAFT

Gary S. Glenna, Seattle; Vinod K. Rajpaul, Bellevue, and Roger F. Yurczyk, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 24, 1984, Ser. No. 685,397  
Int. Cl.<sup>4</sup> B01D 53/04, 53/22

U.S. Cl. 55—21

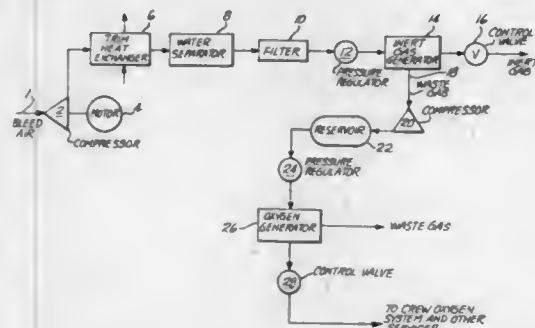
8 Claims

1. In an aircraft, a method of generating oxygen enriched gas and combustibly inert gas from bleed air, comprising: providing first and second gas separation modules; supplying bleed air having an oxygen component and a nitrogen component to the first module; in the first module, separating said bleed air into a first product gas enriched in one of said components, and a first waste gas enriched in the other of said components; transporting the first waste gas from the first module to the second module;

boosting the pressure of the first waste gas, after it exits the first module and before it enters the second module, to a working level required by the second module; and allowing the first waste gas to exit the first module at a relatively low pressure; and in the second module, separating the first waste gas into a

second product gas further enriched in said other of said components, and a second waste gas.

5. In an aircraft, a system of generating oxygen enriched gas and combustibly inert gas from bleed air, comprising: supply means for supplying bleed air having an oxygen component and a nitrogen component to the system; a first gas separation module for receiving the bleed air supplied by the supply means and separating said bleed air into a first product gas enriched in one of said components, and a first waste gas enriched in the other of said components; said module having an outlet; conduit means for transporting the first waste gas out of the first module through said outlet;



a second gas separation module for receiving the first waste gas from the conduit means and separating said waste gas into a second product gas further enriched in said other of said components, and a second waste gas; said second module having an inlet through which it receives the first waste gas; and pressure control means for creating a pressure differential between the outlet of the first module and the inlet of the second module, to boost the pressure at said inlet to a working level required by the second module while allowing the pressure at said outlet to remain at a relatively low level.

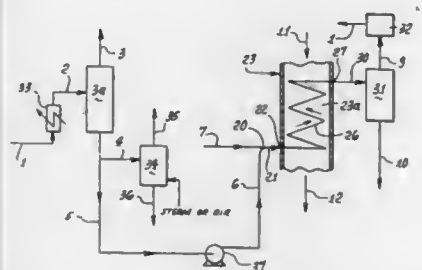
# 4,681,603 FEED GAS SATURATION SYSTEM FOR STEAM REFORMING PLANTS

Harvey D. Spangler, Fort Dodge, Iowa, and Kenneth V. Lamb, Monrovia, Calif., assignors to Kinetics Technology International Corporation, Monrovia, Calif. and Farmland Industries, Corporation, Kansas City, Mo.

Filed Feb. 13, 1986, Ser. No. 829,020  
Int. Cl.<sup>4</sup> B01D 47/06

U.S. Cl. 55—27

16 Claims



1. The method of recovering low level heat from a low or medium temperature first fluid stream, in conjunction with operation of a process employing input hydrocarbon feed gas and providing process effluent separable into process condensate and dry gas, the steps that include: maximizing heat recovery from low level heat sources in systems having only one

temperature difference, by saturating hydrocarbon feedstock with process condensate, by

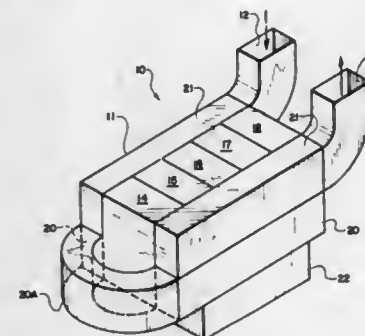
- (a) mixing said condensate with said input feed gas and flowing the resultant two-phase mixture through a heat exchanger;
  - (b) flowing said low or medium temperature fluid stream through said heat exchanger and transferring heat from said steam through a wall to said mixture, thereby to vaporize process condensate and to saturate the hydrocarbon feed gas in the mixture, said low or medium temperature fluid stream consisting of a flue gas at a temperature or temperatures between 350° and 800° F.;
  - (c) and subsequently separating the saturated hydrocarbon feed gas from excess liquid condensate, whereby the separated saturated feed gas may be employed in the process, and the excess condensate may be recycled for mixing with said input feed gas;
  - (d) and including said step of separating said process effluent, which consists of synthesis gas from a steam reforming plant, into dry synthesis gas and aqueous condensate, and boosting the pressure of said condensate for said mixing with input feed gas;
  - (e) said (a) step mixing being carried out by providing multiple nozzles, and injecting said condensate through said nozzles to pass into multiple streams of said input feed gas.
11. The invention of one of claims 1 or 10 wherein said process condensate comprises boiler feedwater.

# 4,681,604 MULTISTAGE FLUID FILTER AND METHOD Kurt W. Niederer, 3021 Mountainbrook Rd., Charlotte, N.C. 28210

Filed Apr. 29, 1986, Ser. No. 856,964  
Int. Cl.<sup>4</sup> B01D 47/00, 50/00

U.S. Cl. 55—96

16 Claims



1. A multistage fluid filter for filtering entrained particulate matter from a moving fluid stream at substantially constant fluid pressure and filtration efficiency during continuous on-line operation, said filter comprising:

- (a) a housing having a fluid inlet and a fluid outlet;
- (b) first, second and third stationary filtration chambers positioned in said housing, each having a filtration medium therein from an upstream side to a downstream side thereof;
- (c) first conduit means for selectably interconnecting any two chambers of said first, second and third filtration chambers in series for fluid flow from the downstream side of one of the two chambers defined as a first filter stage for accumulating particulate matter on the filtration medium thereof to the upstream side of the other of the two chambers defined as a second filter stage having a previously accumulated layer of particulate matter on the filtration medium thereof;
- (d) second conduit means for selectably interconnecting the fluid inlet in the housing with the upstream side of the filtration chamber defined as the first filter stage, the fluid outlet in the housing with the downstream side of the

filtration chamber defined as the second filter stage and for interrupting fluid flow into and out of the third one of said first, second and third filtration chambers to define a cleaning stage therein;

- (e) cleaning means for cleaning particulate matter from the filter medium in the cleaning stage while fluid flow herewith is interrupted; and
- (f) sequencing means for selectably operating said first and second conduit means to, after cleaning particulate matter from the filter medium in the cleaning stage and, upon an increase in resistance to fluid flow through said second filter stage caused by an increase in thickness and/or density in the layer of particulate matter, redefine the cleaning stage as the first filter stage, said first filter stage as said second filter stage and said second filter stage as said cleaning stage, successively to permit the filter to operate continuously after a filter layer is accumulated on the filter medium in any of the first, second or third filtration chambers.

15. A method for filtering entrained particulate matter from a moving fluid stream at substantially constant fluid pressure and filtration efficiency during continuous on-line operation, said method comprising the steps of:

- (a) providing a housing having a fluid inlet and a fluid outlet, first, second and third filtration chambers positioned in said housing, a filtration medium positioned in each filtration chamber from an upstream side to a downstream side thereof, first conduit means for selectably interconnecting any two chambers of the first, second and third filtration chambers in series for fluid flow from the downstream side of one of the two chambers defined as a first filter stage to the upstream side of the other of the two chambers defined as a second filter stage, second conduit means for selectably interconnecting the fluid inlet in the housing with the upstream side of the filtration chamber defined as the first filter stage, the fluid outlet of the housing with the downstream side of the filtration chamber defined as the second filter stage, and for interrupting fluid flow into and out of the third one of said first, second and third filtration chambers to define a cleaning stage therein and cleaning means for cleaning particulate matter from the filter medium in the cleaning stage while fluid flow therewith is interrupted;
- (b) accumulating particulate matter on the clean filter medium in the first filter stage;
- (c) redefining the cleaning stage as the first filter stage, the first filter stage as the second stage and said second filter stage as said cleaning stage, successively, upon an increase in resistance to fluid flow through said second filter stage caused by an increase in thickness and/or density in the layer of the particulate matter;
- (d) interrupting fluid flow to the cleaning stage; and
- (e) cleaning particulate matter from the filter medium in the cleaning stage while the fluid flow therewith is interrupted.

# 4,681,605 ANISOTROPIC MEMBRANES FOR GAS SEPARATION Arye Z. Gollan, Newton, Mass., assignor to A/G Technology Corporation, Needham, Mass.

Filed Jun. 27, 1985, Ser. No. 749,574  
Int. Cl.<sup>4</sup> B01D 53/22

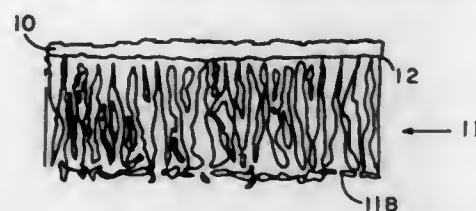
U.S. Cl. 55—158

27 Claims

1. A method of making anisotropic membranes for gas separation which method includes the steps of, forming a casting solution having a base polymer of ethyl cellulose with at least substantially 2.2 ethoxyl groups per anhydroglucose unit and a nonsolvent compatible with said base polymer in a solvent system including at least one solvent having relatively high volatility with a low boiling point below 100° C., casting a membrane precursor with said casting solution, exposing said cast membrane precursor to air for a short time



interval significantly less than a minute to cause sufficient solvent loss to form an integral skin layer, and then immersing the cast membrane precursor into a leaching agent that dissolves said nonsolvent but not said



base polymer sufficiently long to dissolve said nonsolvent and form an anisotropic membrane with pores and an integral, essentially imperfection-free separating skin layer comprising said ethyl cellulose, and then drying said membrane.

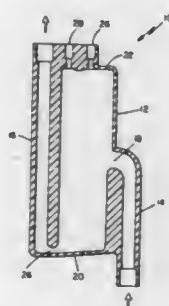
#### 4,681,606 DRIP CHAMBER

Jack C. Swan, Jr., Boulder, Colo., and Paolo Poggioli, Mirandola, Italy, assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Feb. 26, 1986, Ser. No. 833,892  
Int. Cl.<sup>4</sup> B01D 19/00

U.S. Cl. 55-193

6 Claims



1. An in-line flow-through chamber for conveying blood comprising an elongated container having sides, a top and a bottom for mounting with its longitudinal axis in a vertical orientation, an inflow tube formed integrally with said container, extending upward vertically along a side of said container and entering said container through a chamber inlet at a flow direction transverse to said longitudinal axis and at a location spaced from the bottom of said chamber, and an outflow tube formed integrally with said chamber, extending vertically along a side of said container so that tubes attached to said inflow tube and said outflow tube are in line with each other, said outflow tube having its entrance at the bottom of said container and extending upward, said container providing a storage volume with uninhibited flow from said inflow tube to said outflow tube, said container including a port at the top of said container for communication with a pressure monitor, whereby said port is at a position spaced from the direction of flow of blood into said container to avoid directing spurts of blood to said port.

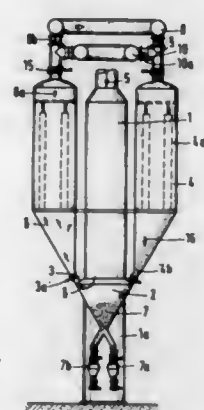
#### 4,681,607 DUST REMOVAL

Rolf Bollerhey, Kempen, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany  
Filed Jun. 13, 1985, Ser. No. 744,505  
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422093

U.S. Cl. 55-284

Int. Cl.<sup>4</sup> B01D 46/04

6 Claims



1. Dedusting equipment using a dust pre-precipitator and a plurality of filters with dry filter elements and being arranged around the pre-precipitator comprising: said pre-precipitator having a top inlet for receiving raw gas and being disposed, arranged and constructed for having said cleaning raw gas flowing down and emerging from the pre-dust precipitator at a bottom thereof, there being a dust hopper provided at the bottom of the dust pre-precipitator for collecting dust particles having been removed from the raw gas in the dust pre-precipitator; the filters of the plurality are arranged around the dust pre-precipitator each having an inlet at the bottom and an outlet at the respective top; means for connecting the dust pre-precipitator to the filters of the plurality at respective inlets thereof, so as to obtain a reversal of gas flow as it flows out of the bottom of the pre-precipitator through the dust hopper and into the filters through the respective inlets thereof; means connected to the filter tops for extracting clean gas from the top of said filters; and means for selectively charging cleaning gas into individual ones of said filters and also from the tops thereof.

#### 4,681,608 SILENCING FILTER

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan  
Continuation of Ser. No. 647,427, Sep. 5, 1984, abandoned. This application Apr. 7, 1986, Ser. No. 849,041  
Claims priority, application Japan, Sep. 9, 1983, 58-139809  
Int. Cl.<sup>4</sup> B01D 27/08

U.S. Cl. 55-276

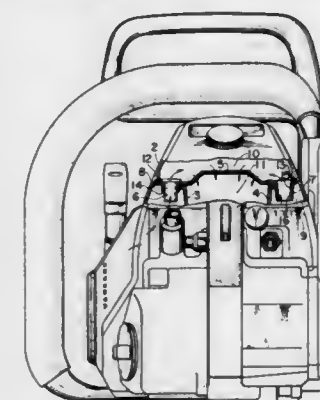
7 Claims

1. A power driven machine comprising a machine frame including an exterior wall and a pair of upwardly extending filter support walls (3,4) defining therebetween a pair of air inlet chambers (8,9) and a central clean-air chamber (11) leading to an internal combustion engine; a generally horizontal filter element extending across said machine and supported by said upwardly extending filter support walls, said filter element defining an upper air chamber (10) overlying the central clean-air and air inlet chambers, and said filter element including a porous air-filtering section between the upper air chamber and the clean-air chamber; and an insertable and replaceable elongated silencing pipe

(6) providing an air passageway between the air inlet chambers and the upper air chamber, said silencing pipe having an upper end terminating at approximately the level of said filter element so that said silencing pipe does not extend substantially into the upper air chamber; whereby air flowing in through an air inlet port is caused to flow upwardly through the air inlet chambers and upwardly through the silencing pipes into the upper air chamber and then downwardly through the porous air-filtering section of said filter element into the central clean-air chamber to the internal combustion engine.

7. A power driven machine comprising a machine frame including an exterior wall and a pair of upwardly extending filter support walls defining therebetween a pair of air inlet chambers and a central clean-air chamber leading to an internal combustion engine;

a generally horizontal filter element extending across said machine and supported by said upwardly extending filter support walls said filter element defining an upper air



chamber overlying the central clean-air chamber and air inlet chambers and said filter element including a porous air-filtering section between the upper air chamber and the clean-air chamber and also including extending portions between the upper air chamber and the inlet chambers; and elongated silencing pipes integral with said extended portions of said filter element, said elongated silencing pipes each having an upper end terminating at approximately the level of said filter element and a lower end extending downwardly into one of said air inlet chambers, said elongated silencing pipes providing air passage ways between the air inlet chambers and the upper air chamber; whereby air flowing in through an air inlet port is caused to flow upwardly through the air inlet chambers and upwardly through the silencing pipes into the upper air chamber and then downwardly through the porous air-filtering section of said filter element into the central clean-air chamber to the internal combustion engine.

#### 4,681,609 TOP LOADING AND INVERTED BACKFLUSHED AIR FILTER SYSTEMS

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

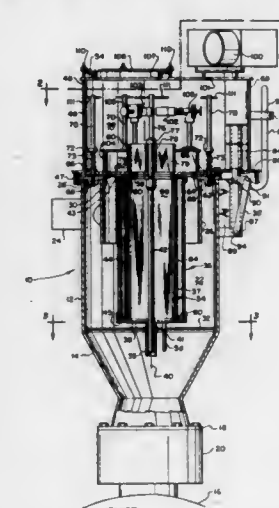
Continuation-in-part of Ser. No. 549,924, Nov. 7, 1983, abandoned. This application Oct. 9, 1984, Ser. No. 657,712  
Int. Cl.<sup>4</sup> B01D 46/04, 29/38

U.S. Cl. 55-302

32 Claims

1. Apparatus for separating particulate material from an air flow stream comprising: a housing including a first housing section forming a material separation chamber and second housing section forming a clean air chamber; an inlet conduit in communication with said housing for

conducting air laden with particulate material into said separation chamber; a transverse wall of said first housing section, defining part of said separation chamber; means forming a bore opening through said transverse wall of said first housing section into said housing and of sufficient diameter to permit insertion and removal of a barrier type filter element with respect to said separation chamber; a barrier type filter element; a transverse wall of said second housing section defining part of said clean air chamber and forming an opening for conducting filtered air from said filter element to said clean air chamber, said transverse wall of said second



housing section including means for sealingly supporting said filter element in said separation chamber in such a way that said filter element is insertable in and removable from said bore and with respect to said transverse wall of said first housing section without requiring entry into said separation chamber; means for sealing between said first and second housing sections; and means for releasably securing said second housing section to said first housing section whereby said second housing section may be moved clear of said bore in said transverse wall of said first housing section sufficiently to permit removal of said filter element from said first housing section.

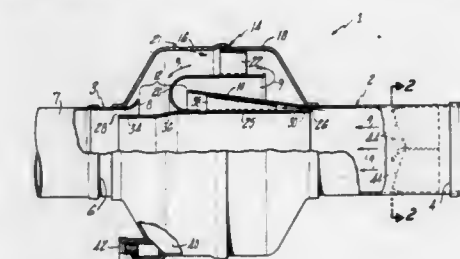
#### 4,681,610 HIGH PERFORMANCE WATER COLLECTOR

John L. Warner, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 13, 1986, Ser. No. 829,049  
Int. Cl.<sup>4</sup> B01D 45/12

U.S. Cl. 55-394

8 Claims



1. Apparatus, adapted for mounting in a duct having an upstream portion and a downstream portion, for drying a

moisture-laden portion of an airstream flowing through said duct, said apparatus being adapted for use with centrifugal separation means for concentrating said moisture-laden portion along walls of said duct, said apparatus comprising:

- an inlet conduit portion attached to said upstream portion of said duct said airstream passing through said inlet conduit portion from said upstream portion,
- an outlet conduit portion attached to said downstream portion of said duct said airstream passing through said outlet conduit portion from said inlet conduit portion to said downstream portion,
- a diffuser chamber means for drying said moisture-laden portion, said diffuser means surrounding and attached to a portion of said inlet conduit portion and a portion of said outlet conduit portion said diffuser chamber means being in communication with said airstream, and
- guide means, extending into said diffuser chamber means and extending into said airstream, said guide means passing said moisture-laden portion from said airstream into said diffuser chamber means, said guide means guiding said moisture-laden portion along a reversing flow path within said diffuser chamber to remove moisture from said moisture-laden portion and said guide means passing a dried portion from said diffuser chamber means to said outlet portion.

4,681,611

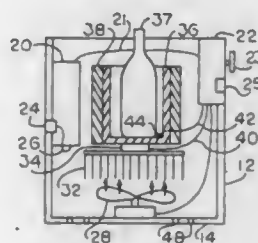
## WINE TEMPERATURE CONTROLLER

Hal J. Bohner, 582 Farallon Ave., Pacifica, Calif. 94044  
Continuation-in-part of Ser. No. 748,705, Jun. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 604,526, Apr. 27, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 853,476

Int. Cl.<sup>4</sup> F25B 21/02

U.S. Cl. 62—3

11 Claims



1. A process for maintaining a bottle of wine at substantially a predetermined temperature while the wine is being served, utilizing a portable device capable of maintaining the bottle of wine at substantially a predetermined temperature, the device including heat conduction means which can be located in heat transfer relationship with the bottle, the process comprising:

- a. cooling the bottle of wine using a non-portable system;
- b. thereafter removing the bottle of wine from the non-portable system and transferring the bottle to the portable device located near the place at which the wine is to be served so that the bottle is in heat transfer relationship with the heat conduction means;
- c. maintaining the heat conduction means at substantially the predetermined temperature;
- d. measuring a temperature corresponding to the temperature of the wine at a time no less than a predetermined time after the bottle has been transferred to the portable cooling device;
- e. determining whether the measured temperature is greater than a second predetermined value;
- f. if the measured temperature is greater than the second value, allowing the bottle to remain in heat transfer relationship with the heat conduction means;
- g. removing the bottle from the portable device to pour wine into a glass after the measured temperature has reached the second predetermined value; and,
- h. returning the bottle to the portable device when the wine

is not being poured so that the wine is maintained at substantially the predetermined temperature.

4,681,612

## PROCESS FOR THE SEPARATION OF LANDFILL GAS

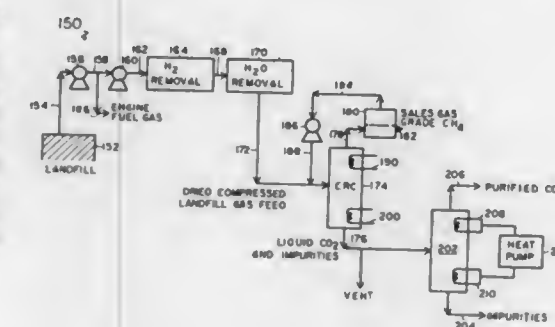
John V. O'Brien, Shrewsbury, Mass.; Arthur S. Holmes, La-Crosse, Wis., and Richard B. Hopewell, Medfield, Mass., assignors to Koch Process Systems, Inc., Westboro, Mass.

Continuation-in-part of Ser. No. 615,577, May 31, 1984, abandoned. This application Jan. 24, 1986, Ser. No. 822,311

Int. Cl.<sup>4</sup> F25J 3/06

U.S. Cl. 62—23

31 Claims



1. A recycle process for the separation of a landfill feed gas stream, having a high concentration of methane and carbon dioxide and containing undesirable trace gas impurities, into a fuel- or sales-grade gas methane product stream and a liquid carbon dioxide product stream, which process comprises:

- (a) introducing an essentially hydrogen-free, dried, compressed, landfill feed gas stream into a cryogenic distillation column;
- (b) withdrawing a methane-enriched overhead product stream from said distillation column;
- (c) withdrawing an enriched liquid carbon dioxide bottom product stream, containing a major amount of the undesirable impurities, from said distillation column;
- (d) introducing the methane-enriched overhead product stream into a gas-permeation membrane apparatus;
- (e) withdrawing from said membrane apparatus a sales- or fuel-grade gas methane product stream;
- (f) withdrawing from said membrane apparatus a carbon-dioxide-enriched gas permeate stream;
- (g) compressing the carbon-dioxide-enriched gas permeate stream; and
- (h) recycling the compressed permeate stream for use in the process.

4,681,613

## SLAG FURNACE MELT FLOW CONTROL VALVE

William F. Porter, Lake Zurich, Ill., assignor to USG Acoustical Products Company, Chicago, Ill.

Filed Mar. 21, 1986, Ser. No. 842,525

Int. Cl.<sup>4</sup> C03B 37/06

U.S. Cl. 65—1

10 Claims

1. In an apparatus including a furnace having at least one wall and adapted to heat mineral slag to a temperature above its melting point and to discharge a molten stream of said slag onto an apparatus for fiberization of the slag into mineral wool, the improvement which comprises a valve assembly including retaining bracket means affixed to said wall, and a valve mounted in said bracket means, said valve comprising a first valve member formed of a metal plate fixedly mounted in said bracket means, and a second valve member formed of a metal plate slidably mounted in said bracket means, each of said valve members having an aperture provided therein for passing molten slag, the apertures of said first and second valve members being juxtaposed in the open condition of said valve

4,681,615

## SILICA GLASS FORMATION PROCESS

Motoyuki Toki; Sadao Kanbe; Satoru Miyashita, and Tetsuhiko Takeuchi, all of Suwa, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP83/00450, § 371 Date Aug. 20, 1984, § 102(e) Date Aug. 20, 1984, PCT Pub. No. WO84/02519, PCT Pub. Date Jul. 5, 1984

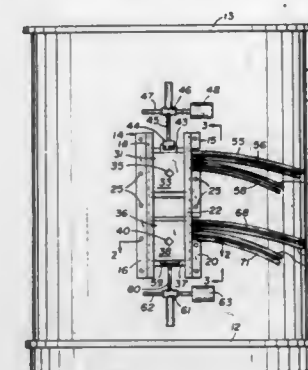
PCT Filed Dec. 22, 1983, Ser. No. 642,606

Claims priority, application Japan, Dec. 23, 1982, 57-228198; Sep. 16, 1983, 58-170643; Sep. 16, 1983, 58-170644; Dec. 16, 1983, 58-237577

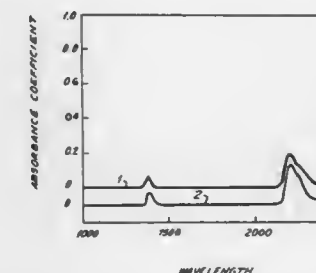
Int. Cl.<sup>4</sup> C03B 19/06

U.S. Cl. 65—18.1

21 Claims



ing water, and duct means connected thereto for transporting water to and from the internal channels of said valve members, and power-operated means for moving said second movable valve member between open and closed position, and to any intermediate position.



- 1. A process for forming a monolithic silica glass article, comprising:
  - hydrolyzing a silicon alkoxide in solution to form a hydrolyzed solution;
  - adding fumed silica to the hydrolyzed solution in an amount between about 0.2 to 5 mols of silica per mol of silicon alkoxide to form a sol solution;
  - gelling the sol solution to form a gel;
  - drying the gel to a dry gel; and
  - sintering the dry gel at a temperature effective to form a glass in order to form a large monolithic silica glass article without cracking.

4,681,616

## GLASS SHEET TEMPERING METHOD AND FURNACE

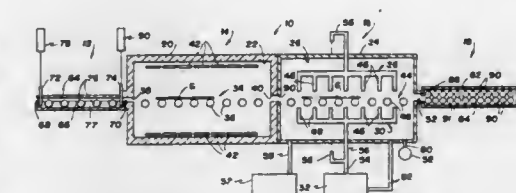
Harold A. McMaster, Woodville, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Division of Ser. No. 754,572, Jul. 15, 1985, Pat. No. 4,620,864, which is a continuation-in-part of Ser. No. 633,637, Jul. 23, 1984, abandoned. This application May 15, 1986, Ser. No. 863,327

Int. Cl.<sup>4</sup> C03B 27/04

U.S. Cl. 65—114

13 Claims



4,681,614

## METHOD OF MANUFACTURING GLASS BODIES

Rolf Clasen, and Heinz Scholz, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Mar. 13, 1986, Ser. No. 839,250

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511439

Int. Cl.<sup>4</sup> C03B 37/016

U.S. Cl. 65—18.1

5 Claims

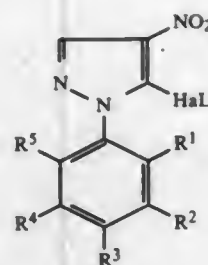
1. In a method of manufacturing glass bodies in which a starting material for the glass body, in the form of microdispersed SiO<sub>2</sub> particles, is used to form an open-pore green body, this green body is subjected to a purification process treatment with a purifying gas reactible with impurities present in the green body, the improvement wherein the green body to be purified is positioned in a sealable container, the container containing said green body is flushed with a purification gas and is then sealed, the green body is heated to a temperature of 600°-900° C. while in said container, the container is evacuated to remove said purification gas and gaseous reaction products from said container and repeating said steps of flushing said green body with a purification gas, heating said body while in contact with said purification gas and evacuating said purification gas and gaseous reaction products from said container are repeated the number of times necessary to provide the green body with a sufficiently small concentration of impurities throughout its entire cross section.

1. A glass sheet furnace for use in a glass sheet processing system, said furnace comprising: an enclosed heating chamber that is pressurized with an ambient at superatmospheric pressure; a forced convection heater for directing heated gas flow towards opposite surfaces of a glass sheet within the heating chamber to provide rapid heating of the glass sheet; an entrance station in communication with the heating chamber for introducing a glass sheet to be heated into the heating chamber; and means for maintaining the superatmospheric pressure within the heating chamber during glass sheet transfer between the heating chamber and the entrance station.

8. A method for heating a glass sheet comprising: positioning



a glass sheet within an enclosed heating chamber having an ambient at superatmospheric pressure; directing heated gas flow to impinge against opposite surfaces of the glass sheet to provide rapid heating of the glass sheet, transferring a glass sheet to be heated from an entrance station to the heating chamber and maintaining the superatmospheric pressure in the heating chamber during the step of transferring.



(I)

4,681,617

# PHOSPHOLIPID COMPOSITIONS AND THEIR USE IN PLANT PROTECTION SPRAY MIXTURES

Miklos Ghyecy, Cologne; Paul-Robert Imberge, Pulheim, and Armin Wendel, Cologne, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie, GmbH, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 508,662, Jun. 28, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 755,967  
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225703

Int. Cl.<sup>4</sup> A01N 57/00; B01F 17/34; B01J 13/00

U.S. Cl. 71-96

8 Claims

1. A phospholipid concentrate suitable as an auxiliary agent in the production and application of plant protectant spray mixtures comprising

- 5 to 60 weight percent natural or synthetic phospholipid from the group consisting of phosphatidyl choline, hydrogenated phosphatidyl choline, phosphatidyl ethanol amine, N-acyl phosphatidyl ethanol amine, phosphatidyl inositol, phosphatidyl serine, phosphatidyl glycerin, phosphatidic acid and mixtures thereof;
- 5 to 62.5 weight percent physiologically acceptable solvent from the group consisting of an alcohol, an ether, a ketone, dimethyl sulfoxide and mixtures thereof;
- 3.3 to 30 weight percent non-ionic co-emulsifier comprising ethoxylates of fatty alcohols or hydrogenated castor oil or nonyl phenol or fatty acid amides; and
- 3.3 to 35 weight percent dissolving intermediaries from the group consisting of sorbitan fatty acid esters, the triglyceride or partial glyceride mixtures of saturated fatty acids and the hydroxy ethyl amides.

7. A spray mixture containing water, a plant protectant and a phospholipid concentrate according to claim 1 wherein the ratio by weight of plant protectant to phospholipid concentrate is from 1:0.5 to 1:5.

4,681,618

# 1-ARYL-5-HALO-4-NITOPYRAZOLES, HERBICIDAL COMPOSITIONS CONTAINING THEM, AND HERBICIDAL METHOD OF USING THEM

Reinhold Gehring, Wuppertal; Otto Schallner, Monheim; Jörg Stetter, Wuppertal; Hans-Joachim Santel, Cologne, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 6, 1986, Ser. No. 816,643

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501323

Int. Cl.<sup>4</sup> A01N 43/56; C07D 231/16

U.S. Cl. 71-92

6 Claims

1. A 1-aryl-4-nitropyrazole of the formula (I),

in which

Hal represents halogen,

R<sup>1</sup> and R<sup>3</sup> independently of one another represent cyano, or halogen, or represent in each case straight-chain or branched alkyl, alkoxy or alkoxy carbonyl with in each case 1 to 4 carbon atoms, or represent in each case straight-chain or branched halogenoalkyl or halogenoalkoxy with in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, or represent a radical —S(O)<sub>n</sub>—R<sup>6</sup> and

R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup> independently of one another and independently of R<sup>1</sup> and R<sup>3</sup> represent the same radicals as R<sup>1</sup> and R<sup>3</sup> and also represent hydrogen,

and wherein

R<sup>6</sup> represents amino, or in each case straight-chain or branched alkyl, alkylamino, dialkylamino or halogenoalkyl with in each case 1 to 4 carbon atoms in the individual alkyl parts and, in the case of halogenoalkyl, with 1 to 9 identical or different halogen atoms and n represents the number 0, 1 or 2.

6. A method of combatting weeds, wherein a herbicidally effective amount of a 1-aryl-4-nitropyrazole of the formula (I) according to claim 1 is applied to the weeds and/or their environment.

4,681,619

# N-PHENYLSULFONYL-N'-PYRIMIDINYLUREAS

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

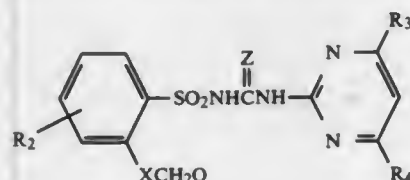
Continuation of Ser. No. 458,595, Jan. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 423,352, Sep. 24, 1982, abandoned, which is a division of Ser. No. 282,779, Jul. 13, 1981, abandoned. This application Aug. 2, 1985, Ser. No. 761,941  
Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81

Int. Cl.<sup>4</sup> C07D 239/69; A01N 43/54

U.S. Cl. 71-92

18 Claims

1. A compound selected from the group consisting of an N-phenylsulfonyl-N'-pyrimidinylurea of the formula:



wherein

Q is —CH<sub>2</sub>Cl, —CCl<sub>3</sub>, —CHClCH<sub>2</sub>Cl, —CHBrCH<sub>2</sub>Br, —CHClCHClCH<sub>3</sub>, —CHBrCHBrCH<sub>3</sub>, —CHBrCBr(CH<sub>3</sub>)<sub>2</sub>, —CBr(CH<sub>3</sub>)CH<sub>2</sub>Br, or —CCl(CH<sub>3</sub>)CH<sub>2</sub>Cl;

X is —S—, —O—, —SO— or —SO<sub>2</sub>—;

Z is O, or S;

R<sub>2</sub> is hydrogen, halo, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, haloalkyl of 1 to 4 carbon atoms, nitro, —YR<sub>5</sub>, —COOR<sub>6</sub>, or

C<sub>1</sub>-C<sub>6</sub>haloalkoxy, or by benzyl or benzyl substituted by halogen and/or C<sub>1</sub>-C<sub>6</sub>alkyl, or salt thereof.

10. A composition which contains a herbicidally and/or growth regulatingly effective amount of a compound according to claim 1 as active component and a carrier.

4,681,621

# HERBICIDAL 2-(2-SUBSTITUTED BENZOYL)-1,3-CYCLOPENTANEDIONES

David L. Lee, Martinez, and William J. Michaely, Richmond, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 683,883, Dec. 20, 1984, abandoned.

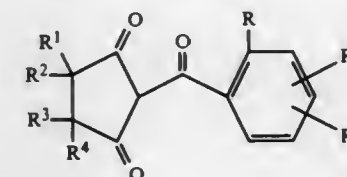
This application Dec. 3, 1985, Ser. No. 804,027

Int. Cl.<sup>4</sup> A01N 41/10, 33/20

U.S. Cl. 71-103

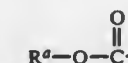
14 Claims

1. A compound of the formula



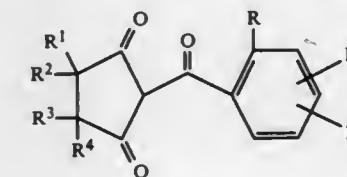
wherein

R is halogen; C<sub>1</sub>-C<sub>4</sub> alkoxy; nitro; cyano; —S(O)<sub>n</sub>R' wherein n is the integer 0, 1, or 2, and R' is C<sub>1</sub>-C<sub>4</sub> alkyl; or R is C<sub>1</sub>-C<sub>4</sub> alkyl optionally substituted with halogen; R<sup>1</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl; R<sup>2</sup> is hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl or

wherein R<sup>a</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl; or

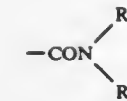
R<sup>1</sup> and R<sup>2</sup> together are alkylene having 3 to 6 carbon atoms; R<sup>3</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl; R<sup>4</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl; R<sup>5</sup> and R<sup>6</sup> independently are (1) hydrogen; (2) halogen; (3) C<sub>1</sub>-C<sub>4</sub> alkyl; (4) C<sub>1</sub>-C<sub>4</sub> alkoxy; (5) OCF<sub>3</sub>; (6) cyano; (7) nitro; (8) C<sub>1</sub>-C<sub>4</sub> haloalkyl; (9) R<sup>b</sup>SO<sub>n</sub>— wherein n is the integer 0, 1, or 2; and R<sup>b</sup> is (a) C<sub>1</sub>-C<sub>4</sub> alkyl; (b) C<sub>1</sub>-C<sub>4</sub> alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR<sup>c</sup>R<sup>d</sup> wherein R<sup>c</sup> and R<sup>d</sup> independently are hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl; (11) R<sup>e</sup>C(O)— wherein R<sup>e</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl or C<sub>1</sub>-C<sub>4</sub> alkoxy; or (12) SO<sub>2</sub>NR<sup>c</sup>R<sup>d</sup> wherein R<sup>c</sup> and R<sup>d</sup> are as defined.

8. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula



wherein

R is halogen; C<sub>1</sub>-C<sub>4</sub> alkoxy; nitro; cyano; —S(O)<sub>n</sub>R' wherein n is the integer 0, 1, or 2, and R' is C<sub>1</sub>-C<sub>4</sub> alkyl; or R is C<sub>1</sub>-C<sub>4</sub> alkyl optionally substituted with halogen; R<sup>1</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl; R<sup>2</sup> is hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl or



in which

Y is —O—, —S—, —SO— or —SO<sub>2</sub>—;

each of R<sub>5</sub> and R<sub>6</sub> is alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or alkynyl of 2 to 6 carbon atoms; and each of R<sub>7</sub> and R<sub>8</sub> independently of the other is hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or alkynyl of 2 to 6 carbon atoms; and each of R<sub>3</sub> and R<sub>4</sub> independently of the other is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, halo, or alkoxyalkyl of 2 to 4 carbon atoms; and

the amine, quaternary ammonium, alkali metal, and alkaline earth metal salts thereof.

14. A herbicidal and growth regulating composition which comprises an effective amount of at least one compound according to claim 1, together with a suitable carrier therefor.

4,681,620

# SULFONYLUREAS AND SULFONYLTHIOUREAS, AND METHOD OF USE THEREOF AS HERBICIDES AND/OR GROWTH REGULATORS

Beat Böhner, Binningen; Werner Föry, Basel; Rolf Schurter, Binningen, all of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 496,325, May 19, 1983, Pat. No. 4,612,037.

This application Mar. 21, 1986, Ser. No. 842,696

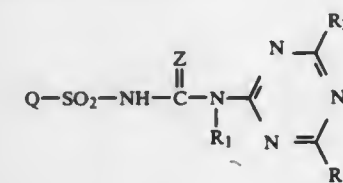
Claims priority, application Switzerland, May 28, 1982, 3314/82

Int. Cl.<sup>4</sup> C07D 403/12; A01N 43/66, 43/70

U.S. Cl. 71-93

15 Claims

1. A compound of the formula

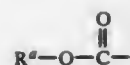


wherein

R<sub>1</sub> is hydrogen or C<sub>1</sub>-C<sub>5</sub>alkyl,

R<sub>2</sub> and R<sub>3</sub>, each independently of the other, are hydrogen, C<sub>1</sub>-C<sub>5</sub>alkyl, C<sub>1</sub>-C<sub>5</sub>alkoxy, C<sub>1</sub>-C<sub>5</sub>alkylthio, C<sub>1</sub>-C<sub>5</sub>haloalkyl, halogen, C<sub>1</sub>-C<sub>5</sub>haloalkylthio, C<sub>1</sub>-C<sub>4</sub>alkylamino, C<sub>1</sub>-C<sub>4</sub>dialkylamino, an alkoxyalkyl group or alkoxyalkoxy group, each containing not more than 6 carbon atoms, Z is oxygen or sulfur, and

Q is a 6-membered heterocyclic group selected from pyrimidine, pyridazine, pyrazine, and triazine and bound through a carbon atom, said group being unsubstituted or substituted by one or two members selected from halogen, pseudohalogen, nitro, C<sub>1</sub>-C<sub>6</sub>alkyl, C<sub>1</sub>-C<sub>6</sub>haloalkyl, C<sub>1</sub>-C<sub>6</sub>alkoxy, C<sub>1</sub>-C<sub>6</sub>alkylthio, C<sub>1</sub>-C<sub>6</sub>haloalkoxy, C<sub>1</sub>-C<sub>6</sub>haloalkylthio, amino, C<sub>1</sub>-C<sub>6</sub>alkylamino, di-C<sub>1</sub>-C<sub>6</sub>alkylamino, C<sub>1</sub>-C<sub>6</sub>alkylcarbonylamino, C<sub>1</sub>-C<sub>6</sub>alkylcarbonyl, C<sub>1</sub>-C<sub>6</sub>alkoxy carbonyl, C<sub>1</sub>-C<sub>6</sub>alkylthiocarbonyl, carbamoyl, C<sub>1</sub>-C<sub>6</sub>alkylaminocarbonyl, C<sub>1</sub>-C<sub>6</sub>dialkylaminocarbonyl, C<sub>1</sub>-C<sub>6</sub>alkylsulfonylethyl, C<sub>1</sub>-C<sub>6</sub>alkylsulfonylethyl, C<sub>2</sub>-C<sub>6</sub>alkenyl, C<sub>2</sub>-C<sub>6</sub>alkynyl, or by phenyl, phenoxy or phenylthio, which are unsubstituted or substituted by halogen, nitro, cyano, C<sub>1</sub>-C<sub>6</sub>alkyl, C<sub>1</sub>-C<sub>6</sub>alkoxy, C<sub>1</sub>-C<sub>6</sub>haloalkyl or



wherein  $R^a$  is  $C_1$ - $C_4$  alkyl; or  $R^1$  and  $R^2$  together are alkylene having 3 to 6 carbon atoms;  $R^3$  is hydrogen or  $C_1$ - $C_4$  alkyl;  $R^4$  is hydrogen or  $C_1$ - $C_4$  alkyl;  $R^5$  and  $R^6$  independently are (1) hydrogen; (2) halogen; (3)  $C_1$ - $C_4$  alkyl; (4)  $C_1$ - $C_4$ ; (5)  $OCF_3$ ; (6) cyano; (7) nitro; (8)  $C_1$ - $C_4$  haloalkyl; (9)  $R^bSO_n$  wherein  $n$  is the integer 0, 1, or 2; and  $R^b$  is (a)  $C_1$ - $C_4$  alkyl; (b)  $C_1$ - $C_4$  alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10)  $-NR^cR^d$  wherein  $R^c$  and  $R^d$  independently are hydrogen or  $C_1$ - $C_4$  alkyl; (11)  $R^eC(O)-$  wherein  $R^e$  is  $C_1$ - $C_4$  or  $C_1$ - $C_4$  alkoxy; or (12)  $SO_2NR^dR^e$  wherein  $R^c$  and  $R^d$  are as defined.

4,681,622

# SUBSTITUTED PHENOXYBENZOIC ACIDS AND DERIVATIVES THEREOF AS HERBICIDES

Robert J. Theissen, Bridgewater, N.J., assignor to Rhoe-Poulenc Agrochimie, Lyons, France

Continuation of Ser. No. 490,357, May 2, 1983, abandoned, which is a continuation of Ser. No. 181,491, Sep. 4, 1980, abandoned, which is a continuation of Ser. No. 837,957, Sep. 29, 1977, abandoned, which is a continuation of Ser. No. 702,367, Jul. 2, 1976, Pat. No. 4,606,758, which is a continuation-in-part of Ser. No. 617,569, Sep. 29, 1975, Pat. No. 3,979,437, which is a continuation of Ser. No. 398,610, Sep. 19, 1973, Pat. No. 3,941,830, which is a continuation of Ser. No. 114,712, Feb. 11, 1971, Pat. No. 3,784,635, which is a continuation-in-part of Ser. No. 819,412, Apr. 25, 1969, Pat. No. 3,652,645, said Ser. No. 702,367, is a continuation-in-part of Ser. No. 545,232, Jan. 29, 1975, Pat. No. 4,002,662, which is a continuation-in-part of Ser. No. 398,610, Sep. 19, 1973, Pat. No. 3,941,830. This application Mar. 9, 1984, Ser. No. 587,973

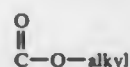
The portion of the term of this patent subsequent to Aug. 14, 1996, has been disclaimed.

Int. Cl.<sup>4</sup> A01N 33/22

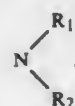
U.S. Cl. 71-108

15 Claims

1. An herbicidal composition comprising as an effective herbicide, a herbicidally effective quantity of 2-nitro-5-(substituted-phenoxy) benzoic acid, salts thereof selected from the group consisting of lithium salts, sodium salts, potassium salts, alkylammonium salts of 1 to 4 carbon atoms and alkanolammonium salts of 1 to 4 carbon atoms, alkyl esters thereof of 1 to 5 carbon atoms and the phenyl ester thereof, wherein said phenoxy is substituted only by a combination of two members selected from the group consisting of halogen, trifluoromethyl, COOH,



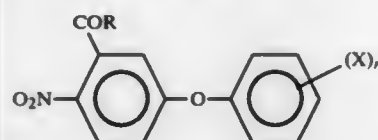
alkyl of 1 to 4 carbon atoms), hydroxy, alkoxy of 1 to 4 carbon atoms,



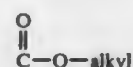
SH,  $SR_1$ ,  $SOR_1$ ,  $SO_2R_1$ ,  $SO_2NH_2$  wherein  $R_1$  and  $R_2$  are selected from the group consisting of alkyl of 1 to 4 carbon atoms, and an agronomically acceptable carrier selected from the group consisting of solid carriers, water and organic solvents.

8. A method for controlling plant growth which comprises

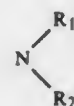
applying a composition consisting essentially of: an herbicidal amount of a compound having the formula:



wherein  $(X)_n$  is a combination of the members selected from the group consisting of halogen, trifluoromethyl, COOH,



(alkyl having 1 to 4 carbon atoms), hydroxy, alkoxy having 1 to 4 carbon atoms,



SH,  $SR_1$ ,  $SOR_1$ ,  $SO_2R_1$ ,  $SO_2NH_2$ ;  $R_1$  and  $R_2$  are selected from the group consisting of alkyl having 1 to 4 carbon atoms,  $R$  is selected from the group consisting of hydroxy, alkoxy having 1 to 5 carbon atoms, and OM wherein M is an alkali metal of lithium, sodium or potassium, alkylammonium having 1 to 4 carbon atoms or alkanolammonium having 1 to 4 carbon atoms and  $n$  is the integer 2; and an agronomically acceptable carrier selected from the group consisting of solid carriers, water and organic carriers.

4,681,623

# PROCESS FOR PRODUCING ALLOY POWDER CONTAINING RARE EARTH METALS

Yasuhiro Okajima; Yasuhiro Tsugita, both of Niihama; Tamaki Takechi, Saijyo, and Syuji Okada, Mitoyo, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Jun. 23, 1986, Ser. No. 877,128

Claims priority, application Japan, Jun. 24, 1985, 60-137512 Int. Cl.<sup>4</sup> B22F 9/00

U.S. Cl. 75-0.5 B

13 Claims

1. In a process for producing an alloy powder containing rare earth metals which includes the steps of (a) preparing a mixture containing a powder of rare earth metal oxide, a powder of a metal which is difficult to volatilize at 900°-1300° C., and a reducing agent, (b) heating the mixture to between 900° and 1300° C. in an inert atmosphere or under vacuum to produce a reaction mixture, and (c) treating the reaction mixture in a wet process to produce the alloy powder containing rare earth elements, the improvement wherein in step (a) at least one chloride selected from alkali metal chlorides and alkaline earth metal chlorides is added to said mixture so that the produced alloy powder will be in a finely divided form and the particles thereof will have a uniform composition and a minimum amount of residual reducing agent and oxygen.

4,681,624

# METHOD OF FILTERING MOLTEN METALS USING A MONOLITHIC REFRACTORY HONEYCOMB FILTER

Thomas P. DeAngelis, Horseheads, and John P. Day, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 26, 1985, Ser. No. 727,529

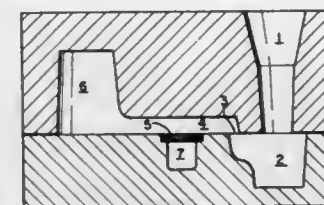
Int. Cl.<sup>4</sup> C22B 9/02

U.S. Cl. 75-28

12 Claims

1. In a method of removing impurities from molten metal by

passing the molten metal through a filter, the improvement comprising providing as the filter a monolithic refractory honeycomb filter consisting essentially of 50-100% by weight of zircon and 0-50% by weight of an oxide selected from the group consisting of magnesium oxide, zinc oxide, cerium oxide, chromium oxide, manganese oxide, titanium oxide, iron



oxide, copper oxide, nickel oxide, and mixtures of these; said filter having a frontal contact surface containing 50-400 open cells per square inch; said open cells defining 60-75% of the frontal surface area and extending substantially longitudinally from the frontal surface through the filter so as to be open at both ends for passage therethrough of the molten metals.

4,681,625

# METHODS FOR SIMULTANEOUSLY DESULFURIZING AND DEGASSING STEELS

William G. Wilson, 820 Harden Dr., Pittsburgh, Pa. 15229 Continuation-in-part of Ser. No. 203,315, Nov. 3, 1980, Pat. No. 4,570,692. This application Nov. 21, 1985, Ser. No. 800,544 Int. Cl.<sup>4</sup> C21C 7/02

U.S. Cl. 75-53

31 Claims

1. The method for removing sulfur and hydrogen from steel comprising the steps of:

- (a) pouring a stream of steel, low in oxygen and free of slag into a vertical tube installed in a ladle which extends from the bottom of the ladle to the top of the ladle,
- (b) providing a means to introduce a flow of inert gas into the bottom of the tube to provide a stirring action within the tube,
- (c) adding a lime based slag with a large capacity to absorb sulfur into the tube;
- (d) adding ferro-alloys and elemental metals into the tube which are known to enhance desulfurization and are necessary to achieve the specified composition of the steel;
- (e) utilizing the stream of inert gas introduced into the bottom of the tube as a means for hydrogen removal.

4,681,626

# METHOD OF REFINING ALUMINUM

Masao Fujishige; Harumi Yokokawa; Seiichi Ujii, and Masayuki Dokiya, all of Yatabemachi, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan Filed Jan. 28, 1986, Ser. No. 823,433

Claims priority, application Japan, Feb. 2, 1985, 60-19106

Int. Cl.<sup>4</sup> C22B 21/02, 7/04

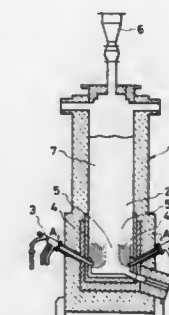
U.S. Cl. 75-68 A

13 Claims

1. A method of reducing and refining aluminum which comprises the steps of:

- filling a blast furnace with a carbon material;
- directing oxygen gas into said carbon material so as to form a plurality of combustion regions in which combustion of said carbon material takes place, said combustion regions extending from the periphery of the furnace toward the center thereof, and the carbon material outside said combustion regions constituting a high-temperature reduction zone, whereby said carbon material serves as a combustion agent as well as a reducing agent;
- feeding an alumina-containing material and a flux onto the top of said carbon material, allowing the alumina-containing material and flux to be melted by the combustion heat from the burning carbon material, thereby forming a

liquid melt mixture of said alumina-containing material and said flux; allowing said liquid melt mixture to flow down into and through said high-temperature reduction zone and causing the alumina in said alumina-containing material to become partially reduced to aluminum by the carbon material; taking out of the furnace a crude aluminum alloy comprising (1) calcium carbide formed from the carbon material and



the flux, (2) the carbon material, and (3) the aluminum formed through the above reduction; hydrogenating said crude aluminum alloy to remove the carbon material and calcium carbide from the crude aluminum alloy and increase the aluminum content of said alloy; taking out of the furnace a slag and hydrogenating the slag to convert unreacted alumina contained in the slag into aluminum.

4,681,627

# PROCESS FOR PREPARING AN INGOT FROM METAL SCRAP

Yoshiharu Mae, Urawa, and Tsutomu Oka, Omiya, both of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

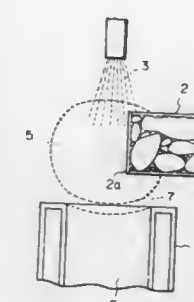
Filed May 27, 1986, Ser. No. 868,120

Claims priority, application Japan, Jun. 3, 1985, 60-120157; Jun. 3, 1985, 60-120158; Jun. 3, 1985, 60-120159; Aug. 23, 1985, 60-185404

Int. Cl.<sup>4</sup> C22B 4/00

U.S. Cl. 75-10.19

30 Claims



1. A process for producing an ingot from metal scrap by first melting the scrap in a vacuum melting furnace and then solidifying the melt in a water-cooled mold into an ingot comprising: charging the metal scrap into a tubular member with a closed end and another end, said tubular member being made of the same material as that of the scrap; heating said tubular member with an electron beam or from said closed end toward the other end thereof to heat and melt said tubular member and said scrap charged into said tubular member to form a melt; said tubular member being held substantially horizontally in



said vacuum melting furnace during said heating step; and a causing the resulting melt to drop into said water-cooled mold wherein it is solidified into an ingot.

4,681,628

## GOLD RECOVERY PROCESSES

Arnold F. Griffin, Scarborough, and Warren D. Hinchliffe, Morley, both of Australia, assignors to Norcim Investments Pty. Ltd., Perth, Australia

Filed Apr. 24, 1986, Ser. No. 855,406

Claims priority, application Australia, May 1, 1985, PH0385 Int. Cl.<sup>4</sup> C22B 11/04

U.S. Cl. 75—118 R

11 Claims

1. A process for the recovery of gold from an alkaline aqueous liquid solution containing gold-cyanide ion, and one or more members selected from the group consisting of silver, copper and mercury comprising adding thiourea to the solution so as to allow formation of a gold complex with thiourea in which the gold complex is soluble and stable in an acid solution; adjusting the pH of the solution to an acid pH ranging from 1 to 4 so that gold and mercury remain in solution in the liquid and silver and/or copper is incorporated in a precipitate containing silver and/or copper cyanide compounds; separating the precipitate from the liquid to leave a solution of dissolved gold complex; and recovering the gold from the solution.

4,681,629

## POWDER METALLURGICAL PROCESS FOR MANUFACTURING COPPER-NICKEL-TIN SPINODAL ALLOY ARTICLES

John H. Reinshagen, North Huntingdon, Pa., assignor to Pfizer Inc., New York, N.Y.

Filed Dec. 19, 1985, Ser. No. 811,140

Int. Cl.<sup>4</sup> B22F 1/00

U.S. Cl. 75—246

13 Claims

1. A process for preparing a discrete copper-base spinodal alloy article which comprises the steps of:

- providing a prealloyed copper base alloy powder containing from about 5 to about 35 percent by weight nickel, from about 4 to about 13 percent by weight tin, and the balance copper;
- compacting the alloy powder to form a green body having structural integrity, sufficient porosity to be penetrated by a reducing atmosphere or a vacuum and substantially the desired size and shape of said article; and
- sintering the green body in the reducing atmosphere or a vacuum at a temperature of from about 1700° F. to about 1800° F. for at least about 30 minutes to form a metallurgical bond and achieve a post-sinter alloy body density which is from 90 to 96 percent of the theoretical density of said alloy body.

4,681,630

## METHOD OF MAKING COPPER COLLOID FOR ACTIVATING INSULATING SURFACES

William R. Brasch, Nesconset, N.Y., assignor to LeaRonai, Inc., Freeport, N.Y.

Division of Ser. No. 423,749, Sep. 27, 1982, abandoned. This application Apr. 25, 1986, Ser. No. 855,997

Int. Cl.<sup>4</sup> B22F 9/00

U.S. Cl. 106—1.11

17 Claims

1. A method for preparing a colloidal copper solution for activating non-conductive substrates prior to electroless metal deposition thereon which comprises: dissolving in water a quantity of at least one copper compound to form a copper solution; preparing a gelatin solution by mixing gelatin with water; mixing the gelatin and copper solutions together; adjusting the pH of the mixed solutions with an acid to a range of less than about 4 but above about 1.5;

preparing a solution of a reducing agent in a quantity in excess of that required to reduce the copper ions; and mixing the reducing agent solution with the previously mixed solutions to form a colloidal copper solution containing active colloidal copper in the form of copper metal, hydrous copper oxides, or mixtures thereof, wherein the colloidal copper solution remains stable at a neutral pH.

4,681,631

## INORGANIC MOLDING COMPOSITION CONTAINING A LITHOGENOUS COMPONENT

Hans-Werner Engels, Troisdorf; Karlheinz Neuschäffer, Leichlingen, and Paul Spielau, Troisdorf-Eschmar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Apr. 7, 1986, Ser. No. 848,493

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512515; Apr. 6, 1985, 3512516

Int. Cl.<sup>4</sup> C04B 12/04

U.S. Cl. 106—4

17 Claims

1. An inorganic, aqueous molding composition hardenable at low temperatures, which contains an alkali silicate solution, an inorganic, solid component reactive with the alkali silicate solution, and optionally proportions of fillers and auxiliary materials said composition containing 0.5–4.0 parts by weight of the inorganic solid component per part by weight of the alkali silicate solution; said solid component consisting essentially of

- vitreous amorphous electrostatic precipitator ash having 45–60% by weight of vitreous SiO<sub>2</sub>, 25–35% by weight of Al<sub>2</sub>O<sub>3</sub>, and 8–11% by weight of Fe<sub>2</sub>O<sub>3</sub>, and/or
- ground calcined bauxite, and the alkali silicate solution containing 1.2–2.5 moles of SiO<sub>2</sub> per mole of K<sub>2</sub>O and/or Na<sub>2</sub>O.

4,681,632

## SOLID PARTICULATE COLORING COMPOSITION

Richard F. T. Bes, and Jan D. Knol, both of Apeldoorn, Netherlands, assignors to Holland Colours Apeldoorn B.V., Netherlands

Filed Feb. 3, 1986, Ser. No. 825,193

Int. Cl.<sup>4</sup> C09D 11/00

U.S. Cl. 106—19

4 Claims

1. Solid particulate coloring composition in the form of a mixture comprising:

- a molten carrier material which is solid at ambient temperature and having a melting point below 250° C.;
- at least one compound which is liquid at ambient temperatures and which comprises a liquid stabilizing agent for polymeric materials in the form of an organometal compound;
- a pigment or dyestuff; and
- a particulate material having a large specific surface, said mixture being divided into particles which are solid under ambient conditions.

4,681,633

## HIGH STRENGTH CALCIUM PHOSPHATE GLASS-CERAMIC MATERIALS

Akira Watanabe, Okayama; Yoshimitsu Takeuchi; Seiji Kihara, both of Bizen; Makoto Mitsudoh, Okayama, and Yoh'ichi Wakabayashi, Akasaka, all of Japan, assignors to Kyushu Refractories Co., Ltd., Okayama, Japan

Continuation of Ser. No. 628,748, Jul. 9, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 844,249

Claims priority, application Japan, Oct. 29, 1983, 58-203546 Int. Cl.<sup>4</sup> C03C 10/02

U.S. Cl. 106—35

1 Claim

1. Dental materials of calcium phosphate glass-ceramics consisting of:

calcium phosphate composite wherein the atomic ratio of calcium to phosphorus Ca/P is 0.35–1.7; and rare earth oxides wherein the content of said rare earth oxide component is 0.05–10 wt. pt. per 100 wt. pt. of calcium phosphate composite whereby the mechanical strength of the dental materials is improved.

4,681,634

## COMPOSITION CIMENTAIRE HYDRAULIQUE A PRISE RETARDEE POUR CIMENTATION A HAUTES TEMPERATURE ET PRESSION

Yves Roca, Leblanc Mesnil; Jacky Rousset, St. Trivier-Sur-Molignens; Pierre Bouchut, Decines; Marie-Christine Leblanc, Boulogne, and Daniel Baffreau, Lavarenne St Hilaire, all of France, assignors to Coatex S.A., Caluire and Total Compagnie Francaise des Petroles S.A., Paris, both of France

Filed Oct. 16, 1985, Ser. No. 787,902

Claims priority, application France, Oct. 16, 1984, 84 16004 Int. Cl.<sup>4</sup> C04B 7/02, 24/00

U.S. Cl. 106—90

16 Claims

1. A hydraulic cement composition, comprising:

- an aqueous liquid phase,
- at least one hydraulic cement,
- a setting-retarder adjuvant preserving or improving rheological properties, comprising a water-soluble polymer obtained from the copolymerization of CH<sub>2</sub>=CR<sub>1</sub>—COOH or maleic anhydride with CH<sub>2</sub>=CR<sub>2</sub>—CONHR<sub>6</sub> and CH<sub>2</sub>=CR<sub>4</sub>—COO—R<sub>3</sub>—OPO<sub>3</sub>H<sub>2</sub>, wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>4</sub> are each independently chosen from the group consisting of hydrogen and C<sub>1</sub>–C<sub>18</sub>-alkyls, R<sub>3</sub> is chosen from the group consisting of alkylenes, alkylene oxides and polyalkylene oxides, and R<sub>6</sub> is chosen from the group consisting of hydrogen, alkyls and alkyl sulfonic acids.

4,681,635

## TOPICAL COLLOIDION COMPOSITIONS

Werner K. Stiefel, Coral Gables, Fla., and Charles F. Breunig, Greenville, N.Y., assignors to Stiefel Laboratories, Inc., Coral Gables, Fla.

Filed Mar. 31, 1986, Ser. No. 846,362

Int. Cl.<sup>4</sup> C08L 1/08, 1/18

U.S. Cl. 106—178

5 Claims

1. In a fluid colloidion composition for topical application in which nitrocellulose is dissolved in an ether-alcohol solvent, the improvement which consists essentially of a quantity of D,L-lactic acid being dissolved in said composition, said quantity being at least sufficient to decrease the drying time of said composition without significantly increasing the viscosity of said composition.

4,681,636

## BONDING PRIMER COMPOSITION

Masayuki Saito, Ichihara, and Mitsuo Hamada, Kisarazu, both of Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,506

Claims priority, application Japan, Jun. 3, 1985, 60-120231 Int. Cl.<sup>4</sup> C09K 3/00; B32B 9/00

U.S. Cl. 106—287.15

5 Claims

1. A primer composition for bonding a silicone rubber composition to a substrate, said composition comprising

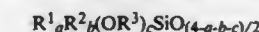
- 100 parts by weight of a silane of the formula



where R represents alkyl containing from one to four carbon atoms, aryl, substituted alkyl where the alkyl portion contains from one to four carbon atoms, or substituted aryl where the substituent is halogen and n is 1, 2 or 3;

- from 5 to 500 parts by weight of an organosilicon com-

pound containing at least two alkoxy groups per molecule and at least one unit corresponding to the average formula



where R<sup>1</sup> is methyl, ethyl, aryl, substituted methyl, substituted ethyl or substituted aryl where the substituent is a halogen or a cyano group R<sup>2</sup> represents a monovalent radical containing a functional group selected from the group consisting of vinyl, allyl, epoxy, methacryloxy, mercapto, amino and N-aminoalkyl, where said functional group is bonded to silicon directly or by means of a divalent hydrocarbon radical; R<sup>3</sup> is methyl, ethyl, propyl, phenyl, 2-methoxyethyl or 2-ethoxyethyl, the value of a is from 0 to 3, inclusive, the value of b is from 0 to 3, inclusive, the value of c is greater than 0 and no greater than 4 and the sum of a+b+c is greater than 0 and no greater than 4;

- from 0.1 to 50 parts by weight of an organotitanate ester; and

- an organic liquid in an amount sufficient to solubilize said primer composition.

4,681,637

## PROCESS FOR THE PRODUCTION OF YELLOW-BROWN ZINC FERRITE PIGMENTS

Jakob Rademachers; Karlheinz Turban; Gerhard Franz; Werner Fuhr, and Bernd Holle, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,902

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409722

Int. Cl.<sup>4</sup> C09C 1/62

U.S. Cl. 106—304

10 Claims

1. A process for the production of an anisometric yellow-brown zinc ferrite pigment consisting essentially of homogeneously mixing zinc oxide having a specific BET surface of more than 2 m<sup>2</sup>/g with needle-shaped α-FeOOH obtained from an iron salt solution by mixing with alkali and subsequently oxidizing in a nucleation and pigment growth stage, the FeOOH having a specific BET surface of about 15 to 25 m<sup>2</sup>/g, an average needle width of about 0.025 to 0.125 μm and an average needle length of about 0.2 to 0.6 μm, annealing the mixture at a temperature of about 700° to 1000° C. in the absence of a chloride catalyst, cooling and grinding.

4,681,638

## IRON BLUE PIGMENTS AND PROCESS FOR PREPARATION

Robert C. Schiek, Glens Falls, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 681,044, Dec. 13, 1984, abandoned.

This application May 2, 1986, Ser. No. 861,645

Int. Cl.<sup>4</sup> C09C 3/06

U.S. Cl. 106—309

11 Claims

1. In the process for the production of iron blue pigment comprising the reaction of ferrous sulfate, alkali metal or ammonium sulfate and alkali metal ferrocyanide to produce a white paste, the subsequent heating and oxidation of said white paste and the isolation of the iron blue pigment, the improvement comprising adding from about 0.3–1.2%, based on weight of ferrous sulfate, of a source of zinc ions to the reaction mixture prior to the oxidation step.

4,681,639

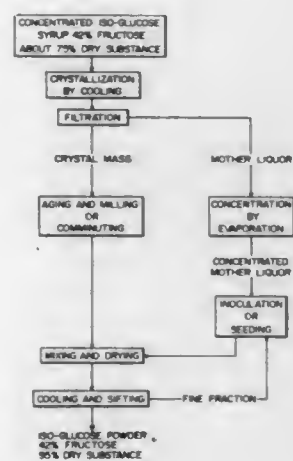
## PROCESS FOR TREATING AND CONVERTING OF ISO-GLUCOSE SIRUP

Karl-Heinz Hinck, Tornesch, Fed. Rep. of Germany, assignor to Starcosa GmbH, Brunswick, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 616,245, Jan. 1, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,851  
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1983, 3320602

Int. Cl.<sup>4</sup> C13F 1/02, 3/00

U.S. Cl. 127—30

10 Claims



1. A process for treating and converting iso-glucose sirup to form a flowable dry end product, said iso-glucose sirup including fructose to the extent of about 42 to 45% by weight of the sirup, comprising the following steps:

- concentrating said iso-glucose sirup by evaporation to produce a concentrated sirup containing dry substance of about 70 to 77% by weight of the concentrated sirup;
- crystallizing said concentrated sirup by a first cooling step at a cooling temperature within the range of 30° C. to 18° C. to produce a predominantly glucose containing crystal mass;
- separating fructose containing mother liquor from said crystal mass;
- aging said crystal mass, to which mother liquor is still adhering, for at least several hours in a batch or pile for causing an after-crystallization to produce an aged crystal mass;
- comminuting or milling said aged crystal mass to form a crystal powder having a particle size in the range from about 10 micron to about 250 micron;
- concentrating said mother liquor containing said fructose, by evaporation to produce a concentrated mother liquor containing dry substance to the extent of about 90% by weight of the concentrated mother liquor;
- mixing said crystal powder and said concentrated mother liquor while simultaneously drying said crystal powder and concentrated mother liquor to produce a mixture containing maximally 42 to 45% of fructose by weight of dry substance;
- performing a second cooling step by cooling said mixture of step (g) while keeping said mixture in motion; and
- sifting said mixture, said steps avoiding the use of any organic solvents to produce said dry flowable end product.

4,681,640

## LASER-INDUCED CHEMICAL VAPOR DEPOSITION OF GERMANIUM AND DOPED-GERMANIUM FILMS

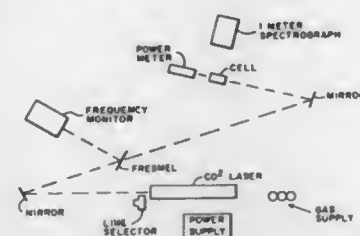
Ann E. Stanley, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 6, 1986, Ser. No. 893,837

Int. Cl.<sup>4</sup> H01L 21/265; B05D 3/06

U.S. Cl. 148—1.5

12 Claims



1. A method for infrared laser-induced chemical vapor deposition of polycrystalline germanium and doped-germanium films wherein in said method as said deposition increases in amount the rate of said deposition does not decrease because of the transparency of said deposited polycrystalline germanium or doped-germanium films to the output frequencies of the infrared laser inducing said deposition, said method comprising:

- placing a prepared substrate into one or more laser reaction cells;
- filling one or more laser reaction cells with one or more compounds selected from germane, ethylgermane, diethylgermane, triethylgermane, tetramethylgermane, dimethylcadmium, and trimethylaluminum to a predetermined pressure from about 3.5 to about 220 torr;
- irradiating said compound with infrared laser radiation in the range of 10.4 or 9.4 micrometer as provided by a continuous-wave CO<sub>2</sub> laser whose single-line operation is varied in output powers between 10 and 150 watts/cm<sup>2</sup>;
- continuing said irradiating for a predetermined time period from about 15 seconds to about one minute to effect laser photochemical dissociation of said compound contained in said laser reaction cell; and
- repeating said irradiating for an additional predetermined time period from about 15 seconds to about one minute as required to achieve said infrared laser-induced chemical vapor deposition of polycrystalline germanium or doped-germanium films.

4,681,641

## ALKALINE RESISTANT PHOSPHATE CONVERSION COATINGS

Ronald W. Zurilla, Farmington Hills, and John Huff, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 574,851, Jan. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 422,971, Jul. 12, 1982, abandoned. This application May 16, 1985, Ser. No. 735,286  
Int. Cl.<sup>4</sup> C23C 22/12, 22/13

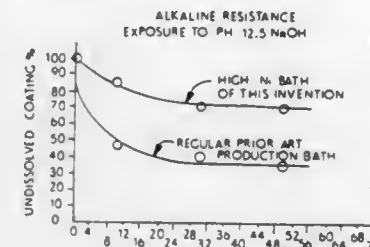
U.S. Cl. 148—6.15 Z

10 Claims

1. A method for increasing the resistance to alkaline dissolution of a phosphate conversion coating on a corrodible metal substrate, said coating being deposited by exposing said substrate to an acidic, aqueous solution containing first and second divalent metal cations and phosphate ions, the method comprising:

- selecting nickel cations as said first divalent metal cations;
- selecting zinc cations as said second divalent metal cations;
- (C) maintaining a minimum zinc ion concentration in said solution of 0.2 grams per liter;
- controlling the concentrations of said first and second

divalent metal cations in said aqueous solution so that the concentration of said nickel cations is maintained at the



time of coating between about 84 and about 94 mole percent of the total first and second divalent metal cations in said solution.

4,681,642

## CAST IRON MAKING BY CERIUM ADDITION

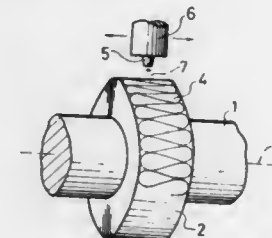
Hideo Nonoyama; Toshiharu Fukuizumi, and Akiyoshi Morita, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 20, 1985, Ser. No. 800,153

Int. Cl.<sup>4</sup> C22C 37/00

U.S. Cl. 148—321

2 Claims



1. A method for preparing a chilled cast iron article having a chilled layer which comprises:

- adding a mischmetal to an iron material free of magnesium having a C.E. value of not more than 4.3 so as to provide a cerium content of from 0.005 to 0.035% by weight;
- casting said iron material containing cerium, and
- remelting by means of a high density energy source at least a portion of the surface of the cast iron.

4,681,643

## FAST BURNING PROPELLANTS

Stirling A. Colgate, 4616 Ridgeway, Los Alamos, N. Mex. 87544, and George E. Roos, P.O. 284, Burns Flat, Okla. 73624  
Continuation-in-part of Ser. No. 220,975, Dec. 29, 1980, abandoned. This application Oct. 3, 1983, Ser. No. 538,578  
Int. Cl.<sup>4</sup> C06B 45/02

U.S. Cl. 149—21

33 Claims

1. A solid or semisolid propellant comprising grains of propellant or propellant components bonded together so as to create voids within the propellant volume, said grains being of near-uniform size such that they have less than about a 20% size variation between the largest and smallest grains, said voids comprising from about 10% to about 50% of the propellant volume, said grains bonded together with sufficient strength to substantially delay the fluidization of the propellant by the onset of Taylor unstable burning, said propellant thereby having a rapid burn rate of from about 10 cm sec<sup>-1</sup> to about 10<sup>4</sup> cm sec<sup>-1</sup>.

## ACCELERATOR FOR GYPSUM PLASTER AND PROCESS OF MANUFACTURE

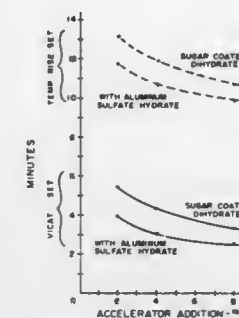
Otto L. Dozza, Palos Heights, Ill., assignor to USG Corporation, Chicago, Ill.

Filed Sep. 27, 1985, Ser. No. 780,921

Int. Cl.<sup>4</sup> B32B 31/06, 13/00

U.S. Cl. 156—39

16 Claims



- forming a dry accelerator composition comprising finely ground calcium sulfate dihydrate having a coating of sugar and having thereover a consolidation therewith of aluminum sulfate hydrate;
- mixing a minor proportion of said accelerator composition and a major proportion of calcium sulfate hemihydrate with water to form an aqueous slurry;
- depositing said slurry on a surface and permitting said slurry to set, and drying the gypsum wallboard formed thereby.

4,681,645

## METHOD AND APPARATUS FOR FUSING TOGETHER THE BOTTOM OF TUBULAR CONTAINER FORMED OF SYNTHETIC RESIN

Sboji Fukushima; Motosaburo Kato; Takashi Mochizuki, and Yukio Wada, all of Shizuoka, Japan, assignors to Pola Chemical Industries, Inc., Shizuoka, Japan

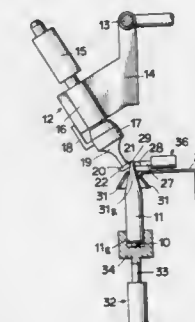
Filed Aug. 5, 1985, Ser. No. 762,820

Claims priority, application Japan, Aug. 7, 1981, 56-123692; May 24, 1982, 57-87765

Int. Cl.<sup>4</sup> B32B 31/26

U.S. Cl. 156—73.1

4 Claims



- A method for fusing together the bottom of a tubular container made of synthetic resin, which comprises: clamping a shoulder of a cylindrical and tubular container which is filled in with its charge and formed of flexible synthetic resin which is capable of being fused by ultrasonic vibrations in clamp means formed at the upper end of a movable rod of an elevator device, said container having its mouth closed by a cap in an openable manner and positioned downwardly,



forcing the upper end of said tubular container into a rectangular and horizontal through-hole formed in the top edge of a downward umbrella-shaped guide formed as one piece by means of said elevator device, thereby to define a flattened portion on the upper end of said tubular container, said flattened portion having its inner faces spaced apart from each other, and successively flattening the upper end of said tubular container by continuing said forcing of the upper end of said tubular container into said rectangular and horizontal through hole, said forcing continuing until the flattened portion extends completely above said through hole and until the upper end of said tubular container is coincident with the upper edge of plate means movable in a horizontal plane, urging said flattened portion projecting from the upper end of said umbrella-shaped guide against a flat urging face of a vibratory terminal formed at the end of a horn portion of an ultrasonic generator which generates ultrasonic waves oscillating in the direction extending at an angle of 10°-45° with respect to the lengthwise direction of said tubular container, said urging being carried out with the use of said plate means formed at the end of a horizontally movable rod of an urging device, thereby to bring said spaced apart inner faces into close contact with each other, said flat urging face of said ultrasonic generator being parallel with the said flattened portion and said flattened portion being positioned completely between said plate means and said flat urging face, and applying ultrasonic waves by said generator to said flattened portion projecting from the upper end of said umbrella-shaped guide and having its inner faces brought into close contact with each other, whereby the inner faces of said flattened portion are fused together.

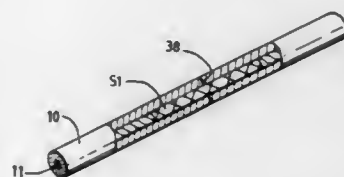
4,681,646

**METHOD FOR SPLICING OF ELASTOMERIC BELTS**  
Gideon Pinto, Carmel, and Jonathan Schanin, Haifa, both of Israel, assignors to Volta Power Belting, Ltd., B'Nai Brak, Israel

Filed Jun. 11, 1985, Ser. No. 743,612  
Claims priority, application Israel, Jul. 30, 1984, 72538  
Int. Cl.<sup>4</sup> B65H 69/06

U.S. Cl. 156-157

9 Claims



1. A method of splicing the ends of elastomeric belts having one or more reinforcing members embedded therein and extending in the longitudinal direction thereof, said method comprising the steps of:

- providing one or more cavities in said ends where said one or more reinforcing members were formerly located and
- subsequently butt-joining said ends, thereby splicing said ends together to form a continuous belt.

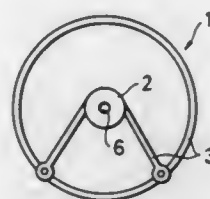
4,681,647  
**METHOD FOR JOINING A FIBER-REINFORCED PLASTIC STRUCTURE**

Katsumi Kondo; Yasuhiro Tsuchiya, both of Toyota; Takatsune Niimi, Aichi; Takashi Yamamoto, Ichinomiya, and Kunihiro Matsuba, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 18, 1985, Ser. No. 745,931  
Claims priority, application Japan, Jun. 19, 1984, 59-126241  
Int. Cl.<sup>4</sup> B65H 81/00

U.S. Cl. 156-172

2 Claims



1. A method for making a rotatable element including a metallic insert, a rim portion and spokes connecting the insert and rim portion, said method comprising the steps of:

- winding a resin-impregnated strand of continuous long-staple fibers around an engaging member formed on a fitting means in the form of a metallic insert by winding said resin-impregnated strand of continuous long-staple fibers in a repeated pattern around a substantial circumferential portion of said insert while placing said fibers in a zig-zag pattern about a multiplicity of radially extending engaging pins provided on said metallic insert; and
- forming said spokes and rim with said strands, said spokes extending outwardly from said metallic insert.

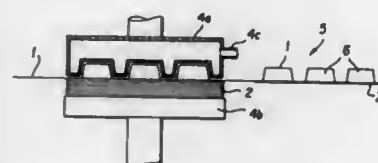
4,681,648

**PROCESS FOR PRODUCING CUSHIONING LAMINATE**  
Atsushi Maeda, Mie, Japan, assignor to Mitsubishi Yuka Badische Co., Ltd., Yokkaichi, Japan

Filed Mar. 21, 1985, Ser. No. 714,267  
Claims priority, application Japan, May 16, 1984, 59-98313  
Int. Cl.<sup>4</sup> B32B 31/20

U.S. Cl. 156-210

8 Claims



1. A process for producing a cushioning laminate which comprises:

- heat-melting a laminated sheet comprising (a) a rigid thermoplastic resin formed polystyrene substrate sheet and (b) a thermoplastic resin adhesive layer having a heat distortion temperature at least 25° C. lower than that of the thermoplastic resin which constitutes the substrate sheet (a),

moving the laminate sheet below an upper mold in such a manner that the substrate sheet (a) is positioned so as to face the upper mold, vacuum molding the laminated sheet using the upper mold to produce a molded article having a desired irregular surface, and

bonding a cardboard plate-shaped member having a high stiffness to the adhesive layer (b) of the laminated sheet while the above-molded article is brought into close contact with the upper mold by vertically raising said cardboard plate-shaped member to contact the adhesive

layer, thereby producing the cushioning laminate having closed air pockets.

4,681,649

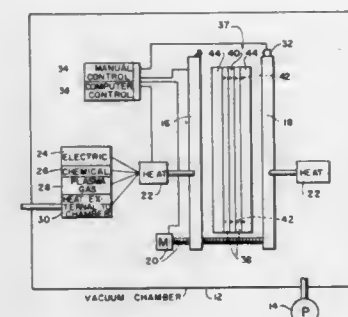
**MULTI-LAYER PRINTED CIRCUIT BOARD VACUUM LAMINATION METHOD**

Fazal A. Fazlin, 12000 - 28th St., North, St. Petersburg, Fla. 33702

Filed Apr. 15, 1985, Ser. No. 723,607  
Int. Cl.<sup>4</sup> B32B 31/20

U.S. Cl. 156-285

3 Claims



1. A method for laminating the layers of a book composed of printed circuit layers and adhesive layers comprising the steps of:

- providing a vacuum chamber including a pair of spaced apart chamber platens;
- loading the book between the pair of chamber platens within the chamber;
- closing the chamber;
- evacuating the chamber;
- moving the chamber platens together to a prespecified distance apart;
- allowing activation and curing of the adhesive of the adhesive layer including the application of heat to the chamber platens at a prespecified temperature and duration by creating a plasma gas inside the chamber to cause such activation and curing of said adhesive;
- separating the chamber platens;
- restoring the vacuum chamber to atmospheric pressure;
- opening the chamber; and
- removing the book from the chamber.

4,681,650

**POWDER REINFORCING LAMINATE APPARATUS**  
Robert C. Simmonds, Jr., Boxford; Douglas H. Crowell, Beverly, and John F. Martin, Essex, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Mar. 10, 1986, Ser. No. 838,086  
Int. Cl.<sup>4</sup> B32B 31/12

U.S. Cl. 156-378

5 Claims

1. A machine for depositing powder in a selected configuration, fusing the configured powder into a laminate and adhering the fused laminate to a shoe substrate comprising heater assembly means including

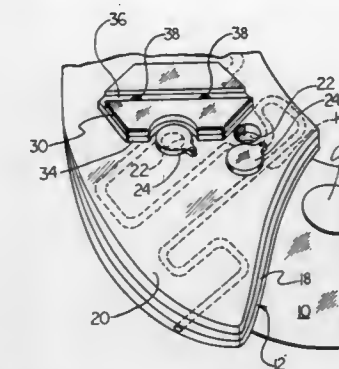
- heater means for raising the temperature of configured powder to fuse the powder into a laminate, and
- a support plate,

said heater assembly having a pair of radially spaced holes extending downwardly through said heater and support plate through which a fused laminate underlying the holes can be observed,

conveyor means for conveying configured powder past said heater means to fuse the configured powder into a fused laminate,

temperature sensor assembly means including means for remotely sensing temperature, means for controlling the displacement of said tempera-

ture sensing means from one location whereat the temperature of the fused laminate below one of said holes will be sensed to a second location whereat the temperature of the fused laminate below the other one of said



holes will be sensed so that said temperature sensing means can view the fused laminate below either one of said holes, means for selectively covering said holes.

4,681,651

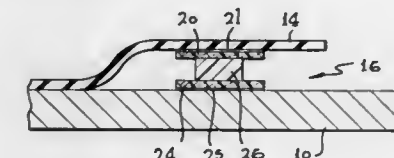
**VACUUM BAG SEALING SYSTEM**

George R. Brozovic, Glendale; Michael O. Djobadze, LaCrescenta, and Felix M. Navarrete, Arleta, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Aug. 7, 1986, Ser. No. 894,147  
Int. Cl.<sup>4</sup> B32B 31/20

U.S. Cl. 156-382

14 Claims



1. A sealing system for the forming of structures and the like in a mold comprising:

- a base plate for mounting the mold;
- a first Teflon coated sealing surface bonded to said base plate extending about said mold;
- a vacuum bag;
- a second Teflon coated sealing surface bonded to said vacuum bag in a complimentary relationship to said first sealing surface when said vacuum bag is placed over said mold and said base plate; and
- adhesive means for detachably sealing said first sealing surface to said second sealing surface so that an airtight seal is formed between said vacuum bag and said base plate.

4,681,652

**MANUFACTURE OF POLYCRYSTALLINE SILICON**  
Leo C. Rogers, 1651 W. Lindner, Mesa, Ariz. 85202, and Alfred J. Heltz, 2950 E. Dover, Mesa, Ariz. 85203

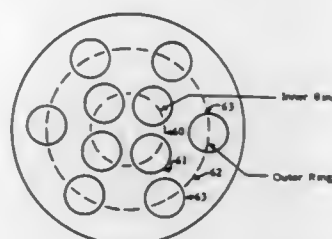
Filed Jan. 5, 1980, Ser. No. 156,659  
Int. Cl.<sup>4</sup> C30B 25/10

U.S. Cl. 156-613

7 Claims

1. In a process of producing polycrystalline or monocrystalline silicon by thermal decomposition and deposition of a silicon-containing composition upon a plurality of deposition members within a reactor chamber, the improvement which comprises the step of mounting the deposition members in an outer ring 50 and an inner ring surrounded by the outer ring

that the deposition members of the outer ring are positioned so as to intercept and absorb the outward radiation from the inner ring in order to cause the outer ring deposition members to act



as an insulative barrier to the heat from the inner ring's radiation and thus to prevent loss of a substantial amount of heat radiated by the inner ring deposition members.

4,681,653

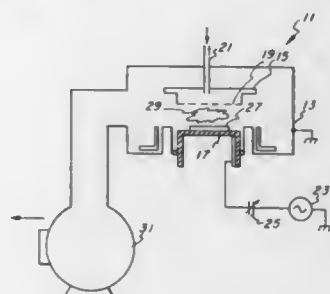
# PLANARIZED DIELECTRIC DEPOSITED USING PLASMA ENHANCED CHEMICAL VAPOR DEPOSITION

Andrew J. Purdes, and Gregory C. Smith, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex. Continuation of Ser. No. 616,517, Jan. 1, 1984, abandoned. This application Mar. 6, 1986, Ser. No. 837,878

Int. Cl.<sup>4</sup> C30B 25/06

U.S. Cl. 156-614

7 Claims



1. A method of smooth topography deposition of a material onto a substrate, comprising the steps of:

- providing a substrate,
- providing a mixture of gases which react in a plasma to provide a dielectric material for deposit,
- flowing said mixture of gases over said substrate,
- exciting said mixture of gases into a plasma over said substrate to deposit said material onto said substrate, and
- simultaneously backspattering a portion of said deposited material to provide a backspattering rate of said deposited material sufficient to obtain a sidewall slope of no more than about sixty degrees,
- wherein said material is silicon dioxide and said gases include silane and nitrous oxide, and
- wherein the pressure of said gases is less than 1000 mTorr; said plasma is excited by an RF power density exceeding 0.1 watt per square centimeter; and the ratio of the flow of nitrous oxide to the flow of silane is about ten.

4,681,654

# FLEXIBLE FILM SEMICONDUCTOR CHIP CARRIER

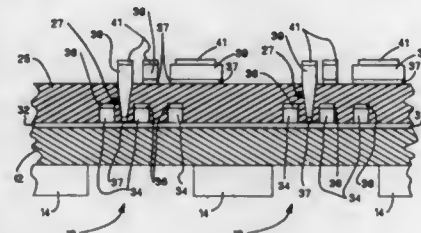
Robert J. Clementi, Binghamton; Charles E. Gazdik, Endicott; William Lafer, Chenango Bridge; Roy L. Lovesky, Vestal; Donald G. McBride, Binghamton; Joel V. Munson, Port Crane, and Eugene P. Skarvinko, Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1986, Ser. No. 865,316

Int. Cl.<sup>4</sup> C23F 1/02; B44C 1/22; B29C 37/00; C03C 15/00

U.S. Cl. 156-630

19 Claims



8. A method for making a circuitized flexible film substrate comprising the steps of:

- coating one side of a carrier foil with uncured polyimide;
  - drying the polyimide on the carrier foil to partially cure the polyimide;
  - coating one side of a tape with an adhesive material, said tape having at least one window-like opening;
  - laminating the tape together with the carrier foil, with the polyimide coated side of the carrier foil facing the adhesive coated side of the tape;
  - removing the carrier foil to leave the tape with a relatively thin continuous layer of polyimide spanning the window-like opening in the tape;
  - fully curing the polyimide on the tape; and
  - circuitizing the polyimide layer spanning the window-like opening in the tape.
12. The method as recited in claim 8 further comprising the step of:
- mounting an electronic device on the circuitry of the polyimide layer spanning the window-like opening in the tape.

4,681,655

# ELECTRICAL INTERCONNECT SUPPORT SYSTEM WITH LOW DIELECTRIC CONSTANT

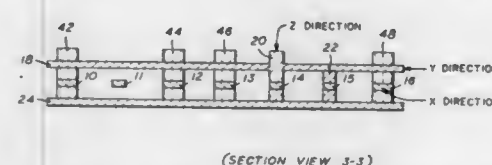
Curtis N. Potter, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Nov. 24, 1986, Ser. No. 934,367

Int. Cl.<sup>4</sup> H01L 21/00

U.S. Cl. 156-632

6 Claims



1. A method of fabricating an anodic aluminum support system for metallic conductors comprising,

- providing two or more metal layers, separated by a coating of aluminum, creating a multiple layer electrical interconnect system,
- anodizing the aluminum,
- applying a resist mask to spaced portions of the top of the system,
- applying an etching solution to the top of the system for removing the anodized aluminum except for the portions covered by the mask thereby providing a multilayer con-

ductor system supported by pillars of anodic aluminum surrounded by low dielectric air.

6. A method of fabricating an anodic aluminum support system having an air bridge for metallic conductors comprising,

- making a multiple layer interconnect system by depositing a first metal layer extending in the X direction and a second metal layer extending in the Y direction and a third layer extending in the Z direction onto a ground plate each of which layer is separated by a coating of aluminum,
- anodizing the aluminum,
- applying a photoresist mask to spaced positions of the top of the system,
- applying an etching solution to the top of the system for removing all of the anodized aluminum except for the portions covered by the mask thereby providing a multilayer conductor supported by pillars of anodic aluminum surrounded by low dielectric air.

4,681,656

# IC CARRIER SYSTEM

James E. Byrum, 1203 Countrywood La., Vista, Calif. 92083

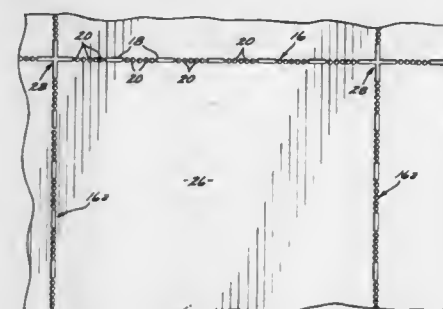
Continuation-in-part of Ser. No. 468,415, Feb. 22, 1983,

abandoned. This application May 1, 1985, Ser. No. 729,228

Int. Cl.<sup>4</sup> C23F 1/02; B44C 1/22; B23K 9/00; C25D 5/02

U.S. Cl. 156-645

30 Claims



1. The method of making a matrix of IC carriers which comprises:

- providing a generally flat sheet ceramic blank which has been sintered by means of a primary, high temperature firing;
  - laser-machining a first plurality of parallel, straightline sequences of elongated, substantially straight-sided slots in said fired ceramic blank; and
  - laser-machining a second plurality of said sequences in said fired ceramic blank which is orthogonal to and intersecting with said first plurality of sequences;
- said IC carriers being defined between adjacent pairs of said first sequences and adjacent pairs of said second sequences.

4,681,657

# PREFERENTIAL CHEMICAL ETCH FOR DOPED SILICON

Bao-Tai Hwang, Poughkeepsie; Wendy A. Orr-Arienzo, Chappaqua, both of N.Y., and Reinhard Glang, Reston, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,402

Int. Cl.<sup>4</sup> H01L 21/306; B44C 1/22; C23F 1/02; C03C 15/00

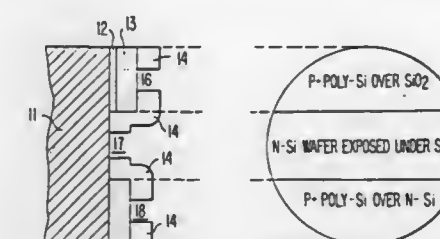
U.S. Cl. 156-657

4 Claims

1. A method for the controllable, preferential patterned etching of a doped silicon layer which overlies an intrinsic or lightly doped crystal surface which comprises the steps of:

- providing an etch mask overlying the silicon layer;
- immersing the doped silicon on the crystal surface in an etchant solution comprising about 0.2-6 mole percent

hydrofluoric acid, 14-28 mole percent nitric acid, and 66-86 mole percent acetic acid/water; and



etching portions of the doped silicon layer exposed through the mask in the solution until the exposed doped silicon is removed and the underlying surface is clear and specular.

4,681,658

# TREATED GLASS FIBERS AND NONWOVEN SHEET-LIKE MAT AND METHOD

Ed C. Hsu, Pittsburgh, and Chester S. Temple, McKees Rocks, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa. Division of Ser. No. 422,617, Sep. 24, 1982, Pat. No. 4,536,446.

This application Mar. 29, 1985, Ser. No. 717,755

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.<sup>4</sup> D21H 5/18

U.S. Cl. 162-156

13 Claims

- Aqueous dispersion of chopped glass fiber strands having a length of about 1/16 of an inch to about 3 inches and having a chemical treating composition consisting essentially of
- a nonionic surfactant,
  - a cationic quaternary ammonium salt surfactant, wherein the ratio of the nonionic or cationic surfactants is about 1 to about 99 to about 99 to 1, and
  - a major amount of water to give an effective total solids content for the composition for treating the glass fibers during their formation,
- where the strands are present in an amount of about 0.001 to about 5 weight percent of the dispersion.

4,681,659

# MULTI-NIP HIGH PRESSURE PRESS

Johann Sbaschnigg, Graz, Austria, assignor to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Continuation-in-part of Ser. No. 541,300, Oct. 12, 1983,

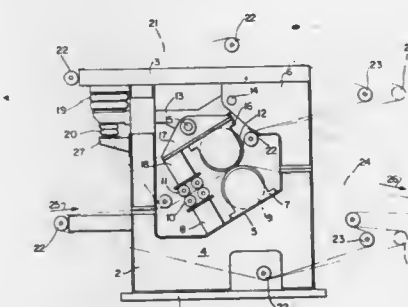
abandoned. This application Oct. 4, 1985, Ser. No. 784,167

Claims priority, application Austria, Oct. 12, 1982, 3756/82

Int. Cl.<sup>4</sup> B30B 9/24; D21F 3/02; F26B 13/28

U.S. Cl. 162-360.1

2 Claims



1. A device for further dehydration of lengths of material and adapted to be attached as a separate unit to a dehydrating machine such as a double, longitudinal or circular strainer, said device comprising a pair of compression rollers mounted in their own frame through the compression nip of which an



individual lower strainer and/or felt belt is caused to pass together with a length of material discharged from said dehydrating machine, said lower strainer and/or felt belt being separate from said dehydrating machine and abutting the lower one of said pair of compression rollers, each of said compression rollers having substantially the same diameter, at least one pair of rollers immediately preceding said pair of compression rollers, each roller of said at least one pair of rollers having a diameter of about one-fourth the diameter of each of said compression rollers, an upper strainer and/or felt belt separate from said dehydrating machine and abutting the upper one of said pair of compression rollers, wherein said lower strainer and/or felt belt and said upper strainer and/or felt belt are guided ascendingly within the area of said pair of compression rollers and said at least one pair of rollers of lesser diameter with said length of material compressed therebetween, and wherein bearings for said upper compression roller and for the upper one of each of said at least one pair of rollers of lesser diameter are attached to a common, movable supported beam on which a lever pivoted to said frame is articulated.

4,681,660

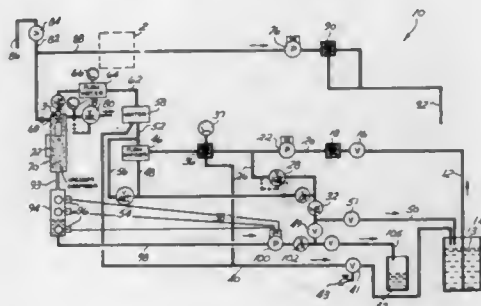
# METHOD AND DEVICE FOR RECLAIMING FLUID LUBRICANTS

Rick R. Budny, 2511 Stratford Dr., St. Joseph, Mich. 49085  
Continuation-in-part of Ser. No. 634,185, Jul. 26, 1984, abandoned, which is a continuation of Ser. No. 453,346, Dec. 27, 1982, abandoned. This application Jul. 15, 1985, Ser. No. 755,005

Int. Cl.<sup>4</sup> C10G 33/06

U.S. Cl. 196—46.1

12 Claims



1. Apparatus for reclaiming fluid lubricants containing solid and liquid contaminants, said apparatus comprising inlet means for introducing a quantity of contaminated fluid into the apparatus, filtering means positioned adjacent to and in direct flow communication with said inlet means for removing said solid contaminants from said contaminated fluid, heater means serially connected and in flow communication with said filtering means for heating the fluid passed from said filtering means to the heater means to a temperature between 60° C. and 83° C., distillation means serially connected and in flow communication with said heater means for reducing the pressure of the fluid passage from said heater means to the distillation means to produce a purified fluid free of solid and liquid contaminants, and adjustable pump means in flow communication with said distillation means for regulating the pressure within the distillation means to correspond to the boiling point of the fluid passed from the heater means, an outlet conduit serially connected to and located in flow communication with said distillation means, said apparatus including a continuous conduit from said inlet means to said outlet conduit, pump means for propelling said fluid from said inlet means to said distillation means, and pump means in flow communication with said distillation means and said outlet conduit for directing said purified fluid from said distillation means through said outlet conduit, said apparatus further including flow dividing means for said heater means located between and in flow communication with said filtering means and said heater means so as to divert preselected percentage of said filtered fluid into said heater means,

said apparatus further including a drain and a receptacle for containing the contaminated fluid, said drain being in flow communication between said flow dividing means and said receptacle, said flow dividing means positioned along said continuous conduit and in flow communication with said drain so as to divert a remaining percentage of the filtered fluid passing through said flow dividing means to said drain, said drain being in flow communication with said receptacle so that said remaining percentage of filtered fluid may be recycled back into said apparatus.

4,681,661

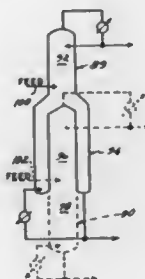
# DUAL DISTILLATION COLUMNS

Rakesh Govind, 10409 Stone Ct., Cincinnati, Ohio 45242  
Continuation-in-part of Ser. No. 541,991, Oct. 14, 1983, abandoned. This application Oct. 9, 1984, Ser. No. 657,731

Int. Cl.<sup>4</sup> B01D 3/26

U.S. Cl. 202—154

2 Claims



1. A distillation apparatus adapted to effect separation of component materials of a first and a second mixture and maintain said mixtures separate comprising a first distillation column comprising:

- a first upper rectifying section and a first lower stripping section;
- a first feed inlet into said first distillation column between said first rectifying section and said first stripping section;
- a first outlet from said first rectifying section;
- a second distillation column comprising a second upper rectifying section and a second lower stripping section;
- a second feed inlet into said second distillation column between said second upper rectifying section and said second lower stripping section;
- a second outlet from said second rectifying upper section;
- wherein the first lower stripping section of said first distillation column surrounds and is in thermal contact with said second upper rectifying section of said second distillation column, and first lower stripping section of said first distillation column and said second upper rectifying section of said second distillation column having a common cylindrical wall, said second upper rectifying section having a top wall, said cylindrical wall and said top wall separating said second upper rectifying section from said first lower stripping section thereby permitting said second upper rectifying section of said second column to be maintained at a higher pressure than said first lower stripping section of said first column without a compressor.

4,681,662

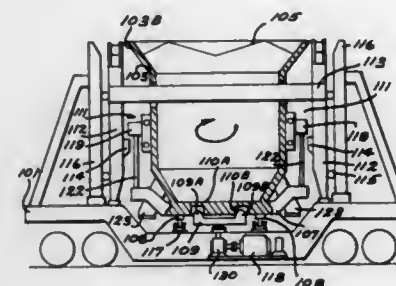
# HOT COKE BUCKET AND BUCKET CAR ASSEMBLY

Shoji Kutsumura, Hokkaido, and Toulchi Isonaga, Shiga, both of Japan, assignors to Nippon Steel Corp. and Fujicar Manufacturing Co. Ltd., both of Japan  
Filed Sep. 24, 1984, Ser. No. 653,768  
Claims priority, application Japan, Sep. 26, 1983, 58-148667[U]; Jun. 1, 1984, 59-81779[U]; Jun. 1, 1984, 59-81780[U]; Aug. 17, 1984, 59-171293; Aug. 17, 1984, 59-171294

Int. Cl.<sup>4</sup> C10B 39/02, 39/14

U.S. Cl. 202—270

3 Claims



1. An assembly of a rotary coke bucket and a bucket car for transporting hot coke to a dry quenching facility comprising: at least three rollers arranged on an upper surface of the bucket car in a circular configuration; a rotary arm rotatably mounted on said upper surface of said car with the rotating axis of said arm being identical to the center of the circular configuration of said rollers; said rotary arm having spaced apart ends and having at each said end an upward projection; driving means for rotating the rotary arm; said coke bucket having a bottom comprising two gate members forming a discharge gate, said two gate members further each having a bottom surface and a semicircular rail disposed thereon, said rails being engaged by said rollers when said bucket is disposed on said car; and a plurality of recesses formed on said bottom surface of each of the discharge gate members to loosely engage with said upward projections of the rotary arm when said bucket is disposed on said car.

4,681,663

# BIPOLAR ELECTRODE FORMATION

Harvey N. Selger, Mayfield Heights, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 12, 1986, Ser. No. 941,204

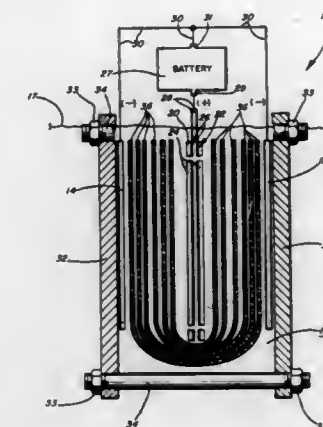
Int. Cl.<sup>4</sup> H01M 10/44

U.S. Cl. 204—21

44 Claims

1. A system useful in the formation of electrodes for use in electrochemical cells, said system comprising: a power supply; a pair of conductive end electrodes spaced apart from one another and disposed in an aqueous electrolyte during operation of said system, said end electrodes being in electrical contact with said power supply to effect current flow in said electrolyte; a pair of precursor electrodes each comprising an electroactive material to be reduced or oxidized disposed on a conductive substrate, said precursor electrodes being disposed in said electrolyte in a configuration substantially precluding contact between said electrolyte and said substrates and orientated relative to said end electrodes so as to permit said reduction or oxidation of said material, said substrates being in electrical contact with said power supply to effect current flow in said electrolyte; restraining means for applying restraining forces to said precursor electrodes substantially maintaining the dimensions of said precursor electrodes during said reduction or oxidation; and, a separator disposed between said precursor electrodes and

said end electrodes permitting said precursor electrodes and said end electrodes to contact said electrolyte and



permitting a substantially uniform application of said restraining forces to said precursor electrodes.

4,681,664

# PROCESS FOR PRODUCING PIECES OF JEWELRY FROM PRECIOUS METALS AND PIECES OF JEWELRY PRODUCED BY IT

Rudolf Eberle, Knittlingen; Wilfried Essert, Pforzheim, and Herbert Kull, Neuenburg, all of Fed. Rep. of Germany, assignors to Juwedor GmbH, Fed. Rep. of Germany  
Filed Feb. 18, 1986, Ser. No. 830,633

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509791; Dec. 21, 1985, 3545549

Int. Cl.<sup>4</sup> C25D 1/02

U.S. Cl. 204—9

15 Claims

1. A process for the production of pieces of jewelry made from metal wherein metal is electrodeposited on an electrically conductive mould core having the spatial contour of the piece of jewelry and on reaching the desired coating thickness the material of the mould core is removed from the electrodeposited metal to leave a hollow jewelry body made of said electrodeposited metal, and wherein said hollow jewelry body is thereafter provided with a solid zone made from metal in at least one area of the piece of jewelry which is likely to be thereafter more strongly stressed than other areas of said piece of jewelry.

4,681,665

# PROCESS AND APPARATUS FOR ELECTROCHEMICAL TREATMENT OF THE SURFACE OF METAL PRODUCTS OF ELONGATE SHAPE

Robert Guillermet, Rives; Michel Ladet, Seyssinet; Gérard Laslaz, and Claude Le Bars, both of Voiron, all of France, assignors to Aluminium Pechiney, Paris, France

Filed Feb. 24, 1984, Ser. No. 583,232

Claims priority, application France, Mar. 16, 1983, 83 04612

Int. Cl.<sup>4</sup> C25D 11/02, 19/00

U.S. Cl. 204—14.1

5 Claims



1. A process for electrochemical treatment, within an elongated electrochemical cell, of the surface of metal products,

wherein the products are static or in movement along the length of said cell comprising the steps of:  
 providing an elongated electrochemical treatment cell with a single compartment containing an electrolyte;  
 providing the cell with a plurality of electrodes positioned along its walls and forming at least four groups;  
 passing current through the electrodes for developing successively along the length of the cell an anodic group, a non-charged group, a cathodic group, and non-charged group spaced apart from each other;  
 electrically switching simultaneously said anodic group, said non-charged group, said cathodic group, and said non-charged group successively along the length of the cell at a speed greater than the speed of said product when said product is in motion.

4,681,666

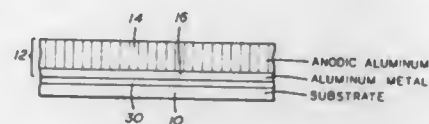
# PLANARIZATION OF A LAYER OF METAL AND ANODIC ALUMINUM

Curtis N. Potter, and Harry Kroger, both of Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Nov. 13, 1986, Ser. No. 930,167  
 Int. Cl.<sup>4</sup> C25D 5/02

U.S. Cl. 204—15

5 Claims



1. A method of planarization of a layer of metal and anodic aluminum in a multilayered electrical interconnect system comprising,  
 coating a substrate with aluminum,  
 anodizing the aluminum from the top towards but not entirely to the bottom leaving a thickness of unanodized aluminum on the bottom,  
 applying an etch mask to the top of the anodic aluminum leaving a predetermined area bare,  
 etching out the anodic aluminum in the bare area down to the unanodized aluminum,  
 plating a metal to the unanodized aluminum in the etched out area, the thickness of the unetched plating being equal to the thickness of the anodic aluminum,  
 removing the mask, and  
 anodizing the unanodized aluminum.

4,681,667

# METHOD OF PRODUCING ELECTROSTRICTIVE EFFECT ELEMENT

Kazuaki Utsumi; Atsushi Ochi; Masanori Suzuki, and Mitsubiro Midorikawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 564,652, Dec. 22, 1983, abandoned.

This application Dec. 10, 1986, Ser. No. 940,210

Claims priority, application Japan, Dec. 22, 1982, 57-225169; Mar. 24, 1983, 58-49250; Oct. 18, 1983, 58-194901; Oct. 18, 1983, 58-194902; Oct. 18, 1983, 58-194903; Oct. 18, 1983, 58-194904

Int. Cl.<sup>4</sup> C25G 7/00

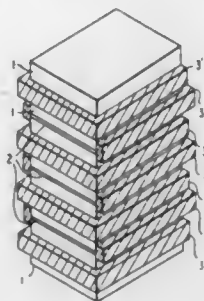
U.S. Cl. 204—15

18 Claims

5. A method of producing an electrostrictive effect element comprising the steps of:

preparing a laminated structure having films or thin plates of electrostrictive material and internal electrodes superposed alternately in such manner that their respective principal surfaces are faced to each other, said laminating structure having flat side surfaces perpendicular to said

principal surfaces and exposing cross sections of said internal electrodes on said flat side surfaces;  
 placing said laminated structure having said flat side surfaces in a suspension solution containing glass powder and selectively depositing said glass powder only on said cross sections of every other one of said internal electrodes and portions of the layers of the electrostrictive material therearound exposed on said flat side surfaces by an electrophoretic deposition process with the other portions of said



layer of said electrostrictive material or said flat side surfaces being maintained exposed; and  
 thereafter sintering said glass powder selectively deposited only on said cross sections of said every other one of said internal electrode layers and said portions of the layers of the electrostrictive material therearound at said flat side surfaces of the laminated structure to form a plurality of separated belts of glass coating films on said flat side surfaces.

4,681,668

# ANODIC ALUMINIUM OXIDE FILM AND METHOD OF FORMING IT

Nigel C. Davies, and Peter G. Sheasby, both of Banbury, England, assignors to Alcan International Limited, Montreal, Canada

Filed Oct. 31, 1985, Ser. No. 793,742

Claims priority, application United Kingdom, Nov. 5, 1984, 8427943

Int. Cl.<sup>4</sup> C25D 11/08

U.S. Cl. 204—28

11 Claims

1. A method of forming an anodic film on an aluminium strip by continuously passing the strip through a phosphoric-acid-containing electrolyte maintained at a temperature of from 25° to 80° C., the contact time between the strip and the electrolyte being not more than 15 seconds during which time the strip is anodized at the current density of at least 250 A/m<sup>2</sup>, the nature, concentration and temperature of the electrolyte being chosen in relation to the current density such that the rate of chemical dissolution of the oxide film is comparable to, but less than, the rate of anodic oxide formation, whereby there is formed on the surface of the strip an anodic oxide film from 15 to 200 nm thick and containing phosphate ion.

4,681,669

# METHOD FOR PRODUCING MAGNETIC RECORDING MEDIA

Toshiro Takahashi; Tadao Tokushima, both of Hamamatsu; Yoshifumi Suzuki, Iwata, and Yukio Wakui, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 14, 1985, Ser. No. 798,234

Claims priority, application Japan, Nov. 16, 1984, 59-241838

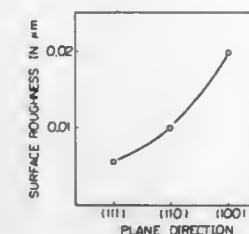
Int. Cl.<sup>4</sup> C25D 11/20

U.S. Cl. 204—35.1

1 Claim

1. Improved method for producing magnetic recording media comprising the steps of

subjecting an Al predominant substrate to anode oxidation to form thereon an Al surface layer with pores,  
 depositing ferromagnetic substance in said pores of said Al surface layer, and



grinding said Al surface layer,  
 the surface of said Al predominant substrate having a K-value specified by

$$K = \frac{S(111)}{\sum S(hkl)} \geq 0.5$$

in which S (1 1 1) is the X-ray reflection intensity by the (1 1 1) crystal plane of Al and  $\sum S(hkl)$  is the total X-ray reflection intensity by all crystal planes of Al, both by Miller indices.

4,681,670

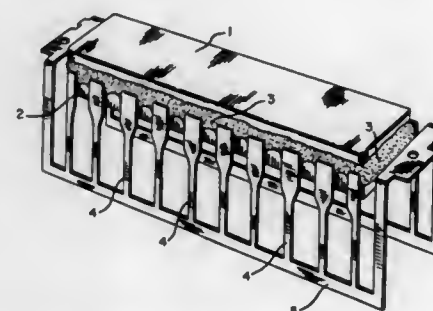
# BATH AND PROCESS FOR PLATING TIN-LEAD ALLOYS

Fred I. Nobel, Sands Point, and David N. Schram, Freeport, both of N.Y., assignors to LeaRonald, Inc., Freeport, N.Y. Division of Ser. No. 774,822, Sep. 11, 1985, Pat. No. 4,640,746, which is a continuation-in-part of Ser. No. 659,818, Oct. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 423,748, Sep. 27, 1982, abandoned. This application Sep. 4, 1986, Ser. No. 903,528

Int. Cl.<sup>4</sup> C25D 3/32, 3/36, 3/56, 3/60

U.S. Cl. 204—44.4

23 Claims



1. A tin, lead or tin/lead alloy electroplating solution comprising a soluble tin compound, or a soluble divalent lead compound, or both; and a complexing agent of a carboxylic acid, phosphonic acid, or an alkali salt thereof in an amount sufficient to maintain the tin and/or lead compounds in said solution; said solution having a pH in the range of about 1.5 to less than 4.

184-023 O.G.-87-11

4,681,671

# LOW TEMPERATURE ALUMINA ELECTROLYSIS

Jean-Jacques Duruz, Geneva, Switzerland, assignor to ELTECH Systems Corporation, Boca Raton, Fla.

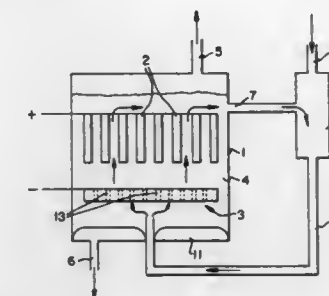
Filed Feb. 13, 1986, Ser. No. 829,435

Claims priority, application Austria, Feb. 18, 1985, 810063/85

Int. Cl.<sup>4</sup> C25C 3/06, 3/12

U.S. Cl. 204—67

20 Claims



1. A method of producing aluminum by electrolysis of alumina dissolved in a molten fluoride electrolyte in an aluminum reduction cell using a low temperature melt, at a temperature up to 860° C., characterized by effecting a continuing steady-state electrolysis using an oxygen-evolving, non-consumable anode having an electrochemically active surface area at least 1.5 times larger than the projected area of the anode onto a horizontal plane, said electrolysis being effected at an anodic current density which is at or below a threshold value corresponding to the maximum transport rate of oxide ions in the electrolyte and at which oxide ions are discharged preferentially to fluoride ions, the electrolyte circulating between an electrolysis zone wherein the electrolyte is depleted of alumina and an enrichment zone wherein the electrolyte is enriched with alumina.

4,681,672

# METHOD FOR ETCHING ELECTRODE FOILS FOR AN ALUMINIUM ELECTROLYTIC CAPACITOR

Koichi Kojima; Akihiro Jujo, both of Osaka; Masanori Okabayashi, Kyoto; Ryolchi Shimatani, Kyoto; Kenji Toyama, Kyoto, and Nobuyoshi Kanzaki, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

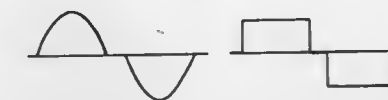
Filed Dec. 27, 1985, Ser. No. 813,861

Claims priority, application Japan, Dec. 28, 1984, 59-280380

Int. Cl.<sup>4</sup> C25F 3/04

U.S. Cl. 204—129.4

2 Claims



1. A method for electrolytically etching an aluminum foil for use as an electrode of an aluminum electrolytic capacitor, which comprises arranging the aluminum foil between and in parallel to a pair of equally spaced electrodes in a 3 to 25% hydrochloric acid solution containing aluminum chloride at a temperature of from 20 to 60 degrees C., and electrolytically etching the aluminum foil on the surfaces thereof by application of an AC current across the paired electrodes without direct application to the aluminum foil to etch the foil, said AC current having a waveform in which each cycle consists of positive and negative half cycles and an OFF time interval between the half cycles at which the AC current is zero, the current waveforms in the positive and negative half cycles being identical, the interval of each half cycle being in the range of from 10, to 100 msec and each OFF time interval at



which the etching current is zero being in the range of from 2 to 30 msec, whereby the size of pits formed by the etching may be suitably controlled.

4,681,673

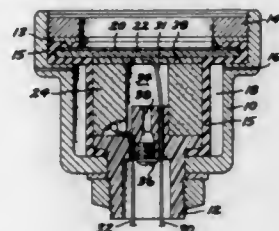
# PORTABLE OXYGEN SENSOR WITH SHORTENED BREAK-IN TIME

Leonard W. Niedrach, and Fritz G. Will, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 665,672, Oct. 29, 1984. This application Jun. 23, 1986, Ser. No. 877,612  
Int. Cl.<sup>4</sup> G01N 27/46; B22F 3/12

U.S. Cl. 204—415

9 Claims



1. A method of forming a preconditioned oxygen sensor cell which comprises providing a porous body of copper metal having a large surface area for its volume, distributing through said body of copper a quantity of cuprous oxide to constitute 0.1 to 5.0 percent of the weight of the body of copper, maintaining a level of porosity of said body of at least 15 percent by volume, and disposing said porous body in an oxygen sensor cell.

4,681,674

# FIXED BED CATALYTIC REACTOR SYSTEM WITH IMPROVED LIQUID DISTRIBUTION

Richard G. Graven, Pennington, and John C. Zahner, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 7, 1985, Ser. No. 795,816  
Int. Cl.<sup>4</sup> C10G 65/02

U.S. Cl. 208—59

6 Claims

1. A continuous process for treating a wax-containing petroleum oil in a multi-phase fixed bed catalytic hydrodewaxing reactor system comprising the steps of feeding the oil and a reactant gas containing hydrogen at feed flow rates above a first bed of porous zeolite hydrodewaxing catalyst particles under hydrodewaxing conversion conditions for concurrent downward flow therethrough; collecting and withdrawing the treated oil from the first bed and redistributing at least a portion of the treated oil to at least one succeeding catalyst bed of porous zeolite hydrodewaxing catalyst particles while permitting the gaseous phase to flow directly to the succeeding catalyst bed; recycling a quantity of treated oil collected below a catalyst bed and reapplying the treated oil at a preceding redistribution zone above the bed from which treated oil is collected, whereby the total of oil feed flow rate and recycled treated oil flow rate is maintained at sufficient liquid flux rate to effect substantially uniform catalyst wetting, thereby enhancing hydrodewaxing conversion.

4,681,675

# ORE FLOTATION

Clarence R. Bresson, and Robert M. Parlman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

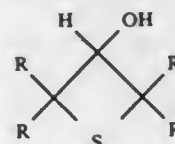
Continuation of Ser. No. 722,627, Apr. 12, 1985, abandoned. This application Apr. 18, 1986, Ser. No. 854,732

Int. Cl.<sup>4</sup> B03D 1/02

U.S. Cl. 209—167

15 Claims

1. A process for recovering metal values selected from the group consisting of: molybdenum and copper, from particulate solids containing said metal values in the presence of at least one sulfide selected from the group consisting of: iron, nickel, lead, and zinc, which process comprises: (a) mixing said solids with water, a collector and a 3-hydroxytrimethylene sulfide of the formula:



- wherein each R is independently H or C<sub>1</sub>-C<sub>3</sub> alkyl radical, to establish a pulp; (b) aerating said pulp to produce a froth containing a first portion of said minerals while allowing a second portion of said minerals to be depressed in said pulp; and (c) recovering said first portion of said minerals from said froth.

4,681,676

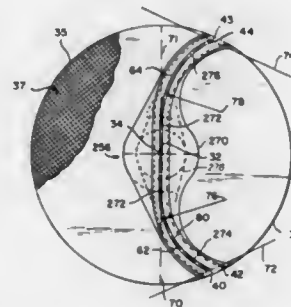
# ANALYTIC SIEVING APPARATUS

Alfred J. Heldinger, Chester, and Robert W. Duyckinck, New Providence, both of N.J., assignors to Mikropul Corporation, Summit, N.J.

Filed Mar. 28, 1985, Ser. No. 716,987  
Int. Cl.<sup>4</sup> B07B 1/55

U.S. Cl. 209—380

3 Claims



1. In a dry particulate sieving device of the type having a circular first chamber adapted to receive and contain particulate material having a range of particle sizes extending above and below a predetermined particle size; a horizontally disposed planar screen serving as the floor of said first chamber and having a plurality of openings therein sized to pass particles having a size below said predetermined particle size therethrough; a second circular chamber disposed below said first chamber

adapted to receive particles passing through said screen; and a rotor assembly having a horizontally disposed upper surface positioned closely adjacent the undersurface of said planar screen adapted to direct an air jet curtain against the undersurface of and through said screen; the improvement wherein the upper surface of said rotor assembly includes an elongate and generally C shaped slot having a substantially diametrically disposed center portion and a pair of arcuately bowed end portions disposed in facing relation and compositely traversing said screen undersurface for emitting a complementally C shaped jet curtain against the undersurface of said screen during rotation thereof.

4,681,677

# WATER PROCESSOR HAVING AUTOMATIC SHUTOFF AND BYPASS MEANS

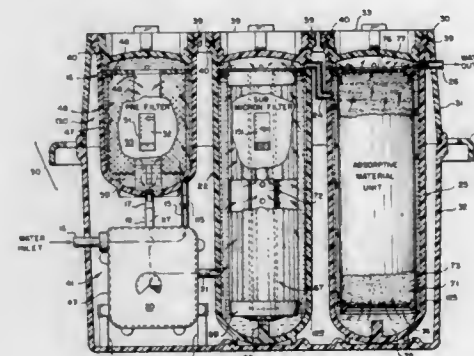
Louis M. Kuh, and Robert C. Lampe, both of Stamford, Conn., assignors to Olin Corporation, Cheshire, Conn.

Continuation of Ser. No. 326,963, Dec. 2, 1981, abandoned, which is a continuation of Ser. No. 167,169, Jul. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 39,936, May 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 879,027, Feb. 17, 1978, abandoned. This application Aug. 5, 1985, Ser. No. 762,816

Int. Cl.<sup>4</sup> B01D 27/10

U.S. Cl. 210—88

16 Claims



1. A fail-safe water processor for in-line installation between a source of water supply and a point of use in a water distribution system, said fail-safe water processor comprising: a housing having inlet means and outlet means adapted to be connected to a water distribution system so that water flowing through the water distribution system passes through said fail-safe water processor; replaceable mechanical filter means and replaceable adsorption means within said housing in serial fluid communication with one another and with said inlet and outlet means said mechanical filter means causing a water pressure drop in water flowing through said water distribution means between said inlet means and said replaceable adsorption means across said mechanical filter means; water metering means within said housing normally in fluid communication with said inlet means and with said replaceable adsorption means, said water metering means being actuated directly by water flowing through said fail-safe water processor regardless of the duration of flow so as to cumulatively total the quantity of water that has flowed through said water metering means to said replaceable adsorption means; shutoff valve means operatively connected to said water metering means to stop water flowing to said replaceable adsorption means after a predetermined quantity of water has passed through said water metering means, said predetermined quantity of water being generally equal to the

maximum safe quantity which can safely be treated by said replaceable adsorption means; first indicator means associated with said water metering means for continuously indicating what portion of the functional life of said replaceable adsorption means has been exhausted and when said replaceable adsorption means is at the end of its functional life and should be replaced;

flow interruption means operatively associated with said replaceable mechanical filter means for measuring the pressure drop of water pressure across said replaceable mechanical filter means and for interrupting water flowing through said replaceable mechanical filter means when a predetermined water pressure differential, indicating the depletion of said replaceable mechanical filter means, exists across said replaceable mechanical filter means; and

second indicator means associated with said replaceable mechanical filter means and said flow interruption means for indicating when the flow interruption means has interrupted the water flowing through said replaceable mechanical filter means and said replaceable mechanical filter means should be replaced.

4,681,678

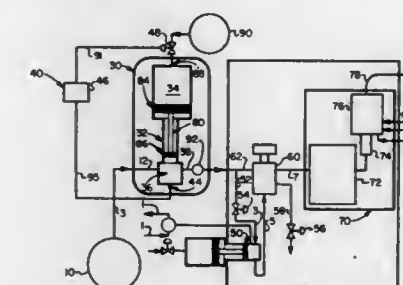
# SAMPLE DILUTION SYSTEM FOR SUPERCRITICAL FLUID CHROMATOGRAPHY

Emory J. Leaseburg, and Kenneth J. Melda, both of Lewisburg, W. Va., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 10, 1986, Ser. No. 917,628  
Int. Cl.<sup>4</sup> B01D 15/08

U.S. Cl. 210—101

1 Claim



1. An apparatus for analyzing a process stream via supercritical fluid chromatography comprising: a. chromatograph means for analyzing a sample of the process stream diluted in a volume of the supercritical fluid via supercritical fluid chromatography; b. pump means for drawing a supercritical fluid substance from a container means through a supply line, pressurizing said supercritical fluid substance and delivering said pressurized supercritical fluid substance to said chromatograph means; and c. extraction means operatively associated with said chromatograph means for drawing a known sample volume from the process and injecting said volume into a known volume of supercritical fluid substance to form a dilute mix for analysis, said extraction means comprising a pneumatically driven syringe pump having a first larger diameter chamber adapted to receive pressurized air, a second smaller diameter chamber adapted to receive supercritical fluid substance from said pump means, and an axially extending plunger having a first large diameter head disposed and axially translatable in sealing relationship within the first chamber and a second small diameter head disposed and axially translatable in sealing relationship within the second chamber, and a sample capture valve for drawing a sample of known volume from the process stream and transferring said sample to the second smaller

diameter chamber to diffuse in the supercritical fluid substance to form said dilute mix.

**4,681,679**  
**FILTERING DEVICE FOR SEPARATING SOLIDS FROM LIQUIDS**

Hans Reber, Wartburgstrasse 5, D-7410 Rentlingen-Sickenhausen, Fed. Rep. of Germany

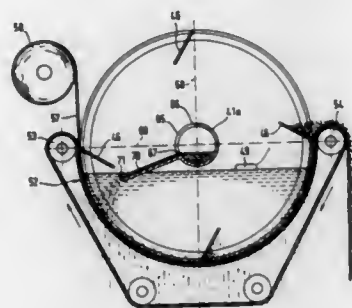
Filed Mar. 18, 1985, Ser. No. 713,272

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409626

Int. Cl.<sup>4</sup> B01D 33/04, 33/14

U.S. Cl. 210-107

6 Claims



1. A filtering device for separating solids from liquids by a gravity filtration process, comprising

- a housing;
- two circular discs spaced from each other in coaxial arrangement and rotatably mounted in said housing with a horizontally oriented axis of rotation, each of said discs having a peripheral flange;
- a delivery spool rotatably mounted on said housing with an axis of rotation parallel to said axis of rotation of said discs;
- a filter belt having a pair of spaced-apart edges, an end supported by said delivery spool, and a portion unwrapped from said delivery spool;
- a plurality of guide pulleys rotatably mounted in said housing with axes of rotation parallel to said axis of rotation of said discs;
- an endless screen support belt having parallel spaced-apart edges arranged and adapted to be guided by said guide pulleys to form an upper strand and a lower strand;
- drive means for driving said endless screen support belt;
- said upper strand of said endless screen support belt supporting said unwrapped portion of said filter belt and pressing said spaced-apart edges of said filter belt against said peripheral flanges of said discs over an arcuate angle of at least 120 degrees, forming with said two discs a half drum-like filter chamber that is open upwards;
- said lower strand of said endless screen support belt returning through the filtered liquid;
- sludge catch bars mounted on said discs to rotate with said discs, extending from and between said discs and arranged to contact said filter belt in said filter chamber;
- a conduit for charging an unfiltered liquid mixture into said filter chamber; and
- a float switch disposed in the area of said filter chamber for detecting the liquid level therein.

**4,681,680**  
**DEVICE FOR THE SELECTIVE AND CONTINUOUS RECOVERY OF HYDROCARBONS PRESENT IN THE FORM OF A SHEET AT THE SURFACE OF AN AQUEOUS MEDIUM**

Luc Delons, Pau, and Roger Chaumont, Condrieu, both of France, assignors to Elf France, Paris, France

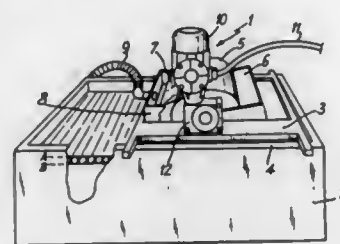
Filed Jan. 10, 1983, Ser. No. 503,048

Claims priority, application France, Jun. 11, 1982, 82 10231

Int. Cl.<sup>4</sup> B01D 17/12

U.S. Cl. 210-110

14 Claims



1. In a device for the selective and continuous recovery of hydrocarbons present in the form of a sheet on the surface of a liquid medium, an extraction means comprising:

- a roller mounted for rotation within a housing and about a horizontal axis, and having a surface comprised of a hydrophobic and oleophilic material and disposed within said housing so that lower portions of the roller surface are capable of being brought into contact with the hydrocarbons to be recovered;
  - recuperator means operatively associated with upper portions of the roller surface to recover hydrocarbons adhered to the hydrophobic and oleophilic material of said surface;
  - a recipient for attracting said sheet to the surface of said roller and for creating an accumulation zone of hydrocarbons which are maintained at a substantially continuous level, comprising a first, inclined face having an axis parallel to the generatrix of said roller and a free upper edge, and a second face connected to the lower edge of said first face, wherein said first face and said second face combine with parallel flanges to define a volume which is upwardly open and which surrounds at least the lower portions of said roller; and
  - means for evacuating said liquid medium from said volume, operatively associated with lowermost portions of said recipient;
- wherein the recipient is mounted for rotation about a horizontal axis between a high position, and a low position in which the upper edge of said first face is immersed at a depth such that the input of liquid entering the recipient is equal to the sum of the rate of extraction by said roller and the rate of evacuation by said evacuation means.

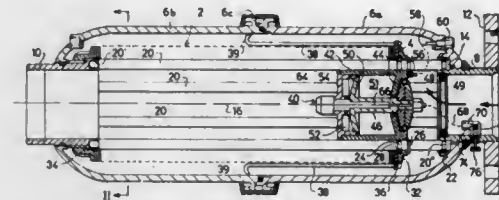
**4,681,681**  
**GROOVED FILTER DISCS**  
Mordeki Drori, 89 Zahal Street, Kiron, Israel  
Filed Jun. 22, 1984, Ser. No. 623,353  
Claims priority, application Israel, Jul. 1, 1983, 69145  
Int. Cl.<sup>4</sup> B01D 29/46

U.S. Cl. 210-133

15 Claims

1. A filter comprising a housing having an inlet and an outlet, and a filter body disposed within said housing for filtering the fluid flowing therethrough from the inlet to the outlet, characterized in that said filter body includes a plurality of grooved filter discs supported in a stack on a plurality of individual rods extending longitudinally of the housing, said rods being supported at their opposite ends by said housing and being disposed in an array around the housing longitudinal axis with spaces between the rods to provide large passageways for the flow of the fluid; each of said grooved filter discs being formed

with an opening of a diameter at least as large as the outer diameter of said array of rods for supporting said discs in stack form on said array of rods; the inner faces of said housing at the opposite sides of the filter body being formed with recesses defining individual sockets each of a configuration corresponding to the ends of said rods; the opposite ends of said rods being seated within said sockets.

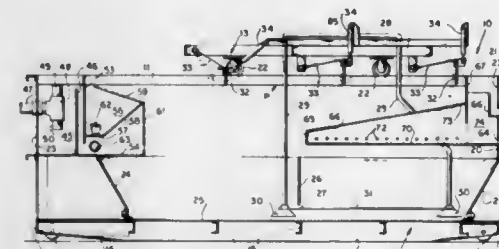


8. A filter comprising a housing having an inlet and an outlet, and a filter body including a plurality of grooved filter discs supported in stacked relation within said housing, characterized in that said housing further includes a stack-removing member disposed at one end of said stack of filter discs, and a handle secured to said stack-removing member to facilitate drawing the filter discs out of the filter housing, when opened for cleaning purposes, without breaking the stack.

**4,681,682**  
**AIR FLOTATION CLARIFIER**  
Harold R. White, New Lenox, and Alex J. Doncer, Palos Heights, both of Ill., assignors to Alar Engineering Corporation, Mokena, Ill.  
Filed Jul. 26, 1983, Ser. No. 517,504  
Int. Cl.<sup>4</sup> B03D 1/24

U.S. Cl. 210-221.2

12 Claims



1. A clarifier comprising an elongated settling tank for a pond of liquid having an inlet at one end, an outlet at the other end, and an overflow trough intermediate said ends, suction means for removing sludge from the bottom of the tank, skimmers for pushing floating scum on a pond when in the tank into said trough, a pressure tank, a compressed air source discharging to the top of said pressure tank, an air-liquid mixer discharging to said pressure tank, a compressor receiving air from the top of said pressure tank discharging to said mixer, means feeding effluent from the outlet of said settling tank to said mixer, means feeding air saturated effluent from said pressure tank to the inlet end of said settling tank, and means projecting into said settling tank from the outlet end thereof for removing clarified liquid as it is formed in the settling tank.

**4,681,683**  
**LAMELLA GRAVITY SEPARATOR**  
Anders Lindstol, deceased, late of Oakville, Canada (by Eva Lindstol, administratrix), assignor to Ecodyne Limited, Oakville, Canada

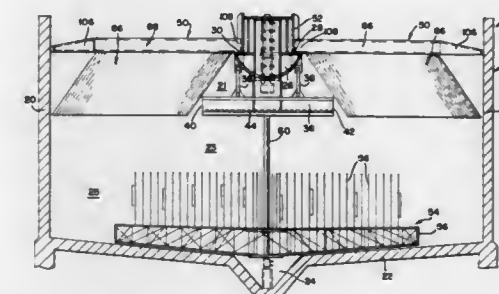
Filed Sep. 9, 1986, Ser. No. 905,703

Claims priority, application Canada, Oct. 9, 1985, 494171

Int. Cl.<sup>4</sup> B01D 17/028

U.S. Cl. 210-521

11 Claims



1. Apparatus for separation of solids suspended in a liquid, comprising:

- (a) a liquid receiving basin;
- (b) a plurality of plate packs positioned within said basin, said plate packs including a plurality of inclined parallel plates therein defining a plurality of parallel inclined flow passages therebetween;
- (c) an inlet distribution means for directing liquid to be treated into said basin and upwardly through said flow passages;
- (d) an elongated collector trough means secured to each of said plate packs in covering relationship to the upper portions thereof, said collector trough means having a floor and upstanding sidewalls, said floor having means defining a plurality of orifices formed therein in communication with said flow passages for directing clarified liquid upwardly therethrough into said collector trough means;
- (e) an elongated outlet trough means extending transversely with respect to said collector trough means for receiving clarified liquid from said collector trough means and directing same from said basin wherein said collector trough means has an outlet opening formed therein in fluid communication with said outlet trough means; and
- (f) said collector trough means having first end portions releasably secured to a sidewall of said basin and second end portions releasably secured to said outlet trough means such that each collector trough means and corresponding plate pack may be individually removed from said basin.

**4,681,684**  
**UNIVERSAL SEPTIC TANK FITTING**  
Michael D. Maroschak, Casselberry; Frederick P. Atchley, Tallahassee, and Douglas G. Everson, Winter Springs, all of Fla., assignors to Plastic Tubing Industries, Inc., Orlando, Fla.  
Filed Apr. 29, 1985, Ser. No. 728,362  
Int. Cl.<sup>4</sup> B01D 21/24

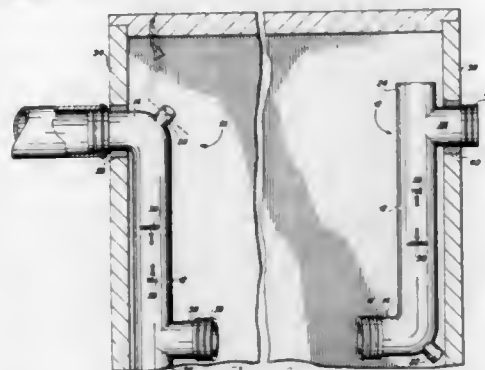
U.S. Cl. 210-532.2

14 Claims

1. A universal septic tank fitting useful as either an inlet sweep or an outlet tee, said fitting comprising:  
a generally tubular member having a central axis;  
a first tube extending into said tubular member adjacent a first end thereof generally radial to said central axis, said first tube having an open end;  
a second tube extending into said tubular member adjacent a second end thereof and generally radial to said central axis, but in a radial direction generally different from the



radial direction of said first tube, said second tube having an open end;  
first vent means adjacent said first end of said tubular member;

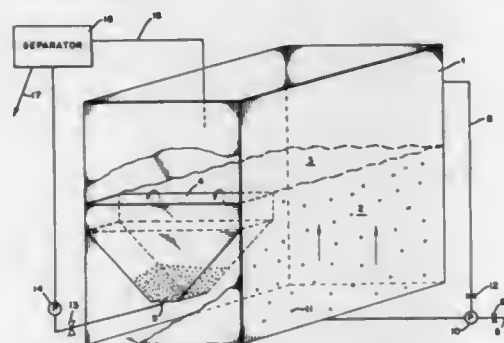


second vent means adjacent said second end of said tubular member; and  
means for closing one of said first and second vent means.

**4,681,685**  
**METHOD AND APPARATUS FOR CONCENTRATING BIOPARTICLES**  
Paul M. Sutton, Bethel, Conn., and Joseph Peplinski, Coldwater, Canada, assignors to Dorr-Oliver Inc., Stamford, Conn.  
Filed Jun. 25, 1985, Ser. No. 748,519  
Int. Cl.<sup>4</sup> C02F 3/08

U.S. Cl. 210-618

14 Claims



1. A method for controlling biomass growth in a reactor comprising:  
concentrating a portion of bioparticles in said reactor by means of at least one concentrator positioned within said reactor and disposed on the inside wall of said reactor such that an opening of said concentrator is positioned substantially at a point near the maximum preferred height of the fluidized bed in said reactor said bioparticles being a media with biomass adhered thereto; and  
removing the concentrated bioparticles from said concentrator to a separating means for separation of said concentrated bioparticles into media and biomass.
2. A system for controlling biomass growth comprising:  
a reactor comprising feed material, bioparticles for fluidizing and treating said feed material, said bioparticles being media with said biomass adhered thereto, and at least one concentrator positioned within said reactor and disposed on the inside wall of said reactor such that an opening of said concentrator is positioned substantially at a point near the maximum preferred height of the fluidized bed in said reactor for concentrating said bioparticles; and  
a separator in communication with said concentrator for removing concentrated bioparticles from said concentra-

tor and separating said concentrated bioparticles into media and biomass.

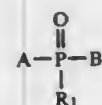
**4,681,686**  
**COTELOMER COMPOUNDS**  
Norman Richardson, 21 Grey Street, Middleton, Manchester, M24 3UF, England; Brian Holt, 70 Moss Park Road, Stretford, Manchester, M32 9HQ, England, and Barry Cook, 11 Warwick Drive, Urmston, Manchester, M31 2AY, England  
Continuation-in-part of Ser. No. 691,083, Jan. 14, 1985, abandoned. This application Jul. 10, 1985, Ser. No. 753,510  
Claims priority, application United Kingdom, Jan. 13, 1984, 8400848

Int. Cl.<sup>4</sup> C02F 5/14

U.S. Cl. 210-699

25 Claims

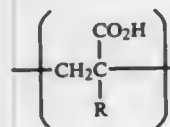
1. A cotelomer compound having the formula



(I)

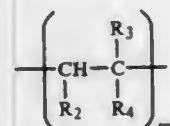
and salts thereof wherein

A is a random polymeric residue comprising at least one unit of formula II



(II)

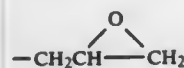
and at least one unit of formula III, different from a unit of formula II,



(III)

and B is hydrogen or a residue A; wherein m and n are integers such that the sum of m+n is an integer of from 3 to 100, the ratio of n:m being from 99 to 1:1 to 99, provided that the resulting telomers are water-soluble and wherein m, n or m and n in a residue A are the same or different from m, n or m and n in a residue B;

R is hydrogen, methyl or ethyl;

R<sub>1</sub> is a residue —OX, wherein X is hydrogen, an alkali metal, an alkaline earth metal, ammonium or an amine residue;R<sub>2</sub> is hydrogen, methyl or a residue —COOR<sub>5</sub> wherein R<sub>5</sub> is hydrogen or a straight or branched chain alkyl having 1 to 8 carbon atoms;R<sub>3</sub> is hydrogen, a straight or branched chain alkyl having 1 to 4 carbon atoms, hydroxymethyl or —COOR<sub>6</sub> wherein R<sub>6</sub> is hydrogen, a residue of the formula

or a residue of the formula



in which R<sub>9</sub> is hydrogen, methyl or phenyl and z is an integer from 1 to 20, or R<sub>6</sub> is a straight or branched chain alkyl having 1 to 8 carbon atoms or said alkyl substituted by —SO<sub>3</sub>M or by

—COOM where M is hydrogen or an alkali metal or alkaline earth metal atom;

R<sub>4</sub> is —COOR<sub>6</sub> where R<sub>6</sub> is as defined above, or R<sub>4</sub> is a straight or branched alkyl having 1 to 8 carbon atoms or said alkyl substituted by one to three carboxylic acid groups; or R<sub>4</sub> is phenyl or said phenyl substituted by —SO<sub>3</sub>M or by —PO<sub>3</sub>M<sub>2</sub>; or R<sub>4</sub> is acetoxy, hydroxymethyl, acetoxymethyl, —SO<sub>3</sub>M, —CH<sub>2</sub>SO<sub>3</sub>M, —PO<sub>3</sub>M<sub>2</sub> or —PO<sub>3</sub>M'<sub>2</sub> in which M is hydrogen or an alkali metal or alkaline earth metal atom and M' is M or alkyl of 1 to 4 carbon atoms; or R<sub>4</sub> is a residue —CONR<sub>7</sub>R<sub>8</sub> wherein R<sub>7</sub> and R<sub>8</sub> are the same or different and each is hydrogen, straight or branched chain alkyl having 1 to 8 carbon atoms, hydroxymethyl, —CH(OH)—COOM, —C(CH<sub>3</sub>)<sub>2</sub>CH<sub>2</sub>SO<sub>3</sub>M, —C(CH<sub>3</sub>)<sub>2</sub>CH<sub>2</sub>PO<sub>3</sub>M<sub>2</sub> or —N(R<sub>10</sub>)COCH<sub>3</sub> in which R<sub>10</sub> is hydrogen or straight or branched chain alkyl of 1 to 4 carbon atoms,

with the proviso that, when R<sub>2</sub> and R<sub>3</sub> are each hydrogen, then R<sub>4</sub> is other than —COOR<sub>6</sub> in which R<sub>6</sub> is —CH<sub>2</sub>CH(R<sub>9</sub>)OH where R<sub>9</sub> is hydrogen or methyl.

**4,681,687**

**USE OF ALKALI METAL NITRITES TO INHIBIT H<sub>2</sub>S FORMATION IN FLUE GAS DESULFURIZATION SYSTEM SLUDGES**

Richard J. Mouché, Batavia, and Peter Song, Midlothian, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.  
Filed Oct. 20, 1986, Ser. No. 920,476  
Int. Cl.<sup>4</sup> C02F 1/50

U.S. Cl. 210-764

3 Claims

1. A method for controlling the growth of sulfate-reducing bacteria including Desulfovibrio desulfuricans and odors including H<sub>2</sub>S produced thereby in flue gas desulfurization scrubber sludges which comprises treating these sludges with a biocidal and odor controlling dosage of an alkali metal nitrite in an amount of at least about 50 ppm, to control the growth of said sulfate reducing bacteria and prevent the biogenic production of said H<sub>2</sub>S.

**4,681,688**

**TUBULAR TRASH NET FOR PRE-TREATING SEWAGE, WITH REPLACEABLE NET CASSETTE**

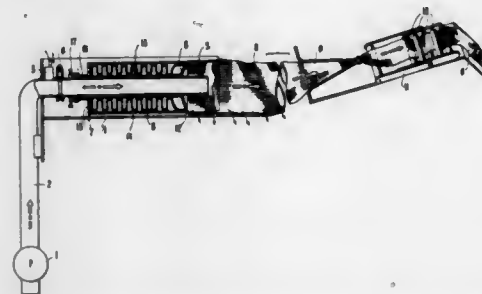
Sten Y. Sondov, and Jan O. From, both of Oslo, Norway, assignors to Interpublic a.s., Oslo, Norway

PCT No. PCT/N085/00030, § 371 Date Jan. 28, 1986, § 102(e)  
Date Jan. 28, 1986, PCT Pub. No. WO85/05616, PCT Pub. Date Dec. 19, 1985

PCT Filed May 31, 1985, Ser. No. 827,965  
Claims priority, application Norway, Jun. 1, 1984, 842200  
Int. Cl.<sup>4</sup> B01D 33/00; C02F 11/12

U.S. Cl. 210-770

11 Claims



1. A method for separating, transporting and dewatering coarse solid particles suspended in water comprising the steps of:  
leading the water through a large-mesh submerged tubular net having an active screening section,  
trapping a substantial number of said coarse solid particles in said net,  
drawing the net forward with its trapped coarse solid parti-

cles up above the surface of the water which has passed through the net at a speed which is regulated by a system of rotating rollers above the water surface to provide new and unrestricted screening area,

said active screening section being located between a replaceable storage cassette from which the large-mesh net is drawn out and the point where the net with its trapped coarse solid particles is pulled up above the water surface the rollers simultaneously transporting the net with its contents and dewatering the net and its contents by pressure, disposing the net and its contents, and replacing the nearly empty storage cassette with a new storage cassette containing a tubular net.

**4,681,689**

**V-SHAPED TROUGH FILTERS, ROTARY ASSEMBLIES THEREOF AND METHODS OF FILTERING THEREWITH**

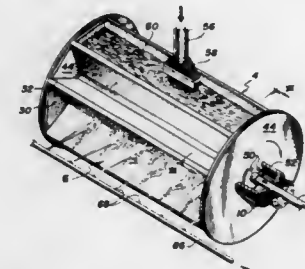
Forrest B. Stannard, Inverness, and Edward J. Highstreet, Crystal River, both of Fla., assignors to The Dehydro Corporation, Charlotte, N.C.

Filed Feb. 26, 1986, Ser. No. 833,002

Int. Cl.<sup>4</sup> B01D 33/08

U.S. Cl. 210-784

8 Claims



1. A rotary filter device comprising: means designed to mitigate problems in the filtration of sewage sludge or similar liquid suspensions prone to form filter cake resistant to the flow of liquid and thereby rapidly reduce the rate of filtration in conventional filtration units, said device being formed of a plurality of filter units, each said unit including

a pair of rigid, porous sheets formed of granular material fixed in a cured resin matrix,  
said sheets each having a substantially flat front side and a substantially flat back side  
said sheets being spaced apart with their front sides defining therebetween a V-shaped trough having a closed apical portion and an opposed open portion, and  
a web closing each end of said trough,  
said filter units being fixed in a cylindrical assembly with the back sides of adjacent units facing one another with a space therebetween and with said apical portion of each unit positioned around a common center,  
means to apply a vacuum to the back side of each of said sheets, and  
means to rotate said cylindrical assembly about said common center.

2. A filtration method comprising: mitigating problems encountered in filtering sewage sludge or similar liquid suspensions prone to form filter cake resistant to the flow of liquid and thereby rapidly reduce the rate of filtration in conventional filtration methods by,  
providing a rotary filter device formed of a plurality of filter units,  
each said unit comprising:  
a pair of rigid, porous sheets formed of granular material fixed in a cured resin matrix,

said sheets each having a substantially flat front side and a substantially flat back side  
 said sheets being spaced apart with their front sides defining therebetween a V-shaped trough having a closed apical portion and an opposed open portion, and an impervious web sealing each end of said trough, said filter units being fixed in a cylindrical assembly with the back sides of adjacent units facing one another with a space therebetween and with said apical portion of each unit positioned around a common center, means to apply a vacuum to the back side of each of said sheets, and means to rotate said cylindrical assembly about said common center as a horizontal axis  
 rotating said device about said horizontal axis at a predetermined rate sufficient that each said unit therein passes seriatim through a first quadrant wherein said unit will attain an uppermost position of rotation, a second quadrant, a third quadrant wherein said unit will attain a lowermost position of rotation and a fourth quadrant, charging a liquid suspension to be filtered into a V-shaped trough positioned in said first quadrant, applying vacuum to a back side of said V-shaped trough in its passage through at least one of said first and second quadrants, discharging filter cake from said V-shaped trough in its passage through said second or third quadrant, and cleaning said V-shaped trough in its passage through at least one of said third and fourth quadrants.

4,681,690

# STABILIZED FRACTURING FLUID AND METHOD OF STABILIZING FRACTURING FLUID

Sholchi Kanda, Kanagawa; Makoto Yanagita, Tokyo, and Yukihiko Sekimoto, Saitama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1986, Ser. No. 819,329

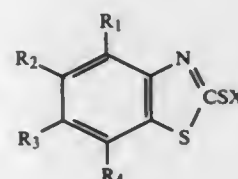
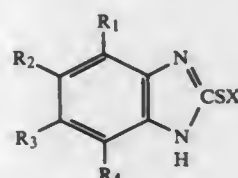
Claims priority, application Japan, Jan. 16, 1985, 60-4011

Int. Cl. E21B 43/26

U.S. Cl. 252-8.551

10 Claims

1. A method of stabilizing an aqueous fracturing fluid containing at least one polymer selected from the group consisting of (1) guar gum and (2) at least one derivative of guar gum selected from the group consisting of hydroxypropylguar, hydroxyethylguar and carboxymethylguar, wherein the said at least one polymer is present in an amount effective to aid in preventing the reduction of rheological properties of the fracturing fluid, which comprises adding at least one stabilizing compound selected from 2-mercaptobenzimidazole and 2-mercaptobenzothiazole compounds to the fracturing fluid, wherein the 2-mercaptobenzimidazole and 2-mercaptobenzothiazole compounds are represented by formulae (1) and (2) respectively:



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub>, each represents a hydrogen atom

or a lower alkyl group, and X is a hydrogen atom, an alkali metal atom, or an ammonium group.

4,681,691

# MOLDABLE COMPOSITION

Harold S. Schriver, Jr., York, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 17, 1985, Ser. No. 735,418

Int. Cl. F16C 33/12

U.S. Cl. 252-12

17 Claims

1. A moldable composition for use in making bulk deformable sealing members for articles comprised of:

a mixture of

- a major amount of an elastomeric material;
  - an amount of filler material at least 30 parts per hundred by weight of said elastomeric material;
  - an amount of a catalyst sufficient to polymerize said elastomeric material; and
  - an amount of oil of between 2.5 and 20 parts per hundred by weight of elastomeric material, said oil being incompatible with said elastomeric material;
- said moldable composition when molded yielding a test member having a Shore A hardness of between 30 and 95, preferably between 50-65 when measured in accordance with ASTM D-2240, whereby

after molding a sealing member from said mixture, said incompatible oil blooms to surface portions of said sealing member resulting in said surface portions of said sealing member having inherent lubricity.

4,681,692

# MULTIFUNCTIONAL LUBRICANT/FUEL ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

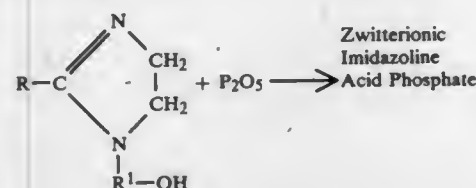
Filed Jul. 1, 1985, Ser. No. 750,196

Int. Cl. C10M 129/00, 137/00

U.S. Cl. 252-32.5

17 Claims

1. A composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor friction reducing or antiwear proportion of an imidazoline derived internal acid phosphate prepared by reacting a hydrocarbyl imidazoline in the following generalized reaction with phosphorus pentoxide:



where R is about C<sub>6</sub> to about C<sub>30</sub> hydrocarbyl or hydrocarbyl substituted with oxygen or sulfur and/or nitrogen and R<sup>1</sup> is C<sub>1</sub> to about C<sub>6</sub> hydrocarbyl.

4,681,693

# STABILIZERS WITH ARYLPHOSPHINIC STRUCTURE FOR PERFLUORO-POLYETHER OILS AND GREASES

Piero Gavezotti, Milan, and Ezio Strepparola, Treviglio, both of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Apr. 23, 1986, Ser. No. 854,786

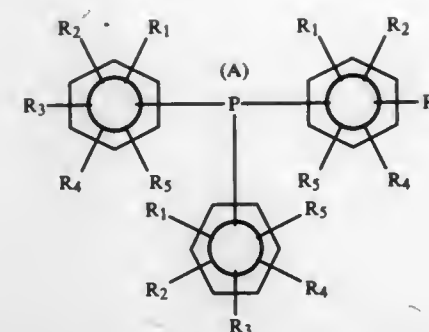
Claims priority, application Italy, Apr. 24, 1986, 20475 A/85

Int. Cl. C10M 137/14

U.S. Cl. 252-49.9

10 Claims

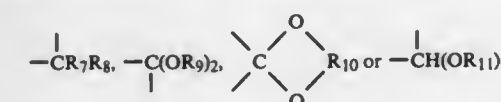
1. An arylphosphine selected from the group consisting of arylphosphines of the formula:



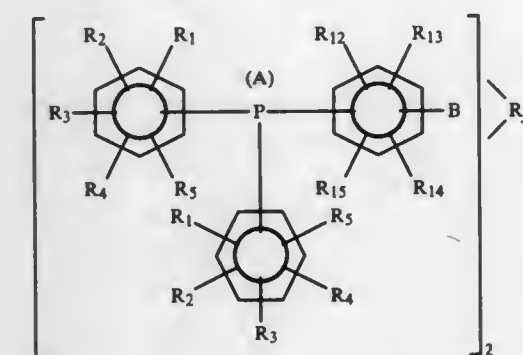
wherein A, when present, can be either oxygen or sulphur; R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, equal to, or different from each other, are —H, —F, —CF<sub>3</sub> or —B—R<sub>1</sub>; with the constraint that at least one of the R<sub>1</sub>—R<sub>5</sub> groups on at least one of benzene rings is a —B—R<sub>1</sub> radical, wherein R<sub>1</sub> is:

- Z—CF<sub>2</sub>O(C<sub>3</sub>F<sub>6</sub>O)<sub>m</sub>(CFXO)<sub>n</sub>—CFY—, wherein X=—F or —CF<sub>3</sub>; Y=—F or —CF<sub>3</sub>; Z=—F, —CF<sub>3</sub> or —CF<sub>2</sub>—CF<sub>3</sub>; in the latter case n=0 and Y=—CF<sub>3</sub>; m and n are integers, with m being comprised between 1 and 30 and n being comprised between 0 and 10, and the molecular weight of R<sub>1</sub> is comprised within the range of from 135 to 6500 and the (C<sub>3</sub>F<sub>6</sub>O) and (CFXO) units are randomly distributed along the chain;
- X—(CF<sub>2</sub>CF<sub>2</sub>CF<sub>2</sub>O)<sub>p</sub>—, wherein Z has the meaning described above, W is H or F and p is an integer from 1 to 30; or
- D—(CF<sub>2</sub>CF<sub>2</sub>O)<sub>q</sub>—, wherein d is —CF<sub>3</sub> or —C<sub>2</sub>F<sub>5</sub>, q is an integer from 1 to 30;

B = —CONR<sub>6</sub>—, —C(R<sub>7</sub>)(R<sub>8</sub>)O—, —C(R<sub>7</sub>)(R<sub>8</sub>)OCH<sub>2</sub>—,



wherein R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, R<sub>9</sub> and R<sub>11</sub> are alkyl radicals containing from 1 to 3 carbon atoms, R<sub>6</sub>, R<sub>7</sub> and R<sub>8</sub> can be also hydrogen; R<sub>10</sub> is an alkylene radical of from 1 to 3 carbon atoms; and



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>12</sub>, R<sub>13</sub>, R<sub>14</sub> and R<sub>15</sub>, equal to or different from each other are —H, —F, —CF<sub>3</sub> or —B—R<sub>1</sub>;

A, B, R<sub>1</sub> have the same meaning as above;

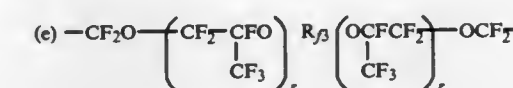
R<sub>2</sub> is:

(d) —CF<sub>2</sub>O(C<sub>2</sub>F<sub>4</sub>O)<sub>p</sub>(CF<sub>2</sub>O)<sub>q</sub>—CF<sub>2</sub>—;

wherein p and q are integers different from zero, and the p/q ratio ranges from 0.5 to 2, preferably from 0.5 to 1.5, the

(I)

average molecular weight being comprised within the range of from 300 to 7000;



wherein r is an integer from 1 to 20 and R<sub>3</sub> is a perfluoroalkylenic radical;

(f) —CF<sub>2</sub>O—(CF<sub>2</sub>CF<sub>2</sub>CF<sub>2</sub>O)<sub>t</sub>—R<sub>3</sub>(OCH<sub>2</sub>CF<sub>2</sub>CF<sub>2</sub>—)

wherein R<sub>3</sub> has the meaning described hereinabove and t is an integer from 1 to 20;

(g) —CF<sub>2</sub>O—(—CF<sub>2</sub>CF<sub>2</sub>CF<sub>2</sub>O—)<sub>s</sub>—CF<sub>2</sub>—,

wherein s is an integer from 1 to 30; or

(h) —CF<sub>2</sub>O—(—CF<sub>2</sub>CF<sub>2</sub>O—)<sub>s</sub>—CF<sub>2</sub>—,

wherein s has the meaning described herein above.

4,681,694

# MARINE CRANKCASE LUBRICANT

Benjamin H. Zoleski, Beacon, N.Y.; Wheeler C. Crawford, Houston, Tex., and Rodney L. Sung, Fishkill, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,156

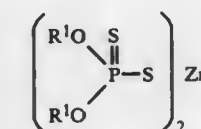
Int. Cl. C10M 133/54, 133/04

U.S. Cl. 252-51.5 R

9 Claims

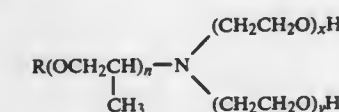
1. A crankcase lubricating oil composition having a Total Base Number ranging from about 3 to about 10 and comprising:

- major portion of a mineral lubricating oil containing from about 1 to about 5 wt. % of at least one overbased salt selected from the group consisting of calcium alkylphenolate or a sulfurized calcium alkylphenolate having a TBN of about 147 and mixtures thereof, from about 0.1 to about 1.0 wt. % of a zinc dithiophosphate



wherein R<sup>1</sup> is a (C<sub>3</sub>—C<sub>12</sub>) hydrocarbyl radical or a hydroxy substituted (C<sub>3</sub>—C<sub>12</sub>) hydrocarbyl radical, and from about 0.5 to about 3.0 wt. % of dinonyldiphenylamine; and

- from about 0.1 to about 5.0 to about 1 wt. % of as, a rust-inhibiting additive, a dialkoxylated alkylpolyoxyalkyl tertiary amine



wherein R is a (C<sub>1</sub>—C<sub>30</sub>) alkyl, n is an integer of about 1 to about 6, and x+y is about 2 to about 30 where both x and y cannot be equal to 0.

4,681,695

# BLEACH COMPOSITIONS

Michael Divo, Euskirchen, Fed. Rep. of Germany, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 28, 1985, Ser. No. 770,540

Claims priority, application United Kingdom, Sep. 1, 1984, 8422158

Int. Cl. C11D 17/00

U.S. Cl. 252-94

25 Claims

1. A bleach activator composition in the form of spray-dried granules having an inner core consisting essentially of from



0.1% to about 50% water-soluble organic peroxyacid bleach precursor and a surface coating comprising from about 10% to about 99.9% of water-soluble or water-dispersible, inorganic hydratable material, and wherein the composition has a pH as a 1% aqueous solution in the range of from about 3 to about 7.

4,681,696

# SOLID STABILIZED ACTIVE HALOGEN-CONTAINING DETERGENT COMPOSITIONS AND METHODS

Anthony J. Bruegge, Cincinnati, and Denny E. Daughtery, West Chester, both of Ohio, assignors to Chemed Corporation, Cincinnati, Ohio

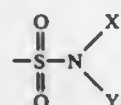
Continuation-in-part of Ser. No. 622,199, Jun. 19, 1984, abandoned. This application Jan. 22, 1986, Ser. No. 821,405

Int. Cl. C11D 3/10, 7/56; C01B 11/06

U.S. Cl. 252-99

9 Claims

1. A method of stabilizing an active efficient halogen source selected from the group consisting of water soluble hypochlorites, halogenated hydantoins, halogenated phosphates, chlorinated isocyanuric acids and salts thereof, comprising mixing free water, one or more sulfonamides selected from the group consisting of water soluble alkyl sulfonamides and water soluble aryl sulfonamides and an active efficient halogen source to form a solution of sulfonamide and halogen source and combining said solution with one or more hydratable detergent builders in an amount effective to form solid detergent, wherein said sulfonamide includes a sulfonamide radical defined by the following formula:



wherein x and y are selected from the group consisting of H, halogen, alkyl, and an alkali or alkaline earth metal ion and at least x or y is H or a metal ion.

4,681,697

# PROCESS FOR PRODUCING SOLID ALUMINUM CHLORIDE COMPOSITIONS

Werner Doetsch, Bad Hoenningen, and Rudolf Siegel, Neuwied, both of Fed. Rep. of Germany, assignors to Kall-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 22, 1986, Ser. No. 854,492

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515341

Int. Cl. C02F 1/52, 5/02

U.S. Cl. 252-175

7 Claims

1. A process for producing a solid, cold-water soluble, sulfate containing aluminum chloride composition comprising the steps of introducing in aqueous solution or aqueous suspension form alkali aluminate, sulfuric acid, hydrochloric acid and hydrated aluminum oxide into a spray drier, and recovering the resulting solid material.

4,681,698

# ELECTROCHEMICAL CELLS HAVING A GELLED ANODE-ELECTROLYTE MIXTURE

Teresita O. Graham, Dobbs Ferry, and John T. Goodman, Croton-on-Hudson, both of N.Y., assignors to Duracell Inc., Bethel, Conn.

Division of Ser. No. 106,996, Dec. 26, 1979, Pat. No. 4,455,358.

This application Jul. 28, 1980, Ser. No. 173,941

Int. Cl. H01B 1/06

U.S. Cl. 252-182.1

7 Claims

1. A method for improving the discharge characteristics of an electrochemical cell having a cathode, a powdered metal anode and an aqueous alkaline electrolyte solution comprising the step of gelling an intimate mixture of the powdered metal anode and electrolyte solution with an agent, said agent comprising a material capable of absorbing water and having a

carbohydrate backbone and water soluble, ionized side chain grafted thereon; said carbohydrate backbone and side chain being in molar ratios of from 1:1 to 1:19; and said side chain being selected from the group consisting of acrylonitrile, acrylamide, acrylic acid, methyl methacrylate, acrylic acid ester, vinylacetate, N-vinyl-2-pyrrolidone, salts of alginic acid, gluconic acid, and mixtures thereof.

4,681,699

# BISAZO DYES AND THEIR USE IN LIQUID CRYSTALLINE MATERIALS

Karl-Heinz Etzbach, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 16, 1985, Ser. No. 776,461

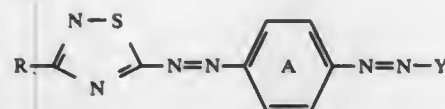
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433927

Int. Cl. C09K 19/00

U.S. Cl. 252-299.1

8 Claims

1. A liquid crystal composition, comprising a bisazo dye which contains a 1,2,4-thiadizole ring, said bisazo dye being of the formula I:

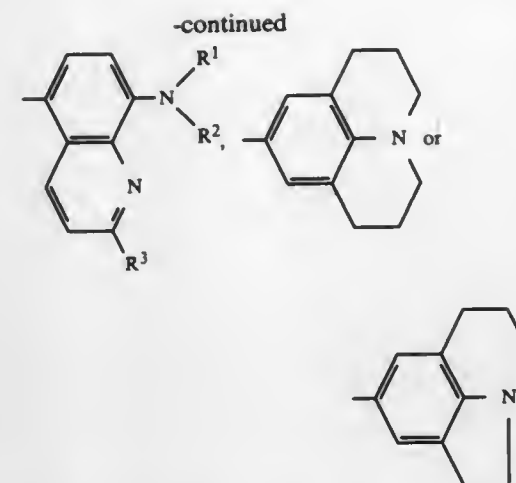
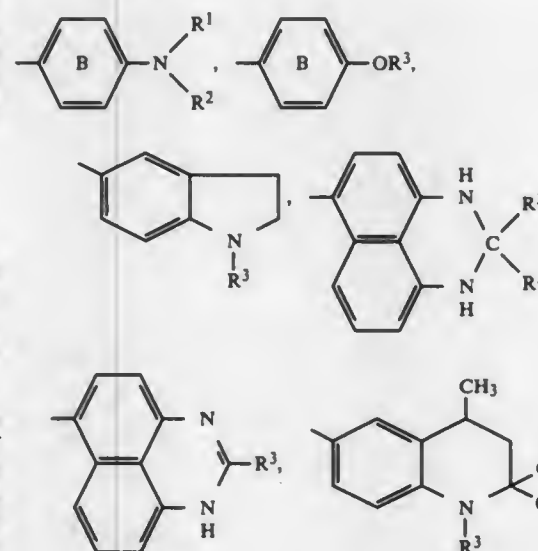


wherein:

R is hydrogen, or phenyl, phenylmethyl, phenylethyl, phenoxy, phenoxyethyl, phenoxyethylthio, or phenylethylthio radical, wherein the said radicals are either unsubstituted or substituted by C<sub>1</sub>-C<sub>24</sub>-alkyl, C<sub>1</sub>-C<sub>24</sub>-alkoxy, C<sub>1</sub>-C<sub>24</sub>-alkoxycarbonyl, C<sub>1</sub>-C<sub>24</sub>-acyloxy, C<sub>5</sub>-C<sub>7</sub>-cycloalkyl, 4-(C<sub>1</sub>-C<sub>12</sub>-alkylcyclohexyl), phenyl, chlorine or bromine, or

R is C<sub>5</sub>-C<sub>7</sub>-cycloalkyl or a C<sub>1</sub>-C<sub>24</sub>-alkylthio or C<sub>1</sub>-C<sub>24</sub>-alkyl, each of which is unsubstituted or substituted by hydroxyl, C<sub>1</sub>-C<sub>24</sub>-alkoxy, C<sub>1</sub>-C<sub>24</sub>-alkoxycarbonyl, C<sub>1</sub>-C<sub>24</sub>-alkylcarbonyl, C<sub>1</sub>-C<sub>24</sub>-dialkylcarbonyl, or C<sub>1</sub>-C<sub>24</sub>-acyloxy,

Y is a radical of the formula:



ring A is unsubstituted or substituted by chlorine, bromine, methyl, ethyl, methoxy, ethoxy, acetylmino, propionylmino, or ring A is fused to a benzene ring, ring B is unsubstituted or substituted by chlorine, bromine, methyl, ethyl, methoxy, ethoxy, acetylmino, propionylmino, or ring B is fused to a benzene ring; R<sub>1</sub> and R<sub>2</sub> are each independently hydrogen, unsubstituted C<sub>1</sub>-C<sub>24</sub> alkyl, C<sub>1</sub>-C<sub>24</sub> alkyl substituted by cyano, hydroxy, acetoxy, or butyryloxy substituent, cyclohexyl, 2-phenylethyl, unsubstituted benzyl, benzyl substituted by C<sub>1</sub>-C<sub>24</sub>-alkyl, cyclohexyl or C<sub>1</sub>-C<sub>12</sub>-alkyl-cyclohexyl substituent, allyl, or together with the nitrogen atom R<sub>1</sub> and R<sub>2</sub> form a piperidino, pyrrolidino or morpholino radical; and, R<sub>3</sub> is hydrogen, C<sub>1</sub>-C<sub>24</sub>-alkyl, or cyclohexyl.

4,681,700

# PARTIAL OXIDATION OF UPGRADED PETROLEUM COKE

Stephen R. Vasconcellos, Langhorn, Pa.; Mitri S. Najjar, Hopewell Junction, and Ralph Garcia, Wallkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 26, 1985, Ser. No. 727,968

Int. Cl. C10J 3/46

U.S. Cl. 252-373

6 Claims

1. In a process for the partial oxidation of particulate petroleum coke substantially comprising carbon and containing a small amount of ash comprising vanadium constituents and other materials to produce in a gas generating zone a raw gaseous stream comprising hydrogen and carbon monoxide and containing entrained unconverted particulate petroleum coke comprising carbon and vanadium containing ash, and said gaseous stream is cooled and scrubbed with water in gas cooling and scrubbing zones to produce a cooled and scrubbed clean gas stream and an aqueous dispersion of vanadium containing unconverted particulate petroleum coke; the improvement comprising:

(1) mixing said aqueous dispersion of vanadium containing unconverted particulate petroleum coke having a solids concentration in the range of about 0.5 to 20.0 weight percent and a particle size in the range of about 38 microns and below to less than about 1700 microns with about 0.10 to 0.50 weight percent (basis weight of said aqueous dispersion of unreacted petroleum coke) of a vanadium collection agent to selectively separate a vanadium enriched unconverted petroleum coke fraction from a vanadium-depleted unconverted petroleum coke fraction, and about 0.5 to 5.0 weight percent of a frothing agent to produce froth; wherein said collection agent has the structural formula ROH where R is a straight chain or branched acyclic saturated alkanol having 4 to 8 carbon atoms with the hydroxyl group on the C<sub>2</sub> or C<sub>3</sub> carbon atom and a methyl or ethyl group on anyone of the carbon

atoms C<sub>2</sub> to C<sub>7</sub>; wherein said frothing agent is selected from the group consisting of cresylic acid, pine oil, polypropylene glycol, and mixtures thereof; and adjusting the pH of said mixture to a value in the range of about 3 to 10, providing the mixture is not already at said pH;

(2) aerating the mixed aqueous dispersion from (1) in a froth flotation zone with a gaseous material from the group consisting of air, nitrogen, carbon monoxide, steam gaseous mixtures of H<sub>2</sub>O and CO, and mixtures thereof, and with or without mechanical agitation forming a layer of froth which floats on a bottom layer of aqueous dispersion, wherein;

(a) said aeration is continued until no more solid particles are visible in the foam and from about 70 to 95 weight percent of the unconverted particulate petroleum coke particles (basis carbon) have floated off in the froth, and said unconverted particulate petroleum coke substantially comprises carbon and also contains a small amount of ash with a decreased amount of vanadium constituents;

(b) the remainder of the unconverted particulate petroleum coke is suspended in the bottom layer of aqueous dispersion and substantially comprises carbon and also contains a small amount of ash with an increased amount of vanadium constituents;

(c) where in comparison with the vanadium content of the ash in the unconverted particulate petroleum coke prior to the froth flotation treatment the vanadium content of the ash in the floated portion of unconverted particulate petroleum coke has been decreased about 40 to 80 weight percent and the vanadium content of the ash in the unconverted particulate petroleum coke in the bottom aqueous dispersion has been increased about 20 to 60 weight percent;

(3) concentrating the froth layer from (2) (a) in a solids-liquid separation zone to produce a concentrated aqueous slurry of unconverted particulate petroleum coke with a decreased amount of vanadium constituents and having a solids concentration in the range of about 10 to 70 weight percent, and said concentrated aqueous slurry is mixed with either, (1) dry fresh particulate petroleum coke substantially comprising carbon and a small amount of ash comprising vanadium constituents, or (2) slurries of said fresh particulate petroleum coke in water or in a liquid hydrocarbon fuel or mixtures thereof;

(4) recycling to said partial oxidation gas generating zone at least a portion of the slurry from (3); and

(5) concentrating the bottom layer of aqueous dispersion from (2) (b) in a solids-liquid separation zone to produce water and a concentrated aqueous slurry of unconverted particulate petroleum coke with an increased amount of vanadium constituents and having a solids concentration in the range of about 10 to 70 weight percent or alternatively 100 weight percent solids, and said concentrated aqueous slurry or alternatively 100% solids is sent to a vanadium recovery zone while the separated water is recycled to the gas cooling and scrubbing zones.

4,681,701

# PROCESS FOR PRODUCING SYNTHESIS GAS

Swan T. Sie, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 14, 1986, Ser. No. 885,553

Claims priority, application United Kingdom, Aug. 30, 1985, 8521608

Int. Cl. C01B 3/34

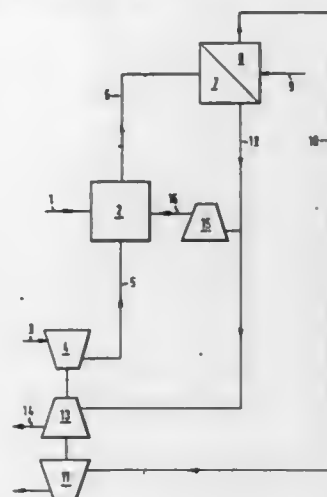
U.S. Cl. 252-373

4 Claims

1. A process for producing synthesis gas by reforming hydrocarbons with steam in a reforming reaction zone equipped with heat exchange means which comprises:

(a) passing an oxygen-containing gas to a compression zone wherein said oxygen-containing gas is compressed and passed to a combustion zone;

- (b) combusting said compressed gas with a fuel in said combustion zone to form a hot combustion gas effluent stream;  
 (c) passing said hot combustion gas effluent stream to a reforming zone wherein a hydrocarbon feed stream is reformed during which heat exchange takes place between said hot combustion gas effluent stream and said reformer zone to produce a synthesis gas withdrawn from said reformer zone and to form a reformer zone heat exchanged combustion gas;



- (d) passing at least a portion of said heat exchanged combustion gas to a turbo-expander and generating power which is used to compress said oxygen-containing gas in step (a); and  
 (e) compressing at least another portion of said heat exchanged combustion gas and recycling said compressed heat exchanged combustion gas to said combustion zone of step (b).

4,681,702

#### SINTERED, ELECTRICAL CONTACT MATERIAL FOR LOW VOLTAGE POWER SWITCHING

Horst Schreiner, and Bernhard Rothkegel, both of Nuremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany  
 Continuation of Ser. No. 577,750, Feb. 7, 1984, abandoned. This application May 16, 1986, Ser. No. 865,932  
 Claims priority, application Fed. Rep. of Germany, Oct. 2, 1983, 3304637

Int. Cl.<sup>4</sup> H01B 1/06

U.S. Cl. 252-518

3 Claims

1. In sintered contact material for low voltage electrical power switchgear consisting of AgSnO<sub>2</sub> and two other metal oxide additives, the improvement consisting of Bi<sub>2</sub>O<sub>3</sub>, and CuO provided as the other metal oxides, and wherein the total metal oxide content is between 15 and 20 percent by volume with the SnO<sub>2</sub> share of at least 80 percent by volume of the total amount of oxide.

4,681,703

#### ALKYL SUBSTITUTED-2,3-DIHYDROFURAN FRAGRANCE COMPOSITIONS

Eugene G. Harris, West Chester, and Richard G. Fayter, Jr., Fairfield, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.  
 Continuation-in-part of Ser. No. 726,220, Apr. 23, 1985, Pat. No. 4,636,571, which is a continuation-in-part of Ser. No. 503,974, Jan. 13, 1983, Pat. No. 4,515,978. This application Jun. 4, 1986, Ser. No. 870,594

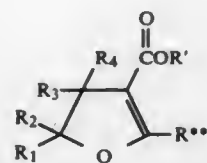
Int. Cl.<sup>4</sup> A01K 7/46

U.S. Cl. 252-522 R

28 Claims

1. A fragrance composition having incorporated therein an

odiferous amount of a 2,3-dihydrofuran compound of the formula



wherein R' is an alkyl group having from 1 to 4 carbon atoms, R\*\* is an alkyl group having from 1 to 5 carbon atoms, R<sub>1</sub> is an alkyl group having from 1 to 4 carbon atoms, R<sub>2</sub> is hydrogen or an alkyl group having from 1 to 6 carbon atoms, and R<sub>3</sub> and R<sub>4</sub> are hydrogen or a methyl group.

4,681,704

#### DETERGENT COMPOSITION CONTAINING SEMI-POLAR NONIONIC DETERGENT ALKALINE EARTH METAL ANIONIC DETERGENT AND AMINO ALKYL BETAINE DETERGENT

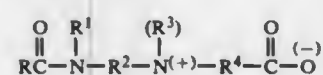
Lowell W. Bernardino; Edward W. Kuhl; Mark H. K. Mao, and Eugene J. Pancheri, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio  
 Continuation of Ser. No. 761,661, Jul. 31, 1985, abandoned, which is a continuation of Ser. No. 591,097, Mar. 19, 1984, abandoned. This application Sep. 8, 1986, Ser. No. 904,828  
 Int. Cl.<sup>4</sup> C11D 1/29, 1/75, 1/90, 1/94

U.S. Cl. 252-546

17 Claims

1. A detergent composition especially effective in removing greasy soils wherein the organic detergent portion of said composition consists essentially of a mixture of:

- (a) from about 1/4% to about 6% of a semi-polar organic nonionic detergent comprising water-soluble amine oxides having one alkyl or hydroxy alkyl moiety of 8 to 28 carbon atoms and two alkyl moieties selected from the group consisting of alkyl groups and hydroxy alkyl groups of 1 to 3 carbon atoms;  
 (b) from about 10% to about 50% of an alkaline earth metal salt of an anionic detergent selected from the group consisting of (1) linear alkyl benzene sulfonates having 9 to 15 carbon atoms in the alkyl group, (2) alkyl sulfates having 8 to 22 carbon atoms, (3) alkyl ether sulfates having 8 to 22 carbon atoms in the alkyl group and 1 to 30 ethylene oxide units, and (4) mixtures thereof;  
 (c) from about 1/4% to about 6% of an acylamidoalkyl betaine of the formula:



wherein R is an alkyl group containing from about 7 to about 21 carbon atoms, R<sup>1</sup> is hydrogen or an alkyl group containing from 1 to about 6 carbon atoms, R<sup>2</sup> is an alkylene group containing from 1 to about 10 carbon atoms, each R<sup>3</sup> is an alkyl or hydroxy group containing from 1 to about 6 carbon atoms or an ethoxylated hydroxy group containing from about 1 to about 10 ethylene oxide units, and R<sup>4</sup> is an alkylene group containing from 1 to about 6 carbon atoms.

4,681,705

#### DECONTAMINATION OF RADIOACTIVELY CONTAMINATED LIQUIDS

Carlton E. Robertson, Wilmington, N.C., assignor to Carolina Power & Light Company, Raleigh, N.C.

Filed Oct. 15, 1985, Ser. No. 787,501

Int. Cl.<sup>4</sup> G21F 9/08; C02F 1/42; C09K 3/00

U.S. Cl. 252-631

26 Claims

1. A method of decontaminating mixtures of radioactively

contaminated water and radioactively contaminated water-immiscible organic liquids to produce a decontaminated organic liquid which can be disposed of in a conventional manner, said method comprising:

- (a) separating a discontinuous mixture of radioactively contaminated water and a radioactively contaminated water-immiscible organic liquid in which the organic liquid comprises a continuous phase into a waste water fraction carrying metal radionuclides and an organic liquid fraction carrying metal radionuclides;  
 (b) decontaminating said waste water fraction;  
 (c) mixing said radioactively contaminated organic liquid fraction with a sufficient amount of an aqueous solution of a water-soluble chelating agent until water-soluble metal-chelate complexes form between said chelating agent and substantially all of said metal radionuclides carried by said organic liquid fraction;  
 (d) separating said aqueous solution from said organic liquid fraction thereby removing said water-soluble metal-chelate complexes containing substantially all of the radionuclides from said organic liquid fraction, making said organic liquid substantially free of radionuclides and safely disposable by conventional methods; and  
 (e) decontaminating said aqueous solution.

4,681,706

#### NUCLEAR WASTE PACKAGING FACILITY

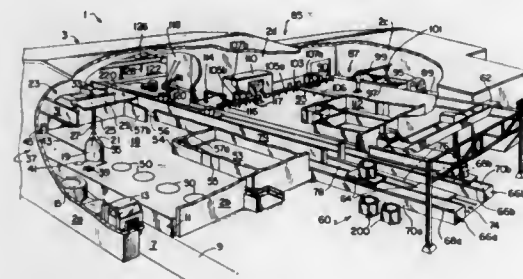
Charles W. Mallory, Severna Park, Md.; Ralph E. Watts, Library; Joseph B. Paladino, Pittsburgh, both of Pa.; John E. Razor, Morehead, Ky.; Arthur W. Lilley, Finleyville; Steven J. Winston, New Stanton, both of Pa., and Billy C. Stricklin, Oak Ridge, Tenn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 5, 1984, Ser. No. 627,964

Int. Cl.<sup>4</sup> G21F 7/06; B25J 21/00; B65B 3/04, 63/02

U.S. Cl. 252-633

18 Claims



1. A nuclear waste packaging facility comprising:

- (a) a first section substantially surrounded by radiation shielding, including means for remotely handling waste delivered to said first section and for placing the waste into a disposal module;  
 (b) a second section substantially surrounded by radiation shielding, including means for handling a deformable container bearing waste that is delivered to said second section, said handling means including a compactor and means for placing the waste bearing deformable container into said compactor, said compactor capable of applying a compacting force to the waste bearing containers sufficient to inelastically deform the waste and container, and means for delivering the deformed waste bearing containers to a disposal module  
 (c) a module transportation and loading section disposed between said first and second sections including a transport means and means for handling empty modules delivered to said facility and for loading the empty modules on said transport means, said transport means moving empty disposal modules to said first section and empty disposal modules to said second section for locating empty modules in a position for loading with nuclear waste, and  
 (d) a grouting station comprising means for pouring grout

into the waste bearing disposal module, and a capping station comprising means for placing a lid onto the waste bearing grout-filled disposal module to completely encapsulate the waste.

4,681,707

#### PROCESS FOR THE PRODUCTION OF CARBOXYLIC ACID ESTERS AND/OR CARBOXYLIC ACIDS

Howard Alper, Ottawa, Canada; Bertrand Despeyroux, Hanan, Fed. Rep. of Germany; David J. H. Smith, Camberley, United Kingdom, and James B. Woell, Ottawa, Canada, assignors to The British Petroleum Company p.l.c., London, England  
 PCT No. PCT/GB83/00240, § 371 Date Apr. 23, 1984, § 102(e) Date Apr. 23, 1984, PCT Pub. No. WO84/01376, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 28, 1983, Ser. No. 606,812

Claims priority, application United Kingdom, Sep. 30, 1982, 8227972; Feb. 24, 1983, 8305182

Int. Cl.<sup>4</sup> C07C 67/38

U.S. Cl. 260-410.9 R

11 Claims

1. A process for the production from an olefinically unsaturated hydrocarbon of a branched-chain saturated carboxylic acid ester and/or the corresponding carboxylic acid wherein the number of ester or carboxylic acid groups is equal to the number of olefinic double bonds in the olefinically unsaturated hydrocarbon which process comprises reacting the olefinically unsaturated hydrocarbon with carbon monoxide and either alcohol or water respectively in the presence of oxygen,

of an added protonic acid selected from the group consisting of hydrochloric acid, sulphuric acid and an organic acid, and

as catalyst (a) palladium, and (b) copper, the component (a) being in the form of an elemental metal or a compound thereof, and the component (b) being in the form of a compound thereof.

6. A process for the production of an unsaturated carboxylic acid di-ester and/or the corresponding dicarboxylic acid which process comprises reacting an acetylenically unsaturated hydrocarbon with carbon monoxide and either alcohol or water respectively in the presence of oxygen,

a protonic acid selected from the group consisting of hydrochloric acid, sulphuric acid, and an organic acid, and

as catalyst (a) palladium, and (b) copper, the component (a) being in the form of elemental metal or a compound thereof, and the component (b) being in the form of a compound thereof.

4,681,708

#### PROCESS FOR CONVERTING AN ALKOXYALKADIENE TO AN ALKYL DIALKOXYALKANOATE

Biau-Hung Chang, West Chester, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 3, 1986, Ser. No. 914,906

Int. Cl.<sup>4</sup> C07C 67/37, 67/38

U.S. Cl. 260-410.9

18 Claims

1. A process for forming an alkyl dialkoxyalkanoate comprising contacting an alkoxyalkadiene with an alkanol and carbon monoxide in the presence of a catalytically effective amount of a cobalt catalyst.

4,681,709

#### ALKYL 9-ALKOXY-7-NONENOATES

Biau-Hung Chang, West Chester, and Ronnie M. Hanes, Milford, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 3, 1986, Ser. No. 914,903

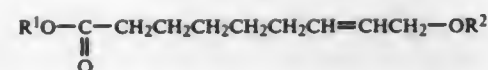
Int. Cl.<sup>4</sup> C07C 69/533

U.S. Cl. 260-410.9

4 Claims

1. A compound having the structural formula





where  $R^1$  and  $R^2$  are the same or different and are  $C_1$ - $C_6$  alkyl.

4,681,710

# PRODUCTION OF SULFONATED AMINES

Ralph Miller, Pleasantville, N.Y.; Jakob L. Bollini, and Robert Schneider, both of Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

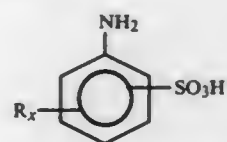
Filed Mar. 22, 1985, Ser. No. 714,769

Int. Cl.<sup>4</sup> C07C 143/58

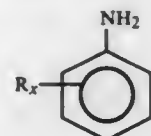
U.S. Cl. 260—508

10 Claims

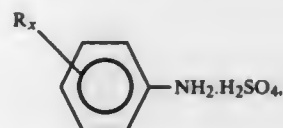
1. In the method for the production of sulfonated aromatic amines of the formula:



where R is H,  $CH_3$ ,  $C_2H_5$ , or halogen; and x is the integer 0 to 2; wherein the aromatic amine of the formula



is treated with concentrated sulfuric acid to form the aromatic amine sulfate at the amine group of the formula



which is then heated to eliminate a mole of water with a rearrangement of the thus formed sulfonate group to the position para or ortho to the restored amine group; the improvement which comprises continuously adding the aromatic amine and concentrated sulfuric acid reactants and mixtures thereof unto and into an indirectly heated, rolling, cascading bed of the preformed, desired, sulfonated, aromatic amine, said bed being maintained above the rearrangement temperature for said sulfonated amine, to eliminate the water from the amine sulfate and to direct the rearrangement of the dehydrated sulfate to the desired sulfonate orientation by the crystalline matrix of the final product comprising said cascading bed and continuously withdrawing the desired sulfonated amine.

4,681,711

# METHOD AND APPARATUS FOR AERATION OF WASTEWATER LAGOONS

John M. Eaton, P.O. Box 666, Safford, Ariz. 85548

Filed May 6, 1986, Ser. No. 860,332

Int. Cl.<sup>4</sup> B01F 3/04

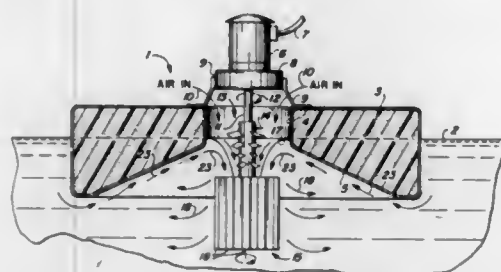
U.S. Cl. 261—91

15 Claims

1. A method for aerating wastewater in a lagoon, comprising the steps of:

(a) supporting an impeller by a shaft driven by an electric motor supported on a float floating on the wastewater in the lagoon, the impeller including a plurality of vertical vanes extending symmetrically and radially outward from

a hub receiving the shaft, so that the impeller is submerged a predetermined distance below the surface of the lagoon; (b) rotating the impeller to centrifugally impel wastewater outwardly between vanes of the impeller creating vacuum regions between the vanes and creating a vortex around the shaft from the surface of the lagoon to a top portion of the impeller; (c) drawing air along the shaft through the vortex into the vacuum regions; (d) moving wastewater into the vacuum region along with the air, and selecting the rotation rate of the impeller, the predetermined distance, and the height and width of the vanes to cause the upper edges of the vanes to effectively



shear incoming air and incoming wastewater so as to produce sufficient turbulence of air and wastewater between the vanes to entrain millions of minute air bubbles into the wastewater between the vanes to produce a mixture thereof; the height of the vanes being approximately 13 inches, and

(e) impelling the mixture centrifugally outwardly from the impeller to produce an outward flow of the mixture creating a zone of influence of about 90 feet around the impeller, wherein a large proportion of the millions of minute air bubbles remain entrained in the wastewater lagoon long enough to dissolve about five pounds of oxygen per horsepower per hour into the wastewater.

4,681,712

# MOLDING PROCESS FOR PLASTICS

Takao Sakakibara, Kasugai; Tsunehiko Toyoda, Yokohama, and Yoshihisa Nagashima, Hiratsuka, all of Japan, assignors to Dai Nippon Torio Co., Ltd., Osaka and Tokai Kogyo Co., Ltd., Aichi, both of Japan

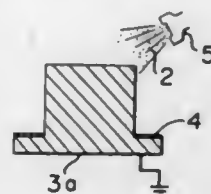
Filed Oct. 30, 1985, Ser. No. 792,841

Claims priority, application Japan, Nov. 5, 1984, 59-233003

Int. Cl.<sup>4</sup> B29C 41/08; B29B 9/12

U.S. Cl. 264—24

14 Claims



1. A molding process for producing a molded plastic product with a resin coating layer formed on its surface, which comprises electrostatically coating an electrically conductive powdery resin composition on the inner surface of a mold, filling and molding a plastic material in the mold to form a molded plastic product, and plasticizing, under compression, said electrically conductive powdery resin composition by the heat of the filled plastic material and/or by the heat for molding the filled plastic material, to form an electrically conductive resin coating layer securely bonded to the surface of the molded plastic product by anchor effect, wherein the electri-

cally conductive powdery resin composition is a thermoplastic or thermosetting powdery resin composition containing from 70 to 95% by weight of an electrically conductive fine powder, and having a particle size of from 0.5 to 100  $\mu$ m.

4,681,713

# METHOD OF MAKING A HOLLOW FIBER MEMBRANE FOR DIALYSIS

Morio Mlyagi; Makoto Ohno, both of Otsu, and Masaru Kanaizumi, Shiga, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Division of Ser. No. 596,974, Apr. 5, 1984, Pat. No. 4,587,168.

This application Nov. 15, 1985, Ser. No. 798,491

Claims priority, application Japan, Mar. 15, 1984, 59-50362

Int. Cl.<sup>4</sup> B29C 27/60

U.S. Cl. 264—41

2 Claims

1. A method for producing a hollow fiber membrane of a cellulose ester useful for dialysis of body liquids, such as blood, which has a membrane thickness of less than 20  $\mu$  but not less than 5  $\mu$ , having a suitable ultra filtration rate retention, and a yield strength  $S_0$  (g/filament) after heat-treatment at 80° C. for 20 hours satisfying the following formula (I):

$$0.90 \leq S_0/S_a \leq 1.10 \quad (I)$$

wherein  $S_0$  represents the yield strength (g/filament) of the hollow fiber membrane measured before heat treatment, which comprises the steps of: extruding a spinning solution of a cellulose ester having a concentration of the cellulose ester of 27 to 37% by weight through cyclic slits around an inner tube of a spinneret having a double tube structure, while extruding simultaneously a core solution through the inner tube of the spinneret; passing the spinning solution extruded from the cyclic slits through a gaseous atmosphere; entering the same into an aqueous coagulation bath having a water content of 65 to 90% by weight; washing the coagulated hollow fibers with hot water of 40° to 80°; passing through a glycerin bath having a glycerin concentration of 25 to 60% by weight and a temperature of glycerin of 35° to 80°; drying with hot air of 60° to 80°; reeling up onto a bobbin; and heat-treating the reeled fibers under a humidity of 10 to 20 g-H<sub>2</sub>O/kg-dry air and a dry-bulb temperature of 60° to 100°.

4,681,714

# MULTIPLE RELEASE MOLD COATING

William J. Lopes, Midland, and Jerome M. Klosowski, Monitor Township, Bay County, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 27, 1985, Ser. No. 813,886

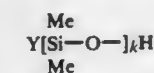
Int. Cl.<sup>4</sup> B29C 33/64, 67/20

U.S. Cl. 264—46.6

11 Claims

1. A method for making molded articles which comprises coating at least one shape determining face of a mold with a composition comprising:

(I) polydimethylsiloxane of the formula



where Y is a methyl or hydroxyl radical with at least 80% of all Y being hydroxyl, and k has an average value of at least about 25;

(II) alkyltriacetoxysilane where the alkyl group is methyl, ethyl, or propyl, and;

(III) a nonreactive organic solvent, and (I) is present in about 5 to 20 parts by weight, (II) is present in about 1 to 20 parts by weight, and (III) is present in at least about equal parts by weight of the total weight of (I) and (II) combined, and the ratio of (II) to (I) by weight is at least 0.2;

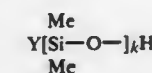
curing said composition

placing molding material in the mold;

converting the molding material into a molded article; and removing the molded article from the mold.

10. A method for making molded articles which comprises coating at least one shape determining face of a mold with a composition comprising:

(I) a mixture of a high molecular weight polydimethylsiloxane and a low molecular weight polydimethylsiloxane, both of the formula



where Y is a methyl or hydroxyl radical with at least 80% of all Y being hydroxyl, the low molecular weight polydimethylsiloxane (A) has a value of k between 25 and 80, the high molecular weight polydimethylsiloxane (B) has an average value of k between about 300 and 1000, and the weight ratio of (A) to (B) is less than 0.5;

(II) alkyltriacetoxysilane where the alkyl group is methyl, ethyl, or propyl, and;

(III) a nonreactive organic solvent,

(IV) a condensation catalyst which decreases the time required to cure the composition in the presence of water; and (I) is present in about 5 to 20 parts by weight, (II) is present in about 1 to 20 parts by weight, and (III) is present in at least about equal parts by weight of the total weight of (I) and (II) combined;

curing said composition;

placing molding material in the mold; and, removing the molded article from the mold.

4,681,715

# STEAM EXPANDABLE POLYMERIC COMPOSITION AND METHOD

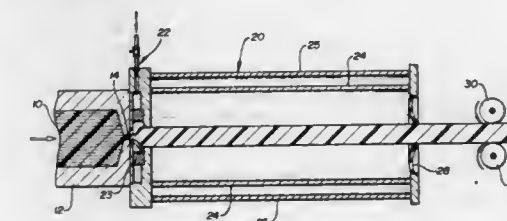
Chung P. Park, Pickerington, and Gerald A. Garcia, Newark, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 672,001, Nov. 16, 1984. This application Sep. 20, 1985, Ser. No. 777,992

Int. Cl.<sup>4</sup> C08V 9/14

U.S. Cl. 264—53

13 Claims



1. A process for the preparation of an expanded polymeric foam comprising the steps of:

(a) melt processing under pressure an alkenyl aromatic polymer having a glass transition temperature of between about 60° to about 100° C. together with a volatile blowing agent to form a flowable admixture, said volatile blowing agent comprising a mixture of from about 40 to about 90% by weight of a primary blowing agent comprising dichlorodifluoromethane, and from about 10 to about 60% by weight of a secondary blowing agent comprising a halogenated hydrocarbon, a hydrocarbon, or an aliphatic alcohol containing from 1 to 4 carbon atoms, said halogenated hydrocarbon, hydrocarbon or aliphatic alcohol having a normal atmospheric boiling point of from about 0° to about 100° C.,

(b) extruding said admixture through a die to a zone of lower pressure and activating said blowing agent to expand said alkenyl aromatic polymer to a cellular structure, and

- (c) exposing said cellular structure to steam at substantially atmospheric pressure to expand further said cellular structure to a foam of lower density.

4,681,716

# PROCESS FOR THE PREPARATION OF POLYBENZIMIDAZOLE FOAMS

John S. Letinski, Metuchen, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 3, 1986, Ser. No. 835,812

Int. Cl.<sup>4</sup> B29D 7/01

U.S. Cl. 264—53

18 Claims

1. A process for the production of polybenzimidazole foamed articles comprising:

- forming a solvent solution of a polybenzimidazole polymer wherein the inherent viscosity of the polybenzimidazole polymer is in the range of about 0.25 to 0.7;
- casting a film from the solvent solution;
- removing sufficient solvent from the polymer such that the film contains from about 10 to about 30 percent by weight of the solvent; and
- heating the polymer in the temperature range of about 350° C. to about 600° C. to form a foamed article.

4,681,717

# PROCESS FOR THE CHEMICAL PREPARATION OF HIGH-FIELD ZNO VARISTORS

Robert A. Brooks, Tijeras; Robert G. Dosch, and Bruce A. Tuttle, both of Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 19, 1986, Ser. No. 830,812

Int. Cl.<sup>4</sup> C04B 33/34; H01B 1/06

U.S. Cl. 264—61

6 Claims

1. In a process for the production of a varistor precursor by intimate mixing of zinc oxide, bismuth oxide, and at least one additional metal oxide dopant, the improvement comprising: mixing the oxides by

- precipitating zinc or coprecipitating zinc and at least one additional metal from a solution of chloride salts thereof by means of an inorganic hydroxide;
- converting said precipitate to oxides by calcining at 400–600 degrees C., and
- precipitating bismuth on the surface of said oxides by contacting with a solution of Bi dissolved in HNO<sub>3</sub>; wherein said additional oxide dopant is MnO, CoO, or a mixture thereof, and wherein the proportions of oxides in said resulting precursor are about:
  - 93–98.5 mole% Zn
  - 0–1.0 mole% Co
  - 0–1.2 mole% Mn
  - 0.1–6.0 mole% Bi.

4,681,718

# METHOD OF FABRICATING COMPOSITE OR ENCAPSULATED ARTICLES

Susan L. Oldham, Long Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 608,614, May 9, 1984,

abandoned. This application Aug. 30, 1985, Ser. No. 770,917

Int. Cl.<sup>4</sup> B29C 39/10, 39/24, 39/42

U.S. Cl. 264—102

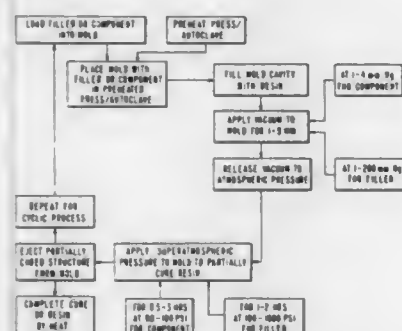
25 Claims

1. A method for forming a resin based filler reinforced composite article which comprises the steps of:

- providing a rigid mold having a cavity therein and an opening in one surface of said mold and communicating with said cavity;
- providing a chamber for containing said mold and for applying heat and varying pressures to said cavity of said mold;
- heating said chamber to a predetermined temperature and maintaining said temperature in said chamber;

- loading a quantity of a particulate filler material in said cavity of said mold;
- loading said mold containing said filler into said heated chamber;
- filling the mold cavity with a low viscosity heat curable thermosetting resin which cures at said predetermined temperature;
- evacuating the mold cavity to a subatmospheric pressure within the range of about 1 to 200 millimeters of mercury for about 1 to 5 minutes, to impose a vacuum on the mold to thereby impregnate the filler material with the resin, degas the mold contents, and expand any remaining voids in the resin;
- releasing the vacuum to atmospheric pressure to collapse any gas bubbles remaining in the mold contents;
- applying a superatmospheric pressure within the range of about 100, to 1000 pounds per square inch (about  $6.90 \times 10^5$  to  $6.90 \times 10^6$  pascals) for about 1 to 2 hours, to the mold to burst any said gas bubbles and cause the heat curable resin to compact and encapsulate particles of the filler loaded in the mold, the temperature and the superatmospheric pressure being maintained for a time sufficient to partially cure the resin and form a unitary structure;
- ejecting the structure from the mold cavity; and
- subjecting the ejected structure to a further heating cycle to completely cure the resin.

15. A method for encapsulating an electrical component which comprises the steps of:



- providing a rigid mold having a cavity therein and an opening in one surface of said mold and communicating with said cavity;
- providing a chamber for containing said mold and for applying heat and varying pressures to said cavity of said mold;
- heating said chamber to a predetermined temperature and maintaining said temperature in said chamber;
- loading the component in said cavity of said mold;
- loading said mold containing said component into said heated chamber;
- filling the mold cavity with a low viscosity heat curable thermosetting resin which cures at said predetermined temperature;
- evacuating the mold cavity to a subatmospheric pressure within the range of about 1 to 4 millimeters of mercury for about 1 to 5 minutes, to impose a vacuum on the mold to thereby impregnate the component with the resin, degas the mold contents, and expand any remaining voids in the resin;
- releasing the vacuum to atmospheric pressure to collapse any gas bubbles remaining in the mold contents;
- applying a superatmospheric pressure within the range of about 50 to 100 pounds per square inch (about  $3.45 \times 10^5$  to  $6.90 \times 10^5$  pascals) for about 30 minutes to 3 hours, to the mold to burst any said gas bubbles and cause the heat curable resin to encapsulate the component loaded in the mold, the temperature and the superatmospheric pressure

- being maintained for a time sufficient to partially cure the resin and form a unitary structure;
- (j) ejecting the structure from the mold cavity; and
- (k) subjecting the ejected structure to a further heating cycle to completely cure the resin.

(e) repeating the steps (c) and (d) with the second pair.

4,681,719

# PRODUCTION OF COMPRESSION MOLDINGS FROM FINELY DIVIDED THERMOPLASTIC POLYMERS

Hans-Henning Vogel, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 10, 1985, Ser. No. 742,909

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3421978

Int. Cl.<sup>4</sup> B29C 11/12

U.S. Cl. 264—122

2 Claims

1. A process for the production of a stable compression molded block of finely divided particles of a thermoplastic polymer, which process comprises:

- mixing the polymer particles with from 0.01 to 0.3% by weight, based on the amount of the polymer, of amorphous silica; and
- then subjecting the resulting mixture to compression molding at a temperature and pressure sufficient to form a stable comminutable block of polymer particles but insufficient to produce a polymer melt.

4,681,720

# METHOD OF AND DEVICE FOR PRODUCING BUNDLES OF HOLLOW FIBERS

Rudolf Baumgart; Manfred Martin, both of Wuppertal; Lothar Löw, Elsenfeld, and Gunter Scheven, Erlenbach, all of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

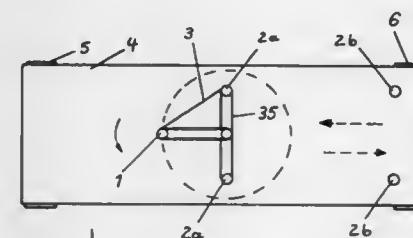
Filed Jan. 17, 1984, Ser. No. 571,519

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1983, 3301268

Int. Cl.<sup>4</sup> B29C 47/20, 53/62; C08J 9/28

U.S. Cl. 264—150

24 Claims



1. A method of producing bundles of hollow fibers, comprising the steps of

- placing at least one pair of stationary take-up elements in a working position and simultaneously placing at least a second pair of stationary take-up elements in a ready position;
- winding at least one continuous hollow fiber about the one pair of stationary take-up elements in the working position so as to create thereon a strand of hollow fibers of a desired thickness;
- moving said one pair together with the strand away from said working position and simultaneously placing said second pair of stationary take-up elements from the ready position into the working position to start winding of another strand thereon without interrupting the hollow fiber;
- then cutting the completed strand into bundles while winding the other strand about the second pair of stationary take-up elements; and

4,681,721

# THERMOPLASTIC FILM EXTRUSION PROCESS EMPLOYING DIE WITH FILTERING ARRANGEMENT

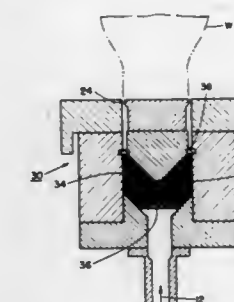
Gordon L. Benoit, Macedon, and Dana M. Boyd, Rushville, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 6, 1985, Ser. No. 795,579

Int. Cl.<sup>4</sup> B29C 47/20

U.S. Cl. 264—169

10 Claims



1. In an annular extrusion die for extruding a tubular thermoplastic film web from a polymer melt with an improved polymer flow history; a die body with a central flow chamber having an inlet means for receiving a flow of a polymer melt, and an outlet communicating with a die orifice for extruding said melt to form a film web; first screen means extending across said inlet to said die chamber, and second screen means arranged in the outlet of said flow chamber to said die orifice; said first and second screen means forming an open space therebetween in said die flow chamber; and an inert particulate material filling the space in said die flow chamber intermediate said first and second screen means, said polymer melt being conveyed through the interstices between said particulate material in said die flow chamber so as to impart to said polymer melt a high degree of filtration, homogenation of high molecular weight gels in said polymer melt, a high shear field to erase the previous shear history of the melt, and causing the melt to randomly change its flow direction, cross-sectional area and distribution when passing through said die flow chamber without creating differential shears tending to adversely affect the uniformity and physical properties of the extruded film web.

6. In a method for extruding a tubular thermoplastic film web from a polymer melt with an improved polymer flow history; conducting said polymer melt through a central die flow and filtering chamber having an inlet means for receiving a flow of said polymer melt, and an outlet communicating with an annular die orifice for extruding said tubular film web; first screen means extending across said inlet to said die chamber, and second screen means arranged in the outlet of said flow chamber to said die orifice; said first and second screen means forming an open space therebetween in said die flow chamber; and an inert particulate material filling the space in said die flow chamber intermediate said first and second screen means, conveying said polymer melt through said first screen means, the interstices between said particulate material in said die chamber and second screen means so as to impart to said polymer melt a high degree of filtration, homogenation of high molecular weight gels in said melt, a high shear field to erase the previous shear history of the melt, and causing the melt to randomly change its flow direction, cross-sectional area and distribution when passing through said die flow chamber without creating differential shears tending to adversely affect the uniformity and physical properties of the extruded film web.



4,681,722

## METHOD OF MAKING A LINEAL STRUCTURAL MEMBER

Neil A. Carter, Reynoldsburg; Ronald R. Harris, and Russell L. Ault, both of Newark, all of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Oct. 7, 1985, Ser. No. 785,303

Int. Cl.<sup>4</sup> B29C 41/30; B32B 31/04

U.S. Cl. 264—171

10 Claims



1. A method of making a lineal structural member comprising feeding a shaped, elongated, generally laminar, porous glass fiber core successively through a resin-impregnating die having an exposed inner peripheral resin-filled cavity of a larger dimension, in a direction of core movement, in a pair of opposed portions parallel to laminations of the core than in a pair of opposed portions perpendicular to laminations of the core, to impregnate a generally uniform thickness of resin into only outer surface portions of the core completely around its periphery while maintaining the interior porous, through a curing chamber wherein the resin impregnated into the outer surface portions thereof is cured, through a resin-encasing die wherein resin is injected under pressure to encase the resin-impregnated core, and through a curing die wherein the encasing resin is cured to form the structural member.

4,681,723

## CALENDER BAND STRIPPING SECTION AND PROCESS FOR STRIPPING CALENDERED SHEET

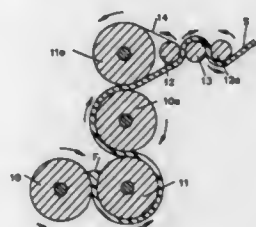
Randy D. Jester, Greer, S.C., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Nov. 1, 1985, Ser. No. 794,347

Int. Cl.<sup>4</sup> B29C 43/24

U.S. Cl. 264—175

10 Claims



1. An apparatus for the manufacture of a continuous sheet of thermoplastic material consisting essentially of:  
a plurality of calendar rolls in cooperating relationship;  
at least one stripper roll;  
means for imparting rotational movement to said calendar rolls and stripper roll, whereby the last calendar roll is operated at the same or greater rotational speed than the preceding calendar roll, and  
an inelastic, flexible, endless belt, capable of efficient heat transfer, which is in close contact with and travels around said stripper roll and the last of said calendar rolls, and  
means for removing a continuous sheet of thermoplastic material from the endless belt in the vicinity of said stripper roll.

6. A process for the manufacture of a continuous sheet of thermoplastic material consisting essentially of:  
(i) heating a thermoplastic material to a thermoplastic state;  
(ii) forming said thermoelastic material into a flexible, continuous sheet by means of a calendar having a plurality of

rolls, with the last calendar roll in close contact with an inelastic, flexible, endless belt capable of efficient heat transfer which travels around said calendar roll and which endless belt is in also close contact with and travels around a stripper roll;

(iii) removing said flexible sheet from said calendar by contacting said flexible sheet with said endless belt, rather than the last roll of the calendar, and conveying said flexible sheet away from the calendar and towards said stripper roll;  
(iv) continuously cooling said flexible sheet;  
(v) removing said cooled flexible sheet from said endless belt.

4,681,724

## REMOVABLE IRREVERSIBLY SHRINKING MALE MANDREL

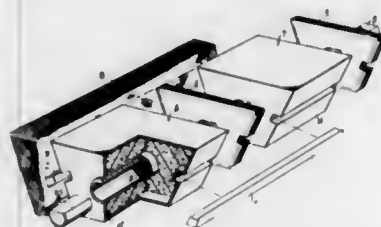
Robert L. Faiz, Sandy Hook; William J. Walker, Monroe; Philip Ramey, Millford; Kenneth M. Adams, Sandy Hook; Nicholas P. Flonc, Hamden, and Dean Nguyen, Stamford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 28, 1986, Ser. No. 856,898

Int. Cl.<sup>4</sup> B29C 1/08

U.S. Cl. 264—257

18 Claims



1. A removable male mandrel for composite resin transfer molding processes, said male mandrel comprising:  
a. a foam that is dimensionally stable at a first temperature;  
b. said foam capable of irreversibly shrinking to less than about 0.5 said foam's original size at a second temperature that is above said first temperature; and  
c. said foam encapsulated by a non-stick elastomer skin.

4,681,725

## INJECTION SKIS AND THEIR PROCESS OF MANUFACTURE

Tetsuzo Maruyama, Iiyama, Japan, assignor to Kabushiki Kaisha Swallow Ski, Nagano, Japan

Division of Ser. No. 662,787, Oct. 19, 1984, abandoned. This application Sep. 10, 1985, Ser. No. 774,366

Claims priority, application Japan, Oct. 21, 1983, 58-197895; Mar. 29, 1984, 59-062638; Apr. 5, 1984, 59-068302; Apr. 11, 1984, 59-073627

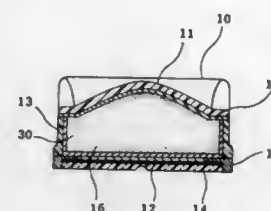
Int. Cl.<sup>4</sup> A63C 5/00, 5/04, 5/12

U.S. Cl. 264—46.5

7 Claims

1. A process for manufacturing injection skis, comprising the steps of:  
disposing a ski lower-surface constituting material comprising glide surface material in a lower mold;  
disposing a sheet-shaped ski upper-surface constituting material capable of being deformed by foaming pressure at a position spaced above said ski lower-surface constituting material to form a space between said ski lower-surface constituting material and said ski upper-surface constituting material;  
disposing an upper mold having an upward concave surface being equivalent to a mountain-shaped projection on the center of the upper surface of a complete ski on the upper

side of said ski upper-surface constituting material and on top of said lower mold;  
injecting a foamy resin into said space between said ski upper and lower-surface constituting materials; and



expanding said foamy resin to force said sheet-shaped ski upper-surface constituting material against said concave surface of said upper mold by the foaming pressure of said foamy resin and to form a mountain-shaped projection on the upper surface of the ski corresponding to said upward concave surface of said upper mold.

4,681,726

## FAST BREEDER REACTOR

Akio Sakurai, Kashiwa, and Ryoichi Kato, Hitachi, both of Japan, assignors to Central Research Institute of Electric Power Industry and Hitachi, Ltd., both of Tokyo, Japan

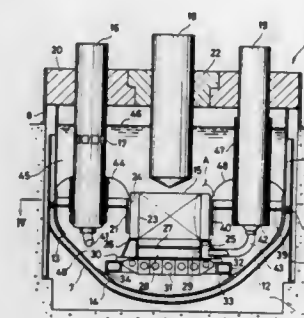
Filed Oct. 23, 1984, Ser. No. 663,981

Claims priority, application Japan, Oct. 24, 1983, 58-197696

Int. Cl.<sup>4</sup> G21G 1/04; G21C 9/00

U.S. Cl. 376—171

20 Claims



1. A fast breeder reactor comprising:  
a nuclear reactor container filled with a liquid metal;  
a reactor core disposed within said nuclear reactor container;  
a first supporting structural member mounted to a first position of said nuclear reactor container so as to support said reactor core;  
a cylindrical structural member surrounding the periphery of said reactor core so as to define an annular gap between said cylindrical structural member and said reactor core for allowing said liquid metal to fully exist therein, said cylindrical structural member being independent of said reactor core and said first structural member; and  
a second supporting structural member mounted to a second position of said nuclear reactor container so as to support said cylindrical structural member, said second position of said nuclear reactor container being substantially apart from said first position.

4,681,727

## PROCESS FOR PRODUCING ASTATINE-211 FOR RADIOPHARMACEUTICAL USE

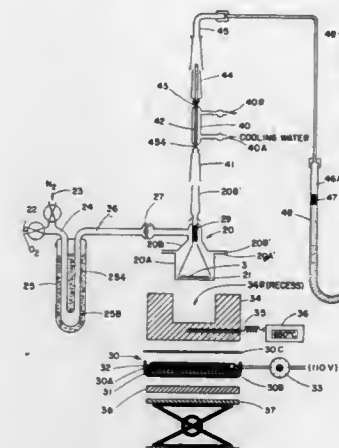
Saed Mirzadeh, East Setauket, and Richard M. Lambrecht, Quogue, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 10, 1984, Ser. No. 598,624

Int. Cl.<sup>4</sup> G21G 1/10

U.S. Cl. 376—198

5 Claims



1. A one-step chemical manipulation in combination with a distillation and collection process for producing At-211 comprising:

a. providing a target of irradiated Bismuth coated to a predetermined thickness of a backing member,  
b. providing a vapor-producing still operably connected with a condenser that has a water cooled condensate collector formed of a dry silica gel mesh therein maintained at a temperature above the freezing point of water, and providing an effluent gas filter that is operably connected to receive effluent gas from the condenser,  
c. heating the target in said still at a temperature in the range of about 630°–680° C. for a time period in the range of 50 to 80 minutes, to evolve At-211 vapor from said target,  
d. providing a dry carrier gas having an oxygen concentration that is sufficient to form Bi<sub>2</sub>O<sub>3</sub>; thereby to essentially preclude vaporization of Bi metal, passing said carrier gas through said still to carry the At-211 vapor to said condenser, and to carry effluent from the condenser to the effluent gas filter,  
e. eluting At-211 from the condensate collector of said condenser with a controlled volume of eluent containing predetermined solvents that are compatible with a given desired radiopharmaceutical procedure, and  
f. collecting said At-211 in said controlled volume of eluent for use in said given radiopharmaceutical procedure.

4,681,728

## NUCLEAR REACTOR

Luciano Veronesi, O'Hara Township, Allegheny County, Pa.; Franklin D. Obermeyer, Pensacola, Fla., and James R. Chrise, Trafford, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 22, 1985, Ser. No. 715,125

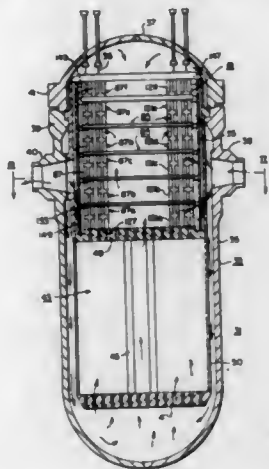
Int. Cl.<sup>4</sup> G21C 7/10, 7/12

U.S. Cl. 376—209

14 Claims

1. A nuclear reactor including a core having a plurality of fuel assemblies, upper internals, and neutron-flux adjusting rods and means for moving said neutron-flux adjusting rods between said fuel assemblies and said upper internals, said upper internals including guide means for guiding said neutron-flux adjusting rods, said guide means including a plurality

of columnar guides for guiding certain of said neutron-flux adjusting rods, each said columnar guide of said plurality including a plurality of coextensive generally vertical guide sections aligned to receive said certain neutron-flux adjusting rods, said guide means also including a plurality of generally horizontal plate sections connected to said guide sections and positioned generally vertically along said upper internals, each said plate section being nested in the manner of a "jig-saw" puzzle and being secured to, adjacent plate sections at the generally vertical level of said each plate section to form an integrated composite plate at each said level extending laterally substantially throughout the upper internals, each said plate section having perforations patterned to pass others of



said neutron-flux adjusting rods, said plate sections being oriented each at its generally vertical level with their perforations for said others of said neutron-flux adjusting rods aligned so that said composite plates serve as guides for said others of said neutron-flux adjusting rods.

2. The nuclear reactor of claim 1 wherein the certain neutron-flux adjusting rods include control rods, and gray rods, and the other neutron-flux adjusting rods include only water-displacement rods, said certain neutron-flux adjusting rods being guided by the columnar guides each of which is formed of a plurality of aligned generally vertical guide sections, and said other neutron-flux adjusting rods being guided by the integrated composite plates.

4,681,729

## MONITORING TEMPERATURE WITHIN A VESSEL

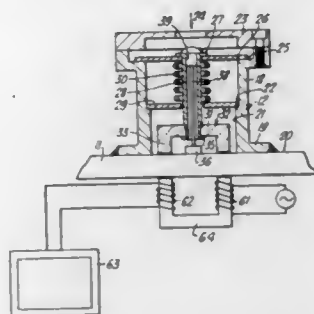
Eric Pendleton, Culcheth; Karl A. Roberts, Warrington, and Alan Murray, Roby, all of England, assignors to National Nuclear Corporation Limited, London, England  
Filed May 6, 1985, Ser. No. 731,035

Claims priority, application United Kingdom, May 21, 1984, 8412982

Int. Cl.<sup>4</sup> G21C 17/00; G01K 13/02

U.S. Cl. 376-247

11 Claims



1. A vessel provided internally with a device for enabling

external detection of temperature changes within the vessel, said device comprising a permanent magnet, means mounting the magnet within the vessel for movement towards and away from a boundary wall of the vessel, means having sufficient magnetic coupling with the magnet to restrain the magnet against movement away from a predetermined position with respect to said boundary wall of the vessel, and temperature-responsive means for urging the magnet away from said predetermined position such that, in the event of a substantial rise in temperature within the vessel, the latter means becomes effective to move the magnet relative to the boundary wall to vary the magnetic field strength detectable by detector means located on the external side of said boundary wall.

4,681,730

## PROCESS AND DEVICE FOR DETECTING LEAKING NUCLEAR FUEL ELEMENTS IN A NUCLEAR ASSEMBLY

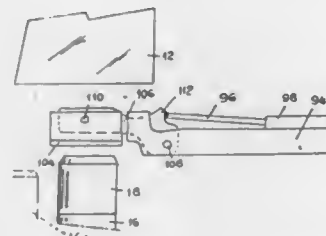
Daniel Beunche, Collonges au Mont d'Or; Christian Maunieux, Lyons, and Pierre Amiet, Condrieu, all of France, assignors to Fragma, Courbevoie, France

Filed Nov. 27, 1985, Ser. No. 802,276

Claims priority, application France, Nov. 29, 1984, 84 18223  
Int. Cl.<sup>4</sup> G21C 17/00

U.S. Cl. 376-252

7 Claims



4. A device for detecting leaking fuel elements in an irradiated fuel assembly comprising a bundle of said fuel elements held in a rigid structure including end pieces connected together by braces, each of said fuel elements having a fluid tight sheath, stack of nuclear fuel pellets in said sheath and an end cap closing an end of said sheath and stack, said device comprising:

- (a) an ultrasonic transducer carried by rod means of dimensions such that they can be inserted into said assembly between one of said end pieces and caps of said elements,
- (b) crossed movement maneuvering means for bringing said transducer above said fuel elements, wherein said maneuvering means comprise means for moving the rod means in a direction transversal to the elements between said one of said end pieces and the caps of said elements and in the longitudinal direction of the elements and wherein the transducer is fixed on said rod means with at least one degree of freedom about a shaft transversal to the element so as to be able to be applied against the end face of caps of said elements.

4,681,731

## NUCLEAR REACTOR CONSTRUCTION WITH BOTTOM SUPPORTED REACTOR VESSEL

John E. Sharbaugh, Bullskin Township, Fayette County, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
Filed Nov. 6, 1985, Ser. No. 795,592

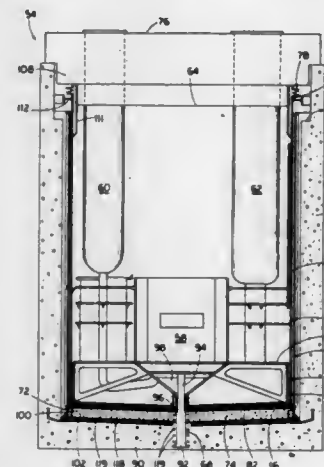
Int. Cl.<sup>4</sup> G21C 9/00

U.S. Cl. 376-285

16 Claims

1. An improved liquid metal nuclear reactor construction comprising:

- (a) a nuclear reactor core having a bottom platform support structure;
- (b) a reactor vessel for holding a large pool of low pressure liquid metal coolant and housing said core within said pool, said vessel having an open top end, a closed bottom end wall and a continuous closed side wall interconnecting said top end and bottom end wall;
- (c) a containment structure surrounding said reactor vessel and having a sidewall spaced outwardly from said reactor vessel side wall and having a base mat spaced below said reactor vessel bottom end wall;
- (d) a central small diameter post anchored to said containment structure base mat and extending upwardly therefrom to said reactor vessel and upwardly therefrom to said reactor core so as to axially fix said bottom end wall of said reactor vessel and provide a center column support for said lower end of said reactor core;
- (e) annular support structure disposed in said reactor vessel on said bottom end wall thereof and extending about said lower end of said core
- (f) structural support means disposed between said containment structure base mat and bottom end of said reactor vessel wall and cooperating with said annular support structure and said central post for supporting said reactor vessel at its bottom end wall on said containment structure base mat so as to allow said reactor vessel to expand



- radially but substantially prevent any lateral motions that might be imposed by the occurrence of a seismic event;
- (g) a bed of insulating material disposed between said containment structure base mat and said bottom end wall of said reactor vessel and uniformly supporting said reactor vessel at its bottom end wall on said containment structure base mat so as to insulate said reactor vessel bottom end wall from said containment structure base mat and allow said reactor vessel bottom end wall to freely expand radially from said central post as it heats up while providing continuous support thereof;
- (h) a deck supported upon said side wall of said containment vessel above said top open end of said reactor vessel; and
- (i) extendible and retractable coupling means extending between said deck and said top open end of said reactor vessel and flexibly and sealably interconnecting said reactor vessel at its top end to said deck.

11. An improved liquid metal nuclear reactor construction comprising:

- (a) a nuclear reactor core having a bottom platform support structure;
- (b) a generally cylindrical reactor vessel for holding a large pool of low pressure liquid metal coolant and housing said core within said pool, said vessel having an open top end, a closed flat bottom end wall with and a continuous cylindrical closed side wall interconnecting said top end and bottom end wall;
- (c) a generally cylindrical concrete containment structure

surrounding said reactor vessel and having a cylindrical side wall spaced outwardly from said reactor vessel side wall and having a flat base mat spaced below said reactor vessel bottom end wall;

- (d) a central small diameter post anchored to said containment structure base mat and extending upwardly therefrom to said reactor vessel and upwardly therefrom to said reactor core so as to axially fix said bottom end wall of said reactor vessel and provide a center column support for said lower end of said reactor core;
- (e) annular reinforced support structure disposed in said reactor vessel on said bottom end wall thereof and extending about said lower end of said core so as to support the periphery thereof while allowing radial expansion to occur
- (f) an annular support ring having a plurality of inward radially extending linear members being disposed between said containment structure base mat and bottom end of said reactor vessel wall and connected to and supporting said reactor vessel at its bottom end wall on said containment structure base mat so as to allow said reactor vessel to expand radially but substantially prevent any lateral motions that might be imposed by the occurrence of a seismic event.
- (g) a bed of insulating material in sand-like granular form disposed between said containment structure base mat and said bottom end wall of said reactor vessel and uniformly supporting said reactor vessel at its bottom end wall on said containment structure base mat so as to insulate said reactor vessel bottom end wall from said containment structure base mat and allow said reactor vessel bottom end wall to freely expand radially from said central post as it heats up while providing continuous support thereof;
- (h) a deck supported upon said side wall of said containment structure above said top open end of said reactor vessel;
- (i) a plurality of serially connected extendible and retractable annular bellows extending between said deck and said top open end of said reactor vessel and flexibly and sealably interconnecting said reactor vessel at its top end to said deck; and
- (j) an annular guide ring with axially positioned radial keys and keyways disposed on said containment structure and extending between its side wall and said top open end of said reactor vessel for providing lateral support of said reactor vessel top opened by limiting imposition of lateral loads on said annular bellows by the occurrence of a lateral seismic event while allowing axial expansion to occur.

4,681,732

## METHOD OF AND DEVICE FOR THE REDUCTION OF REACTIVITY OF A NUCLEAR REACTOR CORE

Werner Mallener, Düsseldorf, and Theodor Overhoff, Niederzier, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany  
Filed Oct. 3, 1984, Ser. No. 656,989

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1983, 3335839

Int. Cl.<sup>4</sup> G21C 7/06

U.S. Cl. 376-337

9 Claims

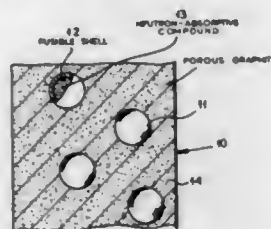
1. In a method of reducing the reactivity of and shutting down a gas-cooled graphite-moderated nuclear reactor having a reactor core containing fuel elements of nuclear fuel embedded in graphite and having graphitic surfaces along which a cooling gas can flow, the improvement which comprises the steps of:

- (a) forming quenching-element particles by enclosing and sealing in a sheath stable at temperatures below a predetermined shutdown temperature for said core, a neutron-absorbing substance which is in a gas phase above said predetermined shutdown temperature, the sealing of said particles by said sheath ceasing upon heating of said parti-



cles to a temperature above said predetermined shutdown temperature;

(b) incorporating a plurality of said particles in a graphite body permeable to said neutron-absorbing substance in said gas phase to form a quenching element, said graphite body having an outer surface permeable to said neutron-absorbing substance in said gas phase; and



(c) introducing at least one of said graphite bodies into said core of said nuclear reactor so that said body is present during normal operation but, upon an elevation of the temperature of said core above said predetermined shutdown temperature, said substance is liberated from said particles, penetrates through said body in the form of a gas and deposits on free graphite surfaces of said core, said particles each having a size sufficient to render them self-shielding against neutron flux in said core.

4,681,733

# PROCESS FOR FIXING ALLOY POWDER MOLDING AT SINTERING

Toshiharu Konishi; Yukio Shimizu; Takahumi Sakuramoto, all of Osaka; Tsuyoshi Morishita, and Shigemi Osaki, both of Hiroshima, all of Japan, assignors to Nitto Electric Industrial Co., Ltd.; Mazda Motor Corporation, Japan

Continuation of Ser. No. 705,180, Feb. 25, 1985, abandoned.

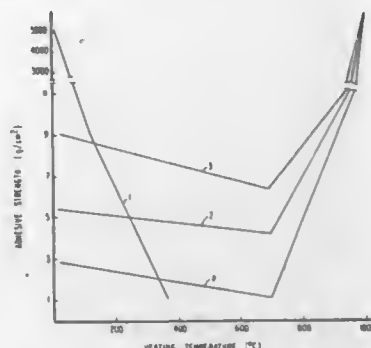
This application Sep. 18, 1985, Ser. No. 777,563

Claims priority, application Japan, Feb. 24, 1984, 59-34887

Int. Cl. A B22F 7/00

U.S. Cl. 419—8

6 Claims



1. A method of sintering an alloy powder molding which comprises placing an alloy powder molding which is formed by rolling a mixture of an alloy powder and a synthetic resin-based pressure-sensitive adhesive composition, on a metal base material by interposing a composition between the alloy powder molding and the metal base material, keeping the assembly at 150° to 400° C. for at least 5 minutes under a non-oxidizing atmosphere, and sintering the alloy powder molding at a sintering temperature, the improvement wherein the composition at a sintering temperature, the improvement wherein the composition comprises as a main component an acrylic copolymer which comprises about 80 to 99.5% by weight of alkyl (meth)acrylate having an average carbon atom number of 2 to 12 in the alkyl moiety and about 20 to 0.5% by weight of a polymerizable monomer having a functional group in the molecule or

a mixture of 100 parts by weight of the copolymer and about 0.1 to 100 parts by weight of a resin which gives adhesive property, the composition having a 10 second shear creep compliance of about 0.1 to  $30 \times 10^{-6}$  cm<sup>2</sup>/dyne at room temperature and at least about 30% by weight of non-volatile materials when heated at 300° C. for 80 minutes under a non-oxidizing atmosphere.

4,681,734

# HEAT SPRAYING MATERIAL AND MANUFACTURING PROCESS THEREOF

Wolfgang Simm, Ecublens, and Hans-Theo Steine, Chavannes, both of Switzerland, assignors to Castolin S.A., Saint-Sulpice, Switzerland

PCT No. PCT/CH85/00011, § 371 Date Sep. 26, 1985, § 102(e) Date Sep. 26, 1985, PCT Pub. No. WO85/03465, PCT Pub. Date Aug. 15, 1985

PCT Filed Jan. 24, 1985, Ser. No. 783,933

Claims priority, application Switzerland, Jan. 31, 1984, 432/84

Int. Cl. A B22F 7/00

U.S. Cl. 419—9

12 Claims

1. A method of manufacture of a powdery material for thermal spraying, characterized in that a molten alloy of composition by weight: chromium: 10 to 30%; aluminium: 1 to 25%; carbon: less than 0.5%; nickel: less than 10%; iron: the remainder; is subjected to atomization from the liquid state with a cooling speed of at least 400° C./sec. and ranging up to 5000° C./sec., so as to produce a powder having a grain size of from -150 to +27 microns, the specific surface of which is higher than 500 cm<sup>2</sup>/g.

4,681,735

# USE OF SILVER-FREE PALLADIUM ALLOYS FOR FIRING ON DENTAL CERAMICS

Werner Groll, Karlstein; Gernot Schöck, Bruchköbel; Doris Hathaway, Hanau, and Rudolf Wagner, Remchingen, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,246

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522523

Int. Cl. A C22C 5/04

U.S. Cl. 420—464

6 Claims

1. A silver-free palladium alloy suitable as a material for baking on a dental ceramic consisting of 60 to 80% palladium, 0 to 8% gold, 0 to 5% platinum, 0 to 1% of ruthenium, rhodium, or of both ruthenium and rhodium, 2 to 20% copper, 1 to 12% of tin, indium, or of both tin and indium, 0.2 to 5% of at least one of the elements tungsten, molybdenum, niobium, and tantalum, and 0 to 15% cobalt, with the proviso that the sum of tin and indium must be between 5 and 14%.

4,681,736

# ALUMINUM ALLOY

Michael M. Kersker, Beverly, Mass.; William G. Truckner, Avonmore, Pa.; Douglas A. Granger, Murrysburg, Pa., and Elwin L. Rooy, Franklin Park Borough, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 7, 1984, Ser. No. 679,550

Int. Cl. A C22C 21/02

U.S. Cl. 420—535

7 Claims

1. An aluminum alloy consisting essentially of about the following percentages of materials:

Si=15.5 to 16.5

Fe=0.55 to 0.65

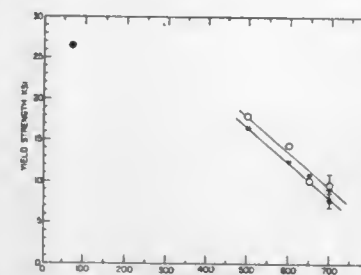
Cu=4.7 to 5.3

Mg=up to 0.65

Ni=5.2 to 5.8

Ti=0.03 to 0.05

P=0.005 to 0.015 (recovered)  
remainder Al and incidental impurities.



2. An aluminum alloy as claimed in claim 1 further containing about the following percentage of Mg:

Mg=0.55 to 0.65.

4,681,737

# STABILIZED SODIUM ERYTHORBATE BOILER CORROSION INHIBITOR COMPOSITIONS AND METHODS

Jerry L. Walker, Coraopolis, and John D. Zupanovich, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Sep. 17, 1985, Ser. No. 777,046

Int. Cl. A C23F 11/04; C02F 1/70; C09K 3/00

U.S. Cl. 422—16

9 Claims

1. A method of inhibiting corrosion in boilers comprising adding to boiler feedwater containing oxygen an effective amount of a chelant-stabilized aqueous solution of sodium erythorbate, wherein said chelant is selected from the group consisting of nitrilotriacetic acid, ethylenediamine tetraacetic acid, N(hydroxyethyl)ethylenediamine triacetic acid, citric acid, and salts thereof, and wherein said chelant is present at a chelant:sodium erythorbate weight ratio of from about 0.001:1 to 1:1, based on active sodium erythorbate.

5. A composition comprising: (a) an aqueous solution of sodium erythorbate and (b) a chelant selected from the group consisting of nitrilotriacetic acid, ethylenediamine tetraacetic acid, N(hydroxyethyl)ethylenediamine triacetic acid, citric acid, and salts thereof, wherein said chelant is present at a chelant:sodium erythorbate weight ratio of from about 0.001:1 to 1:1, based on active sodium erythorbate, and wherein said sodium erythorbate is stabilized by said chelant against oxidative degradation.

7. A method of stabilizing an aqueous solution of sodium erythorbate against oxidative degradation comprising adding to said sodium erythorbate aqueous solution an effective amount of a chelant selected from the group consisting of nitrilotriacetic acid, ethylenediamine tetraacetic acid, N(hydroxyethyl)ethylenediamine triacetic acid, citric acid, and salts thereof.

4,681,738

# METHOD AND APPARATUS FOR STERILIZING OBJECTS

Sidney Low, Black Stump Rd., R.R. 1 Box 873, Weems, Va. 22576

Filed Feb. 4, 1986, Ser. No. 825,580

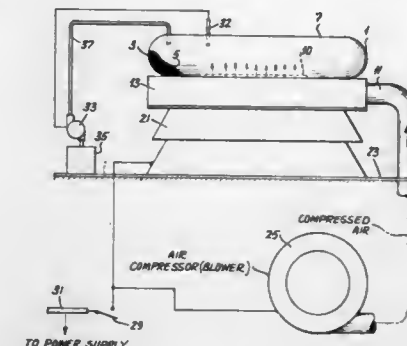
Int. Cl. A A01N 25/08, 25/12; A61L 2/18; B08B 7/04

U.S. Cl. 422—28

6 Claims

1. A method of sterilizing an object comprising immersing the object in an agitated bed of porous particles impregnated

with a liquid disinfectant such that the particles strike a surface of the object immersed therein and release a micro-thin film of



the liquid disinfectant onto the surface of the object, thereby killing pathogens on said surface of the object.

4,681,739

# USE OF CHLORINE DIOXIDE GAS AS A CHEMOSTERILIZING AGENT

David H. Rosenblatt, Baltimore, Md.; Aaron A. Rosenblatt, New York, N.Y., and Joseph A. Knapp, Pittsburgh, Pa., assignors to The Scapas Technology Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 435,331, Oct. 19, 1982, Pat. No. 4,504,442. This application Apr. 18, 1984, Ser. No. 601,443

The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.

Int. Cl. A A61L 1/00

U.S. Cl. 422—37

60 Claims

1. A method for sterilizing the surface of an article wherein the surface is at least substantially gas impermeable and said surface is contaminated with bacterial spores comprising the steps of exposing the spores on said surface to a humid gaseous atmosphere effective to enhance the susceptibility of said spores to subsequent chemosterilization with chlorine dioxide gas, and then exposing said spores present on said surface to an amount of gaseous chlorine dioxide in an inert carrier gas effective to sterilize said surface by killing the spores.

4,681,740

# APPARATUS FOR THE CHEMICAL REACTION BY WET PROCESS OF VARIOUS PRODUCTS

Roger Commarmot, Lyons; Dominique Didenot, Meyzieu, and Jean-Francois Gardais, Chuzelles, all of France, assignors to Societe Prolabo, Paris, France

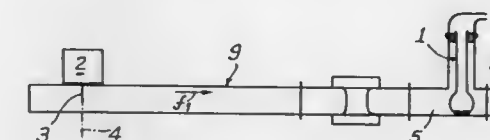
Filed Feb. 27, 1985, Ser. No. 706,339

Claims priority, application France, Mar. 2, 1984, 84 03496

Int. Cl. A G01N 31/16

U.S. Cl. 422—78

7 Claims



1. An apparatus for wet process chemical reactions comprising (i) a micro-wave generator for emitting micro-waves into a micro-wave heating chamber, (ii) a micro-wave heating chamber adapted to contain a sample of product to be heated to form a composition by association with at least one specific reagent, said micro-wave heating chamber comprising a wave guide into which said micro-wave generator emits, said wave guide having an upper wall and defining in said upper wall an opening and wherein an end of the wave guide, located opposite the micro-wave generator with respect to the opening, is

equipped with a water trap chamber, (iii) sample container means having an enlarged sample containing portion at a lower end thereof disposed within said micro-wave heating chamber and an upwardly extending neck portion extending through said opening in said upper wall of such micro-wave heating chamber, and (iv) a stack bordering said opening in said upper wall of said micro-wave heating chamber and rising to a height which is sufficient to form an absorption barrier opposing the propagation of micro-waves outside the micro-wave heating chamber.

4,681,741

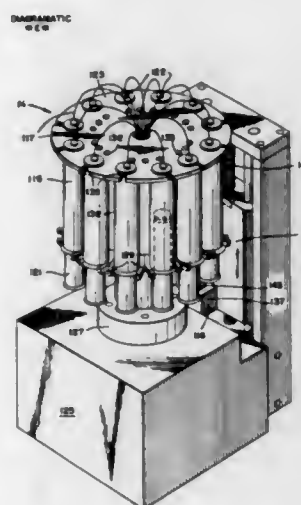
**REAGENT DISPENSER FOR AN ANALYZING SYSTEM**  
Richard W. Hanaway, Roseville, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 750,791, Jul. 1, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 943,820

Int. Cl.<sup>4</sup> B01L 3/02; B01J 35/00

U.S. Cl. 422-100

9 Claims



1. A reagent dispenser assembly for use in an automated analysis system, said dispenser comprising:

a dispensing station;  
a plurality of reagent supply containers associated with said dispensing station;

means for positioning a desired one of said reagent containers at said dispensing station for dispensing a desired amount of reagent therefrom;

means acting on said desired one of said containers at said dispensing station for dispensing therefrom a desired amount of reagent, said dispensing means comprising a plurality of plungers, with each respective plunger being associated with a respective reagent container, the position of each plunger relative to its associated container being determined by the amount of reagent remaining in its container;

a means separate from said containers and plungers for moving said plunger associated with said one of said containers to dispense said desired amount of reagent irrespective of the position of the plunger of said one of said containers prior to said reagent being dispensed, said means for moving said plunger associated with said one of said containers comprises an anvil for engaging said plunger, said anvil being arranged for movement longitudinally of said desired one of said reagent containers, a means for driving said anvil to move it selectively between a first home position where it does not engage said plunger, a second dispense start position where it first engages said plunger and a third finish position where it

pushes the plunger in order to dispense said desired amount of reagent; and  
control means for coordinating the movement of said anvil between its respective positions to dispense said desired amount of said reagent, said control means including means for sensing the first engagement between said anvil and said plunger and responsive thereto, said control means causes said anvil to move to its third position whereby the amount of reagent dispensed is a function of the movement of said anvil between the second dispense start position, which is determined by said means for sensing the first engagement, and said third position.

4,681,742

**ASSAY TRAY**

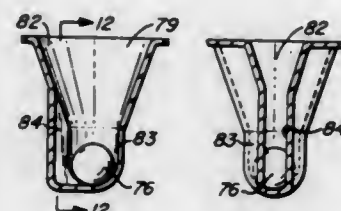
Larry J. Johnson, San Jose; Stephen R. Coates, Orinda, and Remying Loo, Hercules, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Oct. 1, 1984, Ser. No. 656,234

Int. Cl.<sup>4</sup> G01N 33/50, 35/00

U.S. Cl. 422-102

15 Claims



1. An assay tray for carrying out an assay wherein a particulate solid phase is contacted with one or more liquids said tray comprising a plate having a plurality of vertical wells therein for receiving an equal number of solid phase elements and one or more liquids, said wells having

sump means in the bottoms thereof which are unobstructedly accessible from the tops of the wells such that liquids may be essentially completely aspirated from the wells by aspiration apparatus lowered into from the tops of the wells;

a solid phase positioning means in and the sump means comprising an integral part of the structure of each of said wells for positioning a solid phase element in each well such that when said wells are in an upright position a solid phase element placed in any one well in contact with said solid phase positioning means always moves under the influence of gravity to a predetermined location in said any one well away from said sump means.

4,681,743

**CATALYTIC CRACKING APPARATUS**

Frank W. Skrab, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 541,933, Oct. 14, 1983, abandoned.

This application Oct. 10, 1985, Ser. No. 786,276

Int. Cl.<sup>4</sup> B01J 8/18

U.S. Cl. 422-140

9 Claims

1. Apparatus comprising:

(a) a catalyst lift pot having an upper end, a lower end, and a generally cylindrical sidewall having an interior surface defining a first diameter;

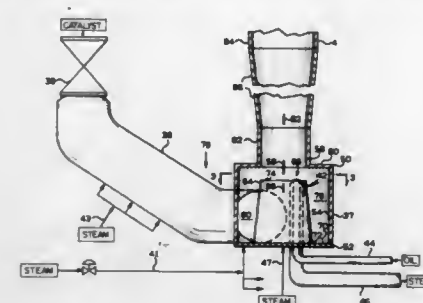
(b) a riser-reactor connected to the upper end of the lift pot, said riser-reactor having a mouth defining a second diameter where it connects to the lift pot which is smaller than the lift pot first diameter;

(c) a plug member extending axially into the lift pot from the lower end of the lift pot, said plug member being generally rotationally symmetric about its longitudinal axis and having an upper end surface which faces the mouth of the riser-reactor, said lift pot, said riser-reactor and said plug

member being construct and arranged so that fluid flowing through the lift pot before flowing into the riser-reactor flows radially inward across the upper end surface of the plug member;

(d) a means for introducing a fluidizable catalyst through the sidewall of the catalyst lift pot between the plug member and the generally cylindrical interior surface of the lift pot; and

(e) a means for releasing a liquid oil feedstock and an atomizing fluid into the lift pot from the upper end surface of the plug member, wherein the means for releasing liquid oil feedstock and atomizing fluid comprises at least one bifluid nozzle opening into the lift pot on the upper end



surface of the plug member, wherein said at least one nozzle comprises an outer tube, having an end, and a coaxially positioned inner tube, having an end and a side wall, defining an annulus between the inner tube and outer tube, the end of the outer tube being connected to the outside of the inner tube by a wall, the end of the inner tube protruding past the end of the outer tube and having a cap affixed thereto with a slot extending at least partially across it, the sidewall of the inner tube having a plurality of apertures connecting the inside of the inner tube and the annulus between the inner tube and the outer tube, and a plate baffle mounted inside of the inner tube and extending partially thereacross.

4,681,744

**HEAT RECOVERY DEVICE**

Jacob Weltman, Tryffelstigen 8, S-611 63 Nyköping, Sweden  
PCT No. PCT/SE85/00031, § 371 Date Sep. 26, 1985, § 102(e)

Date Sep. 26, 1985, PCT Pub. No. WO85/03342, PCT Pub.

Date Aug. 1, 1985

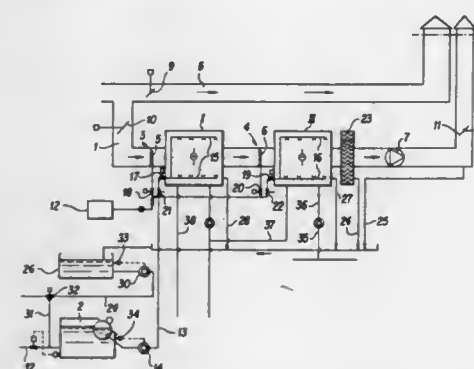
PCT Filed Jan. 25, 1985, Ser. No. 783,229

Claims priority, application Sweden, Jan. 27, 1984, 84580026

Int. Cl.<sup>4</sup> B01D 53/34

U.S. Cl. 422-173

6 Claims



1. A heat recovery device for recovering heat from gases such as sulphurous corrosive flue gases and gases containing organic acids, comprising a first and second indirect heat ex-

changer means with primary and secondary sides respectively, the corrosive gases being passed in series through the primary sides of the first and second heat exchanger means, the secondary sides of the first and second heat exchanger means being connected to heat absorbing medium flows and means for applying a protective controllable thin layer of a fluid onto the surfaces of the first and second heat exchanger means, wherein the amount of the heat absorbing medium passed through the secondary side of the first heat exchanger means is so related to the amount of flue gases passing through the primary side of the first heat exchanger means that the gas temperature is lowered in a first step past the acid dew point and wherein the amount of the heat absorbing medium passed through the secondary side of the second heat exchanger means is so related to the amount of the treated flue gases passing through the primary side of the second heat exchanger means that the gas temperature is lowered in a second step past the water dew point so as to protect the surfaces of said first and second heat exchanger means from corrosion.

4,681,745

**AMMONIA PRODUCTION PROCESS**

Alwyn Pinto, Linthorpe, England, assignor to Imperial Chemical Industries PLC, London, England

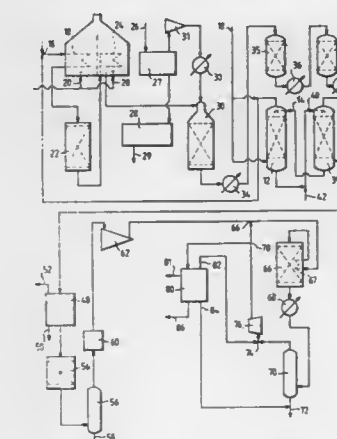
Continuation of Ser. No. 482,224, Apr. 5, 1983, abandoned. This application May 9, 1985, Ser. No. 732,263

Claims priority, application United Kingdom, Apr. 14, 1982, 8210834; Apr. 14, 1982, 8210835

Int. Cl.<sup>4</sup> C01C 1/04

U.S. Cl. 423-359

7 Claims



1. An ammonia production process which comprises the steps of:

(a) primary catalytically reforming a hydrocarbon feedstock with steam over an externally heated catalyst at superatmospheric pressure and in conditions of steam-to-carbon ratio, pressure and temperature to produce a gas containing carbon oxides, hydrogen, and at least 10% v/v of methane on a dry basis;

(b) secondary catalytically reforming the gas from step (a) by introducing air and bringing the mixture towards equilibrium, whereby to produce a gas containing nitrogen, carbon oxides, hydrogen and a decreased quantity of methane;

(c) converting carbon monoxide catalytically with steam to carbon dioxide and hydrogen;

(d) removing carbon oxides to give fresh nitrogen-hydrogen ammonia synthesis gas, the quantity of air used in step (b) being such that the fresh ammonia synthesis gas contains more than 1 molecule of nitrogen per 3 molecules of hydrogen;

(e) adding to the fresh ammonia synthesis gas recycle gas including a stream enriched in hydrogen, the rate of flow



of said stream enriched in hydrogen being such that the mixture of the fresh ammonia synthesis gas and the recycle gas has a hydrogen to nitrogen molar ratio in the range 1.0 to 2.5;

- (f) passing the mixture of the fresh synthesis gas and recycle gas over a synthesis catalyst to produce reacted gas containing ammonia and recovering ammonia from the reacted gas, recycling part of the reacted gas after recovery of ammonia therefrom as part of said recycle gas;
- (g) from the remainder of said reacted gas separating a stream enriched in hydrogen leaving a residual stream, returning the enriched stream to the synthesis as the remainder of said recycle gas; and
- (h) using the residual stream as fuel to supply heat to the externally heated catalyst in step (a), step (b) being operated under such conditions that the outlet methane content from step (b) is such that the residual stream contains methane amounting to 5-15% by carbon atoms of the hydrocarbon feedstock fed to step (a).

4,681,746

# METHOD OF REGULATING THE AMOUNT OF REDUCING AGENT ADDED DURING CATALYTIC REDUCTION OF NO<sub>x</sub> CONTAINED IN FLUE GASES

Stanislaw Michalak, Hespert; Klaus-Dieter Weber, Reichshof, and Jürgen Meier, Wiehl, all of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Continuation of Ser. No. 661,892, Oct. 17, 1984, Pat. No. 4,565,679. This application Oct. 4, 1985, Ser. No. 784,721 Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337793

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> B01J 8/06; C01B 21/00, 31/00

U.S. Cl. 423—239 2 Claims

1. In a process of regulating the amount of reducing agent added during the catalytic reduction of NO<sub>x</sub> of flue gases originating from a combustion installation fired with fossil fuels with which an adjustment value to be used for regulation of a quantity of reducing agent to be added is determined selectively, in response to a prescribed reducing agent/NO<sub>x</sub> stoichiometry factor, from the quantity of combustion air supplied to the combustion installation, as well as from the quantity of exiting flue gas, plus the NO<sub>x</sub> concentration downstream ahead of the catalyzer; the improvement in combination therewith which includes the steps of:

returning to the regulation process, as a primary correction value, the value of the NO<sub>x</sub> concentration in flue gas downstream after said catalyzer corrected via O<sub>2</sub>-concentration in the flue gas always to influence directly the prescribed reducing agent NH<sub>3</sub>-quantity rather than to influence the reducing agent/NO<sub>x</sub>-stoichiometry factor; returning to the regulation process, as a secondary correction magnitude, the flue gas temperature ahead of said catalyzer; and

influencing the set stoichiometry factor in such a way that, while maintaining the NO<sub>x</sub> emission limit value as the desired value of the primary correction value, said stoichiometry factor is regulated specifically via the temperature-dependent activity curve of said catalyzer.

4,681,747

# PROCESS FOR THE PREPARATION OF METALLOSILICATES OF TETRAVALENT LANTHANIDE AND ACTINIDE SERIES METALS USING HETEROPOLY METALLATES

Michael J. Desmond, Cleveland hts.; Janie K. Currie, Novelty, and Frederick A. Pesa, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 16, 1984, Ser. No. 672,594

The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> C01B 35/10

U.S. Cl. 423—277 32 Claims

1. A method for preparing a molecular sieving metallosilicate comprising the following steps:

- (A) providing a mixture comprising: (1) water; (2) an oxide of silicon source; (3) a synthesis directing agent and/or mineralizing agent; and (4) a tetravalent Lanthanide or Actinide series metal containing compound which is a heteropolymetallate of the formula



wherein:

G is an ion selected from the group consisting of hydrogen, Group I-A, II-A, I-B or II-B metals, ammonium, alkyl ammonium, alkyl phosphonium or alkyl arsonium, or a mixture of two or more thereof;

L is P, As, Si, Ge, Al, H or a mixture of two or more thereof;

Q is said tetravalent Lanthanide or Actinide series metal; J is Mo, W, V or Nb or a mixture of two or more thereof; f is a number which when multiplied by the charge of G will result in balancing the charge of the complex within the brackets;

g is a number ranging from zero to about 20;

p is a number ranging from zero to about 20;

r is a number ranging from about 1 to about 50;

s is a number ranging from about 7 to about 150; and

t is a number ranging from zero to about 150; and

- (B) maintaining said mixture at a temperature in the range of about 80° C. to about 300° C. for an effective period of time to provide said metallosilicate.

4,681,748

# SUPEROXIDIZED SODIUM PERBORATE

Werner Doetsch, Bad Hoenningen, and Rudolf Siegel, Neuwied, both of Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Hoellriegelskreuth, Fed. Rep. of Germany

Filed Feb. 11, 1986, Ser. No. 828,244

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505158

Int. Cl.<sup>4</sup> C01B 15/12

U.S. Cl. 423—279 9 Claims

1. Sodium perborate with an active oxygen content of more than 16% by weight, characterized by the following characteristics of the IR spectrum (compressed KBr):

discrete bands within the range of approximately 3430, 2820, 1640, and 1060 cm<sup>-1</sup>;

missing individual bands at 850-870 cm<sup>-1</sup>; and

permeability ratio D<sub>1060</sub>:D<sub>3430</sub> < 1.0, where D represents the permeability at the corresponding wavelength measured in percent.

4,681,749

# PROCESS FOR PREPARATION OF SYNTHETIC CRYSTALLINE ZINC SILICATE MINERAL HAVING A SAUCONITE, WILLEMITE OR HEMIMORPHITE STRUCTURE

Koichi Usui, Hoya; Teiji Sato, and Masanori Tanaka, both of Shibata, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,235

Claims priority, application Japan, Jun. 22, 1984, 59-127570 Int. Cl.<sup>4</sup> C01B 33/20

U.S. Cl. 423—326

13 Claims



1. A process for the preparation of a zinc silicate of the saucnite structure represented by the following formula:



which comprises (1) subjecting a clay mineral of the smectite group to an acid treatment to such an extent that the X-ray diffraction peak of the plane index (001) of the clay mineral substantially disappears and the Al<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub> molar ratio of the acid-treated product is within the range of from 1/11 to 1/99, and (2) subjecting the acid-treated product of the clay mineral and an oxide or hydroxide of zinc or a compound capable of forming said oxide or hydroxide under reaction conditions, to a hydrothermal treatment at a ZnO/SiO<sub>2</sub> molar ratio of about 3/4 at a temperature of 130° to 170° C. and a spontaneous pressure corresponding to the temperature.

4,681,750

# PREPARATION OF AMORPHOUS, PRECIPITATED SILICA AND SILICEOUS FILLER-REINFORCED MICROPOROUS POLYMERIC SEPARATOR

Harlan B. Johnson, Rittman; Thomas G. Krivak, Akron, and David A. Longhini, Uniontown, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 760,187, Jul. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 687,340, Dec. 28, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 853,506

Int. Cl.<sup>4</sup> H01M 2/14; C01B 33/12

U.S. Cl. 423—339

64 Claims

1. In a siliceous filler-reinforced microporous polymeric battery separator, the improvement wherein the siliceous filler comprises amorphous, precipitated silica prepared by the sequential steps of:

- (a) establishing an agitated aqueous solution of alkali metal silicate having (1) an initial alkali metal oxide concentration of from about 2.1 to 2.6 grams per liter and a temperature of from about 179° F. to 186° F., or (2) an initial alkali metal oxide concentration of from about 5.6 to 7.2 grams per liter and a temperature of between about 190° F. and about 198° F.,
- (b) adding slowly to the said aqueous solution further alkali metal silicate in amounts of (1) from about 14.5 to about 19 times, or (2) from about 2 to about 5 times, basis the aforesaid respective initial alkali metal oxide concentration, the amount of alkali metal silicate initially present in the aqueous solution while simultaneously adding acidifying agent to the said aqueous solution in amounts sufficient to maintain the alkali metal oxide concentration in the aqueous solution at substantially its initial level, thereby to form an aqueous slurry of precipitated silica,
- (c) adding additional acidifying agent to the slurry of step (b) until the pH thereof is from about 8 to about 9,
- (d) ageing the slurry of step (c) at (1) between about 176° F. and 186° F., or (2) between about 188° F. and 198° F., basis the aforesaid respective initial temperatures of the initial

aqueous alkali metal silicate solution, for from about 15 to 90 minutes, and thereafter

(e) adding additional acidifying agent to the slurry of step (d) in amounts such that the final solid silica product has an essentially neutral pH.

4,681,751

# CATALYTIC PROCESS FOR MAKING H<sub>2</sub>O<sub>2</sub> FROM HYDROGEN AND OXYGEN

Lawrence W. Gosser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 506,893, Jun. 22, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 726,695

Int. Cl.<sup>4</sup> C01B 15/02

U.S. Cl. 423—584

17 Claims

1. An improved catalytic method for making hydrogen peroxide from hydrogen and oxygen in a reaction medium at superatmospheric pressures, wherein the improvement comprises:

- (i) employing an aqueous reaction medium having no organic component present in excess of about 2% by weight of the reaction medium,
- (ii) employing a catalytically effective amount of Pd on adsorbent carbon, and
- (iii) employing superatmospheric pressures in the range of about 200 psig to 4000 psig.

4,681,752

# CAPSULES CONTAINING THE ACTIVE PRINCIPLE OF AN ALLERGEN, AND PROCESS FOR THEIR PREPARATION

Gaetano Melillo, Naples, Italy, assignor to Laboratorio Farmaceutico Lafarma S.a.S., Milan, Italy, a part interest

Continuation-in-part of Ser. No. 379,269, May 17, 1982, abandoned. This application Apr. 4, 1984, Ser. No. 597,241

Claims priority, application Italy, Jun. 4, 1981, 22136 A/81 Int. Cl.<sup>4</sup> A61K 9/48, 9/72, 9/44, 39/36

U.S. Cl. 424—453

7 Claims

1. A telescoping two piece hard gelatine capsule perforated to emit powder through the holes, to be administered through insertion in an inhaler, inhaler tube or nasal spray, containing 40 mgs. per capsule of a finely subdivided freeze dry, anhydrous powder mixture whose particles are 90% smaller than 10 microns and the remainder 10% smaller than 20 microns of the active constituent of an allergen, which is a member selected from the group consisting of *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*, *Ambrosia elatior*, *Agrostis maritima*, *Agrostis stolonifera*, *Poa pratensis*, *Dactylis glomerata*, *Holcus lamatus*, *Phleum pratense*, *Phalaris Canariensis*, *Lolium perenne*, *Lolium multiflorum*, *Festuca ovina*, *Cynodon dactylon* and *Agrostis alba*, said active constituent being uniformly dispersed into at least one lactose glucose or saccharose excipient having no bronchoconstrictive or irritating action on the nasal mucous membrane in a ratio of excipient to allergen between 1:1 and 50,000:1.

4,681,753

# PHARMACEUTICAL COMPOSITIONS HAVING ANTINEOPLASTIC ACTIVITY

Emanuel Revici, New York, N.Y., assignor to F.C.N.s.r.l., Bergamo, Italy and Alphatime Ltd, Berkhamsted, Great Britain

Filed Mar. 2, 1984, Ser. No. 585,855

Claims priority, application Italy, Mar. 8, 1983, 19958 A/83 Int. Cl.<sup>4</sup> A61K 31/28

U.S. Cl. 424—10

8 Claims

1. A pharmaceutical composition which comprises an effective amount of as the active principle, a combination of:

component (a) which is a diselenide of formula R—Se—Se—R, which is dipropyl, dipentyl, dipheptyl, dinonyl or diundecyl diselenide and component (b) which is 3-heptanone, 3-pentanone or 5-nonanone, said compo-



nents (a) and (b) being present in proportions ranging from 1:10 and 1:50, respectively, and a lipophilic vehicle.

4,681,754

**COUNTERACTING CYCLOSPORIN ORGAN TOXICITY**  
Helene Siegl, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Aug. 30, 1985, Ser. No. 771,278

Claims priority, application United Kingdom, Sep. 4, 1984, 8422253

Int. Cl.<sup>4</sup> A61K 31/50, 31/495, 37/00

U.S. Cl. 424—10

22 Claims

1. A method of counteracting cyclosporin organ toxicity in a subject in need of such treatment which comprises adjunctly administering co-dergocrine or a pharmaceutically acceptable acid addition salt thereof to the subject in an amount effective to counteract cyclosporin organ toxicity.

4,681,755

**DELIVERY DEVICE FOR ZERO-ORDER RELEASE OF AN ACTIVE PRINCIPLE INTO A DISSOLUTION FLUID AND PROCESS FOR ITS PREPARATION**

Paolo Colombo, Pavia; Ubaldo Conte, Varese, and Alberto Rener, Como, all of Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

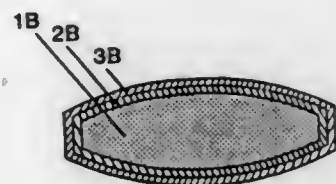
Filed Jul. 22, 1985, Ser. No. 757,601

Claims priority, application Italy, Jul. 26, 1984, 48632 A/84

Int. Cl.<sup>4</sup> A61K 9/22, 9/32

U.S. Cl. 424—486

16 Claims



1. A delivery device which in the presence of a dissolution fluid releases a biologically active principle at a substantially constant rate for an extended period of time, the device comprising

- (a) a reservoir comprising
  - (i) a solid porous matrix of homogenous polymeric material which material is insoluble and unswellable in the dissolution fluid, the geometric dimensions of which remain substantially unchanged over said period of time;
  - (ii) an additive which is soluble in the dissolution fluid and which has a negative heat of dissolution with respect to said fluid; and
  - (iii) the biologically active ingredient, said additive and biologically active ingredient being disposed in the pores of said matrix;
- (b) a first homogenous and continuous coating of a film-forming polymer on said reservoir, said coating maintaining a substantially constant surface area and thickness over said period of time, said polymer being insoluble in said dissolution fluid with said coating being permeable to both said fluid and to a solution of said active ingredient in said fluid, the thickness of said first coating being such as to comply substantially with the relationship:

$$\text{thickness} = D \times S \times C_s / R$$

in which

D is the diffusion constant of said first coating;

S is the surface area of said first coating;

C<sub>s</sub> is the saturation constant of the active principle in the dissolution fluid; and

R is the release rate; and

(c) a second homogenous and continuous coating of a film-forming polymer material which is soluble in the dissolution fluid disposed over said first coating.

4,681,756

**PREVENTION OF N-NITROSO COMPOUND FORMATION IN VIVO**

William J. Mergens, West Caldwell; Harold L. Newmark, Maplewood; Prabhakar R. Sheth, Pearl River, and Jacques L. Tossounian, Pine Brook, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 744,720, Jun. 14, 1985, abandoned, which is a continuation of Ser. No. 462,290, Jan. 31, 1983, abandoned, which is a continuation of Ser. No. 258,962, Apr. 29, 1981, abandoned. This application Jun. 26, 1986, Ser. No. 880,356

Int. Cl.<sup>4</sup> A61K 9/22, 31/555, 31/34

U.S. Cl. 424—451

4 Claims

1. A method for preventing or inhibiting the formation in vivo in the stomach of nitrosamines and nitrosamides resulting from the presence in mammals of nitrites and secondary amines, tertiary amines or secondary amides which comprises orally administering to said mammals, on a daily basis, an amount of a combination of vitamin C and vitamin E which is effective in preventing or inhibiting the formation in vivo of nitrosamines and nitrosamides, said combination being administered in the form of a controlled release, hydrodynamically balanced tablet or capsule in which the ratio of vitamin C to vitamin E ranges from about 10:1 to about 1:10.

4,681,757

**DEODORANT COMPOSITIONS CONTAINING PERSIMMON JUICE AS ACTIVE INGREDIENT**

Takeo Mimasu, Kyoto, and Kuniyoshi Torii, Nishinomiya, both of Japan, assignors to Rilis Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 2, 1985, Ser. No. 783,021

Claims priority, application Japan, Oct. 8, 1984, 59-210211

Int. Cl.<sup>4</sup> A61K 7/035, 7/032, 9/10, 31/74

U.S. Cl. 424—47

7 Claims

1. A deodorant composition comprising as an active deodorant ingredient an effective deodorizing amount of persimmon juice which is pressed out from persimmon fruits and an excipient or adjuvant therefor selected from the group consisting of fumigants, aerosols, fibers, paper, granules and synthetic resins.

4,681,758

**SHAPED, FLAVORED ARTICLES AND METHOD OF PRODUCING SAME**

Katherine J. Fruthaler; Thomas R. Hopkins; Donald O. Hiltzman; Donald H. Kabick, and Lyle R. Kallenbach, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 29, 1986, Ser. No. 868,921

Int. Cl.<sup>4</sup> A23K 1/00; C08L 89/00

U.S. Cl. 424—78

21 Claims

1. A shaped, flavored, beefy aroma article of manufacture having a textured outer surface and a porous inner structure which comprises in the range of 5–50 wt. % of a protein-containing material and in the range of 50–95 wt. % of a polymeric material.

4,681,759

**RIOPROSTIL-PVP COMPLEX**

Linda S. Porubcan, Readington, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed May 8, 1985, Ser. No. 731,701

Int. Cl.<sup>4</sup> C07C 127/00; A61K 31/557, 31/79

U.S. Cl. 424—80

5 Claims

1. A rioprostil: non-crosslinked polyvinylpyrrolidone com-

plex of 1 mole fraction of rioprostil per 2½ mole fraction of polyvinylpyrrolidone monomeric subunits in dry solid form.

4,681,760

**METHOD OF CONFERRING IMMUNOTOLERANCE TO A SPECIFIC ANTIGEN**

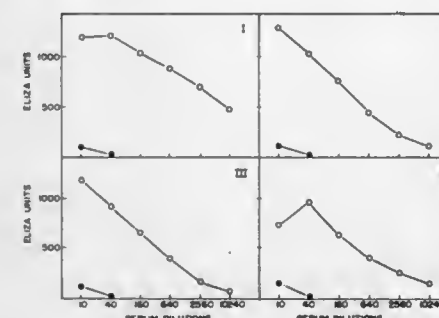
C. Garrison Fathman, Menlo Park, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 17, 1985, Ser. No. 724,063

Int. Cl.<sup>4</sup> A61K 39/00, 39/35, 39/395

U.S. Cl. 424—85

20 Claims



1. A method of conferring immunotolerance to a specific antigen which comprises administering to a subject in need of such tolerance, simultaneous administrations of an effective amount of said antigen and an effective amount of an antibody or derivative thereof which binds to L3T4 or its equivalent, formulated in a pharmaceutically acceptable carrier.

4,681,761

**MAJOR IRON-REGULATED PROTEIN OF NEISSERIA GONORRHOEA AND ITS USE AS VACCINE**

Timothy A. Mietzner, and Stephen A. Morse, both of Atlanta, Ga., assignors to State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University, Portland, Ore.

Filed Oct. 24, 1985, Ser. No. 790,910

Int. Cl.<sup>4</sup> C07K 15/04

U.S. Cl. 424—92

19 Claims

1. In an isolated, immunospecific antigenically substantially pure form suitable for use as a vaccine, the major iron-regulated protein (MIRP) of a pathogenic species of the genus *Neisseria*, the gonococcal congener of which protein having a molecular weight of approximately 37,000 daltons and consisting of about 340 amino acids with the profile and initial amino sequence set forth in Tables I and II of the specification.

15. In a method of producing the MIRP of a pathogenic species of the genus *Neisseria* which comprises the steps of:

- (a) growing cells of that pathogenic species in an iron-depleted bacteriologic media;
- (b) harvesting the thus-grown cells;
- (c) disrupting the cells;
- (d) separating the soluble portion of the cells from the insoluble portion;

the improvement which comprises

- (i) selectivity solubilizing the MIRP from the insoluble portion of the disrupted cells with a cationic surfactant aqueous media; and
- (ii) removing residual contaminants by chromatographic fractionation comprising cationic exchange chromatography in the presence of the cationic surfactant aqueous media; thereby isolating the MIRP in immunospecific antigenically substantially pure form.

4,681,762

**GENETICALLY ATTENUATED BACTERIAL VACCINES WITH MULTIPLE MUTATIONS OF THE SAME PHENOTYPE**

Max P. Oeschger, Silver Spring, Md.; Anne M. Hooke, Annandale, Va., and Joseph A. Bellanti, Bethesda, Md., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 367,008, Apr. 9, 1982, abandoned, which is a division of Ser. No. 41,896, May 23, 1979, Pat. No. 4,337,314. This application Feb. 16, 1984, Ser. No. 580,588

Int. Cl.<sup>4</sup> A61K 39/102, 39/02; C12N 15/00, 1/20

U.S. Cl. 424—92

20 Claims

1. A vaccine composition for the prevention of infectious diseases comprising an immunogenically-effective amount of a genetically attenuated and stable avirulent bacterial strain derived from a virulent bacterial strain by introducing into said virulent strain by genetic transfer and recombination at least two mutations of the same phenotype which renders said virulent strain avirulent, while permitting said avirulent strain to retain immunogenicity, together with an inert pharmacologically acceptable carrier.

4,681,763

**COMPOSITION FOR STIMULATING BONE GROWTH**  
Mark A. Nathanson, Philadelphia, Pa.; A. H. Reddi, Kensington, Md., and T. K. Sampath, Arlington, Mass., assignors to University of Medicine and Dentistry of New Jersey, Newark, N.J.

Filed Jun. 11, 1985, Ser. No. 743,598

Int. Cl.<sup>4</sup> A61K 35/12

U.S. Cl. 424—95

12 Claims

1. A composition for implantation into animals to stimulate new bone growth comprising:  
a material capable of stimulating formation of new bone and cartilage in vivo derived from demineralized bone by use of aqueous guanidine hydrochloride, said material deposited by precipitation onto a pliable physiologically acceptable support.

4,681,764

**POROUS AND SPHERICAL CARBONACEOUS PRODUCT**

Hiroshi Endo, Tokyo; Masao Katoh, Koshigaya, and Kuniaki Hino, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 402,029, Jul. 26, 1982, abandoned, which is a continuation of Ser. No. 205,901, Nov. 12, 1980, abandoned. This application Jul. 15, 1985, Ser. No. 755,218

Claims priority, application Japan, Nov. 22, 1979, 54-151645

Int. Cl.<sup>4</sup> A61K 33/44, 31/19, 31/05

U.S. Cl. 424—125

6 Claims

1. A process for producing a porous and spherical carbon product having 0.30 to 1.20 meq/g of said product of acidic groups, 0.20 to 0.70 meq/g of said product of basic groups, 0.20 to 0.70 meq/g of said product of phenolic hydroxyl groups, less than 0.15 meq/g of said product of carboxyl groups, and equivalent ration of 0.40 to 2.5 of said acidic groups to said basic groups and larger than 0.60 meq/g of the value obtained by subtracting the amount of said carboxyl groups from the sum of said basic groups and said phenolic hydroxyl groups, comprising

- (a) heating a porous and spherical carbon substance having a diameter of 0.05 to 1 mm, a specific pore volume of the spherical particles having a pore radius of less than 80 Å of 0.2 to 1.0 cc/g and a specific pore volume of spherical particles having a pore radius of 100 to 75000 Å of 0.1 to 1.0 cc/g, at a temperature of 350° to 700° C. in an atmosphere containing 0.5 to 20% by volume of oxygen, and
- (b) heating the treated substance of step (a) at a temperature of 800° to 1000° C. in an atmosphere of a gas inert to carbon.





an evacuable growth chamber and means for maintaining a pressure less than approximately  $10^{-10}$  Torr in said evacuable growth chamber,

a molecular beam source disposed inside said evacuable growth chamber and designed for generating a molecular beam directed to a growth position inside said evacuable growth chamber,

a platen disposed at said growth position and designed for mounting a plurality of substrates essentially equidistant from a center point of said platen,

means for rotating said platen about an axis which comprises said center point and which is positioned to provide for a line-of-sight path between said molecular beam source and said growth position;

said molecular beam source being spaced from said axis a distance which is greater than the distance between said substrates and said center point, and said platen being spaced from said molecular beam source a distance which is greater than the distance between said molecular beam source and said axis.

10. Method for molecular beam deposition of a semiconductor material simultaneously on a plurality of substrates;

said method comprising: maintaining a pressure less than approximately  $10^{-10}$  Torr in an evacuable growth chamber,

generating a molecular beam directed to a growth position inside said evacuable growth chamber,

rotating a platen which is disposed at said growth position and on which a plurality of substrates are mounted essentially equidistant from a center point of said platen, rotation being about an axis which comprises said center point and which is positioned to provide for a line-of-sight path for said molecular beam;

the source of said molecular beam being spaced from said axis a distance which is greater than the distance between said substrates and said center point, and said platen being spaced from said source a distance which is greater than the distance between said source and said axis.

4,681,774

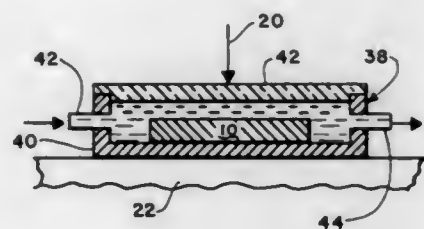
**LASER INDUCED SELECTIVE ELECTROLESS PLATING**  
Michael J. Halliwell, 4435 Willow Mist Dr., Dayton, Ohio 45424, and Joseph Zahavi, c/o Technion Research & Development Foundation, Ltd., Israel Institute of Metals, Haifa, Technion City, Israel

Filed Jan. 17, 1986, Ser. No. 819,558

Int. Cl. C23C 18/28

U.S. Cl. 427-53.1

20 Claims



1. A method for selectively plating a metal onto a workpiece which consists essentially of the steps of

(a) applying a sensitizing solution to said workpiece, thereby providing a sensitized workpiece,

(b) describing a pattern on said workpiece by flash evaporating sensitizer from said workpiece by directing a laser beam onto the thus-sensitized workpiece in an area which is not to receive said metal plated thereon, and

(c) contacting said workpiece with an electroless plating solution to achieve plating in areas wherein said sensitizer remains.

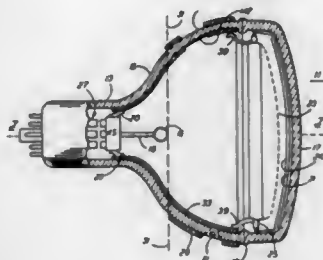
4,681,775

**CRT WITH OPTICAL WINDOW AND METHOD**  
Anthony V. Gallaro, Auburn, N.Y., assignor to North American Phillips Consumer Electronics Corp., New York, N.Y.  
Division of Ser. No. 448,468, Dec. 10, 1982, Pat. No. 4,528,477.  
This application Mar. 13, 1985, Ser. No. 712,319

Int. Cl. B05D 5/12

U.S. Cl. 427-64

4 Claims



1. A method for producing an adherent, electrically conductive transparent metal oxide layer on a defined area of the interior surface of the funnel wall of a cathode ray tube, the method comprising:

(a) applying a layer of a metallo-organic formulation to the defined area, said formulation comprising a mixture of tin resinate, antimony resinate and solvent; and

(b) heating the layer to substantially completely pyrolyze the layer to a metal oxide layer, which is transparent, adherent and conductive.

4,681,776

**IMPROVED METHOD FOR DOUBLE FLOATING TRANSPORT AND PROCESSING OF WAFERS**  
Edward Bok, Dr Badhoevedorp, Netherlands, assignor to Integrated Automation Limited, Badhoevedorp, Netherlands  
PCT No. PCT/NL85/00021, 8371 Date Jan. 28, 1986 8102(e)  
Date Jan. 28, 1986, PCT Pub. No. WO85/05757, PCT Pub. Date Dec. 19, 1985

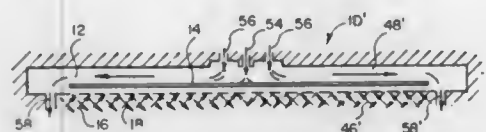
PCT filed Jun. 3, 1985, Ser. No. 823,419

Claims priority, application Netherlands, Jun. 4, 1984, 8401776

Int. Cl. B08B 5/04; B44C 1/22; B05D 5/12; C23C 13/08

U.S. Cl. 427-85

26 Claims



1. Method of double floating transporting and processing wafers within a confined passageway comprising:

a. supplying a fluid medium through a plurality of supply channels intersecting the passageway and,

b. discharging said fluid medium through a plurality of discharge channels intersecting such passageway adjacent said supply channels, such that moving fluid medium cushions while transporting the wafer within said passageway; and

c. selectively rotating said wafer within said passageway by flowing pressurized fluid medium across the planar surface of said wafer and in the desired direction of rotation.

4. Method of transporting and processing wafers within a confined passageway as in claim 1, including during said rotating of said wafer, simultaneously supplying said fluid medium towards both planar sides of said wafer.

12. Method of transporting and processing wafers within a confined passageway as in claim 4, wherein said rotating of

said wafer is at least temporarily effected by continuously supplying pressurized fluid medium in configuration as a rotating radial segment extending across the planar surface of the wafer.

18. Method of transporting and processing wafers within a confined passageway as in claim 12, including temporarily securing said wafer by suction during said rotating.

20. Method of transporting and processing wafers within a confined passage way as in claim 18, wherein said processing includes directing coating agent onto said wafer.

4,681,777

**METHOD FOR ELECTROLESS AND VAPOR DEPOSITION OF THIN FILMS OF THREE TIN SULFIDE PHASES ON CONDUCTIVE AND NONCONDUCTIVE SUBSTRATES**

Robert D. Engelken, 304 Easy St., and Hal E. McCloud, 2011 Emerald St., both of Jonesboro, Ark. 72401

Filed May 5, 1986, Ser. No. 859,927

Int. Cl. B05D 5/12

U.S. Cl. 427-87

22 Claims

1. A process for the electroless and chemical vapor deposition of tin sulfide on a conductive or nonconductive substrate comprising the steps of:

a. Preparing a chemical bath solution comprising a stannous salt, elemental yellow sulfur, and an organic acid;

b. Heating said solution, and then either removing or maintaining the heat source; and

c. Placing said substrate within or above said solution to form on said substrate a  $\text{Sn}_x\text{S}$  ( $0.5 \leq x \leq 1$ ) film.

4,681,778

**METHOD AND APPARATUS FOR MAKING ELECTRICAL CONNECTIONS UTILIZING A DIELECTRIC-LIKE METAL FILM**

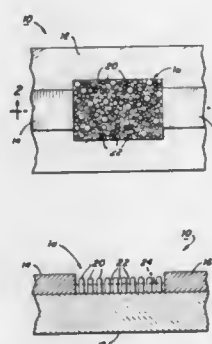
Peter L. Young, South Barrington, Ill., assignor to Optical Materials, Inc., Mercer Island, Wash.

Filed Nov. 14, 1985, Ser. No. 799,926

Int. Cl. B05D 5/12

U.S. Cl. 427-96

9 Claims



1. A method for electrically connecting conductors on a substrate comprising,

depositing an electrically non-conducting film containing a plurality of non-contacting microscopic conductive metal columns or islands on the substrate interconnecting the conductors to be electrically connected, and locally heating the film interconnecting the conductors to melt the columns or islands so that the metal forming the columns or islands flows together to render the film between the conductors conductive.

184-023 O.G.-87-12

4,681,779  
**ANTI-STATIC STYRENE POLYMER PARTICLES BY IMPREGNATION**

Alvin R. Ingram, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 25, 1985, Ser. No. 791,479

Int. Cl. B05D 7/00; C12P 33/14

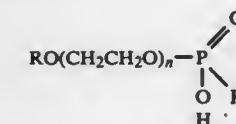
U.S. Cl. 427-222

5 Claims

1. Method of making foamable styrene polymer particles which exhibit anti-lumping properties and anti-static properties during pre-expansion comprising the steps of:

(a) suspending styrene polymer particles in water with the aid of a suspending agent system selected from tricalcium phosphate, calcium hydroxide or calcium carbonate;

(b) adding 3 to 20 weight percent of a blowing agent and 0.1 to 0.4 weight percent of a mixture of phosphate esters having general formula



wherein R may be alkaryl groups, branched alkyl groups having at least 7 carbon atoms, or normal alkyl groups having at least 10 carbon atoms; n may be a positive integer of from 1 to 33; and R' may be  $\text{RO}(\text{CH}_2\text{CH}_2\text{O})_m$  or hydroxyl group; said suspending agent being used in a ratio of agent to phosphate esters of between 3 and 10;

(c) heating the suspension at a temperature of from 80° to 150° C. to impregnate the polymer particles with blowing agent and coat the particles with phosphate esters;

(d) cooling the suspension to room temperature, acidifying the suspension, and separating the impregnated and coated particles from the aqueous system.

4,681,780

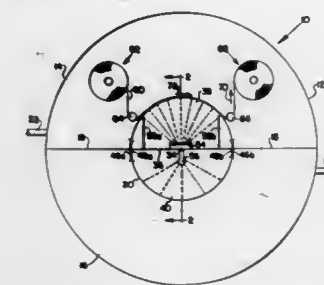
**CONTINUOUSLY CLEANED ROTARY COATING MASK**  
Daniel T. Kamman, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 1, 1983, Ser. No. 556,962

Int. Cl. B05D 5/00, 1/32; C23C 14/04

U.S. Cl. 427-282

10 Claims



1. Apparatus for continually depositing coating materials on a moving web in a precise well-defined pattern, comprising: means for defining at least two separate enclosed chambers, with each of said chambers being capable of supporting a partial vacuum therein and with said chambers being generally isolated from each other;

a pattern defining, movably mounted mask having pattern-forming openings therein, said mask being alternately movable between internal portions of said chambers;

means for moving a surface of said web into pattern opening covering intimate contact with said movably mounted mask for movement therewith and for moving said mask between said internal chamber portions;

means within one of said chambers for applying coating



materials to the said pattern defining openings formed in said movably mounted mask and to a web surface presented thereat; and  
means within another of said chambers for cleaning coating materials from the pattern defining mask surfaces adjacent said pattern mask openings.

9. A method for continually depositing coating materials on a moving web, comprising the steps of:  
providing at least two separate enclosed chambers with each of said chambers being capable of supporting a partial vacuum and with said chambers being generally isolated from one another;  
providing a pattern defining movably mounted mask having pattern-forming openings therein with portions of said mask being alternately movable between said enclosed chambers;  
moving a surface of said web into pattern opening covering intimate contact with said movably mounted mask for movement therewith while simultaneously moving said mask portions between said internal chamber portions;  
providing means within one of said enclosed chambers for applying coating materials to the said pattern defining openings formed in said movably mounted mask and to a web surface presented thereat; and  
providing means within another of said chambers for cleaning coating materials from the pattern defining mask surfaces adjacent said pattern mask openings.

4,681,781

## SHIPPING BAG

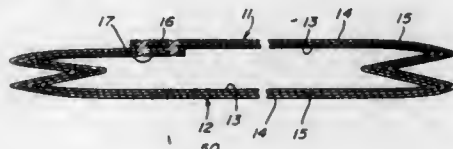
Charles R. Murray, Toronto, and Ray E. Harrison, Brampton, both of Canada, assignors to C-I-L Inc., North York, Canada  
Continuation of Ser. No. 631,540, Jul. 16, 1984, Pat. No. 4,576,844. This application Feb. 19, 1986, Ser. No. 830,858  
Claims priority, application Canada, Nov. 28, 1983, 442097; Apr. 2, 1984, 451106

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> B65D 30/08; B32B 27/08

U.S. Cl. 428-35

20 Claims



1. A thermoplastic shipping bag comprising a front wall and a back wall heat sealed thereto, each of said walls comprising a cross-laminated outer ply comprising at least two sheets of uni-axially oriented polyethylene bonded together, and heat sealed thereto, an inner wall formed of low density polyethylene, said inner wall comprising a distinct inner ply.

4,681,782

## ARTICLE FOR DETERMINING THE PRESENCE OF IMMUNE COMPLEXES

Adil N. Ozkan, Salt Lake City, Utah, assignor to Biostar Medical Products, Inc., Boulder, Colo.  
Continuation-in-part of Ser. No. 363,967, Mar. 31, 1982, Pat. No. 4,450,231. This application Oct. 3, 1983, Ser. No. 538,493  
Int. Cl.<sup>4</sup> G01N 33/536, 33/539

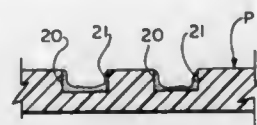
U.S. Cl. 428-36

4 Claims

1. An article for use in performing an immunoassay on a specimen to determine the presence or composition of immune complexes, comprising:

- a solid phase base containing a surface capable of receiving a coating layer thereon; and
- a coating layer received on said surface, said layer consisting of a non-proteinaceous, non-ionic polymer selected from the group consisting of polyethylene glycol, dextran,

polyvinyl chloride, and mixtures thereof, which is adhered to said surface and capable of absorbing immune



complexes which may be present in fluid specimens contacted with said surface.

4,681,783

## TUBULAR LINING MATERIAL FOR PIPE LINES

Masakatsu Hyodo, and Isaburo Yagi, both of Osaka, Japan, assignors to Ashimori Industry Co., Ltd., Japan

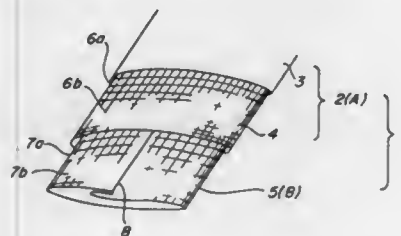
Filed Dec. 17, 1985, Ser. No. 809,865

Claims priority, application Japan, Dec. 18, 1984, 59-265271

Int. Cl.<sup>4</sup> F16L 35/16

U.S. Cl. 428-36

10 Claims



1. A tubular lining material for reinforcing pipe lines, utilizable in a pipe-lining method wherein the tubular lining material, having a binder disposed on the inner surface thereof, is inserted into a pipe line and is allowed to advance within the pipe line as the tubular lining material is turned inside out under fluid pressure whereby the tubular lining material is applied to the inner surface of the pipe line with the binder being interposed between the pipe line and the tubular lining material, said tubular lining material comprising an air-imperious outer tubular jacket coated with an air-imperious outer layer of a synthetic resin and provided on the inside thereof with a reinforcing inner tubular textile jacket, characterized in that the inner reinforcing tubular textile jacket is more coarse in weaving density and larger in diameter than the outer air-imperious tubular textile jacket but has a folded over portion to permit it to fit within said outer textile jacket wherein the product of the length of the diameter and the elongation ratio in the direction of the diameter, on fracture, of the air-imperious outer tubular textile jacket is approximately equal to the product of the length of the diameter and the elongation ratio in the direction of the diameter, on fracture of the reinforcing inner tubular textile jacket.

4,681,784

## LIGHTSAFE MASKING FILM

Ryohel Ebara, and Shin-ichi Sano, both of Saitama, Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Jan. 17, 1986, Ser. No. 819,661

Claims priority, application Japan, Jan. 18, 1985, 60-5660

Int. Cl.<sup>4</sup> B32B 7/06, 7/12

U.S. Cl. 428-40

6 Claims

1. A lightsafe masking film which comprises a substrate of plastic film, a pressure sensitive adhesive layer formed thereon, and a lightsafe peelable layer formed on said adhesive layer, comprising (a) nitrile rubber, (b) nitrocellulose, (c) an epoxy compound as a tackiness improver, and (d) a lightsafe colorant.

4,681,785

SUPPLY ROLL FOR PROTECTIVE COVERS  
ESPECIALLY THOSE MADE OUT OF SHEET PLASTIC,  
FOR MOTOR-VEHICLE SEATS

Stephanie Horn, Schwalmstadt-Treysa, Fed. Rep. of Germany, assignor to Horn-Plastik Theodor Horn KG, Schwalmstadt, Fed. Rep. of Germany

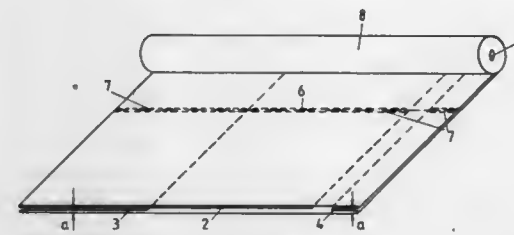
Filed Jan. 13, 1986, Ser. No. 818,169

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1985, 3500928

Int. Cl.<sup>4</sup> B32B 3/10

U.S. Cl. 428-43

2 Claims



1. A supply roll of protective covers made from sheet plastic for motor-vehicle seats comprising: covers attached to each other across their length in a long web and folded over at their ends to form pockets with a seam that can be pulled out over a backrest or forward edge of a seat; said seam comprising perforations between said covers for separating said covers from each other; said web having a length and width and being folded longitudinally to form a longitudinal fold between the pockets in said covers and said web being finally wound into a supply roll; and a supporting fold for holding constant the winding density of the supply roll of wound seat covers over its whole width, said supporting fold comprising additional folds of said cover and being located along the length of the web at the longitudinal fold.

4,681,786

## COVERINGS PROVIDING IMPACT SOUND ISOLATION

John G. Brown, 20205 State Line Rd., Harvard, Ill. 60033

Continuation of Ser. No. 131,516, Mar. 18, 1980, abandoned.

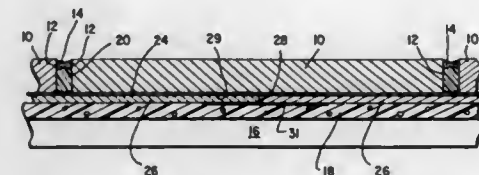
This application Jan. 3, 1984, Ser. No. 567,151

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> B32B 3/10; E04F 13/08

U.S. Cl. 428-44

20 Claims



1. Impact sound isolation of a gravity-held-in-place-horizontal-tile-array of jobsite-installed tiles, comprising, in combination, a horizontal-base-surface, a horizontal-disassociation-cushioning-layer loose laid over said horizontal-base-surface, one or more slip sheets, and a plurality of horizontal-individual-tiles of uniform thickness having a top wearing surface, a bottom surface and three or more sides loose laid and overlying said one or more slip sheets, said tiles being arranged in a patterned layout, joined to one another by means of a dynamic-interactivefluidtight-flexible-joint, and held in place by gravity, friction and accumulated-interactive-assembly over said horizontal-disassociation-cushioning-layer and said one or more slip sheets so that the assembly is cushioned by said horizontal-disassociation-cushioning-layer and responds dynamically, interactively and accommodatively to foot and

rolling traffic, said dynamic-interactive-fluidtightflexible-joint comprising an elastomeric sealant, said impact sound isolation achieved by means of the placement of said horizontal-disassociation-cushioning-layer between the hard top surface of said horizontal-base-surface and the hard bottom surface of said horizontal-individual-tiles and by means of the resilient, dynamic system of said dynamicinteractive-fluidtight-flexible-joint joining said tiles together.

4,681,787

INGOT PRODUCED BY A CONTINUOUS CASTING  
METHOD

Charles D'A. Hunt, Occidental, Calif., assignor to Degussa Electronics Inc., Morgan Hill, Calif.

Division of Ser. No. 656,151, Sep. 28, 1984, Pat. No. 4,583,580. This application Nov. 15, 1985, Ser. No. 798,596

Int. Cl.<sup>4</sup> B22D 11/00, 27/02

U.S. Cl. 428-577

6 Claims



1. A continuously cast ingot of a reactive alloy having a substantial liquidus-solidus temperature difference and a high melting point, said ingot being characterized by a macrostructure in excess of about one millimeter average grain dimensions with a non-uniform shape, orientation and distribution, and being characterized by a microstructure substantially consisting of dendritic crystallites of the order of 500 microns cross sectional size and of the order of 50 microns cell spacing.

4,681,788

INSULATION FORMED OF PRECIPITATED SILICA  
AND FLY ASH

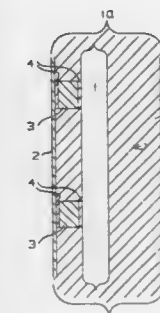
Robert W. Barito, and Kenneth L. Downs, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jul. 31, 1986, Ser. No. 891,157

Int. Cl.<sup>4</sup> B32B 1/00, 1/10; B65B 31/00; E04B 1/74

U.S. Cl. 428-68

19 Claims



1. A slab of board-like material for use as a thermal insulation comprising:

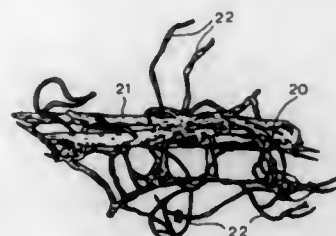
- a. a precipitated silica and a fly ash material, there being between 30% and 70% of said fly ash material based upon the total weight of said precipitated silica and fly ash material; and
- b. a gas and water tight envelope containing said mixture of precipitated silica and fly ash material.

4,681,789

**THERMAL INSULATOR COMPRISED OF SPLIT AND OPENED FIBERS AND METHOD FOR MAKING SAME**James G. Donovan, Norwell, and John Skelton, Sharon, both of Mass., assignors to Albany International Corp., Albany, N.Y.  
Filed Sep. 26, 1985, Ser. No. 780,389  
Int. Cl.<sup>4</sup> B32B 3/02

U.S. Cl. 428—93

6 Claims



1. A synthetic fiber batt thermal insulator material comprising an assembly of individual parent fibers which have diameters in the range of from 9 to 25 microns and provide support for a network of many fibrils, said fibrils having been split away or fibrillated from individual parent fibers and being small in cross-sectional dimension relative to the parent fibers, said batt having the following characteristics:

- a density of less than 1.0, typically about 0.5 lb/cu ft;
- an apparent thermal conductivity measured by the plate-to-plate method according to ASTM C518 with heat flow down of less than 0.5 Btu-in/hr-ft<sup>2</sup>-°F.;
- in the dry state, under a compressive stress of 5 lb/square inch, a compressive strain of at least 90% and a long-term compressive recovery of at least 85% after removal of this stress as determined by the test method of Section 4.3.2 of U.S. Military Specification MIL-B-41826E modified by use of a lower pressure at which initial thickness and recovered-to-thickness are measured;
- zero gauge length condition: 4.02 g sample; 2.00 inches; 0.3 lb/ft<sup>3</sup>; nominally zero load.

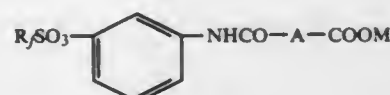
4,681,790

**TREATING COMPOSITION CONTAINING FLUORO-CHEMICAL COMPOUND MIXTURE AND TEXTILES TREATED THEREWITH**James J. Fong, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Filed Feb. 3, 1986, Ser. No. 825,530  
Int. Cl.<sup>4</sup> B32B 27/00

U.S. Cl. 428—96

19 Claims

13. A substrate treated with a composition comprising a blend of  
(a) a compound having the formula



where

- $R_f$  is a fluorinated aliphatic radical;
- A is a divalent radical group obtained by eliminating the carbonyl groups of a dibasic organic acid or an organic anhydride selected from the group consisting of tetrachloro phthalic, tetrabromo phthalic and chlondic; and
- M is a cation selected from the group consisting of  $NH_4^+$ ,  $Na^+$ ,  $K^+$ ,  $Li^+$ ,  $H^+$ , or a protonated alkyl amine having from 1-6 carbon atoms in the alkyl group;
- (b) a normally liquid or low melting solid, water soluble or dispersible, fluoroaliphatic radical-containing poly(oxyalkylene) compound, or composition comprising a mixture of such poly(oxyalkylene) compounds, said poly(oxyalkylene) compound having one or more of said fluoroaliphatic radi-

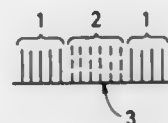
cals and one or more poly(oxyalkylene) moieties, said fluoroaliphatic radicals and poly(oxyalkylene) moieties being bonded together by hetero atom-containing groups or organic linking groups or combinations of said groups.

4,681,791

**THERMOCHROMIC TEXTILE MATERIAL**Yutaka Shibahashi; Norikazu Nakasugi; Takashi Kataoka; Hiroshi Inagaki, all of Aichi; Tutomu Kito, Gifu; Masaharu Ozaki, Aichi; Nobuaki Matunami, Gifu; Naoya Ishimura, and Katuyuki Fujita, both of Aichi, all of Japan, assignors to Pilot Ink Co., Ltd., Aichi, Japan  
Filed Jan. 30, 1986, Ser. No. 824,039  
Claims priority, application Japan, Jan. 30, 1985, 60-15738; Feb. 5, 1985, 60-20244; Feb. 6, 1985, 60-21547; Feb. 27, 1985, 60-38293; Mar. 29, 1985, 60-68129  
Int. Cl.<sup>4</sup> C09D 11/06, 11/12

U.S. Cl. 428—96

10 Claims



1. A thermochromic textile material comprising a textile material composed of a plurality of fibers coated with a thermochromic layer containing a binder and a thermochromic pigment comprising an electron-donative, color former, an electron-accepting developer and a color-changeable controlling agent, wherein each of the fibers is coated with the thermochromic layer containing the thermochromic pigment having a particle size satisfying the formula:

$$0.01 \leq r \leq 10\sqrt{D/d}$$

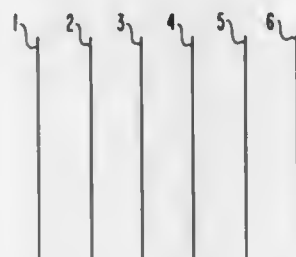
wherein  $r$  represents the particle size of the pigment in  $\mu\text{m}$ ;  $D$  represents the fineness of the fiber in denier; and  $d$  represents the density of the fibers in  $\text{g/cm}^3$ , in which said thermochromic layer is coated to a coverage of from 3 to 90% by weight based on the fibers on a dry basis, and said composition is present in an amount of from 5 to 80% by weight based on the thermochromic layer on a dry basis.

4,681,792

**MULTI-LAYERED FLEXIBLE FIBER-CONTAINING ARTICLES**Gary A. Harpell, Morristown; Igor Palley, Madison, and Dusan C. Prevorsek, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.  
Filed Dec. 9, 1985, Ser. No. 825,037  
Int. Cl.<sup>4</sup> B32B 3/06

U.S. Cl. 428—102

47 Claims



1. An article of manufacture comprising a plurality of first flexible layers arranged in a first portion of said article each of said first flexible layers consisting essentially of uncoated fibers comprising fiber selected from the group of polyolefin fibers,

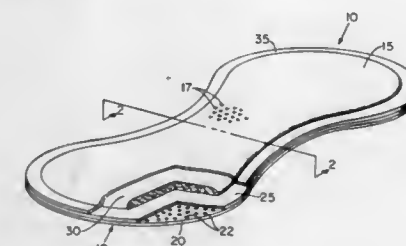
polyvinyl alcohol fibers and polyacrylonitrile fibers having a tensile modulus of at least 300 g/denier and a tenacity of at least about 15 g/denier and a plurality of second flexible layers arranged in a second portion of said article, each of said second flexible layers consisting essentially of uncoated fibers, the resistance to displacement of fibers in each of said second flexible layers being greater than the resistance to displacement of fibers in each of said first flexible layers.

4,681,793

**NON-OCCLUDING, LIQUID-IMPERVIOUS, COMPOSITE BACKSHEET FOR ABSORPTIVE DEVICES**  
E. Kelly Linman; John J. Curro, and Eugene Weinschenker, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio  
Filed May 31, 1985, Ser. No. 740,084  
Int. Cl.<sup>4</sup> B32B 3/10

U.S. Cl. 428—138

18 Claims



1. A composite backsheet for use adjacent an absorbent device, said backsheet comprising:

- (a) a first innermost substantially liquid-impervious layer juxtaposed adjacent said absorbent device, said liquid-impervious layer being soft and compliant, whereby it is resistant to noise under conditions of movement relative to the wearer's body; and
- (b) a second outermost layer comprising a liquid-pervious polymeric film secured in superposed relation adjacent said innermost layer, said polymeric film exhibiting a multiplicity of resilient protuberances across its exposed surface, each protuberance originating in a plane adjacent said innermost layer and protruding outwardly, each protuberance terminating to form a volcano-like aperture at its apex, each of said volcano-like apertures exhibiting a multiplicity of outwardly oriented cusps which contact the wearer's skin in use to prevent said polymeric film from sticking to the wearer's skin, said protuberances further permitting air circulation between said innermost layer and said outermost layer, whereby the wearer's skin remains substantially non-occluded by said composite backsheet at points of contact between said backsheet and the wearer's skin.

4,681,794

**ADHESIVE CONNECTION BETWEEN THE MARGINAL AREA OF A GLASS PANE AND A WINDOW FRAME**Heinz Konert, Cologne, Fed. Rep. of Germany; Luc Vanaschen, Eupen, Belgium, and Gerd Cornils, Merzenich-Girbelsrath, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Paris, France  
Filed Jan. 6, 1986, Ser. No. 816,440  
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1985, 3500205  
Int. Cl.<sup>4</sup> B32B 3/20

U.S. Cl. 428—188

20 Claims

1. An adhesive connection between the marginal area of a glass pane and a window frame, comprising:  
an adhesive bead of adhesive material adhered to said glass pane and said window frame at said marginal area, said bead lacking flanges for gripping said glass pane from two sides; and

means defining a fluid pressure tight hollow space completely enclosed within said adhesive bead, whereby pressurized fluid may be introduced into said hollow space for separating said glass pane from said window frame.

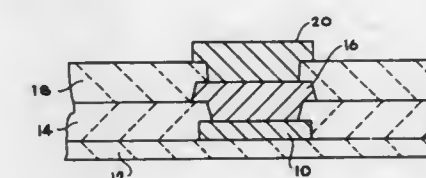


4,681,795

**PLANARIZATION OF METAL FILMS FOR MULTILEVEL INTERCONNECTS**David B. Tuckerman, Livermore, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.  
Continuation-in-part of Ser. No. 748,375, Jun. 24, 1985. This application Aug. 23, 1985, Ser. No. 768,590  
Int. Cl.<sup>4</sup> B32B 3/00; H01L 21/00, 21/04; B05D 3/06

U.S. Cl. 428—209

20 Claims



18. An electrical interconnection structure comprising a plurality of aluminum or aluminum-silicon alloy layers separated by dielectric layers, each aluminum or alloy layer having been planarized to form a flat surface by eliminating any oxide coating of the aluminum or alloy, forming a passivating and antireflection coating of silicon on the aluminum or alloy, and heating to momentarily melt the layer to form a flat surface prior to the formation of an additional dielectric layer, the metal layers having been patterned after planarization according to a preselected pattern and interconnected through the dielectric layers.

4,681,796

**THERMAL TRANSFER RECORDING MEDIUM**Tatsuichi Maehashi, Hachioji; Takao Abe, Tokyo; Kunihiro Koshizuka, Hino, and Yoshihiro Inaba, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan  
Filed Sep. 20, 1985, Ser. No. 778,408  
Claims priority, application Japan, Sep. 28, 1984, 59-202064  
Int. Cl.<sup>4</sup> B41M 5/26

U.S. Cl. 428—212

17 Claims

1. A thermal transfer recording medium having a support and at least one heat fusible coloring agent layer superposed on said support, said heat fusible coloring agent layer comprising at least one coloring agent, at least one heat fusible substance and at least one polymer, wherein the concentration of said polymer in said heat fusible coloring agent layer varies over said layer with the highest concentration thereof being present in the portion of said layer most nearly adjacent said support.



**4,681,797**  
**THERMOFORMABLE, MULTI-LAYER PLASTIC SHEET**  
**HAVING GAS BARRIER PROPERTIES**

Augustinus E. M. Van Iseghem, St-Niklaas, Belgium, assignor to  
 Cobelplast N.V.S.A., Lokeren, Belgium  
 Filed Sep. 19, 1985, Ser. No. 777,797

Claims priority, application Fed. Rep. of Germany, Sep. 26,  
 1984, 3435233

Int. Cl.<sup>4</sup> B32B 7/02

U.S. Cl. 428—212

7 Claims



1. A thermoformable, multi-layer plastic sheet having gas barrier properties, the sheet comprising an inner extrudable gas barrier layer, a glue layer applied to either side of the gas barrier layer, each of the glue layers having layers of a first polyolefin composition bonded to it and at least one of the two first polyolefin layers being bonded to a second polyolefin layer which has a lower melt index than the layer of the first polyolefin composition underneath.

**4,681,798**  
**FIBROUS MAT FACER WITH IMPROVED**  
**STRIKE-THROUGH RESISTANCE**

Frederick A. Gill, and Mario P. Tocci, both of Littleton, Colo.,  
 assignors to Manville Service Corporation, Denver, Colo.  
 Continuation of Ser. No. 685,699, Dec. 24, 1984, Pat. No.  
 4,637,951. This application Nov. 3, 1986, Ser. No. 926,155  
 Int. Cl.<sup>4</sup> B32B 5/24, 17/10; D04H 3/12

U.S. Cl. 428—215

6 Claims

1. A porous, non-woven fabric mat for use as a facer, substrate, or carrier for receiving a curable substance while in the fluid state, said mat comprising a blend of dispersed, substantially randomly oriented fibers and a binder for holding said blend of fibers together;

said blend of fibers comprising microfibers intermixed with base fibers, said microfibers comprising at least two percent (2%) of the total weight of said blend, said base fibers having a mean diameter of between about eight (8) microns and about twenty-five (25) microns;  
 said binder comprising a water miscible combination of a heat settable binder resin and an effective amount of a wet proofing polymer resin compatible with said heat settable binder resin, said wet proofing polymer being selected from a group consisting of water based silicone elastomer and a fluorochemical emulsion.

**4,681,799**  
**ULTRATHIN POLYMERIC IMINE FILMS AND**  
**PROCESS FOR MAKING THE SAME**

Alan K. Engel, Tokyo, Japan, assignor to Research Development  
 Corp. of Japan, Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,497

Claims priority, application Japan, Nov. 1, 1984, 59-229003  
 Int. Cl.<sup>4</sup> B05D 7/00; C08G 12/04

U.S. Cl. 428—220

11 Claims

1. An ultrathin film comprising a polymeric imine which comprises the repeat unit



in which R is aromatic, heteroaromatic, olefinic, acetylenic, or a mixture of these, and R' is aromatic, heteroaromatic, olefinic, acetylenic, or a mixture of these, said film comprising at least

one unit layer, each said unit layer having a thickness less than 20 nanometers.

**4,681,800**  
**IMPREGNATED, SOFT, FLAT GASKET AND**  
**MANUFACTURING METHOD**

Hans-Rainer Zerfass, Burscheid, and Franz-Josef Giesen, Oden-  
 thal, both of Fed. Rep. of Germany, assignors to Goetze AG,  
 Burscheid, Fed. Rep. of Germany

Filed Jan. 17, 1986, Ser. No. 819,729

Claims priority, application Fed. Rep. of Germany, Jan. 17,  
 1985, 3501361; Jun. 13, 1985, 3521138

Int. Cl.<sup>4</sup> B32B 5/16

U.S. Cl. 428—283

25 Claims

1. In an impregnated soft, flat sealing gasket, including a fiber mat and a silicone impregnating agent; the improvement wherein the silicone impregnating agent includes a cross-linking agent which forms radicals under the influence of heat and the silicone impregnating agent has been at least partly cross-linked thereby, and wherein the silicone impregnating agent has been cross-linked in at least one surface region of said flat sealing gasket under the influence of high energy radiation to a greater degree than obtainable by thermal treatment alone.

**4,681,801**  
**DURABLE MELT-BLOWN FIBROUS SHEET MATERIAL**

Gilbert Eian, Mahtomedi, and Paul G. Cheney, Woodbury, both  
 of Minn., assignors to Minnesota Mining and Manufacturing  
 Company, St. Paul, Minn.

Filed Aug. 22, 1986, Ser. No. 899,522

Int. Cl.<sup>4</sup> B32B 5/16

U.S. Cl. 428—283

35 Claims

1. A durable melt-blown fibrous sheet material comprising:  
 (a) a coherent layer of melt-blown organic polymeric fibers, and  
 (b) a plurality of organic polymeric reinforcing fibers extending transversely through the layer of melt-blown fibers and being held in that position by bonding to fibers on the opposing faces of the layer of melt-blown fibers.

**4,681,802**  
**TREATED GLASS FIBERS AND AQUEOUS DISPERSION**  
**AND NONWOVEN MAT OF THE GLASS FIBERS**

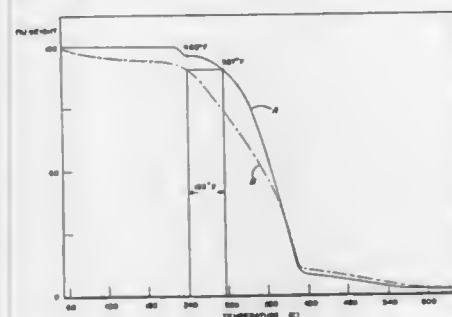
Peter C. Gaa, Pittsburgh, Pa.; Jerry C. Hedden, Shelby, N.C.,  
 and Narasimhan Raghupathi, Murrysville, Pa., assignors to  
 PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 658,009, Oct. 5, 1984, Pat. No. 4,592,956.  
 This application Feb. 28, 1986, Ser. No. 834,990

Int. Cl.<sup>4</sup> C04B 35/80; D04H 1/58

U.S. Cl. 428—288

6 Claims



1. Aqueous dispersion of chopped glass fiber strands having a length of about 1/16 of an inch to about 3 inches and having an aqueous treating composition comprising:

(a) one or more cationic surfactants having one or more primary, secondary, or tertiary amine moieties in an

amount of about 0.01 to about 10 weight percent of said aqueous chemical treating composition,  
 (b) one or more water soluble, poly(oxyalkylene-oxyethylene) copolymers having a ratio of the total amount of ethylene oxide to the total amount of hydrophobic alkylene oxide in the range of around 99/1 to around 78/22 and a molecular weight of around at least 15,000 in an effective amount to provide sufficient protection to the glass fibers,  
 (c) one or more polar functional coupling agents in an amount of about 0.01 to about 2 weight percent of said aqueous chemical treating composition, and  
 (d) water in an amount to give a solids content that is effective for applying said composition to glass fibers, where the strands are present in an amount of about 0.001 to about 5 weight percent of the dispersion.

6. Nonwoven, sheet-like mat made from the dispersion of claim 1, wherein an amount of water has been removed and a polymeric binder has been applied and the mat cured, wherein the binder is selected from the group consisting of urea formaldehyde, phenol formaldehyde, melamine formaldehyde, epichlorohydrin and amino resins and anionic or cationic modified derivatives thereof.

**4,681,803**  
**PIGMENTED, HEAT-SEALABLE COATING**  
**COMPOSITION FOR APPLICATION TO ORIENTED**  
**POLYOLEFIN FILMS**

Leland L. Liu, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 18, 1985, Ser. No. 789,284

Int. Cl.<sup>4</sup> C09J 7/02; B32B 9/04, 27/08

U.S. Cl. 428—348

10 Claims

1. A pigmented heat-sealable coating composition for application to a primer-coated, oriented mono-layer or multi-layer polyolefin film which comprises a blend of (a) a binding and oxygen barrier heat-sealable polyvinylidene chloride homopolymer and/or polyvinylidene chloride copolymer, at a level of from about 50 to about 90 weight percent of the coating composition, containing at least about 50 weight percent copolymerized vinylidene chloride, (b) wax at a level of from about 1.5 to about 10 weight percent of the coating composition, to thereby result in a significant reduction in the coefficient of friction of a film to which the coating composition is applied and (c) pigment at a level of from about 15 to about 25 weight percent of the coating composition.

2. A mono-layer or multi-layer oriented polyolefin film having at least one exposed surface thereof coated with a primer, said primer-coated surface being coated with a coating composition of claim 1.

**4,681,804**  
**POLYBUTYLENE ROOM TEMPERATURE AGED FILM**

Charles C. Hwo, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 30, 1985, Ser. No. 770,912

Int. Cl.<sup>4</sup> B32B 27/00

U.S. Cl. 428—349

10 Claims

1. A room temperature aged cast polymer film having good hot tack, a low heat sealing temperature and high clarity comprising:

a polypropylene or polypropylene-based copolymer or blend as a substrate or core layer; and  
 a polymer blend as a surface layer, wherein said polymer blend comprises a butene-1 propylene copolymer having a propylene content of from about 10% by weight to about 25% by weight.

**4,681,805**  
**STRANDS OF CHEMICALLY TREATED GLASS FIBERS**  
**HAVING A REDUCED TENDENCY TO GIVE GUMMING**  
**DEPOSITS**

Garry D. Puckett, Salisbury, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 23, 1985, Ser. No. 812,038

Int. Cl.<sup>4</sup> D02G 3/00

U.S. Cl. 428—391

17 Claims

1. Strands of chemically treated glass fibers, wherein the glass fibers have a moisture-reduced residue of an aqueous starch-oil chemical treatment, the improvement comprising: poly(oxypropylene) organic alcohol selected from the group consisting of poly(oxypropylene) glycol and poly(oxypropylene) polyol that is liquid and water soluble and that is essentially free of ethylene oxide groups being present in the moisture-reduced residue as the sole starch film-former modifier.

**4,681,806**  
**PARTICLES CONTAINING RELEASABLE FILL**  
**MATERIAL AND METHOD OF MAKING SAME**

Josef Matkan, Malvern, and Richard J. Treleaven, Toorak  
 Gardens, both of Australia, assignors to Minnesota Mining  
 and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1986, Ser. No. 829,005

Int. Cl.<sup>4</sup> A01N 25/28; B01J 13/02; C08G 18/82

U.S. Cl. 428—402.21

12 Claims

1. Method of preparing a spherical particle comprising:  
 (1) admixing a releasable fill material, an isocyanate, and a matrix-forming co-reactant to form a mixture,  
 (2) emulsifying said mixture in an aqueous medium containing a nonreactive emulsifying agent to provide a dispersion of spheres of said mixture,  
 (3) hydrolyzing a first portion of the isocyanate near the surfaces of said spheres by contact with water in the aqueous medium to initiate formation of polyurea (a) at the surfaces of said spheres as a thin, substantially continuous layer and (b) in the interiors of the spheres as a continuum for some distance beneath the surfaces of said spheres, said continuum being a polyurea matrix, and reacting a second portion of the isocyanate within said spheres with said matrix-forming co-reactant to form additional matrix material in the interiors of said spheres.

8. A spherical particle comprising a thin, substantially continuous surface layer of polyurea, surrounding an interior portion comprising a matrix comprising polyurea, said matrix having releasable fill material contained therein, wherein said polyurea matrix forms a continuum extending from said continuous polyurea surface layer into the interior of said particle.

**4,681,807**  
**GRAY BODY COLORED ZINC SULFIDE ACTIVATED**  
**WITH COPPER**

Harry O. Schulze, Wyalusing, and Ronald E. Karam, Towanda,  
 both of Pa., assignors to GTE Products Corp., Danvers, Mass.

Filed Jul. 9, 1985, Ser. No. 753,099

Int. Cl.<sup>4</sup> B32B 9/00

U.S. Cl. 428—403

3 Claims

1. A cathodoluminescent material consisting essentially of particles of copper activated zinc sulfide cathodoluminescent phosphor having at least a partial coating of a mixture of a blue pigment of cobalt aluminate and a red pigment of ferric oxide wherein the ratio of said blue pigment to said red pigment is from about 3.5:1 to about 4.5:1 and the weight percent of said pigments are from about 0.2% to about 2% by weight of said phosphor.



4,681,808

## ADHESION OF SILICONE ELASTOMER TO POLYURETHANE

Harold V. Lefter, III, Sanford, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 2, 1986, Ser. No. 914,420

Int. Cl.<sup>4</sup> B32B 27/00, 5/14, 9/04; B05D 1/36

U.S. Cl. 428—425.5 5 Claims

1. A method of improving the adhesion of a silicone elastomeric coating to a polyurethane substrate consisting essentially of applying to the polyurethane surface from 0.05 to 0.2 grams per square foot of surface of a silane of the formula  $ZSi(OR)_3$  where Z is an amine functional radical and R is a monovalent hydrocarbon radical having from 1 to 6 carbon atoms, then applying a coating of a silicone elastomeric composition comprising the product obtained by mixing:

- (A) from 1.0 to 400 parts by weight of the reaction product of
- an organosilicon resin consisting essentially of  $R''_3Si-O_{1/2}$  units and  $SiO_{4/2}$  units, wherein  $R''$  represents a monovalent hydrocarbon radical, and the ratio of  $R''_3SiO_{1/2}$  units to  $SiO_{4/2}$  units is from 0.6/1 to 0.9/1, and
  - a polyorganohydrogensiloxane;
- (B) 100 parts by weight of a polydiorganosiloxane having the general formula  $HO(R'_2SiO)_xH$ , wherein  $R'$  represents a monovalent hydrocarbon radical and x has a value of from 10 to 1000;
- (C) from 1 to 150 parts by weight of a filler; and
- (D) from 0.10 to 13.3 parts by weight of an organotin catalyst.

5. The laminate of polyurethane, silane and silicone elastomeric composition obtained by the method of claim 1.

4,681,809

## SHAPED BODIES OF CALCIUM SILICATE

Tatsuo Kitano, 7-9, Asahiku, Edomekami, Harue-cho, Sakai-gun, Fukui-ken, Japan

Filed Aug. 21, 1985, Ser. No. 768,086

Claims priority, application Japan, Aug. 27, 1984, 59-177976

Int. Cl.<sup>4</sup> B32B 17/06

U.S. Cl. 428—428 11 Claims

1. A shaped body of calcium silicate of which the whole or the surface layer consists essentially of a mixture of calcium silicate crystal and at least one inorganic compound selected from the group consisting of spodumene, petalite, eucryptite, lithium orthoclase, quartz glass, Vycor glass, cordierite, beryl, aluminum titanate and zirconium phosphate, the weight ratio of the inorganic compound to the calcium silicate crystal being about 1:9 to about 4:1.

4,681,810

## FIRE-RESISTANT INTERLAYER

I. Luis Gomez, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 23, 1985, Ser. No. 812,609

Int. Cl.<sup>4</sup> B32B 17/10; C08K 5/51, 5/53; C08L 29/14

U.S. Cl. 428—429 18 Claims

1. An interlayer of polyvinyl butyral resin containing a compatible mixture of additives dispersed therein providing fire resistant properties thereto, said mixture comprising:

- a plasticizer blend of a char-forming component capable of contributing with the polyvinyl butyral resin to char formation on decomposition of the interlayer during fire exposure and an oxygen sequestering agent of consuming oxygen during fire exposure of the interlayer, wherein the char-forming component is the major constituent;
- a nucleating agent for dispersing fire decomposition products of the interlayer; and
- a heat resistant bonding resin.

4,681,811

## COLOR PLUS CLEAR COATINGS EMPLOYING POLYEPOXIDES AND POLYACID CURING AGENTS IN THE CLEAR COAT

Dennis A. Simpson, Koppel; Debra L. Singer, Pittsburgh; Rosztyslaw Dowbenko, Gibsonia; William P. Blackburn, Evans City, and Charles M. Kania, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 767,020, Aug. 19, 1985, Pat. No. 4,650,718. This application Mar. 7, 1986, Ser. No. 837,118. The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> B05D 1/36, 7/00; B32B 15/08, 27/38

U.S. Cl. 428—413 33 Claims

1. A process for applying a composite coating to a substrate which comprises applying to the substrate a colored film-forming composition to form a base coat and applying to said base coat a clear film-forming composition to form a transparent top coat over the base coat characterized in that the clear film-forming composition is a liquid crosslinkable composition comprising a polyepoxide and a polyacid curing agent having at least two carboxyl groups per molecule, the equivalents of carboxyl per epoxy in the clear film-forming composition being from about 0.3 to 3.0 and sufficient to form a crosslinked coating.

24. A substrate coated in accordance with the process of claim 1.

4,681,812

## REACTIVELY SPUTTERED CHROME SILICON NITRIDE RESISTORS

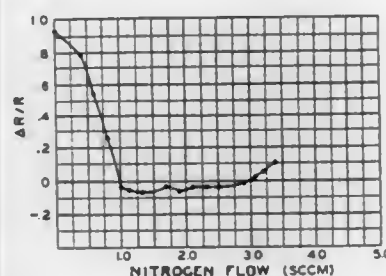
James A. Schuetz, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 616,324, May 31, 1984, Pat. No. 4,569,742.

This application Oct. 7, 1985, Ser. No. 784,987

Int. Cl.<sup>4</sup> B32B 15/00

U.S. Cl. 428—432 13 Claims



1. An electrically resistive thin film, produced on a substrate by a method comprising:
- placing said substrate and a sputtering target comprising silicon and chromium in a reaction chamber;
  - evacuating said reaction chamber;
  - providing a sputtering atmosphere comprising nitrogen and argon in said reaction chamber;
  - applying an electrical bias voltage to said substrate; and
  - providing a radio frequency electrical discharge in said reaction chamber.

4,681,813

## CERAMIC SUBSTRATE FOR A THIN LAYER MAGNETIC HEAD

Hirohide Yamada, Utsunomiya; Masahiko Sakakibara, and Yoshiharu Koike, both of Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyn, Japan

Filed Sep. 20, 1984, Ser. No. 652,660

Claims priority, application Japan, Sep. 21, 1983, 58-174738

Int. Cl.<sup>4</sup> G11B 5/60

U.S. Cl. 428—450 6 Claims

1. A thin layer magnetic head having a sintered ceramic substrate, said substrate consisting essentially of 100 weight parts of a ceramic material and 0.05 to 5 weight parts of at least one compound from the group consisting of silicon oxide and iron oxide, the ceramic material consisting essentially of 20 to 55 weight % of titanium carbide and the balance being substantially aluminum oxide.

4,681,814

## CORROSION INHIBITED METAL

Henry Leidheiser, Jr., Bethlehem, and Hidetaka Konno, Allentown, both of Pa., assignors to Lehigh University, Bethlehem, Pa.

Division of Ser. No. 548,970, Nov. 7, 1983, Pat. No. 4,563,253, which is a continuation-in-part of Ser. No. 437,148, Oct. 27, 1982. This application Aug. 29, 1985, Ser. No. 770,856

Int. Cl.<sup>4</sup> B32B 15/04

U.S. Cl. 428—457 17 Claims

1. A metal member comprising a substrate composed of said metal and a corrosion-resistant surface thereon, said corrosion-resistant surface comprising a metal oxide layer and a water insoluble, oxidation and reduction-resistant complex compound formed between the metal oxide and an organic compound selected from the group consisting of N-benzoyl-N-phenyl-hydroxylamine, cupferron, diphenylguanidine, 8-hydroxyquinoline, 1-nitroso-2-naphthol, phenylthiourea, salicylamide, and salicylanilide, benzohydroxamic acid, 4-hydroxyquinoline, 7-hydroxyquinoline, 5-nitro-8-hydroxyquinoline, 8-nitroquinoline, o-phenylene diamine, salicylaldehyde hydrozone, 1,8-diaminonaphthalene, 8-aminoquinoline, 2,3-diaminonaphthalene and quinoline.

4,681,815

## COATING COMPOSITION OF POLYESTER OLIGOMER AND ACRYLIC BINDER

Andrew F. Rutkiewicz, West Chester, and Clifford H. Strolie, Springfield, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 16, 1986, Ser. No. 852,706

Int. Cl.<sup>4</sup> B32B 15/08; C08L 61/00

U.S. Cl. 428—458 11 Claims

1. A coating composition comprising at least about 60% of a film-forming binder consisting essentially of

- about from 15 to 30% by weight of a polyester oligomer having a weight average molecular weight of about from 3500 to 5000 and prepared from:
  - at least one compound selected from the group consisting of aliphatic triols having from 2 to 6 carbons atoms,
  - at least one compound selected from the group consisting of aliphatic and aromatic diols having from 2 to 14 carbon atoms, and
  - at least one compound selected from the group consisting of aliphatic dibasic acids having from 8 to 14 carbon atoms,
- components (1), (2) and (3) being present in quantities to provide about from 3 to 8 moles of each of components (2) and (3) for each mole of component (1), and
- about from 85 to 70% of a blend of an acrylic polymer, a self-stabilized, dispersed acrylic polymer and an alkylated melamine formaldehyde crosslinking agent.

4,681,816

## COMPOSITE LAMINATES COMPRISING A METALLIC SUBSTRATE AND VIBRATION DAMPER

Mikio Hashimoto, Hiroshima; Yoshinari Nakata, and Hitoshi Koga, both of Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 748,045

Claims priority, application Japan, Jun. 26, 1984, 59-132605

Int. Cl.<sup>4</sup> B32B 15/08; C08L 63/00; E04B 1/84

U.S. Cl. 428—463 9 Claims

1. A composite laminate comprising at least one metallic substrate and at least one vibration damper laminated thereon, said vibration damper being composed of at least one copolymer selected from the group consisting of ethylene-(meth)acrylic acid salt copolymers and modified products thereof, the melting point of said copolymer being in the range of from 60° to 90° C. and the heat of fusion of said copolymer being at least 20 joules per gram as determined by means of a differential scanning calorimeter.

4,681,817

## PISTON RING

Manabu Shinada, Kashiwazaki, Japan, assignor to Kabushiki Kaisha Riken, Tokyo, Japan

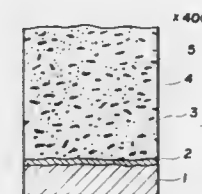
Filed Dec. 23, 1985, Ser. No. 812,124

Claims priority, application Japan, Dec. 24, 1984, 59-270736;

Jan. 31, 1985, 60-17575

Int. Cl.<sup>4</sup> B22F 7/00

U.S. Cl. 428—549 9 Claims



1. A piston ring with a composite plated layer at least on its outer peripheral sliding surface wherein said sliding surface is a wear surface that engages a cylinder wall or the like, said composite plated layer comprising a quantity of hard particles of a granular dispersion material dispersed in a matrix of matrix metal consisting essentially of nickel-cobalt-phosphorous alloy containing about 10% to about 40% by weight of cobalt, about 2% to about 15% by weight of phosphorous, and remainder substantially nickel.

4,681,818

## OXYGEN DIFFUSION BARRIER COATING

Jalajah Unnam, Tabb, and Ronald K. Clark, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 18, 1986, Ser. No. 840,900

Int. Cl.<sup>4</sup> B32B 15/04, 15/00, 15/01

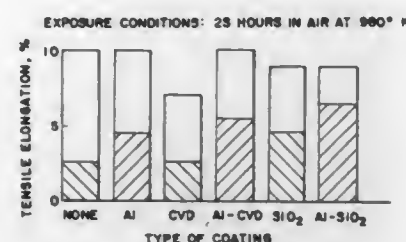
U.S. Cl. 428—607 8 Claims

1. A method of providing an oxygen barrier coating onto a titanium substrate comprising the steps of:

- providing a titanium substrate surface, electron-beam-evaporative depositing a submicron aluminum layer onto the titanium substrate surface,
- depositing by sputtering a submicron silicon-dioxide layer onto the submicron aluminum layer, and
- exposing the titanium substrate to an elevated temperature



during service to chemically react the titanium substrate with the submicron aluminum layer and the submicron



silicon-dioxide layer to form a thermal protective barrier of aluminate and silicide on the titanium substrate surface.

4,681,819

## TREATMENT OF REFRACTORY ARTICLES

Bobdan Gayra, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Jun. 11, 1984, Ser. No. 618,995

Int. Cl.<sup>4</sup> B32B 9/60

U.S. Cl. 428-697

35 Claims

1. A method of treating a formed refractory article for use in contact with molten aluminum metal, to protect, against attack by the molten metal, a surface portion of the article arranged for exposure to the molten metal in use, wherein said article is constructed of refractory material comprising at least one oxide selected from the class consisting of alumina, silica, aluminum silicate, and calcium silicate, said method comprising the steps of

- impregnating said surface portion of the formed refractory article with an aqueous solution of magnesium fluosilicate for establishing thereon a magnesium fluosilicate deposit capable of providing, upon thermal decomposition, fluoride values of a type and in an amount effective to enhance the resistance of said surface portion to attack by molten aluminum metal; and thereafter
- heating at least the impregnated surface portion to decompose the deposited magnesium fluosilicate thereon for producing, in situ, said fluoride values.

28. An article produced by the method of claim 1.

4,681,820

## METHOD OF PRODUCING AN ELECTRICALLY CONDUCTIVE POLYMERIC MATERIAL WITH ADSORBED METAL SULFIDE AND PRODUCT

Shinji Tomibe, Kyoto; Reizo Gomibuchi, Uji, and Kiyofumi Takahashi, Yawata, all of Japan, assignors to Nihon Sanmo Dyeing Co., JPY

Division of Ser. No. 461,035, Jan. 26, 1983, Pat. No. 4,556,507.

This application May 22, 1985, Ser. No. 736,777

Claims priority, application Japan, Dec. 14, 1982, 57-217852 The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> B32B 9/00, 19/00

U.S. Cl. 428-698

13 Claims

1. A method of improving the electrical stability of an electrically conducting article comprising a sulfide of a first metal adsorbed on a substantially cyanic group-free polymeric material, said first metal being selected from the group consisting of copper, cobalt, tin, mercury and lead, comprising treating said polymeric material with a source of ions containing a second metal selected from the group consisting of silver, gold and elements of platinum group.

11. The product obtained by the process of claim 1.

4,681,821

## DUAL BATTERY CONNECTOR ARRANGEMENT

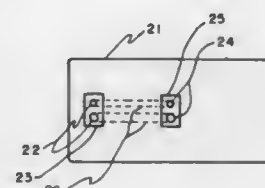
John A. Christopoulos, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 17, 1986, Ser. No. 909,365

Int. Cl.<sup>4</sup> H01M 2/22

U.S. Cl. 429-121

2 Claims



1. An arrangement for modifying a lithium-type battery so that it can be utilized in its customary manner or as a substitute for a Leclanche battery, said Leclanche battery being of predetermined dimensions and having a pair of female connection sockets substantially centrally located on the top surface thereof, said lithium battery being different predetermined dimensions than said Leclanche battery and having a pair of female connection sockets located at a predetermined off-center position on the top surface thereof, said lithium battery also having a second pair of female connection sockets positioned on the top surface thereof and at a location which corresponds to the location of said connection sockets of the Leclanche battery, and a pair of electrical conductors plated on the underside of said top surface of said lithium battery, said electrical conductors serving to interconnect the two pairs of female connection sockets of said lithium battery in parallel.

4,681,822

## NOVEL COMPOSITES OF AN IONIC CONDUCTING POLYMER AND AN ELECTRONIC CONDUCTING POLYMER

Claude M. Berthier, Grenoble, France, and Richard H. Friend, Cambridge, England, assignors to The British Petroleum Company, p.l.c., London, England

PCT No. PCT/GB84/00382, § 371 Date Sep. 9, 1985, § 102(e)

Date Sep. 9, 1985, PCT Pub. No. WO85/02294, PCT Pub. Date May 23, 1985

PCT Filed Nov. 8, 1984, Ser. No. 752,047

Claims priority, application United Kingdom, Nov. 9, 1983, 83 29906

Int. Cl.<sup>4</sup> H01M 6/18

U.S. Cl. 429-191

8 Claims

1. An ionic/electronic composite conductor comprising a continuous, coherent electronic conducting material selected from the group consisting of polyacetylene, polyphenylene, polyphenyl diphenyl vinylene and a substituted polyacetylene intimately mixed with a continuous ionic conducting material which is a mixture of a complex of an ionic salt and a polymeric solvating agent, such that the ionic conducting material has an increased melting point over its normal melting point.

4,681,823

## LITHIUM/FLUORINATED CARBON BATTERY WITH NO VOLTAGE DELAY

Hsueh S. Tung, Williamsville; David J. Friedland, Snyder; Bernard Sukornick, Williamsville, all of N.Y.; Lynn E. McCurry, Los Alamos, N. Mex.; Richard E. Elbeck, Orchard Park, and George D. Lockyer, Clarence Center, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 19, 1986, Ser. No. 864,242

Int. Cl.<sup>4</sup> H01M 4/08, 4/36, 6/16

U.S. Cl. 429-218

9 Claims

1. A method for producing an improved fluorinated carbon, for use as a cathode active material in a lithium fluorinated carbon battery, which inhibits initial voltage delay upon discharge, which comprises:

- introducing a comminuted carbon into a static bed reactor;
- forming a bed of said carbon to a depth of at least 0.5 cm; and
- subjecting said carbon bed to a fluorination reaction under controlled reaction time with fluorine to produce an inhomogeneous fluorinated carbon product and until the carbon attains a weight gain of at least 10 percent.

4,681,824

## METHOD OF MANUFACTURING FLUORESCENT SCREENS OF COLOR PICTURE TUBES

Yoshifumi Tomita, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

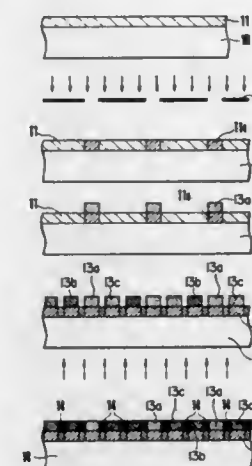
Filed Apr. 16, 1982, Ser. No. 369,155

Claims priority, application Japan, Apr. 20, 1981, 56-58531

Int. Cl.<sup>4</sup> G03C 5/00

U.S. Cl. 430-24

5 Claims



1. A method of manufacturing a fluorescent screen of a color picture tube comprising the steps of: forming a film of substance that becomes sticky when exposed to light on an inner surface of a panel of said tube; exposing predetermined portions of said film through a shadow mask to render sticky exposed portions; repeatedly applying powder of phosphors of respective colors onto the portions which became sticky so as to form phosphor picture elements of respective colors with said film uncovered between said formed picture elements; exposing the uncovered portions of said film other than said predetermined portions to render them sticky without using the shadow mask; and finally applying a powder of light absorbing substance to

said uncovered portions other than said predetermined portions to form a black matrix film.

2. The method according to claim 1 wherein said exposing the other portions is back exposure.

4,681,825

## ELECTROPHOTOSENSITIVE MEMBER HAVING AN AMORPHOUS SILICON-GERMANIUM LAYER

Izumi Osawa, Ikeda; Isao Doi, Toyonaka, and Toshiya Natsumura, Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1985, Ser. No. 753,589

Claims priority, application Japan, Jul. 16, 1984, 59-147918

Int. Cl.<sup>4</sup> G03G 5/082

U.S. Cl. 430-57

11 Claims

1. An electrophotosensitive member which comprises: a substrate; a first amorphous silicon layer having a thickness of about 5 to 30 micrometers; an amorphous silicon:germanium photoconductive layer of about 100 Å to 20 micrometers thickness formed on said first amorphous silicon layer; and a second amorphous silicon layer of about 5 to 30 micrometers thickness formed on said amorphous silicon:germanium layer, said amorphous silicon:germanium layer being situated at a distance from said substrate in the range of 20 to 80% of the total thickness of said layers, said first amorphous silicon layer being of a conductivity type to control a majority carrier of said layer to be a polarity which is the same as the polarity of charging, and said second amorphous silicon layer being a conductivity type to control a majority carrier of said layer to be a polarity opposite to the polarity of charging.

4,681,826

## ELECTROPHOTOGRAPHIC PHOTSENSITIVE MEMBER

Takeo Fukatsu, Uji; Kazuyuki Goto; Hisao Haku, both of Hirakata, and Yukinori Kuwano, Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

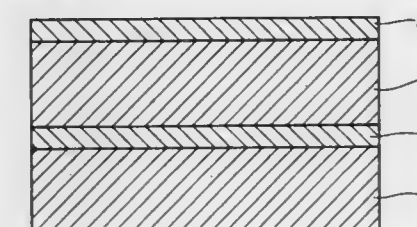
Continuation-in-part of Ser. No. 640,314, Aug. 13, 1984, Pat. No. 4,624,905. This application Aug. 14, 1986, Ser. No. 896,617

Claims priority, application Japan, Feb. 14, 1984, 59-26254; Feb. 14, 1984, 59-26255

Int. Cl.<sup>4</sup> G03G 5/082, 5/14

U.S. Cl. 430-65

13 Claims



1. An electrophotographic photosensitive member comprising:

- a substrate;
- a photoconductive layer superposed on the substrate, said layer comprising amorphous silicon having oxygen added thereto in an amount of from  $2.5 \times 10^{19}$  to  $1.5 \times 10^{22}$  atoms/cm<sup>3</sup> to increase its resistivity; and
- a surface layer superposed on the photoconductive layer, the surface layer having a thickness in the range of from about 0.1 to 5 μm and comprising amorphous silicon having added thereto carbon to form an insulating material therein, the concentration of carbon varying differ-

tially from a minimum on the substrate side of the surface layer to a maximum on the surface side thereof.

4,681,827

# ORGANIC ELECTROPHOTOGRAPHIC MATERIAL SENSITIZED BY CYANINE DYE

Werner Franke, Wiesbaden, and Richard Brahm, Ingelheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
Filed Apr. 15, 1986, Ser. No. 852,157

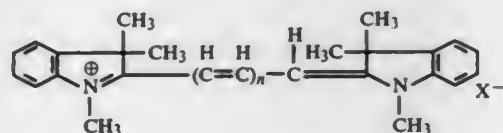
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513747

Int. Cl.<sup>4</sup> G03G 5/06, 5/09

U.S. Cl. 430—83

13 Claims

1. Electrophotographic recording material comprising an electrically conductive base material and at least one photoconductive layer which comprises (i) an organic photoconductor selected from the group consisting of an oxazole, an oxadiazole, a hydrazone and a pyrazoline compound, (ii) a binder and (iii) at least one cyanine sensitizing compound represented by the formula:



wherein n denotes 2 or 3 and X<sup>-</sup> denotes a monovalent anion.

4,681,828

# METHOD OF CHEMICAL ELECTROGRAPHIC IMAGE AMPLIFICATION USING CHEMICALLY ACTIVE TONER PARTICLES

Peter S. Alexandrovich; Joseph W. Manthey; John W. May, and Chandra Sreekumar, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1986, Ser. No. 902,727

Int. Cl.<sup>4</sup> G03G 13/22

U.S. Cl. 430—97

17 Claims

1. A method of forming an image which comprises applying electrographic toner particles to a charge pattern on a support followed by a chemical amplification processing step comprising heating the toner image in the presence of an image-receiving element comprising:

- a cobalt(III) complex capable of releasing an amine on processing, and
- an amplifier which, on reaction with an amine:
  - forms a dye or dye precursor, or
  - reduces the cobalt(III) complex, resulting in the release of additional amine,

said toner comprising an activator which, under the conditions of processing releases an amine either directly or indirectly.

4,681,829

# SINGLE COMPONENT RED DEVELOPER COMPOSITIONS

Bernard Grushkin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1986, Ser. No. 902,720

Int. Cl.<sup>4</sup> G03G 9/08

U.S. Cl. 430—109

17 Claims

1. A positively charged single component toner composition comprised of resin particles, pigment particles selected from the group consisting of substituted perylenes and monoazo pigments, and a charge enhancing additive.

4,681,830

# FLUORINATED CARBON-CONTAINING DEVELOPER COMPOSITION

Randall H. Helland, Richfield, and Craig A. Burton, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 625,314, Jun. 27, 1984, abandoned, which is a continuation of Ser. No. 159,939, Jun. 16, 1980, abandoned. This application Apr. 24, 1986, Ser. No. 855,891  
Int. Cl.<sup>4</sup> G03G 9/08

U.S. Cl. 430—110

15 Claims

1. A flowable, dry powder of particles that has a static conductivity of less than about 10<sup>-3</sup> mhos per centimeter in an electric field of 10,000 d.c. volts per centimeter comprising

(a) from about 30 to 80 parts by weight of a thermoplastic binder that has a static conductivity of at most about 10<sup>-12</sup> mhos per centimeter, said binder being selected from the group consisting of waxes that have a melting point in the range of about 45° C. to 150° C., organic resins that have a softening point above about 60° C., and mixtures of said waxes and said resins; and correspondingly, from about 70 to 20 parts by weight of a magnetically responsive material and

(b) from about 0.4 to 3 parts by weight per 100 parts by weight of component (a) of fluorinated carbon that has a degree of fluorination in the range of 15% to 30% and an average diameter below about 2 microns, wherein said fluorinated carbon comprises a radially dispersed zone around the outer portions of said particles and wherein said fluorinated carbon renders said dry powder more negatively chargeable.

4,681,831

# CHARGEABLE RESINS FOR LIQUID ELECTROSTATIC DEVELOPERS COMPRISING PARTIAL ESTER OF 3-HYDROXYPROPANESULFONIC ACID

James R. Larson, and Torrence J. Trout, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1986, Ser. No. 880,155

Int. Cl.<sup>4</sup> G03G 9/12

U.S. Cl. 430—114

18 Claims

1. A liquid electrostatic developer containing negatively chargeable resin particles with improved charging characteristics, said developer consisting essentially of

- nonpolar liquid having a Kauri-butanol value of less than 30, present in a major amount,
- nonpolar liquid soluble ionic or zwitterionic charge director compound, and
- resin particles of a polymer containing at least one acidic constituent having a pK<sub>a</sub> of less than 4.5 measured at 25° C. in water and an acid number due to said acidic constituent of at least one, the resin particles having an average by area particle size of less than 10 μm.

4,681,832

# ELECTROPHOTOGRAPHIC LIQUID DEVELOPER

Hiromichi Tachikawa; Hiroaki Yokoya; Syu Watarai, and Katuzi Kitatani, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 10, 1986, Ser. No. 817,650

Claims priority, application Japan, Jan. 10, 1985, 60-2518

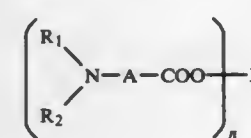
Int. Cl.<sup>4</sup> G03G 9/12

U.S. Cl. 430—115

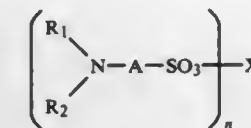
19 Claims

1. An electrophotographic liquid developer comprising a coloring agent, a coating agent, a dispersant, an electric charge adjustor, and a carrier liquid, wherein said coating agent is a copolymer of a long-chain alkyl acrylate or methacrylate and methylmethacrylate, wherein the long-chain alkyl group is a straight-chain or branched alkyl group having from 8 to 22 carbon atoms, the copolymer has a softening temperature within the range of from 40° to 140° C. and a number-average

molecular weight of from 5×10<sup>3</sup> to 1×10<sup>5</sup> and the copolymer of the long-chain alkyl acrylate or methacrylate to methylmethacrylate has a copolymerization molar ratio of from 0.1/9.9 to 5/5 and the electric charge adjustor is an amino acid derivative reaction mixture obtained by mixing with water a reaction mixture which has been obtained by reacting a compound of formula (1) or (2) shown below or an amino acid with a titanium compound in an organic solvent:



(1)



(2)

wherein R<sub>1</sub> and R<sub>2</sub> each represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, an acyl group, an alkylsulfonyl group, an alkylphosphonyl group or an arylsulfonyl or an arylphosphonyl, wherein R<sub>1</sub> and R<sub>2</sub> can be the same or different from each other and wherein R<sub>1</sub> together with R<sub>2</sub> can optionally form a ring, provided that R<sub>1</sub> and R<sub>2</sub> do not both represent hydrogen atoms at the same time; A represents an alkylene group or a substituted alkylene group, X represents a hydrogen atom, a monovalent, divalent, trivalent, or tetravalent metal or a quaternary ammonium cation; and n represents a positive integer.

4,681,833

# LIGHT-SENSITIVE NEGATIVE WORKING COMPOSITION WITH DIAZONIUM CONDENSATE, EPOXY RESIN, AND COMBINATION OF POLYMERS WITH ACRYLIC GROUPS

Kohtaro Nagasawa, Tokyo, and Kunio Morikubo, Saitama, both of Japan, assignors to Somar Corporation, Tokyo, Japan  
Filed Mar. 7, 1985, Ser. No. 709,249

Claims priority, application Japan, Mar. 7, 1984, 59-41874

Int. Cl.<sup>4</sup> G03C 1/60

U.S. Cl. 430—175

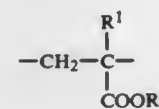
9 Claims

1. A negative-working light-sensitive composition consisting essentially of in admixture:

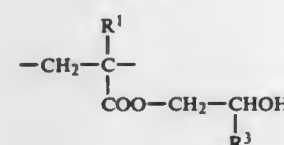
- a light-sensitive diazo compound which is a salt of a 4-diazodiphenylamine/formaldehyde condensate;
- a polymeric compound; and
- an epoxy resin, wherein the polymeric compound (B) is a combination of Polymer (B-1) and Polymer (B-2) as described below:

Polymer (B-1):

Polymer containing the structural units of the following general formulae (i), (ii) and (iii):

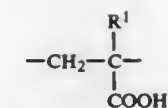


(i)



(ii)

-continued



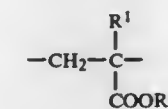
(iii)

(wherein R<sup>1</sup> is a hydrogen atom or a methyl group, R<sup>2</sup> is an unsubstituted or substituted benzyl group, a lower alkyl group).

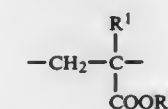
or a halogen-substituted lower alkyl group, and R<sup>3</sup> is a hydrogen atom, a lower alkyl group, or a halogen-substituted lower alkyl group:

Polymer (B-2):

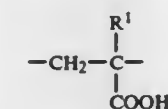
Polymer containing the structural units of the following general formulae (iv), (v) and (vi):



(iv)



(v)



(vi)

(wherein R<sup>1</sup> is the same as defined above, R<sup>4</sup> is a tert- or iso-butyl group, and R<sup>5</sup> is a lower alkyl group),

and wherein the proportion of component (A) is from about 1 to 40% by weight, the proportion of the polymer (B-1) is from about 30 to 75% by weight, the proportion of the polymer (B-2) is from about 0.1 to 20% by weight, and the proportion of the epoxy resin (C) is from about 5 to 50% by weight.

4,681,834

# OPTICAL RECORDING ELEMENT

Howard E. Simmons, III, 751 Crossan Dr., Newark, Del. 19711  
Continuation of Ser. No. 585,106, Mar. 1, 1984, Pat. No. 4,581,317. This application Mar. 10, 1986, Ser. No. 837,844

Int. Cl.<sup>4</sup> G03C 5/24

U.S. Cl. 430—270

2 Claims

1. An optical recording element comprising a light-absorptive layer supported by a dimensionally stable substrate in which the light-absorptive material is a uniformly smooth, thin, homogeneous layer comprising a film-forming polymeric dye diluted with an inert, transparent and compatible polymer to lower the light absorption level thereof, said light-absorptive material having a light absorptivity of at least 0.046 in the visible and/or infrared spectral regions.

4,681,835

# METHOD OF PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING

PYRAZOLOAZOLE-TYPE MAGENTA COUPLER USING A FINAL BATH CONTAINING A SOLUBLE IRON SALT  
Takatoshi Ishikawa, and Kiyoshi Nakazyo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 12, 1985, Ser. No. 807,934

Claims priority, application Japan, Dec. 14, 1984, 59-264185

Int. Cl.<sup>4</sup> G03C 5/00, 5/24, 7/38

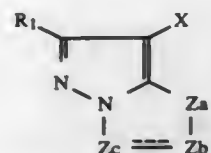
U.S. Cl. 430—386

14 Claims

1. A method for processing a silver halide color photographic material, which comprises processing a photographic



material containing at least one pyrazoloazole type magenta coupler represented by the following general formula (I) in a final bath containing a soluble iron salt in an amount of at least  $1 \times 10^{-4}$  mol/l:



wherein  $R_1$  represents a hydrogen atom or a substituent,  $X$  represents a hydrogen atom or a group capable of being eliminated by the coupling reaction with an oxidation product of an aromatic primary amine developing agent, and  $Z_a$ ,  $Z_b$  and  $Z_c$  each represents methine group, a substituted methine group,  $=N-$  or  $-NH-$ , provided that one of the  $Z_a-Z_b$  and the  $Z_b-Z_c$  bonds is a double bond and the other is a single bond, in which when it represents a double bond, the  $Z_b-Z_c$  bond includes one which constitutes a part of an aromatic ring, and further, the substituent  $R_1$  or  $X$ , or the substituted methine represented by  $Z_a$ ,  $Z_b$  or  $Z_c$  may form a polymer including a dimer.

4,681,836

# SILVER HALIDE PHOTOGRAPHIC MATERIAL AND METHOD FOR FORMING HIGH CONTRAST NEGATIVE IMAGE USING THE SAME

Nobuaki Inoue, Yoshio Inagaki, and Kimioka Kameoka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 660,580, Oct. 12, 1984, abandoned.

This application Nov. 20, 1986, Ser. No. 933,258

Claims priority, application Japan, Oct. 13, 1983, 58-191245

Int. Cl.<sup>4</sup> G03C 1/10, 1/34

U.S. Cl. 430-434

25 Claims

1. A negative-working silver halide photographic material which has at least one silver halide emulsion layer containing silver halide grains containing from  $1 \times 10^{-8}$  to  $8 \times 10^{-6}$  mole of a rhodium salt per mole of silver, and containing in said emulsion layer or another hydrophilic colloidal layer a compound represented by formula (I)



wherein  $R^1$  represents an aliphatic group or an aromatic group;  $R^2$  represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted aryloxy group; and  $G$  represents a carbonyl group, a sulfonyl group, a sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted imino group.

22. A method for forming a high contrast negative image in which a silver halide photographic material having at least one silver halide emulsion layer containing silver halide grain containing from  $1 \times 10^{-8}$  to  $8 \times 10^{-6}$  mole of a rhodium salt per mole of silver, and containing in said emulsion layer or another hydrophilic colloidal layer a compound represented by formula (I)



wherein  $R^1$  represents an aliphatic group or an aromatic group;  $R^2$  represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted aryloxy group; and  $G$  represents a carbonyl group, a sulfonyl group, a sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted imino group; is exposed to an imagewise pattern of light and then development-processed with a developer containing 0.15 mole/liter or more of sulfite ion and having a pH adjusted to from 9.5 to 12.3.

4,681,837

# SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Akio Mitsui, and Noboru Ohta, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

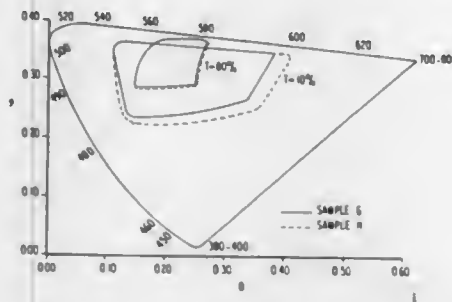
Filed Oct. 15, 1985, Ser. No. 787,820

Claims priority, application Japan, Oct. 12, 1984, 59-213977

Int. Cl.<sup>4</sup> G03C 7/32

U.S. Cl. 430-504

29 Claims



1. A silver halide color photographic material comprising a support having thereon at least three silver halide emulsion layer units sensitive to three primary colors of blue, green and red light, respectively, at least one of the silver halide emulsion layer units having at least two layers which are different in sensitivity from each other and containing at least Coupler (A') described below and Coupler (B) described below and one of said layers is in charge of color formation of the highest density portion in the characteristic curve of these layers and contains Coupler (B) described below which forms a dye having the maximum absorption wavelength different from a dye formed from Coupler (A) described below in an amount of at least 30 mol% of the total amount of the couplers included therein, wherein each of Couplers (A), (A') and (B) form dyes upon oxidative coupling with an aromatic primary amine developing agent during color development processing, Coupler (A) being in at least one of the blue-, green- or red-sensitive silver halide emulsion layer units, and Coupler (A') denotes (i) a coupler which forms a dye having the maximum absorption in the wavelength range from 400 nm to less than (the maximum absorption wavelength of a dye formed from Coupler (A') + 5) nm, when the coupler is employed in a blue-sensitive silver halide emulsion layer unit, (ii) a coupler which forms a dye having the maximum absorption in the wavelength range from 510 nm to less than (the maximum absorption wavelength of a dye formed from Coupler (A') + 5) nm, when the coupler is employed in a green-sensitive silver halide emulsion layer unit, or (iii) a coupler which forms a dye having the maximum absorption in the wavelength range from more than (the maximum absorption wavelength of a dye formed from Coupler (A') - 5) nm to 700 nm, when the coupler is employed in a red-sensitive silver halide emulsion layer unit; Coupler (A') denotes a coupler which is employed in the largest amount by mol among the couplers contained in one or more layers than the layer which is in charge of color formation of the highest density portion in a characteristic curve of the silver halide emulsion layer unit; Coupler (B) denotes a coupler which forms a dye having the maximum absorption in the wavelength range other than that of a dye formed from Coupler (A); and the above described Couplers (A), (A') and (B) are substantially colorless and the maximum absorption of the dyes formed therefrom are present in (i) the wavelength range from 400 nm to 480 nm when they are employed in the blue-sensitive silver halide emulsion layer unit, (ii) the wavelength range from 510 nm to 590 nm when they are employed in the green-sensitive silver halide emulsion layer unit, or (iii) the wavelength range from 600 nm to 700 nm when they are employed in the red-sensitive silver halide emulsion layer unit, wherein Coupler (B) is a coupler which forms a dye, the maximum absorption wavelength thereof is present (i) in the wavelength range from (the maximum absorption wavelength of a dye formed from Coupler (A') + 5) nm to 480 nm, when the coupler

is employed in a blue-sensitive silver halide emulsion layer unit, (ii) in the wavelength range from (the maximum absorption wavelength of a dye formed from Coupler (A') + 5) nm to 590 nm, when the coupler is employed in a green-sensitive silver halide emulsion layer unit or (iii) in the wavelength range from 600 nm to (the maximum absorption wavelength of a dye formed from Coupler (A') - 5) nm, when the coupler is employed in a red-sensitive silver halide emulsion layer unit.

4,681,838

# SILVER HALIDE PHOTOGRAPHIC EMULSION AND PROCESS FOR PRODUCTION THEREOF

Hiroyuki Mifune, Tadao Shishido, and Yoshiaki Suzuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1985, Ser. No. 744,595

Claims priority, application Japan, Jun. 15, 1984, 59-122984

Int. Cl.<sup>4</sup> G03C 1/08, 1/34, 1/02

U.S. Cl. 430-367

33 Claims

1. A process for producing a substantially surface latent image type silver halide photographic emulsion, comprising the steps of precipitation, physical ripening, washing, and chemical ripening wherein at least one compound selected from hydrogen peroxide or an adduct or precursor thereof is added to an emulsion in the step prior to the end of the chemical ripening step.

4,681,839

# SYSTEMS TO PRESERVE LIVING TISSUE

Mitchell R. Swartz, 16 Pembroke Rd., Weston, Mass. 02193

Filed Sep. 23, 1982, Ser. No. 422,038

Int. Cl.<sup>4</sup> A01N 1/02; C12N 1/04, 5/02; C12M 3/00

U.S. Cl. 435-1

65 Claims

1. A system to preserve both living tissue that has been severed from its host or living cells to be stored, cloned or hybridized, that comprises:

a gas-permeable bag capable of receiving the tissue, a quantity of liquid and a biscuit and further means to maintain a sterile environment therefor during storage of the tissue; said biscuit disposed within the bag and in the liquid including both an electrolyte to help maintain cellular internal environment of the tissue and a pH buffer, said biscuit being precisely soluble in the liquid so as to provide a quasistatic biochemical environment; and means to maintain the liquid and tissue at a required temperature, said temperature being above the freezing point of the living tissue.

4,681,840

# DEOXYRIBONUCLEIC ACID MOLECULES USEFUL AS PROBES FOR DETECTING ONCOGENES INCORPORATED INTO CHROMOSOMAL DNA

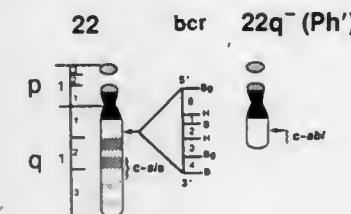
John R. Stephenson, East Norwich; John Groffen, and Nora Heisterkamp, both of Westbury, all of N.Y., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jan. 18, 1984, Ser. No. 571,911

Int. Cl.<sup>4</sup> G01N 33/48, 33/52; C12Q 1/68

U.S. Cl. 435-6

26 Claims



1. A single-stranded deoxyribonucleic acid molecule having

a length less than about 25 kb which comprises at least three distinct nucleotide sequences which are present in a breakpoint cluster region and which are sites for incorporation into a chromosome of a deoxyribonucleic acid molecule encoding an oncogene.

18. A single-stranded deoxyribonucleic acid molecule according to claim 1, which is about 5.8 kb long, is derived from human chromosome 22 and contains sites for incorporation of a deoxyribonucleic acid molecule encoding the oncogene c-abl derived from human chromosome 9 during the Philadelphia translocation.

19. A deoxyribonucleic acid molecule of claim 18 labelled with a detectable marker.

20. A method of diagnosing chronic myelocytic leukemia in a human subject which is associated with an abnormal Philadelphia chromosome containing the translocated oncogene c-abl which comprises cleaving total chromosomal deoxyribonucleic acid with restriction enzymes under cleaving conditions, separating the fragments so obtained by gel electrophoresis, denaturing the fragments to obtain single-stranded deoxyribonucleic acid molecules, recovering the denatured single-stranded fragments from the gel, immobilizing them on a solid support, contacting the immobilized single-stranded deoxyribonucleic acid fragments with a deoxyribonucleic acid probe of claim 19 which includes sites for the incorporation of the chromosome 9 segment containing the oncogene c-abl under conditions permitting hybridization of complementary single-stranded molecules, identifying the hybridized molecules so formed to thereby detect abnormalities in the restriction patterns of the chromosomal deoxyribonucleic acid caused by the presence of the abnormal Philadelphia chromosome.

4,681,841

# ENZYMATIC ASSAY METHOD

Kunio Matsumoto, and Tsutomu Hirata, both of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 3, 1983, Ser. No. 538,680

Claims priority, application Japan, Oct. 1, 1982, 57-173569

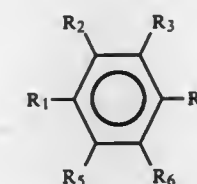
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> C12Q 1/00, 1/34, 1/44; G01N 33/50

U.S. Cl. 435-18

19 Claims

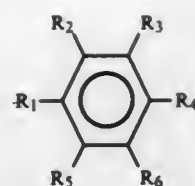
1. A method for assaying a compound of the formula



wherein  $R_1$  is hydroxyl or amino, or hydrogen if at least one of  $R_2$ ,  $R_3$ ,  $R_4$ ,  $R_5$  and  $R_6$  is hydroxyl or amino, and  $R_2$ ,  $R_3$ ,  $R_4$ ,  $R_5$  and  $R_6$  are hydrogen, halogen, lower alkyl, lower alkoxy, amino, substituted amino, hydroxy, carboxyl, or sulfo, or  $R_5$  and  $R_6$  together form a ring, comprising establishing reaction system containing the compound to be assayed and a coupler and an oxidase that consumes  $O_2$  and effects an enzymatic oxidative condensation of said compound to be assayed and said coupler, simultaneously generating a pigment, without the formation of any  $H_2O_2$ ; and measuring a detectable change in said reaction system to assay said compound.

15. A method for assaying a hydrolase, comprising the steps of: generating from a synthetic substrate by the action of said hydrolase a compound of the formula





wherein  $R_1$  is hydroxyl or amino, or hydrogen if at least one of  $R_2, R_3, R_4, R_5$  and  $R_6$  is hydroxyl or amino, and  $R_2, R_3, R_4, R_5$  and  $R_6$  are hydrogen, halogen, lower alkyl, lower alkoxy, amino, substituted amino, hydroxy, carboxyl, or sulfo, or  $R_5$  and  $R_6$  together form a ring; establishing a reaction system containing a said compound and a coupler and an oxidase that consumes  $O_2$  and effects an enzymatic oxidative condensation of said compound and said coupler, simultaneously generating a pigment, without the formation of any  $H_2O_2$ ; measuring a detectable change in said reaction system to assay said compound; and relating the assay of said compound to said hydrolase consumed in generating said compound, thereby to assay said hydrolase.

4,681,842

#### PROCESS AND REAGENT FOR THE DIFFERENTIATED DETERMINATION OF ISOENZYMES OF ALKALINE PHOSPHATASE

Sidney B. Rosalki, London, United Kingdom, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany  
PCT No. PCT/EP84/00004, § 371 Date Sep. 11, 1984, § 102(e) Date Sep. 11, 1984, PCT Pub. No. WO84/02720, PCT Pub. Date Jul. 19, 1984

PCT Filed Jan. 7, 1984, Ser. No. 653,237

Claims priority, application United Kingdom, Jan. 12, 1983, 8300685; May 23, 1983, 8314185

Int. Cl.<sup>4</sup> C12Q 1/42; C12N 9/16

U.S. Cl. 435—21

9 Claims

1. Process for the differentiation of bone and liver isoenzymes of alkaline phosphatase in a sample containing both enzymes comprising mixing the sample with a solubilized lectin which binds N-acetylglucosamine residues of the bone isoenzyme, incubating the mixture obtained for a time sufficient to bind all bone isoenzymes to form a lectin bound portion and a free isoenzyme portion containing liver isoenzyme, separating the lectin bound portion from the free isoenzyme portion and determining the alkaline phosphatase activity in one or both of the portions.

4,681,843

#### IMMOBILIZATION OF CELLS AND ENZYMES

Peter Egerer, Wuppertal; Wulf Crueger, Erkrath, and Christian Gölker, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Feb. 22, 1985, Ser. No. 704,350

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 3408299

Int. Cl.<sup>4</sup> C12P 1/00; C12N 11/04, 11/02, 11/08

U.S. Cl. 435—41

14 Claims

1. In the immobilization of cells and/or enzymes by flocculation and solidification by contacting the cells and/or enzymes with tannin, epihalohydrin/polyamine copolymer and glutaraldehyde, the improvement which comprises effecting the immobilization in the presence of about 0.05 to 1.0 mole per liter of an added primary amine selected from the group consisting of sulphuric acid mono-(2-aminoethyl)-ester, 2-aminoethanol, glycine and tris-(hydroxymethyl)-aminomethane, followed by removal of the primary amine and excess glutaraldehyde by washing.

4,681,844

#### PROCESS FOR PRODUCING AN INTERLEUKIN-1 PREPARATION

Hans-Ake Fabricius, Breisach, and Eckart U. Köttgen, Freiburg, both of Fed. Rep. of Germany, assignors to Shanksville Corporation N.V., Netherlands Antilles

Division of Ser. No. 514,197, Jul. 15, 1983, which is a division of Ser. No. 255,251, Apr. 17, 1981, Pat. No. 4,406,830. This application May 3, 1985, Ser. No. 730,043

Int. Cl.<sup>4</sup> C12P 21/00, 21/02, 21/04; C12N 5/00; A61K 35/14; C07K 3/00, 15/06

U.S. Cl. 435—68

4 Claims

1. A process for producing an Interleukin-1 preparation comprising

- incubating isolated peripheral mononuclear blood cells in a serum-free liquid tissue culture medium for from about 18 to about 24 hours to remove serum proteins adhering to the cell membranes;
- contacting the incubated blood cells with a mitogen for a period of about 4 to 12 hours to activate the monocytic cell population of the mononuclear blood cells for the production of Interleukin-1;
- washing the activated cells with a sterile liquid to remove the mitogen; and
- incubating the activated cells in a serum-free liquid tissue culture medium to collect Interleukin-1 in the liquid phase of the tissue culture medium to thereby obtain a preparation of Interleukin-1.

4,681,845

#### INCREASED GLUCOSE LEVELS IN STARCH SACCHARIFICATION USING IMMOBILIZED AMYLOGLUCOSIDASE

William H. Mueller, Darien, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 16, 1985, Ser. No. 766,328

Int. Cl.<sup>4</sup> C12P 19/20

U.S. Cl. 435—96

8 Claims

1. A method of converting a partially hydrolyzed starch solution to glucose comprising contacting under saccharifying conditions a feedstock of said starch solution with a first portion of a fresh immobilized amyloglucosidase which has been used for less than one half-life followed by contacting under saccharification conditions the resulting hydrolyzed product with a second portion of an aged immobilized amyloglucosidase which has been used for more than one half-life, said first and second portions being in series with the contact times and ratio of aged to fresh immobilized amyloglucosidase sufficient to afford a product containing at least about 94.0% glucose, and recovering the glucose formed thereby.

4,681,846

#### PROCESS FOR THE PREPARATION OF DIFFICIDIN AND DERIVATIVE ANTIBACTERIALS

Kenneth E. Wilson, Westfield; Richard L. Monaghan, Somerset; Cheryl DeRiso, Avenel; Sheldon B. Zimmerman, Springfield; Otto D. Hensens, Red Bank; James E. Flor, Bridgewater, all of N.J.; Sagrario M. Del Val, and Maria I. M. Fernandez, both of Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

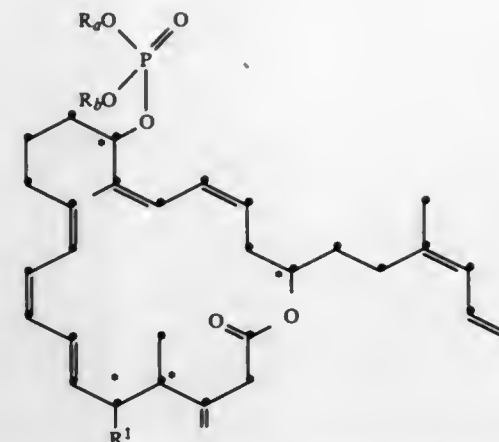
Division of Ser. No. 503,951, Jun. 13, 1983, Pat. No. 4,545,991. This application May 6, 1985, Ser. No. 667,664

Int. Cl.<sup>4</sup> C12P 17/08; C12R 1/125

U.S. Cl. 435—124

8 Claims

1. A process for preparing a compound of the formula:



wherein  $R_a$  and  $R_b$  are members independently selected from the group consisting of hydrogen; alkali metal and alkaline earth metal cations; ammonium; and substituted ammonium; and  $R^1$  is hydrogen or hydroxy; which comprises cultivating *Bacillus subtilis* ATCC 39320 under controlled aerobic conditions in an aqueous nutrient medium and recovering said compound.

4,681,847

#### NOVEL LYSOZYME-SENSITIVE MICROORGANISM

Ryoichi Katsumata, Machida; Tetsuo Oka, Yokohama, and Akira Furuya, Kawasaki, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 372,129, Apr. 27, 1982, abandoned.

This application Jan. 28, 1985, Ser. No. 695,574

Claims priority, application Japan, Apr. 30, 1981, 56-65777; Sep. 25, 1981, 56-151464

Int. Cl.<sup>4</sup> C12N 15/00, 9/36, 1/20, 1/00, 1/06; C12P 21/00, 19/34; C12R 1/13, 1/15

U.S. Cl. 435—172.3

5 Claims

1. A biologically pure culture of a novel lysozyme-sensitive microorganism obtained by mutation treatment of a microorganism belonging to the genus *Corynebacterium* or *Brevibacterium*, having a sensitivity to lysozyme, having the ability to be converted to protoplast by treatment with lysozyme to remove the cell wall without pretreatment with an antibiotic and having an efficient transformation ability due to the high regenerating ability of the protoplast, wherein the lysozyme-sensitive microorganism is selected from the group consisting of *Corynebacterium glutamicum* L-15 (FERM P-5946, ATCC 31834), *Corynebacterium hercules* L-103 (FERM P-5947, ATCC 31866), *Brevibacterium divaricatum* L-204 (FERM P-5948, ATCC 31867) and *Brevibacterium lactofermentum* L-312 (FERM P-5949, ATCC 31868).

5. A biologically pure culture of a novel lysozyme-sensitive microorganism obtained by mutation treatment of a microorganism belonging to the genus *Corynebacterium* or *Brevibacterium*, having a sensitivity to lysozyme, having the ability to be converted to protoplast by treatment with lysozyme to remove the cell wall without pretreatment with an antibiotic and having an efficient transformation ability due to the high regenerating ability of the protoplast, and carrying pCG4 plasmid, wherein the lysozyme-sensitive microorganism is selected from the group consisting of *Corynebacterium glutamicum* L-15/pCG4 (FERM P-590, ATCC 31835), *Corynebacterium hercules* L-103/pCG4 (FERM P-5951, ATCC 31869), *Brevibacterium divaricatum* L-204/pCG4 (FERM P-5952, ATCC 31870) and *Brevibacterium lactofermentum* L-312/pCG4 (FERM P-5953, ATCC 31871).

4,681,848

#### NOVEL PEPTIDE AND USE THEREOF

Kyoze Tsukamoto, Suita; Yuzo Ichimori, Sakai, and Mitsuhiko Wakimasu, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 20, 1983, Ser. No. 534,091

Claims priority, application PCT Int'l Appl., Sep. 22, 1982, PCT/JP82/00381; Nov. 22, 1982, PCT/JP82/00444; May 31, 1983, PCT/JP83/00174

Int. Cl.<sup>4</sup> C12N 5/00

U.S. Cl. 435—240

9 Claims

1. A cloned hybridoma between (a) a spleen cell of a mammal immunized with a polypeptide of the formula:



wherein X is a bond, or a peptide or amino acid residue having 1 to 16 amino acids counting from the C terminus of the peptide chain of



and Y is a peptide or amino acid residue having 1 to 5 amino acids counting from the N terminus of the peptide chain of



or with a conjugate between polypeptide (I) and a carrier protein and (b) lymphoid cell from a mammal of the same or different species from the immunized mammal.

4,681,849

#### SUNFLOWER INDUCTION, MAINTENANCE AND REGENERATION MEDIA, METHODS OF USE AND PLANTS REGENERATED THEREFROM

Karol E. Paterson, Oakland, and Nicholas P. Everett, El Sobrante, both of Calif., assignors to Stauffer Chemical Company, Richmond, Calif.

Filed Feb. 4, 1985, Ser. No. 697,819

Int. Cl.<sup>4</sup> C12N 5/00, 5/02

U.S. Cl. 435—240

6 Claims

1. An inbred sunflower tissue cultured cells induction and maintenance effective media and shoot regeneration effective media system comprising:

- an induction and maintenance effective media comprising MS salts, MS vitamins, about 30 g/L sucrose, about 500 mg/L casamino acids or about 500 mg/L casamino acids and about 40 mg/L adenine sulfate, from about 0.05 to about 0.5 mg/L 2,4-dichlorophenoxy acetic acid or from about 0.05 to about 0.5 mg/L 2,4-dichlorophenoxy acetic acid and about 1 mg/L naphthalenic acid, and from about 0.005 mg/L to about 0.4 mg/L gibberellic acid; and
- a shoot regeneration effective media comprising MS salts, MS vitamins, about 30 g/L sucrose, about 500 mg/L casamino acids or about 500 mg/L casamino acids and about 40 mg/L adenine sulfate, from about 0.05 mg/L to about 2 mg/L benzyladenine and from about 0.005 mg/L to about 0.5 mg/L gibberellic acid.



4,681,850

# PHENYLALANINE AMMONIA LYASE-PRODUCING MICROBIAL CELLS

Jeffrey C. McGuire, Frederick, Md., assignor to Genex Corporation, Gaithersburg, Md.

Filed Nov. 20, 1984, Ser. No. 673,332

Int. Cl.<sup>4</sup> C12N 1/14, 15/00; C12P 13/22; C12R 1/645  
U.S. Cl. 435—254 1 Claim

1. A PAL-constitutive microorganism which is capable of producing PAL in the absence of PAL inducer, wherein said microorganism is a strain of *Rhodotorula rubra*, said strain having the identifying characteristics of *Rhodotorula rubra*, strain GX-5901, NRRL Y 15901.

4,681,851

# BIOLOGICALLY ACTIVE COMPOSITION FOR PURIFYING WASTE WATER AND OUTGOING AIR

Jörg Baumgarten; Werner Frommer, both of Wuppertal; Theo Mann, Langenfeld; Imre Paszik, Monheim; Hans-Georg Rast, Leichlingen, and Dietmar Schäpel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 764,688, Aug. 12, 1985, Pat. No. 4,634,672, which is a continuation of Ser. No. 594,876, Mar. 29, 1984, abandoned. This application Sep. 22, 1986, Ser. No. 910,056

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 3312578

Int. Cl.<sup>4</sup> D06M 16/00; C12N 11/04; C07G 15/00; C02F 3/00  
U.S. Cl. 435—262 7 Claims

1. In a process for the biological purification of waste water and/or outgoing air, by contacting said air and/or water with a biological composition, the improvement wherein said biological composition is a biologically active composition comprising a polyurethane hydrogel containing (i) surface active coal having a specific surface according to BET of above 50 m<sup>2</sup>/g, (ii) a polymer having cationic groups, and (iii) cells having enzymatic activity and being capable of growth.

4,681,852

# NOVEL MICROORGANISM AND METHOD

David E. Tribe, Wilmington, Del., assignor to Austgen-Biojet International Pty. Ltd., Melbourne, Australia

Continuation-in-part of Ser. No. 284,801, Jul. 20, 1981, abandoned. This application Jan. 18, 1983, Ser. No. 459,302  
Claims priority, application Australia, Jul. 18, 1980, PE4590/80

Int. Cl.<sup>4</sup> C12P 13/22; C12N 15/00; C12R 1/19  
U.S. Cl. 435—108 12 Claims

1. A strain of *Escherichia coli* having altered production of 3-deoxy-D-arabino-heptulosonate-7-phosphate (DAHP) synthase and chorismate mutase P-prephenate dehydratase (CMP-PDH), wherein

- (i) said DAHP synthase is not subject to feedback inhibition by phenylalanine, tryptophan, or tryptophan present within the microorganism and said DAHP synthase either
  - (a) is not subject to repression by phenylalanine, tyrosine, or tryptophan or
  - (b) is produced in greater amount than is produced by wild type *E. coli* and
- (ii) said CMP-PDH is not subject to feedback inhibition by phenylalanine and said CMP-PDH either
  - (a) is not subject to repression by phenylalanine or
  - (b) is produced in a greater amount than produced by wild type *E. coli*.

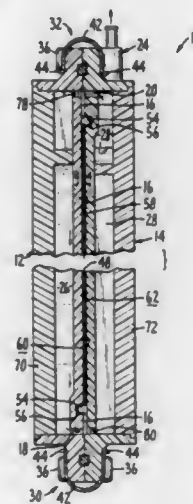
4,681,853

# PERFUSION SLIT CHAMBER FOR FILTER-BOUND SAMPLE ANALYSES

Kenneth J. Hardy, 2132-16th Ave., San Francisco, Calif. 94106, and Michael G. Whitesides, 654 Minnesota St., Daly City, Calif. 94107

Filed Oct. 23, 1985, Ser. No. 790,586

Int. Cl.<sup>4</sup> C12M 1/40  
U.S. Cl. 435—288 3 Claims



1. An apparatus for treating samples bound to a support membrane and the like with a solution without pumping the solution through the membrane, the apparatus comprising:
  - first and second cover plates, at least one of the first and second cover plates having a recess defined on one side thereof, the cover plates being matable to form a treatment chamber therebetween;
  - a membrane supported in the chamber;
  - first and second reagent ports defined in at least one of the first and second cover plates for fluidly communicating into and alternatively out of the treatment chamber with each port communicating with both sides of the membrane;
  - first and second valve means for controlling fluid communication through the first and second reagent ports, respectively, to the treatment chamber;
  - clamping means for releasably securing the mated cover plates together;
  - passageway means extending through the chamber along both sides of the membrane for providing bilaminar flow along the faces of a membrane in the treatment chamber without pumping substantial quantities of solution through the membrane; and
  - internal of the treatment chamber, a plurality of support pegs affixed to the cover plates for supporting the membrane and allowing solution flow on each side of the membrane from the first reagent port to the second reagent port.

4,681,854

# GEOCHEMICAL OIL PROSPECTING METHOD USING IN SITU SIMULATION OF DIAGENETIC PROCESSES

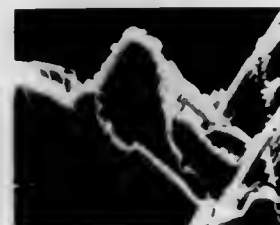
Charles T. Feazel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 28, 1982, Ser. No. 383,369

Int. Cl.<sup>4</sup> G01N 33/24  
U.S. Cl. 436—31 9 Claims

1. A process comprising
  - placing a mineral substrate selected from the group consisting of calcite, dolomite, quartz, anhydrite and feldspar, the mineral substrate having an essentially even planar face,

within a fluid-tight vessel into a subterranean earth formation containing connate formation fluids; causing the mineral substrate to be exposed to the connate formation fluids present; permitting contact of the mineral substrate by the connate formation fluids for at least a time sufficient to effect occlusion or etching on said face of the substrate; withdrawing the mineral substrate within the vessel from the formation;



removing the substrate from the vessel and examining the mineral substrate for indications of occlusion or etching on said face of the mineral substrate; comparing said face of the mineral substrate as placed into the formation with said face of the mineral substrate as withdrawn from the formation; and determining from the occlusion or etching of the withdrawn substrate a property of the formation.

4,681,856

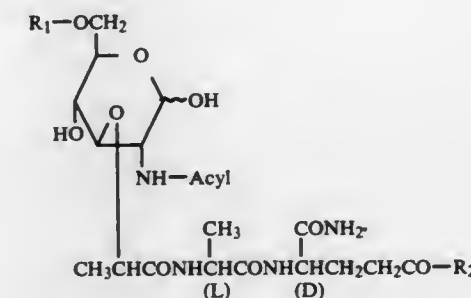
# MURAMYLDIPEPTIDE ACTIVE ESTER DERIVATIVES

Toshiyuki Hamaoka, Nara; Hiromi Fujiwara, Hyogo, and Tsuneo Kusama, Tokyo, all of Japan, assignors to Toshiyuki Hamaoka Daichi Selyaku Co., Ltd., Japan

Filed Aug. 20, 1984, Ser. No. 641,905

Claims priority, application Japan, Aug. 18, 1983, 58-149617  
Int. Cl.<sup>4</sup> C08B 37/00

U.S. Cl. 536—53 8 Claims  
1. A muramyldipeptide derivative represented by the formula:



wherein R<sub>1</sub> represents a straight or branched chain fatty acid residue having 2 to 30 carbon atoms; R<sub>2</sub> represents an active ester residue selected from the group consisting of a p-nitrophenol group, a 2,4-dinitrophenol group, a 2,4,5-trichlorophenol group, a pentachlorophenol group, a pentafluorophenol group, a thiophenol group, an N-hydroxysuccinimido group, an N-hydroxybenzotriazole group, an N-hydroxy-5-norbornene-2,3-dicarboximido group, an N-hydroxyphthalimido group, an N-hydroxymorpholine group, an N-hydroxypiperidine group, a 2-mercaptopyridine group, a 2-hydroxypyridine group, a 3-hydroxypyridine group, an 8-hydroxyquinoline group and a 2-hydroxyphenol group; and "Acyl" represents an acyl group having 2 to 6 carbon atoms.

4,681,857

# METHOD FOR DETECTING PHOSPHORUS SEGREGATES IN METALLIC MATERIAL

Yoshiko Funahashi; Yoshikazu Kamino; Yasuharu Matsumura, and Senichi Harimaya, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 13, 1985, Ser. No. 765,245

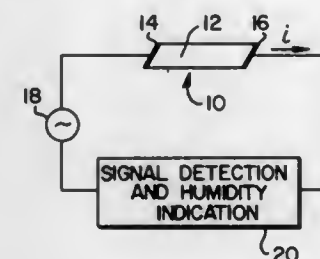
Claims priority, application Japan, Aug. 15, 1984, 59-170227; Aug. 22, 1984, 59-174828

Int. Cl.<sup>4</sup> G01N 33/20

U.S. Cl. 436—39

30 Claims U.S. Cl. 436—78

27 Claims



1. Humidity sensitive apparatus comprising a thin film of hygroscopic, halogenated organic polymer having pendant groups of a relatively strong acidic type and pendant groups of a relatively weak acidic type, and means attached to said polymer film for applying to the same a signal of a type having a parameter which will be affected by said polymer film in varying degree as a function of the water content of said polymer film.

1. A method for detecting phosphorous segregates in a metallic material, comprising,
  - (a) attaching a test sheet onto that surface of a metallic material to be tested,
  - (b) maintaining the sheet in contact with the metallic material surface in the presence of an aqueous solution comprising 0.0005 to 0.2 mol/l of copper ion and 0.0001 to 1.0 mol/l of nitrate ion until stains appear,

- (c) removing the sheet from the metallic material surface, and  
 (d) treating the sheet from step (c) with a color reagent containing molybdate ion to form colored phosphorus molybdate which indicates the presence of phosphorus segregates.

4,681,858

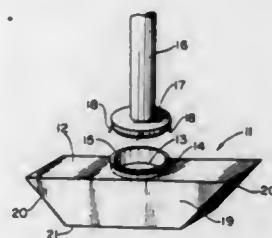
**DISSOLUTION CELL AND METHOD FOR DETERMINING THE IN-VITRO RELEASE OF A DRUG**  
 Atma Chaudhari, West Hill, and Joseph K. S. Lee, Agincourt, both of Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 11, 1986, Ser. No. 940,708

Claims priority, application Canada, Jun. 19, 1986, 511997  
 Int. Cl.<sup>4</sup> B01D 11/02; G01N 1/00, 33/15, 37/00

U.S. Cl. 436—165

13 Claims



1. A dissolution cell assembly for measuring the release rate of a drug comprising:

a dissolution cell comprising

- (a) a rectangular top wall having a central opening therein;  
 (b) a pair of trapezoidal side walls extending generally perpendicularly from said top wall;  
 (c) a pair of end walls comprised of a mesh material and extending from said top wall, said end walls being attached to and disposed between said side walls; and  
 (d) a bottom wall comprised of a mesh material attached to and extending between said end walls and said side walls;  
 (e) closure means for closing said opening releasably attached about said opening; and means for attaching a shaft to said closure means for rotatably mounting said dissolution cell.

9. A method for the in-vitro determination of the release of a drug from a drug form comprising:

(a) placing said drug form in a dissolution cell of a dissolution cell assembly which comprises:

a dissolution cell comprising

- (i) a rectangular top wall having a central opening therein;  
 (ii) a pair of trapezoidal side walls extending generally perpendicularly from said top wall;  
 (iii) a pair of end walls comprised of a mesh material and extending from said top wall, said end walls being attached to and disposed between said side walls; and  
 (iv) a bottom wall comprised of a mesh material attached to and extending between said end walls and said side walls;  
 (v) closure means for closing said opening releasably attachable about said opening; and a shaft attached to and extending from said closure means;  
 (b) attaching said closure means about said opening to close said opening;  
 (c) mounting said shaft in a rotation means;  
 (d) placing said dissolution cell in a dissolution medium;  
 (e) rotating said rotation means to rotate said dissolution cell; and  
 (f) measuring the change in concentration of said drug released from said form at predetermined intervals.

# 4,681,859 **FLUORESCENCE POLARIZATION IMMUNOASSAY FOR HEAVY ANTIGENS**

Peter B. Kramer, Newton Centre, Mass., assignor to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed Sep. 21, 1984, Ser. No. 653,382

Int. Cl.<sup>4</sup> G01N 33/566, 33/563, 33/536, 33/533

U.S. Cl. 436—501

2 Claims

1. A method for determining the presence of a ligand in an aqueous sample comprising the steps of:  
 providing a ligand binding partner capable of specifically combining with said sample ligand at a binding site on said ligand;  
 further providing fluorescently labeled epitope simulating peptide capable of specifically combining with said ligand binding partner whereby binding of (i) said sample ligand of (ii) said simulating peptide to said ligand binding partner blocks binding of (i) said simulating peptide or (ii) said sample ligand, respectively, to said ligand binding partner; allowing said sample ligand and said simulating peptide to combine with said ligand binding partner;  
 illuminating said fluorescent label with polarized light; and detecting fluorescence depolarization and relating said depolarization to the presence or absence of ligand in said sample.

4,681,860

**CERAMIC MATERIALS FROM POLYCARBOSILANES**  
 Duane R. Bujalski, Monitor Township, Bay County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 868,207, May 23, 1986,

abandoned, which is a continuation of Ser. No. 678,122, Dec. 4, 1984, abandoned. This application Dec. 5, 1986, Ser. No. 938,472

Int. Cl.<sup>4</sup> C04B 35/56

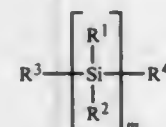
U.S. Cl. 501—88

11 Claims

1. A method of preparing a ceramic material with increased ceramic yield, said method comprising heating a modified polycarbosilane in an inert atmosphere or in a vacuum to a temperature of at least 750° C. until said modified polycarbosilane is converted to a ceramic material with increased ceramic yield relative to a non-modified polycarbosilane heated under the same conditions, wherein said modified polycarbosilane is prepared by mixing the non-modified polycarbosilane with an effective, ceramic yield increasing, amount of iron octoate, wherein the non-modified polycarbosilane is prepared by thermally decomposing and polycondensing a polysilane or polysilanes by heating said polysilane or polysilanes at a temperature of 300°–2000° C. in an inert gas, hydrogen, or vacuum wherein said polysilane or polysilanes are selected from the group consisting of cyclic polysilanes of the general formula



and linear polysilanes of the general formula



where n is greater than or equal to 4; where m is greater than or equal to 2; and where R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> are independently selected from the group consisting of hydrogen, alkyl groups containing 1 to 4 carbon atoms, phenyl, —Si(R<sup>5</sup>)<sub>3</sub> groups where R<sup>5</sup> is an alkyl group containing 1 to 4 carbon atoms, and halogen atoms.

4,681,861

# **SILICON CARBIDE SINTERED BODY AND PROCESS FOR PRODUCTION THEREOF**

Akira Saito, Kokubu, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Jan. 29, 1986, Ser. No. 823,931

Claims priority, application Japan, Jan. 31, 1985, 60-19068  
 Int. Cl.<sup>4</sup> C04B 35/56

U.S. Cl. 501—89

13 Claims

5. A process for producing a silicon carbide sintered body, which comprises the steps of:

- (a) mixing a starting material in powder form composed of 0.2 to 5% by weight, calculated as elemental aluminum, of aluminum nitride, 0.2 to 5% by weight, calculated as elemental rare earth, of at least one rare earth compound, and 0.2 to 10% by weight, calculated as elemental chromium, of chromium carbide, and the balance of silicon carbide; and  
 (b) sintering the mixed powder into an integrated molded article.

11. A silicon carbide sintered body composed of 0.2 to 5% by weight, calculated as elemental aluminum, of aluminum nitride, 0.2 to 5% by weight, calculated as elemental rare earth, of a rare earth compound, 0.2 to 10% by weight, calculated as elemental chromium, of chromium carbide, and the balance being silicon carbide, wherein said silicon carbide is present in the sintered body as particles of the alpha-type crystal structure which are substantially spherical and have an average diameter of 0.5 to 2 micrometers, and particles which contain chromium as a main component and aluminum and silicon when analyzed by an X-ray microanalyzer and show a high luminance under a metallurgical microscope are present in the crystal grain boundary containing the aluminum, rare earth and chromium components.

4,681,862

# **ELECTRICALLY INSULATING FILLER FOR SHEATHED HEATERS**

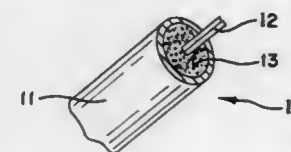
Tadashi Kawabe, and Masafumi Kobune, both of Ako, Japan, assignors to Tateho Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Jan. 2, 1986, Ser. No. 815,633

Claims priority, application Japan, Mar. 19, 1985, 60-56413  
 Int. Cl.<sup>4</sup> C04B 35/02

U.S. Cl. 501—108

8 Claims



1. An electrically insulating filler for sheathed heaters, comprising a volume of globular and nonglobular particles containing at least approximately 95% by weight of MgO and said globular particles forming at least 5 wt. % of the volume.

4,681,863

# **HIGH-DENSITY MAGNESIA-CALCIA CLINKER AND PROCESS FOR PRODUCTION THEREOF**

Kosel Yamamoto, Akira Kaneyasu, and Yo Arita, all of Ube, Japan, assignors to Ube Chemical Industries Co., Ltd., Yamaguchi, Japan

Filed Jul. 17, 1985, Ser. No. 755,782

Int. Cl.<sup>4</sup> C04B 35/04

U.S. Cl. 501—108

15 Claims

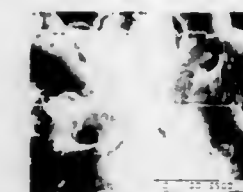
1. A magnesia-calcia clinker having a high density, said clinker containing MgO, CaO and Fe<sub>2</sub>O<sub>3</sub> as oxides, having the following chemical composition in percent by weight

MgO, CaO and Fe <sub>2</sub> O <sub>3</sub>	at least 99% in total
MgO	at least 10%
CaO	at least 10%
Fe <sub>2</sub> O <sub>3</sub>	0.2–5%

and having a density corresponding to at least 97.5% of the theoretical density (d) defined by the following equation

$$d = \frac{A \times B \times 100}{(A - B)x + 100B} = \frac{120288}{0.22x + 336}$$

wherein A is the theoretical density (=3.58 g/cm<sup>3</sup>) of periclase (MgO, B is the theoretical density (=3.36 g/cm<sup>3</sup>) of



calcia (CaO), and x is the proportion in by weight of CaO based on the total amount of CaO and MgO in the magnesia-calcia clinker,

and said Fe<sub>2</sub>O<sub>3</sub> being contained as a solid solution in periclase crystals.

8. A process for producing a magnesia-calcia clinker having a high density, which comprises adding a water-soluble iron compound to sea water, bittern or brine; simultaneously with, or after, the addition of the water-soluble iron compound, adding a calcined product of dolomite, lime or a hydrate thereof to form a precipitate composed mainly of magnesium hydroxide; mixing the resulting magnesium hydroxide with a calcium compound; and dead-burning the resulting mixture.

4,681,864

# **CRACKING CATALYST**

Grant C. Edwards, Silver Spring; Jean-Pierre Gilson, Columbia, and Carl V. McDaniel, Laurel, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jul. 15, 1985, Ser. No. 754,781

Int. Cl.<sup>4</sup> B01J 27/18, 29/06, 21/16

U.S. Cl. 502—63

3 Claims

1. In a method for preparing a catalytic cracking catalyst composition which comprises:

- (a) from about 1 to 50% by weight SAPO-37 molecular sieve which contains from about 5 to 40% by weight of an organic template component selected from the group consisting of TPA, TMA, and mixtures thereof; and  
 (b) an inorganic oxide matrix selected from the group consisting of silica, alumina, silica-alumina sols and gels, clay, zeolites and mixtures thereof;  
 the improvement comprising admixing said SAPO-37 molecular sieve with matrix forming components, and forming a particulate catalyst under conditions wherein said organic template remains in the pore structure of the SAPO-37 molecular sieve prior to use in a catalytic conversion process.  
 2. A catalytic cracking catalyst prepared by the method of claim 1.



4,681,865

## CATALYST FOR THE PRODUCTION OF AROMATIC HYDROCARBONS

Hisaaki Katsuno, Sodegaura; Takashi Murakawa, Ichihara, and Toshikazu Yoneda, Sodegaura, all of Japan, assignors to Research Association For Utilization of Light Oil, Tokyo, Japan

Filed Apr. 28, 1986, Ser. No. 856,756

Claims priority, application Japan, May 7, 1985, 60-95383; Dec. 27, 1985, 60-292775

Int. Cl.<sup>4</sup> B01J 29/12

U.S. Cl. 502-74

15 Claims

1. A catalyst for production of aromatic hydrocarbons, comprising zeolite L treated with a halogen-containing compound and platinum, said catalyst having been formed by treating zeolite L with said halogen-containing compound to form a halogen-compound treated zeolite L and then depositing platinum thereon.

2. The catalyst as claimed in claim 1, wherein the halogen-containing compound is a fluorine-containing compound.

3. The catalyst as claimed in claim 1, wherein the halogen-containing compound is a chlorine-containing compound.

4. The catalyst as claimed in claim 1, wherein the amount of platinum deposited is 0.1 to 5.0 wt % based on the total weight of the catalyst.

4,681,866

## POLYMERIZATION CATALYST, METHOD OF MAKING AND USE THEREFOR

Max P. McDaniel, Bartlesville, Okla., and Paul D. Smith, Houston, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 718,668, Apr. 1, 1985, Pat. No. 4,619,980. This application Jul. 21, 1986, Ser. No. 887,690

Int. Cl.<sup>4</sup> C08F 4/78

U.S. Cl. 502-154

8 Claims

6. A method for producing an ethylene (co)polymerization catalyst which comprises:

(i) treating a predominantly silica-containing, support with 0.01-20 mole % of at least one compound selected from the groups consisting of Group IIIA oxide or compounds convertible to the oxide form, a Group VA or VB oxide or compounds convertible to the oxide form or sulfuric acid, wherein said mole % is based on untreated support and calculated as elemental treating metal,

(ii) calcining the support in a dry, oxygen-containing atmosphere at a temperature in the range of 300°-800° C. for a time in the range of 0.5-20 hours, and thereafter

(iii) combining the product of step (ii) with 0.01 to 10 wt % of at least one a zerovalent chromium compound, calculated as chromium metal and based on the weight of the treated support obtain in step (ii), under substantially anhydrous conditions.

4,681,867

## SUPPORTED FISCHER-TROPSCH CATALYST AND METHOD OF MAKING THE CATALYST

Paul N. Dyer, Allentown; Ronald Pierantozzi, Orefield, and Howard P. Withers, Douglassville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 741,403, Jun. 5, 1985, Pat. No. 4,619,910. This application May 13, 1986, Ser. No. 862,844

The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> B01J 21/06, 21/08, 23/46, 23/74

U.S. Cl. 502-242

12 Claims

1. Method for making a catalyst comprising the following steps:

(a) treating a silica catalyst base material with a nonaqueous solution of a decomposable salt or organic compound of a group IVB metal and removing remaining said nonaqueous solution;

(b) impregnating the product of Step (a) with a nonaqueous

solution of a decomposable salt or organic compound of a Fischer-Tropsch metal catalyst from the group consisting of cobalt, iron or ruthenium, and removing remaining said nonaqueous solution; and

(c) exposing the product of Step (b) to a reducing atmosphere; all while maintaining said material and said products under conditions sufficient to avoid hydrolysis, oxidation, and calcination thereof.

4,681,868

## OXYGENATE CONDENSATION CATALYST

John R. Budge, Cleveland Heights, and Senja V. Compton, Newbury, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 29, 1986, Ser. No. 867,975

Int. Cl.<sup>4</sup> B01J 23/04, 23/18, 23/72

U.S. Cl. 502-307

5 Claims

1. A catalyst useful for the condensation of lower oxygenates to higher molecular weight oxygenates characterized by the formula:



(I)

wherein

A is an alkali group metal or mixture thereof;  
M is a Group IIA-VIIA element, Fe, Co, Ni, Ag, Au, Zn, Cd, P, As, Sb, Group IIIB-IVB element, lanthanides, actinides or mixtures thereof;

wherein

a=0.001-10;

c=0.1-500;

d=0.001-10; and

x=number of oxygen atoms required to satisfy the valency requirement of the remaining elements.

4,681,869

## CATALYST FOR HYDROFINING OF OIL AND PROCESS FOR PREPARING THE CATALYST

Simon G. Kukes, and Stephen L. Parrott, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 27, 1985, Ser. No. 781,082

Int. Cl.<sup>4</sup> B01J 21/04, 21/06

U.S. Cl. 502-349

31 Claims

1. A process for preparing a composition of matter consisting essentially of (a) alumina and (b) at least one of yttrium oxide and zirconium oxide, comprising the steps of:

(A) impregnating alumina with a solution containing at least one compound of a metal selected from the group consisting of yttrium and zirconium; and

(B) heating the material obtained in step (A) under such conditions as to dry the material from step (A) and to at least partially convert said at least one metal compound to at least one of yttrium oxide and zirconium oxide;

wherein said solution used in step (A) also contains at least one compound of aluminum, which is at least partially converted to aluminum oxide in step (B).

4,681,870

## PROTEIN A-SILICA IMMUNOADSORBENT AND PROCESS FOR ITS PRODUCTION

Joseph P. Balint, Jr., and Richard E. Hargreaves, both of Seattle, Wash., assignors to IMRE Corporation, Seattle, Wash.

Filed Jan. 11, 1985, Ser. No. 690,781

Int. Cl.<sup>4</sup> B01J 20/22

U.S. Cl. 502-403

26 Claims

1. A method for preparing an immunoabsorbent material useful for removing IgG and IgG-complexes from biological fluids, said method comprising:

introducing free amino or carboxyl groups onto a silica matrix;

reacting the silica matrix with purified protein A in the

presence of a carbodiimide at a pH in the range from 3.5 to 4.5 to covalently link the protein A to the matrix through the amino or carboxyl groups; and washing the silica matrix at a pH in the range from 2.0 to 2.5 to remove loosely bound protein A from the matrix.

4,681,871

## PHARMACOLOGICALLY ACTIVE PEPTIDES

Hansjorg Teschemacher, Universitat Giessen Frankfurterstr. 107, 6300 Giessen 1; Victor Brantl, Frauenplatz 10, 8000 Munchen; Agnes Henschen, and Friedrich Lottspeich, both of Max Planck Institut fur Biochemie, 8033 Martinsried, all of Fed. Rep. of Germany

PCT No. PCT/DE80/00072, § 371 Date Jan. 25, 1981, § 102(e) Date Jan. 22, 1981, PCT Pub. No. WO80/02696, PCT Pub. Date Dec. 11, 1980

PCT Filed May 20, 1980, Ser. No. 229,577

Claims priority, application Fed. Rep. of Germany, May 25, 1979, 2921216

The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.

Int. Cl.<sup>4</sup> A61K 37/02; C07K 5/08, 5/10, 7/06

U.S. Cl. 514-15

11 Claims

1. Pharmacologically active peptides of the following formulas:

Tyr-Pro-A,

Tyr-Pro-A-Pro,

Tyr-Pro-A-Pro-B,

Tyr-Pro-A-Pro-B-Pro,

Tyr-Pro-A-Pro-B-Pro-C,

Tyr-Pro-A-Pro-B-Pro-C-Pro and

Tyr-Pro-A-Pro-B-Pro-C-Pro-D

wherein

A represents phenylalanine and tyrosine;

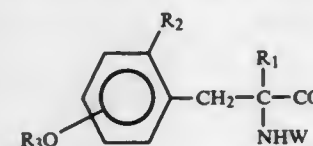
B represents glycine and tyrosine;

C represents isoleucine, proline and tyrosine;

D represents asparagine, proline and isoleucine;

and wherein

(a) the end-positioned tyrosine has the general formula

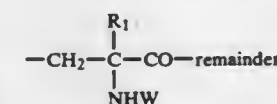


in which

R<sub>1</sub> is hydrogen or an alkyl group with 1 to 4 C-atoms,  
R<sub>2</sub> is hydrogen or together with R<sub>1</sub> form an ethylene bond,

R<sub>3</sub> is hydrogen, an alkyl group with 1 to 4 C-atoms or a R<sub>4</sub>CO-group wherein

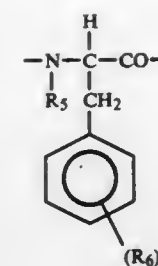
R<sub>4</sub> is a saturated or unsaturated straight or branched chain alkyl residue with 1 to 17 C-atoms, a phenyl residue or a phenylalkyl residue with 7 to 12 C-atoms, in which the phenyl residues can be substituted by 1 or 2 substituents of the halogen series, alkyl with 1 to 4 C-atoms or alkoxy with 1 to 4 C-atoms, in which the R<sub>3</sub>O group is in meta or para position to



in which

W represents hydrogen, alkyl with 1 to 5 C-atoms, alkenyl with 3 to 5 C-atoms, cyclopropylmethyl, cyclobutylmethyl, R<sub>4</sub>CO-, H-Arg, H-Lys-, H-Phe-, or H-Tyr-;

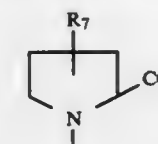
(b) the phenylalanine has the general formula



in which

R<sub>5</sub> represents hydrogen or alkyl with 1 to 4 C-atoms,  
R<sub>6</sub> represents hydrogen, fluorine, chlorine, bromine, nitro, alkyl with 1 to 4 C-atoms or alkoxy with 1 to 4 C-atoms, and Z is 1 or 2;

(c) the proline has the general formula



in which

R<sub>7</sub> represents hydrogen, a hydroxy group, an alkyl group or alkoxy group with 1 to 4 C-atoms;  
an alkyl group or alkoxy group with 1 to 4 C-atoms is bonded at the nitrogen, and one or more keto groups are positioned on the ring; and

(d) the end-positioned, C-terminal amino acid is present as an amide or ester.

4,681,872

## ERYTHROMYCIN A 11,12-CARBONATE AND METHOD OF USE

Leslie A. Freiberg, Waukegan; Howard E. Gracey, Lindenhurst, and Andre G. Pernet, Lake Bluff, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

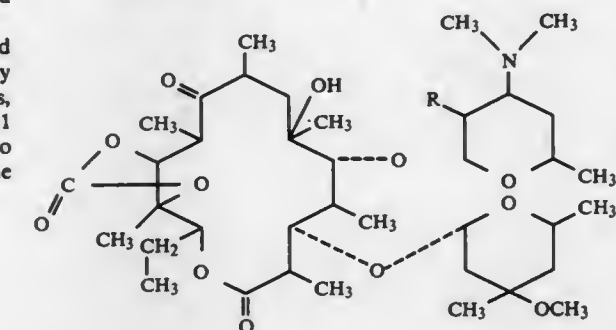
Filed Nov. 12, 1985, Ser. No. 797,263

Int. Cl.<sup>4</sup> A61K 31/71; C07H 17/08

U.S. Cl. 514-29

4 Claims

1. A compound of the formula



where R is hydroxyl, or acyl of 1 to 6 carbon atoms, and pharmaceutically acceptable salts and esters thereof.

3. A pharmaceutical composition in unit dosage form, comprising a therapeutically effective amount of a compound according to claim 1 in combination with a pharmaceutical carrier.

4,681,873

**4-AMINO-3-HALO-2-PYRIDINONE NUCLEOSIDE AND NUCLEOTIDE COMPOUNDS**

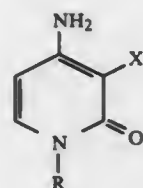
Dennis J. McNamara, and Phillip D. Cook, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 29, 1985, Ser. No. 759,816  
Int. Cl.<sup>4</sup> A61K 31/70; C07H 17/00

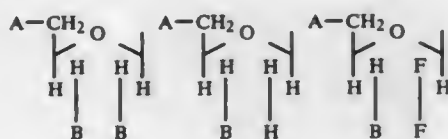
U.S. Cl. 514—50

20 Claims

1. A compound having the structural formula



where R is selected from



wherein X is fluorine, chlorine, or bromine, and A is hydrogen, H<sub>2</sub>PO<sub>4</sub>, benzoyl, 4-methylbenzoyl, acetyl, propionyl or straight or branched-chain alkanoyl of from four to six carbon atoms, and B is hydrogen, benzoyl, 4-methylbenzoyl, acetyl, propionyl or straight or branched-chain alkanoyl of from four to six carbon atoms, and the pharmaceutically acceptable salts thereof.

4,681,874

**THIAZINEPHOSPHONIC ACID DERIVATIVES**

Yoshio Hayase; Mitsuhiro Ichinari, both of Mie; Junji Taguchi, Chiba; Takeo Ishiguro, Shiga, and Toshio Takahashi, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Sep. 6, 1985, Ser. No. 773,133

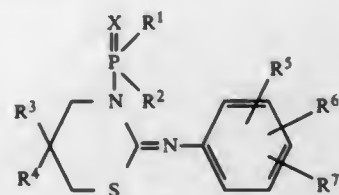
Claims priority, application Japan, Sep. 8, 1984, 59-188744

Int. Cl.<sup>4</sup> C07F 9/65; A01N 43/72; C07D 279/06

U.S. Cl. 514—90

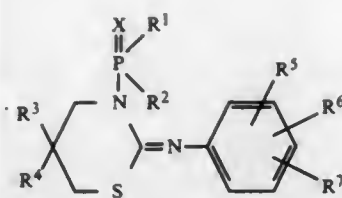
21 Claims

1. A compound of the formula:



wherein R<sup>1</sup> and R<sup>2</sup> each is lower alkoxy, lower alkynoxy, lower alkylthio, lower alkylamino, or C<sub>6</sub>-C<sub>8</sub> arylthio selected from the group consisting of phenylthio, tolylthio and xylylthio; R<sup>3</sup> and R<sup>4</sup> each is hydrogen or lower alkyl; R<sup>5</sup>, R<sup>6</sup>, and R<sup>7</sup> each is hydrogen, lower alkyl, lower alkoxy, halogen, or trifluoromethyl; and X is oxygen or sulfur.

9. An insecticidal composition comprising an insecticidally effective amount of one or more of the compounds of the formula:



wherein R<sup>1</sup> and R<sup>2</sup> each is lower alkoxy, lower alkynoxy, lower alkylthio, lower alkylamino, or C<sub>6</sub>-C<sub>8</sub> arylthio selected from the group consisting of phenylthio, tolylthio and xylylthio; R<sup>3</sup> and R<sup>4</sup> each is hydrogen or lower alkyl; R<sup>5</sup>, R<sup>6</sup>, and R<sup>7</sup> each is hydrogen, lower alkyl, lower alkoxy, halogen, or trifluoromethyl; and X is oxygen or sulfur and one or more carriers therefor.

4,681,875

**3,17-ESTRIOL DIESTERS, METHODS OF THEIR USE, AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM**

Henry Laurent; Dieter Bittler; Sybille Beler, and Walter Elger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,737

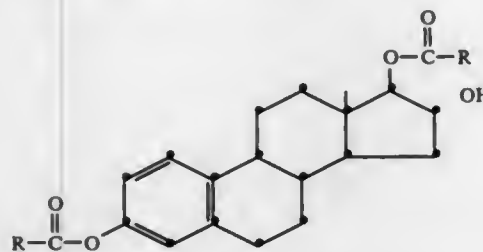
Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418562

Int. Cl.<sup>4</sup> C07J 00/00; A61K 31/56

U.S. Cl. 514—182

19 Claims

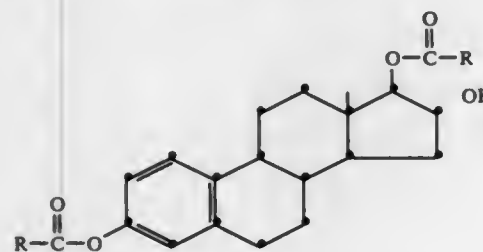
1. An estriol ester of the formula



wherein

R, in each case, is a hydrocarbon aliphatic, cycloaliphatic, aliphatic or aromatic group of 3-10 carbon atoms.

18. A method of achieving a gynecological effect in a patient comprising administering an effective amount of a 3,17-beta-estriol diester of the formula:



wherein

R, in each case, is a hydrocarbon aliphatic cycloaliphatic-aliphatic or aromatic group of 1-10 carbon atoms.

4,681,876

**ANTIFUNGAL UTILITY OF BILE ACIDS**

Brian A. Marples, Loughborough, and Reginald J. Stretton, Quorn, both of England, assignors to National Research Development Corporation, London, England

Filed Jul. 15, 1985, Ser. No. 755,016

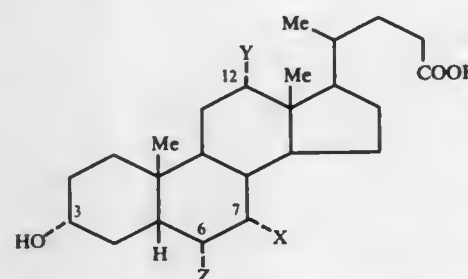
Claims priority, application United Kingdom, Jul. 13, 1984, 8417895

Int. Cl.<sup>4</sup> A61K 31/56; C07J 1/00

U.S. Cl. 514—182

6 Claims

1. A method of combatting a fungal infection in a human patient which comprises applying topically to the site of the infection in the patient at least one bile acid of the general formula



wherein Me represents a methyl group and each of X, Y and Z independently represents a hydrogen atom or a hydroxyl group or a derivative thereof which is a conjugate formed between the COOH group shown and the NH<sub>2</sub> group of an amino acid having 3 to 6 chain atoms, inclusive of the amino and acid groups, or a salt pharmaceutically acceptable of such an acid or conjugate.

4,681,877

**PIVALOYLOXYMETHYL****7-β-[2-(2-AMINO-4-THIAZOLYL)-2-METHOXYIMINOACETAMIDO]-3-(2-AMINO-1,3-THIADIAZOLYL-5-THIOMETHYL)-3-CEPHEME-4-CARBOXYLATE AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME**

Shigeaki Muto; Takao Ando; Takayoshi Fujii; Akihiko Kanno, all of Tokyo; Yoko Onishi, Mitaka; Isamu Motokawa, Hino; Takao Furusho, Machida, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1983, Ser. No. 562,003

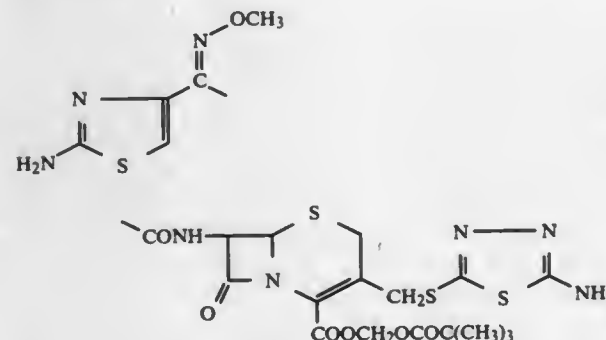
Claims priority, application Japan, Dec. 24, 1982, 57-233697; Mar. 1, 1983, 58-33579

Int. Cl.<sup>4</sup> A61K 31/545; C07D 501/36

U.S. Cl. 514—206

4 Claims

1. Pivaloyloxymethyl 7-beta-[2-amino-4-thiazolyl]-2-methoxyiminoacetamido]-3-(2-amino-1,3-thiadiazolyl)-5-thiomethyl)-3-cepHEME-4-carboxylate represented by the following formula:



4. A method for the treatment of infectious diseases caused

by bacteria which comprises administering an effective amount of the compound pivaloyloxymethyl 7-beta-[2-(2-amino-4-thiazolyl)-2-methoxyiminoacetamido]-3-(2-amino-1,3,4-thiadiazolyl-5-thiomethyl)-3-cepHEME-4-carboxylate of claim 1.

4,681,878

**FLUOROPHENO-THIAZINE AND PHARMACEUTICAL USE**

John D. McDermid, Durham, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 759,504, Jul. 26, 1985, abandoned, which is a continuation of Ser. No. 678,338, Dec. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 616,311, Jun. 1, 1984, abandoned. This application Jul. 23, 1986, Ser. No. 888,278

Int. Cl.<sup>4</sup> A61K 31/54; C07D 279/28

U.S. Cl. 514—223

14 Claims

1. A compound which is 2-[10-(2-Dimethylaminopropyl)-7-fluoro-2-phenothiazinyl]-2-methylpropionic acid or a salt, ester or amide thereof.

7. A method of relieving the detrimental effects of histamine in a mammal comprising administering to said mammal an effective amount of 2-[10-(2-Dimethylaminopropyl)-7-fluoro-2-phenothiazinyl]-2-methylpropionic acid or a salt, ester or amide thereof.

4,681,879

**11-SUBSTITUTED****5H,11H-PYRROLO[2,1-C][1,4]BENZOXAZEPINES AS ANTIPSYCHOTIC AND ANALGESIC AGENTS**

Richard C. Effland, Bridgewater; Larry Davis, Sergeantsville, and Kevin J. Kapples, Bridgewater, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

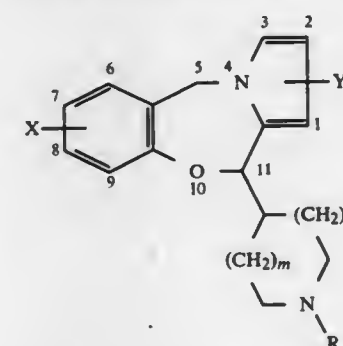
Continuation-in-part of Ser. No. 549,098, Nov. 7, 1983, Pat. No. 4,608,374. This application Mar. 20, 1985, Ser. No. 713,938. The portion of the term of this patent subsequent to Aug. 26, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> C07D 413/04; A61K 31/40, 31/445

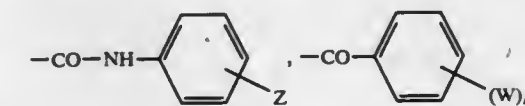
U.S. Cl. 514—211

60 Claims

1. A compound of the formula

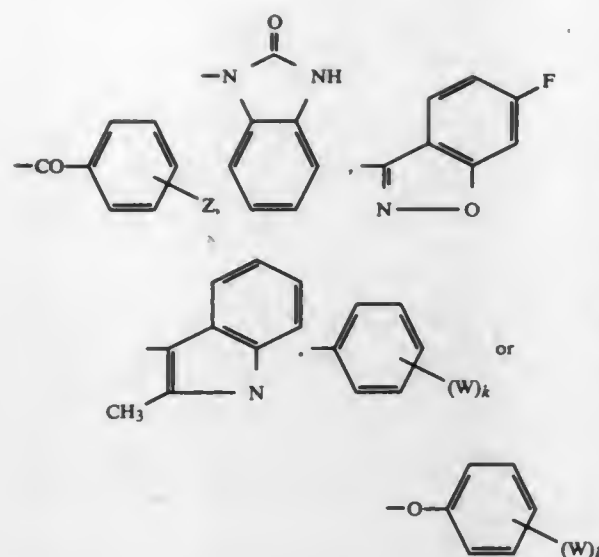


where m and n are each independently 0, 1 or 2 and m+n is 1 or 2, X and Y are each independently hydrogen, loweralkyl or halogen, and R is hydrogen, cyano, —C(NH<sub>2</sub>)NOH,



unsubstituted loweralkyl, or substituted loweralkyl having one to three substituents each of which being independently cyano, hydroxy, cycloalkyl of 3-6 carbon atoms, furyl, thienyl,





being 1, 2 or 3, W being each independently hydrogen, halogen, hydroxy, loweralkyl, trifluoromethyl, loweralkoxy, nitro, amino, diloweralkylamino, phenoxy, or benzyloxy, and Z being hydrogen, loweralkyl or halogen, or a pharmaceutically acceptable acid addition salt thereof.

4,681,880

#### USE OF THIO ISOSTERES OF ERGOT PEPTIDE ALKALOIDS AS VASOCONSTRICTORS

Hans Kobel, Basel; Jean-Jacques Sanglier, Oberwil; Hans Tschertter, Allschwil, and Georg Bolliger, Binningen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland Division of Ser. No. 404,832, Aug. 3, 1982, Pat. No. 4,542,135.

This application Jul. 2, 1985, Ser. No. 751,272

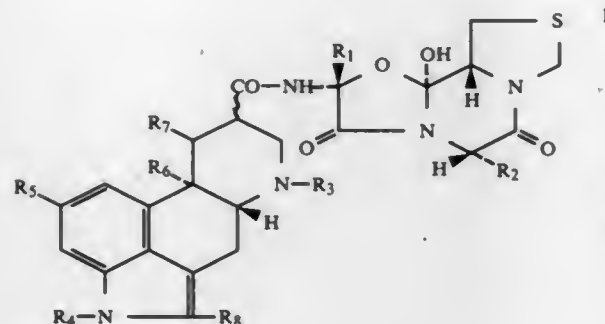
Claims priority, application Switzerland, Aug. 7, 1981, 5104/81

Int. Cl.<sup>4</sup> A61K 31/495; C07D 519/02

U.S. Cl. 514—250

10 Claims

1. A method of inducing vasoconstriction in a subject which comprises administering to a subject in need of such treatment a therapeutically effective amount of a compound of formula I.



wherein

R<sub>1</sub> is (C<sub>1-4</sub>)alkyl,  
R<sub>2</sub> is (C<sub>1-6</sub>)alkyl or benzyl,  
R<sub>3</sub> and R<sub>4</sub> independently are hydrogen or (C<sub>1-4</sub>)alkyl,  
R<sub>5</sub> is hydrogen or bromine,  
R<sub>6</sub> and R<sub>7</sub> are each hydrogen, or  
R<sub>6</sub> and R<sub>7</sub> together form a single bond, or  
R<sub>6</sub> is methoxy and R<sub>7</sub> is hydrogen, and  
R<sub>8</sub> is hydrogen, methyl, or halogen of atomic number from 9 to 35,  
with the proviso that when R<sub>5</sub> is bromine R<sub>7</sub> is hydrogen, in

free base form or in pharmaceutically acceptable acid addition salt form.

4,681,881

5-ALKOXY-PYRIDO[4,3-d]PYRIMIDINE DERIVATIVES  
Jörgen Kleinschroth, Denzlingen; Karl Mannhardt, Elzach-Oberprechtal; Johannes Hartenstein, Stegen-Wittental; Hartmut Osswald, Waldkirch, and Bernd Wagner, Denzlingen, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 819,961

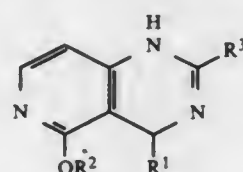
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502590

Int. Cl.<sup>4</sup> A61K 31/505; C07D 487/04

U.S. Cl. 514—258

5 Claims

1. A compound of the formula or its tautomers



wherein

R<sup>1</sup> is phenyl or phenyl substituted by one or two of the same or different substituents selected from halogen, nitro, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, difluoromethoxy, trifluoromethoxy, dimethylamino, diethylamino methylthio, trifluoromethyl, and methylenedioxy;

R<sup>2</sup> is a straight or branched alkyl group having one to six carbon atoms;

R<sup>3</sup> is a straight or branched alkyl group having up to six carbon atoms, or phenyl or phenyl substituted by one or more of the same or different substituents selected from halogen, nitro, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, difluoromethoxy, trifluoromethoxy, dimethylamino, diethylamino, methylthio, trifluoromethyl, and methylenedioxy, or a pharmacologically acceptable acid addition salt thereof.

4,681,882

4-ALKOXY-PYRIDO[2,3-D]PYRIMIDINE DERIVATIVES  
Jörgen Kleinschroth; Gerhard Satzinger, both of Denzlingen; Karl Mannhardt, Elzach-Oberprechtal; Johannes Hartenstein, Stegen-Wittental; Hartmut Osswald, Waldkirch; Günter Weinheimer, Denzlingen, and Edgar Fritsch, St. Peter, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Oct. 16, 1985, Ser. No. 787,844

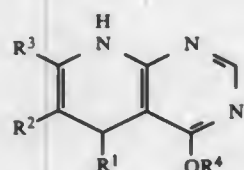
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438351

Int. Cl.<sup>4</sup> A61K 31/435; C07D 471/04

U.S. Cl. 514—258

9 Claims

1. A compound of the formula



wherein

R<sup>1</sup> is phenyl, pyridyl or thienyl, or phenyl substituted by up to three of the same or different groups selected from a straight or branched alkyl with up to four carbon atoms, halogen, nitro, a straight or branched alkoxy with up to

four carbon atoms, difluoromethoxy, trifluoromethoxy, dialkylamino, alkylthio or trifluoromethyl or a methylenedioxy group;

R<sup>2</sup> represents a nitrile group, a carboxyl group or an alkoxy-carbonyl residue with up to six carbon atoms;

R<sup>3</sup> is a straight-chained or branched alkyl group with up to four carbon atoms or an amino group; and

R<sup>4</sup> represents a straight-chained or branched alkyl group with up to four carbon atoms; or a pharmaceutically acceptable salt thereof.

8. A pharmaceutical composition comprising a vasospasmodically effective amount of a compound as claimed in claim 1 with a pharmaceutically acceptable carrier or diluent.

4,681,884

#### DIAZINE-ETHENYLPHENYL OXAMIC ACIDS AND ESTERS AND SALTS THEREOF

Karl G. Grozinger, Ridgefield, and James T. Oliver, Middlebury, both of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

Continuation-in-part of Ser. No. 528,522, Sep. 7, 1983, abandoned.

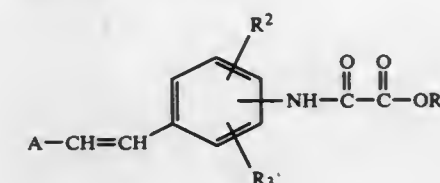
This application May 10, 1985, Ser. No. 733,007

Int. Cl.<sup>4</sup> A61K 31/505; C07D 239/26, 239/30, 239/34

U.S. Cl. 514—256

29 Claims

1. A compound of the formula



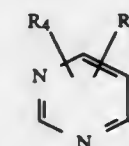
wherein

R<sub>1</sub> is hydrogen or alkyl of 1 to 4 carbon atoms;

R<sub>2</sub> is hydrogen, methyl, hydroxyl, alkoxy of 1 to 4 carbon atoms, di(alkyl of 1 to 2 carbon atoms)amino-(alkoxy of 1 to 4 carbon atoms) or halogen;

R<sub>3</sub> is hydrogen or NHCOCOR<sub>1</sub>;

A is



R<sub>4</sub> is hydrogen, methyl, alkoxy of 1 to 4 carbon atoms, hydroxyl, amino, alkanoyloxy of 1 to 2 carbon atoms, di(alkyl of 1 to 2 carbon atoms)-amino-(alkoxy of 1 to 4 carbon atoms) or acetamido; and

R<sub>5</sub> is hydrogen, amino, alkoxy of 1 to 4 carbon atoms, halogen or NHCOCOR<sub>1</sub>;

or, when R<sub>1</sub> is hydrogen, a nontoxic, pharmaceutically acceptable salt thereof.

28. A composition comprising an effective antiallergic amount of a compound of any of claims 1, or 2, and a nontoxic, pharmaceutically acceptable carrier.

4,681,885

#### 5-OXO-PYRIDO[4,3-PYRIMIDINE DERIVATIVES

Jörgen Kleinschroth, Denzlingen; Karl Mannhardt, Elzach-Oberprechtal; Johannes Hartenstein, Stegen-Wittental; Hartmut Osswald, Waldkirch, and Bernd Wagner, Denzlingen, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 819,958

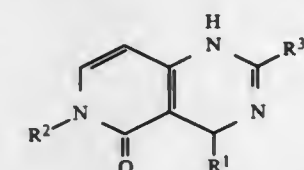
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1985, 3502742

Int. Cl.<sup>4</sup> A61K 31/505; C07D 487/04

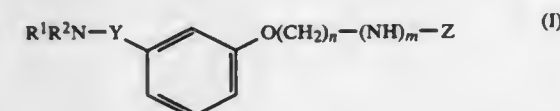
U.S. Cl. 514—258

5 Claims

1. A compound of the formula,



wherein R<sup>1</sup> is phenyl or phenyl substituted in the two and/or three or six position by one or more of the same or different



or a pharmaceutically acceptable salt thereof, wherein:

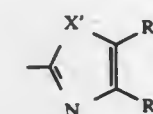
R<sup>1</sup> and R<sup>2</sup> are independently C<sub>1-4</sub>alkyl; or R<sup>1</sup> and R<sup>2</sup> together with the nitrogen atom to which they are joined represent a pyrrolidino, piperidino or hexahydroazepino ring;

Y is a straight-chain or branched-chain C<sub>1-4</sub>alkyl;

n is 2 to 5;

m is 1;

Z is:



wherein

X' is oxygen, or sulphur;

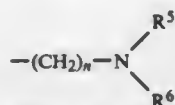
R<sup>7</sup> and R<sup>8</sup> are independently hydrogen, C<sub>1-4</sub>alkyl, phenyl, benzyl, halo, benzyloxy or C<sub>1-4</sub>alkoxy; or

R<sup>7</sup> and R<sup>8</sup> may be joined to form a benzene ring; said benzene ring being optionally substituted by up to 3 moieties selected from C<sub>1-4</sub>alkyl, C<sub>1-4</sub>alkoxy, halo, phenyl, benzyl or benzyloxy;

with the proviso that when X' is oxygen R<sup>7</sup> and R<sup>8</sup> are independently C<sub>1-4</sub>alkyl, phenyl, hydrogen or benzyl, or are joined to form an optionally substituted benzene ring.

18. A pharmaceutical composition for blocking histamine H<sub>2</sub>-receptors which comprises an effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

substituents selected from halogen, nitro, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, difluoromethoxy, trifluoromethoxy, dimethylamino, diethylamino, methylthio, trifluoromethyl and methylenedioxy R<sup>2</sup> is hydrogen, a C<sub>1</sub>-C<sub>6</sub> alkyl group, a C<sub>1</sub>-C<sub>8</sub> alkoxy group, or a C<sub>1</sub>-C<sub>8</sub> aminoalkyl group of the formula



R<sup>5</sup> and R<sup>6</sup> may be the same or different and represent a straight or branched alkyl group or together form an alkylene group and n is two or three, R<sup>3</sup> is a straight or branched alkyl group having one to four carbon atoms, phenyl or phenyl substituted by one or more of the same or different substituents selected from halogen, nitro, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, difluoromethoxy, trifluoromethoxy, dimethylamino, diethylamino, methylthio, trifluoromethyl and methylenedioxy, or a pharmacologically acceptable acid addition salt thereof.

4. A pharmaceutical composition comprising a vasospasmodically effective amount of a compound according to claim 1 together with a pharmacologically acceptable carrier or or diluent.

4,681,886

#### SUBSTITUTED 4-PHENOXY OR 4-PHENYLTHIO PROLINES

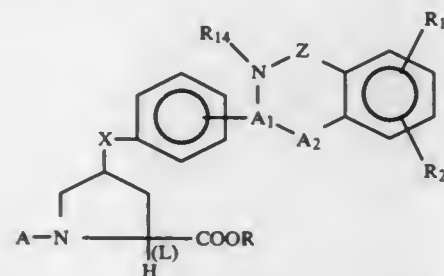
Rudiger D. Haugwitz, Titusville, and Peter W. Sprague, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 373,570, Apr. 30, 1982, abandoned. This application Apr. 25, 1983, Ser. No. 488,491 Int. Cl.<sup>4</sup> A61K 31/505, 31/54; C07D 403/12, 417/12

U.S. Cl. 514-259

17 Claims

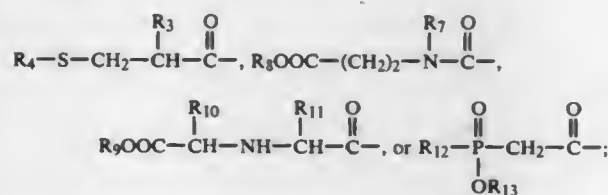
1. A compound of the formula



and a physiologically acceptable salt thereof wherein x is oxygen or sulfur;

-A<sub>1</sub>-A<sub>2</sub>- is -CH-NH- or -C=N-;

A is



R, R<sub>8</sub> and R<sub>9</sub> are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, benzhydryl, and a physiologically acceptable salt forming ion;

R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, halo substituted lower alkyl, nitro, and -SO<sub>2</sub>NH<sub>2</sub>;

Z is

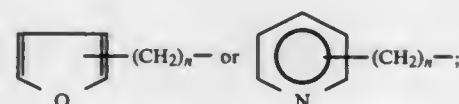
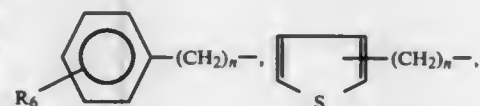


R<sub>3</sub> is hydrogen, lower alkyl, halo substituted lower alkyl, phenyl, benzyl, phenethyl or cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons;

R<sub>4</sub> is hydrogen or



R<sub>5</sub> is lower alkyl,

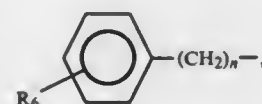


n is zero, one, two, three or four;

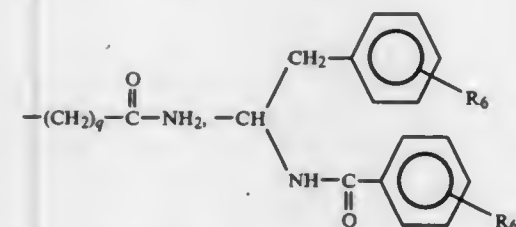
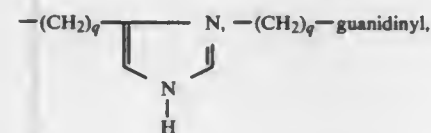
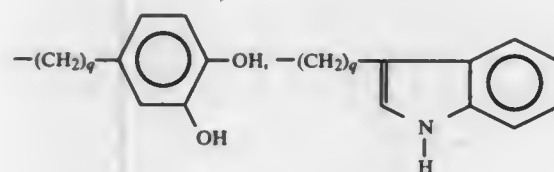
R<sub>6</sub> is hydrogen, lower alkyl, lower alkoxy, halogen, or hydroxy;

R<sub>7</sub> is lower alkyl or cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons;

R<sub>10</sub> is hydrogen, lower alkyl,

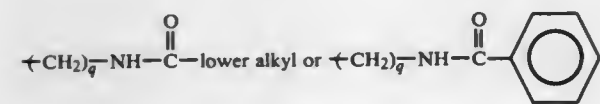
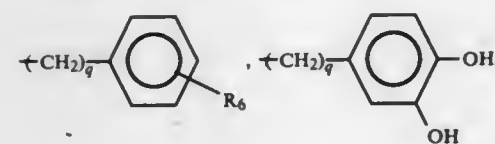
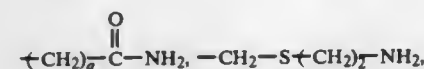
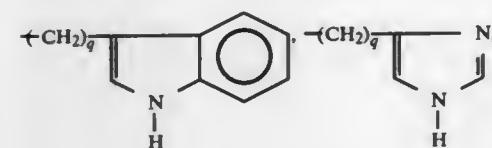


halo substituted lower alkyl, hydroxy substituted lower alkyl, -(CH<sub>2</sub>)<sub>q</sub>-cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons, -(CH<sub>2</sub>)<sub>q</sub>-N(lower alkyl)<sub>2</sub>, -(CH<sub>2</sub>)<sub>q</sub>-NH<sub>2</sub>, -(CH<sub>2</sub>)<sub>q</sub>-carboxy, -(CH<sub>2</sub>)<sub>q</sub>-SH, -(CH<sub>2</sub>)<sub>q</sub>-S-lower alkyl,

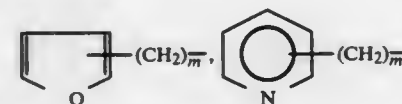
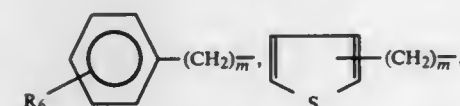


q is one, two, three or four;

R<sub>11</sub> is hydrogen, lower alkyl, halo substituted lower alkyl, hydroxy substituted lower alkyl, -(CH<sub>2</sub>)<sub>q</sub>-NH<sub>2</sub>, -(CH<sub>2</sub>)<sub>q</sub>-N(lower alkyl)<sub>2</sub>, -(CH<sub>2</sub>)<sub>q</sub>-guanidinyll,



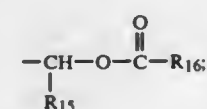
R<sub>12</sub> is alkyl of 1 to 10 carbons,



cycloalkyl-(CH<sub>2</sub>)<sub>m</sub>- wherein cycloalkyl is a saturated ring of 3 to 7 carbons;

m is zero or an integer from 1 to 7;

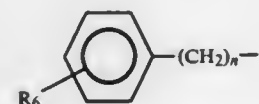
R<sub>13</sub> is hydrogen, lower alkyl, benzyl, benzhydryl, a physiologically acceptable salt forming ion or



R<sub>15</sub> is hydrogen, lower alkyl, cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons, or phenyl;

R<sub>16</sub> is hydrogen, lower alkyl, lower alkoxy, cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons, phenyl, benzyl, or phenethyl; and

R<sub>14</sub> is hydrogen, lower alkyl, cycloalkyl-(CH<sub>2</sub>)<sub>n</sub>- wherein cycloalkyl is a saturated ring of 3 to 7 carbons,



halo substituted lower alkyl, hydroxy substituted lower alkyl, -(CH<sub>2</sub>)<sub>q</sub>-N(lower alkyl)<sub>2</sub>, or -(CH<sub>2</sub>)<sub>q</sub>-NH<sub>2</sub>.

4,681,887

#### PHARMACEUTICAL COMPOSITIONS WITH A NEUROLEPTIC ACTION AND PROCESS FOR PREPARING SAME

Gábor Megyeri; Tibor Keve; Béla Stefkó; Erik Bogsch; János Galambos; Anna Kassainée Zieger; Ferenc Trischler; Éva Pálosi; Dóra Groó; Egon Kárpáti; Zsolt Szombathelyi; László Szporny, all of Budapest; Béla Kiss, Vecsés; István Laszlovsky, and Erzsébet Lapis, both of Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

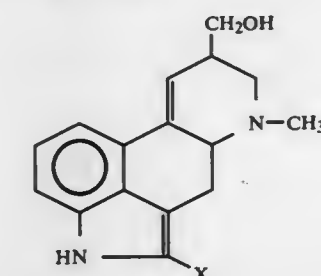
Filed Jun. 23, 1986, Ser. No. 877,298

Claims priority, application Hungary, Jun. 21, 1985, 2445/85 Int. Cl.<sup>4</sup> A61K 31/44

U.S. Cl. 514-284

7 Claims

1. A method of treating a psychiatric disease responsive to a dopaminergic antagonistic effect in a mammalian subject needing said treatment which comprises the step of administering to said mammalian subject a therapeutically effective amount of a compound of the Formula (I)



wherein X is chloro, bromo, or iodo; or a pharmaceutically acceptable acid addition salt thereof.

4,681,888

#### THIENOPYRIDINE DERIVATIVES AND ANTI-THROMBOTIC COMPOSITIONS CONTAINING THE SAME

Andre Esanu, Paris, France, assignor to Societe de Conseils de Recherches et d'Applications Scientifiques, Paris, France

Continuation-in-part of Ser. No. 792,484, Oct. 29, 1985, abandoned. This application Aug. 8, 1986, Ser. No. 894,780

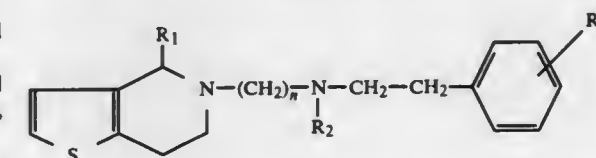
Claims priority, application United Kingdom, Nov. 16, 1984, 8429087

Int. Cl.<sup>4</sup> A61K 31/44; C07D 495/04

U.S. Cl. 514-301

2 Claims

1. A derivative of 5-(ω-phenethylamino-alkyl)-4,5,6,7-tetrahydro-thieno-(3,2-c)-pyridine of the formula



wherein n is an integer of from 2 to 5, R<sub>1</sub> represents a hydrogen atom or a 3,4-dimethoxyphenyl group, R<sub>2</sub> represents a hydrogen atom, an alkyl group having up to 4 carbon atoms or a 4-cyano-4-(3,4-dimethoxyphenyl)-5-methylhexyl group and R<sub>3</sub> represents two or three methoxy groups; and therapeutically acceptable salts thereof.

2. An anti-thrombotic therapeutic composition of matter containing, as an active ingredient therein, an anti-thrombotically effective amount of a compound according to claim 1 in admixture with a therapeutically acceptable diluent or carrier.



4,681,889

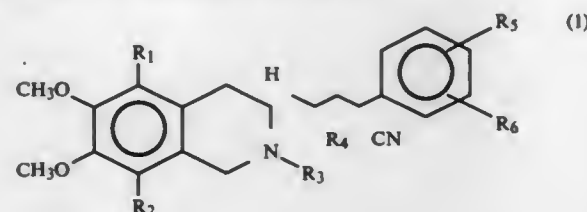
**METHOD FOR TREATING CARDIOVASCULAR DISEASE WITH CALCIUM CHANNEL ANTAGONISTS**  
Robin Clark, Palo Alto; Joseph M. Muchowski, Sunnyvale; Fang-Ting Chin, Union City; John O. Gardner, Los Altos, and Jacob Berger, Los Altos Hills, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 803,464, Dec. 2, 1985, Pat. No. 4,613,606. This application Jun. 27, 1986, Ser. No. 879,689  
Int. Cl.<sup>4</sup> A61K 31/47; C07D 217/20

U.S. Cl. 514—307

5 Claims

1. A method for treating cardiovascular diseases susceptible to treatment with calcium channel blockers, which method comprises administering an effective amount of a compound of formula 1 to a mammal in need thereof



wherein

R<sub>1</sub> and R<sub>2</sub> are each independently —H or lower alkoxy;  
R<sub>3</sub> and R<sub>4</sub> are each independently lower alkyl; and  
R<sub>5</sub> and R<sub>6</sub> are each —OCH<sub>3</sub>, or together form —OCH<sub>2</sub>O— or —OCH<sub>2</sub>CH<sub>2</sub>O—;  
and pharmaceutically acceptable acid addition salts thereof.

4,681,890

**3,4-DIHYDROBENZOPYRAN COMPOUNDS AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME**

Koichi Kanehira; Manzo Shiono; Yoshiji Fujita; Takashi Nishida, all of Kurashiki, and Johji Yamahara, Otsu, all of Japan, assignors to Kararay Co., Ltd., Okayama, Japan  
Filed Oct. 23, 1985, Ser. No. 790,670

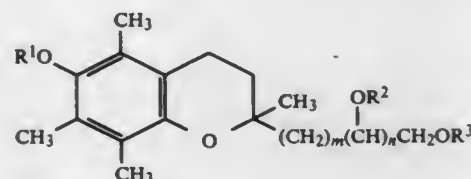
Claims priority, application Japan, Oct. 30, 1984, 59-229367; Mar. 4, 1985, 60-43380

Int. Cl.<sup>4</sup> C07D 405/12; A61K 31/455

U.S. Cl. 514—333

12 Claims

1. A 3,4-dihydrobenzopyran compound of the formula:



wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are each hydrogen or nicotinoyl group and at least one of them is nicotinoyl group, m is an integer of 0, 1 or 2, and n is an integer of 0 or 1.

4,681,891

**DIHYDRO-2,6-DIMETHYL PYRIDINES, FORMULATIONS AND METHOD OF USE FOR TREATING ANGINA PECTORIS, HIGH BLOOD PRESSURE OR DISTURBANCES OF CEREBRAL OR PERIPHERAL BLOOD FLOW**

Karl Schönaufinger, Alzenau; Helmut Bohn, Schöneck; Piero Martorana, Bad Homburg, and Rolf-Eberhard Nitz, Frankfurt, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Fed. Rep. of Germany  
Filed Nov. 12, 1985, Ser. No. 796,806

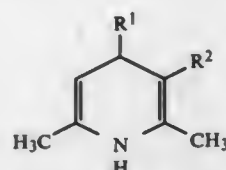
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1984, 3443179

Int. Cl.<sup>4</sup> C07D 413/04, 417/04; A61K 31/44

U.S. Cl. 514—340

8 Claims

1. A 1,4-dihydropyridine of the formula



wherein R<sup>1</sup> is a phenyl radical unsubstituted or optionally substituted with one or two identical or different substituents selected from the group consisting of alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogen, trifluoro-methyl, nitro, cyano and benzyloxy groups, R<sup>2</sup> is a radical selected from the group consisting of 1,2,4-oxadiazole, 1,3,4-oxadiazole, 1,2,4-thiadiazole and 1,3,4-thiadiazole radicals which are either unsubstituted or substituted with a radical selected from the group consisting of alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, aralkyl having 7 to 9 carbon atoms, alkylalkyl having a total of 2 to 5 carbon atoms, cycloalkyl having 5 or 6 carbon atoms, amino-carbonylmethylthio, methoxy carbonyl, ethoxycarbonyl and phenyl, and salts thereof with pharmacologically acceptable acids.

4,681,892

**ISOXAZOLIDINE INSECTICIDES AND FUNGICIDES**

Axel Ingendoh, Velbert; Wolfgang Scheinert, Leverkusen; Benedikt Becker, Mettmann; Kurt Halcour, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Feb. 27, 1986, Ser. No. 834,169

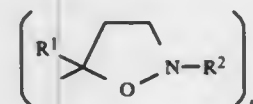
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509547

Int. Cl.<sup>4</sup> A61K 31/42; C07D 261/02

U.S. Cl. 514—378

10 Claims

1. An isoxazolidine of the formula



in which

n is 2 or 3,

R<sup>1</sup> is H or C<sub>1-4</sub>-alkyl,

R<sup>2</sup> is C<sub>1-10</sub>-alkyl, optionally substituted by C<sub>3-6</sub>-cycloalkyl; or is C<sub>3-6</sub>-cycloalkyl, optionally substituted by C<sub>1-10</sub>-alkyl or C<sub>3-6</sub>-cycloalkyl,

A is a di- or trivalent phenyl radical which is optionally substituted by C<sub>1-4</sub>-alkyl.

9. A method of combating insects, arachnids or fungi which comprises applying thereto or to a habitat thereof an insecticidally, arachnidically or fungicidally effective amount of a compound according to claim 1.

4,681,893

**TRANS-6-[2-(3- OR 4-CARBOXAMIDO-SUBSTITUTED PYRROL-1-YL)ALKYL]-4-HYDROXYPYRAN-2-ONE INHIBITORS OF CHOLESTEROL SYNTHESIS**

Bruce D. Roth, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

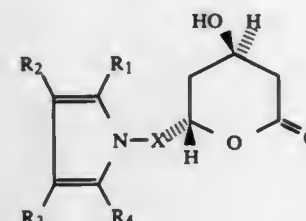
Filed May 30, 1986, Ser. No. 868,867

Int. Cl.<sup>4</sup> A61K 31/40, 31/35; C07D 207/327

U.S. Cl. 514—422

9 Claims

1. A compound of structural formula 1



wherein

X is —CH<sub>2</sub>—, —CH<sub>2</sub>CH<sub>2</sub>—, —CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>—, or —CH<sub>2</sub>CH(CH<sub>3</sub>)—;

R<sub>1</sub> is

1-naphthyl;  
2-naphthyl;  
cyclohexyl;  
norbornenyl;  
phenyl;  
phenyl substituted with

fluorine,  
chlorine,  
bromine,  
hydroxyl,  
trifluoromethyl,  
alkyl of from one to four carbon atoms,  
alkoxy of from one to four carbon atoms, or  
alkanoyloxy of from two to eight carbon atoms;

either of R<sub>2</sub> or R<sub>3</sub> is —CONR<sub>5</sub>R<sub>6</sub> where R<sub>5</sub> and R<sub>6</sub> are independently

hydrogen;  
alkyl of from one to six carbon atoms;  
phenyl;

phenyl substituted with

fluorine,  
chlorine,  
bromine,  
cyano,  
trifluoromethyl, or  
carboalkoxy of from three to eight carbon atoms;

and the other of R<sub>2</sub> or R<sub>3</sub> is

hydrogen;  
alkyl of from one to six carbon atoms;

cyclopropyl;  
cyclobutyl;  
cyclopentyl;  
cyclohexyl;  
phenyl; or  
phenyl substituted with

fluorine,  
chlorine,  
bromine,  
hydroxyl,  
trifluoromethyl,  
alkyl of from one to four carbon atoms,

alkoxy of from one to four carbon atoms, or  
alkanoyloxy of from two to eight carbon atoms;

R<sub>4</sub> is

alkyl of from one to six carbon atoms;  
cyclopropyl;  
cyclobutyl;  
cyclopentyl;  
cyclohexyl; or  
trifluoromethyl;

or a hydroxy acid or pharmaceutically acceptable salts thereof, corresponding to the opened lactone ring of the compounds of structural formula 1 above.

8. A pharmaceutical composition, useful as a hypocholesterolemic agent, comprising a hypocholesterolemic effective amount of a compound in accordance with claim 1 in combination with a pharmaceutically acceptable carrier.

9. A method of inhibiting cholesterol biosynthesis in a patient in need of such treatment by administering a pharmaceutical composition as defined by claim 8.

4,681,894

**HYDROXAMIC ACIDS AND ESTERS**

William V. Murray, Belle Mead, and Michael P. Wachter, Bloomsbury, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

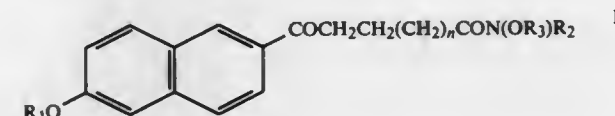
Filed Sep. 26, 1986, Ser. No. 912,901

Int. Cl.<sup>4</sup> C07C 83/10; A61K 31/085, 31/185, 31/21

U.S. Cl. 514—507

14 Claims

1. A compound of the formula



where

R<sub>1</sub> is C<sub>1-12</sub> alkyl, C<sub>3-12</sub> branched-chain alkyl, C<sub>2-6</sub> alkenyl, C<sub>3-6</sub> alkynyl or aralkyl wherein the alkyl group of the aralkyl is a C<sub>1-3</sub> alkyl and wherein the aralkyl group is unsubstituted or substituted with a C<sub>1-2</sub> alkyl or hydroxy-alkyl wherein the alkyl group is C<sub>1-6</sub>;

R<sub>2</sub> is H, C<sub>1-10</sub> alkyl, C<sub>3-10</sub> branched-chain alkyl, C<sub>5-7</sub> cycloalkyl, phenyl or phenyl substituted with C<sub>1-3</sub> alkyl or C<sub>1-3</sub> alkoxy;

R<sub>3</sub> is H or C<sub>1-3</sub> alkyl; and

(CH<sub>2</sub>)<sub>n</sub> is a straight- or branched-alkyl chain wherein n is 0-5.

9. A pharmaceutical composition for topical, oral, parenteral and aerosol administration, comprising an effective amount of a compound according to claim 1 as the active ingredient dispersed in a pharmaceutically acceptable carrier.

4,681,895

NOVEL

**GUANIDINOMETHYLCYCLOHEXANECARBOXYLIC ACID COMPOUNDS AND ANTI-ULCER DRUG CONTAINING THE SAME**

Toshio Satoh, Tokushima, and Goro Tsukamoto, Toyonaka, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 836,711

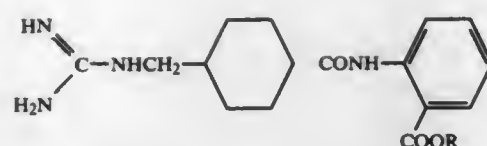
Claims priority, application Japan, Jun. 8, 1985, 60-47236

Int. Cl.<sup>4</sup> A61K 31/245; C07C 129/00

U.S. Cl. 514—535

6 Claims

1. An N-phenyl-trans-4-guanidinomethylcyclohexanecarboxamide compound of the formula:



wherein R is hydrogen atom or a lower alkyl group, and a pharmaceutically acceptable salt thereof.

4,681,896

**PHARMACEUTICAL AND DIETARY COMPOSITION**  
David F. Horrobin, Montreal, Canada, assignor to Efamol Limited, Surrey, England

Filed Jan. 31, 1984, Ser. No. 575,744

Claims priority, application United Kingdom, Feb. 1, 1983, 8302708

Int. Cl.<sup>4</sup> A61K 31/23

U.S. Cl. 514—552

14 Claims

1. A method of treating an atopic disorder wherein
  - (1) an effective amount of a metabolite of linoleic acid selected from the group consisting of GLA, DGLA, AA a 22:4n-6 essential fatty acid and a 22:5n-6 essential fatty acid, and
  - (2) an effective amount of a metabolite of alpha-linolenic acid selected from the group consisting of 18:4n-3, 20:4n-3, 20:5n-3, 22:5n-3 and 22:6n-3 essential fatty acids,
 are administered alone or in an acceptable pharmaceutical carrier or diluent to a person suffering from said disorder.

4,681,897

**PHARMACEUTICAL PRODUCTS PROVIDING ENHANCED ANALGESIA**

Larry M. Brand, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

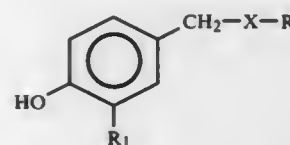
Division of Ser. No. 571,043, Jan. 16, 1984, abandoned. This application Dec. 24, 1984, Ser. No. 684,642

Int. Cl.<sup>4</sup> A61K 31/19, 31/16

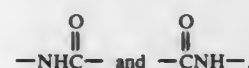
U.S. Cl. 514—557

15 Claims

1. An analgesic composition comprising a safe and effective amount of:
  - (a) a capsaicinoid analgesic compound of the general formula:



wherein R<sub>1</sub> is selected from the group consisting of OH and OCH<sub>3</sub>, X is selected from the group consisting of



- and R is a C<sub>16</sub>-C<sub>21</sub> cis-monounsaturated alkenyl;
- (b) a nonsteroidal analgesic selected from the group consisting of ibuprofen, naproxen, ketoprofen, fenaprofen, su-  
profen, flurbiprofen, benoxaprofen, perprofen, and car-  
profen; and
- (c) a pharmaceutically-acceptable carrier; wherein the  
weight ratio of (a):(b) is from about 20:1 to about 1:20.

# **4,681,898** **N-N-DISUBSTITUTED ALKENAMIDES AND** **PHENYLALKENAMIDES**

Jeffrey Nadelson, Denville, N.J., assignor to Sandoz Pharma-  
ceuticals Corp., E. Hanover, N.J.

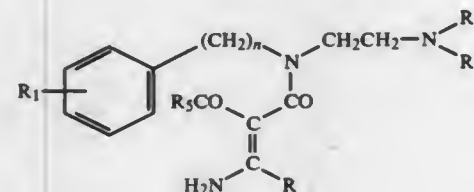
Continuation-in-part of Ser. No. 505,804, Jan. 20, 1983,  
abandoned, which is a continuation-in-part of Ser. No. 330,601,  
Dec. 14, 1981, abandoned. This application May 8, 1984, Ser.  
No. 608,126

Int. Cl.<sup>4</sup> C07C 103/22

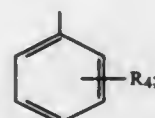
U.S. Cl. 514—619

13 Claims

1. A compound of the formula



where  
n is 0 or 1;  
R is lower alkyl, or



R<sub>2</sub> and R<sub>3</sub> are each, independently, lower alkyl,  
R<sub>1</sub> and R<sub>4</sub> are each, independently, hydrogen, halo having  
an atomic weight of 19 to 36, lower alkyl or lower alkoxy,  
and

R<sub>5</sub> is hydrogen or alkyl of 1 to 6 carbon atoms,  
or a pharmaceutically acceptable acid addition salt thereof.

12. A method for treating diabetes which comprises adminis-  
tering to an animal in need of said treatment a hypoglycemic  
effective amount of a compound of claim 1.

4,681,899

**METHOD OF PREVENTING THE GROWTH OF**  
**MALARIA PARASITES IN ERYTHROCYTES**

S. Tsuyoshi Ohnishi, 4220 Pine St., Philadelphia, Pa. 19104

Filed Mar. 29, 1985, Ser. No. 717,978

Int. Cl.<sup>4</sup> A61K 31/18, 31/135

U.S. Cl. 514—602

5 Claims

1. A method of inhibiting the growth of malaria parasites in  
a malaria victim comprising administering to said victim in a  
concentration sufficient enough to inhibit the growth of ma-  
laria parasites of a material selected from the group consisting  
of 1-propranolol; 1-, d-propranolol, 1-alprenolol and N-(6-  
aminohexyl)-5-chloro-1-naphthalenesulfonamide.

4,681,900

**BIOCIDE ACTIVATOR**

Tetsuji Iwasaki, Wakayama, Japan, assignor to Kao Corpora-  
tion, Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 689,904

Claims priority, application Japan, Jan. 13, 1984, 59-4569

Int. Cl.<sup>4</sup> A01N 25/00, 25/02; C11C 3/00

U.S. Cl. 514—786

17 Claims

1. A composition comprising (A) a carrier, (B) an effective  
amount of a biocide or plant growth regulator, and (C) from  
0.1 to 5 parts by weight, per 1 part by weight of (B), of an  
activator which is a polymeric composition prepared by a  
process of adding (1) an alkylene oxide selected from the group  
consisting of (a) propylene oxide and (b) both of propylene  
oxide and ethylene oxide, to (2) a mixture of at least one fatty

acid triglyceride and at least one polyhydric alcohol, the molar  
ratio of triglyceride/polyhydric alcohol in said mixture being  
in the range of from 1/0.2 to 1/2, the addition of said alkylene  
oxide (1) to said mixture (2) being performed under conditions  
effective to cause polymerization addition of said alkylene  
oxide (1) with said mixture (2) to form said polymeric composi-  
tion, the amount of propylene oxide added to said mixture  
being in the range of from 1 to 100 mols per 1 mol of the sum  
of the number of mols of triglyceride and polyhydric alcohol in  
said mixture.

4,681,903

**POLYESTER POLYOLS, A PROCESS FOR THEIR**  
**PRODUCTION AND THEIR USE IN THE ISOCYANATE**  
**POLYADDITION PROCESS**

Peter Haas, Haan; Hans-Ulrich Weber, Monheim; Claus-Dieter  
Sommerfeld, Much; Manfred Giersig, Cologne, and Rolf Wie-  
dermann, Odenthal, all of Fed. Rep. of Germany, assignors to  
Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep.  
of Germany

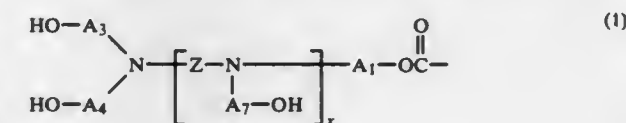
Filed Aug. 4, 1986, Ser. No. 892,978

Claims priority, application Fed. Rep. of Germany, Aug. 24,  
1985, 3530360; Sep. 10, 1985, 3532140; Mar. 20, 1986, 3609361  
Int. Cl.<sup>4</sup> C08G 18/14

U.S. Cl. 521—167

19 Claims

1. A polyester polyol corresponding to the formula



4,681,901

**NEOPRENE FOAM OF INCREASED CONTINUOUS**  
**VOLUME**

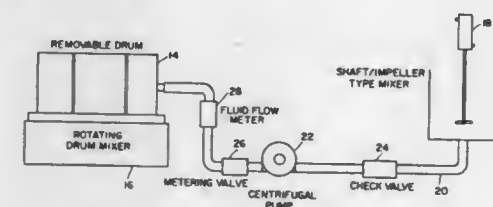
F. Paul Gavin, Mason, N.H.; David F. Brigham, Ellitoville  
Plantation, Me., and Ann H. Gavin, Mason, N.H., assignors to  
ModuForm, Inc., Fitchburg, Mass.

Filed Apr. 25, 1986, Ser. No. 856,295

Int. Cl.<sup>4</sup> C08J 9/24

U.S. Cl. 521—54

31 Claims



1. A process for manufacturing neoprene structures, which  
consists essentially of:

- (a) chopping neoprene foam into pieces;
- (b) mixing the chopped neoprene foam with an neoprene  
latex adhesive;
- (c) forming the neoprene mixture into a desired shape and  
structure and providing means by which said neoprene  
mixture can retain said shape and structure; and
- (d) drying the mixture.

4,681,902

**FLAME RETARDANT PHENOLIC FOAMS**

Alexander W. S. Duncan, Epsom, England; David G. Summers,  
Gwent, and Kenneth C. Thomas, South Glamorgan, both of  
Wales, assignors to BP Chemicals Limited, London, England

Filed Nov. 3, 1986, Ser. No. 926,992

Claims priority, application United Kingdom, Nov. 16, 1985,  
8528294

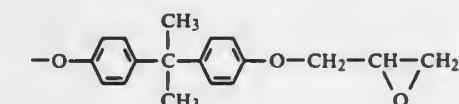
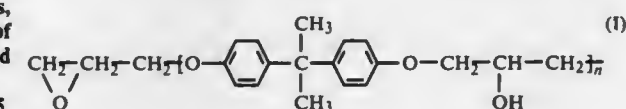
Int. Cl.<sup>4</sup> C08J 9/14

U.S. Cl. 521—85

10 Claims

1. A flame retardant resole foam having a k value below  
0.020 W/m k said foam having incorporated therein a flame  
retardant comprising:

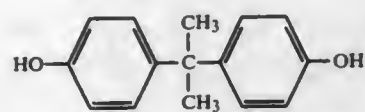
- (i) a halo-substituted diphenyl oxide with or without addi-  
tional hydrocarbyl substituents in the phenyl nuclei, and
- (ii) an organic phosphorus compound.



where n is approximately 100; a curing agent; and an inorganic  
filler;  
wherein the curing agent is a condensation product of 100



parts by weight of a polybasic carboxylic acid anhydride and 40-60 parts by weight of bisphenol A having Formula (II):



4,681,905

**STABILIZER COMPOSITIONS FOR SYNTHETIC RESINS IMPARTING IMPROVED LIGHT STABILITY**  
Naohiro Kubota, Ageo, and Atsushi Nishimura, Saitama, both of Japan, assignors to Adeka Argus Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,372

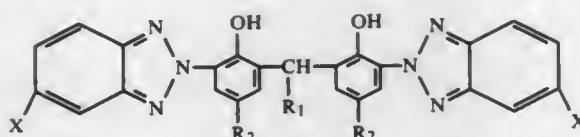
Claims priority, application Japan, Nov. 7, 1984, 59-234373  
Int. Cl.<sup>4</sup> C08K 5/34

U.S. Cl. 524-191

36 Claims

1. A stabilizer composition for improving the resistance of synthetic resins to deterioration when exposed to ultraviolet light, comprising

- (1) a 2,2,6,6-tetramethyl-piperidyl compound containing in the molecule at least one 2,2,6,6-tetramethyl-piperidyl group; and
- (2) an alkylidene-bis-(benzotriazolyl phenol) having the formula:



wherein:

- $R_1$  is hydrogen or alkyl having from one to about twelve carbon atoms;  
 $R_2$  is alkyl having from one to about twelve carbon atoms or arylalkyl having from seven to about sixteen carbon atoms;  
 $X$  is selected from the group consisting of hydrogen, halogen, alkyl having from one to about twelve carbon atoms, aryl having from six to ten carbon atoms, arylalkyl having from seven to about sixteen carbon atoms, alkoxy having from one to about twelve carbon atoms, aryloxy having from six to ten carbon atoms; and arylalkoxy having from seven to about sixteen carbon atoms.

4,681,906

**POLYPHENYLENE COMPOSITIONS CONTAINING SULFONATE HAVING IMPROVED MELT BEHAVIOR**  
Visvaldis Abolins, and Thomas A. Morelli, both of Delmar, N.Y., assignors to General Electric Company, Selkirk, N.Y.

Filed Nov. 1, 1985, Ser. No. 794,203

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> C08L 71/04

U.S. Cl. 524-166

8 Claims

1. A thermoplastic composition having improved melt behavior consisting essentially of:

- (a) a polyphenylene ether resin having an intrinsic viscosity less than approximately, 0.42 dl/g as measured in chloroform at 25° C.; and
- (b) a compound of the formula  $R-SO_3X$  wherein  $R$  represents an alkyl or aralkyl radical having 5 to 25 carbon atoms and  $X$  represents an alkali metal ion, in an amount effective for improving the melt behavior of said polyphenylene ether resin.

4,681,907  
**STABILIZERS FOR HALOGEN-CONTAINING ORGANIC POLYMERS COMPRISING AN ORGANOTIN MERCAPTIDE AND A DIESTER OF AN UNSATURATED DICARBOXYLIC ACID**

Keith A. Mesch, and Gary M. Conroy, both of Cincinnati, Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

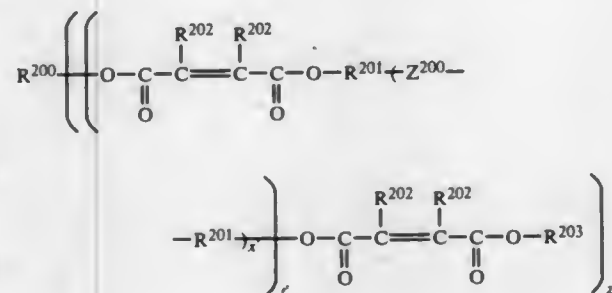
Continuation-in-part of Ser. No. 673,470, Nov. 20, 1984, Pat. No. 4,593,059. This application Sep. 20, 1985, Ser. No. 777,131  
 Int. Cl.<sup>4</sup> C08K 5/58

U.S. Cl. 524-180

27 Claims

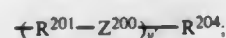
1. A composition capable of stabilizing halogen-containing organic polymers against the deteriorative effects of heat, light and weathering, said composition comprising the product produced by combining:

- A. an organotin compound or mixture of organotin compounds selected from the group consisting of organotin sulfides, organotin mercaptides, organotin carboxylates, and mixtures thereof; and
- B. in an amount sufficient to synergize the stabilization of the halogen-containing organic polymer but insufficient to plasticize said polymer, an essentially non-lubricating diester of a  $C_1$ - $C_{10}$  alcohol and an ethylenically unsaturated dicarboxylic acid having one carboxyl group on each carbon atom of the ethylene group said diester having the formula:



where:

$R^{200}$  and  $R^{203}$  each have from 1 to 10 carbon atoms and are at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl, multivalent hydrocarbyl group having a valence equal to  $z'$ , multivalent hydroxyl substituted hydrocarbyl group having a valence equal to  $z'$ , and

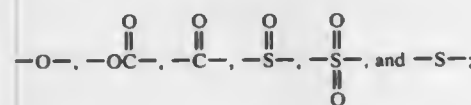


$R^{201}$  is at each independent occurrence selected from alkylene, alkenylene, cycloalkylene, cycloalkenylene, a multivalent hydrocarbyl group and multivalent hydroxyl-substituted hydrocarbyl group;

$R^{202}$  is at each independent occurrence selected from hydrogen, alkyl and alkylene;

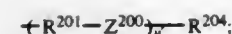
$R^{204}$  is at each independent occurrence selected from hydrogen and alkyl;

$Z^{200}$  is at each independent occurrence selected from



$t'$  is zero or an integer from 1 to about 20;

$x'$  is zero or an integer from 1 to about 20 with the proviso that if  $x'=0$  or  $t'=0$  then  $R^{200}$  is

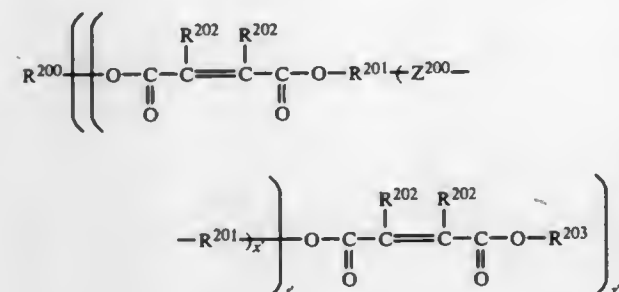


$y'$  is an integer from 1 to 10; and

$z'$  is an integer from 1 to 4.

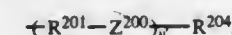
26. A composition comprising a halogen-containing organic polymer and, in an amount sufficient to stabilize said polymer against the deteriorative effects of heat, light and weathering, a stabilizer composition comprising the product produced by combining:

- A. an organotin compound or mixture of organotin compounds selected from the group consisting of organotin sulfides, organotin mercaptides, organotin carboxylates and mixtures thereof; and
- B. in an amount sufficient to synergize the stabilization of the halogen-containing organic polymer but insufficient to plasticize said polymer, an essentially non-lubricating diester of  $C_1$  to  $C_{10}$  alcohol and an ethylenically unsaturated dicarboxylic acid having one carboxyl group on each carbon atom of the ethylene group, said diester having the formula:



where:

$R^{200}$  and  $R^{203}$  each have from 1 to 10 carbon atoms and are at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl, multivalent hydrocarbyl group having a valence equal to  $z'$ , multivalent hydroxyl substituted hydrocarbyl group having a valence equal to  $z'$ , and

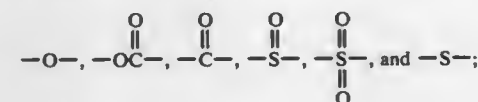


$R^{201}$  is at each independent occurrence selected from alkylene, alkenylene, cycloalkylene, cycloalkenylene, a multivalent hydrocarbyl group and multivalent hydroxyl-substituted hydrocarbyl group;

$R^{202}$  is at each independent occurrence selected from hydrogen, alkyl and alkylene;

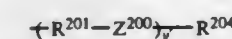
$R^{204}$  is at each independent occurrence selected from hydrogen and alkyl;

$Z^{200}$  is at each independent occurrence selected from



$t'$  is zero or an integer from 1 to about 20;

$x'$  is zero or an integer from 1 to about 20 with the proviso that if  $x'=0$  or  $t'=0$  then  $R^{200}$  is



$y'$  is an integer from 1 to 10; and

$z'$  is an integer from 1 to 4.

4,681,908

**HARD ORGANOPOLYSILOXANE RELEASE COATING**  
Dennis W. Broderick, Rhodes, and Harold L. Vincent, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 550,168, Nov. 9, 1983, Pat. No. 4,585,705. This application Oct. 31, 1985, Ser. No. 793,411

The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> C08K 5/54; C08G 77/16

U.S. Cl. 524-268

8 Claims

1. A composition of matter comprising

- (A) 100 parts by weight of a hydroxyfunctional polysiloxane resin copolymer containing  $CH_3SiO_{3/2}$  units,  $C_6H_5SiO_{3/2}$  units,  $(C_6H_5)_2SiO$  units and  $C_6H_5(CH_3)SiO$  units wherein there is present 0.5 to 5 weight percent hydroxy radicals attached to silicon atoms, the organic group to silicon ratio is from 0.8 to 1.4 and the  $C_6H_5$  to silicon ratio is from 0.35 to 0.85;
- (B) from 4 to 240 parts by weight, based on 100 parts of (A), of  $CH_3SiO_{3/2}$ ; and
- (C) from 0.2 to 6 parts by weight, based on 100 parts of (A), of a fluid polysiloxane having the formula  $(RR'R''Si)_xO[(CH_3)_2SiO]_y$ , wherein  $x$  has a value of from 250 to 850,  $R$  is  $OH$  or  $CH_3$ — and  $R'$  and  $R''$  are  $CH_3$ —, wherein there is present in component (C), less than fifteen percent by weight of  $(CH_3)_3SiO$  units.

4,681,909

**ROSIN EMULSION SIZING AGENT**

Koji Ohta; Masaaki Yoshimura, both of Chiba, and Mizuori Takahashi, Ichihara, all of Japan, assignors to Dic-Hercules Chemicals, Inc., Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,212

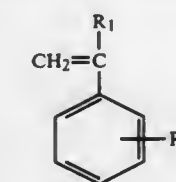
Claims priority, application Japan, Oct. 26, 1984, 59-224065  
 Int. Cl.<sup>4</sup> C08L 93/04

U.S. Cl. 524-272

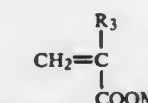
3 Claims

1. A rosin emulsion sizing agent comprising 20 to 50% by weight of fortified rosin, 2 to 30% by weight of an anionic saponification product of a styrene/acrylic acid copolymer or a styrene/methacrylic acid copolymer, and water.

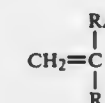
2. The sizing agent of claim 1 wherein the styrene/acrylic acid copolymer or styrene/methacrylic acid copolymer is a copolymer composed of 80 to 20% by weight of at least one monomer represented by the general formula



wherein  $R_1$  represents H or  $CH_3$ , and  $R_2$  represents H,  $CH_3$ ,  $CH_2CH_3$ ,  $CH(CH_3)_2$ , or  $C(CH_3)_2$ , 20 to 60% by weight of at least one monomer represented by the general formula



wherein  $R_3$  represents H,  $CH_3$  or  $CH_2COOH$ , and  $M$  represents H, Li, Na, K or  $NH_4$ , and 0 to 40% by weight of at least one monomer represented by the general formula



wherein  $R_4$  represents H or  $CH_3$ , and  $R_5$  represents CN,  $OCOCH_3$ ,  $COOCH_3$ ,  $COOC_2H_5$ ,  $COOC_3H_7$ ,  $COOC_4H_9$ ,  $COOC_6H_{13}$ ,  $COOC_8H_{17}$ ,  $COOC_{12}H_{25}$ ,  $CONH_2$ ,  $CONHCH_3$ ,  $CON(CH_3)_2$  or  $COOCH_2CH_2OH$ .

4,681,910

## AQUEOUS WATER-REPELLENT COATINGS

William B. Crockatt, Mississauga, and John Rinma, Oakville, both of Canada, assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 13, 1986, Ser. No. 818,036

Int. Cl.<sup>4</sup> C08L 23/04, 33/06, 91/04, 91/06

U.S. Cl. 524—487

14 Claims

1. An aqueous coating composition which dries to provide a continuous film from which a wax will slowly and progressively exude to provide a water-repellent surface that confers long-term water resistance consisting essentially of from about 5 percent to about 50 percent of an aqueous wax dispersion including at least about 30 percent of a petroleum wax, at least about 10 percent of a polyethylene wax and an amount of a surfactant sufficient to stabilize the dispersion; and from about 50 percent to about 95 percent of an aqueous emulsion of copolymerized monoethylenically unsaturated monomers having a sufficiently low glass transition temperature to coalesce on air drying, said proportions being by weight of solids based on the total solids not including any pigment, thickener, preservative or defoamer which may be present.

4,681,911

## REINFORCED COMPOSITES

Ike Y. Chang, West Chester, Pa., assignor to E.I. Du Pont de Nemours and Company, Wilmington, Del.

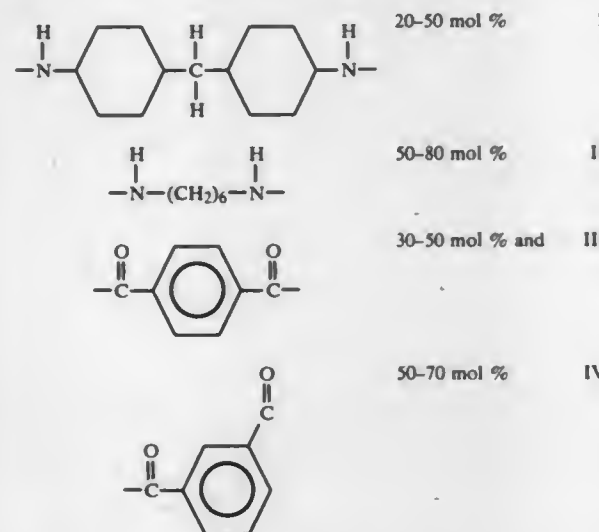
Filed Jan. 17, 1986, Ser. No. 819,562

Int. Cl.<sup>4</sup> C08K 7/14; C08L 77/00

U.S. Cl. 524—607

4 Claims

1. A composite comprising a matrix formed of a copolyamide of the following units:



with units I and II constituting 100 mol % of the diamino radical and units III and IV constituting 100 mol % of the diacid units, reinforced with from about 30 to 70% by volume of continuous filaments selected from the group of glass, carbon and p-aramid filaments.

# 4,681,912 PROCESS FOR MANUFACTURING INVERSE MICROLATICES OF WATERSOLUBLE COPOLYMERS, THE RESULTANT INVERSE MICROLATICES AND THEIR USE FOR IMPROVING THE PRODUCTION OF HYDROCARBONS

Jean-Pierre Durand, Chatou; Denise Nicolas, Maurepas; Norbert Kohler, Saint Germain en Laye; Francois Dawans, Bougival, and Francoise Candau, Strasbourg, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France  
Filed Jun. 7, 1985, Ser. No. 742,445

Claims priority, application France, Jun. 7, 1984, 84 08906; Jun. 7, 1984, 84 08907

Int. Cl.<sup>4</sup> C08J 0/00

U.S. Cl. 524—827

13 Claims

1. A process for producing a stable inverse microlatex comprising the steps of:

(a) admixing:

an aqueous solution containing at least one acrylic monomer (i) selected from acrylamide and methacrylamide and at least another acrylic monomer (ii) selected from acrylic acid, methacrylic acid and alkali salts of said acids, at a concentration from 20 to 80% by weight in said aqueous solution;

an oily phase comprising at least one hydrocarbon liquid, the ratio by weight between said aqueous solution and said oily phase being from 0.5/1 to 3/1, and

a non-ionic surfactant or a non-ionic surfactant mixture having a H L B from 8 to 11, in a proportion, with respect to all the involved constituents, higher than about a value y, given, in percent by weight, by the relationship:

$$y = 5.8 X^2 - 110 X + 534$$

wherein X is the H L B of said surfactant or said surfactant mixture, so as to form an inverse microemulsion, and

(b) subjecting the inverse microemulsion obtained in step (a) to copolymerization conditions.

4,681,913

# METHOD FOR PREVENTING PREMATURE CURING OF SILICONE COMPOSITIONS AND COMPOSITIONS MADE THEREBY

Edwin R. Evans, Clifton Park, and Arnold Torkelson, Burnt Hills, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 741,374, Jun. 5, 1985, abandoned. This application Aug. 18, 1986, Ser. No. 898,784

Int. Cl.<sup>4</sup> C08L 83/04

U.S. Cl. 524—862

18 Claims

1. In a curable silicone composition comprising:

I. a first package comprising:

(a) an olefin-containing polydiorganosiloxane, and

(b) a precious metal or precious metal containing hydrosilation catalyst, and

II. a second package comprising:

(c) an organohydrogenpolysiloxane crosslinking agent, the improvement comprising including in said second package from about 0.05 to about 3.0 parts by weight of Lewis base to substantially neutralize any Lewis acid present in said second package which was generated in situ.

4,681,914

# SOLID CAST DETERGENTS CONTAINING ENCAPSULATED HALOGEN BLEACHES AND METHODS OF PREPARATION AND USE

Keith E. Olson, Apple Valley, and Kent R. Brittain, Eagan, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 728,748, Apr. 30, 1985. This application May 8, 1986, Ser. No. 861,064

Int. Cl.<sup>4</sup> C11D 7/06, 7/56, 11/00, 17/00

U.S. Cl. 252—91

33 Claims

1. A solid, cast detergent-bleach composition, comprising:

(a) at least 30 wt-%, based upon the composition, alkaline hydratable chemical;

(b) an effective amount of a hardness-sequestrant wherein the hardness-sequestrant is different than the alkaline hydratable chemical;

(c) about 0 to 15 wt-%, based upon the composition, polyelectrolyte wherein the polyelectrolyte is different than the alkaline hydratable chemical and the hardness-sequestrant;

(d) at least 5 wt-%, based upon the alkaline hydratable chemical, water of hydration; and

(e) about 0.5 to 25 wt-%, based upon the composition, randomly dispersed encapsulated bleach particles, comprising:

(i) about 20 to 90 wt-%, based upon the encapsulated bleach particles, core which comprises a source of active-halogen bleach;

(ii) about 0 to 50 wt-%, based upon the encapsulated bleach particles, first coating which comprises a soluble inorganic coating agent; and

(iii) about 10 to 80 wt-%, based upon the encapsulated bleach particles, second coating which comprises a synthetic detergent.

17. A process for forming a substantially uniform solid cast detergent-bleach composition, comprising the steps of:

(a) heating about 20 to 75 wt-%, based upon the composition, of a 40 to 80 wt-% aqueous solution of an alkali metal hydroxide to about 50° to 95° C.;

(b) substantially uniformly distributing into the aqueous caustic solution:

(i) an effective amount of a wash water hardness sequestrant;

(ii) about 0 to 15 wt-%, based upon the composition, polyelectrolyte which is different than the hardness-sequestrant;

(iii) about 10 to 60 wt-%, based upon the composition, alkaline hydratable chemical which is different than the hardness-sequestrant and the polyelectrolyte; and

(iv) about 0.5 to 25 wt-%, based upon the composition, encapsulated bleach particles comprising:

(A) about 20 to 90 wt-%, based upon the encapsulated bleach particles, core which comprises a source of active-halogen bleach;

(B) about 0 to 50 wt-%, based upon the encapsulated bleach particles, first coating which comprises a soluble inorganic coating agent; and

(C) about 10 to 80 wt-%, based upon the encapsulated bleach particles, second coating which comprises a synthetic detergent; to form a liquid detergent-bleach composition; and

(c) allowing the liquid detergent-bleach composition to thicken and solidify.

4,681,915

# IMPACT MODIFIED POLYPHENYLENE ETHER-POLYAMIDE COMPOSITIONS

Gary M. Bates, Voorheesville; Gregory R. Chambers, and Sai-Pei Ting, both of Delmar, all of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,808

Int. Cl.<sup>4</sup> C08L 71/04

U.S. Cl. 525—148

16 Claims

1. A thermoplastic resin composition comprising:

a. a base resin comprising a compatible combination of a polyphenylene ether resin and a polyamide resin; and

b. a property improving amount of an impact modifying agent core-shell structure consisting essentially of a crosslinked acrylate core and an interpenetrating, cross-linked styrenic shell wherein the agent is prepared by polymerization a styrene with polyethylenically unsaturated cross-linking agent in the presence of the crosslinked acrylate core.

4,681,916

# POLY (VINYL CHLORIDE) COMPOSITIONS

Muyen M. Wu, Hudson; George S. Li, Solon, and Elmer J. Dewitt, Cuyahoga Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

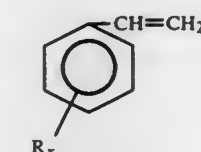
Filed May 5, 1986, Ser. No. 859,517

Int. Cl.<sup>4</sup> C08L 27/06

U.S. Cl. 525—210

16 Claims

1. A composition comprising an intimate admixture of (a) 50 to 98 parts by weight of a vinyl chloride polymer having an inherent viscosity of at least 0.4, and (b) 50 to 2 parts by weight of an addition terpolymer containing acrylonitrile, indene and a third monomer selected from methyl methacrylate or at least one monomer of the group  $\alpha$ -methylstyrene and vinyl aromatics of the formula:



where each R is independently selected from Cl, H and a  $C_1$  to  $C_9$  alkyl group and  $x = 1$  or 2, combined in the polymer structure such that

(1) when the third monomer is methyl methacrylate, the polymer contains in weight percent 2-35 acrylonitrile, 10-67 indene, 5-85 methyl methacrylate, and the moles of acrylonitrile plus methyl methacrylate are equal to or more than the moles of indene,

(2) when the third monomer is one or both of  $\alpha$ -methylstyrene and said vinyl aromatics, the polymer contains in weight percent 10-40 acrylonitrile, 5-67 indene and 4-70 of said third monomer, and the moles of acrylonitrile plus said vinyl aromatics is equal to or greater than the moles of  $\alpha$ -methylstyrene plus indene.

4,681,917

# POLY (VINYL CHLORIDE) COMPOSITIONS

George S. Li, Solon; Muyen M. Wu, Hudson, and Elmer J. Dewitt, Cuyahoga Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 5, 1986, Ser. No. 859,518

Int. Cl.<sup>4</sup> C08L 27/06

U.S. Cl. 525—210

6 Claims

1. A composition comprising an intimate admixture of (a) 50 to 98 parts by weight of a vinyl chloride polymer having an inherent viscosity of at least 0.4 and (b) 50 to 2 parts by weight of an addition copolymer containing indene and one comonomer selected from acrylonitrile, methyl methacrylate and





isomerize the halogenated rubber thereby shifting a substantial fraction of the halogen from an initial secondary allylic configuration to a primary allylic configuration which comprises contacting a solution of the rubber with a Friedel-Crafts catalyst at a temperature of about 20° C. to about 150° C. for a reaction time sufficient to cause the isomerization wherein the isomerized rubber contains less than 0.25 mole percent conjugated diene and at least 0.6 weight percent halogen.

**4,681,922**  
**THERMOPLASTIC POLYSILOXANE-POLYESTER**  
**(CARBONATE) BLOCK COPOLYMERS, THEIR**  
**PREPARATION AND USE**

Manfred Schmidt; Winfried Paul; Dieter Freitag, all of Krefeld, and Dietrich Rathmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

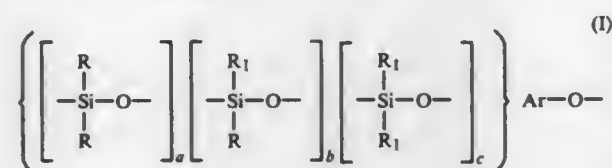
Filed Nov. 29, 1984, Ser. No. 676,483

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3344911

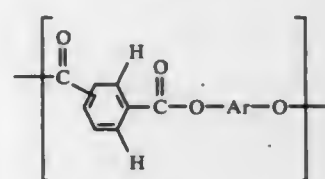
Int. Cl.<sup>4</sup> C08G 77/40, 63/24, 63/46

U.S. Cl. 525-474 7 Claims

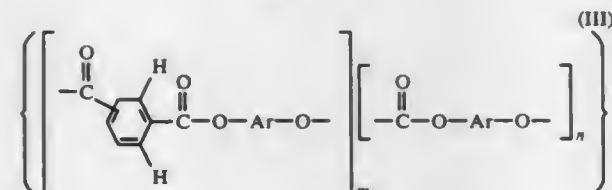
1. A siloxane-polyester(carbonate) block copolymer with repeat structural units of the formulae



and



or



wherein

R and R<sub>1</sub> each denote optionally halogen-substituted C<sub>1</sub>-C<sub>20</sub>-alkyl, C<sub>2</sub>-C<sub>6</sub>-alkenyl, C<sub>6</sub>-C<sub>14</sub>-aryl, C<sub>7</sub>-C<sub>15</sub>-aralkyl or C<sub>7</sub>-C<sub>15</sub>-alkaryl,

a, b and c together denote a number from 10 to 100 and Ar denotes a mononuclear or polynuclear aromatic radical having 6 to 30 C atoms,

and the ratio m/n is 1:9 to 9:1, characterized in that the structural units I represent 0.5 to 7.5% by weight and the structural units II or III represent 99.5 to 92.5% by weight of the siloxane-polyester(carbonate) block copolymer (disregarding the terminating groups), and the ratio of the isophthalic acid units to the terephthalic acid units in the structural units II and III is 3:7 to 7:3.

**4,681,923**  
**MODIFIED QUINONE-DIAZIDE GROUP-CONTAINING**  
**PHENOLIC NOVOLAK RESINS**

Christopher G. Demmer, Cambridge, and Edward Irving, Burwell, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

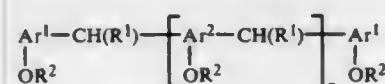
Filed Feb. 21, 1986, Ser. No. 831,685

Claims priority, application United Kingdom, Mar. 2, 1985, 8505402

Int. Cl.<sup>4</sup> C08G 8/32; C08L 61/14

U.S. Cl. 525-504 20 Claims

1. An electrodepositable photosensitive modified phenolic novolak resin of general formula



where

Ar<sup>1</sup> represents a divalent aromatic group linked through aromatic carbon atoms to the indicated groups —OR<sup>2</sup> and —CH(R<sup>1</sup>)—,

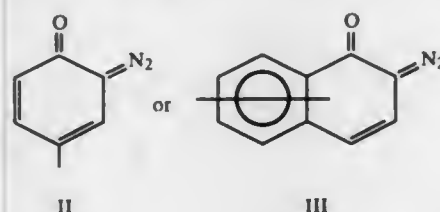
Ar<sup>2</sup> represents a trivalent aromatic group linked through aromatic carbon atoms to the indicated groups —OR<sup>2</sup> and —CH(R<sup>1</sup>)—,

R<sup>1</sup> represents a hydrogen atom or an alkyl, aryl or carboxyl group,

R<sup>2</sup> represents a hydrogen atom, an alkyl group, an alkyl group substituted by a hydroxyl or alkoxy group, or a group of formula —CO—R<sup>3</sup>—COOH, —SO<sub>2</sub>R<sup>4</sup>, —COR<sup>5</sup> or —SO<sub>2</sub>R<sup>5</sup>, at least 1% of the groups R<sup>2</sup> representing a group —CO—R<sup>3</sup>—COOH and at least 4% of the groups R<sup>2</sup> representing a group —SO<sub>2</sub>R<sup>4</sup>,

R<sup>3</sup> denotes a divalent aliphatic, cycloaliphatic, aromatic or araliphatic group,

R<sup>4</sup> denotes a 1,2-benzoquinone diazide group or 1,2-naphthoquinone diazide group of formula



II

III

the free valency bond of formula III being in the 4- or 5-position,

R<sup>5</sup> represents a carboxyl-free monovalent aliphatic, cycloaliphatic, aromatic or araliphatic group, and n denotes zero or an integer of 1 to 20.

**4,681,924**  
**CATALYST SYSTEMS FOR POLYMERIZATIONS AT**  
**HIGH TEMPERATURES**

James J. Harris; Donald E. Hostetler, and G. Stanley Achorn, all of West Chester, Pa., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,224

Int. Cl.<sup>4</sup> C08F 4/64, 210/02

U.S. Cl. 526-125 13 Claims

1. A method of preparing low density polyethylene having a density of between 0.91 and 0.93 grams per cubic centimeter comprising copolymerizing ethylene with from 1 to 50 percent by weight of an alpha-monoolefin comonomer having 3 to 20 carbon atoms, said copolymerization being carried out at a temperature between 200° C. and 300° C. at pressure up to 50,000 psig in the presence of

(a) a catalyst prepared by

(i) co-comminuting a mixture of an anhydrous magnesium

halide, anhydrous aluminum halide and a first electron donor, and

(ii) co-comminuting the mixture from (i) with a complex of a titanium compound and a second electron donor, which may be different from or the same as said first electron donor; said co-comminuting being carried out under an inert atmosphere in the presence of an inert solvent, and

(b) a co-catalyst comprising a synergistic mixture of between 40 to 80 mole percent of an alkyl aluminum chloride and 20 to 60 mole percent of an oxygen-containing aluminum compound selected from the group consisting of aluminum oxide, dialkyl aluminum alkoxide, alkyl aluminum dialkoxide, aluminum trialkoxide, tetraalkyldialuminumoxane, pentaalkyltrialuminumoxane, and hexaalkyltetraaluminumoxane, wherein alkyl may be linear or branched alkyl groups having 1 to 10 carbon atoms in the group.

**4,681,925**  
**FLUORINATED POLYACRYLATES AND**  
**POLYACRYLAMIDES HAVING A CONTROLLED**  
**CROSS-LINKING DEGREE, AND PROCESS FOR**  
**PREPARING SAME**

Ezio Strepparola, Treviglio, and Alberto Re, Milan, both of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Feb. 21, 1986, Ser. No. 831,617

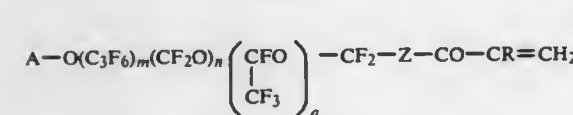
Claims priority, application Italy, Feb. 22, 1985, 19629 A/85

Int. Cl.<sup>4</sup> C08F 14/18

U.S. Cl. 526-246 4 Claims

1. Acrylic or methacrylic polymers, having a controlled cross-linking degree, prepared by radical polymerization of a monomer mixture comprising:

(a) from 1% to 99% by moles of a monomer of the monoacrylate or monoacrylamide type, consisting of a perfluoropolyoxyalkylene chain and having one of the following general formulas:



wherein:

m, n and q are integers from 0 to 50, and m+n+q is not lower than 2, the oxyfluoropolyalkylene units being statistically distributed along the chain;

A is a perfluoroalkyl end groups of the type



Z is —CX(Y)O—(CH<sub>2</sub>—CH<sub>2</sub>O)<sub>p</sub>— or —CH<sub>2</sub>NR'—;

X is a hydrogen atom or a fluorine atom;

Y is CF<sub>3</sub> or it may be also H if also X is H;

R and R', like or different from each other, may be H or CH<sub>3</sub>;

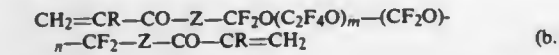
p=0-3;

(a.2) wherein Z and R have the above defined meanings and r is an integer of at least 2;

(a.3) F(CH<sub>2</sub>CF<sub>2</sub>CF<sub>2</sub>O)<sub>r</sub>CH<sub>2</sub>CF<sub>2</sub>—Z—CO—CR=CH<sub>2</sub>

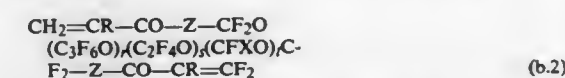
wherein s is an integer comprised between 1 and 50 and Z and R have the meanings above defined;

(b) from 99% to 1% by moles of a monomer of the diacrylate or diacrylamide type, consisting of a perfluoropolyoxyalkylene chain and having one of the following formulas:

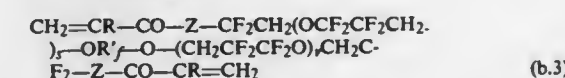


in which the units —C<sub>2</sub>F<sub>4</sub>O— and —CF<sub>2</sub>O— are statisti-

cally distributed along the chain, Z and R being the same as defined hereinbefore, and m and n being integers from 1 to 50;



wherein r, s and t are integers from 1 to 50 and Z and R have the meanings as above defined:



wherein s and v are integers from 1 to 50 and Z and R have the meanings as above defined, R' being a perfluoroalkylene radical of 1-6 carbon atoms.

**4,681,926**  
**RAPID SETTING POLYMERS FROM BICYCLIC AMIDE**  
**ACETALS/POLYOLS/POLYISOCYANATES**

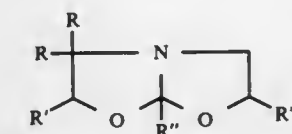
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 11, 1986, Ser. No. 850,657

Int. Cl.<sup>4</sup> C08G 18/08, 18/16

U.S. Cl. 528-48 12 Claims

1. The process for preparing a rapid setting, bubble free rigid polyurethane of improved properties comprising reacting a bicyclic amide acetal conforming to the formula



Wherein R, R' and R'' independently represent hydrogen or an alkyl group having from 1 to 18 carbon atoms, and R''' also represents an alkyl ether group having from 1 to 18 carbon atoms, an aryl ether or alkaryl ether group having from 6 to 20 carbon atoms, R'' represents an alkyl group having from 1 to 18 carbon atoms, an aryl group having from 6 to 12 carbon atoms or an alkaryl group having from 7 to 20 carbon atoms, a polyisocyanate and a polyol in the presence of a plasticizer selected from the group consisting of carboxylic acid esters, organic phosphites, organic phosphates, alkylene carbonates, lactones, fatty oils, cyclic polyethers, aromatic compounds free from ester groups, partially hydrogenated aromatic compounds free from ester groups, and halogenated aliphatic compounds boiling above a temperature in the range of from about room temperature to about 200° C.

**4,681,927**  
**PROCESS FOR PRODUCING OXYMETHYLENE**  
**COPOLYMER**

Toshibakazu Umemura, Takarazuka; Isamu Masumoto, and Yukihiro Iha, both of Yokkaichi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 27, 1986, Ser. No. 866,959

Claims priority, application Japan, May 29, 1985, 60-116290

Int. Cl.<sup>4</sup> C08G 2/10, 2/16

U.S. Cl. 528-232 10 Claims

1. A process for producing an oxymethylene copolymer by copolymerizing trioxane with at least one cyclic comonomer selected from the group consisting of cyclic ethers and cyclic formals, said process comprising

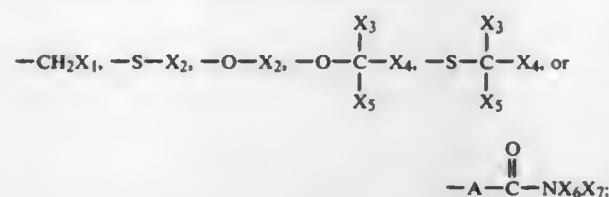
(1) polymerizing trioxane alone or with a cyclic comonomer in the presence of a polymerization catalyst until the conversion of trioxane reaches 10 to 95%, and

(2) thereafter adding a cyclic comonomer and a polymeriza-





phenyl or a 4, 5, 6 or 7-membered heterocycle, or one of  $R_3$  and  $R_4$  is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxy, carbonyl, 2-phenylethynyl, 2-phenylethynyl, carboxyl,



$X_1$  is azido, amino, hydroxy, alkanoylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,  $-S-X_2$  or  $-O-X_2$ ;

$X_2$  is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, substituted alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl or heteroarylcarbonyl;

one of  $X_3$  and  $X_4$  is hydrogen and the other is hydrogen or alkyl, or  $X_3$  and  $X_4$  when taken together with the carbon atom to which they are attached form a cycloalkyl group;

$X_5$  is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxy, alkoxy, aminocarbonyl, (substituted amino)carbonyl, or cyano;

$A$  is  $-CH=CH-$ ,  $-CH_2-CH=CH-$ ,  $-(CH_2)_n-$ ,  $-(CH_2)_n-O-$ ,  $-(CH_2)_n-NH-$ , or  $-(CH_2)_n-S-CH_2-$ ;  $n$  is 0, 1, 2 or 3;  $n'$  is 1 or 2;

$X_6$  and  $X_7$  are the same or different and each is hydrogen or alkyl, or  $X_6$  is hydrogen and  $X_7$  is amino, substituted amino, acylamino or alkoxy;

$R_5$  is hydroxyl, alkyl, substituted alkyl, phenyl, substituted phenyl, alkoxy, alkylthio, (substituted alkyl)oxy, (substituted alkyl)thio, phenyloxy, phenylthio, (substituted phenyl)oxy or (substituted phenyl)thio; and

$Y$  is oxygen or sulfur;

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the terms "alkanoyl", "alkenyl", and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or carboxyl groups;

the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxy, alkoxy, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, (4, 5, 6 or 7-membered heterocycle)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;

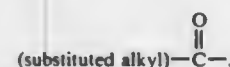
the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furylimino, benzylimino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "a 4, 5, 6, or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetidinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or one of the above groups substituted

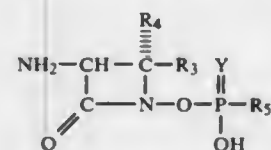
with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furylimino, benzylimino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "substituted amino" refers to a group having the formula  $-NY_1Y_2$  wherein  $Y_1$  is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and  $Y_2$  is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino;

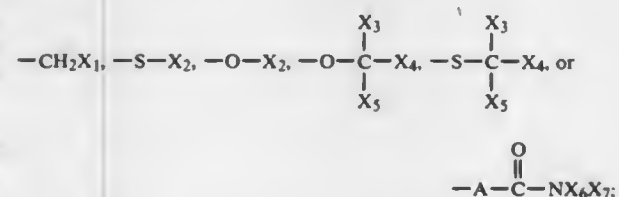
the term "substituted alkanoyl" refers to a group having the formula



2. A  $\beta$ -lactam having the formula



or a salt thereof, wherein  $R_3$  and  $R_4$  are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle, or one of  $R_3$  and  $R_4$  is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxy, carbonyl, 2-phenylethynyl, 2-phenylethynyl, carboxyl,



$X_1$  is azido, amino, hydroxy, alkanoylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,  $-S-X_2$  or  $-O-X_2$ ;

$X_2$  is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, substituted alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl or heteroarylcarbonyl;

one of  $X_3$  and  $X_4$  is hydrogen and the other is hydrogen or alkyl, or  $X_3$  and  $X_4$  when taken together with the carbon atom to which they are attached form a cycloalkyl group;  $X_5$  is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxy, alkoxy, aminocarbonyl, (substituted amino)carbonyl, or cyano;

$A$  is  $-CH=CH-$ ,  $-CH_2-CH=CH-$ ,  $-(CH_2)_n-$ ,  $-(CH_2)_n-O-$ ,  $-(CH_2)_n-NH-$ , or  $-(CH_2)_n-S-CH_2-$ ;  $n$  is 0, 1, 2 or 3;  $n'$  is 1 or 2;

$X_6$  and  $X_7$  are the same or different and each is hydrogen or alkyl, or  $X_6$  is hydrogen and  $X_7$  is amino substituted amino, acylamino or alkoxy;

$R_5$  is hydroxyl, alkyl, substituted alkyl, phenyl, substituted phenyl, alkoxy, alkylthio, (substituted alkyl)oxy, (substituted alkyl)thio, phenyloxy, phenylthio, (substituted phenyl)oxy or (substituted phenyl)thio;

$Y$  is oxygen or sulfur;

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the terms "alkanoyl", "alkenyl", and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or carboxyl groups;

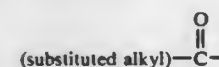
the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxy, alkoxy, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, (4, 5, 6 or 7-membered heterocycle)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furylimino, benzylimino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "a 4, 5, 6, or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetidinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furylimino, benzylimino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "substituted amino" refers to a group having the formula  $-NY_1Y_2$  wherein  $Y_1$  is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and  $Y_2$  is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino;

the term "substituted alkanoyl" refers to a group having the formula



#### 4,681,938 NOVEL POLYCYCLIC HYDRAZONES OF RIFAMYCINS, THEIR MANUFACTURE, AND THEIR PHARMACEUTICAL COMPOSITIONS FOR TREATING TUBERCULOSIS

Peter Traxler, Schönenbuch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

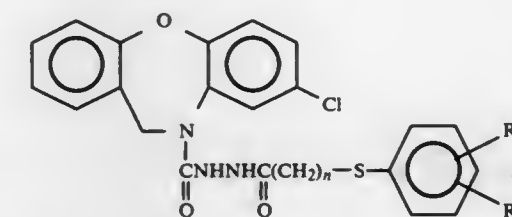
Continuation-in-part of Ser. No. 644,886, Aug. 27, 1984, Pat. No. 4,551,450. This application Aug. 8, 1985, Ser. No. 763,725. The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl. C07D 519/00; A61K 31/495, 31/395  
U.S. Cl. 540-458

9 Claims  
1. The hydrazones of 3-foreylrifamycin SV with 3-amino-7-ethylperhydro-1H-pyrido[1,2-a]pyrazine and a pharmaceutically acceptable alkali metal salt thereof in the form of an individual isomer or a mixture comprising more than one such isomer.

4,681,939  
8-CHLORODIBENZ[B,F][1,4]OXAZEPINE-10-(11H)-CARBOXYLIC ACID, 2-[(PHENYLTHIO)ALKANOYL]HYDRAZIDES  
Richard A. Mueller, Glencoe, Ill., assignor to G. D. Searle & Co., Skokie, Ill.  
Division of Ser. No. 770,457, Aug. 29, 1985. This application Nov. 14, 1986, Ser. No. 931,369  
Int. Cl. C07D 267/20

U.S. Cl. 540-547  
1. A compound of the formula:



wherein

$R^1$  is:

- (a) hydrogen;
- (b) alkyl of 1 to 4 carbon atoms, inclusive;
- (c) alkoxy of 1 to 4 carbon atoms inclusive or
- (d) halogen;

wherein

$R^2$  is:

- (a) hydrogen;
- (b) alkyl of 1 to 4 carbon atoms, inclusive;
- (c) alkoxy of 1 to 4 carbon atoms, inclusive; or
- (d) halogen; and

wherein

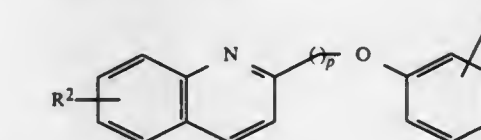
$n$  is an integer from 1 to 4 inclusive.

4,681,940  
5-[3-[[2-QUINOLYL]METHOXY]PHENYL]-1,3-OXAZOLES

John H. Musser, Malvern, and Reinhold H. W. Bender, Valley Forge, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

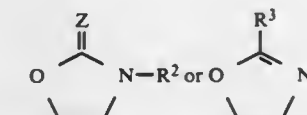
Filed Nov. 19, 1985, Ser. No. 799,673  
Int. Cl. C07D 417/12, 413/12, 413/14

U.S. Cl. 546-174  
1. A compound having the formula



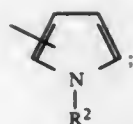
wherein

$R^1$  is



$R^2$  is hydrogen or lower alkyl;  
 $R^3$  is hydrogen, lower alkyl, phenyl, thienyl, furyl, pyridyl,  $CF_3$ ,  $-(CH_2)_pCOOR^2$  or



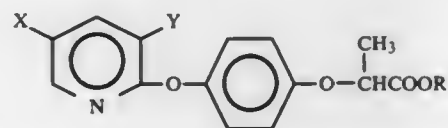


P is O-3  
Z is O or S;  
and the pharmaceutically acceptable salts thereof.

#### 4,681,941 METHOD OF PREPARING ESTERS OF ARYLOXYPHENOXY PROPANOIC ACID

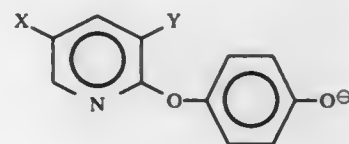
Timothy J. Adaway, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.  
Continuation-in-part of Ser. No. 494,196, May 13, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 721,987  
Int. Cl.<sup>4</sup> C07D 213/55, 213/64

U.S. Cl. 546—302 16 Claims  
1. In a method of preparing an ester of an aryloxyphenoxy propanoic acid of the formula

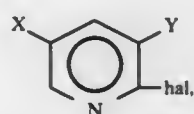


wherein

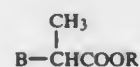
X represents H, CF<sub>3</sub>, Cl, F, Br or I;  
Y represents Cl, H, F, Br, CF<sub>3</sub> or I and  
R represents C<sub>1</sub>-C<sub>8</sub> alkyl or C<sub>3</sub>-C<sub>6</sub> alkoxyalkyl;  
which comprises forming



by the reaction of



wherein X and Y are as defined above and hal is Cl, F, Br, or I,  
with the dianion of hydroquinone under an inert atmosphere while maintaining the water content of the reaction mixture at less than 1,000 ppm and thereafter, without isolation of the phenate intermediate, reacting with an excess stoichiometric amount of a propionate of the formula



wherein

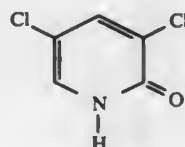
R is as defined above; and  
B represents Cl or Br  
at a temperature that does not exceed 35° C.

#### 4,681,942 PROCESS FOR THE PRODUCTION OF 3,5-DICHLORO-2-PYRIDONE

Daniel Quarroz, Canton Valais, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland  
Filed Jun. 19, 1986, Ser. No. 875,927  
Claims priority, application Switzerland, Jun. 25, 1985, 2691/85

Int. Cl.<sup>4</sup> C07D 211/72

U.S. Cl. 546—303 9 Claims  
1. Process for the production of 3,5-dichloro-2-pyridone having the formula:

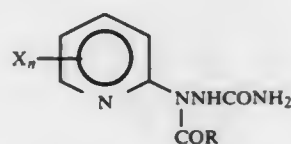


comprising reacting 6-hydroxynicotinic acid with chlorine or a chlorine-releasing agent.

#### 4,681,943 1-ACYL-1-(2-PYRIDINYL)SEMICARBAZIDES

Charles E. Whitten, Plymouth, Mass., and R. Garth Pews, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.  
Continuation-in-part of Ser. No. 676,892, Nov. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 465,743, Feb. 11, 1983, abandoned. This application Mar. 17, 1986, Ser. No. 840,359  
Int. Cl.<sup>4</sup> C07D 213/75

U.S. Cl. 546—306 2 Claims  
1. A compound of the formula



wherein

R represents C<sub>1</sub>-C<sub>4</sub> alkyl;  
each X independently represents Cl, F, Br, NO<sub>2</sub>, C<sub>1</sub>-C<sub>4</sub> alkyl, NH<sub>2</sub>, mono- or dialkylamino wherein each alkyl contains from 1 to 4 carbon atoms, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, C<sub>1</sub>-C<sub>4</sub> alkylsulfonyl, C<sub>1</sub>-C<sub>4</sub> alkylsulfonyl, CN, CF<sub>3</sub>, CCl<sub>3</sub>, phenoxy or substituted phenoxy of the formula

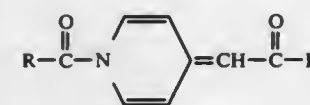


wherein

each Z independently represents Cl, F, Br, NO<sub>2</sub>, CN, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, with the proviso that when either n is 2 or 3, all X groups are sterically compatible with each other and all Z groups are sterically compatible with each other; and  
each n independently represents an integer of from 0 to 3, inclusive.

4,681,944  
PROCESS FOR PREPARING CERTAIN 1-LOWER  
ALKANOYL OR BENZOYL-4-(LOWER ALKANOYL OR  
BENZOYL-METHYLIDENE)-1,4-DIHYDROPYRIDINES  
OR ACID ADDITION SALTS THEREOF  
Robert M. Ippolito, 7471 Yonge St., Apt. 707, Thornhill, Ontario, Canada (L3T 2C1), and Stephen Vigmond, 291 Avenue Rd., #701, Toronto, Ontario, Canada (M4V 2G9)  
Filed Jun. 11, 1985, Ser. No. 743,499  
Int. Cl.<sup>4</sup> C07D 211/82

U.S. Cl. 546—340 7 Claims  
1. A process for preparing a compound of formula II



or acid addition salts thereof wherein R represents C<sub>1</sub>-C<sub>5</sub> alkyl or phenyl which comprises reacting an acylating agent selected from an acyl halide of formula R-CO-X, an anhydride of formula R-CO-O-CO-R and mixtures thereof wherein R is as defined above and X is halogen, with 4-methylpyridine, in solution in a suitable solvent under substantially anhydrous conditions, and using a molar ratio of acylating agent to 4-methylpyridine of from about 5:1 to 1:1, with or without a strong anhydrous acid catalyst.

4,681,945  
PREPARATION OF SYMMETRICAL  
TETRACHLOROPYRIDINE FROM CHLORINATED  
β-(TRICHLOROMETHYL) PYRIDINES EMPLOYING A  
CATALYST  
Paula L. Humphreys, San Ramon, and Thomas J. Dietsche, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.  
Continuation-in-part of Ser. No. 431,515, Sep. 30, 1982, abandoned. This application Sep. 7, 1984, Ser. No. 648,109  
Int. Cl.<sup>4</sup> C07D 213/26

U.S. Cl. 546—345 1 Claim  
1. A catalytic process of chlorinating a mixture rich in 2,6-dichloro-3-trichloromethyl pyridine to form a mixture rich in 2,5,6-trichloromethyl pyridine and 2,3,5,6-tetrachloro pyridine comprising:

(a) establishing in a reactor means a reactor charge comprising a mixture rich in 2,6-dichloro-3-trichloro-methyl pyridine and a sufficient amount of ferric chloride catalyst; and  
(b) while maintaining the reactor charge in liquid phase at a temperature of at least about 160° C., feeding chlorine into and agitating the reactor charge for a sufficient time to catalytically convert the mixture rich in 2,6-dichloro-3-trichloromethyl pyridine to a mixture rich in 2,5,6-trichloro-3-trichloromethyl pyridine and 2,3,5,6-tetrachloro pyridine.

4,681,946  
PREPARATION OF NICOTINAMIDE  
Karl G. Baur, Ludwigshafen; Volker Diehl, Ellerstadt; Peter Stops, Altrip; Hans Hellbach, Lampertheim, and Erwin Brunner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany  
Continuation of Ser. No. 555,402, Nov. 28, 1983, abandoned. This application Nov. 14, 1985, Ser. No. 797,990  
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244522  
Int. Cl.<sup>4</sup> C07B 43/06; C07D 213/82

U.S. Cl. 546—317 7 Claims  
1. In a process for the preparation of nicotineamide by amidation of nicotinic acid, the improvement which comprises: reacting a solution of nicotinic acid in nicotineamide, with a

nicotinic acid content of 50 to 80% by weight based on the solution, in a first stage with an excess of ammonia at from 190° to 240° C., while removing the water of reaction at the same time by distillation;  
subjecting the resulting solution, which is a crude mixture of nicotinic acid and predominantly nicotineamide, in a second stage to fractional distillation in a column under vacuum, removing a pure nicotineamide at the bottom of the column and removing a mixture of nicotinic acid and nicotineamide with a lower nicotineamide content than the feed at the top of the column; and  
recycling said nicotinic acid/nicotinamide mixture obtained in the second stage to the first stage while replenishing the recycled mixture with fresh nicotinic acid.

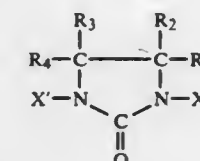
#### 4,681,947 PREPARATION OF OPTICALLY-ACTIVE CYANOMETHYL ESTERS

Donald W. Stoutamire, 904 Bel Passi Dr., and Charles H. Tie-man, 2209 Fremont St., both of Modesto, Calif. 95350  
Division of Ser. No. 551,652, Nov. 14, 1983, Pat. No. 4,560,515, which is a continuation-in-part of Ser. No. 443,513, Nov. 22, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 692,472  
Int. Cl.<sup>4</sup> B01J 31/00

U.S. Cl. 544—370 2 Claims  
1. A catalyst which comprises a cyclo(D-phenylalanyl-D-histidine) dipeptide.

4,681,948  
N,N'-DIHALO-2-IMIDAZOLIDINONES  
Shelby D. Worley, Auburn, Ala., assignor to PPG Industries, Inc., Pittsburgh, Pa.  
Filed Mar. 31, 1986, Ser. No. 846,767  
Int. Cl.<sup>4</sup> C07D 233/32

U.S. Cl. 548—319 15 Claims  
1. N,N'-dihalo-2-imidazolidinone represented by the graphic formula:



wherein X and X' are each halogen selected from the group chlorine and bromine, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> are each selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, hydroxy, and substituted phenyl, said phenyl substituents being each selected from the group consisting of C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, and hydroxy, provided that not more than one of the substituents R<sub>1</sub>-R<sub>4</sub> is hydrogen, provided further that when both X and X' are chlorine, not more than three of the substituents R<sub>1</sub>-R<sub>4</sub> are methyl.

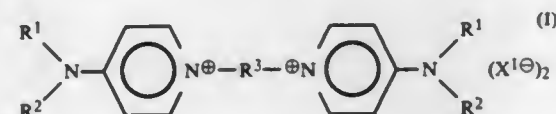
4,681,949  
BIS-AMINOPYRIDINIUM SALTS AS PHASE TRANSFER  
CATALYSTS FOR AROMATIC ETHER IMIDE  
PREPARATION  
Daniel J. Brunelle, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
Division of Ser. No. 553,713, Nov. 21, 1983, Pat. No. 4,595,760. This application Apr. 30, 1986, Ser. No. 857,657  
Int. Cl.<sup>4</sup> C07D 209/48, 403/10, 403/12

U.S. Cl. 548—461 8 Claims  
1. In a method for preparing an aromatic ether by the reaction, in a non-polar organic solvent in the presence of a phase transfer catalyst, of (A) at least one hydroxyaromatic compound alkali metal salt having the formula

$R^1(OM)_a$ 

, II

wherein  $R^1$  is an aromatic radical containing about 6-30 carbon atoms, M is an alkali metal and a is 1 or 2, with (B) at least one activated halo- or nitro-substituted aromatic compound; the improvement which comprises using as said phase transfer catalyst at least one bis-aminopyridinium salt having the formula



wherein:

each of  $R^1$  and  $R^2$  is independently an aliphatic hydrocarbon-based radical containing about 1-13 carbon atoms, or  $R^1$  and  $R^2$  together form a divalent aliphatic hydrocarbon-based radical containing about 4-13 carbon atoms; and  $R^3$  is a divalent hydrocarbon-based radical containing about 4-25 atoms in a single chain connecting the quaternary nitrogen atoms; and  $X^1$  is an anion-forming atom or radical.

4,681,950

## THIOXANTHONE DERIVATIVES

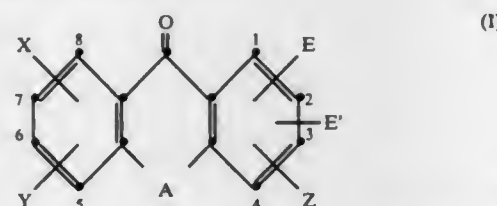
Walter Fischer, Reinach, Switzerland; Jürgen Finter, Freiburg, Fed. Rep. of Germany, and Hans Zweifel, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.  
Division of Ser. No. 551,768, Nov. 14, 1983, Pat. No. 4,585,876.  
This application Dec. 23, 1985, Ser. No. 812,554  
Claims priority, application Switzerland, Nov. 25, 1982, 6872/82

Int. Cl.<sup>4</sup> C07D 335/14, 311/86

U.S. Cl. 549-27

1. A compound of the formula I

8 Claims



in which A is —S—, X and Y independently of one another are hydrogen,  $C_{1-20}$ -alkyl, halogen, —OR', —SR' or —NO<sub>2</sub>, Z is hydrogen,  $C_{1-4}$ -alkyl, halogen, —OR', —SR', —NO<sub>2</sub>, —NH<sub>2</sub>, —OH or —NHCOCH<sub>3</sub>, E and E' independently of one another are —COOR'', or —CON(R'')<sub>2</sub>, R' is  $C_{1-20}$ -alkyl, phenyl, halogenophenyl, nitrophenyl, alkyl- or alkoxy-phenyl having in each case 1-4 C atoms in the alkyl or alkoxy moiety, benzyl or phenethyl, the radicals R'' independently of one another are hydrogen, M<sup>+</sup>,  $C_{1-20}$ -alkyl, alkoxyalkoxyalkyl having 3-10 C atoms or hydroxyalkyl having 2-8 C atoms, n is the number 1, 2 or 3, and M<sup>+</sup> is an alkali metal cation.

4,681,951

## BICYCLO[3.3.0]OCTENE DERIVATIVES

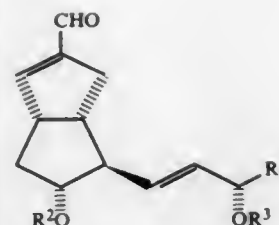
Masakatsu Shibasaki; Toshiaki Mase, both of Tokyo; Mikiko Sodeoka, and Yuji Ogawa, both of Sagamihara, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan  
Filed Aug. 17, 1984, Ser. No. 641,587  
Claims priority, application Japan, Dec. 27, 1983, 58-244695; Feb. 10, 1984, 59-22010; Mar. 28, 1984, 59-58458

Int. Cl.<sup>4</sup> C07D 309/10; C07C 47/40

U.S. Cl. 549-214

1 Claim

1. A bicyclo[3.3.0]octene derivative represented by the formula:



wherein

$R^1$  is a straight, branched or cyclic alkyl group or alkenyl group each having 5 to 10 carbon atoms; and  $R^2$  and  $R^3$  are each separately a hydrogen atom or a protective group of a hydroxy group.

4,681,952

## INTERMEDIATES IN THE PREPARATION OF 2,2-DIMETHYL-3-ARYL-CYCLOPROPANECARBOXYLIC ACIDS AND ESTERS

Reinhard Lantzsch, Leverkusen; Dieter Arlt, Cologne, and Manfred Jautelat, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

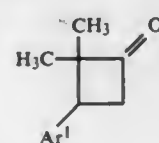
Division of Ser. No. 496,719, May 20, 1983, abandoned. This application Nov. 7, 1984, Ser. No. 669,182

Int. Cl.<sup>4</sup> C07D 333/38, 333/37, 333/16, 307/02

U.S. Cl. 549-61

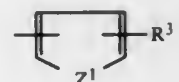
1 Claim

1. A process for the preparation of a 2,2-dimethyl-3-aryl-cyclobutanone of the formula



in which

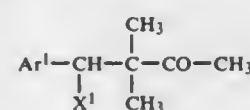
Ar<sup>1</sup> is naphthyl or the radical



Z<sup>1</sup> is oxygen, sulphur or 1,2-ethenediyl, and

R<sup>3</sup> is halogen, cyano, nitro or trialkylsilyl or a radical, which is optionally substituted by halogen, from the series comprising alkyl, cycloalkyl, alkenyl, alkoxy, alkylenedioxy, alkylthio, alkylsulphinyl, alkylsulphonyl, dialkylamino, phenyl and phenoxy,

comprising reacting a 1-aryl-1-halogeno-2,2-dimethyl-3-butanone of the formula



in which

X<sup>1</sup> is chlorine or bromine, with about 1 to 1.2 times the molar amount of a base in the presence of a diluent at a temperature between about -20° and +150° C.

4,681,953

## PROCESS FOR PREPARING

## DIHALOVINYLCYCLOPROPANECARBOXYLATES

Kiyoshi Kondo; Kiyohide Matsui; Akira Negishi, all of Kanagawa, and Yuriko Takahatake, Tokyo, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan  
Filed Aug. 22, 1975, Ser. No. 606,807

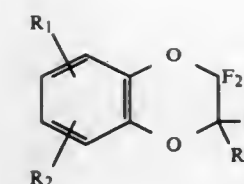
Claims priority, application Japan, Sep. 10, 1974, 49-103521; Sep. 26, 1974, 49-109975; Sep. 26, 1974, 49-109976; Nov. 30, 1974, 49-136631; Nov. 30, 1974, 49-136632; Dec. 2, 1974, 49-137026; Dec. 3, 1974, 49-137752; Jan. 16, 1975, 50-6429; Jan. 22, 1975, 50-8673; Jan. 31, 1975, 50-12389; Feb. 19, 1975, 50-19917; Feb. 19, 1975, 50-19918; Feb. 24, 1975, 50-21857; Mar. 11, 1975, 50-28606; Mar. 11, 1975, 50-28607; Jun. 4, 1975, 50-66592; Jun. 4, 1975, 50-66593

Int. Cl.<sup>4</sup> C07C 69/74, 69/65

U.S. Cl. 549-65

9 Claims

1. Ethyl 4,6,6-trichloro-3,3-dimethyl-5-hexenoate.  
8. Ethyl 2-(β,β,β-trichloroethyl)-3,3-dimethylcyclopropanecarboxylate.



(I)

in which

$R_1$  and  $R_2$  each independently is H, F, Cl, Br, COF, COCl, CO-O-alkyl, CN, alkyl, NO<sub>2</sub>, SO<sub>2</sub>F, SO<sub>2</sub>Cl, OCF<sub>3</sub>, OCF<sub>2</sub>Cl, SCF<sub>3</sub>, CF<sub>3</sub>, SCF<sub>2</sub>Cl, phenyl, substituted phenyl, O-alkyl, O-aryl, S-alkyl or S-aryl, or  $R_1$  and  $R_2$  together are

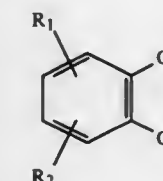


$R_3$  is alkyl, aryl, CO-O-alkyl, CN, substituted alkyl or substituted aryl, and  $R_4$  is alkyl, aryl, CO-O-alkyl, CN, substituted alkyl or substituted aryl.

6. A process for the preparation of a compound according to claim 1,

which comprises

(a) reacting a pyrocatechol of the formula



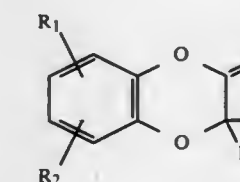
with a carbonyl-containing compound of the formula



in which

X is halogen, O-alkyl, S-alkyl or hydroxy and Y is halogen,

in the presence of a solvent and with the addition of a condensing agent, to produce a benzodioxenone of the formula



(b) reacting the benzodioxenone at elevated temperature with phosphorus pentachloride to produce a dichlorobenzodioxene of the formula

4,681,955

## BENZO-FUSED FLUORINATED HETEROCYCLIC COMPOUNDS AND A PROCESS FOR THEIR PREPARATION

Albrecht Marhold, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 6, 1985, Ser. No. 762,984

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431222

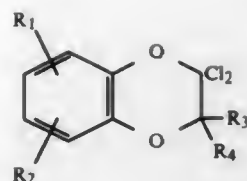
Int. Cl.<sup>4</sup> C07D 319/20, 319/22

U.S. Cl. 549-362

13 Claims

1. A benzo-fused fluorinated heterocyclic compound of the formula





and  
(c) reacting the dichlorobenzodioxene with a fluorinating agent.

4,681,956

### CATALYST COMPOSITION FOR EFFECTING METATHESIS OF OLEFINS

Richard R. Schrock, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.  
Filed Sep. 25, 1985, Ser. No. 780,049  
Int. Cl.<sup>4</sup> C07F 11/00

U.S. Cl. 556—12 7 Claims  
1. A catalyst suitable for the metathesis of an olefin having the formula:



wherein:

R<sup>1</sup> and R<sup>2</sup> are alkyl, aryl, aralkyl, haloalkyl, haloaryl, haloaralkyl or a silicon-containing analog thereof; and R<sup>3</sup> is alkyl, aryl, aralkyl or a substituent resulting from the reaction of the M=CHR<sup>3</sup> moiety of said catalyst with an olefin being metathesized and wherein M is Mo or W.

4,681,957

### METHOD OF PREPARING HYDROCARBON SUBSTITUTED DITHIOCARBAMATES OF MOLYBDENUM

Gopal H. Singhal, Houston, and Claude C. Culross, Baytown, both of Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.  
Filed Sep. 3, 1985, Ser. No. 771,865  
Int. Cl.<sup>4</sup> C07F 11/00

U.S. Cl. 556—38 5 Claims

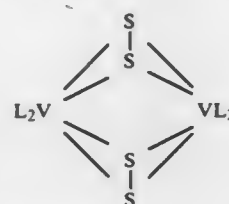
1. A method for preparing a dihydrocarbyl substituted dithiocarbamate of molybdenum comprising the steps of:

- adding an alkali metal hydroxide to a mixture of a dihydrocarbyl substituted amine, carbon disulfide and water and allowing the alkali metal hydroxide, the dihydrocarbyl substituted amine and the carbon disulfide to react to produce an alkali metal salt of a dihydrocarbyl substituted dithiocarbamate in an inert atmosphere and at a temperature within the range from about -5° to about 30° C.;
- combining at least a portion of the alkali metal salt of the dihydrocarbyl substituted dithiocarbamate from step (a) with an alkali metal molybdate and acidifying the resulting combination at a pH within the range from about 3.5 to about 5.5 in an inert atmosphere and at a temperature within the range from about -5° to about 5° C. to produce a dihydrocarbyl substituted dithiocarbamate of molybdenum; and
- recovering a dihydrocarbyl substituted dithiocarbamate of molybdenum.

### 4,681,958 DITHIOACID VANADIUM SULFIDE DIMER COMPOSITIONS

Thomas R. Halbert, Annandale, and Edward I. Stiefel, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.  
Filed Oct. 15, 1985, Ser. No. 787,154  
Int. Cl.<sup>4</sup> C07F 9/00

U.S. Cl. 556—42 14 Claims  
2. Neutral vanadium sulfide dimer complex of the general formula L<sub>2</sub>VS<sub>4</sub>VL<sub>2</sub> having the structure:



wherein L is a 1,1-dithioacid.

4,681,959

PREPARATION OF INSOLUBLE METAL ALKOXIDES  
Richard J. Ayen, Darien, Conn.; John H. Burk, Mohegan Lake, and Carl C. Greco, Garnerville, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.  
Filed Apr. 22, 1985, Ser. No. 725,847

Int. Cl.<sup>4</sup> C07F 7/28, 7/00, 1/00, 3/00, 5/00, 5/02  
U.S. Cl. 556—54 17 Claims

1. A process for the production of metal alkoxides selected from the group consisting of alkoxides of strontium, barium, gallium, indium, boron, yttrium, titanium, zirconium, and hafnium, said alkoxides being insoluble in organic solvents, which process comprises:

- reacting a halide of an at least divalent metal with an alcohol to form an intermediate compound, said intermediate compound being a halo alkoxy metal compound; and
- reacting the intermediate compound of (a) with an alcohol, said alcohol forming part of an organic solvent system, in the presence of a hydrogen halide acceptor, said hydrogen halide acceptor forming a hydrogen halide compound soluble in the organic solvent system.

4,681,960

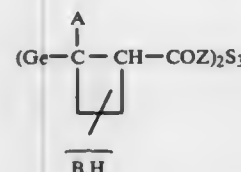
### ORGANOGERMANIUM COMPOUND

Norihiro Kakimoto; Takashi Katayama, both of Tokyo; Tadahiko Hazato, Saitama, and Tsutomu Ohnishi, Tokyo, all of Japan, assignors to Asahi Germanium Research Institute, Tokyo, Japan  
Filed Jul. 2, 1984, Ser. No. 626,787

Claims priority, application Japan, Jul. 1, 1983, 58-119856; Jul. 11, 1983, 58-125725  
Int. Cl.<sup>4</sup> C07F 7/30

U.S. Cl. 556—83 7 Claims

1. An organogermanium compound having the formula:



wherein A represents a lower alkyl group or a phenyl group; when A represents a lower alkyl group, B represents a lower alkyl group connected to the same carbon atom and Z represents a hydroxyl or amino group; when A represents a phenyl group, B represents a hydrogen atom or a lower alkyl group

and Z represents a hydroxyl or amino group; said alkyl group selected from the group consisting of methyl, ethyl and propyl.

4,681,961

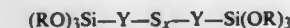
### ADHESION PROMOTERS FOR THE PRODUCTION OF VOLCANIZATES HAVING A FAVORABLE FILLER/ELASTOMER BOND

Dieter Zerpner; Roland Streck, and Horst G. Haag, all of Marl, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany  
Filed Feb. 10, 1986, Ser. No. 827,695

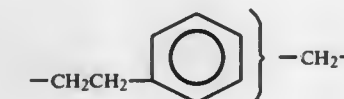
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504241; Aug. 14, 1985, 3529109  
Int. Cl.<sup>4</sup> C07F 7/08, 7/18

U.S. Cl. 556—428 7 Claims

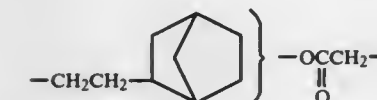
1. An oligosulfane mixture of the formula



wherein R is methyl or ethyl, which residues R can be identical or different, x is the number of S atoms in the individual compounds and Y is



or



wherein the free ethylene linkage in each case is bonded to silicon and wherein the symbol } refers to substitution at either of the two encompassed positions in the individual compounds and in each case indicates a mixture of isomers; the oligosulfane being characterized by a value V of 2-6 which is the number of S atoms, based on two Si atoms, as determined by elementary analyses.

4,681,962

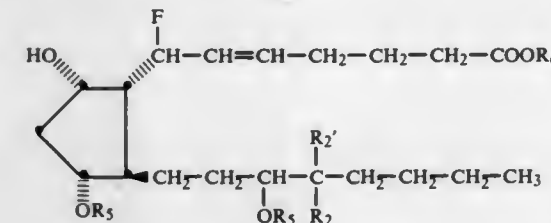
### NOVEL 7-FLUORO-DIHYDRO PGI COMPOUNDS

George W. Holland, North Caldwell; Hans Maag, Upper Montclair, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.  
Division of Ser. No. 747,740, Jun. 24, 1985, Pat. No. 4,634,782.

This application Sep. 8, 1986, Ser. No. 885,994  
Int. Cl.<sup>4</sup> C07F 7/08, 7/18

U.S. Cl. 556—441 3 Claims

1. A composition selected from the group consisting of compounds of the formula:



wherein R<sub>6</sub> is hydrogen or lower alkyl; R<sub>2</sub> is hydrogen, methyl or fluoro, R<sub>2</sub>' is fluoro, hydrogen, trifluoromethyl or methyl; R<sub>5</sub> is tri(lower alkyl)silyl; with the proviso that when R<sub>2</sub>' is trifluoromethyl, R<sub>2</sub> is hydrogen or methyl; optical antipodes or racemates thereof.

4,681,963

### HYDROSILYLATION CATALYST, METHOD FOR MAKING AND USE

Larry N. Lewis, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
Division of Ser. No. 810,629, Dec. 19, 1985. This application Dec. 9, 1986, Ser. No. 939,915  
Int. Cl.<sup>4</sup> C07F 7/08, 7/10

U.S. Cl. 556—453 2 Claims

1. A method which comprises effecting reaction between a silicon hydride and a vinyl siloxane in the presence of a platinum colloid catalyst comprising a colloidal hydrosilylation catalyst comprising:

- the reaction product of
  - a silicon hydride or siloxane hydride, and
  - from 6 to 50 moles of =SiH of (i) per mole of platinum in a Pt(O) or Pt(II) complex of at least one ligand selected from a member of the class consisting of phosphines, halides, C<sub>(1-8)</sub> alkyl radicals, C<sub>(6-14)</sub> aryl radicals, C<sub>(1-8)</sub> aliphatically unsaturated organic radicals, cyanide and carbon monoxide, and
- 2 to 20 parts by weight of aprotic solvent per part of (A).

4,681,964

### METHOD OF INCREASING THE REACTIVITY OF PHOSPHORUS PENTASULFIDE

Dennis C. Annarelli, Newtown, Pa., and Frank J. Dominiani, Jr., Flemington, N.J., assignors to FMC Corporation, Philadelphia, Pa.  
Filed Feb. 11, 1985, Ser. No. 700,208

Int. Cl.<sup>4</sup> C07F 9/165

U.S. Cl. 558—112 10 Claims

1. The method for accelerating the alcoholysis or phenolysis of phosphorus pentasulfide which comprises contacting phosphorus pentasulfide with an alcohol or phenol in the presence of a catalytic amount of a catalyst consisting essentially of a member selected from the group consisting of water, phosphoric acid and its metal salts, and sulfuric acid.

4,681,965

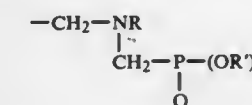
### PHOSPHORUS CONTAINING AROMATIC AMINO POLYOLS

George P. Speranza; Michael E. Brennan, both of Austin, and Robert A. Grigsby, Jr., Georgetown, all of Tex., assignors to Texaco Inc., White Plains, N.Y.  
Filed Aug. 8, 1985, Ser. No. 763,503

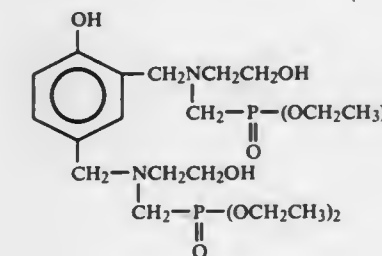
Int. Cl.<sup>4</sup> C07F 9/40

U.S. Cl. 558—162 7 Claims

1. A compound comprising a phenol which is substituted by a phosphorus containing structure having the formula:



X in which R is an alkanol or polyoxyalkylene group, and R' is an alkyl group, said compound being a polyol.  
7. A compound having the formula:



4,681,966

## INTERMEDIATE FOR THIOL BASED COLLAGENASE INHIBITORS

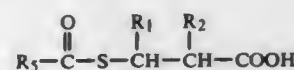
David K. Donald, High Wycombe; Michael M. Hann, Watlington; John Saunders, Ickford, and Harry J. Wadsworth, High Wycombe, all of Great Britain, assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 703,973, Feb. 21, 1985, which is a continuation-in-part of Ser. No. 685,180, Dec. 21, 1984. This application Apr. 2, 1986, Ser. No. 847,367

Int. Cl.<sup>4</sup> C07C 153/023, 153/017

U.S. Cl. 558—255

1. A compound of the formula



wherein R<sub>1</sub> represents lower alkyl, phenyl, or phenyl lower alkyl; R<sub>2</sub> represents lower alkyl; and R<sub>3</sub> represents lower alkyl.

4,681,967

## TRANSESTERIFICATION OF CARBOXYLIC OR CARBONIC ESTERS

Michael J. Green, Hedon, England, assignor to BP Chemicals Limited, London, England

Division of Ser. No. 551,863, Nov. 15, 1983, Pat. No. 4,559,188.

This application Aug. 23, 1985, Ser. No. 768,960

Claims priority, application United Kingdom, Nov. 26, 1982, 8233765; Jan. 7, 1983, 8300444

Int. Cl.<sup>4</sup> C07C 67/02, 68/06

U.S. Cl. 558—277

8 Claims

1. A process for the transesterification of a carboxylic or carbonic acid ester which process essentially consists of reacting the carboxylic or carbonic acid ester under transesterification conditions with an alcohol in the presence, as catalyst, of a cyclic amidine,

wherein the cyclic amidine forms part of a fused ring system containing six and five membered rings, or six and seven membered rings, or two six membered rings.

4,681,968

## METHOD OF PRODUCING ADIPONITRILE

Dean T. Tsou, Solon; Marc W. Blachman, Lyndhurst, and James D. Bunting, Richmond Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 26, 1985, Ser. No. 705,937

Int. Cl.<sup>4</sup> C07C 120/00, 121/26

U.S. Cl. 558—361

12 Claims

1. In a process for the production of adiponitrile from acrylonitrile comprising:

- mixing a first row transition metal salt, a metallic reducing agent selected from Mg, Mn and Zn, acrylonitrile and an organic amide solvent to form a first solution;
- heating said first solution for a time sufficient to form an active transition metal complex; and
- adding a quench solution to said first solution to liberate said transition metal from said complex and produce adiponitrile, said quench solution comprising a proton donor material having  $0 < \text{pK}_a < 12$  and an organic solvent for the proton donor material,

the improvement wherein said quench solution comprises an organic proton donor dissolved in an organic amide solvent, wherein said quench solution contains from zero up to a maximum of 2 moles of methanol per mole of proton donor.

4,681,969

## PROCESS FOR THE PREPARATION OF AN ENANTIOMERIC PAIR OF ISOMERS OF CYFLUTHRIN

John Williams, and Michael J. Robson, both of Berkshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 26, 1985, Ser. No. 769,493

Claims priority, application United Kingdom, Sep. 11, 1984, 8422872

Int. Cl.<sup>4</sup> C07C 121/75

U.S. Cl. 558—407

6 Claims

1. A process for obtaining an enhanced yield of a crystalline material consisting essentially of the enantiomeric pair of isomers represented by (S)- $\alpha$ -cyano-4-fluoro-3-phenoxybenzyl (1R,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate and (R)- $\alpha$ -cyano-4-fluoro-3-phenoxybenzyl (1S,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate in racemic proportions and substantially free from any other isomer of  $\alpha$ -cyano-4-fluoro-3-phenoxybenzyl-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate, which comprises the steps of:

- Forming a concentrated solution of (RS)- $\alpha$ -cyano-3-phenoxybenzyl (1RS,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate which is free from trans isomer, with an organic solvent selected from lower alkanols containing up to six carbon atoms,
- adjusting the temperature of the solution to a temperature within the range  $-10^\circ \text{C}$ . to  $25^\circ \text{C}$ . and adding a quantity of crystals of the enantiomeric pair of isomers to the solution, the added crystals remaining thereafter in the solid undissolved state,
- maintaining the solution at a temperature within the said range for a sufficient period to allow the crystalline material to precipitate from the solution,
- separating the precipitated crystalline material from the solution, and
- optionally, if required, subjecting the crystalline material to recrystallisation,

characterised in that a base is present during at least step (c) of the process whereby at least a proportion of the enantiomeric pair of isomers represented by (R)- $\alpha$ -cyano-4-fluoro-3-phenoxybenzyl (1R,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate and (S)- $\alpha$ -cyano-4-fluorophenoxybenzyl (1R,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate is converted to the enantiomeric pair of isomers represented by (S)- $\alpha$ -cyano-4-fluoro-3-phenoxybenzyl (1R,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate and (R)- $\alpha$ -cyano-4-fluoro-3-phenoxybenzyl (1S,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate.

4,681,970

## BICYCLO-SUBSTITUTED PHENYLACETONITRILE DERIVATIVES

Chi-Dean Liang, Glenview, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 789,255, Oct., 1985, Pat. No. 4,593,042. This application Mar. 21, 1986, Ser. No. 842,688

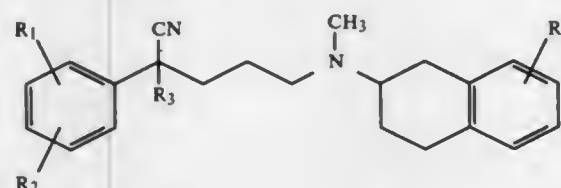
The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> C07C 121/78

U.S. Cl. 558—408

6 Claims

1. A compound of the formula



wherein R<sub>1</sub> and R<sub>2</sub> are the same or different and each is se-

lected from hydrogen, halo, C<sub>1</sub>-C<sub>4</sub> alkoxy or trifluoromethyl; R<sub>3</sub> is straight or branched chain alkyl of from about 1 to 15 carbon atoms; and R<sub>6</sub> is selected from hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, or C<sub>1</sub>-C<sub>4</sub> alkoxy.

4,681,971

## PHENYL SUBSTITUTED AMINODICARBOXYLATE ESTERS

Johannes Pfenniger, Marly; Abul Iqbal, Ettingen, and Alain C. Rochat, Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,868

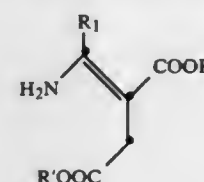
Claims priority, application Switzerland, Nov. 7, 1984, 5358/84

Int. Cl.<sup>4</sup> C07C 121/52, 101/28, 149/40, 79/46

U.S. Cl. 558—414

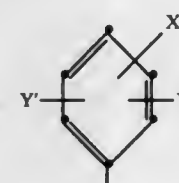
3 Claims

1. An aminodicarboxylate ester of the formula



wherein

R<sub>1</sub> is a radical of the formula



wherein each of X, Y and Y' independently is a hydrogen or halogen atom, a carbamoyl, trifluoromethyl, cyano, C<sub>2</sub>-C<sub>6</sub>alkylcarbamoyl, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub>alkoxy, C<sub>1</sub>-C<sub>6</sub>alkylmercapto, C<sub>2</sub>-C<sub>6</sub>alkoxycarbonyl, C<sub>2</sub>-C<sub>6</sub>alkanoylamino or C<sub>2</sub>-C<sub>6</sub>alkylamino group; or is a phenoxy, phenylmercapto, phenoxy carbonyl, phenylcarbamoyl or benzoylamino group each unsubstituted or substituted by halogen, C<sub>1</sub>-C<sub>6</sub>alkyl or C<sub>1</sub>-C<sub>6</sub>alkoxy, at least one of the substituents X, Y and Y' being a hydrogen atom, and R and R' are the same or different and are C<sub>1</sub>-C<sub>18</sub>alkyl, cyclohexyl, phenyl or said phenyl substituted by nitro, chlorine, C<sub>1</sub>-C<sub>6</sub>alkyl or C<sub>1</sub>-C<sub>6</sub>alkoxy.

4,681,972

## SEPARATION OF DIASTEREOMERS

James S. Kaltenbronn, and Michael A. Stier, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 16, 1986, Ser. No. 908,438

Int. Cl.<sup>4</sup> C07B 57/00

U.S. Cl. 560—29

3 Claims

1. A process for separating S,S-isomers of Boc-benzine or Boc-cyclotine from diastereomeric mixtures thereof which comprises the steps of:

- contacting the mixture with the R-(+)  $\alpha$ -methylbenzylamine or R-(+) 1-(1-naphthyl)-ethylamine to produce a salt,
- fractionally crystallizing from an acetate/alcohol solution one or more times to yield crystals in which the S,S-isomer predominates, and
- regenerating the acid.

4,681,973

## DIRECT N-ACYLATION OF AMINO ACIDS

Martin L. Kantor, Mamaroneck, N.Y., assignor to USV Pharmaceutical Corporation, Fort Washington, D.C.

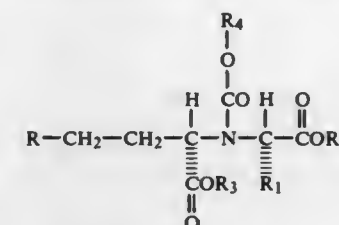
Filed Feb. 27, 1986, Ser. No. 833,706

Int. Cl.<sup>4</sup> C07C 125/06

U.S. Cl. 560—33

10 Claims

1. A process of preparing a compound of the formula



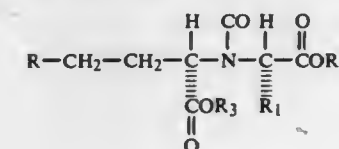
wherein:

R is H, lower alkyl, aryl, aryl lower alkyl, dimethylamino lower alkyl, halo lower alkyl, imidazolyl lower alkyl, indolyl lower alkyl, mercapto lower alkyl, lower alkoxy, lower alkenoxy, acylamino lower alkoxy, aryloxy, or aryloxy lower alkoxy;

R<sub>1</sub> is, lower alkyl, aryl, aryl lower alkyl, acylamino lower alkyl, imidazolyl lower alkyl, indolyl lower alkyl, mercapto lower alkyl, or lower alkylthio lower alkyl;

R<sub>2</sub> and R<sub>3</sub> are independently H, lower alkyl, di(lower alkyl)-amino, cycloalkyl, polycycloalkyl, cycloalkyl lower alkyl or aryl lower alkyl provided that at least one of R<sub>2</sub> or R<sub>3</sub> is hydrogen, and R<sub>4</sub> is 2,2,2-trichloroethyl; comprising the steps of:

(a) reacting a compound of the formula:



with a compound of formula:



III

wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> denote a radical group as defined above, in the reaction solvent methylene chloride; (b) completing the reaction by the addition of pyridine; (c) washing the reaction mixture with hydrochloric acid; (d) washing the reaction mixture with water; (e) separating the organic solvent from the mixture and obtaining a solid residue; (f) dissolving said solid residue in cyclohexane; (g) crystallizing the dissolved residue; and (h) separating the so obtained crystals from cyclohexane.

4,681,974

## FLUORINE-CONTAINING POLYMER

Iwao Hisamoto, and Masayuki Yamana, both of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Apr. 23, 1985, Ser. No. 726,323

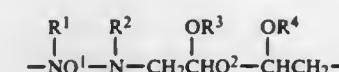
Claims priority, application Japan, Apr. 28, 1984, 59-87100

Int. Cl.<sup>4</sup> C07C 69/773, 69/80, 69/67, 93/04

U.S. Cl. 560—87

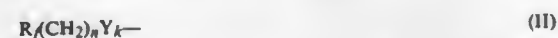
8 Claims

1. A fluorine-containing polymer comprising units of the formula:

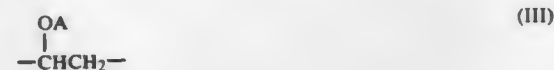




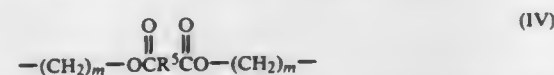
wherein  $R^1$  and  $R^2$  are, the same or different, a group of the formula:



wherein  $R_f$  is a  $C_3$ - $C_{21}$  fluorine-containing aliphatic group which may contain at least one oxy group,  $Y$  is a group of the formula:



wherein  $A$  is hydrogen or a lower acyl group,  $n$  is an integer of 0 to 8,  $k$  is 0 or 1;  $R^3$  and  $R^4$  are, the same or different, hydrogen or a lower acyl group, and  $Q^1$  and  $Q^2$  are, the same or different, a  $C_3$ - $C_{120}$  oxyalkylene group optionally having a hydroxyl group, or a group of the formula:



wherein  $R^5$  is a  $C_3$ - $C_{120}$  alkylene group optionally having an oxy group or a  $C_6$ - $C_{15}$  aromatic group and  $m$  is an integer of 1 to 8; said polymer having a number average molecular weight of 5000 to 100,000.

#### 4,681,975 POLYESTER

Ryuichi Hasegawa, and Kohji Hayashi, both of Kuwana, Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

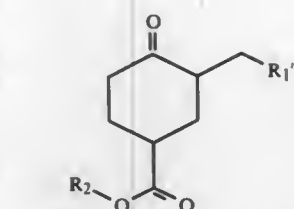
Continuation of Ser. No. 478,105, Mar. 23, 1983, Pat. No. 4,596,886. This application Mar. 13, 1986, Ser. No. 839,278  
Claims priority, application Japan, Apr. 30, 1982, 57-73205;  
Jun. 24, 1982, 57-109042; Jun. 25, 1982, 57-109613

The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.  
Int. Cl.<sup>4</sup> C07C 69/773

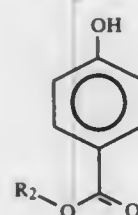
U.S. Cl. 560-90

6 Claims

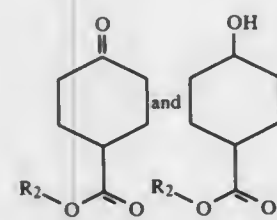
1. A plasticizer which is liquid at 25° C., which comprises: a polybasic acid, a polyhydric alcohol and a monohydric alcohol or a monobasic acid as a molecular weight controlling agent as its reactive monomer constituents, in a ratio of 1.0 equivalent of said polybasic acid to 0.1 to 3 equivalents of said polyhydric alcohol, wherein the polyhydric alcohol is composed of at least 20% by weight of 1,2-butanediol in an amount which is sufficient to impart plasticizing properties to said plasticizer.



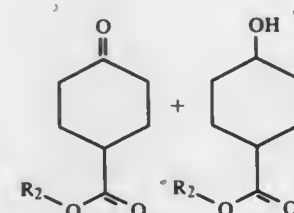
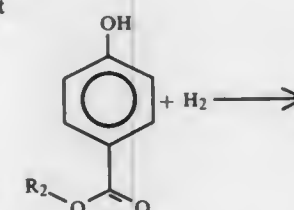
wherein  $R_1''$  represents  $C_1$ - $C_6$  alkyl and  $R_2$  is selected from the group consisting of ethyl and methyl comprising the step of reacting the compound having the structure:



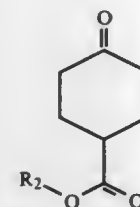
with the hydrogen in order to create a mixture of compounds having the structures:



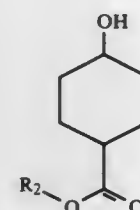
using a palladium catalyst at temperatures in the range of from about 130° up to about 170° C. and pressures in the range of from about 40 psig up to about 100 psig in accordance with the reaction:



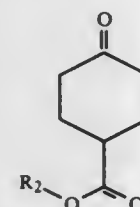
and separating by means of fractional distillation the compound having the structure:



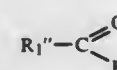
from the compound having the structure:



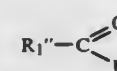
and then reacting the compound having the structure:



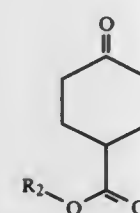
with an aldehyde defined according to the structure:



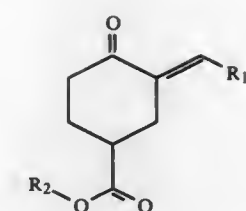
in the presence of hydrogen chloride gas at a temperature in the range of from about -10° C. up to about +10° C. and in the presence of a solvent inert to the reactants or products of reaction, the mole ratio of aldehyde defined according to the structure:



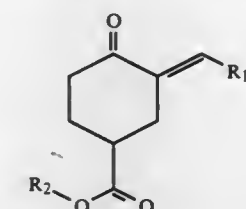
to ketone defined according to the structure:



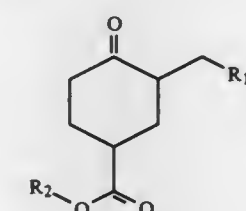
being from about 0.5:1.5 up to about 1.5:0.5 thereby forming the compound having the structure:



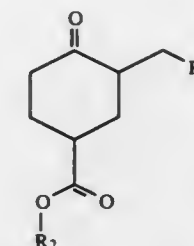
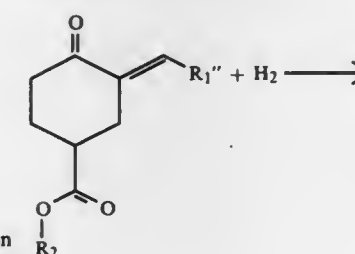
and then reacting the compound having the structure:



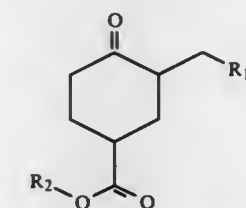
with hydrogen in order to form the compound having the structure:



according to the reaction:



using a palladium on carbon or palladium on calcium carbonate catalyst, at a pressure in the range of 35 psig up to about 150 psig in the presence of an inert solvent and separating by means of fractional distillation the compound having the structure:



4,681,977

## PREPARATION OF CHLORO-OLEFINS

Eberhard Steckhan, Meckenheim; Reinhard Wolf, Koenigswinter-Thomasberg, and Hermann Puetter, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,423

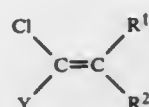
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423762

Int. Cl.<sup>4</sup> C07C 67/317

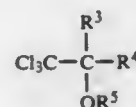
U.S. Cl. 560—262

5 Claims

1. A process for the preparation of a chloroolefin of the formula:



where Y is chlorine or hydrogen, R<sup>1</sup> is hydrogen, alkyl of 1 to 3 carbon atoms or a radical which, together with R<sup>2</sup> forms a cycloaliphatic C<sub>4</sub>- to C<sub>8</sub>-ring, R<sup>2</sup> is a carboxyl, carbalkoxy or a hydrocarbon radical which contains 1 to 12 carbon atoms and which may contain halogen atoms or hydroxyl or keto groups, or a radical which, together with R<sup>1</sup> forms a cycloaliphatic C<sub>4</sub>- to C<sub>8</sub>-ring, wherein a trichloromethyl compound of the formula



where R<sup>3</sup> is hydrogen, alkyl of 1 to 3 carbon atoms or a radical which, together with R<sup>4</sup> forms a cycloaliphatic C<sub>4</sub>- to C<sub>8</sub>-ring, R<sup>4</sup> is a carboxyl, carbalkoxy, or a hydrocarbon radical which contains 1 to 12 carbon atoms and which may contain halogen atoms or hydroxyl or keto groups, or a radical which, together with R<sup>3</sup> forms a cycloaliphatic C<sub>4</sub>-C<sub>8</sub>-ring or a radical which, together with —OR<sup>5</sup> forms a 4- to 6-membered cyclic ether or a lactone ring, and R<sup>5</sup> is hydrogen, alkyl, acyl or a radical, which, together with R<sup>4</sup> forms a 4- to 6-membered cyclic ether or a lactone ring, is treated with a chromium(II) salt in an aqueous medium at from —35° to 110° C.

4,681,978

## PROCESS FOR PRODUCING 2,6-NAPHTHALENEDICARBOXYLIC ACID

Takashi Yamauchi, Shochiro Hayashi, and Atsushi Sasakawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1985, Ser. No. 770,249

Claims priority, application Japan, Sep. 10, 1984, 59-189442

Int. Cl.<sup>4</sup> C07C 51/265

U.S. Cl. 562—413

6 Claims

1. A process for producing 2,6-naphthalenedicarboxylic acid, comprising (1) oxidizing 2,6-diisopropyl-naphthalene in a lower fatty acid as a solvent in the presence of a catalyst comprising a water-soluble cobalt salt, a water-soluble manganese salt, or mixture thereof in an amount of at least 0.5 gram-atom of Co, Mn or mixture thereof to 1 mol of 2,6-diisopropyl-naphthalene by a molecular oxygen-containing gas, thereby obtain-

ing 6-isopropyl-2-naphthoic acid and (2) further oxidizing the thus obtained 6-isopropyl-2-naphthoic acid in the lower fatty acid in the presence of the catalyst comprising a water-soluble cobalt salt, a water-soluble manganese salt or mixture thereof in an amount of from 0.0025 to 0.12 gram-atom to 1 mol of 6-isopropyl-2-naphthoic acid by the molecular oxygen-containing gas.

4,681,979

## METHOD FOR PRODUCING COMPOUNDS HAVING A DOUBLE BOND AT THE TERMINAL

Masashi Araki, Takatsuki, and Takuo Hibi, Ichihara, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Nov. 3, 1986, Ser. No. 925,920

Claims priority, application Japan, Nov. 11, 1985, 60-252574

Int. Cl.<sup>4</sup> C07C 1/24

U.S. Cl. 585—640

11 Claims

1. A method for producing a compound having a double bond at an end of the molecule, comprising dehydrating a compound represented by the general formula



wherein R is a C<sub>2</sub>-C<sub>20</sub> hydrocarbon group having optionally double bonds, in the presence of a zirconium oxide catalyst treated with alkali solution.

4,681,980

## METHOD FOR IMPROVING AN ELECTRICAL INSULATING HYDROCARBON

Atsushi Sato, Tokyo; Keiji Endo, Yokosuka; Shigenobu Kawakami, Ichikawa; Hitoshi Yanagishita, and Shozo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 563,742, Dec. 20, 1983, abandoned. This application Nov. 6, 1985, Ser. No. 795,366

Claims priority, application Japan, Dec. 25, 1982, 57-233238; Jul. 20, 1983, 58-132331

Int. Cl.<sup>4</sup> H01B 3/22

U.S. Cl. 585—6.3

5 Claims

1. A method of preparing an electrical insulating composition which comprises:

- alkylating at least one aromatic hydrocarbon with an alkylating agent in the presence of an alkylating catalyst to produce an alkylation product, said alkylation product comprising unreacted substances, mono and polyalkylated aromatic hydrocarbons, diarylalkanes and heavier products;
- recovering a fraction comprising diarylalkanes as a feedstock;
- dehydrogenation said feedstock in the presence of a dehydrogenation catalyst under conditions effective to provide a dehydrogenation reaction mixture comprising at least 0.5% by weight of aromatic monoolefin or diolefin having two condensed or two noncondensed aromatic nuclei and at least 10% by weight of unreacted feedstock and to provide a bromine number of said dehydrogenation reaction mixture which is at least 0.4 cg/g higher than the bromine number of said feedstock; and
- recovering said reaction mixture.

## ELECTRICAL

4,681,981

## THERMOVOLTAIC CELLS

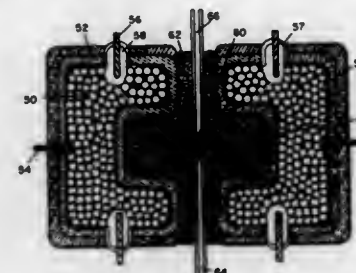
Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Continuation-in-part of Ser. No. 612,718, May 21, 1984, which is a continuation-in-part of Ser. No. 588,344, Mar. 12, 1984. This application Jul. 29, 1985, Ser. No. 760,111

Int. Cl.<sup>4</sup> H01L 35/30

U.S. Cl. 136—205

7 Claims



- An electric current-generating cell comprising: an open-cellular foamed multiple thermocouple having a conductive matrix with a plurality of conductors of different material from said matrix embedded in said foam matrix with a portion of each conductor exposed on the inside of said cells; a vessel containing such open-cellular foamed multiple thermocouple; an electroconductor contacting a portion of said foam matrix; means to excite said open-cellular foamed multiple thermocouple to produce electric current; electrode means to carry said electric current outside said open-cellular foamed multiple thermocouple, said electrode means being further adapted to form said cells' output terminals, said electrode means further including: a first electrode entered into said vessel and surrounded by said open-cellular foamed multiple thermocouple; and a second electrode contiguous with said electroconductor contacting said foam matrix.

4,681,982

## LIGHT-ELECTRICITY CONVERSION SEMICONDUCTOR DEVICE

Susumu Yoshida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

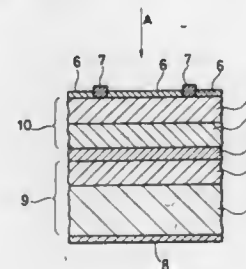
Filed May 8, 1986, Ser. No. 860,799

Claims priority, application Japan, May 8, 1985, 60-97031

Int. Cl.<sup>4</sup> H01L 31/06

U.S. Cl. 136—249

1 Claim



- A semiconductor light-electricity conversion device, comprising: a Group III-V compound semiconductor region having a pn junction therein and comprising gallium and arsenic; a silicon region having a pn junction, said two regions positioned in optical series relation; a zinc selenide layer inserted between said two regions; and

a plurality of electrodes for outputting light generated current from said two regions.

4,681,983

## SEMICONDUCTOR SOLAR CELLS

Tomas Markvart, and Arthur F. W. Willoughby, both of Southampton, England, assignors to The Secretary of State for Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

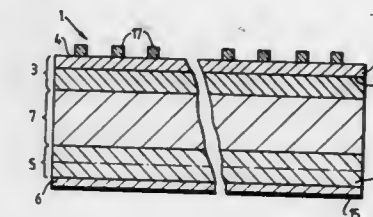
Filed Sep. 18, 1985, Ser. No. 777,343

Claims priority, application United Kingdom, Sep. 18, 1984, 8423558

Int. Cl.<sup>4</sup> H01L 31/06, 31/18

U.S. Cl. 136—255

11 Claims



- A photovoltaic solar cell which comprises a piece of Czochralski-grown semiconductor material incorporating a first region which is p-type, a second region which is n-type, a p-n junction between the two and electrodes on different surfaces of the piece, a first electrode making contact with the first region and a second electrode making contact with the second region, wherein the piece incorporates in its body a lattice defect gettering zone and a defect denuded zone extending between the p-n junction and the lattice defect gettering zone, said denuded zone having a thickness of 100 microns or less as measured from a surface of said cell on which solar radiation is intended to fall.

4,681,984

## SOLAR CELL COMPRISING A SEMICONDUCTOR BODY FORMED OF AMORPHOUS SILICON AND HAVING A LAYER SEQUENCE P-SiC/I/N

Matthias Moeller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

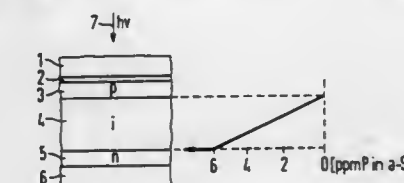
Filed Mar. 10, 1986, Ser. No. 837,814

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3513012

Int. Cl.<sup>4</sup> H01L 31/06

U.S. Cl. 136—258

8 Claims



- A solar cell, comprising in sequence: a transparent base electrode comprising doped stannic oxide; a semiconductor body comprising amorphous silicon with an intrinsic i-layer between a p-type SiC layer and an n-type layer, said p-type SiC layer being in contact with the transparent base electrode; said intrinsic layer (i) having a phosphorus doping profile rising in the direction towards the i/n junction between the n-type layer and i-layer.



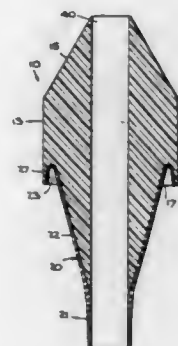
4,681,985

# PREMOLDED MECHANICALLY PRESTRESSED VOLTAGE STRESS CONTROL CONES FOR HIGH VOLTAGE CABLES AND METHOD OF FABRICATING SAME

Carlos Katz, Edison; Attila F. Dima, Piscataway, and George S. Eager, Jr., Upper Montclair, all of N.J., assignors to Cable Technology Laboratories, Inc., New Brunswick, N.J.  
Filed Apr. 24, 1985, Ser. No. 726,781  
Int. Cl.<sup>4</sup> H02G 15/068

U.S. Cl. 174—73 R

14 Claims



1. A premolded mechanically prestressed voltage stress control cone for high voltage cable termination comprising a body of cross-linked polymeric electrical insulating material having a straight through circular bore concentric with an axis of said body, the outer surface of said body defining a surface of revolution centered about said axis and having a contour in the direction parallel to said axis for controlling the electric field and reducing the maximum electrical voltage gradient to a non-degrading level when assembled with a high voltage cable, a tubular layer of semiconductive cross-linked polymeric material concentric with said axis and extending in one direction up over said body for a predetermined distance and extending in the opposite direction away from said body to define an extension of said bore, said layer being bonded to said body throughout the interface therebetween, and said body and layer having locked-in mechanical stresses that are releasable upon the application of heat to said materials to cause shrinkage in the radial direction of said body and layer for reducing the diameter of said bore.

14. The method of fabricating a premolded mechanically prestressed voltage stress control cone for high voltage cable termination that comprises the steps of molding a body of cross-linkable polymeric electrical insulating material to have an outer surface configured to define a surface of revolution centered about an axis and having a contour in the direction parallel to said axis for controlling the electric field and reducing the maximum electrical voltage gradient to a non-degrading level when assembled with a given high voltage cable, bonding to said body a tubular layer of semiconductive cross-linkable polymeric material concentric with said axis and extending in one direction up over said body for a predetermined distance and extending in the opposite direction away from said body, forming a straight circular bore of first diameter through said body and said layer concentric with said axis said first diameter being smaller than the outside diameter of the insulation of the predetermined size high voltage cable with which said voltage control cone is intended to be assembled, cross-linking said respective materials and thereafter radially expanding said materials under appropriate thermal conditions to mechanically prestress said materials and radially expand said bore to a diameter sufficient to pass with at least a sliding fit over the insulation shield of said predetermined size cable.

4,681,986

# SPLICE CONSTRUCTION FOR ELECTRICAL CABLE AND METHOD FOR MAKING THE SAME

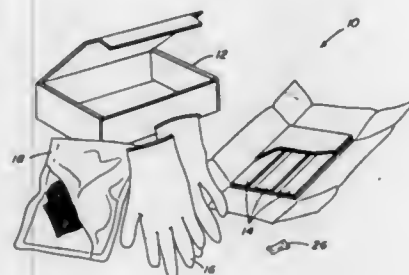
Robert A. Settineri, Gibsonia, Pa., assignor to Royston Laboratories, Inc., Pittsburgh, Pa.

Filed Feb. 24, 1986, Ser. No. 832,072

Int. Cl.<sup>4</sup> H02G 15/08, 1/14

U.S. Cl. 174—84 R

13 Claims



1. A kit for use in forming a protective structure encapsulating structure about a splice in electroconductive cables, said kit comprising:

- a plurality of extensible and windable strips of a malleable, hand-moldable polymeric sealant adapted for hand molding about said splice, a sealant being characterized by a cold-flow property and a low-temperature brittleness property of less than  $-20^{\circ}\text{C}.$ ; and
- a hermetically-sealed container containing a restraining fabric impregnated with a resin which is adapted for winding around said sealant after it is molded about said splice and is curable, by contact with moisture, into a hard, moisture-resistant protective shield means for said sealant.

6. A splice construction of the type wherein ends from a plurality of electroconductive cables are spliced together by a splicing implement and enclosed within a protective structure, the improvement wherein said protective structure is formed of:

- a malleable, hand-moldable rubber composition molded about the splice itself and substantially enclosing said splicing implement;
- at least one strip of a rubber composition being stretched over said hand-moldable rubber position, said strip covering all exposed electroconductive metal of said splice construction; and
- a hard shield member substantially enclosing all of said rubber composition, said shield member formed of a moisture-cured resin on a fabric matrix.

8. A process for protecting a splice construction of a heavy electroconductive cable of the type used in cathodic protection, said process comprising the steps of:

- molding a tacky malleable rubber composition about a splice and substantially enclosing a splice implement;
- stretching a strip of said rubber composition over said molded composition to cover all exposed electroconductive metal of said splice construction;
- wrapping a fabric impregnated with a coldwater curable resin over said rubber composition; and
- curing said resin to a hard, protective composition.

4,681,987

# ELECTRONIC EQUIPMENT HAVING A KEY INPUT FUNCTION

Kaname Suwa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

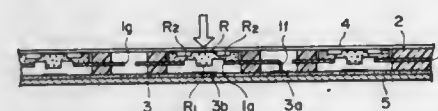
Continuation of Ser. No. 567,502, Jan. 3, 1984, abandoned. This application Mar. 6, 1986, Ser. No. 837,654

Claims priority, application Japan, Jan. 11, 1983, 58-1770; May 6, 1983, 58-78344; May 17, 1983, 58-84938

Int. Cl.<sup>4</sup> H01H 13/70; H05K 7/10

U.S. Cl. 200—5 A

12 Claims



1. Electronic equipment having a key input function, comprising:

printed circuit board means having an electrical circuit including a plurality of stationary contacts (3b), a plurality of connecting contacts (3a) and a connecting pattern for connecting said stationary contacts with said connecting contacts;

frame means arranged on the surface of said printed circuit board means on which said electrical circuit is formed, said frame means including,

- an insulating layer of an electrically insulative material, said insulating layer having a hole corresponding to each of said stationary and connecting contacts, and
- a metal layer insertion-molded therein, said metal layer having at least one first portion corresponding to said connecting contact, in one of said holes and in contact with said corresponding connecting contact to provide fixed electrical connection between said first portion and said corresponding connecting contact and at least one second portion corresponding to said stationary contact, in another of said holes, wherein said second portion has an opening smaller than the insulating layer hole; and

key input means including a movable contact member associated with said second portion for providing selective electrical connection between said second portion and said corresponding stationary contact, wherein said movable contact member is partially mounted to said metal layer and has another portion abutting said printed circuit board in proximity of said stationary contact, and wherein said frame means is mounted on said printed circuit board means such that said first portion and said second portion are aligned with said corresponding connecting contact and said corresponding stationary contact, respectively, and said movable contact is supported by said metal layer of said frame means.

4. Electronic equipment according to claim 1 further comprising a plurality of movable contact members, wherein each of said movable contact members electrically connects one of said stationary contacts to said electrical circuit through one of said first portions and one of said second portions when pressed.

4,681,988

# SWITCH SELECTOR MECHANISM

George A. Hodkin, Loughborough, England, and Roger H. Blane, Krugersdorp, South Africa, assignors to Associated Electrical Industries Limited, England

Filed Jan. 16, 1986, Ser. No. 819,873

Claims priority, application United Kingdom, Jan. 16, 1985, 8501070

Int. Cl.<sup>4</sup> H01H 3/00

U.S. Cl. 200—17 R

6 Claims

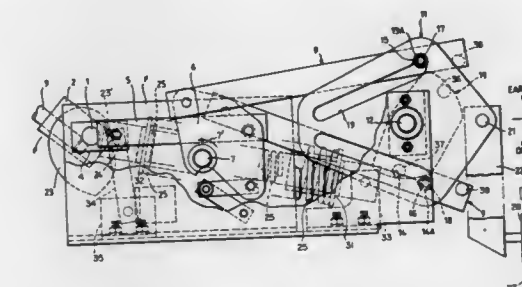
1. A selector mechanism, comprising:  
(a) an actuator;

(b) an actuating member movable under the control of the actuator;

(c) an operating member having a pair of elongated slots each having a recess adjacent one end, said operating member being pivotally movable in one or other direction from a neutral position;

(d) a pair of elongated links pivotally connected at one end to the actuating member and each link carrying, at a position spaced from said connected end, a projection engaging in a respective one of the slots in the operating member, each projection being located within a respective recess when the operating member is in said neutral position; and

(e) a selector device movable to cause a surface thereof to



engage one or other of the projections so as to retain the respective projection within its respective recess, to cause movement of the actuating member to be transmitted to the operating member, so as to pivot the operating member in the direction determined by movement of the respective link, while leaving the projection carried by the other link free to leave its respective recess and move along its slot.

3. The selector mechanism according to claim 1; and further comprising link means connected between the operating member and a movable conducting member of an interrupter/isolator assembly, for transmitting movement of the operating member to the conducting member so as to cause the latter to engage either an isolator or an earth contact in dependence upon the direction of movement of the operating member.

4,681,989

# IGNITION DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINES

Naotaka Nakamura, Chita; Kenji Yagi, Nagoya; Shunzo Yamaguchi, Okazaki; Ichirou Yoshida, Kariya, and Morihiro Atsumi, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

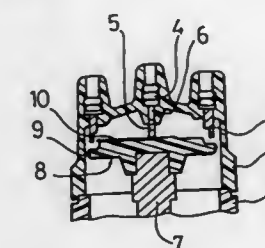
Filed Dec. 17, 1985, Ser. No. 810,225

Claims priority, application Japan, Dec. 20, 1984, 59-270270

Int. Cl.<sup>4</sup> F02P 7/02; H01C 7/10; H01H 19/00

U.S. Cl. 200—19 R

3 Claims



1. A distributor comprising:  
a plurality of fixed electrodes adapted to be electrically

connected to a plurality of sparking plugs of an internal combustion engine, and  
 a rotating electrode adapted to be rotatable in synchronism with a crank of the internal combustion engine and forming a narrow gap sequentially with each of the said fixed electrodes,  
 wherein it is featured that at least one of said plurality of fixed electrodes and said rotating electrode is made of a ceramic that has the function of a varistor and has as a main material at least one of zinc oxide (ZnO) and nickel oxide (NiO) and as an additive at least one of bismuth oxide (Bi<sub>2</sub>O<sub>3</sub>), manganese dioxide (MnO<sub>2</sub>) and cobalt oxide (CoO), which are sintered together.

4,681,990

## ELECTRIC BY-PASS SWITCH

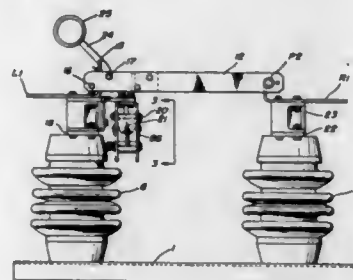
Anthony Osborne, Duluth, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Filed Sep. 15, 1986, Ser. No. 907,239

Int. Cl.<sup>4</sup> H01H 31/04

U.S. Cl. 200—48 KB

15 Claims



1. An electric switch comprising a pair of main fixed contacts insulated from each other, a pair of main movable contacts arranged to engage and to disengage said main fixed contacts respectively and insulated from each other, an elongated by-pass switch electrically connected with and pivotally mounted at one end on one of said main fixed contacts and having its other end arranged electrically to connect and to disconnect the other of said main fixed contacts, latch means movably mounted on said by-pass switch and arranged to latch said by-pass switch closed whereby said fixed contacts are electrically interconnected, and actuator means mounted on and movable with said main movable contacts for engaging and imparting latching movement to said latch means in coordination with opening movement of said main movable contacts.

4,681,991

## VIBRATING SENSING DEVICE

Francis J. Anderson, Foxrock, Co. Dublin, Ireland, assignor to Anderson Research and Development Limited, Ireland

Filed Feb. 11, 1986, Ser. No. 828,125

Claims priority, application Ireland, Feb. 11, 1985, 322/85

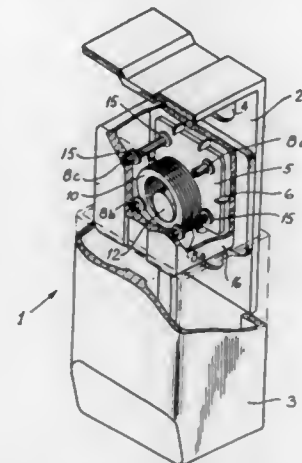
Int. Cl.<sup>4</sup> H01H 35/14

U.S. Cl. 200—61.45 R

34 Claims

1. A vibration sensing device comprising:  
 a non-conductive base support member;  
 at least two spaced-apart electrically conductive and mutually electrically insulated supports forming a support assembly and mounted on the base support member;  
 a plurality of electrically conductive main inertia masses supported by and in electrical contact with the support assembly so as to form a first set of electrical connections which may be broken by vibration; and  
 an electrically conductive additional inertia mass supported by and in electrical contact with at least two of the main

inertia masses so as to form a second set of electrical connections which may be broken by vibration, said main



and additional inertia masses and support assembly forming part of an electrical monitoring circuit.

4,681,992

## CUSHIONED CLAMP CYLINDER WITH PROXIMITY SWITCHES

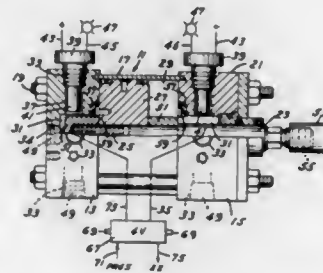
Ronald J. Kazmierski, Mt. Clemens, Mich., assignor to C. M. Smille & Company, Ferndale, Mich.

Filed Mar. 6, 1986, Ser. No. 836,738

Int. Cl.<sup>4</sup> H01H 35/38

U.S. Cl. 200—82 E

6 Claims



1. A cushioned clamp cylinder with proximity switches comprising a cylinder assembly including a cylinder having a spaced cap and head of square shape defining a plurality of right angularly related end faces, there being sealed opposed cushion chambers in said cap and head, there being a sensing port in each end face of said cap and head communicating with said cushion chamber;

a normally open proximity switch connected to a light and having an inductive probe selectively positioned into one of said sensing ports adjacent each cushioned chamber; one sensing port of said cap and head being connected to a pressure conduit and the other two sensing ports being plugged;

said cylinder assembly including a piston rod mounting a reciprocal piston within said cylinder; spaced inductive sleeves mounted on said piston rod alternately movable into said cushion chambers, for alternately activating the proximity switches as said piston bottoms at opposite ends of said cylinder;

a flexible annular insert ring axially positioned and retained within said cap and head respectively, having an internal annular wiping bead in sealing engagement with and centrally receiving said inductive sleeves for alternately sealing off said cushion chambers, the compressed air in

said chambers bringing said piston to a smooth stop as it bottoms out within said cylinder;  
 and an apertured bleed screw adjustably threaded into each cap and head laterally offset from an adjacent sensing port and in communication with said cushion chambers respectively, for regulating exhaust bleeding therefrom depending upon the load reactively applied to said piston, said proximity switches on alternately closing providing a visible indication of the respective bottoming out of said piston at opposite ends of said cylinder.

4,681,993

## SPRING OPERATING MECHANISM FOR AN ELECTRICAL SWITCH

Tadashi Kondo, and Kiyoshi Yabe, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

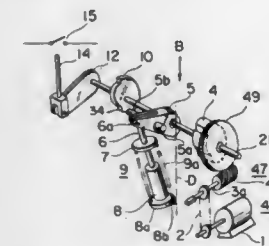
Filed Mar. 24, 1986, Ser. No. 843,198

Claims priority, application Japan, Mar. 25, 1985, 60-44202[U]

Int. Cl.<sup>4</sup> H01H 3/02

U.S. Cl. 200—153 SC

4 Claims



4. A device comprising:  
 a drive mechanism;  
 a drive lever having an engaging surface and connected to said drive mechanism for rotation about an axis;  
 an actuating lever rotatable about said axis independent of said drive lever and having a first and a second engagement surface, said first engagement surface engageable with said engaging surface of said drive lever and said actuating lever being rotated when said engaging surface of said drive lever engages and pushes said first engagement surface of said actuating lever;  
 an energy storing means connected in an over-center relationship to said actuating lever for selectively storing and releasing energy in accordance with the rotational movement of said actuating lever;  
 a driven lever rotatable about said axis independent of said drive lever and said actuating lever and having an engagement surface engageable with said second engagement surface of said actuating lever, said driven lever being rotated when said actuating lever rotates and said second engagement surface of said actuating lever pushes said engagement surface of said driven lever; and  
 a single common shaft for mounting thereon said drive lever, said actuating lever, and said driven lever.

4,681,994

HIGH PRECISION AND COMPACT CONTACT SWITCH  
 Kunio Nagata, Otokuni; Tatsuo Aoi, Ibaraki; Norio Iwakiri, Otokuni; Hiroshi Osumi, Kurayoshi; Nobuyuki Ogata, Kurayoshi, and Norihito Yamane, Kurayoshi, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 7, 1985, Ser. No. 795,767

Claims priority, application Japan, Nov. 13, 1984, 59-239646

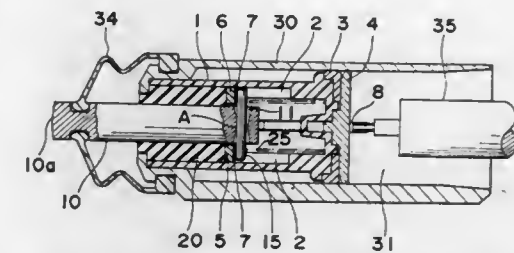
Int. Cl.<sup>4</sup> H01H 13/10

U.S. Cl. 200—16 B

2 Claims

1. A contact switch assembly which comprises a housing; a pair of fixed contact elements fixedly supported within the housing; a plunger having first and second ends opposite to each other and axially slidably extending into the housing with the first and second ends situated exteriorly and interiorly of

the housing; a generally cylindrical movable contact member tiltably carried by the plunger adjacent the second end so as to extend transversely of the plunger, said movable contact member having its opposite end portions adapted to contact the respective fixed contact elements; a support piece for the sup-



port of the fixed contact elements and made of synthetic resin; and means for urging the movable contact member to cause the opposite end portions of said movable contact member to contact the respective fixed contact elements, and wherein said fixed contact elements are embedded in said support piece.

4,681,995

## HEAT PIPE RING STACKED ASSEMBLY

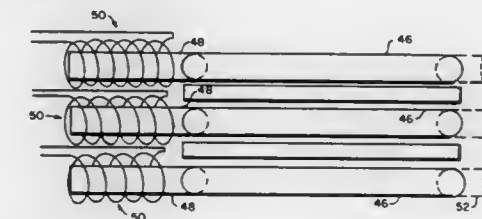
Brian S. Ahern, 69 Middle Rd., Boxboro, Mass. 01719, and Joseph A. Adamski, 468 Central St., Framingham, Mass. 01701

Filed Apr. 4, 1986, Ser. No. 848,179

Int. Cl.<sup>4</sup> H05B 6/10

U.S. Cl. 219—10.51

5 Claims



1. A heat pipe for use in a crystal growth furnace, said heat pipe comprising:  
 a ring-shaped tubular body having a wall comprising a plurality of layers of refractory materials, the inside of said tubular body having a means for supporting capillary action of a working fluid placed inside said tubular body; and  
 at least one arm attached to said tubular body, said at least one arm being integrally attached to said tubular body on an external circumference and being substantially perpendicular to the axis through the center of said body, said at least one arm communicating with said inside of said tubular body and acting as a secondary heat pipe to convey heated working fluid to said ring-shaped tubular body.

4,681,996

## ANALYTICAL PROCESS IN WHICH MATERIALS TO BE ANALYZED ARE DIRECTLY AND INDIRECTLY

HEATED AND DRIED BY MICROWAVE RADIATION  
 Michael J. Collins, and Wyatt P. Hargett, Jr., both of Matthews, N.C., assignors to CEM Corporation, Matthews, N.C. Division of Ser. No. 450,198, Dec. 16, 1982, Pat. No. 4,566,804.

This application Dec. 19, 1985, Ser. No. 811,540

Int. Cl.<sup>4</sup> H05B 6/78; G01N 25/00

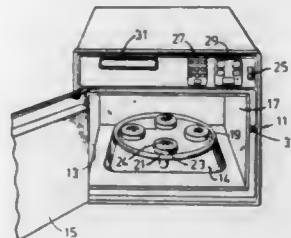
U.S. Cl. 219—10.55 M

10 Claims

1. A process for analyzing a thermally sensitive material for its content of volatilizable components without degrading the material, which comprises supporting the material to be ana-



lyzed, which includes lossy and non-lossy volatilizable component(s), by means of a support which comprises 40 to 95% of a matrix material which is transmissive of microwave radiation, 5% to 60% of a microwave absorptive material dispersed in such matrix material, which microwave absorptive material has a Curie temperature in the range of 85° to 650° C., above which it becomes microwave transmissive, so as thereby to prevent excessive heating of the support and the material to be analyzed, which matrix material is stable and form retaining at the Curie temperature of the dispersed material, and directing microwave radiation onto the material to be analyzed and onto



the support for such material so as directly to heat the material when it contains lossy volatilizable component(s) and indirectly to heat such material by heating the support when the material to be analyzed no longer contains any lossy component(s), which support heats the material to a temperature no higher than the Curie temperature of the dispersed microwave absorptive material in the matrix of the support, at which temperature the material being analyzed is not degraded, and applying sufficient microwave radiation to bring the microwave absorptive material of the support to its Curie temperature.

4,681,997

#### WIRE-CUT, ELECTRIC DISCHARGE MACHINING POWER SUPPLY UNIT

Michiya Inoue, Hino; Haruki Obara, Sagami, and Shunzo Izumiya, Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

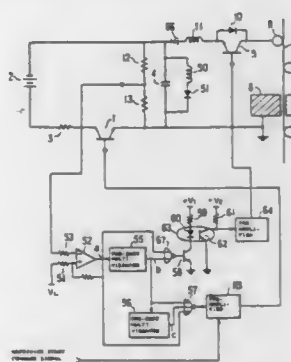
PCT No. PCT/JP84/00478, § 371 Date Jun. 10, 1985, § 102(e) Date Jun. 10, 1985, PCT Pub. No. WO85/01685, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 11, 1984, Ser. No. 744,486

Claims priority, application Japan, Oct. 12, 1983, 58-157839 Int. Cl. B23H 1/02

U.S. Cl. 219—69 C

5 Claims



1. A wire-cut, electric discharge machining power supply unit for use in machining a workpiece, comprising:  
a DC power source;  
a first switching element coupled to said DC power source;  
a capacitor coupled to said DC power source and said first

switching element, said capacitor being charged by said DC power source via said first switching element;  
a second switching element coupled to said capacitor;  
a wire electrode coupled to said second switching element and positioned adjacent the workpiece, the stored charges of said capacitor being discharged between the workpiece and said wire electrode via said second switching element; and  
a series circuit, consisting of a diode and an inductance, connected in parallel to said capacitor, said diode being connected in a backward direction relative to the polarity of the charged voltage of said capacitor.

4,681,998

#### METHOD OF STUD WELDING AND WELDING GUN USED THEREFOR

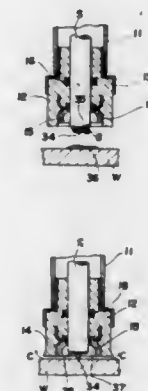
Toshiharu Kon, Yokohama, Japan, assignor to Nikkal Kensei Kaisha, Yokohama and O.S.E. Kaishiki Kaisha, Tokyo, both of Japan

Filed Jul. 26, 1985, Ser. No. 759,347

Int. Cl. B23K 9/20

U.S. Cl. 219—99

5 Claims



1. A method of welding a metal stud having an electrode on its forward tip to a base material in an underwater environment comprising surrounding the tip of the stud in an annular, cup-shaped heat-resisting and resilient liquid sealing member that is open towards the base material, affixing a thermally decomposable gas generating agent to the tip of the stud, bringing the open side of the liquid sealing member tightly into contact with the base material to provide a sealed space for the tip of the stud, supplying electric current across the electrode of the stud and the base material to produce an arc and generate heat thereby causing the electrode to become molten and the gas generating agent to decompose and generate gas at a sufficiently high enough pressure to instantaneously expel out of the liquid-sealing member any water present around the tip of the stud thereby establishing a water free atmosphere for the welding operation.

4,681,999

#### APPARATUS FOR WELDING DENTAL ELEMENTS

Arturo Hruska, Via G. Carducci 10, 00187 Rome, Italy

Filed Mar. 13, 1985, Ser. No. 711,100

Claims priority, application Italy, Jun. 20, 1984, 48426 A/84; Aug. 28, 1984, 48767 A/84

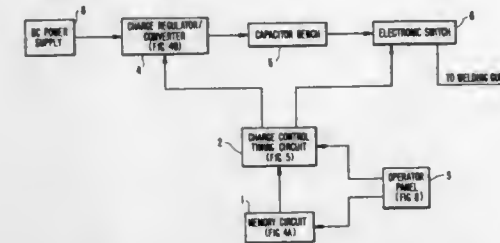
Int. Cl. B23K 11/26

U.S. Cl. 219—111

18 Claims

10. An apparatus for performing a welding operation on dental crowns or bridges, said apparatus comprising:  
memory means for storing welding sequence data pertaining to a plurality of selectable welding sequences, each of said welding sequences comprising a plurality of pulses, said welding sequence data comprising voltage potential data for each of said plurality of pulses;

operator control means for selecting at least one of said welding sequences for implementation during a desired welding operation, said operator control means generating corresponding control signals;  
charge control timing means responsive to said control signals from said operator control means for generating charge control timing signals;



power supply means responsive to said charge control timing signals for generating a plurality of electrical pulses in accordance with said welding sequence data from said memory means corresponding to said at least one welding sequence selected by said operator control means; and welding gun means responsive to said plurality of electrical pulses for performing said welding operation.

4,682,000

#### WELDING TRANSFORMER AND RECTIFIER ASSEMBLY

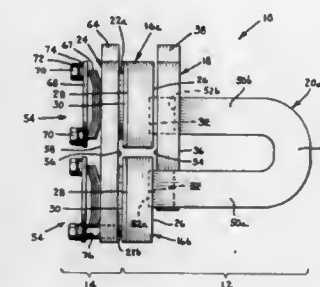
Gary E. Holt, Holland; Mark B. Siehling, and Stanley R. Van Antwerp, both of Hudsonville, all of Mich., assignors to Conrac Corporation, Hudsonville, Mich.

Filed Mar. 18, 1985, Ser. No. 712,796

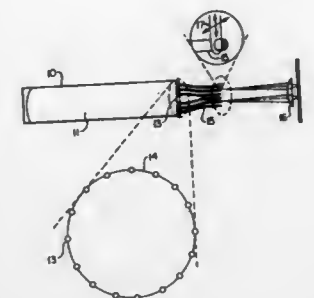
Int. Cl. B23K 11/24

U.S. Cl. 219—116

20 Claims



8. A transformer/rectifier assembly comprising:  
secondary coil means;  
a pair of secondary connector pads electrically coupled to said coil means, each pad defining a rectifier face generally opposite said coil means;  
a rectifier means overlying and abutting each secondary pad;  
a rectified bus overlying and abutting said rectifier means; and  
spring means for biasing said rectified bus toward said rectifier means, said spring means including means for independently adjusting the biasing force toward each rectifier means, said spring means further including a spring concentrically oriented with respect to each said rectifier means.



1. Apparatus for simultaneously joining the leads of a multi-lead device to pads on a substrate, the apparatus comprising,  
(a) a laser having a resonant cavity,  
(b) a mirror disposed at one end of the resonant cavity, the mirror having a plurality of holes for outputting a plurality of beamlets of substantially collimated radiant energy, there being a beamlet for each lead to be simultaneously bonded of the multi-lead device,  
(c) a corresponding plurality of elongate flexible optical wave guides, each beamlet entering the near end of a different one of the optical wave guides,  
(d) adjustable means attached to each of the flexible optical wave guides for enabling the far end of each of those wave guides to be moved in two orthogonal planes whereby the far end of each of the optical wave guides may be independently positioned in different patterns which match the arrangement of the leads of different multi-lead devices,  
(e) means for focussing the beamlets emerging from the far ends of the wave guides upon the joints to be bonded such that the beamlets impinge upon the joints to be bonded at an acute angle to the substrate.

4,682,002

#### METHOD OF LASER WELDING SHEET METAL PROTECTED BY LOW-VAPORIZING-TEMPERATURE MATERIALS

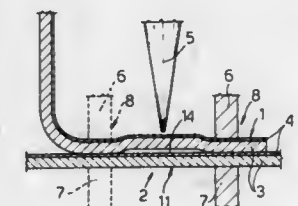
Alberto Delle Piane, Bruino; Franco Sartorio, Turin; Maichl Cantello, Aglie', and Guglielmo Ghiringhella, Quincinetto, all of Italy, assignors to Prima Progetti S.p.A., Turin, Italy

Filed Oct. 31, 1984, Ser. No. 666,726

Claims priority, application Italy, Sep. 20, 1984, 67940 A/84 Int. Cl. B23K 26/00

U.S. Cl. 219—121 LD

10 Claims



1. A method of laser welding a plurality of metal sheets, at least one of said sheets being protected by a layer of low-vaporizing-temperature material, the method comprising:  
orienting said sheet in facing relationship in the weld area,

said layer of protective material being located between said two metal sheets in the weld area; supporting said sheets so that the facing opposed surfaces thereof are in relatively loose contact in the weld area to permit the escape of gases from between said sheets in the weld area; providing a low resistance path substantially parallel to and along at least a substantial part of the weld area for the escape of gases generated by the vaporization of said layer of protective material between said sheets in the weld area; and sweeping the weld area with a laser beam emitted by a laser welding machine.

4,682,003

## LASER BEAM GLASS CUTTING

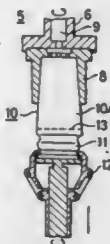
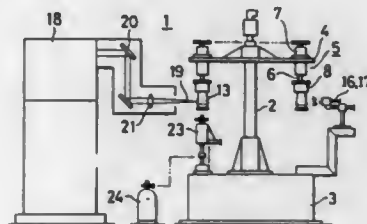
Takao Minakawa, Chiba; Shigeo Shiono, Ibaraki, and Junichi Nishihashi, Tokyo, all of Japan, assignors to Sasaki Glass Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1985, Ser. No. 810,187

Claims priority, application Japan, Apr. 3, 1985, 60-69014

Int. Cl.<sup>4</sup> B23K 26/00

U.S. Cl. 219—121 LN



1. A method of fusion cutting glass using a laser beam to effect local heating of the glass, in which method the region of the glass to be cut is maintained at a high temperature below the softening point of the glass, the glass is then repeatedly irradiated with a laser beam to be fused along a required cut-off line while a downwardly directed tensile force is applied to a part to be cut off so that a rectangularly shaped cut edge is obtained.

4,682,004

## MEASURING ARRANGEMENT HAVING A CAPACITIVE MEASURING ELECTRODE AND A WORKING TOOL WITH INTEGRATED ELECTRODE

Karl-Heinz Schmall, Baden-Baden, Fed. Rep. of Germany, assignor to GET Gesellschaft für Elektronik-Technologie mbH, Baden-Baden, Fed. Rep. of Germany

Filed Feb. 3, 1986, Ser. No. 825,144

Claims priority, application Switzerland, Feb. 8, 1985, 581/85

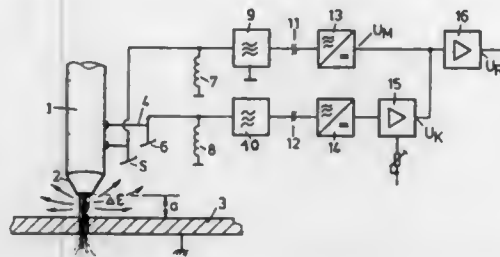
Int. Cl.<sup>4</sup> B23K 15/00

U.S. Cl. 219—121 PC

12 Claims

1. A measuring arrangement for measuring the spacing between a metal workpiece and a thermal tool when working on the workpiece, the arrangement comprising a thermal tool adjustably mounted for working on a metal workpiece when in use, a capacitive measuring electrode fixed to said tool so as to leave a space between itself and said workpiece in a region in

which heat is developed by said tool when in use, a compensation capacitive electrode fixed to said tool so as to leave a space between itself and said workpiece in a region in which heat is developed by said tool when in use, an atmosphere providing a common dielectric between said capacitive measuring electrode and said compensation capacitive electrode on the one hand and said workpiece on the other hand, said compensation capacitive electrode being positioned to produce a different spacing-dependent capacitance with respect to said workpiece



from that of said capacitive measuring electrode, a measuring electric circuit including said measuring electrode for producing signals related to said spacing-dependent capacitance of said capacitive measuring electrode, a compensating electric circuit including said compensation electrode for producing signals related to said spacing-dependent capacitance of said compensation capacitive electrode, and means for receiving said signals from said measuring and said compensating circuits and combining them to produce an output dependent substantially only on the positions of said capacitive electrodes.

4,682,005

## PLASMA WELDING OR CUTTING TORCH PROVIDED WITH A NOZZLE CARTRIDGE

Gérard Marblé, Cergy, France, assignor to Lalr Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

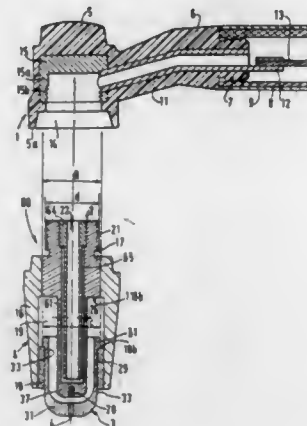
Filed Feb. 18, 1986, Ser. No. 830,113

Claims priority, application France, Feb. 22, 1985, 85 02553

Int. Cl.<sup>4</sup> B23K 15/00

U.S. Cl. 219—121 PM

9 Claims



1. A plasma welding and cutting torch comprising a torch body having an interior, a source of plasma-producing gas connected to said interior, an annular skirt connected to the torch body and comprising at least a seat and a rear abutment, an electrode disposed in the skirt, an electrical supply conductor connected to the electrode, a plasma outlet nozzle freely slidably mounted in the skirt in facing relation to and at a variable distance from the electrode and provided with a plasma outlet orifice, the nozzle being movable between said seat and

said rear abutment and applicable against said seat solely under the effect of an elastic force.

4,682,006

## SELF-CLAMPING ARC LIGHT REFLECTOR FOR WELDING TORCH

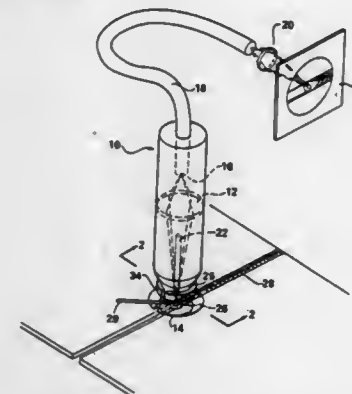
Stephen S. Gordon, Tarzana, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 783,890, Oct. 3, 1985, Pat. No. 4,633,060. This application Sep. 30, 1986, Ser. No. 913,447

Int. Cl.<sup>4</sup> B23K 9/00

U.S. Cl. 219—124.34

9 Claims



1. In an electric arc welding torch having a housing with an internal viewing system for viewing the weld area, the improvement comprising:

an annular member on the end of the torch housing adjacent the welding area, said annular member having an internal reflective surface coaxially with the end of the arc welding torch and extending outwardly therefrom for reflecting the arc light onto the welding area thereby providing a more even light distribution and a clearer image for the internal optical viewing system, said annular member having a vertical split at one location along its circumference whereby adjacent ends forming the split may be spread to place or remove the annular member from the end of the torch housing.

4,682,007

## DEFOGGING AND DEICING SHIELD STRUCTURE

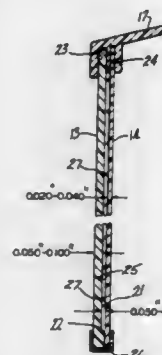
James M. Hollander, Main St., Goshen, Mass. 01032

Filed Apr. 17, 1986, Ser. No. 853,169

Int. Cl.<sup>4</sup> H05B 3/26

U.S. Cl. 219—211

19 Claims



1. In a protective helmet and face shield assembly including fastener means for securing the shield releasably to the helmet

and hinge means between the fastener means and the shield permitting relative motion between the shield and the helmet an improved face shield comprising:

at least two spaced, plastic lenses providing a field of view, one lens defining a face lens and another lens defining a weather lens, a surface of one of said lenses being imprinted solely by silk screening with an electrically conductive circuit substantially throughout said field of view, said circuit being arranged upon said surface in accordance with a pattern of spaced, continuous, generally parallel lines, said lines at maximum width and minimum spacing occupying no more than about eight percent (8%), per unit area, of said field of view, said field of view being otherwise free of coatings or films.

4,682,008

## SELF-TEMPERATURE CONTROL TYPE GLOW PLUG

Mitsuke Masaka, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 836,831

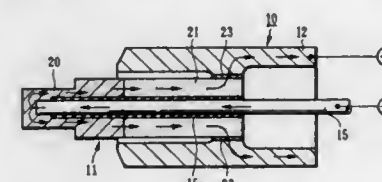
Claims priority, application Japan, Mar. 22, 1985, 60-55988;

Mar. 22, 1985, 60-55989; Mar. 22, 1985, 60-55990; Mar. 22, 1985, 60-55991; Mar. 22, 1985, 60-55992

Int. Cl.<sup>4</sup> H05B 3/00; F02P 19/02

U.S. Cl. 219—270

20 Claims



1. A self-temperature control type glow plug comprising a rod heater held at a front end of a hollow metal holder and having one end extending outside said hollow metal holder, said rod heater including a heating section made of a conductive ceramic material with a small positive temperature coefficient and a control section made of a conductive ceramic material with a positive temperature coefficient larger than that of said heating section, said heating section being formed integrally with said control section.

4,682,009

## WALL MOUNTED COMBINED RADIATIVE-CONVECTIVE ELECTRIC SPACE HEATER

Roland Meiser, Ehningen; Josef Burkert, and Ralf Bendel, both of Bad Mergentheim, all of Fed. Rep. of Germany, assignors to Thermotechnik G. Bauknecht GmbH, Fellbach and Reinhold Barlian, Bad Mergentheim, both of, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,513

Int. Cl.<sup>4</sup> F24H 3/00; H05B 3/00

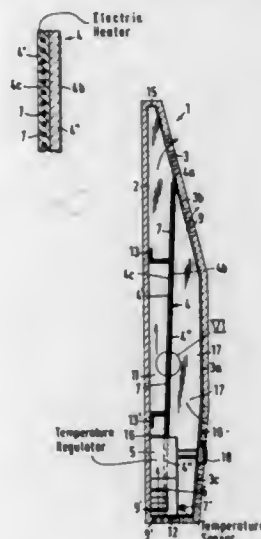
U.S. Cl. 219—377

13 Claims

1. A space heating apparatus for mounting on a wall surface of a room to be heated, the apparatus comprising: a housing including a substantially flat rear wall adapted for mounting to the wall surface, and a front wall adjacent said rear wall, said front wall and said rear wall conjointly defining a space therebetween through which the air to be heated passes, said front wall having a lower portion extending upwardly from the bottom of said housing a solid uninterrupted mid portion devoid of any openings and an upper portion extending upwardly from said mid portion to the top of said housing; an inlet means at the lower end of said housing for admitting and directing the air into said space; air outlet means at the upper end of said housing whereat the heated air leaves said space and passes from said housing;



a solid, uninterrupted metal plate having a first flat side and a second flat side;  
 an electrically insulating plastic layer formed only on said first flat side of said metal plate so as to leave said second side as an uncovered and exposed metal surface;  
 said metal plate being mounted in said space so as to partition said space into two convecting channels and having an upper portion extending above said mid portion of said front wall;  
 said plastic layer and said rear wall conjointly defining one of said convecting channels for communicating with a portion of said air outlet means and for conducting a portion of the incoming air admitted to said space as it moves upwardly to said portion of said air outlet means;  
 said second flat side and said front wall with said solid uni-



errupted mid portion conjointly defining the other one of said convecting channels for communicating with the remainder of said air outlet means and for conducting the remainder of the incoming air admitted to said space as it moves upwardly to said remainder of said air outlet means;  
 resistance heating means embedded in and throughout said plastic layer for heating the air rising in both of said convecting channels and for radiating heat from said second flat side of said plate; and,  
 said remainder of said outlet means being formed in the upper portion of said front wall so as to be disposed laterally of said upper portion of said metal plate thereby permitting at least a portion of the heat radiated from said second flat side of said metal plate to pass therethrough directly into the room to be heated.

4,682,010

# IN-LINE ELECTRIC HEATER FOR AN AEROSOL DELIVERY SYSTEM

Donald F. Drapeau, Windsor; Benjamin N. Moore, Haddam, and Henry B. Hall, Madison, all of Conn., assignors to Safeway Products, Inc., Middletown, Conn.

Continuation-in-part of Ser. No. 472,761, Mar. 7, 1983, abandoned. This application Apr. 12, 1985, Ser. No. 723,034 Int. Cl.<sup>4</sup> H05B 3/00; F24H 3/00; A61M 16/00; H01C 3/00 U.S. Cl. 219—381 11 Claims

1. An in-line heater for an aerosol delivery system comprising:  
 an elongated tubular electrically insulated body having first and second ends coaxially aligned along the major axis of said tubular body, said first and second ends containing an aerosol inlet and outlet, respectively, said body further having an unrestricted flow passage therein from the first

to the second end, and first and second terminal housings adjacent said first and second ends thereof;  
 a first electrical terminal positioned in the first terminal housing of said tubular body;  
 a second electrical terminal positioned in the second terminal housing of said tubular body; and  
 heating means connected to said first and second terminals, said heating means comprising an elongated strip of electrically conductive mesh of very low mass so as to be



almost instantaneously responsive and self supporting, the conductive mesh strip axially extending and being spirally wound within the tubular body to loosely fill the tubular body from its first end to its second end and to extend substantially across the space between the sidewalls of the tubular body so that the maximum surface area of the mesh strip heating means is exposed to the aerosol mixture passing through the tubular body thereby minimizing the impedance, interruption and restriction of the aerosol flow.

4,682,011

# FURNACE FOR THE PARTIAL HEAT TREATMENT OF WORK TOOLS

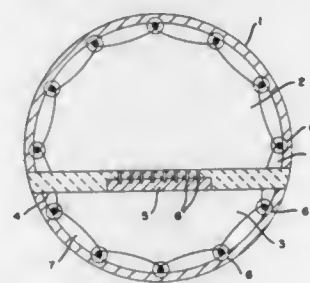
Gerhard Hoffmann, Kahl; Rudolf Bauer, Eschborn; Paul Heilmann, Maintal, and Erwin Schumann, Bruckköbel, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 599,306, Apr. 12, 1984, abandoned. This application Nov. 5, 1985, Ser. No. 795,292 Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313651

Int. Cl.<sup>4</sup> H05B 3/62

U.S. Cl. 219—390

10 Claims



1. A furnace for the controlled partial heat treatment of work tools comprising a vacuum one-chamber furnace provided with compressed gas quenching for the partial heat treatment of work tools, each of said tools having a working region and a clamping region, support means (5), located inside said chamber, adapted for releasably positioning the clamping region of at least one work tool, said furnace having an interior space and provided with all-around heating in the form of heating means located inside said furnace interior space, said support means (5) being integrated in a plate (4) made of heat insulating material, which plate subdivides said furnace interior space into two separate heating section chambers (2, 3), each of said separate heating section chambers (2, 3) provided by separately controllable heating means, there being no cooling means for cooling of work tools during the heat treatment and without heating the clamping region of said work tools beyond their material specific conversion temperature.

4,682,012

# APPARATUS FOR CONTROLLING AND ADJUSTING HEAT OUTPUT DURING THE HEATING PHASE OF A COOKING VESSEL

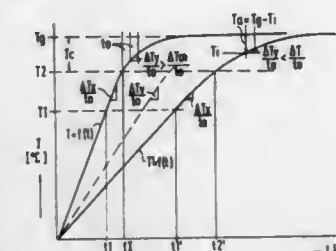
Kurt Wolf, and Wolfram K. Andre, both of Wildbad, Fed. Rep. of Germany, assignors to Kurt Wolf & Co. KG, Fed. Rep. of Germany

Filed Feb. 14, 1986, Ser. No. 829,840 Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505233

Int. Cl.<sup>4</sup> H05B 1/02

U.S. Cl. 219—490

16 Claims



1. An apparatus having a control circuit means for controlling and adjusting heat output of a heating element during the heating phase of a cooking vessel operable in at least a first and a second mode of operation prior to reaching a first and a second preset cooking temperature, respectively, said apparatus comprising:

switch means for selectively activating said heating element according to one of said first and second modes of operation;

temperature sensor means (TF) for continuously measuring an actual temperature (Ti) at said cooking vessel;

base measurement circuit means (MO) in communication with said temperature sensor means (TF) and said control circuit means (HSt) for monitoring said actual temperature measurements (Ti) and signalling said control circuit means when a first trigger temperature (T1) in said first mode of operation or a third trigger temperature (T3) in said second mode of operation has been reached;

first switch circuit means (S1) in communication with said temperature sensor means (TF) for measuring a first temperature increase ( $\Delta T_x$ ) during consecutive preset time intervals (to);

second switch circuit means (S2) in communication with said first switch circuit means (S1) for receiving said first temperature increase measurements ( $\Delta T_x$ ) and conveying said first temperature increase measurements ( $\Delta T_x$ ) to a first program memory means (PSP1) after said first trigger temperature (T1) has been reached and before a second trigger temperature (T2) greater than said first trigger temperature (T1) and less than said first preset cooking temperature (Tg) has been reached in said first mode of operation;

third switch circuit means (S3) in communication with said temperature sensor (TF) for measuring a second temperature increase ( $\Delta T_y$ ) during consecutive said preset time intervals (to) after said second trigger temperature (T2) and said third trigger temperature (T3) in said first and second modes of operation, respectively, have been reached and until said first preset cooking temperature (Tg) and said second preset cooking temperature (Tw) have been reached, respectively;

comparison circuit means (V) in communication with said third switch circuit means (S3) for receiving said second temperature increase measurements ( $\Delta T_y$ ) and comparing each said second temperature increase ( $\Delta T_y$ ) to a preset minimum temperature increase ( $\Delta T_m$ ); signalling said control circuit (HSt) when said second temperature increase ( $\Delta T_y$ ) is less than said preset minimum temperature increase ( $\Delta T_m$ ); and signalling a second program memory means (PSP2) when said second temperature increase

( $\Delta T_y$ ) is equal to and greater than said preset minimum temperature increase ( $\Delta T_m$ );

measurement circuit means (M3) in communication with said temperature sensor means (TF) for measuring a temperature differential (Ta) between said measured actual temperature (Ti) and said first and second preset cooking temperatures (Tg, Tw) in said first and second modes of operation, respectively, when said second temperature increase ( $\Delta T_y$ ) is equal to and greater than said preset minimum temperature increase ( $\Delta T_m$ ) during the preceding said preset time interval (to); and

said control circuit means (HSt) in communication with said base measurement circuit (MO), said first and second program memory means (PSP1, PSP2), and said heating element for maintaining said heating element at a first preset output until said first trigger temperature (T1) and said third trigger temperature (T3) are reached in said first and second modes of operation, respectively; regulating said heating element according to said first and second program memory means (PSP1, PSP2); and maintaining said heating element at a second preset output when said second temperature increase ( $\Delta T_y$ ) is equal to and greater than said preset minimum temperature increase ( $\Delta T_m$ ).

4,682,013

# APPARATUS FOR CONTROLLING THE COOKING PROCESS IN A PRESSURE COOKER

Wolfram K. Andre, and Kurt Wolf, both of Wildbad, Fed. Rep. of Germany, assignors to Kurt Wolf & Co. KG, Fed. Rep. of Germany

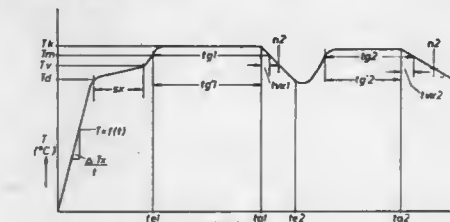
Filed Dec. 19, 1985, Ser. No. 811,004

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447296

Int. Cl.<sup>4</sup> H05B 1/02

U.S. Cl. 219—497

20 Claims



1. Apparatus for controlling a cooking process comprising at least two cooking phases separated by an interruption in a cooking system with a pressure cooker heated by a heating element and controlled by a control circuit, said apparatus comprising: a temperature sensor means (TF) detecting and emitting signals indicating the temperature at said pressure cooker; an adjustable timing means (ZG) for presetting a desired preset cooking time (tg1, tg2); a temperature selector means (TW) adjustable to at least a first preset cooking temperature (Tk) and a second preset cooking temperature (Tk') lower than said first preset cooking temperature (Tk); differentiating means (DG) receiving said temperature signals from said temperature sensor means (TF) and determining a slope ( $\Delta T_x/t$ ) of a temperature-time curve characteristic of said cooking system during a heating up period in each said cooking phase; a temperature measurement means (TM) in communication with a time measurement means (ZM), said temperature measurement means detecting when a measurement temperature (Tm) is reached and signalling said time measurement means (ZM) when a temperature Td corresponding to a vapor phase temperature and a temperature Tv corresponding to an evaporation temperature is reached in each said cooking phase, and said time measuring means (ZM) measuring a time interval (sx) therebetween; a control circuit means (L) receiving signals corresponding to said slope ( $\Delta T_x/t$ ), said measurement temperature (Tm), said time interval (sx), said preset cooking time

(tg1, tg2), and said preset cooking temperature (Tk, Tk'), said control circuit means (L) commencing measurement of said preset cooking time (tg1, tg2) when said measurement temperature (Tm) signal is received, said control circuit means (L) determining an adjustment time interval (tvx1, tvx2) for at least one said cooking phase, said adjustment time interval (tvx1, tvx2) proportional to said time interval (sx) and inversely proportional to said slope ( $\Delta T_x/t$ ), and said control circuit means (L) subtracting said adjustment time interval (tvx1, tvx2) from said preset cooking time (tg1, tg2) to determine a shortened cooking time; and a switching means (Z) dividing said cooking process into said successive cooking phases, said switching means (Z) signalling said control circuit (L) to store said measured values for said slope ( $\Delta T_x/t$ ), and said time interval (sx) for the preceding said cooking phase, said control circuit means (L) retrieving and utilizing said measured values in subsequent said cooking phases to determine said adjustment time intervals (tvx1, tvx2).

4,682,014

## SIMPLE DATA INPUT APPARATUS

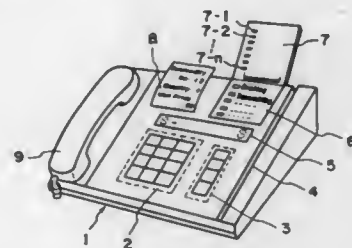
Teruhiko Iwama, Kawasaki, Japan, assignor to Nitsuko Limited, Kanagawa, Japan

Filed Jan. 2, 1986, Ser. No. 815,486

Int. Cl.<sup>4</sup> G06F 15/20

U.S. Cl. 235—375

7 Claims



1. A simple data input apparatus having a magnetic card reader, a memory for storing data read by said magnetic card reader, and an input guide section having a plurality of indicating lamps, said apparatus being provided with an input guide sheet having input items printed on a surface thereof for inputting of data to said apparatus and including a magnetic strip having the order in which these items are to be indicated stored thereon in advance, wherein the input items stored on said magnetic strip are read by said card reader and stored in said memory, after which said input guide sheet is placed on said input guide section and said indicating lamps are lighted in dependence upon data stored in said memory and in accordance with the input items printed on said input guide sheet.

4,682,015

## LOW POWERED HIGH AMBIENT LIGHT BAR CODE READER CIRCUIT

Ronald Quan, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 7, 1985, Ser. No. 709,472

Int. Cl.<sup>4</sup> G06K 7/10

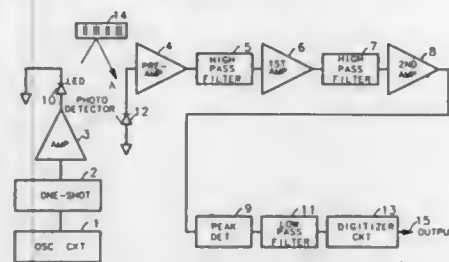
U.S. Cl. 235—472

8 Claims

1. A low power bar code reader detection circuit comprising:  
an oscillation circuit for driving a light-emitting device, having a low duty cycle and high frequency, to provide a pulse-modulated light source;  
a photodetector for detecting reflected pulse-modulated light images from a bar code and for providing an image signal in response thereto;  
a plurality of amplifier stages connected to the photodetector for amplifying the image signal, wherein the amplifier

stages conduct substantially only upon peak amplitudes of the image signal,

a peak modulation detector means connected to the final stage of the plurality of amplifier stages for demodulating and holding the peak amplitude of the amplified image



signal, the peak modulation detector means demodulating peak amplitude without the means of a detector diode; and a digitizing circuit connected to the peak modulation detector means, the digitizing circuit having the detected image signal as an input signal for digitizing.

4,682,016

## PEN-TYPE BAR CODE READER

Toshiyuki Inoue, Yamanashi, Japan, assignor to Nisshin Kohki Co., Ltd., Nagano, Japan

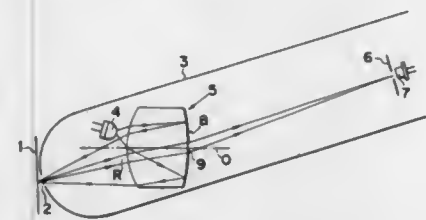
Filed Jul. 9, 1985, Ser. No. 753,197

Claims priority, application Japan, Jul. 20, 1984, 59-109848[U]

Int. Cl.<sup>4</sup> G06K 7/10

U.S. Cl. 235—462

6 Claims



1. A pen-type bar code reader comprising:  
a generally pen-shaped holder;  
a bar code detector provided at one end of said holder;  
a receptor provided within said holder and spaced from said detector;  
a convex lens system provided within said holder and interposed between and spaced from said detector and receptor, said convex lens system being disposed so that the optical axis thereof is angled with respect to the center ray of a detection light flux from said detector to said receptor;  
a bar code illumination light source provided within said holder and disposed at a position between said convex lens system and said detector and symmetric to said light flux with respect to said optical axis; and  
a reflector provided on a surface of said convex lens system curved away from said detector, except a region for transmitting said detection light flux, to concentrate or focus light rays from said light source to said detector.

4,682,017

## SHOCK-RESISTANT INTEGRATED CIRCUIT CARD

Yoshihiko Nakahara, Masao Muramatsu, and Kouichi Ueno, all of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Japan

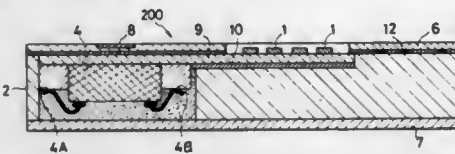
Filed Dec. 24, 1985, Ser. No. 813,036

Claims priority, application Japan, Dec. 29, 1984, 59-277734

Int. Cl.<sup>4</sup> G06K 15/00

U.S. Cl. 235—492

8 Claims



1. A shock-resistant integrated circuit card, comprising:  
(a) an elongated carrier having at least one long side and an exterior surface;  
(b) an integrated circuit mounted within the carrier and having interior terminals located within the carrier at a marginal edge region adjacent said one long side;  
(c) exterior terminals mounted on the carrier and exposed to said exterior surface, said exterior terminals being located at a remote region spaced apart from said marginal edge region; and  
(d) a flexible circuitboard supported by the carrier and extending between said marginal edge region and said remote region, said flexible board flexibly and electrically interconnecting the interior and exterior terminals to maintain an electromechanical connection therebetween despite the application of forces tending to deform the card.

4,682,019

## AMORPHOUS SILICON PHOTOELECTRIC TRANSDUCER WITH A PHOTOCONDUCTIVE COLORANT LAYER

Hisashi Nakatsui, Hiroyuki Imataki, both of Kawasaki, and Yoshioki Hajimoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

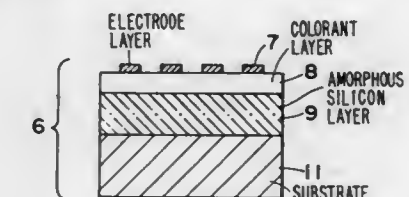
Continuation of Ser. No. 735,511, May 20, 1985, which is a continuation of Ser. No. 344,799, Feb. 1, 1982, abandoned. This application Feb. 20, 1986, Ser. No. 831,116

Claims priority, application Japan, Feb. 9, 1981, 56-17752

Int. Cl.<sup>4</sup> H01L 31/04

U.S. Cl. 250—211 R

4 Claims



1. A photosensitive transducer which comprises, in sequence, a substrate, a photoconductive amorphous silicon layer and a colorant layer comprising a photoconductive dye or pigment adapted to provide said amorphous silicon layer with enhanced photoconductivity and modified spectral sensitivity.

4,682,020

## PICOSECOND GATED LIGHT DETECTOR

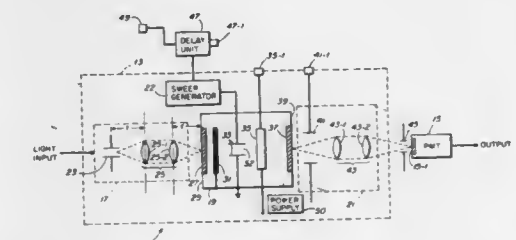
Robert R. Alfano, 3777 Independence Ave., Bronx, N.Y. 10463

Filed Mar. 1, 1984, Ser. No. 585,214

Int. Cl.<sup>4</sup> H01J 31/50

U.S. Cl. 250—213 VT

8 Claims



1. A light detector having an ultrafast input gate for use in measuring the intensity of a light signal over an ultrashort time window, said light detector comprising:

- a streak camera for receiving said light signal and producing a streak image of the light signal over an ultrashort time window;
- a photomultiplier tube for measuring the intensity of the light in at least a portion of the streak image produced by the streak camera and producing an analog electrical output signal corresponding to the intensity of the light so measured;
- said streak camera comprising:
  - a streak camera tube, said streak camera tube having an input end, an output end, a photocathode at the input end, a phosphor screen at the output end and a pair of sweeping electrodes between the input end and the output end, the streak image produced by the streak camera being formed on the phosphor screen
  - an input slit;
  - input relay optics for imaging the input slit onto the photocathode;
  - output relay optics for imaging the streak image

4,682,018

## PROCESS FOR THE TEMPERATURE COMPENSATION OF A PHOTOCONDUCTING DETECTOR

Jean P. Moy, St. Egreve, France, assignor to Thomson-CSF, Paris, France

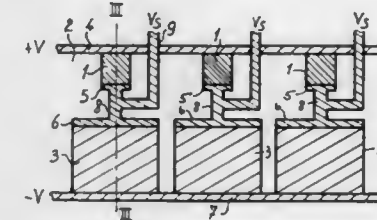
Filed Dec. 27, 1984, Ser. No. 686,870

Claims priority, application France, Jan. 3, 1984, 84 00030

Int. Cl.<sup>4</sup> H01J 40/14

U.S. Cl. 250—211 R

5 Claims



1. A photodetector comprising an output mode terminal and a pair of voltage supply terminals, a photoconductor means having first and second ends of which the first is connected to one of the voltage supply terminals and the second to the output mode terminal, a resistor means having first and second ends of which the first is connected to the other of the voltage supply terminals and the second to the output mode terminal, the photoconductor and resistor means each comprising a separate layer of the same semiconductor materials on a common substrate, the layer of the photoconductor means being open to incident radiation to be detected, the layer of the resistor means being closed to such radiation.



- formed on the phosphor screen onto the photomultiplier tube,  
 v. a sweep generator for driving the sweeping electrodes, and  
 vi. aperture means between the phosphor screen and the output relay optics for limiting the portion of the streak image formed on the phosphor screen that is collected by the relay lens and imaged onto the photomultiplier tube, and  
 d. a delay unit coupled to the sweep generator for delaying the output signal of the sweep generator,  
 e. the sweep generator together with the size of the streak image defining the size of the ultrashort time window.

4,682,021

# HEADER ASSEMBLY FOR AN INTENSIFIED CHARGE COUPLED IMAGE SENSOR

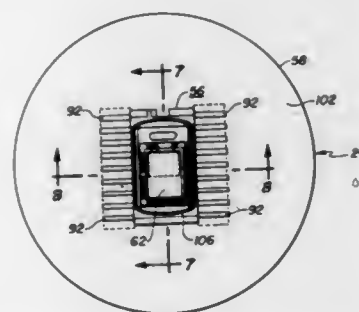
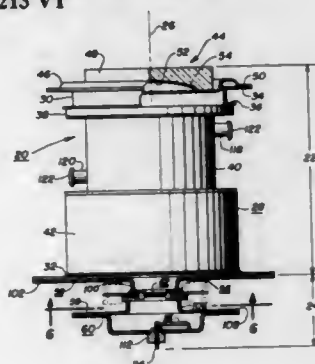
Robert W. Fitts, Lititz, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 29, 1986, Ser. No. 823,536

Int. Cl.<sup>4</sup> H01J 31/50

U.S. Cl. 250—213 VT

5 Claims



1. In an intensified charge-coupled image sensor having a longitudinally extending optical axis, said image sensor comprising  
 an image intensifier section including an envelope having therein a photoemissive cathode for emitting photoelectrons in a pattern corresponding to the intensity of radiation incident thereon, and  
 a header assembly including a charge-coupled device for receiving the photoelectrons from said cathode, an insulative header for retaining said charge-coupled device, a header input member attached between said insulative header and said image intensifier section, and closure means for closing the output end of said header assembly, wherein the improvement comprises  
 said insulative header including a plurality of substantially rectangular insulative members joined together in layers to form a hermetic, dimensionally stable, thermally inert structure, said header having a first major surface and an oppositely disposed second major surface, an imaging

aperture formed in the header and having a sidewall, the imaging aperture being disposed about the optical axis of the image sensor, means for preventing electrostatic charge buildup on the first major surface of the header and on the sidewall bordering the imaging aperture, an electrode surface having a plurality of discrete electrode pads disposed between two of the insulative members of the header, the electrode pads extending outwardly from the periphery of the imaging aperture, half of the contact pads being located at spaced intervals along one long side of the header and the other half of the contact pads being located at spaced intervals along the other long side of the header, each of the contact pads being connected to a different outwardly extending electrical lead, the electrical leads being arranged in oppositely disposed rows,  
 the header input member having a substantially rectangular portion attached to the first major surface of the header and an annular portion attached to the image intensifier section of the image sensor, and  
 the closure means including a header output member having a substantially rectangular portion attached to the second major surface of the header and an end portion closed by an end-closure cap.

4,682,022

# DETECTOR PREAMPLIFIER FOR USE WITH A MCT DETECTOR

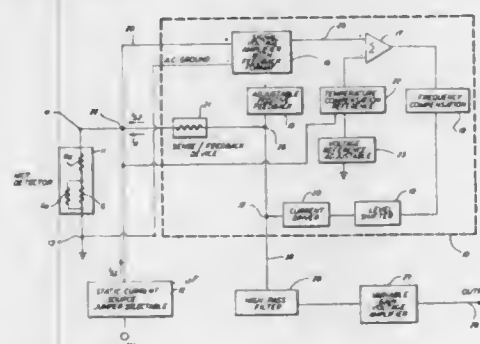
Robert A. Hault, Bethel, and Robert P. Ragusa, New Milford, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 21, 1985, Ser. No. 704,355

Int. Cl.<sup>4</sup> H03K 3/01, 3/26, 3/42

U.S. Cl. 250—214 A

12 Claims



1. A preamplifier having particular utility for a detector that exhibits a fixed electrical resistance effect and a conductance effect which changes with incident light intensity, comprising:  
 means for providing to the detector a substantially fixed voltage potential and a current that varies with a change in the detector conductance;  
 means responsive to said current for providing an output signal being indicative of the incident light intensity on the detector; and  
 positive feedback circuit means for substantially offsetting any nonlinearity caused by the fixed electrical resistance effect of the detector to thereby linearize said output signal, said positive feedback circuit means being connected to said providing means and comprising means for providing a negative resistance effect to substantially nullify the electrical resistance effect of the detector.

4,682,023

# BOTTLE SIDEWALL DEFECT DETECTOR EMPLOYING MASKING MEANS

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

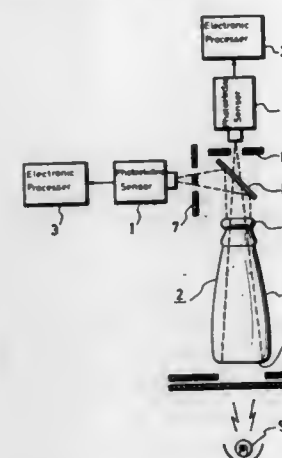
Filed Feb. 28, 1986, Ser. No. 834,639

Claims priority, application Japan, Mar. 12, 1985, 60-48689

Int. Cl.<sup>4</sup> G01N 9/04

U.S. Cl. 250—223 B

4 Claims



1. A defect inspection apparatus for bottles made of transparent material comprising:  
 a light source located under a bottle made of transparent material and to be inspected for irradiating a bottom of said bottle;  
 a photoelectric conversion sensor installed above a mouth of said bottle for receiving such a light that enters said bottle from its bottom, passes through the inside of the sidewall of said bottle and then is emitted upwards from the said mouth and;  
 an electric processor for electrically processing a responsive electrical signal from said photoelectric conversion sensor to thereby inspect defects of said bottle.

4,682,024

# LASER RADIATION WARNING SENSOR UTILIZING POLARIZATION

Thorsteinn Halldorsson, Munich, and Ernst A. Seiffarth, Taufkirchen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

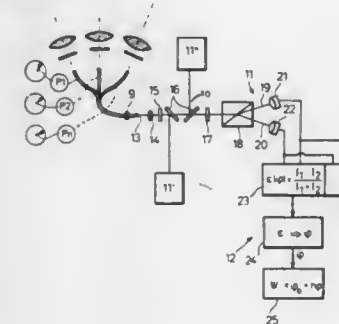
Filed Feb. 5, 1986, Ser. No. 826,240

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513350

Int. Cl.<sup>4</sup> G01J 1/20

U.S. Cl. 250—225

14 Claims



1. Apparatus for the recognition and directional detection of

optical radiation, especially laser radiation, including at least two optical input systems having two different directions of view with defined fields of view, and having respective light guide paths leading to a detector comprising a polarimeter and circuit means coupled to the detector for evaluating a signal from the detector, the respective light guide paths each having therein a polarization means for the linear polarization of radiation incident on the respective optical systems, said light guide paths terminating in an end facing the detector, said polarization means in each light guide path determining at said end facing the detector a specific direction of polarization different from the direction of polarization of each of the other light guide paths, said circuit means comprising means for determining a direction of each of the incident laser radiation as a function of the direction of polarization determined by said polarimeter.

4,682,025

# ACTIVE MIRROR WAVEFRONT SENSOR

Peter M. Livingston, Palos Verdes Estates, and Jean C. Shelton, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

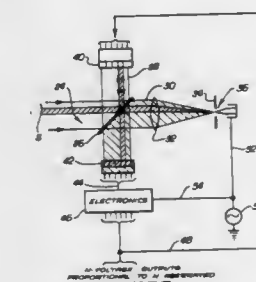
Continuation of Ser. No. 599,871, Apr. 13, 1984, abandoned.

This application Oct. 14, 1986, Ser. No. 919,542

Int. Cl.<sup>4</sup> G01J 1/20; G01B 11/00

U.S. Cl. 250—201

39 Claims



1. An active mirror wavefront sensor, comprising:  
 beam splitting means for splitting an input beam into a reference-arm beam and a sample beam;  
 means for generating a reference beam from the reference-arm beam;  
 means for modulating the reference beam with a high-frequency dither signal;  
 means for recombining the sample beam and the reference beam to produce an interference pattern;  
 multi-element detection means positioned to provide electrical signals indicative of the interference pattern;  
 multiple electrical circuits connected one to each element of the detection means, and each including synchronous detector means for removing dither-frequency components from the electrical signals, and means to provide a phase correction signal from the electrical signals;  
 elemental deformable mirror means positioned to effect wavefront changes in the sample beam; and  
 means for coupling the phase correction signals to the deformable mirror means, whereby each element of the deformable mirror means is automatically adjusted to maintain a practically zero phase difference between the sample beam and the reference beam.

4,682,026

# METHOD AND APPARATUS HAVING RF BIASING FOR SAMPLING A PLASMA INTO A VACUUM CHAMBER

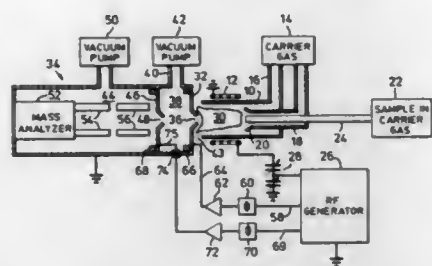
Donald J. Douglas, Toronto, Canada, assignor to MDS Health Group Limited, Rexdale, Canada

Filed Apr. 10, 1986, Ser. No. 850,188

Int. Cl. H01J 49/10

U.S. Cl. 250-288

19 Claims



1. Apparatus for sampling ions in a plasma into a vacuum chamber comprising:

- means for generating a plasma, including (i) an electrical induction coil having first and second terminals and at least one turn between said first and second terminals, said turn defining a space within said coil for generation of said plasma, and (ii) generating means for generating a first RF voltage to apply to said coil to provide heating within said space to generate said plasma,
- a vacuum chamber including an orifice plate defining a wall of said vacuum chamber,
- said orifice plate having an orifice therein located adjacent said space for sampling a portion of said plasma through said orifice into said vacuum chamber,
- second generating means for generating a second RF voltage of frequency the same as that of said first RF voltage and phase locked to said first RF voltage,
- and means connected between said orifice plate and said second generating means for biasing said orifice plate with said second RF voltage to increase the flow of said ions through said orifice.

4,682,027

# METHOD AND APPARATUS FOR SAMPLE CONFIRMATION IN GAS CHROMATOGRAPHY

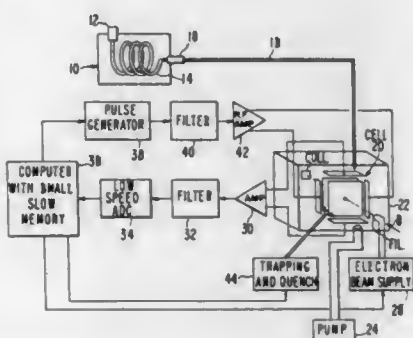
Gregory J. Wells, Suisun, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 25, 1986, Ser. No. 856,721

Int. Cl. H01J 49/38

U.S. Cl. 250-291

6 Claims



- Apparatus for analysis of a vapor sample comprising: a pulsed ion-cyclotron resonance device including:
  - a sample cell,

- means for ionizing a portion of said vapor sample within said sample cell,
- magnet means for creating a substantially uniform magnetic field within said sample cell,
- means for exciting said ions with a pulsed, wide-band rf field orthogonal to said magnetic field,
- means for detecting the cyclotron resonance of the excited ions and for generating a signal in the time domain,
- means for digitizing said time domain signal, and
- means for directly comparing said digitized time domain signal with at least one reference time domain signal and quantifying the degree of correlation of said sample and reference signals.

4,682,028

# METHOD OF ADJUSTING RADIATION IMAGE READ-OUT CONDITIONS

Hiroshi Tanaka, and Nobuyoshi Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

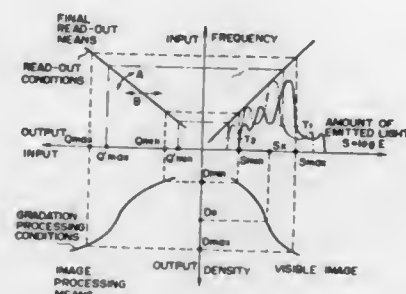
Filed Jan. 28, 1985, Ser. No. 695,332

Claims priority, application Japan, Jan. 26, 1984, 59-12658

Int. Cl. G03C 5/16

U.S. Cl. 250-327.2

6 Claims



1. A method of adjusting radiation image read-out conditions used in a radiation image recording and reproducing system wherein preliminary read-out conducted by scanning a stimuable phosphor sheet carrying a radiation image of an object stored therein by stimulating rays of a level lower than the level of the stimulating rays used in final read-out and approximately detecting the image information stored in the stimuable phosphor sheet is carried out prior to the final read-out for scanning the stimuable phosphor sheet by the stimulating rays which cause the stimuable phosphor sheet to emit light in proportion to the radiation energy stored and detecting the emitted light by a photoelectric read-out means to obtain an image signal, read-out conditions for the final read-out are adjusted on the basis of the information obtained by the preliminary read-out, the final read-out is conducted by use of the read-out conditions, the image signal obtained by the final read-out is sent to an image processing means, and a visible image is reproduced by use of the image signal processed by the image processing means,

the method of adjusting radiation image read-out conditions comprises the steps of:

- determining a histogram of the amount of the light emitted by said stimuable phosphor sheet during said preliminary read-out,
- associating range portions of said histogram with portions of said object;
- selecting for the final read-out one or more portions of said object associated with contiguous range portions of said histograms, said contiguous range portions being less than the total range of said histogram and being a desired image information range;
- from said histogram, calculating the maximum light emission amount  $S_{max}$  and the minimum light emission

4,682,030

# INFRARED RADIATION DETECTOR WITH INTEGRAL FRESNEL LENS WINDOW

Michael A. Rose, Winchester, and Martin Renals, Swindon, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

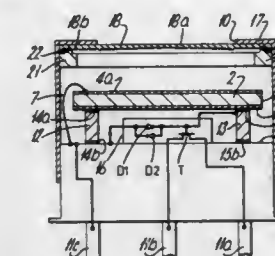
Filed Aug. 19, 1985, Ser. No. 767,317

Claims priority, application United Kingdom, Aug. 24, 1984, 8421507

Int. Cl. G01J 5/08

U.S. Cl. 250-338

14 Claims



- An infrared radiation detector comprising: a hermetically sealed housing; and a pyroelectric detector element arranged in the hermetically sealed housing; characterized in that the hermetically sealed housing comprises: a canister having an aperture therein; and a Fresnel lens arranged in the hermetically sealed housing over the aperture to condense radiation onto the detector element.

4,682,029

# STEREOSCOPIC INFRARED IMAGER HAVING A TIME-SHARED DETECTOR ARRAY

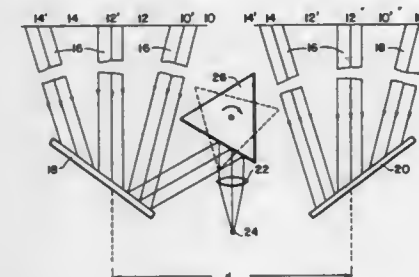
Neal Diepeveen, Fair Lawn, and Robert E. Bastian, Wyckoff, both of N.J., assignors to Magnavox Government and Industrial Electronics Company, New York, N.Y.

Filed Oct. 22, 1985, Ser. No. 790,276

Int. Cl. G01J 5/08

U.S. Cl. 250-330

16 Claims



- A device for producing a stereoscopic visible image of an invisible radiation scene, said device comprising: means for producing a first invisible image of the scene viewed from a first viewing position; means for producing a second invisible radiation image of the scene viewed from a second viewing position spaced from the first viewing position; a radiation detector for detecting the invisible radiation images; means for alternately scanning the first and second invisible radiation images across the detector, each scan having a starting time and a scan rate; a light source; means for driving the light source to produce visible light having an intensity proportional to the intensity of the invisible radiation incident on the detector; means for producing a first visible image of the light source in a first field of view at a third viewing position; means for producing a second visible image of the light source in a second field of view at a fourth viewing position spaced from the third viewing position; means for alternately scanning the first visible image across the first field of view and the second visible image across the second field of view, each scan having a starting time and a scan rate; and means for synchronizing the starting time and scan rate of the visible scanning means with the starting time and scan rate of the invisible radiation scanning means.

4,682,031

# INFRARED GAS ANALYZER

Walter Fabinski, Krefeld, and Werner Schaefer, Kronberg, both of Fed. Rep. of Germany, assignors to Hartmann & Braun AG, Frankfurt am Main, Fed. Rep. of Germany

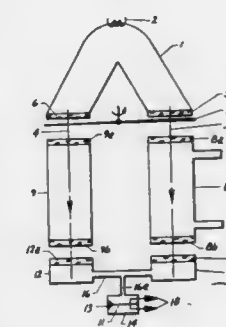
Filed Apr. 25, 1986, Ser. No. 856,585

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515128

Int. Cl. G01N 21/37

U.S. Cl. 250-345

3 Claims



- Infrared gas analyzer including a source of infrared radiation, a measuring chamber receiving and being passed through a first beam of infrared radiation from said source; a reference chamber disposed for receiving a second beam from said source; a first and second receiving chamber respectively disposed on radiation exit sides of said measuring and reference chambers and filled with a particular gas, the improvement comprising: a pressure communicating duct system including a particular chamber connected to said two receiving chambers; and a foil of polyvinylidene fluoride being piezo electrically effective and being disposed and tensioned across said particular chamber to partition said particular chamber



such that the pressure from the two receiving chambers act on said foil, there being means for attracting an electrical signal from opposite surfaces of said foil.

4,682,032

# JOULE-THOMSON CRYOSTAT HAVING A CHEMICALLY-DEPOSITED INFRARED DETECTOR AND METHOD OF MANUFACTURE

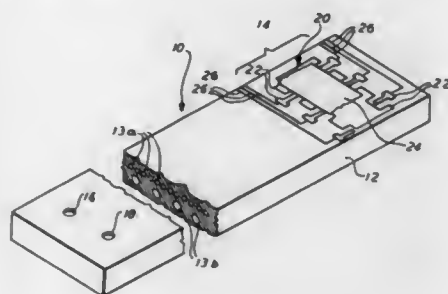
John R. Barrett, Wayland, Mass., assignor to Ittek Corporation, Lexington, Mass.

Filed Jan. 17, 1986, Ser. No. 819,576

Int. Cl.<sup>4</sup> G01J 5/04; H01L 23/34

U.S. Cl. 250-352

17 Claims



1. In combination with a Joule-Thomson cryostat having an elongated substrate with gas-carrying channels formed therein, an infrared detector chemically deposited directly on said substrate, such that said infrared detector is cooled by a gas flowing through the channels of said substrate.

4,682,033

# CAMERA FOR DETECTING X AND $\gamma$ RAYS, WHOSE SCINTILLATION BLOCK HAS AN ENTRANCE WINDOW CONSTITUTED BY A MECHANICALLY STIFF AND LOW ABSORBING X AND $\gamma$ RADIATION SUPPORT

Guy N. Martin, Noiseau, and Michel R. Jatteau, Lesigny, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1985, Ser. No. 750,620

Claims priority, application France, Jul. 6, 1984, 84 10786

Int. Cl.<sup>4</sup> G01T 1/164

U.S. Cl. 250-363 R

8 Claims



1. A scintillation camera comprising a scintillation block including a scintillation crystal, an entrance window and an optical exit window; light intensifying means for receiving signals from said scintillator block; and signal measuring and displaying means for providing measured signals

the improvement comprising said entrance window of said scintillation block being a mechanically stiffened supporting structure having a low absorption for ionizing radiation, wherein said mechanically stiffened supporting structure includes a honeycomb structure attached to at

least one sheet, said honeycomb structure being provided perpendicular to a face of said sheet.

4,682,034

# BLAST WAVE DENSITOMETER SYSTEM

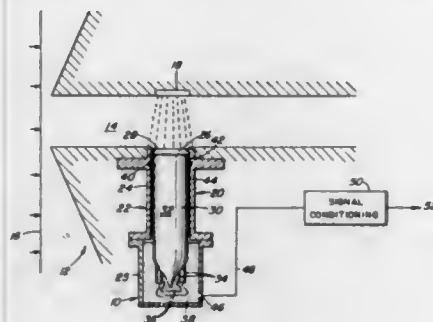
David H. Saint, Medicine Hat, and John W. Funk, Vancouver, both of Canada, assignors to Her Majesty the Queen in right of Canada, Canada

Filed May 6, 1985, Ser. No. 731,050

Int. Cl.<sup>4</sup> G01N 23/08

U.S. Cl. 250-363 R

10 Claims



1. A densitometer comprising:
  - a source of beta radiation
  - a detector including
    - (a) a housing spaced from the source of beta radiation;
    - (b) a scintillator mounted in the housing to receive radiation from the beta radiation source;
    - (c) an abrasion resistant light seal over the scintillator for preventing ambient light from entering the scintillator while passing beta radiation from the source to the scintillator;
    - (d) a photomultiplier tube in the housing to receive light emitted by the scintillator, the photomultiplier tube having a glass envelope and electrical connection pins secured directly to the envelope at a base end thereof;
    - (e) a dynode divider chain mounted directly on the pins of the photomultiplier tube;
    - (f) an elastomeric potting compound, opaque to ambient light, securing the base end of the photomultiplier tube envelope, the electrical connection pins and the dynode divider chain within and out of contact with the housing; and
    - (g) an O-ring around the photomultiplier tube envelope, centering the tube in the housing.

4,682,035

# SOLID STATE COUNTING SYSTEM FOR HIGH ENERGY BETA AND GAMMA DECAY ISOTOPES

Seth D. Shulman, Washington, D.C., assignor to Bioscan, Inc., Washington, D.C.

Filed Apr. 23, 1985, Ser. No. 726,247

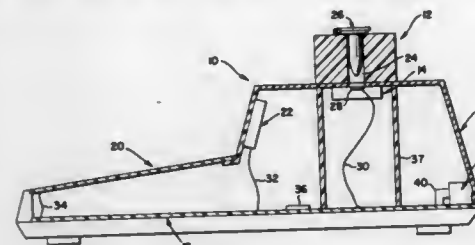
Int. Cl.<sup>4</sup> G01T 1/24

U.S. Cl. 250-370

46 Claims

1. A portable, bench top radiation detection apparatus for quantitative analysis of radioactive samples comprising:
  - a sample holder having an opening defining an interior sample receiving zone for receiving a container containing a single radiation-emitting sample;
  - a generally planar, solid state radiation detector positioned adjacent said sample holder at one end of the sample receiving zone for detecting radiation emitted by said radiation-emitting sample;
  - signal analyzing means responsive to said radiation detector for quantitatively analyzing radiation emitted by said radiation-emitting sample, said signal analyzing means including means for storing a value related to a pre-

selected radiation emitting characteristic of a known radiation-emitting sample positioned in said sample receiving zone, and means responsive to said stored value for



analyzing radiation emissions from a different sample placed in said sample receiving zone; and means for displaying a radiation emission characteristic for said different radiation-emitting sample.

4,682,036

# GAMMA RAY COMPENSATION-TYPE NEUTRON IONIZATION CHAMBER

Naoaki Wakayama; Hideshi Yamagishi, both of Ibaraki; Shinji Fukakusa, and Toshimasa Tomoda, both of Amagasaki, all of Japan, assignors to Japan Atomic Energy Research Institute and Mitsubishi Denki Kabushiki Kaisha, both of, Japan

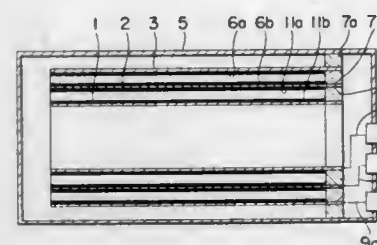
Filed Jan. 23, 1985, Ser. No. 693,889

Claims priority, application Japan, Jan. 23, 1984, 59-9721

Int. Cl.<sup>4</sup> G01T 1/185, 3/00

U.S. Cl. 250-374

6 Claims



1. A neutron ionization chamber of the gamma ray compensation type comprising:

- a neutron sensing ionization chamber portion having an electrode surface coated with a neutron-sensing material;
- a gamma ray sensing ionization chamber portion which has a low neutron sensitivity in comparison with the neutron sensitivity of said neutron-sensing material;
- means for subtracting ionization currents in the gamma ray sensing ionization chamber portion from ionization currents in the neutron sensing ionization chamber portion; and
- a coating material which is coated on an electrode surface of the gamma ray sensing ionization chamber portion, said coating material including a material for sensing neutrons the percentage of which is less than the percentage of said neutron-sensing material of the neutron sensing ionization chamber portion.

4,682,037

# PROJECTION EXPOSURE APPARATUS HAVING AN ALIGNMENT LIGHT OF A WAVELENGTH OTHER THAN THAT OF THE EXPOSURE LIGHT

Masao Kosugi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,258

Claims priority, application Japan, Jul. 10, 1984, 59-143465; Aug. 15, 1984, 59-169205

Int. Cl.<sup>4</sup> G01B 11/00; G01J 1/20

U.S. Cl. 250-548

13 Claims



1. An apparatus for exposing, with light of a first wavelength, a second member to a pattern of a first member, so as to transfer the pattern of the first member onto the second member, said apparatus comprising:

- means for irradiating the first member with the light of the first wavelength;
- means for producing light of a second wavelength different from the first wavelength;
- projecting means for optically projecting, onto the second member, an image of the pattern of the first member irradiated with the light of the first wavelength from said irradiating means, said projecting means having an optical characteristic in which aberration is corrected with respect to the light of the first wavelength, said projecting means having a refracting surface for refracting the light of the first wavelength, and said refracting surface having a predetermined reflection factor with respect to the light of the second wavelength; and
- adjusting means effective to bring the second member and the projected image of the pattern of said first member into a predetermined positional relation, the positional relation being determined using the light of the second wavelength having been reflected by said refracting surface of said projecting means.

4,682,038

# ARRANGEMENT FOR MONITORING AND CONTROLLING WEBS IN PACKAGING MACHINES

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Filed Nov. 15, 1984, Ser. No. 671,843

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341539

Int. Cl.<sup>4</sup> G01N 21/88

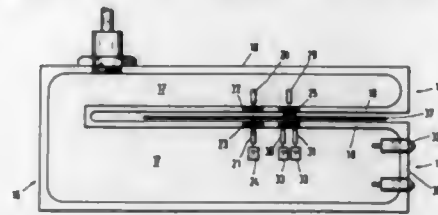
U.S. Cl. 250-548

7 Claims

1. In a packaging machine for packaging objects with a web which is passed along a path through said packaging machine, said web being divided into a plurality of blanks, said web further having an elongate tear-open strip running along the length of said web and along the path through which said web passes, a device for monitoring conditions of said web, said device comprising:

- a first set of sensors for sensing a first set of characteristics of said web, said first of characteristics including material defects, and for accordingly providing a signal indicative of a material defect; and

a second set of sensors for sensing a second set of characteristics of said web, different from said first set of characteristics, said second set of characteristics including posi-



tional orientation of said web with respect to said packaging machine, and for accordingly providing a signal indicative of mispositioning.

4,682,039

# PHOTOELECTRIC TAPE PROFILE DETECTOR FOR FILE SECURITY

Herbert U. Ragle, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

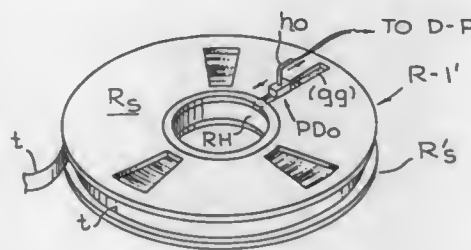
Filed Feb. 24, 1982, Ser. No. 351,952

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.<sup>4</sup> G01N 21/86

U.S. Cl. 250—560

19 Claims



1. A method of photo-electrically developing a wrapping profile, or winding signature, for a tape web segment adapted to be wrapped upon a prescribed reel, this method being adapted to enhance computer tape file security so that each time such a web is wound upon a reel, the winding mode, after repeated windings, is assumed to leave the array of wrapped web edges in a unique edge wrap profile represented by the position of each winding edge as sighted radially along one side of the reel, such a profile constituting the "winding signature", this method involving:

providing photo-electric means for automatically monitoring the relative positions of these web-edges and so detecting this "winding-signature", and also for electronically representing and storing these position values as a prescribed encoded signature representation each time the web is wound; this means being adapted to automatically make such "signature" representation available for use in monitoring unspooling and respooling operations.

4,682,040

# IMAGE PICKUP APPARATUS FOR A PRINTED WIRING BOARD

Tetsuo Hohki; Tetsuo Sano, both of Kyoto; Eiji Kodama, Higashi-Osaka, and Hisayuki Tsujinaka, Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed May 6, 1985, Ser. No. 730,797

Claims priority, application Japan, Jun. 2, 1984, 59-113628

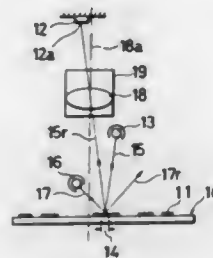
Int. Cl.<sup>4</sup> G01N 21/47, 21/55, 21/89

U.S. Cl. 250—571

12 Claims

1. An image pickup apparatus for a printed wiring board comprising illumination source means for supplying constant irradiation light on the surface of a printed wiring board pro-

vided with copper patterns and a solid state image sensor for receiving light reflected by said surface of said printed wiring board through a lens thereby to output image pickup signals, said solid state image sensor comprising a one-dimensional CCD image sensor extending over said printed wiring board and having a light receiving surface set parallel to the surface of said board and opposed to said surface of said printed wiring board, said illumination source means



being formed by a main illumination source arranged to reflect light specularly on said surface of said printed wiring board with respect to said light receiving surface of said solid state image sensor and a subsidiary illumination source arranged to reflect light diffusely on said surface of said printed wiring board with respect to said light receiving surface of said solid state image sensor thereby to supply said light receiving surface with scattering light diffusely reflected by the surface of said copper patterns.

4,682,041

# COATING QUALITY MEASURING DEVICE AND METHOD

Tsuneyuki Egami, Gamagori; Tsutomu Salto, Okazaki; Mitosi Ando, Nishio; Ryuzon Hori, Toyota; Takashi Kamo, Toyota, and Kazunori Yoshida, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

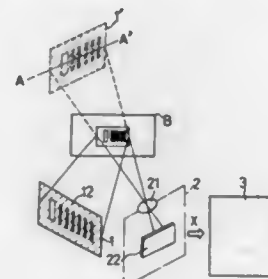
Filed Sep. 19, 1985, Ser. No. 777,682

Claims priority, application Japan, Sep. 20, 1984, 59-197705

Int. Cl.<sup>4</sup> G01N 21/86

U.S. Cl. 250—571

20 Claims



1. A coating quality measuring device for measuring the coating quality of a coated surface, comprising:

a pattern plate positioned opposite the coated surface to be measured, said pattern plate being provided with a plurality of strip pattern portions arranged at intervals on a surface of said pattern plate opposite the coated surface, each of said strip pattern portions having a constant width and transmitting light differently than a ground portion of said pattern plate, said pattern plate including a reference pattern portion having a width greater than said constant width, said reference pattern portion width being large enough that a level of light of an image of said reference pattern portion reflected from said coated surface remains substantially invariant to changes in coating quality; image-pickup means for forming an image of said pattern

plate reflected off said coated surface, and for scanning the formed reflected image along a line extending in a width direction of each pattern portion, and for successively generating output signals having signal levels which vary corresponding to a light level of the reflected image of each said pattern portion and said ground portion along the scanned line; and computing means for computing the coating quality of the coated surface by processing the signal levels of successively generated output signals.

4,682,042

# INFORMATION READING DEVICE WITH DRIVER CIRCUITRY SEPARATE FROM SENSOR BOARD

Yosuke Igarashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

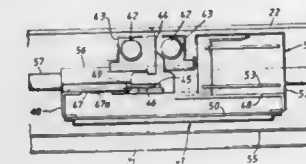
Filed Oct. 18, 1985, Ser. No. 788,836

Claims priority, application Japan, Oct. 30, 1984, 59-228505

Int. Cl.<sup>4</sup> H01J 40/14

U.S. Cl. 250—578

21 Claims



1. An information reading device for reading information from an original document, said device comprising:

a main body member having an inner bottom surface; an original table member mounted on said main body member and having a surface spaced from and substantially parallel to said inner bottom surface to support an original document to be scanned; a carriage member mounted on said main body member and movable reciprocally in a plane substantially parallel to said original table member surface; carriage driving means for reciprocally moving said carriage member; a scanner mounted on said carriage member, said scanner including,

a light source disposed to irradiate light onto the original document positioned on said table member surface during reciprocal movement of said carriage member, and light leading means positioned to guide said irradiated light reflected from the original document to a selected location;

a sensor board having image sensing means on one surface thereof, said sensor board being mounted on said carriage member and disposed to position said image sensing means at said selected location for receiving said irradiated reflected light from said light leading means and for converting said irradiated reflected light into electrical signals;

a driver board mounted on said carriage member adjacent to but spaced from said sensor board, said driver board having driving circuitry for driving said image sensing means incorporated into one surface of said driver board; and means for electrically connecting said image sensing means and said driving circuitry.

4,682,043

# OBTAINING UNIFORMITY OF RESPONSE IN ANALYTICAL MEASUREMENT IN A NEUTRON-CAPTURE-BASED ON-LINE BULK-SUBSTANCE ELEMENTAL-ANALYZER APPARATUS

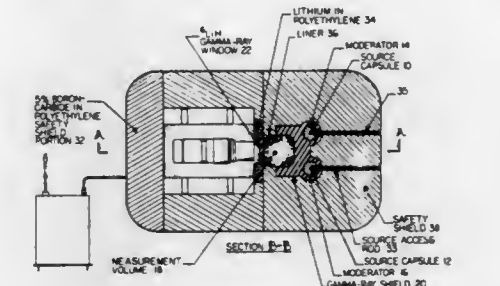
J. Howard Marshall, 145 Hurlbut, Apt. 305, Pasadena, Calif. 91105

Continuation of Ser. No. 866,488, Jan. 3, 1978. This application Jul. 30, 1979, Ser. No. 61,833

Int. Cl.<sup>4</sup> G01F 23/00

U.S. Cl. 250—358.1

8 Claims



1. An improved apparatus for the on-line analysis of the composition of a bulk substance in a measurement volume, wherein said analysis includes the production and capture of neutrons and the detection of the resulting capture gamma rays, said apparatus comprising, in combination:

(a) means for containing the bulk substance to be analyzed, said means comprising a bulk substance receiving passage-way substantially square in cross-section having first, second, third and fourth interconnected sides said means for containing the bulk substance being at least partly surrounded by a neutron-reflecting substance; (b) neutron-producing means for providing neutrons which generate gamma rays by neutron-capture reactions with the nuclei in the bulk substance being analyzed, the neutron-producing means being operably associated with the means for containing the bulk substance; and (c) means for gamma-ray detection operably associated with the neutron-producing means and the means for containing the bulk substance being analyzed, the means for gamma-ray detection producing electrical signals indicative of the gamma-ray energies to provide for the measurement of the energy spectrum of the capture gamma rays.

4,682,044

# ENGINE IDLING LOAD CONTROL MEANS

Makoto Hotate; Tadashi Kaneko; Toshio Nishikawa, all of Hiroshima; Tadataka Nakazumi, Kure, and Nobuo Takeuchi, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 25, 1985, Ser. No. 791,447

Claims priority, application Japan, Oct. 25, 1984, 59-225378; Oct. 25, 1984, 59-225379

Int. Cl.<sup>4</sup> H02J 7/00

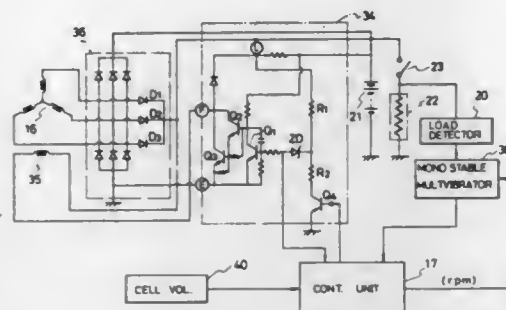
U.S. Cl. 290—40

9 Claims

1. A power plant including an engine, electric generator means driven by said engine to produce an electric output which is adapted to be supplied to an electric load, electric cell means connected with said load such that an electric power is supplied from said generator means to said electric load when the generator means provides an output voltage higher than a voltage of the electric cell means but from said electric cell means when the voltage of said generator means is lower than the voltage of the electric cell means, load detecting means for detecting an instance wherein the electric load is turned on, engine control means for increasing engine output when said



engine is being operated in an idling condition and subjected to said electric load, generator output regulating means for regulating the electric output voltage of said generator means in accordance with an electric current to said electric load so that a field current of said generator means is increased as the electric output voltage of the generator means increases, gen-



erator control means responsive to a signal from said load detecting means showing that the electric load has just been turned on for controlling said generator electric output voltage regulating means to suppress an increase of the field current and thereby suppress an increase of the electric output voltage of the electric generator means for a predetermined time so as to prevent an abrupt decrease in speed of the engine.

4,682,045

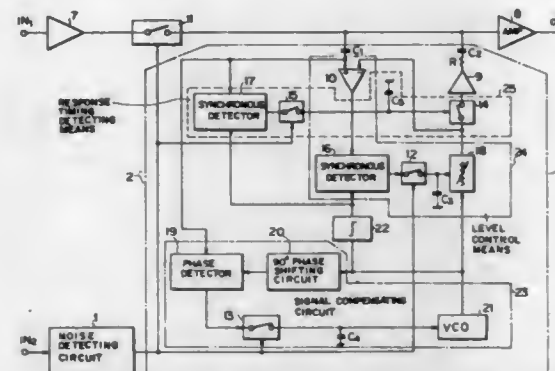
# NOISE ELIMINATING SIGNAL COMPENSATION CIRCUIT

Kiyoshi Amazawa, and Akira Mori, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan  
Filed Feb. 6, 1986, Ser. No. 826,828

Claims priority, application Japan, Feb. 12, 1985, 60-25440  
Int. Cl.<sup>4</sup> H04H 5/00

U.S. Cl. 307-125

5 Claims



1. A noise eliminating signal compensation circuit, comprising:

- input terminal means and output terminal means;
- switch means having an input coupled to said input terminal means and adapted to be turned on and off for respectively passing and blocking an input signal present at said input terminal means, said switch means having an output which is coupled to said output terminal means;
- noise detecting means coupled to said input terminal means for detecting a noise component intermittently present at said input terminal means and for respectively turning said switch means off and on in response to the presence and absence of said noise component; and
- signal compensation circuit means having an input coupled through a coupling capacitor to said output of said switch means for generating a compensation signal in response to said input signal, wherein said signal compensation circuit means includes signal generating means responsive to said input signal when said switch means is turned on for

generating a frequency signal having a frequency equal to that of said input signal, includes level control means responsive to said input signal and said frequency signal for adjusting a level of said frequency signal to a level substantially equal to that of said input signal, said adjusted signal being said compensation signal, and includes response timing detecting means for detecting a response timing of said signal generating means and level control means relative to said input signal and for supplying said compensation signal from said level control means to holding means upon detection of the response timing, said holding means facilitating application of said compensation signal to said output terminal means when said switch means is turned off;

wherein said coupling capacitor connected between said switch means and said signal compensation circuit means passes only high frequency signal components, and wherein said response timing detecting means includes a first switch which is connected between said level control means and said holding means and which is turned on by said response timing detecting means upon detection of the response timing.

4,682,046

# POSITIVE OR NEGATIVE VOLTAGE POWER SUPPLY WITH SLIDEABLE CARRIER SWITCHING MECHANISM

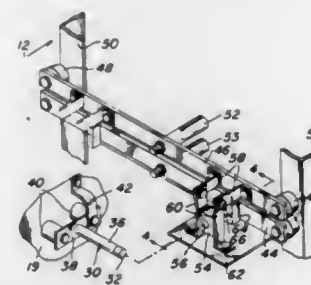
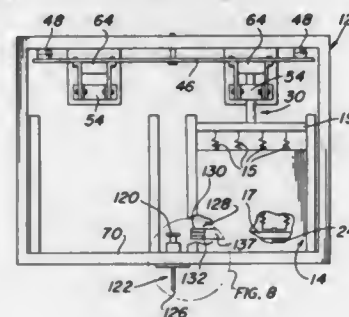
David H. Buerkel, Wayne, Pa., assignor to Applied Energy Systems, Inc., Malvern, Pa.

Filed Aug. 1, 1986, Ser. No. 892,670

Int. Cl.<sup>4</sup> H02J 1/00

U.S. Cl. 307-138

9 Claims



1. An electrical apparatus for selectively providing voltages of different polarities including:

- (a) a support;
- (b) a carrier slidably mounted on the support for movement between first and second positions, said carrier including electrical circuitry therein;
- (c) a positive source of power and a negative source of power; and
- (d) conductor means on the carrier for connecting the positive source of power to said circuitry when the carrier is in the first position and for connecting the negative source

of power to the circuitry when the carrier is in said second position.

4,682,047

# COMPLEMENTARY

METAL-OXIDE-SEMICONDUCTOR INPUT CIRCUIT  
Frithjof von Sichert, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

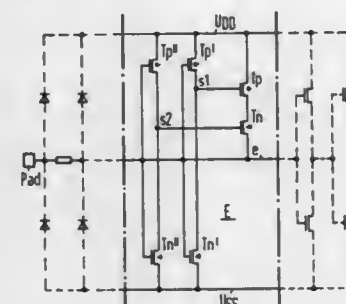
Filed Aug. 18, 1986, Ser. No. 898,144

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530917

Int. Cl.<sup>4</sup> H03K 17/08, 19/003, 19/094, 17/687

U.S. Cl. 307-200 B

4 Claims



1. In a complementary metal-oxide-semiconductor circuit of the type which includes a circuit input, complementary metal-oxide-semiconductor transistors each having a threshold voltage, and an operating voltage source, the improvement of an input circuit comprising a switched resistor which is controlled from the input to define the potential at the input terminal when the same is not connected, said improvement comprising:

a metal-oxide-semiconductor transistor circuit including first and second serially connected transistors connected between the circuit input and the operating voltage source, said first transistor having a gate and a first threshold voltage near the threshold voltage of one of the channel types, said second transistor having a gate and a second threshold voltage near the threshold voltage of the other channel type, said first and second threshold voltages lying in a region between the threshold voltages of the complementary metal-oxide-semiconductor transistors; and

control means connected between the input and said gates and responsive to the potential at the input to operate said first and second transistors to states of conductivity which cause a potential to be defined at the input.

4,682,048

# OUTPUT CIRCUIT WITH IMPROVED TIMING CONTROL CIRCUIT

Shoji Ishimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,454

Claims priority, application Japan, Nov. 21, 1983, 58-219016

Int. Cl.<sup>4</sup> H03K 5/13, 5/159, 17/28; G11C 8/00

U.S. Cl. 307-269

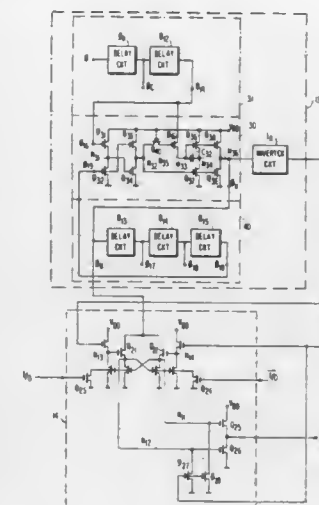
9 Claims

1. An output circuit comprising:

- a driver circuit having a first control terminal, a second control terminal and an output terminal, said driver circuit operatively generating a first timing signal at said output terminal during a period from a time when a first control signal is applied to said first control terminal under absence of application of a second control signal to said second control terminal to a time when said second control signal is applied to said second control terminal,
- a delay circuit having an input terminal coupled to said output terminal of said driver circuit and an output termi-

nal coupled to said second control terminal of said driver circuit, said delay circuit generating said second control signal at the output terminal thereof when a predetermined time period has elapsed from the generation of said first timing signal, and

an output section having an operation control terminal coupled to said output terminal of said driver circuit, a data



input terminal receiving an input data signal and a data output terminal, said output section operatively generating at said data output terminal an output data signal corresponding to an input data signal applied to said data input terminal when said first timing signal is present, whereby said output data signal is generated during said predetermined period.

4,682,049

PULSE SHAPER FOR INDUCTIVE TRANSMITTERS  
Michael Kirschner, Pforzheim; Günter Rapp, Hemmingen, and Martin Zechmann, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE85/00310, § 371 Date Mar. 19, 1986, § 102(e) Date Mar. 19, 1986, PCT Pub. No. WO86/01860, PCT Pub. Date Mar. 27, 1986

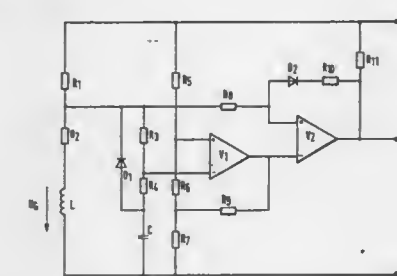
PCT Filed Sep. 9, 1985, Ser. No. 857,748

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1984, 3433777

Int. Cl.<sup>4</sup> H03K 5/08

U.S. Cl. 307-268

4 Claims



1. A pulse shaper for inductive transmitters, in particular inductive crankshaft angle transmitters on internal combustion engines, comprising a Schmitt trigger which includes a first and a second differential amplifier each having two inputs; first setting means connected to one input of the first amplifier to

apply thereto a substantially fixed potential during an equilibrium condition of the Schmitt trigger; a peak value detector for coupling via said first setting means an inductive transmitter to the one input of the first amplifier, said detector including a detecting diode and a capacity for storing a detected peak value signal; second setting means connected to the other input of the first amplifier to set a fixed trigger threshold; the output of the first amplifier being connected to one input of the second amplifier and the other input of the second amplifier being connected to said inductive transmitter; a feedback diode connected between the output and the other input of the second amplifier, the feedback diode being in blocking condition when the second amplifier is switched off; and feedback means connected between the output of the first amplifier and the second setting means to adjust another trigger threshold whose value depends on a previously detected peak value signal stored in said capacity.

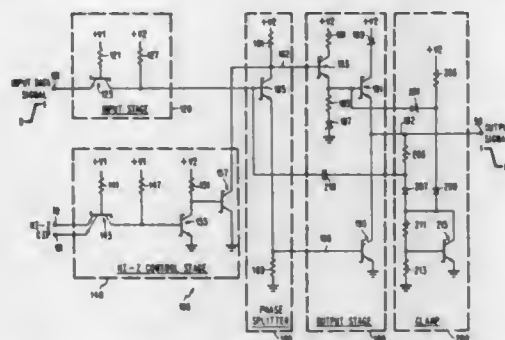
4,682,050

## SMALL SIGNAL SWING DRIVER CIRCUIT

Herve L. Beranger, Fontainebleau, France; Gene J. Gaudenzi, Purdys; Dennis C. Reedy, Stormville, both of N.Y., and Helmut Schettler, Dettenhausen, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

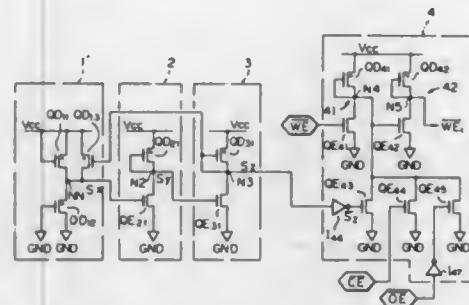
Filed Jan. 8, 1986, Ser. No. 817,143

Int. Cl.<sup>4</sup> H03K 3/01, 19/088; H01L 9/02; H03B 1/04  
U.S. Cl. 307—270 10 Claims



4. A driver for applying a digital output signal to an interconnect line, the driver comprising:  
an input circuit, responsive to a digital data input signal applied to a data input of the driver, the input circuit comprising at least one serially connected intermediate circuit, each intermediate circuit producing a corresponding intermediate signal;  
an output circuit, responsive to at least one of the intermediate signals, for producing the digital output signal; and  
a clamp and output transition control circuit, connected between the output of the driver and an input of at least one of the intermediate circuits, for sinking current from the output of the driver whenever the voltage at the output of the driver exceeds a pre-selected threshold value and for controlling a falling transition time in the digital output signal produced by the driver, which comprises:  
(a) sinking means, connected to the output of the driver, for sinking current whenever the voltage at the output of the driver exceeds the value of the threshold voltage; and  
(b) a capacitor, connected at a first end to the input of at least one of the intermediate circuits and connected at a second end to said sinking means, for controlling the falling transition time.

4,682,051  
VOLTAGE LEVEL DETECTION CIRCUIT  
Hideki Arakawa, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan  
Filed Feb. 27, 1985, Ser. No. 706,284  
Claims priority, application Japan, Feb. 28, 1984, 59-35112  
Int. Cl.<sup>4</sup> H03K 17/30  
U.S. Cl. 307—359 12 Claims

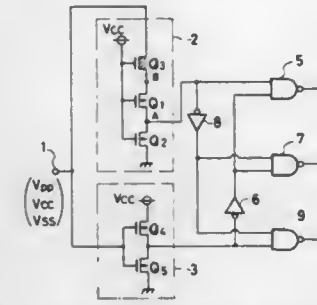


1. A voltage level detection circuit connected between first and second feed lines, comprising:  
a first depletion-type metal insulator semiconductor (MIS) transistor, connected between said first feed line and a common node, having a gate connected to said first feed line, having a source and having a drain, the source and drain forming source-drain current path between said common node and said first feed line;  
a second depletion-type MIS transistor, connected between said common node and said second feed line, having a gate connected to said second feed line, having a source and having a drain, the source and drain forming a source-drain current path between said common node and said second feed line;  
output signal generation means, connected to said common node, for generating an output signal when the potential at said common node reaches a predetermined value, said output signal generation means including:  
a first inverter circuit having an input terminal connected to said common node and having an output terminal; and  
a second inverter circuit having an input terminal connected to said output terminal of said first inverter circuit; and  
a third depletion-type MIS transistor having a drain connected to the drain of said first depletion-type MIS transistor, having a source connected to the source of said first depletion-type MIS transistor, and having a gate connected to said output terminal of said output signal generation means, for stabilizing said output signal at said output terminal of said output signal generation means.

4,682,052  
INPUT BUFFER CIRCUIT  
Mikio Kyomasu, Hamamatsu, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan  
Filed Jan. 18, 1985, Ser. No. 693,017  
Claims priority, application Japan, Jan. 20, 1984, 59-9064  
Int. Cl.<sup>4</sup> H03K 17/30, 17/693  
U.S. Cl. 307—361 5 Claims

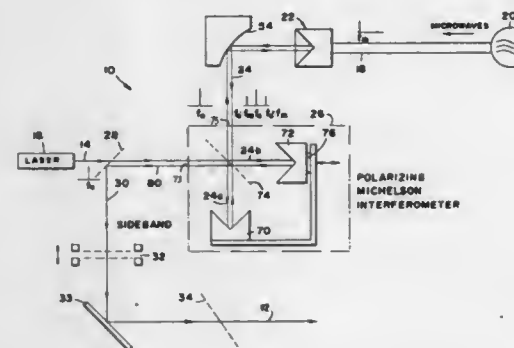
1. Circuitry comprising:  
input means for receiving an input signal capable of taking any one of first, second and third levels;  
first detecting means connected to said input means and having a first threshold level which is lower than said first level but higher than said second level for outputting a first result of comparison between said input signal and said first threshold level, wherein said first detecting means includes a CMOS inverter and a depletion type

MOS transistor connected in series with said CMOS inverter having a source/drain connected to a first reference potential, said depletion type MOS transistor having a source/drain connected to said input means;  
second detecting means connected to said input means and having a second threshold level which is lower than said second level but higher than said third level for outputting



a second result of comparison between said input means and said second threshold level; and  
third detecting means connected to said first and second detecting means for determining the level of said input signal applied to said input signal in accordance with said first and second results and for outputting a signal which is a function of the level of the input signal applied to the input means.

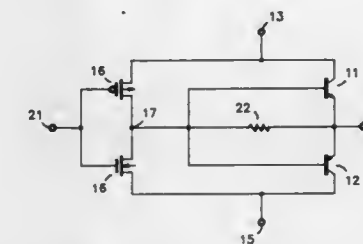
4,682,053  
METHOD AND MEANS FOR GENERATION OF TUNABLE LASER SIDEBANDS IN THE FAR-INFRARED REGION  
Herbert M. Pickett, La Canada, and Jam Farhoomand, Pasadena, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.  
Filed Oct. 3, 1985, Ser. No. 783,887  
Int. Cl.<sup>4</sup> G02F 2/00; H01S 3/00  
U.S. Cl. 307—425 7 Claims



1. Apparatus for generating tunable electromagnetic radiation of a far-infrared wavelength comprising:  
means for generating infrared radiation of a predetermined first frequency;  
means for generating microwave radiation of a microwave frequency, said generating means being capable of continuously varying the frequency of the microwave radiation, at least within a predetermined range;  
means for mixing said infrared and microwave radiation to generate mixed radiation containing first infrared radiation of said first infrared frequency and second infrared radiation of a second infrared frequency representing a

first sideband frequency which differs from said first frequency by said microwave frequency;  
means for separating radiation of said second infrared frequency from said mixed radiation;  
said separating means comprising a polarizing Michelson interferometer which includes first and second rooftop reflectors and a first polarizer, all arranged so said mixed radiation encounters said first polarizer, with one part of the mixed radiation passing through said first polarizer to said first reflector and back to the first polarizer, and another part of the mixed radiation reflecting off said first polarizer to said second reflector and back to the first polarizer, said separating means also including a second polarizer positioned to receive at least a portion of the first radiation part from the first polarizer after the first radiation part reflects from the first reflector to the first polarizer, and to also receive at least a portion of the second radiation part from the first polarizer after the second radiation part has reflected from the second reflector;  
said first and second reflectors located at different distances from the first polarizer, the difference in distance equal to an integral number of wavelengths of one infrared frequency of the mixed radiation and also equal to an integral number plus one-half times the wavelength of another infrared frequency of said mixed radiation, whereby to differently polarize the different infrared frequencies to allow the second polarizer to pass one infrared frequency and reflect the other.

4,682,054  
BICMOS DRIVER WITH OUTPUT VOLTAGE SWING ENHANCEMENT  
Kevin L. McLaughlin, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.  
Filed Jun. 27, 1986, Ser. No. 879,750  
Int. Cl.<sup>4</sup> H03K 19/01  
U.S. Cl. 307—446 4 Claims



1. A circuit comprising:  
a first supply voltage terminal;  
a second supply voltage terminal;  
an input terminal;  
an output terminal;  
a first bipolar transistor coupled between said first supply voltage terminal and said output terminal and having a base coupled to a node;  
a second bipolar transistor coupled between said output terminal and said second supply voltage terminal and having a base coupled to said node;  
first means coupled between said first supply voltage terminal and said node and coupled to said input terminal for providing a voltage for biasing said first transistor, said first means providing a high impedance to said input terminal;  
second means coupled between said node and said second supply voltage terminal and coupled to said input terminal for biasing said second transistor, said second means providing a high impedance to said input terminal; and  
a resistor coupled between said node and said output terminal.



4,682,055

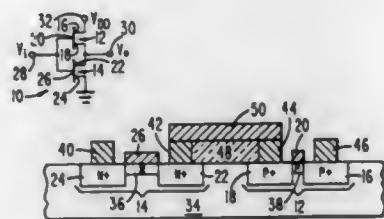
CFET INVERTER HAVING EQUAL OUTPUT SIGNAL RISE AND FALL TIMES BY ADJUSTMENT OF THE PULL-UP AND PULL-DOWN TRANSCONDUCTANCES  
Lakshminarasimha C. Upadhyayula, East Windsor Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 17, 1986, Ser. No. 839,917

Int. Cl.<sup>4</sup> H03K 17/687

U.S. Cl. 307—451

5 Claims



## 1. A logic circuit comprising:

input, output, and a pair of power supply terminals having a potential difference therebetween of between about 0.5 and 1 volt;

a P-channel metal semiconductor field effect transistor having gate, source, and drain electrodes; and

an N-channel metal semiconductor field effect transistor having gate, source, and drain electrodes, the P-channel transistor drain electrode being coupled to the N-channel transistor drain electrode and to said output terminal, said gate electrodes being coupled together and to said input terminal, said source electrodes being respectively coupled to said power supply terminals; wherein

the length of said P-channel transistor channel region is between about 0.1 and 0.5  $\mu\text{m}$ , to ensure substantially equal currents in said transistors when changing the logic state.

4,682,056

SWITCHING CIRCUIT HAVING LOW SPEED/POWER PRODUCT

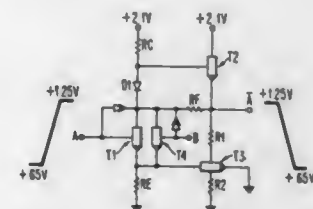
Gene J. Gandenzi, Purdys, and Dennis C. Reedy, Stormville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1985, Ser. No. 787,949

Int. Cl.<sup>4</sup> H03K 19/01, 19/088, 17/04, 17/60

U.S. Cl. 307—456

8 Claims



8. A logical binary circuit having a low speed/power product for driving a highly capacitive load, said logical binary circuit comprising:

at least one input terminal;

an output terminal;

first active circuit means for charging said highly capacitive load from a first potential to a second potential in response to a first binary input impressed on said at least one input terminal, where the absolute magnitude of said second potential is approximately twice the voltage magnitude of said first potential; and

second active circuit means interconnected with said first circuit means, said second circuit means discharging said

highly capacitive load from said second potential to said first potential in response to a second logical binary input impressed on said at least one input terminal;

said first and second active circuit means interconnected between said at least one input terminal and said output terminal; and,

said logical binary circuit being further characterized in that a portion of said first active circuit means for charging said highly capacitive load is also employed in said second active circuit means for discharging said highly capacitive load and wherein said portion of said first active circuit means employed in both charging and discharging said highly capacitive load is at least one input transistor directly connected to said at least one input terminal.

4,682,057

CIRCUIT DESIGN TECHNIQUE TO PREVENT CURRENT HOGGING WHEN MINIMIZING INTERCONNECT STRIPES BY PARALLELING STL OR ISL GATE INPUTS

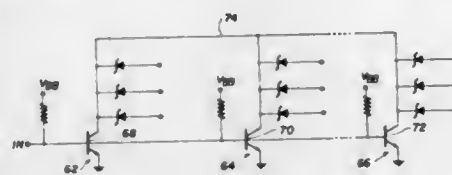
Brent R. Doyle, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 14, 1981, Ser. No. 301,761

Int. Cl.<sup>4</sup> H03K 19/091

U.S. Cl. 307—459

10 Claims



## 1. A logic circuit, comprising:

a plurality of single-input, multiple-output logic gates each having a transistor including a base, emitter and collector, said single-input being applied to said base of said transistor, said multiple-outputs being taken from said collector of said transistor through Schottky diodes, said collector having an ohmic collector contact, said bases of said plurality of transistors being connected together and driven by a current source means, said emitters of said plurality of transistors being connected to a common potential node; and

contact means interconnecting said ohmic collector contacts of said plurality of gates for reducing current hogging between the bases of said transistors when said logic gates have unequal load currents drawn by said multiple outputs.

4,682,058

THREE-STATE LOGIC CIRCUIT FOR WIRE-ORING TO A DATA BUS

Laszlo V. Gal, Poway, Calif., assignor to Unisys Corporation, Detroit, Mich.

Filed Jul. 3, 1986, Ser. No. 881,735

Int. Cl.<sup>4</sup> H03K 17/16

U.S. Cl. 307—473

6 Claims

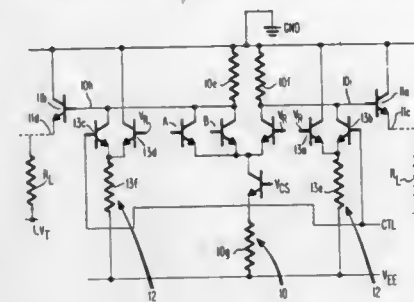
## 5. A three-state logic circuit comprising:

a conductor for carrying output signals of said circuit;

a logic gate having input terminals for receiving input logic signals and having a means for generating high and low output voltages  $V_H$  and  $V_L$  on said conductor as a logical function of said input logic signals; and

a control circuit, connected to said conductor in parallel with said logic gate, which responds to a control signal by lowering said voltages  $V_H$  and  $V_L$  on said conductor by an increment which is at least as large as  $V_H - V_L$ ; said control circuit including a pair of transistors that respectively receive a reference voltage and a control signal on

their base, having collectors that respectively connect to said conductor and to a ground bus, and having emitters



that are coupled together through a resistive means to a voltage bus.

4,682,059

COMPARATOR INPUT STAGE FOR INTERFACE WITH SIGNAL CURRENT

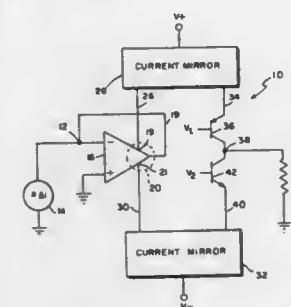
Carlos M. Garcia, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 31, 1985, Ser. No. 793,316

Int. Cl.<sup>4</sup> H03F 3/18

U.S. Cl. 307—496

31 Claims



## 1. A current interface circuit, comprising:

an input mode for receiving an input current flow from a current source;

a circuit output;

an impedance buffering circuit connected to the input node and having means for maintaining a low impedance at the input node and having first and second current outputs and having first circuit means for producing a change in a current flow at said first current output and at said second current output in response to a change in magnitude of said input current flow; and

second circuit means, connected to said first and second current outputs and to said circuit output, for producing a change in current flow at the circuit output in response to said current flow changes at said first and second outputs; wherein said second circuit means includes a first current mirror having a controlled leg connected to said first current output and a controllable leg connected to the circuit output, and a second current mirror having a controlled leg connected to said second current output and a controllable leg connected to the circuit output;

wherein said controllable legs are connected to the circuit by respective complementary conductivity transistor devices, each device having a first terminal connected to the controllable leg of the respective current mirrors, a second terminal connected to the circuit output, and a control terminal connected to a biasing voltage.

4,682,060

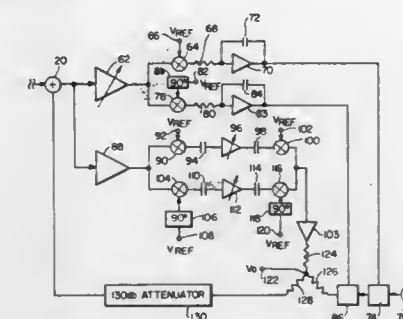
NOISE SUPPRESSION IN AN I-F SUBSTITUTION LOOP  
Bengt A. Ulriksson, Gaithersburg, and Lawrence Fletcher, Frederick, both of Md., assignors to Weinschel Engineering Co., Inc., Gaithersburg, Md.

Filed Mar. 5, 1985, Ser. No. 708,494

Int. Cl.<sup>4</sup> H03B 3/04; H04B 1/10

U.S. Cl. 307—543

6 Claims



## 1. A noise reduction circuit for use with an I-F substitution loop comprising

an I-F substitution loop having a summing junction, a source of I-F signals, having side band frequencies and an I-F frequency,

a source of a substitution signal, means supplying both said signals to said summing junction, amplification loop means for transforming and amplifying a signal at said summing junction and feeding back to the summing junction an amplified and transformed signal produced by said amplification loop means,

said amplification loop means including first amplifier means for receiving as an input signal the signal at said summing junction, and providing a first DC output signal bandpass filtered to provide a pass band at the side band frequencies and a stop band at the I-F frequency,

second amplifier means connected in a quadrature with said first amplifier means for receiving as an input signal the signal at said summing junction, and providing a second DC output signal bandpass filtered to provide a pass band at the side band frequencies and a stop band at the I-F frequency,

means applying said first and second output signals to said summing junction,

third amplifier means for receiving as input signals and summing together said first and second output signals for providing at an output terminal a third output signal, and means for connecting said third output signal to said summing junction.

4,682,061

MOSFET TRANSISTOR SWITCH CONTROL  
William J. Donovan, San Bernardino, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 1, 1986, Ser. No. 858,154

Int. Cl.<sup>4</sup> H03K 17/687, 3/42, 3/26; G02B 27/00

U.S. Cl. 307—571

11 Claims

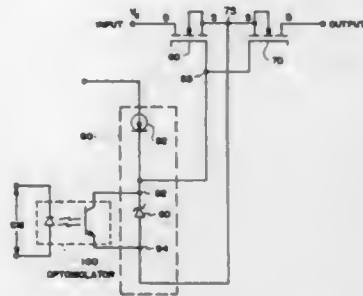
## 1. An isolated MOSFET switch control circuit having an input port and an output port comprising:

first and second switching MOSFETs for switching an input signal through the switch control circuit, the MOSFETs having their gates connected together at a gate junction, their sources connected together at a source junction, the drain of the first MOSFET connected to the input port and the drain of the second MOSFET connected to the output port;

current source means for generating a fixed enhancement voltage the current source means comprising a constant current diode having its anode connected to an external

voltage source, and a zener diode being connected at the cathode to the cathode of the constant current diode, a first switching means and the gate junction of the MOSFETs and being connected at the anode to a second switching terminal of the switching means and the source junction of the MOSFETs;

circuit control means for operating the switch control circuit; and



wherein said switching means for isolating the circuit control means from the switching MOSFETs and for applying and disconnecting the current source means to the switch control circuit such that, when the circuit control means turns the switching means off, the current source is applied and the switching MOSFETs will be turned on, a first switching terminal of and when the circuit control means turns the switching means off, the current source is disconnected and the switching MOSFETs will be turned off.

4,682,062

**ANTI-THEFT SYSTEM FOR MOTOR VEHICLES**

Zvi Weinberger, Ramot 03-345/43, Jerusalem, Israel

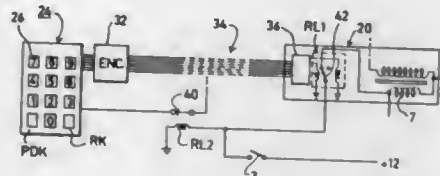
Filed Feb. 27, 1986, Ser. No. 833,288

Claims priority, application Israel, Feb. 27, 1985, 74461

Int. Cl.<sup>4</sup> B60R 25/00

U.S. Cl. 307—10 AT

18 Claims



1. An anti-theft system for motor vehicles, comprising:

- a vehicle ignition switch for starting the vehicle when turned to an On-position and for terminating vehicle operation when turned to an Off-position;
- a code input device for inputting a code;
- a storage device for storing a predetermined code;
- an electronic system including comparison means for comparing the inputted code with the stored code;
- an enabling device actuated by said comparison means when the inputted code corresponds to the storage code;
- said enabling device being effective, when actuated, to enable starting the vehicle engine by the vehicle ignition switch being turned to its On-position;
- a manually operable reset device effective, when operated with the ignition switch in its Off-position, to deactivate said enabling device, but not effective when operated with the ignition switch in its On-position to deactivate the enabling device;
- and a manually operable protection-disable device effective, when operated, to disable said reset device from deactuating said enabling device when the reset device is operated with the ignition switch in its Off-position.

4,682,063

**CONTROL MOTOR FOR A SERVO VALVE**

Herbert Lembke, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

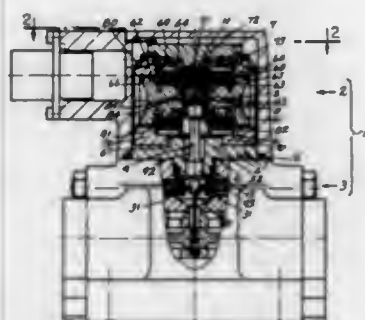
Filed Jan. 21, 1986, Ser. No. 820,730

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1985, 3501836

Int. Cl.<sup>4</sup> F15B 13/043; H01F 7/14

U.S. Cl. 310—29

7 Claims



1. A control motor for a servo valve, comprising:

- pole means comprising a U-shaped support member including two diametrically oppositely disposed side wall elements defining an armature space;
- a closing plate mounted to and extending between first ends of said sidewall elements;
- first and second control spool elements supported by said pole means and disposed between said sidewall elements;
- a thin walled tube;
- a soft metal armature member resiliently mounted to said tube and disposed between said spool elements within said armature space; and
- permanent magnet means including a permanent single polarized cobalt-samarium magnet mounted to said closing plate member for polarizing said armature member.

4,682,064

**COOLANT GAS FLOW SEPARATOR BAFFLE FOR A DYNAMOELECTRIC MACHINE**

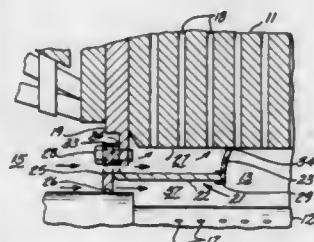
Kim H. Crounse, Ballston Lake, and James B. Archibald, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,643

Int. Cl.<sup>4</sup> H02K 9/00

U.S. Cl. 310—61

9 Claims



1. In a gas cooled dynamoelectric machine having a rotor and a stator, the stator spaced from and surrounding the rotor with an annular gap therebetween; a gas baffle positioned at least at one end of the dynamoelectric machine for limiting the flow of gas coolant into the annular gap from its adjacent dynamoelectric machine end, the gas baffle comprising:

- a plurality of gas baffle segments surrounding the rotor and extending axially inward into the gap between the rotor and stator; the plurality of segments defining a radially outer annular passage in fluid communication with the dynamoelectric machine end and a portion of the stator

cooling passages; and, an inner annular passage surrounding the dynamoelectric machine rotor;

each baffle segment comprising a shell section which includes a support flange at its axially outer end for attaching the shell section to a dynamoelectric machine end; a sealing flange member at the axially inner end of the shell section for separating the outer passage from the inner passage; and,

a separate plate member including a gas seal forming the axially outer end of the baffle for limiting gas coolant flow into the inner annular passage; the plate member and the shell section including the sealing flange member each being separately and independently adjustable.

4,682,065

**MOLDED PLASTIC MOTOR HOUSING WITH INTEGRAL STATOR MOUNTING AND SHAFT JOURNALING PROJECTION**

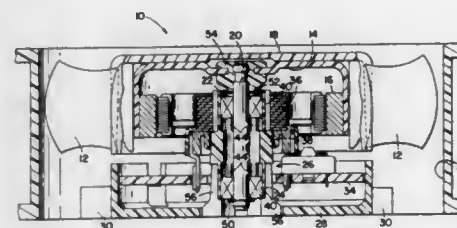
George A. English, and Charles R. Marracino, both of Torrington, Conn., assignors to Nidec-Torin Corporation, Torrington, Conn.

Filed Nov. 13, 1985, Ser. No. 797,638

Int. Cl.<sup>4</sup> H02K 5/16

U.S. Cl. 310—90

14 Claims



1. A molded plastic housing for a small electric motor having an annular stator and rotor arranged diametrically in inner-outer relationship and a central shaft operatively associated with and rotatable with the annular rotor disposed diametrically within the stator, said housing having at least one radially extending end wall and a centrally located and integrally molded stator mounting and shaft journaling tubular housing portion which projects axially from the end wall, said projecting housing portion having intermediate and axially spaced opposite end sections, the opposite end section being flexible, first and second bearings disposed respectively in the opposite end sections for rotatably receiving and holding said shaft, each of said opposite end sections having their flexibility enhanced by at least three axially extending and circumaxially spaced reduced diameter and reduced thickness zones at least approximately the length of its associated bearing, and each of said end sections having at least three circumaxially spaced narrow discrete reduced diameter zones which extend axially, each of said bearings and its associated end section having an interference fit at least at said reduced diameter zones, and said annular stator being mounted on and about said projecting tubular housing portion.

4,682,066

**ALIGNMENT SYSTEM FOR PERMANENT MAGNET MOTORS**

Salvatore R. Abbratuzzato, Tlmonlum; Richard T. Walter, Baldwin, and Dale K. Wheeler, Fallston, all of Md., assignors to Black &amp; Decker Inc., Newark, Del.

Filed Nov. 12, 1985, Ser. No. 796,928

Int. Cl.<sup>4</sup> H02K 21/28, 5/02

U.S. Cl. 310—154

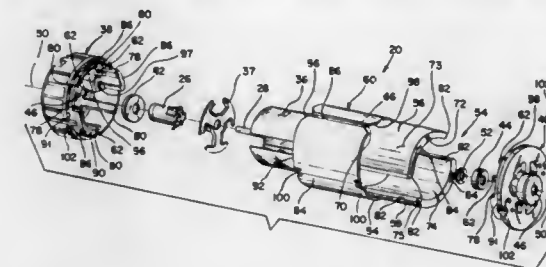
14 Claims

1. A permanent magnet motor for use in an electrically powered device, comprising:

- two axially spaced end caps defining respective end cap bores, said end caps having opposing surfaces that are parallel to one another when said bores are axially aligned,

and further having radially outwardly facing support surfaces located a predetermined radial distance from the axes of said bores;

- an armature rotatably connected to said end caps via said end cap bores along an armature axis;
- a permanent magnet array disposed about said armature and having an inner radial surface, an outer radial surface, and axial end surfaces, said inner radial surface engaging said



support surfaces of said end caps so as to define a predetermined air gap between said armature and said inner surface of said permanent magnet array; and

spring means comprising a one-piece longitudinally split tubular ferromagnetic wrapper connecting said two end caps and engaging said outer radial surface of said permanent magnet array for biasing said inner radial surface of said permanent magnet array against said support surfaces of said end caps.

4,682,067

**SYNCHRONOUS ELECTRIC MOTOR HAVING A DISC-SHAPED PERMANENT MAGNET ROTOR**

Claude Oudet, Besancon, France, assignor to Portescap, Chaux-de-Fonds, Switzerland

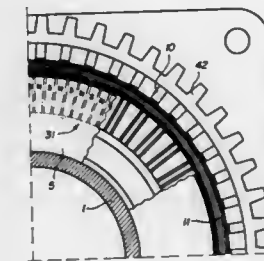
Filed May 7, 1986, Ser. No. 860,460

Claims priority, application Switzerland, May 10, 1985, 1998/85

Int. Cl.<sup>4</sup> H02K 21/12

U.S. Cl. 310—156

2 Claims



1. A synchronous electric motor, comprising at least one rotor part of substantially annular disc form, magnetized axially so as to present, on its opposite flat faces, a series of magnetic poles of alternate polarities, disposed regularly along an annular zone of each face, the rotor part being mounted on a rotary shaft, the motor also comprising an assembly of several elementary magnetic circuits which are isolated magnetically from one another, an annular electric energizing coil which is coupled with the said assembly of elementary magnetic circuits, each of said circuits providing an air-gap and the assembly of these air-gaps forming an annular region in which are disposed the magnetized zones of the rotor part, each of the elementary magnetic circuits having a substantially flat C-configuration, being placed substantially radially with respect to said rotor shaft and having a central opening in which is placed said annular coil, the transverse sections of each elementary magnetic circuit, considered along the path of the magnetic field, being substantially C-shaped.



flux generated by said energizing coil, having a practically constant area, at least in the portions of the circuit situated in proximity to the air-gap, in the portions situated at the height of the central opening, measured from the rotor shaft, and in the portion opposite to the air-gap with respect to the central opening.

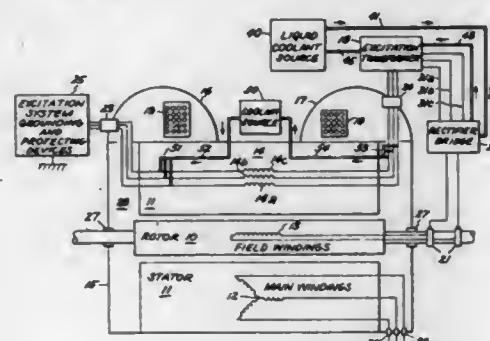
4,682,068

# LIQUID COOLED STATIC EXCITATION SYSTEM FOR A DYNAMOELECTRIC MACHINE

George M. Cotzas, Schenectady; Morris V. VanDusen, Clifton Park, and Thomas E. VanSchaick, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.  
Filed Sep. 16, 1985, Ser. No. 776,331  
Int. Cl.<sup>4</sup> H02K 9/197; H02P 11/00

U.S. Cl. 310—198

17 Claims



1. A static excitation system for a dynamoelectric machine, the machine having a rotatable field winding for producing a rotating magnetic field, a stator core with a multiphase set of main armature windings disposed in slots in the stator core and first cooling means for providing a first coolant for cooling at least the set of main armature windings, the excitation system comprising:

- a multiphase excitation transformer having a core and a set of respective primary windings respectively coupled to predetermined respective main armature windings of the set of main armature windings and a set of secondary windings, the secondary windings respectively corresponding to and in electromagnetic flux flow communication with the windings of the set of primary windings;
- rectifier means electrically coupled to the set of secondary windings for supplying electrical energy to the field winding for producing the magnetic field;
- wherein said excitation transformer includes first heat exchange means in heat flow communication with the primary and secondary windings and with the core of the excitation transformer, said first heat exchange means operationally including a liquid coolant for cooling the core of the transformer; and,
- wherein the rectifier means includes second heat exchange means for cooling the rectifier means, the second heat exchange means coupled in series liquid coolant flow communication with the first heat exchange means.

4,682,069

# KEY JOINT APPARATUS FOR ASSEMBLY OF ELECTRICAL MOTORS

Torvald Stahl, Alvsjo, Sweden, assignor to Flygt Aktiebolag, Solna, Sweden

Filed May 8, 1986, Ser. No. 861,011

Claims priority, application Sweden, May 14, 1985, 8502391  
Int. Cl.<sup>4</sup> F16B 3/00; H02K 1/22

U.S. Cl. 310—261

1 Claim

1. Improved key joint apparatus for assembling an electric rotor to a shaft, said shaft having a longitudinally extending keyway disposed in an axial direction thereon, the improvement comprising a key having first and second parts fixed in

position with respect to one another, said first part for being disposed in said axial direction in said longitudinally extending keyway on said shaft, said first part having a width and height corresponding substantially to the width and depth, respectively, exhibited by said keyway, and said second part being



narrower than said first part and extending in a radial direction therefrom, said first part and said shaft having a common axial direction and said second part extending diagonally over at least a portion of said first part along an axis which is inclined to said axial direction, said axial direction and said axis not intersecting when extended.

4,682,070

# DOWNHOLE OIL WELL VIBRATING SYSTEM

Plambeck Eric D., Carpinteria, Calif., assignor to Piezo Sona-Tool Corporation, Carpinteria, Calif.

Filed Jul. 30, 1984, Ser. No. 635,669

Int. Cl.<sup>4</sup> H01L 41/08

U.S. Cl. 310—334

16 Claims



- In combination for use in an oil well,
- a plurality of transducer assemblies each including a transducer and a support member disposed in envelope relation to the transducer, the transducer assemblies having a cylindrical configuration and being disposed at spaced axial positions,
- an electrical bus extending axially through the centers of the transducer assemblies,
- electrical connections from the electrical bus to each of the transducers,
- a mounting rail extending axially in abutting relationship to the transducer assemblies and coupled mechanically to the support members to support the transducer assemblies, the mounting rail being made from an electrically conductive material to serve as an electrical ground and to provide an electrical ground to the support members, and
- a plurality of spacer means each supported by the mounting rail at a spaced position and each receiving the electrical

bus to support the electrical bus, each of the spacer means being made from an insulating material.

4,682,071

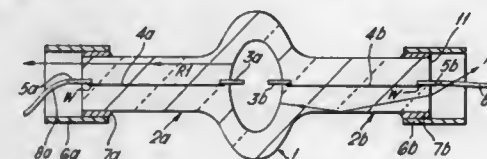
# LAMPS AND RIBBON SEALS

Paul Thorpe, Greater Manchester, England, assignor to The General Electric Company, p.l.c., England  
Continuation-in-part of Ser. No. 496,130, May 19, 1983, abandoned. This application Jun. 19, 1986, Ser. No. 876,276  
Claims priority, application United Kingdom, May 28, 1982, 8215699

Int. Cl.<sup>4</sup> H01J 5/32

U.S. Cl. 313—43

7 Claims



1. An air-exposed lamp of the kind having an envelope in which there is contained means for generating light, the envelope being provided with at least one elongate stem which is at least partially transparent to radiations emanating from the interior of the envelope in use of the lamp, said at least one stem having an end face at a position remote from the envelope, at least one current-supply foil embedded within and extending along said at least one stem and connected at its inner and outer ends to an inner conductor and a terminal conductor respectively, the foil being formed of a metal which is oxidizable when exposed to air at the elevated temperatures produced in use of the lamp, wherein the end face of said at least one stem is open to the atmosphere and is highly polished so that a large proportion of radiation from the lamp which is incident upon it is transmitted through it without being reflected back towards the foil so as to reduce the temperature of at least the outer end of the foil when the lamp is in use, and thus reduce the tendency to oxidation, thereby lengthening the lamp life.

4,682,072

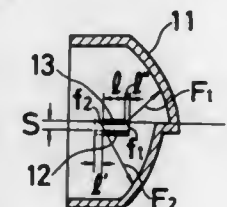
# HEADLAMP FOR VEHICLE

Takeo Ichihara, Hatano; Yukio Yamanaka, Yokohama, and Akihiko Tsurumaru, Sagami, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 634,877, Jul. 26, 1984, abandoned. This application Nov. 26, 1986, Ser. No. 935,117

Int. Cl.<sup>4</sup> H01J 5/16

U.S. Cl. 313—115

1 Claim



1. A headlamp for a vehicle in which a main filament and a sub-filament are arranged in parallel to a rotational axis of a paraboloidal surface of a reflector, and the sub-filament is positioned above the main filament, wherein:  
the reflector is different in focal position of the paraboloidal surface thereof between an upper surface and a lower surface,  
the focal point on the lower surface side is positioned front-

wardly more than a length of the sub-filament from the focal point on the upper surface side,  
the sub-filament is positioned between both the focal points, and

the main filament is longer than the sub-filament and is positioned thereunder and in parallel alignment therewith to produce corresponding different illumination patterns, the main filament producing a larger illumination pattern than the sub-filament, and the illumination pattern of the sub-filament being formed on proportion to the length of the sub-filament, wherein

the main filament is disposed so as to extend beyond the sub-filament by an interval in the range 1 to 1+L/2 such that 1 is the difference between the lengths of the main filament and the sub-filament, and L is the length of the main filament to thereby efficiently utilize luminescence to obtain a light distribution pattern of light luminous intensity and reduce the vertical dimension employed in said head lamp.

4,682,073

# ELECTRON OPTICS FOR THE ELECTRON BEAM GENERATING SYSTEM OF A COLOR PICTURE TUBE

Norbert Staub, Denkendorf, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands  
Continuation of Ser. No. 480,208, Mar. 30, 1983, abandoned.

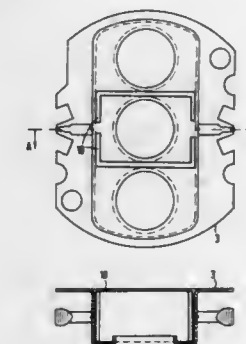
This application Nov. 6, 1986, Ser. No. 928,663

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 321248

Int. Cl.<sup>4</sup> H01J 29/50, 29/56

U.S. Cl. 313—414

6 Claims



1. In an electron gun assembly usable in a multiple electron beam television picture tube wherein at least one of grid 3 or grid 4 includes a pot-shaped housing disposed in the electron beam generating system of said picture tube, said pot-shaped housing having a plurality of separate, spaced apart, apertures formed therein through which the electron beams pass, each of said apertures having a central axis, the axes of said apertures lying in a common plane,

an improvement wherein field forming devices utilized in said at least one of grid 3 or grid 4 consist of:

- a first planar, rectangular, shielding member of magnetic material and means for affixing said member to the housing between a first selected pair of apertures through which pass first and second adjacent electron beams with said shielding member extending perpendicular to said plane;
- a second planar, rectangular, shielding member of magnetic material spaced apart from said planar shielding member and affixed to the housing between a second selected pair of apertures through which pass second and third adjacent electron beams with said second shielding member extending perpendicular to said plane whereby said first and second shielding members are parallel to each other.

4,682,074

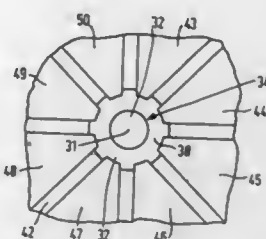
ELECTRON-BEAM DEVICE AND SEMICONDUCTOR  
DEVICE FOR USE IN SUCH AN ELECTRON-BEAM  
DEVICEArthur M. E. Hoeberechts, and Gerardus G. P. van Gorkom,  
both of Eindhoven, Netherlands, assignors to U.S. Phillips  
Corporation, New York, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,883

Claims priority, application Netherlands, Nov. 28, 1984,  
8403613Int. Cl.<sup>4</sup> H01J 29/04

U.S. Cl. 313-444

20 Claims



1. An electron-beam device comprising in an evacuated envelope a target onto which at least one electron beam is focussed and a semiconductor emitter device for generating the at least one electron beam, which semiconductor emitter device comprises a semiconductor body having a major surface supporting a first electrically insulating layer having at least one aperture, which semiconductor body comprises at least one pn-junction at which electrons can be generated by means of avalanche multiplication by applying a reverse voltage across the pn-junction, which electrons emanate from the semiconductor body at the location of the aperture in the first electrically insulating layer to form the electron beam, which first insulating layer supports at least one accelerating electrode having a portion thereof disposed adjacent the edge of said aperture, said electrode being at least partly covered with a second electrically insulating layer which leaves the aperture in the first insulating layer exposed and which carries electrodes for influencing the electron beam, characterized in that the electrodes on the second electrically insulating layer comprise at least four-beam forming electrodes which are regularly spaced around the aperture and have means electrically connected thereto for applying respective potentials for producing at least one n-pole field, where n is an even integer which is greater than or equal to 4 and smaller than or equal to 16.

4,682,075

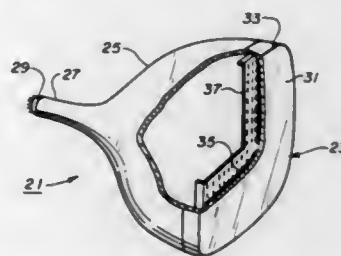
IMAGE DISPLAY INCLUDING IMPROVED  
LIGHT-ABSORBING MATRIXJordan R. Nelson, Pennington, and William K. Wissing, Yard-  
ville, both of N.J., assignors to RCA Corporation, Princeton,  
N.J.

Filed Dec. 19, 1985, Ser. No. 811,118

Int. Cl.<sup>4</sup> H01J 29/32, 29/28

U.S. Cl. 313-466

7 Claims



1. In an image display including a viewing screen comprising spaced elemental image areas and a light-absorbing matrix adjacent said spaced areas, the improvement comprising said matrix consisting essentially of partially-graphitized carbon black particles.

4,682,076

MICROWAVE TUBE WITH IMPROVED OUTPUT  
SIGNAL EXTRACTING STRUCTURETakao Kageyama, and Ryuzo Orui, both of Tokyo, Japan, as-  
signors to NEC Corporation, Japan

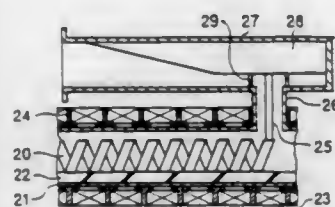
Filed Jul. 15, 1985, Ser. No. 755,412

Claims priority, application Japan, Jul. 16, 1984, 59-147128

Int. Cl.<sup>4</sup> H01J 25/00

U.S. Cl. 315-4

10 Claims



9. A helix slow-wave circuit type travelling wave tube which includes an evacuated envelope containing an electron gun means located at one end thereof for providing a beam of electrons and a collector means located at the other end of the evacuated envelope for collecting the electron beam provided by the electron gun means, a helix slow-wave circuit located in the evacuated envelope in such a manner that the electron beam passes through the slow-wave circuit to the collector, means at an upstream side of the electron beam for applying a microwave signal to the slow-wave circuit, and means at a downstream side of the electron beam for extracting an amplified output signal from the slow-wave circuit, said circuit being characterized in that the output signal extracting means comprises a coaxial line including an outer conductor which is air-tightly fixed at one end thereof to the evacuated envelope and an inner conductor having one end connected to one end of the helix slow-wave circuit at an angle to the center axis of the electron beam; an output waveguide which is air-tightly fixed to the other end of the coaxial line outer conductor so that the other end of the coaxial line inner conductor extends into the output waveguide; a resistive ridge formed on an inner wall surface of the output waveguide to oppose the inner conductor of the coaxial line, a dielectric hollow cylindrical member positioned in the output waveguide to surround the other end of the coaxial line inner conductor, the cylindrical member being air-tightly fixed at its one end to the inner wall of the output waveguide and at its other end to the ridge formed in the output waveguide, and the other end of the coaxial line inner conductor being connected to the ridge formed in the output waveguide.

10. A microwave tube as claimed in claim 9 wherein the cylindrical member is made of ceramic.

4,682,077

## TELEVISION CAMERA TUBE DEVICE

Masanori Maruyama, Kokubunji; Masamichi Moriya; Shinichi  
Kato, both of Mobara; Masakazu Fukushima, Tokyo;  
Yasuhiko Nonaka, Mobara, and Chihaya Ogusu, Tokyo, all of  
Japan, assignors to Nippon Hoso Kyokai and Hitachi, Ltd.,  
both of Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 755,014

Claims priority, application Japan, Jul. 18, 1984, 59-147540

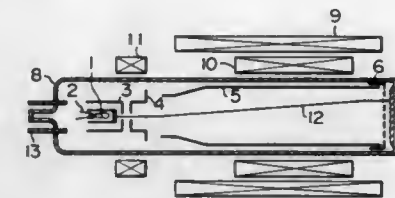
Int. Cl.<sup>4</sup> H01J 29/46; H04N 5/228

U.S. Cl. 315-14

12 Claims

1. A television camera tube device comprising:  
a cathode electrode for emission of electrons along a beam path;  
a first grid electrode following said cathode electrode on said beam path, said first grid electrode having a first aperture and being connected to receive a positive voltage at a first voltage level relative to the potential of said cathode electrode so as to produce a laminar flow electron beam;

a second grid electrode following said first grid electrode on said beam path, said second grid electrode having a second aperture which is smaller than said first aperture and being connected to receive a positive voltage relative to said cathode electrode which is higher in level than that applied to the first grid electrode; and



means for decreasing said positive voltage applied to said first grid electrode from said first level to a second level to change said electron beam from a laminar flow beam to a beam having a cross-over adjacent said second grid electrode, thereby increasing the amount of the electrons passing through said second aperture.

4,682,078

## WIRELESS EMERGENCY LIGHTING UNIT

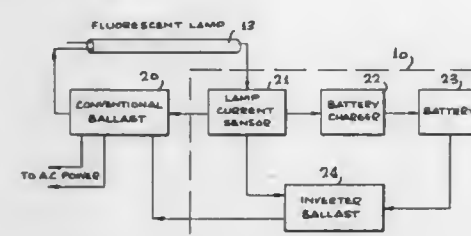
Chiriac Pascalide, North Hollywood, Calif., assignor to Radiant  
Illumination, Inc., North Hollywood, Calif.

Filed Jan. 28, 1985, Ser. No. 695,277

Int. Cl.<sup>4</sup> H05B 37/00, 41/14

U.S. Cl. 315-86

1 Claim



1. An externally wireless emergency power unit for use with a standard fluorescent lamp of the type mountable in a conventional fixture incorporating conventional ballast means and operable when powered by an AC line through said conventional ballast means, said lamp being illuminated when power from said AC line is operatively connected to first and second terminals on said fixture, said emergency power unit being operable to illuminate said lamp when the AC line voltage falls below a predetermined level, said unit comprising:

a unitized elongated housing and circuit means wholly enclosed within said housing;  
said housing comprising connectors carried on its opposite ends, one of said connectors being adapted to be inserted in one socket of said conventional fixture and the other of said connectors being adapted to engage with a connector at one end of said standard fluorescent lamp, the connector at the other end of which is adapted to engage another socket of said fixture;  
said circuit means comprising a pair of leads adapted to be connected through said one connector from said ballast means to apply a voltage derived from said AC line to a first winding of a heater voltage transformer within said emergency unit, a second winding of said transformer being connected through said other connector to said one end of said lamp;  
a rechargeable storage battery;  
a battery charging circuit for charging said battery;  
an inverter circuit including a transistor having a collector-emitter circuit energizable from said battery;  
sensor means for sensing said voltage across said pair of

leads to determine when said voltage falls below a predetermined level; and

switch means, including a switch contact connecting the emitter of said collector-emitter circuit and one side of said battery, responsive to said sensor when said voltage is at or above said level, for connecting said battery charging circuit to derive charging current from current flowing through said lamp and disabling said inverter circuit by opening said switch contact and, when said voltage falls below said level, for disabling said charging circuit and connecting said battery across the collector-emitter circuit of said inverter circuit by closing said switch contact and connecting the output voltage from said inverter circuit between said other connector connected to said one end of said fluorescent lamp and, through one of said leads, said one connector and said ballast means, to the other end of said lamp, whereby said lamp is illuminated from said battery when said voltage falls below said level, said sensor means comprising a rectifier bridge having its input terminals connected across said pair of leads and having its output terminals connected across a single relay coil, said single relay coil controlling said switch means.

4,682,079

## LIGHT STRING ORNAMENT CIRCUITRY

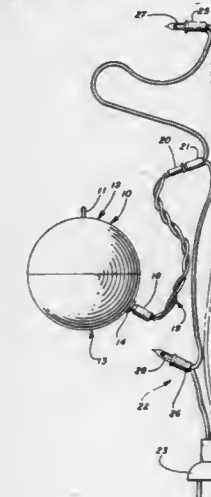
Robert E. Sanders, Lenexa, Kans.; Charles J. Flynn, and John L.  
Vertreese, both of Kansas City, Mo., assignors to Hallmark  
Cards, Inc., Kansas City, Mo.

Filed Oct. 4, 1984, Ser. No. 657,680

Int. Cl.<sup>4</sup> H05B 37/00, 39/00, 41/00

U.S. Cl. 315-186

30 Claims



1. An ornament for installation in a string of lights connected to an AC line voltage source to be in series with the lights of the string, said ornament comprising: ornamental means for producing attractive visual effects, an electrically operated load device arranged when energized to produce sensory effects augmenting the attractive visual effects produced by said ornamental means, a coupling circuit having a pair of input



terminals and a pair of output terminals and arranged to provide a path for current flow from one input terminal and thence in one direction from one output terminal to the other through a load coupled thereto and then to the other input terminal and to also provide a path for current flow from said other input terminal and thence in said one direction from said one output terminal to the other through load coupled thereto and thence to said one input terminal to thereby provide for AC current flow between said input terminals of said coupling circuit while providing for DC current flow through said load, means arranged for connecting said input terminals of said coupling circuit in said string of lamps in series relation to all other lamps of said string, connection means defining a load which includes said load device and which is connected to said output terminals of said coupling circuit, and protection means operative in the absence of current through said load for insuring a path for current flow of at least a certain magnitude in said one direction from said one output terminal to said other output terminal and insuring AC current flow through all lights of said string, said certain magnitude of current flow being sufficient for energization of all lights of said string at substantially full intensity, and said protection means being effective for limiting the voltage between said output terminals of said coupling circuit, to thereby insure AC current flow through lights of said string irrespective of DC current drawn by said connection means and to protect against excessive voltages between said input terminals of said coupling circuit and across said connection means.

4,682,080

## DISCHARGE LAMP OPERATING DEVICE

Soichiro Ogawa, and Yoshio Watanabe, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

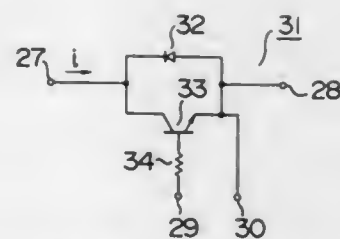
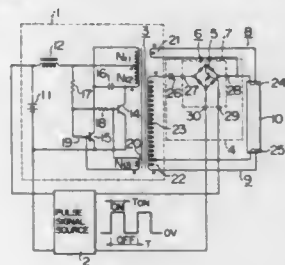
Filed Aug. 16, 1985, Ser. No. 766,197

Claims priority, application Japan, Aug. 17, 1984, 59-170414; Aug. 17, 1984, 59-170415

Int. Cl.<sup>4</sup> H05B 37/02, 39/04, 41/36

U.S. Cl. 315-209 R

16 Claims



1. A discharge lamp operating apparatus having a dimming function comprising:  
an inverter having first secondary windings to be connected to electrodes of a discharge lamp for supplying currents continuously to heat said electrodes and a second secondary winding to be connected to said electrodes for causing a discharge current to flow between said electrodes;  
discharge current supply means connected between said

second secondary winding and said electrodes for supplying said discharge current, including switching means connected to said second secondary winding for controlling the supply of the discharge current to said electrodes at a duty factor determined by a desired dimming factor, and a capacitor connected in series with said second secondary winding and said switching means, and said switching means being formed by an anti-parallel connection of a first diode and a transistor.

4,682,081

SINGLE-ENDED, SELF-OSCILLATING DC-DC CONVERTER FOR INTERMITTENTLY ENERGIZED LOAD HAVING  $V_{BE}$  RESPONSIVE CURRENT LIMIT CIRCUIT

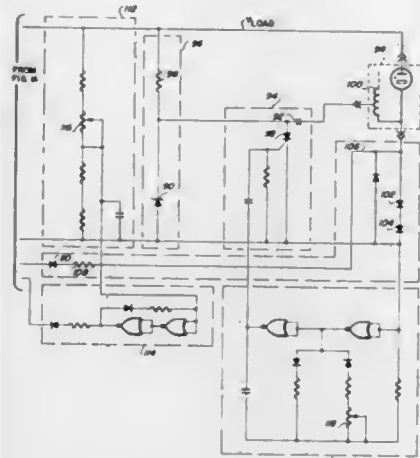
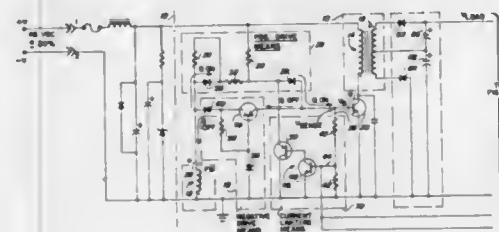
Scott T. Sikora, Mesa, Ariz., assignor to Tomar Electronics, Inc., Tempe, Ariz.

Filed Nov. 4, 1985, Ser. No. 794,415

Int. Cl.<sup>4</sup> H05B 41/29, 41/34

U.S. Cl. 315-219

33 Claims



1. Apparatus for delivering current to an intermittently energized load comprising:

- a coupled inductor including a primary winding, a secondary winding and a feedback winding;
- a switching transistor having base, collector and emitter terminals and being coupled in series with said primary winding for switching between conductive and non-conductive states to control the flow of current through said primary winding;
- positive drive means coupled to the base of said switching transistor for providing a positive bias voltage to said switching transistor to switch into and maintain said switching transistor in the conductive state to transfer energy into said inductor;
- current limiting means for removing the positive bias voltage from said switching transistor when the primary winding current reaches a predetermined value to thereby switch said switching transistor out of the conductive

state and into the non-conductive state, said current limiting means including

- voltage threshold sensing means for comparing the base to emitter voltage of said switching transistor to a fixed threshold voltage representative of a preselected collector current limit of said switching transistor and for generating a control signal when the switching transistor base to emitter voltage exceeds the fixed threshold voltage;
- positive removal means coupled to said voltage threshold sensing means and to said positive drive means for removing the positive bias voltage from said switching transistor in response to the control signal from said voltage threshold sensing means;
- a load coupled to said secondary winding for receiving energy stored in said inductor after said switching transistor is switched into the non-conductive state by said current limiting means; and
- negative drive means coupled between said feedback winding and the base of said switching transistor for supplying a constant negative bias voltage to the base of said transistor as energy is transferred from said inductor into said load, wherein the negative bias voltage remains constant as the voltage across said feedback winding varies.

4,682,082

## GAS DISCHARGE LAMP ENERGIZATION CIRCUIT

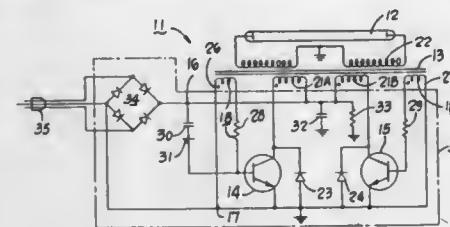
Robert B. MacAskill, Bay Village, and Jeffrey J. Braun, Parma, both of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed May 16, 1985, Ser. No. 734,546

Int. Cl.<sup>4</sup> H05B 41/14

U.S. Cl. 315-219

16 Claims



1. An electronic energization circuit for a luminous gas discharge lamp comprising, in combination:  
a transformer having a generally rectangular hysteresis loop;  
at least one primary winding on said transformer;  
secondary winding means on said transformer having an output connectable to said lamp;  
input terminals for supplying a voltage to said electronic energization circuit;  
a first semiconductor connected to said at least one primary winding and to said input terminals; and  
control means connected to said semiconductor to eliminate striations in the gas plasma within the lamp by establishing unequal on and off times of said semiconductor.

4,682,083

## FLUORESCENT LAMP DIMMING ADAPTOR KIT

Robert P. Alley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 665,673, Oct. 29, 1984, abandoned.

This application Jul. 11, 1986, Ser. No. 883,469

Int. Cl.<sup>4</sup> H05B 37/02

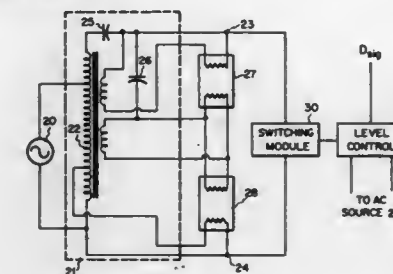
U.S. Cl. 315-307

26 Claims

1. An add-on fluorescent lamp dimming adaptor for connecting to a conventional nondimming ballast in a fluorescent lighting system, said system including a source of ac voltage,

said ballast having terminals for connecting to a fluorescent lamp, said adaptor comprising:

a switching module adapted to be coupled to said terminals for switching current from said lamp, said switching module being connected in parallel with said lamp so as to divert current from said lamp when said switching module conducts; and



a level control coupled to said switching module, said level control controlling the conductive state of said switching module to vary the current in said lamp according to a dimming control signal supplied to said level control, said level control causing said switching module to switch at a frequency in the range of 300 hertz and higher during times that said lamp current is being varied.

4,682,084

## HIGH INTENSITY DISCHARGE LAMP SELF-ADJUSTING BALLAST SYSTEM SENSITIVE TO THE RADIANT ENERGY OR HEAT OF THE LAMP

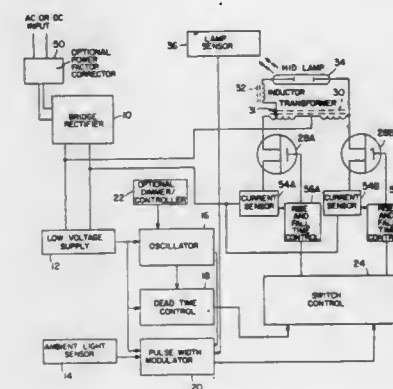
Donald S. Kuhnelt, Houston, and Sidney A. Ottenstein, Spring, both of Tex., assignors to Innovative Controls, Incorporated, Houston, Tex.

Filed Aug. 28, 1985, Ser. No. 770,663

Int. Cl.<sup>4</sup> G05F 1/00; H05B 37/02, 37/04, 41/36

U.S. Cl. 315-307

6 Claims



1. A self-adjusting ballast system for mercury vapor, high intensity discharge lamps having outputs of 100 watts or greater, comprising:

- a direct current source;
- a lamp circuit containing a high intensity discharge lamp;
- sensing means for sensing the radiant energy output of said lamp;
- a pulse width modulator which, in response to the output of said sensing means, varies the width of the pulses that power said lamp during warm-up of said lamp;
- a high frequency oscillator;
- a DC to AC converter that converts current from said direct source to pulses of alternating current for powering said lamp, said converter comprising:  
at least one switch for gating current to said lamp;

a switch control means, responsive to said high frequency oscillator, for controlling said switch and thereby controlling the frequency of the alternating current pulses that power said lamp;  
current sensing means for sensing the current being supplied to said lamp; and  
current control means for limiting the current through said lamp to a predetermined safe level when the current sensed by said current sensing means exceeds a reference value.

2. A self-adjusting ballast system for mercury vapor, high intensity discharge lamps having output of 100 watts or greater, comprising:

- a direct current source;
- a lamp circuit containing a high intensity discharge lamp; sensing means for sensing the heat output of said lamp;
- a pulse width modulator which, in response to the output of said sensing means, varies the width of the pulses that power said lamp during warm-up of said lamp;
- a high frequency oscillator;
- a DC to AC converter that converts current from said direct current source to pulses if alternating current for powering said lamp, said converter comprising:
  - at least one switch for gating current to said lamp;
  - a switch control means, responsive to said high frequency oscillator, for controlling said switch and thereby controlling the frequency of the alternating current pulses that power said lamp;
- current sensing means for sensing the current being supplied to said lamp; and  
current control means for limiting the current through said lamp to a predetermined safe level when the current sensed by said current sensing means exceeds a reference value.

4,682,085

**GULLWING DISTORTION CORRECTED DEFLECTION CIRCUITRY FOR A SQUARE-PLANAR PICTURE TUBE**  
Peter E. Haferl, Adliswil, Switzerland; Hugh F. Sutherland, II; David W. Luz, both of Indianapolis, Ind.; James A. McDonald; George C. Waybright, both of Carmel, Ind., and Donald H. Willis, Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

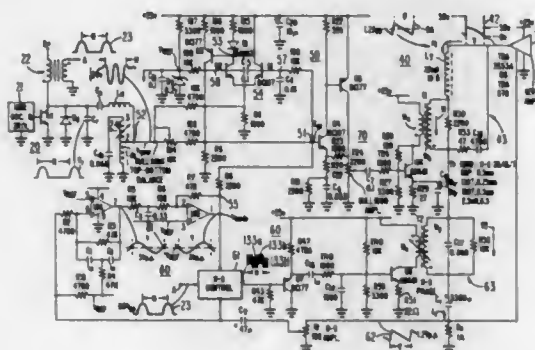
Filed May 10, 1985, Ser. No. 733,661

Claims priority, application United Kingdom, Jun. 12, 1984, 8414946; Jan. 12, 1984, 8414947

Int. Cl. H01J 29/56

U.S. Cl. 315-371

31 Claims



1. Picture tube display apparatus with gullwing raster distortion correction, comprising:

- a picture tube having a phosphor screen located on an aspherical faceplate of relatively flat contour;
- line and field deflection circuits for generating line and field deflection currents in respective line and field deflection

windings to scan a raster on said phosphor screen, said raster thereby being subject to gullwing distortion; and  
gullwing distortion correction means responsive to a first signal repeating at a line rate and to a second signal repeating at a field rate for modulating said field deflection current during a line deflection period within the field deflection trace interval in a manner that produces gullwing distortion correction of the corresponding raster scan line.

4,682,086

**CATHODE RAY TUBE DISPLAY SYSTEMS**

Andrew M. Mallinson, Salem, N.H., and Adrian H. W. Hoodless, Radwell, England, assignors to Ferranti, plc, Cheshire, England

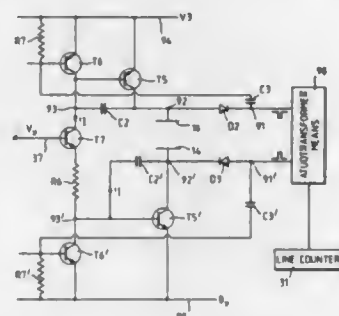
Filed Sep. 14, 1984, Ser. No. 650,642

Claims priority, application United Kingdom, Sep. 15, 1983, 8324712

Int. Cl. H01J 29/56, 29/70, 29/72

U.S. Cl. 315-371

10 Claims



1. A cathode ray tube (CRT) display system including distortion correction means for the CRT having digital means arranged to provide digital output signals to drive at least one digital-to-analogue converter (DAC), in response, said at least one DAC being arranged to generate a function, to shape the waveforms of deflection signals to be applied to one pair of deflection plates of the CRT, partially to cause a conventional raster scan pattern co-incident with the CRT screen, the digital means providing digital output signals, in response, the DAC being arranged to generate the function, representative of variations of the corresponding analogue output from the DAC, the analogue output of the DAC being applied to the associated pair of deflection plates of the CRT via integrating means, the integrating means including two integrators, each integrator including an amplifier and a feedback capacitor, there also being provided means to supply pulses, negative-going pulses to be supplied to one integrator, and positive-going pulses to be supplied to the other integrator, in operation, and when the pulses are removed, in response to an appropriate signal from the digital means, current flowing from the capacitor of said one integrator to the capacitor of said other integrator, and the arrangement being such that a positive-going voltage ramp is applied to one deflection plate, and a negative-going voltage ramp is applied to the other deflection plate, of the required sawtooth waveforms to be applied to the deflection plates, and the current flowing between the two capacitors is arranged to flow through an input bipolar transistor, and a resistor, the varying analogue output from the DAC causing a potential, in relation to a datum reference potential, to be applied to the base of the input transistor, so that the varying analogue output applied to the base of the input transistor causes corresponding variations of the sawtooth waveforms, to cause distortion of the raster scan pattern, otherwise obtained, to be corrected.

4,682,087

**APPARATUS FOR CONTROLLING AMPLITUDE OF VERTICAL DEFLECTION SIGNAL**

Masafumi Kikuchi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

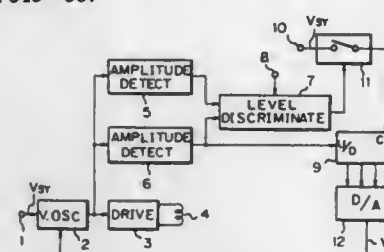
PCT No. PCT/JP85/00293, § 371 Date Jan. 28, 1986, § 102(e) Date Jan. 28, 1986, PCT Pub. No. WO85/05751, PCT Pub. Date Dec. 19, 1985

PCT Filed May 29, 1985, Ser. No. 833,402

Claims priority, application Japan, May 29, 1984, 59-109257 Int. Cl. H02J 29/70; H04N 5/52

U.S. Cl. 315-387

7 Claims



1. An apparatus for controlling an amplitude of a vertical deflection signal comprising:  
a vertical oscillating circuit for generating a sawtooth signal having a vertical period;  
a detecting circuit for detecting whether an amplitude of said sawtooth signal is in a proper level range;  
a counter for counting a vertical synchronizing signal when the amplitude of said sawtooth signal is out of said range in response to an output of said detecting circuit; and  
a D/A converter for converting an output of said counter into an analog detection signal, characterized in that an amplitude of a vertical deflection signal formed by said sawtooth signal is controlled by an output of said D/A converter.

4,682,088

**POWER MEMORY SEAT AND MIRROR CONTROL SYSTEM**

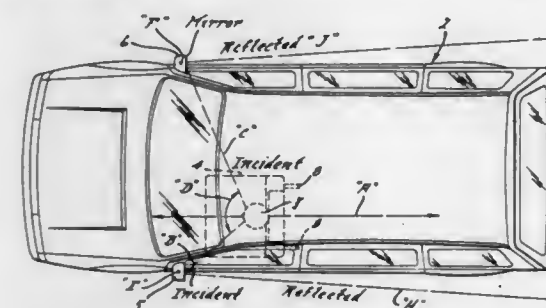
Thomas M. Sullivan, Grosse Pointe Woods, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 10, 1986, Ser. No. 849,984

Int. Cl. G05B 19/29

U.S. Cl. 318-568

5 Claims



1. A power memory seat and mirror control system for controlling movement of an adjustable seat in a vehicle in conjunction with controlling movement of an adjustable driver door rearview mirror and an adjustable passenger door rearview mirror, said seat being the type having a first motive power means adapted to slideably move a seat cushion of said seat along a pair of transport tracks between front rear end stops of said pair of tracks, a second motive power means adapted to move longitudinally a front end and a back end of said seat cushion to a plurality of chosen height positions above said pair of tracks, and a third motive power means adapted to tilt a seat back of said seat from a chosen upright position through

a plurality of recline positions; said driver door mirror and said passenger door mirror being the type having a fourth motive power means adapted for angular rotation of said driver door mirror about a first vertical driveshaft protruding from a driver door, a fifth motive power means adapted for angular rotation of said driver door mirror about a horizontal axis of a first horizontal drive shaft protruding from said driver door, a sixth motive power means adapted for angular rotation of said passenger door mirror about a second vertical drive shaft protruding from a passenger door and a seventh motive power means adapted for angular rotation of said passenger door mirror about said horizontal axis of a second horizontal drive shaft protruding from said passenger door, said first and second vertical and horizontal drive shafts, respectively, having keepers for limiting rotations of said driver door mirror and said passenger door mirror to within chosen limitations, the system comprising:

- (a) switch means, coupled to each of said first through seventh motive power means being manually actuatable for generating supply voltage level signals for driving each of said first through seventh motive power means when adjusting said seat cushion and said seat back, said driver door mirror and said passenger door mirror to desired locations;
- (b) potentiometer means cooperating with each of said first through seventh motive power means for providing analog voltage indicative of the amount of horizontal and attitudinal movement of said seat cushion, the amount of tilt of said seat back and the amount of angular rotation of said driver door mirror and said passenger door mirror from an initial position to a final position in response to manual actuations of said switch means;
- (c) a first buffer means in a control module cooperating with said switch means for receiving said generated supply voltage level signals from said switch means, converting said supply voltage level signals to independent switch logic level signals, and storing said independent switch logic level signals in respective registers;
- (d) a second buffer means in said control module cooperating with said potentiometer means for receiving said analog voltages from said potentiometer means, converting said analog voltages into independent equivalent digital number words, and storing said independent equivalent digital number words in respective registers;
- (e) microcomputer means in said control module interconnecting said first buffer means, and said second buffer means for performing logic and analog functions for controlling said system, said microcomputer means comprising a motor control means for driving said motive power means of said seat, of said driver door mirror, and of said passenger door mirror in response to control signals from control circuits within said microcomputer means; memory means including a static random access memory means for temporarily storing said independent switch logic level signals and said independent equivalent digital number words, and a nonvolatile storage memory means for long duration storing of said independent switch logic level signals and said independent equivalent digital number words; said microcomputer means providing control signals to said motor control means during an automatic mode of operation of said system, and said microcomputer means providing means for determining end stop locations so that movement of said seat and said driver door and passenger door mirrors is so controlled so as to prevent said seat and said mirrors from abutting said end stops, whereby wear and tear of said end stops are prevented; said motor control means in said microcomputer means being interconnected to a motor buffer means within said control module for interfacing said motor control means to said first through seventh motor power means.
- (f) memory switch means coupled to said first buffer means comprised of at least one set switch and a first driver store switch and a second driver store switch, said set switch being actuated with either said first driver store switch or



said second driver store switch to transfer said stored independent switch logic level signals and said stored independent equivalent digital number words into said non-volatile storage memory means converting said independent signals and words into non-volatile data used by said microcomputer for providing control signals to said motor control means during an automatic mode of operation of said system.

4,682,089

## ROBOT CONTROL SYSTEM

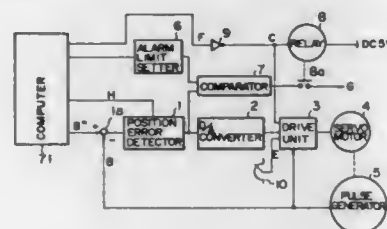
Masumi Tamari, Tama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 13, 1985, Ser. No. 808,499

Claims priority, application Japan, Dec. 17, 1984, 59-264626  
Int. Cl.<sup>4</sup> G05B 19/42

U.S. Cl. 318—568

8 Claims



1. A control system for a robot having an operation axis and a servo motor driving the operation axis, said control system comprising:

- (a) position error detecting means detecting an error of the actual position with reference to a desired instantaneous position;
- (b) a drive circuit responsive to the position error for supplying a current to the servo motor to reduce the position error;
- (c) limit means for limiting the current supplied from the drive circuit to the servo motor, thereby to limit the torque of the servo motor;
- (d) switching means for turning on or off said limit means; and
- (e) means for setting a limit value, wherein the drive circuit comprises an operational amplifier with a limiter limiting the output of the operational amplifier to said limit value set by said setting means.

4,682,090

## RESOLVER CIRCUIT

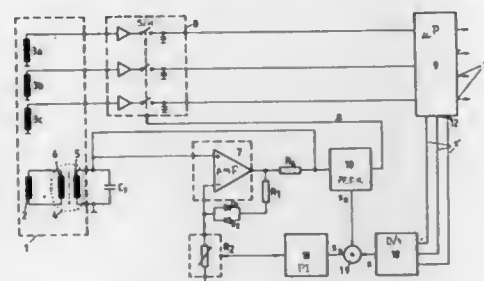
Karl-Heinz Schmidt, and Artur Seibt, both of Vienna, Austria, assignors to Voest-Alpine Automotive m.b.H., Linz, Austria

Filed Aug. 6, 1986, Ser. No. 893,657

Int. Cl.<sup>4</sup> G05B 1/06

U.S. Cl. 318—661

20 Claims



1. A resolver circuit for maintaining the quality of the function generator's rotor signal furnished by signal windings of the function generator in accordance with the angular position of the rotor and an excitation signal supplied to the function

generator through an adjustable transformer which has a primary winding and a secondary winding, said circuit comprising:

- a capacitor associated with a winding of the adjustable transformer to form a parallel inductive capacitive circuit;
- an oscillation amplifier having inverting and noninverting inputs, and an output which supplies the excitation signal to the primary winding of the automatic transformer which is connected in a positive feedback path about said oscillation amplifier;
- nonlinear means in a negative feedback path about said oscillation amplifier;
- a microcomputer for receiving the rotor signal and generating a control signal representative of the quality of the rotor signal;
- summing means for receiving the control signal and an excitation quality signal representative of the quality of the excitation signal and providing a difference signal representative of the difference between the control signal and the excitation quality signal; and
- gain altering means associated with a feedback path about said oscillation amplifier for altering the gain associated with the feedback path in response to the difference signal.

4,682,091

## TELESCOPE CONTROL SYSTEM

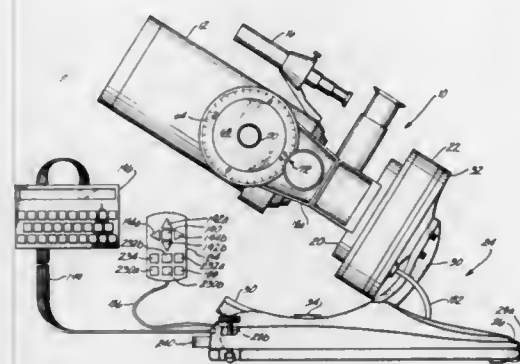
John J. Krewalk, West Lake Village, Calif., and Eric C. Silverberg, Austin, Tex., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,748

Int. Cl.<sup>4</sup> G05B 19/40

U.S. Cl. 318—685

18 Claims



1. A control for a telescope mounted for pivotal motion about at least one axis, the control comprising:

- means for driving the telescope to pivot about the axis, said driving means including a stepper motor coupled to the telescope to pivot the telescope about said axes in discrete, stepped increments, each increment corresponding to a control pulse issued to the driving means;
- means for issuing an index signal when the telescope is at a reference position; and
- means for generating control pulses and issuing said pulses to the driving means for controlling the telescope to pivot about the axis, said control means including means for accounting for pulses issued relative to said reference position to control the position of the telescope.

4,682,092

## SYNCHRONOUS MOTOR DRIVE WITH CHOPPER REGULATOR

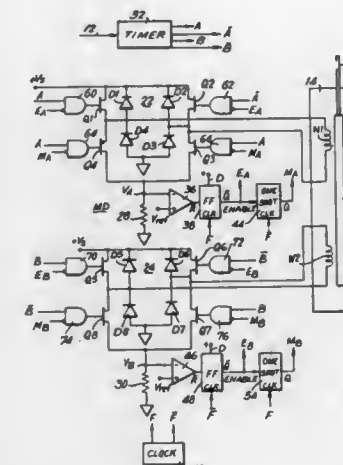
John Pellegrino, 31 Bennington St., Quincy, Mass. 02169, and Simyon Palmin, 11 Sandy Ridge Cir., Sharon, Mass. 02067

Filed Jun. 6, 1985, Ser. No. 741,877

Int. Cl.<sup>4</sup> H02K 19/10

U.S. Cl. 318—696

21 Claims



4,682,093

## POWER SUPPLY SYSTEMS FOR INDUCTIVE ELEMENTS

John Murphy, Bishopstow; Francis McMullin, Clare; Michael Egan, Wilton; John V. Byrne, Dublin, and Patrick Kenneally, Clare, all of Ireland, assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

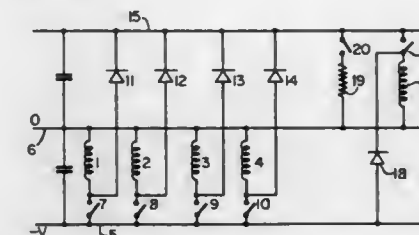
Filed Oct. 18, 1985, Ser. No. 789,036

Claims priority, application Ireland, Oct. 19, 1984, 2700/84; Apr. 16, 1985, 959/85

Int. Cl.<sup>4</sup> H02P 7/36

U.S. Cl. 318—701

4 Claims



3. A power supply for a plurality of inductive elements, said system having first, second and third rails, said first and second rails being energizable at differing potentials and each said element being switchingly connectible between the rails, and the system including means for current flow between each said element and said third rail when the connection of said element between the first and second rails is broken, a further inductive element of substantially the same value of inductance as each of said plurality of inductive elements being switchingly connectible between said third rail and one of said first and second rails, and the system also comprising means for connecting said further element between said third rail and said one of the first and second rails when the voltage on the third rail is equal to or greater than a predetermined value and means for current flow between the further inductive element and the other of said first and second rails when the connection of said further element between the third rail and said one of the first and second rails is broken.

4,682,094

## CONTROL SYSTEM FOR A POWER CONVERTER DRIVING A SYNCHRONOUS MOTOR

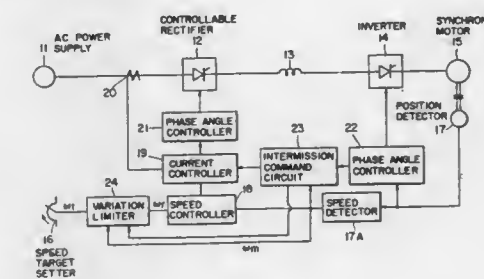
Akihiko Kuroiwa, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 22, 1985, Ser. No. 800,769

Claims priority, application Japan, Nov. 27, 1984, 59-250106  
Int. Cl.<sup>4</sup> H02P 5/40, 5/28

U.S. Cl. 318—723

8 Claims



1. For energizing windings of a motor from a source, a motor driver, comprising:

- a first switching circuit having switches for alternately applying current to one of the windings during successive periods;
- first measuring means for measuring the current through the winding;
- first interrupt means for enabling and disabling said switches during a period; and
- first timing means responsive to said measuring means and coupled to said interrupt means for causing said interrupt means to enable and disable said switches during a period to produce a power cycle in which current flows through the winding, then a first circulating cycle in which current flows from the winding and back to the winding entirely within the switching circuit and outside the source, and then a reset cycle in which current flows from the winding through the source against the polarity of the source;
- a second switching circuit having switches for applying current to a second winding during successive periods;
- second measuring means for measuring the current through the second windings;
- second interrupt means for enabling and disabling the switches during a second period 90 offset from the first period; and
- second timing means responsive to said second measuring means and coupled to said second interrupt means for causing said second interrupt means to enable and disable said switches during a period to produce current flows during a second set of cycles corresponding to the power cycle, the circulating cycle, and the reset cycle of said first timing means in said second winding; and
- coordinating means for constraining said first timing means and said second timing means to cause the reset cycle of one winding to occur during the power cycle of the other winding.

1. A method of controlling a power converter driving a synchronous motor, said power converter comprising a controllable rectifier converting an AC power into a DC power and an inverter of a load commutation type converting the DC power into an AC power of a variable frequency which is

supplied to said synchronous motor, said method comprising the steps of:

- providing a speed target;
- providing a speed reference in accordance with the speed target, the speed reference being varied to follow the speed target but within a variation rate;
- detecting the speed of the synchronous motor;
- producing, by use of a speed controller, a current reference in accordance with the speed reference and the detected speed;
- detecting the current of said rectifier;
- adjusting the average current through the rectifier in accordance with the current reference and the detected current thereby to reduce the deviation of the detected speed from the speed reference;
- detecting the rotary position of the synchronous motor;
- determining the firing phase angle of the inverter in accordance with the detected rotary position;
- causing intermission of the current through the rectifier for intermission commutation of the inverter when the detected speed is below a predetermined threshold;
- resetting the current reference at zero and the speed reference at the actual speed when the detected speed exceeds said predetermined threshold; and
- causing load commutation of the inverter when said detected speed is higher than said predetermined threshold.

4,682,095

#### CIRCUIT ARRANGEMENT FOR CONTROLLING STARTING CURRENT OF A MOTOR

Nobuo Shibata; Isamu Yasunobu; Shigeo Neki; Kenichi Ohara, and Takashi Dohi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Japan

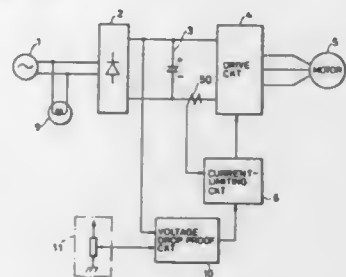
Filed Jun. 20, 1986, Ser. No. 876,913

Claims priority, application Japan, Jun. 20, 1985, 60-134576

Int. Cl. H02P 1/26

U.S. Cl. 318-778

4 Claims



1. A circuit arrangement for controlling starting current of motor arranged to be driven by a power circuit including a rectifying means responsive to a.c. voltage source, a capacitor for smoothing rectified voltage from said rectifying means, and a drive circuit for driving said motor using a d.c. voltage across said capacitor, said circuit arrangement comprising:

- (a) a first comparator responsive to said voltage across said capacitor and a reference voltage for producing an output voltage when said voltage across said capacitor is below said reference voltage;
- (b) a current detecting circuit for detecting current to said drive circuit or current to said motor;
- (c) a second comparator responsive to a voltage indicative of said current detected by said current detecting circuit and to a second reference voltage which is variable in response to said output voltage from said first comparator, said second comparator being arranged to produce an output signal when said voltage indicative of said current is higher than said second voltage; and
- (d) a control circuit responsive to said output signal from said second comparator for controlling said drive circuit to control said current to said motor.

#### 4,682,096 SWITCHING REGULATOR SYSTEM FOR A MOTOR DRIVING CIRCUIT

Hideo Nishijima; Takayasu Ito, and Isao Fukushima, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

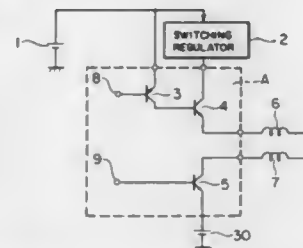
Filed Oct. 11, 1985, Ser. No. 786,500

Claims priority, application Japan, Oct. 11, 1984, 59-211329

Int. Cl. H02P 5/28

U.S. Cl. 318-808

6 Claims



1. A motor driving circuit comprising:
  - a first PNP transistor having the emitter connected to a first reference power source;
  - a first NPN transistor having the base connected to the collector of said first PNP transistor;
  - a second NPN transistor having the emitter connected to a second reference power supply;
  - a motor driving coil connected between the emitter of said first NPN transistor and the collector of said second NPN transistor; and
  - a switching regulator of a step-down and variable type connected between said first reference power supply and the collector of said first NPN transistor, the output voltage of said switching regulator being controlled by a collector voltage of said first NPN transistor, wherein the base of said first PNP transistor and the base of said second NPN transistor are controlled.

4,682,097

#### CHARGING SYSTEM FOR AN AUTOMOTIVE ENGINE

Fujio Matsui, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

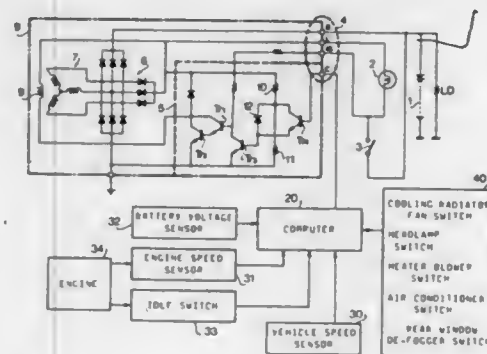
Filed Jun. 5, 1986, Ser. No. 871,028

Claims priority, application Japan, Jun. 8, 1985, 60-124762

Int. Cl. H02J 7/16

U.S. Cl. 320-64

3 Claims



1. A charging system for an automotive engine having a regulator for regulating the charge of battery, a vehicle speed sensor, an engine speed sensor, and an electric load sensor, the system comprising:
  - first means for obtaining a balance vehicle speed at which mean charging current and mean discharging current are substantially balanced;

second means for deciding a charge stop vehicle speed corresponding to the balance vehicle speed;

comparing means for comparing an actual vehicle speed with the charge stop vehicle speed and for producing a charge stop signal;

third means responsive to the charge stop signal for disabling the regulator so as to stop the charging of the battery.

4,682,098

#### VOLTAGE-CURRENT CONVERTER

Evert Seevinck, Eindhoven; Roelof F. Wassenaar, Enschede, and Eerke Holle, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

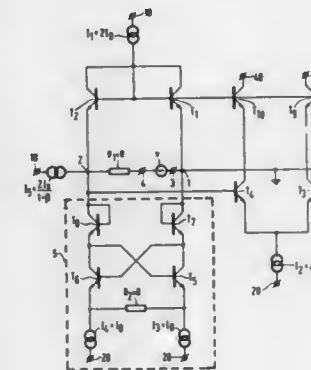
Filed Jul. 1, 1986, Ser. No. 880,854

Claims priority, application Netherlands, Jul. 1, 1985, 8501882

Int. Cl. G05F 3/20, 1/56

U.S. Cl. 323-315

8 Claims



1. A voltage-current converter comprising: a first and a second supply terminal, a first current source coupled at one end to the first supply terminal and by means of a first transistor connected as a diode to a first terminal at a reference potential and by means of a second transistor connected as a diode to a second terminal, means coupling a series arrangement of an input port for applying a signal voltage and a first resistor for converting the signal voltage into a signal current between the first and the second terminal, a third and a fourth transistor having bases coupled to the first and the second terminal, respectively, means connecting the emitters of the third and fourth transistors by means of a common second current source to the second supply terminal and wherein the collector of at least one of the third and fourth transistors forms an output for supplying an output current proportional to the signal current, and a correction circuit for correcting a non-linearity in the voltage-current conversion due to non-linear emitter resistors of the first and the second transistor, the correction circuit comprising a circuit having a first input terminal coupled to the first terminal and a second input terminal coupled to the second terminal, said correction circuit having a negative input impedance whose resistance is substantially equal to the resistance of the first resistor.

4,682,099

#### LOGARITHMIC POTENTIOMETER CIRCUIT

Claus Koken, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,771

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412532

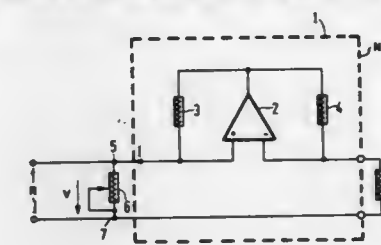
Int. Cl. G01R 27/02

U.S. Cl. 324-63

10 Claims

1. A logarithmic potentiometer circuit comprising, an adjustable ohmic resistance element having a linearly adjustable ohmic resistance characteristic, means connecting said linearly adjustable ohmic resistance element in parallel with a bipolar circuit arrangement having a negative ohmic resistance value,

and means connecting the parallel combination of the linearly adjustable resistance element and the negative resistance bipo-



lar circuit to a pair of terminals at which an approximately logarithmic resistance characteristic is derived.

4,682,100

#### METHOD OF MEASURING A DC CURRENT OR A LOW-FREQUENCY AC CURRENT

Frank H. Hagelin, Alvrjo, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

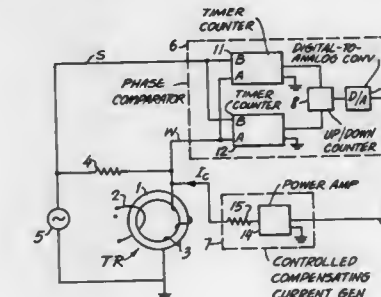
Continuation-in-part of Ser. No. 626,876, Jun. 29, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 853,709

Claims priority, application Sweden, Dec. 21, 1982, 8207304; PCT Int'l Appl., Dec. 14, 1983, PCT/SE83/00450

Int. Cl. G01R 19/10

U.S. Cl. 324-117 R

4 Claims



1. Method of measuring a DC or a low frequency AC current comprising the steps of providing a transformer with a core about which there is wound a primary and a secondary winding, feeding the current to be measured through the primary winding, whereby a first flux is generated in the transformer, generating a modulating voltage, phase shifting the modulating voltage, applying the phase shifted modulating voltage across the secondary winding, and with an amplitude so as to saturate the core, measuring separations in phase between the modulating voltage and the phase shifted modulating voltage at two consecutive zero passages, and feeding a compensating current of increasing amplitude through the secondary winding until a measured difference between the two separations in phase is zero, the amplitude of the compensating current at zero difference in separation in phase being a representation of the current to be measured.



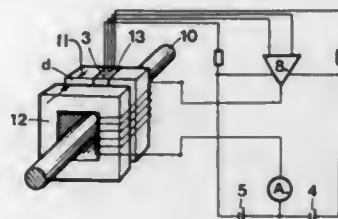
4,682,101

## CURRENT TRANSFORMER FOR DIRECT AND ALTERNATING CURRENT

Pierre Cattaneo, Collonges, France, assignor to Lem S.A., Geneva, Switzerland

Filed Jan. 24, 1986, Ser. No. 821,976

Claims priority, application Switzerland, Feb. 5, 1985, 00499/85

Int. Cl.<sup>4</sup> G01R 33/00, 19/00; G05F 1/325; H01F 40/06  
U.S. Cl. 324—117 H 3 Claims

1. A current transformer for measuring direct and alternating currents in a conductor, comprising:

a magnetic circuit including a first ferromagnetic core and a second ferromagnetic core magnetically coupled to said first core, said cores being disposed about the conductor so that a magnetic field is induced in said cores by the current in said conductor, only said first core having an air gap and a Hall effect element positioned within said air gap for producing an electric signal dependent on the magnetic field induced in said first core, a winding wound about at least said first core, an amplifier connected to receive said electric signal as an input, said amplifier producing an output signal, means for applying said output signal to said winding in a direction tending to cancel the magnetic field induced in said cores by the conductor, and a current measuring device connected in series with said winding for measuring the current in said winding, which is proportional to the current in the conductor.

4,682,102

## SOLID STATE WATTHOUR METER WITH SWITCHED-CAPACITOR INTEGRATION

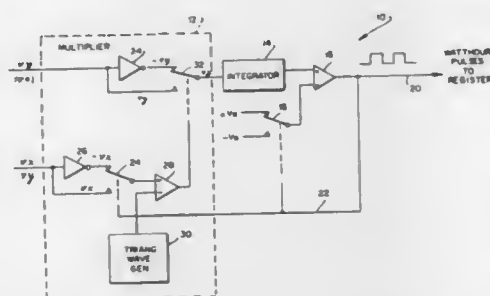
Miran Milković, Schenectady, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed Dec. 23, 1985, Ser. No. 812,369

Int. Cl.<sup>4</sup> G01R 11/02

U.S. Cl. 324—142

7 Claims



1. An electronic watthour metering apparatus comprising: means for producing a product signal responsive to an analog voltage related to one of a load voltage and a current said product signal being pulse-width modulated in relation to the other of said load voltage and current; means for integrating said product signal; a hysteresis comparator responsive to an integrated output of said means for integrating and effective for changing its output between first and second different voltages upon

said integrated output attaining third and fourth different values;

said means for producing a product signal including means responsive to said first voltage for driving said means for integrating in a first direction and responsive to said second voltage for driving, said means for integrating in a second direction whereby an offset voltage is cancelled; said means for integrating including;

an operational amplifier having a first capacitor connected between its output and its input;

a second capacitor connectable for charging by said product signal;

switching means for transferring an amount of charge related to said product signal into said second capacitor;

said switching means including means for applying said amount of charge to said input of said operational amplifier; and

a clock including means for driving said switching means between said transferring and said applying at a predetermined frequency, whereby a current proportional to said predetermined frequency and a ratio of capacitances of said first and second capacitors passes through said second capacitor to said input of said operational amplifier.

4,682,103

## CIRCUITRY FOR TESTING GENERATOR OUTPUT

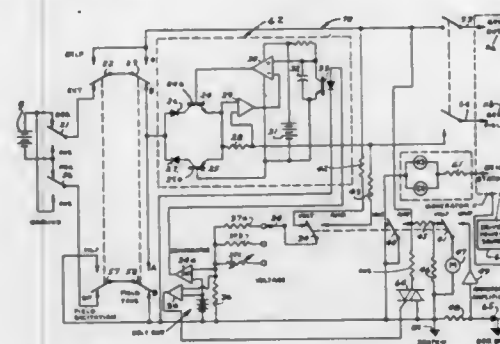
Nicholas F. DeNardis, Rte. 1, Box 209A, Greenwood, Wis. 54437

Filed Jul. 6, 1984, Ser. No. 629,205

Int. Cl.<sup>4</sup> G01R 31/00; H02K 11/00

U.S. Cl. 324—158 MG

1 Claim



1. Means measuring the short circuit output current of a generator with an excitation voltage proportional to the rated output voltage of the generator, comprising

a circuitry including an ammeter in circuit with a generator, an induced element of said generator being in series with the internal impedance of said generator and with said ammeter, short circuiting said generator,

said circuitry including an appropriate voltage source, said voltage source providing an excitation voltage applied to the field of said generator,

means causing said excitation voltage to be a predetermined proportion of the rated voltage of said generator, whereby the output current of said generator passes over said ammeter as a linear function proportional to said field excitation voltage,

said ammeter being calibrated to convert the reading of said current passing thereover into a direct reading of the full output current of said generator under load,

said circuitry including an absolute value comparator referenced to a common voltage source, and

a switch selectable attenuator in connection with said comparator monitoring the output voltage of said generator.

4,682,104

## ANGULAR DISPLACEMENT PICKUP, PARTICULARLY FOR THE DETECTION OF TORQUE IN POWER STEERING

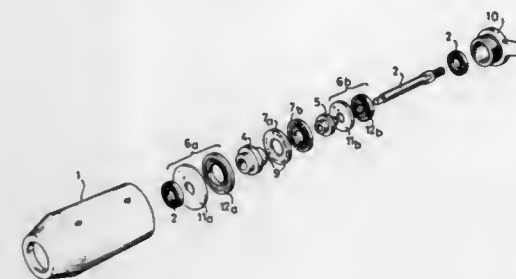
Claude Lombard, Le Chesnay; Jean-Paul Brisset, Thiais; Gérard Catier, Issy les Moulineaux; Jean-Luc Marais, Nanterre, and Gino Zammarchi, Chatou, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jul. 30, 1984, Ser. No. 635,494

Claims priority, application France, Jul. 29, 1983, 83 12511  
Int. Cl.<sup>4</sup> G01B 7/14, 7/24

U.S. Cl. 324—208

14 Claims



1. A contactless angular displacement apparatus for measurement of torque, comprising:

two coaxial disks electrically insulated from each other and having opposing faces which disks are each rotatable in relation to one another by an angle to be detected, wherein said disks carry on said opposing faces conductive plane coils with said coils being in the shape of spirally wound sectors coiled alternately in both directions and wherein the mutual induction of said coils varies as a function of the relative angular position of said disks; at least one rotary transformer mounted coaxially with said disks;

circuit means for supplying the primary of one of said at least one rotary transformer with a high frequency signal input whereby the secondary of said one rotary transformer supplies an induction electromotive force to one of said disks; and

processing circuit means for processing signal indicating the induction electromotive force supplied by the other one of said disks.

4,682,105

## APPARATUS FOR ELECTRICALLY CONTACTLESSLY MEASURING THE THICKNESS OF ELECTRICALLY CONDUCTING THIN FILMS ON NON-CONDUCTING TRAVELLING WEBS IN VACUUM DEPOSITION APPARATUS

Gernot Thorn, Hanau am Main, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany  
Filed Sep. 25, 1984, Ser. No. 654,762

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335766

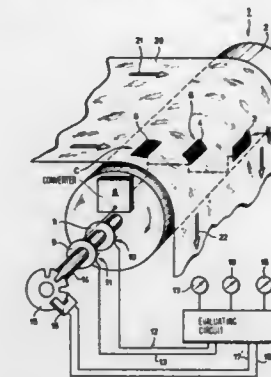
Int. Cl.<sup>4</sup> G01B 7/08, 7/10; G01R 33/12

U.S. Cl. 324—230

4 Claims

1. Apparatus for electrically contactlessly measuring the thickness of electrically conducting thin films on non-conducting travelling webs in vacuum deposition apparatus comprising: at least one roller around which the webs runs, a plurality of individual sensors each with a circumferentially spatially limited measuring region with respect to the circumference of said roller for developing measurement signals which represent a measure for the film thickness, an evaluating circuit for the measurement signals, a converter for coupling said sensors in common to said evaluating circuit, in which measuring apparatus the sensors are arranged in the roller against its surface and are distributed lengthwise of the roller to rotate with the said roller and are coupled to the evaluating circuit, said roller having at least one position indicator for indicating

the position of the sensors during the time in which the respective sensor and the web move in concentric circles, and said evaluating circuit having means coupled to said at least one position indicator for receiving from said position indicator a



position signal for each sensor and for evaluating the measurement signal in response to its respective position signal only for a defined angle of rotation in which the respective sensor and the web move in concentric circles.

4,682,106

## METHODS OF, AND APPARATUS FOR, PROTON DECOUPLING IN NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY

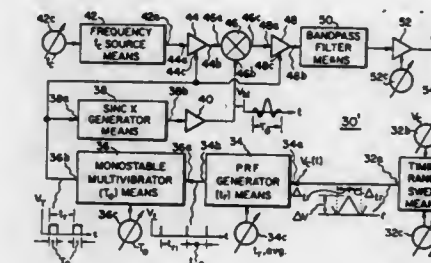
Dimitrios Vatis, Schenectady; Paul A. Bottomley, Clifton Park, and Thomas H. Foster, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,405

Int. Cl.<sup>4</sup> G01R 33/08

U.S. Cl. 324—307

38 Claims



21. Apparatus for providing a radio-frequency signal having at least one selected one of (1) first specie decoupling and (2) nuclear Overhauser enhancement effect, upon a second nuclei specie in a sample in a nuclear magnetic resonance (NMR) experiment, comprising:

means for providing a radio-frequency (RF) signal at a center frequency substantially equal to the Larmor frequency of a first specie, different from said second nuclear specie, in said sample;

means for modulating the amplitude of the RF signal with a time-dependent sinc ( $\omega_0 t$ ) signal waveform;

means for adjusting at least one selected one of (1) the amplitude of the modulated radio-frequency signal and (2) the instantaneous center frequency, across a range of frequencies related to a chemical shift spectrum  $\omega_0$  of the first specie; and

means for applying the adjusted signal to the sample to cause at least one selected one of (1) minimization of the coupling of the first nuclear specie to, and (2) nuclear Over-

hauser enhancement of, magnetic resonance spectroscopy response signals provided by the second nuclear specie.

4,682,107

# METHOD OF OPERATING A NUCLEAR MAGNETIC RESONANCE SPECTROMETER

Max R. Bendall, 274 Ford Road, Burbank, Queensland, Australia (4123), and David T. Pegg, 7 Fanfare Street, 8 Mile Plains, Brisbane, Queensland, Australia (4123)

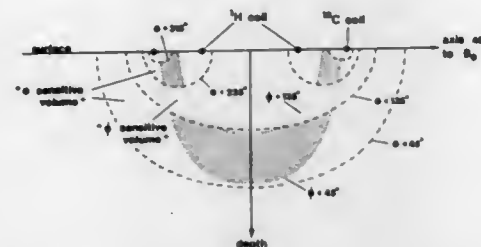
Filed Mar. 25, 1985, Ser. No. 715,244

Claims priority, application European Pat. Off., Mar. 29, 1984, 84103483.8

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—307

4 Claims



1. A method of operating a nuclear magnetic resonance spectrometer in relation to a sample comprising two types of nuclear magnetic resonators, by applying to the sample a sequence of radiofrequency pulses and delay periods, the pulses thereof comprising radiofrequency bursts of two different radiofrequencies corresponding to the resonant frequencies of the two types of magnetic resonators, such that the scalar coupling interactions between the two types of magnetic resonators are allowed to evolve, characterized in that

pulses of rf bursts at one of the two radiofrequencies are applied to one of two spaced coils and pulses of rf bursts at the other radiofrequency are applied to the other coil, the two spaced coils being shaped and positioned to provide inhomogeneous rf fields in the sample to overlap sensitive volumes of their rf fields at a region of the sample so that NMR signal emission of greatest intensity will be obtained from the overlapping sensitive volumes.

4,682,108

# MAGNETIC RESONANCE EQUIPMENT FOR THE PRODUCTION OF IMAGES OF A TEST OBJECT

Eckart Stetter, Erlangen; Helmut Reichenberger, Eckental; Siegfried Schneider, Erlangen, and Axel Wirth, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 26, 1985, Ser. No. 759,535

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428391

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—309

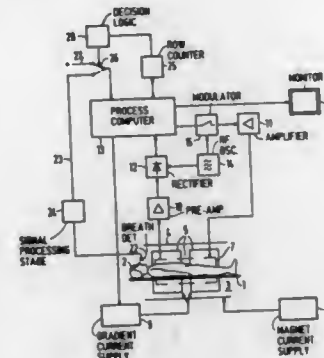
10 Claims

1. Apparatus for producing images of a test object using nuclear magnetic resonance, at least a portion said test object being subject to physical motion, said apparatus comprising:

- first means for applying magnetic primary and gradient fields to the test object and for detecting deflection of nuclear spins of the test object from their equilibrium position by a radio-frequency magnetic excitation pulse, said first means producing a plurality of time-sequential measurement signals representative of said nuclear spin deflection in response to a respective plurality of excitation pulses time-sequentially applied with corresponding gradient fields;
- second means, responsive to said produced measurement signals, for calculating an image of a cross-sectional slice of the test object by Fourier transformation from a matrix of Fourier rows, each Fourier row being calculated from

at least one of said time-sequential measurement signals as a projection of the nuclear spins on a frequency axis caused by the plurality of magnetic field gradients in said slice;

- third means for generating a motion signal representative of said physical motion of said portion of the test object;
- fourth means, coupled to said second means, for counting Fourier rows; and



- value of said motion signal when within said region.

4,682,109

# METHOD AND DEVICE FOR DETERMINING AN NMR DISTRIBUTION IN A REGION OF A BODY

Johannes J. M. Cuppen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

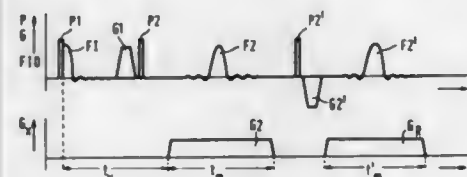
Filed Oct. 11, 1985, Ser. No. 786,557

Claims priority, application Netherlands, Nov. 29, 1984, 8403627

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—309

11 Claims



11. An apparatus for producing an NMR image of a region of a body, said apparatus comprising means for generating a steady, uniform magnetic field, means for generating an RF electromagnetic pulse so as to cause precessional motion of nuclear spins in the body under examination disposed in said steady magnetic field to thereby generate a resonance signal, means for generating a gradient magnetic field, means for taking signal samples of said resonance signal, means for controlling said pulse generating means, said gradient field generating means and said sample taking means so that during a first measurement period in successive measurement cycles, a plurality of first signal samples are taken of said resonance signal which is conditioned by varying the intensity of said gradient field from measurement cycle to measurement cycle or by varying the time duration during which the body under examination is exposed to said gradient field, and so that during a second measurement period in at least some of said measurement cycles, a plurality of reference signal samples are taken of

said resonant signal which is non-conditioned, said reference signal samples being taken in the presence of a gradient field which is the same during said second measurement period of each measurement cycle during which said reference signal samples are taken, and means for forming, from said first signal samples and said reference signal samples, an NMR image of said region of said body being examined, said image forming means including means for using said reference signal samples to modify transformation of the first signal samples so as to reduce the effect on said image of movements of said body during examination thereof.

matrix being comprised of n signal samples obtained during a respective one of said measurement cycles.

4,682,111

# MAGNETIC RESONANCE IMAGING MAGNET

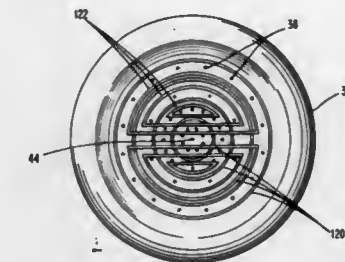
Simon H. C. Hughes, Gurnee, Ill., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 5, 1985, Ser. No. 708,448

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—320

12 Claims



# METHOD OF REDUCING ARTEFACTS IN IMAGES FORMED BY MEANS OF FOURIER ZEUGMATOGRAPHY

Johannes H. den Boef, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

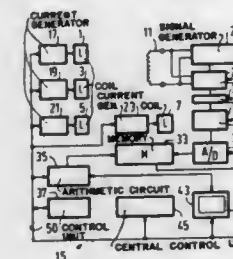
Filed Mar. 4, 1985, Ser. No. 707,707

Claims priority, application Netherlands, Mar. 5, 1984, 8400699

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—309

13 Claims



12. A device for determining the nuclear magnetic resonance distribution in a region of a body, comprising:

- means for generating a steady, uniform magnetic field,
- means for generating a high-frequency electromagnetic excitation pulse so as to produce precessional motion of the magnetization of nuclei in the body thereby generating a resonance signal,
- means for generating at least one gradient magnetic field during a preparation period so as to condition said resonance signal,
- sampling means for sampling said resonance signal after conditioning thereof so as to obtain a set of n sample signals,
- processing means for processing said sample signals, and
- control means for controlling at least said radiation generating means, said gradient field generating means, said sampling means and said processing means so as to generate and sample a plurality of said resonance signals, each resonance signal being generated and sampled after conditioning thereof during a respective one of a plurality of measurement cycles which follow one another with a waiting period between successive cycles, the control means supplying the gradient field generating means with control signals for adjusting the intensity and/or the duration of at least one gradient magnetic field so that the integral of the intensity over the duration of said at least one gradient magnetic field is different after each waiting period,

the control means comprising programmed computer means for generating and applying further control signals to the pulse generating means in accordance with a programmed schedule so that said pulse generating means generates a pulse having either a first phase or a second phase during a measurement cycle, the second phase being shifted 180° with respect to the first phase, said device further comprising means for storing said sample signals obtained during successive measurement cycles so as to obtain a matrix of n' rows, each row of said

1. A magnet for use in a magnetic resonance imaging device, comprising:

- first and second pole pieces of magnetically conductive material;
- first and second coils located around said first and second pole pieces, respectively, to generate a magnetic field between said pole pieces when said coils are energized;
- additional magnetically conductive material arranged to provide a closed loop magnetic flux return path for said pole pieces; and wherein
- said pole pieces each include means for uniformly distributing said magnetic field between said pole pieces comprising an exposed surface on each of said pole pieces spaced apart from one another with each said exposed surface having a toroidal portion and a central concave portion surrounded by said toroidal portion, said toroidal portion smoothly transitioning to said central concave portion and said central concave portion comprising a smooth concave indent in said exposed surface.

4,682,112

# NMR ANTENNA AND METHOD FOR DESIGNING THE SAME

Steve Beer, Burlington, Mass., assignor to Elscint Ltd., Haifa, Israel

Filed Oct. 10, 1984, Ser. No. 659,457

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324—322

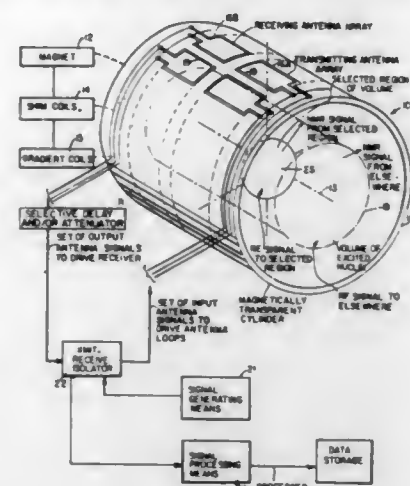
34 Claims

1. An antenna system for nuclear magnetic resonance (NMR) imaging or spectroscopy comprising:

- means to transmit radio-frequency (RF) signals for exciting nuclei in a volume of an object positioned in a substantially uniform magnetic field whose strength is functionally related to the frequency of the RF signal;
- a receiving antenna array comprising a group of loop antennas operatively associated with the object for receiving signals from said volume of the object, each loop antenna in said array producing a separate output signal; and
- signal processing means for processing said output signals to produce processed signals;
- said signal processing means being constructed and arranged to control the relative phases and amplitudes of each of said separate output signals during processing



such that the contribution to said processed signals from signals emanating from a selected region of said volume is



significantly greater than the contribution from signals emanating from elsewhere in said volume.

4,682,113

# PURE WATER CONDUCTIVITY SENSOR

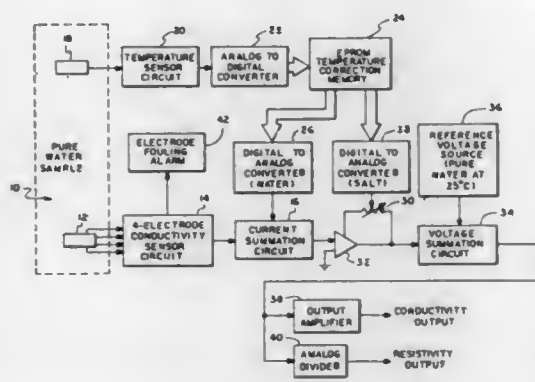
Theodore R. Barben, II, Carson City, Nev., assignor to TBI, Carson City, Nev.

Filed Dec. 3, 1985, Ser. No. 804,217

Int. Cl.<sup>4</sup> G01R 27/22

U.S. Cl. 324-441

10 Claims



1. A system for measuring conductivity of a high purity water sample comprising:

a total conductivity measuring means having a multiple electrode probe immersed in said sample for generating a total conductivity signal proportional to the total conductivity of the sample;

a temperature sensing means for generating a temperature output indicative of the temperature of the sample;

first compensation means responsive to the temperature output from the temperature sensing means for generating a pure water correction signal corresponding to the conductivity of absolutely pure water at the temperature of the sample;

first summation means for subtracting the pure water correction signal generated by the first compensation means from the total conductivity signal generated by the conductivity measuring means to produce a net conductivity signal indicative of the conductivity value of salt impurities in the sample;

second compensation means for generating a salt correction signal corresponding to the ratio between the conductiv-

ity of the salt at the measured temperature as compared with a standard reference temperature;

amplifier means responsive to the salt correction signal for adjusting the net conductivity signal applied to its input to produce an adjusted salt conductivity output proportional to the conductivity of the salt at a standard reference temperature;

second summation means for adding the adjusted salt conductivity output to a fixed amplitude signal, which corresponds to the conductivity of absolutely pure water at the standard reference temperature, to produce a combined output signal corresponding to the total conductivity of the sample being measured at the standard reference temperature.

4,682,114

# POWER MODULATOR PROVIDED WITH A TRANSFORMER

Jeanne Anconturier, L'Hay-Les-Roses; Hubert Leboutet, St. Cloud, and Jean-Louis Pource, Chatillon-Sous-Bagneux, all of France, assignors to CGR/MEV, Buc, France

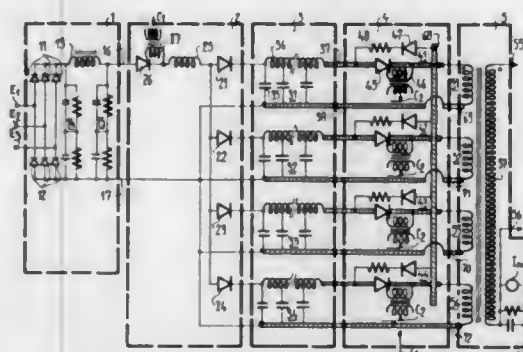
Filed Apr. 13, 1984, Ser. No. 599,818

Claims priority, application France, Apr. 15, 1983, 83 06223

Int. Cl.<sup>4</sup> H03K 3/86, 3/00; H03L 5/00; H01F 27/28

U.S. Cl. 328-67

11 Claims



1. Power modulator equipped with a transformer to receive electrical impulses produced by an impulse generator stage and to produce higher voltage electric impulses, wherein the said transformer is one of the armoured type and comprises a certain number of primary windings connected in parallel to said impulse generator stage through distribution elements, these primary windings being wound about the secondary winding of this transformer, said primary windings each being connected to said distribution elements by a pair of conductor wires connected to opposite ends of the primary windings which are brought close together to reduce inductive losses.

4,682,115

# APPARATUS FOR REGENERATING ORIGINAL SIGNALS

Seiichi Mita, Tsukui; Morishi Izumita, Inagi; Yuichi Michikawa, Katsuta; Hitoshi Katayama, Nerima; Hiroshi Shiono, Mito; Hitoshi Takagi; Morito Rokuda, both of Katsuta, and Nobukazu Dol, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1985, Ser. No. 742,792

Claims priority, application Japan, Jun. 11, 1984, 59-119487

Int. Cl.<sup>4</sup> H03K 5/00, 5/01

U.S. Cl. 328-164

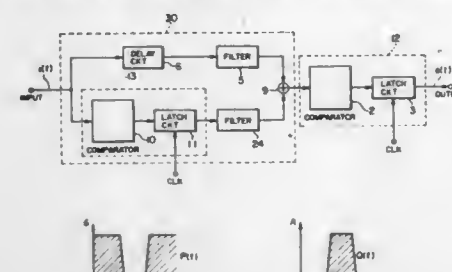
6 Claims

1. An apparatus for regenerating an original digital signal which is applied to a system which cuts off a predetermined frequency band component in the original digital signal and outputs the remaining signal components, comprising:

first means responsive to the output of said system for gener-

ating from said output signal of said system a first signal corresponding to the predetermined frequency band component which has been cut off by said system;

second means responsive to the output of said system for outputting a second signal which is obtained by delaying the output signal of said system by a time that corresponds to the time a signal is delayed by said first means;



third means connected to said first and second means for adding said first and second signals and for outputting a signal representing the addition result thereof; and

fourth means connected to said third means for digitizing said output signal of said third means so as to regenerate said original digital signal.

4,682,116

# HIGH SPEED PHASE LOCKED LOOP FILTER CIRCUIT

Dan H. Wolaver, Worcester, Mass., and Warren E. Little, Salem, N.H., assignors to General Signal Corporation, Stamford, Conn.

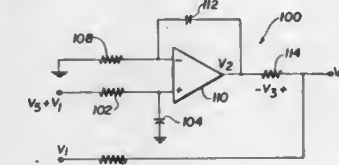
Division of Ser. No. 474,489, Mar. 11, 1983, Pat. No. 4,547,747.

This application Aug. 1, 1985, Ser. No. 761,355

Int. Cl.<sup>4</sup> H03K 5/00; H03B 1/00

U.S. Cl. 328-167

2 Claims



1. A loop filter means, for use in a phase locked loop circuit having reference signal generating means, and having frequency comparison means and phase comparison means which produce input signals for said loop filter means, comprising:

operational amplifier means having inverting and non-inverting inputs, output and integrating feedback means for noninvertingly integrating input signals from said frequency and phase comparison means, said input signals being connected to said non-inverting input;

said integrating feedback means comprising feedback capacitor means connecting the output of said operational amplifier means to the inverting input of said operational amplifier means;

second capacitor means connecting the noninverting input of said operational amplifier means to a reference potential;

voltage divider means having first and second inputs and an output, the output of said operational amplifier means being connected to said first input of said voltage divider means and selected inputs from one of said input signals being connected at said second input of said voltage divider means, said voltage divider means attenuating and summing said output of said operational amplifier means and said selected input signal to provide an output signal of said loop filter means at said output of said voltage divider means.

# QUADRATURE DEMODULATION DATA RECEIVER WITH PHASE ERROR CORRECTION

Rodney W. Gibson, Burgess Hill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 662,861, Oct. 19, 1984, abandoned.

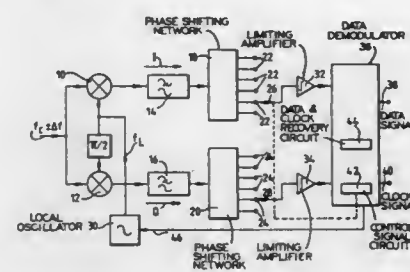
This application Apr. 30, 1986, Ser. No. 858,849

Claims priority, application United Kingdom, Oct. 21, 1983, 8328162

Int. Cl.<sup>4</sup> H03D 3/00

U.S. Cl. 329-50

6 Claims



5. A data receiver comprising quadrature mixers having outputs coupled by signal paths to a coherent data demodulator, means for applying an incoming signal to each of said mixers, low pass filter means in each of said signal paths, and means for correcting phase errors after the outputs from the mixers have been low pass filtered in said filter means, the data demodulator including means for determining the phase error in the incoming signal and producing a control signal in response to the phase error determined;

wherein said correcting means includes phase shifting networks in said signal paths to the data demodulator, and said receiver further comprises means for using said control signal to determine a phase correction to be applied to said phase shifting networks.

4,682,118

# PHASE SHIFT KEYING AND PHASE MODULATION TRANSMISSION SYSTEM

David V. Thiel, Rochdale, Australia, assignor to Griffith University, Brisbane, Australia

PCT No. PCT/AU84/00262, § 371 Date Sep. 16, 1985, § 102(e)

Date Sep. 16, 1985, PCT Pub. No. WO85/02966, PCT Pub.

Date Jul. 4, 1985

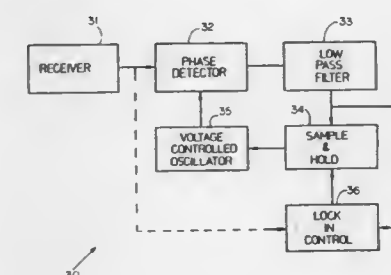
PCT Filed Dec. 19, 1984, Ser. No. 770,287

Claims priority, application Australia, Dec. 22, 1983, PG2964

Int. Cl.<sup>4</sup> H03D 3/00

U.S. Cl. 329-122

6 Claims



1. A phase demodulator including:  
a receiver means for receiving a modulated signal transmitted by a transmitter; and  
a modified phase locked loop adapted to receive the modulated signal from the receiver means, said phase locked loop including a phase detector for receiving the modu-

lated signal, a low pass filter receiving an output from the phase detector, a voltage controlled oscillator providing a controlled input to the phase detector, a sample and hold circuit for receiving the output from the filter and providing a control signal for the voltage controlled oscillator and lock-in control means deriving a lock control signal from at least one of the modulated signals and the output of the filter to provide a lock-in control signal for the sample and hold circuit whereby in use when the lock-in control signal to the sample and hold circuit is high the phase locked loop locks onto the modulated signal and when the lock-in control signal is low the sample and hold circuit output is fixed independent of the filter output and if there is no change in the phase or frequency of the modulated signal the phase locked loop remains locked and the output of the sample and hold circuit approximates the output of the filter although the connection between the filter and sample and hold circuit is blocked and if a change in phase or frequency of the modulated signal occurs then the difference between the sample and hold circuit and the filter outputs is proportional to the phase or frequency shift in the modulated signal, and said lock-in control means including a divider and one shot in series, said divider receiving the modulated signal and the output of the one shot providing the lock-in control signal.

4,682,119

# CLASS AB AMPLIFIER AND A DISTORTION CORRECTOR THEREFOR

Jean Michel, Trappes, France, assignor to Thomson-CSF, Paris, France

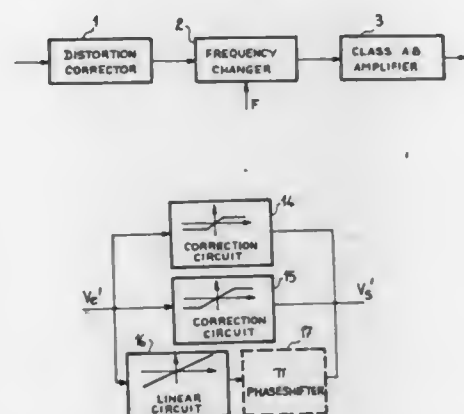
Filed Jan. 27, 1986, Ser. No. 822,834

Claims priority, application France, Jan. 25, 1985, 85 01081

Int. Cl.<sup>4</sup> H03F 1/32

U.S. Cl. 330-149

2 Claims



1. A class AB amplifier including a distortion corrector, the corrector comprising a trough corrector, the quiescent current of the amplifier being chosen so that the characteristic  $V_s = f(V_c)$  of the amplifier, where  $V_c$  and  $V_s$  are respectively the input and output voltages of the amplifier has a monotonic variation drift,

and wherein the characteristic  $V_s = f(V_c)$  of the trough corrector where  $V_c'$  and  $V_s'$  are respectively the input and output voltages of the trough corrector has a concavity which increases in absolute value of slope towards increasing absolute values of  $V_s'$ .

## 4,682,120 SHORT CIRCUIT PROTECTION DEVICE FOR AN INTEGRATED CIRCUIT AND A LOAD CONNECTED THERETO

Sergio Palara, Bareggio, and Aldo Torazzina, Monza, both of Italy, assignors to SGS Microelettronica S.p.A., Milan, Italy

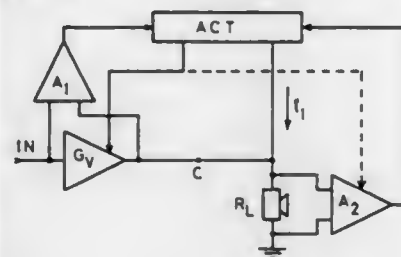
Filed Sep. 27, 1984, Ser. No. 655,338

Claims priority, application Italy, Sep. 27, 1983, 23003 A/83

Int. Cl.<sup>4</sup> H03F 21/00

U.S. Cl. 330-298

20 Claims



12. The method of protecting an amplifier circuit driving a load impedance comprising the step of: deactivating said amplifier circuit and applying a preselected current to said load impedance in response to a first amplifier condition; and activating said amplifier circuit and halting said current in response to a first impedance condition.

4,682,121

## PHASE DISCRIMINATOR AND DATA STANDARDIZER

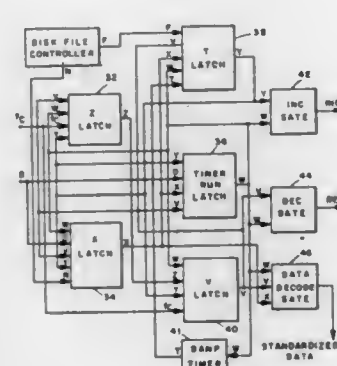
Dale B. Chapman, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 4, 1985, Ser. No. 698,105

Int. Cl.<sup>4</sup> H03L 7/02; H03D 3/18

U.S. Cl. 331-1 A

20 Claims



1. An apparatus, responsive to the difference in phase between an input data signal having transitions and a variable-frequency clock signal having transitions, for producing a phase correction signal to change the frequency of said clock signal, comprising:

reference timing means responsive to an input data signal having transitions for producing a timing reference signal having a predetermined reference timing period; multi-variable circuit means responsive to said reference timing signal and to a transition of a variable-frequency clock signal for measuring a phase difference between said input data and clock signals by producing and changing a

plurality of variable signals in a sequence defining a multi-state transition cycle in which each transition between adjacent states is determined by the change in one respective variable and for producing phase difference signals indicative of said measured phase difference; and gate means responsive to said phase difference signals for producing a phase correction signal to change the frequency of said reference clock signal.

4,682,122

## FREQUENCY SYNTHESIZER STAGE ADDING HIGH FREQUENCY STEPS TO AN INITIAL FREQUENCY

Joël Remy, Paris, and Roger Charbonnier, Meudon Bellevue, both of France, assignors to Adret Electronique, Trappes, France

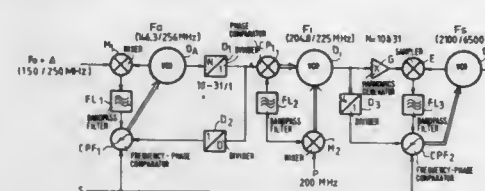
Filed Oct. 15, 1985, Ser. No. 786,975

Claims priority, application France, Jun. 1, 1984, 84 08650

Int. Cl.<sup>4</sup> H03L 7/18

U.S. Cl. 331-2

4 Claims



1. A frequency synthesizer for generating an output frequency  $F_s$  by adding large frequency steps to a frequency itself comprising smaller frequency steps and comprising first and second circuits, each of said circuits including at least one current or voltage controlled oscillator controlled by a phase lock loop, the first circuit dividing, by means of a programmable divider, the input frequency  $F_0 + \Delta$  ( $\Delta$  being the sum of the small steps) by a rational division factor and adding to the result of this division a standard frequency  $P$  which is in a fixed integral ratio with the large steps so as to give an intermediate frequency  $F_i$ , while the second circuit multiplies the said intermediate frequency by the said rational factor, wherein the second circuit divides the intermediate frequency  $F_i$  by a fixed integral ratio  $D$  and compares the result  $F_i/D$  of the division to a beat between the output frequency  $F_s$  and a harmonic  $N$ .  $F_i$  of the intermediate frequency, while the said rational factor is  $N + 1/D$ .

4,682,123

## DIGITAL VOICE AND DATA FREQUENCY MODULATION CIRCUIT

Roger K. Loper, Norway, and Richard A. Freeman, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 11, 1986, Ser. No. 873,241

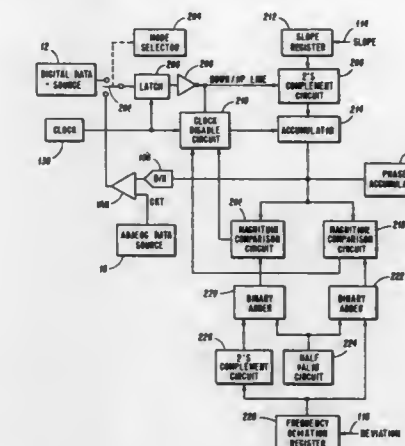
Int. Cl.<sup>4</sup> H03C 3/00

U.S. Cl. 332-16 R

18 Claims

17. In a frequency modulation system: means for providing a data signal; means for selectively providing a slope value; first means for providing a signal indicative of an increase in the amplitude of the data signal; second means for providing a signal indicative of a decrease in the amplitude of said data signal; means for accumulating the slope value responsive to said first means and accumulating the negative of said slope value responsive to said second means; means for disabling the accumulating means when the accu-

culated value exceeds a predetermined maximum level or subceeds a predetermined minimum value; and



means for generating a signal whose frequency is dependent upon the value in the accumulating means.

4,682,124

## CIRCUIT INCLUDING A DC-FM PHASE LOCKED LOOP

Johann Schutz, Munich, Fed. Rep. of Germany, assignor to Schlumberger Messgerate GmbH, Munich, Fed. Rep. of Germany

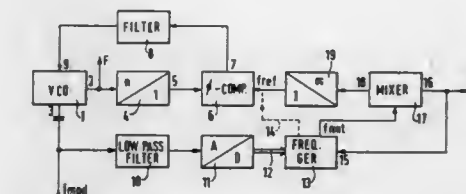
Filed Sep. 17, 1986, Ser. No. 908,477

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3433222

Int. Cl.<sup>4</sup> H03C 3/06

U.S. Cl. 332-19

5 Claims



1. A circuit including a DC-FM phase locked loop, the circuit comprising a variable frequency oscillator having a control input for a modulation signal, a frequency divider connected between the output of said oscillator feeding one input of a phase comparator, a second input of said phase comparator being connected to receive a reference frequency, and the output of said phase comparator being connected, via a filter, to a frequency control input of said oscillator, wherein a quartz-stabilized but frequency-variable frequency generator is provided for the generation of said reference frequency, and wherein said modulation signal is fed via a low pass filter to the input of an analog-to-digital converter for conversion to corresponding digital signals, which are fed to control inputs of said frequency generator so as to cause the output reference frequency produced by said generator to fluctuate, in response to low frequency and DC components of said modulation signal, by substantially the same amount as the output frequency of said frequency divider.



4,682,125

**RF COIL COUPLING FOR MRI WITH TUNED RF REJECTION CIRCUIT USING COAX SHIELD CHOKE**  
William H. Harrison, Malibu; Mitsuki Arakawa, Hillsborough, and Barry M. McCarten, Piedmont, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.  
Filed Feb. 10, 1986, Ser. No. 827,638  
Int. Cl.<sup>4</sup> H03H 7/01

U.S. Cl. 333—12

6 Claims



1. A coaxial cable RFI choke assembly for reducing transmission, via the outside of the outer coaxial conductor, of RF signals having a predetermined frequency while passing RF signals of the same predetermined frequency on the inside of said coaxial conductor, said assembly comprising:

- a coiled section of coaxial cable having an outer conductive member and including plural coil turns between first and second coil ends which cable, insofar as the outer conductive member is concerned, provides inductance L;
- a lumped fixed capacitor of capacitance C physically disposed transversely across one of said coil ends and electrically connected in parallel across both of said coil ends, said inductance L and capacitance C presenting a parallel resonant circuit approximately at said predetermined frequency which substantially impedes the flow of said RF signals via the outside of the outer conductive member;
- a conductive tuning rod positioned within the center of said coiled section so as to achieve parallel resonance of the assembly substantially at said predetermined frequency; adhesive material fixing said tuning rod and coiled section of coaxial cable in place relative one another;
- a forming cylinder of insulation material with said coiled section of coaxial cable being wound thereonto and having a cavity in its center section into which said tuning rod is located; and
- a cylindrical housing, closed on each end, encapsulating said assembly, having a coaxial cable input connection disposed at one end of the housing and a coaxial cable output connection disposed at the other end of the housing.

4,682,126

**ELECTROMAGNET FOR PROGRAMMABLE MICROWAVE CIRCULATOR**

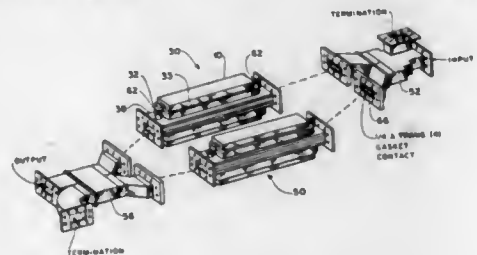
Walter E. Milberger, Severna Park; Joel R. Cohen, Silver Spring, and Leonard Dubrowsky, Owings Mills, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 1, 1984, Ser. No. 616,347

Int. Cl.<sup>4</sup> H01P 1/18, 1/22; H01F 27/34

U.S. Cl. 333—81 B

4 Claims



1. An electromagnet structure for a high-power variable attenuator using a programmable microwave circulator,

wherein the circulator comprises input power divider means which divides input RF power to two phase shifters, and an output hybrid coupler between the two phase shifters and an output RF port to recombine the power, the power from the input power divider means to the two phase shifters having the same relative phase and the same amplitude, the two phase shifters being controlled to introduce a relative phase shift, the two phase shifters being designed to operate from zero to 90° phase shift to achieve minimum to maximum attenuation characteristics;

wherein each of said phase shifters comprises a waveguide section having ferrite slabs mounted on interior walls, and the electromagnet structure forms a yoke for each phase shifter, comprising core means for each phase shifter with winding means on part of the core means, the core means having pole faces adjacent opposite outer surfaces of the waveguide means, so that there is an air gap between the pole faces, the ferrite slabs being located in the air gap to be biased by the magnetic flux;

wherein the core means includes laminations of magnetic material having a high permeability, with a magnetic path having a first portion through the magnetic material and a second portion through the air gap, so that the effective length of the magnetic path is equal to the sum of first and second terms, the first term being the length of the first portion and the second term being equal to said permeability multiplied by the length of the second portion, the second term being very large such that the first term is insignificant and therefore the flux density is substantially equal to ampere turns supplied by said winding means divided by the length of the air gap, and the permeability required is much smaller than the permeability of the magnetic material;

wherein said core means further includes a non-magnetic filler forming spacers between said laminations, the laminations being relatively thin and the spacers comparatively thick so that the resulting average permeability is sufficient to provide said required phase shift.

4,682,127

**ULTRA-HIGH FREQUENCY SIGNAL SWITCHING MATRIX HAVING ACTIVE COMPONENT SWITCHING JUNCTIONS**

John Magarshack, Reuil Malmaison, France, assignor to Thomson-CSF, Paris, France

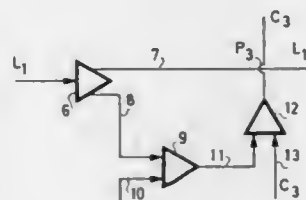
Filed Aug. 14, 1984, Ser. No. 640,804

Claims priority, application France, Aug. 17, 1983, 83 13391

Int. Cl.<sup>4</sup> H04Q 1/00

U.S. Cl. 333—103

15 Claims



1. A matrix for switching ultra-high frequency electrical signals from a first plurality of input channels or rows towards a second plurality of output channels or columns, the transfer of a signal from a respective input channel to a respective output channel being carried out at a switching point, said switching matrix being characterized in that each switching point comprises:

- a power divider, whose input receives the signal transferred by a respective input channel and which supplies at its output a signal divided into a plurality of equal signals,
- a controllable switch, controlled by an external signal,

which transfers at least one output signal coming from the divider to a power combiner, the combiner transmits the signal transmitted by the switch to a respective output channel, the system constituted by the power divider, the controllable switch and the power combiner being realized by active components of field effect transistor type.

4,682,128

PHASE SHIFTER

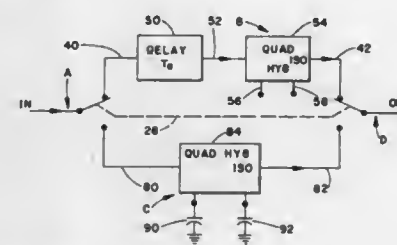
Robert W. Sproul, 309 Parkside Rd., Harrington Park, N.J. 07640, and Michael F. Ponzo, 417 Marven Ave., Hackensack, N.J. 07601

Filed Jan. 22, 1986, Ser. No. 820,998

Int. Cl.<sup>4</sup> H03H 7/20; H01P 1/18

U.S. Cl. 333—139

20 Claims



1. A phase shifter system comprising:

a first path including:

- (a) a first path input,
- (b) a delay, with a delay input and a delay output,
- (c) a first quadrature hybrid, with a first input port, a first output port at an isolated port to the input port, and a first non-isolated port to the input port, and
- (d) a first path output, with the first path input, the delay, the first quadrature hybrid, and the first path output being in series electrical connection; and
- a second path, selectively connectable electrically to, and in parallel with, the first path, the second path including:
- (a) a second path input,
- (b) a second path output, and
- (c) a second quadrature hybrid, with a second input port electrically connected with the second path input, a second output port at an isolated port to the input port electrically connected with the second path output, and a second non-isolated port to the input port; and
- a reactive load means for determining a system phase shift, the reactive load means being electrically connected to one of the first and second non-isolated ports of the quadrature hybrids.

4,682,129

**THICK FILM PLANAR FILTER CONNECTOR HAVING SEPARATE GROUND PLANE SHIELD**

Frank C. Bakermans, Raleigh, N.C., and Charles J. Trexler, York, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 480,592, Mar. 30, 1983, abandoned. This application Dec. 2, 1985, Ser. No. 803,369

Int. Cl.<sup>4</sup> H01P 13/648

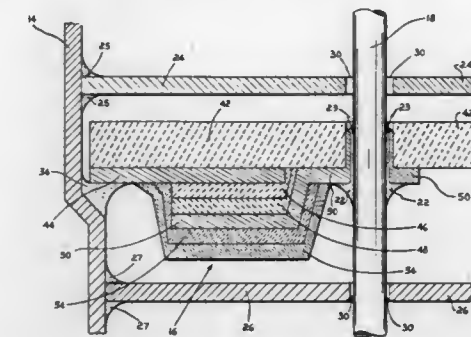
U.S. Cl. 333—184

5 Claims

1. In an electrical connector for filtering a wide band of frequencies

comprising a conductive housing enclosing a planar filter member having opposed surfaces and at least one row of conductive pins extending through the opposed surfaces; the filter member comprising multiple capacitors, there being a capacitor associated with each pin; each capacitor having at least one conductive layer forming a ground electrode in electrical contact with the housing, at least one conductive layer forming a pin electrode in electrical contact with its respective pin and dielectric material separating the electrodes, the ground electrode

being common to all pins in a row and being an elongated conductive layer along one side of the row of pins; the improvement comprising at least one ground plane disposed over at least one surface of the filter member, the ground plane having peripheral edges in electrical contact with the housing and holes for accommodating the con-



ductive pins without touching the pins, and the further improvement wherein the conductive layer forming the ground electrode, the conductive layer forming the pin electrode, and the dielectric material separating the electrodes are formed by screen printing alternate conductive and dielectric thick film layers on an alumina substrate.

4,682,130

**FILTER FUNCTIONING WITH ACOUSTIC WAVES**

Wolf-Eckhart Bulst, Vaterstetten; Gertrud Lindemann, and Peter Zibis, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

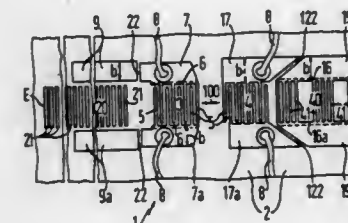
Filed Dec. 27, 1985, Ser. No. 813,827

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1985, 3501567

Int. Cl.<sup>4</sup> H03H 9/145, 9/64; H01L 41/04

U.S. Cl. 333—195

7 Claims



1. An electric acoustic wave filter, comprising:

- a substrate having at least one electrically conductive transducer structure formed of finger-like portions and a large-area pad connecting to the finger-like portions on each side of the transducer structure, said large-area pads having leads connected thereto and having a substantially larger width in a direction perpendicular to wave propagation through the transducer structure as compared to a width of busbars which would connect the respective finger-like portions if a large-area pad was not required for connecting with a lead;
- at least one reflector structure arranged directly next to the transducer structure, said reflector structure having a plurality of finger-like portions arranged for reflection of waves travelling along the wave propagation direction;
- an auxiliary coating running along the wave propagation direction at both sides of the reflector structure and adjacent ends of the finger-like portions thereof, said auxiliary coatings having a width in said direction perpendicular to the wave propagation direction approximately the same as

said width of the respective large-area pads, said auxiliary coatings extending along at least that portion of the reflector structure in the direction of wave propagation which is essential for functioning of reflection by said structure; and

said auxiliary coatings being electrically separated from said respective large-area pads by a relatively small interruption compared to a length of said large-area pads in the wave propagation direction,

whereby said auxiliary coatings provide exposure compensation during an exposure of the digital structures during manufacture of the finger-like portions since said widths of said auxiliary coatings correspond to the respective widths of the large-area pads so that a substantially same over-shooting occurs in regions of said reflector structure as occurs in regions of said transducer structure.

4,682,131

# **HIGH-Q RF FILTER WITH PRINTED CIRCUIT BOARD MOUNTING TEMPERATURE COMPENSATED AND IMPEDANCE MATCHED HELICAL RESONATORS**

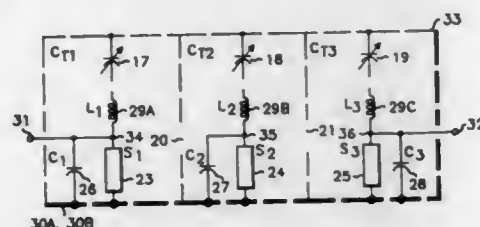
Colin J. May, Sassafras, Australia, assignor to Motorola Inc., Schaumburg, Ill.

Filed Jun. 7, 1985, Ser. No. 742,502

Int. Cl.<sup>4</sup> H01P 1/20

U.S. Cl. 333—202

13 Claims



1. An improved, temperature compensated, bandpass helical filter arrangement exhibiting a given input impedance and a given output impedance and wherein the frequency range of interest of the filter may be changed as desired, said filter arrangement including in combination:

- a modified ground plane having a dielectric layer with a plurality of segments formed thereon, each segment forming microstrip transmission line means configured to have a low impedance end and a high impedance end;
- a plurality of helical resonators, each helical resonator having one end thereof coupled to the high impedance end of a respective one of said microstrip transmission line means;
- a plurality of capacitor means, each capacitor means respectively connected in parallel with an associated one of said microstrip transmission line means between the high impedance end and low impedance end thereof; and
- conductor means coupled to at least two of said microstrip transmission line means at the high impedance ends, respectively forming an input and an output for said helical filter arrangement,

said capacitor means providing temperature compensation for said helical filter arrangement and said microstrip transmission line means having an electrical length less than one-quarter wavelength for the frequency range and having a configuration predetermined in accordance with a thickness and dielectric constant associated with the dielectric layer of the modified ground plane for providing an inductive impedance, which, in combination with said capacitor means, provides combined reactances to effect a desired impedance match to said helical resonators from the input or the output, as well as further determining the selected frequency range of the filter.

## **REMOTE CONTROL CIRCUIT BREAKER HAVING A RETRACTABLE SWITCH CONTACT**

Elie Belbel, Eplauy sur Seine; Christian Bataille, Ville d'Avray; Christian Blanchard, Rueil Malmaison; André Haury, Le Raincy, and Michel Lauraire, Courbevoie, all of France, assignors to La Telemecanique Electrique, France

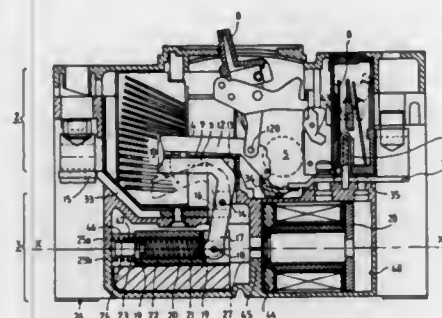
Filed Jan. 21, 1986, Ser. No. 820,297

Claims priority, application France, Nov. 15, 1985, 85 17209

Int. Cl.<sup>4</sup> H01H 75/00, 77/00, 83/00

U.S. Cl. 335—14

8 Claims



7. A circuit breaker comprising:

- i. at least one switch means having a closed and an open position, said switch means comprising:
  - a first bent pivoting lever having first and second arms connected together by a bent portion, said first arm having a contact end provided with a first contact and a second arm having a coupling end, said first pivoting lever being pivotally mounted about a pivoting axis placed between said bent portion and said coupling end;
  - a second pivoting lever which comprises a third arm having a contact end provided with a second contact adapted to cooperate with the first contact, said third arm facing said first arm and extending substantially parallel thereto when said first contact is applied against said second contact in said closed position, and said first and second pivoting levers being adapted so that the first contact opens with a sliding movement over the second contact;
- ii. tripping means acting on said second lever for causing rapid opening of the second contact;
- iii. at least a current detector for tripping said tripping mechanism when an excessive overcurrent is flowing through said switch means;
- iv. an electromagnetic actuating means comprising a mobile element movable in translation under the effect of a control signal applied to said actuating means and means for transmitting the movement of the mobile element to the first pivoting lever, said transmission means, rigid and movable in translation parallel to the axis of movement of the mobile element being coupled to said coupling end of said pivoting lever in a position thereof which is centered on said axis,

wherein said transmission means comprise a stirrup piece, mounted for pivoting at the coupling end of said first pivoting lever and between the legs of which is placed a compression spring which bears on a cross piece carried by an insulating slider having a housing for guiding the stirrup piece parallel to said movement of the mobile element and rigid connection means between said slider and said mobile element, said cross piece being disposed so as to come into abutment against the first pivoting lever for causing opening of the first contact when said mobile element is actuated and for being moved by said first pivoting lever while compressing the spring without moving the slider when the first contact opens under the effect of said repulsion forces.

## **ELECTRO-MAGNETIC RELAY HAVING TWO ARMATURES**

Josef Kern, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

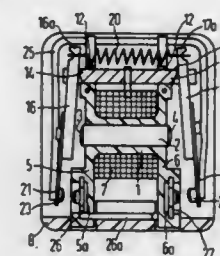
Filed Aug. 8, 1986, Ser. No. 894,827

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1985, 3529158

Int. Cl.<sup>4</sup> H01H 67/02

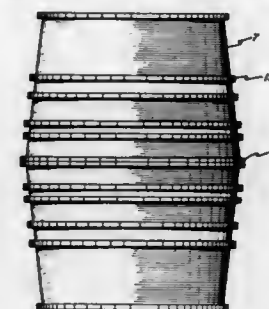
U.S. Cl. 335—119

9 Claims



- 1. An electro-magnetic relay, comprising:
    - a coil having a coil body defining a mounting plane and an axially extending core extending parallel to the mounting plane and a winding around said core;
    - a yoke disposed adjacent said coil and parallel to said axis and having a bearing blade at each of first and second opposite ends;
    - first and second flat armatures extending substantially perpendicular to said axis at respective opposite ends of said coil, each of said flat armatures being seated on one of said bearing blades at one of said opposing yoke ends and forming a working air gap with an end of said core, each of said first and second flat armatures having a continuation extending beyond said bearing blade;
    - a common restoring spring stressed for tension connecting said continuations of said first and second armatures behind said bearing blades;
    - a contact spring carried by each of said first and second armatures;
    - movable contact elements on said contact springs;
    - an electrical conductor element connecting said movable contact elements on said two contact springs; and
    - cooperating contact elements for interaction with said movable contact elements,
- whereby said first and second armatures are independently openable to form a two contact series connection relay.

superconducting wire wound circumferentially around said form under sufficient tension so that during superconduct-



ting magnet operation said form remains under compression.

4,682,135

## **ELASTIC SUPPORT MEMBERS FOR AN ELECTRIC ACTUATOR**

Tsuyoshi Yamakawa, Fuwa, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

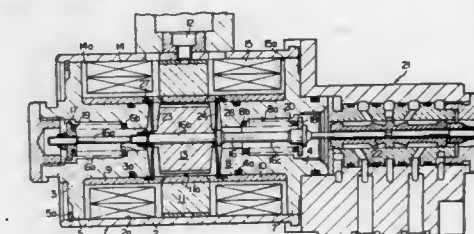
Filed Apr. 1, 1986, Ser. No. 846,738

Claims priority, application Japan, Apr. 3, 1985, 60-70440

Int. Cl.<sup>4</sup> H01F 7/08

U.S. Cl. 335—256

1 Claim



- 1. An electric actuator comprising
  - a housing,
  - a permanent magnet disposed within said housing,
  - an axially movable armature disposed within said housing,
  - an actuating coil supported by said housing for driving said armature to axially move, and
  - an axially moveable actuating rod fixedly connected to said armature, wherein said electric actuator further comprises a pair of elastic support members having radially inner end portions fixedly connected to said actuating rod at opposite portions thereof adjacent said armature and radially outer end portions fixedly connected to said housing, respectively, each of said elastic support members consisting of a plurality of thin leaves laminated one upon the other, each of said elastic support members being formed with a plurality of arm portions equiangularly spaced apart with respect to one another and radially extending between said radially inner and outer end portions and a plurality of generally triangular openings each disposed between two adjacent arm portions, each of said arm portions being axially deflected with respect to said radially inner and outer end portions of said elastic support member.

4,682,134

## **CONICAL, UNIMPREGNATED WINDING FOR MR MAGNETS**

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,921

Int. Cl.<sup>4</sup> H01F 7/22

U.S. Cl. 335—216

9 Claims

- 1. A winding for use in a cryostat of a superconductor magnet comprising:
  - a form comprising a shell having the shape of two truncated cones joined at their respective bases; and

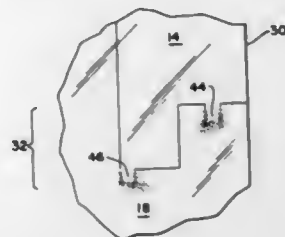


**4,682,136**  
**FUSED COVERING FOR AN ELECTRICAL CONDUCTOR AND METHOD FOR MAKING THE FUSED COVERING**  
 Raymond A. Prokop, Ingleside, Ill., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Nov. 26, 1985, Ser. No. 801,724  
 Int. Cl.<sup>4</sup> H01F 5/00

U.S. Cl. 335—282

18 Claims



1. For an electrical assembly of the type having an electrical conductor disposed on the interior and a protective cover which includes a first wall and a second wall that engages the first wall, the improvement which comprises:

- a first wall having a continuous seal lip extending from the wall, the lip having at least two surfaces in the uninstalled condition which are melted such that the lip is partially melted in the installed condition and is substantially fused with the second wall such that the leakage of fluids between the walls is blocked.

**4,682,137**  
**MAGNETIZING APPARATUS FOR THE MAGNETIZATION OF KEYS AND ROTORS OF MAGNETIC SAFETY LOCK SYSTEMS**

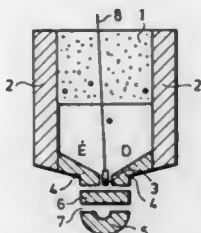
Tibor Kasza; Gyula Kákonyi; Illés Kócsó; Attila Buzás, and László Radányi, all of Budapest, Hungary, assignors to Elzett Művek, Budapest, Hungary

Filed Sep. 18, 1985, Ser. No. 777,208

Claims priority, application Hungary, Sep. 28, 1984, 3679/84  
 Int. Cl.<sup>4</sup> H01F 7/20

U.S. Cl. 335—284

5 Claims



1. Magnetizing apparatus for the magnetization of magnetic blades to be journaled into two sides of the shank of a key for magnetic safety locks by means of surface magnetization with coded orientation, comprising an exciting magnet, magnetic flux-conducting soft iron members having tapering shanks connected with the poles of the exciting magnet of the apparatus and an air-gap formed between the ends of the shanks of the magnetic flux-conducting soft iron members, wherein the exciting magnet of the apparatus is a permanent magnet made of intermetallic compounds of rare earth metals of shell 4f and transition metals of shell 3d produced by means of powder metallurgy or casting, the rare earth metal consisting of at least one of Sm, Pr, Nd, Y, Gd, La, Dy, Eu, Yb, Er and Ce and the transition metal consisting of at least one of Fe, Co and Ni for improving the magnetic properties of the material; and wherein at least portions of said soft irons contiguous to said air gap are made of a material of high magnetic saturation value, e.g. an alloy of Fe, Co, V; wherein the direction of the feed of

said blades is parallel with the direction of a magnetic field across the poles of the flux-conducting soft iron members, and wherein a flux-guiding magnet made of an RCo alloy (where R represents a rare earth metal) is placed into the air gap between the tapering shanks of the flux-conducting soft iron fitted to the permanent magnet.

**4,682,138**  
**PUSH-BUTTON ACTUATED OVERLOAD PROTECTIVE CIRCUIT BREAKER**

William F. Sell, Altdorf, Fed. Rep. of Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

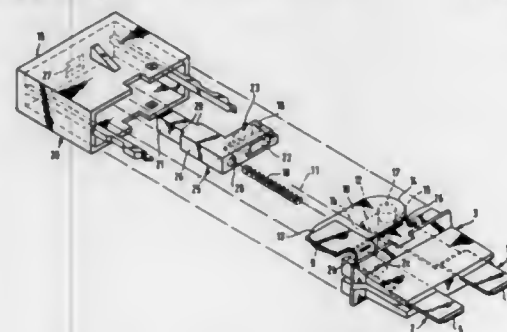
Filed Jul. 25, 1986, Ser. No. 889,477

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 8522254[U]

Int. Cl.<sup>4</sup> H01H 71/16

U.S. Cl. 337—68

9 Claims



1. A push button-actuated overload protective circuit breaker with bimetal cutout and having a central longitudinal circuit breaker axis; said circuit breaker comprising a housing, a push button extending into the housing from the outside, and, in the interior of the housing,

- (a) a fixed contact element and a bimetal contact element, arranged besides each other and being devised each as an elongated punched-out part having the shape of substantially a right parallelepiped of flat rectangular cross-sectional area, both contact elements being mounted in a mounting wall of the housing, and having each a longitudinal central axis, substantially parallel with said longitudinal circuit breaker axis, and two opposite large faces and, connecting said large faces, two opposite narrow side faces therebetween, main sections through said longitudinal contact element axes parallel with said large faces being located in planes which are spaced from, but parallel with each other, and each of said contact elements having an inner free end, located inside said housing interior; a fixed contact post mounted on said inner free end of said fixed contact element;
- (b) a bimetal snap disc being fastened with a first end thereof on the inner free end of said bimetal contact element and extending transverse to said longitudinal axes of said contact elements, another end of said bimetal snap disc, opposite said first end thereof, overlapping the inner free end of said fixed contact element; and a movable contact post on said other end of said bimetal snap disc;
- (c) a slider body having a longitudinal recessed passageway therein adapted for having the said fixed contact element extend through said recessed passageway in a manner such that said slider body at least partly surrounds said fixed contact element and is displaceable on the same rearward and forward in the direction of said longitudinal circuit breaker axis,

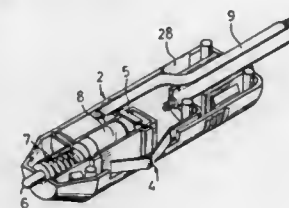
said slider body comprising an insulating wall member having a wall surface extending between the main sections of the two contact elements and being supported for displacement in the direction of the longitudinal axes of the contact elements; which insulating wall member is in a position outside but adjacent the two contact posts when they abut against one another in the rest position; and

which insulating wall member can be moved into a separating position between the two contact posts when the latter are moved apart from each other due to bending of the bimetal snap disc relative to a fixed portion of the bimetal contact element; and which insulating wall member is adapted for being displaced from a contact posts-separating position to the rest position by means of said pressure button.

**4,682,139**  
**ELECTRICAL AUTOMOBILE PLUG**  
 Jung-Tsan Kuo, No. 20, Her Chung Street, Tainan, Taiwan  
 Filed Aug. 15, 1986, Ser. No. 897,031  
 Int. Cl.<sup>4</sup> H01H 85/02, 85/52

U.S. Cl. 337—186

2 Claims

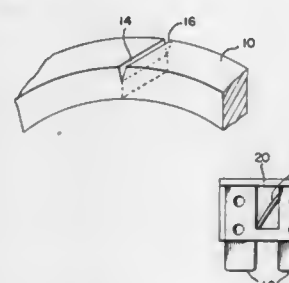


1. An electrical plug comprising a base, a cover, first and second conducting strips, a contact and a spring, said base having a seat at the middle position therewithin to receive and keep the first conducting strip therein; said base further having a first hole to expose part of said first conducting strip to act as cathode of said plug; said base also having an elongated seat capable of holding a fuse disposed proximate to one end thereof with a second hole on said one end; said contact having a slender post disposed on said hole which acts as an anode; said contact further having a spring holding means to hold the spring thereon; said base also having a means for holding said second conducting strip, including two slots are disposed on one side of said elongated seat with the first slot proximate to the second hole and the second slot remotely positioned from the second hole such that when said second conducting strip is placed at the first slot, said spring electrically contacts the second conducting strip, while when said second conducting strip is placed at the second slot, a fuse providable in said elongated seat is also placed between the spring and the second conducting strip so as to provide protection.

**4,682,140**  
**MINIATURE PLUG IN FUSE**  
 Jose M. Diaz-Noriega, Apartado Postal 3020, 64000 Monterrey, N.L., Mexico  
 Filed Aug. 8, 1986, Ser. No. 894,940  
 Int. Cl.<sup>4</sup> H01H 85/14, 85/16

U.S. Cl. 337—260

3 Claims



1. A fuse for opening an electrical circuit in response to a predetermined current flow comprising:  
 a plastic housing;  
 a pair of spaced conductive terminals supported in and extending outwardly from said housing for connection into an electrical circuit;

a fusible link within said housing electrically connected to said terminals and rigidly supported at its opposite ends thereby; and  
 means defining at least one cut extending partially through said link, at least a portion of the side walls of said cut being in electrical contact with each other at ambient temperature, but separable from each other in response to current generated heat causing bending of said link reducing the cross section of the link and raising its electrical resistance.

**4,682,141**  
**DYNAMICALLY OPTIMIZED THERMOSTAT (DOT) WITH TUNABLE BIMETAL ELEMENT**

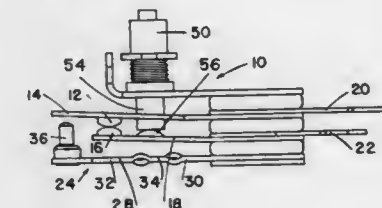
Colin D. Hickling, Frankfort, Ky., assignor to Trig, Inc., Frankfort, Ky.

Filed Feb. 18, 1986, Ser. No. 830,227

Int. Cl.<sup>4</sup> H01H 37/52

U.S. Cl. 337—379

18 Claims



1. A tuned actuator element for a temperature responsive switch that provides control of initial overshoot and consistent operation of a heating element within a relatively narrow temperature range by opening and closing electrical contacts, comprising:

- a bimetal assembly in the form of an elongated, relatively flat bimetal strip with bending action to open and close the contacts, said strip including a bimetal base portion and a bimetal extension portion connected together at a joint and integral tuning means for modifying the thermodynamic properties of the element; said tuning means including a plurality of spaced, relatively narrow connecting webs separated by at least one aperture in said bimetal strip for controlling the flow of heat through said strip and across the joint between the base and extension portions.

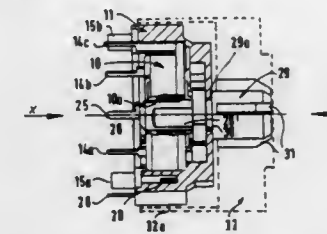
**4,682,142**  
**ROTARY POTENTIOMETER WITH SWITCH**  
 Martin Lohner, Balingen, and Fritz Prestel, Hausen a. Tann, both of Fed. Rep. of Germany, assignors to BSG-Schalttechnik GmbH & Co. KG, Balingen, Fed. Rep. of Germany  
 Filed Apr. 24, 1986, Ser. No. 855,810

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514708

Int. Cl.<sup>4</sup> H01C 10/36

U.S. Cl. 338—172

10 Claims



1. Rotary potentiometer with switch, comprising a wiper that runs on a resistor track and at least one switch that can be actuated by the rotary motion of a fulcrum pin simultaneously, preferably when reaching the potentiometer end position, characterized in that an enclosed, prefabricated rotary potentiometer component (10) with its own casing and external connecting tongues (14a, 14b, 14c) is inserted in an additional, cup-shaped upper casing that is open on one side and in which

switching contact supports are located which are held in place by wall sections (16, 17, 18) of the additional casing (11), the said switching contact supports being switched by a cam actuating member (cam ring 27) attached to a fulcrum pin (29) that simultaneously effects the rotation and the mounting of the potentiometer component (10) in the upper casing.

4,682,143

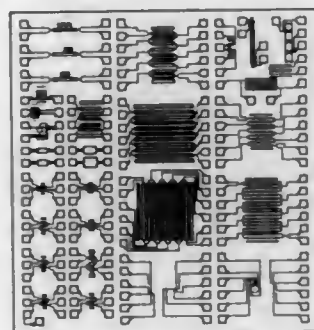
**THIN FILM CHROMIUM-SILICON-CARBON RESISTOR**  
John W. Chu, Los Altos Hills, and Bradley J. Berezna, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 30, 1985, Ser. No. 792,723

Int. Cl.<sup>4</sup> H01C 1/012

U.S. Cl. 338—307

11 Claims



1. An improved thin film chromium-silicon-carbon resistor material comprising from about 25 to 35 wt. % chromium, about 40 to 55 wt. % silicon, and about 20 to 30 wt. % carbon and characterized by a resistivity of from greater than about 800 ohms per square to less than about 1200 ohms per square, a temperature coefficient of resistance of less than 200 ppm per degree Centigrade, and lifetime absolute and matching stability of less than 0.1% change in resistivity.

4,682,144

**LIGHT TRANSMISSION SYSTEM FOR TRAINS**  
Hajime Ochiai, Nishinomiya, and Kenji Morihara, Takarazuka, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

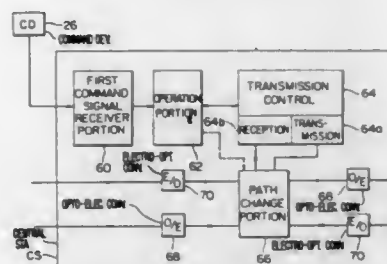
Continuation-in-part of Ser. No. 598,451, Apr. 9, 1984, abandoned. This application Oct. 18, 1985, Ser. No. 788,971

Claims priority, application Japan, Apr. 7, 1983, 58-62488

Int. Cl.<sup>4</sup> B61L 15/00; G08B 26/00

U.S. Cl. 340—48

5 Claims



1. A light transmission system for a train including at least two sub-train compositions each composed of a plurality of interconnected vehicles including end vehicles comprising a command signal generating means disposed in each of said end vehicles, said means in a selected one of said end vehicles used as a head vehicle for generating a first command signal; and central stations including at least one last central station

respectively disposed in each of said end vehicles, each of said central stations including means for receiving operating signals and being responsive to said first command signal for generating a second command signal and responsive to a received second command signal for passing therethrough any of said operating signals input thereto when said central station is a station other than said at least one last central station and for returning any of said operating signals input thereto when said central station is said at least one last central station.

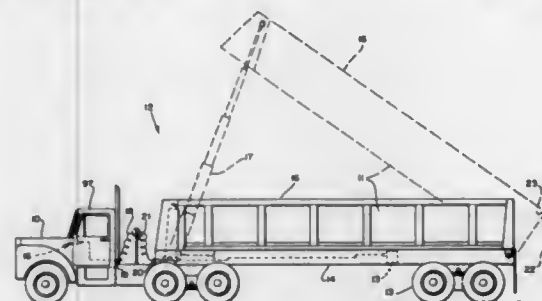
4,682,145

**TRUCK LEVEL SENSING AND INDICATING SYSTEM**  
Clarence A. Brawner, Jr., 7207 Fisher Rd., Dallas, Tex. 75214  
Filed May 3, 1985, Ser. No. 730,204

Int. Cl.<sup>4</sup> B60Q 1/00

U.S. Cl. 340—52 H

8 Claims



1. A level sensing system for trailer dump trucks with a sensor-data transmitter positioned in a truck where it is to monitor the transverse level condition of the truck generally on the trailer frame in the area of the trailer rear wheels comprising: a sensor-data transmitter mountable on a truck; a data receiver and display unit usually positioned in the cab of a truck; a plumb vane included in said sensor-data transmitter; pitch axis mount means for said plumb vane; roll axis mount means for said plumb vane; a frame mounting said plumb vane and said roll axis mount means; dual cross members at the lower portion of said frame one in front of said plumb vane and one behind said plumb vane; said frame mounting a plurality of light emanating devices on one of said dual cross members of said frame; said frame also mounting a plurality of light sensitive activation devices subject to activation and deactivation by the amount of light impinging thereon; said plurality of light emanating devices and said plurality of light sensitive activation devices positioned such that light paths between matched pairs of said devices are subject to intrusion interruption by said plumb vane when said sensor-data transmitter experiences predetermined amounts of roll from the transverse level state consistent with the transverse level condition of the trailer truck wheel set the said sensor-data transmitter is mounted near; signal transmission means interconnecting said sensor-data transmitter and said data receiver and display unit; and indicator means with said data receiver and display unit activated to indicate a roll state of the wheel set and the sensor-data transmitter when predetermined left or right roll angles are exceeded; wherein said plurality of light emanating devices are light emitting diodes; said plurality of light sensitive activation devices are phototransistors; said sensor-data transmitter is a digital data transmitter; said data receiver is a digital signal processing data receiver; said signal transmission means is a system with a common potential reference line, a DC voltage level line, and digital signal line means; there is a left hand set and a right hand set of light emitting diode and phototransistor combinations positioned to the right and left relative to said plumb vane and so sensitivity set as to trigger off with roll to a respective left or right side beyond a predetermined set degree of roll; and wherein said data receiver and display unit

includes at least two lights as indicator means indicating a roll state of the wheel set and the sensor-data transmitter by one of the lights coming on when predetermined left or right roll angles are exceeded.

4,682,146

**AUTOMOTIVE INDICATOR SYSTEM**  
Harry Friedman, III, 9 Sewell Ave., Brookline, Mass. 02146  
Filed Jan. 13, 1986, Ser. No. 818,261

Int. Cl.<sup>4</sup> B60Q 1/26

U.S. Cl. 340—77

21 Claims



1. A rare gas automobile indicator light system comprising: an elongated rare gas tube having a pair of electrodes, one disposed at each end of the tube, means for mounting said rare gas tube at the rear of the automobile in a position viewable behind the automobile, means for controlling power applied to both electrodes on a selective basis to provide illumination of the rare gas tube, said means for controlling including first control means operative from first switch means for exciting only one electrode at a variable increasing power level to cause light intensity to progress from the end of the tube at which is disposed the excited electrode to the other end of the tube to thereby provide a light sweeping effect to indicate one of right and left turn indication, and second control means operative from second switch means for simultaneously exciting both electrodes at a substantially constant power level to provide a substantially constant light output to indicate one of park and brake indication.

4,682,147

**EMERGENCY SIGN**  
Norman E. Bowman, Jonesboro, Ark., assignor to Don Gilbert Industries, Inc., Jonesboro, Ark.

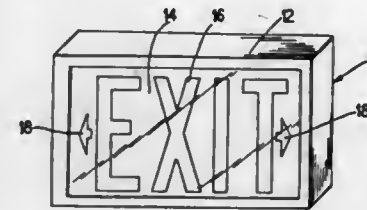
Continuation of Ser. No. 749,813, Jun. 28, 1985, abandoned.

This application Nov. 12, 1986, Ser. No. 929,514

Int. Cl.<sup>4</sup> G08B 7/00

U.S. Cl. 340—286 R

9 Claims



1. An emergency sign comprising: a housing, at least one display board mounted within said housing, a plurality of light emitting diodes arranged on said display board to form a perceivable intelligence, said light emitting diodes connected in a plurality of series circuits, each of said series circuits having an identical number of light emitting diodes, said series circuits connected in parallel, a control circuit connected across said series circuits for

supplying power to said light emitting diodes, said control circuit including:

a transformer connected to AC power, a rectifier connected to outputs of said transformer, a voltage regulator connected across said rectifier and having an output connected to said plurality of series circuits, a battery, a comparator having a first input at a first threshold level connected to an output of said rectifier to trigger said first threshold level in response to signals from said rectifier, a first output of said comparator for transmitting a first triggering signal upon the triggering of said first threshold level, means responsive to said first triggering signal for connecting said battery to said plurality of series circuits, a second input of said comparator connected to said battery and having at least a second threshold level, a second output of said comparator for transmitting a second triggering signal upon the triggering of said second threshold level, and means responsive to said second triggering signal for applying charging current to said battery.

4,682,148

**DISPLAY PAGER HAVING MEMORY OVERFLOW INDICATION AND CONCURRENT MESSAGE DISPLAY FUNCTIONS**

Yoshio Ichikawa, and Kazumori Yamada, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

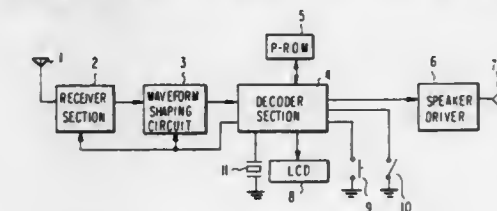
Filed Sep. 8, 1983, Ser. No. 530,311

Claims priority, application Japan, Nov. 27, 1982, 57-206862

Int. Cl.<sup>4</sup> H04Q 9/00; H04M 11/02; G06F 3/14

U.S. Cl. 340—311.1

12 Claims



1. A radio paging receiver for receiving a carrier wave modulated with a paging signal comprising a preamble code, and address code and a message, said receiver comprising: memory means for storing a prescribed number of received messages; display means having a plurality of first display digits and one second display digit; first counter means (AC) for counting the number of messages which are received during the display of an earlier received message on said first display digits; second counter means (RC) for counting the number of messages which have been read out in response to switching signals produced by actuation of a manually operable switch (9), said second counter means registering a count of one on the first actuation of said switch when no message is displayed on said first display digits and thereafter being incremented on successive actuations of said switch; and control section means for reading in response to any one of said switching signals a message out of said memory means and the contents of said second counter means and displaying the read-out message and the contents of said second counter means on said first and second display digits, respectively, counting up the contents of said second counter means every time a received message is read out and displayed, said control section means further including means responsive to said receiver receiving and storing a new message during the display of an earlier



received message on said first display digits, for keeping the display of said earlier message as it is while altering the display of said second display digit to indicate that a new message has been received and stored and thereafter causing display of said new message in response to completion of the display of said earlier received message while causing the decrementing of the contents of said counter means each time a new message is displayed.

4,682,149

### HIGH RESOLUTION PIPELINED DIGITAL-TO-ANALOG CONVERTER

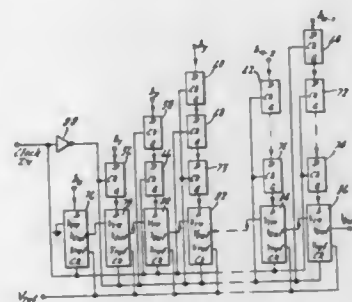
Lawrence E. Larson, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 2, 1985, Ser. No. 782,777

Int. Cl. H03M 1/72

U.S. Cl. 340—347 DA

15 Claims



1. A device for converting a digital signal into an analog representation, the device having a one-bit digital-to-analog converter responsive to a clock signal having successive first and second portions, the one-bit converter comprising:

- a first capacitor;
- first switching means for charging the first capacitor upon receipt of the digital signal during the first portion of said clock signal;
- a second capacitor
- second switching means for charging said second capacitor during said first portion of said clock signal upon receipt of an analog from another of said devices;
- a third capacitor having substantially twice the capacitance of said first and second capacitors;
- third switching means for transferring the charge from the first and second capacitors to the third capacitor during the second portion of said clock signal; and
- isolating means for discharging and preventing the charging of the third capacitor during the succeeding first portions of said clock signal whereby the third capacitor responsively discharges an analog signal output during succeeding second portions of said clock signal.

4,682,150

### DATA COMPRESSION METHOD AND APPARATUS

Gene R. Mathes, Zanesville, and Robert L. Protheroe, Cambridge, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 9, 1985, Ser. No. 806,309

Int. Cl. H03M 7/30

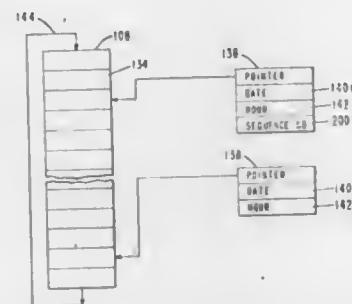
U.S. Cl. 340—347 DD

5 Claims

1. In a data processing system which includes a processor unit and a data terminal device having a keyboard operated to generate data identifying the operator of the keyboard and the type of terminal transaction, means for outputting time of day data which includes the date, the hour and minutes, and memory means including a circular buffer for storing a plurality of data records which includes the identity of the operator, the type of terminal transaction and the time and date the

keyboard is operated, a method for processing the data records comprising the steps of:

- generating a first data record including a data portion identifying the keyboard operator, the type of terminal transaction and minutes and a time of day data portion comprising the hour and the date of the keyboard operation;
- storing the first data record in a first location in the circular buffer;
- storing the time of day portion of said first data record in a first storage area of the memory means;
- generating a plurality of second data records each including a data portion identifying the keyboard operator, type of terminal transaction and minutes and a time of day data portion comprising the hour and date of the keyboard operation;



comparing the time of day data portion of each subsequently generated second data records with the time of day data portion stored in the first storage area of the memory means;

- storing the data portions of each subsequently generated second data records identifying the keyboard operator, the type of terminal transaction and the minutes in consecutive locations in the circular buffer; and
- storing those time of day data portions of the second data records in said consecutive locations in the circular buffer when the time of day data portions are not the same as the time of day data portions stored in the first storage area of the memory means.

4,682,151

### POSITION TO DUTY CYCLE CONVERSION APPARATUS AND METHOD

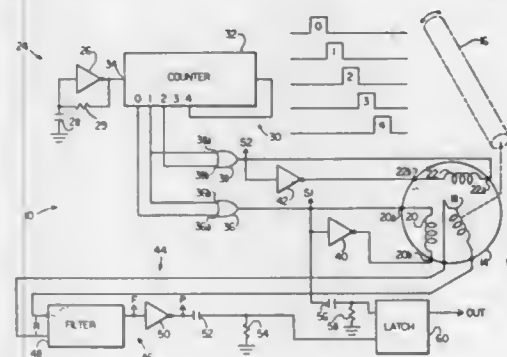
John P. Hoffman, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 4, 1985, Ser. No. 804,555

Int. Cl. H03M 1/00

U.S. Cl. 340—347 SY

2 Claims



1. Apparatus for producing an electrical signal having a duty cycle that varies in response to the angular position of a rotatable shaft, comprising:

- a resolver having a frame, said shaft being rotatably mounted in said frame, a rotor coil connected to said shaft, and first and second stator coils each having respective first and second stator coil terminals, said stator coils being mounted on said frame and positioned about said rotor coil;
- generator means for producing a rectangular-wave timing signal;
- a counter having a plurality of coded output terminals, and a count input terminal connected to said generator means;
- first and second logic gates, each having respective input terminals connected to predetermined ones of said counter coded output terminals, and output terminals connected to respective ones of said first and second stator coil terminals;
- first and second signal inverters, each having an input terminal connected to a respective one of said first and second logic gate output terminals, and an output terminal connected to a respective one of said first and second stator coil terminals;
- a low pass filter having an output terminal, and an input terminal connected to said rotor coil;
- a signal conditioning circuit having an output terminal, and an input terminal connected to said filter output terminal;
- a latch having a first input terminal connected to one of said first and second logic gate output terminals, and a second input terminal connected to said signal conditioning circuit output terminal; and
- wherein each of said first and second stator coils includes respective first and second stator coil terminals, one of said first and second stator coil terminals being connected to a respective one of said first and second logic gate output terminals, and the other of said first and second stator coil terminals being connected to a respective one of said first and second signal inverter output terminals.

4,682,152

### DIGITAL DATA COMPANDING

Hiroo Okamoto; Takao Arai, both of Yokohama, and Takashi Hoshino, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

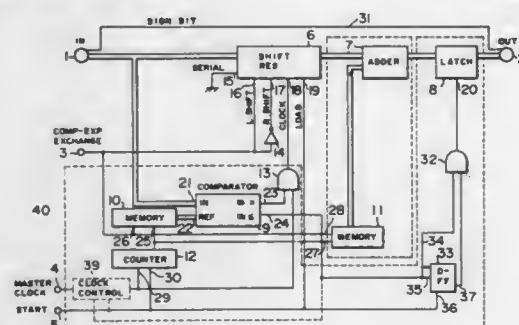
Filed Apr. 15, 1982, Ser. No. 368,868

Claims priority, application Japan, Apr. 20, 1981, 56-58532; Mar. 12, 1982, 57-37986

Int. Cl. H03M 7/50

U.S. Cl. 340—347 DD

21 Claims



- A reversible compressor-expander circuit for transforming a digital input signal into another digital signal having a reduced number of bits in the case of compressing and an increased number of bits in the case of expanding, comprising: a digital input terminal for receiving a digital input signal of a first number of bits;
- means for classifying the digital input signal in one of a number of predetermined ranges according to the magnitude of the digital input signal, including memory means for storing the boundary values of adjacent ranges;
- means for transforming the digital input signal into an intermediate signal with a predetermined scaling assigned to the designated range by shifting the bit positions of said digital input signal to a lower order in the case of compressing and to a higher order in the case of expanding;
- means for providing a predetermined off-set value assigned to the designated range; and
- means for adding said intermediate signal and said off-set value to provide said another digital signal, the off-set value being so selected that said another digital signal increases continuously with the increase of said digital input signal, whereby each value of said output signal represents only one possible value of a received input signal.

4,682,153

### FAIL-SAFE SENSOR SYSTEM

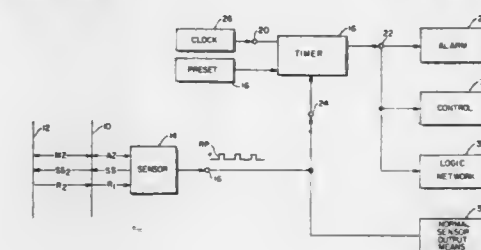
James M. Boozer, Hampton; Robert W. Mayer; Alan J. Kumasaka, both of Hackettstown; Paul R. Strelecki, Metuchen, and Paul F. Lindlau, Long Valley, all of N.J., assignors to Amerace Corporation, Hackettstown, N.J.

Filed Oct. 23, 1985, Ser. No. 790,445

Int. Cl. G08B 29/00, 1/00; G08G 1/14

U.S. Cl. 340—507

16 Claims



- A fail-safe sensor system comprising: counting means having a selectively settable counting mode for counting input signals received at an input terminal representing an estimated maximum time period during which an object should be encountered within a sensor active zone or a monitor zone beyond and producing an output signal at an output terminal when the number of input signals received exceeds a predetermined number indicating that said sensor system may not be functioning; said counting means further having a reset mode for eliminating the count in said counting means and reinitiating the counting operation upon the receipt of a reset signal at a reset terminal indicating the presence of an object in the signal path active zone or monitor zone portions; transducer means for alternatively transmitting sensing signals traversing in order an active zone in which an object is sought and a monitor zone in which an object may be present and being adapted to receive return signals firstly from objects in said active zone and secondly from objects in said monitor zone;
- first means coupling said transducer means to said reset terminal of said counting means to apply a reset signal thereat for each return signal received by said transducer;
- clock means for producing a regular series of signals;
- second means coupling said clock means to said input terminal of said counting means to provide a series of input signals therefor;
- control means, and
- third means coupling said output terminal of said counting means to said control means to operate said control means if the count in said counting means is permitted to exceed said predetermined number between two consecutive reset signals.

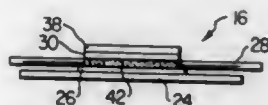
# 4,682,154 LABEL FOR USE IN ANTI-THEFT SURVEILLANCE SYSTEM

Edward R. Fearon, Richardson, Tex., and Robert E. Fearon, Tulsa, Okla., assignors to E.A.S. Technologies, Inc., New York, N.Y.

Filed Feb. 12, 1986, Ser. No. 828,541  
Int. Cl.<sup>4</sup> G08B 13/24

U.S. Cl. 340—572

60 Claims



1. An electromagnetic element comprising:  
a plurality of very thin layers of magnetic material having sufficiently small thicknesses so as not to individually exhibit magnetic properties;  
a layer of dielectric material disposed between each of said thin layers to form said element; and  
said layers interacting to provide said element with ferromagnetic properties at frequencies in preselected high ranges.

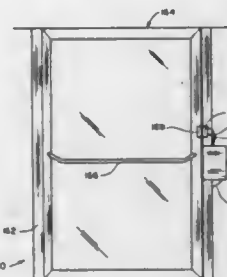
# 4,682,155 PERSONNEL SECURITY SYSTEM

John R. Shirley, Crestwood, Mo., assignor to Central Security Mfg. Corp., Fenton, Mo.

Filed Jan. 13, 1986, Ser. No. 818,260  
Int. Cl.<sup>4</sup> G08B 13/08, 13/18

U.S. Cl. 340—573

18 Claims



1. A security sensing system for monitoring the passage of persons through a door or like opening comprising:  
a transmitter module for installing on persons to be monitored, a sensing module for installing adjacent to a door opening to be monitored, and means responsive to the opening of the door to enable the sensing module to respond to the signal transmitted by the transmitter module to produce an output response, and alarm means energizable in response to the production of the output response to produce an alarm condition,  
the transmitter module including a housing having a transmitter circuit, a source of power for the transmitter circuit and transmitter antenna means installed therein,  
the sensing module including a receiving circuit and associated sensing means located adjacent to the door opening to be monitored, and  
said means responsive to the opening of the door including means to enable the receiving circuit in the sensing module whereby the receiving circuit can respond to signals transmitted by the transmitter module to produce a response for energizing the alarm means.

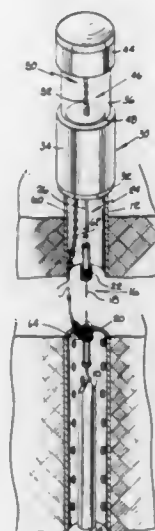
# 4,682,156 SOLVENT DETECTOR

H. Kent Wainwright, Laramie, Wyo., assignor to In-Situ, Inc., Laramie, Wyo.

Filed Nov. 2, 1984, Ser. No. 667,877  
Int. Cl.<sup>4</sup> G08B 21/00

U.S. Cl. 340—603

27 Claims



1. A solvent detecting apparatus adapted for use partially within a well casing, comprising:  
a sensing element that is dissolvable in the presence of a solvent, said sensing element constituting a major portion of the length of that part of the apparatus within the well casing, wherein when a solvent contacts any portion of said sensing element at least part of the contacted portion of the sensing element dissolves;  
a weighing assembly connected to a portion of said sensing element, said weighing assembly being movable between a first position and a second position;  
a mass connected to a portion of said sensing element, said mass causing said weighing assembly to be located at said first position of said weighing assembly, said mass being separate from said sensing element and being made of a material different from that of said sensing element;  
an alarm indicating means operatively connected to said weighing assembly for providing an indication of the presence of a solvent when any portion of said sensing element dissolves in response to contact with a solvent.

# 4,682,157 POLAR FLUID DETECTION SYSTEM UNAFFECTED BY POWER LINE VOLTAGES

Sara M. Musmann, Indianapolis, and Roy E. Kidd, Clayton, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

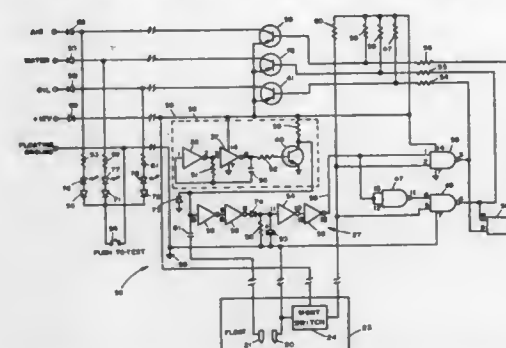
Filed Feb. 27, 1986, Ser. No. 833,188  
Int. Cl.<sup>4</sup> G08B 21/00; H03K 5/153; H01H 47/12

U.S. Cl. 340—605

6 Claims

1. An apparatus for sensing the presence of polar fluids regardless of the presence of undesired power line voltages comprising:  
probe means for contacting said polar fluid;  
means for providing an oscillating voltage to said probe means,  
detector means for providing a fluid polar characteristic related signal, said detector means electrically connected to said probe means for sensing the state of said probe

means and including a means for preventing said undesired voltages in said polar fluid caused by said electric



power lines coming in contact with the fluid from altering said signal and adversely affecting said detector means.

# 4,682,158 GUIDANCE DEVICE FOR MANIPULATION OF MACHINE

Masaji Ito, Ageo; Akira Midorikawa, Yokohama; Masayuki Shinada, Yokohama; Tatsuo Hirono, Yokohama; Hirobumi Yoshino, Tokyo, and Mitsuo Shibusawa, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

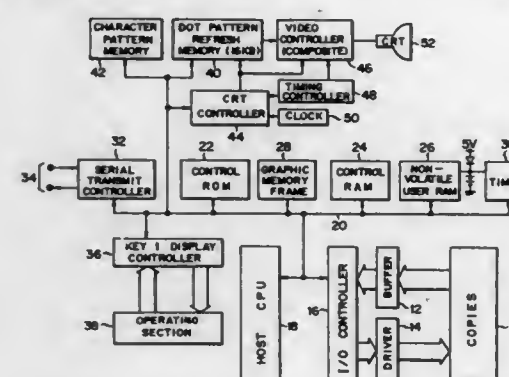
Filed Apr. 17, 1985, Ser. No. 724,162

Claims priority, application Japan, Apr. 18, 1984, 59-57173; Apr. 18, 1984, 59-57174; Apr. 18, 1984, 59-57175; Apr. 19, 1984, 59-78847; Apr. 27, 1984, 59-85881; Apr. 27, 1984, 59-85882; Apr. 27, 1984, 59-85883; Jun. 21, 1984, 59-126431; Jun. 22, 1984, 59-127536; Jul. 3, 1984, 59-136637

Int. Cl.<sup>4</sup> G08B 21/00

U.S. Cl. 340—679

4 Claims



1. A device for guiding the manipulation of a machine, said machine having multiple keys to which various functions are assigned, comprising:

first sensor means for sensing a condition in which the machine needs a maintenance operation;  
second sensor means for sensing a mounting condition of movable elements included in said machine;  
display means for displaying prompts which specify a procedure of the maintenance operation;  
storage means for storing displays of the prompts associated with the first sensor means; and  
control means for controlling said storage means and display means in response to outputs of the first and second sensor means;  
said control means being constructed to, when the first sensor means senses said condition of the machine, read displays of the prompts associated with said condition out of the storage means to display said prompts on the display means and, thereafter, sequentially read out displays of the prompts associated with the second sensor means to display said prompts on the display means in response to

an output of the second sensor means and, upon completion of the steps indicated by said displayed data, provide prompts of additional steps in the process of operating said machine.

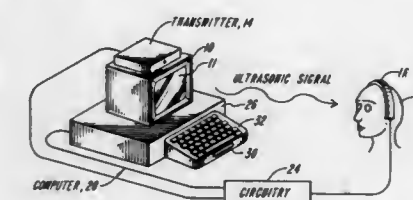
# 4,682,159 APPARATUS AND METHOD FOR CONTROLLING A CURSOR ON A COMPUTER DISPLAY

Keith K. Davison, Brookline, Mass., assignor to Personics Corporation, Concord, Mass.

Filed Jun. 20, 1984, Ser. No. 622,732  
Int. Cl.<sup>4</sup> G09G 1/00

U.S. Cl. 340—709

25 Claims



1. An apparatus for controlling the movement of a cursor of a computer display in response to corresponding movement of an operator's head, comprising:  
transmitting means for generating and transmitting an ultrasonic signal of a suitable frequency or frequencies;  
receiving means mountable relative to the operator's head so as to move with said head and so as to receive signals transmitted by said transmitting means, said receiving means including at least two individual ultrasonic receivers;  
means for directly determining the phase of said received signals and producing information signals representing the phase relationship between signals received by respective said ultrasonic receivers;  
processing means for receiving and storing said information signals from said phase determining means, said processing means also analyzing consecutive signals produced by said phase determining means, differences in said analyzed consecutive signals being used to compute position movement information for said cursor;  
means for supplying said position movement information to a controller of the cursor of the computer display.

# 4,682,160 REAL TIME PERSPECTIVE DISPLAY EMPLOYING DIGITAL MAP GENERATOR

Paul B. Beckwith, Jr., Indialantic, and Donald S. Bistarkey, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jul. 25, 1983, Ser. No. 517,037  
Int. Cl.<sup>4</sup> G09G 1/16

U.S. Cl. 340—729

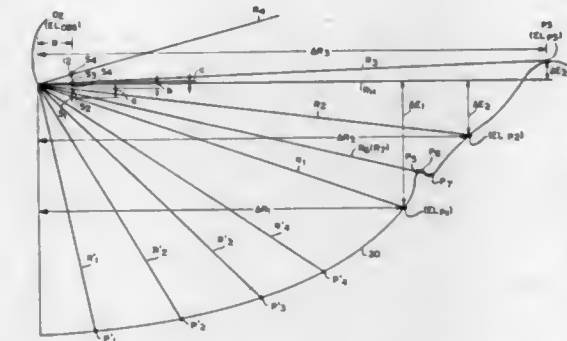
62 Claims

1. For use with a digital data base in which a terrain map in the form of data representative of the elevation of said terrain over a prescribed geographical area is stored, a method of producing, on a display screen, a perspective image of said terrain to an observer comprising the steps of  
(a) storing, in addressable memory locations of a memory, a portion of the digital data representing the elevation of said terrain over a portion of said geographical area such that, as stored in said memory, said terrain elevation representative data has a prescribed geographical orientation;  
(b) establishing an elevation and viewing direction of an observer and, within the data stored in said memory, the geographical position of said observer as projected onto said terrain map;  
(c) controllably accessing respective elevation data values



stored in addressable memory locations of said memory which effectively correspond to points lying along a plurality of contour paths respectively radiating from an address corresponding to said geographical position and traversing said map;

- (d) translating the points lying along said plurality of contour paths onto locations of said display screen in accordance with the effective intersections of a plurality of observation lines with a prescribed image window, said image window corresponding to the display screen as seen by said observer and having an effective elevation and geographical position on said terrain map determined in



accordance with said elevation and viewing direction established for said observer, said observation lines extending from the effective elevation of said observer at the establishes geographical position thereof through said points lying along said plurality of contour paths on said terrain map; and

- (e) generating respective images of aid terrain at locations on said display screen as translated in step (d) corresponding to points lying along said plurality of contour paths on said terrain map in accordance with data accessed from said addressable memory locations of said memory in step (c).

4,682,161

#### VARIABLE SIZE CHARACTER DISPLAY WITHOUT LOSS OF OBSCURED CHARACTER POSITIONS

Richard E. F. Bugg, Coudsdon, England, assignor to U.S. Philips Corporation, New York, N.Y.

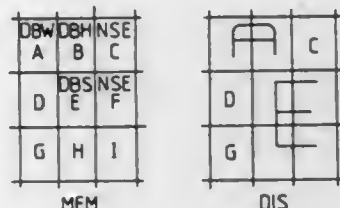
Filed Aug. 22, 1984, Ser. No. 643,338

Claims priority, application United Kingdom, Sep. 1, 1983, 8323401

Int. Cl. 4 G09G 1/06

U.S. Cl. 340—731

9 Claims



1. A data display apparatus for displaying on a screen of a raster scan display device data represented by digital codes, the displayed data being comprised of discrete characters arranged in character rows each comprising a number of character positions, in which said digital codes represent both character data which identifies character shape and attribute data which identifies character size, said apparatus comprising, means for selectively displaying in accordance with the re-

ceived data a character either normal size in one character position or enlarged size in at least two corresponding character positions in adjacent character rows, characterized in that said means includes a twin row buffer comprising two buffers each of which can hold the character and attribute data for all of the positions of a row of characters and of which one functions as a "fill" row buffer for receiving character and attribute data for a character row and the other as a "display" row buffer for providing such previously received data for the display of the preceding character row, and vice versa alternately, means operable in respect of each character position of the current "fill" row buffer for examining the corresponding character position in the current "display" row buffer and to insert into the "fill" row buffer position the attribute data for the "display" row buffer position, if the latter position is for the top half of an enlarged size character.

4,682,162

#### ELECTRONIC DISPLAY UNIT

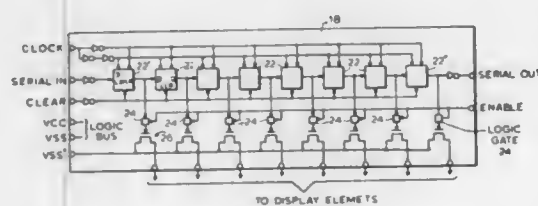
Charles J. Holloman, Norwalk, Conn., assignor to Trans-Lux Corporation, Norwalk, Conn.

Filed Sep. 14, 1984, Ser. No. 650,781

Int. Cl. 4 G09G 3/22

U.S. Cl. 340—799

12 Claims



1. A display unit comprising:

- a plurality of display elements arranged in an array of rows and columns;
- a plurality of memory elements adapted to store information indicative of the status of said display element, each memory element being associated with one of said display elements, memory elements corresponding to each row being arranged and connected to pass said information to an adjacent memory element along a preselected direction;
- control means for feeding said information into said memory elements; and
- a plurality of FETs, each FET having a gate connected directly to a corresponding memory element, each of said FETs having a channel resistance and source to drain voltage controlled by a voltage on said gate indicative of the status of a respective display element, from said memory element to provide a feed-back to said gate thereby providing a constant current source to the corresponding display element for a uniform brightness.

4,682,163

#### METHOD FOR WRITING CHARACTERS ON A LIQUID CRYSTAL DISPLAY

Forrest E. Brooks, Tempe, Ariz., assignor to ITT Corporation, New York, N.Y.

Filed Feb. 1, 1985, Ser. No. 697,189

Int. Cl. 4 G09G 3/00

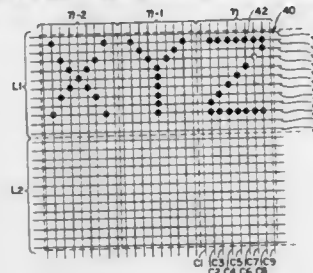
U.S. Cl. 340—805

13 Claims

1. A method for increasing the speed at which characters may be written onto a liquid crystal display of the type which includes a plurality of row and column electrodes, in which the writing of each element of a character is completed by the coincident application of M cycles of a write voltage to the row and column electrodes that are associated with that element, M being an integer greater than or equal to 2, and in which the elements making up each character are grouped into

a plurality of horizontal slices of that character, said method comprising the steps of:

- (a) applying M/P cycles of the write voltage to the row and column electrodes that are associated with predetermined elements of successive horizontal slices of a selected character, and thereby partially completing the writing of said character, P being an integer which is smaller than M;
- (b) simultaneously with step (a), successively applying M/P cycles of the write voltage to the row and column electrodes that are associated with predetermined elements of



the corresponding horizontal slices of at least one previously selected character, and thereby advancing the completion of the writing of said previously selected character;

- (c) repeating steps (a) and (b) for successive sets of at least two horizontally adjacent characters; and
- (d) discontinuing the coincident application of the write voltage to the row and column electrodes that are associated with predetermined elements of each character after M cycles of the write voltage have been applied to each of such elements.

4,682,164

#### ATTACHMENT FOR REMOTE CONTROL OF A PLURALITY OF SIGNAL MONITORS

Donald D. Lacy, 11400 Wilson Rd., Utica, Ohio 43080

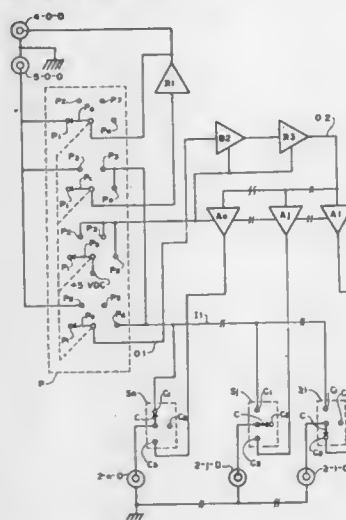
Continuation of Ser. No. 588,754, Mar. 13, 1984, abandoned.

This application Nov. 21, 1986, Ser. No. 935,072

Int. Cl. 4 H04Q 1/00

U.S. Cl. 340—825.03

15 Claims



1. A control system for selectively enabling monitoring at a master station or at any selected one of a plurality of slave stations of electrical signals generated by a respective computer at either the master station or by a respective computer at any one of the slave stations as selected by an operator of the master station, said control system comprising

- (A) a master switching unit having
- (1) a first input adapted to be connected to a master station computer signal source for reception thereof of signals generated by said master signal source,

- (2) a first output adapted to be connected to a master station signal monitor for output thereto of signals to be monitored,

- (3) a plurality of master inputs/outputs with each of said inputs/outputs adapted to be connected to a respective one of the slave stations for either input thereto or output therefrom of signals to be monitored, and

- (4) master switching circuit means interconnecting with said first input, said first output and said inputs/outputs and selectively operable to alternately connect in signal transmitting relationship

- (a) said first input and said first output,

- (b) said first input and at least one of said master inputs/outputs,

- (c) one of said master inputs/outputs and said first output, or

- (d) one of said master inputs/outputs said first output and at least one other of said master inputs/outputs, and

- (B) a plurality of slave switching units each of which is adapted to be operatively associated with a respective one of a plurality of slave stations, each said slave switching unit having

- (1) a slave input adapted to be connected to a computer signal source of the respective slave station for reception thereof of signals generated by said slave signal source,

- (2) a slave output adapted to be connected to a signal monitor of the respective slave station for output thereto of signals to be monitored,

- (3) a slave input/output coupled with a respective one of said master switching unit's inputs/outputs in signal transmitting relationship, and

- (4) slave switching circuit means interconnecting with said slave input and said slave input/output and connecting said slave output and input/output in signal transmitting relationship and selectively operable to connect said slave input with said slave output in signal transmitting relationship or to interrupt such signal transmitting relationship.

4,682,165

#### APPARATUS FOR INHIBITING REPETITIVE MESSAGE DETECTIONS IN A ZONE BATCHED COMMUNICATION SYSTEM

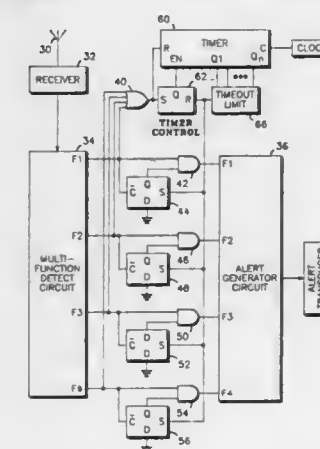
Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1985, Ser. No. 794,993

Int. Cl. 4 H04Q 7/00; G08B 5/22; H04B 7/00

U.S. Cl. 340—825.5

16 Claims



1. A multifunction receiver for generating a plurality of alerts, each alert associated with a function, the receiver being adapted for operation in a time sequential zone batched mes-

sage communication system having a plurality of zone comprising:

- receiver means for receiving selective call signals transmitted in a first zone;
- function detection means responsive to said receiver means for identifying a selective call signal designating the actuation of one of said multifunctions and producing a corresponding control signal in response thereto;
- alert means coupled to said function detection means and responsive to said control signal for producing an alerting signal corresponding to the function detected; and
- logic means coupled between said detection means and said alert means for storing the control signal and for disabling a second control signal generated in response to receiving the selective call signal from a second zone for a previously detected function, from being supplied to said alert means for a derived time interval.

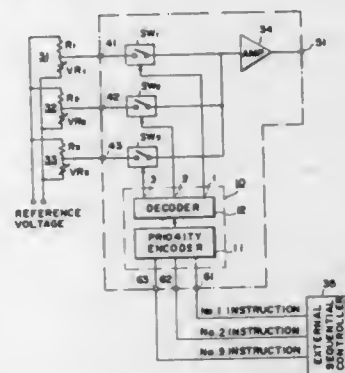
4,682,166

#### SET POINT CHANGE-OVER CIRCUIT FOR FLUID CONTROL VALVES

Kunihiko Takeuchi, Kawasaki; Fujio Baba; Yasuo Shimomura, both of Tokyo, and Yuji Morishige, Funabashi, all of Japan, assignors to Tokyo Keiki Company Limited, Tokyo, Japan  
Filed Nov. 8, 1985, Ser. No. 796,410

Claims priority, application Japan, Nov. 8, 1984, 59-234050  
Int. Cl.<sup>4</sup> H04Q 1/00; G05B 15/02, 11/01; G06G 7/57  
U.S. Cl. 340—825.5

4 Claims



1. In a set point change-over circuit for changing over the application of set point to a fluid control valve to one of a plurality of predetermined set points in accordance with a set point select instruction from an external control circuit, the combination comprising:

- (a) a plurality of input means each having a preset predetermined set point;
- (b) output means for generating one of said set points for application to said fluid control valve;
- (c) switching means responsive to said set point select instruction to select said one set point to be applied to said fluid control valve from said set points preset in said input means and sending the same to said output means; and
- (d) priority circuit means for sending said set point select instruction from said external control circuit to said switching means, said priority circuit means being responsive to the simultaneous application of two or more set point select instructions from said external control circuit such that only highest-priority one of said two or more set point select instructions is sent to said switching means and the other instructions are ignored.

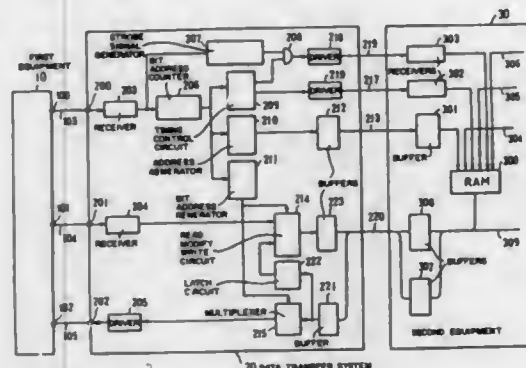
4,682,167

#### DATA TRANSFER SYSTEM FOR NUMERICALLY CONTROLLED EQUIPMENT

Yoshiaki Ikeda, Hachioji, and Mitsuru Kuwasawa, Kunitachi, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan  
PCT No. PCT/JP85/00267, § 371 Date Jan. 16, 1986, § 102(e)  
Date Jan. 16, 1986, PCT Pub. No. WO85/05471, PCT Pub. Date Dec. 5, 1985

PCT Filed May 15, 1985, Ser. No. 822,422  
Claims priority, application Japan, May 16, 1984, 59-98093  
Int. Cl.<sup>4</sup> H04Q 9/00; G06F 13/00; H04L 13/00  
U.S. Cl. 340—825.23

3 Claims



1. A data transfer system through which each bit of serial data sent from first equipment is transferred to a predetermined bit of a predetermined address of a RAM in second equipment upon each occurrence of a plurality of clock pulses which are delivered from the first equipment in synchronism with each data bit, comprising:

- a counter which is incremented by the clock pulses, said counter coupled to the first equipment;
- an address generator, coupled to said counter, for responding to the output of said counter to generate an address of the RAM;
- a bit address generator, coupled to said counter, for responding to the output of said counter to generate a bit address for specifying a bit position in one address of the RAM;
- a timing control circuit, coupled to said counter, for responding to the output of said counter to generate timing signals for a read cycle and a write cycle succeeding the read cycle, during the period of generation of one address by said address generator; and
- a read modify write circuit, coupled to said bit address generator and the first equipment, for substituting a bit of the serial data sent from the first equipment for data at the bit position specified by said bit address generator from a plurality of bits of a parallel data corresponding to the address generated by said address generator, the parallel data being read out of the RAM in the read cycle specified by said timing control circuit, the parallel data having the substituted data bit being transferred to the address in the RAM generated by said address generator during the write cycle specified by said timing control circuit.

4,682,168

#### TIME-SLOT ADDRESSED, SYSTEM KEYED MULTIPLEX DEVICE

Paul S. Chang, and Edward C. Dowling, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.  
Continuation of Ser. No. 567,476, Jan. 3, 1984, abandoned. This application Aug. 20, 1986, Ser. No. 898,854

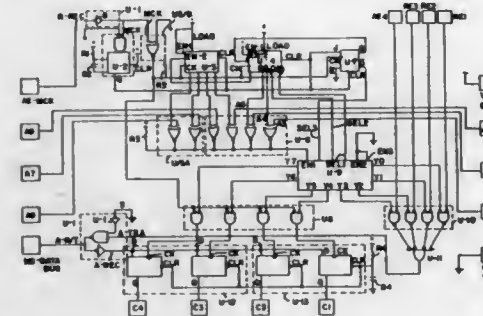
Int. Cl.<sup>4</sup> G08C 19/00; H04Q 11/00; G05B 23/02  
U.S. Cl. 340—825.65

18 Claims

1. A remotely addressed terminal for a multiplex system of the type comprising a master controller which includes means for generating a series of clock pulses on a timing signal bus

and means for transmitting data between a data bus and the controller, said terminal comprising:

- means, coupled to the timing signal bus, for maintaining a count of the clock pulses, said count comprising a first set of lower order bits and a second set of higher order bits;
- interface means for transmitting a plurality of data signals between the data bus and the terminal, each of said data signals associated with a respective data channel;
- means, included in the interface means and responsive to the first set of lower order bits, for selecting the data signal having the data channel corresponding to a current value of the first set lower order bits;



- means for storing a preset address code;
- means, included in the interface means and responsive to the second set of higher order bits and the preset address code, for causing the interface means to transmit the selected data signal between the data bus and the terminal when the preset address code corresponds to a current value of the second set of higher order bits;
- means, responsive to the clock pulses, for generating a reset signal when the time interval between successive clock pulses exceeds a selected value; and
- means for resetting the count in response to the reset signal.

4,682,169

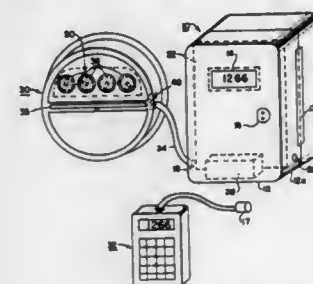
#### METHOD OF AND SYSTEM FOR ACCUMULATING VERIFIABLE ENERGY DEMAND DATA FROM REMOTE ELECTRICITY METERS

Scott C. Swanson, Roswell, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 776,719, Sep. 16, 1985, Pat. No. 4,639,728. This application Apr. 9, 1986, Ser. No. 849,897  
Int. Cl.<sup>4</sup> G08C 19/16

U.S. Cl. 379—104

13 Claims



1. A system for accumulating energy demand data from an electricity meter of a type having means for generating pulses corresponding to a demand rate, comprising:

- a primary power supply;
- an auxiliary battery power supply operative to provide power for said system during outages of said primary supply;
- low battery circuit means for detecting when the output voltage of said auxiliary battery power supply falls below

- a predetermined threshold magnitude and for providing a low battery signal;
- clock means for maintaining time data corresponding to the current time of day and date; and
- memory means for storing time data from said clock means corresponding to the time of day and date at which said low battery circuit means provides said low battery signal.

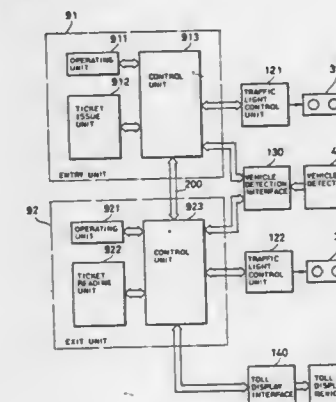
4,682,170

#### APPARATUS FOR COLLECTING TOLL

Mitsuru Kobota, Tokyo, and Kozo Amita, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 23, 1984, Ser. No. 674,311  
Claims priority, application Japan, Nov. 25, 1983, 58-220733  
Int. Cl.<sup>4</sup> G07B 15/00; G08G 1/065, 1/02  
U.S. Cl. 340—928

1 Claim



1. A apparatus for collecting toll from vehicles using a toll facility such as a toll road or a toll parking lot wherein tickets carrying data necessary for control are issued for the vehicles at one or a plurality of entry gates and the data on the tickets are read and identified at one or a plurality of exit gates, said apparatus comprising:

- entry processing means installed at one end of an entry/exit common gate which is chosen from at least one of said entry gates and said exit gates and functions as both an entry gate and an exit gate for issuing said tickets;
- exit processing means installed at another end of said entry/exit common gate for identifying said tickets;
- first traffic signal means, disposed at said entry/exit common gate, for informing operators of vehicles entering said toll facility as to whether entry to said entry/exit common gate is permitted or not;
- second traffic signal means, disposed at said entry/exit common gate, for informing operators of vehicles exiting said toll facility as to whether entry to said entry/exit common gate is permitted or not;
- setting means for setting whether said entry/exit common gate is used as an entry gate or an exit gate; and
- control means for causing said entry processing means to be in its operative state and said exit processing means to be in its inoperative state and for causing said first traffic signal means to indicate that entry into said toll facility through said entry/exit common gate is permitted and said second traffic signal means to indicate that exit from said toll facility through said entry/exit common gate is not permitted when said setting means is set so that said entry/exit common gate is used as an entry gate; and for causing said entry processing means to be in its inoperative state and said exit processing means to be in its operative state and for causing said first traffic signal means to indicate that entry into said toll facility through said entry/exit common gate is not permitted and said second traffic signal means to indicate that exit from said toll



facility through said entry/exit common gate is permitted when said setting means is set so that said entry/exit common gate is used as an exit gate, further comprising vehicle detecting means, electrically connected to said control means and disposed at said entry/exit common gate, for detecting a vehicle passing through said vehicle entry/exit common gate and class of the passed vehicle wherein said control means transfers information supplied from said vehicle detecting means to said entry processing means when said setting means is set so that said entry/exit common gate is used as an entry gate and said control means transfers said information to said exit processing means when said setting means is set so that said entry/exit common gate is used as an exit gate;

said entry processing means writes data indicative of data, time, class of vehicles, and gate number necessary for control and issues said ticket on which said data is written based on the transfer of said information produced by said vehicle detecting means; and  
said exit processing means performs identification between the class of vehicle written on said ticket and information on the class of vehicle exiting said toll facility detected by said vehicle detecting means on the transfer of said information.

4,682,171

# TURN-AND-BANK INDICATOR WHICH DISPLAYS THE TOTAL ANGLE OR TOTAL TIME OF A TURN

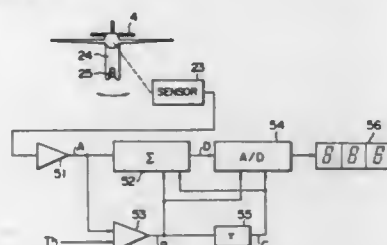
Shuji Nakamura, Komae, Japan, assignor to Tokyo Aircraft Instrument Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 729,159

Int. Cl.<sup>4</sup> G01C 23/00, 21/00

U.S. Cl. 340—975

6 Claims



1. A turn-and-bank indicator which integrates the displacement of a pointer of the turn-and-bank indicator with respect to time, the pointer indicating the turning rate of an airplane, comprising:

- a non-contact converter which outputs an electrical signal in proportion to the deflection of the pointer;
- an amplifier which amplifies the output of the non-contact converter;
- an integrator which obtains an integration of the output of the amplifier with respect to time; and
- a digital display unit which displays the output from the integrator, the digital display unit being positioned adjacent the pointer,

wherein the integrator for obtaining the integration of the output of the amplifier with respect to time integrates the time corresponding to a period when the output of the amplifier exceeds a predetermined level which is attained during turning of the airplane, and wherein the digital display displays units of time.

## 4,682,172 ANTENNA SYSTEM FOR A FLYING BODY FOR JAMMING RADIO TRANSMITTING AND RECEIVING DEVICES

Günther Kubrdt, Elchingen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

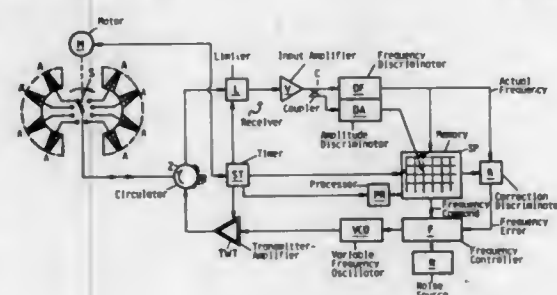
Filed Dec. 19, 1984, Ser. No. 683,563

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346155

Int. Cl.<sup>4</sup> G01S 7/38; H04K 3/00

U.S. Cl. 342—15

9 Claims



1. An antenna system for a flying body for jamming radio transmitting and receiving devices, comprising:

- a plurality of individual signal transmit/receive antennas each having a directional radiation pattern which covers a different azimuth sector when the flying body is in its normal flight attitude;
- a command receiver having an input for receiving signals from said antennas and including frequency discriminating means for producing representations of the frequencies of respective received signals, and further including amplitude discriminator means for producing representations of the amplitudes of the respective signals as received via one of the antennas;

a common transmitter including a variable frequency oscillator having a frequency control input and an RF output, a frequency control means having an output connected to said frequency control input and a frequency command input, said common transmitter producing a transmitter signal which is in essentially linear amplification of the RF signal produced by the frequency oscillator;

transmit/receive means connected to said common receiver and to said common transmitter for conducting signals received by said antennas to said common receiver and for conducting the transmitter signal from said common transmitter to said antennas;

switch means connected to said transmit/receive means for selectively or cyclically connecting said antennas to said common receiver and to said common transmitter via said transmit/receive means;

timer means connected to said common receiver, said common transmitter and said switch means, said timer means having alternating receive and transmit modes, said timer means enabling said common receiver during the receive mode to receive signals from any of the selected antennas during one complete cycle of said switch means and enabling said common transmitter during the transmit mode for furnishing transmitter signals to any of the selected antennas for at least one complete cycle of said switch means; and

memory and processor means being connected for storing the frequency representations from said frequency discriminating means and having an output connected for supplying stored frequency representations to said frequency command input of said frequency control means such that each stored frequency representation corresponds to one of said antennas via which signals were received, said memory means having storage locations for storing amplitude representations, said memory means

being organized as a two-dimensional matrix having rows corresponding to the respective antennas and columns corresponding to respective received signal frequency values, wherein the amplitude representations produced during a receive mode are each stored in a respective memory location defined by the column corresponding to the frequency of the received signal and the row corresponding to the antenna via which this signal is received, said memory means, during a given transmit mode, feeding frequency representations to said frequency command input of said frequency control means which correspond to the antenna currently connected to said common transmitter and which were stored as frequency representations during the previous receive mode, said processor means evaluates the amplitude representations stored in each column of said memory means and preserves only a selected number of amplitude representations representing the highest amplitude values stored in each column and deletes the rest, the selected number of amplitude representations being less than the total number in the respective column, the evaluating and deleting occurring between a receive mode and a subsequent transmit mode, and wherein said frequency control means is responsive to the frequency representation received at its frequency command input for tuning said variable frequency oscillator to the frequency indicated by that frequency representation.

4,682,173

## RADAR RESPONDER

Keigo Kotoh, and Nobuhiro Nakamura, both of Kawanishi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

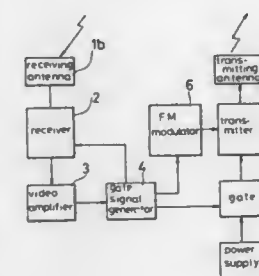
Filed Jan. 10, 1985, Ser. No. 690,217

Claims priority, application Japan, Jan. 31, 1984, 59-16252

Int. Cl.<sup>4</sup> G01S 13/80

U.S. Cl. 342—51

5 Claims



1. A radar responder for transmitting an electric wave signal in response to a radar signal from a searcher's radar, comprising:

FM modulator means for sweeping said electric wave signal across a predetermined frequency deviation width including the reception frequency of said searcher's radar a predetermined number of times within a predetermined period to produce a radar responding signal, in response to the reception of said radar signal;

said modulator means including means for modulating said radar responding signal to produce a distinction signal for distinguishing an individual radar responder, and means for abbreviating said distinction signal when said searcher's radar is more than a predetermined distance from said radar responder and transmitting said distinction signal in full when said searcher's radar is less than said predetermined distance from said radar responder.

## 4,682,174 MOVING TARGET INDICATOR USING A SURFACE ACOUSTIC WAVE DEVICE

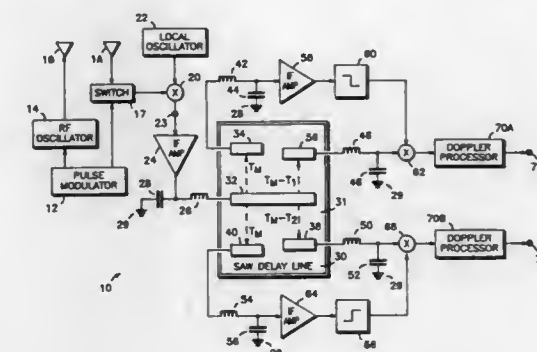
Carl T. Richmond, Scottsdale, and Joseph O. Lester, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 7, 1985, Ser. No. 785,125

Int. Cl.<sup>4</sup> G01S 13/52

U.S. Cl. 342—160

12 Claims



1. A pseudo-coherent, moving target indicator comprising: a first amplifier having an input and an output, said first amplifier input being adapted to receive an intermediate frequency signal;

a surface acoustic wave delay line operative at the intermediate frequency and having an input transducer, a first output transducer, and a second output transducer, said delay line input transducer being coupled to the output of said first amplifier, and said delay line first and second output transducers being located relative to the input transducer so that a distance between the input transducer and the first output transducer minus a distance between the input transducer and the second output transducer equals a predetermined distance;

a second amplifier having an input and an output, said second amplifier input being coupled to a first one of the first and second output transducers of said delay line; and  
a mixer having a reference input coupled to the output of said second amplifier, having a signal input coupled to a second one of the first and second output transducers of said delay line and having an output for providing a Doppler signal.

4,682,175

## FREQUENCY MODULATED CONTINUOUS WAVE RADAR AND APPLICATION THEREOF TO A ALTIMETRIC PROBE

Michel Lazarus, Gif-sur-Yvette, France, assignor to Thomson CSF, Paris, France

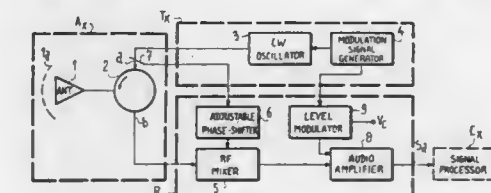
Filed Feb. 17, 1984, Ser. No. 581,415

Claims priority, application France, Feb. 18, 1983, 83 02721

Int. Cl.<sup>4</sup> G01S 13/32

U.S. Cl. 342—165

10 Claims



1. Apparatus for reducing the composite coupling signal in a frequency modulated, continuous wave radar having a single antenna and a duplexer, comprising:

modulation means for providing a modulation signal; oscillation means for receiving said modulation signal, and adapted for providing a modulated, continuous wave signal to an input of said duplexer; phase shift means for receiving said modulated, continuous wave signal and providing a phase-shifted, modulated, continuous wave signal; mixer means adapted for receiving a received signal from an output of said duplexer, and for mixing said received signal with said phase-shifted, modulated, continuous wave signal to provide a mixed signal; injection means, having a first input coupled to said modulation means and a second input for receiving a DC control input signal, for providing an injection signal related to said modulated signal and to said control input signal; and amplifier means for receiving said injection signal and said mixed signal and providing an output signal having reduced composite coupling signal components.

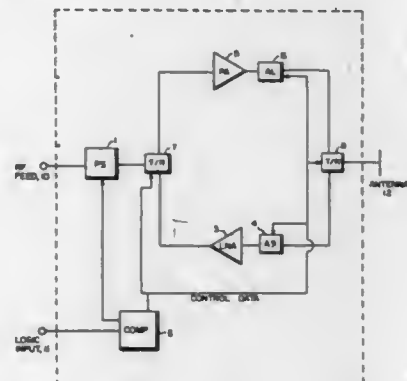
4,682,176

**ACTIVE MATCHING TRANSMIT/RECEIVE MODULE**  
Edward J. Jones, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 12, 1986, Ser. No. 838,970  
Int. Cl.<sup>4</sup> G01S 7/02

U.S. Cl. 342—175

3 Claims



1. In combination with a phased array radar system having an antenna which transmits and receives radio frequency signals, a power amplifier which provides said radio frequency signals to said antenna during transmission, and a low noise amplifier which receives said radio frequency signals from said antenna during reception, an active matching transmit/receive module comprising:

a control means which sends command signals during radar transmission to provide an optimum output impedance match for maximum power transfer, said control means also sending command signals to provide an optimum input impedance match between said low noise amplifier with said antenna;

an active load matching circuit which conducts said radio frequency signals from said power amplifier to said antenna, said active load matching circuit allowing a maximum power transfer during radar transmission by matching said power amplifier's output impedance so that it is approximately a complex conjugate of the antenna's load, said active load matching circuit including first and second output inductors, first and second grounding capacitors, each being connected with a common electrical ground, first and second output capacitors, and a first switching means which is electrically connected to said power amplifier and said antenna and conducts said radio frequency signals through a plurality of selectable output circuit configurations by making a first output selection between said first and second output inductors and con-

necting said first output selection to said power amplifier, said first switching means making a second output selection between said first and second grounding capacitors and connecting said second output selection to said first output selection, said first switching means making a third output selection between said first and second output capacitors and connecting said third output selection in a series circuit between said first output selection and said antenna, said first switching means being electrically connected to and receiving said command signals from said control means and making said first, second and third output selections in response thereto to produce variations of selectable output impedance for said power amplifier; and

an active source matching circuit which conducts said radio frequency signals from said antenna to said low noise amplifier while providing selectable impedance matching between said low noise amplifier and said antenna, said selectable impedance matching comprising a plurality of impedance matching values from which may be selected an optimum input impedance match between the low noise amplifier and the antenna which results in a minimum of noise during signal reception, said active source matching circuit including first and second input resistors; first and second input inductors; first and second input capacitors; and a second switching means which is electrically connected to said antenna and said low noise amplifier and conducts said radio frequency signals through a plurality of selectable circuit configurations by making a first selection between said first and second input resistors and connecting said first selection to said antenna and a grounding voltage, said second switching means making a second selection between said first and second input inductors and connecting said second selection to said antenna, said switching means making a third selection between said first and second input capacitors and connecting said third selection to said low noise amplifier and to said first and second selections, said switching means also being electrically connected to and receiving said command signals from said control means, and command signals directing said first, second and third selections, said second switching means thereby providing variations of selectable impedance matches, including said optimum input impedance match, between said low noise amplifier and said antenna.

4,682,177

**DISPLAY FOR RADARS OR SONARS**

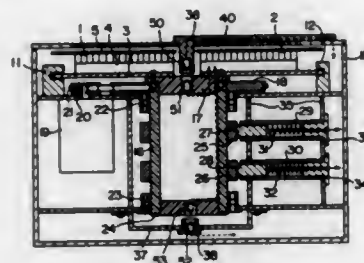
Hajime Shmizu, 68, Yamate-cho, Naka-Ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Dec. 28, 1984, Ser. No. 687,421

Claims priority, application Japan, Jul. 7, 1983, 58-122386  
Int. Cl.<sup>4</sup> G01S 7/26

U.S. Cl. 342—176

8 Claims



1. A display apparatus for visually presenting the reflected wave information of a sonar or radar, comprising:  
a rotating member;  
a plurality of light-emitting display elements supported on said rotating member;

a light-receiving means on said rotating member having a light-receiving opening directed axially along the rotating axis of said rotating member for receiving an optical signal regarding the reflected wave information and sending it to said plurality of light-emitting display elements;  
a fixed member adjacent said rotating member; and  
light-emitting means on said fixed member having a light-emitting opening in spaced opposed relation to and coaxial with said light-receiving opening on the rotating axis of said rotating member for sending the optical signal to said light-receiving means.

4,682,178

**HF ARRANGEMENT**

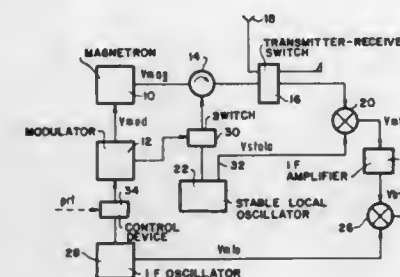
Kjell S. Anflo, Hagersten, and Jan W. I. Grabs, Balsta, both of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1985, Ser. No. 690,926

Claims priority, application Sweden, Jan. 12, 1984, 8400140  
Int. Cl.<sup>4</sup> G01S 7/28; H03B 9/10; H03L 7/24

U.S. Cl. 342—202

5 Claims



1. A coherent radar comprising a transmitting tube, in particular a magnetron, a modulator for driving the magnetron in order to generate and transmit HF-pulses, a stable local oscillator for producing an intermediate frequency signal by mixing its output signal with echo pulses caused by the transmitted pulses, which intermediate frequency signal has a frequency which corresponds to the difference between the stable local oscillator frequency and the frequency of the transmitted pulses, and an oscillator operating at an intermediate frequency the output signal of which is led to a phase sensitive detector together with the intermediate frequency signal obtained by the mixing in order to detect the echo pulse and to generate a signal containing information about the mutual phase position between transmitted and received HF-signals, characterized in that a signal derived from the stable local oscillator is fed to the tuning cavities of the magnetron, at least in the moment of transmission, and that the modulator and the intermediate frequency oscillator are mutually time controlled in such manner that the leading edge of the modulator pulse and thereby the magnetron pulse always appears at a predetermined phase position of the output signal of the intermediate frequency oscillator.

4,682,179

**OMNIDIRECTIONAL ELECTROMAGNETIC LENS**

Reinhold Gerharz, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 3, 1985, Ser. No. 730,013

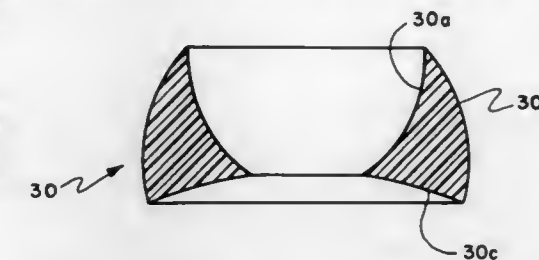
Int. Cl.<sup>4</sup> H01Q 15/02, 15/23

U.S. Cl. 343—755

1 Claim

1. An omnidirectional electromagnetic lens with a body of revolution about an axis of revolution and formed from a material transparent and refractive to electromagnetic waves and having three curved surfaces: a top reflective surface and

transparent side and bottom surfaces, whereby said top surface is a segment of a paraboloid with an axis colinear to said axis of



revolution, and said side and bottom surfaces are segments of spheres with their centers on said axis of revolution.

4,682,180

**MULTIDIRECTIONAL FEED AND FLUSH-MOUNTED SURFACE WAVE ANTENNA**

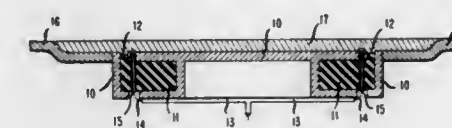
Michael J. Gans, Monmouth Beach, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 23, 1985, Ser. No. 779,108

Int. Cl.<sup>4</sup> H01Q 13/18, 15/10

U.S. Cl. 343—769

10 Claims



1. A multidirectional antenna feed arrangement comprising:  
a ground plane including an annular cavity within the ground plane comprising a width between inner walls which approximates a quarter-wavelength of a radio wave to be launched or received by the antenna feed arrangement to prevent a shorting of the radio wave within the cavity, and an annular slot forming an opening from the cavity in a first major surface of the ground plane, the annular slot including a predetermined width which produces a predetermined capacitive reactance that is substantially balanced by an inductive reactance produced by the approximate quarter-wavelength width of the cavity in the ground plane; and  
means, disposed at multiple spaced-apart locations around a first edge of the annular slot, and capable of simultaneously delivering or receiving a radio frequency message signal to or from multiple locations around the annular slot for exciting or extracting a corresponding radio wave in the cavity and slot and launching or receiving said radio wave from the slot.

4,682,181

**FLUSH MOUNTED TACAN BASE STATION ANTENNA APPARATUS**

Theodore A. Dumas, Dallas, Tex., and Leslie V. Griffie, Marysville, Kans., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 22, 1985, Ser. No. 725,962

Int. Cl.<sup>4</sup> H01Q 1/38, 3/24

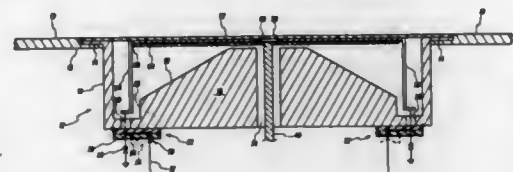
U.S. Cl. 343—789

2 Claims

2. Antenna comprising, in combination:  
a ground plane means having a circular cavity;  
circular feed element means located in said cavity below the top of said ground plane means and having a diameter less than that of said cavity;  
radiating conductive signal shaping means, comprising a plurality of triangular shaped elements having a substan-



tially circular profile, mounted even with the top of said ground plane means, the shaping means having a diameter similar to that of said feed element means and a diameter less than that of the cavity, juxtaposed said feed element means and in combination with said signal shaping means producing an omnidirectional signal; and



signal redirection means for selectively and electrically connecting at least one of said signal shaping means to said ground plane means to modify the output transmission signal to be directional.

4,682,182

## MARKING DEVICE FOR PIPE

Akihiro Oyama, Yokosuka; Yutaka Funyu, and Kazuyuki Sakurada, both of Handa, all of Japan, assignors to Kawasaki Steel Corporation, Tokyo, Japan

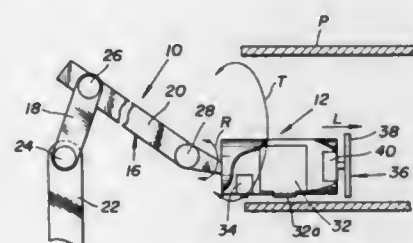
Filed Dec. 4, 1985, Ser. No. 805,341

Claims priority, application Japan, Dec. 4, 1984, 59-255101

Int. Cl.<sup>4</sup> G01D 15/16

U.S. Cl. 346-1.1

28 Claims



1. A method for applying marks to the surface of a hollow product with a constant radius of curvature, comprising the steps of:

- mounting a marking head of the motile end of a multi-axis movable arm assembly;
- mounting a sensor on said motile end of said movable arm assembly;
- causing a first movement of said movable arm assembly carrying said marking head from a predetermined initial position toward said product;
- detecting a reference position of said product during said first movement of said movable arm assembly by means of said sensor which reference position is set at a predetermined distance from a marking start position which is determined in relation to the distance between said marking head and said sensor;
- deriving the position of said reference position of said product relative to said initial position;
- deriving a marking start position on the basis of the derived reference position and a preset distance from said reference position of said product;
- causing a second movement of said movable arm to carry said marking head to said marking start position;
- deriving a path through which to move said marking head on the basis of said marking start position and preset offsets from said marking station position, said path including a marking end position;
- causing a third movement to move said marking head along said path;

activating said marking head to perform a marking operation in synchronism with said third movement;

detecting when said marking head reaches said marking end position and then stopping said third movement; and

causing a fourth movement of said movable arm to return said marking head to said initial position.

4,682,183

## GUTTER FOR AN INK JET PRINTER

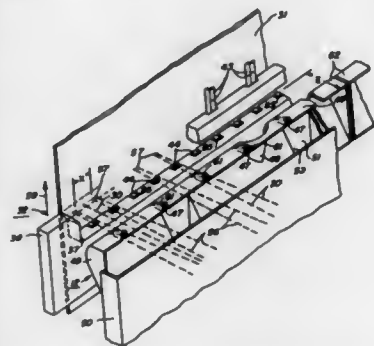
Gilbert M. Elchinger, Kernersville, N.C.; Edward C. Mutschler, Jr., Yardley, Pa., and Eugene Behun, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 21, 1986, Ser. No. 887,453

Int. Cl.<sup>4</sup> G01D 15/18

U.S. Cl. 346-75

10 Claims



1. An ink jet gutter assembly for a continuous multiple stream, pagewidth ink jet printer having an array of optical stitch sensors mounted in a frame member and spaced a predetermined distance upstream from a moving recording medium, the stitch sensors having light emitting input fibers with faces substantially in a plane perpendicular to the recording medium, each input fiber face having a center, ink droplets emitted from nozzles of a droplet generator of the printer are directed along trajectories to the recording medium to form images thereon one line of pixels at a time, the droplets not directed to the recording medium are diverted to the gutter assembly for collecting and reuse by the printer, the gutter assembly comprising:

- at least one integral structure mounted upstream and adjacent the array of stitch sensors, the integral structure having a generally open concave shape with respect to the direction of droplet flight paths and having a flat surface portion with a plurality of equally spaced projections for collecting the gutter droplets, an arcuate portion, and a flat sloping portion;
- the flat surface portion being below the trajectories of the droplets and substantially parallel to the stitch sensors and lineal printed segments by each nozzle;
- the arcuate portion being intermediate the flat surface portion and the flat sloping portion with the flat sloping portion being furthest from the droplet trajectories; and
- the plurality of droplet collecting projections formed in the flat surface portion in a manner which cause them to extend upwardly out of the flat surface portion toward and above the droplet flight paths, each projection having an entrance substantially perpendicular to the flight direction of the droplets for receiving the droplets from two adjacent nozzles that are not to be printed, the projection having relatively narrowly spaced side walls and a back wall that slopes from the entrance with a predetermined angle with respect to the trajectories of the droplets entering therein, the width of the back wall at the projection entrance being wider than its opposite end portion that contours into the flat surface portion of the integral structure at the interface between the flat surface portion and the arcuate portion, so that the side walls are closer to each other near said intersection and in a side view each

projection appears triangularly shaped, the back wall of the projection having a narrower width at a location intermediate the entrance and the opposite end portion so that in plane view, it appears as an hour glass shape, this hour glass shape prevents interference with droplets from separate adjacent nozzles directed to the stitch point pixels on the recording medium.

4,682,184

## SUCTION RECOVERING DEVICE FOR AN INK JET PRINTER AND INK JET PRINTER HAVING THE SAME DEVICE

Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 798,396, Nov. 15, 1985, abandoned.

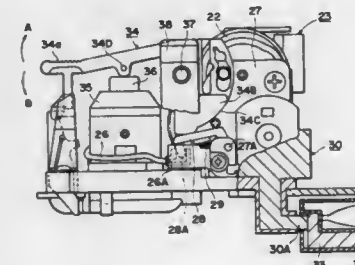
This application Sep. 4, 1986, Ser. No. 903,843

Claims priority, application Japan, Nov. 19, 1984, 59-244054

Int. Cl.<sup>4</sup> G01D 15/16

U.S. Cl. 346-140 R

12 Claims



1. A suction recovering device for an ink jet printer provided with liquid injection recording means for injecting ink to the recording surface of a recording medium to thereby effect recording and a cap member opposed to said liquid injection recording means in a predetermined position, characterized in that a porous cellular structure in which capillary forces are created is provided below said cap member, said porous cellular structure being designed so as to be capable of contacting a porous absorbing member in a waste ink reservoir.

4,682,185

## INK JET METHOD AND APPARATUS UTILIZING A WEB OF HOT MELT INK

John G. Martner, P.O. Box 292, Brookfield, Conn. 06804

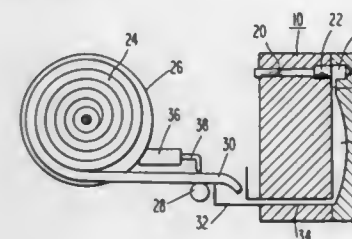
Filed Nov. 8, 1984, Ser. No. 669,575

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> G01D 15/16, 9/00

U.S. Cl. 346-140 R

23 Claims



1. A method of operating an ink jet comprising the following steps:

- advancing a flexible web of hot melt ink;
- sequentially heating portions of the web as the web is advanced;
- melting said sequentially heated portions of the web;
- supplying the ink in the liquid state to the ink jet; and

ejecting droplets of ink from the ink jet.

4,682,186

## METHOD FOR FORMING A COLOR IMAGE

Takashi Sasaki, Tokyo; Nobuaki Sakurada, Yokohama, and Hideaki Kawamura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

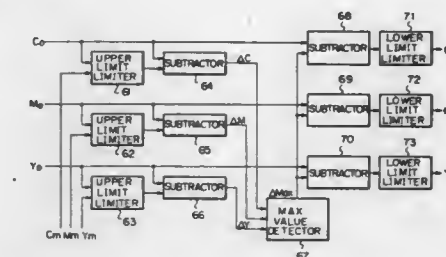
Filed Oct. 25, 1984, Ser. No. 664,763

Claims priority, application Japan, Nov. 4, 1983, 58-207770

Int. Cl.<sup>4</sup> G01D 15/18; H04N 1/46; G03F 3/08

U.S. Cl. 346-140 R

12 Claims



1. A method for forming a color image, comprising the steps of:

- supplying a plurality of color signals which represent respective colors
- providing a plurality of coloring materials respectively corresponding to each of said plurality of color signals, wherein the level of each said signal corresponds to an amount of coloring material used to represent the respective color;
- detecting whether any said color signal exceeds a predetermined level corresponding to the maximum amount of coloring material capable of representing the respective color;
- converting the color signals such that the levels of said converted signals are suppressed only when said detecting step detects a color signal which exceeds said predetermined level, wherein said level of said detected color signal is not suppressed below said predetermined level; and
- variably controlling the respective amounts of said coloring materials to form a color image in response to said converted color signals.

4,682,187

## INK JET METHOD AND APPARATUS UTILIZING GRANULAR OR HOT MELT INK

John G. Martner, P.O. Box 292, Brookfield, Conn. 06804

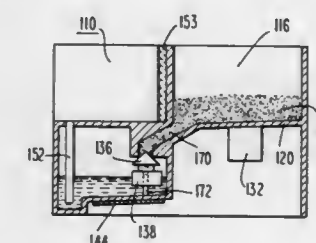
Filed Nov. 8, 1984, Ser. No. 669,579

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> G01D 15/16

U.S. Cl. 346-140 R

17 Claims



1. A hot melt ink jet apparatus comprising: an ink jet chamber including an inlet and an orifice for ejecting droplets of ink;

a bin including an outlet for storing hot melt ink in particle form;  
means for advancing said particles in said bin toward said outlet including vibration means for fluidizing said particles; and  
a melting area coupled to said outlet for melting said particles and supplying melted ink to said inlet of said chamber.

4,682,188

# SERIAL INK JET PRINTING ARRANGEMENT PROVIDING A REMOVABLY MOUNTING OF THE PRINTING HEAD ON A CARRIAGE

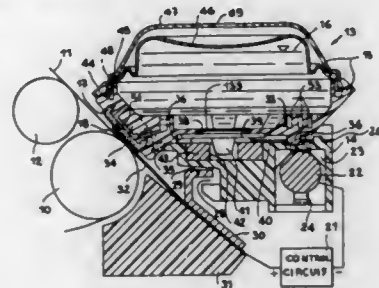
Pietro Castellano, Castellamonte, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Sep. 10, 1985, Ser. No. 774,369

Claims priority, application Italy, Sep. 10, 1984, 67890 A/84  
Int. Cl.<sup>4</sup> G01D 15/16

U.S. Cl. 346—140 R

4 Claims



1. An ink jet printing arrangement for printing lines of information on a print support carrier, comprising a single cylindrical guide member parallel to said lines, a carriage mounted on said guide member for being transversely moved with respect to said support carrier, a printing head mounted on said carriage, said printing head including a plate carrying at least one nozzle for the emission of ink droplets and a linear projection parallel to said lines and adapted to contact said support carrier to hold said nozzle at a constant spacing from said support carrier, wherein the improvement includes:

an annular permanent magnet secured to said carriage, and a ferromagnetic disk secured to said head and provided with a substantially frustoconical projection for centering said annular magnet, said annular magnet cooperating with said disk to hold said printing head removably in contact with said carriage and said linear projection in contact with said support carrier, whereby the angular position of said carriage on said guide member is automatically adjusted.

4,682,189

# REPRODUCTION OF CHARACTER IMAGES, PARTICULARLY FOR TYPESETTING APPARATUS

Haydn V. Purdy, Dowa Cottage, Dowa Place, Windsor, Berkshire, and Ronald C. McIntosh, 17 Avenue Road, St. Albans, Hertfordshire, both of England

Continuation of Ser. No. 563,535, Dec. 20, 1983, abandoned, which is a continuation of Ser. No. 436,202, Oct. 22, 1982, abandoned, which is a continuation of Ser. No. 189,962, Jan. 21, 1980, abandoned. This application Sep. 2, 1986, Ser. No. 903,864  
Claims priority, application United Kingdom, May 31, 1978, 25275/78; May 31, 1979, PCT/GB79/00093

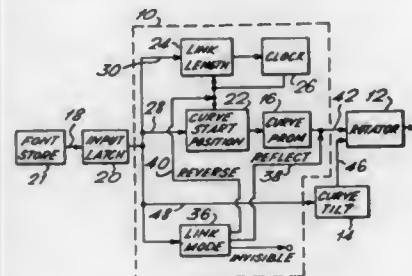
Int. Cl.<sup>4</sup> G06F 15/626; G09G 1/14

U.S. Cl. 364—523

20 Claims

1. Apparatus for reproducing a character as a visible image,

comprising a randomly addressable memory holding a sequential record of vector steps representative of incremental sections along the length of a predetermined curve, means to address the memory and generate a series of vector step instructions matched to the outline of the character to be reproduced, rotator means for orientating the individual steps and producing a modified sequence of step instructions according to the desired re-orientation, said rotator means further com-



prising means to generate from each of the individual vector step instructions two steps at right angles to each other, the size of these generated steps being determined by sine and cosine functions of the angle through which the section is to be rotated; and an incrementing plotter driven by said modified step instruction to trace a finely resolved sequential character outline.

4,682,190

# IMAGE PROCESSING APPARATUS FOR COMBINING IMAGE AND CHARACTER DATA

Yoshinori Ikeda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 586,733, Mar. 6, 1984, abandoned. This application May 30, 1986, Ser. No. 869,824

Claims priority, application Japan, Mar. 8, 1983, 58-36673; Mar. 17, 1983, 58-44989; Mar. 17, 1983, 58-44990; Mar. 17, 1983, 58-44991

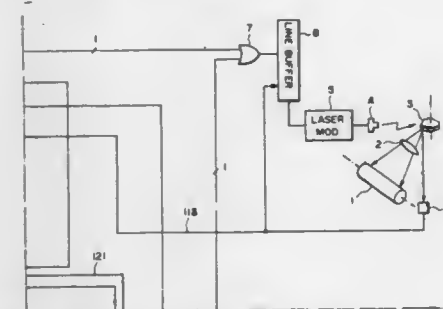
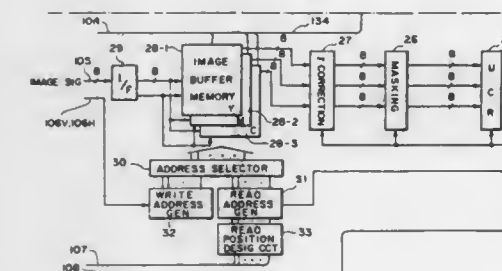
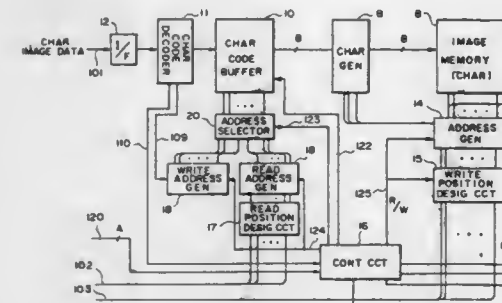
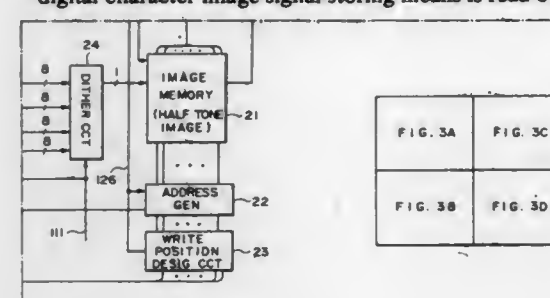
Int. Cl.<sup>4</sup> G01D 15/14

U.S. Cl. 346—154

35 Claims

1. An image processing apparatus comprising:  
image signal input means for entering an image signal;  
character code signal input means for entering a character code signal;  
means for half-tone processing the image signal to produce a digital half-tone image signal, said half-tone processing means including means for storing the image signal entered by said image signal input means;  
converting means for converting the character code signal into a digital character image signal, said converting means including means for storing the character code signal entered by said character code input means;  
digital character image signal storing means for storing the digital character image signal converted by said converting means; and  
common image forming means for receiving the digital half-tone image signal and the digital character image signal;  
wherein said common image forming means provides a sync signal that is synchronized with an image forming opera-

tion, and the digital character image signal stored in said digital character image signal storing means is read out in



response to the sync signal and transmitted to said common image forming means.

4,682,191

# HEAT-SENSITIVE RECORDING PAPER

Shigehisa Tamagawa, and Tetsuro Fuchizawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 5, 1986, Ser. No. 826,466

Claims priority, application Japan, Feb. 5, 1985, 60-20251

Int. Cl.<sup>4</sup> B41M 5/18

U.S. Cl. 503—200

14 Claims

1. A heat-sensitive recording paper comprising a paper support having thereon a heat-sensitive color forming layer, wherein said paper support contains at least 10% by weight of a pigment and has an internal bonding strength as defined by Tappi-RC-308 of from 0.5 to 2.5 kg/cm.

4,682,192

# HEAT-SENSITIVE RECORDING SHEET

Masaharu Nomura, Yono; Hiroaki Tsugawa, Matsudo; Yukio Ishizaka, Tokyo, and Hiroomi Hosoi, Urawa, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan  
Filed Jul. 22, 1985, Ser. No. 757,366

Claims priority, application Japan, Jul. 31, 1984, 59-159235; Mar. 7, 1985, 60-43586

Int. Cl.<sup>4</sup> B41M 5/18

U.S. Cl. 503—200

9 Claims

1. A heat-sensitive recording sheet comprising:

- a support sheet;
- a thermo-sensitive color forming layer formed on the said support sheet, said thermo-sensitive color forming layer comprising a colorless to pale color leuco dye and an acidic material capable of coloring the colorless to pale color leuco dye when heat is applied thereto;
- an over-coat layer formed on the said heat-sensitive, color-forming layer, said over-coat layer comprising a colloidal inorganic silicate selected from the group consisting of colloidal magnesium aluminum silicates and fluorine-containing colloidal magnesium silicates or a mixture of the said colloidal inorganic silicate and a water-soluble, high-molecular compound or a slightly water-soluble high-molecular compound.

4,682,193

# RECORDING MATERIALS

Ken Iwakura, Kanagawa, and Takekatsu Sngiyama, Shizuoka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1985, Ser. No. 704,695

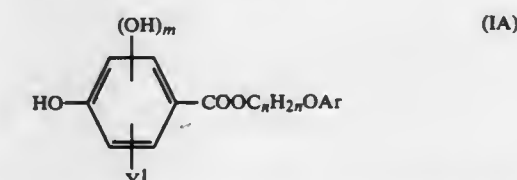
Claims priority, application Japan, Feb. 22, 1984, 59-31952; Feb. 22, 1984, 59-31953; Mar. 6, 1984, 59-42368

Int. Cl.<sup>4</sup> B41M 5/16, 5/18, 5/22

U.S. Cl. 503—209

5 Claims

1. A recording material containing (A) an electron-donating colorless dye and (B) an electron-accepting compound, wherein the electron-accepting compound is a compound represented by formula (IA) wherein said electron-accepting compound is represented by formula (IA):



wherein Ar represents an aryl group, Y<sup>1</sup> represents an alkyl group, an alkoxy group, a halogen atom or a hydroatom atom, m is 0 or 1 and n is an integer of from 2 to 5.

4,682,194

# HEAT-SENSITIVE RECORDING MATERIAL

Toshimasa Usami; Toshiharu Tanaka, and Shohel Yoshida, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 735,227, May 17, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,093

Claims priority, application Japan, May 17, 1986, 59-99490

Int. Cl.<sup>4</sup> B41M 5/18

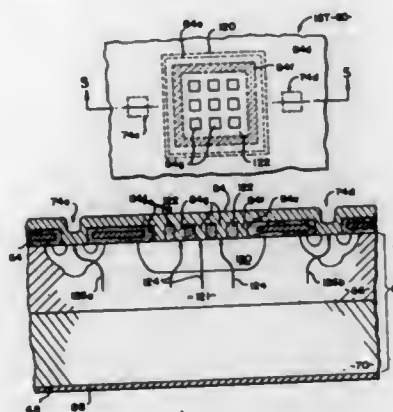
U.S. Cl. 503—215

15 Claims

1. A heat-sensitive recording material comprising a support and a recording layer comprising microcapsules containing a leuco dye and an organic solvent in a core thereof and a color developer outside of said microcapsules capable of reacting with said leuco dye to produce a color, said microcapsules having walls being of a polymer having a glass transition point of from about 60° C. to 200° C.



4,682,195  
**INSULATED GATE DEVICE WITH CONFIGURED  
 EMITTER CONTACT PAD**  
 Hamza Yilmaz, Dewitt, N.Y., assignor to General Electric Com-  
 pany, Research Triangle Park, N.C.  
 Filed Sep. 30, 1985, Ser. No. 781,383  
 Int. Cl.<sup>4</sup> H01L 29/78  
 U.S. Cl. 357-23.4



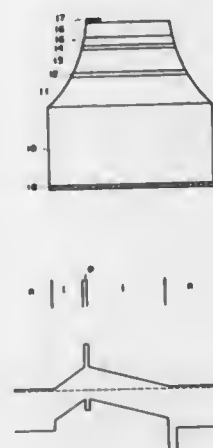
1. In a semiconductor device comprising a silicon semiconductor substrate having a major surface overlying a drift region of first conductivity type; a plurality of active cells for conducting a main device forward current, each of said cells including a base region of second conductivity type extending from said major surface into said drift region and an emitter region of said first conductivity type extending from said major surface into said base region forming an emitter-base PN junction therewith; a distributed gate electrode insulatingly spaced from said major surface and overlying a selected portion of each of said cells such that a voltage applied to said gate electrode creates an electric field that controls the magnitude of said main device current; an emitter electrode electrically insulated from said gate electrode and making ohmic contact with exposed portions of said base and emitter regions of each of said cells at said major surface, said emitter electrode including a metallic emitter pad spaced from said major surface by an insulating layer; a blocking region of second conductivity type extending from said major surface into said drift region and underlying said emitter pad; said emitter pad including a first portion disposed in ohmic contact with said blocking region; the improvement comprising: said first portion of the emitter pad being disposed so as to surround a second portion of the emitter pad, said second portion of the emitter pad including a plurality of contact portions extending through said insulating layer to make ohmic contact with said blocking region, said contact portions being substantially uniformly distributed over the area of said second portion.

4,682,196  
**MULTI-LAYERED SEMI-CONDUCTOR  
 PHOTODETECTOR**

Kazuo Sakai, Tokyo; Yuichi Matsushima, Tokorozawa; Shigeyuki Akiba, Tokyo, and Katsuyuki Utaka, Musashino, all of Japan, assignors to Kokusai Denso Denwa Kabushiki Kaisha, Shinjuku, Japan  
 Continuation of Ser. No. 557,650, Dec. 2, 1983, abandoned. This application Dec. 9, 1985, Ser. No. 806,746  
 Claims priority, application Japan, Dec. 7, 1982, 57-213301; Dec. 7, 1982, 57-213302  
 Int. Cl.<sup>4</sup> H01L 27/14, 29/205, 29/12  
 U.S. Cl. 357-30

1. A multilayered semiconductor photodetector formed by a sequential lamination of a first semiconductor layer having a carrier concentration more than  $10^{17} \text{ cm}^{-3}$ , a second semiconductor layer having a carrier concentration less than  $10^{16} \text{ cm}^{-3}$ , a third semiconductor layer having a carrier concentra-

tion more than  $10^{17} \text{ cm}^{-3}$  and a thickness less than 300 Å, a fourth semiconductor layer having a carrier concentration less than  $10^{16} \text{ cm}^{-3}$  and a fifth semiconductor layer having a carrier concentration more than  $10^{17} \text{ cm}^{-3}$ , said first semiconductor layer and said fifth semiconductor layer being of the same conductivity type, said third semiconductor layer being different in conductivity type from said fifth semiconductor layer, said second semiconductor layer and said fourth semiconductor layer being intrinsic, one of said second semiconductor layer and said fourth semiconductor layer being a light absorb-



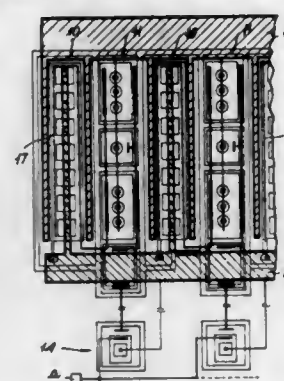
ing layer, and electrodes being provided to apply an electric field across said layers between said first semiconductor layer and said fifth semiconductor layer, the bandgaps of said first semiconductor layer and said fifth semiconductor layer being greater than those of said second semiconductor layer and said fourth semiconductor layer, and the bandgap of said third semiconductor layer being such that a potential barrier caused by a difference between bandgaps of said third semiconductor layer and said light absorbing layer effectively prevents a dark current caused by majority carriers in said first semiconductor layer and said fifth semiconductor layer.

4,682,197  
**POWER TRANSISTOR WITH SPACED  
 SUBTRANSISTORS HAVING INDIVIDUAL  
 COLLECTORS**

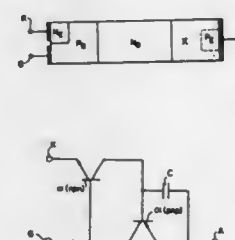
Flavio Villa, Milan; Bruno Murari, Monza; Franco Bertotti, Milan; Aldo Torazzini, Monza, and Fabrizio Stefani, Cardano al Campo, all of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy  
 Filed Dec. 23, 1985, Ser. No. 812,109  
 Claims priority, application Italy, Jan. 8, 1985, 19050 A/85  
 Int. Cl.<sup>4</sup> H01L 29/72, 23/52, 27/10, 29/08  
 U.S. Cl. 357-36

1. An integrated semiconductor device, comprising a plurality of elementary transistors arranged side-by-side and an equal plurality of current source means, each elementary transistor including respective emitter, base and collector areas defining together an elementary transistor width, said collector areas of said elementary transistors extending adjacent to one another, being physically separated from each other and electrically connected to each other through a common collector contact area including collector contact portions extending side-by-side to each other in electrical contact with said collector areas, said emitter areas of said elementary transistors extending adjacent to one another, physically separated from each other and electrically connected to each other through a common emitter contact area including emitter contact portions extending side-by-side to each other in electrical contact with said emitter areas and in interleaved fashion with said collector contact portions, each said current source means having at least one terminal individually connected to said base area of a

respective one of said plurality of elementary transistors for current driving said respective one of said elementary transistors.



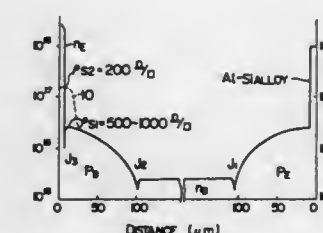
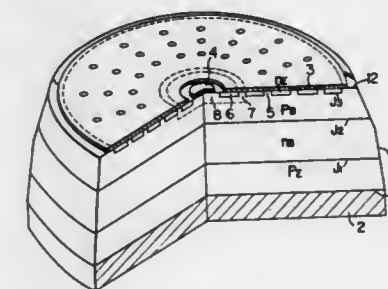
4,682,198  
**GATE TURN-OFF THYRISTOR WITH INTEGRAL  
 CAPACITIVE ANODE**  
 Shiroku Sakurada, Katsuta, and Yasuhiko Ikeda, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
 Filed Mar. 7, 1985, Ser. No. 709,139  
 Claims priority, application Japan, Mar. 7, 1984, 59-42124  
 Int. Cl.<sup>4</sup> H01L 29/74  
 U.S. Cl. 357-38



1. A gate turn-off thyristor comprising:  
 a semiconductor substrate having a first layer which is exposed on a first main surface of said semiconductor substrate and which is of a first conductivity type, a second layer of a second conductivity type, a third layer of the first conductivity type which is in contact with said second layer to form a PN junction with said second layer and which is exposed on a second main surface of said substrate, a fourth layer of the second conductivity type which is in contact with said third layer to form a PN junction with said third layer and which is exposed on the second main surface of said substrate, and a fifth layer of the first conductivity type which is provided between and in contact with said first layer and said second layer to form a PN junction with said second layer, said fifth layer having an impurity concentration which is selected to be smaller than those in said first and second layers, said fifth layer being exposed on the first main surface of said semiconductor substrate;  
 an anode electrode conductively connected to at least said first layer at the first main surface of said semiconductor substrate, said anode electrode also being connected to said fifth layer;  
 a cathode electrode conductively connected to said fourth layer at the second main surface of said semiconductor substrate; and  
 a gate electrode connected to said third layer at the second main surface of said semiconductor substrate,

wherein said fifth layer functions as a capacitor to be charged during the turn-on operation and to be discharged during the turn-off operation of the gate turn-off thyristor.

4,682,199  
**HIGH VOLTAGE THYRISTOR WITH OPTIMIZED  
 DOPING, THICKNESS, AND SHEET RESISTIVITY FOR  
 CATHODE BASE LAYER**  
 Tsutomu Yatsuo; Naohiro Momma; Masayoshi Naito, and Masahiro Okamura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
 Continuation of Ser. No. 261,666, May 7, 1981, abandoned, which is a continuation of Ser. No. 949,119, Oct. 10, 1978, abandoned. This application Apr. 28, 1983, Ser. No. 489,505  
 Claims priority, application Japan, Oct. 14, 1977, 52-123235  
 Int. Cl.<sup>4</sup> H01L 29/74  
 U.S. Cl. 357-38



1. A thyristor comprising a semiconductor body having a pair of major surfaces disposed opposite to each other and four pnnp layers of alternate different conductivity types laminated between the major surfaces to form p-n junctions between adjacent layers, said four layers including first and second intermediate layers and first and second outer layers, a pair of main electrodes respectively making ohmic contact to each outer layer on each major surface, and means for applying a triggering gate signal to switch the blocking stage of the thyristor to the conduction state between the main electrodes, and further comprising  
 means for providing said thyristor with a dv/dt withstand capability substantially equal to or greater than 1500 V/μsec and a non-firing gate current substantially equal to or greater than 10 mA, said means comprising said first intermediate layer among said four layers having an impurity concentration higher than that of said second intermediate layer, with a maximum impurity concentration of 3 to  $5 \times 10^{15} \text{ atoms/cm}^3$  at an interface in the vicinity of said first outer layer adjacent to said first intermediate layer, wherein the impurity concentration in said first intermediate layer gradually decreases toward the second intermediate layer, and  
 in conjunction with said maximum impurity concentration, said first intermediate layer having a thickness of 90 to 110 μm and a sheet resistance of 600 to 1000 ohm/□ between said first outer layer and said second intermediate layer underneath said interface.

4,682,200

# SEMICONDUCTOR MEMORY DEVICE WITH MATCHED EQUIVALENT SERIES RESISTANCES TO THE COMPLEMENTARY DATA LINES

Hideaki Uchida, Takasaki; Kinya Mitsumoto, Ohme; Yoshiaki Yazawa, Hitachi; Shinji Nakazato, Maebashi, and Masanori Odaka, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

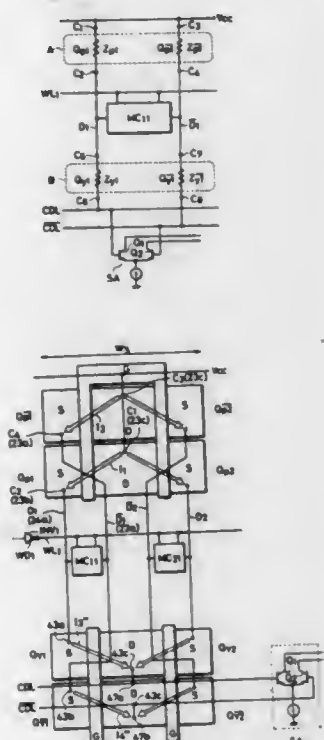
Filed Apr. 14, 1986, Ser. No. 851,485

Claims priority, application Japan, Apr. 12, 1985, 60-76551

Int. Cl.<sup>4</sup> H01L 27/02

U.S. Cl. 357-41

12 Claims



1. A semiconductor memory device comprising:
  - (a) a plurality of memory cells which store information therein;
  - (b) a plurality of word lines and a plurality of pairs of complementary data lines coupled to said plurality of memory cells so that each memory cell is coupled to a word line and a pair of complementary data lines, ends on one side of said plurality of pairs of complementary data lines being connected to a power source voltage; and
  - (c) a sense circuit which is connected to the ends on the other side of said plurality of pairs of complementary data lines, and which reads information stored in each of the memory cells;
 wherein said pairs of complementary data lines have equivalent series resistances that are equal to each other between the ends on one side connected to said power source voltage and the ends on the other side connected to said sense circuit.

4,682,201

# GATE ARRAY CELL

Robert Lipp, Los Gatos, Calif., assignor to California Devices, Inc., San Jose, Calif.

Continuation of Ser. No. 662,614, Oct. 19, 1984, abandoned.

This application Jul. 14, 1986, Ser. No. 883,474

Int. Cl.<sup>4</sup> H01L 27/02

U.S. Cl. 357-42

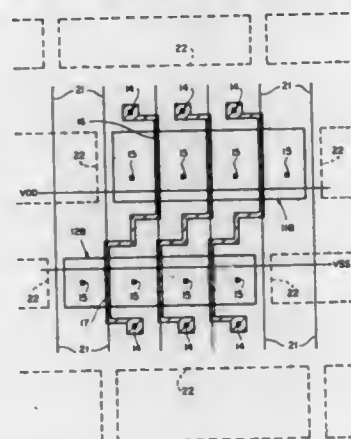
5 Claims

1. A gate array device comprising a two-dimensional array of cells forming horizontal rows and vertical columns wherein

vertically adjacent rows of cells are abutting, so that no routing channels adjacent the rows are reserved,

cells in alternate rows comprising a plurality of identical and abutting N-channel devices having horizontally aligned source/drain contacts,

cells of rows intermediate each of said rows of N-channel device cells comprising a plurality of identical and abutting P-channel devices, successive vertical cells of one conductivity type defining columns offset from columns defined by cells of the intermediate rows of opposite conductivity type, wherein all but one of the source/drain contacts in each said N-type cell are vertically aligned in columns with the source/drain contacts of one of said P-type cells to define a plurality of pairs of vertically



aligned complementary devices, and source/drain contacts of said plurality of pairs of complementary devices in vertically abutting cells lying on straight vertical lines parallel to the columns and a plurality of polysilicon lines comprising the gates of each said pair of vertically aligned complementary devices, all of said polysilicon lines following meandered patterns between horizontally adjacent source/drain contacts while connecting the gate contacts of said vertically abutting cells, connections between circuits formed on said gate array device comprising first and second layers of metal lines running parallel to the rows and columns of cells whereby said interconnects pass through the cells without an increase in size in cell area.

4,682,202

# MASTER SLICE IC DEVICE

Tetsu Tanizawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 30, 1984, Ser. No. 635,680

Claims priority, application Japan, Jul. 29, 1983, 58-137698

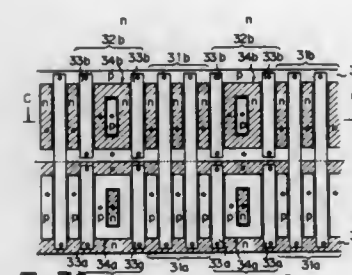
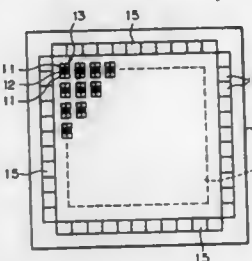
Int. Cl.<sup>4</sup> H01L 27/10, 29/70, 29/78

U.S. Cl. 357-45

9 Claims

1. A master slice integrated circuit device comprising:
  - a basic cell array portion disposed at an inner area of a semiconductor chip; and
  - a plurality of input/output cells arranged at the periphery of said basic cell array portion and effecting signal transmission to and from external circuits;
 said basic cell array portion having a plurality of first basic cells each comprising a p-type MIS transistor and an n-type MIS transistor, said first basic cells being divided into at least four blocks, and a plurality of second basic cells each comprising a pnp-type bipolar transistor and an

nnp-type bipolar transistor, said second basic cells being arranged between said four blocks, wherein connections



between said blocks of first basic cells may be made via said second basic cells.

4,682,203

# SOLID-STATE IMAGE PICKUP DEVICE WITH PHOTOGRAPHIC SENSITIVITY CHARACTERISTICS

Ryuji Konda, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kawagawa, Japan

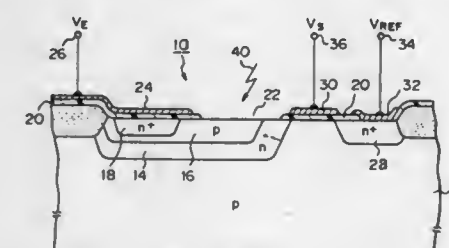
Filed Aug. 16, 1985, Ser. No. 766,335

Claims priority, application Japan, Aug. 23, 1984, 59-174158

Int. Cl.<sup>4</sup> H01L 27/02

U.S. Cl. 357-51

9 Claims



1. A solid-state image pickup device having photosensitive cells disposed on a semiconductor substrate of a first conductivity type, wherein said photosensitive cells are arranged in a principal surface of said semiconductor substrate, each of said photosensitive cells includes:
  - a phototransistor means for generating photocarriers associated with light incident thereto and storing the generated photocarriers therein;
  - said phototransistor means including,
    - a first region of semiconductor material of a second conductivity type which is opposite to the first conductivity type forming a collector electrode of said phototransistor means;
    - a second region of semiconductor material of the first conductivity type disposed in said first region forming a base electrode of said phototransistor means; and
    - a third region of semiconductor material of the second conductivity type disposed in said second region forming an emitter electrode of said phototransistor means;

totransistor means for reading out in the form of a video signal the photocarriers stored in said phototransistor means; and

capacitor means disposed in said principal surface and connected to another electrode of said phototransistor means; said capacitor means including,

a layer of insulating material disposed on said third region; and

a layer of conductive material disposed on said layer of insulating material forming one electrode of said capacitor means;

said third region also forming the other electrode of said capacitor means,

said readout gate means including an IGFET in which said first region functions as either of source and drain electrodes thereof.

4,682,204

# FUSE ELEMENT FOR INTEGRATED CIRCUIT MEMORY DEVICE

Masakazu Shiozaki, Yokohama, and Hidetaro Nishimura, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 467,296, Feb. 17, 1983, abandoned.

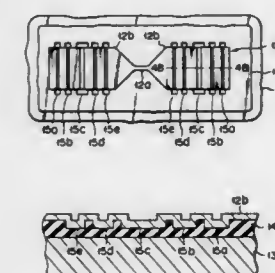
This application Dec. 11, 1985, Ser. No. 807,128

Claims priority, application Japan, Mar. 9, 1982, 57-35800

Int. Cl.<sup>4</sup> H01L 27/02, 29/06, 23/48

U.S. Cl. 357-51

3 Claims



1. A fuse element for use within an integrated memory which is formed on an insulation layer mounted on a semiconductor substrate having said integrated memory formed thereon and prepared from a prescribed material to be thermally broken off in case of need, comprising:
  - a melting away portion;
  - connecting portions which are integrally formed at both ends of said melting away portions with a greater width than that of said melting away portion for connecting said melting away portion to said integrated memory;
  - each of said connecting portions being provided with a plurality of paired step sections for increasing the heat capacity of said connecting portions, said plurality of paired stepped sections tightly contacting the surface of corresponding paired step sections formed on said insulating layer, each said paired step section of said connecting portion including a first step which steps down from a first level to a second level and a second step which steps up from said second level to a third level coplanar with the said first level.



4,682,205

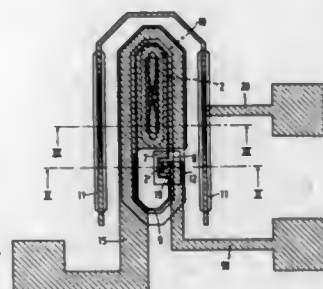
## SEMICONDUCTOR DEVICE

Adrianus W. Ladikhuize, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
Continuation of Ser. No. 541,643, Oct. 13, 1983. This application  
Mar. 5, 1986, Ser. No. 837,867  
Claims priority, application Netherlands, Oct. 25, 1982,  
8204105

Int. Cl.<sup>4</sup> H01L 29/40, 29/44, 29/78

U.S. Cl. 357—53

7 Claims



1. A semiconductor device comprising a semiconductor body having a planar pn-junction between a first region of a first conductivity type adjoining a surface and a second region of the second opposite conductivity type also adjoining the surface, which latter region has a lower doping than the first region, means for reverse biasing said planar junction in operation, an electrically insulating layer on the surface, and on this layer a narrow strip-shaped electrically conductive layer which is located above the pn junction, is bounded by a first and a second edge and extends above the second region, said first edge substantially coinciding with the line of intersection of the pn junction and the surface, the potential of said conductive layer being substantially equal to that of the first region, characterized in that the conductive layer is locally provided with a widened part for contacting purposes, said widened part being constituted by a protuberance of at least said first edge towards the first region thereby increasing said second region's depletion zone at said protuberance, said first region being altered relative to said first edge of said conducting layer at said widened part whereby said first edge substantially coincides with said line of intersection also at the area of said widened part and partly encloses an area of said second region.

4,682,206

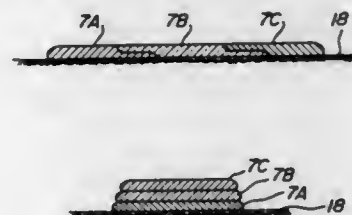
THIN RIBBON OF SEMICONDUCTOR MATERIAL  
Noboru Tsuya, 1-38, Kashiwagi 2-Chome, Sendai City, and Kenichi Arai, Sendai, both of Japan, assignors to Noboru Tsuya, Sendai, Japan  
Division of Ser. No. 597,565, Apr. 9, 1984, Pat. No. 4,525,223, which is a continuation of Ser. No. 375,314, May 5, 1982, abandoned, which is a continuation of Ser. No. 55,031, Jul. 6, 1979, abandoned. This application Apr. 10, 1985, Ser. No. 721,675

Claims priority, application Japan, Sep. 19, 1978, 53-114848; Oct. 12, 1978, 53-125485

Int. Cl.<sup>4</sup> H01L 29/04

U.S. Cl. 357—59

8 Claims



1. A thin ribbon of semiconductor material made of pure

silicon or silicon with less than 10 atomic % of at least one additional impurity element, for improving the properties of a semiconductor, selected from the group consisting of hydrogen, phosphorus, sulfur, oxygen, boron, arsenic, tellurium, tin, selenium, aluminum, gallium, indium, chromium, silver, iron and bismuth; wherein said thin ribbon of semiconductor material has a polycrystalline structure composed more than 50% of grains having a grain size of more than 5  $\mu$ m as a result of heat-treatment, has a thickness of 50–200  $\mu$ m, and a sufficient flexibility such that it is windable on a pipe having a diameter of 34 mm without cracking or breaking, and is composed of at least two layers of two different types of semiconductor material selected from p-type, i-type and/or n-type semiconductor material.

4,682,207

## SEMICONDUCTOR DEVICE INCLUDING LEADLESS PACKAGES AND A BASE PLATE FOR MOUNTING THE LEADLESS PACKAGES

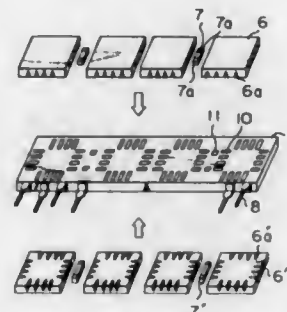
Hidehiko Akasaki, Alzuwakamatsu, and Takehisa Tsujimura, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 476,262, Mar. 17, 1983. This application Oct. 3, 1986, Ser. No. 915,851

Claims priority, application Japan, Mar. 17, 1982, 57-42254  
Int. Cl.<sup>4</sup> H01L 23/32

U.S. Cl. 357—74

7 Claims



1. A semiconductor device for mounting on a printed circuit board, comprising:  
a plurality of leadless packages, each of said leadless packages comprises:  
a semiconductor chip housed therein; and  
a plurality of electrodes formed on a surface of said leadless package;  
a base plate having two main surfaces on which said leadless packages are mounted and having a side surface formed along one edge of said base plate, said base plate having conductor patterns formed on both of said two main surfaces, said conductor patterns having said electrodes soldered thereto, and said side surface having pad patterns formed thereon, said base plate capable of being mounted on the printed circuit board in such a manner that said main surfaces are perpendicular to the surface of the printed circuit board; and  
a plurality of lead pins which project from only one edge of said base plate in a direction parallel to said two main surfaces, each of said lead pins having a connecting portion perpendicularly folded, the length of said connecting portion being less than the thickness of said base plate, said connecting portion connected to respective ones of said pad patterns formed on said side surface along said one edge of said base plate so that said main surfaces are free from said lead pins.

4,682,208

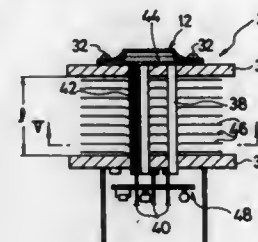
## TRANSISTOR PROTECTION DEVICE

Tooshio Ohashi, Atsugi, and Shukon Yamamoto, Sano, both of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan  
Filed Jan. 14, 1985, Ser. No. 691,066

Claims priority, application Japan, Jan. 13, 1984, 59-4517  
Int. Cl.<sup>4</sup> H01L 23/02; F28F 7/00; H01B 7/34; H02B 1/00

U.S. Cl. 357—81

9 Claims



1. A transistor detection device for radiating heat generated in a transistor, comprising:  
a base platform for supporting the transistor;  
heat conducting rods attached to the bottom surface of the transistor and extending away from said bottom surface to conduct heat generated mainly at the bottom surface of said transistor away from said transistor;  
electrically insulated hollow rods attached to the bottom surface of said transistor and receiving conductors extending from said transistor for connecting said transistor to an electrical circuit; and  
a plurality of radiation fins attached to said heat conductive rods to radiate the heat conducted by said rods from the transistor.

4,682,209

## DIGITAL CHROMINANCE PROCESSOR WITH A PHASE AND FREQUENCY CONTROLLED DIGITAL OSCILLATOR INDEPENDENT OF THE STABLE OSCILLATOR FREQUENCY

Antonius H. H. J. Nillesen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

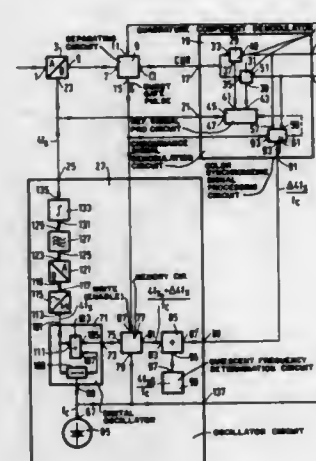
Filed Mar. 4, 1986, Ser. No. 836,236

Claims priority, application Netherlands, Mar. 25, 1985, 8500864

Int. Cl.<sup>4</sup> H04N 9/45

U.S. Cl. 358—19

2 Claims



1. A digital chrominance signal processing circuit an input (1) of which is coupled at least via an analogue-to-digital converter (3) to an input (17) of a digital chrominance signal demodulation circuit (19) having a reference signal input (21) which, as is also a sampling signal input (23) of the analogue-to-

digital converter, is coupled to an output (25) of an oscillator circuit (27) comprising a stable oscillator (65) and a digital-to-analogue converter (121) and a control signal input (89) of which is coupled to a control signal output (91) of the chrominance signal demodulation circuit, characterized in that the control signal input (89) of the oscillator circuit (27) is coupled via an adder circuit (85) to a frequency-determining input (73) of a digital oscillator (71) a clock signal input (69) of which is coupled to an output (67) of the stable oscillator (65) which is independent of the chrominance signal, whilst an output (101) of the digital oscillator (71) is coupled to the output (25) of the oscillator circuit (27) at least via the digital-to-analogue converter (121), whilst a further input (95) of the adder circuit (85) is coupled to a circuit (99) for producing a digital number which determines the quiescent frequency of the digital oscillator (71).

4,682,210

## AUTOMATIC WHITE BALANCE ADJUSTING CIRCUIT FOR IMAGE PICKUP DEVICE

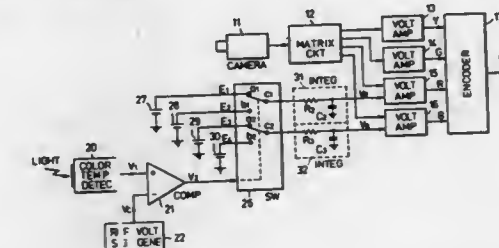
Yuichi Ikemura, Nagareyama, and Hiroshi Takano, Iwai, both of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Mar. 31, 1986, Ser. No. 846,572

Claims priority, application Japan, Apr. 5, 1985, 60-71934  
Int. Cl.<sup>4</sup> H04N 9/73

U.S. Cl. 358—29

8 Claims



1. An automatic white balance adjusting circuit for an image pickup device, said image pickup device comprising a camera tube, a matrix circuit for obtaining a luminance signal and three primary color signals from an output image pickup signal of said camera tube, amplifier means for independently amplifying output signals of said matrix circuit, and an encoder for obtaining a color video signal from output signals of said amplifier means, said automatic white balance adjusting circuit comprising:

color temperature detecting circuit means for producing a detection signal having a voltage in correspondence with a color temperature of an incoming light to said image pickup device;  
reference voltage signal generating circuit means for generating an A.C. reference voltage signal;  
comparing circuit means for obtaining a discrimination signal by comparing said detection signal with said reference voltage signal;  
a plurality of voltage source means for applying different voltages in correspondence with different color temperatures;  
selecting circuit means for selecting and obtaining voltages from the voltage source means depending on the output discrimination signal of said comparing circuit means; and  
integrating circuit means for integrating output voltage signals of said selecting circuit means,  
said integrating circuit means applying output voltage signals thereof to corresponding ones of said amplifier means to variably control amplifications thereof so that a white balance of the color video signal produced from said encoder is automatically adjusted.

4,682,211

# COLOR IMAGE SENSING APPARATUS WITH ONE NON-FEEDBACK CLAMP CIRCUIT AND AT LEAST ONE FEEDBACK CLAMP CIRCUIT

Toshio Kaji, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

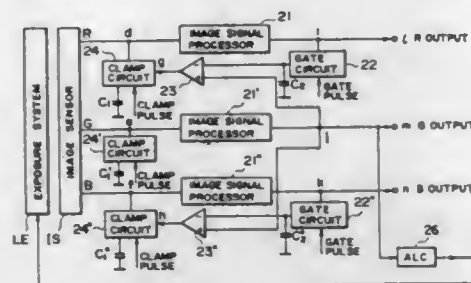
Filed Jan. 24, 1985, Ser. No. 694,239

Claims priority, application Japan, Jan. 27, 1984, 59-13155

Int. Cl.<sup>4</sup> H04N 9/04, 9/07, 9/09, 9/64

U.S. Cl. 358—41

16 Claims



1. An image signal processing apparatus comprising:
  - (a) a plurality of channels for respectively processing different component signals of an image signal;
  - (b) a plurality of clamping means for respectively clamping the component signals in the respective channels;
  - (c) feedback means provided for at least one, but not all, of said channels, each said feedback means for feeding back the respective clamped component signal to an input of the respective clamping means; and
  - (d) level control means for controlling the level of said image signal on the basis of the component signal in a channel for which a feedback means is not provided.

4,682,212

# SOLID-STATE IMAGE PICKUP DEVICE FOR PRODUCING COLOR-SEPARATED VIDEO SIGNALS BY USE OF AFTERIMAGE RISE-TIME

Masafumi Inuiya, and Masatoshi Tabel, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

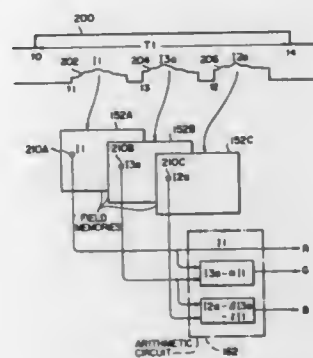
Filed Jan. 23, 1985, Ser. No. 694,037

Claims priority, application Japan, Jan. 26, 1984, 59-10977

Int. Cl.<sup>4</sup> H04N 9/07, 9/04; G01J 3/50; H01J 5/16

U.S. Cl. 358—44

12 Claims



5. A solid-state image pickup device comprising:
  - (a) a semiconductor substrate; and
  - (b) an array of photosensitive cells formed on the substrate so as to produce, when driven, color-separated component video signals proportional to light incident to the array, each of said photosensitive cells comprising,
    - (i) a plurality of first layers of a photoconductive material

laminated over said substrate, each sensitive to all wavelengths of visible light, and  
at least one second layer disposed between selected portions of adjacent ones of said first layers and comprising a non-photosensitive material which is substantially transparent with respect to the incident light.

4,682,213

# MAGNITUDE INDEPENDENT HANGING DOT DETECTOR

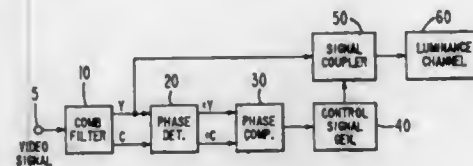
Robert A. Wargo, Ringoes, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 24, 1985, Ser. No. 791,145

Int. Cl.<sup>4</sup> H04N 9/64

U.S. Cl. 358—31

13 Claims



1. In a video signal processor including: a comb filter for producing comb filtered luminance and chrominance signals, a luminance processing channel, and means for coupling said comb filtered luminance signal to said luminance processing channel including means for altering the frequency composition of said comb filtered luminance signal in response to a control signal; a magnitude independent hanging dot detector comprising:
  - (a) phase detecting means coupled to said comb filter for generating a first signal representing the phase angle of said comb filtered luminance signal and a second signal representing the phase angle of said comb filtered chrominance signal;
  - (b) means for determining the change over a predetermined time period of said first signal and the change over said predetermined time period of said second signal;
  - (c) means for comparing the change over said predetermined time period of said first signal to the change over said predetermined time period of said second signal; and
  - (d) means coupled to said comparing means for generating said control signal in response to said comparison.

4,682,214

# TEST PATTERN PROJECTOR FOR A COLOR TELEVISION CAMERA

Kiyoshi Sato, and Nobuo Matsui, both of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Division of Ser. No. 480,138, Mar. 29, 1983, abandoned. This application Jun. 12, 1986, Ser. No. 873,877

Claims priority, application Japan, Mar. 29, 1982, 57-48828; Jan. 22, 1983, 58-9162

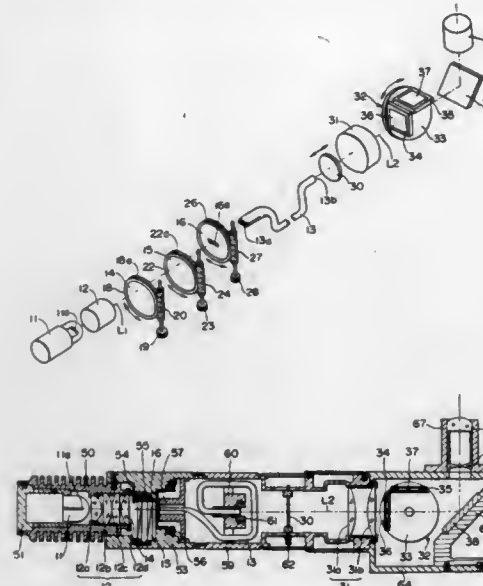
Int. Cl.<sup>4</sup> H04N 9/04

U.S. Cl. 358—55

3 Claims

1. In a color television camera, a test pattern projector comprising:
  - (a) a light source for emitting illuminating light;
  - (b) a first optical system for converging the illumination emitted from said light source;
  - (c) said light source having a filament that is elongated in a direction perpendicular to the optical axis of said first optical system;
  - (d) a diaphragm having a slot therethrough, said slot extending in a direction perpendicular to said optical axis and said optical axis passing through the midpoint of the length of the slot;
  - (e) means for rotating said diaphragm about said optical axis;

means for diffusing the illuminating light passing through said slot;  
a parabolic shading compensating filter for making said diffused illumination light uniform in intensity, the light transmissivity of said filter progressively increasing in a direction away from the center thereof;



test pattern charts to be illuminated by said diffused illuminating light; and  
a second optical system for forming an image of a selected said test pattern chart on an image pick-up apparatus.

4,682,215

# CODING SYSTEM FOR IMAGE PROCESSING APPARATUS

Eiichi Adachi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

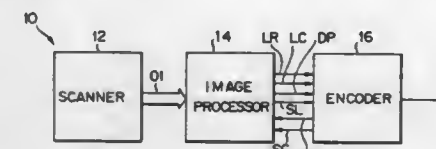
Filed May 28, 1985, Ser. No. 738,351

Claims priority, application Japan, May 28, 1984, 59-108029; Feb. 14, 1985, 60-25146; Feb. 14, 1985, 60-25147

Int. Cl.<sup>4</sup> H04N 1/46

U.S. Cl. 358—75

3 Claims



1. A coding system for reading image information in multiple density levels, dividing the read image information into a plurality of level planes each covering image information of the same density level, sequentially coding predetermined blocks of image information wherein each of said blocks is associated with one of said density levels, said coding system comprising:
  - (a) adding means for adding identification data representative of respective ones of said level planes wherein said identification data is added before coded data associated with said ones of said planes; and
  - (b) means for locating coded data associated with a predetermined one of said level planes based on said added identification data at the beginning of said coded data and means for omitting coded data which does not include valid data from any coded data associated with those of said level planes containing valid data.

4,682,216

# COLOR IMAGE PICTURE FORMING PROCESS AND APPARATUS WHICH IMPROVES THE QUALITY OF THE BLACK PORTIONS OF THE PICTURE

Takashi Sasaki, Tokyo; Nobuaki Sakurada, Yokohama; Hideaki Kawamura, Tokyo, and Jiro Moriyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

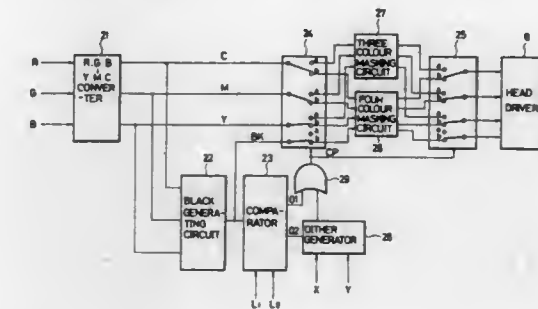
Filed Mar. 1, 1984, Ser. No. 585,234

Claims priority, application Japan, Mar. 8, 1983, 58-37696; Mar. 8, 1983, 58-37697; Mar. 8, 1983, 58-37699; Jan. 18, 1984, 59-6930

Int. Cl.<sup>4</sup> G03F 3/08; H04N 1/40, 1/46; G01D 15/16

U.S. Cl. 358—79

50 Claims



6. A color image picture forming process comprising the steps of:
  - (a) forming dots of colorants of four colors of cyan, magenta, yellow and black;
  - (b) a first expression step of expressing black in the picture using the cyan, magenta and yellow colorants;
  - (c) a second expression step of expressing black in the picture using the black colorant;
  - (d) selecting said first expression step when a black component of color image picture data is smaller than a predetermined value; and
  - (e) selecting said first and second expression steps alternately or at random when the black component is larger than the predetermined value.

38. A color image picture forming process comprising the steps of:
  - (a) forming dots of colorants of three primary colors and black;
  - (b) detecting a black component from color image picture data;
  - (c) combining the black component with a noise signal when the black component is larger than a first predetermined value, wherein the first predetermined value is 50% or more of the highest optical density expressible using the black colorant;
  - (d) expressing black in the picture using the three primary color colorants when the black component is smaller than a second predetermined value lower than the first predetermined value; and
  - (e) expressing black in the picture using the black colorant when the black component is larger than the second predetermined value.

4,682,217

# VIDEO SIGNAL PROCESSING

Morgan W. A. David, Farnham, and David J. Hedley, Winchester, both of United Kingdom, assignors to Sony Corporation, Tokyo, Japan

Filed May 6, 1986, Ser. No. 860,209

Claims priority, application United Kingdom, May 8, 1985, 8511648; May 8, 1985, 8511649

Int. Cl.<sup>4</sup> H04N 13/00, 7/18

U.S. Cl. 358—89

10 Claims

1. A method of processing video signals to achieve a visual effect corresponding to that which would be achieved if an input two-dimensional image were projected onto a three-dimensional surface, the method comprising:

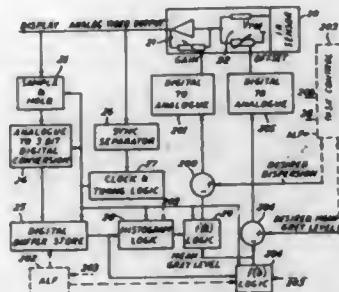








comparing the determined values with corresponding desired values, and



varying the video signal to reduce differences between the determined and desired values.

4,682,230

## ADAPTIVE MEDIAN FILTER SYSTEM

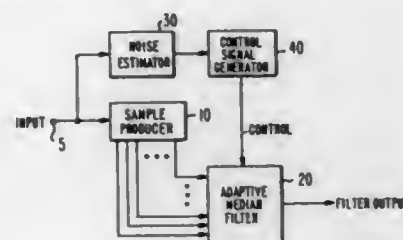
Stuart S. Perlman, Princeton Township, Mercer County; Sanford Eisenhandler, East Windsor; Paul W. Lyons, Plumstead Township, Ocean County, and Michael J. Shumila, Hamilton Township, Mercer County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 21, 1986, Ser. No. 842,644

Int. Cl.<sup>4</sup> H04N 5/21

U.S. Cl. 358—167

8 Claims



1. An adaptive median filter system, comprising: a source of an input signal possibly including noise; means responsive to said input signal for producing successive sets of samples representing said input signal; means for adaptively median filtering said samples responsive to control signal; means responsive to said input signal for estimating the relative density of said noise; and means responsive to said estimated noise density for generating said control signal.

4,682,231

## BRIGHTNESS AND CONTRAST ADJUSTING APPARATUS

Yoshifumi Yamakawa, Shinagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP85/00352, § 371 Date Feb. 10, 1986, § 102(e) Date Feb. 10, 1986, PCT Pub. No. WO86/00483, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 21, 1985, Ser. No. 832,720

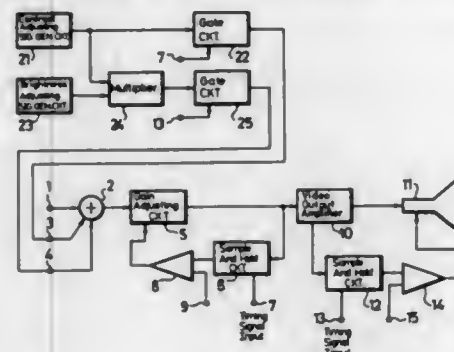
Claims priority, application Japan, Jun. 21, 1984, 59-128114 Int. Cl.<sup>4</sup> H04N 5/58

U.S. Cl. 358—168

5 Claims

1. A brightness and contrast adjusting apparatus, which is characterized in that the apparatus comprises an inserting circuit for inserting first and second reference signals to a video signal, a variable amplifier for amplifying said references inserted video signal, a gain adjusting circuit for detecting said first reference signal from an output of said variable amplifier

and for adjusting a gain of said variable amplifier such that a magnitude of said detected first reference signal becomes equal to a predetermined value, a circuit for supplying the outlet of said variable amplifier to a cathode ray tube, a brightness adjusting circuit for detecting said second reference signal from said supplying circuit and for adjusting a brightness of



said cathode ray tube in response to a magnitude of said detected second reference signal, an adjusting circuit for varying levels of said first and second reference signals, and a constant multiplier circuit for making the level of said second reference signal equal to a constant multiple of the level of said first reference signal.

4,682,232

## CAPACITOR COUPLED CIRCUIT

Tsutomu Takayama; Seiji Hashimoto; Toshio Kaji; Masao Suzuki, and Akihiko Tojo, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

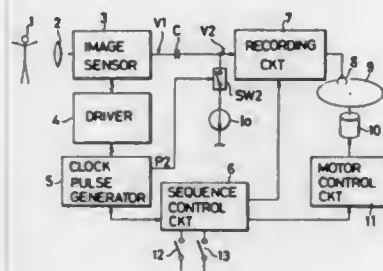
Filed Oct. 4, 1985, Ser. No. 784,843

Claims priority, application Japan, Oct. 11, 1984, 59-211485

Int. Cl.<sup>4</sup> H04N 5/16, 5/18

U.S. Cl. 358—172

18 Claims



1. A capacitor coupled circuit comprising:

- (a) instructing means for instructing said capacitor coupled circuit to start an operation;
- (b) a coupling capacitor disposed in a signal line;
- (c) a current source circuit for flowing a predetermined level of current into or out of said coupling capacitor; and
- (d) a timing signal producing circuit for producing a timing signal to said current source circuit in such a manner that said coupling capacitor is made to effect a charging or discharging by said current source circuit in synchronism with the instruction action of said instructing means.

4,682,233

## VIDEO OUTPUT SIGNAL CLAMPING CIRCUIT

Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, Princeton, N.J.

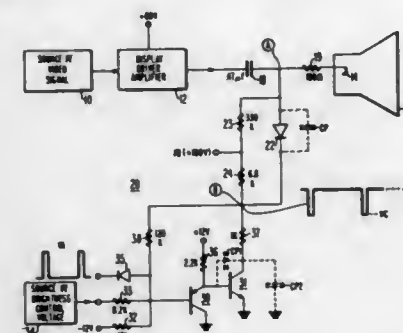
Filed May 29, 1986, Ser. No. 868,084

Claims priority, application United Kingdom, Oct. 1, 1985, 8524199

Int. Cl.<sup>4</sup> H04N 5/18

U.S. Cl. 358—173

9 Claims



1. In a system for processing a video signal having image and blanking intervals, said system including an image display device for displaying video information in response to a video signal applied to an intensity control electrode thereof, and a display driver amplifier, video signal clamping apparatus comprising:

- a capacitor for AC coupling a video signal from an output of said display driver amplifier;
- a video signal path for coupling said video signal from said capacitor to said intensity control electrode;
- a switching network including a switching device having an input electrode and an output electrode having an associated parasitic capacitance, and including a feedback path coupled from said output electrode to said input electrode of said switching device;
- a semiconductor clamping device having a first electrode coupled to said video signal path and a second electrode coupled to a point in said feedback path of said switching network, said clamping device being rendered conductive during said blanking interval and nonconductive during said image interval in response to conductive and nonconductive states of said switching means, respectively; and
- a decoupling impedance, included in said feedback path, connected between said second electrode of said clamping device and said output electrode of said switching means, for decoupling said parasitic capacitance associated with said output electrode of said switching device from said point in said feedback path.

4,682,234

## VIDEO NOISE REDUCTION IN PICTURE-IN-PICTURE TELEVISION RECEIVER

Saiprasad V. Naimpally, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Corp., Knoxville, Tenn.

Filed Dec. 31, 1985, Ser. No. 815,347

Int. Cl.<sup>4</sup> H04N 5/262, 9/64

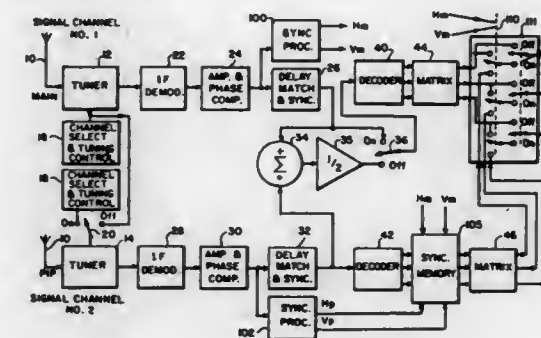
U.S. Cl. 358—183

6 Claims

1. In a television receiver having display means, first and second tuning means for tuning in a first and second selected one of a plurality of television channels, respectively, processing means coupled to said first and said tuning means for processing first and second television signals received on said first and second selected channels, respectively and for applying processed first and second television signals to said display means to create a first and second television picture, respectively, said television receiver further having user-operable selector switch means having an "on" position signifying de-

sired display of both and first and said second television picture and an "off" position signifying desired display of said first television picture only, and output selector means for applying only said first television signals to said display means when said selector switch means is in said "off" position, noise reduction means comprising

means coupled to said selector switch means for automatically tuning said second tuning means to said first selected television channel when said selector switch means is in said "off" position;



combining means connected to said processing means for generating combined signals corresponding to a predetermined combination of said first and second television signals; and additional selector means connected to said combining means and said processing means for substituting said combined signals for said first television signals when said user operable selector switch means is in said "off" position.

4,682,235

## ORTHO-LINEAR IMAGING DEVICE

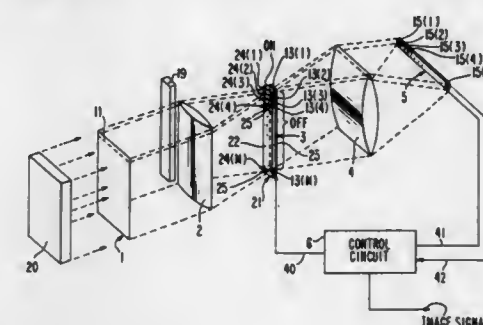
Samuel B. Chism, Jr., Houston, Tex., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Oct. 18, 1985, Ser. No. 789,055

Int. Cl.<sup>4</sup> H04N 3/12

U.S. Cl. 358—212

10 Claims



1. An apparatus for converting a two-dimensional image that has been divided into several imaginary image line segments into electronic form, comprising:

- a linear array of photodetectors for converting light received from the image into electronic signals;
- an image lens situated between the image and the array for focusing each image line segment onto the array;
- a light modulator interposed between the image and the image lens for selectively permitting the illumination of the image lens with light received from one of the image line segments; and
- an object lens positioned between the image and the light modulator for focusing the two-dimensional image onto the light modulator.

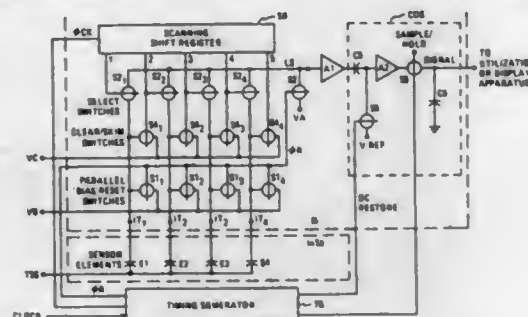
**4,682,236**  
**READ AND CLEAR READOUT CIRCUIT AND METHOD**  
**OF OPERATION OF AN IR SENSING CHARGE**  
**INJECTION DEVICE**

Samuel C. Wang, Liverpool; John M. Swab, Baldwinsville; Michael L. Winn, Liverpool; and Martin D. Gibbons, Camillus, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,474  
 Int. Cl.<sup>4</sup> H04N 3/14

U.S. Cl. 358—213.26

8 Claims



1. In a charge injection device (CID) for optical sensing eliminating readout circuit lag, the combination comprising:
  - A. n optical sensor elements ( $E_{1-n}$ ) arranged in an array on a substrate, each element equivalently representable by a capacitor, diode, and battery network, which when reversely biased to a suitable voltage (VB) forms a potential well in which bias charges are maintained, and as a function of optical irradiance, photon induced signal charges are stored, and
  - B. a readout circuit comprising:
    - (1) n input terminals ( $IT_{1, 2, 3 \dots n}$ ) each connected to one of said n sensor elements ( $E_{1-n}$ ), a node including a sensing line, and a signal output terminal,
    - (2) a first voltage source (VB) and n controllable reset switches ( $S_{1, 2, 3 \dots n}$ ), for periodically biasing said sensor elements to said charge storing voltage (VB),
    - (3) amplification means (A1) having the input thereof coupled to said node, said node exhibiting a capacitance, and an output
    - (4)
      - (i) a second voltage source (VA) having a value selected to remove charge from said potential wells and
      - (ii) a reset switch (S3) for periodically resetting said node to said second voltage,
    - the resetting of said sensor elements and said node to said first and said second voltages, respectively, occurring simultaneously as the first step in the readout sequence of each sensor element,
    - (5)
      - (i) a third voltage source (VC) having a value selected to remove signal charge remaining in the wells after readout or in excess of said value to skim the bias charge, and
      - (ii) n controllable clear/skim switches ( $S_{4, 1, 2, 3 \dots n}$ ) for periodically clearing or clearing and skimming each sensor element
    - (6) timing means including:
      - (i) a scanning shift register providing an output establishing successive sensor readout intervals and successive clearing or clearing and skimming intervals, and
      - (ii) n element select switches ( $S_{2, 1, 2, 3 \dots n}$ ) controlled by said register for connecting successive sensor elements for readout to said node to inject the charges stored in said wells into the substrate as the voltage at said node and the selected sensor element equalize at a voltage dependent on optical intensity, said injection being the second step in the sensor readout sequence,
    - the (jth) timing means output being coupled to the jth select switch for defining the readout interval for the jth sensor and to a prior (e.g. (j-1)th) clearing or clearing and skimming switch for causing clearing or clearing and skimming operation on said prior (e.g. (j-1)th) sensor element, and thereby clearing or clearing and skimming each sensor element after readout on the following sensor readout interval, and
    - (7) a correlated double sampling circuit whose input is connected to the output of said amplification means, and whose output is connected to said signal output terminal for taking a first voltage sample following reset, but prior to injection, and a second voltage sample during injection, the readout value for the selected sensor representing the difference between said first and second sample voltages.

tion being the second step in the sensor readout sequence, the (jth) timing means output being coupled to the jth select switch for defining the readout interval for the jth sensor and to a prior (e.g. (j-1)th) clearing or clearing and skimming switch for causing clearing or clearing and skimming operation on said prior (e.g. (j-1)th) sensor element, and thereby clearing or clearing and skimming each sensor element after readout on the following sensor readout interval, and

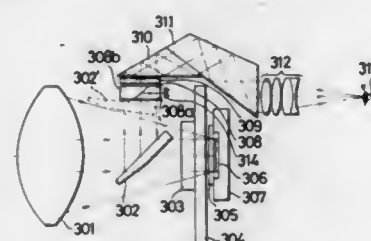
(7) a correlated double sampling circuit whose input is connected to the output of said amplification means, and whose output is connected to said signal output terminal for taking a first voltage sample following reset, but prior to injection, and a second voltage sample during injection, the readout value for the selected sensor representing the difference between said first and second sample voltages.

**4,682,237**  
**PHOTOGRAPHIC OPTICAL APPARATUS**  
 Masatake Kato, Tokyo; Tetsuharu Nishimura, and Hideo Yokota, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha

Filed May 1, 1985, Ser. No. 729,293  
 Claims priority, application Japan, May 7, 1984, 59-90765; Jun. 20, 1984, 59-126825; Aug. 24, 1984, 59-176463; Aug. 27, 1984, 59-179059; Dec. 27, 1984, 59-280576

Int. Cl.<sup>4</sup> H04N 5/225; G02B 13/16  
 U.S. Cl. 358—225

28 Claims



1. A photographic optical apparatus comprising:
  - (a) optical path selecting means for selecting one of two optical paths of an objective optical system;
  - (b) image receiving means arranged in one of the two optical paths to receive an image of said objective optical system and produce a video signal;
  - (c) optical filtering means arranged between said optical path selecting means and said image receiving means to apply optical filtering to an image to be received by said image receiving means;
  - (d) optical directing means arranged on the other of said optical paths to change the direction of said other optical path;
  - (e) a predetermined image plane lying in between said optical path selecting means and said optical directing means;
  - (f) an eyepiece for observing said predetermined image plane through said optical directing means; and
  - (g) optical correcting means for correcting the image performance due to said objective optical system, arranged in a space between said optical path selecting means and said predetermined image plane and having an optical path length which is substantially equal to the optical path length of said optical filtering means.

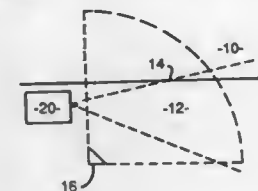
**4,682,238**  
**ENERGY-EFFICIENT LIGHTING SYSTEM FOR**  
**TELEVISION**

Duane C. Cawthorne, Amarillo, Tex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 29, 1986, Ser. No. 823,546  
 Int. Cl.<sup>4</sup> H04N 5/238

U.S. Cl. 358—228

9 Claims



1. A television light intensity control system for a viewing area subjected to natural and controllable artificial light comprising:

a television camera comprising:  
 a transducer means for converting light from the viewing area to an first-signal representative of the intensity of the light; and  
 an optical system for transmitting light from said viewing area into said camera, said system including optical control means for automatically controlling from a maximum value to a minimum value the ratio of light passing from said optical system to light incident upon said optical system;

lamp means for providing the artificial light over the viewing area; and

lamp control means for using the first signal from said transducer means to control the intensity of artificial light from said lamp means to provide only sufficient artificial light as needed to keep the total of artificial and natural light leaving said optical system at a constant intensity, said artificial light being provided while the ratio of said optical control means is a substantially maximum value, said constant intensity being sufficient for said camera to generate a television video signal representative of a satisfactory television picture.

**4,682,239**  
**VERY LARGE VIDEO DISPLAY APPARATUS WHICH**  
**CAN BE CONSTRUCTED OF A NUMBER OF MODULAR**  
**UNITS**

Yuji Watanabe, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 8, 1985, Ser. No. 689,599  
 Claims priority, application Japan, Jan. 13, 1984, 59-5389; Jan. 27, 1984, 59-13877

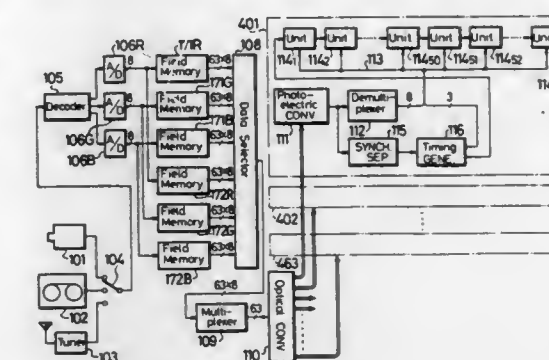
Int. Cl.<sup>4</sup> H04N 3/14, 5/70

U.S. Cl. 358—241

7 Claims

7. A video display system comprising:  
 a video display source for supplying a video signal;  
 a plurality of units arranged to form a display device, each of said units including a plurality of display cells arranged in an X-Y matrix form; and  
 driving means for supplying said video signal to said units; characterized in that  
 said driving means supplies the video signal to said units in a manner that the display cells included in one unit are supplied with the video signal in succession to complete a

whole display of said one unit and the display cells included in a neighboring unit are then supplied with the



video signal to complete a whole display of said neighboring unit so that interlaced scanning of said units occur.

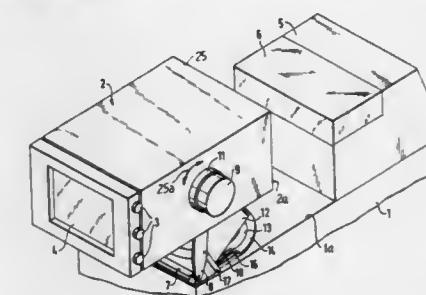
**4,682,240**  
**INTERLOCKED TELEVISION CAMERA AND**  
**ELECTRONIC VIEWFINDER COMBINATION**  
 Horst Bachmann, Reinheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 22, 1986, Ser. No. 866,568  
 Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520457

Int. Cl.<sup>4</sup> G03B 13/10

U.S. Cl. 358—224

20 Claims



1. Television camera and electronic viewfinder combination, in which the television camera (1) has a camera housing formed with an essentially flat top surface (1a) and a tower block (5, 6) projecting upwardly from the top surface; an electronic viewfinder (2) of essentially block structure; first securing means (8, 12) for securing said electronic viewfinder to the top surface (1a) of the camera housing for pivotal movement about a horizontal axis (7) located close to said top surface, to permit pivoting of the electronic viewfinder between a rest position close to the top surface of the TV camera and a working position remote from the top surface; and second securing means (13, 14) for mounting the electronic viewfinder for rotary movement about a vertical axis (13a), and comprising, in accordance with the invention, means for preventing rotary movement of the electronic viewfinder (2) unless the viewfinder block structure is pivoted away from its rest position and into the working position, including means (16, 17, 18, 27, 28) for interlocking the first securing means (8, 12) and the second securing means (13, 14) and for preventing movement about both the horizontal axis (7) and the vertical axis (13a) when the viewfinder is not moved from its rest position into the working position.



4,682,241

## DATA TRANSFER SYSTEM

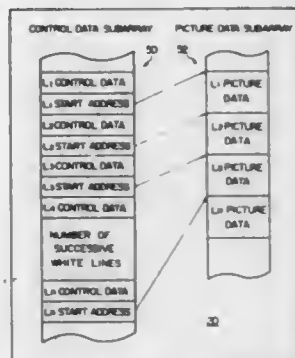
Eiichi Adachi, Tokyo, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,842

Claims priority, application Japan, May 28, 1984, 59-108030  
Int. Cl.<sup>4</sup> H04N 1/419

U.S. Cl. 358—261

3 Claims



1. A data transfer system wherein a common bus is used comprising

first means operative to successively produce pieces of information each consisting of a limited number of data bits, said pieces of information including those having a predetermined nature,

second means responsive to said pieces of information produced by said first means and operative to discriminate pieces of information having said predetermined nature from other pieces of information,

third means for counting the pieces of information having said predetermined nature when such pieces of information occur successively, and

fourth means responsive to encode the successively occurring pieces of information having said predetermined nature into a single piece of information including a code indicating the predetermined nature and a code indicating the number of the successively occurring pieces of information having said predetermined nature.

4,682,242

## APPARATUS FOR IMAGE POSTURE CORRECTION

Yasutoshi Sugita, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

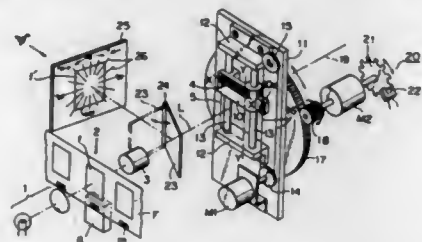
Continuation of Ser. No. 773,220, Sep. 6, 1985, abandoned. This application Dec. 8, 1986, Ser. No. 939,227

Claims priority, application Japan, Oct. 1, 1984, 59-205977

Int. Cl.<sup>4</sup> H04N 1/12; G03B 27/70

U.S. Cl. 358—285

20 Claims



1. An apparatus for correcting a posture of an image comprising:

an image sensor;  
optical means for projecting an image onto said image sensor;  
monitoring means for monitoring the image projected by said optical means;  
correction means for relatively correcting an error of posture of the projected image relative to said image sensor;  
input means for inputting a value corresponding to a deflec-

tion of the image monitored by said monitoring means with respect to a reference position; and  
control means for controlling said correcting means in response to the input value so as to cause the posture of the image projected onto said image sensor to become appropriately corrected.

4,682,243

## MAGNIFICATION RATIO CONVERSION IN IMAGE REPRODUCTION

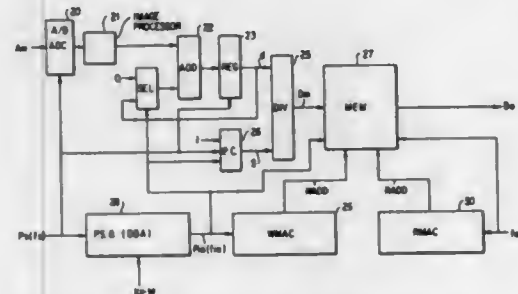
Famihiro Hatayama, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 27, 1985, Ser. No. 716,686

Claims priority, application Japan, Mar. 30, 1984, 59-64657  
Int. Cl.<sup>4</sup> H04N 1/04

U.S. Cl. 358—287

9 Claims



1. A method for controlling image magnification ratio in an electronic image reproduction system, comprising the steps of:

(a) scanning an original image;  
(b) sampling the original image in synchronism with a sampling pulse signal of a constant frequency  $f_s$  independent of a predetermined magnification ratio to obtain corresponding digital image data;

(c) averaging the digitized image data among a number of pixels corresponding to the magnification ratio; and  
(d) writing the image data obtained in step (c) into a memory device, the writing being synchronized with a writing pulse signal of a frequency  $f_{in} = K_2 M f_s$ , wherein  $K_2$  is a constant and  $M$  is the magnification ratio.

4,682,244

## OPTICAL RECORDING DEVICE

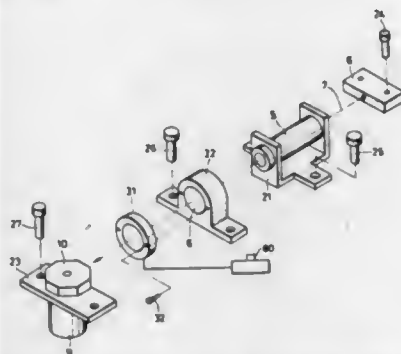
Yoshiyuki Ishitate, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,537

Claims priority, application Japan, Nov. 7, 1984, 59-233337  
Int. Cl.<sup>4</sup> H04N 1/04

U.S. Cl. 358—287

5 Claims



1. An optical recording device for printing scanned images as a whole at a predetermined scale size comprising:

a beam oscillator for producing a beam;  
scanning means for line-scanning the beam produced by the beam oscillator;  
means for receiving the line-scanned beam in the form of a scanned spot and for recording an image formed by the scanned spot; and

aperture means for varying the size of said line-scanned beam and thereby varying the size of printing dots formed by said scanned spot to enhance resolution of a printed scaled image.

4,682,245

## VIDEO AND AUDIO SIGNAL RECORDING, REPRODUCING AND EDITING APPARATUS WITH REPLACEMENT OF VIEWED LUMINANCE SIGNAL COMPONENT DURING INSERT AUDIO EDITING MODE

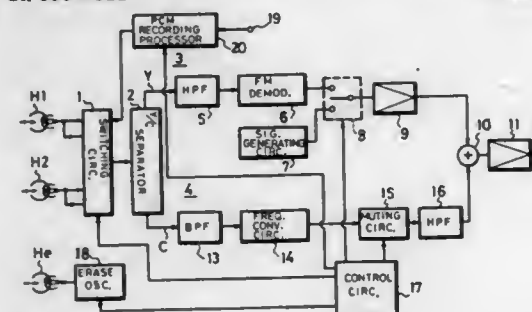
Masahiro Shibata; Tatsuo Tsujibayashi, both of Tokyo; Hiroyuki Sato, Kanagawa, and Yoshinori Machida, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 11, 1986, Ser. No. 872,861

Claims priority, application Japan, Jun. 18, 1985, 60-132639  
Int. Cl.<sup>4</sup> H04N 5/782, 5/91, 9/79

U.S. Cl. 358—311

7 Claims



1. An apparatus for recording and reproducing a color video signal and an audio signal in respective areas of successive slant tracks on a record tape, said apparatus comprising:

first and second rotary heads attached to a rotary drum for recording and reproducing said color video and audio signals in alternate slant tracks on the tape wrapped about said drum; playback circuit means for processing luminance and chrominance components of said color video signal reproduced by said first and second rotary heads; audio circuit means for supplying an audio signal to said rotary heads to be recorded; signal generator means for generating a predetermined substitute signal; muting means for muting the processed chrominance component; and control means for replacing said processed luminance component by said substitute signal from said signal generator means and for operating said muting means to mute said processed chrominance component while said audio signal is recorded to replace a previously recorded audio signal.

4,682,246

## CHARACTERIZING THE INFORMATION TRANSFER CHARACTERISTICS OF A RECORDING MEDIUM

Edward Efron, Irvine; James O. McPherson, Newport Beach, and Young B. Kim, Long Beach, all of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 339,011, Jan. 12, 1982. This application Sep. 30, 1982, Ser. No. 429,349

The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> H04N 17/06; G11B 27/36

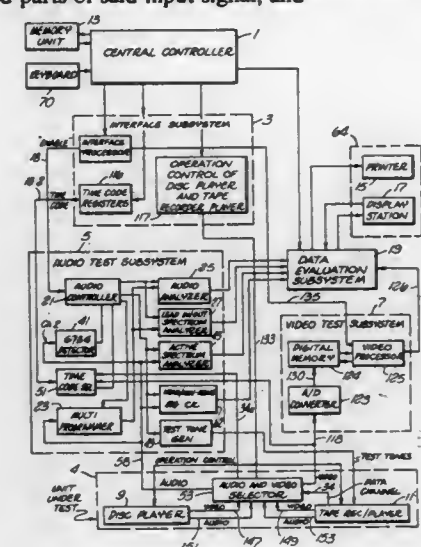
U.S. Cl. 358—335

5 Claims

1. A method of analyzing the signal transferring characteristics of a video signal processing unit comprising the steps of:

(a) establishing an input video test signal of known content;  
(b) measuring selected parameters of selected parts of said video input test signal;  
(c) feeding said video input test signal to said signal processing unit;  
(d) measuring said parameters of parts of the output signal

from said signal processing unit corresponding to said selected parts of said input signal; and



(e) comparing said selected parameters of said input signal with the corresponding parameters of said output signal.

4,682,247

## TAPE SPEED DETERMINING APPARATUS FOR VIDEO SIGNAL REPRODUCING APPARATUS

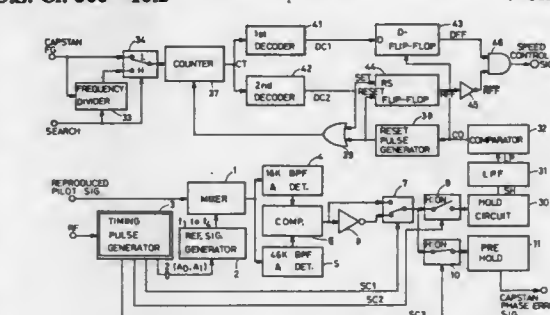
Nobuhide Doutsubo, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 18, 1985, Ser. No. 713,067

Claims priority, application Japan, Mar. 19, 1984, 59-52720  
Int. Cl.<sup>4</sup> H04N 5/783; G11B 15/46

U.S. Cl. 360—10.2

7 Claims



1. A tape speed determining apparatus for a video signal recording/reproducing apparatus, operable at a plurality of operating speeds, using a helical scanning system in which a video signal including a plurality of fields recorded on a video tape in a slanted manner is reproduced by means of a rotating head system in which a plurality of reproducing heads which are switched by a reproducing head selection pulse are mounted on a rotating body, said video tape being recorded with a signal that is intended to be reproduced at one of said plurality of operating speeds, said recording/reproducing apparatus using a pilot signal system wherein a plurality of pilot signals recorded with said video signal in an overlapping manner are reproduced and wherein reference signals are supplied with predetermined timing, said tape speed determining apparatus comprising:

timing pulse generator means for deriving timing pulses in response to said reproducing head selection pulse, including means for generating timing pulses that last for an infinitesimal period of time, and delay means for delaying

by said period of time selection of reference signals from among said reference signals;  
error signal detecting means for detecting, during said infinitesimal period of time, an error signal generated by comparison of the levels of two beat frequencies of said pilot signals, said error signal being sampled by said timing pulses and converted to a pulsed waveform representative of amplitudes of a sequence of said error signals the polarity of which is inverted for alternate fields;  
low pass filter means for deriving from said pulsed waveform a fundamental wave; and  
means for determining from the frequency and waveform of said fundamental wave whether an operating speed at which said fundamental wave is produced is the intended reproduction speed of said video signal and for providing a signal indicative of said determination.

4,682,248

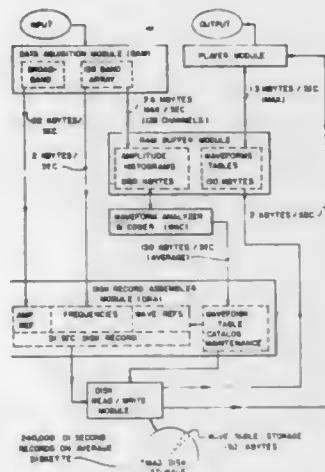
# AUDIO AND VIDEO DIGITAL RECORDING AND PLAYBACK SYSTEM

David M. Schwartz, Englewood, Colo., assignor to CompuSonics Video Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 651,111, Sep. 17, 1984, which is a continuation-in-part of Ser. No. 486,561, Apr. 19, 1983, Pat. No. 4,472,747. This application Sep. 17, 1985, Ser. No. 776,809 Int. Cl.<sup>4</sup> G11B 5/00; G10L 5/02

U.S. Cl. 360—32

3 Claims



1. A microcomputer recording system for recording analog audio and video signals in digital data form comprising:  
converting means for converting an analog audio signal into a multiplicity of digital data streams wherein at least one of said data streams is a relatively broadband reference signal representative of the amplitude of a preselected range of audio frequencies, and wherein another of said data streams is produced by filtering the analog audio signal to produce a data stream channel indicative of a plurality of discrete frequencies encompassed by the bandwidth represented by the first data stream; and  
wherein another of said digital data stream is a reference signal representative of the amplitude of the audio signal for each of plurality of discrete frequencies;  
sampling means for producing a sequential stream of samples in each of said digital data streams;  
selection means for selecting a predetermined portion of the digital data samples produced by said sampling means in each digital data stream;  
means for separately storing each of said selected data samples produced by said sampling means;  
means for comparing the reference data stream containing amplitude data with the reference data stream containing frequency data to produce frequency spectrogram data

representative of the frequency and energy of the original audio signal;  
means for comparing said histogram data with selected waveform parameters and producing addressable data representative of the waveform of the original input data;  
means for sequentially assembling and storing the frequency spectrogram data and the amplitude reference data and the addressable waveform data for subsequent use; and  
converting means for converting an analog video signal into a multiplicity of digital data streams wherein the first of said digital data streams is a sequential time code representative of the beginning of each video frame, and wherein another of said digital data streams is produced by filtering the analog time domain signal to produce a data stream channel indicative of chrominance; and  
wherein another of said data streams is indicative of brightness; and  
wherein another of said digital data streams is indicative of pixel spatial relationships; and  
wherein another of said data streams is indicative of the temporal frame to frame relationships; and  
coding means for receiving each data stream individually, said coding means including means for mathematically transforming each digital data stream into modified data streams each capable of being subsequently analyzed by comparison of the chrominance, brightness and spatial factors present respectively in said modified data streams, and  
means for selecting predetermined data bits from each of said modified data streams after comparison, in a sufficient amount to reconstruct each chrominance, brightness and spatial factors for video presentation, and  
means for storing said digital data bits for retrieval.

4,682,249

# METHOD OF DOCUMENTATING AN INVENTORY, AND A SEALING MECHANISM FOR USE THEREWITH

Kurt Andréasson, Postlada 973, Bollebygd, Sweden (51700)

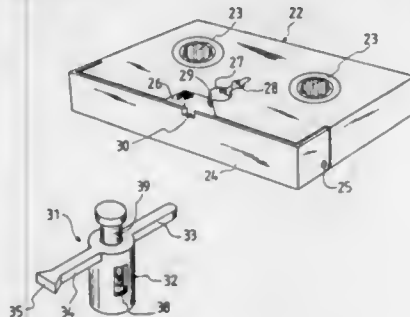
Filed Apr. 18, 1985, Ser. No. 724,414

Claims priority, application Sweden, Apr. 19, 1984, 8402203

Int. Cl.<sup>4</sup> H04N 5/782; G11B 33/00

U.S. Cl. 360—33.1

13 Claims



1. A sealing mechanism to prevent tampering for a magnetic tape cassette of the type wherein a casing is provided with a cylindrical passage having at least one opening in its envelope wall, said mechanism, comprising:  
a body adapted for introduction into said cylindrical passage and having at least one projecting lip for engagement with said envelope wall of said opening;  
protruding members interconnected by a fragile portion to said body so located that a removal of a fitted mechanism is impossible until said protruding members have been separated; and  
at least one arm extending sidewardly from said body and a member means for gripping a lid of said cassette.

4,682,250

# APPARATUS FOR RECORDING A VIDEO SIGNAL SAMPLED AT FREQUENCY F, AND REPRODUCING THE VIDEO SIGNAL AS A SIGNAL ESSENTIALLY SAMPLED AT FREQUENCY 2F

Akira Hirota, Chigasaki, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

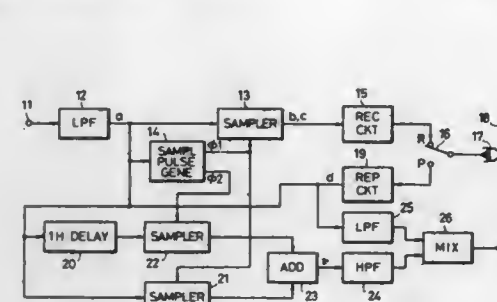
Filed Jun. 13, 1984, Ser. No. 620,016

Claims priority, application Japan, Jun. 15, 1983, 58-107379

Int. Cl.<sup>4</sup> H04N 5/78, 9/491, 5/91

U.S. Cl. 360—33.1

6 Claims



1. An apparatus for recording and reproducing a video signal on and from a recording medium, said video signal being accompanied by synchronizing signals but not by other multiplexed signals, said apparatus comprising:

a sampling pulse generator supplied with a video signal, for producing sampling signals  $\phi_1$  and  $\phi_2$  which are in phase with a horizontal synchronizing signal of the video signal and mutually differ in phase by  $180^\circ$ , each of said sampling signals  $\phi_1$  and  $\phi_2$  having a frequency  $f_s$  which satisfies an equation

$$f_s = (2n + 1)f_H/2,$$

where n is an integer and  $f_H$  is a horizontal scanning frequency of the video signal;

first sampling means for sampling a recording video signal which is to be recorded by the sampling signal  $\phi_1$  which is produced by said sampling pulse generator when said sampling pulse generator is supplied with said recording video signal, said recording video signal having a band with an upper limit frequency  $f_a$ , said frequencies  $f_a$  and  $f_s$  satisfying a relation  $f_a < f_s < 2f_a$ ;

recording and reproducing means for recording an output signal of said first sampling means on the recording medium and for reproducing the signal from the recording medium;

delay means for delaying a reproduced video signal which is reproduced from the recording medium by said recording and reproducing means by a delay time of one horizontal scanning period;

second sampling means for alternately sampling input and output signals of said delay means by the sampling signals  $\phi_1$  and  $\phi_2$  which are produced by said sampling pulse generator when said sampling pulse generator is supplied with said reproduced video signal, said second sampling means comprising a first sampler for sampling the input signal of said delay means by the sampling signal  $\phi_1$ , and a second sampler for sampling the output signal of said delay means by the sampling signal  $\phi_2$ ; and

adding means for adding alternately sampled signals from said second sampling means, and for obtaining a reproduced output signal which has essentially been sampled at a frequency of  $2f_s$ .

4,682,251

# VIDEO SIGNAL REPRODUCING APPARATUS HAVING A NOISE REDUCTION CIRCUIT

Akira Hirota, Chigasaki, and Takaya Tsushima, Ayase, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 20, 1985, Ser. No. 713,787

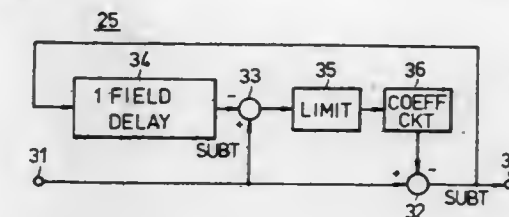
Claims priority, application Japan, Mar. 21, 1984, 59-53997;

Mar. 21, 1984, 59-53998; Mar. 21, 1984, 59-53999

Int. Cl.<sup>4</sup> H04N 5/91

U.S. Cl. 360—33.1

12 Claims



1. A video signal reproducing apparatus comprising:  
reproducing means for reproducing from a recording medium a pre-recorded video signal, said pre-recorded video signal having field correlation and having a predetermined band; and

a noise reduction circuit supplied with a reproduced video signal from said reproducing means for essentially reducing noise included within the reproduced video signal, said noise reduction circuit comprising first and second subtracting circuits supplied with the reproduced video signal from said reproducing means, a one-field delay circuit for delaying an output of said first subtracting circuit by a predetermined time period and for supplying a delayed signal to said second subtracting circuit, said predetermined time period being equal to one field or a time period which is a natural number multiple of one horizontal scanning period and is extremely close to one field, and limiter for amplitude-limiting an output of said second subtracting circuit and for supplying an amplitude limited signal to said first subtracting circuit, said output of said first subtracting circuit being obtained as an output of said noise reduction circuit, said one-field delay circuit having a transmission band which is narrower than a band of said reproduced video signal.

4,682,252

# METHOD AND APPARATUS FOR EVALUATING A RECORDING SYSTEM UTILIZING A PROGRAMMABLE WINDOW GENERATOR HAVING FIRST AND SECOND MULTIVIBRATORS PROVIDING DELAY

Robert F. Smith, Santa Clara County, Calif., assignor to Seagate Technology, Scotts Valley, Calif.

Filed Dec. 2, 1985, Ser. No. 803,732

Int. Cl.<sup>4</sup> G11B 27/00, 5/02; H03K 5/159

U.S. Cl. 360—67

5 Claims

1. A system for evaluating a disc drive having at least one disc storing data on a plurality of tracks by comparing data read back from said disc track to the edges of a fixed window, the data being selectively read from any one of the tracks, said system comprising a first monostable multivibrator having data input coupled to receive the data read from said any one of said disc drive tracks, and delay means for modifying the data rate output of said monostable multivibrator, said delay means comprising a second monostable multivibrator having an input receiving a fixed frequency signal, the output of said second monostable multivibrator being coupled to a control input of said first monostable multivibrator for controlling the time constant of the first monostable multivibrator, whereby the period of said fixed frequency to said second monostable multi-





and a rear section joined to and supporting the front section of said guide ribs and having a height half the height of said front section of said guide ribs, said upper housing section is provided in the other of said pinch guide openings with a pair of similarly formed tape guide ribs, and both said housing sections are provided with partition walls at positions corresponding to and in engagement with the rear section of said respective guide ribs whereby the mating housing sections provide a magnetic tape cassette with improved dimensional accuracy and ease of mold removal during formation.

4,682,259

# MAGNETIC TAPE CASSETTE WITH DUSTPROOF MECHANISM

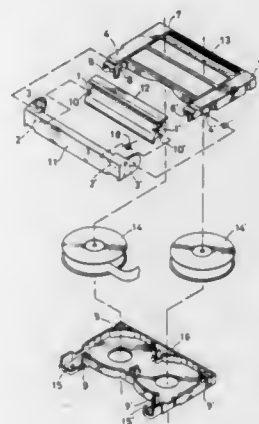
Masatoshi Okamura, Saku; Haruo Shiba, Komoro; Kenji Hashizume, and Yoshiya Sakata, both of Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan  
Filed Aug. 14, 1985, Ser. No. 765,585

Claims priority, application Japan, Aug. 15, 1984, 59-124032[U]

Int. Cl.<sup>4</sup> G11B 23/02

U.S. Cl. 360-132

3 Claims



1. A magnetic tape cassette including:
  - a housing having an opened front portion and being defined by mated upper and lower parts;
  - a front lid pivotally mounted at the front portion for movement between an opened and closed position, said front lid normally being biased to said closed position;
  - an inner lid having two opposed ends and having a pivot at each end for engagement of said front lid, said inner lid being adapted for movement between an opened and closed position, when said front and inner lids are in their closed positions, a magnetic tape which is located between said lids is protected, and when said front and inner lids are in their opened positions said magnetic tape is exposed;
  - comprises:
    - a coil spring having a first and second end and being fitted on one of said pivots of said inner lid, said first end being engaged with said front lid, said second end being engaged with said inner lid, such that said inner lid is normally urged to its said closed position;
    - a guide pin being provided on said end of said inner lid;
    - said housing having a groove for receipt of said guide pin;
    - whereby when said front lid is moved to said opened position, said guide pin of said inner lid travels in said groove thereby moving said inner lid into said opened position.

4,682,260

# MAGNETIC DISK CARTRIDGE

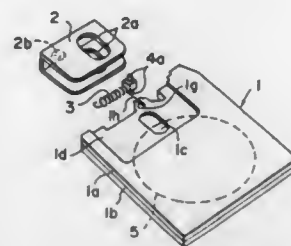
Kengo Oishi, and Osamu Suzuki, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan  
Filed Apr. 16, 1984, Ser. No. 600,434

Claims priority, application Japan, Apr. 22, 1983, 58-60451[U]

Int. Cl.<sup>4</sup> G11B 23/03

U.S. Cl. 360-133

5 Claims



1. A magnetic disk cartridge having a case and a magnetic disk rotatably housed in the case, the magnetic disk cartridge comprising:

- (i) a shutter for opening and closing window sections provided in said case for insertion of a magnetic head for recording, said shutter being fitted on outer wall surfaces of said case in a manner slidable in a direction approximately normal to the depth direction of apertures of said window sections,
- (ii) a spring having two ends for always urging said shutter to close said window sections, the two ends of said spring being engaged respectively with a part of said case and with a part of said shutter, and
- (iii) an engagement means for engaging at least one end of said spring with said case or said shutter via an engagement member, where at least one of said two ends is integrally connected to said engagement means, and wherein said engagement member comprises a block secured to at least one end of said spring and having approximately cylindrical engagement protrusions vertically and symmetrically positioned on the upper surface and the lower surface of said block, and means disposed on said shutter or said case for resiliently receiving and holding in place said protrusions.

4,682,261

# PRODUCTION CONTROL SYSTEM, ESPECIALLY FOR GARMENT MANUFACTURE

Keith Benson, Sheffield, and John McCormack, Derbyshire, both of England, assignors to Production Control Information (PCI) Limited, England

Filed May 12, 1983, Ser. No. 494,147

Claims priority, application United Kingdom, May 14, 1982, 8214090; May 14, 1982, 8214191

Int. Cl.<sup>4</sup> G06F 1/00, 15/46

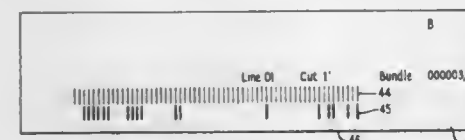
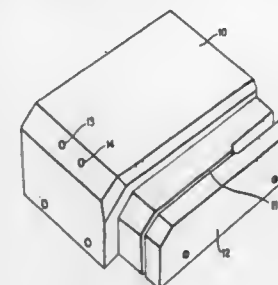
U.S. Cl. 364-468

20 Claims

1. An operator input device (OID) for use in a system of production or work control, comprising a card reader for scanning a card to ticket bearing encoded data when said card is placed in the card reader and generating electrical signals representative of said encoded data, a cable for supply low-voltage external electrical power to the OID over a pair of electrical lines, pulse train-generating-circuitry responsive to the card reader output signals to derive a stream of pulses of at least two different durations representing the encoded data, said pulse train-generating circuitry taking its electrical supply from said pair of lines, and short-circuiting means powered from said pair of lines and responsive to said stream of pulses to substantially reduce the ohmic resistance between said lines for a succession of time periods corresponding to the time durations of said pulses, whereby the data from the card or ticket is

transmitted by the OID on the same cable pair as supplies the OID with its electrical power,

each said card or ticket bearing two parallel bar code tracks, the first being a clock track of regularly spaced thin bars, and the second a data track having either a thick bar or a



space opposite each thin bar bit of the clock track to indicate ones and zeroes,  
said scanning means comprising a first emitter/receiver combination scanning the clock track and a second emitter/receiver combination scanning the data track.

4,682,262

# BATTERY CHARGER SPARK SUPPRESSOR

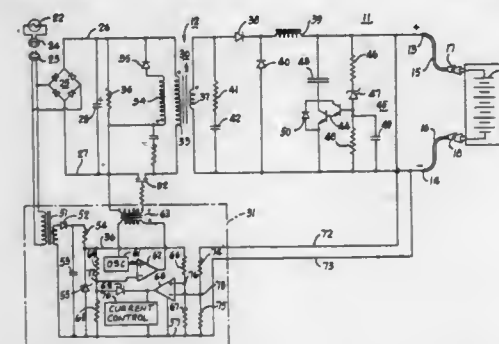
Kurt Monsell, Portville, N.Y., assignor to Acme Electric Corporation, Olean, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,344

Int. Cl.<sup>4</sup> H02H 7/18

U.S. Cl. 361-6

14 Claims



1. A battery charger spark suppression circuit comprising, in combination:
  - first and second output terminals on said battery charger;
  - a semiconductor switch having first and second main electrodes and a control electrode;
  - a large filter capacitor;
  - means connecting said capacitor in series with said main electrodes and connected across said first and second output terminals of said battery charger;
  - means to delay supplying a voltage from said charger output terminals even though the battery charger may be energized until after said battery charger output terminals are connected to a battery to be charged;
  - a bias circuit connected to said control electrode and one of said main electrodes and connected to said battery charger

output terminals to develop a voltage from the battery to be charged to turn on said semiconductor switch; and said bias circuit having an impedance across said battery charger output terminals at least one order of magnitude greater than the impedance of said filter capacitor and semiconductor switch thereby to suppress the possibility of a spark upon connection of said charger output terminals to a battery to be charged.

4,682,263

# ELECTRICAL SHORT-CIRCUIT MONITORING ARRANGEMENT FOR VARIABLE-SPEED, THREE-PHASE MOTORS, INCLUDING THEIR FEED LINES

Eckhard Gradnitzer, Zirndorf, Austria, and Herwig Klantschek, Fuerth, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

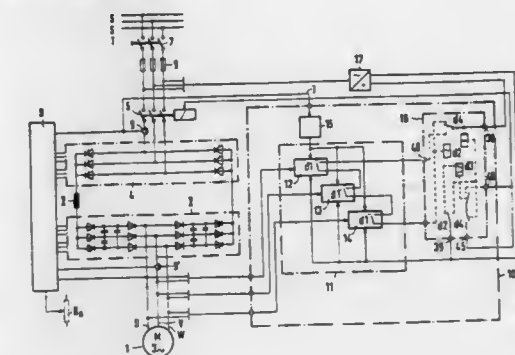
Filed Nov. 15, 1985, Ser. No. 798,266

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442827

Int. Cl.<sup>4</sup> H02H 7/08

U.S. Cl. 361-31

7 Claims



1. An electric short-circuit monitoring circuit for a variable speed three-phase motor and the supply lines thereto, said circuit being of the type having a constant-current, d.c.-link converter with a line-commutated system-end thyristor converter, an intermediate reactance circuit, and a self-commuting machine-end converter, said monitoring circuit comprising:
  - means for monitoring the magnitude level of a ripple voltage superimposed on an output of said d.c.-link converter as a consequence of motor voltage commutation and supplied to each of the three motor phases connected to the output;
  - means for filtering the ripple voltages to obtain harmonic frequency voltages thereof;
  - means for comparing the harmonic frequency ripple voltage magnitude level for each of the phases to a preset reference voltage amplitude;
  - means for generating an interrupt signal in the event that the magnitude of any one of the harmonic frequency ripple voltage levels falls below the preset voltage amplitude reference and
  - means for interrupting the power supply to the motor in response to the interrupt signal.

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# CIRCUIT BREAKER WITH DIGITAL SOLID-STATE TRIP UNIT FITTED WITH A CALIBRATION CIRCUIT

Pierre Demeyer, Uriage, France, assignor to Merlin Gerin, France

Filed Feb. 10, 1986, Ser. No. 827,371

Claims priority, application France, Feb. 25, 1985, 85 03158

Int. Cl.<sup>4</sup> H02H 3/093

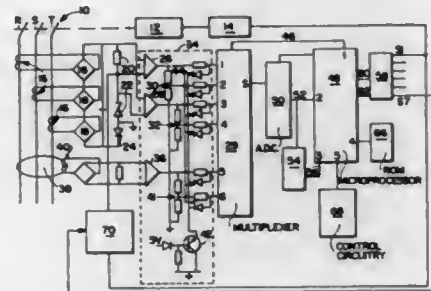
U.S. Cl. 361-96

6 Claims

1. A digital solid-state trip unit for an electrical circuit breaker, comprising:



current sensor means for generating analog current signals proportional to respective currents flowing through conductors protected by said breaker;  
 peak-detector means for rectifying said current signals and for producing a direct analog signal representative of a maximum value of said current signals;  
 calibration circuit means connected to said peak-detector means for multiplying said direct analog signal by at least four gains to produce at least four calibrated outputs to be connected to at least four inputs of an addressable multiplexer means, said gains related by predetermined ratios, said calibration circuit means comprising at least two amplifiers having a predetermined gain ratio, each amplifier having an input connected to said direct analog signal and an output connected to a respective one of said at least four inputs of said addressable multiplexer means and a respective divider bridge, each divider bridge having a mid-point connected to a respective one of said at least four inputs of said addressable multiplexer means;



said addressable multiplexer means having at least four inputs, connected to said calibrated outputs, for selecting one of said calibrated outputs to provide a multiplexer output signal, said multiplexer output signal being a continuous analog signal representative of said selected calibrated output;  
 digital-to-analog converter means, connected to said multiplexer means, for converting said multiplexer output signal to a sampled digitized signal;  
 digital processing means, connected to said analog-to-digital converter means, for providing a circuit breaker tripping order instantaneously or after a short time delay or long time delay when said digitized signal exceeds respective predetermined levels, said multiplexer means being controlled by said processing means to select one of said calibrated outputs compatible with an input range of said analog-to-digital converter means; and  
 circuit breaker trip means activated by said tripping order.

4,682,265

## IONISATOR FOR VEHICLES

László Hirose, Gábor Banati, and Ervin Lipacher, all of Budapest, Hungary, assignors to Medicor Muek, Budapest, Hungary

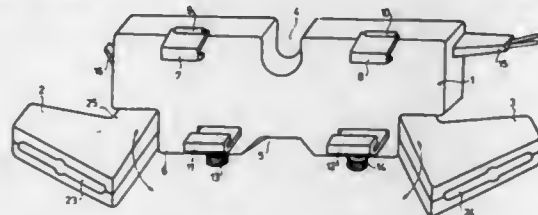
Continuation of PCT HU85/00031, filed May 21, 1985, published as WO85/05598, Dec. 19, 1985.

Filed Jun. 14, 1985, Ser. No. 755,181

Claims priority, application Hungary, May 30, 1984, 2108/84 Int. Cl. B60H 3/00; H01T 23/00

U.S. Cl. 361-231

5 Claims



1. A housing for a vehicle ionisator comprising a body fixed

within the inner space of the motor vehicle and ionisator armatures coupled thereto said body being a flat longitudinal body (1), on both sides of which an ionisator armature (2, 3) is formed in a mirror-symmetrical fashion, a jointed coupling having an oblique axis with respect to a front plate (6) of the body (1) for coupling each of said armatures to said body in an adjustable fashion, and wherein the body (1) comprises fixing elements.

4,682,266

## OZONATOR POWER SUPPLY EMPLOYING A CURRENT SOURCE INVERTER

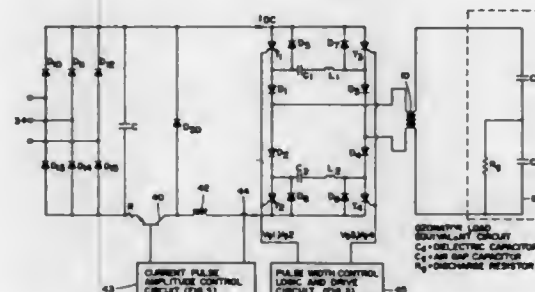
Anh N. Huynh, Edgewood, Ky., and Phoivos D. Ziogas, Branson, Canada, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,862

Int. Cl. H01T 23/00; H02M 7/521

U.S. Cl. 361-235

12 Claims



1. A current source inverter power supply circuit for supplying substantially rectangular current pulses of alternating polarity, alternating in a cycle from a base level to a positive rectangular current pulse, returning to the base level, and then alternating to a negative rectangular current pulse, and then returning to the base level, and then repeating the cycle to generate rectangular current pulses of alternating polarity for an ozonator comprising:

(a) a DC/AC semiconductor switch bridge inverter coupled at its input terminals to a direct current power source and at its output terminals to an electrical load comprising a step up high voltage transformer having its primary winding coupled to said semiconductor bridge inverter and its secondary winding coupled to the ozonator, said semiconductor switch bridge inverter comprising a first semiconductor switch and series connected diode and a fourth semiconductor switch and series connected diode coupled to conduct current in a first direction through the primary winding of said high voltage transformer, and a second semiconductor switch and series connected diode and a third semiconductor switch and series connected diode coupled to conduct current in a second, opposite direction through the primary winding of said high voltage transformer, with each semiconductor switch having a positive electrode, a negative electrode and a gate control electrode;

(b) a forced commutation circuit for commutating off said semiconductor switches, including a first series connected commutating capacitor and inductor connected across the negative electrodes of the first and third semiconductor switches, and a second series connected commutating capacitor and inductor connected across the positive electrodes of the second and fourth semiconductor switches, and fifth, sixth, seventh and eighth commutating diodes connected respectively in parallel, with a reversed polarity, across each of said first, second, third and fourth semiconductor switches, such that each commutating capacitor and inductor coupled thereto to turn off the semiconductor switch across which it is connected; and

(c) a control circuit for generating gating control signals for said semiconductor switches, said gating control circuit controlling the width of the positive substantially rectangular current pulses conducted through the ozonator load in a first direction by gating said first and fourth semiconductor switches on, and then commutating at least one of said first and fourth semiconductor switches off to return to the base level by controlling the timing of a gating signal applied to at least one of said second and third semiconductor switches, which connects a charged commutating capacitor and inductor across and forward biases a commutating diode of at least one of the first and fourth semiconductor switches, and said gating control circuit controlling the width of negative substantially rectangular current pulses conducted through the ozonator load in a second direction, opposite said first direction, by gating said second and third semiconductor switches on, and then commutating at least one of said second and third semiconductor switches off to return to the base level by controlling the timing of a gating signal applied to at least one of said first and fourth semiconductor switches, which connects a charged commutating capacitor and inductor across and forward biases a commutating diode of at least one of the second and third semiconductor switches.

4,682,267

## PANEL ALIGNMENT SYSTEM

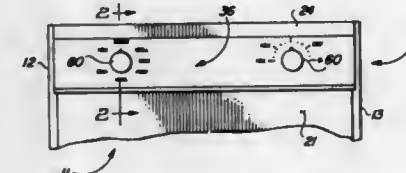
Thomas C. Magilton, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Aug. 1, 1986, Ser. No. 891,484

Int. Cl. H02B 1/00

U.S. Cl. 361-331

9 Claims



1. A control center including panel alignment apparatus, the combination comprising: means defining a control housing; control support means mounted in said control housing; at least one selector switch attachable to said control support means, said selector switch having a generally forwardly extending actuating shaft; a panel member spaced from said control support means and movable relative thereto, said panel member defining an aperture for receiving said actuating shaft, said panel member further including operating indicia associated with said aperture; alignment means attachable to said control support means and including a projecting portion engageable with said panel member for effecting a connection therebetween; and means for attaching one of said selector switch and said alignment means to said control support means in a relatively fixed position and the other in an adjustable position for limited movement relative to said control support means, said actuating shaft being disposed in said aperture and said alignment means being connected to said panel member with said selector switch and said alignment means in said fixed and adjustable positions whereby said actuating shaft and said operating indicia on said panel member are cooperably disposed, the other of said selector switch and said alignment means being movable from said adjustable position for aligning said operating indicia with said actuating shaft of said selector switch, said means for attaching being operable for locking the other of said selector switch and said alignment means in place when alignment is achieved.

4,682,268

## MOUNTING STRUCTURE FOR ELECTRONIC CIRCUIT MODULES

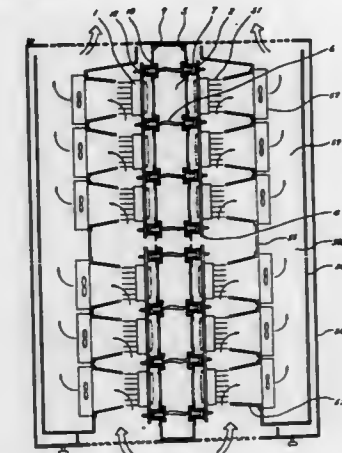
Minoru Okano, and Mitsuo Kohmoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,453

Claims priority, application Japan, Feb. 7, 1985, 60-20883; Feb. 7, 1985, 60-20884; Feb. 19, 1985, 60-21317[U] Int. Cl. H05K 7/20

U.S. Cl. 361-384

8 Claims



1. A mounting structure with electronic circuit modules comprising:  
 a plurality of said electronic circuit modules each having a back panel, a plurality of heat-generating electronic components each having a heat sink for heat radiation and mounted on one surface of each of said back panels, and a plurality of first connectors mounted on the other surface of each of said back panels;  
 a frame having a plurality of first holes and defining a hollow inside structure for mounting said plurality of electronic circuit modules;  
 a plurality of cable assemblies, each of which has at its both ends second connectors engaged with one of said first connectors through one of said plurality of first holes, and connecting said first connectors within said frame; and  
 means mounting said plurality of electronic circuit modules onto said frame.

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## HEAT DISSIPATION FOR ELECTRONIC COMPONENTS ON A CERAMIC SUBSTRATE

Martin J. Pitasi, Newbury, Mass., assignor to Teradyne, Inc., Boston, Mass.

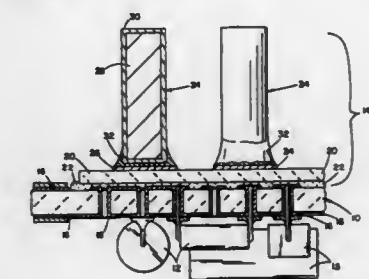
Continuation-in-part of Ser. No. 659,648, Oct. 11, 1984,

abandoned. This application Sep. 9, 1986, Ser. No. 908,779

Int. Cl. H05K 7/20

U.S. Cl. 361-386

7 Claims



1. The combination of a ceramic substrate carrying elec-

tronic components and a heat dissipator for the electronic components, said combination comprising

- a ceramic substrate carrying electronic components on one surface and having an opposite surface,
- a ceramic plate adjacent to said ceramic substrate and having a first surface adhered in heat conductive relationship to said opposite surface of said substrate by a layer of adhesive, said plate having a second surface, and
- a plurality of separate, spaced, free-standing, metallic, cylindrical heat-conducting elements mounted in an array on and extending from said second surface of said ceramic plate, said heat conducting elements being electrically isolated from said electronic components, said elements and exposed portions of said ceramic plate having a combined surface area greater than 1.5 times the surface area of said ceramic plate alone.

4,682,270

## INTEGRATED CIRCUIT CHIP CARRIER

Graham K. Whitehead, Ipswich, and Kenneth Taylor, East Barnet, both of England, assignors to British Telecommunications public limited company, United Kingdom

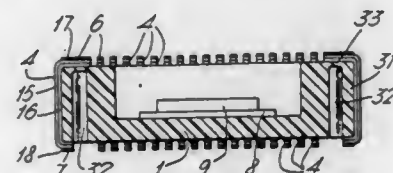
Filed May 16, 1985, Ser. No. 734,650

Claims priority, application United Kingdom, May 18, 1984, 8412674

Int. Cl.<sup>4</sup> H05K 1/18

U.S. Cl. 361-401

31 Claims



1. A leadless chip carrier comprising:

- a body having a die attachment site and a body outer wall portion;
- first contact pads;
- a peripheral sidewall portion radially outward of said body outer wall portion and having a peripheral inner wall portion and a peripheral outer wall portion, said peripheral sidewall portion laterally spaced from said body outer wall portion and having an underside second contact pads for attaching, in use, the chip carrier to a circuit board, said peripheral sidewall portion having a predetermined height, the second contact pads being electrically connected to the first contact pads;
- a link region, disposed near an upper carrier surface remote from said underside, connecting the peripheral sidewall portion to said body, the link region, the peripheral sidewall portion and said body defining a slot disposed generally about a periphery of said body, the link region having a thickness substantially less than said predetermined height and being an elastically deformable region such that, in use, thermally induced strains of the carrier relative to the circuit board are accommodated by the link region.

4,682,271

## PRINTED CIRCUIT BOARD AND METHOD FOR FABRICATION THEREOF

Kazuhiko Yamada, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1986, Ser. No. 844,609

Claims priority, application Japan, Apr. 8, 1985, 60-72563

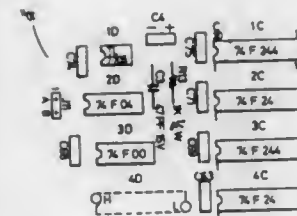
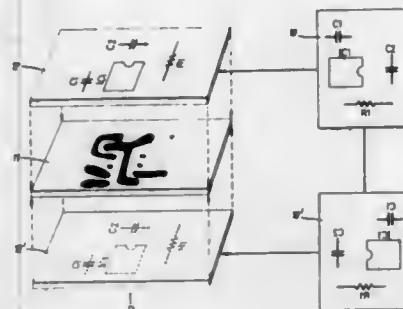
Int. Cl.<sup>4</sup> H05K 1/02

U.S. Cl. 361-409

7 Claims

1. A printed circuit board having a circuit pattern formed on at least one of the first and second faces of a substrate and having images which represent components to be mounted on

said substrate printed on the first face and the second face of said substrate, wherein the images printed on the first face are reversed images of those printed on the second face, and the



reversed images are located at positions on said first face corresponding to respective positions of the images on the second face.

4,682,272

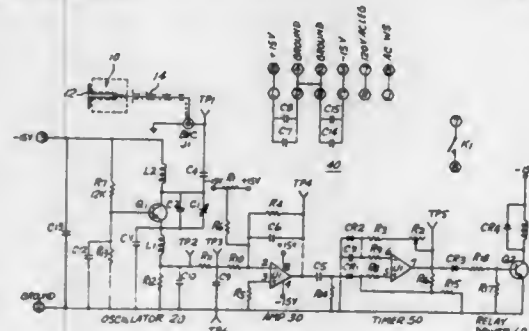
## METHOD OF TESTING AND ADJUSTING A PICO FARAD DETECTOR CIRCUIT

James J. Furlong, Seattle, and Dwayne E. Howe, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash. Continuation of Ser. No. 655,495, Sep. 28, 1984, Pat. No. 4,639,824, and a continuation-in-part of Ser. No. 353,750, Mar. 1, 1982, abandoned. This application Oct. 23, 1986, Ser. No. 922,218

Int. Cl.<sup>4</sup> H01H 47/12

U.S. Cl. 361-437

2 Claims



1. The method of testing and adjusting a picofarad detector circuit comprising the steps of: measuring the capacitance of a sensor cable; comparing waveforms to verify oscillator circuit operation; adjusting sensitivity for maximum voltage shift upon activation of the picofarad detector circuit; adjusting a threshold voltage to provide a threshold voltage having a predetermined level prior to activation of said picofarad detector circuit; and, adjusting the ON time period to a predetermined value subsequent to the step of activating by touching a test wire to a sensor plate.

4,682,273

## ILLUMINATING ANGLE ADJUSTING APPARATUS FOR AN ELECTRONIC FLASH DEVICE

Toshihiko Taniguchi, and Yukio Miki, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

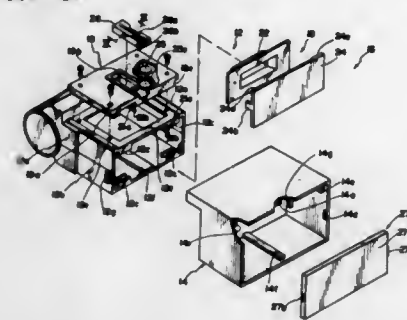
Filed Jan. 16, 1986, Ser. No. 819,348

Claims priority, application Japan, Jan. 18, 1985, 60-5619[U]

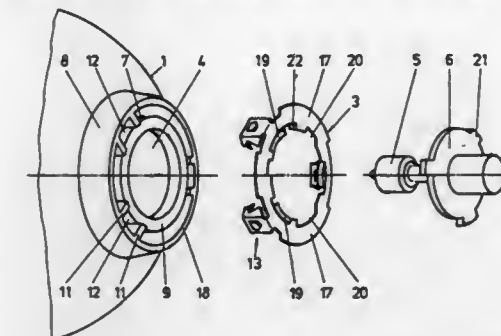
Int. Cl.<sup>4</sup> G03B 15/02

U.S. Cl. 362-18

9 Claims



a quadrilateral shape and being substantially as deep and wide as said tabs; said barbs engaging edges of said openings; said



securing tabs being bent into a U-shape; said openings in said reflector receiving said tabs.

1. An illuminating angle adjusting apparatus for an electronic flash device, comprising:

- a body member including a motor for generating a driving force;
- a light emitting portion disposed in said body member and including a light emitter;
- a zooming frame carrying an optical lens at its front portion and movable relative to said light emitting portion for adjusting an illuminating angle of said electronic flash device;
- a transmission mechanism for moving said zooming frame relative to said light emitting portion, said transmission mechanism including a driving force output means disposed almost at the center of said body member in the lateral direction and a driven means disposed almost at the center of said zooming frame for engaging with said driving force output means thereby being moved by said output means; and
- a pair of guide means disposed on the respective side portions of said body member and said zooming frame, each of said guide means including guide portions disposed in said body member and said zooming frame respectively, and said guide means being disposed almost in the same vertical position as said transmission mechanism.

4,682,275

## MOUNT STRUCTURES FOR SUSPENDER MEMBERS OF PORTABLE FLASHLIGHTS

Kelichi Ohashi, Shizuoka, Japan, assignor to Skylight Industry Co. Ltd., Japan

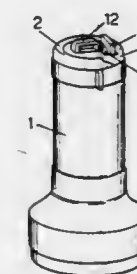
Filed May 9, 1986, Ser. No. 861,408

Claims priority, application Japan, Nov. 21, 1985, 60-262159

Int. Cl.<sup>4</sup> F21L 15/14

U.S. Cl. 362-191

1 Claim



1. A mount structure for a suspender member of a portable flashlight which includes a female member integrally provided on a body of the portable flashlight and a male member detachably fitted over the female member in a sliding manner, said female member having therein a retainer groove into which a first projection of said male member is slidably fitted from one direction and a stopper member for limiting the movement of said projection, said male member having a second operable projection which can be locked in a locking hole formed in said female member in a state where said first projection is fitted into said retainer groove and restrained by said stopper member of said female member, said second operable projection being resiliently supported in such a manner that it can be engaged within or disengaged out of said locking hole, and being usually biased for lacking within said locking hole, said male member being fixed relative to the female member with said second operable projection and stopper member in a state where said second operable projection is locked within said locking hole, and said male member having a hook member through which a desired suspender strap is inserted.

4,682,274

## AUTOMOTIVE HEADLIGHT

Erwin Freudenreich; Horst Flerlage, both of Lippstadt, and Karlernst Sewing, Lippstadt-Hörste, all of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,463

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602234

Int. Cl.<sup>4</sup> H01R 33/46; F21M 3/00

U.S. Cl. 362-61

11 Claims

1. An automotive headlight comprising: a bow-shaped plastic reflector having an apex and an opening at said apex; a sheet metal retaining ring surrounding said opening at the rear of the reflector; an incandescent lamp held by said retaining ring and inserted into said opening at said apex; securing tabs on said retaining ring, said securing tabs being bent back toward said reflector; barbs on said securing tabs for securing said retaining ring to said reflector; opening forming means on said reflector at said apex and surrounding said opening at said apex, said opening forming means forming a plurality of openings having



4,682,276

# LOW VOLTAGE LIGHTING FIXTURE WITH INTEGRAL THERMALLY CONTROLLED COAXIAL TRANSFORMER

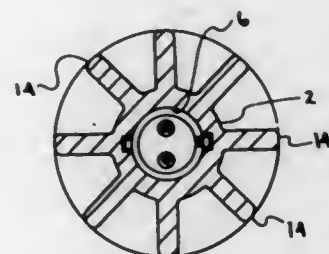
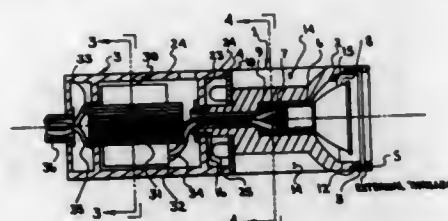
Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed Apr. 22, 1986, Ser. No. 854,561

Int. Cl. F21V 29/00, 7/00

U.S. Cl. 362-294

10 Claims



1. A low voltage lighting fixture comprising:
  - a lamp housing having distal and proximal ends and made of heat conducting material, having an electrically connecting lamp socket on a central axis, a low voltage lamp supported substantially within the distal end of the housing by the lamp socket and a plurality of cooling fins disposed about the exterior of the lamp socket;
  - a generally planar thermal barrier made of a heat insulating material, disposed at the proximal end of the lamp housing and in thermal contact with a portion of the area of the lamp housing cooling fins;
  - a tubular transformer housing coaxially disposed at the proximal end of the lamp housing, attached thereto in abutment with the thermal barrier and in thermal contact with a portion of the area of the thermal barrier; and
  - a transformer means disposed within the transformer housing, having high voltage input electrical conducting means connectable to a source of external alternating current power and low voltage output electrical conducting means passing through the thermal barrier and connected to the lamp socket of the lamp housing.

4,682,277

# MOVABLE LIGHT SOURCE TYPE EXPOSURE APPARATUS

Yoshio Yazaki, Tokyo, Japan, assignor to ORC Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 11, 1986, Ser. No. 884,516

Claims priority, application Japan, May 24, 1986, 61-119899

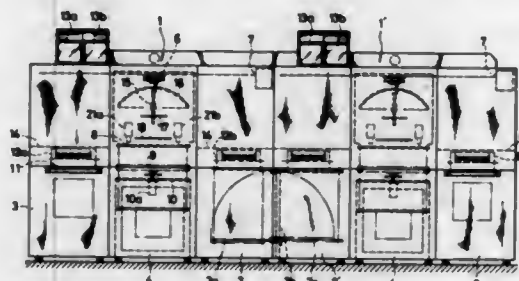
Int. Cl. F21V 7/00; G03B 27/54

U.S. Cl. 362-296

1 Claim

1. An exposure apparatus of movable light-source type, comprising a light source disposed at a position corresponding to a focal point of a substantially parabolic reflector, a first light-shielding member disposed right beneath said light source and intended to prevent the light rays from said light source from being irradiated directly over an original image and a material to be exposed; a second light-shielding member disposed at a position closer to the position of said original image and material to be exposed so as to cause the formation of a shadow capable of making equal the cumulated amounts of

light rays at points thereon, a positioning/fixing means intended, for each exposure, to position and fix a retaining frame for said original and a retaining frame for said material to be exposed, and a light-source moving means for moving a lamp



housing having said substantially parabolic reflector, light source, first light-shielding member and second light-shielding member over said original and said material to be exposed for purpose of causing the material to be exposed.

4,682,278

# PROCEDURE AND DEVICE FOR DETECTING THE NON-CONDUCTING STATE OF TURN-OFF THYRISTORS

Rainer Marquardt; Theodor Salzmann, both of Erlangen, and Michael Peppel, Koenigstein, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

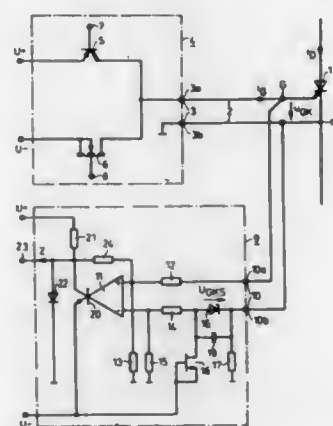
Filed Sep. 12, 1985, Ser. No. 775,471

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1984, 3434607

Int. Cl. H02H 7/122

U.S. Cl. 363-58

58 Claims



1. A device for operating a turn-off thyristor comprising: a threshold voltage comparator circuit having: a first input connected to a gate terminal of the turn-off thyristor at a second input terminal; a negative threshold voltage value reference element connected within the threshold voltage comparator circuit in series with the second input terminal; a status signal output for issuing a status signal when the voltage between the first input and the second input terminal is less than the negative threshold voltage; and a differential amplifier connected within the threshold voltage comparator as a zero voltage comparator having its output connected to the status signal output having a first input connected to the threshold voltage comparator first input, and a second input connected in series with a reference voltage element to the threshold voltage comparator circuit second input in order to generate the negative threshold voltage value.

4,682,279

# OPERATION MODE CONTROLLER

Shin Watabe, Nishibiwajima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 616,244, Jun. 1, 1984, abandoned. This

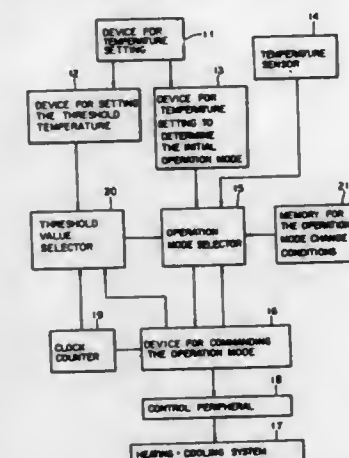
application Dec. 1, 1986, Ser. No. 937,451

Claims priority, application Japan, Jun. 7, 1983, 58-101438

Int. Cl. G05B 11/01; F25B 29/00

U.S. Cl. 364-141

8 Claims



1. An operation mode controller for controlling a system having at least three operation modes comprising:
  - sensing means for determining a current value of a specific variable;
  - means for presetting a desired value of said specific variable;
  - means for presetting a plurality of sets of threshold values of said specific variable, each said set of threshold values associated with one of the operation modes and each set may contain an upper value limit and a lower limit value;
  - selecting means for choosing a first one of said plurality of sets of threshold values to provide change condition information;
  - memory means for storing change condition information in the controller;
  - operation mode selector means for comparing the current value of the specific variable and threshold values of said first one of said plurality of sets of threshold values chosen by said selecting means; wherein a new one of said operation modes is selected only when the current value of the specific variable exceeds said upper value limit or falls below said lower value limit of said first one of said plurality of sets of threshold values, said new operation mode being selected in accordance with said change condition information in said memory means;
  - means for producing a command for an operation mode in response to the operation of said operation mode selector means, a first operation mode being changed to said new operation mode when said new one of said operation modes is selected by said operation mode selector means, the first operation mode being unchanged when said operation mode selector does not select said new one of said operation modes, said command being sent to a control peripheral of the system and to said selecting means;
  - counter means for sending a signal to said selecting means at a predetermined time  $t$  after the means for producing a command produces a command for the operation mode;
  - said selecting means further selecting a set of threshold values from said means for presetting a plurality of sets of threshold values that corresponds to the operation mode that corresponds to said command after receiving said signal from said counter means; and
  - means for setting an initial operation mode wherein said current value of said specific variable is compared to a preset initial value.

4,682,280

# SIMULATION ARRANGEMENT FOR DETERMINING DESIRED VALUES FOR THE TRANSPORT OF WORKPIECES OF A MULTISTAGE PRESS

Franz Schneider, Helmut Brattinger, and Otto Feinauer, all of Göttingen, Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

PCT No. PCT/DE84/00277, § 371 Date Aug. 22, 1985, § 102(e)

Date Aug. 22, 1985, PCT Pub. No. WO85/02921, PCT Pub. Date Jul. 4, 1985

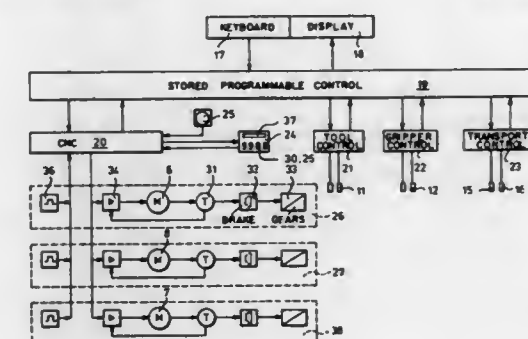
PCT Filed Dec. 19, 1984, Ser. No. 768,478

Claims priority, application European Pat. Off., Dec. 24, 1983, 83113091.9

Int. Cl. G05B 19/42; G06F 15/46

U.S. Cl. 364-191

8 Claims



1. A multi-stage press simulation arrangement for determining desired values for the transport of a workpiece and related gripper movement and tool automation by using less than all the elements of a multi-stage press comprising:
  - transport means separate from said multi-stage press for physically replicating the movement of at least one transport means of said multi-stage press, the transport means including movable transfer rails carrying gripping devices and moving along guide means and at least one driving means for driving said transfer rails through braking means and movement changing means;
  - a means for tool automation, a means for gripper control and a means for control of a workpiece transport connected to said transport means; and
  - a program control means for controlling the movement of said transport means through said driving means and generating a program to be used on said multi-stage press for the sequence of movement of said transport means with respect to said tool automation means, gripper control means and said transport control means.

4,682,281

# DATA STORAGE UNIT EMPLOYING TRANSLATION LOOKASIDE BUFFER POINTER

Gary A. Woffinden, Scotts Valley, and Donald L. Hanson, Los Altos Hills, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Aug. 30, 1983, Ser. No. 528,094

Int. Cl. G06F 12/08, 12/10

U.S. Cl. 364-200

9 Claims

1. A memory apparatus for a data processing system that generates logical addresses identifying requested data stored at locations in a mainstore addressed by system addresses; the apparatus comprising:
  - register means, adapted for communication with the data processing system, for storing a requesting logical address, the logical address including a first field and a second field;
  - translation lookaside buffer means, in communication with the register means, for storing translations to system addresses at translation lookaside buffer locations addressed by the first field of the requesting logical address;





4,682,286

## SYSTEM FOR SUPERVISING PHOTOMECHANICAL PROCESS

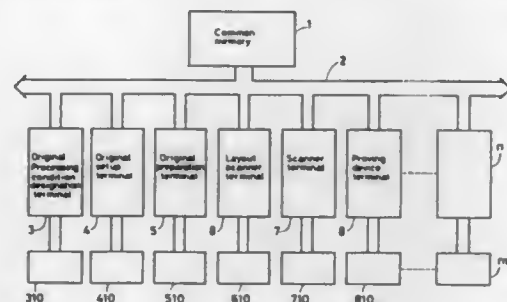
Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Nov. 21, 1984, Ser. No. 674,329

Claims priority, application Japan, Dec. 30, 1983, 58-247933 Int. Cl. G06F 13/12, 13/16

U.S. Cl. 364-200

9 Claims



1. A method for supervising a photomechanical process comprising the steps of:

- inputting data via a bus into a common memory unequipped with a CPU by means of a terminal attached to operate a device;
- transmitting data when necessary via the bus from the memory by means of the terminal to carry out a stage of the photomechanical process by the device;
- renewing the data to operate the device stored in the memory when operation of the device completes; and
- rewriting as necessary the data stored in the memory to operate the device only by means of the terminal corresponding to the device.

4,682,287

## ELECTRONIC ODOMETER

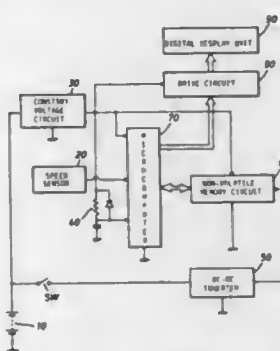
Tooru Mizuno, Nagoya; Keizi Oosugi, Kariya; Motoharu Esaki, Ooba, and Takao Ogawa, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 28, 1984, Ser. No. 645,154

Claims priority, application Japan, Aug. 30, 1983, 58-158387 Int. Cl. G06F 15/20; G01C 22/02

U.S. Cl. 364-561

4 Claims



2. An electronic odometer adapted for use in a wheeled vehicle, comprising:

- speed detecting means for producing a series of speed signals, respectively indicative of a speed of the vehicle;
- main non-volatile memory means, having first to mn-th storage means each of which can respectively store therein a first binary digit indicative of a predetermined unit travel distance of the vehicle only one of said storage

areas changing its stored binary digit value in response to the increment if said predetermined unit travel distance; auxiliary non-volatile memory means for incrementally storing therein a plurality of second binary digits, each indicative of mn times said predetermined unit travel distance; data processing means including: (a) first means for repetitively determining said predetermined unit travel distance in response to said speed signals, (b) second means responsive to each determination of said predetermined unit travel distance for sequentially searching said storage areas of said main non-volatile memory means to determine whether said first binary digit is respectively stored in all the storage areas of said main non-volatile memory means, and for applying said first binary digit to only one of the non-stored storage areas of said main non-volatile memory means if said first binary digit is not stored in all of said storage areas, and for applying said second binary digit to said auxiliary non-volatile memory means and erasing all of said first binary digits stored in the storage areas of said main non-volatile memory means if said first binary digit is stored in all of said storage areas, and (c) third means for determining a total mileage of the vehicle based on the first and second binary digits respectively stored in said main and auxiliary non-volatile memory means and for producing an output signal indicative thereof; and display means responsive to the output signal from said third means of said data processing means for indicating the total mileage of the vehicle.

4,682,288

## ELECTRONIC CONTROL FOR TOTALING DENOMINATIONS OF SEVERAL COUNTRIES

Dale L. Taipale, Delafield, and John G. Brome, Waukesha, both of Wis., assignors to Brandt, Inc., Watertown, Wis.

Continuation of Ser. No. 899,761, Aug. 21, 1986, abandoned,

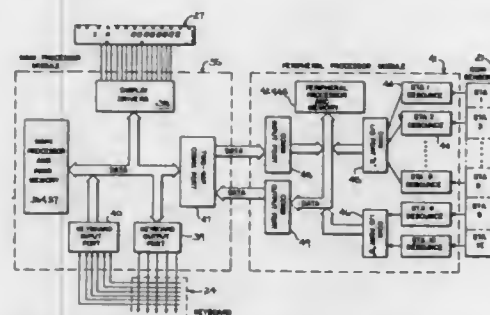
which is a continuation of Ser. No. 596,439, Apr. 3, 1984,

abandoned. This application Nov. 24, 1986, Ser. No. 935,625

Int. Cl. G07G 7/48, 1/12; G07D 9/00; G06M 9/00

U.S. Cl. 364-406

12 Claims



1. An electronic device for totaling and displaying monetary values by denomination from a batch of coins in one of a plurality of national monetary systems, the electronic device being connectable to a coin sorter of a type having a plurality of coin slots for receiving a plurality of denominations in the batch of coins and of a type having signal generating means responsive to coins passing into the coin slots for generating signals indicative of the number of coins in a respective denomination passing into each of the respective slots, wherein the electronic device comprises:

- user-operable input means operable at some times for entering individual values for respective denominations of a selected national monetary system, said user-operable input means also being operable at other times for entering commands to display accumulated monetary values for the respective denominations in the batch of coins;
- arithmetic means connectable to detect the signals from the signal generating means, said arithmetic means being

responsive to such signals and to the individual values entered through the user-operable input means for calculating accumulated monetary values for the respective denominations in the batch of coins based on the individual values entered through the user-operable input means; display means for displaying accumulated monetary values for the respective denominations in the batch of coins; and communication means coupled to the user-operable input means for receiving the individual values of the respective denominations, said communication means also being coupled for transmitting the individual values to the arithmetic means and being coupled for receiving the accumulated monetary values from the arithmetic means, said communication means being responsive to one of the commands entered through the user-operable input means for selecting an accumulated monetary value for one of the respective denominations in the batch of coins for display on the display means.

4,682,289

## VIEW INTERPOLATION IN A TOMOGRAPHY SYSTEM USING PIPE LINE PROCESSING

Eitaro Nishihara, Tochigi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

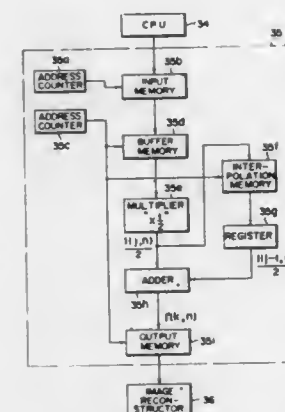
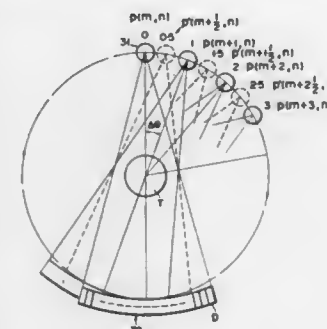
Continuation of Ser. No. 455,999, Jan. 6, 1983, abandoned. This application Jan. 23, 1986, Ser. No. 821,211

Claims priority, application Japan, Jan. 6, 1982, 57-380

Int. Cl. G06F 15/42; A61B 6/03

U.S. Cl. 364-414

13 Claims



1. A computerized tomography apparatus for reconstructing a cross-sectional image of an object comprising source means for directing fan-shaped beams of radiation to pass through the object; detector means having a plurality of elements for detecting the radiation through the object along a plurality of paths of said fan-shaped beams and for providing measured projection data representative of radiation intensity integrated along each of said paths; scanning means for rotating at least said source about the

object to cause said fan-shaped beams to assume successive different angularly spaced viewpoints m relative to the object

estimating means for generating estimated projection data for imaginary viewpoints between said viewpoints m, said estimating means including: transfer means for transferring a train of said projection data obtained from said detector means at said viewpoints m, said train periodically including two successive identical projection data therein, and adding means for successively adding the last two projection data transferred from said transfer means to generate a stream of said measured projection data with said estimated projection data interspersed at positions among said measured projection data corresponding to positions of said imaginary viewpoints among said viewpoints m; and image reconstruction means for performing convolutions and back projections of the estimated projection data provided from said estimating means to reconstruct the cross-sectional image of the object.

10. A computerized tomography apparatus for reconstructing a cross sectional image of an object comprising:

source means for directing fan shaped beams of radiation to pass through the object; detector means having a plurality of elements for detecting the radiation through the object along a plurality of paths of said fan shaped beams and for providing corresponding output signals representative of radiation intensity integrated along each of said paths; scanning means for effecting relative rotation between said source means and said detector means and for obtaining projection data from said output signals at different viewpoints with respect to said object; transfer means receiving the projection data from said scanning means and transferring projection data indicated by a maximum integer which does not exceed  $C \times N$  at transfer sequence N, where C is a constant larger than 0 and less than 1, and N is a successive integer; generating means comprising a memory device for storing the projection data transferred from said transfer means at transfer sequence N-1, multiplying means for multiplying the projection data transferred from said transfer means at transfer sequence N-1 and the projection data transferred from said transfer means at transfer sequence N by respective weighting values, and adding means for adding the projection data transferred from said transfer means at transfer sequence N-1 and N and multiplied by said respective weighting values to provide estimated data at  $C \times (N-1)$  viewpoint; and image reconstruction means for forming a reconstructed image of the object from said estimated projection data to reconstruct the cross sectional image of the object.

4,682,290

## METHOD OF RECONSTRUCTING A HIGH RESOLUTION IMAGE BY TOMODENSITOMETRY

Siv C. Tan, Paris; Didier Le Galle, Jouy en Josas, and Claude Benchimol, Paris, all of France, assignors to Thomson - CGR, Paris, France

Filed Mar. 26, 1985, Ser. No. 716,354

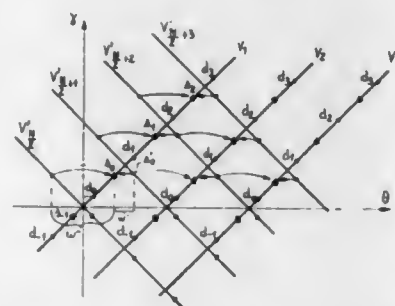
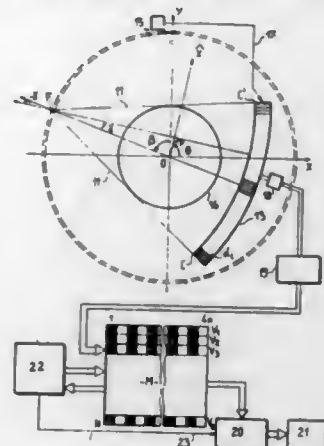
Claims priority, application France, Mar. 30, 1984, 84 05042 Int. Cl. G06F 15/42, 15/52

U.S. Cl. 364-414

2 Claims

1. A method of reconstructing images by tomodensitometry, of the type having a source-detectors assembly, the method comprising rotating a source-detectors assembly in the plane of a section whose image it is desired to form, said source emitting a penetrating radiation beam in the form of a fan and taking and storing a succession of views for different rotational angles  $\beta$  of the source-detectors assembly with respect to a fixed reference axis system (XOY) of said plane, a plurality of detectors being arranged so as to converge towards the focal point (F) of

said source and each view being sampled for angles  $\gamma$  representative of the detectors and referenced from a straight line (OF) joining a center of rotation (O) of the source-detectors assembly and said focal point (F), an angular shift between two adjacent



detectors  $\Delta\gamma$  being constant and an angular shift between views being constant, with the angular shift between said straight line (OF) and the nearest detector thereto adjusted to

$$\left| \frac{\Delta\gamma}{4} \right|$$

and

taking and storing a series of views spaced apart over a complete revolution of said source-detectors assembly, measuring for each view a number of intermediate values representing sampling interlaced with that of said detectors, each intermediate value of a given angle  $\gamma$  being obtained by a combination of at least two linear absorption values inferred from measured values taken from the views situated on each side of a fictitious view whose image by a transformation  $T(\theta, \gamma) = (\theta + (2k-1)\pi, -\gamma)$  contains a point representative of said intermediate value in a space  $(\theta, \gamma)$  with  $\theta = \beta + \gamma$  and  $k$  a relative integer, said measured values of said views being taken from an angle detector opposite one of said desired intermediate value, and applying a reconstruction algorithm, comprising a convolution and a rear projection to the views thus completed by said intermediate values.

4,682,291

#### NOISE ARTIFACTS REDUCTION

Asher Reuveni, Natanya, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Oct. 26, 1984, Ser. No. 665,047

Int. Cl. G06F 15/42; G01T 1/29; G01N 23/04

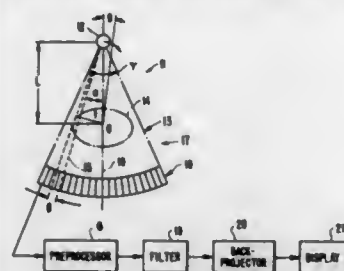
U.S. Cl. 364-414 18 Claims

1. A method for rearranging divergent beam derived data to obtain tomographic images with uniform noise distribution, the method including the steps of:

directing divergent beams of penetrating radiation through a

body being examined from source means on one side of said body, angularly displacing the divergent beams relative to the body,

detecting radiation that has passed through the body at a number of angularly spaced positions to derive sets of detected radiation data representative of a plurality of angularly spaced shadowgrams indicative of the absorption of the radiation by different portions of the body,



reordering the sets of detected radiation data from sets of data corresponding to divergent projections to sets of data corresponding to parallel projections, said reordering step including the step of interpolating using uniform noise distribution interpolation, rebinning at least a portion of the sets of data corresponding to said parallel projections to form another set of parallel projections, and using the rebinned data in the formation of a displayed image.

4,682,292

#### FAULT TOLERANT FLIGHT DATA RECORDER

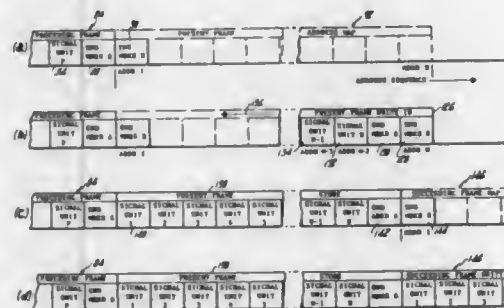
Richard L. Bue, West Hartford, and Ratchford Michael, East Granby, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 23, 1984, Ser. No. 633,730

Int. Cl. G11B 5/02

U.S. Cl. 364-424

5 Claims



1. The method of storing serial bit data signal units in electronic memory, comprising the steps of:

arranging the data signal units in successive frames, serially, from a data signal unit to a last data signal unit in each frame;

adding first and second pointer signal units following said last data signal unit in each frame, said first pointer and second pointer signal units and said data signal units each having a plurality of signal bits; and

storing the frames at successive memory address locations in electronic memory, by first storing said second pointer signal unit of a present frame to a first address location furthest from a preceding stored frame, and proceeding serially backwards with the data signal units until said first data signal unit of the present frame is stored at the address location of said second pointer signal unit of said preceding stored frame to replace said second pointer signal unit of said preceding stored frame, whereby said present frame is stored with said first and second pointer

signal units and said preceding stored frames are stored with said first pointer signal unit.

4,682,293

#### AUTOMATIC REGULATING PROCESS AND DEVICE FOR MULTIFUEL INTERNAL COMBUSTION ENGINES

Emanuel Goldenberg, Poissy, and André Douaud, Puteaux, both of France, assignors to Institut Français du Pétrole, Rueil-Malmaison, France

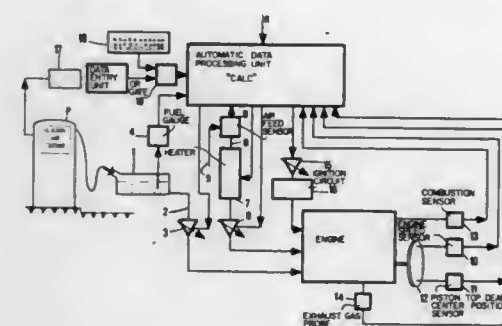
Filed Oct. 28, 1982, Ser. No. 437,241

Claims priority, application France, Oct. 28, 1981, 81 20372

Int. Cl. F02M 43/00; G06D 11/02; G06F 15/20

U.S. Cl. 364-431.05

7 Claims



1. Apparatus for automatically regulating the running conditions of an internal combustion engine connected to a fuel tank, the apparatus comprising:

means for connecting the fuel tank to the engine, the connecting means including only a single fuel line extending between the fuel tank and the engine, the single fuel line having a valve therein, the valve having valve control means associated therewith for controlling flow of fuel through the fuel line;

an automatic data processing unit, the automatic data processing unit including a memory and a plurality of inputs, the inputs being connected to the following outputs:

a fuel level output from a fuel level monitor in the fuel tank; an output of a fresh fuel data selector such as a card or keyboard which passes data relating to fresh fueling of the tank, the data including the amount of and appropriate stoichiometric air-fuel ratio of the fresh fuel which has filled the tank, the output of the data selector being connected to the memory for storage with data relating to previous fresh fuelings and with the fuel level output so as to provide a current air-fuel ratio for fuel existing in the fuel tank;

outputs from the engine of combustion air feed rate and combustion air temperature sensors;

an output from the engine of an exhaust gas monitor;

an output from the engine of an ignition timer; and

an output of a tachometer associated with the engine;

the automatic data processing unit including the following output lines:

a control signal line connected to a heater for operating the heater to select the temperature of the combustion air;

a control signal line connected to a combustion air valve for operating the combustion air valve to select the rate at which combustion air flows to the engine;

a control signal line connected to an ignition circuit for controlling the timing of the ignition circuit of the engine; and

a control signal line connected to a valve control means for controlling the valve in the single fuel line to select the rate at which the fuel is delivered to the engine;

whereby:

the outputs of the automatic data processor are a function of the inputs to the data processor including the input of the fresh fuel data corresponding to the amount and type of

fuel currently in the tank, and the amount and type of fuel which previously filled the tank.

4,682,294

#### ELECTRIC ENERGY DISTRIBUTING DEVICES COMPRISING MICROPROCESSORS

Michel Duc, Savigny S/Orge; Philippe Montreuil, Torcy, and Jean-Jacques Meuleman, Orsay, all of France, assignors to Automobiles Citroën, Neuilly-sur-Seine and Automobiles Péngeot, Paris, both of, France

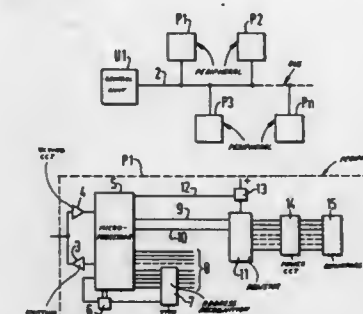
Filed Oct. 17, 1984, Ser. No. 661,669

Claims priority, application France, Oct. 18, 1983, 83 16843

Int. Cl. G06F 11/20

U.S. Cl. 364-492

2 Claims



1. A device for distributing electrical energy, particularly in vehicles, from a current source to a multiplicity of peripherals electrically connected to said source, said device comprising: a central control unit provided with means for transmitting, receiving, storing and processing coded information for controlling the startup and shutdown of current controllers of said peripherals;

a coded information bus connected to said central control unit; and

a peripheral circuit for each of said peripherals, each of said peripheral circuits including microprogrammed means programmed with subprograms for each of said peripherals and identical to those of the other microprogrammed means of the other peripheral circuits at respective addresses so that each of the microprogrammed means have identical sets of said subprograms for each of said peripherals, and with an address recognition circuit responsive to coded information received from said bus for identifying the coded information for each particular peripheral circuit and then addressing a specific one of said subprograms to be carried out at the particular peripheral circuit for controlling the operation of a respective current controller.

4,682,295

#### ANTI-SKID BRAKE CONTROL SYSTEM WITH OPERATIONAL MODE CONTROL AND METHOD THEREFOR

Jun Kibo, Hino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 17, 1984, Ser. No. 601,363

Claims priority, application Japan, May 16, 1983, 58-84088

Int. Cl. B60T 8/34

U.S. Cl. 364-426

22 Claims

1. An anti-skid brake control system for an automotive hydraulic brake system comprising:

a hydraulic brake circuit including a wheel cylinder for applying braking force to a vehicle wheel;

a pressure control valve disposed within said hydraulic circuit and operative to increase fluid pressure in said wheel cylinder in a first position thereof, to decrease the fluid pressure in said wheel cylinder in a second position





distortion caused by low and high frequency attitude fluctuation and scanning velocity fluctuation comprising the steps of: determining a first set of distortion correction coefficients for a low-frequency component of geometric distortion based on a low-frequency component of attitude data in said image signal; determining a first deviation quantity on the satellite image corresponding to the attitude fluctuation based on a high-frequency component of attitude fluctuation data and scanning velocity fluctuation data in said image signal; determining a second set of distortion correction coefficients covering a high frequency component of the geometric distortion by adding signals representing said determined first deviation quantity to a second deviation quantity which corresponds to said first set of distortion correction coefficients; and correcting the digital image signal representing said satellite image based on said determined second set of distortion correction coefficients.

4,682,301

# DIGITAL FILTER FOR PROCESSING TWO-DIMENSIONAL DIGITAL IMAGE

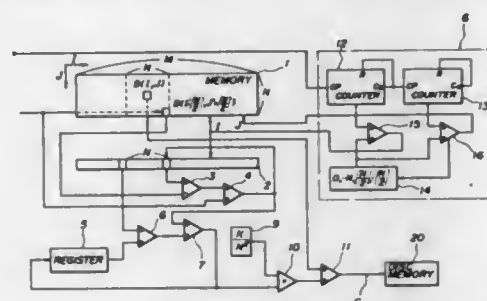
Isao Horiba, Kariya, and Ken Ishikawa, Matsudo, both of Japan, assignors to Hitachi Medical Corp., Japan  
Continuation of Ser. No. 528,248, Aug. 31, 1983, abandoned.

This application Jun. 6, 1986, Ser. No. 871,246

Claims priority, application Japan, Sep. 2, 1982, 57-151804  
Int. Cl.<sup>4</sup> G06F 15/31; H01J 40/14

U.S. Cl. 364-724

21 Claims



1. A digital filter for subjecting each of  $M \times M$  picture elements to a filtration process where a parameter of each picture element is modified at least in accordance with the sum of the values of said parameter for each of  $N \times N$  picture elements surrounding said picture element, said filter comprising:

a buffer storage means for storing at least a portion of said  $M \times M$  picture elements; and

processing means responsive to at least one of the picture elements stored in said buffer storage means for effecting said filtration process including first subprocessing means responsive to said one picture element for obtaining said sum of the values of said parameter for each of the  $N \times N$  picture elements in a time period which is independent of the value of  $N$ .

4,682,302

# LOGARITHMIC ARITHMETIC LOGIC UNIT

Tim A. Williams, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1984, Ser. No. 681,453

Int. Cl.<sup>4</sup> G06F 7/556; G05F 7/50

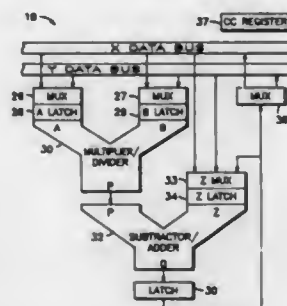
U.S. Cl. 364-768

11 Claims

1. In a digital signal processing system, a logarithmic arithmetic logic unit for receiving first and second operands and implementing predetermined algorithms, comprising:

first calculating means for selectively receiving the first and second operands, each operand being in a logarithmic number representation, and for either multiplying or di-

viding said operands by effecting an addition or subtraction, respectively, of said first and second operands to provide an intermediate resultant operand at an output, said first calculating means having a zero value operand detector for detecting when either the first or second operand has a quantized zero logarithmic value and having zero force means for outputting a quantized zero value without effecting said addition or subtraction, thereby minimizing quantization error; and second calculating means having a first input coupled to the output of the first calculating means for receiving said



intermediate resultant operand, and a second input for selectively receiving a third operand in a logarithmic number representation, said second calculating means selectively effecting a subtraction or addition of the intermediate resultant operand with the third operand to provide a final resultant operand in an logarithmic number representation, said second calculating means having bypass means for selectively directly outputting a predetermined one of the intermediate resultant operand or the third operand without effecting an addition or subtraction, said selective coupling being effected without use of a bypass path external to the second calculating means.

4,682,303

# PARALLEL BINARY ADDER

Masaru Uya, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

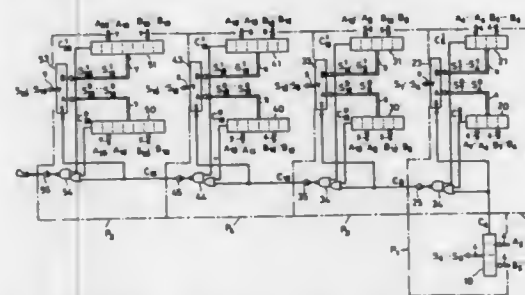
Filed Aug. 23, 1984, Ser. No. 643,385

Claims priority, application Japan, Sep. 5, 1983, 58-163503

Int. Cl.<sup>4</sup> G05F 7/50

U.S. Cl. 364-788

4 Claims



1. A parallel binary adder comprising: first order block-adder means for adding a first blocked addend to a first blocked augend with a carry input of 0, a row of block-adder means having a second order block-adder means and subsequent order block-adder means for adding respective blocked addends to respective blocked augends in respective block-adder means, each block-adder means comprising: first adder means for adding a blocked addend to a blocked augend under a first premise that carry input data is 0, second adder means for adding said blocked addend to said

blocked augend under a second premise that carry input data is 1, block-carry signal generator means for generating a block-carry signal based on a carry output signal from said first adder means and a carry output signal from said second adder means and a block-carry signal from an adjacent lower order block, and data selector means for selectively issuing one output signal from either said first adder means or said second adder means as a block-sum output signal, responding to said block-carry signal from an adjacent lower order block-adder means, a number of bits of said first adder means and said second adder means in a block-adder means being larger than a number of bits of said first adder means and said second adder means in an adjacent lower order block-order, thereby substantially synchronizing incoming times of said carry output signals from said first adder means and said second adder means with said block-carry signal from said adjacent lower order block-adder means.

4,682,304

# ASYNCHRONOUS MULTIPLE BUFFERED COMMUNICATIONS INTERFACE HAVING AN INDEPENDENT MICROPROCESSOR FOR CONTROLLING HOST/PERIPHERAL EXCHANGES

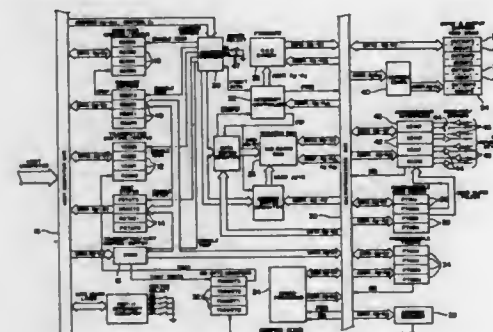
Lannie J. Tierney, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 520,395, Aug. 4, 1983, abandoned. This application May 23, 1986, Ser. No. 867,640

Int. Cl.<sup>4</sup> G06F 3/00, 13/00

U.S. Cl. 364-900

13 Claims



1. A communication interface for controlling data transmission between a host computer and at least one external device, the data consisting of one or more characters, said communications interface comprising:

(a) control means comprising a microprocessor; (b) data storage means and bus means coupling said control means in addressing relation to said data storage means so that said data storage means is addressed by said microprocessor of said control means; (c) said interface further including means for

(i) coupling data from the host computer to an output buffer maintained within said data storage means, said output buffer having a plurality of sequentially addressable data storage character locations in said data storage means which are addressed by said microprocessor without data transfer from said microprocessor such that a data character received from the host computer is stored in the next sequentially available data storage location of said output buffer without reading of said data by said microprocessor; and

(ii) data transfer from said output buffer to an external output device independently of the operation of the host computer; and

(d) address storage means for storing a pointer to the next sequentially available data storage location of said output buffer, said address storage means being accessed by said microprocessor for obtaining said pointer for addressing

said next sequentially available data storage location of said output buffer.

4,682,305

# STORAGE SYSTEM

Tatsuo Ishikawa, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

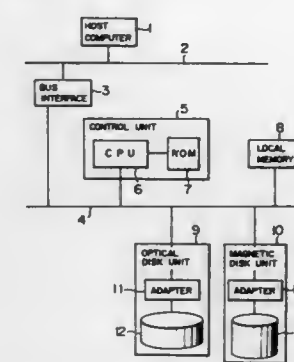
Filed Sep. 27, 1984, Ser. No. 654,955

Claims priority, application Japan, Sep. 30, 1983, 58-182284

Int. Cl.<sup>4</sup> G06F 12/00

U.S. Cl. 364-900

18 Claims



1. A storage system which comprises:

a bus line; a first storage unit incapable of rewriting connected to said bus line;

a second storage unit capable of rewriting connected to said bus line, said second storage unit having a control table for registering one or more addresses of said first storage unit in which data are desired to be rewritten and one or more addresses of said second storage unit in which said rewrite data are temporarily stored; and

a control unit connected to said bus line for controlling said second storage unit in accordance with said control table such that said data desired to be rewritten into said addresses of said first storage unit are temporarily stored in the corresponding addresses of said second storage unit.

4,682,306

# SELF-REFRESH CONTROL CIRCUIT FOR DYNAMIC SEMICONDUCTOR MEMORY DEVICE

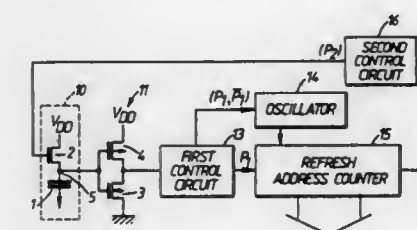
Takayasu Sakurai, Tokyo, and Tetsuya Iizuka, Funabashi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 20, 1985, Ser. No. 767,602

Claims priority, application Japan, Aug. 20, 1984, 59-172754  
Int. Cl.<sup>4</sup> G11C 7/00

U.S. Cl. 365-222

6 Claims



1. A self-refresh control circuit for a dynamic semiconductor memory device having a plurality of memory cells, comprising:



leak current monitor means consisting of a capacitor having voltage leakage characteristics similar to those of the memory cells of said memory device to determine the status of the charge of said memory cells;  
means connected to said capacitor for charging said capacitor to a predetermined voltage;  
an inverter circuit connected at its input to said capacitor for detecting the voltage of said capacitor and providing a refresh signal when said voltage is less than a predetermined minimum level;  
refresh timing control means connected to the output of said inverter circuit for controlling a refresh operation for said memory cells in response to said refresh signal; and  
pulse generating means for detecting when said refresh operation has been completed and then generating a signal to said charging means to cause said charging means to charge said leak current monitor means.

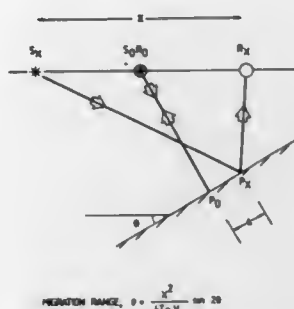
4,682,307

## UNDERWATER SEISMIC TESTING

Paul Newman, Westerham, United Kingdom, assignor to Horizon Exploration Limited, Swanley, United Kingdom  
Filed Aug. 21, 1984, Ser. No. 642,840  
Int. Cl.<sup>4</sup> G01V 1/38

U.S. Cl. 367—21

3 Claims



1. A method of underwater seismic investigating, which comprises:

- determining seismic velocity distribution data in the region of interest;
- traversing the region of interest with a survey vessel towing a single seismic source-receiver pair with a fixed separation between said source and said receiver;
- firing said single seismic source repeatedly at predetermined intervals;
- recording the sub-sea response to the repeated firings of said seismic source using said single seismic receiver to produce thereby single-trace data; and
- subjecting said single-trace data and said seismic velocity distribution data in the region of interest to signal processing comprising a first deconvolution stage and a second 3-D imaging stage to generate thereby detailed sub-sea geological data.

4,682,308

## ROD-TYPE MULTIPOLE SOURCE FOR ACOUSTIC WELL LOGGING

Jing-Yau Chung, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed May 4, 1984, Ser. No. 607,340

Int. Cl.<sup>4</sup> G01V 1/00; H04R 17/00

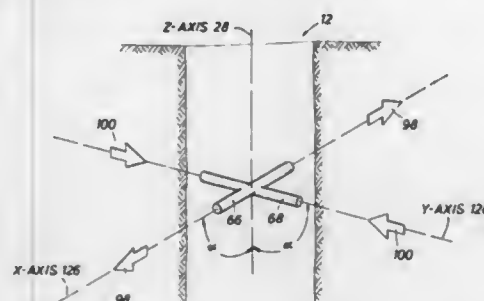
U.S. Cl. 367—31

27 Claims

1. Apparatus for introducing  $2^N$  pole acoustic waves into a subsurface earth formation traversed by a borehole having a longitudinal axis, where  $N$  is an integer not less than two, including:

- a housing having a central longitudinal axis and defining at least one window, said housing being adapted to be disposed in the borehole so that the central longitudinal axis

of the housing is substantially parallel to the longitudinal axis of the borehole; and  
a number of rods disposed within said housing, each rod having a longitudinal axis extending through one of said windows, and each rod being composed of material selected so that the rod changes in length along its longitudinal



axis in response to electrical excitation so as to generate acoustic waves within said housing in a manner such that the acoustic waves will propagate toward the formation and be incident at the interface between the borehole and the formation in the direction of the longitudinal axis of the rod, and will thereafter interfere in the formation to produce a  $2^N$ -pole acoustic wave in the formation.

4,682,309

## DEVICE FOR GENERATING ACOUSTIC PULSES BY IMPLOSION, INSIDE A WELL

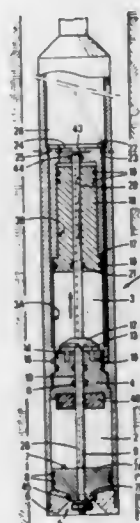
Pascal Dedole, Rueil Malmaison, and Jean Laurent, Morainvilliers, both of France, assignors to Institut Français du Pétrole, Rueil-Malmaison, France

Filed Nov. 28, 1984, Ser. No. 675,854

Claims priority, application France, Nov. 29, 1983, 83 19185  
Int. Cl.<sup>4</sup> G01V 1/38, 1/14

U.S. Cl. 367—146

7 Claims



1. A device for generating acoustic pulses by implosion inside a well comprising an elongate rigid body having a section less than that of the well and connected by a cable to a surface installation, said rigid body comprising a first and second coaxial chamber isolated from each other by a fixed separation element, said first chamber having an opening at one end thereof communicable with a medium external of the rigid body, a first piston adapted for tightly sliding inside said first chamber between a first position and a second position,

said piston having a face exposed to pressure outside said rigid body and being secured to a valve adapted form moving in the second chamber and coming into engagement against a seat formed on the separation element, in the first position of said first piston, a second piston adapted for tightly sliding inside the rigid body on a side of the valve opposite said first piston and having a stroke at least equal to that of the first piston between its first and second positions, means for establishing, on one side of the first piston, a pressure very much lower than the external pressure, and a hydraulic control system comprising drive means and hydraulic circuits, disposed inside said rigid body for moving said first piston to its first position, through the second piston pushing the valve onto its seat and for intermittently maintaining the valve against its seat, when the second piston is brought back to the end of the second chamber opposite said separation element, wherein said hydraulic control system comprises means for providing a fluid at a first pressure equal to a hydrostatic pressure prevailing outside the rigid body and pump means for intermittently delivering fluid at a second upper pressure for returning the first piston to the first position, wherein said opening of said first chamber has a section less than that of said first chamber, said first piston comprising a part whose section is adapted to that of said opening and which closes said opening in the first position of said first piston, and the section of the valve is greater than that of said part of said first piston, and wherein said valve is secured to the first piston by a rod passing through said separation element and said second chamber comprises two parts of unequal sections, said second piston comprises two parts of different sections adapted respectively to the sections of the two parts of said second chamber, a largest section end of said second piston being adapted to come into abutment against the valve.

4,682,310

## ARTICLE WITH ELECTRIC TIMEPIECE

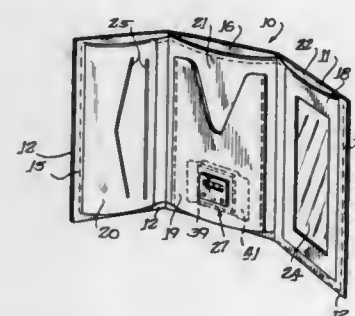
Eric W. Land, and Raymond W. Young, both of West Bend, Wis., assignors to Amity Leather Products Company, West Bend, Wis.

Filed May 14, 1985, Ser. No. 734,336

Int. Cl.<sup>4</sup> G04B 37/00; A44C 5/00

U.S. Cl. 368—278

6 Claims



1. A pocket-sized leather product having a timepiece integrally associated therewith comprising, in combination, a battery-powered watch mounted on an integral oversized, planar flange and having a cover member, the planar flange having a marginal edge portion extending beyond the edges of the cover member and comprising a printed circuit board of operating the battery-powered watch; a multi-layer leather product having a cutout in its outer layer sized to receive the cover member of the watch in substantially flush relationship to the outer layer; and means for securing the watch to the leather product by means of the oversized flange.

4,682,311

## PHOTOMAGNETIC DIFFERENTIAL REPRODUCING SYSTEM

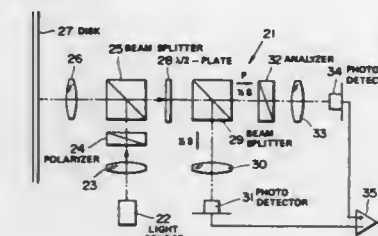
Nobuhide Matsubayashi, and Kieichi Kato, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed Jan. 29, 1986, Ser. No. 823,559

Claims priority, application Japan, Jan. 31, 1985, 60-16912

Int. Cl.<sup>4</sup> G11B 11/00

U.S. Cl. 369—13

3 Claims



1. A photomagnetic differential reproducing system, comprising:

- light projecting means for condensing and projecting a linearly polarized beam upon a recording medium having a recording layer formed of a ferromagnetic substance, the projected polarized beam being reflected from the medium with a deflection angle in either direction according to a magnetization direction of the medium;
- halfwave plate means for rotating a polarization direction of the reflected and deflected polarized beam, by an angle;
- beam splitter means for splitting the reflected beam passed through said halfwave plate into a transmitted light and a reflected light while functioning as an analyzer for one of the transmitted light and reflected light, said splitter means being formed with a reflection factor of zero or 100% for s- or p-polarized light, the polarization directions of both the lights being perpendicular to each other;
- analyzer means having a predetermined orientation angle for analyzing the other of the transmitted light and the reflected light;
- two photodetector means for receiving the light reflected from or transmitted through said beam splitter without passing through said analyzer means and the light reflected from or transmitted through said beam splitter passing through said analyzer means and transducing the received lights into two electric signals corresponding thereto, respectively; and
- differential amplifier means responsive to the two transduced electric signals for outputting a differential output signal between the two.

4,682,312

## DISC PLAYER WITH SEARCH NOISE SUPPRESSION

Tsuneo Furuya, Tokyo, and Yoshizumi Inazawa, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
Division of Ser. No. 497,404, May 23, 1983, Pat. No. 4,592,036.

This application Mar. 6, 1986, Ser. No. 837,028

Claims priority, application Japan, May 23, 1982, 57-87157; May 25, 1982, 57-88445

Int. Cl.<sup>4</sup> G11B 20/10, 20/24

U.S. Cl. 369—32

7 Claims

1. A reproducing apparatus for reproducing program information from a substantially planar disc containing a plurality of blocks of digital program information data, each block including address data, the apparatus comprising:

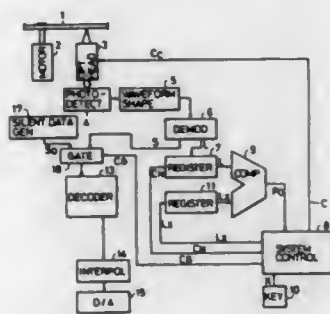
- an optical head for reading said digital program information data and address data on said disc, said disc being moveable relative to said optical head, and for providing an output comprising reproduced digital program information data and address data, said optical head being selectively operable in a searching mode for locating predetermined address data associated with predetermined pro-

gram information and a playback mode for providing program information data for conversion into said predetermined program information;

processing circuit means for converting obtained information data into a program information output, said processing circuit means cooperating with said optical head to obtain therefrom said reproduced program information data for conversion into said program information output, said processing circuit means including decoding circuitry for accepting said program information data in said output of said optical head and performing a decoding operation thereon to provide decoded program information data at a predetermined delay time from the start of said decoding operation;

detecting means for detecting said address data in said output of said optical head;

system controlling means for controlling said optical head



when operating in said searching mode and for establishing said playback mode of said optical head in response to the detection of said predetermined address data by said detecting means; and

noise-suppressing means including a silent-data generating means for cooperating with said processing circuit means to suppress the conversion into program information output of reproduced program information data while said optical head is in said searching mode, said silent-data generating means providing a silent-data signal corresponding to program information data substantially without program information to said processing circuit means in lieu of said reproduced program information data while said optical head is in said searching mode, said processing means converting said silent-data signal into silent program information, whereby noise generated by the conversion of reproduced program information data is suppressed while the optical head is in the search mode.

4,682,313

## DISK STORING SYSTEM FOR DISK PLAYER

Kazunari Miyake, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Jun. 3, 1985, Ser. No. 740,718

Claims priority, application Japan, Sep. 18, 1984, 59-197619; Sep. 18, 1984, 59-197620

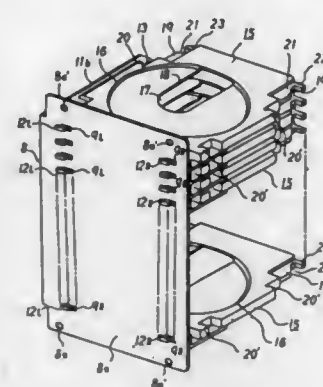
Int. Cl.<sup>4</sup> G11B 23/04

U.S. Cl. 369—39

4 Claims

1. A disk storage system for a disk player comprising a cabinet containing a reproducing unit, a plurality of shelves vertically arranged within said cabinet, disk holders, each containing a recess for holding a disk therein, and an opening in the bottom thereof for the reproducing unit to be inserted therein, said disk holders being disposed in said plurality of shelves, a disk extracting mechanism operatively associated with said disk holders for transferring said disk holders containing said disk to said reproducing unit; said recess in said disk holder having peripheral walls which are inclined to support the periphery of the disk, and said disk holder

being provided with a rib disposed around the opening in the bottom thereof for supporting the disk at the radial,



center, non-recording portion of the disk, whereby the recording portion of the disk does not come into contact with the bottom of the disk holder.

4,682,314

## DISC PLAYBACK APPARATUS

Harushige Nakagaki; Yoshimi Iso, both of Yokohama, and Shigeki Inoue, Toyokawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

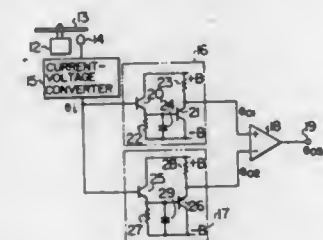
Filed Aug. 26, 1983, Ser. No. 526,782

Claims priority, application Japan, Aug. 30, 1982, 57-149311

Int. Cl.<sup>4</sup> G11B 21/10

U.S. Cl. 369—44

6 Claims



1. An apparatus for use in an optical disc player, for detecting flaws on a disc, said disc player including an optical pickup for receiving a reflected light from a light spot on the disc and for deriving a recording information signal, comprising: parallel connected first and second electric circuits for receiving said recording information signal and for producing respective outputs; and a comparator for receiving said respective outputs and for detecting a dent in said recording information signal to thereby detect a flaw on said disc, said dent being caused by said flaw;

said first electric circuit including first level detecting means for detecting a maximum value level of said recording information signal, said first level detecting means including a first resistor and a first capacitor having values set so that a discharge time constant of said first resistor and first capacitor is large as compared with a time interval corresponding to a width of the flaw, to enable the detection of said maximum value level without disturbance from said flaw;

said second electric circuit including second level detecting means for detecting a change of the maximum value level of said recording information signal, said second level detecting means including a second resistor and a second capacitor having values set so that a discharge time constant of said second resistor and second capacitor is small

enough to follow the change of the dent in the level of said recording information signal;

said comparator comparing the output of said first level detecting means with the output of said second level detecting means to detect the flaw and for providing an output indicative thereof.

4,682,315

## FOCUSING ERROR DETECTION DEVICE FOR USE IN OPTICAL DISK TYPE RECORDING SYSTEM

Atsushi Uejima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

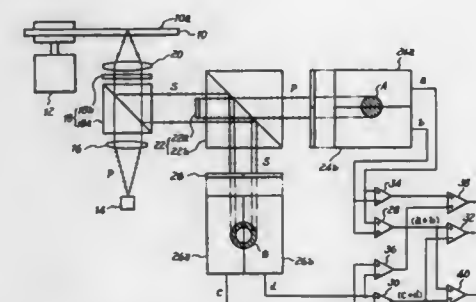
Filed Jun. 14, 1985, Ser. No. 744,921

Claims priority, application Japan, Jun. 22, 1984, 59-127323

Int. Cl.<sup>4</sup> G11B 7/09

U.S. Cl. 369—45

8 Claims



1. A focussing error detection device for use in an optical disk type recording system wherein a light beam is converged by objective lens means onto a recording surface of a disk and wherein the light beam reflected by said recording surface is divided by a first beam divider interposed between said objective lens means and a light beam source, said detection device comprising a focussing error detection device which comprises a second beam divider for further dividing the light beam divided by said first beam divider into a central light beam fraction and a peripheral light beam fraction, a first photo detector for detecting the quantity of the central light beam fraction, a second photo detector for detecting the quantity of the peripheral light beam fraction, and a subtracter for indicating the difference between the output from the first photo detector and the second photo detector.

4,682,316

## OPTICAL INFORMATION PROCESSING APPARATUS FOR LIGHT BEAM FOCUS DETECTION AND CONTROL

Masamichi Tateoka, Yokohama, and Hideaki Yano, Kokubunji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

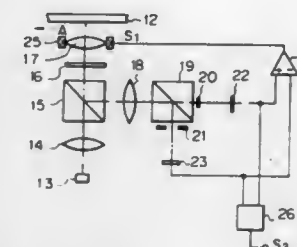
Filed May 21, 1985, Ser. No. 736,342

Claims priority, application Japan, May 29, 1984, 59-110206

Int. Cl.<sup>4</sup> H04N 7/00

U.S. Cl. 369—46

7 Claims



1. An optical information processing apparatus comprising: record/reproduction means for irradiating a focused light

beam onto a track on a record medium to record or reproduce information;

tracking control means for precisely directing the irradiated light beam to the track;

split means for splitting at least a portion of a reflected or transmitted light beam of the irradiated light beam from the record medium into two light beams;

first screen means for screening a center area of a first of the split light beams across a width of said track so as to transmit a peripheral area of the first split light beam;

second screen means for screening a peripheral area of the second of the split light beams across the width of said track so as to transmit a center area of the second split light beam; and

detection means for comparing light intensities of the two light beams transmitted without being screened by said first and second screen means to detect a focusing state of the irradiated light beam with respect to said record medium.

4,682,317

## SUBCODE SIGNAL READING CIRCUIT IN AN OPTICAL TYPE DISC PLAYER

Norio Tomisawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

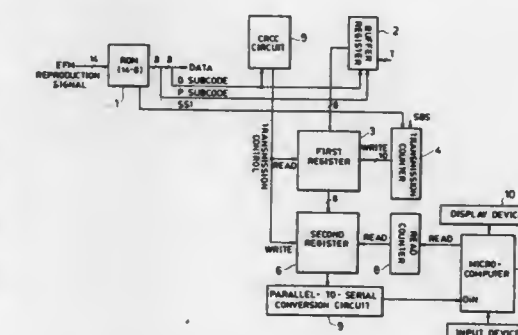
Filed Oct. 11, 1984, Ser. No. 660,435

Claims priority, application Japan, Oct. 14, 1983, 58-190912

Int. Cl.<sup>4</sup> G11B 7/00

U.S. Cl. 369—59

5 Claims



1. A subcode signal reading circuit in an optical type digital audio compact disc reproduction device for processing P subcode and Q subcode data read from a compact disc by the reproduction device comprising:

an eight to fourteen modulation (EFM) demodulation circuit for receiving an EFM reproduction signal reproduced from the optical type compact disc, EFM-demodulating the EFM reproduction signal and outputting a demodulated data signal in eight-bit increments;

a first register in which one of the Q subcode signal included in the demodulated eight-bit signal provided by said EFM demodulation circuit is written in 8-bit divided fashion;

a second register to which contents of said first register are transmitted; and

an error detection circuit for detecting whether or not the Q subcode produced by said EFM demodulation circuit contains error,

transmission of the contents of said first register to said second register being controlled by an output of said error detection circuit, the transmission being made when no error has been detected by said error detection circuit, and an output of said second register being used in said optical type disc reproduction device as a correct Q subcode to be read.



# 4,682,318 METHOD AND APPARATUS FOR UPDATING OPTICAL MEMORY DISC

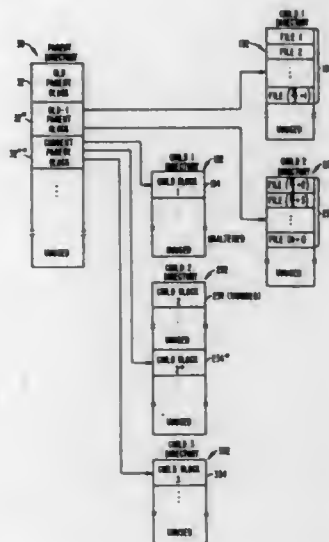
Bruce E. Busby, Sunnyvale, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 16, 1985, Ser. No. 788,013

Int. Cl.<sup>4</sup> G11B 5/76, 5/09

U.S. Cl. 369—59

13 Claims



1. A method of updating a memory disc, the disc being of the type that has a plurality of zones, one of the zones containing at least one directory block that includes a plurality of entries in the form of addresses which point at data, the method comprising the steps of  
reading the entries of the one directory block into a temporary location;  
altering the entries of the one directory block with new directory information;  
dividing the entries of the one directory block into two new directory blocks, each of the new directory blocks being designated by a separate pointer;  
writing the two new directory blocks from the temporary location onto the memory disc; and  
storing the pointers into a new directory pointer block of the memory disc, whereby  
subsequent addition of new directory information requires the alteration of less than all of the directory blocks.

4,682,319

## PIVOTING FRONT COVER FOR A DRAWER

Hermanus F. Einhaus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 4, 1985, Ser. No. 784,915

Claims priority, application Netherlands, Oct. 12, 1984, 8403117

Int. Cl.<sup>4</sup> G11B 17/04; A47B 81/06

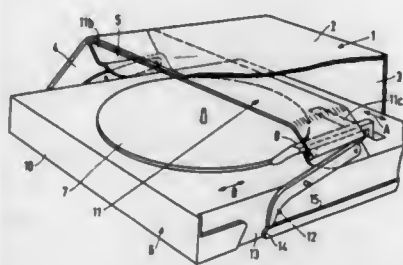
U.S. Cl. 369—75.2

20 Claims

1. An apparatus having a front closure for space above an extendable drawer, to provide ready access to a top surface of the drawer, comprising

a housing having a front opening and a side wall,  
a drawer, rectilinearly slidable in outward and inward directions with respect to said housing, through said opening,  
a front cover for covering a portion of the opening above the drawer, pivotable relative to said housing between open and closed positions, and  
control means on the drawer for controlling pivotal movement of the cover during sliding movement of the drawer, characterized in that said apparatus comprises a control element connected to said housing side wall,

said drawer has a guide edge extending generally in the directions of slidable rectilinear movement of said drawer, said control means comprise an actuating projection and a reset projection on said drawer, each disposed adjacent said housing side wall,  
said front cover comprises a front portion, and at least one side portion extending rearwardly from the front portion and articulated to said control element, said side portion having at least two bearing edges arranged such that in



said closed position one of said bearing edges bears on said guide edge, and in said open position another of said bearing edges bears on said guide edge, and  
said element, projections and edges are arranged such that during outward movement said actuating projection engages said control element to pivot said cover to the open position, and during inward movement said reset projection engages said control element to pivot said cover to the closed position.

4,682,320

## POWER-OPERATED DEVICE FOR ASSISTING LOADING AND UNLOADING A DISC PLAYER

Stéphane A. M. d'Alayer de Costemore d'Arc, Genappe, Belgium, assignor to Staal S. A., Belgium

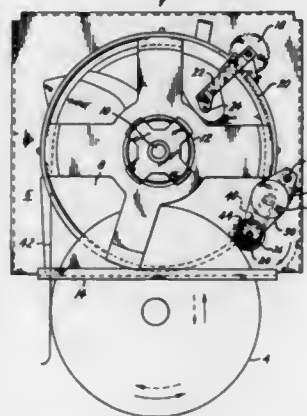
Filed Aug. 23, 1985, Ser. No. 768,562

Claims priority, application Belgium, Mar. 14, 1985, 0/214648

Int. Cl.<sup>4</sup> G11B 25/04

U.S. Cl. 369—77.1

7 Claims



1. A power-driven device for assisting the loading and unloading operations of a slot-type disc player apparatus, said apparatus being mounted in a housing having an entrance slot for discs, said device comprising:  
guide means in said housing engageable by the edge of the disc during rolling movement of the disc along a substantially linear path through the entrance into and out of the housing;  
power-operated roller means mounted in said housing on a movable support and carried by said support to be engage-

able with the edge of the disc generally diametrically opposite the edge engaging said guide means, said roller means having an aggressive surface engageable with both the inward and outward edges of the disc; and  
bidirectional drive means including a motor connected to drive said roller means in both directions to positively rotate the disc by engagement first with the inward edge thereof and subsequently with the outward edge thereof to cause rolling movement thereof along said guide means to load the disc into the apparatus in one direction of rotation and, first with the outward edge thereof and subsequently with the inward edge thereof to cause rolling movement thereof along said guide means, to unload the disc out of the apparatus in the other direction of rotation.

4,682,321

## OPTICAL RECORDING MEDIUM

Takashi Takaoka, Yokohama; Satoru Koyahara, Tokyo, and Tetsuo Saito, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

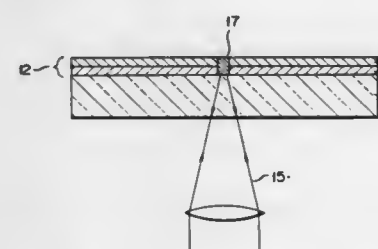
Filed Jan. 24, 1985, Ser. No. 694,664

Claims priority, application Japan, Jan. 28, 1984, 59-14058

Int. Cl.<sup>4</sup> G01D 15/34; G11B 7/24

U.S. Cl. 369—284

9 Claims



1. An optical recording medium for recording information, comprising a substrate and a recording layer comprising two thin semiconductor films disposed on said substrate, said two thin semiconductor films consisting of a combination of thin films made of two materials selected from the group consisting of germanium, tellurium, bismuth, antimony and alloys thereof, wherein said thin semiconductor films can be at least partially converted into a single layer when irradiated with a laser beam and information can be recorded by said partial conversion.

4,682,322

## DISK CARTRIDGE

Teruo Ohta, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 20, 1986, Ser. No. 865,002

Claims priority, application Japan, May 20, 1985, 60-074915[U]

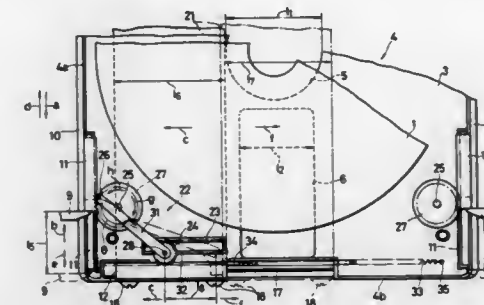
Int. Cl.<sup>4</sup> G11B 25/04, 7/00

U.S. Cl. 369—291

6 Claims

1. In a disk cartridge, wherein a disk used as a recording medium is accommodated in a cartridge comprising an upper half and a lower half, a first rack and a second rack are so provided as to be slidably movable along respective sides of the cartridge, which are perpendicular to each other, a transmission mechanism provided within the cartridge links the first rack with the second rack, a shutter is secured to the second rack, and at least recording head or reproducing head insertion openings of the cartridge are opened and closed by the shutter as the second rack is moved through the transmission mechanism by the first rack operated by an external force, the improvement in which said transmission mechanism comprises a third rack fixed in said cartridge in parallel with and opposite to said second rack, a second pinion meshed with both said second rack and said third rack and movable along said fixed

third rack, a first pinion meshed with said first rack, rotatably mounted in said cartridge and having an eccentric pin, and a rod



connecting said eccentric pin with the shaft of said second pinion.

4,682,323

## INTERCONNECTING INTEGRATED CIRCUITS

Kenneth G. Corfield, Hampstead, and John S. Heeks, Harlow, both of England, assignors to Standard Telephones and Cables Public Limited Company, London, England

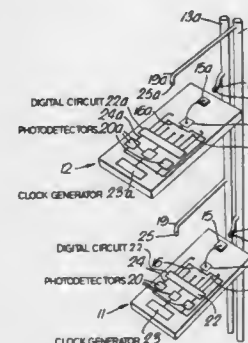
Filed Apr. 12, 1985, Ser. No. 723,491

Claims priority, application United Kingdom, Apr. 14, 1984, 8409751

Int. Cl.<sup>4</sup> H04B 9/00

U.S. Cl. 370—4

9 Claims



1. An integrated circuit device including a digital integrated circuit having a plurality of electrical signal outputs and inputs, switch means whereby said outputs are coupled selectively to a common output pad in a time division multiplex sequence, clock means connected to the switch means and to the circuit inputs whereby the switch means is controlled to effect said sequence and whereby the inputs are enabled in synchronism with said sequence, and a light or infrared source coupled to the common output whereby, in use, the multiplexed output signal is modulated on to an optical or infrared carrier for transmission to the inputs of similar circuit devices, wherein each said circuit input is coupled to a respective photodetector whereby the optical signal is applied to that input, and wherein, in use, said inputs are so controlled by the clock means that each said input is selectively enabled only for a respective time slot of a multiplexed signal received from similar circuit devices.





said virtual pin means including means for switching to the test mode in response to said first control signal, said switching means including means for storing the test signal from the first logic network in response only to said second control signal, said switching means for switching the logic system to the system mode in response to said third control signal and maintaining the system mode during cycling of the system clock whereby the first logic network is coupled to the second network through an effectively transparent and inactive virtual pin means performing no system logic functions.

4,682,330

## HIERARCHICAL TEST SYSTEM ARCHITECTURE

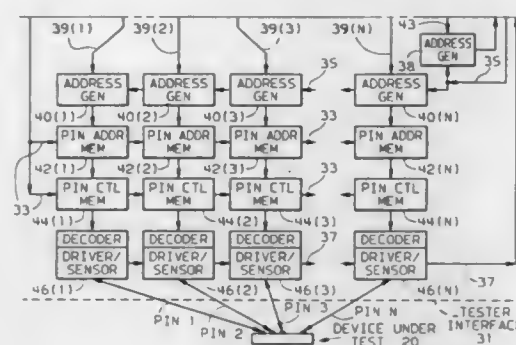
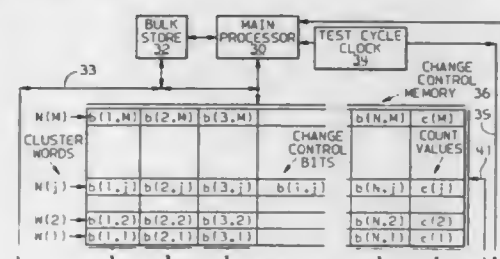
Ernest H. Millham, Catlett, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,428

Int. Cl.<sup>4</sup> G06F 11/00; G01R 31/28

U.S. Cl. 371-20

4 Claims



1. In a stored program complex logic tester, including a test cycle clock for controlling the sequence of test cycle intervals, and a tester interface having a plurality of N contacts which operatively connect respective terminals of a device under test to a respective one of a plurality of N driver/sensor pairs, each driver/sensor pair having a digital control input, a hierarchical test sequencer, comprising:

- a change control memory having an address input, a plurality of N control bit outputs and a count value output, for storing a plurality of M cluster words, each j-th one of said M cluster words including a plurality of N change control bits  $b(i,j)$  and a count value  $C(j)$ , (where  $i$  is an integer from 1 to N and  $j$  is an integer from 1 to M);
- a first address generating means having a first input connected to said count value output and a second input connected to said test cycle clock, for synchronously changing the address applied to said address input of said change control memory in response to said count value output, to access said cluster words therein;
- a plurality of N pin address memories, each corresponding to a respective i-th one of said N change control bit outputs and each having an address input and a data output, for storing a second plurality of instruction address values

in an i-th one of said N pin address memories, said second plurality being the sum of the products of said count value  $C(j)$  times said change control bit  $b(i,j)$  for all values of  $j$  from 1 to M;

- a plurality of N second address generating means, each having an input connected to a respective i-th one of said N control bit outputs and an input connected to said test cycle clock, and an output connected to said address input of a respective i-th one of said N pin address memories, for changing the address input to said respective i-th pin address memory in response to a first binary value of an i-th change control bit  $b(i,j)$  output by said change control memory;
- a plurality of N pin control memories, each having an address input connected to said output of a respective i-th one of said N pin address memories, and a data output connected to said digital control input of a respective i-th one of said N driver/sensor pairs, for storing a plurality of pin function instructions accessible by said instruction address values, each said instruction controlling the test function of said respective driver/sensor pair during one of said test cycle intervals;

whereby an improved complex logic tester is formed.

4,682,331

## LOGIC CIRCUIT WITH SELF-TEST

Shojiro Mori, Ageo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

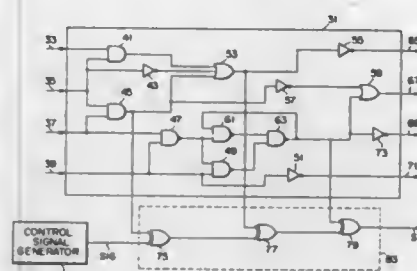
Filed Oct. 18, 1984, Ser. No. 662,142

Claims priority, application Japan, Oct. 20, 1983, 58-196767

Int. Cl.<sup>4</sup> G01R 31/28

U.S. Cl. 371-25

20 Claims



1. A logic circuit comprising:

- a logic section for receiving an exterior input signal and providing an exterior output signal, said logic section including a plurality of interior logic elements having corresponding input terminals and output terminals for providing interior logic signals, said input terminals and said output terminals being interconnected to perform logic operations to generate a value for said exterior output signal according to the value of said exterior input signal; and
- a checking circuit for receiving a control signal and the values of said interior logic signals of said output terminals of selected interior logic elements, for logically combining the value of said control signal and said received values of said interior logic signals, and for generating an error detection signal having an expected value if each of said selected logic elements is operating correctly and an error value if at least one of said selected logic elements is operating incorrectly.

4,682,332

## METHOD AND APPARATUS FOR RECORDING DIGITAL SIGNALS

Hiroo Okamoto; Masaharu Kobayashi; Takaharu Noguchi, and Takao Arai, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

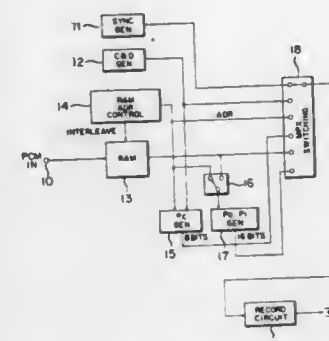
Filed Jan. 24, 1985, Ser. No. 694,658

Claims priority, application Japan, Jan. 25, 1984, 59-10098

Int. Cl.<sup>4</sup> G06F 11/10

U.S. Cl. 371-38

7 Claims



1. A method of recording digital signals which are divided into blocks each having  $n$  digital signals (where  $n$  is a positive integer), a synchronizing signal providing a reference timing for reproduction, a control signal related to said digital signals, an identification signal for identifying the address of a block, an error detection code for detecting an error in said control signal and said identification signal, and an error detection and correction code for detecting and/or correcting an error in said  $n$  digital signals and said identification signal, said method comprising the steps of:

- generating a first error detection code by performing an algebraic operation on said control signal and said identification signal in each block;
- generating a second error detection and correction code by performing an algebraic operation on said digital signals and said identification signal in each block; and
- combining said generated first error detection code and said generated second error detection and correction code together with the remaining signal in said block to form a recording block.

4,682,333

## DECODER FOR DECODING A TWO-STAGE ENCODED CODE

Ken Onishi, Kyoto, and Yasuo Sugiya, Ibaragi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

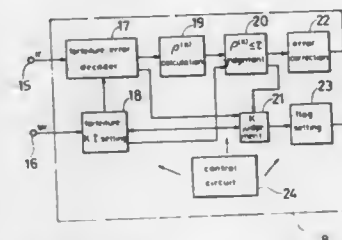
Filed Jun. 24, 1985, Ser. No. 748,402

Claims priority, application Japan, Jun. 28, 1984, 59-135507

Int. Cl.<sup>4</sup> G06F 11/10

U.S. Cl. 371-39

2 Claims



1. A decoder for decoding a code C which is two-stage

encoded by a  $C_1$  code ((N, K, D) Q dimensional code) and a  $C_2$  code ((n, k, d) q dimensional code), comprising:

- a  $C_1$  decoder including:
  - error correction means for conducting an error correction of errors below the number  $[(D-1)/2]([M]$  is the biggest integer which does not exceed M) to output a decoded word at a first output terminal, and
  - a weight generator which generates a weight signal  $w_j$  ( $j=1, 2, \dots, n$ ) at a second output terminal when  $i$  ( $i=0$  to  $[(D-1)/2]$ ) errors are corrected and an error detection (correction disability) is judged;
- a  $C_2$  decoder for decoding the  $C_2$  code including,
  - forfeiture/error correction means having input terminals connected to said first and second output terminals for judging the position  $j$  of the weight signal  $w_j$  among a weight vector  $w$  in a received word  $r$  which is obtained in accordance with the decoded word output from the  $C_1$  decoder which satisfies the inequality  $w_j \geq D/2 - K$  ( $K=0, 1, \dots, [(D-1)/2]$ ), and conducting a forfeiture error decoding which satisfies the inequality

$$ne^{(k)} + 2ne^{(k)} \leq 2\tau/D$$

$ne^{(k)}$  = the number of forfeitures when  $k=0, 1, \dots, (D-1)/2$ ,  
 $ne^{(k)}$  = the number of errors when  $k=0, 1, \dots, (D-1)/2$ ,  
 $0 \leq \tau < dD/2$ ,

weighted distance calculating means for calculating a weighted distance  $\rho^{(k)}$  between a decoded word  $r^{(k)}$  and the received word  $r$  when a decoded word in each of  $K=0, 1, \dots, [(D-1)/2]$  is obtained, comparator means for comparing the weighted distance  $\rho^{(k)}$  and an integer  $\tau$ , means for outputting the decoded word  $r^{(k)}$  as a correct decoded word when  $\rho^{(k)}$  is smaller than or equal to  $\tau$ , and means for outputting a correction disability signal when  $\rho^{(k)}$  is larger than  $\tau$  or no decoded word is obtained by the forfeiture error correction means, wherein

$$w_j = \begin{cases} i & \text{when } i \text{ errors are corrected} \\ D/2 \text{ or } (D+1)/2 & \text{when an error detection is judged} \end{cases}$$

$$ir = (r_1, r_2, \dots, r_n)$$

$$iw = (w_1, w_2, \dots, w_n)$$

$$\rho^{(k)} = \sum_{j=1}^n \delta_j$$

$$\delta_j = \begin{cases} w_j & \text{when } j \text{ is not a forfeiture position and} \\ r_j^{(k)} = r_j \\ D - w_j & \text{when } j \text{ is not a forfeiture position and} \\ r_j^{(k)} \neq r_j \\ D/2 \text{ or } (D-1)/2 & \text{when } j \text{ is a forfeiture position.} \end{cases}$$

4,682,334

## SYNCHRONOUS DATA TRANSMISSION METHOD AND DEVICE IMPLEMENTING SAME

Bernard Le Mouel, Saint Quay Perros; Hervé Le Bescont, and Jean-Paul Le Meur, both of Lannion, all of France, assignors to Compagnie Industrielle Des Telecommunications Cit-Alcatel, France

Filed May 20, 1985, Ser. No. 736,038

Claims priority, application France, May 23, 1984, 84 08084

Int. Cl.<sup>4</sup> H03K 5/26; G08C 25/00

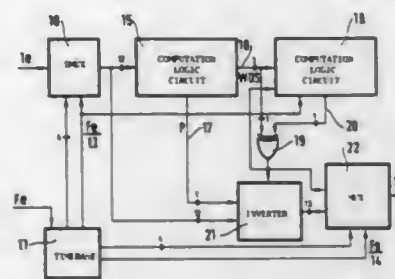
U.S. Cl. 371-55

12 Claims

11. An encoder for implementing a synchronous data transmission method employing an MB 1C 1F type code in which the binary data to be transmitted is divided into successive blocks each of M bits (where M is an integer) each coded by a word comprising (M+2) bits made up of the M bits of the

block, complemented or not according to whether the word which would be obtained without complementing would have a word digital sum WDS equal to the difference between the number of marks (logic 1) and spaces (logic 0) of the word of the same or opposite sign as a running digital sum RDS equal to the difference between the numbers of ones and zeros in data already encoded, a complement bit C indicating whether complementing is applied or not and a frame bit complemented or not with the M bits of the block, whereby on decoding the blocks formed at the encoding stage may be reconstituted, in which method M is even and the value of the frame bit is determined according to a parity of each block of M bits, the encoder comprising:

- a demultiplexer for transforming the data to be transmitted into successive blocks of M bits,
- a circuit for computing the word digital sum WDS and the parity of each block connected to the output of said demultiplexer,



- a complementing decision circuit for comparing the signs of the word digital sum WDS and the running digital sum RDS,
- a circuit for computing the running digital sum RDS of the binary data already encoded on the basis of the output signal from said circuit computing the digital word sum and the output signal from said complementing decision circuit,
- a complementing circuit controlled by said complementing decision circuit, said complementing circuit processing the block of M bits available at the output of said demultiplexer and its parity bit delivered by said circuit computing the word digital sum and parity, and
- a multiplexer for transforming into an isochronous binary data bit stream the words delivered by said complementing circuit to which has been added a complement bit delivered by said complementing decision circuit.

4,682,335

## COMPOSITE LASER OSCILLATOR

John L. Hughes, Canberra, Australia, assignor to Hughes Technology PTY LTD, Canberra, Australia

Filed Feb. 14, 1985, Ser. No. 701,496

Claims priority, application Australia, Feb. 15, 1984, PG3626  
Int. Cl.<sup>4</sup> H01S 3/30

U.S. Cl. 372-6

11 Claims



1. A scalable laser oscillator system comprising: a bundle of single mode, single polarization, thin clad optical fiber laser oscillators, each optical fiber laser oscillator having two ends and a laser gain medium disposed between said ends, said bundle being coherently packed with the two ends of each of said fiber oscillators being optically polished and coated with layers of dielectric material such that said ends act as laser mirrors, one mirror being substantially 100% reflective at a lasing, which may be different for each oscillator and the other mirror being partially reflective at said lasing wavelength to allow for the transmission and emission of laser light generated within said oscillator, said bundle ends being compressed into two solid optically polished faces such that said 100% reflecting mirrors together form a reflecting face and said partially reflecting mirrors together form an output face, the remainder of said fibre bundle being loosely bound to allow for excitation of the laser gain medium;

said fibre oscillators which operate in response to control signals from a computer, reflect onto said end mirrors phases of outputs of each fiber oscillator are locked together and combine to form a single lobe output beam as a result of laser light leaking from individual fiber oscillators to neighboring fiber oscillators through said thin cladding.

4,682,336

## Q-SWITCHED LASER RESONATOR OF INTEGRAL CONSTRUCTION

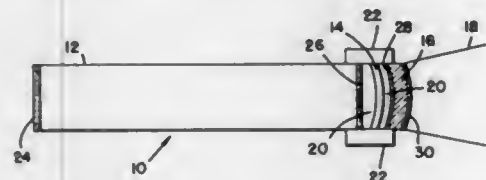
James L. Hendrix, Northridge, and Leroy O. Braun, Malibu, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 29, 1986, Ser. No. 868,381

Int. Cl.<sup>4</sup> H01S 3/11

U.S. Cl. 372-10

18 Claims



1. A Q-switched laser resonator having an integral construction comprising a laser rod, a Q-switch device having a first and a second surface, and an optical coupler, and further comprising: first bonding means for bonding the first surface of said Q-switch device to an end surface of said rod; and second bonding means for bonding the second surface of said Q-switch device to said coupler.

4,682,337

## LASER DIODE WITH BURIED ACTIVE LAYER AND LATERAL CURRENT LIMITATION BY USE OF A SELF-ADJUSTED PN-JUNCTION

Markus-Christian Amann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

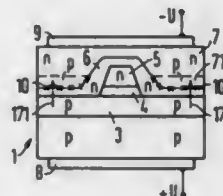
Filed Sep. 13, 1985, Ser. No. 776,156

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435148

Int. Cl.<sup>4</sup> H01S 3/19

U.S. Cl. 372-44

16 Claims



1. A method for producing a laser diode having a laser-active strip in a buried layer of a hetero-layer structure of III-V

semiconductor material wherein the buried layer is flanked by an inhibiting pn-junction such that a current limitation to the laser-active strip results, comprising the steps of:

- providing a first semiconductor layer of first conductivity type and doped with a re-doping dopant of relatively high diffusion coefficient;
- providing a second layer on the first layer which will become the laser-active strip;
- providing a third semiconductor layer of second conductivity type on the second layer and having a dopant with a relatively low diffusion coefficient compared to the re-doping dopant;
- structuring the second and third layers so as to create the laser-active strip with a layer lying thereover;
- providing a fourth semiconductor layer of second conductivity type having a relatively weakly diffusing dopant compared to the re-doping dopant over the second and third layers and on the first layer where the second and third layers have been removed;
- providing a fifth semiconductor layer of second conductivity type similarly doped like the fourth layer with a dopant of a low diffusion coefficient relative to the re-doping dopant but a degree of doping of the fourth layer being sufficiently higher than a degree of doping of the fifth layer such that given a re-doping of zones of the fifth layer by the high diffusion coefficient dopant of the first layer, the fourth layer still remains of second conductivity type at regions where the re-doping dopant diffuses through; and
- creating a re-doped zone by diffusing the re-doping high diffusion coefficient dopant from the first layer through the fourth layer and into zones of the fifth layer so as to convert said zones of the fifth layer from second conductivity type to first conductivity type and thus create said inhibiting pn-junction flanking the laser-active strip and between portions of the fourth and fifth layers.

4,682,338

## MULTI-LAMP LASER PUMPING CAVITY

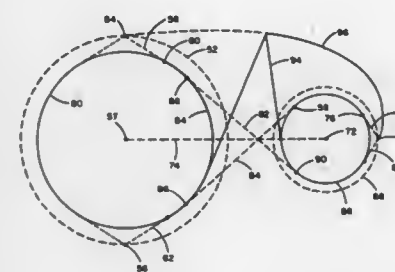
John D. Kuppenheimer, Jr., Tewksbury, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Dec. 26, 1985, Ser. No. 813,356

Int. Cl.<sup>4</sup> H01S 3/093

U.S. Cl. 372-72

4 Claims



1. An optically pumped laser comprising:
  - A. a cylindrical laser rod having a longitudinal central rod axis;
  - B. a plurality of cylindrical lamps for optically pumping the

laser rod, the lamps having longitudinal central lamp axes parallel to the rod axis, the lamps being so located with respect to each other and to the laser rod as to define in cross section a base line associated with each lamp and extending between the rod axis and the lamp axis of the associated lamp, the base lines being equal in length and equiangularly spaced; and

C. a reflector wall consisting essentially of first and second wall sections associated with each lamp, the cross sections of the first and second wall sections associated with a given lamp essentially following first and second curves extending from a lamp cusp associated with the given lamp to second and first rod cusps, respectively, associated with the given lamp, the first and second curves consisting of the loci of points to which the sums of the distances, exterior to the laser rod and the given lamp, from first and second rod starting points, respectively, associated with the given lamp and from first and second lamp starting points, respectively, on the given lamp equal a fixed quantity, where:

- i. the rod cusps are points spaced a predetermined rod stand-off distance from the rod surface, are equal in number to the number of lamps, are equiangularly spaced around the laser rod, and are equidistant from the adjacent base lines, the two rod cusps associated with a given lamp being a pair of rod cusps adjacent to each other and disposed on opposite sides of the base line associated with the given lamp;
- ii. the first and second lamp starting points on a given lamp are the points of tangency therewith of first and second tangent lines, respectively, associated with the given lamp, the first and second tangent lines associated with a given lamp being the lines that (a) intersect the base line associated with the given lamp, (b) are tangent to the given lamp, (c) are tangent to the rod if the points of tangency of such lines on the laser rod are beyond the horizons of the first and second rod cusps, respectively, associated with the given lamp, and (d) otherwise include the first and second rod cusps, respectively, associated with the given lamp;
- iii. the first and second rod starting points associated with a given lamp (a) are the first and second rod cusps, respectively, associated with the given lamp if the tangent lines associated with the given lamp include those rod cusps and (b) are otherwise the points of tangency with the laser rod of the first and second tangent lines, respectively, associated with the given lamp; and
- iv. the lamp cusp associated with a given lamp is a point that is colinear with the given-lamp and laser-rod axes, is disposed on the side of the given lamp opposite the laser rod, and is spaced from the lamp surface by a lamp stand-off distance whose value is such that the effective lamp perimeter of the given lamp equals the part of the effective rod perimeter associated with the given lamp, where the effective lamp perimeter for a given lamp is the sum of the part of the lamp perimeter outside the lamp-cusp horizon plus twice the distance from the lamp cusp to the lamp-cusp horizon and where the part of the effective rod perimeter associated with a given lamp is the shortest distance outside the lamp between the rod cusps associated with the given lamp.

4,682,339

## LASER ARRAY HAVING MUTUALLY COUPLED RESONATORS

Edward A. Sziklas, Glastonbury, and Gary E. Palma, Bloomfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 30, 1986, Ser. No. 890,587

Int. Cl.<sup>4</sup> H01S 3/08

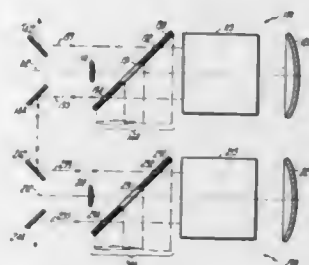
U.S. Cl. 372-95

5 Claims

1. A laser system having at least two independently pumped



unstable laser resonators, each having a feedback region in which optical radiation resonates, an output region in which output radiation exits from said feedback region and an output coupling means for coupling out a main beam from said output region in which laser extracted radiation extracted from a first one of said at least two unstable laser resonators is coupled unidirectionally into at least one other of said unstable laser resonators, whereby said extracted radiation from said first unstable laser resonator influences said at least one other unstable laser resonator, wherein the improvement comprises a



system in which each of said resonators is mutually and substantially symmetrically, bidirectionally coupled to said at least one other unstable resonator, through extraction means for extracting at least one coupling portion of said output radiation having, in total, a coupling radiation power and transporting means for transporting said at least one coupling portion of said output radiation that is mode-matched to an adjoint mode of said at least one other unstable laser resonator into at least one corresponding output region of said other one of said at least two unstable laser resonators to produce a laser system having a scaled-up laser output.

4,682,340

#### APPARATUS FOR AND METHOD OF EXTRACTING AN OUTPUT BEAM FROM A LASER SYSTEM

Timothy A. Dave, Mountain View, and Steve Guch, Jr., Saratoga, both of Calif., assignors to GTE Government Systems Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 814,448, Dec. 30, 1985, abandoned. This application Apr. 14, 1986, Ser. No. 851,985

Int. Cl.<sup>4</sup> H01S 3/08

U.S. Cl. 372-108

15 Claims



1. Apparatus for extracting an output beam from a laser system having a laser oscillator with an output, a phase conjugate mirror means spaced from said oscillator and aligned with the output of said oscillator to reflect said oscillator output in a direction back toward the oscillator, amplifying means aligned with said oscillator output between said oscillator and said mirror means, and at least one quarter-wave plate aligned with said oscillator output between said oscillator and said mirror means, the improvement comprising:

a birefringent element between said plate and said oscillator and having a surface traversing reflected and unreflected portions of said output at acute angles thereto to divert at least part of the reflected portion of said oscillator output away from said oscillator.

4,682,341

#### ELECTRIC ARC FURNACE

Joachim Ehle, Lautenbach; Klaus Timm, Wentorf, and Heinfried Ahlers, Asendorf, all of Fed. Rep. of Germany, assignors to Fuchs Systemtechnik GmbH, Willstätt-Legelshurst, Fed. Rep. of Germany

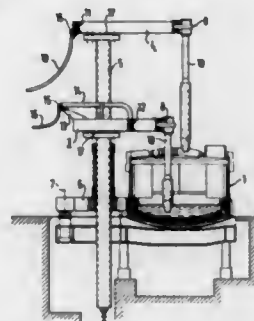
Filed Nov. 27, 1985, Ser. No. 802,252

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443574; May 10, 1985, 3516940

Int. Cl.<sup>4</sup> H05B 7/10

U.S. Cl. 373-99

17 Claims



1. An electric arc furnace comprising: at least one electrode support arm having electrode holding means including a contact jaw supported on the electrode support arm and connected to a heavy-current conductor, and also an electrode clamping stirrup displaceable by an actuating rod which is arranged within the electrode support arm and which is longitudinally displaceable by an actuating device between a clamping position in which the electrode clamping stirrup presses the electrode against the contact jaw and a release position in which the electrode clamping stirrup releases the electrode, at least over a part of its length, on the outside, the electrode support arm having a region which is provided with a layer of copper or another good conductor of electricity, and which forms the heavy-current conductor for the supply of power to the contact jaw, the electrode clamping stirrup being electrically insulated with respect to the electrode support arm, the actuating rod having an end portion which extends towards the electrode and is electrically insulatedly mounted in a sliding guide.

4,682,342

#### SIGNAL TRANSMISSION SYSTEM

Kenichi Uetani, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

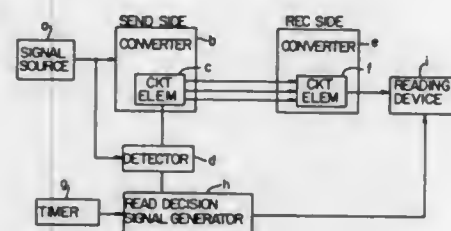
Filed Feb. 14, 1986, Ser. No. 829,028

Claims priority, application Japan, Feb. 19, 1985, 60-30846

Int. Cl.<sup>4</sup> H04K 1/10

U.S. Cl. 375-38

5 Claims



1. A signal transmission system for transmitting source signals through dispersed circuit elements comprising a signal source for generating said source signals, detection means receiving said signal for detecting a change in said signals and for generating an output detection signal, a transmitting con-

verter including a plurality of circuit elements for converting said source signals into a group of parallel signals and for transmitting said parallel signals when said circuit elements are actuated in response to said detection signal, said circuit element having a dispersion in operating time interval, read decision signal generating means for generating a read decision signal after lapse of the time interval, determined by the longest transient switching time of any one of said circuit elements, following the generation of the detection signal, a receiving converter receiving said parallel signals for converting the same into reception signals, and reading means for reading said reception signals of said converter when the read decision signal has been generated.

4,682,343

#### PROCESSING CIRCUIT WITH ASYMMETRY CORRECTOR AND CONVOLUTIONAL ENCODER FOR DIGITAL DATA

Harold J. Pfiffner, Los Angeles, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 11, 1984, Ser. No. 649,327

Int. Cl.<sup>4</sup> H04L 27/40; G06F 11/10

U.S. Cl. 375-59

8 Claims



1. A circuit for correcting input parameter variations in incoming signals of simultaneously transmitted but separately propagated data and clock pulse bits and for convolutionally encoding the corrected signal, comprising:

(a) corrector means for providing a series of corrected data pulses at the incoming data rate to an encoder, wherein the corrector means comprises:

- (1) means for receiving the incoming clock pulse bits;
- (2) means for forming from the received clock pulse bits a regenerated clock signal, said forming means having frequency adjustment means whereby, frequency of regenerated clock signal is adjusted to coincide with the received clock signal;
- (3) means for receiving the data pulse bits;
- (4) phase adjusting means for adjusting the phase of the regenerated clock signal relative to the received data signal to maintain phase coincidence;
- (5) mislock detector means for detecting and correcting a possible mislock condition whenever the phase adjustment means and the frequency adjustment means cooperate to create a false frequency lock between the received clock pulses and the regenerated clock signal;

(b) a convolutional encoder for encoding a series of digital data pulses, comprising:

- (1) means for receiving the series of data pulses;
- (2) means for encoding the series of data pulses to produce an encoded data stream wherein each bit of the series of data pulses is represented by two bits of the encoded data stream, and wherein the means for encoding further comprises;
- (3) main register means for receiving and storing a series of a plurality of data pulses in corresponding number of shift register stages;
- (4) first means for modulo-two adding the contents of a first group of selected ones of the shift register stages;
- (5) second means for modulo-two adding the contents of a second group of selected ones of the shift register stages, said first and second groups being equal in number and differing from each other by at least one shift register stage;
- (6) storage means for separately and serially loading the

outputs of said first and second means for modulo-two adding;

(7) parallel register means for parallel loading the contents of said storage means;

(8) said parallel register means further comprising means for serially transferring out the signals stored therein as coded digital data pulses.

4,682,344

#### RF FSK TRANSMITTER

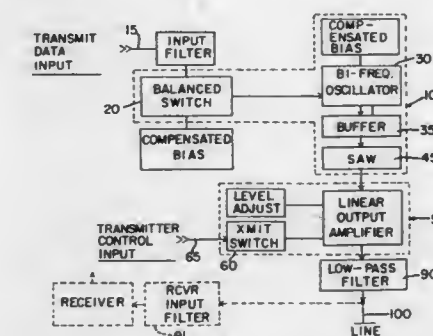
Gerald L. Somer, Sebastopol, Calif., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 30, 1985, Ser. No. 760,686

Int. Cl.<sup>4</sup> H04L 27/12; H03C 3/00

U.S. Cl. 375-62

14 Claims



1. An rf modem transmitter including a digital to analog converter for converting an input data signal having a first and a second state to a modulated analog signal, and a transmitter amplifier for amplifying the analog signal and controlling a transmitted carrier, wherein:

said digital to analog converter comprises a master oscillator having a frequency determining means;

switchable means for altering the frequency of said master oscillator;

means for selectively switching said frequency altering means, said switching means switchable between a first and a second state and coupled to said frequency determining means such that said master oscillator operates at a first frequency when said switching means is in said first state, and a second differing frequency when said switching means is in said second state,

said switching means comprising an electronic switch means operatively coupled to said frequency altering means, said electronic switch means having a control input;

said switching means further comprising means for balancing the first-to-second state and second-to-first state switching times of said switching means such that said first-to-second state switching time of said switching means is equal to said second-to-first state switching time of said switching means,

said balancing means comprising means for delaying control signals, said delaying means having an input, and an output operatively coupled to said control input of said electronic switch means,

said delay means providing delayed control signals at its output for controlling said electronic switch means responsive to switching control signals applied to the delay means input, whereby said switching control signals corresponding to desired transitions of said electronic switch means from said first-to-second states are delayed an amount substantially equal to the second-to-first state switching time of said electronic switching means.

4,682,345

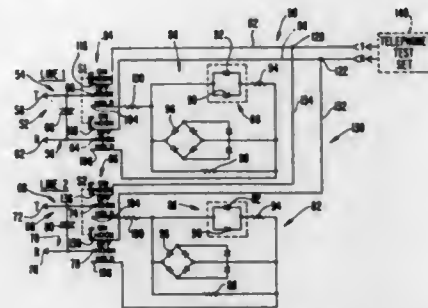
# ADAPTER FOR COUPLING TOGETHER TWO SUBSCRIBERS' LINES TO A TELEPHONE TEST SET

William R. Elsenpeter, Camarillo, Calif., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 10, 1985, Ser. No. 806,804  
Int. Cl. H04M 1/21; H04B 3/46

U.S. Cl. 379-1

7 Claims



5. In a two-line adapter for connecting two telephone lines to a telephone test set in which a separate hold circuit is provided for selectively placing each of the telephone lines on hold, the improvement comprising:

each hold circuit having means for continuously indicating the direction of current flow between a tip and ring line of an associated telephone line.

4,682,346

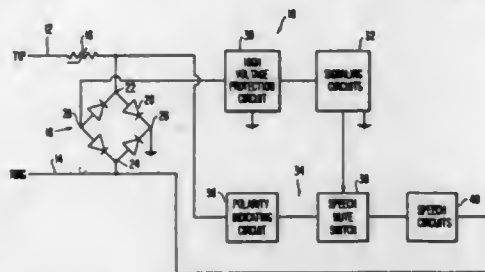
# TELEPHONE TEST SET

Richard W. Faith, Oxnard, and Thomas W. Durston, Camarillo, both of Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Dec. 24, 1985, Ser. No. 813,156  
Int. Cl. H04B 3/46

U.S. Cl. 379-22

25 Claims



1. A telephone test set comprising:

(a) a first lead and a second lead which are respectively adapted to be connected to a tip line and a ring line of a telephone line;

(b) a full wave rectifying means for providing a rectified output of an input signal and having a pair of input terminals which are respectively connected to the first lead and the second lead and a pair of output terminals which respectively output a voltage of a first polarity and a second polarity;

(c) a shunt circuit coupled between the pair of input terminals of the full wave rectifying means which is comprised of a series connection of a means for transmitting and receiving voice communications and a switching means having an open circuit condition when a control signal of a first magnitude is applied to a control terminal and having a closed circuit condition when the control signal of a second magnitude is applied to the control terminal to permit current to flow within the shunt circuit;

(d) a signaling means coupled between the pair of output terminals for producing signals to place a telephone call over the tip and ring lines to a central office when in an activated state and for not producing signals when in an inactive state, and

(e) control means responsive to the signaling means for producing the control signal having the first magnitude when the signaling means for placing a telephone call is in the active state and having the second magnitude when the signaling means for placing a telephone call is in the inactive state.

4,682,347

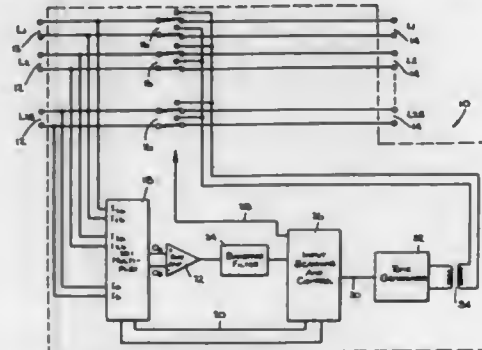
# TELEPHONE LINE SELECTION AND ISOLATION METHOD AND APPARATUS

Daniel Lynch, Jackson, N.J., assignor to Keptel, Inc., Ocean, N.J.

Filed Feb. 10, 1986, Ser. No. 828,205  
Int. Cl. H04B 3/46

U.S. Cl. 379-29

19 Claims



10. Apparatus for identifying and isolating a selected telephone line from among a plurality of telephone lines at a location remote from the central office, upon the application of a test signal to the selected line, comprising:

input/output means coupling each line of the plurality of lines to a respective subscriber line;

line selection means coupled to said input/output means, for selecting an evaluation line in a preselected sequence from among the plurality of lines in response to an input sequencing signal, and providing signals from said evaluation line as an evaluation output;

filter means coupled to said line selection means for filtering said evaluation output within a preselected wide frequency band and providing a filtered signal output;

control and detection means coupled to said filter means, operational in an initial detection mode for detecting the presence of an initial detection signal in an initial detection band within said wide frequency band during a preselected short time interval and, upon detection of said initial detection signal, operational in a validation mode for detecting the presence of a validated test signal by detecting the presence of a validation signal lying in a validation band within said initial detection band during a preselected number of sequential long time intervals, for providing as an output a "commence test" signal upon detection of said validated test signal or a said input sequencing signal upon failure to detect a said initial test signal during said short time interval or a said validation signal during any said long time interval; and

isolation means coupled to said control and detection means and to said input/output means, for disconnecting said evaluation line from said respective subscriber line in response to said "commence test" signal.

4,682,348

# LIFE SAFETY AUDIO SYSTEM HAVING A VOICE SYNTHESIZER AND A CONSTANT VOLUME TELEPHONE NETWORK

Brian D. Dawson, and James R. Leacock, both of Lincoln, Nebr., assignors to Emhart Industries, Inc., Indianapolis, Ind.

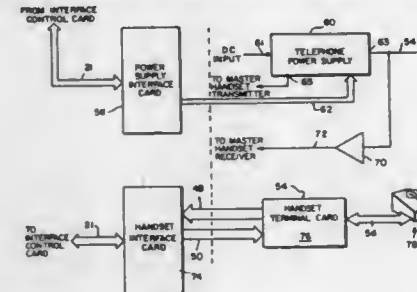
Filed May 16, 1985, Ser. No. 734,554  
Int. Cl. H04M 11/04

U.S. Cl. 379-37

3 Claims

1. In a life safety system for monitoring a building or the like and having a plurality of detectors located throughout the

building for detecting alarm conditions, a plurality of speakers located throughout the building, a source of pre-stored voice messages which can be broadcast over the speakers, a telephone network, the improvement comprising a voice synthesizer for providing the source of pre-stored voice messages and the telephone network comprising a constant volume telephone network which comprises a telephone line, a plurality of telephones connected to the telephone lines including a master telephone having a transmitter, a telephone line power supply having an adjustable output voltage, sensing and adjusting



means for sensing the number of telephones off-hook and causing the output voltage of the telephone line power supply to be adjusted in response to the number of telephone off-hook, the telephone power supply comprising a voltage regulator having a DC input coupled to a source of DC voltage, a regulated DC output coupled to the telephone line, and an adjust input coupled to the sensing and adjusting means, and the telephone network includes means for coupling the master telephone's transmitter to the adjust input of the voltage regulator.

4,682,349

# SWITCHING SYSTEM WITH VIDEO SWITCHING MATRIX

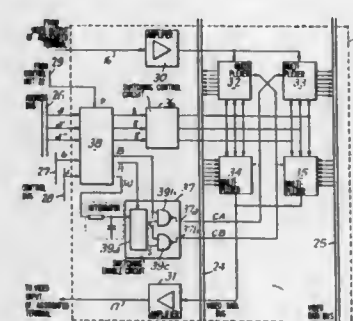
Pierre Sorriaux, 13, Place G. Braque, 95100 Argenteuil, France

Filed Apr. 8, 1985, Ser. No. 720,772

Claims priority, application France, Apr. 10, 1984, 84 05669  
Int. Cl. H04Q 3/52; H04N 5/268

U.S. Cl. 379-54

4 Claims



1. Switching system with a video switching matrix of the type used for setting up a dual video connection between a calling terminal and a called terminal in a telecommunication network re-grouping an array of N subscriber terminals each of which is provided with means for transmitting and receiving video signals, wherein said video switching matrix comprises:

(a) first and second data bus, each one comprising n conductors or channels for routing the video signals,

(b) at least one address bus,

(c) control conductors, and

(d) an array of N switching points, each one being associated to a respective subscriber terminal and being connected to said buses and control conductors each switching point comprising:

first and second output switches each having one data input, n data outputs, one validation input and control inputs, the

data inputs of said output switches being jointly connected to the video transmitting means of the associated terminal, the n data outputs of the first output switch being connected to the first data bus and the n outputs of the second output switch being connected to the second data bus,

first and second input switches each having n data inputs and one data output, one validation input and control inputs, the data output of said input switches being jointly connected to the video receiving means of the associated terminal, the n data inputs of the first input switch being connected to the first data bus and the n data inputs of the second input switch being connected to the second data bus,

a circuit receiving address signals transmitted on the address bus and producing control signals applied in parallel to the control inputs of said output and input switches, for controlling said switches in order to select on each data bus a channel corresponding to the received address, and

a circuit receiving the signal transmitted on the control conductors and having a first output connected in parallel to the validation inputs of the first output switch and of the second input switch and a second output connected in parallel to the validation inputs of the second output switch and of the first input switch, so as to, enable depending on the signals received from said control conductors, either the pair formed by the first output switch and the second input switch, or the pair formed by the second output switch and the first input switch, to allow the setting up of a connection between the video transmission means of the associated terminal and the channel selected on one of the data buses, and of a connection between the channel selected on the other data bus and the video receiving means of the associated terminal.

4,682,350

# EQUIPMENT FOR WIRELESS TELEPHONE TRANSMISSION

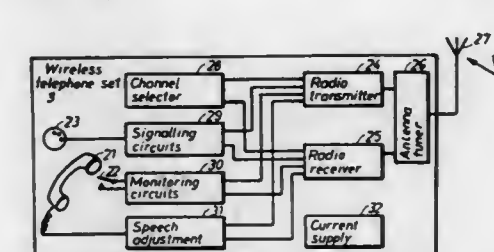
Dag E. Akerberg, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 598,353, Mar. 6, 1984, abandoned. This application Apr. 10, 1986, Ser. No. 850,222

Claims priority, application Sweden, Jul. 6, 1982, 8204187  
Int. Cl. H04N 11/00

U.S. Cl. 379-61

7 Claims



1. In a telephone communication system including at least a first unit and a second unit for audio information wherein each of the units includes a radio transmitter and a radio receiver, the method of radio communicating audio information between the units comprising the steps of dividing telephone audio information communication time into a plurality of equal time slots, dividing each time slot into a first and second period, during each first period radio transmitting from one of said units over a radio channel having a given range of frequencies to the other of said units and during each second period radio transmitting from said other unit to said one unit over said radio channel, the duration of said periods with respect to each other being a function of which transmitter is active at a given time.



4,682,351

## CORDLESS TELEPHONE SYSTEM

Masayuki Makino, Tokyo, Japan, assignor to NEC Corporation, Japan

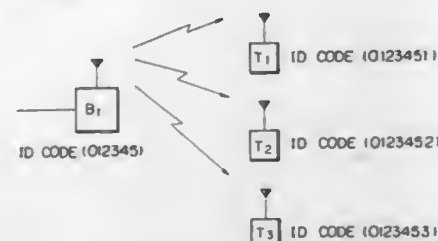
Filed Oct. 23, 1985, Ser. No. 790,329

Claims priority, application Japan, Oct. 29, 1984, 59-225691

Int. Cl.<sup>4</sup> H01H 11/08

U.S. Cl. 379-62

6 Claims



1. A cordless telephone system including a single base station and a plurality of mobile stations which are connectable to the base station over a radio link;

said mobile stations each being provided with an identification code which is different from identification codes assigned to the other mobile stations, said identification code being indicative of a master-slave relationship of said mobile station to the other mobile stations and a particular priority order of said mobile station with respect to reception of a telephone call;

said base station being constructed to determine whether any of the mobile stations which has originated a telephone call is a master mobile station or a slave mobile station referencing the identification code assigned to said particular mobile station and, if said mobile station is a master station, connect said mobile station to a subscriber's line to allow dial signals to be transmitted and, if said mobile station is a slave station, inhibit transmission of dial signals although connecting the mobile station to the subscriber's line;

said base station being further constructed to, at the time of reception of a telephone call, transmit control signals sequentially to the mobile stations on a time division basis according to the order of priority;

whereby the master mobile station is capable of originating and receiving a telephone call, while each of the slave mobile stations is capable of only receiving a telephone call.

4,682,352

## UNIVERSAL MODEM RECEIVER TRANSMITTER

Stephen J. Durham, Cupertino, Calif., assignor to Cermatek Microelectronics, Inc., Sunnyvale, Calif.

Filed Aug. 20, 1985, Ser. No. 767,523

Int. Cl.<sup>4</sup> H04M 11/00

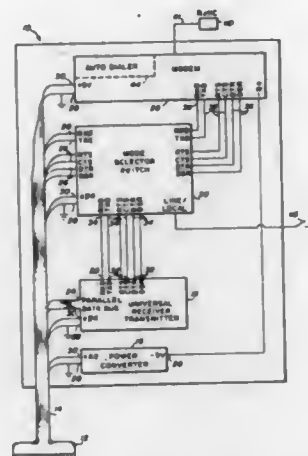
U.S. Cl. 379-98

7 Claims

6. A retrofit modem for installing in a host data terminal, comprising:

connection means for connecting to said host data terminal; universal receiver transmitter means connected to said connection means for converting data format; modem means for interfacing said host data terminal to telephone lines; and mode selector switch means connected to the universal receiver transmitter means and to both the connection

means and the modem means, for connecting a serial data bus side of the universal receiver transmitter means selec-



tively between said host data terminal and the modem means.

4,682,353

## KEY TELEPHONE SYSTEM

Masayoshi Inoue, Kenichiro Hirano, and Ryolchi Tanihata, all of Tokyo, Japan, assignors to NEC Corporation, Japan

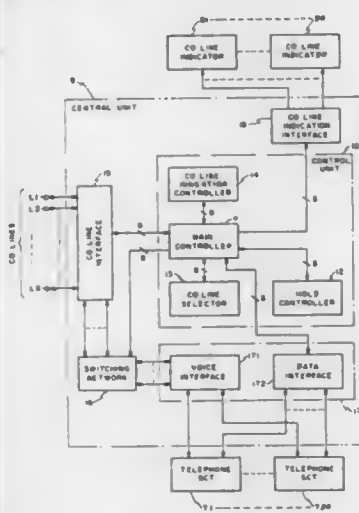
Filed Mar. 18, 1986, Ser. No. 840,732

Claims priority, application Japan, Mar. 20, 1985, 60-57329

Int. Cl.<sup>4</sup> H04M 3/42, 1/00

U.S. Cl. 379-163

9 Claims



1. A key telephone system comprising:

a plurality of telephone sets, each set having a hold button for temporarily holding a central office line over which a communication is being held, a plurality of call park lamps for temporarily indicating that said central office line is being held, a plurality of call park buttons individually associated with said call park lamps, an outgoing call button for seizing an idle one of the central office lines when an outgoing call is to be initiated, and an answer button for seizing one of the central office lines over which an incoming call is being received so as to respond to said incoming call;

at least one external indicator for indicating various states of each of the central office lines; and

a central unit having hold control means for selectively energizing said call park lamps to indicate when said central office lines are being held responsive to an operation of said hold button and for controlling a response to that central office line in response to an operation of one of said call park buttons, central office line selecting means for selecting and seizing an idle one of the central office lines in response to an operation of said outgoing call button and for selecting and seizing one of the central office lines over which an incoming call is being received in response to an operation of said answer button, and central office line indication control means for controlling said external indicator to indicate various states of said central office lines.

4,682,354

## AUTOMATIC CALL COVERAGE FOR UNATTENDED PBX STATIONS

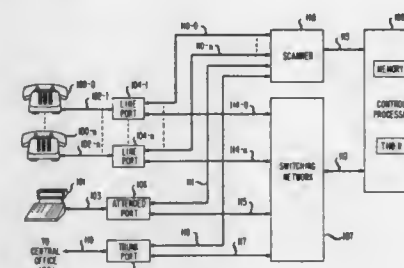
Vincent D. Vanacore, Boulder, Colo., assignor to AT&amp;T Company and AT&amp;T Information Systems, Inc., both of Holmdel, N.J.

Filed Dec. 4, 1984, Ser. No. 677,802

Int. Cl.<sup>4</sup> H04M 3/50, 3/54

U.S. Cl. 379-211

22 Claims



1. In a telephone switching system serving a plurality of station devices connected to associated port circuits where a processor controls interconnections between said port circuits in response to service requests received from said station devices, an automatic call coverage arrangement comprising:

means responsive to a first incoming call to one of said station devices remaining unanswered for a predetermined length of time for storing an indication that said first incoming call has not been answered; means responsive to said stored indication for routing said first incoming call to a designated coverage facility; and said routing means responsive to said stored indication for additionally routing all subsequently received incoming calls, that are directed to said one station device, to said designated coverage facility in lieu of ringing said one station device.

4,682,355

## ELECTRONIC FEEDING BRIDGE FOR A SPACE DIVISION SWITCHING NETWORK

Francois P. Bailly, Palaiseau, and Alain Bourgoin, Dourdan, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Sep. 13, 1984, Ser. No. 650,181

Claims priority, application France, Sep. 15, 1983, 83 14693

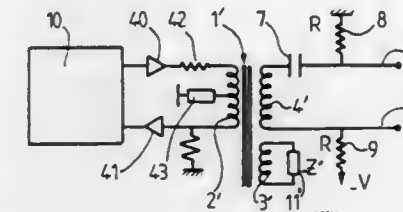
Int. Cl.<sup>4</sup> H04B 3/16

U.S. Cl. 379-346

4 Claims

1. An electronic feeding bridge for a switching network, comprising: a pair of two wires adapted to be connected on the one hand to a sub set, on the other hand to the two ends of a first winding of a transformer via at least one capacitor connected between one of the ends of said first winding and the associated wire of said pair, the transformer comprising a second winding connected to said switching network and the two wires of said pair being respectively connected to two feed

resistors, one taken to earth, the other to a feed potential, a third winding to which a negative impedance circuit is connected, so as to cooperate, in alternating current, with the feed resistors and thus to present in parallel on said pair of wires,



toward the sub set with respect to the capacitor, an impedance greater than that of the two feed resistors connected in series, and a disabling line connected to said negative impedance circuit such that oscillations are avoided across said sub set when lines connected to said sub set are open.

4,682,356

## APPARATUS FOR TRANSMITTING AND/OR RECEIVING BALANCED SIGNALS ON A TWO-WIRE TELECOMMUNICATION LINE

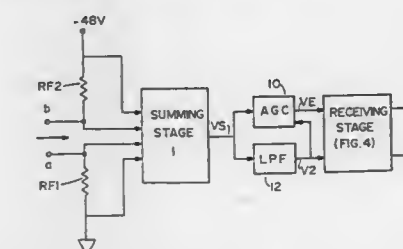
Morris L. Minch, Coral Springs, and Theodore W. Wagner, West Palm Beach, both of Fla., assignors to Siemens Corporation, New York, N.Y.

Division of Ser. No. 350,028, Feb. 18, 1982, Pat. No. 4,485,277, which is a continuation-in-part of Ser. No. 137,810, Apr. 4, 1980, abandoned. This application Jul. 2, 1984, Ser. No. 627,243

Int. Cl.<sup>4</sup> H04B 3/04

U.S. Cl. 379-347

2 Claims



1. A unidirectional repeater circuit for a two-wire branch of a four-wire telecommunication line comprising

a first summing stage having four inputs and an output, a first input being connected to a first wire of said two-wire branch of said four-wire telecommunication line via a first resistor, a second input being connected directly to said first wire, a third input being connected to a second wire of said two-wire branch of said four-wire telecommunication line via a second resistor, and a fourth input being connected directly to said second wire;

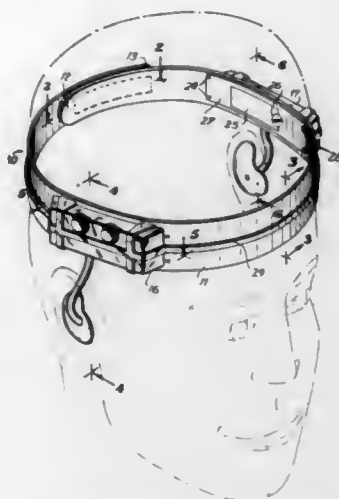
a gain control stage connected to the output of the first summing stage, the gain control stage for supplying a control signal and an AC signal at first and second outputs respectively; and

a receiving stage connected to the first and second outputs of the gain control stage for providing an output to a two-wire telecommunication line, the receiving stage comprising first and second operational amplifiers, the first operational amplifier being connected to a first reference voltage at its non-inverting input and having its output connected to its inverting input via a third resistor and to a first wire of the two-wire telecommunication line via a fourth resistor, the second operational amplifier having its non-inverting input connected to a second reference voltage and to the second output of the gain control stage, its output being connected via a fifth resistor to a second wire of said two-wire telecommunication line, via a sixth resis-





person's ears, the earpiece means having an opening for transmission of sound to the user's ear canal, the earpiece means



being adapted to substantially hermetically seal around the user's ear canal.

4,682,364

#### FADER CIRCUIT ARRANGEMENT IN ELECTRICAL REPRODUCING APPARATUS AND FADER CONTROL FOR SUCH AN ARRANGEMENT

Joachim A. Dünnebacke, Herborn, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

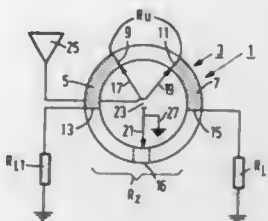
Filed Jul. 12, 1985, Ser. No. 754,099

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 3427000

Int. Cl.<sup>4</sup> H03G 3/00

U.S. Cl. 381-109

11 Claims



1. A fading circuit in an electrical reproduction apparatus for fading the signals applied to first and second reproduction units comprising:

a variable resistor having first and second ends of a resistance element connected to said first and second reproduction units, respectively, and having a movable wiper means which, when moving along said resistance element in a first direction, forms a fading resistance which decreases from a maximum to a minimum value in series with said first reproduction unit, and a fading resistance which increases in resistance from a minimum to a maximum in series with said second reproductions unit; and an additional variable resistor having a wiper means coupled with said first variable resistor wiper means, said additional variable resistor means providing first and second variable resistances in parallel with said first and second reproduction units, said first variable resistance increasing from a minimum to a maximum while said second variable resistance decreases from a maximum to a minimum when said first variable resistor wiper means moves in said first direction.

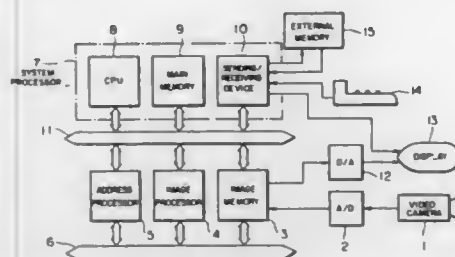
#### 4,682,365 SYSTEM AND METHOD FOR PREPARING A RECOGNITION DICTIONARY

Miyahiko Orita, Yoshiaki Kobayashi, and Tadaaki Mishima, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Jan. 7, 1985, Ser. No. 742,559

Claims priority, application Japan, Jun. 8, 1984, 59-116462  
Int. Cl.<sup>4</sup> G06K 9/68

U.S. Cl. 382-14

7 Claims



1. Method for preparing a recognition dictionary of decision tree structure, by which identification (classification) is effected, by the use of electronic data processing means while allocating each of a plurality of features prepared for objects to be recognized by recognition means to each of the nodes of a decision tree comprising

- a step of estimating the maximum depth in representation of node level of the decision tree necessary for recognizing one of the objects to be recognized,
- a step of estimating the sum of node numbers, which is the total sum of the depths in representation of node level of the decision tree necessary for recognizing all of the objects to be recognized, and
- a step responsive to a requirement to said system of extracting (selecting) independently a feature, for which the maximum estimated depth according to said step (a) is the smallest, or a feature for which the sum of the estimated node numbers according to said step (b) is the smallest.

4,682,366

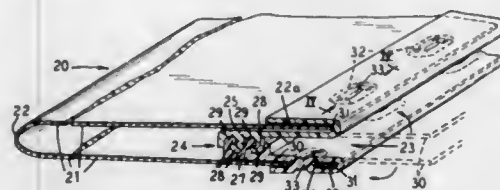
#### ATTACHMENT OF PLASTIC ZIPPER TO INCOMPATIBLE BAG WALL WEB

Steven Ausnit, New York, and Per Bentsen, Suffern, both of N.Y., assignors to Minigrip, Incorporated, Orangeburg, N.Y.  
Filed Aug. 27, 1985, Ser. No. 769,894

Int. Cl.<sup>4</sup> B65D 33/16

U.S. Cl. 383-65

18 Claims



1. In a bag comprising a thin web material body having side margins and with an openable top flanked by opposed upwardly projecting pull flanges, and an extruded plastic zipper means carried by said body along said pull flanges, and wherein:

- said bag body and said zipper means are fusibly incompatible;
- said zipper means comprising a pair of fusible extruded plastic strips extending from side-to-side of said bag to and between said margins and having complementary separably interlockable zipper profiles and located parallel to and substantially below upper ends of said pull flanges;

each of said strips having a base parallel to said pull flanges; holes in portions of the material of said bag body and aligned with said strips;

and fused connecting anchors extending from said zipper strips through said holes and permanently attaching said zipper strips to said bag body in a manner to effect cooperation of said strips with said pull flanges so that the profiles of said strips can be separated from an interlocked relation by pulling said pull flanges in respective opposite directions;

said holes being elongated with their length parallel to said zipper strips and said anchors being of elongated cross section complementary to said holes so as to strengthen the anchoring relationship of said anchors and said portions of the bag material and to resist stresses of pulling forces applied to said portions of the bag material bag and through said anchors when pulling the pull flanges apart and thereby pulling separating the zipper profiles from their interlocked relation.

10. A method of making a bag equipped with extruded plastic reclosable zipper means, comprising:

forming a bag body from thin web material and having opposite side margins and an openable top flanked by opposed upwardly projecting pull flanges;

providing a pair of opposed extruded plastic zipper strips fusibly incompatible with the material of said bag body and having complementary separably interlockable zipper profiles and each strip having a base;

assembling said profile strips along said pull flanges with said bases parallel to said pull flanges, and locating said strips with their profiles substantially below upper ends of said pull flanges;

permanently attaching said zipper strips to said bag body by fusibly connecting anchors from said zipper strips through holes in said bag material in a manner to effect cooperation of said strips with said pull flanges so that said profiles of said strips can be separated from an interlocked relation by pulling said pull flanges in respective opposite directions;

and elongating said holes lengthwise of said fastener strips and correspondingly elongating the cross section of said anchors so as to strengthen the anchoring relationship of said anchors and said bag material to resist stresses from pulling forces applied to said bag material by said anchors when pulling the pull flanges apart and separating the profiles from an interlocked relation.

4,682,367

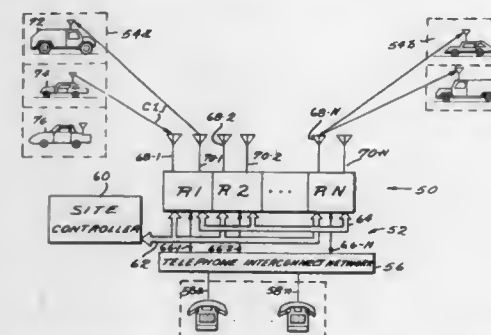
#### MOBILE RADIO COMMUNICATIONS SYSTEM WITH JOIN FEATURE

Jeffery S. Childress, Lynchburg; Marc A. Dissosway, Forest, and Houston H. Hughes, III, Lynchburg, all of Va., assignors to General Electric Company, Lynchburg, Va.  
Filed Nov. 13, 1985, Ser. No. 797,503

Int. Cl.<sup>4</sup> H04B 7/14, 1/00

U.S. Cl. 455-17

12 Claims



1. In a trunking radio transceiver of the type which operates on a plurality of channels, the improvement comprising: means for controlling said transceiver to (1) transmit, on a

non-used channel X, a request to join ongoing transceiver communications being conducted over a further channel Y, (2) thereafter leave said channel X and scan said plural channels, and (3) thereafter tune to said channel Y in response to signalling transmitted to said transceiver so as to permit transceiver participation in said ongoing transceiver communications thereon.

4,682,368

#### MOBILE RADIO DATA COMMUNICATION SYSTEM USING A SPEECH RECOGNITION TECHNIQUE

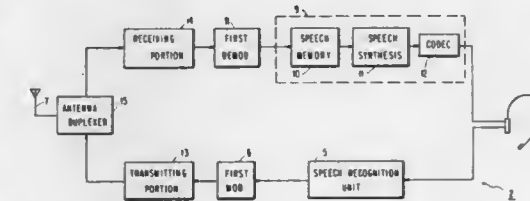
Tsutomu Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,067

Claims priority, application Japan, Mar. 27, 1984, 59-57457  
Int. Cl.<sup>4</sup> H04B 7/00

U.S. Cl. 455-38

6 Claims



1. A data communication system which allows an operator to input data in the form of a speech signal comprising:

a fixed unit including

control means for controlling generation of an operation command code sequence for an instruction to said operator and for processing a code associated with a speech signal supplied by the operator in response to the instruction,

first modulator means for modulating the operation command code sequence to generate a first modulated signal, and

first demodulator means for demodulating a received signal to generate said code associated with said speech signal; and

at least one portable unit including speech recognition means for recognizing said speech signal and outputting said code associated with the speech signal,

second modulator means for modulating the code associated with said speech signal to generate a second modulated signal, said second modulated signal being the signal received by said first demodulator means,

second demodulator means for demodulating the first modulated signal to generate said operation command code sequence,

speech synthesis means for generating a speech signal associated with the operation command code sequence, and a headset operated by the operator for receiving the speech signal uttered by the operator and receiving the speech signal supplied from the speech synthesis means.

4,682,369

#### RIPPLE AND DROOP REDUCTION CIRCUIT

Elliott G. Schrader, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 4, 1985, Ser. No. 707,938

Int. Cl.<sup>4</sup> H04B 1/04

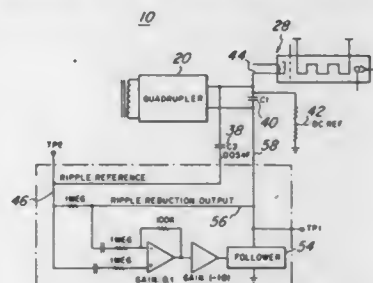
U.S. Cl. 455-127

7 Claims

1. A ripple reduction circuit for a radar transmitter, comprising:

- (a) power supply means having a supply output;
- (b) supply capacitor means having first and second electrodes and coupled across said supply output;

- (c) ripple and droop reduction means comprising;
- (d) first means including an operational amplifier having a pair of inputs and an output for providing a signal on said output which is a function of the difference between signals on the input thereof;
- (e) ripple reference measuring means coupled between a first electrode of said supply capacitor means and one input of said operational amplifier; and
- (f) ripple reduction means coupled between the second electrode of said supply capacitor means and the other input of said first means including an operational amplifier;
- (g) the output of said first means including an operational amplifier being coupled to said ripple reduction means and said second electrode of said supply capacitor means.
7. A radar transmitter comprising:
- (a) a power supply means;
- (b) a power supply capacitor having a first plate operatively connected to the power supply means;
- (c) a ripple and droop reduction means operatively connected to the power supply means across the power supply capacitor to a second plate of the power supply capacitor for reducing substantially the ripple and droop voltages from the power supply capacitor; and
- (d) an electronic tube operatively connected to the power supply capacitor for producing an electron beam for modulation by an RF input single, wherein
- (e) the ripple and droop reduction means comprises a ripple



reference obtaining means operatively connected to the power supply, and a ripple reduction means operatively connected to the second plate for reducing substantially the ripple of the power supply when it is off and the droop of the power supply capacitor when the power supply is on, wherein

- (f) the ripple reduction output means includes an operational amplifier ac connected across the beam supply filter capacitor and outputting a low level, single ended version of the ac ripple and droop appearing across the beam supply filter capacitor, an inverter amplifier means operatively connected to the operational amplifier for inverting its output signal and amplifying its absolute level to that appearing across the beam supply filter capacitor to provide an inverted image of the ac across the beam supply filter capacitor, and a follower means operatively connected to the inverter means for providing a low impedance output for insertion in series with the beam supply filter capacitor whereby the ac component of the voltage

- between the electronic tube and ground is reduced substantially, wherein
- (g) the follower means includes at least one stage of emitter follower transistors operatively connected to the inverter means, and wherein
- (h) the at least one emitter follower stage includes an NPN transistor and a PNP transistor having their bases connected to the inverter amplifier and their emitters connected together through a pair of reversed diodes and a capacitor.

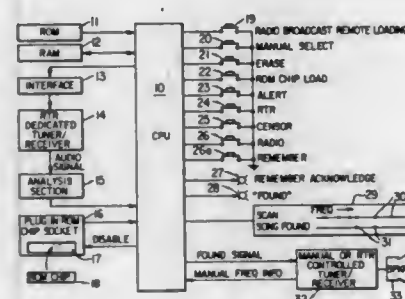
#### 4,682,370 APPARATUS FOR AUTOMATICALLY DETECTING AND PLAYING DESIRED AUDIO SEGMENTS OVER A BROADCAST RECEIVER

Gordon H. Matthews, 5301 Mariners Way, Plano, Tex. 75075  
Continuation-in-part of Ser. No. 434,868, Oct. 15, 1982, Pat. No. 4,499,601. This application Feb. 8, 1985, Ser. No. 699,844  
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl. H03J 7/18; H04B 1/16

U.S. Cl. 455-166

31 Claims



1. A method of detecting and playing desired audio programs over a broadcast receiver which may be selectively tuned to receive broadcast signals from any one of a plurality of different broadcast stations comprising:
- inputting from an external source a plurality of representations each representing a desired audio segment,
- storing said representations,
- scanning the audio programs being broadcast over the receiver by a plurality of different broadcast stations,
- generating in response to said scanning step representations each representing a first portion of at least one of said audio programs, each audio program further comprising a remaining portion,
- comparing said stored representations with said generated representations, and
- playing a remaining portion of a desired audio program over the broadcast receiver when said comparing step determines a match between the stored representation of a desired audio segment and a generated representation of said at least one audio program.

## DESIGNS

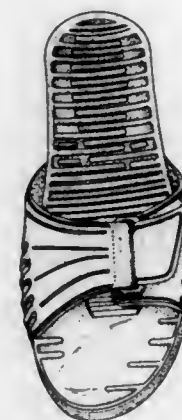
JULY 21, 1987

### 290,900 SANDAL

Michael M. Schornstein, Memphis, Tenn., and Malcolm G. Blissett, Grand Rapids, Mich., assignors to Scholl, Inc., Memphis, Tenn.

Filed May 17, 1985, Ser. No. 722,252  
Term of patent 14 years

U.S. Cl. D2-293

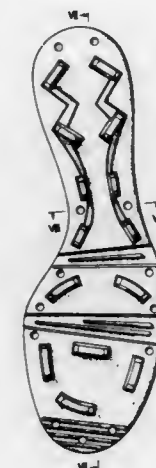


### 290,903 SHOE SOLE

Masanobu Inohara, and Yoshiaki Hase, both of Akashi, Japan, assignors to Asics Corporation, Japan

Filed Apr. 12, 1985, Ser. No. 722,736  
Claims priority, application Japan, Jan. 17, 1985, 60-1297  
Term of patent 14 years

U.S. Cl. D2-320



### 290,901 SHOE UPPER

James K. Tong, Beaverton, Oreg., and Robert L. Peterson, Taichung, Taiwan, assignors to Pensa, Inc., Portland, Oreg.

Filed Aug. 22, 1986, Ser. No. 899,124  
Term of patent 14 years

U.S. Cl. D2-314



### 290,904 DICKIE

Edward M. Crouch, 25 Regency Crescent, Whitby, Ontario, Canada L1N 7K8

Continuation of Ser. No. 427,485, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 143,303, Apr. 24, 1980. This application Feb. 2, 1984, Ser. No. 576,351

Term of patent 14 years

U.S. Cl. D2-602



### 290,902 SHOE SOLE

Brenda Kelley, Beaverton, Oreg., assignor to Pensa, Inc., Portland, Oreg.

Filed Aug. 22, 1986, Ser. No. 899,123  
Term of patent 14 years

U.S. Cl. D2-320





290,905  
UMBRELLA HANDLE

Julie A. Selig, Cincinnati, Ohio, assignor to 'totes', incorporated, Charles B. King, 5302 Blakeford Ct., Bethesda, Md. 20816  
Loveland, Ohio

Filed Nov. 2, 1984, Ser. No. 667,597

Term of patent 14 years

U.S. Cl. D3—16



290,907  
GUN RACK

Charles B. King, 5302 Blakeford Ct., Bethesda, Md. 20816

Filed Sep. 12, 1984, Ser. No. 649,727

Term of patent 14 years

U.S. Cl. D3—38



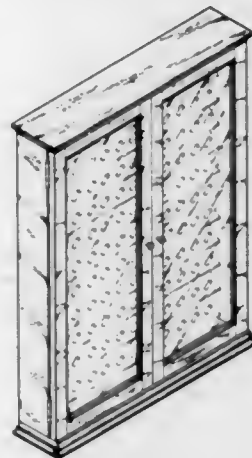
290,906  
CABINET FOR SPOOLS OF SEWING THREAD OR THE LIKE

John S. Lux, 5825 North Haven Dr., North Highlands, Calif. 95660

Filed Jan. 22, 1985, Ser. No. 693,562

Term of patent 14 years

U.S. Cl. D3—25



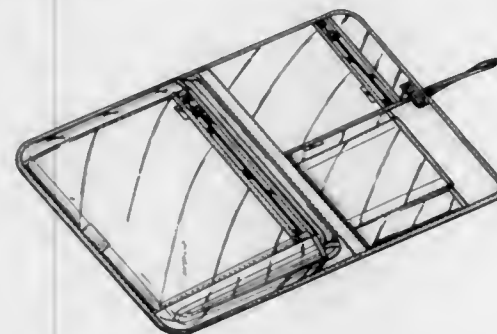
290,908  
COMBINED CARRYING BAG FOR INFANT ACCESSORIES AND CHANGING MAT

Suzanne Thomas, New York, N.Y., assignor to Accessories by Us, Inc., New York, N.Y.

Filed Jul. 25, 1985, Ser. No. 758,996

Term of patent 14 years

U.S. Cl. D3—71



290,909  
FOUNTAIN BRUSH

Franco Clivio, Zürich, Switzerland, and Dieter Raffler, Neu-Ulm, Austria, assignors to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,066

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 14638403

The portion of the term of this patent subsequent to Jul. 28,

2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D4—115



290,911  
GLIDER SEAT

Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.

Filed Aug. 10, 1984, Ser. No. 639,597

Term of patent 14 years



290,912  
ADJUSTABLE SOFA

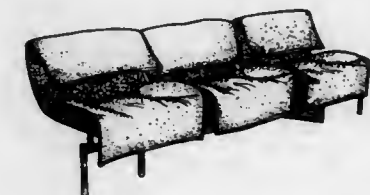
Rodrigo Rodriguez, Carimate, Italy, assignor to Cassina S.p.A., Meda, Italy

Filed Jan. 10, 1985, Ser. No. 690,150

Claims priority, application Italy, Jul. 11, 1984, 22542/84[U]

Term of patent 14 years

U.S. Cl. D6—367



290,910  
HAIRBRUSH

Alan E. Steadman, Altrincham, and Christopher A. Burridge, Surbiton, both of England, assignors to Denroy Plastics Limited, Bangor, Northern Ireland

Filed Nov. 19, 1984, Ser. No. 674,283

Claims priority, application United Kingdom, May 19, 1984, 1019849

Term of patent 14 years

U.S. Cl. D4—136



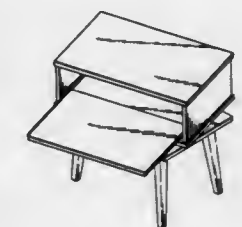
290,913  
COMBINED ADJUSTABLE TABLE AND EXTENDIBLE SHELF UNIT

Kemper H. Richter, 2802 Lynn St., Bellingham, Wash. 98225

Filed Jan. 22, 1985, Ser. No. 693,597

Term of patent 14 years

U.S. Cl. D6—430

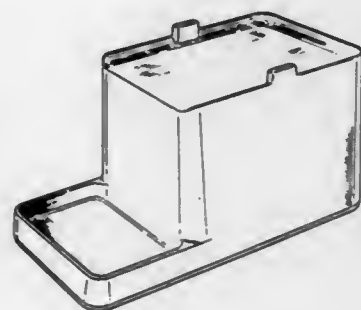


290,914

## BEVERAGE SERVING STAND

Arthur R. Carlson, Melbourne, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia  
Filed Aug. 31, 1984, Ser. No. 646,568  
Term of patent 14 years

U.S. Cl. D6-474

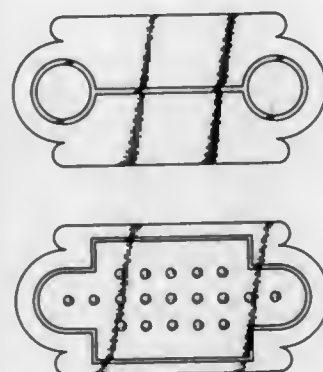


290,916

## BATHTUB MAT

Debbie A. Madison, and Michael G. Madison, both of 34960 Judy Ln., Cathedral City, Calif. 92234  
Filed Feb. 21, 1985, Ser. No. 704,043  
Term of patent 14 years

U.S. Cl. D6-583



290,917

## BEAR SLEEPING BAG AND RUG

Kenneth S. Rollins, Jr., 503 S. Hughes Blvd., Elizabeth City, N.C. 27909

Filed Jan. 7, 1985, Ser. No. 689,532  
Term of patent 14 years

U.S. Cl. D6-589

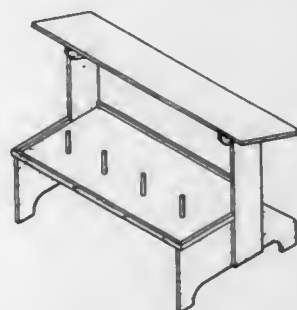


290,915

## WORK TABLE FOR A KNITTING MACHINE OR THE LIKE

Thomas W. Hoover, 913 Rosewood Ln., Arlington, Tex. 76010  
Filed Mar. 11, 1985, Ser. No. 710,471  
Term of patent 14 years

U.S. Cl. D6-477

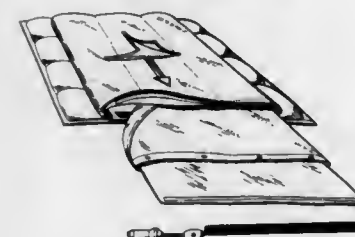
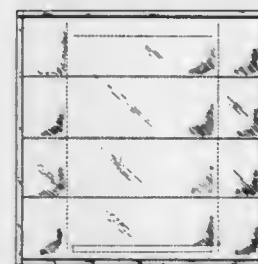
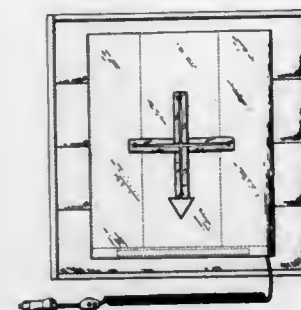


290,918

## ELECTRICALLY HEATED COMFORTER OR THE LIKE

Joyce A. Ball, and Glen W. McKetrick, both of 7031 Mills Ave., Jacksonville, Fla. 32211  
Filed Feb. 27, 1985, Ser. No. 706,176  
Term of patent 14 years

U.S. Cl. D6-603

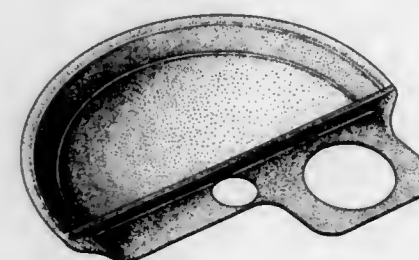


290,919

## COMBINED HAND-HELD PLATE AND BEVERAGE HOLDER

William M. Beute, 132 Mt. Airy Rd., Bernardsville, N.J. 07924  
Filed Apr. 26, 1985, Ser. No. 727,784  
Term of patent 14 years

U.S. Cl. D7-38

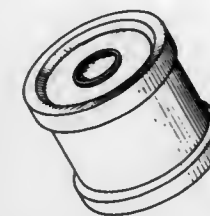


290,920

## ICE CREAM SANDWICH MAKER OR THE LIKE

John V. Zaruba, Chicago, Ill.; Rino Conti, Stoughton, Mass., and Howard J. Morrison, Deerfield, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.  
Filed Feb. 1, 1985, Ser. No. 697,327  
Term of patent 14 years

U.S. Cl. D7-43

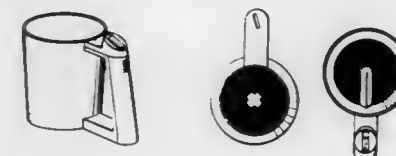


290,921

## BATTERY POWERED FLOUR SIFTER

Jamshid Dardashti, Los Angeles, Calif., assignor to J & F Import-Export International, Inc., Los Angeles, Calif.  
Filed Jul. 12, 1984, Ser. No. 630,318  
Term of patent 14 years

U.S. Cl. D7-47

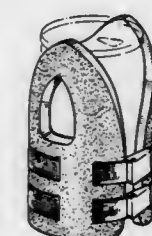


290,922

## BEVERAGE CAN HOLDER

Freddy Herrera, 2410 Hackett #126, Houston, Tex. 77008  
Filed May 3, 1985, Ser. No. 732,247  
Term of patent 14 years

U.S. Cl. D7-70

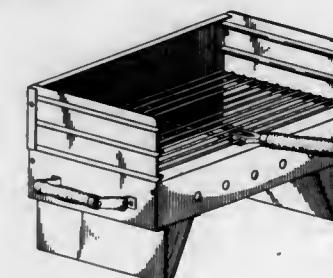


290,923

## BARBEQUE GRILL

Fredrick J. Erickson, Des Moines, Iowa, assignor to Ebco, Inc., Marshalltown, Iowa  
Filed Sep. 23, 1985, Ser. No. 778,805  
Term of patent 14 years

U.S. Cl. D7-337





290,924

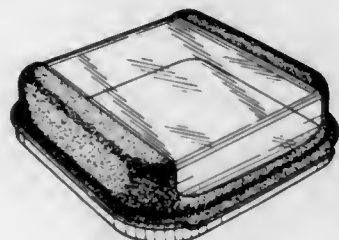
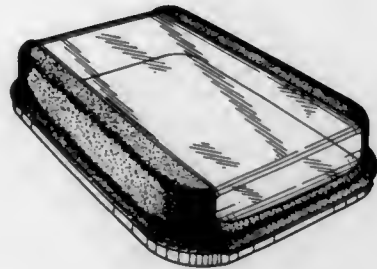
## COVER OR THE LIKE

Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 3, 1984, Ser. No. 637,467

Term of patent 14 years

U.S. Cl. D7—391



290,925

## SHANK FOR A GARDEN SHEAR

Alan K. Pittaway, High Wycombe, England, and Christopher R. B. Harrison, Mid-Glamorgan, Wales, assignors to Wilkinson Sword Limited, High Wycombe, England

Filed Nov. 28, 1984, Ser. No. 675,490

Term of patent 14 years

U.S. Cl. D8—5



290,926

## PLYWOOD CARRIER

Maurice C. Embra, 1834 West 1st Avenue, Vancouver, British Columbia, Canada V6J 1G5

Filed May 30, 1984, Ser. No. 615,377

Term of patent 14 years

U.S. Cl. D8—14



290,927

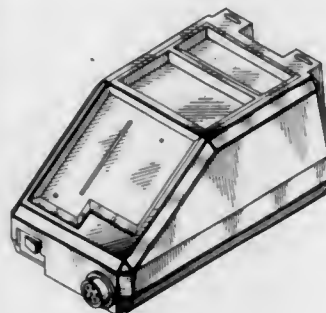
## SOLDERING STATION

David A. Pagani, Newport Beach, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.

Filed Dec. 18, 1984, Ser. No. 683,019

Term of patent 14 years

U.S. Cl. D8—30



290,928

## SLIDEABLE, RESILIENT GUIDE BLOCK FOR WINDOWS

Einar Strandengen, Oslo, Norway, assignor to A/S Grorud Jeruvarefabrik, Oslo, Norway

Filed Aug. 23, 1985, Ser. No. 768,591

Claims priority, application Norway, Mar. 20, 1985, 66114

Term of patent 14 years

U.S. Cl. D8—349



290,929

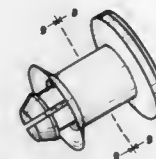
## PRINTED CIRCUIT BOARD STAND-OFF

Royce W. Hill, Flippin, Ark., assignor to Micro Plastics, Inc., Flippin, Ark.

Filed Feb. 27, 1985, Ser. No. 706,462

Term of patent 14 years

U.S. Cl. D8—354



290,931

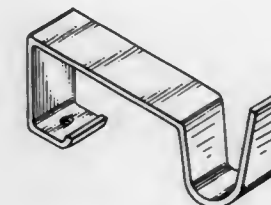
## LADDER HOOK BRACKET

Jerald C. Powell, 120 E. Winters Dr., Colorado Springs, Colo. 80907

Filed Aug. 14, 1984, Ser. No. 640,732

Term of patent 14 years

U.S. Cl. D8—373



290,932

## CONVEYOR CHAIN LINK

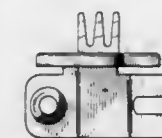
Goran Abbestam, Gothenburg, and Leif Lachonius, Surte, both of Sweden, assignors to Aktiebolaget SKF, Gothenburg, Sweden

Filed Oct. 10, 1984, Ser. No. 659,372

Claims priority, application Sweden, Apr. 10, 1984, 841176

Term of patent 14 years

U.S. Cl. D8—499



290,930

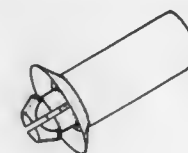
## CIRCUIT BOARD SUPPORT

Royce W. Hill, Flippin, Ark., assignor to Micro Plastics, Inc., Flippin, Ark.

Filed May 15, 1985, Ser. No. 734,154

Term of patent 14 years

U.S. Cl. D8—354

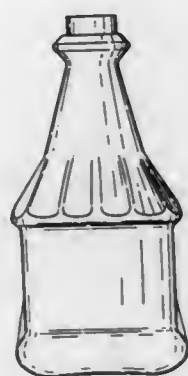


290,933  
BOTTLE

William S. Maginnis, Jr., Fullerton, Calif., assignor to Hunt-Wesson Foods, Inc., Fullerton, Calif.

Filed Sep. 13, 1984, Ser. No. 650,115  
Term of patent 14 years

U.S. Cl. D9—385

290,934  
BOTTLE

Vernon C. Rader, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio  
Division of Ser. No. 564,945, Dec. 23, 1983. This application  
Apr. 24, 1986, Ser. No. 857,570

Term of patent 14 years

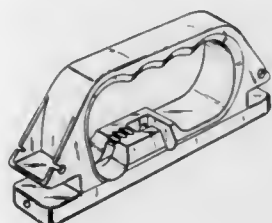
U.S. Cl. D9—413

290,935  
HANDLE FOR PACKAGES OR THE LIKE

Charles G. D. Williams, 31 Harbor Sight Dr., Rolling Hills Estates, Calif. 90274

Filed Jul. 15, 1985, Ser. No. 755,156  
Term of patent 14 years

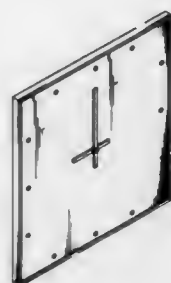
U.S. Cl. D9—434

290,936  
CLOCK DESIGN

Michael W. Hill, 1116 W. Main St., Marshalltown, Iowa 50158  
Filed Jan. 18, 1984, Ser. No. 621,620

Term of patent 14 years

U.S. Cl. D10—25

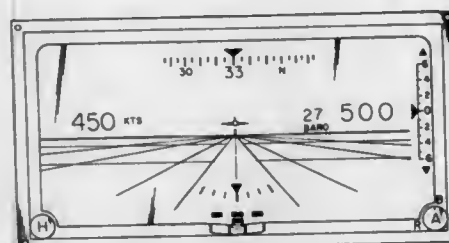
290,937  
AIRCRAFT FLIGHT INSTRUMENT

Vincent A. Devino, Hauppauge, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 15, 1984, Ser. No. 660,636

Term of patent 14 years

U.S. Cl. D10—67

290,938  
NECKLACE

Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein

Filed Apr. 12, 1985, Ser. No. 722,451

Claims priority, application Italy, Oct. 12, 1984, 36149/84[U]  
Term of patent 14 years

U.S. Cl. D11—3

290,939  
JEWELRY PENDANT OR THE LIKE

Kurt J. Lerner, P.O. Box 396, Murphy, N.C. 28906  
Filed Jul. 16, 1985, Ser. No. 755,351

Term of patent 14 years

U.S. Cl. D11—81

290,940  
KNOCK-DOWN TRICYCLE

Stephen W. Smith, Bedford, Pa., and William H. Ziegler, Jr., Opelika, Ala., assignors to Brown Group Recreational Products, Inc., Bedford, Pa.

Filed Aug. 12, 1985, Ser. No. 764,535

Term of patent 14 years

U.S. Cl. D12—113

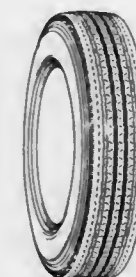
290,941  
AUTOMOBILE TIRE

Hideki Matsuda, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed May 30, 1984, Ser. No. 615,199

Claims priority, application Japan, Nov. 30, 1983, 58-51626  
Term of patent 14 years

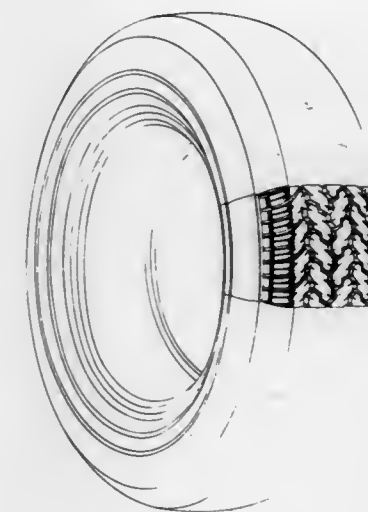
U.S. Cl. D12—142

290,942  
TIRE

Ronald L. Messer, Simpsonville, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland  
Filed Oct. 29, 1985, Ser. No. 792,481

Term of patent 14 years

U.S. Cl. D12—147

290,943  
COVER FOR A VEHICLE BRAKE FLUID RESERVOIR

Daniel L. Irby, 5678 Berkeley Rd., Goleta, Calif. 93117

Filed Jul. 12, 1984, Ser. No. 630,101

Term of patent 14 years

U.S. Cl. D12—155

290,944  
COVER FOR A VEHICLE BRAKE FLUID RESERVOIR

Daniel L. Irby, 5678 Berkeley Rd., Goleta, Calif. 93117

Filed Jul. 12, 1984, Ser. No. 630,104

Term of patent 14 years

U.S. Cl. D12—155





290,945

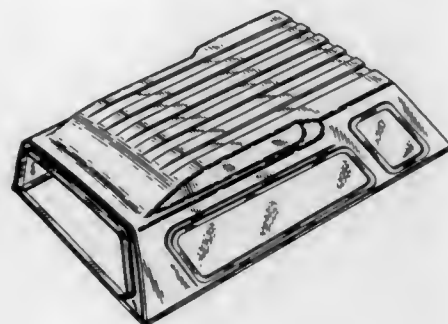
## PICKUP CANOPY

Henry O. Geisler, Boring, Oreg., assignor to Gem Top Mfg. Inc., Clackamas, Oreg.

Filed May 28, 1985, Ser. No. 738,298

Term of patent 14 years

U.S. Cl. D12-156



290,946

## WHEEL

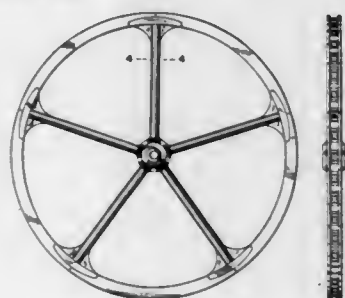
Ulf Brader, Göteborg, Sweden, assignor to Innofibre AB, Göteborg, Sweden

Filed Jul. 26, 1984, Ser. No. 634,627

Claims priority, application Sweden, Jan. 26, 1984, 84-0236

Term of patent 14 years

U.S. Cl. D12-205



290,947

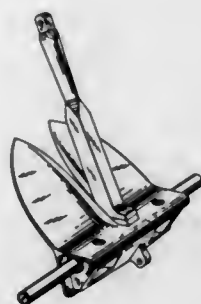
## ANCHOR

Rocco D. Albertini, Media; Arthur W. McClellan, Aston; Stephen A. Kokoszka, Chester, and Patrick C. Girtan, Media, all of Pa., assignors to Baldt Incorporated, Chester, Pa.

Filed Mar. 18, 1985, Ser. No. 712,700

Term of patent 14 years

U.S. Cl. D12-215



290,948

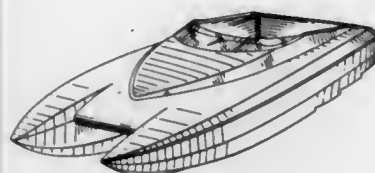
## CATAMARAN TYPE BOAT

Peter C. Hledin, 3530 Burton Ridge, Apt. K, Grand Rapids, Mich. 49506

Filed Jan. 31, 1985, Ser. No. 696,781

Term of patent 14 years

U.S. Cl. D12-310



290,949

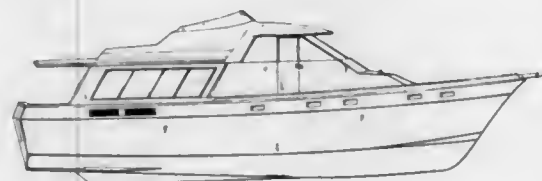
## CRUISING YACHT

Clark T. Scarboro, Lake Stevens, Wash., assignor to Bayliner Marine Corporation, Seattle, Wash.

Filed Nov. 13, 1985, Ser. No. 805,000

Term of patent 14 years

U.S. Cl. D12-315



290,950

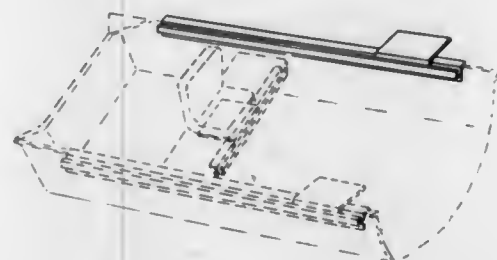
## BOAT ACCESSORY EXTRUSION

Allen Strickland, P.O. Box 612, Blackshear, Ga. 31516

Filed Jun. 15, 1984, Ser. No. 620,857

Term of patent 14 years

U.S. Cl. D12-317



290,951

## ULTRALIGHT AIRCRAFT

Francis J. Hanback, 15 Clipper Rd, Abalone Cove, Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 539,003, Oct. 4, 1983, abandoned. This application Sep. 4, 1985, Ser. No. 772,433

Term of patent 14 years

U.S. Cl. D12-322



290,952

## PANEL FOR PHOTOTYPESETTER OR THE LIKE

John Price, Peabody, Mass., assignor to Xyvision, Inc., Woburn, Mass.

Filed May 18, 1984, Ser. No. 612,046

Term of patent 14 years

U.S. Cl. D13-35



290,953

## SPEAKER ENCLOSURE

Michael E. Sklaar, White Birch Rd., R.D. 2, Box 377, Putnam Valley, N.Y. 10579, and Michael Z. Berkowicz, 110 Caterson Ter., Hartsdale, N.Y. 10530

Filed Nov. 13, 1984, Ser. No. 670,684

Term of patent 14 years

U.S. Cl. D14-33



290,954

## HOUSING FOR CREDIT CARD PAYMENT TELEPHONE

Clifford D. Read, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 5, 1985, Ser. No. 752,890

Term of patent 14 years

U.S. Cl. D14-61



290,955

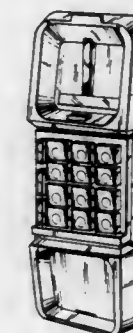
## TELEPHONE STAND FOR A HANDSET TRANSCEIVER

James M. Rittenhouse, Watchung; Barry M. Haber, Manalapan, and Ting W. Wong, Oceanport, all of N.J., assignors to Conair Corporation, Edison, N.J.

Filed Aug. 23, 1985, Ser. No. 768,632

Term of patent 14 years

U.S. Cl. D14-62

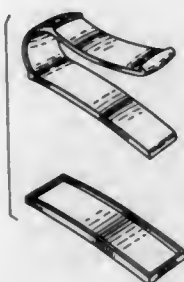


290,956

COMBINED SHOULDER REST FOR A TELEPHONE  
HANDSET AND AN ADAPTER THEREFOR  
Frederick G. Witham, 12022 NE. Fremont St., Portland, Oreg.  
97220

Filed Apr. 29, 1985, Ser. No. 728,252  
Term of patent 14 years

U.S. Cl. D14—65



290,957

HAND-HELD SCANNING RECEIVER  
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research  
of Electronics, Inc., Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 664,060  
Term of patent 14 years

U.S. Cl. D14—68

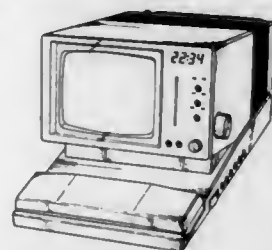


290,958

COMBINED TELEPHONE, CLOCK, RADIO AND  
TELEVISION RECEIVER  
Yoshiaki Kawata, Hyogo; Masaki Yamamoto, Nara; Toyoyuki  
Uematsu, Osaka; Hiroyuki Tsubaki, Osaka, and Yutaka Itoh,  
Osaka, all of Japan, assignors to Matsushita Electric Indus-  
trial Co., Ltd., Osaka, Japan

Filed Nov. 13, 1984, Ser. No. 670,849  
Claims priority, application Japan, May 15, 1984, 59-19594  
Term of patent 14 years

U.S. Cl. D14—79

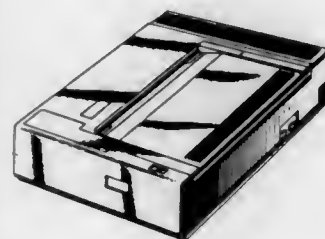


290,959

FACSIMILE MACHINE  
Yoshihisa Ooie, Osaka, Japan, assignor to Sharp Corporation,  
Osaka, Japan

Filed Jan. 11, 1985, Ser. No. 690,687  
Claims priority, application Japan, Jul. 12, 1984, 59-29329  
Term of patent 14 years

U.S. Cl. D14—94



290,960

CABINET FOR PROCESS DATA ACQUISITION AND  
CONTROL EQUIPMENT  
James E. Brann, Davie, Fla., assignor to Autech Partners Ltd.,  
Pompano Beach, Fla.

Filed Nov. 15, 1984, Ser. No. 671,735  
Term of patent 14 years

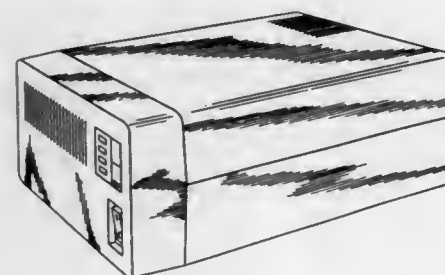
U.S. Cl. D14—102



290,961

WORK-STATION CONTROLLER  
Peter J. Mendel, Lexington, Ky., assignor to International Busi-  
ness Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 569,090, Jan. 9, 1984, abandoned. This  
application Nov. 25, 1986, Ser. No. 935,157

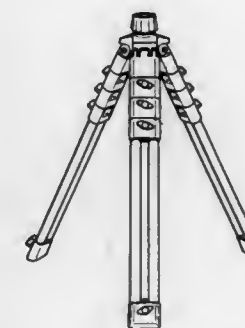
Term of patent 14 years  
U.S. Cl. D14—107

290,963  
TRIPOD

Dieter Groschupp, Weiherweg 2, D-8506 Langenzenn, Fed. Rep.  
of Germany

Filed Apr. 5, 1985, Ser. No. 720,091  
Claims priority, application Fed. Rep. of Germany, Oct. 8,  
1984, MR 8102

Term of patent 14 years  
U.S. Cl. D16—45



290,964

EYEGGLASS SIDE GUARD  
Edward V. L. Kalbach, 575 W. 3200 South, Nibley, Utah 84321  
Filed May 20, 1985, Ser. No. 735,632

Term of patent 14 years  
U.S. Cl. D16—123



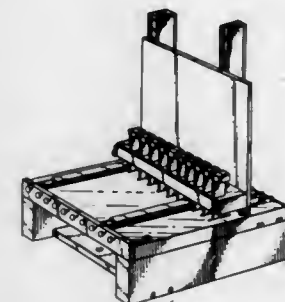
290,962

ELECTRONIC COMPONENT VERTICAL STACK FEED  
APPARATUS FOR USE IN PRINTED CIRCUIT  
ASSEMBLY MACHINES

David R. Harding, Ojai, Calif., assignor to Micro Component  
Technology, Inc., St. Paul, Minn.

Filed Jan. 24, 1984, Ser. No. 573,386  
Term of patent 14 years

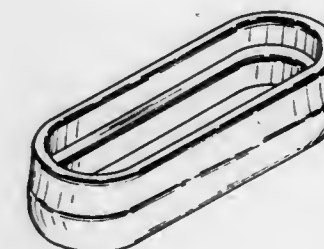
U.S. Cl. D15—199



290,965

PISTON VALVE ASSEMBLY OIL SHIELD  
Stuart L. Satalof, Las Vegas, Nev., and Steven I. Weiner, 3080  
Garnet Ct., Las Vegas, Nev. 89121, assignors to Steven I.  
Weiner, Las Vegas, Nev.

Filed May 4, 1984, Ser. No. 607,177  
Term of patent 14 years  
U.S. Cl. D17—13





290,966

## PRINTING MACHINE

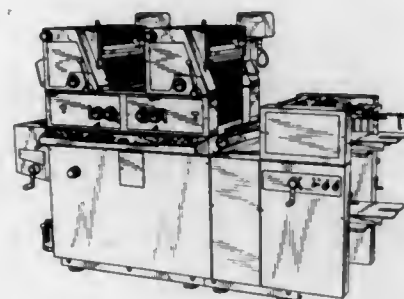
Toshiaki Saito, Koji Ishii, and Tetsuyuki Doi, all of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Jul. 17, 1985, Ser. No. 755,991

Claims priority, application Japan, Jan. 23, 1985, 60-2139

Term of patent 14 years

U.S. Cl. D18-13



290,967

## PRINTER

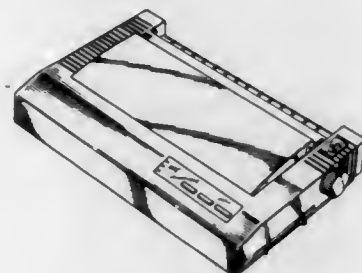
Nobutoshi Mochizuki, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1985, Ser. No. 805,550

Claims priority, application Japan, Jul. 22, 1985, 60-31005

Term of patent 14 years

U.S. Cl. D18-13



290,968

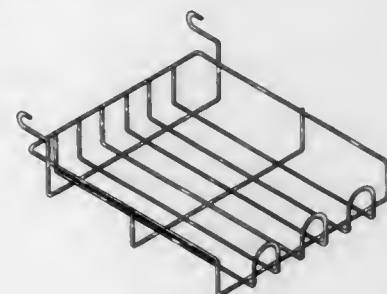
## RECEIVING TRAY FOR A PRINTER

Beverly C. Rich, 111 W. Timonium Rd., Timonium, Md. 21093

Filed Apr. 1, 1985, Ser. No. 718,474

Term of patent 14 years

U.S. Cl. D18-22



290,969

## REMOTE CONTROLLER FOR A PRINTER

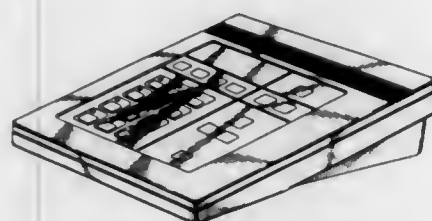
Masatoki Sutou, Okazaki; Jan Nishiseko; Takako Onishi, both of Toyokawa; Seichi Yamagishi, Machida, all of Japan; Walter F. Anderson, Jr., Minneapolis, and Brian D. Sabo, Rosemount, both of Minn., assignors to Minolta Camera K.K., Osaka, Japan and Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Filed May 22, 1985, Ser. No. 736,716

Claims priority, application Japan, Nov. 22, 1984, 59-48256

Term of patent 14 years

U.S. Cl. D18-22



290,970

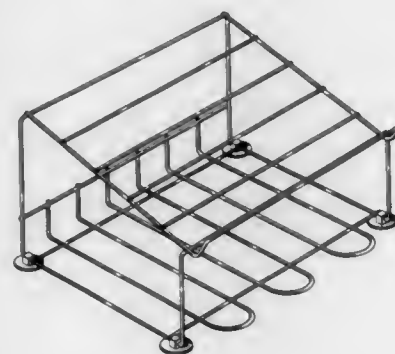
## PRINTER STAND

Beverly C. Rich, 111 W. Timonium Rd., Timonium, Md. 21093

Filed Apr. 1, 1985, Ser. No. 718,476

Term of patent 14 years

U.S. Cl. D18-23



290,971

## MUSICAL CLEF PAPER CLIP

Tom Quilty, 8985 Riderwood Dr., Sunland, Calif. 91040

Filed Dec. 3, 1984, Ser. No. 677,743

Term of patent 14 years

U.S. Cl. D19-65



290,972

## MAGNETIC HOLDER FOR A PIECE OF PAPER

Kenji Irie, Osaka, Japan, assignor to Irie Co., Ltd., Osaka, Japan; Roger Butcher, 5921 Petaluma Ct., Sacramento, Calif. 95841

Filed Jul. 11, 1984, Ser. No. 629,598

Term of patent 14 years

U.S. Cl. D19-90



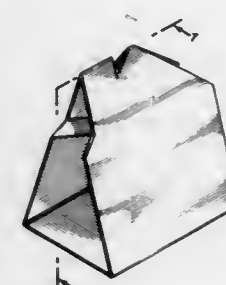
290,974

## SIGN

Filed Oct. 15, 1985, Ser. No. 787,731

Term of patent 14 years

U.S. Cl. D20-38



290,975

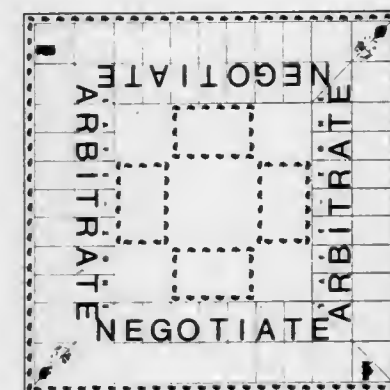
## GAME BOARD

Christine Mahoney, Houston, Tex., assignor to Labor-Management Publications, Inc., Lansing, Mich.

Filed Apr. 8, 1985, Ser. No. 720,982

Term of patent 14 years

U.S. Cl. D21-25



290,973

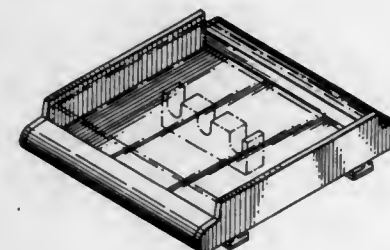
## DESK CONSOLE ELEMENT

Robert A. O'Neil, West Chicago, Ill., assignor to McDonald Products Corporation, Buffalo, N.Y.

Filed May 21, 1984, Ser. No. 612,460

Term of patent 14 years

U.S. Cl. D19-92



290,976

## FESTOONED PINATA

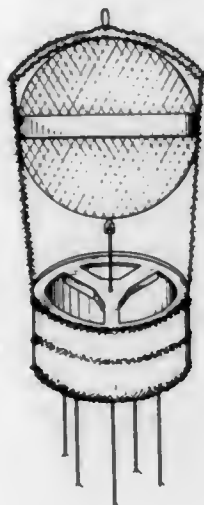
Ricardo Bajo, 1607 89th St., North Bergen, N.J. 07047

Filed Aug. 16, 1984, Ser. No. 641,433

The portion of the term of this patent subsequent to Jul. 21, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D21-59



290,977

## FESTOONED PINATA

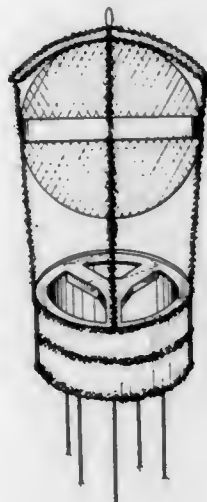
Ricardo Bajo, 1607 89th St., North Bergen, N.J. 07047

Filed Aug. 16, 1984, Ser. No. 641,447

The portion of the term of this patent subsequent to Jul. 21, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D21-59



290,978

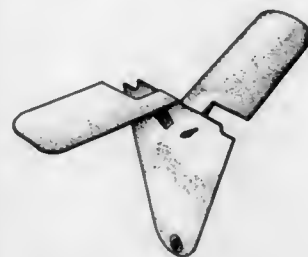
## FLYING TOY

James L. Capo, and Carl L. Capo, both of 4902 Brookhaven Dr., Middletown, Ohio 45044

Filed Mar. 11, 1985, Ser. No. 710,778

Term of patent 14 years

U.S. Cl. D21-82



290,979

## TOY COW

Akito Sato, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Nagoya, Japan

Filed Aug. 2, 1984, Ser. No. 637,247

Term of patent 14 years

U.S. Cl. D21-148



290,980

## TOY BEAR FIGURE

Ralph Shaffer, Columbia Station; William Davidson, Lakewood, both of Ohio; Elena Kucharik, New Canaan, Conn., and Michael J. Spindle, Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio

Filed Jan. 16, 1985, Ser. No. 691,955

Term of patent 14 years

U.S. Cl. D21-159



290,981

## TOY BEAR FIGURE

Ralph Shaffer, Columbia Station; William Davidson, Lakewood, both of Ohio; Elena Kucharik, New Canaan, Conn., and Michael J. Spindle, Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio

Filed Jan. 16, 1985, Ser. No. 691,956

Term of patent 14 years

U.S. Cl. D21-159



290,983

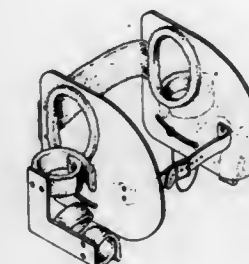
## TRAINING HARNESS FOR TRACK AND FIELD ATHLETES

Mark L. Taylor, 5120 Pomegranate Ave., Sacramento, Calif. 95823

Filed May 20, 1985, Ser. No. 735,909

Term of patent 14 years

U.S. Cl. D21-191



290,984

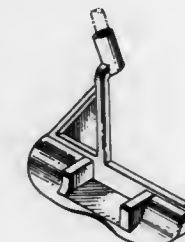
## GOLF CLUB HEAD

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Filed Sep. 24, 1984, Ser. No. 653,533

Term of patent 14 years

U.S. Cl. D21-219



290,982

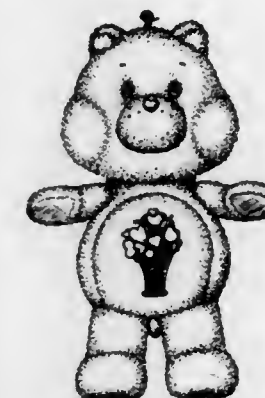
## TOY BEAR FIGURE

Ralph Shaffer, Columbia Station; William Davidson, Lakewood, both of Ohio; Elena Kucharik, New Canaan, Conn., and Michael J. Spindle, Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio

Filed Jan. 16, 1985, Ser. No. 691,957

Term of patent 14 years

U.S. Cl. D21-159



290,985

## GOLF TOOL

Joseph K. Dikoff, P.O. Box 4553, Christiansted, St. Croix, V.I. 00820

Filed Jan. 28, 1985, Ser. No. 695,305

Term of patent 14 years

U.S. Cl. D21-234





290,986  
FISHING REEL SPOOL

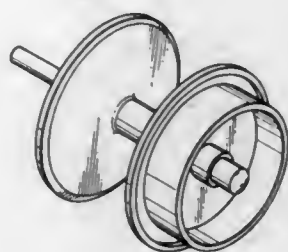
Kaname Yamaguchi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,398

Claims priority, application Japan, Jul. 4, 1984, 59-27626

Term of patent 14 years

U.S. Cl. D22—137



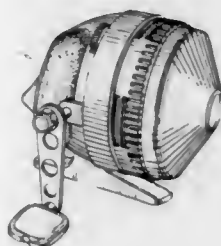
290,987  
SPIN CAST FISHING REEL

Richard J. Robbins, Derby, Kans., and Roy Stiner, Tulsa, Okla., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jul. 20, 1984, Ser. No. 633,018

Term of patent 14 years

U.S. Cl. D22—141



290,988  
FISHING REEL

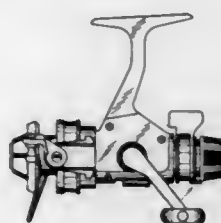
Seiji Myojo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 7, 1984, Ser. No. 668,954

Claims priority, application Japan, May 24, 1984, 59-21287

Term of patent 14 years

U.S. Cl. D22—141



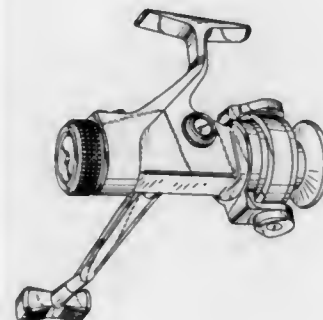
290,989  
SPINNING FISHING REEL

Richard E. Ten Eyck, and Gary P. Israel, both of Wichita, Kans., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jan. 15, 1984, Ser. No. 621,227

Term of patent 14 years

U.S. Cl. D22—141



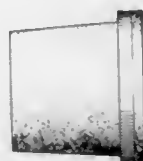
290,990  
INSULATED COVER FOR A FAUCET OR THE LIKE

Lewis B. Izzi, Shelby, N.C., assignor to Plastic Oddities, Inc., Shelby, N.C.

Filed Mar. 27, 1985, Ser. No. 716,555

Term of patent 14 years

U.S. Cl. D23—1



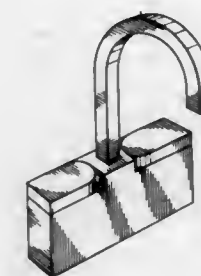
290,991  
FAUCET

Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.

Filed Dec. 27, 1985, Ser. No. 813,770

Term of patent 14 years

U.S. Cl. D23—25



290,992  
FAUCET SPOUT

Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Dec. 2, 1985, Ser. No. 803,721

Term of patent 14 years

U.S. Cl. D23—32



290,993  
SPRAY NOZZLE

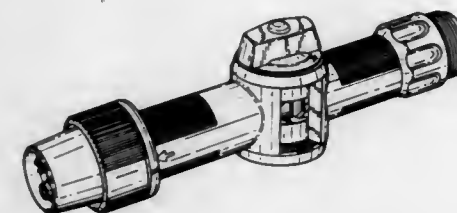
Franco Clivio, Zürich, Switzerland, and Dieter Raffler, Neu-Ulm, Fed. Rep. of Germany, assignors to Gardena Kress & Kastner GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,063

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, GRAIII14638403

Term of patent 14 years

U.S. Cl. D23—35



290,994  
WATER CLOSET

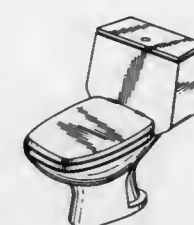
Jacques P. Hardion, Selles-sur-Cher, France, assignor to Produits Ceramiques de Touraine, Selles-sur-Cher, France

Filed Jan. 17, 1984, Ser. No. 571,531

Claims priority, application France, Sep. 30, 1983, 833556

Term of patent 14 years

U.S. Cl. D23—65



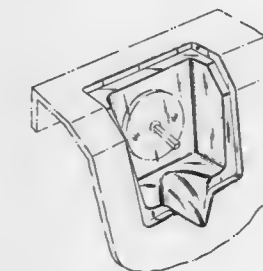
290,995  
OVERFLOW CAVITY AND COVER FOR BATHTUB

Harvey E. Diamond, 12953 Woodbridge St., Studio City, Calif. 91604

Filed Jan. 20, 1984, Ser. No. 572,626

Term of patent 14 years

U.S. Cl. D23—69



290,996  
COMPACT HEAT EXCHANGER

Grady A. Bingham, Morehead City, N.C., assignor to Thermal Concepts, Inc.

Filed Oct. 24, 1984, Ser. No. 664,357

Term of patent 14 years

U.S. Cl. D23—136



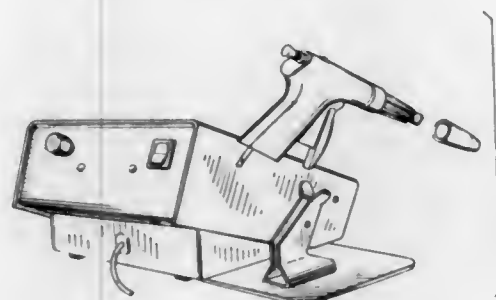
290,997  
ELECTRIC FAN

Toshiyuki Utsuki, Tachikawa; Shuichi Kouno, Tokorozawa; Kazunori Yanagisawa, Yamato, and Yasuo Tsumurai, Higashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Dec. 26, 1985, Ser. No. 813,631  
Claims priority, application Japan, Oct. 21, 1985, 60-43826  
Term of patent 14 years  
U.S. Cl. D23—155



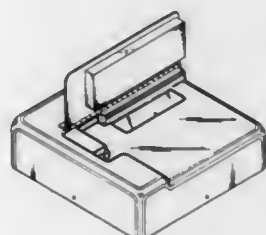
291,000  
COMBINED INJECTOR GUN, CAP, AND POWER UNIT  
FOR DENTAL TREATMENT

Michael J. Botich, Montclair, Calif., assignor to Unitek Corporation, Monrovia, Calif.  
Filed Mar. 8, 1984, Ser. No. 587,338  
Term of patent 14 years  
U.S. Cl. D24—10



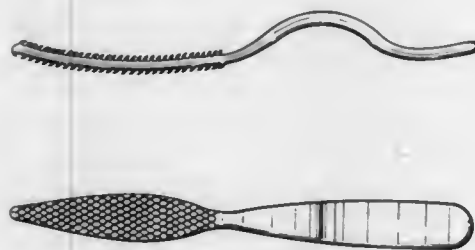
290,998  
PORTABLE X-RAY FILM PRINTER FOR IMPRINTING  
PATIENT INFORMATION OR THE LIKE ON  
UNEXPOSED PORTION OF X-RAY FILM

Roderique S. Gemmill, Davie, Fla., assignor to Radiation Concepts, Inc., Davie, Fla.  
Filed Feb. 19, 1985, Ser. No. 703,115  
Term of patent 14 years  
U.S. Cl. D24—2



291,001  
TONGUE SCRAPER

Jean Gaskins, 11416 Nairn Rd., Wheaton, Md. 20902  
Filed Nov. 22, 1985, Ser. No. 806,216  
Term of patent 14 years  
U.S. Cl. D24—10



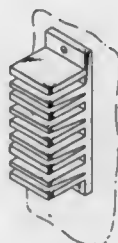
290,999  
VIAL

Robert M. Novak, Baltimore, Md., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.  
Filed Oct. 20, 1983, Ser. No. 543,679  
Term of patent 14 years  
U.S. Cl. D24—8



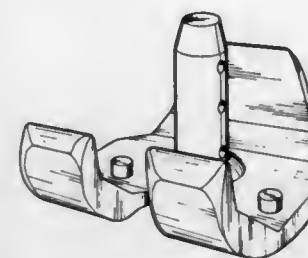
291,002  
DENTAL TRAY RACK

James B. Zimmerman, 11 Lakeshore Plz., Kirkland, Wash. 98033  
Division of Ser. No. 496,928, May 23, 1983, Pat. No. D. 285,254.  
This application Feb. 25, 1986, Ser. No. 836,459  
Term of patent 14 years  
U.S. Cl. D24—31



291,003  
KNEE PROSTHESIS

Ronald L. Huckstep, 108 Sugarloaf Cresc., Castlecrag, N.S.W., Australia 2068  
Filed Jul. 23, 1984, Ser. No. 633,630  
Claims priority, application Australia, Feb. 3, 1984, 6411/84  
Term of patent 14 years  
U.S. Cl. D24—33



291,006  
EXTRUSION FOR LADDER STEP

Ronald A. Minichillo, and Wayne R. Broyles, both of Elkhart, Ind., assignors to Kemberly, Inc., Elkhart, Ind.  
Filed Oct. 15, 1984, Ser. No. 662,237  
Term of patent 14 years  
U.S. Cl. D25—69



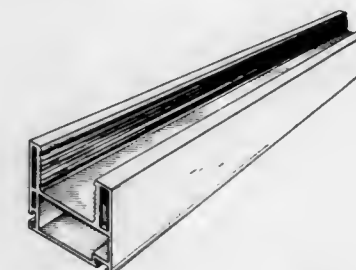
291,004  
POOLING CONTAINER FOR PARENTERAL FLUIDS  
AND THE LIKE

Michael R. Kellman, Mundelein, and Richard L. West, Ingleside, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.  
Filed Sep. 21, 1983, Ser. No. 534,474  
Term of patent 14 years  
U.S. Cl. D24—56



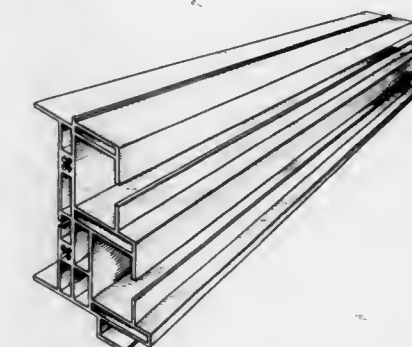
291,007  
WINDOW COMPONENT EXTRUSION

Ludwig Reisinger, McPherson, and Dennis Westphal, Galva, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.  
Filed Oct. 24, 1984, Ser. No. 664,385  
Term of patent 14 years  
U.S. Cl. D25—74



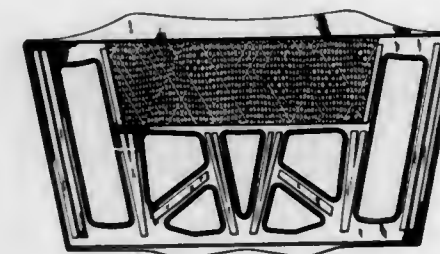
291,008  
WINDOW COMPONENT EXTRUSION

Ludwig Reisinger, McPherson, and Dennis Westphal, Galva, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.  
Filed Oct. 23, 1984, Ser. No. 664,403  
Term of patent 14 years  
U.S. Cl. D25—74



291,005  
KIDNEY BELT PAD

Remo Berlese, 31036 Ospedaletto di Istrana ViaCastellana 90 Zona Ind., Treviso, Italy  
Filed Sep. 21, 1984, Ser. No. 653,952  
Term of patent 14 years  
U.S. Cl. D24—64





291,009

## EXTRUSION

Gerth Weilow, Bergsättravägen 3, 151 49 Södertälje, Sweden  
 Filed Oct. 16, 1984, Ser. No. 661,358  
 Claims priority, application Sweden, Apr. 17, 1984, 84-1276  
 Term of patent 14 years

U.S. Cl. D25—75



291,011

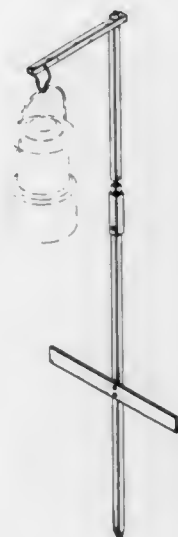
## CAMPING LIGHT STANDARD

William C. Fleming, 1440 Cheswick Pl., Westlake Village, Calif. 91361

Filed Aug. 15, 1985, Ser. No. 765,645

Term of patent 14 years

U.S. Cl. D26—138

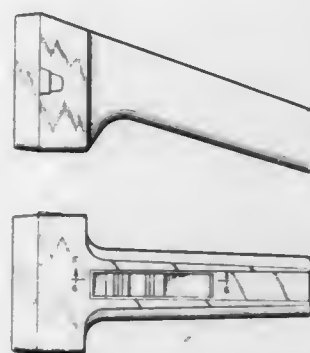


291,010

## FLASHLIGHT

Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.  
 Filed May 23, 1984, Ser. No. 613,322  
 Term of patent 14 years

U.S. Cl. D26—46



291,012

## LAMP

Lars Liljeqvist, Olafsgatan 13 A, S-703 61 Örebro, Sweden  
 Filed Jun. 15, 1984, Ser. No. 620,933  
 Claims priority, application Sweden, Dec. 16, 1983, 83-3350  
 Term of patent 14 years

U.S. Cl. D26—104



291,013

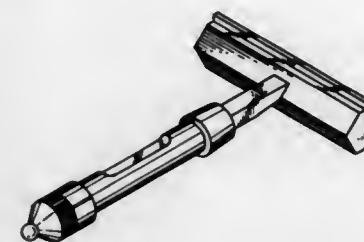
## COMBINED DISPOSABLE RAZOR AND SHAVING CREAM CONTAINER

Marvin W. Plummer, 230 Midway Ave., Madisonville, Ky. 42431

Filed Aug. 7, 1985, Ser. No. 763,286

Term of patent 14 years

U.S. Cl. D28—46



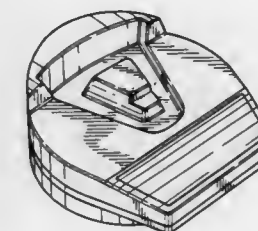
291,016

BASE FOR AN APPLIANCE SUCH AS AN IRON  
 Ronald E. Babros, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Oct. 16, 1985, Ser. No. 787,885

Term of patent 14 years

U.S. Cl. D32—73



291,014

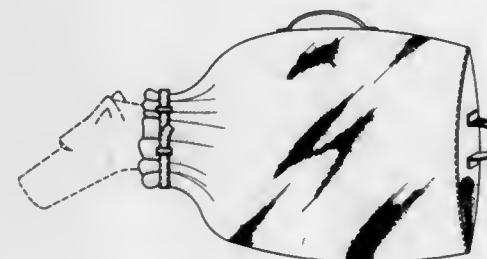
## PET ENCLOSURE BAG FOR PEST ERADICATION, TRANSPORTATION AND SECURITY

Matthew W. Grum, 39 Blanche Ct., New Monmouth, N.J. 07748

Filed Nov. 22, 1985, Ser. No. 806,181

Term of patent 14 years

U.S. Cl. D30—1



291,017

## TRAILER STAND

Ronald Magness, Rte. 2, Box 26F, Flint, Tex. 75762  
 Filed Jun. 18, 1984, Ser. No. 622,013

Term of patent 14 years

U.S. Cl. D34—31



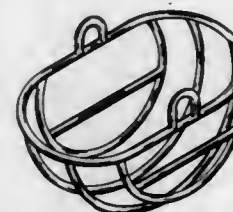
291,015

## HORSE MUZZLE

Derald R. Torrens, and Joann Torrens, both of 8726 LaFayette Ave., Omaha, Nebr. 68114

Continuation-in-part of Ser. No. 583,632, Feb. 27, 1984, abandoned. This application Sep. 17, 1984, Ser. No. 651,347  
 Term of patent 14 years

U.S. Cl. D30—33

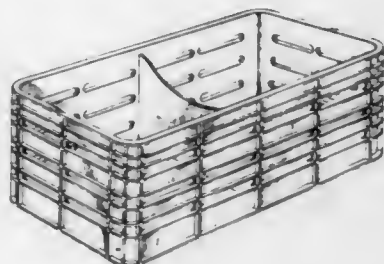


291,018  
CITRUS CRATE

Kornel Lates, Thornhill, Canada, assignor to Scepter Manufacturing Co. Ltd., Toronto, Canada

Filed Dec. 5, 1984, Ser. No. 678,250  
Term of patent 14 years

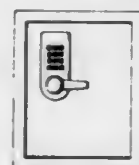
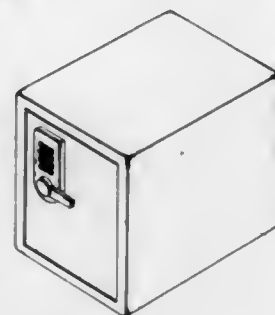
U.S. Cl. D34-46



291,019  
SAFE

Harold N. Druibet, 1033 Naranca Ave., El Cajon, Calif. 92021  
Filed Nov. 16, 1984, Ser. No. 672,183

Term of patent 14 years  
U.S. Cl. D99-28



# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF JULY, 1987

NOTE—Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A/G Technology Corporation: See—  
Gollan, Arye Z., 4,681,605, Cl. 55-158.000.
- A. Nattermann & Cie, GmbH: See—  
Ghyzcy, Miklos; Imberge, Paul-Robert; and Wendel, Armin, 4,681,617, Cl. 71-86.000.
- A. O. Smith Harvestore Products, Inc.: See—  
Olson, George E., 4,680,980, Cl. 74-125.000.
- A-1 Security Manufacturing Corp.: See—  
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- A V L Gesellschaft für Verbrennungskraftmaschinen und Messtechnik mbh Prof. Dr. Dr. h.c. Hans List: See—  
Schukoff, Bruno, 4,681,080, Cl. 123-506.000.
- Aarts, Petrus J. J.; and Huber, Alois, to U.S. Philips Corporation. Recording and/or reproducing apparatus. 4,681,281, Cl. 242-200.000.
- AB Betjanten: See—  
Olofsson, Lars; and Hospers, Martin, 4,681,241, Cl. 221-124.000.
- Abbott Laboratories: See—  
Freiberg, Leslie A.; Gracey, Howard E.; and Pernet, Andre G., 4,681,872, Cl. 514-29.000.
- Abbratuzzato, Salvatore R.; Walter, Richard T.; and Wheeler, Dale K., to Black & Decker Inc. Alignment system for permanent magnet motors. 4,682,066, Cl. 310-154.000.
- Abdrakov, Ravil S.: See—  
Aubakirov, Marat T.; Limanov, Esengali L.; Syzydkov, Askar K.; Abdrakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.
- Abe, Hitoshi: See—  
Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atusi; and Shirotori, Hidefumi, 4,680,999, Cl. 82-36.00B.
- Abe, Keizo: See—  
Yamazaki, Iwao; Nakamichi, Yuji; Abe, Keizo; and Okudera, Tatsuya, 4,682,221, Cl. 358-107.000.
- Abe, Takao: See—  
Machashi, Tatsuchi; Abe, Takao; Koshizuka, Kunihiro; and Inaba, Yoshihiro, 4,681,796, Cl. 428-212.000.
- Abiru, Norifumi: See—  
Ohdai, Yozo; Abiru, Norifumi; and Ohbayashi, Eiji, 4,680,950, Cl. 72-130.000.
- Abolins, Visvaldis; and Morelli, Thomas A., to General Electric Company. Polyphenylene compositions containing sulfonate having improved melt behavior. 4,681,906, Cl. 524-166.000.
- Accurat System Inc.: See—  
James, James R., 4,681,137, Cl. 137-568.000.
- Achorn, G. Stanley: See—  
Harris, James J.; Hostetler, Donald E.; and Achorn, G. Stanley, 4,681,924, Cl. 526-125.000.
- Acme Electric Corporation: See—  
Monsell, Kurt, 4,682,262, Cl. 361-6.000.
- Action Industries, Inc.: See—  
Pine, James J., 4,681,365, Cl. 297-85.000.
- Adachi, Eiichi, to Ricoh Company, Ltd. Coding system for image processing apparatus. 4,682,215, Cl. 358-75.000.
- Adachi, Eiichi, to Ricoh Company Ltd. Data transfer system. 4,682,241, Cl. 358-261.000.
- Adachi, Takashi; and Hidaka, Hidemasa, to Meiji Seika Kaisha Ltd. Sweetener. 4,681,771, Cl. 426-658.000.
- Adams, Kenneth M.: See—  
Faiz, Robert L.; Walker, William J.; Ramey, Philip; Adams, Kenneth M.; Flonc, Nicholas P.; and Nguyen, Dean, 4,681,724, Cl. 264-257.000.
- Adamski, Joseph A.: See—  
Ahern, Brian S.; and Adamski, Joseph A., 4,681,995, Cl. 219-10.510.
- Adaway, Timothy J., to Dow Chemical Company. The Method of preparing esters of aryloxyphenoxy propanoic acid. 4,681,941, Cl. 546-302.000.
- Adeka Argus Chemical Co., Ltd.: See—  
Kubota, Naohiro; and Nishimura, Atsushi, 4,681,905, Cl. 524-91.000.
- Adret Electronique: See—  
Remy, Joel; and Charbonnier, Roger, 4,682,122, Cl. 331-2.000.
- Advanced Micro Devices, Inc.: See—  
Chu, John W.; and Berezna, Bradley J., 4,682,143, Cl. 338-307.000.
- Aerojet-General Corporation: See—  
Washburn, William J., 4,681,038, Cl. 102-464.000.
- Aeschlimann, Heinz, to Kern & Co. AG. Method and apparatus for measuring relative position. 4,681,433, Cl. 356-5.000.
- Agency of Industrial Science and Technology: See—  
Fujishige, Masao; Yokokawa, Harumi; Ujiie, Seiichi; and Dokiya, Masayuki, 4,681,626, Cl. 75-68.00A.
- Ooka, Akihiro; Okamoto, Kenji; and Yamada, Koji, 4,680,818, Cl. 5-81.00R.
- Agrozet, koncernovy podnik: See—  
Polanecky, Václav, 4,681,020, Cl. 89-138.000.
- Ahern, Brian S.; and Adamski, Joseph A. Heat pipe ring stacked assembly. 4,681,995, Cl. 219-10.510.
- Ahlers, Heinfried: See—  
Ehle, Joachim; Timm, Klaus; and Ahlers, Heinfried, 4,682,341, Cl. 373-99.000.
- Ahmad, Anees; and Huse, Richard, to Perkin-Elmer Corporation. The Adjustable mount for large mirrors. 4,681,408, Cl. 350-609.000.
- Aida, Satoru: See—  
Hirama, Shigemitsu; Aida, Satoru; and Soyama, Hideo, 4,680,919, Cl. 53-499.000.
- Air Products and Chemicals, Inc.: See—  
Dyer, Paul N.; Pierantozzi, Ronald; and Withers, Howard P., 4,681,867, Cl. 502-242.000.
- Airpot Corporation: See—  
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- Aisin Seiki Kabushiki Kaisha: See—  
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- Akai, Yoshifumi: See—  
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- Akasaki, Hidehiko; and Tsujimura, Takehisa, to Fujitsu Limited. Semiconductor device including leadless packages and a base plate for mounting the leadless packages. 4,682,207, Cl. 357-74.000.
- Akazawa, Hideo: See—  
Ueda, Toshitsugu; Kohsaka, Fusao; Yamazaki, Daisuke; and Akazawa, Hideo, 4,680,970, Cl. 73-702.000.
- Akerberg, Dag E., to Telefonaktiebolaget LM Ericsson. Equipment for wireless telephone transmission. 4,682,350, Cl. 379-61.000.
- Akiba, Shigeyuki: See—  
Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, 4,682,196, Cl. 357-30.000.
- Akiyama, Susumu: See—  
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.
- Akzo NV: See—  
Baumgart, Rudolf; Martin, Manfred; Low, Lothar; and Scheven, Gunter, 4,681,720, Cl. 264-150.000.
- Alaki, Yasuhide; Ohtake, Masayuki; and Ihara, Keisuke, to Bridgestone Corporation. Golf ball. 4,681,323, Cl. 273-232.000.
- Alar Engineering Corporation: See—  
White, Harold R.; and Doncer, Alex J., 4,681,682, Cl. 210-221.200.
- Albany International Corp.: See—  
Donovan, James G.; and Skelton, John, 4,681,789, Cl. 428-93.000.
- Albrecht, Gene A.: See—  
Johnson, James S.; and Albrecht, Gene A., 4,680,866, Cl. 33-356.000.
- Albrecht, Wilhelm: See—  
Burghoff, Karl; Schiller, Werner; Albrecht, Wilhelm; Harsch, Herbert; and Burghoff, Heinz-Georg, 4,680,952, Cl. 72-161.000.
- Alcan Aluminum Corporation: See—  
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- Alcan International Limited: See—  
Davies, Nigel C.; and Sheasby, Peter G., 4,681,668, Cl. 204-28.000.
- Gnyra, Bohdan, 4,681,819, Cl. 428-697.000.
- Alcatel N.V.: See—  
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- Aleshire, Rex A.: See—  
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- Alexandrovich, Peter S.; Manthey, Joseph W.; May, John W.; and Sreekumar, Chandra, to Eastman Kodak Company. Method of chemical electrographic image amplification using chemically active toner particles. 4,681,828, Cl. 430-97.000.
- Alfano, Robert R. Picosecond gated light detector. 4,682,020, Cl. 250-213.0VT.
- All-Mark Corporation, Inc.: See—  
Hayduchok, Leon; and Strauss, Leopold, 4,681,471, Cl. 401-34.000.
- Allen, James C. Walking beam pump having adjustable crank pin. 4,681,515, Cl. 417-218.000.
- Alley, Robert P., to General Electric Company. Fluorescent lamp dimming adaptor kit. 4,682,083, Cl. 315-307.000.
- Allied Corporation: See—  
Bouley, Jean C., 4,681,391, Cl. 439-444.000.
- Fulmer, Keith H.; Peebles, Arthur K.; and Steininger, Hugh D., 4,681,196, Cl. 192-3.00H.
- Harpell, Gary A.; Palley, Igor; and Prevorsek, Dusan C., 4,681,792, Cl. 428-102.000.
- Rupp, James W., 4,680,844, Cl. 29-156.40R.



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- Allwin, Roger P.; and Budke, Mark, to MWL Tool Company. Setting tool for a well tool. 4,681,159, Cl. 166-124.000.
- Alper, Howard; Despeyroux, Bertrand; Smith, David J. H.; and Woell, James B., to British Petroleum Company p.l.c., The. Process for the production of carboxylic acid esters and/or carboxylic acids. 4,681,707, Cl. 260-410.90R.
- Alphatime Ltd.: See—  
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- Aluminium Pechiney: See—  
Guillemet, Robert; Ladet, Michel; Laslaz, Gerard; and Le Bars, Claude, 4,681,665, Cl. 204-14.100.
- Aluminum Company of America: See—  
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- Aly, Abou: See—  
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- Alyfuku, Kiyoshi: See—  
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,681,420, Cl. 354-409.000.
- ALZA Corporation: See—  
Gale, Robert M.; and Berggren, Randall G., 4,681,584, Cl. 604-897.000.
- Urquhart, John; and Theeuwes, Felix, 4,681,583, Cl. 604-892.000.
- Amada Company, Limited: See—  
Sakamoto, Katsuyoshi, 4,680,955, Cl. 72-462.000.
- Amann, Markus-Christian, to Siemens Aktiengesellschaft. Laser diode with buried active layer and lateral current limitation by use of a self-adjusted pn-junction. 4,682,337, Cl. 372-44.000.
- Amazawa, Kiyoshi; and Mori, Akira, to Clarion Co., Ltd. Noise eliminating signal compensation circuit. 4,682,045, Cl. 307-125.000.
- Amdahl Corporation: See—  
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- Amerace Corporation: See—  
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- American Davidson, Inc.: See—  
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- American Hoechst Corporation: See—  
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- American Home Products Corporation: See—  
Guley, Paul C., 4,681,765, Cl. 424-456.000.
- Musser, John H.; and Bender, Reinhold H. W., 4,681,940, Cl. 546-174.000.
- American Hospital Supply Corporation: See—  
Hanaway, Richard W., 4,681,741, Cl. 422-100.000.
- American Medical and Emergency Research Corporation: See—  
Rolnick, Michael A., 4,681,094, Cl. 128-10.000.
- American Telephone and Telegraph Company: See—  
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- American Telephone & Telegraph Co., AT&T Bell Lab.: See—  
Schrofer, Eldred P., 4,682,284, Cl. 364-200.000.
- American Telephone and Telegraph Company AT&T Bell Laboratories: See—  
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- Amity Leather Products Company: See—  
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- Amoco Corporation: See—  
Crowley, Michael S., 4,680,908, Cl. 52-378.000.
- Amory, Henri; and Prost, Jean-Michel, to Pathe Marconi EMI SA. Apparatus for the projection moulding of disc records. 4,681,527, Cl. 425-546.000.
- AMP Incorporated: See—  
Bhatt, Vipul, 4,681,397, Cl. 350-96.200.
- Chang, Paul S.; and Dowling, Edward C., 4,682,168, Cl. 340-825.650.
- Lockard, Joseph L., 4,681,382, Cl. 439-92.000.
- Schriver, Harold S., Jr., 4,681,691, Cl. 252-12.000.
- Somer, Gerald L., 4,682,344, Cl. 375-62.000.
- Ampafrance, S.A.: See—  
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- Analog and Digital Systems, Inc.: See—  
DeFreitas, Richard E.; and Sullivan, Daniel T., 4,682,362, Cl. 381-61.000.
- Anderson, Arthur B.; and Brandt, Sherry L., to Procter & Gamble Company. The. Pantiliner with ventilation areas. 4,681,578, Cl. 604-385.00R.
- Anderson, Francis J., to Anderson Research and Development Limited. Vibrating sensing device. 4,681,991, Cl. 200-61.45R.
- Anderson Research and Development Limited: See—  
Anderson, Francis J., 4,681,991, Cl. 200-61.45R.
- Andersson, Denny. Ski holding device. 4,681,246, Cl. 224-267.000.
- Ando, Mitosi: See—  
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- Ando, Takao: See—  
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- Automation Associates, Inc.: See—  
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- Back, Gerhard; and Mosimann, Walter, to Ciba-Geigy Corporation. Process for dyeing natural or synthetic polyamide fibre materials with 1:1 metal complex dyes or mixtures of dyes with fluoride, fluorosilicate or fluoroborate. 4,681,596, Cl. 8-620.000.
- Baffreau, Daniel: See—  
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- Baggio, Giorgio: See—  
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- Bakermans, Frank C.; and Trexler, Charles J., to Du Pont de Nemours, E. I., and Company. Thick film planar filter connector having separate ground plane shield. 4,682,129, Cl. 333-184.000.
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- Balogh, John M.: See—  
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- Balogh, Thomas K.; and Balogh, John M. Method and lens for producing a wide angle image. 4,681,405, Cl. 350-420.000.
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- Baranski, Edward J. Twin arbor resaw with a fence having a continuous rotatable belt. 4,681,005, Cl. 83-404.400.
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- Bardue, Casey M.: See—  
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- Barito, Robert W.; and Downs, Kenneth L., to General Electric Company. Insulation formed of precipitated silica and fly ash. 4,681,788, Cl. 428-68.000.
- Barlian, Reinhold: See—  
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- Barmag AG: See—  
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- Bartesch, Helmut; and Florin, Gerd, to Sulzer-Escher Wisa Limited. Apparatus for treating soybeans. 4,681,029, Cl. 99-483.000.
- Bartholomew, Donald D., to Proprietary Technology, Inc. Swivelable quick connector assembly. 4,681,351, Cl. 285-319.000.
- Bartlett, Keith G.: See—  
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- Eitzbach, Karl-Heinz, 4,681,699, Cl. 252-299.100.
- Pfaff, Klaus-Peter; Paust, Joachim; and Hartmann, Horst, 4,681,936, Cl. 536-124.000.
- Ritter, Klaus; Michaelson, Klaus; and Mair, Gunther, 4,681,328, Cl. 277-80.000.
- Steckhan, Eberhard; Wolf, Reinhard; and Puetter, Hermann, 4,681,977, Cl. 560-262.000.
- Vogel, Hans-Henning, 4,681,719, Cl. 264-122.000.
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- Bata Schuh AG: See—  
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- Krewalk, John J.; and Silverberg, Eric C., 4,682,091, Cl. 318-685.000.
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- Bean, Lloyd F.; Forbes, Richard L., II; Swift, Joseph A.; and Thorp, Bruce E., to Xerox Corporation. Brush end seals for blade cleaner housing. 4,681,426, Cl. 355-15.000.
- Beasley, Michael W., to Unisys Corp. Minimum latency tie-breaking arbitration logic circuitry. 4,682,282, Cl. 364-200.000.
- Beattie, Joanne L.: See—  
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- Beck, Walter; Berger, Siegfried; and Werner, Margrit, to Beck, Walter; and Werner, Margrit. Method and apparatus for aspirating secreted fluids from a wound. 4,681,562, Cl. 604-54.000.
- Becker, Benedikt: See—  
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- Beckwith, Paul B., Jr.; and Bistartkey, Donald S., to Harris Corporation. Real time perspective display employing digital map generator. 4,682,160, Cl. 340-729.000.
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- Belko, Robert P.: See—  
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- Bendall, Max R.; and Pegg, David T. Method of operating a nuclear magnetic resonance spectrometer. 4,682,107, Cl. 324-307.000.
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- Bendit, Kurt J. Differential timer. 4,681,463, Cl. 368-96.000.
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- Benoit, Gordon L.; and Boyd, Dana M., to Mobil Oil Corporation. Thermoplastic film extrusion process employing die with filtering arrangement. 4,681,721, Cl. 264-169.000.
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- Berezak, Bradley J.: See—  
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- Berger, Abe; and Vora, Rohitkumar H., to M&T Chemicals Inc. Poly(a-mide-amide acid), polyamide acid, poly(esteramide acid), poly(a-mide-imide), polyimide, poly(esterimide) from poly arylene diamine. 4,681,928, Cl. 528-353.000.
- Berger, Jacob: See—  
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- Berger, Mitchell S.: See—  
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- Berger, Siegfried: See—  
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- Berggren, Randall G.: See—  
Gale, Robert M.; and Berggren, Randall G., 4,681,584, Cl. 604-897.000.
- Bergkvist, Jorgen, to ASEA STAL Aktiebolag. Multibed fluidized bed boiler. 4,681,065, Cl. 122-4.00D.
- Bergquist, Thomas O. Support stand for a minnow trap. 4,680,887, Cl. 43-100.000.
- Bernardino, Lowell W.; Kuhl, Edward W.; Mao, Mark H. K.; and Pancheri, Eugene J., to Procter & Gamble Company. The Detergent composition containing semi-polar nonionic detergent alkaline earth metal anionic detergent and amino alkylbetaine detergent. 4,681,704, Cl. 252-546.000.
- Bernasconi, Marco L.: See—  
Juzi, Heniz; and Bernasconi, Marco L., 4,681,129, Cl. 137-154.000.

- Bernath, Oskar, to Georg Fischer Aktiengesellschaft Brugg. Mechanism for deposition of sheet metal. 4,681,003, Cl. 83-80.000.
- Berthier, Claude M.; and Friend, Richard H., to British Petroleum Company, p.l.c., The. Novel composites of an ionic conducting polymer and an electronic conducting polymer. 4,681,822, Cl. 429-191.000.
- Bertotti, Franco: See—  
Villa, Flavio; Murari, Bruno; Bertotti, Franco; Torazzina, Aldo; and Stefani, Fabrizio, 4,682,197, Cl. 357-36.000.
- Bes, Richard F. T.; and Knol, Jan D., to Holland Colours Apeldoorn B.V. Solid particulate coloring composition. 4,681,632, Cl. 106-19.000.
- Beuneche, Daniel; Mauvieux, Christian; and Amiet, Pierre, to Fragma. Process and device for detecting leaking nuclear fuel elements in a nuclear assembly. 4,681,730, Cl. 376-252.000.
- Beurskens, Godefridus P. F., to Hajime Industries Ltd. Apparatus for detecting containers having a deviating property. 4,682,220, Cl. 358-106.000.
- Bezin, Michel. Safety stirrup for horse-riding. 4,680,921, Cl. 54-49.000.
- Bhatt, Vipul, to AMP Incorporated. Optical switching arrangement. 4,681,397, Cl. 350-96.200.
- Bicoll, Norton J. Anesthetic device. 4,681,101, Cl. 128-303.00R.
- Bienert, Horst; and Kohlpaintner, Georg, to Webasto-Werk W. Baier GmbH & Co. Sliding roof for vehicles having a wind deflector. 4,681,364, Cl. 296-217.000.
- Bintech (PTY) Ltd.: See—  
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- Bioscan, Inc.: See—  
Shulman, Seth D., 4,682,035, Cl. 250-370.000.
- Biostar Medical Products, Inc.: See—  
Ozkan, Adil N., 4,681,782, Cl. 428-36.000.
- Birkhauser, Robert R., III, to Auto Glass Specialists, Inc. Windshield repair assembly. 4,681,520, Cl. 425-12.000.
- Bischofberger, Jurg; and Lattion, Andre, to Rieter Machine Works, Ltd. Open-end yarn piecer. 4,680,925, Cl. 57-263.000.
- Bistartkey, Donald S.: See—  
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- Bittler, Dieter: See—  
Laurent, Henry; Bittler, Dieter; Beier, Sybille; and Elger, Walter, 4,681,875, Cl. 514-182.000.
- Bittner, Ronald D. Convertible water bed. 4,680,820, Cl. 5-451.000.
- Blachman, Marc W.: See—  
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- Black & Decker Inc.: See—  
Abbratozzato, Salvatore R.; Walter, Richard T.; and Wheeler, Dale K., 4,682,066, Cl. 310-154.000.
- Blackburn, William P.: See—  
Simpson, Dennis A.; Singer, Debra L.; Dowbenko, Rostyslaw; Blackburn, William P.; and Kania, Charles M., 4,681,811, Cl. 428-413.000.
- Blaimschein, Gottfried, to GFM Gesellschaft. Milling machine. 4,681,491, Cl. 409-200.000.
- Blanchard, Christian: See—  
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- Blane, Roger H.: See—  
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- Blaney, Ted L.: See—  
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- Blonder-Tongue Laboratories, Inc.: See—  
Mistry, Kantilal, 4,682,359, Cl. 380-7.000.
- Bloom, David M.; and Kolner, Brian H., to Stanford University. High speed testing of electronic circuits by electro-optic sampling. 4,681,449, Cl. 356-364.000.
- Blumcraft of Pittsburgh: See—  
Horgan, William J., Jr., 4,680,903, Cl. 52-127.800.
- Bocking, Bruce; Cervantes, Joe A., Jr.; Green, Douglas H.; La Sota, Bruce W.; Marshall, David H.; Rodriguez, Bernard; and Van Gorden, Glen. Auto-coupling tool for drill-pipes. 4,681,175, Cl. 175-393.000.
- Boden, Richard M.: See—  
Sprecker, Mark A.; Wiegner, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,681,976, Cl. 560-126.000.
- Bodine, James A.; Kuehn, Judson S.; and Silcox, William H., to Chevron Research Company. Slidable electric valve device having a spring. 4,681,298, Cl. 251-129.100.
- Boehringer Ingelheim Pharmaceuticals, Inc.: See—  
Grozinger, Karl G.; and Oliver, James T., 4,681,884, Cl. 514-256.000.
- Boehringer Mannheim GmbH: See—  
Rosalki, Sidney B., 4,681,842, Cl. 435-21.000.
- Boeing Company, The: See—  
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- Church, Royce F.; McCaffrey, Donald B.; and Plude, Leo W., 4,681,286, Cl. 244-129.500.
- Furlong, James J.; and Howe, Dwayne E., 4,682,272, Cl. 361-437.000.
- Glatfelter, Edward W., 4,681,511, Cl. 416-131.000.
- Glenn, Gary S.; Rajpaul, Vinod K.; and Yurczyk, Roger F., 4,681,602, Cl. 55-21.000.
- Bogsch, Erik: See—  
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- Bohn, Helmut: See—  
Schonafinger, Karl; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,681,891, Cl. 514-340.000.
- Bohner, Beat; Forzy, Werner; Schurter, Rolf; and Pissiotas, Georg, to Ciba-Geigy Corporation. Sulfonyleureas and sulfonylethiureas, and method of use thereof as herbicides and/or growth regulators. 4,681,620, Cl. 71-93.000.
- Bohner, Hal J. Wine temperature controller. 4,681,611, Cl. 62-3.000.
- Bok, Edward, to Integrated Automation Limited. Improved method for double floating transport and processing of wafers. 4,681,776, Cl. 427-85.000.
- Boles, Robert G.: See—  
Farley, Harold C.; and Boles, Robert G., 4,681,013, Cl. 89-1.815.
- Boliden Aktiebolag: See—  
Marklund, Olle E.; Elmlid, Carl-Gustaf; Marklund, Ulf P.; and Borell, Michael C., 4,681,268, Cl. 241-24.000.
- Bollerhey, Rolf, to Mannesmann AG. Dust removal. 4,681,607, Cl. 55-284.000.
- Bolliger, Georg: See—  
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- Bollini, Jakob L.: See—  
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- Bolton, John D'Arcy. Safety ski harness. 4,681,337, Cl. 280-615.000.
- Boner, James C.; Berger, Mitchell S.; and Fine, Marc, to Diosonics, Inc. Ultrasound guided surgical instrument guide and method. 4,681,103, Cl. 128-303.00B.
- Boneta, Louis, to Moose Industries, Inc. Snow plow for small vehicles. 4,680,880, Cl. 37-236.000.
- Bontemps, Raymond. Portable device for skin massage by cold. 4,681,095, Cl. 128-24.100.
- Boozer, James M.; Mayer, Robert W.; Kumasaka, Alan J.; Strelecki, Paul R.; and Lindlau, Paul F., to Amerace Corporation. Fail-safe sensor system. 4,682,153, Cl. 340-507.000.
- Borell, Michael C.: See—  
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- Borst, Gaylord M.: See—  
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- Bos, Sinnighe J.: See—  
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- Bosley, Bruce C.: See—  
Cronkhite, Paul W.; Bosley, Bruce C.; Jones, James H.; and Patel, Asit G., 4,680,893, Cl. 51-5.00R.
- Bottomley, Paul A.: See—  
Vatis, Dimitrios; Bottomley, Paul A.; and Foster, Thomas H., 4,682,106, Cl. 324-307.000.
- Boucherie, Leonel, to G.B. Boucherie, Firma. Process for removing the wrapper from a fibre bundle. 4,680,850, Cl. 29-426.300.
- Bouchut, Pierre: See—  
Roca, Yves; Roussel, Jacky; Bouchut, Pierre; Leblanc, Marie-Christine; and Baffreau, Daniel, 4,681,634, Cl. 106-90.000.
- Boulanger, Edward, to Lance Wire and Cable, Inc. Integral connector having plastic spring-clips. 4,681,386, Cl. 439-347.000.
- Bouley, Jean C., to Allied Corporation. Electric connector. 4,681,391, Cl. 439-444.000.
- Bourgoin, Alain: See—  
Bailey, Francois P.; and Bourgoin, Alain, 4,682,355, Cl. 379-346.000.
- Bowdy, Fredrick E.; Glasenapp, Rudi K. H.; and Ridgway, Glen E., to Boeing Company. The. Nose wheel water spray deflector enabling wheel and tire changes without deflector removal. 4,681,285, Cl. 244-103.00R.
- Bowman, Norman E., to Don Gilbert Industries, Inc. Emergency sign. 4,682,147, Cl. 340-286.00R.
- Boyd, Dana M.: See—  
Benoit, Gordon L.; and Boyd, Dana M., 4,681,721, Cl. 264-169.000.
- Boyd, Harper, to Boyd's Bit Service, Inc. Borehole drill pipe continuous side entry or exit apparatus and method. 4,681,162, Cl. 166-242.000.
- Boyd's Bit Service, Inc.: See—  
Boyd, Harper, 4,681,162, Cl. 166-242.000.
- Bozung, Hanns-Gunther; and Nachtigal, Joachim, to Siemens Aktiengesellschaft. Control device for an internal combustion engine with an exhaust gas turbocharger. 4,680,933, Cl. 60-608.000.
- BP Chemicals Limited: See—  
Duncan, Alexander W. S.; Summers, David G.; and Thomas, Kenneth C., 4,681,902, Cl. 521-85.000.
- Green, Michael J., 4,681,967, Cl. 558-277.000.
- Brabb, James D.; and Simpson, Dennis L., to White Castle System, Inc. Swath-controlling variable chute and chute-activated damper for a broadcast spreader. 4,681,265, Cl. 239-665.000.
- Brach, Reiner, to Reiner Brach Import-Export. Method for dressing hot rolled strip coils, especially coilbox coils. 4,680,951, Cl. 72-160.000.
- Brahm, Richard: See—  
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- Braitering, Helmut: See—  
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Brammall, Terrence; and Guiler, Richard S., to Trans-Guard Industries, Inc. Security seal for use with stranded cable. 4,681,355, Cl. 292-323.000.

Brammall, Terrence N., to Trans-Guard Industries, Inc. Conical cable lock. 4,681,356, Cl. 292-327.000.

Brand, Larry M., to Procter & Gamble Company, The. Pharmaceutical products providing enhanced analgesia. 4,681,897, Cl. 514-557.000.

Brandell, John R. Golf exercise device. 4,681,317, Cl. 272-137.000.

Brandl, Rudolf; and Matt, Heinz, to Heckler & Koch GmbH. Magazine for automatic weapons. 4,681,019, Cl. 89-33.040.

Brandt, Inc.: See—

Taipale, Dale L.; and Brome, John G., 4,682,288, Cl. 364-406.000.

Brandt, Sherry L.: See—

Anderson, Arthur B.; and Brandt, Sherry L., 4,681,578, Cl. 604-385.00R.

Brann, Dale: See—

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Brantl, Victor: See—

Teschemacher, Hansjorg; Brantl, Victor; Henschen, Agnes; and Lottspeich, Friedrich, 4,681,871, Cl. 514-15.000.

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Braun, Hermann: See—

Mueller, Sieghard; Braun, Hermann; Dumschat, Helmut; and Trautwein, Hans-Juergen, 4,680,954, Cl. 72-405.000.

Braun, Jeffrey J.: See—

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Braun, Leroy O.: See—

Hendrix, James L.; and Braun, Leroy O., 4,682,336, Cl. 372-10.000.

Brawner, Clarence A., Jr. Truck level sensing and indicating system. 4,682,145, Cl. 340-52.00H.

Brazeway, Inc.: See—

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BRD Company Limited: See—

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Bremer, Johannes, to N.V. Optische Industrie "De Oude Delft". Device for detecting differences in color. 4,681,454, Cl. 356-402.000.

Breitenstein, Charles T.; and Holecck, Allen R., to Carbide International Inc. Tool unloading mechanism for automatic tool grinding machine. 4,680,896, Cl. 51-215.0UE.

Brennan, Michael E.: See—

Speranza, George P.; Brennan, Michael E.; and Grigsby, Robert A., Jr., 4,681,965, Cl. 558-162.000.

Bresson, Clarence R.; and Parلمان, Robert M., to Phillips Petroleum Company. Ore flotation. 4,681,675, Cl. 209-167.000.

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Schulz, Rene; Teubler, Heinz; and Breuer, Peter, 4,681,517, Cl. 417-300.000.

Breunig, Charles F.: See—

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Bridgestone Corporation: See—

Alaki, Yasuhide; Ohtake, Masayuki; and Ihara, Keisuke, 4,681,323, Cl. 273-232.000.

Brigham, David F.: See—

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Briner, Emil; and Hieronymi, Richard, to Rieter Machine Works Limited. Method of starting spinning of a yarn in a friction spinning device. 4,680,924, Cl. 57-263.000.

Brisset, Jean-Paul: See—

Lombard, Claude; Brisset, Jean-Paul; Catier, Gerard; Marais, Jean-Luc; and Zammarchi, Gino, 4,682,104, Cl. 324-208.000.

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Alper, Howard; Despeyroux, Bertrand; Smith, David J. H.; and Woell, James B., 4,681,707, Cl. 260-410.90R.

Berthier, Claude M.; and Friend, Richard H., 4,681,822, Cl. 429-191.000.

British Telecommunications public limited company: See—

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Brittain, Kent R.: See—

Olson, Keith E.; and Brittain, Kent R., 4,681,914, Cl. 252-91.000.

Broderick, Dennis W.; and Vincent, Harold L., to Dow Corning Corporation. Hard organopolysiloxane release coating. 4,681,908, Cl. 524-268.000.

Brodeur, Rene H.; and Terlecky, Boris S., to Trailer Train Company. Railroad car with universal coupling capability. 4,681,040, Cl. 105-3.000.

Brodman, Richard F.; and Siegel, Sharon B. Intracardiac catheter and a method for detecting myocardial ischemia. 4,681,117, Cl. 128-642.000.

Brome, John G.: See—

Taipale, Dale L.; and Brome, John G., 4,682,288, Cl. 364-406.000.

Brookbank, Earl B., III, to TRW, Inc. Apparatus and method for supplying electric power to cable suspended submersible pumps. 4,681,169, Cl. 166-385.000.

Brooks, Forrest E., to ITT Corporation. Method for writing characters on a liquid crystal display. 4,682,163, Cl. 340-805.000.

Brooks, Robert A.; Dosch, Robert G.; and Tuttle, Bruce A., to United States of America, Energy. Process for the chemical preparation of high-field ZnO varistors. 4,681,717, Cl. 264-61.000.

Brotz, Gregory R. Thermovoltaic cells. 4,681,981, Cl. 136-205.000.

Brouwer Turf Equipment Limited: See—

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Brown, David J., to Massey-Ferguson Services N.V. Transmission direction selection system. 4,680,983, Cl. 74-474.000.

Brown, David M. Collapsible sawhorse. 4,681,187, Cl. 182-129.000.

Brown, John G. Coverings providing impact sound isolation. 4,681,786, Cl. 428-44.000.

Brown, Robert R., to Colt Industries Inc. Vehicular air intake scoop. 4,681,178, Cl. 180-68.300.

Brown, Thomas H.; Mitchell, Robert C.; Smith, Ian R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Histamine H<sub>2</sub>-antagonist oxazole and thiazole derivatives and compositions therefor. 4,681,883, Cl. 514-212.000.

Brown & Williamson Tobacco Corporation: See—

Johnson, Robert R., 4,681,125, Cl. 131-336.000.

Strubel, David G.; and Sanford, Robert A., 4,681,126, Cl. 131-370.000.

Brozovic, George R.; Djobadze, Michael O.; and Navarrete, Felix M., to Lockheed Corporation. Vacuum bag sealing system. 4,681,651, Cl. 156-382.000.

Bruegge, Anthony J.; and Daugherty, Denny E., to Chemed Corporation. Solid stabilized active halogen-containing detergent compositions and methods. 4,681,696, Cl. 252-99.000.

Brunelle, Daniel J., to General Electric Company. Bis-aminopyridinium salts as phase transfer catalysts for aromatic ether imide preparation. 4,681,949, Cl. 548-461.000.

Brunner, Erwin: See—

Baur, Karl G.; Diehl, Volker; Stops, Peter; Hellbach, Hans; and Brunner, Erwin, 4,681,946, Cl. 546-317.000.

Brunner, Heinz; and Seeger, Stefan, to SIPRA Patententwicklungs-und Beteiligungsgesellschaft mbH. Arrangement for positive supply of elastomer filaments in textile machines. 4,681,272, Cl. 242-47.010.

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Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,680,830, Cl. 16-241.000.

Brychta, Ondrej; and Zabrodsky, Vladimir, to Konstruktiva Trencin, narodny podnik. Multinozzle generator for high frequency nozzle ventilation of lungs. 4,681,100, Cl. 128-204.250.

BSG-Schalttechnik GmbH & Co. KG: See—

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Buerkel, David H., to Applied Energy Systems, Inc. Positive or negative voltage power supply with slideable carrier switching mechanism. 4,682,046, Cl. 307-138.000.

Bugg, Richard E. F., to U.S. Philips Corporation. Variable size character display without loss of obscured character positions. 4,682,161, Cl. 340-731.000.

Bujalski, Duane R., to Dow Corning Corporation. Ceramic materials from polycarbosilanes. 4,681,860, Cl. 501-88.000.

Bulst, Wolf-Eckhart; Lindemann, Gertrud; and Zibis, Peter, to Siemens Aktiengesellschaft. Filter functioning with acoustic waves. 4,682,130, Cl. 333-195.000.

Burghoff, Heinz-Georg: See—

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Burghoff, Karl; Schiller, Werner; Albrecht, Wilhelm; Harsch, Herbert; and Burghoff, Heinz-Georg, to Max Kammerer GmbH. Process and apparatus for the production of strands for Bowden cables. 4,680,952, Cl. 72-161.000.

Burk, John H.: See—

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Burke, Hubert K.; and Michon, Gerald J., to General Electric Company. High-sensitivity CID photometer/radiometer. 4,681,440, Cl. 356-218.000.

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Burnett, Sibley C.: See—

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Burrington, James D.: See—

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Burroughs Wellcome Co.: See—

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Burton, Craig A.: See—

Helland, Randall H.; and Burton, Craig A., 4,681,830, Cl. 430-110.000.

Busby, Bruce E., to Sony Corporation. Method and apparatus for updating optical memory disc. 4,682,318, Cl. 369-59.000.

Bush, Earl D., to Handy Button Machine Company. Tapered surface panel retainer. 4,680,915, Cl. 52-766.000.

Butka, Kemal. Vessel such as a ship, boat and the like provided with stabilizing means. 4,681,053, Cl. 114-122.000.

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Kasza, Tibor; Kakonyi, Gyula; Kocso, Illes; Buzas, Attila; and Radvanyi, Laszlo, 4,682,137, Cl. 335-284.000.

Buzdov, Ruslan D.: See—

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Byrne, Barbara J.: See—

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Byrne, John V.: See—

Murphy, John; McMullin, Francis; Egan, Michael; Byrne, John V.; and Kenneally, Patrick, 4,682,093, Cl. 318-701.000.

Byrne, Larry D.; and Byrne, Barbara J. Method for agglomerating powdered coal by compaction. 4,681,597, Cl. 44-15.00R.

Byrum, James E. IC carrier system. 4,681,656, Cl. 156-645.000.

C-I-L Inc.: See—

Murray, Charles R.; and Harrison, Ray E., 4,681,781, Cl. 428-35.000.

C. M. Smillie & Company: See—

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C. R. Bard, Inc.: See—

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Cable Technology Laboratories, Inc.: See—

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CACI, Inc. - Federal: See—

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Calgon Corporation: See—

Walker, Jerry L.; and Zupanovich, John D., 4,681,737, Cl. 422-16.000.

California Devices, Inc.: See—

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Camilleri, Paul, to S.W.R. (Australia) Pty. Ltd. Casting of structural walls. 4,681,483, Cl. 405-267.000.

Canada, Her Majesty the Queen in right of: See—

Saint, David H.; and Funk, John W., 4,682,034, Cl. 250-363.00R.

Candau, Francoise: See—

Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Francoise, 4,681,912, Cl. 524-827.000.

Canon Kabushiki Kaisha: See—

Fujino, Masahisa; Fukahori, Hidehiko; and Satoh, Toshihiko, 4,681,417, Cl. 354-234.100.

Ikeeda, Yoshinori, 4,682,190, Cl. 346-154.000.

Kaji, Toshio, 4,682,211, Cl. 358-41.000.

Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, 4,682,237, Cl. 358-225.000.

Kawabata, Takashi; Sato, Yuichi; Tsunekawa, Tokuchi; and Matsumura, Susumu, 4,681,432, Cl. 356-4.000.

Kodaira, Takanori, 4,681,418, Cl. 354-288.000.

Kosugi, Masao, 4,682,037, Cl. 250-548.000.

Nakatsui, Hisashi; Imataki, Hiroyuki; and Hajimoto, Yoshioki, 4,682,019, Cl. 250-211.00R.

Okada, Shinjiro; and Kanbe, Junichiro, 4,681,404, Cl. 350-350.00S.

Sakai, Shinji; and Kawabata, Takashi, 4,681,419, Cl. 354-402.000.

Sasaki, Takashi; Sakurada, Nobuaki; and Kawamura, Hideaki, 4,682,186, Cl. 346-140.00R.

Sasaki, Takashi; Sakurada, Nobuaki; Kawamura, Hideaki; and Moriama, Jiro, 4,682,216, Cl. 358-79.000.

Suda, Yasuo; Aiyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,681,420, Cl. 354-409.000.

Sugita, Yasutoshi, 4,682,242, Cl. 358-285.000.

Suwa, Kaname, 4,681,987, Cl. 200-5.00A.

Takayama, Tsutomu; Hashimoto, Seiji; Kaji, Toshio; Suzuki, Masao; and Tojo, Akihiko, 4,682,232, Cl. 358-172.000.

Tateoka, Masamichi; and Yano, Hideaki, 4,682,316, Cl. 369-46.000.

Terasawa, Koji, 4,682,184, Cl. 346-140.00R.

Uchidoi, Masanori; and Suzuki, Nobuyuki, 4,681,441, Cl. 356-222.000.

Yamada, Akira; and Tokura, Go, 4,681,421, Cl. 354-485.000.

Cantello, Maichi: See—

Delle Piane, Alberto; Sartorio, Franco; Cantello, Maichi; and Ghiringhella, Guglielmo, 4,682,002, Cl. 219-121.0LD.

Carbide International Inc.: See—

Breitenstein, Charles T.; and Holecck, Allen R., 4,680,896, Cl. 51-215.0UE.

Carl Schenck AG: See—

Dodd, Hans-Walter, 4,680,975, Cl. 73-862.090.

Carl-Zeiss-Stiftung: See—

Hoffmeister, Dietrich, 4,680,945, Cl. 62-514.00R.

Carlin, Bruce. Method for providing wall storage. 4,681,380, Cl. 312-242.000.

Carlson, Danis R. Process for treating plants. 4,680,889, Cl. 47-58.000.

Carolina Power & Light Company: See—

Robertson, Carlton E., 4,681,705, Cl. 252-631.000.

Carpenter, James H.; Mullins, Ronald L.; and Smith, Ronald L., to Pangborn Corporation. Portable abrasive throwing wheel device. 4,680,899, Cl. 51-427.000.

Carpenter, James H., Jr. Method and apparatus for cleaning workpieces. 4,680,898, Cl. 51-419.000.

Carter, Neil A.; Harris, Ronald R.; and Ault, Russell L., to Owens-Corning Fiberglass Corporation. Method of making a lineal structural member. 4,681,722, Cl. 264-171.000.

Carty, John J. Chimney stack having erodable liner with electrical generating capacity. 4,681,025, Cl. 98-58.000.

Caselli, Joseph M., Sr. Leadered fishing lure holder with means for receiving leader and hooks. 4,680,886, Cl. 43-57.100.

Casio Computer Co., Ltd.: See—

Morikawa, Shigenori; Hanzawa, Kohtaro; Sasaki, Hiroyuki; and Morokuma, Hiroshi, 4,681,008, Cl. 84-1.280.

Cassella Aktiengesellschaft: See—

Schonafinger, Karl; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,681,891, Cl. 514-340.000.

Castellano, Pietro, to Ing. C. Olivetti & C., S.p.A. Serial ink jet printing arrangement providing a removably mounting of the printing head on a carriage. 4,682,188, Cl. 346-140.00R.

Castolin S.A.: See—

Simm, Wolfgang; and Steine, Hans-Theo, 4,681,734, Cl. 419-9.000.

Caterpillar Inc.: See—

Hoffman, John P., 4,682,151, Cl. 340-347.0SY.

Zborowski, David G., 4,681,177, Cl. 180-9.560.

Catier, Gerard: See—

Lombard, Claude; Brisset, Jean-Paul; Catier, Gerard; Marais, Jean-Luc; and Zammarchi, Gino, 4,682,104, Cl. 324-208.000.

Catsouras, George: See—

Grech, Leonard, 4,681,084, Cl. 126-52.000.

Cattaneo, Pierre, to Lem S.A. Current transformer for direct and alternating current. 4,682,101, Cl. 324-117.00H.

Cavalli, Alfredo. Apparatus for preparing ice cream and the like. 4,681,458, Cl. 366-149.000.

Cawthorne, Duane C., to United States of America, Energy. Energy-efficient lighting system for television. 4,682,238, Cl. 358-228.000.

CCaley, Douglas A., to Paccar Inc. Air drying system for pneumatic circuits. 4,680,938, Cl. 62-93.000.

Cedercreutz, Axel; and Salminen, Ari, to Tamfelt Oy AB. Spiral wire and a method of manufacturing such a wire. 4,681,287, Cl. 245-6.000.

Celanese Corporation: See—

Letinski, John S., 4,681,716, Cl. 264-53.000.

CEM Corporation: See—

Collins, Michael J.; and Hargett, Wyatt P., Jr., 4,681,996, Cl. 219-10.55M.

Cemedine Co., Ltd.: See—

Ikeeda, Shigeru; and Okamura, Naomi, 4,681,524, Cl. 425-376.00R.

Centaure Sciences, Inc.: See—

Deckert, Clinton; and Wilson, Larry L., 4,681,563, Cl. 604-67.000.

Centore, Anthony. Round electrical cable adapting tool. 4,680,852, Cl. 29-461.000.

Central Research Institute of Electric Power Industry: See—

Sakurai, Akio; and Kato, Ryoichi, 4,681,726, Cl. 376-171.000.

Central Security Mfg. Corp.: See—

Shirley, John R., 4,682,155, Cl. 340-573.000.

Cermetek Microelectronics, Inc.: See—

Durham, Stephen J., 4,682,352, Cl. 379-98.000.

Cervantes, Joe A., Jr.: See—

Bocking, Bruce; Cervantes, Joe A., Jr.; Green, Douglas H.; La Sota, Bruce W.; Marshall, David H.; Rodriguez, Bernard; and Van Gorden, Glen, 4,681,175, Cl. 175-393.000.

Cetus Corporation: See—

Johnson, Larry J.; Coates, Stephen R.; and Looor, Rueyming, 4,681,742, Cl. 422-102.000.

CGR/MEV: See—

Aucouturier, Jeanne; Leboutet, Hubert; and Pourre, Jean-Louis, 4,682,114, Cl. 328-67.000.

Chambers, Gregory R.: See—

Bates, Gary M.; Chambers, Gregory R.; and Ting, Sai-Pei, 4,681,915, Cl. 525-148.000.

Chamran, Delories M., legal representative: See—

Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,681,444, Cl. 356-318.000.

Chamran, Morteza M., deceased: See—

Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,681,444, Cl. 356-318.000.

Chang, Biau-Hung, to National Distillers and Chemical Corporation. Process for converting an alkoxyalkadiene to an alkyl dialkoxyalkanoate. 4,681,708, Cl. 260-410.900.

Chang, Biau-Hung; and Hanes, Ronnie M., to National Distillers and Chemical Corporation. Alkyl 9-alkoxy-7-nonenates. 4,681,709, Cl. 260-410.900.

Chang, Ike Y., to E.I. Du Pont de Nemours and Company. Reinforced composites. 4,681,911, Cl. 524-607.000.

Chang, Paul S.; and Dowling, Edward C., to AMP Incorporated. Time-slot addressed, system keyed multiplex device. 4,682,168, Cl. 340-825.650.

Chapman, Dale B., to International Business Machines Corporation. Phase discriminator and data standardizer. 4,682,121, Cl. 331-1.00A.

Charbonnier, Roger: See—

Remy, Joel; and Charbonnier, Roger, 4,682,122, Cl. 331-2.000.

Charles Wyle Engineering Corporation: See—

Sirkin, Robert, 4,681,242, Cl. 222-41.000.

Chaudhari, Atma; and Lee, Joseph K. S., to Warner-Lambert Company. Dissolution cell and method for determining the in-vitro release of a drug. 4,681,858, Cl. 436-165.000.

Chaumont, Roger: See—

Delons, Luc; and Chaumont, Roger, 4,681,680, Cl. 210-110.000.



Chemed Corporation: See—  
Bruegge, Anthony J.; and Daughtery, Denny E., 4,681,696, Cl. 252-99.000.

Chen, Chin-Chi; and Lin, Yung-Shing. Golf club head. 4,681,321, Cl. 273-167.00H.

Cheney, Paul G.: See—  
Eian, Gilbert; and Cheney, Paul G., 4,681,801, Cl. 428-283.000.

Cheng, Dah Y., to International Power Technology, Inc. Control system for Cheng dual-fluid cycle engine system. 4,680,927, Cl. 60-39.300.

Chevron Research Company: See—  
Bodine, James A.; Kueha, Judson S.; and Silcox, William H., 4,681,298, Cl. 251-129.100.

Chickanosky, John J.; Courtney, Jack W.; and Murphy, Robert H., to International Business Machines Corporation. Holder for plastic leaded chip carrier. 4,681,221, Cl. 206-328.000.

Chien, Sze-Foo; Redus, Clifford L.; and Sigwardt, Peter L., to Texaco Inc. Method for determining quality of reduced quality steam. 4,681,466, Cl. 374-42.000.

Childress, Jeffery S.; Dissosway, Marc A.; and Hughes, Houston H., III, to General Electric Company. Mobile radio communications system with join feature. 4,682,367, Cl. 455-17.000.

Ching, Neng H.; Marson, Ralph G.; Norman, Michael J.; and Hughes, John L. Femtosecond laser pulse measuring system. 4,681,436, Cl. 356-121.000.

Chion, Pierre; and Menault, Jacques, to Rhovyl. Process for disperse dyeing dry-spun atactic polyvinyl chloride-based filaments and fibres before drawing. 4,681,594, Cl. 8-489.000.

Chion, Pierre; and Menault, Jacques, to Rhovyl. Process for disperse dyeing dry-spun atactic polyvinyl chloride-based filaments and fibres after drawing the wet tow. 4,681,595, Cl. 8-489.000.

Chism, Samuel B., Jr., to Ford Aerospace & Communications Corporation. Ortho-linear imaging device. 4,682,235, Cl. 358-212.000.

Chiu, Fang-Ting: See—  
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,681,889, Cl. 514-307.000.

Cho, George E. S.; and Kesler, Stephen B., to Kontron Inc. Balloon catheter wrapping apparatus. 4,681,092, Cl. 128-1.00D.

Chrise, James R.: See—  
Veronesi, Luciano; Obermeyer, Franklin D.; and Chrise, James R., 4,681,728, Cl. 376-209.000.

Christiansen, Tyrone: See—  
Beer, Rafael; and Christiansen, Tyrone, 4,681,415, Cl. 354-120.000.

Christopoulos, John A., to United States of America. Army. Dual battery connector arrangement. 4,681,821, Cl. 429-121.000.

Chrysler Motors Corporation: See—  
Hassan, Morris, 4,681,304, Cl. 267-8.00R.

Sullivan, Thomas M., 4,682,088, Cl. 318-568.000.

Chu, Chung K.; and Schinazi, Raymond F., to University of Georgia Research Foundation, Inc.; and Emory University. 2',3'-dideoxy-5-substituted uridines and related compounds as antiviral agents. 4,681,933, Cl. 536-23.000.

Chu, John W.; and Berezna, Bradley J., to Advanced Micro Devices, Inc. Thin film chromium-silicon-carbon resistor. 4,682,143, Cl. 338-307.000.

Chung, Jing-Yau, to Exxon Production Research Company. Rod-type multipole source for acoustic well logging. 4,682,308, Cl. 367-31.000.

Chung, Landy. Boiler furnace air register. 4,681,532, Cl. 431-183.000.

Church, Royce F.; McCaffrey, Donald B.; and Plude, Leo W., to Boeing Company. The Door anti-hijacking latch/lock mechanism with pneumatic decompression override. 4,681,286, Cl. 244-129.500.

Churyo Engineering Co., Ltd.: See—  
Hayashi, Shochi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, 4,680,874, Cl. 34-143.000.

Ciba-Geigy Corporation: See—  
Back, Gerhard; and Mosimann, Walter, 4,681,596, Cl. 8-620.000.

Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,681,620, Cl. 71-93.000.

Demmer, Christopher G.; and Irving, Edward, 4,681,923, Cl. 525-504.000.

Farooq, Saleem; Reinehr, Dieter; and Schmid, Werner, 4,681,593, Cl. 8-128.00R.

Fischer, Walter; Finter, Jurgen; and Zweifel, Hans, 4,681,950, Cl. 549-27.000.

Meyer, Willy; and Fory, Werner, 4,681,619, Cl. 71-92.000.

Miller, Ralph; Bollini, Jakob L.; and Schneider, Robert, 4,681,710, Cl. 260-508.000.

Pfenninger, Johannes; Iqbal, Abul; and Rochat, Alain C., 4,681,971, Cl. 558-414.000.

Schiek, Robert C., 4,681,638, Cl. 106-309.000.

Traxler, Peter, 4,681,938, Cl. 540-458.000.

Cirrito, William: See—  
Hirsch, Gerald B.; Volk, Stanley; Cirrito, William; and Brann, Dale, 4,680,815, Cl. 2-171.300.

Citizen Watch Co., Ltd.: See—  
Hashimoto, Shingo; Sunaga, Kazuyuki; and Kasugai, Kaoru, 4,682,254, Cl. 360-103.000.

Nabeyama, Takatoshi; and Sakita, Eiichi, 4,681,459, Cl. 368-16.000.

Nishimura, Katsuo, 4,681,460, Cl. 368-21.000.

Clarion Co., Ltd.: See—  
Amazawa, Kiyoshi; and Mori, Akira, 4,682,045, Cl. 307-125.000.

Clark, Frank J.: See—  
Cole, William M.; Fenske, Steven L.; Serbin, David J.; Malani, Shrikant R.; Clark, Frank J.; and Beattie, Joanne L., 4,681,929, Cl. 528-493.000.

Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, to Syntex (U.S.A.) Inc. Method for treating

cardiovascular disease with calcium channel antagonists. 4,681,889, Cl. 514-307.000.

Clark, Ronald K.: See—  
Unnam, Jalaiah; and Clark, Ronald K., 4,681,818, Cl. 428-607.000.

Clasen, Rolf; and Scholz, Heinz, to U.S. Philips Corporation. Method of manufacturing glass bodies. 4,681,614, Cl. 65-18.100.

Clausen, Peter J. M.: See—  
Petersen, Jorgen H.; and Clausen, Peter J. M., 4,681,533, Cl. 431-208.000.

Clawson, Lawrence G., to Raytheon Company. High condensing recuperative furnace. 4,681,085, Cl. 126-110.00R.

Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., to International Business Machines Corporation. Flexible film semiconductor chip carrier. 4,681,654, Cl. 156-630.000.

Clemons, Johnny M.: See—  
Daniels, Julia G.; Ledbetter, Frank E., III; Clemons, Johnny M.; Penn, Benjamin G.; and White, William T., 4,680,897, Cl. 51-281.00R.

Cloutier, Richard. Snow blower with snow channel of vertical scraper snow belt. 4,680,881, Cl. 37-237.000.

Coates, Fredrica V. Adjustable size diaper and folding method therefor. 4,681,581, Cl. 604-391.000.

Coates, Philip V.; and Eaton, Brian J., to Emi Limited. Controlling the grey levels represented by a video signal. 4,682,229, Cl. 358-166.000.

Coates, Stephen R.: See—  
Johnson, Larry J.; Coates, Stephen R.; and Loo, Rueyming, 4,681,742, Cl. 422-102.000.

Coatex S.A.: See—  
Roca, Yves; Rousset, Jacky; Bouchut, Pierre; Leblanc, Marie-Christine; and Baffreau, Daniel, 4,681,634, Cl. 106-90.000.

Cobe Laboratories, Inc.: See—  
Swan, Jack C., Jr.; and Poggioli, Paolo, 4,681,606, Cl. 55-193.000.

Cobelpast N.V.S.A.: See—  
Van Iseghem, Augustinus E. M., 4,681,797, Cl. 428-212.000.

Coble, Stephen J.; and Arkans, Edward J. IV rate meter. 4,681,569, Cl. 604-253.000.

Coca-Cola Company, The: See—  
Credle, William S., Jr., 4,681,518, Cl. 417-395.000.

Cochran, Wilson V., to Toro Company, The. Two piece variable stator for sprinkler nozzle flow control. 4,681,260, Cl. 239-240.000.

Cockman, Haggie I. Low profile sprinkler head. 4,681,263, Cl. 239-391.000.

Cohen, Joel R.: See—  
Milberger, Walter E.; Cohen, Joel R.; and Dubrowsky, Leonard, 4,682,126, Cl. 333-81.00B.

Cole, William M.; Fenske, Steven L.; Serbin, David J.; Malani, Shrikant R.; Clark, Frank J.; and Beattie, Joanne L., to Firestone Tire & Rubber Company, The. Use of rubber solvent-resin solvent and miscella mixtures for extraction-expression of rubber and resins from guayule shrub. 4,681,929, Cl. 528-493.000.

Coleman Company, Inc.: See—  
Nedoluha, Heinz F., 4,681,052, Cl. 114-98.000.

Colgate, Stirling A.; and Roos, George E. Fast burning propellants. 4,681,643, Cl. 149-21.000.

Collins, Michael J.; and Hargett, Wyatt P., Jr., to CEM Corporation. Analytical process in which materials to be analyzed are directly and indirectly heated and dried by microwave radiation. 4,681,996, Cl. 219-10.55M.

Colombani, Louie V. Multiple-ring toilet seat assembly and mounting means. 4,680,816, Cl. 4-240.000.

Colombo, Paolo; Conte, Ubaldo; and Reiner, Alberto, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Delivery device for zero-order release of an active principle into a dissolution fluid and process for its preparation. 4,681,755, Cl. 424-486.000.

Colon, Herman; and Maletsky, Albert, to Malcolm Nicol & Co. Wetness indicating hot-metal adhesives. 4,681,576, Cl. 604-361.000.

Colpo Co., Ltd.: See—  
Takasugi, Mitsuo, 4,681,243, Cl. 222-83.000.

Colt Industries Inc.: See—  
Brown, Robert R., 4,681,178, Cl. 180-68.300.

Combustion Engineering, Inc.: See—  
Leaseburge, Emory J.; and Meida, Kenneth J., 4,681,678, Cl. 210-101.000.

Comet - Construzione Occhiali Metallo S.p.A.: See—  
Taddei, Lorenzo, 4,681,411, Cl. 351-137.000.

Commarmot, Roger; Didenot, Dominique; and Gardais, Jean-Francois, to Societe Prolabo. Apparatus for the chemical reaction by wet process of various products. 4,681,740, Cl. 422-78.000.

Compagnie Industrielle Des Telecommunications Cit-Alcatel: See—  
Le Mouel, Bernard; Le Bescont, Herve; and Le Meur, Jean-Paul, 4,682,334, Cl. 371-55.000.

Compton, Senja V.: See—  
Budge, John R.; and Comptou, Senja V., 4,681,868, Cl. 502-307.000.

CompuSonics Video Corporation: See—  
Schwartz, David M., 4,682,248, Cl. 360-32.000.

Conero, Ronald S.; and Landis, Terry L., to Ivac Corporation. Optical flow sensor. 4,680,977, Cl. 73-861.410.

Conley, Ralph R.: See—  
Wetzler, Dallas G.; and Conley, Ralph R., 4,681,261, Cl. 239-265.190.

Conrac Corporation: See—  
Holt, Gary E.; Siehling, Mark B.; and Van Antwerp, Stanley R., 4,682,000, Cl. 219-116.000.

Conrad Scholtz AG: See—  
Nolte, Gunther, 4,681,503, Cl. 414-144.000.

Conroy, Gary M.: See—  
Mesch, Keith A.; and Conroy, Gary M., 4,681,907, Cl. 524-180.000.

Conte, Ubaldo: See—  
Colombo, Paolo; Conte, Ubaldo; and Reiner, Alberto, 4,681,755, Cl. 424-486.000.

Contin, Jose L., to MDC Vacuum Products Corporation. High vacuum gate valve having improved metal vacuum seal joint. 4,681,329, Cl. 277-167.500.

Cook, Barry: See—  
Richardson, Norman; Holt, Brian; and Cook, Barry, 4,681,686, Cl. 210-699.000.

Cook, Phillip D.: See—  
McNamara, Dennis J.; and Cook, Phillip D., 4,681,873, Cl. 514-50.000.

Cook, Sanford L.; and Kirkup, David, to Standard-Keil Hardware Manufacturing Co. Hardware for mounting a sliding door panel. 4,680,828, Cl. 16-90.000.

Cooper, Thomas F., to Xerox Corporation. Sorting apparatus. 4,681,310, Cl. 270-53.000.

CooperVision, Inc.: See—  
Hood, Larry L.; and Imonti, Maurice M., 4,681,561, Cl. 604-22.000.

Coplands, Carl W., to Seton Products Limited. Corset. 4,681,113, Cl. 450-134.000.

Cordis Corporation: See—  
Hooven, Michael D., 4,681,559, Cl. 604-9.000.

Corfield, Kenneth G.; and Heeks, John S., to Standard Telephones and Cables Public Limited Company. Interconnecting integrated circuits. 4,682,323, Cl. 370-4.000.

Cornils, Gerd: See—  
Kunert, Heinz; Vanaschen, Luc; and Cornils, Gerd, 4,681,794, Cl. 428-188.000.

Corning Glass Works: See—  
DeAngelis, Thomas P.; and Day, John P., 4,681,624, Cl. 75-28.000.

Costa Mas, Miguel-Angel. Integral accelerator-brake control for motorcycles. 4,681,198, Cl. 192-3.00S.

Cosulich, Joseph J.: See—  
Dvirka, Miro; Psihos, George J.; and Cosulich, Joseph J., 4,681,045, Cl. 110-345.000.

Cotzas, George M.; VanDusen, Morris V.; and VanSchaick, Thomas E., to General Electric Company. Liquid cooled static excitation system for a dynamoelectric machine. 4,682,068, Cl. 310-198.000.

Council, Buford W., Jr., to Bausch & Lomb Incorporated. Toric lenses, method and apparatus for making same. 4,680,998, Cl. 82-1.00C.

Courtney, Jack W.: See—  
Chickanosky, John J.; Courtney, Jack W.; and Murphy, Robert H., 4,681,221, Cl. 206-328.000.

Courtney, William L. Combined life vest device and buoyancy compensator. 4,681,552, Cl. 441-92.000.

Coussau, Jean: See—  
Crespin, Gerard; and Coussau, Jean, 4,681,495, Cl. 411-298.000.

Cramer, Hans, to H. Krantz GmbH & Co. Link chain, especially a tethering chain. 4,680,839, Cl. 26-89.000.

Crandall, Robert E.; Kosulic, Kenneth F.; Rooney, Thomas C.; and Smith, Larry C., to Rexnord Inc. Drive system for belt press. 4,681,033, Cl. 100-118.000.

Crawford, Wheeler C.: See—  
Zoleski, Benjamin H.; Crawford, Wheeler C.; and Sung, Rodney L., 4,681,694, Cl. 252-51.50R.

Credle, William S., Jr., to Coca-Cola Company, The. Single-acting, gas operated pump. 4,681,518, Cl. 417-395.000.

Creedon, Richard L., to GA Technologies Inc. Rail gun barrel with axially prestressed insulators. 4,681,015, Cl. 89-8.000.

Creedon, Richard L., to GA Technologies Inc. Rail gun barrel with gas containment means. 4,681,016, Cl. 89-8.000.

Crespin, Gerard; and Coussau, Jean, to Framatome & Cie. Device and process for fixing two parts with a captive screw. 4,681,495, Cl. 411-298.000.

Crockatt, William B.; and Rimma, John, to DeSoto, Inc. Aqueous water-repellent coatings. 4,681,910, Cl. 524-487.000.

Cromer, Charles J. Freeze protection valve for solar heaters. 4,681,088, Cl. 126-420.000.

Cronkwhite, Paul W.; Bosley, Bruce C.; Jones, James H.; and Patel, Asit G., to Motorola, Inc. Apparatus for polishing semiconductor wafers. 4,680,893, Cl. 51-5.00R.

Crosbie, Donald A. Apparatus and method of shoring masonry, stone, concrete and other materials over openings in buildings. 4,681,290, Cl. 248-225.310.

Crouse, Kim H.; and Archibald, James B., to General Electric Company. Coolant gas flow separator baffle for a dynamoelectric machine. 4,682,064, Cl. 310-61.000.

Crowe, William E., to Hughes Tool Company. Rotary power slips. 4,681,193, Cl. 188-67.000.

Crowell, Douglas H.: See—  
Simmonds, Robert C., Jr.; Crowell, Douglas H.; and Martin, John F., 4,681,650, Cl. 156-378.000.

Crowley, Michael S., to Amoco Corporation. Refractory anchor. 4,680,908, Cl. 52-378.000.

Crueger, Wulf: See—  
Egerer, Peter; Crueger, Wulf; and Golker, Christian, 4,681,843, Cl. 435-41.000.

Crystal, Anthony A.: See—  
Rummel, Raymond W.; and Crystal, Anthony A., 4,680,948, Cl. 68-3.00R.

Cucci, Gerald R.; and Peterson, Thomas P., to Rosemount Inc. Isolating mount for external vibration sensitive sensor. 4,681,293, Cl. 248-603.000.

Cuervo, Armando A. Method and apparatus for therapeutic motion and sound treatment of infants. 4,681,096, Cl. 128-33.000.

Cuiper, Glen H., to Hughes Tool Company. Internal nonrotating tie-back connector. 4,681,166, Cl. 166-345.000.

Culross, Claude C.: See—  
Singhal, Gopal H.; and Culross, Claude C., 4,681,957, Cl. 556-38.000.

Cummins Engine Company, Inc.: See—  
Kubo, Isoroku, 4,681,326, Cl. 277-27.000.

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Currie, Janie K.: See—  
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- Hoffmann, Gerhard; Bauer, Rudolf; Heilmann, Paul; and Schumann, Erwin, 4,682,011, Cl. 219-390.000.
- Degussa Electronics Inc.: See—  
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- Dehem, Paul R.: See—  
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- Dejneka, Tamara: See—  
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- DeSoto, Inc.: See—  
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- Despeyroux, Bertrand: See—  
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- Devoy, James M., to Eastman Kodak Company. Apparatus for producing interleaved copy sheets. 4,681,428, Cl. 355-3.0SH.
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- Dianne Eastman Revocable Trust: See—  
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- Diehl, Volker: See—  
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- Diekmann, Robert L., to Huff Corporation. Apparatus for assembling a bicycle frame. 4,680,849, Cl. 29-252.000.
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- Dieter Grasslin Feinwerktechnik: See—  
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- Dietsche, Thomas J.: See—  
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- Dissosway, Marc A.: See—  
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- Divo, Michael, to Procter & Gamble Company, The. Bleach compositions. 4,681,695, Cl. 252-94.000.
- Djobadze, Michael O.: See—  
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- Dodt, Hans-Walter, to Carl Schenck AG. Test stand for power plants and method. 4,680,975, Cl. 73-862.090.
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- Doi, Nobukazu: See—  
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- Dokiya, Masayuki: See—  
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- Dollison, William W., to Otis Engineering Corporation. Hydraulic control circuit and valve assembly. 4,680,930, Cl. 60-375.000.
- Dominiani, Frank J., Jr.: See—  
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- Doncer, Alex J.: See—  
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- Dornier System GmbH: See—  
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- Dorr-Oliver Inc.: See—  
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- Dosch, Robert G.: See—  
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- Humphreys, Paula L.; and Dietsche, Thomas J., 4,681,945, Cl. 546-345.000.
- Park, Chung P.; and Garcia, Gerald A., 4,681,715, Cl. 264-53.000.
- Whitten, Charles E.; and Pews, R. Garth, 4,681,943, Cl. 546-306.000.
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- Lopes, William J.; and Klosowski, Jerome M., 4,681,714, Cl. 264-46.600.
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- Dowell Schlumberger Incorporated: See—  
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- Dowling, Edward C.: See—  
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- Downs, Kenneth L.: See—  
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- Doyle, Brent R., to Harris Corporation. Circuit design technique to prevent current hogging when minimizing interconnect stripes by paralleling STL or ISL gate inputs. 4,682,057, Cl. 307-459.000.
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- Dresser Industries, Inc.: See—  
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- Drost, Kerry P. Cable driven spa thermostat controller. 4,681,255, Cl. 236-51.000.
- Drugge, Folke N. Apparatus for removing manhole covers and the like. 4,681,300, Cl. 254-131.000.
- Drummond, Todd: See—  
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- Du Corday, Gerard M. Periodical hanging system and apparatus. 4,681,232, Cl. 211-46.000.
- Ducret, Bernard: See—  
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- Dunlop Limited: See—  
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- Dunnebacke, Joachim A., to U.S. Philips Corporation. Fader circuit arrangement in electrical reproducing apparatus and fader control for such an arrangement. 4,682,364, Cl. 381-109.000.
- Du Pont de Nemours, E. I., and Company: See—  
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- Bakermans, Frank C.; and Trezler, Charles J., 4,682,129, Cl. 333-184.000.
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- Rutkiewicz, Andrew F.; and Strolle, Clifford H., 4,681,815, Cl. 428-458.000.
- Webster, Owen W., 4,681,918, Cl. 525-282.000.
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- Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Francoise, to Institut Francais du Petrole. Process for manufacturing inverse microlatices of watersoluble copolymers, the resultant inverse microlatices and their use for improving the production of hydrocarbons. 4,681,912, Cl. 524-827.000.
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- Durston, Thomas W.: See—  
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- Fischer, Nikolaus H. J.; Mathey, Christoph; and Schoffl, Rainer, 4,681,017, Cl. 89-29.000.
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- Dynavac, Inc.: See—  
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- Dynisco, Inc.: See—  
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- E.A.S. Technologies, Inc.: See—  
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- E. R. Squibb & Sons, Inc.: See—  
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 Fujino, Yukio; and Kabaya, Morihiro, to Nishikawa Sangyo Co., Ltd. Bedding incorporating far infrared radiator, 4,680,822, Cl. 5-421.000.  
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 G. Siempelkamp GmbH & Co.: See—  
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- Goi, Hiroshi: See—  
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- Gold, Peter N. Screwdriver, 4,680,996, Cl. 81-456.000.
- Goldberg, Eugene P.: See—  
Sayano, Reizo; and Goldberg, Eugene P., 4,681,585, Cl. 623-6.000.
- Goldenberg, Emanuel; and Douaud, Andre, to Institut Francais du Petrole. Automatic regulating process and device for multifuel internal combustion engines, 4,682,293, Cl. 364-431.050.
- Goldfarb, Jerry; and Klenoff, Bruce. Amphibious personal audio system, 4,682,363, Cl. 381-74.000.
- Goldner, Erwin P. Pipe tapping tool, 4,680,848, Cl. 29-213.00R.
- Golker, Christian: See—  
Egerer, Peter; Cruiger, Wulf; and Golker, Christian, 4,681,843, Cl. 435-41.000.
- Gollan, Arye Z., to A/G Technology Corporation. Anisotropic membranes for gas separation, 4,681,605, Cl. 55-158.000.
- Goller, Ernst: See—  
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- Gollin, Robert: See—  
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- Gomez, I. Luis, to Monsanto Company. Fire-resistant interlayer, 4,681,810, Cl. 428-429.000.
- Gomibuchi, Reizo: See—  
Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, 4,681,820, Cl. 428-698.000.
- Gongwer, Calvin A.: See—  
Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.
- Goodman, John T.: See—  
Graham, Teresita O.; and Goodman, John T., 4,681,698, Cl. 252-182.100.
- Gordon, Eric M.: See—  
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- Gordon, Stephen S., to United States of America, National Aeronautics and Space Administration. Self-clamping arc light reflector for welding torch, 4,682,006, Cl. 219-124.340.
- Gosser, Lawrence W., to Du Pont de Nemours, E. I., and Company. Catalytic process for making H<sub>2</sub>O<sub>2</sub> from hydrogen and oxygen, 4,681,751, Cl. 423-584.000.
- Goto, Hiroshi: See—  
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- Gould Inc.: See—  
Seiger, Harvey N., 4,681,663, Cl. 204-21.000.
- Gourlandi, Albert J. A. Method and apparatus for automatically treating animals, preferably birds, such as young chicks, young guinea-fowls, young turkeys, 4,681,565, Cl. 604-115.000.
- Govind, Rakesh. Dual distillation columns, 4,681,661, Cl. 202-134.000.
- Grabs, Jan W. I.: See—  
Anflo, Kjell S.; and Grabs, Jan W. I., 4,682,178, Cl. 342-202.000.
- Gracey, Howard E.: See—  
Freiberg, Leslie A.; Gracey, Howard E.; and Pernet, Andre G., 4,681,872, Cl. 514-29.000.
- Graco Inc.: See—  
O'Hara, John G.; Powers, Frederick A.; and Peter, Steven E., 4,681,516, Cl. 417-239.000.
- Gradnitzer, Eckhard; and Klauschek, Herwig, to Siemens Aktiengesellschaft. Electrical short-circuit monitoring arrangement for variable-speed, three-phase motors, including their feed lines, 4,682,263, Cl. 361-31.000.
- Graff, Allan H.: See—  
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- Graham, Olin L., to United States of America, National Aeronautics and Space Administration. Method and apparatus for telemetry adaptive bandwidth compression, 4,682,225, Cl. 358-133.000.
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- Grand Slam, Inc.: See—  
Lay, William C., 4,681,318, Cl. 273-26.00R.

- Granger, Douglas A.: See—  
Kersker, Michael M.; Truckner, William G.; Granger, Douglas A.; and Rooy, Elwin L., 4,681,736, Cl. 420-535.000.
- Grannemann, Gerhard: See—  
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- Grassano, Vincent R. Shock-absorbent connector, 4,681,303, Cl. 267-8.00R.
- Grauman, R. J.; Sponagle, G. W.; and Rachuk, T. W. System and method for ice movement detection in determination of ice breakup, 4,680,961, Cl. 73-170.00R.
- Graven, Richard G.; and Zahner, John C., to Mobil Oil Corporation. Fixed bed catalytic reactor system with improved liquid distribution, 4,681,674, Cl. 208-59.000.
- Grech, Leonard, to Catsouras, George, a part interest. Burner control system, 4,681,084, Cl. 126-52.000.
- Greco, Carl C.: See—  
Ayen, Richard J.; Burk, John H.; and Greco, Carl C., 4,681,959, Cl. 556-34.000.
- Green, Douglas H.: See—  
Bocking, Bruce; Cervantes, Joe A., Jr.; Green, Douglas H.; La Sota, Bruce W.; Marshall, David H.; Rodriguez, Bernard; and Van Gorden, Glen, 4,681,175, Cl. 175-393.000.
- Green, Michael J., to BP Chemicals Limited. Transesterification of carboxylic or carbonic esters, 4,681,967, Cl. 558-277.000.
- Green, Robert. Portable work device, 4,681,305, Cl. 269-139.000.
- Griese, Klaus; Mayer, Siegfried; and Weigle, Dieter, to Robert Bosch GmbH. Radial piston pump having sealing disc, 4,681,514, Cl. 417-213.000.
- Griffie, Leslie V.: See—  
Dumas, Theodore A.; and Griffie, Leslie V., 4,682,181, Cl. 343-789.000.
- Griffin, Arnold F.; and Hinchliffe, Warren D., to Norcim Investments Pty. Ltd. Gold Recovery processes, 4,681,628, Cl. 75-118.00R.
- Griffith, Ronald C., to Pennwalt Corporation. 7,8,9,10-tetrahydro-6-oxo-6H-dibenzo(b,d)pyranolxy-propanes, 4,681,954, Cl. 549-280.000.
- Griffith University: See—  
Thiel, David V., 4,682,118, Cl. 329-122.000.
- Grigsby, Robert A., Jr.: See—  
Speranza, George P.; Brennan, Michael E.; and Grigsby, Robert A., Jr., 4,681,965, Cl. 558-162.000.
- Grims, Frank J.: See—  
Stefnik, William S.; and Grims, Frank J., 4,680,902, Cl. 52-126.400.
- Grobler, Jan H. A., to Binteck (PTY) Ltd. Delay starters, 4,681,036, Cl. 102-275.300.
- Groffen, John: See—  
Stephenson, John R.; Groffen, John; and Heisterkamp, Nora, 4,681,840, Cl. 435-6.000.
- Groll, Werner; Schock, Gernot; Hathaway, Doris; and Wagner, Rudolf, to Degussa Aktiengesellschaft. Use of silver-free palladium alloys for firing on dental ceramics, 4,681,735, Cl. 420-464.000.
- Gronlund, Robert L.; and Stewart, John, to Knappe & Vogt Manufacturing Company. Side mounting bracket for drawer slide, 4,681,289, Cl. 248-224.400.
- Groo, Dora: See—  
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- Grotkasten, Klaus, to Fried. Krupp G.m.b.H. Feeding and positioning apparatus for a heating press, 4,681,521, Cl. 425-36.000.
- Grozier, Karl G.; and Oliver, James T., to Boehringer Ingelheim Pharmaceuticals, Inc. Diazine-ethenylphenyl oxamic acids and esters and salts thereof, 4,681,884, Cl. 514-256.000.
- Gruenke, Roger A.: See—  
Bach, David T.; Gruenke, Roger A.; and Levin, Herman W., 4,681,443, Cl. 356-246.000.
- Grushkin, Bernard, to Xerox Corporation. Single component red developer compositions, 4,681,829, Cl. 430-109.000.
- GS-Hydro Oy: See—  
Sundholm, Goran, 4,681,352, Cl. 285-334.100.
- GTE Government Systems Corporation: See—  
Dave, Timothy A.; and Guch, Steve, Jr., 4,682,340, Cl. 372-108.000.
- GTE Laboratories Incorporated: See—  
Sandman, Daniel J.; and Elman, Boris S., 4,681,920, Cl. 525-328.100.
- GTE Products Corp.: See—  
Schulze, Harry G.; and Karam, Ronald E., 4,681,807, Cl. 428-403.000.
- GTE Valeron Corporation: See—  
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- Gueret, Jean-Louis H., to "L'Oreal". Rigid make up compact with a flexible inner shell frame, 4,681,127, Cl. 132-82.00R.
- Guerra, John M.; and Plummer, William T., to Polaroid Corporation. Optical proximity imaging method and apparatus, 4,681,451, Cl. 356-373.000.
- Guevara, Erick: See—  
Hambleton, Thomas P.; Guevara, Erick; and Rychiger, Peter, 4,680,917, Cl. 53-440.000.
- Guidry, John P.; and Gavranovic, Lee Roy C., to Well Improvement Specialists, Inc. Sand control system, 4,681,163, Cl. 166-278.000.
- Guiler, Richard S.: See—  
Brammall, Terrence; and Guiler, Richard S., 4,681,355, Cl. 292-323.000.
- Guillemet, Robert; Ladet, Michel; Laslaz, Gerard; and Le Bars, Claude, to Aluminium Pechiney. Process and apparatus for electrochemical treatment of the surface of metal products of elongate shape, 4,681,665, Cl. 204-14.100.
- Guley, Paul C., to American Home Products Corporation. Rapid releasing triamterene containing gelatin capsule dosage forms for once daily antihypertensive use, 4,681,765, Cl. 424-456.000.
- H. J. Langen & Sons Limited: See—  
Langen, Jacobus J., 4,680,832, Cl. 17-25.000.
- H. Krantz GmbH & Co.: See—  
Cramer, Hans, 4,680,839, Cl. 26-89.000.
- H. Stoll GmbH & Co.: See—  
Muller, Adam; and Goller, Ernst, 4,680,946, Cl. 66-64.000.
- Haag, Horst G.: See—  
Zerpner, Dieter; Streck, Roland; and Haag, Horst G., 4,681,961, Cl. 556-428.000.
- Haardt, Henry; and Magdon, John, to International Hydron Corporation. Tricurve optical metal master mold and method of making, 4,681,295, Cl. 249-135.000.
- Haas, Peter; Weber, Hans-Ulrich; Sommerfeld, Claus-Dieter; Giersig, Manfred; and Wiedermann, Rolf, to Bayer Aktiengesellschaft. Polyester polyols, a process for their production and their use in the isocyanate polyaddition process, 4,681,903, Cl. 521-167.000.
- Hafert, Peter E.; Sutherland, Hugh F., II; Luz, David W.; McDonald, James A.; Waybright, George C.; and Willis, Donald H., to RCA Corporation. Gullwing distortion corrected deflection circuitry for a square-planar picture tube, 4,682,085, Cl. 315-371.000.
- Hagelin, Frank H., to Telefonaktiebolaget LM Ericsson. Method of measuring a DC current or a low-frequency AC current, 4,682,100, Cl. 324-117.00R.
- Hajime Industries Ltd.: See—  
Beurskens, Godefridus P. F., 4,682,220, Cl. 358-106.000.
- Yoshida, Hajime, 4,682,023, Cl. 250-223.00B.
- Hajimoto, Yoshioki: See—  
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- Haku, Hisao: See—  
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- Halbert, Thomas R.; and Stiefel, Edward I., to Exxon Research and Engineering Company. Dithioacid vanadium sulfide dimer compositions, 4,681,958, Cl. 556-42.000.
- Halcour, Kurt: See—  
Ingendoh, Axel; Scheinert, Wolfgang; Becker, Benedikt; Halcour, Kurt; and Stendel, Wilhelm, 4,681,892, Cl. 514-378.000.
- Hale, Alan A., to General Electric Company. Triangular cutting tool insert having cutting edges with recesses, 4,681,486, Cl. 407-114.000.
- Halkey-Roberts Corporation: See—  
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- Hall, Henry B.: See—  
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- Halldorsson, Thorsteinn; and Seiffarth, Ernst A., to Messerschmitt-Bolkow-Blohm GmbH. Laser radiation warning sensor utilizing polarization, 4,682,024, Cl. 250-225.000.
- Halling, Horace P., to Pressure Science Incorporated. V-coupling for installation in narrow annular spaces, 4,681,353, Cl. 285-411.000.
- Halliwel, Michael J.; and Zahavi, Joseph. Laser induced selective electrodeless plating, 4,681,774, Cl. 427-53.100.
- Hallmark Cards, Inc.: See—  
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- Hama, Yasuo; and Takaku, Shigetake, to Hitachi, Ltd. Ultrasonic probe jig, 4,680,969, Cl. 73-661.000.
- Hamada, Mitsuo: See—  
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- Hamaoka, Toshiyuki; Fujiwara, Hiromi; and Kusama, Tsuneo, to Toshiyuki Hamaoka Daiichi Seiyaku Co., Ltd. Muramyl dipeptide active ester derivatives, 4,681,856, Cl. 536-53.000.
- Hambleton, Thomas P.; Guevara, Erick; and Rychiger, Peter, to International Paper Company. Process for providing filled containers, 4,680,917, Cl. 53-440.000.
- Han, Joseph U.: See—  
Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.
- Hanaway, Richard W., to American Hospital Supply Corporation. Reagent dispenser for an analyzing system, 4,681,741, Cl. 422-100.000.
- Hancock, LaVon F. Video tape cassette tool, 4,680,997, Cl. 81-487.000.
- Handy Button Machine Company: See—  
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- Hanes, Ronnie M.: See—  
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- Hann, Michael M.: See—  
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- Hanna, Mark: See—  
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- Hanson, Donald L.: See—  
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- Hansson, Torbjorn: See—  
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- Hanzawa, Koharo: See—  
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- Hanzawa, Shigeru: See—  
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- Hardy, Frederick E.; and Ingram, Barry T., to Procter & Gamble Company, The. Peracid and bleach activator compounds and use thereof in cleaning compositions, 4,681,592, Cl. 8-111.000.
- Hardy, Kenneth J.; and Whitesides, Michael G. Perfusion slit chamber for filter-bound sample analyses, 4,681,853, Cl. 435-288.000.
- Hargett, Wyatt P., Jr.: See—  
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- Hargreaves, Richard E.: See—  
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- Harimaya, Senichi: See—  
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- Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., to General Electric Company. Method for prepolarizing and centering a piezoceramic power switching device, 4,680,840, Cl. 29-25.350.
- Harpell, Gary A.; Paley, Igor; and Prevorsek, Dusan C., to Allied Corporation. Multi-layered flexible fiber-containing articles, 4,681,792, Cl. 428-102.000.
- Harringer, Robert V.; Rada, Robert O.; and Vesely, Edward J., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Method and apparatus for presenting an article to a work station, 4,681,208, Cl. 198-341.000.
- Harris Corporation: See—  
Beckwith, Paul B., Jr.; and Bistarkay, Donald S., 4,682,160, Cl. 340-729.000.
- Doyle, Brent R., 4,682,057, Cl. 307-459.000.
- Elsenpeter, William R., 4,682,345, Cl. 379-1.000.
- Faith, Richard W.; and Durston, Thomas W., 4,682,346, Cl. 379-22.000.
- Garcia, Carlos M., 4,682,059, Cl. 307-496.000.
- Harris, Duane H.: See—  
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- Harris, Eugene G.; and Fayter, Richard G., Jr., to National Distillers and Chemical Corporation. Alkyl substituted 2,3-dihydrofuran fragrance compositions, 4,681,703, Cl. 252-522.00R.
- Harris Graphics Corporation: See—  
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- Harris, James J.; Hostetter, Donald E.; and Achorn, G. Stanley, to National Distillers and Chemical Corporation. Catalyst systems for polymerizations at high temperatures, 4,681,924, Cl. 526-125.000.
- Harris, Ronald R.: See—  
Carter, Neil A.; Harris, Ronald R.; and Ault, Russell L., 4,681,722, Cl. 264-171.000.
- Harris, William H.; Klag, James P.; and Lam, Joseph W., to Thrall Car Manufacturing Company. Lightweight center beam railroad car, 4,681,041, Cl. 105-355.000.
- Harrison, Ray E.: See—  
Murray, Charles R.; and Harrison, Ray E., 4,681,781, Cl. 428-35.000.
- Harrison, William H.; Arakawa, Mitsuaki; and McCarten, Barry M., to University of California, The Regents of the. RF coil coupling for MRI with tuned RF rejection circuit using coax shield choke, 4,682,125, Cl. 333-12.000.
- Harry Major Machine & Tool Co.: See—  
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- Harsch, Herbert: See—  
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- Hart, Charlayan. Personal color analysis method, 4,681,546, Cl. 434-99.000.
- Hartenstein, Johannes: See—  
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- Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Oswald, Hartmut; Weinheimer, Gontar; and Fritsch, Edgar, 4,681,882, Cl. 514-258.000.
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- Hartman, Leo, to Hoogovens Groep B.V. Method for the manufacture of metal packaging cans, and a semi-product in the manufacture of such cans, 4,681,237, Cl. 220-70.000.
- Hartmann & Braun AG: See—  
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- Hartmann, Clinton S.: See—  
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- Hartmann, Horst: See—  
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- Harvey, Raymond A., to Xerox Corporation. Sheet stacker, 4,681,312, Cl. 271-207.000.
- Harvey, Robert D. Method and apparatus for dispensing oil well proppant additive, 4,681,245, Cl. 222-643.000.
- Hasegawa, Akinori: See—  
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- Hasegawa, Junzo; Kawabata, Susumu; and Mimura, Nobuharu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. High-speed spindle, 4,681,492, Cl. 409-231.000.
- Hasegawa, Ryuichi; and Hayashi, Kohji, to Mitsubishi Monsanto Chemical Company. Polyester, 4,681,975, Cl. 560-90.000.
- Hashimoto, Mikio; Nakata, Yoshinari; and Koga, Hitoshi, to Mitsui Petrochemical Industries, Ltd. Composite laminates comprising a metallic substrate and vibration damper, 4,681,816, Cl. 428-463.000.
- Hashimoto, Seiji: See—  
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- Hashimoto, Shingo; Sunaga, Kazuyuki; and Kasugai, Kaoru, to Citizen Watch Co., Ltd. Gimbal spring supported magnetic recording head, 4,682,254, Cl. 360-103.000.
- Hashizume, Kenji: See—  
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- Hassan, Morris, to Chrysler Motors Corporation. Deflection jounce bumper for strut suspension, 4,681,304, Cl. 267-8.00R.
- Hatayama, Fumihiro, to Dainippon Screen Mfg. Co., Ltd. Magnification ratio conversion in image reproduction, 4,682,243, Cl. 358-287.000.
- Hathaway, Doris: See—  
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- Hatmann, Clinton S.: See—  
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- Haugwitz, Rudiger D.; and Sprague, Peter W., to E. R. Squibb & Sons, Inc. Substituted 4-phenoxy or 4-phenylthio prolines, 4,681,886, Cl. 514-259.000.
- Hauni-Werke Korber & Co. KG: See—  
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- Haury, Andre: See—  
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- Hayakawa, Kizo: See—  
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- Hayasaka, Koichi; and Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Downshift timing and engine brake control for automatic transmission, 4,680,992, Cl. 74-869.000.
- Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, to Shionogi & Co., Ltd. Thiazinephosphonic acid derivatives, 4,681,874, Cl. 514-90.000.
- Hayashi, Kazuhiro: See—  
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- Hayashi, Kohji: See—  
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- Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, to Mitsubishi Jukogyo Kabushiki Kaisha; and Churyo Engineering Co., Ltd. Device for extracting water from a load of washed articles, 4,680,874, Cl. 34-143.000.
- Hayashi, Shoichi: See—  
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- Hayashi, Shozo: See—  
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- Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Cooling system for use in cab-over type vehicles, 4,681,179, Cl. 180-68.400.
- Hayduchok, Leon; and Strauss, Leopold, to All-Mark Corporation, Inc. Kit comprising multicolored fluid dispenser markers together with eradicating fluid dispenser, stamps and stamp pad, 4,681,471, Cl. 401-34.000.
- Hayman, Dennis J., to United States Brass Corporation. Tub-shower diverter apparatus, 4,681,140, Cl. 137-597.000.
- Hayward, Robert D., to Gilbert Engineering Company, Inc. Non-radiating coaxial outlet, 4,681,390, Cl. 439-578.000.
- Hazato, Tadahiko: See—  
Kakimoto, Norihiro; Katayama, Takashi; Hazato, Tadahiko; and Ohnishi, Tsutomu, 4,681,960, Cl. 556-83.000.
- Heagerty, Michael S. Drawing guide, 4,680,864, Cl. 33-26.000.
- Heath, Robert B.; and Nagel, Colin M., to Safe-N-Sound Pty. Limited. Child restraint bassinet, 4,681,368, Cl. 297-230.000.
- Hebrank, John H., to Embrex Inc. High speed automated injection system for avian embryos, 4,681,063, Cl. 119-1.000.
- Heckler & Koch GmbH: See—  
Beckmann, Rudi, 4,681,018, Cl. 89-33.040.
- Brandl, Rudolf; and Matt, Heinz, 4,681,019, Cl. 89-33.040.
- Hedden, Jerry C.: See—  
Gaa, Peter C.; Hedden, Jerry C.; and Raghupathi, Narasimhan, 4,681,802, Cl. 428-288.000.
- Hedley, David J.: See—  
David, Morgan W. A.; and Hedley, David J., 4,682,217, Cl. 358-89.000.

- Heeks, John S.: See—  
Corfield, Kenneth G.; and Heeks, John S., 4,682,323, Cl. 370-4.000.
- Heerah, Atma, to U.S. Philips Corporation. Digital video signal processing apparatus for providing zoom and compressive images with soft focus, 4,682,227, Cl. 358-160.000.
- Heidelberger Druckmaschinen AG: See—  
Jeschke, Willi; Kipphan, Helmut; and Löffler, Gerhard, 4,681,455, Cl. 356-445.000.
- Heidinger, Alfred J.; and Duyckinck, Robert W., to Mikropul Corporation. Analytic sieving apparatus, 4,681,676, Cl. 209-380.000.
- Heilmann, Paul: See—  
Hoffmann, Gerhard; Bauer, Rudolf; Heilmann, Paul; and Schumann, Erwin, 4,682,011, Cl. 219-390.000.
- Heindl, Alfons: See—  
Schulte, Rudolf R.; East, Gary P.; and Heindl, Alfons, 4,681,560, Cl. 604-9.000.
- Heine, Helmut A.: See—  
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- Heine Optotechnik GmbH & Co. KG: See—  
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- Heinemann, Otto; and Schmits, Heinz-Herbert, to Krupp Polysius AG. Driving apparatus, 4,681,021, Cl. 91-178.000.
- Heinrich Baumgarten KG: See—  
Baumgarten, Rolf, 4,680,829, Cl. 16-114.00A.
- Heinrich, Charles E.: See—  
Swenson, Paul F., Jr.; and Heinrich, Charles E., 4,681,510, Cl. 415-168.000.
- Heisterkamp, Nora: See—  
Stephenson, John R.; Groffen, John; and Heisterkamp, Nora, 4,681,840, Cl. 435-6.000.
- Heitz, Alfred J.: See—  
Rogers, Leo C.; and Heitz, Alfred J., 4,681,652, Cl. 156-613.000.
- Hella KG Hueck & Co.: See—  
Freudenreich, Erwin; Flerlage, Horst; and Sewing, Karlernst, 4,682,274, Cl. 362-61.000.
- Helland, Randall H.; and Burton, Craig A., to Minnesota Mining and Manufacturing Company. Fluorinated carbon-containing developer composition, 4,681,830, Cl. 430-110.000.
- Hellbach, Hans: See—  
Baur, Karl G.; Diehl, Volker; Stops, Peter; Hellbach, Hans; and Brunner, Erwin, 4,681,946, Cl. 546-317.000.
- Hellman, Nat, III, to Microcomputer Accessories, Inc. Modular cable management system for related electronics equipment, 4,681,378, Cl. 312-108.000.
- Hemmke, Ronald L.; and Spykerman, Scott A., to Prince Corporation. Visor system, 4,681,363, Cl. 296-97.00G.
- Hendrix, James L.; and Braun, Leroy O., to Hughes Aircraft Company. Q-switched laser resonator of integral construction, 4,682,336, Cl. 372-10.000.
- Henkell & Co.: See—  
Weiss, Manfred, 4,681,767, Cl. 426-14.000.
- Henry, Kenneth J.; and Kotwicki, Allan J., to General Motors Corporation. Emulation system for a motor vehicle drivetrain, 4,680,959, Cl. 73-117.000.
- Henschen, Agnes: See—  
Teschemacher, Hansjorg; Brantl, Victor; Henschen, Agnes; and Lottspeich, Friedrich, 4,681,871, Cl. 514-15.000.
- Hensens, Otto D.: See—  
Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., 4,681,846, Cl. 435-124.000.
- Herbert, John M. Apparatus for preparing frozen drinks, 4,681,030, Cl. 99-484.000.
- Herges, Peter: See—  
Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, 4,681,185, Cl. 180-247.000.
- Herman, Thomas: See—  
Lidow, Alexander; and Herman, Thomas, 4,680,853, Cl. 29-571.000.
- Hernandez, Kenneth J., to Manville Corporation. Wrap-around carrier with improved handle, 4,681,217, Cl. 206-141.000.
- Herron, Marie. Cervical exam teaching method, 4,681,547, Cl. 434-273.000.
- Hershel, Ronald S. Condenser system, 4,681,414, Cl. 353-102.000.
- Hewitt, Steven W.: See—  
Simkins, Philip P., 4,681,216, Cl. 206-45.130.
- Hewlett Packard Company: See—  
Davidson, Robert J., 4,681,447, Cl. 356-351.000.
- Goel, Atul; Bartlett, Keith G.; and Trutna, W. R., 4,681,430, Cl. 355-77.000.
- Johnson, Samuel A., 4,680,859, Cl. 29-611.000.
- Quan, Ronald, 4,682,015, Cl. 235-472.000.
- Sieger, Roger R.; and Walsh, Edward, 4,682,255, Cl. 360-106.000.
- Heys, George, Jr.; Aleshire, Rex A.; Hines, Frank; and Belknap, William M., to NCR Corporation. System for selectively coupling a plurality of stations into a single communications path, 4,682,325, Cl. 370-85.000.
- Hibi, Takuo: See—  
Araki, Masashi; and Hibi, Takuo, 4,681,979, Cl. 585-640.000.
- Hickling, Colin D., to Trig, Inc. Dynamically optimized thermostat (dot) with tunable bimetal element, 4,682,141, Cl. 337-379.000.
- Hicks, John W., Jr., to Polaroid Corporation. Stressed core optical fiber and method, 4,681,399, Cl. 350-96.300.
- Hidaka, Hidemasa: See—  
Adachi, Takashi; and Hidaka, Hidemasa, 4,681,771, Cl. 426-658.000.
- Hieronymi, Richard: See—  
Briner, Emil; and Hieronymi, Richard, 4,680,924, Cl. 57-263.000.
- High Brandon Incorporated: See—  
Shu, Brandon, 4,681,083, Cl. 126-9.00R.
- Highstreet, Edward J.: See—  
Stannard, Forrest B.; and Highstreet, Edward J., 4,681,689, Cl. 210-784.000.
- Hildebrandt, Edmund. Top and board therefor, 4,681,320, Cl. 273-109.000.
- Hill, Charles E.; Hill, Edwin L.; and Hill, Ernest W., to PJH, Inc. Underwater dredging apparatus and cutter head therefor, 4,680,879, Cl. 37-67.000.
- Hill, Edwin L.: See—  
Hill, Charles E.; Hill, Edwin L.; and Hill, Ernest W., 4,680,879, Cl. 37-67.000.
- Hill, Ernest W.: See—  
Hill, Charles E.; Hill, Edwin L.; and Hill, Ernest W., 4,680,879, Cl. 37-67.000.
- Hillman, Tom V. Holder for bicycle chains, 4,681,557, Cl. 474-119.000.
- Hilti Aktiengesellschaft: See—  
Müllauer, Wolfgang; and Raab, Dieter, 4,681,489, Cl. 408-1.00R.
- Vollmer, Helmut; Kousek, Heinz; and Maier, Elmar, 4,681,493, Cl. 411-8.000.
- Himmetsberger, Alois; Pavlovec, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, to TMC Corporation. Ski binding part, in particular a front jaw, 4,681,339, Cl. 280-633.000.
- Hinchliffe, Warren D.: See—  
Griffin, Arnold F.; and Hinchliffe, Warren D., 4,681,628, Cl. 75-118.00R.
- Hinck, Karl-Heinz, to Starcosa GmbH. Process for treating and converting of iso-glucose sirup, 4,681,639, Cl. 127-30.000.
- Hines, Frank: See—  
Heys, George, Jr.; Aleshire, Rex A.; Hines, Frank; and Belknap, William M., 4,682,325, Cl. 370-85.000.
- Hinn, Werner, to RCA Corporation. Video output signal clamping circuit, 4,682,233, Cl. 358-173.000.
- Hino, Kuniaki: See—  
Endo, Hiroshi; Katoh, Masao; and Hino, Kuniaki, 4,681,764, Cl. 424-125.000.
- Hinzmann, Alfred; Preisner, Peter; and Presser, Erich, to Hauni-Werke Korber & Co. KG. Apparatus for manipulating particles of tobacco or filter material, 4,681,124, Cl. 131-109.100.
- Hirama, Shigemitsu; Aida, Satoru; and Soyama, Hideo. Article delivery transferring device in a collective packing machine, 4,680,919, Cl. 53-499.000.
- Hirano, Kenichiro: See—  
Inoue, Masayoshi; Hirano, Kenichiro; and Tanihata, Ryoichi, 4,682,353, Cl. 379-163.000.
- Hirata, Tsutomu: See—  
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- Hirono, Tatsuo: See—  
Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsuo; Yoshino, Hirobumi; and Shibusawa, Mitsuo, 4,682,158, Cl. 340-679.000.
- Hiros, Laszlo; Banati, Gabor; and Lipscher, Ervin, to Medicor Mueyk. Isolator for vehicles, 4,682,265, Cl. 361-231.000.
- Hirose Elec. Co., Ltd.: See—  
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.
- Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.
- Hirota, Akira, to Victor Company of Japan, Ltd. Apparatus for recording a video signal sampled at frequency  $f_s$  and reproducing the video signal as a signal essentially sampled at frequency  $2f_s$ , 4,682,250, Cl. 360-33.100.
- Hirota, Akira; and Tushima, Takuya, to Victor Company of Japan, Ltd. Video signal reproducing apparatus having a noise reduction circuit, 4,682,251, Cl. 360-33.100.
- Hirsch, Gerald B.; Volk, Stanley; Cirrito, William; and Brann, Dale, to Solarcraft, Inc. Solar powered headwear fan, 4,680,815, Cl. 2-171.300.
- Hisamoto, Iwao; and Yamana, Masayuki, to Daikin Industries Ltd. Fluorine-containing polymer, 4,681,974, Cl. 560-87.000.
- Hitachi Keio Engineering Co., Ltd.: See—  
Watanabe, Kenichi, 4,681,452, Cl. 356-375.000.
- Hitachi, Ltd.: See—  
Hama, Yasuo; and Takaku, Shigetake, 4,680,969, Cl. 73-661.000.
- Kobayashi, Haruhiko; and Otani, Tadahiko, 4,681,077, Cl. 123-489.000.
- Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.
- Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.
- Nakagaki, Harushige; Iso, Yoshimi; and Inoue, Shigeki, 4,682,314, Cl. 369-44.000.
- Nishijima, Hideo; Ito, Takayasu; and Fukushima, Isao, 4,682,096, Cl. 318-808.000.



- OGAWA, Soichiro; and Watanabe, Yoshio, 4,682,080, Cl. 315-209.00R.
- Okamoto, Hiroo; Arai, Takao; and Hoshino, Takashi, 4,682,152, Cl. 340-347.0DD.
- Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, 4,682,332, Cl. 371-38.000.
- Orita, Miyahiko; Kobayashi, Yoshiki; and Mishima, Tadaaki, 4,682,365, Cl. 382-14.000.
- Sakurada, Shuroku; and Ikeda, Yasuhiko, 4,682,198, Cl. 357-38.000.
- Sakurai, Akio; and Kato, Ryoichi, 4,681,726, Cl. 376-171.000.
- Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotsuka, 4,682,300, Cl. 364-371.000.
- Tomita, Yoshifumi, 4,681,824, Cl. 430-24.000.
- Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, 4,682,200, Cl. 357-41.000.
- Watanabe, Kenichi, 4,681,452, Cl. 356-375.000.
- Yatsuo, Tsutomu; Momma, Naohiro; Naito, Masayoshi; and Okamura, Masahiro, 4,682,199, Cl. 357-38.000.
- Hitachi Medical Corp.: See—
- Horiba, Isao; and Ishikawa, Ken, 4,682,301, Cl. 364-724.000.
- Hitachi Metals, Ltd.: See—
- Yamada, Hirohide; Sakakibara, Masahiko; and Koike, Yoshiharu, 4,681,813, Cl. 428-450.000.
- Hitachi Seiki Co., Ltd.: See—
- Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atsusi; and Shirotori, Hidefumi, 4,680,999, Cl. 82-36.00B.
- Hitzman, Donald O.: See—
- Fruthaler, Katherine J.; Hopkins, Thomas R.; Hitzman, Donald O.; Kubicek, Donald H.; and Kallenbach, Lyle R., 4,681,758, Cl. 424-78.000.
- Ho, Vu Q.; Nentwich, Heinz J.; and Naquib, Hussein M., to Northern Telecom Limited. Forming low resistivity hillock free conductors in VLSI devices, 4,680,854, Cl. 29-576.00B.
- Hodkin, George A.; and Blane, Roger H., to Associated Electrical Industries Limited. Switch selector mechanism, 4,681,988, Cl. 200-17.00R.
- Hoeberechts, Arthur M. E.; and van Gorkom, Gerardus G. P., to U.S. Philips Corporation. Electron-beam device and semiconductor device for use in such an electron-beam device, 4,682,074, Cl. 313-444.000.
- Hoechst Aktiengesellschaft: See—
- Frank, Werner; and Brahm, Richard, 4,681,827, Cl. 430-83.000.
- Obermeier, Rainer; Salomon, Ingeborg; and Ludwig, Jürgen, 4,681,931, Cl. 530-351.000.
- Hoechst-Roussel Pharmaceuticals Inc.: See—
- Eftland, Richard C.; Davis, Larry; and Kapples, Kevin J., 4,681,879, Cl. 514-211.000.
- Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, to Daimler-Benz Aktiengesellschaft. Apparatus for the automatic engagement and disengagement of drive elements of a motor vehicle, 4,681,185, Cl. 180-247.000.
- Hoffman, John P., to Caterpillar Inc. Position to duty cycle conversion apparatus and method, 4,682,151, Cl. 340-347.0SY.
- Hoffman-La Roche Inc.: See—
- Mergens, William J.; Newmark, Harold L.; Sheth, Prabhakar R.; and Tossounian, Jacques L., 4,681,756, Cl. 424-451.000.
- Hoffmann, Dieter; and Trumper, Reinhard, to O & K Orenstein & Koppel AG. Displaceable inclined hoist, 4,681,205, Cl. 198-307.100.
- Hoffmann, Gerhard; Bauer, Rudolf; Heilmann, Paul; and Schumann, Erwin, to Degussa Aktiengesellschaft. Furnace for the partial heat treatment of work tools, 4,682,011, Cl. 219-390.000.
- Hoffmann-La Roche Inc.: See—
- Holland, George W.; Maag, Hans; and Rosen, Perry, 4,681,962, Cl. 556-441.000.
- Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,681,930, Cl. 530-351.000.
- Hoffmeister, Dietrich, to Carl-Zeiss-Stiftung. Cooling chamber for processing specimens for microscopic and electron-microscopic investigations, 4,680,945, Cl. 62-514.00R.
- Hofmann, Manfred; Muller, Hans; and Waldecker, Ralf, to Metzeler Kautschuk GmbH. Two chamber engine mount with hydraulic damping, 4,681,306, Cl. 267-140.100.
- Hogan, Timothy. Power tool device, 4,680,831, Cl. 17-23.000.
- Hohki, Tetsuo; Sano, Tetsuo; Kodama, Eiji; and Tsujinaka, Hisayuki, to Dainippon Screen Mfg. Co., Ltd. Image pickup apparatus for a printed wiring board, 4,682,040, Cl. 250-571.000.
- Holecck, Allen R.: See—
- Breitenstein, Charles T.; and Holecck, Allen R., 4,680,896, Cl. 51-215.0UE.
- Holladay, Wilfred E. Book holder, 4,681,291, Cl. 248-444.100.
- Holland Colours Apeldoorn B.V.: See—
- Bes, Richard F. T.; and Knol, Jan D., 4,681,632, Cl. 106-19.000.
- Holland, George W.; Maag, Hans; and Rosen, Perry, to Hoffmann-La Roche Inc. Novel 7-fluoro-dihydro PGI compounds, 4,681,962, Cl. 556-441.000.
- Hollander, James M. Defogging and deicing shield structure, 4,682,007, Cl. 219-211.000.
- Holle, Bernd: See—
- Rademachers, Jakob; Turban, Karlheinz; Franz, Gerhard; Fuhr, Werner; and Holle, Bernd, 4,681,637, Cl. 106-304.000.
- Holle, Eerke: See—
- Seevinck, Evert; Wassenaar, Roelof F.; and Holle, Eerke, 4,682,098, Cl. 323-315.000.
- Hollister Incorporated: See—
- Tokarz, Joseph S.; and Jensen, Marvin E., 4,681,572, Cl. 604-329.000.
- Holloman, Charles J., to Trans-Lux Corporation. Electronic display unit, 4,682,162, Cl. 340-799.000.
- Holmes, Arthur S.: See—
- O'Brien, John V.; Holmes, Arthur S.; and Hopewell, Richard B., 4,681,612, Cl. 62-23.000.
- Holscher, Uvo, to Drägerwerk Aktiengesellschaft. Electrochemical measuring cell having an ancillary electrode, 4,681,115, Cl. 128-635.000.
- Holt, Brian: See—
- Richardson, Norman; Holt, Brian; and Cook, Barry, 4,681,686, Cl. 210-699.000.
- Holt, Gary E.; Siehling, Mark B.; and Van Antwerp, Stanley R., to Conrac Corporation. Welding transformer and rectifier assembly, 4,682,000, Cl. 219-116.000.
- Holtman, Dennis C.: See—
- Stern, Beth A.; and Holtman, Dennis C., 4,681,577, Cl. 604-378.000.
- Home, William. Automatic electronic ignition system, 4,681,529, Cl. 431-74.000.
- Homma, Koichi: See—
- Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotsuka, 4,682,300, Cl. 364-371.000.
- Honzarenko, Art, to Progressive Machine Co., Inc. Traversing mechanism control, 4,681,275, Cl. 242-67.10R.
- Honda Giken Kogyo Kabushiki Kaisha: See—
- Anno, Nobuo; and Arai, Takeo, 4,681,068, Cl. 123-41.860.
- Kurihara, Norimitsu; Ozaki, Masaaki; Goto, Hiroshi; and Asakura, Masahiko, 4,681,070, Cl. 123-179.00H.
- Nishikawa, Masao; and Aoki, Takashi, 4,680,928, Cl. 60-329.000.
- Noguchi, Kunio; Totsune, Atsushi; Kajita, Koji; and Hosaka, Takefumi, 4,681,078, Cl. 123-490.000.
- Shimizu, Yasuo, 4,681,181, Cl. 180-79.100.
- Yamato, Akihiro; Koike, Yuzuru; and Futa, Kyoze, 4,681,075, Cl. 123-339.000.
- Honda, Susumu: See—
- Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,681,930, Cl. 530-351.000.
- Honeywell Inc.: See—
- Donovan, William J., 4,682,061, Cl. 307-571.000.
- Johnson, James S.; and Albrecht, Gene A., 4,680,866, Cl. 33-356.000.
- Schuetz, James A., 4,681,812, Cl. 428-432.000.
- Honma, Masayuki, to Nissan Motor Co., Ltd. Overhead camshaft engine, 4,681,069, Cl. 123-90.270.
- Hood, Larry L.; and Imonti, Maurice M., to CooperVision, Inc. Ultrasonic decoupling sleeve, 4,681,561, Cl. 604-22.000.
- Hoodless, Adrian H. W.: See—
- Mallinson, Andrew M.; and Hoodless, Adrian H. W., 4,682,086, Cl. 315-371.000.
- Hoogovens Groep B.V.: See—
- Hartman, Leo, 4,681,237, Cl. 220-70.000.
- Hooke, Anne M.: See—
- Oeschger, Max P.; Hooke, Anne M.; and Bellanti, Joseph A., 4,681,762, Cl. 424-92.000.
- Hooven, Michael D., to Cordis Corporation. Plural valve three stage pressure relief system, 4,681,559, Cl. 604-9.000.
- Hopewell, Richard B.: See—
- O'Brien, John V.; Holmes, Arthur S.; and Hopewell, Richard B., 4,681,612, Cl. 62-23.000.
- Hopkins, Thomas R.: See—
- Fruthaler, Katherine J.; Hopkins, Thomas R.; Hitzman, Donald O.; Kubicek, Donald H.; and Kallenbach, Lyle R., 4,681,758, Cl. 424-78.000.
- Horgan, William J., Jr., to Blumcraft of Pittsburgh. Door shoe assembly, 4,680,903, Cl. 52-127.800.
- Hori, Ryuzou: See—
- Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.
- Horiba, Isao; and Ishikawa, Ken, to Hitachi Medical Corp. Digital filter for processing two-dimensional digital images, 4,682,301, Cl. 364-724.000.
- Horie, Naoki: See—
- Ando, Noriyoshi; Mikuni, Hajime; Matsunaga, Mitsuru; Horie, Naoki; and Kishigami, Tomohisa, 4,682,228, Cl. 358-161.000.
- Horikoshi, Koki: See—
- Shibanai, Ichiro; Horikoshi, Koki; and Kato, Takashi, 4,681,934, Cl. 536-46.000.
- Horikoshi, Yukio: See—
- Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,681,519, Cl. 418-152.000.
- Horizon Exploration Limited: See—
- Newman, Paul, 4,682,307, Cl. 367-21.000.
- Horn-Plastik Theodor Horn KG: See—
- Horn, Stephanie, 4,681,785, Cl. 428-43.000.
- Horn, Stephanie, to Horn-Plastik Theodor Horn KG. Supply roll for protective covers especially those made out of sheet plastic, for motor-vehicle seats, 4,681,785, Cl. 428-43.000.
- Horning, Sheng-Chong. Sport shoe lacing device, 4,680,835, Cl. 24-117.000.
- Horodysky, Andrew G., to Mobil Oil Corporation. Multifunctional lubricant/fuel additives and compositions thereof, 4,681,692, Cl. 252-32.500.

- Horrobin, David F., to Efamol Limited. Pharmaceutical and dietary composition, 4,681,896, Cl. 514-552.000.
- Horvath, Barbara L.: See—
- Horvath, Ronald F.; and Horvath, Barbara L., 4,681,144, Cl. 141-1.000.
- Horvath, Ronald F.; and Horvath, Barbara L. Automatic fueling apparatus and method, 4,681,144, Cl. 141-1.000.
- Hosaka, Takefumi: See—
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- Hoshino Gakki Co., Ltd.: See—
- Hoshino, Masao, deceased; and Hoshino, Yoshihiro, legal representative, 4,681,011, Cl. 84-313.000.
- Hoshino, Masao, deceased; and by Hoshino, Yoshihiro, legal representative, to Hoshino Gakki Co., Ltd. Tremolo arm mounting for stringed instrument, 4,681,011, Cl. 84-313.000.
- Hoshino, Takashi: See—
- Okamoto, Hiroo; Arai, Takao; and Hoshino, Takashi, 4,682,152, Cl. 340-347.0DD.
- Hoshino, Yoshihiro, legal representative: See—
- Hoshino, Masao, deceased; and Hoshino, Yoshihiro, legal representative, 4,681,011, Cl. 84-313.000.
- Hosoi, Hiroomi: See—
- Nomura, Masaharu; Tsugawa, Hiroaki; Ishizaka, Yukio; and Hosoi, Hiroomi, 4,682,192, Cl. 503-200.000.
- Hospers, Martin: See—
- Olofsson, Lars; and Hospers, Martin, 4,681,241, Cl. 221-124.000.
- Hostetler, Donald E.: See—
- Harris, James J.; Hostetler, Donald E.; and Achorn, G. Stanley, 4,681,924, Cl. 526-125.000.
- Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadatsuka; and Takeuchi, Nobuo, to Mazda Motor Corporation. Engine idling load control means, 4,682,044, Cl. 290-40.000.
- Houlit, Robert A.; and Ragusa, Robert P., to Perkin-Elmer Corporation. The detector preamplifier for use with a MCT detector, 4,682,022, Cl. 250-214.00A.
- Howard Smith Screen Company: See—
- Arterbury, Bryant A.; and Spangler, James E., 4,681,161, Cl. 166-227.000.
- Howe, Dwayne E.: See—
- Furlong, James J.; and Howe, Dwayne E., 4,682,272, Cl. 361-437.000.
- Howeth, D. Franklin. Top loading and inverted backflushed air filter systems, 4,681,609, Cl. 55-302.000.
- Hruska, Arturo. Apparatus for welding dental elements, 4,681,999, Cl. 219-111.000.
- Hsien-Yang, Chang. Toy device which can be opened and positioned at any desired angle, 4,681,554, Cl. 446-231.000.
- Hsu, Ed C.; and Temple, Chester S., to PPG Industries, Inc. Treated glass fibers and nonwoven sheet-like mat and method, 4,681,658, Cl. 162-156.000.
- Htun, Myat: See—
- Fellers, Christer; Htun, Myat; and Hansson, Torbjorn, 4,680,873, Cl. 34-116.000.
- Huang, Peter H., to United States of America, Commerce. Humidity sensing and measurement employing halogenated organic polymer membranes, 4,681,855, Cl. 436-39.000.
- Huber, Alois: See—
- Aarts, Petrus J. J.; and Huber, Alois, 4,681,281, Cl. 242-200.000.
- Huber, Bernhard, to Perkin-Elmer Corporation. The gas control device for controlling the fuel gas and oxidizing agent supply to a burner in an atomic absorption spectrometer, 4,681,530, Cl. 431-89.000.
- Huels Aktiengesellschaft: See—
- Zerpner, Dieter; Streck, Roland; and Haag, Horst G., 4,681,961, Cl. 556-428.000.
- Huff, John: See—
- Zurilla, Ronald W.; and Huff, John, 4,681,641, Cl. 148-6.15Z.
- Huffy Corporation: See—
- Diekmann, Robert L., 4,680,849, Cl. 29-252.000.
- Huffman, Marie C.; and Huffman, Norman C. Level with dual pointers, 4,680,867, Cl. 33-391.000.
- Huffman, Norman C.: See—
- Huffman, Marie C.; and Huffman, Norman C., 4,680,867, Cl. 33-391.000.
- Hugele, Benoit, to Hutchinson S.A. Safety device and tire construction for vehicles or other contrivances, 4,681,147, Cl. 152-158.000.
- Hughes Aircraft Company: See—
- Hendrix, James L.; and Braun, Leroy O., 4,682,336, Cl. 372-10.000.
- Larson, Lawrence E., 4,682,149, Cl. 340-347.0DA.
- Oldham, Susan L., 4,681,718, Cl. 264-102.000.
- Hughes, Houston H., III: See—
- Childress, Jeffery S.; Dissosway, Marc A.; and Hughes, Houston H., III, 4,682,367, Cl. 455-17.000.
- Hughes, John L., to Hughes Technology PTY LTD. Composite laser oscillator, 4,682,335, Cl. 372-6.000.
- Hughes, John L.: See—
- Ching, Neng H.; Marson, Ralph G.; Norman, Michael J.; and Hughes, John L., 4,681,436, Cl. 356-121.000.
- Hughes, Simon H. C., to Kabushiki Kaisha Toshiba. Magnetic resonance imaging magnet, 4,682,111, Cl. 324-320.000.
- Hughes Technology PTY LTD: See—
- Hughes, John L., 4,682,335, Cl. 372-6.000.
- Hughes Tool Company: See—
- Crowe, William E., 4,681,193, Cl. 188-67.000.
- Cuiper, Glen H., 4,681,166, Cl. 166-345.000.
- Huls Aktiengesellschaft: See—
- Scharf, Helmut; and Kriz, Wilfried, 4,681,046, Cl. 110-346.000.
- Hummel, Karl, to Interlava AG. Vacuum cleaner, 4,680,827, Cl. 15-319.000.
- Humphreys, Paula L.; and Dietsche, Thomas J., to Dow Chemical Company. The preparation of symmetrical tetrachloropyridine from chlorinated  $\beta$ -(trichloromethyl) pyridines employing a catalyst, 4,681,945, Cl. 546-345.000.
- Hung, Peter; and De Luca, Paul V., to Porta Systems Corp. Resilient sealing device for telephone subscriber terminals, 4,681,383, Cl. 439-135.000.
- Hunsucker, William A. Roll restraint of anchored vessel, 4,681,059, Cl. 114-293.000.
- Hunt, Charles D'A., to Degussa Electronics Inc. Ingot produced by a continuous casting method, 4,681,787, Cl. 428-577.000.
- Hunt, Paul D.: See—
- Rice, Mark S.; and Hunt, Paul D., 4,681,054, Cl. 114-124.000.
- Hunter Engineering Company, Inc.: See—
- Flowers, John E.; Romanowski, Christopher A.; and Smith, Dennis M., 4,681,152, Cl. 164-477.000.
- Hupka, Gyorgy: See—
- Nagy, Zoltan; Hupka, Gyorgy; Szalay, Otto; and Kovacs, Attila, 4,681,531, Cl. 431-181.000.
- Huse, Richard: See—
- Ahmad, Anees; and Huse, Richard, 4,681,408, Cl. 350-609.000.
- Huston, Jon: See—
- Leisman, Thomas; and Huston, Jon, 4,681,186, Cl. 182-47.000.
- Huszcuk, Andrew R., to Research and Education Institute, Inc. Harbor-UCLA Medical Center. Respiratory analyzer calibration apparatus with controlled respiratory gas exchange simulation, 4,680,956, Cl. 73-1.00G.
- Hutchinson S.A.: See—
- Hugele, Benoit, 4,681,147, Cl. 152-158.000.
- Huynh, Anh N.; and Ziogas, Phoivos D., to National Distillers and Chemical Corporation. Ozonator power supply employing a current source inverter, 4,682,266, Cl. 361-235.000.
- Huzinec, Robert J.; and Graff, Allan H., to Warner-Lambert Company. Coatings for chewing gums containing gum arabic and a soluble calcium salt, 4,681,766, Cl. 426-5.000.
- Hwang, Bao-Tai; Orr-Arienza, Wendy A.; and Glang, Reinhard, to International Business Machines Corporation. Preferential chemical etch for doped silicon, 4,681,657, Cl. 156-657.000.
- Hwo, Charles C., to Shell Oil Company. Polybutylene room temperature aged film, 4,681,804, Cl. 428-349.000.
- Hydes, Paul C.: See—
- Picker, Donald H.; and Hydes, Paul C., 4,681,091, Cl. 128-1.00R.
- Hydril Company: See—
- Weston, Harry, 4,681,133, Cl. 137-315.000.
- Hydronautics, Incorporated: See—
- Johnson, Virgil E., Jr., 4,681,264, Cl. 239-589.100.
- Hyodo, Masakatsu; and Yagi, Isaburo, to Ashimori Industry Co., Ltd. Tubular lining material for pipe lines, 4,681,783, Cl. 428-36.000.
- Ichihara, Takeo; Yamanaka, Yukio; and Tsurumaru, Akihiko, to Stanley Electric Co., Ltd. Headlamp for vehicle, 4,682,072, Cl. 313-115.000.
- Ichikawa, Yoshio; and Yamada, Kazumori, to NEC Corporation. Display pager having memory overflow indication and concurrent message display functions, 4,682,148, Cl. 340-311.100.
- Ichikoh Industries, Ltd.: See—
- Enomoto, Masao, 4,681,409, Cl. 350-637.000.
- Ichimori, Yuzo: See—
- Tsukamoto, Kyoze; Ichimori, Yuzo; and Wakimasu, Mitsuhiro, 4,681,848, Cl. 435-240.000.
- Ichinari, Mitsuhiro: See—
- Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, 4,681,874, Cl. 514-90.000.
- Igarashi, Yosuke, to Kabushiki Kaisha Toshiba. Information reading device with driver circuitry separate from sensor board, 4,682,042, Cl. 250-578.000.
- Iha, Yukihiro: See—
- Umemura, Toshikazu; Masumoto, Isamu; and Iha, Yukihiro, 4,681,927, Cl. 528-232.000.
- Ihara, Keisuke: See—
- Alaki, Yasuhide; Ohtake, Masayuki; and Ihara, Keisuke, 4,681,323, Cl. 273-232.000.
- Iizuka, Tetsuya: See—
- Sakurai, Takayasu; and Iizuka, Tetsuya, 4,682,306, Cl. 365-222.000.
- Ikeda, Kazushige: See—
- Mouri, Akihiko; and Ikeda, Kazushige, 4,680,929, Cl. 60-368.000.
- Ikeda, Shigeru; and Okamura, Naomi, to Cemedine Co., Ltd. Extrusion device, 4,681,524, Cl. 425-376.00R.
- Ikeda, Yasuhiko: See—
- Sakurada, Shuroku; and Ikeda, Yasuhiko, 4,682,198, Cl. 357-38.000.
- Ikeda, Yoshiaki; and Kuwasawa, Mitsuru, to Fanuc Ltd. Data transfer system for numerically controlled equipment, 4,682,167, Cl. 340-825.230.
- Ikeda, Yoshinori, to Canon Kabushiki Kaisha. Image processing apparatus for combining image and character data, 4,682,190, Cl. 346-154.000.
- Ikejima, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. Speed control apparatus for elevator, 4,681,191, Cl. 187-119.000.
- Ikemura, Yuichi; and Takano, Hiroshi, to Victor Company of Japan, Ltd. Automatic white balance adjusting circuit for image pickup device, 4,682,210, Cl. 358-29.000.
- Ilk, Emil. Drinking glass having a press-molded stem and a base (or pedestal), 4,681,236, Cl. 215-99.500.



- Imataki, Hiroyuki: See—  
Nakatsui, Hisashi; Imataki, Hiroyuki; and Hajimoto, Yoshiaki, 4,682,019, Cl. 250-211.00R.
- Imberge, Paul-Robert: See—  
Ghyzcy, Miklos; Imberge, Paul-Robert; and Wendel, Armin, 4,681,617, Cl. 71-86.000.
- Imonti, Maurice M.: See—  
Hood, Larry L.; and Imonti, Maurice M., 4,681,561, Cl. 604-22.000.
- Imperial Chemical Industries PLC: See—  
Pinto, Alwyn, 4,681,745, Cl. 423-359.000.
- Williams, John; and Robson, Michael J., 4,681,969, Cl. 558-407.000.
- IMRE Corporation: See—  
Balint, Joseph P., Jr.; and Hargreaves, Richard E., 4,681,870, Cl. 502-403.000.
- In-Situ, Inc.: See—  
Wainwright, H. Kent, 4,682,156, Cl. 340-603.000.
- Inaba, Yoshihiro: See—  
Maehashi, Tatsuichi; Abe, Takao; Koshizuka, Kunihiro; and Inaba, Yoshihiro, 4,681,796, Cl. 428-212.000.
- Inagaki, Hazime: See—  
Tabata, Osamu; Inagaki, Hazime; and Kitano, Tomoyuki, 4,680,963, Cl. 73-204.000.
- Inagaki, Hiroshi: See—  
Shibahashi, Yutaka; Nakasui, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.
- Inagaki, Yoshio: See—  
Inoue, Nobuaki; Inagaki, Yoshio; and Kameoka, Kimitaka, 4,681,836, Cl. 430-434.000.
- Inazawa, Yoshizumi: See—  
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- Incardona, Angelo: See—  
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,681,499, Cl. 411-307.000.
- Industrial Research Development, Inc.: See—  
Stewart, Victor M., 4,680,909, Cl. 52-409.000.
- Ing. C. Olivetti & C., S.p.A.: See—  
Castellano, Pietro, 4,682,188, Cl. 346-140.00R.
- Ingels, Luis: See—  
White, Larry; and Ingels, Luis, 4,680,825, Cl. 15-105.000.
- Ingendoh, Axel; Scheinert, Wolfgang; Becker, Benedikt; Halcour, Kurt; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Isoxazolidine insecticides and fungicides, 4,681,892, Cl. 514-378.000.
- Ingram, Alvin R., to Atlantic Richfield Company. Anti-static styrene polymer particles by impregnation, 4,681,779, Cl. 427-222.000.
- Ingram, Barry T.: See—  
Hardy, Frederick E.; and Ingram, Barry T., 4,681,592, Cl. 8-111.000.
- Innovative Controls, Incorporated: See—  
Kuhnel, Donald S.; and Ottenstein, Sidney A., 4,682,084, Cl. 315-307.000.
- Inoue, Masayoshi; Hirano, Kenichiro; and Tanihata, Ryoichi, to NEC Corporation. Key telephone system, 4,682,353, Cl. 379-163.000.
- Inoue, Michiya; Obara, Haruki; and Izumiya, Shunzo, to Fanuc Ltd. Wire-cut, electric discharge machining power supply unit, 4,681,997, Cl. 219-69.00C.
- Inoue, Nobuaki; Inagaki, Yoshio; and Kameoka, Kimitaka, to Fuji Photo Film Co., Ltd. Silver halide photographic material and method for forming high contrast negative image using the same, 4,681,836, Cl. 430-434.000.
- Inoue, Shigeki: See—  
Nakagaki, Harushige; Iso, Yoshimi; and Inoue, Shigeki, 4,682,314, Cl. 369-44.000.
- Inoue, Shosaku: See—  
Goto, Shigeru; Asano, Masaru; Ishida, Matsuhiko; and Inoue, Shosaku, 4,681,207, Cl. 198-333.000.
- Inoue, Toshiyuki, to Nishin Kohki Co., Ltd. Pen-type bar code reader, 4,682,016, Cl. 235-462.000.
- Institut Francais du Pétrole: See—  
Dedole, Pascal; and Laurent, Jean, 4,682,309, Cl. 367-146.000.
- Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Françoise, 4,681,912, Cl. 524-827.000.
- Goldenberg, Emanuel; and Douaud, Andre, 4,682,293, Cl. 364-431.050.
- Rojey, Alexandre; and Ramet, Claude, 4,680,939, Cl. 62-114.000.
- Integrated Automation Limited: See—  
Bok, Edward, 4,681,776, Cl. 427-85.000.
- Interlava AG: See—  
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- Intermedics Intracocular, Inc.: See—  
Sayano, Reizo; and Goldberg, Eugene P., 4,681,585, Cl. 623-6.000.
- International Business Machines Corporation: See—  
Karidis, John P., 4,681,467, Cl. 400-124.000.
- International Business Machines Corporation: See—  
Beranger, Herve L.; Gaudenzi, Gene J.; Reedy, Dennis C.; and Schettler, Helmut, 4,682,050, Cl. 307-270.000.
- Chapman, Dale B., 4,682,121, Cl. 331-1.00A.
- Chickanosky, John J.; Courtney, Jack W.; and Murphy, Robert H., 4,681,221, Cl. 206-328.000.
- Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., 4,681,654, Cl. 156-630.000.
- Gaudenzi, Gene J.; and Reedy, Dennis C., 4,682,056, Cl. 307-456.000.
- Hwang, Bao-Tai; Orr-Arienza, Wendy A.; and Glang, Reinhard, 4,681,657, Cl. 156-657.000.
- Iwami, Tomoyuki, 4,682,297, Cl. 364-521.000.
- Kantor, Sherwood; Selby, Garry J.; and Wolfe, Larry L., 4,681,424, Cl. 355-14.00R.
- Millham, Ernest H., 4,682,330, Cl. 371-20.000.
- Wagner, Dietmar, 4,681,442, Cl. 356-237.000.
- International Flavors & Fragrances Inc.: See—  
Sprecker, Mark A.; Wieggers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,681,976, Cl. 560-126.000.
- International Hydron Corporation: See—  
Haardt, Henry; and Magdon, John, 4,681,295, Cl. 249-135.000.
- International Paper Company: See—  
Hambleton, Thomas P.; Guevara, Erick; and Rychiger, Peter, 4,680,917, Cl. 53-440.000.
- International Power Technology, Inc.: See—  
Cheng, Dah Y., 4,680,927, Cl. 60-39.300.
- International Rectifier Corporation: See—  
Lidow, Alexander; and Herman, Thomas, 4,680,853, Cl. 29-571.000.
- International Rolling Mill Consultants, Inc.: See—  
Ginzburg, Vladimir B.; and Jones, G. Brian, 4,680,978, Cl. 73-862.070.
- Interpublic a.s.: See—  
Sondov, Sten Y.; and From, Jan O., 4,681,688, Cl. 210-770.000.
- Intersteel Technology, Inc.: See—  
Vallomy, John A., 4,681,537, Cl. 432-242.000.
- Intradym Maschinen AG: See—  
Egger, Hans R., 4,681,484, Cl. 406-63.000.
- Intravascular Surgical Instruments, Inc.: See—  
Kensley, Kenneth; and Nash, John, 4,681,106, Cl. 128-305.000.
- Inuiya, Masafumi; and Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Solid-state image pickup device for producing color-separated video signals by use of afterimage rise-time, 4,682,212, Cl. 358-44.000.
- Ippolito, Robert M.; and Vigmond, Stephen. Process for preparing certain 1-lower alkanoyl or benzoyl-4-(lower alkanoyl or benzoyl-methylidene)-1,4-dihydropyridines or acid addition salts thereof, 4,681,944, Cl. 546-340.000.
- Iqbal, Abul: See—  
Pfenninger, Johannes; Iqbal, Abul; and Rochat, Alain C., 4,681,971, Cl. 558-414.000.
- Irino, Etsuro, to Mitsubishi Denki Kabushiki Kaisha. Automobile telephone apparatus, 4,682,357, Cl. 379-356.000.
- Irvine Industries, Inc.: See—  
Lobanoff, Mark, 4,681,366, Cl. 297-191.000.
- Irving, Edward: See—  
Demmer, Christopher G.; and Irving, Edward, 4,681,923, Cl. 525-504.000.
- Ishida, Matsuhiko: See—  
Goto, Shigeru; Asano, Masaru; Ishida, Matsuhiko; and Inoue, Shosaku, 4,681,207, Cl. 198-333.000.
- Ishiguro, Takeo: See—  
Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, 4,681,874, Cl. 514-90.000.
- Ishihara, Hidetoshi: See—  
Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, 4,680,874, Cl. 34-143.000.
- Ishikawa, Ken: See—  
Horiba, Isao; and Ishikawa, Ken, 4,682,301, Cl. 364-724.000.
- Ishikawa, Masakazu: See—  
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- Ishikawa, Takatoshi; and Nakazyo, Kiyoshi, to Fuji Photo Film Co., Ltd. Method of processing silver halide color photographic material containing pyrazoloazole-type magenta coupler using a final bath containing a soluble iron salt, 4,681,835, Cl. 430-386.000.
- Ishikawa, Tatsuo, to Kabushiki Kaisha Toshiba. Storage system, 4,682,305, Cl. 364-900.000.
- Ishimoto, Shoji, to NEC Corporation. Output circuit with improved timing control circuit, 4,682,048, Cl. 307-269.000.
- Ishimura, Naoya: See—  
Shibahashi, Yutaka; Nakasui, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.
- Ishitate, Yoshiyuki, to Fuji Xerox Co., Ltd. Optical recording device, 4,682,244, Cl. 358-287.000.
- Ishizaka, Yukio: See—  
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- Ishizaki, Fumio: See—  
Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atsui; and Shirotori, Hidefumi, 4,680,999, Cl. 82-36.00B.
- Iso, Yoshimi: See—  
Nakagaki, Harushige; Iso, Yoshimi; and Inoue, Shigeki, 4,682,314, Cl. 369-44.000.
- Isonaga, Touichi: See—  
Kutsumura, Shoji; and Isonaga, Touichi, 4,681,662, Cl. 202-270.000.
- Itabashi, Yoshifumi: See—  
Yasuda, Kazuo; Ando, Toshiharu; Itabashi, Yoshifumi; and Tsuchihashi, Masaru, 4,681,904, Cl. 523-457.000.
- Itek Corporation: See—  
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- Ito, Hajime: See—  
Yano, Naomichi; Ito, Hajime; and Tanaka, Shigeru, 4,681,134, Cl. 165-47.000.
- Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsu; Yoshino, Hirobumi; and Shibusawa, Mitsuo, to Ricoh Company, Ltd. Guidance device for manipulation of machine, 4,682,158, Cl. 340-679.000.
- Ito, Takayasu: See—  
Nishijima, Hideo; Ito, Takayasu; and Fukushima, Isao, 4,682,096, Cl. 318-808.000.
- Itoh, Kenji: See—  
Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, 4,680,855, Cl. 29-583.000.
- ITT Corporation: See—  
Brooks, Forrest E., 4,682,163, Cl. 340-805.000.
- Ivac Corporation: See—  
Conero, Ronald S.; and Landis, Terry L., 4,680,977, Cl. 73-861.410.
- Ivey, Charles W., to Fasco Industries, Inc. Combination heater-light-ventilator unit, 4,681,024, Cl. 98-34.600.
- Iwakiri, Norio: See—  
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.00B.
- Iwakura, Ken; and Sugiyama, Takekatsu, to Fuji Photo Film Co., Ltd. Recording materials, 4,682,193, Cl. 503-209.000.
- Iwama, Teruhiko, to Nitsuko Limited. Simple data input apparatus, 4,682,014, Cl. 235-375.000.
- Iwami, Tomoyuki, to International Business Machines Corp. Digital raster scan display system, 4,682,297, Cl. 364-521.000.
- Iwasaki, Tetsuji, to Kao Corporation. Biocide activator, 4,681,900, Cl. 514-786.000.
- Iwatsu Electric Co., Ltd.: See—  
Yokovama, Yasuyuki; Nakamura, Kiyoaki; Goi, Hiroshi; and Fujioka, Koichiro, 4,681,313, Cl. 271-273.000.
- Izumita, Morishi: See—  
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.
- Izumiya, Shunzo: See—  
Inoue, Michiya; Obara, Haruki; and Izumiya, Shunzo, 4,681,997, Cl. 219-69.00C.
- J. I. Case Company: See—  
Ledermann, Donald L.; and Otten, Ronald L., 4,681,335, Cl. 280-446.00R.
- J.M. Voith GmbH: See—  
Elsner, Ernst, 4,680,986, Cl. 74-866.000.
- Jacobs, Harvey C. Constant speed control for positive displacement variable stroke hydraulic motor, 4,680,931, Cl. 60-447.000.
- Jagenberg Aktiengesellschaft: See—  
Thieversen, Karl; and Weiss, Peter, 4,681,274, Cl. 242-58.300.
- Jakob, Lothar. Loose-leaf binder for stacks of sheets, 4,681,473, Cl. 402-15.000.
- James, David R., to James Industries Limited. Invalid hoists, 4,680,819, Cl. 5-86.000.
- James Industries Limited: See—  
James, David R., 4,680,819, Cl. 5-86.000.
- James, James R., to Accuratio System Inc. Reaction injection molding pressure developing and balancing circuit, 4,681,137, Cl. 137-568.000.
- James, Michael J., to Global Castors Limited. Dual-wheel casters with positive lock mechanism, 4,681,192, Cl. 188-1.120.
- Jandy Industries: See—  
Falconer, Ralph A., 4,681,139, Cl. 137-537.000.
- Jansen, Rudolf, to Otto Junker GmbH. Charging sluice for annealing oven, 4,681,536, Cl. 432-59.000.
- Japan Atomic Energy Research Institute: See—  
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- Japan Aviation Elec.: See—  
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.
- Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.
- Japan Tobacco Company: See—  
Kobayashi, Hideki; Okumoto, Yutaka; and Komori, Mikio, 4,681,505, Cl. 414-744.00R.
- Jatteau, Michel R.: See—  
Martin, Guy N.; and Jatteau, Michel R., 4,682,033, Cl. 250-363.00R.
- Jautelat, Manfred: See—  
Lantzsch, Reinhard; Arlt, Dieter; and Jautelat, Manfred, 4,681,952, Cl. 549-61.000.
- Jeal, Harvey P., to Avdel Limited. Method of making a self-locking blind fastener, 4,680,823, Cl. 10-86.00A.
- Jenkins, Walter N.; and Davies, Gordon I., to National Research Development Corporation. Producing directed spray, 4,681,258, Cl. 239-66.000.
- Jenkins, William D.: See—  
Rhoades, Lawrence J.; Jenkins, William D.; and Pertle, David D., 4,681,600, Cl. 51-293.000.
- Jensen, Marvin E.: See—  
Tokarz, Joseph S.; and Jensen, Marvin E., 4,681,572, Cl. 604-329.000.
- Jeol Ltd.: See—  
Saito, Toshinori; and Takeuchi, Makoto, 4,681,513, Cl. 417-2.000.
- Jeschke, Willi; Kipphan, Helmut; and Löffler, Gerhard, to Heidelberger Druckmaschinen AG. Method of determining the area coverage of a printed original or printing plate for printing presses, 4,681,455, Cl. 356-445.000.
- Jester, Randy D., to American Hoechst Corporation. Calender band stripping section and process for stripping calendered sheet, 4,681,723, Cl. 264-173.000.
- Jet Research Center, Inc.: See—  
Regalbutto, John A., 4,681,037, Cl. 102-310.000.
- Jidosha Kiki Co., Ltd.: See—  
Masaka, Mitsuke, 4,682,008, Cl. 219-270.000.
- Suzuki, Yoshio; Ohe, Takeshi; and Koike, Ichiro, 4,681,182, Cl. 180-79.100.
- Suzuki, Yoshio; Sonoda, Hiroto; and Yabe, Hideo, 4,681,184, Cl. 180-141.000.
- Johnson, Harlan B.; Krivak, Thomas G.; and Longhini, David A., to PPG Industries, Inc. Preparation of amorphous, precipitated silica and siliceous filler-reinforced microporous polymeric separator, 4,681,750, Cl. 423-339.000.
- Johnson, Harvey R., to Strain Measurement Devices Limited. Method of manufacture of strain gauges, 4,680,858, Cl. 29-610.05G.
- Johnson, James S.; and Albrecht, Gene A., to Honeywell Inc. Magnetic flux detector correction system, 4,680,866, Cl. 33-356.000.
- Johnson & Johnson Dental Products, Company: See—  
DeLuca, Robert D.; and Forbes-Jones, Robin M., 4,681,538, Cl. 433-9.000.
- Johnson, Larry J.; Coates, Stephen R.; and Loo, Rueyming, to Cetus Corporation. Assay tray, 4,681,742, Cl. 422-102.000.
- Johnson, Robert R., to Brown & Williamson Tobacco Corporation. Mouthpiece for tobacco smoke article, 4,681,125, Cl. 131-336.000.
- Johnson, Samuel A., to Hewlett-Packard Company. Thermal ink jet print head method of manufacture, 4,680,859, Cl. 29-611.000.
- Johnson, Virgil E., Jr., to Hydronautics, Incorporated. Enhancing liquid jet erosion, 4,681,264, Cl. 239-589.100.
- Johnston, Mary H.: See—  
Owen, Robert B.; and Johnston, Mary H., 4,681,437, Cl. 356-129.000.
- Jokel, Isidore. Window intrusion barrier, 4,680,890, Cl. 49-55.000.
- Jokela, Veikko: See—  
Forss, Kaj; Sten, Matti; Peltonen, Juhani; and Jokela, Veikko, 4,681,935, Cl. 536-56.000.
- Jolley, Sue H.; and Jolley, William H. Storage pod, 4,681,361, Cl. 296-37.700.
- Jolley, William H.: See—  
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- Jones, Edward J., to United States of America, Air Force. Active matching transmit/receive module, 4,682,176, Cl. 342-175.000.
- Jones, G. Brian: See—  
Ginzburg, Vladimir B.; and Jones, G. Brian, 4,680,978, Cl. 73-862.070.
- Jones, James H.: See—  
Cronkhite, Paul W.; Bosley, Bruce C.; Jones, James H.; and Patel, Asit G., 4,680,893, Cl. 51-5.00R.
- Jones, Marshall G., to General Electric Company. High power laser energy delivery system, 4,681,396, Cl. 350-96.180.
- Jones, Paul W.; and Bardue, Casey M., to Physio-Control Corporation. Medical instrument including electrodes adapted for right and left-handed use, 4,681,112, Cl. 128-419.00D.
- Jujo, Akihiro: See—  
Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.
- Julius Blum Gesellschaft m.b.H.: See—  
Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,680,830, Cl. 16-241.000.
- Junk, Dieter; and Rauf, Richard, to Kleinfewers GmbH. Apparatus for rotating the shells of rolls in calendars or the like, 4,680,843, Cl. 29-116.00R.
- Juwedor GmbH: See—  
Eberle, Rudolf; Essert, Wilfried; and Kull, Herbert, 4,681,664, Cl. 204-9.000.
- Juzi, Heniz; and Bernasconi, Marco L., to Sulzer Brothers Limited. Apparatus for uniformly distributing a two-phase mixture, 4,681,129, Cl. 137-154.000.
- Kabashima, Shoshi: See—  
Maruyama, Yoshio; and Kabashima, Shoshi, 4,681,528, Cl. 425-562.000.
- Kabaya, Morihoro: See—  
Fujino, Yukio; and Kabaya, Morihoro, 4,680,822, Cl. 5-421.000.
- Kabushiki Kaisha Daikin Seisakusho: See—  
Teramace, Hiroshi; and Yoshimura, Yoshinari, 4,681,201, Cl. 192-106.200.
- Kabushiki Kaisha Kobe Seiko Sho: See—  
Orimo, Taiji; Fukui, Tsugushi; and Fukumizu, Shinichi, 4,681,457, Cl. 366-84.000.
- Kabushiki Kaisha Komatsu Seisakusho: See—  
Miki, Toshiyuki; Tomioka, Kunio; Nakajima, Masao; and Sakurai, Terushige, 4,681,210, Cl. 198-468.200.
- Kabushiki Kaisha Riken: See—  
Shinada, Manabu, 4,681,817, Cl. 428-549.000.
- Kabushiki Kaisha Swallow Ski: See—  
Maruyama, Tetsuzo, 4,681,725, Cl. 264-46.500.
- Kabushiki Kaisha Tokai Rika Denki Seisakusho: See—  
Kubota, Kazuhisa; and Yasuda, Shigekazu, 4,681,435, Cl. 356-71.000.
- Tamura, Keiichi; Nishimura, Yuji; and Kawaharazaki, Takashi, 4,681,347, Cl. 280-804.000.
- Kabushiki Kaisha Toshiba: See—  
Hughes, Simon H. C., 4,682,111, Cl. 324-320.000.
- Igarashi, Yosuke, 4,682,042, Cl. 250-578.000.



Ishikawa, Tatsuo, 4,682,305, Cl. 364-900.000.  
 Kubota, Mitsuru; and Amita, Koza, 4,682,170, Cl. 340-928.000.  
 Kunii, Yutaka, 4,681,120, Cl. 128-660.000.  
 Kuroiwa, Akihiko, 4,682,094, Cl. 318-723.000.  
 Mori, Shojiro, 4,682,331, Cl. 371-25.000.  
 Sakurai, Takayasu; and Iizuka, Tetsuya, 4,682,306, Cl. 365-222.000.  
 Takao, Takashi; Koyahara, Satoru; and Saito, Tetsuo, 4,682,321, Cl. 369-284.000.  
 Tamari, Masumi, 4,682,089, Cl. 318-568.000.  
 Tanimoto, Yasufumi, 4,681,425, Cl. 355-14.0CU.  
 Yamada, Kazuhiko, 4,682,271, Cl. 361-409.000.  
 Kabushiki Kaisha Toyota Chuo Kenkyusho: See—  
 Hasegawa, Junzo; Kawabata, Susumu; and Mimura, Nobuharu, 4,681,492, Cl. 409-231.000.  
 Tabata, Osamu; Inagaki, Hazime; and Kitano, Tomoyuki, 4,680,963, Cl. 73-204.000.  
 Kadlec, Joseph, to Zenith Electronics Corporation. Monostable multi-vibrator for video display, 4,682,226, Cl. 358-148.000.  
 Kaempfen, Charles E. Composite twine structure, 4,680,923, Cl. 57-251.000.  
 Kageyama, Takao; and Orui, Ryuzo, to NEC Corporation. Microwave tube with improved output signal extracting structure, 4,682,076, Cl. 315-4.000.  
 Kaji, Toshio, to Canon Kabushiki Kaisha. Color image sensing apparatus with one non-feedback clamp circuit and at least one feedback clamp circuit, 4,682,211, Cl. 358-41.000.  
 Kaji, Toshio: See—  
 Takayama, Tsutomu; Hashimoto, Seiji; Kaji, Toshio; Suzuki, Masao; and Tojo, Akihiko, 4,682,232, Cl. 358-172.000.  
 Kajita, Koji: See—  
 Noguchi, Kunio; Totsune, Atsushi; Kajita, Koji; and Hosaka, Takefumi, 4,681,078, Cl. 123-490.000.  
 Kakimoto, Norihiro; Katayama, Takashi; Hazato, Tadahiko; and Ohnishi, Tsutomu, to Asai Germanium Research Institute. Organogermanium compound, 4,681,960, Cl. 556-83.000.  
 Kakonyi, Gyula: See—  
 Kasza, Tibor; Kakonyi, Gyula; Kocso, Illes; Buzas, Attila; and Radvanyi, Laszlo, 4,682,137, Cl. 335-284.000.  
 Kali-Chemie Aktiengesellschaft: See—  
 Doetsch, Werner; and Siegel, Rudolf, 4,681,697, Cl. 252-175.000.  
 Kallenbach, Lyle R.: See—  
 Fruthaler, Katherine J.; Hopkins, Thomas R.; Hitzman, Donald O.; Kubicek, Donald H.; and Kallenbach, Lyle R., 4,681,758, Cl. 424-78.000.  
 Kallin, Fredrik L. N.; and Evans, Edward R., to NCR Corporation. Thermal printing apparatus, 4,681,468, Cl. 400-120.000.  
 Kaltenbronn, James S.; and Stier, Michael A., to Warner-Lambert Company. Separation of diastereomers, 4,681,972, Cl. 560-29.000.  
 Kameoka, Kimitaka: See—  
 Inoue, Nobuaki; Inagaki, Yoshio; and Kameoka, Kimitaka, 4,681,836, Cl. 430-434.000.  
 Kamino, Yoshikazu: See—  
 Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,681,857, Cl. 436-78.000.  
 Kamman, Daniel T., to Polaroid Corporation. Continuously cleaned rotary coating mask, 4,681,780, Cl. 427-282.000.  
 Kammerer, Gerd, to Dieter Grasslin Feinwerktechnik. Device for thermostatic valves, particularly for the temperature reduction of thermostat-controlled radiators, 4,681,254, Cl. 236-42.000.  
 Kamo, Takashi: See—  
 Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.  
 Kanaizumi, Masaru: See—  
 Miyagi, Morio; Ohno, Makoto; and Kanaizumi, Masaru, 4,681,713, Cl. 264-41.000.  
 Kanbe, Junichiro: See—  
 Okada, Shinjiro; and Kanbe, Junichiro, 4,681,404, Cl. 350-350.00S.  
 Kanbe, Sadao: See—  
 Toki, Motoyuki; Kanbe, Sadao; Miyashita, Satoru; and Takeuchi, Tetsuhiko, 4,681,615, Cl. 65-18.100.  
 Kanda, Shoichi; Yanagita, Makoto; and Sekimoto, Yukihiro, to Nitto Chemical Industry Co., Ltd. Stabilized fracturing fluid and method of stabilizing fracturing fluid, 4,681,690, Cl. 252-8.551.  
 Kanebo, Ltd.: See—  
 Satoh, Toshio; and Tsukamoto, Goro, 4,681,895, Cl. 514-535.000.  
 Kanegawa, Kiyoharu, to Rhythm Motor Parts Mfg. Co., Ltd. Ball joint socket, 4,681,475, Cl. 403-40.000.  
 Kanehira, Koichi; Shiono, Manzo; Fujita, Yoshiji; Nishida, Takashi; and Yamahara, Tohji, to Kuraray Co., Ltd. 3,4-dihydrobenzopyran compounds and pharmaceutical composition containing the same, 4,681,890, Cl. 514-333.000.  
 Kaneko, Atsumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Surveying instrument with image display unit, 4,682,218, Cl. 358-93.000.  
 Kaneko, Kenji, to Asahi Precision Co. Ltd. Automatic compensator for compensating collimation error due to two-directional inclination in surveying instruments, 4,681,438, Cl. 356-143.000.  
 Kaneko, Minoru: See—  
 Mikiya, Toshio; Kaneko, Minoru; and Kazama, Yasuo, 4,681,172, Cl. 173-139.000.  
 Kaneko, Tadashi: See—  
 Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadataka; and Takeuchi, Nobuo, 4,682,044, Cl. 290-40.000.  
 Kaneta, Keisuke, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Method of controlling fuel injection, 4,681,079, Cl. 123-491.000.

Kaneyasu, Akira: See—  
 Yamamoto, Kosei; Kaneyasu, Akira; and Arita, Yo, 4,681,863, Cl. 501-108.000.  
 Kania, Charles M.: See—  
 Simpson, Dennis A.; Singer, Debra L.; Dowbenko, Rostyslaw; Blackburn, William P.; and Kania, Charles M., 4,681,811, Cl. 428-413.000.  
 Kanno, Akihiko: See—  
 Muto, Shigesaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.  
 Kantor, Martin L., to USV Pharmaceutical Corporation. Direct u-acylation of amino acids, 4,681,973, Cl. 560-33.000.  
 Kantor, Sherwood; Selby, Garry J.; and Wolfe, Larry L., to International Business Machines Corporation. Compensation for fine line prints, 4,681,424, Cl. 355-14.00R.  
 Kanzaki, Nobuyoshi: See—  
 Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.  
 Kao Corporation: See—  
 Iwasaki, Tetsuji, 4,681,900, Cl. 514-786.000.  
 Kapples, Kevin J.: See—  
 Effland, Richard C.; Davis, Larry; and Kapples, Kevin J., 4,681,879, Cl. 514-211.000.  
 Kapusta, Janusz J. Decorative, functional element for construction and the like, 4,681,481, Cl. 404-34.000.  
 Karabed, Razmik; and Mehrbians, Raphael. Holographic game cards, 4,681,324, Cl. 273-295.000.  
 Karam, Ronald E.: See—  
 Schulze, Harry O.; and Karam, Ronald E., 4,681,807, Cl. 428-403.000.  
 Karidis, John P., to International Business Machines Corporation. Impact printing applications, 4,681,467, Cl. 400-124.000.  
 Karpati, Egon: See—  
 Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo; Kiss, Bela; Laszlovsky, Istvan; and Lapis, Erzebet, 4,681,887, Cl. 514-284.000.  
 Karpisek, Ladislav S. Tubular conveyor, 4,681,214, Cl. 198-819.000.  
 Kassainee Zieger, Anna: See—  
 Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo; Kiss, Bela; Laszlovsky, Istvan; and Lapis, Erzebet, 4,681,887, Cl. 514-284.000.  
 Kasugai, Kaoru: See—  
 Hashimoto, Shingo; Sunaga, Kazuyuki; and Kasugai, Kaoru, 4,682,254, Cl. 360-103.000.  
 Kasza, Tibor; Kakonyi, Gyula; Kocso, Illes; Buzas, Attila; and Radvanyi, Laszlo, to Elzett Muvek. Magnetising apparatus for the magnetisation of keys and rotors of magnetic safety lock systems, 4,682,137, Cl. 335-284.000.  
 Kataoka, Takashi: See—  
 Shibahashi, Yutaka; Nakasuiji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tsutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.  
 Katayama, Hitoshi: See—  
 Mita, Seichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.  
 Katayama, Takashi: See—  
 Kakimoto, Norihiro; Katayama, Takashi; Hazato, Tadahiko; and Ohnishi, Tsutomu, 4,681,960, Cl. 556-83.000.  
 Katayama, Toshiaki: See—  
 Koya, Yoshihiro; and Katayama, Toshiaki, 4,681,151, Cl. 164-76.100.  
 Kato, Kiichi: See—  
 Matsubayashi, Nobuhide; and Kato, Kiichi, 4,682,311, Cl. 369-13.000.  
 Kato, Masaaki; Nishimura, Tetsuharu; and Yokota, Hideo, to Canon Kabushiki Kaisha. Photographic optical apparatus, 4,682,237, Cl. 358-225.000.  
 Kato, Motosaburo: See—  
 Fukushima, Shoji; Kato, Motosaburo; Mochizuki, Takashi; and Wada, Yukio, 4,681,645, Cl. 156-73.100.  
 Kato, Ryoichi: See—  
 Sakurai, Akio; and Kato, Ryoichi, 4,681,726, Cl. 376-171.000.  
 Kato, Shinichi: See—  
 Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.  
 Kato, Takashi: See—  
 Shibana, Ichiro; Horikoshi, Koki; and Kato, Takashi, 4,681,934, Cl. 536-46.000.  
 Katoh, Masao: See—  
 Endo, Hiroshi; Katoh, Masao; and Hino, Kuniaki, 4,681,764, Cl. 424-125.000.  
 Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, to Kyowa Hakko Kogyo Co., Ltd. Novel lysozyme-sensitive microorganism, 4,681,847, Cl. 435-172.300.  
 Katsumo, Hisashi; Murakawa, Takashi; and Yoneda, Toshikazu, to Research Association For Utilization of Light Oil. Catalyst for the production of aromatic hydrocarbons, 4,681,865, Cl. 502-74.000.

Katz, Carlos; Dima, Attila F.; and Eager, George S., Jr., to Cable Technology Laboratories, Inc. Premolded mechanically prestressed voltage stress control cones for high voltage cables and method of fabricating same, 4,681,985, Cl. 174-73.00R.  
 Kavli, Fred; and Park, Kyong, to Kavlico Corporation. Dual diaphragm differential pressure transducer, 4,680,971, Cl. 73-718.000.  
 Kavlico Corporation: See—  
 Kavli, Fred; and Park, Kyong, 4,680,971, Cl. 73-718.000.  
 Kawabata, Susumu: See—  
 Hasegawa, Junzo; Kawabata, Susumu; and Mimura, Nobuharu, 4,681,492, Cl. 409-231.000.  
 Kawabata, Takashi; Sato, Yuichi; Tsunekawa, Tokuchi; and Matsumura, Susumu, to Canon Kabushiki Kaisha. Photo-electric converting device, 4,681,432, Cl. 356-4.000.  
 Kawabata, Takashi: See—  
 Sakai, Shinji; and Kawabata, Takashi, 4,681,419, Cl. 354-402.000.  
 Kawabe, Tadashi; and Kobune, Masafumi, to Tateho Kagaku Kogyo Kabushiki Kaisha. Electrically insulating filler for sheathed heaters, 4,681,862, Cl. 501-108.000.  
 Kawaharazaki, Takashi: See—  
 Tamura, Keiichi; Nishimura, Yuji; and Kawaharazaki, Takashi, 4,681,467, Cl. 346-140.00R.  
 Kawakami, Shigenobu: See—  
 Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,681,980, Cl. 585-6.300.  
 Kawamura, Hideaki: See—  
 Sasaki, Takashi; Sakurada, Nobuaki; and Kawamura, Hideaki, 4,682,186, Cl. 346-140.00R.  
 Sasaki, Takashi; Sakurada, Nobuaki; Kawamura, Hideaki; and Moriyama, Jiro, 4,682,216, Cl. 358-79.000.  
 Kawasaki Jukogyo Kabushiki Kaisha: See—  
 Nishida, Hiroshi, 4,681,058, Cl. 114-271.000.  
 Tamba, Shinichi; Miyake Hitomi; Fukui Noboru; and Miguchi, Akio, 4,681,067, Cl. 123-41.100.  
 Kawasaki Steel Corporation: See—  
 Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,681,857, Cl. 436-78.000.  
 Oyama, Akihiro; Funyu, Yutaka; and Sakurada, Kazuyuki, 4,682,182, Cl. 346-1.100.  
 Kazakhsky Politekhicheskyy Institut Imeni V.I. Lenina: See—  
 Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.  
 Kazama, Yasuo: See—  
 Mikiya, Toshio; Kaneko, Minoru; and Kazama, Yasuo, 4,681,172, Cl. 173-139.000.  
 Kazmierski, Ronald J., to C. M. Smilie & Company. Cushioned clamp cylinder with proximity switches, 4,681,992, Cl. 200-82.00E.  
 Kearney-National, Inc.: See—  
 Osborne, Anthony, 4,681,990, Cl. 200-48.0KB.  
 Keck, Karl, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch, 4,681,200, Cl. 192-70.270.  
 Kee, Gene A.; and Hanna, Mark. One-person battering ram, 4,681,171, Cl. 173-90.000.  
 Kees, George, Jr., to Kees Surgical Specialty Co. Device for holding an aneurysm clip, 4,681,107, Cl. 128-325.000.  
 Kees Surgical Specialty Co.: See—  
 Kees, George, Jr., 4,681,107, Cl. 128-325.000.  
 Keller, Alfred: See—  
 Weitmann, Heinz; and Keller, Alfred, 4,680,965, Cl. 73-445.000.  
 Kemnitz, Tadeusz: See—  
 Moran, Michael J.; and Kemnitz, Tadeusz, 4,681,176, Cl. 177-114.000.  
 Kendall, Giles A.: See—  
 Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Morales, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.  
 Kenneally, Patrick: See—  
 Murphy, John; McMullin, Francis; Egan, Michael; Byrne, John V.; and Kenneally, Patrick, 4,682,093, Cl. 318-701.000.  
 Kensey, Kenneth; and Nash, John, to Intravascular Surgical Instruments, Inc. Catheter based surgical methods and apparatus therefor, 4,681,106, Cl. 128-305.000.  
 Kepple, Dean A., to United Technologies Corporation. Dual spectra optical pyrometer having a serial array of photodetectors, 4,681,434, Cl. 356-45.000.  
 Keptel, Inc.: See—  
 Lynch, Daniel, 4,682,347, Cl. 379-29.000.  
 Kern & Co. AG.: See—  
 Aeschlimann, Heinz, 4,681,433, Cl. 356-5.000.  
 Kern, Josef, to Siemens Aktiengesellschaft. Electro-magnetic relay having two armatures, 4,682,133, Cl. 335-119.000.  
 Kernforschungsanlage Julich GmbH: See—  
 Mallener, Werner; and Overhoff, Theodor, 4,681,732, Cl. 376-337.000.  
 Kerry, Peter R.; and Lewis, Jeffrey L., to Koninklijke Emballage Industrie Van Leer B.V. Package filled with a water-soluble toxic pulverulent or granular product, 4,681,228, Cl. 206-484.000.  
 Kersker, Michael M.; Truckner, William G.; Granger, Douglas A.; and Rooy, Elwin L., to Aluminum Company of America. Aluminum alloy, 4,681,736, Cl. 420-535.000.  
 Kessler, Stephen B.: See—  
 Cho, George E. S.; and Kessler, Stephen B., 4,681,092, Cl. 128-1.00D.  
 Ketharanathan, Vettivetpillai. Biomaterial, 4,681,588, Cl. 623-11.000.

Kettler, Daniel G. A.: See—  
 d'Agostino, Guy; Dhainaut, Andre; Kettler, Daniel G. A.; and Leclerc, Henry R., 4,681,327, Cl. 277-29.000.  
 Keve, Tibor: See—  
 Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo; Kiss, Bela; Laszlovsky, Istvan; and Lapis, Erzebet, 4,681,887, Cl. 514-284.000.  
 Khashirov, Vladislav K.: See—  
 Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.  
 Khazhuer, Vladimir S.: See—  
 Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.  
 Kida, Takashi: See—  
 Kobari, Osamu; and Kida, Takashi, 4,681,535, Cl. 432-48.000.  
 Kidd, Roy E.: See—  
 Mussmann, Sara M.; and Kidd, Roy E., 4,682,157, Cl. 340-605.000.  
 Kihara, Seiji: See—  
 Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; Mitsudoh, Makoto; and Wakabayashi, Yoh'ichi, 4,681,633, Cl. 106-35.000.  
 Kikendall, Garth D.: See—  
 Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,681,499, Cl. 411-507.000.  
 Kikuchi, Masafumi, to Sony Corporation. Apparatus for controlling amplitude of vertical deflection signal, 4,682,087, Cl. 315-387.000.  
 Kikuta, Shigeru: See—  
 Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.  
 Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.  
 Kim, Choong W. Supercavitation centrifugal pump, 4,681,508, Cl. 415-116.000.  
 Kim, Young B.: See—  
 Efron, Edward; McPherson, James O.; and Kim, Young B., 4,682,246, Cl. 358-335.000.  
 Kinetics Technology International Corporation: See—  
 Spangler, Harvey D.; and Lamb, Kenneth V., 4,681,603, Cl. 55-27.000.  
 Kinugawa, Masumi: See—  
 Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugina, Kengo, 4,680,964, Cl. 73-204.000.  
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 Nagashima, Akira, 4,681,608, Cl. 55-276.000.  
 Tasaki, Takanobu; and Nagashima, Akira, 4,681,188, Cl. 181-229.000.  
 Kipphan, Helmut: See—  
 Jeschke, Willi; Kipphan, Helmut; and Loffler, Gerhard, 4,681,455, Cl. 356-445.000.  
 Kirch, Otto; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Guide device for the workpiece of a sewing machine, 4,681,051, Cl. 112-306.000.  
 Kiriake, Masaharu: See—  
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 Kirkup, David: See—  
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 Kirschner, Michael; Rapp, Gunter; and Zechmann, Martin, to Robert Bosch GmbH. Pulse shaper for inductive transmitters, 4,682,049, Cl. 307-268.000.  
 Kishigami, Tomohisa: See—  
 Ando, Noriyoshi; Mikuni, Hajime; Matsunaga, Mitsuru; Horie, Naoki; and Kishigami, Tomohisa, 4,682,228, Cl. 358-161.000.  
 Kistling, James W., III, to NL Industries, Inc. Method and apparatus for running long tools into and out of a pressurized enclosure, 4,681,168, Cl. 166-381.000.  
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 Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo; Kiss, Bela; Laszlovsky, Istvan; and Lapis, Erzebet, 4,681,887, Cl. 514-284.000.  
 Kitano, Tatsuo. Shaped bodies of calcium silicate, 4,681,809, Cl. 428-428.000.  
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 Kitchens, Doyle. Accessory for bass fishing boat, 4,681,219, Cl. 206-315.110.  
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- Klauschek, Herwig: See—  
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- Kleemann, Eugene: See—  
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- Kleinewefers GmbH: See—  
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- Kleinschroth, Jorgen; Mannhardt, Karl; Hartenstein, Johannes; Oswald, Hartmut; and Wagner, Bernd, to Godecke Aktiengesellschaft. 5-alkoxy-pyrido[4,3-d]pyrimidine derivatives. 4,681,881, Cl. 514-258.000.
- Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Oswald, Hartmut; Weinheimer, Gontar; and Fritsch, Edgar, to Godecke Aktiengesellschaft. 4-alkoxy-pyrido[2,3-d]pyrimidine derivatives. 4,681,882, Cl. 514-258.000.
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- Klenoff, Bruce: See—  
Goldfarb, Jerry; and Klenoff, Bruce, 4,682,363, Cl. 381-74.000.
- Klosowski, Jerome M.: See—  
Lopes, William J.; and Klosowski, Jerome M., 4,681,714, Cl. 264-46.600.
- Knuth, Daniel J.; and Engel, Gary L. Test system providing testing sites for logic circuits. 4,682,329, Cl. 371-15.000.
- KM-Engineering AG: See—  
Uehlinger, Werner H.; and Franek, Jozef T., 4,681,001, Cl. 83-37.000.
- Knap, Florian J. Dental articulator and method. 4,681,539, Cl. 433-73.000.
- Knappe & Vogt Manufacturing Company: See—  
Gronlund, Robert L.; and Stewart, John, 4,681,289, Cl. 248-224.400.
- Knapp, Joseph A.: See—  
Rosenblatt, David H.; Rosenblatt, Aaron A.; and Knapp, Joseph A., 4,681,739, Cl. 422-37.000.
- Knoff, Bernd: See—  
Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, 4,681,185, Cl. 180-247.000.
- Knol, Jan D.: See—  
Bes, Richard F. T.; and Knol, Jan D., 4,681,632, Cl. 106-19.000.
- Knoa, Lewis. Method of chemical deodorization of articles and solutions used in medical and biological procedures. 4,681,575, Cl. 604-359.000.
- Kobal, Gerd. Process for measuring sensory qualities and apparatus therefor. 4,681,121, Cl. 128-731.000.
- Kobari, Osamu; and Kida, Takashi, to Toho Development Engineering Co., Ltd. Preheating mechanism for source metal for melt. 4,681,535, Cl. 432-48.000.
- Kobayashi, Haruhiko; and Otani, Tadahiko, to Hitachi, Ltd. Air-fuel ratio controlling method and apparatus for an internal combustion engine. 4,681,077, Cl. 123-489.000.
- Kobayashi, Hideki; Okumoto, Yutaka; and Komori, Mikio, to Japan Tobacco Company. Stocker in reel supply apparatus. 4,681,505, Cl. 414-744.00R.
- Kobayashi, Ikuya: See—  
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.
- Kobayashi, Masaharu: See—  
Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, 4,682,332, Cl. 371-38.000.
- Kobayashi, Tamotsu; Goto, Shigeru; Ohta, Hironobu; and Torimaru, Takashi, to Yokogawa Hokushin Electric Corporation. Electromagnetic flow meter converter. 4,680,973, Cl. 73-861.160.
- Kobayashi, Yoshiki: See—  
Orita, Miyahiko; Kobayashi, Yoshiki; and Mishima, Tadaaki, 4,682,365, Cl. 382-14.000.
- Kobel, Hans; Sanglier, Jean-Jacques; Tschertner, Hans; and Bolliger, Georg, to Sandoz Ltd. Use of thio isosteres of ergot peptide alkaloids as vasoconstrictors. 4,681,880, Cl. 514-250.000.
- Kobler, Ingo; and Plantsch, Josef, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Rotary offset printing machine system. 4,681,035, Cl. 101-217.000.
- Kobune, Masafumi: See—  
Kawabe, Tadashi; and Kobune, Masafumi, 4,681,862, Cl. 501-108.000.
- Koch, Joachim, to Dragerwerk Aktiengesellschaft. Incubator for premature and newborns. 4,681,090, Cl. 128-1.00B.
- Koch Process Systems, Inc.: See—  
O'Brien, John V.; Holmes, Arthur S.; and Hopewell, Richard B., 4,681,612, Cl. 62-23.000.
- Kocso, Illes: See—  
Kasza, Tibor; Kakonyi, Gyula; Kocso, Illes; Buzas, Attila; and Radvanyi, Laszlo, 4,682,137, Cl. 335-284.000.
- Kodaira, Takanori, to Canon Kabushiki Kaisha. Camera. 4,681,418, Cl. 354-288.000.
- Kodaka, Yoshiro: See—  
Naito, Hideshi; Kodaka, Yoshiro; and Shiokama, Yoshiharu, 4,681,406, Cl. 350-429.000.
- Kodama, Eiji: See—  
Hohki, Tetsuo; Sano, Tetsuo; Kodama, Eiji; and Tsujinaka, Hisayuki, 4,682,040, Cl. 250-571.000.
- Koelwij, Rob, to OTE Valeron Corporation. End mill cutting tool and indexable insert therefor. 4,681,485, Cl. 407-42.000.
- Koenig, Dean B. Aquatic ride. 4,681,550, Cl. 440-40.000.
- Koga, Hitoshi: See—  
Hashimoto, Mikio; Nakata, Yoshinari; and Koga, Hitoshi, 4,681,816, Cl. 428-463.000.
- Kohler, Norbert: See—  
Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Françoise, 4,681,912, Cl. 524-827.000.
- Kohler, Wolfgang: See—  
Schulzen, Herbert; Kohler, Wolfgang; and Schliessmann, Kurt, 4,681,034, Cl. 101-211.000.
- Kobpaintner, Georg: See—  
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- Kohmoto, Mitsuo: See—  
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- Kohsaka, Fusao: See—  
Ueda, Toshitsugu; Kohsaka, Fusao; Yamazaki, Daisuke; and Akazawa, Hideo, 4,680,970, Cl. 73-702.000.
- Koike, Ichiro: See—  
Suzuki, Yoshio; Ohe, Takeshi; and Koike, Ichiro, 4,681,182, Cl. 180-79.100.
- Koike, Kihachiro: See—  
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.
- Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.
- Koike, Yoshiharu: See—  
Yamada, Hirohide; Sakakibara, Masahiko; and Koike, Yoshiharu, 4,681,813, Cl. 428-450.000.
- Koike, Yuzuru: See—  
Yamato, Akihiro; Koike, Yuzuru; and Futa, Kyoze, 4,681,075, Cl. 123-339.000.
- Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, to Matsushita Electric Industrial Co., Ltd. Method for etching electrode foils for an aluminum electrolytic capacitor. 4,681,672, Cl. 204-129.400.
- Kojima, Kunio: See—  
Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, 4,680,874, Cl. 34-143.000.
- Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atsusi; and Shirotori, Hidefumi, to Kyoritsu Seiki Corporation; and Hitachi Seiki Co., Ltd. Replaceable tool. 4,680,999, Cl. 82-36.00B.
- Koken, Claus, to U.S. Philips Corporation. Logarithmic potentiometer circuit. 4,682,099, Cl. 324-63.000.
- Kokusai Denshin Denwa Kabushiki Kaisha: See—  
Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, 4,682,196, Cl. 357-30.000.
- Kokusai Kinzoku Kogyo Kabushiki Kaisha: See—  
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- Kolanowski, Clarence: See—  
Schneider, Thomas E.; Kolanowski, Clarence; and Patterson, Richard L., 4,680,841, Cl. 29-33.00M.
- Kolb, Richard P.: See—  
Friedle, Dennis J.; Kolb, Richard P.; and Borst, Gaylord M., 4,681,056, Cl. 114-146.000.
- Kolbus GmbH & Co. KG: See—  
Rathert, Horst; Grannemann, Gerhard; and Erdboris, Ulrich, 4,681,500, Cl. 412-33.000.
- Kollmorgen Technologies Corporation: See—  
Murphy, John; McMullin, Francis; Egan, Michael; Byrne, John V.; and Kenneally, Patrick, 4,682,093, Cl. 318-701.000.
- Kolner, Brian H.: See—  
Bloom, David M.; and Kolner, Brian H., 4,681,449, Cl. 356-364.000.
- Komatsu, Shuichi; Shimotori, Kazumi; Takeda, Hiromitsu; and Nakahashi, Masako, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of joining Ni-base heat resisting alloys. 4,681,251, Cl. 228-208.000.
- Komori, Mikio: See—  
Kobayashi, Hideki; Okumoto, Yutaka; and Komori, Mikio, 4,681,505, Cl. 414-744.00R.
- Komura, Fuminobu: See—  
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotsuka, 4,682,300, Cl. 364-571.000.
- Kon, Toshiharu, to Nikkai Kensetsu Kabushiki Kaisha; and O.S.E. Kabushiki Kaisha. Method of stud welding and welding gun used therefor. 4,681,998, Cl. 219-99.000.
- Konda, Ryuji, to Fuji Photo Film Co., Ltd. Solid-state image pickup device with photographic sensitivity characteristics. 4,682,203, Cl. 357-51.000.
- Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiro, to Toyota Jidosha Kabushiki Kaisha. Method for joining a fiber-reinforced plastic structure. 4,681,647, Cl. 156-172.000.
- Kondo, Kenshi, to Nihon Den-Netzu Keiki Co., Ltd. Vapor phase soldering apparatus. 4,681,249, Cl. 228-37.000.
- Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, to Sagami Chemical Research Center. Process for preparing dihalovinylcyclopropanecarboxylates. 4,681,953, Cl. 549-65.000.
- Kondo, Tadashi; and Yabe, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Spring operating mechanism for an electrical switch. 4,681,993, Cl. 200-153.05C.

- Koninklijke Emballage Industrie Van Leer B.V.: See—  
Kerry, Peter R.; and Lewis, Jeffrey L., 4,681,228, Cl. 206-484.000.
- Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, to Nitto Electric Industrial Co., Ltd. Mazda Motor Corporation. Process for fixing alloy powder molding at sintering. 4,681,733, Cl. 419-8.000.
- Konishioku Photo Industry Co., Ltd.: See—  
Machashi, Tatsuichi; Abe, Takao; Koshizuka, Kunihiro; and Inaba, Yoshihiro, 4,681,796, Cl. 428-212.000.
- Konno, Hidetaka: See—  
Leidheiser, Henry, Jr.; and Konno, Hidetaka, 4,681,814, Cl. 428-457.000.
- Konstruktiva Trencin, narodny podnik: See—  
Brychta, Ondrej; and Zabrodsky, Vladimir, 4,681,100, Cl. 128-204.250.
- Kontron Inc.: See—  
Cho, George E. S.; and Kessler, Stephen B., 4,681,092, Cl. 128-1.00D.
- Kooy, Herman. Cabinet for cut-out flowers. 4,680,942, Cl. 62-256.000.
- Kornrumpf, William P.: See—  
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., 4,680,840, Cl. 29-25.350.
- Kornylak, Andrew T., to Omniquet, Inc. Multi-track gravity conveyor. 4,681,203, Cl. 193-35.00R.
- Korthaus, Helmut: See—  
Wilke, Richard; and Korthaus, Helmut, 4,680,982, Cl. 74-424.80R.
- Kosch, Delmar D., to Weldmatic Patents, Inc. Welding wire dispenser. 4,681,277, Cl. 242-156.200.
- Koshizuka, Kunihiro: See—  
Machashi, Tatsuichi; Abe, Takao; Koshizuka, Kunihiro; and Inaba, Yoshihiro, 4,681,796, Cl. 428-212.000.
- Kosmas, Nikolaos. Bobbin in run-out detector, and a bobbin changing mechanism incorporating the detector. 4,681,050, Cl. 112-278.000.
- Koster, William H.: See—  
Slusarchyk, William A.; Dejneka, Tamara; Koster, William H.; and Gordon, Eric M., 4,681,937, Cl. 540-355.000.
- Kosugi, Masao, to Canon Kabushiki Kaisha. Projection exposure apparatus having an alignment light of a wavelength other than that of the exposure light. 4,682,037, Cl. 250-548.000.
- Kosulic, Kenneth F.: See—  
Crandall, Robert E.; Kosulic, Kenneth F.; Rooney, Thomas C.; and Smith, Larry C., 4,681,033, Cl. 100-118.000.
- Kotoh, Keigo; and Nakamura, Nobuhiro, to Mitsubishi Denki Kabushiki Kaisha. Radar responder. 4,682,173, Cl. 342-51.000.
- Kottgen, Eckart U.: See—  
Fabricius, Hans-Ake; and Kottgen, Eckart U., 4,681,844, Cl. 435-68.000.
- Kotwicki, Allan J.: See—  
Henry, Kenneth J.; and Kotwicki, Allan J., 4,680,959, Cl. 73-117.000.
- Kounou, Tadami: See—  
Morishita, Akira; Akai, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.
- Kousek, Heinz: See—  
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- Kovacs, Attila: See—  
Nagy, Zoltan; Hupka, Gyorgy; Szalay, Otto; and Kovacs, Attila, 4,681,531, Cl. 431-181.000.
- Koya, Yoshihiro; and Katayama, Toshiaki, to Mitsubishi Chemical Industries Limited. Method for production of fiber-reinforced metal composite material. 4,681,151, Cl. 164-76.100.
- Koyahara, Satoru: See—  
Takakura, Takashi; Koyahara, Satoru; and Saito, Tetsuo, 4,682,321, Cl. 369-284.000.
- Kramer, Peter B., to Ortho Diagnostic Systems Inc. Fluorescence polarization immunoassay for heavy antigens. 4,681,859, Cl. 436-501.000.
- Kranz, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Apparatus for correcting the flight path of a missile. 4,681,283, Cl. 244-3.220.
- Krautkramer-Branson, Incorporated: See—  
Rost, Manfred, 4,680,967, Cl. 73-628.000.
- Kredo, Theodore A., to Garrett Corporation. The. Lightweight, compact heat exchanger. 4,681,155, Cl. 165-76.000.
- Kreeft, Hendrik K.: See—  
Duurland, Jozef M.; Bos, Sinnighe J.; and Kreeft, Hendrik K., 4,681,280, Cl. 242-199.000.
- Krewalk, John J.; and Silverberg, Eric C., to Bausch & Lomb Incorporated. Telescope control system. 4,682,091, Cl. 318-685.000.
- Krieg, John: See—  
Press, Irving D.; and Krieg, John, 4,681,349, Cl. 285-55.000.
- Krisloff, Steven. Dry sump lubrication system for an internal combustion engine. 4,681,189, Cl. 184-6.130.
- Krivak, Thomas G.: See—  
Johnson, Harlan B.; Krivak, Thomas G.; and Longhini, David A., 4,681,750, Cl. 423-339.000.
- Krix, Wilfried: See—  
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- Kroger, Harry: See—  
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- Kruckenberg, Winfried; Leverenz, Klaus; and Otten, Hans-Gunter, to Bayer Aktiengesellschaft. Benzoisothiazole azo dyestuffs. 4,681,932, Cl. 534-575.000.
- Kruger, Kurt J.; and Miller, Lester, to Dart Industries Inc. Electrical connector system. 4,681,385, Cl. 439-252.000.
- Krupp Polysius AG: See—  
Heinemann, Otto; and Schmits, Heinz-Herbert, 4,681,021, Cl. 91-178.000.
- Krusey, Robert, to Deere & Company. Variable length link for a three-point hitch. 4,681,336, Cl. 280-482.000.
- Kubicek, Donald H.: See—  
Fruthe, Katherine J.; Hopkins, Thomas R.; Hitzman, Donald O.; Kubicek, Donald H.; and Kallenbach, Lyle R., 4,681,758, Cl. 424-78.000.
- Kubo, Isoroku, to Cummins Engine Company, Inc. Gas lubricated piston ring assembly. 4,681,326, Cl. 277-27.000.
- Kubo, Jun, to Nissan Motor Company, Limited. Anti-skid brake control system with operational mode control and method therefor. 4,682,295, Cl. 364-426.000.
- Kubo, Yutaka: See—  
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotsuka, 4,682,300, Cl. 364-571.000.
- Kubota, Kazuhisa; and Yasuda, Shigekazu, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Contact pattern observation apparatus. 4,681,435, Cl. 356-71.000.
- Kubota, Ltd.: See—  
Mouri, Akihiko; and Ikeda, Kazushige, 4,680,929, Cl. 60-368.000.
- Yano, Naomichi; Ito, Hajime; and Tanaka, Shigeru, 4,681,154, Cl. 165-47.000.
- Kubota, Mitsuru; and Amita, Kozo, to Kabushiki Kaisha Toshiba. Apparatus for collecting toll. 4,682,170, Cl. 340-928.000.
- Kubota, Naohiro; and Nishimura, Atsushi, to Adeka Argus Chemical Co., Ltd. Stabilizer compositions for synthetic resins imparting improved light stability. 4,681,905, Cl. 524-91.000.
- Kubota, Yasuhiko: See—  
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- Kuehn, Judson S.: See—  
Bodine, James A.; Kuehn, Judson S.; and Silcox, William H., 4,681,298, Cl. 251-129.100.
- Kuh, Louis M.; and Lampe, Robert C., to Olin Corporation. Water processor having automatic shutoff and bypass means. 4,681,677, Cl. 210-88.000.
- Kuhl, Edward W.: See—  
Bernardino, Lowell W.; Kuhl, Edward W.; Mao, Mark H. K.; and Pancheri, Eugene J., 4,681,704, Cl. 252-546.000.
- Kuhnel, Donald S.; and Ottenstein, Sidney A., to Innovative Controls, Incorporated. High intensity discharge lamp self-adjusting ballast system sensitive to the radiant energy or heat of the lamp. 4,682,084, Cl. 315-307.000.
- Kuhrdt, Gunther, to Licentia Patent-Verwaltungs-GmbH. Antenna system for a flying body for jamming radio transmitting and receiving devices. 4,682,172, Cl. 342-15.000.
- Kukes, Simon G.; and Parrott, Stephen L., to Phillips Petroleum Company. Catalyst for hydrofining of oil and process for preparing the catalyst. 4,681,869, Cl. 502-349.000.
- Kull, Herbert: See—  
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- Kumasaka, Alan J.: See—  
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- Kunert, Heinz; Vanaschen, Luc; and Cornils, Gerd, to Saint-Gobain Vitrage. Adhesive connection between the marginal area of a glass pane and a window frame. 4,681,794, Cl. 428-188.000.
- Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, to Hoffmann-La Roche Inc.; and Takeda Chemical Industries Ltd. Immune interferon and a method for its extraction and purification. 4,681,930, Cl. 530-351.000.
- Kunii, Yutaka, to Kabushiki Kaisha Toshiba. Ultrasonic diagnosing apparatus. 4,681,120, Cl. 128-660.000.
- Kunishi, Shinsuke: See—  
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- Kunz, Peter, to Ludwig Boschert GmbH & Co. KG. Coupling for rotatably connecting a reel with a drive shaft. 4,681,478, Cl. 403-341.000.
- Kuo, Jung-Tsan. Electrical automobile plug. 4,682,139, Cl. 337-186.000.
- Kuppenheimer, John D., Jr., to Sanders Associates, Inc. Multi-lamp laser pumping cavity. 4,682,338, Cl. 372-72.000.
- Kupper, Wilhelm, to W. Schlafhorst & Co. Tube transfer device. 4,681,230, Cl. 209-615.000.
- Kuraray Co., Ltd.: See—  
Kanehira, Koichi; Shiono, Manzo; Fujita, Yoshiji; Nishida, Takashi; and Yamahara, Tohji, 4,681,890, Cl. 514-333.000.
- Kureha Kagaku Kogyo Kabushiki Kaisha: See—  
Endo, Hiroshi; Katoh, Masao; and Hino, Kuniaki, 4,681,764, Cl. 424-125.000.
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- Kurihara, Norimitsu; Ozaki, Masaaki; Goto, Hiroshi; and Asakura, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Suction gas heater control device for engines. 4,681,070, Cl. 123-179.00H.
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- Kuroiwa, Akihiko, to Kabushiki Kaisha Toshiba. Control system for a power converter driving a synchronous motor. 4,682,094, Cl. 318-723.000.
- Kurt Wolf & Co. KG: See—  
Andre, Wolfram K.; and Wolf, Kurt, 4,682,013, Cl. 219-497.000.  
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- Kutsumura, Shoji; and Isonaga, Tsuchi, to Nippon Steel Corp.; and Fujicar Manu. Co. Ltd. Hot coke bucket and bucket car assembly. 4,681,662, Cl. 202-270.000.
- Kuwano, Yukinori: See—  
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- Kuwawasa, Mitsuru: See—  
Ikeda, Yoshiaki; and Kuwasawa, Mitsuru, 4,682,167, Cl. 340-825.230.
- Kyocera Corporation: See—  
Saito, Akira, 4,681,861, Cl. 301-89.000.
- Kyodo Printing Co., Ltd.: See—  
Nakahara, Yoshihiko; Muramatsu, Masao; and Ueno, Kouichi, 4,682,017, Cl. 235-492.000.
- Kyomasa, Mikio, to Ricoh Company Ltd. Input buffer circuit. 4,682,052, Cl. 307-361.000.
- Kyoritsu Seiki Corporation: See—  
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- Kyowa Hakko Kogyo Co., Ltd.: See—  
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- Kyushu Refractories Co., Ltd.: See—  
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; Mitsudoh, Makoto; and Wakabayashi, Yohichi, 4,681,633, Cl. 106-35.000.
- L. & C. Steimmuller GmbH: See—  
Michalak, Stanislaw; Weber, Klaus-Dieter; and Meier, Jürgen, 4,681,746, Cl. 423-239.000.
- L. Schuler GmbH: See—  
Mueller, Sieghard; Braun, Hermann; Dumschat, Helmut; and Trautwein, Hans-Juergen, 4,680,954, Cl. 72-405.000.  
Schneider, Franz; Brautinger, Helmut; and Feinauer, Otto, 4,682,280, Cl. 364-191.000.
- La Telemecanique Electrique: See—  
Belbel, Elie; Bataille, Christian; Blanchard, Christian; Haury, André; and Lauraire, Michel, 4,682,132, Cl. 335-14.000.
- Laboratorio Farmaceutico Lafarma S.A.S.: See—  
Meliello, Gaetano, 4,681,752, Cl. 424-453.000.
- Lacy, Donald D. Attachment for remote control of a plurality of signal monitors. 4,682,164, Cl. 340-825.030.
- Ladet, Michel: See—  
Guillemet, Robert; Ladet, Michel; Laslaz, Gerard; and Le Bars, Claude, 4,681,665, Cl. 204-14.100.
- Lafer, William: See—  
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- Lai, Winston. Collapsible golf cart with one-step folding operation. 4,681,341, Cl. 280-646.000.
- Laine, David J.: See—  
Sloan, George C.; and Laine, David J., 4,680,817, Cl. 4-663.000.
- Lair Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—  
Marhic, Gerard, 4,682,005, Cl. 219-121.0PM.
- Lam, Joseph W.: See—  
Harris, William H.; Klag, James P.; and Lam, Joseph W., 4,681,041, Cl. 105-355.000.
- Lamb, Kenneth V.: See—  
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- Lambrecht, Richard M.: See—  
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- Lampe, Robert C.: See—  
Kuh, Louis M.; and Lampe, Robert C., 4,681,677, Cl. 210-88.000.
- Lance Wire and Cable, Inc.: See—  
Boulanger, Edward, 4,681,386, Cl. 439-347.000.
- Landgraf, Hermann; Schuss, Werner; and Worschischek, Rainer-Karl, to Siemens Aktiengesellschaft. Dental handpiece arrangement. 4,681,540, Cl. 433-126.000.
- Landis, Terry L.: See—  
Conero, Ronald S.; and Landis, Terry L., 4,680,977, Cl. 73-861.410.
- Landreneau, Michael D. Catheter assembly having balloon extended flow path. 4,681,564, Cl. 604-97.000.
- Lange, Gerhard, to WAFIOS Maschinenfabrik GmbH & Co. Kommanditgesellschaft. Process and apparatus for the production of oval chain links from round wire. 4,680,926, Cl. 59-27.000.
- Langen, Jacobus J., to H. J. Langen & Sons Limited. Meat tenderizing needle. 4,680,832, Cl. 17-25.000.
- Lantzsch, Reinhard; Arlt, Dieter; and Jautelat, Manfred, to Bayer Aktiengesellschaft. Intermediates in the preparation of 2,2-dimethyl-3-aryl-cyclopropanecarboxylic acids and esters. 4,681,952, Cl. 549-61.000.
- LaPan, Theodore T. Split vapor/liquid fuel supply system for internal combustion engines. 4,681,081, Cl. 123-522.000.
- Lapcevic, Robert E. Method for rapid obturation of root canals. 4,681,345, Cl. 433-224.000.
- Lapis, Erzsébet: See—  
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo; Kiss, Bela; Laszlovsky, Istvan; and Lapis, Erzsébet, 4,681,887, Cl. 514-284.000.
- Lardner, George E., to Halkey-Roberts Corporation. Check valve with preset cracking pressure. 4,681,132, Cl. 137-271.000.
- Larson, James R.; and Trout, Tarence J., to Du Pont de Nemours, E. I., and Company. Chargeable resins for liquid electrostatic developers comprising partial ester of 3-hydroxypropanesulfonic acid. 4,681,831, Cl. 430-114.000.
- Larson, Lawrence E., to Hughes Aircraft Company. High resolution pipelined digital-to-analog converter. 4,682,149, Cl. 340-347.0DA.
- LaRue, Philip R., to Naphs, Inc. Screwdriver. 4,680,995, Cl. 81-437.000.
- Laser Corporation of America: See—  
Locke, Edward V., 4,682,001, Cl. 219-121.0LC.
- Laskaris, Evangelos T., to General Electric Company. Conical, unimpregnated winding for MR magnets. 4,682,134, Cl. 335-216.000.
- Laslaz, Gerard: See—  
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- La Sota, Bruce W.: See—  
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- Laszlovsky, Istvan: See—  
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- Lattion, Andre: See—  
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- Lauraire, Michel: See—  
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- Laurent, Jean: See—  
Dedole, Pascal; and Laurent, Jean, 4,682,309, Cl. 367-146.000.
- Lay, William C., to Grand Slam, Inc. Ball hitting practice device. 4,681,318, Cl. 273-26.00R.
- Lazarus, Michel, to Thomson CSF. Frequency modulated continuous wave radar and application thereof to a altimetric probe. 4,682,175, Cl. 342-165.000.
- Leacock, James R.: See—  
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- LeaRonald, Inc.: See—  
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Nobel, Fred I.; and Schram, David N., 4,681,670, Cl. 204-44.400.
- Leaseburge, Emory J.; and Melda, Kenneth J., to Combustion Engineering, Inc. Sample dilution system for supercritical fluid chromatography. 4,681,678, Cl. 210-101.000.
- Le Bars, Claude: See—  
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- Le Bescont, Herve: See—  
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- Leblanc, Marie-Christine: See—  
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- Leboutet, Hubert: See—  
Aucouturier, Jeanne; Leboutet, Hubert; and Pourre, Jean-Louis, 4,682,114, Cl. 328-67.000.
- Lechner, Paula. Surgical prep block and surgical assist block. 4,681,309, Cl. 269-328.000.
- Leclerc, Henry R.: See—  
d'Agostino, Guy; Dhainaut, Andre; Kettler, Daniel G. A.; and Leclerc, Henry R., 4,681,327, Cl. 277-29.000.
- Ledbetter, Frank E., III: See—  
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- Ledermann, Donald L.; and Otten, Ronald L., to J. I. Case Company. Center pivot hitch assembly. 4,681,335, Cl. 280-446.00R.
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- Lee, David L.; and Michael, William J., to Stauffer Chemical Company. Herbicidal 2-(2-substituted benzoyl)-1,3-cyclopentanediones. 4,681,621, Cl. 71-103.000.
- Lee, Joseph K. S.: See—  
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- Lefler, Harold V., III, to Dow Corning Corporation. Adhesion of silicone elastomer to polyurethane. 4,681,808, Cl. 428-425.500.
- Le Galle, Didier: See—  
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- Legg, Gene A., to Alcan Aluminum Corporation. Method of setting up rotary splitter tooling. 4,680,851, Cl. 29-433.000.
- Lehigh University: See—  
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- Leidel, Dieter S.; Eirich, Hubert; Eirich, Paul; and Eirich, Walter. Method of regenerating old casting sand. 4,681,267, Cl. 241-23.000.
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- Leisman, Thomas; and Huston, Jon, to Dynavac, Inc. Escape chute. 4,681,186, Cl. 182-47.000.
- Leland Stanford Junior University, The Board of Trustees of the: See—  
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- Lem S.A.: See—  
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- Lembke, Herbert, to Mannesmann Rexroth GmbH. Control motor for a servo valve. 4,682,063, Cl. 310-29.000.
- Lemelson, Jerome H. Contact lens containing light sensitive material. 4,681,412, Cl. 351-162.000.
- Lemelson, Jerome H. Audio visual apparatus and method. 4,681,548, Cl. 434-311.000.
- Le Meur, Jean-Paul: See—  
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- Lenk, Erich, to Barmag AG. Melt spinning apparatus. 4,681,522, Cl. 425-72.00S.
- Leonard, Daniel F. Auxiliary dumping apparatus for vehicles. 4,681,371, Cl. 298-1.00A.
- Leonard, George H., to Airport Corporation. Socket construction for torsion member. 4,681,307, Cl. 267-154.000.
- Leonard, Paul A. Cooling apparatus for a gas transmission system. 4,681,156, Cl. 165-124.000.
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Lodge, Rudolf; Leonhard, Bernhard; and Stille, Volker, 4,681,211, Cl. 198-789.000.
- Leslie, James B., to Rodime PLC. Servo positioning system for disk drive system. 4,682,253, Cl. 360-77.000.
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Richmond, Carl T.; and Lester, Joseph O., 4,682,174, Cl. 342-160.000.
- Letinski, John S., to Celanese Corporation. Process for the preparation of polybenzimidazole foams. 4,681,716, Cl. 264-53.000.
- Leverenz, Klaus: See—  
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- Levin, Herman W.: See—  
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- Lewis, Jeffrey L.: See—  
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- Lewis, Larry N., to General Electric Company. Hydrosilylation catalyst, method for making and use. 4,681,963, Cl. 556-453.000.
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- Li, George S.: See—  
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- Lieptz, Nathan S. Flexible gun-bore cleaning implement with rotatable pusher end. 4,680,824, Cl. 15-104.165.
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- Lilliston, William E., Jr.: See—  
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- Lilliston, William E., Sr.; and Lilliston, William E., Jr., to Lilliston, William E., Jr. Mobile fan for poultry farming. 4,681,064, Cl. 119-21.000.
- Lillquist, Robert D.: See—  
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- Limanov, Esengali L.: See—  
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- Lindemann, Gertrud: See—  
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- Lindlau, Paul F.: See—  
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- Lindner, Harald: See—  
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- Lindstol, Eva, administratrix: See—  
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- Linman, E. Kelly; Curro, John J.; and Weinschenker, Eugene, to Procter & Gamble Company, The. Non-occluding, liquid-impervious, composite backsheet for absorptive devices. 4,681,793, Cl. 428-138.000.
- Lintott, Edward R., to Lucas Industries public limited company. Winding method. 4,680,857, Cl. 29-596.000.
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- Lipscher, Ervin: See—  
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- Liska, Frank T.: See—  
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- Little, Warren E.: See—  
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- Liu, Leland L., to Mobil Oil Corporation. Pigmented, heat-sealable coating composition for application to oriented polyolefin films. 4,681,803, Cl. 428-348.000.
- Livingston, Peter M.; and Shelton, Jean C., to TRW Inc. Active mirror wavefront sensor. 4,682,025, Cl. 250-201.000.
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- Lobanoff, Mark, to Irvin Industries, Inc. Vanity mirror or vehicle accessory assembly and mounting apparatus therefor. 4,681,366, Cl. 297-191.000.
- Lockard, Joseph L., to AMP Incorporated. Electrical connector for transmission cable. 4,681,382, Cl. 439-92.000.
- Locke, Edward V., to Laser Corporation of America. Multi-lead laser soldering apparatus. 4,682,001, Cl. 219-121.0LC.
- Lockheed Corporation: See—  
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- Farley, Harold C.; and Boles, Robert G., 4,681,013, Cl. 89-1.815.
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- Lockheed Missiles & Space Company, Inc.: See—  
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- Lockyer, George D.: See—  
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- Lodispoto, Alberto, to Minonzio, Luigi; and Verzilli, Giovanni, a part interest to each. Wooden-shoe to treat hyperlordosis and lipodystrophy located in the thighs and glutei. 4,681,114, Cl. 128-581.000.
- Loffler, Gerhard: See—  
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- Lonza Ltd.: See—  
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- Loper, Roger K.; and Freeman, Richard A., to Rockwell International Corporation. Digital voice and data frequency modulation circuit. 4,682,123, Cl. 332-16.00R.
- Lopes, William J.; and Klosowski, Jerome M., to Dow Corning Corporation. Multiple release mold coating. 4,681,714, Cl. 264-46.600.
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- Lottspeich, Friedrich: See—
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- Lovesky, Roy L.: See—
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- Low, Lothar: See—
- Baumgart, Rudolf; Martin, Manfred; Low, Lothar; and Scheven, Gunter, 4,681,720, Cl. 264-150.000.
- Low, Sidney. Method and apparatus for sterilizing objects. 4,681,738, Cl. 422-28.000.
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- Lintott, Edward R., 4,680,857, Cl. 29-596.000.
- Ludikhuize, Adrianus W., to U.S. Philips Corporation. Semiconductor device. 4,682,205, Cl. 357-53.000.
- Ludwig Boschert GmbH & Co. KG: See—
- Kunz, Peter, 4,681,478, Cl. 403-341.000.
- Ludwig, Jurgen: See—
- Obermeier, Rainer; Salomon, Ingeborg; and Ludwig, Jurgen, 4,681,931, Cl. 530-351.000.
- Luk Lamellen und Kupplungsbau GmbH: See—
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- Maucher, Paul; and Friedmann, Oswald, 4,681,199, Cl. 192-70.230.
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- Menzel, Waldemar, 4,680,944, Cl. 62-342.000.
- Lund, Eric W.; and Young, Raymond W., to Amity Leather Products Company. Article with electric timepiece. 4,682,310, Cl. 368-278.000.
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Halldorsson, Thorsteinn; and Seifarth, Ernst A., 4,682,024, Cl. 250-225.000.

Kranz, Walter, 4,681,283, Cl. 244-3.220.

Sodeikat, Dieter, 4,680,968, Cl. 73-651.000.

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Vesua, Jacques; and Derrien, Michel, 4,681,284, Cl. 244-102.00R.

Metzeler Kautschuk GmbH; See—  
Hofmann, Manfred; Müller, Hans; and Waldecker, Ralf, 4,681,306, Cl. 267-140.100.

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Duc, Michel; Montreuil, Philippe; and Meuleman, Jean-Jacques, 4,682,294, Cl. 364-492.000.

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Burke, Hubert K.; and Michon, Gerald J., 4,681,440, Cl. 356-218.000.

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Hellman, Nat, III, 4,681,378, Cl. 312-108.000.

Microdot Inc.; See—  
Berecz, Imre, 4,681,497, Cl. 411-377.000.

Microelectronics and Computer Technology Corporation; See—  
Potter, Curtis N., 4,681,655, Cl. 156-632.000.

Potter, Curtis N.; and Kroger, Harry, 4,681,666, Cl. 204-15.000.

Midorikawa, Akira; See—  
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Midorikawa, Mitsuhiro; See—  
Utsumi, Kazuaki; Ochi, Atsushi; Suzuki, Masanori; and Midorikawa, Mitsuhiro, 4,681,667, Cl. 204-15.000.

Mietzner, Timothy A.; and Morse, Stephen A., to State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University. Major iron-regulated protein of *Neisseria gonorrhoeae* and its use as vaccine. 4,681,761, Cl. 424-92.000.

Mifune, Hiroyuki; Shihido, Tadao; and Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion and process for production thereof. 4,681,838, Cl. 430-367.000.

Migliore, Neil. Method of installing marble panels. 4,680,914, Cl. 52-747.000.

Miguchi, Akio; See—  
Tamba, Shinichi; Miyake Hitomi; Fukui Noboru; and Miguchi, Akio, 4,681,067, Cl. 123-41.100.

Miki, Toshiyuki; Tomioka, Kunio; Nakajima, Masao; and Sakurai, Terushige, to Kabushiki Kaisha Komatsu Seisakusho; and Aoki Corporation. Apparatus for feeding bars through a bending or like processing station. 4,681,210, Cl. 198-468.200.

Miki, Yukio; See—  
Taniguchi, Toshihiko; and Miki, Yukio, 4,682,273, Cl. 362-18.000.

Mikiya, Toshio; Kaneko, Minoru; and Kazama, Yasuo, to Nitto Kohki Co., Ltd. Cushioning device for use with a pneumatic impact tool or the like. 4,681,172, Cl. 173-139.000.

Mikropul Corporation; See—  
Heidinger, Alfred J.; and Duyckinek, Robert W., 4,681,676, Cl. 209-380.000.

Mikuni, Hajime; See—  
Ando, Noriyoshi; Mikuni, Hajime; Matsunaga, Mitsuru; Horie, Naoki; and Kishigami, Tomohisa, 4,682,228, Cl. 358-161.000.

Milberger, Walter E.; Cohen, Joel R.; and Dubrowsky, Leonard, to United States of America, Air Force. Electromagnet for programmable microwave circulator. 4,682,126, Cl. 333-81.00B.

Milkovic, Miran, to General Electric Company. Solid state watt-hour meter with switched-capacitor integration. 4,682,102, Cl. 324-142.000.

Millauer, Wolfgang; and Raab, Dieter, to Hilti Aktiengesellschaft. Process of forming openings. 4,681,489, Cl. 408-1.00R.

Miller, David, to Delta International Machinery Corp. Blade tensioning device for scroll saw. 4,681,006, Cl. 83-782.000.

Miller, Donald E., to Brazeway, Inc. Method of manufacturing lateral header extensions. 4,680,845, Cl. 29-157.00R.

Miller, Jack E., to Harry Major Machine & Tool Co. Accumulating conveyor. 4,681,212, Cl. 198-803.200.

Miller, Jack V. Low voltage lighting fixture with integral thermally controlled coaxial transformer. 4,682,276, Cl. 362-294.000.

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Kruger, Kurt J.; and Miller, Lester, 4,681,385, Cl. 439-252.000.

Miller, Ralph; Bollini, Jakob L.; and Schneider, Robert, to Ciba-Geigy Corporation. Production of sulfonated amines. 4,681,710, Cl. 260-508.000.

Miller, Robert L.; See—  
Fenton, Paul V., Jr.; Miller, Robert L.; and Santin, Ernest M., 4,681,566, Cl. 604-135.000.

Millham, Ernest H., to International Business Machines Corporation. Hierarchical test system architecture. 4,682,330, Cl. 371-20.000.

Mimasu, Takeo; and Torii, Kuniyoshi, to Rilis Kagaku Kogyo Kabushiki Kaisha. Deodorant compositions containing persimmon juice as active ingredient. 4,681,757, Cl. 424-47.000.

Mimoto, Osamu; See—  
Oba, Harutaro; Ozawa, Yasuhiko; Yamaguchi, Yasuyoshi; and Mimoto, Osamu, 4,681,422, Cl. 355-3.00R.

Mimura, Nobuharu; See—  
Hasegawa, Junzo; Kawabata, Susumu; and Mimura, Nobuharu, 4,681,492, Cl. 409-231.000.

Minakawa, Takao; Shiono, Shigeo; and Nishihaashi, Junichi, to Sasaki Glass Co., Ltd. Laser beam glass cutting. 4,682,003, Cl. 219-121.0LN.

Minch, Morris L.; and Wagner, Theodore W., to Siemens Corporation. Apparatus for transmitting and/or receiving balanced signals on a two-wire telecommunication line. 4,682,356, Cl. 379-347.000.

Minigrip, Incorporated; See—  
Ausnit, Steven; and Bentsen, Per, 4,682,366, Cl. 383-65.000.

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Ooka, Akihiro; Okamoto, Kenji; and Yamada, Koji, 4,680,818, Cl. 5-81.00R.

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Eian, Gilbert; and Cheney, Paul G., 4,681,801, Cl. 428-283.000.

Fong, James J., 4,681,790, Cl. 428-96.000.

Helland, Randall H.; and Burton, Craig A., 4,681,830, Cl. 430-110.000.

Matkan, Josef; and Treleven, Richard J., 4,681,806, Cl. 428-402.210.

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Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, 4,681,825, Cl. 430-57.000.

Taniguchi, Toshihiko; and Miki, Yukio, 4,682,273, Cl. 362-18.000.

Minonzio, Luigi; See—  
Lodispoto, Alberto, 4,681,114, Cl. 128-581.000.

Mirzadeh, Saeed; and Lambrecht, Richard M., to United States of America, Energy. Process for producing astatine-211 for radiopharmaceutical use. 4,681,727, Cl. 376-198.000.

Misawa, Rintaro, to Sunwa Sharyo Manufacturing Co., Ltd. Hand truck. 4,681,330, Cl. 280-47.200.

Mischenko, Nicholas, to Motorola, Inc. Flex-lock dovetail mounting apparatus for radio transceivers and accessories. 4,681,476, Cl. 403-42.000.

Mishima, Tadaaki; See—  
Orita, Miyahiko; Kobayashi, Yoshiaki; and Mishima, Tadaaki, 4,682,365, Cl. 382-14.000.

Mistry, Kantilal, to Blonder-Tongue Laboratories, Inc. Television picture and sound scrambler and method. 4,682,359, Cl. 380-7.000.

Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, to Hitachi, Ltd. Apparatus for regenerating original signals. 4,682,115, Cl. 328-164.000.

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Mitchell, Robert C.; See—  
Brown, Thomas H.; Mitchell, Robert C.; Smith, Ian R.; and Young, Rodney C., 4,681,883, Cl. 514-212.000.

Mitel Corporation; See—  
Ramsay, John R.; and Styrna, Zbigniew B., 4,682,328, Cl. 371-13.000.

Mitsubishi Chemical Industries Limited; See—  
Koya, Yoshihiro; and Katayama, Toshiaki, 4,681,151, Cl. 164-76.100.

Mitsubishi Denki Kabushiki Kaisha; See—  
Goto, Shigeru; Asano, Masaru; Ishida, Matsuhiko; and Inoue, Shosaku, 4,681,207, Cl. 198-333.000.

Ikejima, Hiroyuki, 4,681,191, Cl. 187-119.000.

Irino, Eisuro, 4,682,357, Cl. 379-356.000.

Kondo, Tadashi; and Yabe, Kiyoshi, 4,681,993, Cl. 200-153.05C.

Kotoh, Keigo; and Nakamura, Nobuhiko, 4,682,173, Cl. 342-51.000.

Morishita, Akira; Akai, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.

Murai, Takashi, 4,680,935, Cl. 62-45.000.

Ochiai, Hajime; and Morihara, Kenji, 4,682,144, Cl. 340-48.000.

Onishi, Ken; and Sugiyama, Yasuo, 4,682,333, Cl. 371-39.000.

Sugita, Kazuhiko, 4,681,206, Cl. 198-328.000.

Toshiaki, Ishii, 4,681,190, Cl. 187-101.000.

Uetani, Kenichi, 4,682,342, Cl. 375-38.000.

Wakayama, Naoki; Yamagishi, Hideaki; Fukakusa, Shinji; and Tomoda, Toshimasa, 4,682,036, Cl. 250-374.000.

Yasuda, Kazuo; Ando, Toshiharu; Itabashi, Yoshifumi; and Tsuchihashi, Masaru, 4,681,904, Cl. 523-457.000.

Yoshida, Susumu, 4,681,982, Cl. 136-249.000.

Mitsubishi Gas Chemical Company, Inc.; See—  
Umamura, Toshiyuki; Masumoto, Isamu; and Iha, Yukihiro, 4,681,927, Cl. 528-232.000.

Mitsubishi Jukogyo Kabushiki Kaisha; See—  
Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, 4,680,874, Cl. 34-143.000.

Watabe, Shin, 4,682,279, Cl. 364-141.000.

Mitsubishi Kinzoku Kabushiki Kaisha; See—  
Mae, Yoshiharu; and Oka, Tsutomu, 4,681,627, Cl. 75-10.190.

Mitsubishi Monsanto Chemical Company; See—  
Hasegawa, Ryuichi; and Hayashi, Kohji, 4,681,975, Cl. 560-90.000.

Mitsubishi Yuka Badische Co., Ltd.; See—  
Maeda, Atsushi, 4,681,648, Cl. 156-210.000.

Mitsudoh, Makoto; See—  
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; Mitsudoh, Makoto; and Wakabayashi, Yoh'ichi, 4,681,633, Cl. 106-35.000.

Mitsui, Akio; and Ohta, Noboru, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,681,837, Cl. 430-504.000.

Mitsui Petrochemical Industries, Ltd.; See—  
Hashimoto, Mikio; Nakata, Yoshinari; and Koga, Hitoshi, 4,681,816, Cl. 428-463.000.

Mitsumoto, Kinya; See—  
Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, 4,682,200, Cl. 357-41.000.

Miyagi, Morio; Ohno, Makoto; and Kanaizumi, Masaru, to Toyo Boseki Kabushiki Kaisha. Method of making a hollow fiber membrane for dialysis. 4,681,713, Cl. 264-41.000.

Miyake Hitomi; See—  
Tamba, Shinichi; Miyake Hitomi; Fukui Noboru; and Miguchi, Akio, 4,681,067, Cl. 123-41.100.

Miyake, Kazunari, to Sharp Kabushiki Kaisha. Disk storing system for disk player. 4,682,313, Cl. 369-39.000.

Miyake, Shinichi; See—  
Ueba, Yoshinobu; and Miyake, Shinichi, 4,681,400, Cl. 350-96.340.

Miyashita, Satoru; See—  
Tokii, Motoyuki; Kanbe, Sadao; Miyashita, Satoru; and Takeuchi, Tetsuhiko, 4,681,615, Cl. 65-18.100.

Miyawaki, Motohisa, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the transmission ratio in an infinitely variable transmission. 4,680,991, Cl. 74-868.000.

Mizuno, Hirotaka; See—  
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotaka, 4,682,300, Cl. 364-571.000.

Mizuno, Tiaki; See—  
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.

Mizuno, Tooru; Oosugi, Keizi; Esaki, Motoharu; and Ogawa, Takao, to Nippondenso Co., Ltd. Electronic odometer. 4,682,287, Cl. 364-661.000.

Mizusawa Industrial Chemicals, Ltd.; See—  
Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, 4,681,749, Cl. 423-326.000.

Mobil Oil Corporation; See—  
Benoit, Gordon L.; and Boyd, Dana M., 4,681,721, Cl. 264-169.000.

Graven, Richard G.; and Zahner, John C., 4,681,674, Cl. 208-59.000.

Horodysky, Andrew G., 4,681,692, Cl. 252-32.500.

Liu, Leland L., 4,681,803, Cl. 428-348.000.

Pennison, Harold P., 4,681,158, Cl. 166-77.500.

Mochizuki, Takashi; See—  
Fukushima, Shoji; Kato, Motosaburo; Mochizuki, Takashi; and Wada, Yukio, 4,681,645, Cl. 156-73.100.

ModuForm, Inc.; See—  
Gavin, F. Paul; Brigham, David F.; and Gavin, Ann H., 4,681,901, Cl. 521-54.000.

Moeller, Matthias, to Siemens Aktiengesellschaft. Solar cell comprising a semiconductor body formed of amorphous silicon and having a layer sequence p-SiC/i-n. 4,681,984, Cl. 136-258.00



Monogram Industries, Inc.: See—  
Pratt, John D.; and Belanger, Victor, 4,681,494, Cl. 411-54.000.  
Monroy, Enrique A., to Dentsply Research & Development Corp. Rapid denture technique. 4,681,543, Cl. 433-196.000.  
Monsanto Company: See—  
Gomez, I. Luis, 4,681,810, Cl. 428-429.000.  
Monsell, Kurt, to Acme Electric Corporation. Battery charger spark suppressor. 4,682,262, Cl. 361-6.000.  
Montres Rado S.A.: See—  
Gogniat, Paul, 4,681,461, Cl. 368-69.000.  
Montreuil, Philippe: See—  
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Moog, Inc.: See—  
Tillman, Alfred J., 4,681,135, Cl. 137-489.500.  
Moore, Alix A.: See—  
McGovern, Lore H.; and Moore, Alix A., 4,681,573, Cl. 604-329.000.  
Moore, Benjamin N.: See—  
Drapeau, Donald F.; Moore, Benjamin N.; and Hall, Henry B., 4,682,010, Cl. 219-381.000.  
Moos, Hans J.: See—  
Simonsen, Jens K.; and Moos, Hans J., 4,680,974, Cl. 73-861.380.  
Moore Industries, Inc.: See—  
Boneta, Louis, 4,680,880, Cl. 37-236.000.  
Moralez, Christopher M.: See—  
Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.  
Moran, Michael J.; and Kemnitz, Tadeusz, to 501 USM Corporation. Product handling and weighing apparatus. 4,681,176, Cl. 177-114.000.  
Morelli, Thomas A.: See—  
Abolins, Visvaldis; and Morelli, Thomas A., 4,681,906, Cl. 524-166.000.  
Mori, Akira: See—  
Amazawa, Kiyoshi; and Mori, Akira, 4,682,045, Cl. 307-123.000.  
Mori, Shojiro, to Kabushiki Kaisha Toshiba. Logic circuit with self-test. 4,682,331, Cl. 371-25.000.  
Mori, Yasushi, to Nissan Motor Co., Ltd. Control for shock-free shift in an automatic transmission. 4,680,988, Cl. 74-866.000.  
Moriwara, Kenji: See—  
Ochiai, Hajime; and Morihara, Kenji, 4,682,144, Cl. 340-48.000.  
Morikane, Hiroyuki: See—  
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Morikawa, Shigenori; Hanzawa, Kohtarō; Sasaki, Hiroyuki; and Morokuma, Hiroshi, to Casio Computer Co., Ltd. Tone information processing device for an electronic musical instrument. 4,681,008, Cl. 84-1.280.  
Morikubo, Kunio: See—  
Nagasawa, Kohtarō; and Morikubo, Kunio, 4,681,833, Cl. 430-175.000.  
Morimoto, Yoshihiko, to Fuji Jukogyo Kabushiki Kaisha. Control system for an infinitely variable transmission. 4,680,987, Cl. 74-866.000.  
Morishige, Yuji: See—  
Takeuchi, Kunihiko; Baba, Fujio; Shimomura, Yasuo; and Morishige, Yuji, 4,682,166, Cl. 340-825.500.  
Morishima, Hideki: See—  
Nakamura, Norihiko; Morishima, Hideki; and Yamaguchi, Yoshito, 4,681,465, Cl. 368-246.000.  
Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, to Mitsubishi Denki Kabushiki Kaisha. Planetary gear starter. 4,680,979, Cl. 74-7.00E.  
Morishita, Tsuyoshi: See—  
Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, 4,681,733, Cl. 419-8.000.  
Morita, Akiyoshi: See—  
Nonoyama, Hideo; Fukuizumi, Toshiharu; and Morita, Akiyoshi, 4,681,642, Cl. 148-321.000.  
Moriya, Masamichi: See—  
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.  
Moriyama, Jiro: See—  
Sasaki, Takashi; Sakurada, Nobuaki; Kawamura, Hideaki; and Moriyama, Jiro, 4,682,216, Cl. 358-79.000.  
Morokuma, Hiroshi: See—  
Morikawa, Shigenori; Hanzawa, Kohtarō; Sasaki, Hiroyuki; and Morokuma, Hiroshi, 4,681,008, Cl. 84-1.280.  
Morris, Richard S. Aquatic device. 4,681,551, Cl. 441-76.000.  
Morse, Stephen A.: See—  
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Morton, Randall E.: See—  
Lindsay, Thomas A.; and Morton, Randall E., 4,681,395, Cl. 350-96.160.  
Morton Thiolol, Inc.: See—  
Mesch, Keith A.; and Conroy, Gary M., 4,681,907, Cl. 524-180.000.  
Mosimann, Walter: See—  
Back, Gerhard; and Mosimann, Walter, 4,681,596, Cl. 8-620.000.

Motokawa, Isamu: See—  
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.  
Motorola, Inc.: See—  
Cronkrite, Paul W.; Bosley, Bruce C.; Jones, James H.; and Patel, Asit G., 4,680,893, Cl. 51-5.00R.  
Davis, Walter L., 4,682,165, Cl. 340-825.500.  
May, Colin J., 4,682,131, Cl. 333-202.000.  
McLaughlin, Kevin L., 4,682,054, Cl. 307-446.000.  
Mischenko, Nicholas, 4,681,476, Cl. 403-42.000.  
Richmond, Carl T.; and Lester, Joseph O., 4,682,174, Cl. 342-160.000.  
Williams, Tim A., 4,682,302, Cl. 364-768.000.  
Mouche, Richard J.; and Song, Peter, to Nalco Chemical Company. Use of alkali metal uirites to inhibit H<sub>2</sub>S formation in flue gas desulfurization system sludges. 4,681,687, Cl. 210-764.000.  
Mouradian, James T. Neck apparatus for stringed musical instruments. 4,681,009, Cl. 84-293.000.  
Mouri, Akihiko; and Ikeda, Kazushige, to Kabota, Ltd. Swivelling working vehicle. 4,680,929, Cl. 60-368.000.  
Mowry, William H., Jr., to Standard Register Co., The. Financial document protection. 4,681,348, Cl. 283-58.000.  
Moy, Jean P., to Thomson-CSF. Process for the temperature compensation of a photoconducting detector. 4,682,018, Cl. 250-211.00R.  
Moyer, William D., to Automation Associates, Inc. Multiple part simultaneous forming apparatus. 4,680,842, Cl. 29-33.00P.  
Muchowski, Joseph M.: See—  
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,681,889, Cl. 514-307.000.  
Mueller, Richard A., to O. D. Searle & Co. 8-chlorodibenz[b,f][1,4]oxazepine-10-(11H)-carboxylic acid, 2-[(phenylthio)alkenyl]hydrazides. 4,681,939, Cl. 540-547.000.  
Mueller, Sieghard; Braun, Hermann; Dumschat, Helmut; and Trautwein, Hans-Juergen, to L. Schuler GmbH. Gripping devices in idling stage areas of a transfer press. 4,680,954, Cl. 72-405.000.  
Mueller, William H., to UOP Inc. Increased glucose levels in starch saccharification using immobilized amyloglucosidase. 4,681,845, Cl. 435-96.000.  
Muhlhaus, Ludwig: See—  
Schwarz, Hans-Dieter; Pietzarka, Friedrich W.; Lichtenthaler, Werner; and Muhlhaus, Ludwig, 4,681,157, Cl. 165-145.000.  
Mulflur, W. Joseph; and Munson, James R., to Reagent Chemical & Research Company. Treatment of cooking oils and fats. 4,681,768, Cl. 426-417.000.  
Muller, Adam; and Goller, Ernst, to H. Stoll GmbH & Co. Flat-bed knitting machine having a spool table. 4,680,946, Cl. 66-64.000.  
Muller, Hans: See—  
Hofmann, Manfred; Muller, Hans; and Waldecker, Ralf, 4,681,306, Cl. 267-140.100.  
Muller, Hans-Martin, to Robert Bosch GmbH. Electronically controlled fuel injection system for an internal combustion engine. 4,681,076, Cl. 123-488.000.  
Mullins, Ronald L.: See—  
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Mundo, Charles J., Jr.: See—  
Sims, John C., deceased; and Mundo, Charles J., Jr., 4,681,431, Cl. 356-4.000.  
Munnell, Jeffrey C.: See—  
Smith, Forrest P., Jr.; and Munnell, Jeffrey C., 4,680,884, Cl. 42-66.000.  
Munson, James R.: See—  
Mulflur, W. Joseph; and Munson, James R., 4,681,768, Cl. 426-417.000.  
Munson, Joel V.: See—  
Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., 4,681,654, Cl. 156-630.000.  
Murai, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Cryogenic container. 4,680,935, Cl. 62-45.000.  
Murakawa, Takashi: See—  
Katsuno, Hisashi; Murakawa, Takashi; and Yoneda, Toshikazu, 4,681,865, Cl. 502-74.000.  
Muramatsu, Masao: See—  
Nakahara, Yoshihiko; Muramatsu, Masao; and Ueno, Kouichi, 4,682,017, Cl. 235-492.000.  
Murari, Bruno: See—  
Villa, Flavio; Murari, Bruno; Bertotti, Franco; Torazzina, Aldo; and Stefani, Fabrizio, 4,682,197, Cl. 357-36.000.  
Murata Kikai Kabushiki Kaisha: See—  
Matsui, Isamu; Uchida, Hiroshi; Otoshima, Hiroo; Kubota, Yasuhiko; and Masai, Tetsuji, 4,681,271, Cl. 242-18.00R.  
Ueda, Yutaka; and Kiriake, Masaharu, 4,681,231, Cl. 209-656.000.  
Murata, Syuuji: See—  
Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.  
Murkens, David. Cylindrical square. 4,680,869, Cl. 33-533.000.  
Murphy, John; McMullin, Francis; Egan, Michael; Byrne, John V.; and Kenneally, Patrick, to Kollmorgen Technologies Corporation. Power supply systems for inductive elements. 4,682,093, Cl. 318-701.000.  
Murphy, Robert H.: See—  
Chickanosky, John J.; Courtney, Jack W.; and Murphy, Robert H., 4,681,221, Cl. 206-328.000.

Murray, Alan: See—  
Pendleton, Eric; Roberts, Karl A.; and Murray, Alan, 4,681,729, Cl. 376-247.000.  
Murray, Charles R.; and Harrison, Ray E., to C-I-L Inc. Shipping bag. 4,681,781, Cl. 428-35.000.  
Murray, William V.; and Wachter, Michael P., to Ortho Pharmaceutical Corporation. Hydroxamic acids and esters. 4,681,894, Cl. 514-507.000.  
Musser, John H.; and Bender, Reinhold H. W., to American Home Products Corporation. 5-[3-[[2-quinolyl]methoxy]phenyl]-1,3-oxazoles. 4,681,940, Cl. 546-174.000.  
Mussmann, Sara M.; and Kidd, Roy E., to Emhart Industries, Inc. Polar fluid detection system unaffected by power line voltages. 4,682,157, Cl. 340-605.000.  
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pivaloyloxymethyl 7-β-(2-amino-4-thiazolyl)-2-methoxyiminoacetamido]-3-(2-amino-1,3-thiadiazolyl-5-thiomethyl)-3-cephem-4-carboxylate and pharmaceutical composition containing the same. 4,681,877, Cl. 514-206.000.  
Mutschler, Edward C., Jr.: See—  
Elchinger, Gilbert M.; Mutschler, Edward C., Jr.; and Behun, Eugene, 4,682,183, Cl. 346-75.000.  
MWL Tool Company: See—  
Allwin, Roger P.; and Budke, Mark, 4,681,159, Cl. 166-124.000.  
Nabeyama, Takatoshi; and Sakita, Eiichi, to Citizen Watch Co., Ltd. Apparatus for displaying astrological information. 4,681,459, Cl. 368-16.000.  
Nachtigal, Joachim: See—  
Bozung, Hanns-Gunther; and Nachtigal, Joachim, 4,680,933, Cl. 60-608.000.  
Nadelson, Jeffrey, to Sandoz Pharmaceuticals Corp. N-N-disubstituted alkenamides and phenylalkenamides. 4,681,898, Cl. 514-619.000.  
Nagasawa, Kohtarō; and Morikubo, Kunio, to Somar Corporation. Light-sensitive negative working composition with diazonium condensate, epoxy resin, and combination of polymers with acrylic groups. 4,681,833, Cl. 430-175.000.  
Nagashima, Akira, to Kioritz Corporation. Silencing filter. 4,681,608, Cl. 55-276.000.  
Nagashima, Akira: See—  
Takaki, Takanobu; and Nagashima, Akira, 4,681,188, Cl. 181-229.000.  
Nagashima, Yoshihisa: See—  
Sakakibara, Takao; Toyota, Tsunehiko; and Nagashima, Yoshihisa, 4,681,712, Cl. 264-24.000.  
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, to Omron Tateisi Electronics Co. High precision and compact contact switch. 4,681,994, Cl. 200-16.00B.  
Nagayama, Susumu: See—  
Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, 4,680,855, Cl. 29-583.000.  
Nagel, Colin M.: See—  
Heath, Robert B.; and Nagel, Colin M., 4,681,368, Cl. 297-250.000.  
Nagy, Zoltan; Hupka, Gyorgy; Szalay, Otto; and Kovacs, Attila, to Magyar Asvanyolaj es Foldgaz Kiserleti. Process and equipment for the thermic conversion of the components of gas currents contaminating the environment. 4,681,531, Cl. 431-181.000.  
Naipally, Saiprasad V., to North American Philips Consumer Electronics Corp. Video noise reduction in picture-in-picture television receiver. 4,682,234, Cl. 358-183.000.  
Naito, Hideshi; Kodaka, Yoshiro; and Shiokama, Yoshiharu, to Nippon Kogaku K. K. Zoom lens assembly. 4,681,406, Cl. 350-429.000.  
Naito, Masayoshi: See—  
Yatsuo, Tsutomu; Momma, Naohiro; Naito, Masayoshi; and Okamura, Masahiro, 4,682,199, Cl. 357-38.000.  
Najjar, Mitri S.: See—  
Vasconcellos, Stephen R.; Najjar, Mitri S.; and Garcia, Ralph, 4,681,700, Cl. 252-373.000.  
Nakagaki, Harushige; Iso, Yoshimi; and Inoue, Shigeki, to Hitachi, Ltd. Disc playback apparatus. 4,682,314, Cl. 369-44.000.  
Nakagawa, Kiyohara: See—  
Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.  
Nakagawa, Taiichi: See—  
Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.  
Nakahara, Yoshihiko; Muramatsu, Masao; and Ueno, Kouichi, to Kyodo Printing Co., Ltd. Shock-resistant integrated circuit card. 4,682,017, Cl. 235-492.000.  
Nakahashi, Masako: See—  
Komatsu, Shuichi; Shimotori, Kazumi; Takeda, Hiromitsu; and Nakahashi, Masako, 4,681,251, Cl. 228-208.000.  
Nakajima, Masao: See—  
Miki, Toshiyuki; Tomioka, Kunio; Nakajima, Masao; and Sakurai, Terushige, 4,681,210, Cl. 198-468.200.  
Nakajima, Nobuyoshi: See—  
Tanaka, Hiroshi; and Nakajima, Nobuyoshi, 4,682,028, Cl. 250-127.200.  
Nakajima, Yoshinori, to Ricoh Company, Ltd. Bidirectional serial printer. 4,681,470, Cl. 400-323.000.  
Nakamichi, Yuji: See—  
Yamazaki, Iwao; Nakamichi, Yuji; Abe, Keizo; and Okudera, Tatsuya, 4,682,221, Cl. 358-107.000.  
Nakamura, Daijuro, to SM Industrial Co., Ltd. Screen roll means. 4,681,279, Cl. 242-107.300.  
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, to Toyota Jidosha Kabushiki Kaisha. Wheel slip control system. 4,681,374, Cl. 303-106.000.  
Nakamura, Kazumasa: See—  
Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.  
Nakamura, Kiyooki: See—  
Yokovama, Yasuyuki; Nakamura, Kiyooki; Goi, Hiroshi; and Fujio, Koichiro, 4,681,313, Cl. 271-273.000.  
Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichiro; and Atsumi, Morihiro, to Nippondenso Co., Ltd. Ignition distributor for internal combustion engines. 4,681,989, Cl. 200-19.00R.  
Nakamura, Nobuhiro: See—  
Kotoh, Keigo; and Nakamura, Nobuhiro, 4,682,173, Cl. 342-51.000.  
Nakamura, Norihiko; Morishima, Hideki; and Yamaguchi, Yoshito, to Rhythm Watch Co. Ltd. Alarm signalling electronic timepiece with timer function. 4,681,465, Cl. 368-246.000.  
Nakamura, Shuji, to Tokyo Aircraft Instrument Co., Ltd. Turn-and-bank indicator which displays the total angle or total time of a turn. 4,682,171, Cl. 340-975.000.  
Nakamura, Toshinobu, to Shinagawa Shoko Co., Ltd. Fixing component. 4,681,288, Cl. 248-71.000.  
Nakasui, Norikazu: See—  
Shibahashi, Yutaka; Nakasui, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunani, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.  
Nakata, Yoshinari: See—  
Hashimoto, Mikio; Nakata, Yoshinari; and Koga, Hitoshi, 4,681,816, Cl. 428-463.000.  
Nakatsui, Hisashi; Imataki, Hiroyuki; and Hajimoto, Yoshioki, to Canon Kabushiki Kaisha. Amorphous silicon photoelectric transducer with a photoconductive colorant layer. 4,682,019, Cl. 250-211.00R.  
Nakaya, Takashi, to Meinan Machinery Works, Inc. Conveyor system for conveying veneer sheets with spacings therebetween. 4,681,002, Cl. 83-71.000.  
Nakaya, Yasuhiro: See—  
Asai, Toshio; Nakaya, Yasuhiro; and Onodera, Yasuaki, 4,681,118, Cl. 128-643.000.  
Nakazato, Shinji: See—  
Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, 4,682,200, Cl. 357-41.000.  
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Ken-saku; and Nishino, Yoshimitsu, to Hirose Elec. Co., Ltd.; NEC Corporation; and Japan Aviation Elec. Cord clamping mechanism. 4,681,388, Cl. 439-449.000.  
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Ken-saku; and Nishino, Yoshimitsu, to Hirose Elec. Co., Ltd.; NEC Corporation; and Japan Aviation Elec. Lock pin for mounting board-mount type connector on board. 4,681,389, Cl. 439-557.000.  
Nakazumi, Tadataka: See—  
Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadataka; and Takeuchi, Nobuo, 4,682,044, Cl. 290-40.000.  
Nakazyo, Kiyoshi: See—  
Ishikawa, Takatoshi; and Nakazyo, Kiyoshi, 4,681,835, Cl. 430-386.000.  
Nalco Chemical Company: See—  
Mouche, Richard J.; and Song, Peter, 4,681,687, Cl. 210-764.000.  
Naphs, Inc.: See—  
LaRue, Philip R., 4,680,995, Cl. 81-437.000.  
Naquib, Hussein M.: See—  
Ho, Vu Q.; Nentwich, Heinz J.; and Naquib, Hussein M., 4,680,854, Cl. 29-576.00B.  
Nash, John: See—  
Kensley, Kenneth; and Nash, John, 4,681,106, Cl. 128-305.000.  
Nathanson, Mark A.; Reddi, A. H.; and Sampath, T. K., to University of Medicine and Dentistry of New Jersey. Composition for stimulating bone growth. 4,681,763, Cl. 424-95.000.  
National Distillers and Chemical Corporation: See—  
Chang, Biau-Hung, 4,681,708, Cl. 260-410.900.  
Chang, Biau-Hung; and Hanes, Ronnie M., 4,681,709, Cl. 260-410.900.  
Harris, Eugene G.; and Fayter, Richard G., Jr., 4,681,703, Cl. 252-522.00R.  
Harris, James J.; Hostetler, Donald E.; and Achorn, G. Stanley, 4,681,924, Cl. 526-125.000.  
Huynh, Anh N.; and Ziogas, Phoivos D., 4,682,266, Cl. 361-235.000.  
National Nuclear Corporation Limited: See—  
Pendleton, Eric; Roberts, Karl A.; and Murray, Alan, 4,681,729, Cl. 376-247.000.  
National Research Development Corporation: See—  
Jenkins, Walter N.; and Davies, Gordon I., 4,681,258, Cl. 239-66.000.  
Marples, Brian A.; and Stretton, Reginald J., 4,681,876, Cl. 514-182.000.  
National Standard Company: See—  
Rausch, Doyle W., 4,681,558, Cl. 474-205.000.



- Natiw, Edna C. Puppet or doll having structure provided by stuffing. 4,681,555, Cl. 446-327.000.
- Natsuhara, Toshiya: See—  
Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, 4,681,825, Cl. 430-57.000.
- Navarrete, Felix M.: See—  
Brozovic, George R.; Djobadze, Michael O.; and Navarrete, Felix M., 4,681,651, Cl. 156-382.000.
- NCR Corporation: See—  
Heys, George Jr.; Aleshire, Rex A.; Hines, Frank; and Belknap, William M., 4,682,325, Cl. 370-85.000.
- Kallin, Fredrik L. N.; and Evans, Edward R., 4,681,468, Cl. 400-120.000.
- Mathes, Gene R.; and Protheroe, Robert L., 4,682,150, Cl. 340-347.000.
- NEC Corporation: See—  
Ichikawa, Yoshio; and Yamada, Kazumori, 4,682,148, Cl. 340-311.100.
- Inoue, Masayoshi; Hirano, Kenichiro; and Tanihata, Ryoichi, 4,682,353, Cl. 379-163.000.
- Ishimoto, Shoji, 4,682,048, Cl. 307-269.000.
- Kageyama, Takao; and Orui, Ryuzo, 4,682,076, Cl. 315-4.000.
- Makino, Masayuki, 4,682,351, Cl. 379-62.000.
- Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.
- Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.
- Okano, Minoru; and Kohmoto, Mitsuo, 4,682,268, Cl. 361-384.000.
- Takahashi, Tsutomu, 4,682,368, Cl. 455-38.000.
- Utsumi, Kazuaki; Ochi, Atsushi; Suzuki, Masanori; and Midorikawa, Mitsuhiro, 4,681,667, Cl. 204-15.000.
- Nedoluha, Heinz F.; to Coleman Company, Inc., The. Inhaul boom end for sailboard boom assembly. 4,681,052, Cl. 114-98.000.
- Negishi, Akira: See—  
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,681,953, Cl. 549-65.000.
- Nehring, John R.; to C. R. Bard, Inc. Suction canister with disposable liner and check valve. 4,681,571, Cl. 604-320.000.
- Neki, Shigeo: See—  
Shibata, Nobuo; Yasunobu, Isamu; Neki, Shigeo; Ohara, Kenichi; and Dohi, Takashi, 4,682,095, Cl. 318-778.000.
- Nelson, Jordan R.; and Wising, William K.; to RCA Corporation. Image display including improved light-absorbing matrix. 4,682,075, Cl. 313-466.000.
- Nentwich, Heinz J.: See—  
Ho, Vu Q.; Nentwich, Heinz J.; and Naquib, Hussein M., 4,680,854, Cl. 29-576.000.
- Netolicky, Charles E.: See—  
Dvorak, Robert F.; Netolicky, Charles E.; and Palmer, Neil R., 4,681,061, Cl. 116-279.000.
- Neuman, Eli; to Perfectdata Corporation. Micro floppy disc head cleaner. 4,682,257, Cl. 360-128.000.
- Neuschaffer, Karlheinz: See—  
Engels, Hans-Werner; Neuschaffer, Karlheinz; and Spielau, Paul, 4,681,631, Cl. 106-4.000.
- Newman, John; to Rotaflex PLC. Electric sockets. 4,681,384, Cl. 439-137.000.
- Newman, Paul; to Horizon Exploration Limited. Underwater seismic testing. 4,682,307, Cl. 367-21.000.
- Newmark, Harold L.: See—  
Mergens, William J.; Newmark, Harold L.; Sheth, Prabhakar R.; and Tosounian, Jacques L., 4,681,756, Cl. 424-451.000.
- NGK Insulators, Ltd.: See—  
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, 4,681,074, Cl. 123-271.000.
- Nguyen, Dean: See—  
Faiz, Robert L.; Walker, William J.; Ramey, Philip; Adams, Kenneth M.; Flonc, Nicholas P.; and Nguyen, Dean, 4,681,724, Cl. 264-257.000.
- Nicolas, Denise: See—  
Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Françoise, 4,681,912, Cl. 524-827.000.
- Nicolas, Jean-Marie; to U.S. Philips Corporation. Apparatus for examining an object by ultrasonic echography. 4,680,966, Cl. 73-597.000.
- Nidec-Torin Corporation: See—  
English, George A.; and Marracino, Charles R., 4,682,065, Cl. 310-90.000.
- Niederer, Kurt W. Multistage fluid filter and method. 4,681,604, Cl. 55-96.000.
- Niedrach, Leonard W.; and Will, Fritz G.; to General Electric Company. Portable oxygen sensor with shortened break-in time. 4,681,673, Cl. 204-415.000.
- Niemann, Ludwig C.; to McCully, Gerald R.; and Niemann, Ludwig C. Florist's implement. 4,681,224, Cl. 206-423.000.
- Nihon Den-Netsu Keiki Co., Ltd.: See—  
Kondo, Kenichi, 4,681,249, Cl. 228-37.000.
- Nihon Sanmo Dyeing Co.: See—  
Tomibe, Shinji; Gombuchi, Reizo; and Takahashi, Kiyofumi, 4,681,820, Cl. 428-698.000.
- Niimi, Takatsune: See—  
Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiro, 4,681,647, Cl. 156-172.000.
- Nikaido, Masataka; and Matsuda, Sakurako; to Matsushita Electric Industrial Co., Ltd. Sound generator for electronic musical instrument. 4,681,007, Cl. 84-1.100.
- Nikkai Kensetsu Kabushiki Kaisha: See—  
Kon, Toshiharu, 4,681,998, Cl. 219-99.000.
- Nillesen, Antonius H. H. J.; to U.S. Philips Corporation. Digital chrominance processor with a phase and frequency controlled digital oscillator independent of the stable oscillator frequency. 4,682,209, Cl. 358-19.000.
- Nippon Denso Kabushiki Kaisha: See—  
Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuui, 4,681,143, Cl. 137-625.370.
- Nippon Gakki Seizo Kabushiki Kaisha: See—  
Takahashi, Toshiro; Tokushima, Tadao; Suzuki, Yoshifumi; and Wakui, Yukio, 4,681,669, Cl. 204-35.100.
- Tomisawa, Norio, 4,682,317, Cl. 369-59.000.
- Nippon Hoso Kyokai: See—  
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.
- Nippon Kayaku Kabushiki Kaisha: See—  
Nomura, Masaharu; Tsugawa, Hiroaki; Ishizaka, Yukio; and Hosoi, Hiroomi, 4,682,192, Cl. 503-200.000.
- Nippon Kogaku K. K.: See—  
Naito, Hideshi; Kodaka, Yoshiro; and Shiokama, Yoshiharu, 4,681,406, Cl. 350-429.000.
- Nippon Petrochemicals Company Limited: See—  
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,681,980, Cl. 585-6.300.
- Nippon Piston Ring Co., Ltd.: See—  
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,681,519, Cl. 418-152.000.
- Nippon Soken, Inc.: See—  
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.
- Nippon Steel Corp.: See—  
Kutsumura, Shoji; and Isonaga, Touichi, 4,681,662, Cl. 202-270.000.
- Nippon Telegraph and Telephone Corp.: See—  
Okumura, Yasuyuki; and Hayashi, Kazuhiro, 4,682,327, Cl. 370-100.000.
- Nippondenso Co., Ltd.: See—  
Ando, Noriyoshi; Mikuni, Hajime; Matsunaga, Mitsuru; Horie, Naoki; and Kishigami, Tomohisa, 4,682,228, Cl. 358-161.000.
- Mizuno, Tooru; Oosugi, Keizi; Esaki, Motoharu; and Ogawa, Takao, 4,682,287, Cl. 364-561.000.
- Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichiro; and Atsumi, Morihiro, 4,681,989, Cl. 200-19.000.
- Onogi, Nobuyoshi; and Shimamoto, Mamoru, 4,681,082, Cl. 123-643.000.
- Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshihisa; Mizuno, Taki; Suzuki, Atsushi; and Sugura, Kengo, 4,680,964, Cl. 73-204.000.
- Nishida, Hiroshi; to Kawasaki Jukogyo Kabushiki Kaisha. Small watercraft with asymmetrical bow portion. 4,681,058, Cl. 114-271.000.
- Nishida, Takashi: See—  
Kanehira, Koichi; Shiono, Manzo; Fujita, Yoshiji; Nishida, Takashi; and Yamahara, Tohji, 4,681,890, Cl. 514-333.000.
- Nishihara, Eitaro; to Tokyo Shibaura Denki Kabushiki Kaisha. View interpolation in a tomography system using pipe line processing. 4,682,289, Cl. 364-414.000.
- Nishihashi, Junichi: See—  
Minakawa, Takao; Shiono, Shigeo; and Nishihashi, Junichi, 4,682,003, Cl. 219-121.000.
- Nishijima, Hideo; Ito, Takayasu; and Fukushima, Isao; to Hitachi, Ltd. Switching regulator system for a motor driving circuit. 4,682,096, Cl. 318-808.000.
- Nishijima, Masaru; to Sharp Kabushiki Kaisha. Copying machine having a control process to reduce copying time. 4,681,423, Cl. 355-14.000.
- Nishikawa, Masao; and Aoki, Takashi; to Honda Giken Kogyo Kabushiki Kaisha. Warm-up promotion device for automatic transmission. 4,680,928, Cl. 60-329.000.
- Nishikawa Sangyo Co., Ltd.: See—  
Fujino, Yukio; and Kabaya, Morihiro, 4,680,822, Cl. 5-421.000.
- Nishikawa, Toshio: See—  
Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadataka; and Takeuchi, Nobuo, 4,682,044, Cl. 290-40.000.
- Nishimura, Akira: See—  
Ono, Kimizo; and Nishimura, Akira, 4,681,093, Cl. 128-6.000.
- Nishimura, Atsushi: See—  
Kubota, Naohiro; and Nishimura, Atsushi, 4,681,905, Cl. 524-91.000.
- Nishimura, Hidetaro: See—  
Shiozaki, Masakazu; and Nishimura, Hidetaro, 4,682,204, Cl. 357-51.000.
- Nishimura, Katsuo; to Citizen Watch Co., Ltd. World time watch. 4,681,460, Cl. 368-21.000.
- Nishimura, Tetsuharu: See—  
Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, 4,682,237, Cl. 358-225.000.
- Nishimura, Yuji: See—  
Tamura, Keiichi; Nishimura, Yuji; and Kawaharazaki, Takashi, 4,681,347, Cl. 280-804.000.
- Nishino, Yoshimitsu: See—  
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.

- Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.
- Nissan Motor Co., Ltd.: See—  
Hayasaka, Koichi; and Sugano, Kazuhiko, 4,680,992, Cl. 74-869.000.
- Hayashi, Yoshimasa, 4,681,179, Cl. 180-68.400.
- Honma, Masayuki, 4,681,069, Cl. 123-90.270.
- Kubo, Jun, 4,682,295, Cl. 364-426.000.
- Mori, Yasushi, 4,680,988, Cl. 74-866.000.
- Ohashi, Toshio; and Yamamoto, Shukou, 4,682,208, Cl. 357-81.000.
- Ugawa, Satoru; and Obuchi, Satoshi, deceased, 4,680,892, Cl. 49-374.000.
- Nissan Shatai Company, Limited: See—  
Uchida, Noriaki, 4,681,153, Cl. 165-31.000.
- Nisshin Kohki Co., Ltd.: See—  
Inoue, Toshiyuki, 4,682,016, Cl. 235-462.000.
- Nitsuko Limited: See—  
Iwama, Teruhiko, 4,682,014, Cl. 235-375.000.
- Nitto Chemical Industry Co., Ltd.: See—  
Kanda, Shioichi; Yanagita, Makoto; and Sekimoto, Yukihiko, 4,681,690, Cl. 252-8.551.
- Nitto Electric Industrial Co., Ltd.: Mazda Motor Corporation: See—  
Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, 4,681,733, Cl. 419-8.000.
- Nitto Kohki Co., Ltd.: See—  
Mikiya, Toshio; Kaneko, Minoru; and Kazama, Yasuo, 4,681,172, Cl. 173-139.000.
- Nitz, Rolf-Eberhard: See—  
Schonafinger, Karl; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,681,891, Cl. 514-340.000.
- NL Industries, Inc.: See—  
Kisling, James W., III, 4,681,168, Cl. 166-381.000.
- Nobatake, Atsuo: See—  
Okayasu, Shinpei; Uchikoshi, Shinichi; and Nobatake, Atsuo, 4,681,591, Cl. 8-115.680.
- Nobel, Fred I.; and Schram, David N.; to LeaRon, Inc. Bath and process for plating tin/lead alloys. 4,681,670, Cl. 204-44.400.
- Nogami, Takahiro: See—  
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.
- Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.
- Noguchi, Kunio; Totsune, Atsushi; Kajita, Koji; and Hosaka, Takefumi; to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio control system for an internal combustion engine. 4,681,078, Cl. 123-490.000.
- Noguchi, Masaru; to Fuji Photo Film Co., Ltd. Light beam scanning system. 4,681,394, Cl. 350-6.600.
- Noguchi, Takaharu: See—  
Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, 4,682,332, Cl. 371-38.000.
- Nolte, Gunther; to Conrad Scholtz AG. Method and device for unloading bulk material from a large container. 4,681,503, Cl. 414-144.000.
- Nomura, Masaharu; Tsugawa, Hiroaki; Ishizaka, Yukio; and Hosoi, Hiroomi; to Nippon Kayaku Kabushiki Kaisha. Heat-sensitive recording sheet. 4,682,192, Cl. 503-200.000.
- Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, to Toyota Jidosha Kabushiki Kaisha. Wheel slip control system. 4,681,373, Cl. 303-106.000.
- Nomura, Yoshihisa: See—  
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.
- Nonaka, Yasuhiko: See—  
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.
- Nonoyama, Hideo; Fukuzumi, Toshiharu; and Morita, Akiyoshi; to Toyota Jidosha Kabushiki Kaisha. Cast iron making by cerium addition. 4,681,642, Cl. 148-321.000.
- Norcin Investments Pty. Ltd.: See—  
Griffin, Arnold F.; and Hinchliffe, Warren D., 4,681,628, Cl. 75-118.000.
- Nordica S.p.A.: See—  
Pozzobon, Alessandro; and Baggio, Giorgio, 4,680,878, Cl. 36-117.000.
- Norman, Michael J.: See—  
Ching, Neng H.; Marson, Ralph G.; Norman, Michael J.; and Hughes, John L., 4,681,436, Cl. 356-121.000.
- North American Philips Consumer Electronics Corp.: See—  
Gallaro, Anthony V., 4,681,775, Cl. 427-64.000.
- Naipally, Saiprasad V., 4,682,234, Cl. 358-183.000.
- Northern Telecom Limited: See—  
Ho, Vu Q.; Nentwich, Heinz J.; and Naquib, Hussein M., 4,680,854, Cl. 29-576.000.
- Petersen, Olav, 4,681,549, Cl. 439-181.000.
- NPK "Textiling Maschinostroene": See—  
Bahov, Dinko A.; and Bahov, Hristo A., 4,680,833, Cl. 19-244.000.
- Numata, Toshio: See—  
Uesaka, Sadaaki; Numata, Toshio; and Umezaki, Kazunori, 4,681,229, Cl. 209-534.000.
- Nunokawa, Eiichi: See—  
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- N.V. Optische Industrie "De Oude Delft": See—  
Bremer, Johannes, 4,681,454, Cl. 356-402.000.
- N.V. Sky Climber Europe S.A., naamloze vennootschap: See—  
Rinio, Johannes, 4,681,301, Cl. 254-333.000.
- O & K Orenstein & Koppel AG: See—  
Hoffmann, Dieter; and Trumper, Reinhard, 4,681,205, Cl. 198-307.100.
- O.S.E. Kabushiki Kaisha: See—  
Kon, Toshiharu, 4,681,998, Cl. 219-99.000.
- Oba, Harutaro; Ozawa, Yasuhiko; Yamaguchi, Yasuyoshi; and Mimoto, Osamu; to Tokyo Electric Co., Ltd. Paper supply device for an electrostatic photographic printer. 4,681,422, Cl. 355-3.000.
- Obara, Haruki: See—  
Inoue, Michiya; Obara, Haruki; and Izumiya, Shunzo, 4,681,997, Cl. 219-69.000.
- Oberhofer, David P.; to Sullivan Corporation. Manufactured refining element. 4,681,270, Cl. 241-298.000.
- Obermeier, Rainer; Salomon, Ingeborg; and Ludwig, Jurgen; to Hochst Aktiengesellschaft. Process for the isolation and purification of alpha-interferons. 4,681,931, Cl. 530-351.000.
- Obermeyer, Franklin D.: See—  
Veronesi, Luciano; Obermeyer, Franklin D.; and Chrise, James R., 4,681,728, Cl. 376-209.000.
- Obkircher, Bernt; to Dornier System GmbH. Classification of carbon containing waste, refuse or the like. 4,681,599, Cl. 43-92.000.
- O'Brien, John V.; Holmes, Arthur S.; and Hopewell, Richard B.; to Koch Process Systems, Inc. Process for the separation of landfill gas. 4,681,612, Cl. 62-23.000.
- O'Brien, William D., Jr. Boat launching apparatus. 4,681,334, Cl. 280-414.100.
- Obuchi, Fukashi, Ruriko Obuchi, legal representatives: See—  
Ugawa, Satoru; and Obuchi, Satoshi, deceased, 4,680,892, Cl. 49-374.000.
- Obuchi, Satoshi, deceased: See—  
Ugawa, Satoru; and Obuchi, Satoshi, deceased, 4,680,892, Cl. 49-374.000.
- Ochi, Atsushi: See—  
Utsumi, Kazuaki; Ochi, Atsushi; Suzuki, Masanori; and Midorikawa, Mitsuhiro, 4,681,667, Cl. 204-15.000.
- Ochiai, Hajime; and Morihara, Kenji; to Mitsubishi Denki Kabushiki Kaisha. Light transmission system for trains. 4,682,144, Cl. 340-48.000.
- Odaka, Masanori: See—  
Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, 4,682,200, Cl. 357-41.000.
- Oeschger, Max P.; Hooke, Anne M.; and Bellanti, Joseph A.; to Research Corporation. Genetically attenuated bacterial vaccines with multiple mutations of the same phenotype. 4,681,762, Cl. 424-92.000.
- Ogasawara, Takayuki: See—  
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, 4,681,074, Cl. 123-271.000.
- Ogata, Nobuyuki: See—  
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.000.
- Ogawa, Soichiro; and Watanabe, Yoshio; to Hitachi, Ltd. Discharge lamp operating device. 4,682,080, Cl. 315-209.000.
- Ogawa, Takao: See—  
Mizuno, Tooru; Oosugi, Keizi; Esaki, Motoharu; and Ogawa, Takao, 4,682,287, Cl. 364-561.000.
- Ogawa, Yuji: See—  
Shibasaki, Masakatsu; Mase, Toshiaki; Sodeoka, Mikiko; and Ogawa, Yuji, 4,681,951, Cl. 549-214.000.
- Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru; to NGK Insulators, Ltd. Structure of divided combustion chamber for internal combustion engine. 4,681,074, Cl. 123-271.000.
- Ogusu, Chihaya: See—  
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.
- O'Hara, John G.; Powers, Frederick A.; and Peter, Steven E.; to Graco Inc. Leakage preventing liquid supply pump. 4,681,516, Cl. 417-259.000.
- Ohara, Kenichi: See—  
Shibata, Nobuo; Yasunobu, Isamu; Neki, Shigeo; Ohara, Kenichi; and Dohi, Takashi, 4,682,095, Cl. 318-778.000.
- O'Hare, Louis R. Convection powered solar heater for water tanks. 4,681,089, Cl. 126-434.000.
- Ohashi, Kaoru: See—  
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.
- Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.
- Ohashi, Keiichi; to Skylight Industry Co. Ltd. Mount structures for suspender members of portable flashlights. 4,682,275, Cl. 362-191.000.
- Ohashi, Toshio; and Yamamoto, Shukou; to Nissan Motor Co., Ltd. Transistor protection device. 4,682,208, Cl. 357-81.000.
- Ohbayashi, Eiji: See—  
Ohdoi, Yozo; Abiru, Norifumi; and Ohbayashi, Eiji, 4,680,950, Cl. 72-130.000.
- Ohdoi, Yozo; Abiru, Norifumi; and Ohbayashi, Eiji; to Asahi-Seiki Manufacturing Co., Ltd. Method of and an apparatus for forming tension springs with German type hooks. 4,680,950, Cl. 72-130.000.



- Ohe, Takeshi: See—  
Suzuki, Yoshio; Ohe, Takeshi; and Koike, Ichiro, 4,681,182, Cl. 180-79.100.
- Ohgami, Masaaki, to Fuji Jukogyo Kabushiki Kaisha; and Van Doorne's Transmissie B. V. System for controlling the transmission ratio of an infinitely variable transmission. 4,680,990, Cl. 74-868.000.
- Ohi, Toshio, to Furukawa Co., Ltd.; and Okumura Corporation. Rock drills for drilling continuously arrayed bores. 4,681,170, Cl. 173-50.000.
- Ohnishi, S. Tsuyoshi. Method of preventing the growth of malaria parasites in erythrocytes. 4,681,899, Cl. 514-602.000.
- Ohnishi, Tsutomu: See—  
Kakimoto, Norihiro; Katayama, Takashi; Hazato, Tadahiko; and Ohnishi, Tsutomu, 4,681,960, Cl. 356-83.000.
- Ohno, Makoto: See—  
Miyagi, Morio; Ohno, Makoto; and Kanaizumi, Masaru, 4,681,713, Cl. 264-41.000.
- Ohta, Hironobu: See—  
Kobayashi, Tamotsu; Goto, Shigeru; Ohta, Hironobu; and Torimaru, Takashi, 4,680,973, Cl. 73-861.160.
- Ohta, Koji; Yoshimura, Masaaki; and Takahashi, Mizunori, to Dic-Hercules Chemicals, Inc. Rosin emulsion sizing agent. 4,681,909, Cl. 524-272.000.
- Ohta, Noboru: See—  
Mitsui, Akio; and Ohta, Noboru, 4,681,837, Cl. 430-504.000.
- Ohta, Teruo, to Sony Corporation. Disk cartridge. 4,682,322, Cl. 369-291.000.
- Ohtake, Masayuki: See—  
Alaki, Yasuhide; Ohtake, Masayuki; and Ihara, Keisuke, 4,681,323, Cl. 273-232.000.
- Ohtsuka, Ichiro: See—  
Tsunewaki, Koichiro; and Ohtsuka, Ichiro, 4,680,888, Cl. 47-58.000.
- Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge. 4,682,260, Cl. 360-133.000.
- Oka, Tetsuo: See—  
Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, 4,681,847, Cl. 435-172.300.
- Oka, Tsutomu: See—  
Mae, Yoshiharu; and Oka, Tsutomu, 4,681,627, Cl. 75-10.190.
- Okabayashi, Masanori: See—  
Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.
- Okada, Shinjiro; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Liquid crystal device and driving method therefor. 4,681,404, Cl. 350-350.00S.
- Okada, Syuji: See—  
Okajima, Yasuhiro; Tsugita, Yasuhiro; Takechi, Tamaki; and Okada, Syuji, 4,681,623, Cl. 75-0.50B.
- Okada, Taketoshi: See—  
Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, 4,680,874, Cl. 34-143.000.
- Okajima, Yasuhiro; Tsugita, Yasuhiro; Takechi, Tamaki; and Okada, Syuji, to Sumitomo Metal Mining Company Limited. Process for producing alloy powder containing rare earth metals. 4,681,623, Cl. 75-0.50B.
- Okamoto, Hiroo; Arai, Takao; and Hoshino, Takashi, to Hitachi, Ltd. Digital data companding. 4,682,152, Cl. 340-347.0DD.
- Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, to Hitachi, Ltd. Method and apparatus for recording digital signals. 4,682,332, Cl. 371-38.000.
- Okamoto, Kenji: See—  
Ooka, Akihiro; Okamoto, Kenji; and Yamada, Koji, 4,680,818, Cl. 5-81.00R.
- Okamoto, Kyoichi: See—  
Morishita, Akira; Akai, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.
- Okamoto, Yoshio: See—  
Yuki, Heime; and Okamoto, Yoshio, 4,681,919, Cl. 525-292.000.
- Okamura, Masahiro: See—  
Yatsuo, Tsutomu; Momma, Naohiro; Naito, Masayoshi; and Okamura, Masahiro, 4,682,199, Cl. 357-38.000.
- Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, to TDK Corporation. Magnetic tape cassette with dust-proof mechanism. 4,682,259, Cl. 360-132.000.
- Okamura, Naomi: See—  
Ikeda, Shigeru; and Okamura, Naomi, 4,681,524, Cl. 425-376.00R.
- Okano, Minoru; and Kohmoto, Mitsuo, to NEC Corporation. Mounting structure for electronic circuit modules. 4,682,268, Cl. 361-384.000.
- Okayasu, Shinpei; Uchikoshi, Shinichi; and Nobatake, Atsuo, to Takase Dyeing & Printing Works, Ltd. Process for producing an electromagnetic radiation-shielding, metallized polyester fiber textile material. 4,681,591, Cl. 8-115.680.
- Okazaki, Naoto: See—  
Sato, Toru; Okazaki, Naoto; and Fujii, Katsumasa, 4,681,099, Cl. 128-204.230.
- Okudera, Tatsuya: See—  
Yamazaki, Iwao; Nakamichi, Yuji; Abe, Keizo; and Okudera, Tatsuya, 4,682,221, Cl. 358-107.000.
- Okumoto, Yutaka: See—  
Kobayashi, Hideki; Okumoto, Yutaka; and Komori, Mikio, 4,681,505, Cl. 414-744.00R.
- Okumura Corporation: See—  
Ohi, Toshio, 4,681,170, Cl. 173-50.000.
- Okumura, Yasuyuki; and Hayashi, Kazuhiro, to Nippon Telegraph and Telephone Corp. Polyphase phase lock oscillator. 4,682,327, Cl. 370-100.000.
- Oldham, Susan L., to Hughes Aircraft Company. Method of fabricating composite or encapsulated articles. 4,681,718, Cl. 264-102.000.
- Olin Corporation: See—  
Kuh, Louis M.; and Lampe, Robert C., 4,681,677, Cl. 210-88.000.
- Oliver, James T.: See—  
Grozinger, Karl G.; and Oliver, James T., 4,681,884, Cl. 514-256.000.
- Olofsson, Lars; and Hospers, Martin, to AB Betjanten. Vending machine. 4,681,241, Cl. 221-124.000.
- Olson, George E., to A. O. Smith Harvestore Products, Inc. Drive mechanism. 4,680,980, Cl. 74-125.000.
- Olson, Keith E.; and Brittain, Kent R., to Ecolab Inc. Solid cast detergents containing encapsulated halogen bleaches and methods of preparation and use. 4,681,914, Cl. 252-91.000.
- Olympus Optical Co., Ltd.: See—  
Matsubayashi, Nobuhide; and Kato, Kiichi, 4,682,311, Cl. 369-13.000.
- Omniquet, Inc.: See—  
Kornylak, Andrew T., 4,681,203, Cl. 193-35.00R.
- Omron Tateisi Electronics Co.: See—  
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.00B.
- Onishi, Ken; and Sugiyama, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Decoder for decoding a two-stage encoded code. 4,682,333, Cl. 371-39.000.
- Onishi, Yoko: See—  
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.
- Ono, Kimizo; and Nishimura, Akira, to Sumitomo Electric Industries, Ltd. Endoscope. 4,681,093, Cl. 128-6.000.
- Onodera, Yasuaki: See—  
Asai, Toshio; Nakaya, Yasuhiro; and Onodera, Yasuaki, 4,681,118, Cl. 128-643.000.
- Onogi, Nobuyoshi; and Shimamoto, Mamoru, to Nippondenso Co., Ltd. Ignition system for internal combustion engine. 4,681,082, Cl. 123-643.000.
- Ooka, Akihiro; Okamoto, Kenji; and Yamada, Koji, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Transfer device for moving recumbent person. 4,680,818, Cl. 5-81.00R.
- Oosugi, Keizi: See—  
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- Optical Materials, Inc.: See—  
Young, Peter L., 4,681,778, Cl. 427-96.000.
- ORC Manufacturing Co., Ltd.: See—  
Yazaki, Yoshio, 4,682,277, Cl. 362-296.000.
- Orimo, Taiji; Fukui, Tsugushi; and Fukumizu, Shinichi, to Kabushiki Kaisha Kobe Seiko Sho. Continuous mixer. 4,681,457, Cl. 366-84.000.
- Orita, Miyahiko; Kobayashi, Yoshiki; and Mishima, Tadaaki, to Hitachi, Ltd. System and method for preparing a recognition dictionary. 4,682,365, Cl. 382-14.000.
- Orr-Arienza, Wendy A.: See—  
Hwang, Bao-Tai; Orr-Arienza, Wendy A.; and Glang, Reinhard, 4,681,657, Cl. 156-657.000.
- Orr, Ladd J.; and Tuss, John J., to Warner & Swasey Company, The. Coordinate measuring machine with covers. 4,680,868, Cl. 33-503.000.
- Ortho Diagnostic Systems Inc.: See—  
Kramer, Peter B., 4,681,859, Cl. 436-501.000.
- Ortho Pharmaceutical Corporation: See—  
Murray, William V.; and Wachter, Michael P., 4,681,894, Cl. 514-507.000.
- Porubcan, Linda S., 4,681,759, Cl. 424-80.000.
- Orui, Ryuzo: See—  
Kageyama, Takao; and Orui, Ryuzo, 4,682,076, Cl. 315-4.000.
- Osaki, Shigemi: See—  
Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, 4,681,733, Cl. 419-8.000.
- Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, to Minolta Camera Kabushiki Kaisha. Electrophotosensitive member having an amorphous silicon-germanium layer. 4,681,825, Cl. 430-57.000.
- Osborne, Anthony, to Kearney-National, Inc. Electric by-pass switch. 4,681,990, Cl. 200-48.0KB.
- Oshita, Saiichiro, to Fuji Jukogyo Kabushiki Kaisha. Electrically operated power steering device. 4,681,183, Cl. 180-79.100.
- Oswald, Hartmut: See—  
Kleinschroth, Jorgen; Mannhardt, Karl; Hartenstein, Johannes; Oswald, Hartmut; and Wagner, Bernd, 4,681,881, Cl. 514-258.000.
- Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Oswald, Hartmut; Weinheimer, Genter; and Fritsch, Edgar, 4,681,882, Cl. 514-258.000.
- Kleinschroth, Jorgen; Mannhardt, Karl; Hartenstein, Johannes; Oswald, Hartmut; and Wagner, Bernd, 4,681,885, Cl. 514-258.000.
- Osumi, Hiroshi: See—  
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.00B.

- Otani, Atusi: See—  
Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atusi; and Shirotori, Hidefumi, 4,680,999, Cl. 82-36.00B.
- Otani, Tadahiko: See—  
Kobayashi, Haruhiko; and Otani, Tadahiko, 4,681,077, Cl. 123-489.000.
- Otis Engineering Corporation: See—  
Dollison, William W., 4,680,930, Cl. 60-375.000.
- Otoshima, Hiroo: See—  
Matsui, Isamu; Uchida, Hiroshi; Otoshima, Hiroo; Kubota, Yasuhiko; and Masai, Tetsuji, 4,681,271, Cl. 242-18.00R.
- Otten, Hans-Gunter: See—  
Kruckenberg, Winfried; Leverenz, Klaus; and Otten, Hans-Gunter, 4,681,932, Cl. 534-575.000.
- Otten, Ronald L.: See—  
Ledermann, Donald L.; and Otten, Ronald L., 4,681,335, Cl. 280-446.00R.
- Ottenstein, Sidney A.: See—  
Kuhnel, Donald S.; and Ottenstein, Sidney A., 4,682,084, Cl. 315-307.000.
- Otto Junker GmbH: See—  
Jansen, Rudolf, 4,681,536, Cl. 432-59.000.
- Oudet, Claude, to Portescap. Synchronous electric motor having a disc-shaped permanent magnet rotor. 4,682,067, Cl. 310-156.000.
- Outboard Marine Corporation: See—  
Friedle, Dennis J.; Kolb, Richard P.; and Borst, Gaylord M., 4,681,056, Cl. 114-146.000.
- Overhoff, Theodor: See—  
Mallener, Werner; and Overhoff, Theodor, 4,681,732, Cl. 376-337.000.
- Owen, Robert B.; and Johnston, Mary H., to United States of America, National Aeronautics and Space Administration. Laser schlieren crystal monitor. 4,681,437, Cl. 356-129.000.
- Owens-Corning Fiberglass Corporation: See—  
Carter, Neil A.; Harris, Ronald R.; and Ault, Russell L., 4,681,722, Cl. 264-171.000.
- Oyama, Akihiro; Funyu, Yutaka; and Sakurada, Kazuyuki, to Kawasaki Steel Corporation. Marking device for pipe. 4,682,182, Cl. 346-1.100.
- Oyama, Fusami; and Takahashi, Akira, to Fuji Jukogyo Kabushiki Kaisha. Power transmission system for rear wheels of a motor vehicle. 4,681,180, Cl. 180-76.000.
- Ozaki, Masaaki: See—  
Kurihara, Norimitsu; Ozaki, Masaaki; Goto, Hiroshi; and Asakura, Masahiko, 4,681,070, Cl. 123-179.00H.
- Ozaki, Masaharu: See—  
Shibahashi, Yutaka; Nakasui, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.
- Ozawa, Yasuhiko: See—  
Oba, Harutaro; Ozawa, Yasuhiko; Yamaguchi, Yasuyoshi; and Mimoto, Osamu, 4,681,422, Cl. 355-3.00R.
- Ozil, Maurice; and Falguieres, Alain. Universal coupling means. 4,682,285, Cl. 364-200.000.
- Ozkan, Adil N., to Biostar Medical Products, Inc. Article for determining the presence of immune complexes. 4,681,782, Cl. 428-36.000.
- Paccar Inc.: See—  
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- Palmer, Kenneth L., to General Mills, Inc. Fruit products containing flaked grains. 4,681,770, Cl. 426-615.000.
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- Ramey, Philip: See—Faiz, Robert L.; Walker, William J.; Ramey, Philip; Adams, Kenneth M.; Fione, Nicholas P.; and Nguyen, Dean, 4,681,724, Cl. 264-257.000.
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- Rapp, Gunter: See—Kirschner, Michael; Rapp, Gunter; and Zechall, Martin, 4,682,049, Cl. 307-268.000.
- Raschke, Klaus, to W. Haking Enterprises Limited. Camera shutter cocking mechanism. 4,681,416, Cl. 354-173.100.
- Razor, Julia S.; and Tickner, Ernest G., to Schering Aktiengesellschaft. Method of production and use of microbubble precursors. 4,681,119, Cl. 128-660.000.
- Rast, Hans-Georg: See—Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, 4,681,851, Cl. 435-262.000.
- Ratchford Michael: See—Bue, Richard L.; and Ratchford Michael, 4,682,292, Cl. 364-424.000.
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- Razor, John E.: See—Mallory, Charles W.; Watts, Ralph E.; Paladino, Joseph B.; Razor, John E.; Lilley, Arthur W.; Winston, Steven J.; and Stricklin, Billy C., 4,681,706, Cl. 252-633.000.



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Fitts, Robert W., 4,682,021, Cl. 250-213.0VT.  
Haferl, Peter E.; Sutherland, Hugh F., II; Luz, David W.; McDonald, James A.; Waybright, George C.; and Willis, Donald H., 4,682,085, Cl. 315-371.000.  
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- Reber, Hans. Filtering device for separating solids from liquids. 4,681,679, Cl. 210-107.000.
- Rebuffat, Carlo: See—  
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- Reddi, A. H.: See—  
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- Reedy, Dennis C.: See—  
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- Regalbuto, John A., to Jet Research Center, Inc. Tanged charge holder. 4,681,037, Cl. 102-310.000.
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- Reillaudoux, Jean-Claude: See—  
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- Reinehr, Dieter: See—  
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- Reiner, Alberto: See—  
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- Reiner Brach Import-Export: See—  
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- Reinshagen, John H., to Pfizer Inc. Powder metallurgical process for manufacturing copper-nickel-tin spinodal alloy articles. 4,681,629, Cl. 75-246.000.
- Reising, George S.; and Dragoo, Jerry L., to Procter & Gamble Company, The. Disposable diapers with unitary waistshield and elastically expandable waistbands. 4,681,580, Cl. 604-385.00A.
- Remy, Joel; and Charbonnier, Roger, to Adret Electronique. Frequency synthesizer stage adding high frequency steps to an initial frequency. 4,682,122, Cl. 331-2.000.
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- Renfro, Cecil S.: See—  
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- Research Corporation: See—  
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- Research Development Corp. of Japan: See—  
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- Reuveni, Asher, to Elscint Ltd. Noise artifacts reduction. 4,682,291, Cl. 364-414.000.
- Revici, Emanuel, to F.C.N.s.r.l.; and Alphatime Ltd. Pharmaceutical compositions having antineoplastic activity. 4,681,753, Cl. 424-10.000.
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Crandall, Robert E.; Kosulic, Kenneth F.; Rooney, Thomas C.; and Smith, Larry C., 4,681,033, Cl. 100-118.000.  
Martin, Donald E., 4,681,215, Cl. 198-843.000.
- Reznik, David. Apparatus and method for drying and curing coated substrates. 4,680,871, Cl. 34-1.000.
- Rhoades, Lawrence J.; Jenkins, William D.; and Pertle, David D., to Extrude Hone Corporation. Cutting tool fabrication process. 4,681,600, Cl. 51-293.000.
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- Rhythm Watch Co. Ltd.: See—  
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- Rice, Mark S.; and Hunt, Paul D., to CACI, Inc. - Federal. Marine vessel and method for transporting a vehicle. 4,681,054, Cl. 114-124.000.
- Rice, Paul. Diagnostic patient support apparatus. 4,681,308, Cl. 269-322.000.
- Richardson, David G.: See—  
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- Richardson, Elvet M.; and Sim, Teik P. Waste heating recovery system. 4,680,941, Cl. 62-184.000.
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- Richter, Karl-Heinz: See—  
Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, 4,681,185, Cl. 180-247.000.
- Ricoh Company, Ltd.: See—  
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- Ridgway, Glen E.: See—  
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- Riess, Hartmut: See—  
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Mimasu, Takeo; and Torii, Kuniyoshi, 4,681,757, Cl. 424-47.000.
- Riml, Peter, to Liebherr-Werk Telfs Ges m.b.H. Apparatus for tensioning a track chain of a tracklaying vehicle. 4,681,376, Cl. 305-10.000.
- Rimma, John: See—  
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- Rinio, Johannes, to N.V. Sky Climber Europe S.A., naamloze vennootschap. Arrangement for lifting and lowering or for pulling loads. 4,681,301, Cl. 254-333.000.
- Ristvedt, Mark E.: See—  
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- Ritter, Klaus; Michaelsen, Klaus; and Mair, Gunther, to BASF Aktiengesellschaft. Magnetic liquid shaft seal. 4,681,328, Cl. 277-80.000.
- Roalson, Ronald L.: See—  
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- Robb, James R., to Rockwell International Corporation. Address range comparison system using multiplexer for detection of range identifier bits stored in dedicated RAM's. 4,682,283, Cl. 364-200.000.
- Robert Bosch GmbH: See—  
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Muller, Hans-Martin, 4,681,076, Cl. 123-488.000.
- Roberts, C. Kenard, to Stanley Works, The. Knife blade package and container therefor. 4,681,223, Cl. 206-354.000.
- Roberts, Fred E. Adjustable table top assembly. 4,681,042, Cl. 108-6.000.
- Roberts, Karl A.: See—  
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- Roberts, Terry E.: See—  
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- Robertshaw Controls Company: See—  
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- Robertson, Carlton E., to Carolina Power & Light Company. Decontamination of radioactively contaminated liquids. 4,681,705, Cl. 252-631.000.
- Robson, Michael J.: See—  
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- Roca, Yves; Rousset, Jacky; Bouchut, Pierre; Leblanc, Marie-Christine; and Baffreau, Daniel, to Coatex S.A.; and Total Compagnie Fran-

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- Rochat, Alain C.: See—  
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- Rock, Erich; Ruppachter, Helmut; and Brustle, Klaus, to Julius Blum Gesellschaft m.b.H. Furniture hinge having an intermediate mounting member and a separate disengaging mechanism. 4,680,830, Cl. 16-241.000.
- Rockar, James A., to PPG Industries, Inc. Rafter with internal drainage feature and sloped glazing system incorporating same. 4,680,905, Cl. 52-200.000.
- Rockwell International Corporation: See—  
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- Rockwell-Rimoldi S.p.A.: See—  
Marchesi, Franco, 4,681,047, Cl. 112-162.000.
- Rodarte, Michael R. Aerodynamic throwing implement. 4,681,553, Cl. 446-46.000.
- Rodime PLC: See—  
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- Rodriguez, Bernard: See—  
Bocking, Bruce; Cervantes, Joe A., Jr.; Green, Douglas H.; La Sota, Bruce W.; Marshall, David H.; Rodriguez, Bernard; and Van Gorden, Glen, 4,681,175, Cl. 175-393.000.
- Roestenberg, Jerome R. Block sander vacuum. 4,680,895, Cl. 51-170.00R.
- Rogers, David L.: See—  
Mason, Ronald G.; Pitzer, Emory W.; McDaniel, Max P.; Rogers, David L.; and Waterman, James W., 4,681,266, Cl. 241-18.000.
- Rogers, Leo C.; and Heitz, Alfred J. Manufacture of polycrystalline silicon. 4,681,652, Cl. 156-613.000.
- Rojey, Alexandre; and Ramet, Claude, to Institut Francais du Pétrole. Process for producing heat and/or cold by means of a compression engine operating with a mixed working fluid. 4,680,939, Cl. 62-114.000.
- Rokuda, Morito: See—  
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.
- Rolnick, Michael A., to American Medical and Emergency Research Corporation. Balloon laryngoscope. 4,681,094, Cl. 128-10.000.
- Roman Products, Inc.: See—  
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- Romanowski, Christopher A.: See—  
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- Rooney, Thomas C.: See—  
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- Roos, George E.: See—  
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- Rooy, Elwin L.: See—  
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- Rosalki, Sidney B., to Boehringer Mannheim GmbH. Process and reagent for the differentiated determination of isoenzymes of alkaline phosphatase. 4,681,842, Cl. 435-21.000.
- Rosati, Riccardo; and Rebuffat, Carlo. Circular mechanical anastomotic gun. 4,681,108, Cl. 128-334.00R.
- Rose, Michael A.; and Renals, Martin, to U.S. Philips Corporation. Infrared radiation detector with integral fresnel lens window. 4,682,030, Cl. 250-338.000.
- Rosemount Inc.: See—  
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- Rosen, Perry: See—  
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- Rosenblatt, Aaron A.: See—  
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- Rosenblatt, David H.; Rosenblatt, Aaron A.; and Knapp, Joseph A., to Scopus Technology Co., Ltd., The. Use of chlorine dioxide gas as a chemosterilizing agent. 4,681,739, Cl. 422-37.000.
- Rosenbusch, Helmut: See—  
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- Rost, Manfred, to Krautkramer-Branson, Incorporated. Ultrasonic angle test probe having at least two transducers. 4,680,967, Cl. 73-628.000.
- Rotaflex PLC: See—  
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- Roth, Bruce D., to Warner-Lambert Company. Trans-6-[2-(3- or 4-carboxamido-substituted pyrrol-1-yl)alkyl]-4-hydroxypyran-2-one inhibitors of cholesterol synthesis. 4,681,893, Cl. 514-422.000.
- Roth, Howard. Pegboard mounted tool holder. 4,681,233, Cl. 211-70.600.
- Rothkegel, Bernhard: See—  
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- Rouge, Anthony; and Schulze, Joachim, to Rouge, Anthony. Wind propelled land vehicle. 4,681,333, Cl. 280-87.04A.
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- Royston Laboratories, Inc.: See—  
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- Rubinstein, Leon. Plastic swivel connector and mold therefor. 4,680,837, Cl. 24-237.000.
- Ruble, Paul E. Self-loading binder. 4,681,472, Cl. 402-3.000.
- Ruelle, Jean-Jacques; d'Andrea, Giacomo; and Asselberghs, Leopold, to Solvay & Cie. Apparatus for fast determination of the rheological properties of thermoplastics. 4,680,958, Cl. 73-56.000.
- Rummel, Raymond W.; and Crystal, Anthony A., to White Consolidated Industries, Inc. Dryer mounting bracket assembly. 4,680,948, Cl. 68-3.00R.
- Rupp, James W., to Allied Corporation. Method of manufacturing a rotor. 4,680,844, Cl. 29-156.40R.
- Ruppachter, Helmut: See—  
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- Rutkiewicz, Andrew F.; and Strolle, Clifford H., to Du Pont de Nemours, E. I., and Company. Coating composition of polyester oligomer and acrylic binder. 4,681,815, Cl. 428-458.000.
- Rychiger, Peter: See—  
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- S.W.R. (Australia) Pty. Ltd.: See—  
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- Safe-N-Sound Pty. Limited: See—  
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- Safeway Products, Inc.: See—  
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- Sagami Chemical Research Center: See—  
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- Saint, David H.; and Funk, John W., to Canada, Her Majesty the Queen in right of. Blast wave densitometer system. 4,682,034, Cl. 250-363.00R.
- Saint-Gobain Vitrage: See—  
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- Saito, Akira, to Kyocera Corporation. Silicon carbide sintered body and process for production thereof. 4,681,861, Cl. 501-89.000.
- Saito, Masayuki; and Hamada, Mitsuo, to Toray Silicone Co., Ltd. Bonding primer composition. 4,681,636, Cl. 106-287.150.
- Saito, Tetsuo: See—  
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- Saito, Toshinori; and Takeuchi, Makoto, to Jeol Ltd. Two-stage pump assembly. 4,681,513, Cl. 417-2.000.
- Saito, Tsutomu: See—  
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.
- Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, to Kokusai Denshin Denwa Kabushiki Kaisha. Multi-layered semiconductor photodetector. 4,682,196, Cl. 357-30.000.
- Sakai, Shinji; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Automatic focusing device. 4,681,419, Cl. 354-402.000.
- Sakakibara, Masahiko: See—  
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- Sakakibara, Takao; Toyoda, Tsunehiko; and Nagashima, Yoshihisa, to Dai Nippon Toray Co., Ltd.; and Tokai Kogyo Co., Ltd. Molding process for plastics. 4,681,712, Cl. 264-24.000.
- Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, to Nippon Piston Ring Co., Ltd. Rotor for rotary fluid pump. 4,681,519, Cl. 148-152.000.
- Sakamoto, Katsuyoshi, to Amada Company, Limited. Die exchange device. 4,680,955, Cl. 72-462.000.
- Sakata, Yoshiya: See—  
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- Sakita, Eiichi: See—  
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- Sakurada, Kazuyuki: See—  
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- Sakurada, Shiroku; and Ikeda, Yasuhiko, to Hitachi, Ltd. Gate turn-off thyristor with integral capacitive anode. 4,682,198, Cl. 357-38.000.
- Sakurai, Akio; and Kato, Ryoichi, to Central Research Institute of Electric Power Industry; and Hitachi, Ltd. Fast breeder reactor. 4,681,726, Cl. 376-171.000.



Sakurai, Takayasu; and Iizuka, Tetsuya, to Kabushiki Kaisha Toshiba. Self-refresh control circuit for dynamic semiconductor memory device. 4,682,306, Cl. 365-222.000.

Sakurai, Terushige: See—  
Miki, Toshiyuki; Tomioka, Kunio; Nakajima, Masao; and Sakurai, Terushige, 4,681,210, Cl. 198-468.200.

Sakuramoto, Takahumi: See—  
Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, 4,681,733, Cl. 419-8.000.

Salminen, Ari: See—  
Cedercreutz, Axel; and Salminen, Ari, 4,681,287, Cl. 245-6.000.

Salomon, Ingeborg: See—  
Obermeier, Rainer; Salomon, Ingeborg; and Ludwig, Jürgen, 4,681,931, Cl. 350-351.000.

Salzmann, Theodor: See—  
Marquardt, Rainer; Salzmann, Theodor; and Poppel, Michael, 4,682,278, Cl. 363-58.000.

Sampath, T. K.: See—  
Nathanson, Mark A.; Reddi, A. H.; and Sampath, T. K., 4,681,763, Cl. 424-95.000.

Sanada, Yukitomo: See—  
Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.

Sanchez, Ruben G. Re-closure device for pop top containers. 4,681,238, Cl. 220-260.000.

Sanders Associates, Inc.: See—  
Kuppenheimer, John D., Jr., 4,682,338, Cl. 372-72.000.

Sanders, Robert E.; Flynn, Charles J.; and Vertrees, John L., to Hallmark Cards, Inc. Light string ornament circuitry. 4,682,079, Cl. 315-186.000.

Sandman, Daniel J.; and Elman, Boris S., to GTE Laboratories Incorporated. Chemical modification of polydiacetylene crystals. 4,681,920, Cl. 525-328.100.

Sandoz Ltd.: See—  
Kobel, Hans; Sanglier, Jean-Jacques; Tschertter, Hans; and Bolliger, Georg, 4,681,880, Cl. 514-250.000.

Sandoz Pharmaceuticals Corp.: See—  
Nadelson, Jeffrey, 4,681,898, Cl. 514-619.000.

Sanford, Robert A.: See—  
Strubel, David G.; and Sanford, Robert A., 4,681,126, Cl. 131-370.000.

Sangamo Weston, Inc.: See—  
Swanson, Scott C., 4,682,169, Cl. 379-104.000.

Sanglier, Jean-Jacques: See—  
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Sano, Shin-ichi: See—  
Ebara, Ryohiei; and Sano, Shin-ichi, 4,681,784, Cl. 428-40.000.

Sano, Tetsuo: See—  
Hohki, Tetsuo; Sano, Tetsuo; Kodama, Eiji; and Tsujinaka, Hisayuki, 4,682,040, Cl. 250-571.000.

Santel, Hans-Joachim: See—  
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; and Schmidt, Robert R., 4,681,618, Cl. 71-92.000.

Santin, Ernest M.: See—  
Fenton, Paul V., Jr.; Miller, Robert L.; and Santin, Ernest M., 4,681,566, Cl. 604-135.000.

Santrade Limited: See—  
Markusson, Lars O., 4,681,488, Cl. 407-114.000.

Pettersson, Lars T., 4,681,487, Cl. 407-114.000.

Sanyo Electric Co., Ltd.: See—  
Doutsbo, Nobuhide, 4,682,247, Cl. 360-10.200.

Fukatsu, Takeo; Goto, Kazuyuki; Haku, Hisao; and Kuwano, Yukinori, 4,681,826, Cl. 430-65.000.

Sardella, Louis M., to Wm. C. Staley Machinery Corporation. Intermittently protruding feeder for paperboard blanks. 4,681,311, Cl. 271-11.000.

Sartorio, Franco: See—  
Delle Piane, Alberto; Sartorio, Franco; Cantello, Maichi; and Ghiringhello, Guglielmo, 4,682,002, Cl. 219-121.0LD.

Sarwinski, Raymond E.; Purcell, John R.; Parker, Judson W.; and Burnett, Sibley C., to GA Technologies Inc. Cryogenic magnet systems. 4,680,936, Cl. 62-45.000.

Sasakawa, Atsushi: See—  
Yamauchi, Takashi; Hayashi, Shoichiro; and Sasakawa, Atsushi, 4,681,978, Cl. 562-413.000.

Sasaki Glass Co., Ltd.: See—  
Minakawa, Takao; Shiono, Shigeo; and Nishihashi, Junichi, 4,682,003, Cl. 219-121.0LN.

Sasaki, Hiroyuki: See—  
Morikawa, Shigenori; Hanzawa, Kohtaro; Sasaki, Hiroyuki; and Morokuma, Hiroshi, 4,681,008, Cl. 84-1.280.

Sasaki, Takashi; Sakurada, Nobuaki; and Kawamura, Hideaki, to Canon Kabushiki Kaisha. Method for forming a color image. 4,682,186, Cl. 346-140.00R.

Sasaki, Takashi; Sakurada, Nobuaki; Kawamura, Hideaki; and Moriyama, Jiro, to Canon Kabushiki Kaisha. Color image picture forming process and apparatus which improves the quality of the black portions of the picture. 4,682,216, Cl. 358-79.000.

Sato, Akira; and Maki, Fumio, to Parker Arrester Co., Ltd. Spray coating chamber free from painting mist leakage. 4,681,026, Cl. 98-115.200.

Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, to Nippon Petrochemicals Company Lim-

ited. Method for improving an electrical insulating hydrocarbon. 4,681,980, Cl. 585-6.300.

Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, to Toyota Jidosha Kabushiki Kaisha; and Nippon Denso Kabushiki Kaisha. Electromagnetic directional control valve. 4,681,143, Cl. 137-625.370.

Sato, Hiroyuki: See—  
Shibata, Masahiro; Tsujibayashi, Tatsuo; Sato, Hiroyuki; and Machida, Yoshinori, 4,682,245, Cl. 358-311.000.

Sato, Jun, to Shimano Industrial Company Limited. Fishing reel. 4,681,276, Cl. 242-84.10R.

Sato, Kiyoshi; and Matsui, Nobuo, to Fuji Photo Optical Co., Ltd. Test pattern projector for a color television camera. 4,682,214, Cl. 358-55.000.

Sato, Teiji: See—  
Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, 4,681,749, Cl. 423-326.000.

Sato, Toru; Okazaki, Naoto; and Fujii, Katsumasa, to Tottori University. Breath-synchronized concentrated-oxygen supplier. 4,681,099, Cl. 128-204.230.

Sato, Tsunehiko: See—  
Shibata, Norio; Takeda, Hideo; Sato, Tsunehiko; and Tanaka, Yasunori, 4,681,062, Cl. 118-410.000.

Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiyama, Kengo, to Nippondenso Co., Ltd. Heat-wire type airflow quantity measuring apparatus. 4,680,964, Cl. 73-204.000.

Sato, Yuichi: See—  
Kawabata, Takashi; Sato, Yuichi; Tsunekawa, Tokuchi; and Matsumura, Susumu, 4,681,432, Cl. 356-4.000.

Satoh, Takateru; Shiba, Haruo; and Nunokawa, Eiichi, to TDK Corporation. Video cassette cartridge construction. 4,682,258, Cl. 360-132.000.

Satoh, Toshihiko: See—  
Fujino, Masahisa; Fukahori, Hidehiko; and Satoh, Toshihiko, 4,681,417, Cl. 354-234.100.

Satoh, Toshio; and Tsukamoto, Goro, to Kanebo, Ltd. Novel guanidinomethylcyclohexanecarboxylic acid compounds and anti-ulcer drug containing the same. 4,681,895, Cl. 514-535.000.

Satzinger, Gerhard: See—  
Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; Weinheimer, Gonter; and Fritsch, Edgar, 4,681,882, Cl. 514-258.000.

Saunders, John: See—  
Donald, David K.; Hann, Michael M.; Saunders, John; and Wadsworth, Harry J., 4,681,966, Cl. 558-255.000.

Sayano, Reizo; and Goldberg, Eugene P., to Intermedics Intracocular, Inc. Intracocular implant. 4,681,585, Cl. 623-6.000.

Sbaschnigg, Johann, to Maschinenfabrik Andritz Aktiengesellschaft. Multi-nip high pressure press. 4,681,659, Cl. 162-360.100.

Schaefer, Werner: See—  
Fabinski, Walter; and Schaefer, Werner, 4,682,031, Cl. 250-345.000.

Schallner, Otto: See—  
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; and Schmidt, Robert R., 4,681,618, Cl. 71-92.000.

Schanin, Jonathan: See—  
Pinto, Gideon; and Schanin, Jonathan, 4,681,646, Cl. 156-157.000.

Schapel, Dietmar: See—  
Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, 4,681,851, Cl. 435-262.000.

Scharf, Helmut; and Krix, Wilfried, to Huls Aktiengesellschaft. Method of utilizing distillation residues of phthalic acid anhydride or maleic acid anhydride. 4,681,046, Cl. 110-346.000.

Scharfenbergkupplung GmbH: See—  
Forster, Hilmar; and Lindner, Harald, 4,681,235, Cl. 213-50.000.

Schatz, Oskar. Apparatus for supercharging an internal combustion engine. 4,680,932, Cl. 60-605.000.

Scheinert, Wolfgang: See—  
Ingendoh, Axel; Scheinert, Wolfgang; Becker, Benedikt; Halcour, Kurt; and Stendel, Wilhelm, 4,681,892, Cl. 514-378.000.

Schenke, Reynold A.: See—  
Schenke, Robert W.; and Schenke, Reynold A., 4,681,534, Cl. 431-290.000.

Schenke, Robert W.; and Schenke, Reynold A. Candle holder with drain holes. 4,681,534, Cl. 431-290.000.

Schering Aktiengesellschaft: See—  
Laurent, Henry; Bittler, Dieter; Beier, Sybille; and Elger, Walter, 4,681,875, Cl. 514-182.000.

Rasor, Julia S.; and Tickner, Ernest G., 4,681,119, Cl. 128-660.000.

Schettler, Helmut: See—  
Beranger, Herve L.; Gaudenzi, Gene J.; Reedy, Dennis C.; and Schettler, Helmut, 4,682,050, Cl. 307-270.000.

Scheven, Gunter: See—  
Baumgart, Rudolf; Martin, Manfred; Low, Lothar; and Scheven, Gunter, 4,681,720, Cl. 264-150.000.

Schiek, Robert C., to Ciba-Geigy Corporation. Iron blue pigments and process for preparation. 4,681,638, Cl. 106-309.000.

Schiller, Werner: See—  
Burghoff, Karl; Schiller, Werner; Albrecht, Wilhelm; Harsch, Herbert; and Burghoff, Heinz-Georg, 4,680,952, Cl. 72-161.000.

Schinazi, Raymond F.: See—  
Chu, Chung K.; and Schinazi, Raymond F., 4,681,933, Cl. 536-23.000.

Schliessmann, Kurt: See—  
Schulzen, Herbert; Kohler, Wolfgang; and Schliessmann, Kurt, 4,681,034, Cl. 101-211.000.

Schlumberger Messgerate GmbH: See—  
Schutz, Johann, 4,682,124, Cl. 332-19.000.

Schmall, Karl-Heinz, to GET Gesellschaft für Elektronik-Technologie mbH. Measuring arrangement having a capacitive measuring electrode and a working tool with integrated electrode. 4,682,004, Cl. 219-121.0PC.

Schmed, Arthur; and Frei, Hans-Peter, to Gesamat AG. Apparatus for the preparation of hot beverages, particularly a coffee machine. 4,681,028, Cl. 99-289.00R.

Schmid, Werner: See—  
Farooq, Saleem; Reinehr, Dieter; and Schmid, Werner, 4,681,593, Cl. 8-128.00R.

Schmidt, Karl-Heinz; and Seibt, Artur, to Voest-Alpine Automotive m.b.H. Resolver circuit. 4,682,090, Cl. 318-661.000.

Schmidt, Manfred; Paul, Winfried; Freitag, Dieter; and Rathmann, Dietrich, to Bayer Aktiengesellschaft. Thermoplastic polysiloxane-polyester (carbonate) block copolymers, their preparation and use. 4,681,922, Cl. 525-474.000.

Schmidt, Otto H.; Heine, Helmut A.; and Rosenbusch, Helmut, to Proper Manufacturing Co., Inc.; and Heine Optotechnik GmbH & Co. KG. Headband with optical device adjustably coupled thereto. 4,681,413, Cl. 351-205.000.

Schmidt, Robert R.: See—  
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; and Schmidt, Robert R., 4,681,618, Cl. 71-92.000.

Schmits, Heinz-Herbert: See—  
Heinemann, Otto; and Schmits, Heinz-Herbert, 4,681,021, Cl. 91-178.000.

Schneider, Franz; Braitering, Helmut; and Feinauer, Otto, to L. Schuler GmbH. Simulation arrangement for determining desired values for the transport of workpieces of a multistage press. 4,682,280, Cl. 364-191.000.

Schneider, Robert: See—  
Miller, Ralph; Bollini, Jakob L.; and Schneider, Robert, 4,681,710, Cl. 260-508.000.

Schneider, Siegfried: See—  
Stetter, Eckart; Reichenberger, Helmut; Schneider, Siegfried; and Wirth, Axel, 4,682,108, Cl. 324-309.000.

Schneider, Thomas E.; Kolanowski, Clarence; and Patterson, Richard L., to Molex Incorporated. Electrical harness fabrication apparatus. 4,680,841, Cl. 29-33.00M.

Schock, Gernot: See—  
Groll, Werner; Schock, Gernot; Hathaway, Doris; and Wagner, Rudolf, 4,681,735, Cl. 420-464.000.

Schoff, Rainer: See—  
Fischer, Nikolaus H. J.; Mathey, Christoph; and Schoff, Rainer, 4,681,017, Cl. 89-29.000.

Scholz, Heinz: See—  
Clasen, Rolf; and Scholz, Heinz, 4,681,614, Cl. 65-18.100.

Schonafinger, Karl; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, to Cassella Aktiengesellschaft. Dihydro-2,6-dimethyl pyridines, formulations and method of use for treating angina pectoris, high blood pressure or disturbances of cerebral or peripheral blood flow. 4,681,891, Cl. 514-340.000.

Schrader, Elliott G., to Texas Instruments Incorporated. Ripple and droop reduction circuit. 4,682,369, Cl. 455-127.000.

Schram, David N.: See—  
Nobel, Fred I.; and Schram, David N., 4,681,670, Cl. 204-44.400.

Schreiner, Horst; and Rothkegel, Bernhard, to Siemens Aktiengesellschaft. Sintered, electrical contact material for low voltage power switching. 4,681,702, Cl. 252-518.000.

Schrivver, Harold S., Jr., to AMP Incorporated. Moldable composition. 4,681,691, Cl. 252-12.000.

Schrock, Richard R., to Massachusetts Institute of Technology. Catalyst composition for effecting metathesis of olefins. 4,681,956, Cl. 556-12.000.

Schrofer, Eldred P., to American Telephone & Telegraph Co., AT&T Bell Lab. Queue administration method and apparatus. 4,682,284, Cl. 364-200.000.

Schuetz, James A., to Honeywell Inc. Reactively sputtered chrome silicon nitride resistors. 4,681,812, Cl. 428-432.000.

Schukoff, Bruno, to A V L Gesellschaft für Verbrennungskraftmaschinen und Messtechnik mbh Prof. Dr. Dr. h.c. Hans List. Device for the temporary interruption of the pressure build-up in a fuel injection pump. 4,681,080, Cl. 123-506.000.

Schulte, Rudolf R.; East, Gary P.; and Heindl, Alfons, to Pudenz-Schulte Medical Research Corp. Subcutaneous infusion reservoir and pump system. 4,681,560, Cl. 604-9.000.

Schulz, Rene; Teubler, Heinz; and Breuer, Peter, to Vickers Systems GmbH. Hydraulic pump. 4,681,517, Cl. 417-300.000.

Schulze, Harry O.; and Karam, Ronald E., to GTE Products Corp. Gray body colored zinc sulfide activated with copper. 4,681,807, Cl. 428-403.000.

Schulze, Joachim: See—  
Rouge, Anthony; and Schulze, Joachim, 4,681,333, Cl. 280-87.04A.

Schulzen, Herbert; Kohler, Wolfgang; and Schliessmann, Kurt. Process for printing a substrate by the hot-transfer printing method. 4,681,034, Cl. 101-211.000.

Schumann, Erwin: See—  
Hoffmann, Gerhard; Bauer, Rudolf; Heilmann, Paul; and Schumann, Erwin, 4,682,011, Cl. 219-390.000.

Schunter, Roland, to Floordress Reinigungsgeraete. Floor wiper frame. 4,680,826, Cl. 15-147.00R.

Schurter, Rolf: See—  
Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,681,620, Cl. 71-93.000.

Schuss, Werner: See—  
Landgraf, Hermann; Schuss, Werner; and Worschiscek, Rainer-Karl, 4,681,540, Cl. 433-126.000.

Schuster, Lorenz M. Glass and bottle tote. 4,681,225, Cl. 206-426.000.

Schutz, Johann, to Schlumberger Messgerate GmbH. Circuit including a DC-FM phase locked loop. 4,682,124, Cl. 332-19.000.

Schwartz, David M., to CompuSonics Video Corporation. Audio and video digital recording and playback system. 4,682,248, Cl. 360-32.000.

Schwarz, Hans-Dieter; Pietzarka, Friedrich W.; Lichtenthaler, Werner; and Muhlhaus, Ludwig, to Uhde GmbH. Crossflow heat exchanger. 4,681,157, Cl. 165-145.000.

Schwing, Friedrich, to Friedrich Wilh. Schwing GmbH. Two-cylinder viscous liquid pump with pipe switch. 4,681,022, Cl. 91-471.000.

Scopas Technology Co., Ltd., The: See—  
Rosenblatt, David H.; Rosenblatt, Aaron A.; and Knapp, Joseph A., 4,681,739, Cl. 422-37.000.

Scott & Fetzer Company, The: See—  
MacAskill, Robert B.; and Braun, Jeffrey J., 4,682,082, Cl. 315-219.000.

Seagate Technology: See—  
Smith, Robert F., 4,682,252, Cl. 360-67.000.

Seeger, Stefan: See—  
Brunner, Heinz; and Seeger, Stefan, 4,681,272, Cl. 242-47.010.

Seevinck, Evert; Wassenaar, Roelof F.; and Holle, Eerke, to U.S. Philips Corporation. Voltage-current converter. 4,682,098, Cl. 323-315.000.

Seibt, Artur: See—  
Schmidt, Karl-Heinz; and Seibt, Artur, 4,682,090, Cl. 318-661.000.

Seiffarth, Ernst A.: See—  
Halldorsson, Thorsteinn; and Seiffarth, Ernst A., 4,682,024, Cl. 250-225.000.

Seiger, Harvey N., to Gould Inc. Bipolar electrode formation. 4,681,663, Cl. 204-21.000.

Seiko Epson Kabushiki Kaisha: See—  
Toki, Motoyuki; Kanbe, Sadao; Miyashita, Satoru; and Takeuchi, Tetsuhiko, 4,681,615, Cl. 65-18.100.

Sekimoto, Yukihiko: See—  
Kanda, Shoichi; Yanagita, Makoto; and Sekimoto, Yukihiko, 4,681,690, Cl. 252-8.551.

Selbach, Bernd; and Vary, Peter, to U.S. Philips Corporation. Method of recognizing speech pauses. 4,682,361, Cl. 381-46.000.

Selby, Garry J.: See—  
Kantor, Sherwood; Selby, Garry J.; and Wolfe, Larry L., 4,681,424, Cl. 355-14.00R.

Sell, William F., to Ellenberger & Poensgen GmbH. Push-button actuated overload protective circuit breaker. 4,682,138, Cl. 337-68.000.

Semiconductor Energy Laboratory Co., Ltd.: See—  
Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, 4,680,855, Cl. 29-583.000.

Sequeira, Richard J.; and Valadez, Frank R. Gas flow pulsation dampener and pressure differential control. 4,681,136, Cl. 137-494.000.

Serbin, David J.: See—  
Cole, William M.; Fenske, Steven L.; Serbin, David J.; Malani, Shrikant R.; Clark, Frank J.; and Beattie, Joanne L., 4,681,929, Cl. 528-493.000.

Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotaka, to Hitachi, Ltd. Image correction processing method and apparatus. 4,682,300, Cl. 364-571.000.

Seton Products Limited: See—  
Coplans, Carl W., 4,681,113, Cl. 450-134.000.

Settineri, Robert A., to Royston Laboratories, Inc. Splice construction for electrical cable and method for making the same. 4,681,986, Cl. 174-84.00R.

Settler, Bert. Antimony electrode assembly and method of manufacture, and use thereof. 4,681,116, Cl. 128-635.000.

Sevey, Douglas, to Waterloo Industries, Inc. Removable drawer slide and interlock with drawer. 4,681,381, Cl. 312-333.000.

Sewing, Karlernst: See—  
Freudenreich, Erwin; Flerlage, Horst; and Sewing, Karlernst, 4,682,274, Cl. 362-61.000.

SGF Sueddeutsche Gelenkscheibenfabrik GmbH & Co. KG: See—  
Wahling, Werner; and Ziegler, Gunther, 4,680,984, Cl. 74-574.000.

SGS Microelectronica S.p.A.: See—  
Palara, Sergio; and Torazzina, Aldo, 4,682,120, Cl. 330-298.000.

Villa, Flavio; Murari, Bruno; Bertotti, Franco; Torazzina, Aldo; and Stefani, Fabrizio, 4,682,197, Cl. 357-36.000.

Shanksville Corporation N.V.: See—  
Fabricius, Hans-Ake; and Kottgen, Eckart U., 4,681,844, Cl. 435-68.000.

Sharbaugh, John E., to United States of America, Energy. Nuclear reactor construction with bottom supported reactor vessel. 4,681,731, Cl. 376-285.000.

Sharp Kabushiki Kaisha: See—  
Miyake, Kazunari, 4,682,313, Cl. 369-39.000.

Nishijima, Masaru, 4,681,423, Cl. 355-14.00R.

Sheasby, Peter G.: See—  
Davies, Nigel C.; and Sheasby, Peter G., 4,681,668, Cl. 204-28.000.

Sheem, Sang K. Game toy. 4,681,325, Cl. 273-345.000.

Shell Oil Company: See—  
Hwo, Charles C., 4,681,804, Cl. 428-349.000.

Sie, Swan T., 4,681,701, Cl. 252-373.000.



- Shelton, Jean C.: See—  
Livingston, Peter M.; and Shelton, Jean C., 4,682,025, Cl. 250-201.000.
- Sherwin-Williams Company, The: See—  
Sprute, Fritz A., 4,681,262, Cl. 239-306.000.
- Sheth, Prabhakar R.: See—  
Mergens, William J.; Newmark, Harold L.; Sheth, Prabhakar R.; and Tossounian, Jacques L., 4,681,756, Cl. 424-451.000.
- Shiba, Haruo: See—  
Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, 4,682,259, Cl. 360-132.000.
- Sato, Takateru; Shiba, Haruo; and Nunokawa, Eiichi, 4,682,258, Cl. 360-132.000.
- Shibahashi, Yutaka; Nakasuiji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Totum; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, to Pilot Ink Co., Ltd. Thermochromic textile material, 4,681,791, Cl. 428-96.000.
- Shibana, Ichiro; Horikoshi, Koki; and Kato, Takashi. Crosslinking agent and process for the preparation of the same, 4,681,934, Cl. 536-46.000.
- Shibasaki, Masakatsu; Mase, Toshiaki; Sodeoka, Mikiko; and Ogawa, Yuji, to Sagami Chemical Research Center. Bicyclo(3.3.0)octene derivatives, 4,681,951, Cl. 549-214.000.
- Shibata, Masahiro; Tsujibayashi, Tatsuo; Sato, Hiroyuki; and Machida, Yoshinori, to Sony Corporation. Video and audio signal recording, reproducing and editing apparatus with replacement of viewed luminance signal component during insert audio editing mode, 4,682,245, Cl. 358-311.000.
- Shibata, Nobuo; Yasunobu, Isamu; Neki, Shigeo; Ohara, Kenichi; and Dohi, Takashi, to Matsushita Electric Industrial Co. Ltd. Circuit arrangement for controlling starting current of a motor, 4,682,095, Cl. 318-778.000.
- Shibata, Norio; Takeda, Hideo; Sato, Tsunehiko; and Tanaka, Yasunori, to Fuji Photo Film Co., Ltd. Coating apparatus, 4,681,062, Cl. 118-410.000.
- Shibusawa, Mitsuo: See—  
Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsuo; Yoshino, Hirobumi; and Shibusawa, Mitsuo, 4,682,158, Cl. 340-679.000.
- Shiley Inc.: See—  
Edelman, William, 4,681,104, Cl. 128-303.100.
- Shimamoto, Mamoru: See—  
Onogi, Nobuyoshi; and Shimamoto, Mamoru, 4,681,082, Cl. 123-643.000.
- Shimano Industrial Company Limited: See—  
Sato, Jun, 4,681,276, Cl. 242-84.10R.
- Shimatani, Ryoichi: See—  
Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.
- Shimizu, Hajime. Display for radars or sonars, 4,682,177, Cl. 342-176.000.
- Shimizu, Shoji, to Excell Corporation. Apparatus for molding plastic products, 4,681,525, Cl. 425-527.000.
- Shimizu, Yasuo, to Honda Giken Kogyo Kaisha. Electric power steering system for vehicles, 4,681,181, Cl. 180-79.100.
- Shimizu, Yukio: See—  
Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, 4,681,733, Cl. 419-8.000.
- Shimomura, Yasuo: See—  
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- Shimotori, Kazumi: See—  
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- Shinada, Manabu, to Kabushiki Kaisha Riken. Piston ring, 4,681,817, Cl. 428-549.000.
- Shinada, Masayuki: See—  
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- Shinagawa Shoko Co., Ltd.: See—  
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- Shiokama, Yoshiharu: See—  
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- Shiono, Hiroshi: See—  
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.
- Shiono, Manzo: See—  
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- Shiono, Shigeo: See—  
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- Shionogi & Co., Ltd.: See—  
Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, 4,681,874, Cl. 514-90.000.
- Shiozaki, Masakazu; and Nishimura, Hidetaro, to Tokyo Shibaura Denki Kabushiki Kaisha. Fuse element for integrated circuit memory device, 4,682,204, Cl. 357-51.000.
- Shirai, Akira: See—  
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- Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.
- Shirley, John R., to Central Security Mfg. Corp. Personnel security system, 4,682,155, Cl. 340-573.000.
- Shirotori, Hideo: See—  
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- Shishido, Tadao: See—  
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- Shoemaker, Jack W. Pipe laying method and apparatus, 4,681,439, Cl. 356-154.000.
- Shopsky, Harvey J., to Robertshaw Controls Company. Valve construction and method of making the same, 4,681,296, Cl. 251-11.000.
- Short, Keith E., to Sundstrand Corporation. Boiler for a torpedo and system including the same, 4,680,934, Cl. 60-652.000.
- Shu, Brandon, to High Brandon Incorporated. Portable cooking, toasting, roasting, and carbonado heating device, 4,681,083, Cl. 126-9.00R.
- Shulman, Seth D., to Bioscan, Inc. Solid state counting system for high energy beta and gamma decay isotopes, 4,682,035, Cl. 250-370.000.
- Shumila, Michael J.: See—  
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- Sick, Erwin, to Erwin Sick GmbH Optik-Elektronik. Optoelectronic comparison apparatus for structures on plane surfaces or for planar structures, 4,681,453, Cl. 356-394.000.
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Singleton, Robert P., 4,680,994, Cl. 81-57.290.
- Sie, Swan T., to Shell Oil Company. Process for producing synthesis gas, 4,681,701, Cl. 252-373.000.
- Siebert, Louis P. Motorcycle jack, 4,681,299, Cl. 254-8.00R.
- Siegel, Rudolf: See—  
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- Doetsch, Werner; and Siegel, Rudolf, 4,681,748, Cl. 423-279.000.
- Siegel, Sharon B.: See—  
Brodman, Richard F.; and Siegel, Sharon B., 4,681,117, Cl. 128-642.000.
- Siegl, Helene, to Sandoz Ltd. Counteracting cyclosporin organ toxicity, 4,681,754, Cl. 424-10.000.
- Siehling, Mark B.: See—  
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- Siemens Aktiengesellschaft: See—  
Amann, Markus-Christian, 4,682,337, Cl. 372-44.000.
- Bozung, Hanns-Gunther; and Nachtigal, Joachim, 4,680,933, Cl. 60-608.000.
- Bulst, Wolf-Eckhart; Lindemann, Gertrud; and Zibis, Peter, 4,682,130, Cl. 333-195.000.
- Gradnitzer, Eckhard; and Klautschek, Herwig, 4,682,263, Cl. 361-31.000.
- Kern, Josef, 4,682,133, Cl. 335-119.000.
- Landgraf, Hermann; Schuss, Werner; and Worschischek, Rainer-Karl, 4,681,540, Cl. 433-126.000.
- Marquardt, Rainer; Salzmann, Theodor; and Peppel, Michael, 4,682,278, Cl. 363-58.000.
- Moeller, Matthias, 4,681,984, Cl. 136-258.000.
- Schreiner, Horst; and Rothkegel, Bernhard, 4,681,702, Cl. 252-518.000.
- Stetter, Eckart; Reichenberger, Helmut; Schneider, Siegfried; and Wirth, Axel, 4,682,108, Cl. 324-309.000.
- von Siehart, Frithjof, 4,682,047, Cl. 307-200.00B.
- Siemens Corporation: See—  
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- Siemens-Pacesetter, Inc.: See—  
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- Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: See—  
Colombo, Paolo; Conte, Ubaldo; and Reiner, Alberto, 4,681,755, Cl. 424-486.000.
- Sigwardt, Peter L.: See—  
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- Sikora, Scott T., to Tomar Electronics, Inc. Single-ended, self-oscillating DC-DC converter for intermittently energized load having  $V_{BE}$  responsive current limit circuit, 4,682,081, Cl. 315-219.000.
- Silcox, William H.: See—  
Bodine, James A.; Kuehn, Judson S.; and Silcox, William H., 4,681,298, Cl. 251-129.100.
- Silverberg, Eric C.: See—  
Krewalk, John J.; and Silverberg, Eric C., 4,682,091, Cl. 318-685.000.
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- Sim, Teik P.: See—  
Richardson, Elvet M.; and Sim, Teik P., 4,680,941, Cl. 62-184.000.
- Simkins, Philip P., to Hewitt, Steven W., a part interest. Display case for fragrance bottles, jewelry, or the like, and hinge used therein, 4,681,216, Cl. 206-45.130.
- Simm, Wolfgang; and Steine, Hans-Theo, to Castolin S.A. Heat spraying material and manufacturing process thereof, 4,681,734, Cl. 419-9.000.

- Simmonds, Robert C., Jr.; Crowell, Douglas H.; and Martin, John F., to USM Corporation. Powder reinforcing laminate apparatus, 4,681,650, Cl. 156-378.000.
- Simmons, Howard E., III. Optical recording element, 4,681,834, Cl. 430-270.000.
- Simonsen, Jens K.; and Moos, Hans J., to Danfoss A/S. Mass flow meter on the coriolis principle, 4,680,974, Cl. 73-861.380.
- Simpson, Dennis A.; Singer, Debra L.; Dowbenko, Rostyslaw; Blackburn, William P.; and Kania, Charles M., to PPG Industries, Inc. Color plus clear coatings employing polyepoxides and polyacid curing agents in the clear coat, 4,681,811, Cl. 428-413.000.
- Simpson, Dennis L.: See—  
Brabb, James D.; and Simpson, Dennis L., 4,681,265, Cl. 239-665.000.
- Simpson, Leslie J., to Flight Equipment and Engineering Limited. Reclinable vehicle seats, 4,681,369, Cl. 297-316.000.
- Sims, John C., deceased (by Sims, Lucille, executrix); and Mundo, Charles J., Jr., to Sineco, Inc. Optical ranging anti-collision technique and system, 4,681,431, Cl. 356-4.000.
- Sims, Lucille, executrix: See—  
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- Sineco, Inc.: See—  
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- Singer, Debra L.: See—  
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- Singleton, Robert P., to Sidewinder Products Corporation. Socket wrench with reversing ratchet, 4,680,994, Cl. 81-57.290.
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Brunner, Heinz; and Seeger, Stefan, 4,681,272, Cl. 242-47.010.
- Sirkin, Robert, to Charles Wyle Engineering Corporation. Solvent pump, 4,681,242, Cl. 222-41.000.
- Skarvinko, Eugene P.: See—  
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- Skelton, John: See—  
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- Skraba, Frank W., to Phillips Petroleum Company. Catalytic cracking apparatus, 4,681,743, Cl. 422-140.000.
- Skyline Industry Co. Ltd.: See—  
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- Skyline Products, Inc.: See—  
Stadjuhar, Robert C.; and Renfro, Cecil S., 4,680,883, Cl. 40-471.000.
- Sieger, Roger R.; and Walsh, Edward, to Hewlett-Packard Company. Actuator arm bearing preload arrangement for a rotary disc drive, 4,682,255, Cl. 360-106.000.
- Sloan, George C.; and Laine, David J. Compact personal hygiene center, 4,680,817, Cl. 4-663.000.
- Slusarchyk, William A.; Dejneka, Tamara; Koster, William H.; and Gordon, Eric M., to E. R. Squibb & Sons, Inc. 3-acylamino-2-oxo-1-azetidinyloxy esters of phosphonic acids, phosphoric acid and phosphoric acid esters, 4,681,937, Cl. 540-355.000.
- SM Industrial Co., Ltd.: See—  
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- Smith, Daniel P.; and Lillquist, Robert D., to General Electric Company. Stimulated scanning infrared imaging system, 4,682,222, Cl. 358-113.000.
- Smith, David E., to Aspen Peripherals. Guide for restoring and removing a tape leader block to and from a tape cassette, 4,681,278, Cl. 242-195.000.
- Smith, David J. H.: See—  
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- Smith, Dennis M.: See—  
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- Smith, Forrest P., Jr.; and Munnell, Jeffrey C. Safety firearm mechanism, 4,680,884, Cl. 42-66.000.
- Smith, Gregory C.: See—  
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- Smith, Ian R.: See—  
Brown, Thomas H.; Mitchell, Robert C.; Smith, Ian R.; and Young, Rodney C., 4,681,883, Cl. 514-212.000.
- Smith Kline & French Laboratories Limited: See—  
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- Smith, Larry C.: See—  
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- Smith, Paul D.: See—  
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- Smith, Robert F., to Seagate Technology. Method and apparatus for evaluating a recording system utilizing a programmable window generator having first and second multivibrators providing delay, 4,682,252, Cl. 360-67.000.
- Smith, Robert J. Method and apparatus for starting a diesel engine at a subfreezing temperature, 4,681,071, Cl. 123-180.00R.
- Smith, Ronald L.: See—  
Carpenter, James H.; Mullins, Ronald L.; and Smith, Ronald L., 4,680,899, Cl. 51-427.000.
- Smith, Thomas T. Container opening technology, 4,681,358, Cl. 294-15.000.
- Smith, Timothy B.: See—  
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- Snaper, Alvin A. Dental bur with enhanced durability, 4,681,541, Cl. 433-165.000.
- Societe Anonyme de Telecommunications: See—  
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- Societe Cogema, Framatome et Uranium Pechiney: See—  
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- Societe de Conseils de Recherches et d'Applications Scientifiques: See—  
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- Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": See—  
d'Agostino, Guy; Dhainaut, Andre; Kettler, Daniel G. A.; and Leclerc, Henry R., 4,681,327, Cl. 277-29.000.
- Societe Prolabo: See—  
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- Sodeikat, Dieter, to Messerschmitt-Bolkow-Blohm GmbH. Mechanical vibrator, 4,680,968, Cl. 73-651.000.
- Sodeoka, Mikiko: See—  
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- Soderberg, Paul B., to Soderberg Research & Development, Inc. Apparatus and method for automatically and periodically introducing a fluid into a producing oil well, 4,681,167, Cl. 166-371.000.
- Soderberg Research & Development, Inc.: See—  
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- Solarcraft, Inc.: See—  
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- Solaroli, Sergio: See—  
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- Soltysiak, Peter, to Mannesmann Aktiengesellschaft. Resilient suspension for conduits, 4,681,294, Cl. 248-613.000.
- Solvay & Cie: See—  
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- Somar Corporation: See—  
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- Nagasawa, Kohtarō; and Morikubo, Kunio, 4,681,833, Cl. 430-175.000.
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- Sommerfeld, Claus-Dieter: See—  
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- Sondov, Sten Y.; and From, Jan O., to Interpublic a.s. Tubular trash net for pre-treating sewage, with replaceable net cassette, 4,681,688, Cl. 210-770.000.
- Sonex Research, Inc.: See—  
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- Song, Peter: See—  
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- Sonoda, Hirotetu: See—  
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- Sony Corporation: See—  
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- David, Morgan W. A.; and Hedley, David J., 4,682,217, Cl. 358-89.000.
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- Soyama, Hideo: See—  
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- Spangler, Harvey D.; and Lamb, Kenneth V., to Kinetics Technology International Corporation; and Farmland Industries, Corporation. Feed gas saturation system for steam reforming plants, 4,681,603, Cl. 55-27.000.
- Spangler, James E.: See—  
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- Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, to Lockheed Corporation. Controlled expansion protruding-head rivet design and method of installing same, 4,681,499, Cl. 411-507.000.



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- Spence-Bate, Harry A. H.; and Smith, Timothy B., to Spence-Bate, Joyce Florence. Film lamina handling. 4,681,429, Cl. 355-73.000.
- Spence-Bate, Joyce Florence: See—  
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- Speranza, George P.; Brennan, Michael E.; and Grigsby, Robert A., Jr., to Texaco Inc. Phosphorus containing aromatic amino polyols. 4,681,965, Cl. 558-162.000.
- Spielau, Paul: See—  
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- Sprague, Peter W.: See—  
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- Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., to International Flavors & Fragrances Inc. Process for preparing alkyl substituted and unsubstituted para-carboalkoxy cyclohexanones. 4,681,976, Cl. 560-126.000.
- Sproul, Robert W.; and Ponzo, Michael F. Phase shifter. 4,682,128, Cl. 333-139.000.
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- Staer S. A.: See—  
d'Alayer de Costemore d'Arc, Stephane A. M., 4,682,320, Cl. 369-77.100.
- Stacks, Ronald R. Method of treating wells with aqueous foam. 4,681,164, Cl. 166-304.000.
- Stadjuhar, Robert C.; and Renfro, Cecil S., to Skyline Products, Inc. Scroll module and sign system for internally illuminated signs. 4,680,883, Cl. 40-471.000.
- Stahl, Torvald, to Flygt Aktiebolag. Key joint apparatus for assembly of electrical motors. 4,682,069, Cl. 310-261.000.
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- Standard Oil Company, The: See—  
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- Desmond, Michael J.; Currie, Jamie K.; and Pesa, Frederick A., 4,681,747, Cl. 423-277.000.
- Li, George S.; Wu, Muyen M.; and Dewitt, Elmer J., 4,681,917, Cl. 525-210.000.
- Tsou, Dean T.; Blachman, Marc W.; and Burrington, James D., 4,681,968, Cl. 558-361.000.
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- Stanley, Ann E., to United States of America, Army. Laser-induced chemical vapor deposition of germanium and doped-germanium films. 4,681,640, Cl. 148-1.500.
- Stanley Electric Co., Ltd.: See—  
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- Stanley Works, The: See—  
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- State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University: See—  
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- Lee, David L.; and Michaely, William J., 4,681,621, Cl. 71-103.000.
- Paterson, Karol E.; and Everett, Nicholas P., 4,681,849, Cl. 435-240.000.
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- Steckhan, Eberhard; Wolf, Reinhard; and Puetter, Hermann, to BASF Aktiengesellschaft. Preparation of chloro-olefins. 4,681,977, Cl. 560-262.000.
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- Steininger, Hugh D.: See—  
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- Stelma, Michael J.; and Dehem, Paul R. Drummer's glove. 4,681,012, Cl. 84-422.00S.
- Sten, Matti: See—  
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- Stendel, Wilhelm: See—  
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- Stephenson, John R.; Groffen, John; and Heisterkamp, Nora, to United States of America, Commerce. Deoxyribonucleic acid molecules useful as probes for detecting oncogenes incorporated into chromosomal DNA. 4,681,840, Cl. 435-6.000.
- Stern, Beth A.; and Holtman, Dennis C., to Personal Products Company. Disposable urinary and fecal waste containment product. 4,681,577, Cl. 604-378.000.
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- Stetter, Jorg: See—  
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; and Schmidt, Robert R., 4,681,618, Cl. 71-92.000.
- Stewart, John: See—  
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- Stewart, Leo J. Locking device for articles such as sailboards. 4,680,949, Cl. 70-14.000.
- Stewart, Victor M., to Industrial Research Development, Inc. Roofing system. 4,680,909, Cl. 52-409.000.
- Sticht, Walter. Modular machine table for production plants. 4,681,043, Cl. 108-153.000.
- Stiefel, Edward I.: See—  
Halbert, Thomas R.; and Stiefel, Edward I., 4,681,958, Cl. 556-42.000.
- Stiefel Laboratories, Inc.: See—  
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- Stiefel, Werner K.; and Breunig, Charles F., to Stiefel Laboratories, Inc. Topical colloid compositions. 4,681,635, Cl. 106-178.000.
- Stier, Michael A.: See—  
Kaltenbronn, James S.; and Stier, Michael A., 4,681,972, Cl. 560-29.000.
- Stille, Volker: See—  
Lodige, Rudolf; Leonhard, Bernhard; and Stille, Volker, 4,681,211, Cl. 198-789.000.
- Stoecker, Don R. Mobile home skirting system. 4,680,904, Cl. 52-169.120.
- Stolz, Hermann, to MATO Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG. Belt gripping device. 4,681,359, Cl. 294-81.210.
- Stops, Peter: See—  
Baur, Karl G.; Diehl, Volker; Stops, Peter; Hellbach, Hans; and Brunner, Erwin, 4,681,946, Cl. 546-317.000.
- Stout, Donald E.: See—  
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- Stoutamire, Donald W.; and Tieman, Charles H. Preparation of optically-active cyanomethyl esters. 4,681,947, Cl. 544-370.000.
- Strain Measurement Devices Limited: See—  
Johnson, Harvey R., 4,680,858, Cl. 29-610.0SG.
- Strato Medical Corporation: See—  
Fenton, Paul V., Jr.; Miller, Robert L.; and Santin, Ernest M., 4,681,566, Cl. 604-135.000.
- Strauss, Leopold: See—  
Hayduchok, Leon; and Strauss, Leopold, 4,681,471, Cl. 401-34.000.
- Straza, George C. P.: See—  
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- Straza, George T.; and Straza, George C. P. Golf club head. 4,681,322, Cl. 273-173.000.
- Streck, Roland: See—  
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- Strelecki, Paul R.: See—  
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- Strepparola, Ezio; and Re, Alberto, to Ausimont S.p.A. Fluorinated polyacrylates and polyacrylamides having a controlled cross-linking degree, and process for preparing same. 4,681,925, Cl. 526-246.000.
- Strepparola, Ezio: See—  
Gavezotti, Piero; and Strepparola, Ezio, 4,681,693, Cl. 252-49.900.
- Stretton, Reginald J.: See—  
Marples, Brian A.; and Stretton, Reginald J., 4,681,876, Cl. 514-182.000.
- Stricklin, Billy C.: See—  
Mallory, Charles W.; Watts, Ralph E.; Paladino, Joseph B.; Razor, John E.; Lilley, Arthur W.; Winston, Steven J.; and Stricklin, Billy C., 4,681,706, Cl. 252-633.000.
- Strolle, Clifford H.: See—  
Rutkiewicz, Andrew F.; and Strolle, Clifford H., 4,681,815, Cl. 428-458.000.
- Strubel, David G.; and Sanford, Robert A., to Brown & Williamson Tobacco Corporation. Process for manufacturing reconstituted tobacco. 4,681,126, Cl. 131-370.000.
- Styrna, Zbigniew B.: See—  
Ramsay, John R.; and Styrna, Zbigniew B., 4,682,328, Cl. 371-13.000.
- Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Light measuring device. 4,681,420, Cl. 354-409.000.
- Sugano, Kazuhiko: See—  
Hayasaka, Koichi; and Sugano, Kazuhiko, 4,680,992, Cl. 74-869.000.
- Sugimoto, Takao: See—  
Yamanaka, Teruo; Sugimoto, Takao; and Hayakawa, Kizo, 4,680,960, Cl. 73-117.300.
- Sugino, Hiromu: See—  
Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,681,930, Cl. 530-351.000.
- Sugishita, Susumu: See—  
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,681,519, Cl. 418-152.000.
- Sugita, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha. Curvilinear escalator. 4,681,206, Cl. 198-328.000.
- Sugita, Yasutoshi, to Canon Kabushiki Kaisha. Apparatus for image posture correction. 4,682,242, Cl. 358-285.000.
- Sugiura, Kengo: See—  
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.
- Sugiyama, Takekatsu: See—  
Iwakura, Ken; and Sugiyama, Takekatsu, 4,682,193, Cl. 503-209.000.
- Sugiyama, Yasuo: See—  
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- Sukornick, Bernard: See—  
Tung, Hsueh S.; Friedland, David J.; Sukornick, Bernard; McCurry, Lynn E.; Eibeck, Richard E.; and Lockyer, George D., 4,681,823, Cl. 429-218.000.
- Sullivan Corporation: See—  
Oberhofer, David P., 4,681,270, Cl. 241-298.000.
- Sullivan, Daniel T.: See—  
DeFreitas, Richard E.; and Sullivan, Daniel T., 4,682,362, Cl. 381-61.000.
- Sullivan, Thomas M., to Chrysler Motors Corporation. Power memory seat and mirror control system. 4,682,088, Cl. 318-568.000.
- Sulzer Brothers Limited: See—  
Juzi, Heniz; and Bernasconi, Marco L., 4,681,129, Cl. 137-154.000.
- Sulzer-Escher Wyss Limited: See—  
Bartesch, Helmut; and Florin, Gerd, 4,681,029, Cl. 99-483.000.
- Sumitomo Chemical Company, Ltd.: See—  
Araki, Masashi; and Hibi, Takuo, 4,681,979, Cl. 585-640.000.
- Tsunewaki, Koichiro; and Ohsuka, Ichiro, 4,680,888, Cl. 47-58.000.
- Sumitomo Electric Industries, Ltd.: See—  
Ono, Kimizo; and Nishimura, Akira, 4,681,093, Cl. 128-6.000.
- Ueba, Yoshinobu; and Miyake, Shinichi, 4,681,400, Cl. 350-96.340.
- Sumitomo Metal Mining Company Limited: See—  
Okajima, Yasuhiro; Tsugita, Yasuhiro; Takechi, Tamaki; and Okada, Syuji, 4,681,623, Cl. 75-0.50B.
- Summers, David G.: See—  
Duncan, Alexander W. S.; Summers, David G.; and Thomas, Kenneth C., 4,681,902, Cl. 521-85.000.
- Sunaga, Kazuyuki: See—  
Hashimoto, Shingo; Sunaga, Kazuyuki; and Kasugai, Kaoru, 4,682,254, Cl. 360-103.000.
- Sundholm, Goran, to GS-Hydro Oy. Joint for a pipe provided with a flared end. 4,681,352, Cl. 285-334.100.
- Sundstrand Corporation: See—  
Short, Keith E., 4,680,934, Cl. 60-652.000.
- Sung, Rodney L.: See—  
Zoleski, Benjamin H.; Crawford, Wheeler C.; and Sung, Rodney L., 4,681,694, Cl. 252-51.50R.
- Sunouchi, Akio: See—  
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,681,420, Cl. 354-409.000.
- Sunwa Sharyo Manufacturing Co., Ltd.: See—  
Misawa, Rintaro, 4,681,330, Cl. 280-47.200.
- Sutherland, Hugh F., II: See—  
Haferl, Peter E.; Sutherland, Hugh F., II; Luz, David W.; McDonald, James A.; Waybright, George C.; and Willis, Donald H., 4,682,085, Cl. 315-371.000.
- Sutton, Paul M.; and Peplinski, Joseph, to Dorr-Oliver Inc. Method and apparatus for concentrating bioparticles. 4,681,685, Cl. 210-618.000.
- Suwa, Kaname, to Canon Kabushiki Kaisha. Electronic equipment having a key input function. 4,681,987, Cl. 200-5.00A.
- Suzuki, Atsushi: See—  
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.
- Suzuki Jidosha Kogyo Kabushiki Kaisha: See—  
Kaneta, Keisuke, 4,681,079, Cl. 123-491.000.
- Suzuki, Masanori: See—  
Utsumi, Kazuaki; Ochi, Atsushi; Suzuki, Masanori; and Midorikawa, Mitsuhiro, 4,681,667, Cl. 204-15.000.
- Suzuki, Masao: See—  
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- Suzuki, Nobuyuki: See—  
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,681,420, Cl. 354-409.000.
- Uchidoi, Masanori; and Suzuki, Nobuyuki, 4,681,441, Cl. 356-222.000.
- Suzuki, Osamu: See—  
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- Suzuki, Yoshiaki: See—  
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- Suzuki, Yoshifumi: See—  
Takahashi, Toshiro; Tokushima, Tadao; Suzuki, Yoshifumi; and Wakui, Yukio, 4,681,669, Cl. 204-35.100.
- Suzuki, Yoshio; Ohe, Takeshi; and Koike, Ichiro, to Jidosha Kiki Co., Ltd. Electric power steering apparatus. 4,681,182, Cl. 180-79.100.
- Suzuki, Yoshio; Sonoda, Hirotsugu; and Yabe, Hideo, to Jidosha Kiki Co., Ltd. Hydraulic reaction force apparatus for power steering system. 4,681,184, Cl. 180-141.000.
- Swab, John M.: See—  
Wang, Samuel C.; Swab, John M.; Winn, Michael L.; and Gibbons, Martin D., 4,682,236, Cl. 358-213.260.
- Swan, Jack C., Jr.; and Poggioli, Paolo, to Cobe Laboratories, Inc. Drip chamber. 4,681,606, Cl. 55-193.000.
- Swanson, Scott C., to Sangamo Weston, Inc. Method of and system for accumulating verifiable energy demand data from remote electricity meters. 4,682,169, Cl. 379-104.000.
- Swartout, Willson C. Passive automobile seat belt reminding device. 4,681,345, Cl. 280-801.000.
- Swartz, Mitchell R. Systems to preserve living tissue. 4,681,839, Cl. 435-1.000.
- Swengel, Robert C., Sr., to Donsco Incorporated. Oscillating device having improved support legs. 4,681,314, Cl. 272-52.000.
- Swenson, Paul F., Jr.; and Heinrich, Charles E., to TRD Corporation. Pump for saturated liquid. 4,681,510, Cl. 415-168.000.
- Swift, Joseph A.: See—  
Bean, Lloyd F.; Forbes, Richard L., II; Swift, Joseph A.; and Thorp, Bruce E., 4,681,426, Cl. 355-15.000.
- Switchcraft, Inc.: See—  
Bailey, James R.; and Long, Eric L., 4,681,398, Cl. 350-96.200.
- Sykora, Jan; and Wangler, Jan, to PRAGA-Zavody Klementa Gottwald, narodni podnik. Hydraulic shift control device for an automatic transmission having two gear ratios. 4,680,989, Cl. 74-867.000.
- Syntex (U.S.A.) Inc.: See—  
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,681,889, Cl. 514-307.000.
- Syzdykov, Askar K.: See—  
Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.
- Szalay, Otto: See—  
Nagy, Zoltan; Hupka, Gyorgy; Szalay, Otto; and Kovacs, Attila, 4,681,531, Cl. 431-181.000.
- Szasz, Tibor: See—  
Himmetsberger, Alois; Pavlovec, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, 4,681,339, Cl. 280-633.000.
- Sziklas, Edward A.; and Palma, Gary E., to United Technologies Corporation. Laser array having mutually coupled resonators. 4,682,339, Cl. 372-95.000.
- Szombathelyi, Zsolt: See—  
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogesch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo; Kiss, Bela; Laszlovsky, Istvan; and Lapis, Erzsébet, 4,681,887, Cl. 514-284.000.
- Szporny, Laszlo: See—  
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogesch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny,



- Laszlo, Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.
- Tabata, Osamu; Inagaki, Hazime; and Kitano, Tomoyuki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Semiconductor flow velocity sensor. 4,680,963, Cl. 73-204.000.
- Tabei, Masatoshi: See—
- Inuiya, Masafumi; and Tabei, Masatoshi, 4,682,212, Cl. 358-44.000.
- Tabor, Elhanan, to "AR-KAL" Plastics Products (1973). Combined pressure regulated and check valve. 4,681,130, Cl. 137-220.000.
- Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Kitatani, Katuzi, to Fuji Photo Film Co., Ltd. Electrophotographic liquid developer. 4,681,832, Cl. 430-115.000.
- Taddei, Lorenzo, to Comet - Construzione Occhiali Metallo S.p.A. Eyeglass nosepiece holder. 4,681,411, Cl. 351-137.000.
- Taguchi, Junji: See—
- Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, 4,681,874, Cl. 514-90.000.
- Tai Cheong Blinds Company Ltd.: See—
- Tung-Chow, Siu, 4,681,149, Cl. 160-134.000.
- Taipale, Dale L.; and Brome, John G., to Brandt, Inc. Electronic control for totaling denominations of several countries. 4,682,288, Cl. 364-406.000.
- Takagi, Hitoshi: See—
- Mita, Seichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.
- Takahashi, Akira: See—
- Oyama, Fusami; and Takahashi, Akira, 4,681,180, Cl. 180-76.000.
- Takahashi, Kiyofumi: See—
- Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, 4,681,820, Cl. 428-698.000.
- Takahashi, Mizunori: See—
- Ohta, Koji; Yoshimura, Masaaki; and Takahashi, Mizunori, 4,681,909, Cl. 524-272.000.
- Takahashi, Toshio: See—
- Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, 4,681,874, Cl. 514-90.000.
- Takahashi, Toshiro; Tokushima, Tadao; Suzuki, Yoshifumi; and Wakui, Yukio, to Nippon Gakki Seizo Kabushiki Kaisha. Method for producing magnetic recording media. 4,681,669, Cl. 204-35.100.
- Takahashi, Tsutomu, to NEC Corporation. Mobile radio data communication system using a speech recognition technique. 4,682,368, Cl. 455-38.000.
- Takahatake, Yuriko: See—
- Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,681,953, Cl. 549-65.000.
- Takaku, Shigetake: See—
- Hama, Yasuo; and Takaku, Shigetake, 4,680,969, Cl. 73-661.000.
- Takano, Hiroshi: See—
- Ikemura, Yuichi; and Takano, Hiroshi, 4,682,210, Cl. 358-29.000.
- Takaoka, Takashi; Koyahara, Satoru; and Saito, Tetsuo, to Kabushiki Kaisha Toshiba. Optical recording medium. 4,682,321, Cl. 369-284.000.
- Takase Dyeing & Printing Works, Ltd.: See—
- Okayasu, Shinpei; Uchikoshi, Shinichi; and Nobatake, Atsuo, 4,681,591, Cl. 8-115.680.
- Takasugi, Mitsuo, to Colpo Co., Ltd. Cartridge with plug opening mechanism. 4,681,243, Cl. 222-83.000.
- Takayama, Tsutomu; Hashimoto, Seiji; Kaji, Toshio; Suzuki, Masao; and Tojo, Akihiko, to Canon Kabushiki Kaisha. Capacitor coupled circuit. 4,682,232, Cl. 358-172.000.
- Takechi, Tamaki: See—
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- Takeda Chemical Industries Ltd.: See—
- Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,681,930, Cl. 530-351.000.
- Tsukamoto, Kyozo; Ichimori, Yuzo; and Wakimasu, Mitsuhiro, 4,681,848, Cl. 435-240.000.
- Takeda, Hideo: See—
- Shibata, Norio; Takeda, Hideo; Sato, Tsunehiko; and Tanaka, Yasunori, 4,681,062, Cl. 118-410.000.
- Takeda, Hiromitsu: See—
- Komatsu, Shuichi; Shimotori, Kazumi; Takeda, Hiromitsu; and Nakahashi, Masako, 4,681,251, Cl. 228-208.000.
- Takeuchi, Kunihiko; Baba, Fujio; Shimomura, Yasuo; and Morishige, Yuji, to Tokyo Keiki Company Limited. Set point change-over circuit for fluid control valves. 4,682,166, Cl. 340-825.500.
- Takeuchi, Makoto: See—
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- Takeuchi, Nobuo: See—
- Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadataka; and Takeuchi, Nobuo, 4,682,044, Cl. 290-40.000.
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- Toki, Motoyuki; Kanbe, Sadao; Miyashita, Satoru; and Takeuchi, Tetsuhiko, 4,681,615, Cl. 65-18.100.
- Takeuchi, Yoshimitsu: See—
- Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; Mitsudoh, Makoto; and Wakabayashi, Yoh'ichi, 4,681,633, Cl. 106-35.000.
- Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Heat-sensitive recording paper. 4,682,191, Cl. 503-200.000.
- Tamari, Masumi, to Kabushiki Kaisha Toshiba. Robot control system. 4,682,089, Cl. 318-568.000.
- Tamba, Shinichi; Miyake Hitomi; Fukui Noboru; and Miguchi, Akio, to Kawasaki Jukogyo Kabushiki Kaisha. Liquid-cooled engine of the vertical shaft type. 4,681,067, Cl. 123-41.100.
- Tamfelt Oy AB: See—
- Cedercreutz, Axel; and Salminen, Ari, 4,681,287, Cl. 245-6.000.
- Tamura, Kaoru; and Torii, Shumpeita, to Fuji Photo Film Co., Ltd. Cassette for stimulative phosphor sheet. 4,681,227, Cl. 206-455.000.
- Tamura, Keiichi; Nishimura, Yuji; and Kawaharazaki, Takashi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Automatic seatbelt apparatus. 4,681,347, Cl. 280-804.000.
- Tan, Siv C.; Le Galle, Didier; and Benchimol, Claude, to Thomson - CGR. Method of reconstructing a high resolution image by tomodensitometry. 4,682,290, Cl. 364-414.000.
- Tanaka, Hiroshi; and Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Method of adjusting radiation image read-out conditions. 4,682,028, Cl. 250-327.200.
- Tanaka, Masanori: See—
- Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, 4,681,749, Cl. 423-326.000.
- Tanaka, Shigeru: See—
- Yano, Naomichi; Ito, Hajime; and Tanaka, Shigeru, 4,681,154, Cl. 165-47.000.
- Tanaka, Toshiharu: See—
- Usami, Toshimasa; Tanaka, Toshiharu; and Yoshida, Shohei, 4,682,194, Cl. 503-215.000.
- Tanaka, Yasunori: See—
- Shibata, Norio; Takeda, Hideo; Sato, Tsunehiko; and Tanaka, Yasunori, 4,681,062, Cl. 118-410.000.
- Taniguchi, Toshihiko; and Miki, Yukio, to Minolta Camera Kabushiki Kaisha. Illuminating angle adjusting apparatus for an electronic flash device. 4,682,273, Cl. 362-18.000.
- Tanihata, Ryoichi: See—
- Inoue, Masayoshi; Hirano, Kenichiro; and Tanihata, Ryoichi, 4,682,353, Cl. 379-163.000.
- Tanimoto, Yasufumi, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,681,425, Cl. 355-14.00U.
- Tanizawa, Tetsu, to Fujitsu Limited. Master slice IC device. 4,682,202, Cl. 357-45.000.
- Tansey, John. Femoral stem prosthesis. 4,681,590, Cl. 623-23.000.
- Tasaki, Takanobu; and Nagashima, Akira, to Kioritz Corporation. Intake silencer. 4,681,188, Cl. 181-229.000.
- Tate, Steven H.: See—
- Disher, Brennan C.; and Tate, Steven H., 4,681,173, Cl. 175-7.000.
- Tateho Kagaku Kogyo Kabushiki Kaisha: See—
- Kawabe, Tadashi; and Kobune, Masafumi, 4,681,862, Cl. 501-108.000.
- Tateoka, Masamichi; and Yano, Hideaki, to Canon Kabushiki Kaisha. Optical information processing apparatus for light beam focus detection and control. 4,682,316, Cl. 369-46.000.
- Taylor, Jimmie. Top for motorcycles and snowmobiles. 4,681,362, Cl. 296-78.100.
- Taylor, Kenneth: See—
- Whitehead, Graham K.; and Taylor, Kenneth, 4,682,270, Cl. 361-401.000.
- TBI: See—
- Barben, Theodore R., II, 4,682,113, Cl. 324-441.000.
- TDK Corporation: See—
- Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, 4,682,259, Cl. 360-132.000.
- Satoh, Takateru; Shiba, Haruo; and Nunokawa, Eiichi, 4,682,258, Cl. 360-132.000.
- Teijin Seiki Company Limited: See—
- Yamakawa, Tsuyoshi, 4,682,135, Cl. 335-256.000.
- Tektronix, Inc.: See—
- Tierney, Lannie J., 4,682,304, Cl. 364-900.000.
- Telefonaktiebolaget LM Ericsson: See—
- Akerberg, Dag E., 4,682,350, Cl. 379-61.000.
- Hagelin, Frank H., 4,682,100, Cl. 324-117.00R.
- Temple, Chester S.: See—
- Hsu, Ed C.; and Temple, Chester S., 4,681,658, Cl. 162-156.000.
- Teradyne, Inc.: See—
- Pitasi, Martin J., 4,682,269, Cl. 361-386.000.
- Teramachi, Hiroshi. Table feed apparatus. 4,681,506, Cl. 414-749.000.
- Teramae, Hiroshi; and Yoshimura, Yoshinari, to Kabushiki Kaisha Daikin Seisakusho. Clutch disc. 4,681,201, Cl. 192-106.200.
- Terasawa, Koji, to Canon Kabushiki Kaisha. Suction recovering device for an ink jet printer and ink jet printer having the same device. 4,682,184, Cl. 346-140.00R.
- Terita, Robert S., to Bead Chain Manufacturing Company. Swaged compliant connector pins for printed circuit boards. 4,681,392, Cl. 439-751.000.
- Terlecky, Boris S.: See—
- Brodeur, Rene H.; and Terlecky, Boris S., 4,681,040, Cl. 105-3.000.
- Terumo Kabushiki Kaisha: See—
- Yamamoto, Yuichi, 4,681,582, Cl. 604-890.000.
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- Te Velde, Ties S.; and Van de Venne, Joannes L. M., to U.S. Philips Corporation. Display device with micromechanical leaf spring switches. 4,681,403, Cl. 350-334.000.
- Teves, Alfred: See—
- Belart, Juan, 4,681,375, Cl. 303-114.000.
- Texaco Inc.: See—
- Chien, Sze-Foo; Redus, Clifford L.; and Sigwardt, Peter L., 4,681,466, Cl. 374-42.000.

- Disher, Brennan C.; and Tate, Steven H., 4,681,173, Cl. 175-7.000.
- Speranza, George P.; Brennan, Michael E.; and Grigsby, Robert A., Jr., 4,681,965, Cl. 558-162.000.
- Vasconcellos, Stephen R.; Najjar, Mitri S.; and Garcia, Ralph, 4,681,700, Cl. 252-373.000.
- Zoleski, Benjamin H.; Crawford, Wheeler C.; and Sung, Rodney L., 4,681,694, Cl. 252-51.50R.
- Texas Instruments Incorporated: See—
- Purdes, Andrew J.; and Smith, Gregory C., 4,681,653, Cl. 156-614.000.
- Schrader, Elliott G., 4,682,369, Cl. 455-127.000.
- Theeuwes, Felix: See—
- Urquhart, John; and Theeuwes, Felix, 4,681,583, Cl. 604-892.000.
- Theissen, Robert J., to Rhone-Poulenc Agrochimie. Substituted phenylbenzoic acids and derivatives thereof as herbicides. 4,681,622, Cl. 71-108.000.
- Thelen, Werner, to G. Siempelkamp GmbH & Co. Conveyor for particleboard-making apparatus. 4,681,523, Cl. 425-168.000.
- Thermotechnik G. Bauknecht GmbH: See—
- Meiser, Roland; Burkert, Josef; and Bendel, Ralf, 4,682,009, Cl. 219-377.000.
- Thiel, David V., to Griffith University. Phase shift keying and phase modulation transmission system. 4,682,118, Cl. 329-122.000.
- Thiessen, Karl; and Weiss, Peter, to Jagenberg Aktiengesellschaft. Method and device for attaching a web of material rolling to the beginning of a wound fresh web. 4,681,274, Cl. 242-58.300.
- Thomas, Kenneth C.: See—
- Duncan, Alexander W. S.; Summers, David G.; and Thomas, Kenneth C., 4,681,902, Cl. 521-85.000.
- Thomas, Scipio. Pneumatic seat support with linkage and horizontal shock absorbers. 4,681,292, Cl. 248-584.000.
- Thompson, Marion L. Energy absorbing barrier. 4,681,302, Cl. 256-13.100.
- Thomson - CGR: See—
- Tan, Siv C.; Le Galle, Didier; and Benchimol, Claude, 4,682,290, Cl. 364-414.000.
- Thomson CSF: See—
- Lazarus, Michel, 4,682,175, Cl. 342-165.000.
- Magarshack, John, 4,682,127, Cl. 333-103.000.
- Michel, Jean, 4,682,119, Cl. 330-149.000.
- Moy, Jean P., 4,682,018, Cl. 250-211.00R.
- Thorn, Gernot, to Leybold-Heraeus GmbH. Apparatus for electrically contactlessly measuring the thickness of electrically conducting thin films on non-conducting travelling webs in vacuum deposition apparatus. 4,682,105, Cl. 324-230.000.
- Thorp, Bruce E.: See—
- Bean, Lloyd F.; Forbes, Richard L., II; Swift, Joseph A.; and Thorp, Bruce E., 4,681,426, Cl. 355-15.000.
- Thorp, Paul, to General Electric Company, p.l.c., The. Lamps and ribbon seals. 4,682,071, Cl. 313-43.000.
- Thrall Car Manufacturing Company: See—
- Harris, William H.; Klag, James P.; and Lam, Joseph W., 4,681,041, Cl. 105-355.000.
- Tickner, Ernest G.: See—
- Rasor, Julia S.; and Tickner, Ernest G., 4,681,119, Cl. 128-660.000.
- Tieman, Charles H.: See—
- Stoutamire, Donald W.; and Tieman, Charles H., 4,681,947, Cl. 544-370.000.
- Tierney, Lannie J., to Tektronix, Inc. Asynchronous multiple buffered communications interface having an independent microprocessor for controlling host/peripheral exchanges. 4,682,304, Cl. 364-900.000.
- Tiffany, Carlton R. Rainbow projector. 4,681,402, Cl. 350-286.000.
- Tillman, Alfred J., to Moog, Inc. Time-delay valve. 4,681,135, Cl. 137-489.500.
- Timm, Klaus: See—
- Ehle, Joachim; Timm, Klaus; and Ahlers, Heinfried, 4,682,341, Cl. 373-99.000.
- Timmers, Richard E. Auxiliary seat. 4,681,367, Cl. 297-232.000.
- Ting, Sai-Pei: See—
- Bates, Gary M.; Chambers, Gregory R.; and Ting, Sai-Pei, 4,681,915, Cl. 525-148.000.
- Tleuvov, Murat G.: See—
- Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuvov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.
- TMC Corporation: See—
- Himmelsberger, Alois; Pavlovic, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, 4,681,339, Cl. 280-633.000.
- Spitaler, Engelbert, 4,681,338, Cl. 280-628.000.
- Tocci, Mario P.: See—
- Gill, Frederick A.; and Tocci, Mario P., 4,681,798, Cl. 428-215.000.
- Toho Development Engineering Co., Ltd.: See—
- Kobari, Osamu; and Kida, Takashi, 4,681,535, Cl. 432-48.000.
- Tojo, Akihiko: See—
- Takayama, Tsutomu; Hashimoto, Seiji; Kaji, Toshio; Suzuki, Masao; and Tojo, Akihiko, 4,682,232, Cl. 358-172.000.
- Tokai Kogyo Co., Ltd.: See—
- Sakakibara, Takao; Toyoda, Tsunehiko; and Nagashima, Yoshihisa, 4,681,712, Cl. 264-24.000.
- Tokarz, Joseph S.; and Jensen, Marvin E., to Hollister Incorporated. Female urinary incontinence device. 4,681,572, Cl. 604-329.000.
- Toki, Motoyuki; Kanbe, Sadao; Miyashita, Satoru; and Takeuchi, Tetsuhiko, to Seiko Epson Kabushiki Kaisha. Silica glass formation process. 4,681,615, Cl. 65-18.100.
- Tokura, Go: See—
- Yamada, Akira; and Tokura, Go, 4,681,421, Cl. 354-485.000.
- Tokushima, Tadao: See—
- Takahashi, Toshiro; Tokushima, Tadao; Suzuki, Yoshifumi; and Wakui, Yukio, 4,681,669, Cl. 204-35.100.
- Tokyo Aircraft Instrument Co., Ltd.: See—
- Nakamura, Shuji, 4,682,171, Cl. 340-975.000.
- Tokyo Electric Co., Ltd.: See—
- Oba, Harutaro; Ozawa, Yasuhiko; Yamaguchi, Yasuyoshi; and Mimoto, Osamu, 4,681,422, Cl. 355-3.00R.
- Tokyo Keiki Company Limited: See—
- Takeuchi, Kunihiko; Baba, Fujio; Shimomura, Yasuo; and Morishige, Yuji, 4,682,166, Cl. 340-825.500.
- Tokyo Shibaura Denki Kabushiki Kaisha: See—
- Komatsu, Shuichi; Shimotori, Kazumi; Takeda, Hiromitsu; and Nakahashi, Masako, 4,681,251, Cl. 228-208.000.
- Nishihara, Eitaro, 4,682,289, Cl. 364-414.000.
- Shiozaki, Masakazu; and Nishimura, Hidetaro, 4,682,204, Cl. 357-51.000.
- Tomar Electronics, Inc.: See—
- Sikora, Scott T., 4,682,081, Cl. 315-219.000.
- Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, to Nihon Sanmo Dyeing Co., JPK. Method of producing an electrically conductive polymeric material with adsorbed metal sulfide and product. 4,681,820, Cl. 428-698.000.
- Tomioaka, Kunio: See—
- Miki, Toshiyuki; Tomioaka, Kunio; Nakajima, Masao; and Sakurai, Terushige, 4,681,210, Cl. 198-468.200.
- Tomisawa, Norio, to Nippon Gakki Seizo Kabushiki Kaisha. Subcode signal reading circuit in an optical type disc player. 4,682,317, Cl. 369-59.000.
- Tomita, Yoshifumi, to Hitachi, Ltd. Method of manufacturing fluorescent screens of color picture tubes. 4,681,824, Cl. 430-24.000.
- Tomoda, Toshimasa: See—
- Wakayama, Naoki; Yamagishi, Hideshi; Fukakusa, Shinji; and Tomoda, Toshimasa, 4,682,036, Cl. 250-374.000.
- Toray Silicone Co., Ltd.: See—
- Saito, Masayuki; and Hamada, Mitsuo, 4,681,636, Cl. 106-287.150.
- Torazzina, Aldo: See—
- Palara, Sergio; and Torazzina, Aldo, 4,682,120, Cl. 330-298.000.
- Villa, Flavio; Murari, Bruno; Bertotti, Franco; Torazzina, Aldo; and Siefani, Fabrizio, 4,682,197, Cl. 357-36.000.
- Torii, Kuniyoshi: See—
- Mimasu, Takeo; and Torii, Kuniyoshi, 4,681,757, Cl. 424-47.000.
- Torii, Shumpeita: See—
- Tamura, Kaoru; and Torii, Shumpeita, 4,681,227, Cl. 206-455.000.
- Torimaru, Takashi: See—
- Kobayashi, Tamotsu; Goto, Shigeru; Ohta, Hironobu; and Torimaru, Takashi, 4,680,973, Cl. 73-861.160.
- Torkelson, Arnold: See—
- Evans, Edwin R.; and Torkelson, Arnold, 4,681,913, Cl. 524-862.000.
- Toro Company, The: See—
- Cochran, Wilson V., 4,681,260, Cl. 239-240.000.
- Toshiaki, Ishii, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling an elevator. 4,681,190, Cl. 187-101.000.
- Toshiyuki Hamaoka Daiichi Seiyaku Co., Ltd.: See—
- Hamaoka, Toshiyuki; Fujiwara, Hiromi; and Kusama, Tsuneco, 4,681,856, Cl. 536-53.000.
- Tossounian, Jacques L.: See—
- Mergens, William J.; Newmark, Harold L.; Sheth, Prabhakar R.; and Tossounian, Jacques L., 4,681,756, Cl. 424-451.000.
- Total Compagnie Francaise des Petroles S.A.: See—
- Roca, Yves; Rousset, Jacky; Bouchut, Pierre; Leblanc, Marie-Christine; and Baffreau, Daniel, 4,681,634, Cl. 106-90.000.
- Totsune, Atsushi: See—
- Noguchi, Kunio; Totsune, Atsushi; Kajita, Koji; and Hosaka, Takefumi, 4,681,078, Cl. 123-490.000.
- Tottori University: See—
- Sato, Toru; Okazaki, Naoto; and Fujii, Katsumasa, 4,681,099, Cl. 128-204.230.
- Toussant, John W.; and Blaney, Ted L., to Procter & Gamble Co., The. Absorbent article having reservoirs. 4,681,579, Cl. 604-385.00R.
- Toyama, Kenji: See—
- Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.
- Toyoda, Tsunehiko: See—
- Sakakibara, Takao; Toyoda, Tsunehiko; and Nagashima, Yoshihisa, 4,681,712, Cl. 264-24.000.
- Toyota Jidosha Kabushiki Kaisha: See—
- Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.
- Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiro, 4,681,647, Cl. 156-172.000.
- Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.



- Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.
- Nonoyama, Hideo; Fukuizumi, Toshiharu; and Morita, Akiyoshi, 4,681,642, Cl. 148-321.000.
- Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyoharu; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.
- Yoshitsugu, Noritada, 4,681,346, Cl. 280-804.000.
- Trahan, Curtis J.; Trahan, Mary C.; and Spector, George. Carry bag convertible to a mat, 4,681,195, Cl. 190-2.000.
- Trahan, Mary C.: See—  
Trahan, Curtis J.; Trahan, Mary C.; and Spector, George, 4,681,195, Cl. 190-2.000.
- Trailer Train Company: See—  
Brodeur, Rene H.; and Terlecky, Boris S., 4,681,040, Cl. 105-3.000.
- Trans-Guard Industries, Inc.: See—  
Brammell, Terrence; and Guiler, Richard S., 4,681,355, Cl. 292-323.000.
- Brammell, Terrence N., 4,681,356, Cl. 292-327.000.
- Trans-Lux Corporation: See—  
Holloman, Charles J., 4,682,162, Cl. 340-799.000.
- Trautwein, Hans-Juergen: See—  
Mueller, Sieghard; Braun, Hermann; Dumschat, Helmut; and Trautwein, Hans-Juergen, 4,680,954, Cl. 72-405.000.
- Traxler, Peter, to Ciba-Geigy Corporation. Novel polycyclic hydrazones of rifamycins, their manufacture, and their pharmaceutical compositions for treating tuberculosis, 4,681,938, Cl. 540-458.000.
- TRD Corporation: See—  
Swenson, Paul F., Jr.; and Heinrich, Charles E., 4,681,510, Cl. 415-168.000.
- Treleaven, Richard J.: See—  
Matkan, Josef; and Treleaven, Richard J., 4,681,806, Cl. 428-402.210.
- Trexler, Charles J.: See—  
Bakermans, Frank C.; and Trexler, Charles J., 4,682,129, Cl. 333-184.000.
- Tribe, David E., to Austgen-Biojet International Pty. Ltd. Novel microorganism and method, 4,681,852, Cl. 435-108.000.
- Trig, Inc.: See—  
Hickling, Colin D., 4,682,141, Cl. 337-379.000.
- Trischler, Ferenc: See—  
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassaneie Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo; Kiss, Bela; Laszlovsky, Istvan; and Lapis, Ersebet, 4,681,887, Cl. 514-284.000.
- Tritt, Eugen, to S + T Marketing AG. Microsurgical tool, 4,681,105, Cl. 428-303.170.
- Troester, Thomas F. Continuously variable transmission with epicyclic constant mesh gearing, 4,680,985, Cl. 74-785.000.
- Tronzo, Raymond G. Adjustable acetabular cup prosthesis as part of a total cup replacement system, 4,681,589, Cl. 623-22.000.
- Troup, Cathryn H., legal representative: See—  
Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.
- Troup, Edward M., deceased (by Troup, Cathryn H., legal representative); Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., to Anthony Manufacturing Corp. Rotary drive sprinkler, 4,681,259, Cl. 239-206.000.
- Trout, Tarence J.: See—  
Larson, James R.; and Trout, Tarence J., 4,681,831, Cl. 430-114.000.
- Troutner, Vernon H., to McNeilab, Inc. Valve apparatus for photoactivation patient treatment system, 4,681,568, Cl. 604-250.000.
- Truckner, William G.: See—  
Kersker, Michael M.; Truckner, William G.; Granger, Douglas A.; and Rooy, Elwin L., 4,681,736, Cl. 420-535.000.
- Trumper, Reinhard: See—  
Hoffmann, Dieter; and Trumper, Reinhard, 4,681,205, Cl. 198-307.100.
- Trutna, W. R.: See—  
Goel, Atul; Bartlett, Keith G.; and Trutna, W. R., 4,681,430, Cl. 355-77.000.
- TRW Cam Gears Limited: See—  
Downing, Philip A., 4,680,981, Cl. 74-422.000.
- TRW, Inc.: See—  
Brookbank, Earl B., III, 4,681,169, Cl. 166-385.000.
- Livingston, Peter M.; and Shelton, Jean C., 4,682,025, Cl. 250-201.000.
- Tscherter, Hans: See—  
Kobel, Hans; Sanglier, Jean-Jacques; Tscherter, Hans; and Bolliger, Georg, 4,681,880, Cl. 514-250.000.
- Tsou, Dean T.; Blachman, Marc W.; and Burrington, James D., to Standard Oil Company, The. Method of producing adiponitrile, 4,681,968, Cl. 558-361.000.
- Tsuchihashi, Masaru: See—  
Yasuda, Kazuo; Ando, Toshiharu; Itabashi, Yoshifumi; and Tsuchihashi, Masaru, 4,681,904, Cl. 523-457.000.
- Tsuchiya, Yasuhiro: See—  
Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiro, 4,681,647, Cl. 156-172.000.
- Tsugawa, Hiroaki: See—  
Nomura, Masaharu; Tsugawa, Hiroaki; Ishizaka, Yukio; and Hosoi, Hiroomi, 4,682,192, Cl. 503-200.000.
- Tsugita, Yasuhiro: See—  
Okajima, Yasuhiro; Tsugita, Yasuhiro; Takechi, Tamaki; and Okada, Syuji, 4,681,623, Cl. 75-0.50B.
- Tsujibayashi, Tatsuo: See—  
Shibata, Masahiro; Tsujibayashi, Tatsuo; Sato, Hiroyuki; and Machida, Yoshinori, 4,682,245, Cl. 358-311.000.
- Tsujimura, Takehisa: See—  
Akasaki, Hidehiko; and Tsujimura, Takehisa, 4,682,207, Cl. 357-74.000.
- Tsujinaka, Hisayuki: See—  
Hohki, Tetsuo; Sano, Tetsuo; Kodama, Eiji; and Tsujinaka, Hisayuki, 4,682,040, Cl. 250-571.000.
- Tsukamoto, Goro: See—  
Sato, Toshio; and Tsukamoto, Goro, 4,681,895, Cl. 514-535.000.
- Tsukamoto, Kyozo; Ichimori, Yuzo; and Wakimasu, Mitsuhiro, to Takeda Chemical Industries, Ltd. Novel peptide and use thereof, 4,681,848, Cl. 435-240.000.
- Tsunekawa, Tokuchi: See—  
Kawabata, Takashi; Sato, Yuichi; Tsunekawa, Tokuchi; and Matsumura, Susumu, 4,681,432, Cl. 356-4.000.
- Tsunewaki, Koichiro; and Ohtsuka, Ichiro, to Sumitomo Chemical Company, Limited. Hybrid seed production in common wheat using cytoplasmic male sterility, 4,680,888, Cl. 47-58.000.
- Tsurumaru, Akihiko: See—  
Ichihara, Takeo; Yamanaka, Yukio; and Tsurumaru, Akihiko, 4,682,072, Cl. 313-115.000.
- Tsuruta, Matsuhisa, to Aisin Seiki Kabushiki Kaisha. Disc brake assembly with parking brake mechanism, 4,681,194, Cl. 188-71.900.
- Tsushima, Takuya: See—  
Hirota, Akira; and Tsushima, Takuya, 4,682,251, Cl. 360-33.100.
- Tsuya, Noboru; and Arai, Kenichi, to Tsuya, Noboru. Thin ribbon of semiconductor material, 4,682,206, Cl. 357-59.000.
- Tuckerman, David B., to United States of America, Energy. Planarization of metal films for multilevel interconnects, 4,681,795, Cl. 428-209.000.
- Tung-Chow, Siu, to Tai Cheong Blinds Company Ltd. Window blinds for vehicles, 4,681,149, Cl. 160-134.000.
- Tung, Hsueh S.; Friedland, David J.; Sukornick, Bernard; McCurry, Lynn E.; Eibeck, Richard E.; and Lockyer, George D., to Allied Corporation. Lithium/fluorinated carbon battery with no voltage delay, 4,681,823, Cl. 429-218.000.
- Turban, Karlheinz: See—  
Rademachers, Jakob; Turban, Karlheinz; Franz, Gerhard; Fuhr, Werner; and Holle, Bernd, 4,681,637, Cl. 106-304.000.
- Turner, Reginald R. Hot-water-furnace supplemental heater, 4,681,257, Cl. 237-56.000.
- Tuss, John J.: See—  
Orr, Ladd J.; and Tuss, John J., 4,680,868, Cl. 33-503.000.
- Tuttle, Bruce A.: See—  
Brooks, Robert A.; Dosch, Robert G.; and Tuttle, Bruce A., 4,681,717, Cl. 264-61.000.
- Ube Chemical Industries Co., Ltd.: See—  
Yamamoto, Kosei; Kaneyasu, Akira; and Arita, Yo, 4,681,863, Cl. 501-108.000.
- Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, to Hitachi, Ltd. Semiconductor memory device with matched equivalent series resistances to the complementary data lines, 4,682,200, Cl. 357-41.000.
- Uchida, Hiroshi: See—  
Matsui, Isamu; Uchida, Hiroshi; Otoshima, Hiroo; Kubota, Yasuhiko; and Masai, Tetsuji, 4,681,271, Cl. 242-18.00R.
- Uchida, Noriaki, to Nissan Shatai Company, Limited. Automotive air conditioning system with independent temperature control for dual air flows, 4,681,153, Cl. 165-31.000.
- Uchidoi, Masanori; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Light measuring device, 4,681,441, Cl. 356-222.000.
- Uchikoshi, Shinichi: See—  
Okayasu, Shinpei; Uchikoshi, Shinichi; and Nobatake, Atsuo, 4,681,591, Cl. 8-115.680.
- Ueba, Yoshinobu; and Miyake, Shinichi, to Sumitomo Electric Industries, Ltd. Plastic optical fibers, 4,681,400, Cl. 350-96.340.
- Ueda, Toshitsugu; Kohsaka, Fusao; Yamazaki, Daisuke; and Akazawa, Hideo, to Yokogawa Hokushin Electric Corporation. Apparatus for measuring pressure, 4,680,970, Cl. 73-702.000.
- Ueda, Yutaka; and Kiriaki, Masaharu, to Murata Kikai Kabushiki Kaisha. Article selecting and conveying system, 4,681,231, Cl. 209-656.000.
- Uehlinger, Werner H.; and Franek, Jozef T., to KM-Engineering AG. Method of making scroll strip blanks, 4,681,001, Cl. 83-37.000.
- Uejima, Atsushi, to Fuji Photo Film Co., Ltd. Focussing error detection device for use in optical disk type recording system, 4,682,315, Cl. 369-45.000.
- Uemura, Isamu; and Yamamoto, Kazumasa, to Kokusan Kinzoku Kogyo Kabushiki Kaisha. Automotive door handle container, 4,681,357, Cl. 292-336.300.
- Ueno, Kouichi: See—  
Nakahara, Yoshihiko; Muramatsu, Masao; and Ueno, Kouichi, 4,682,017, Cl. 235-492.000.
- Uesaka, Sadaaki; Numata, Toshio; and Umezaki, Kazunori, to Glory Kogyo Kabushiki Kaisha. Note sorting and counting apparatus, 4,681,229, Cl. 209-534.000.
- Uetani, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. Signal transmission system, 4,682,342, Cl. 375-38.000.

- Ugawa, Satoru; and Obuchi, Satoshi, deceased (by Obuchi, Fukashi, Ruriko Obuchi, legal representatives), to Nissan Motor Co., Ltd. Device for guiding upward and downward movement of window pane of automotive vehicle door, 4,680,892, Cl. 49-374.000.
- Uhde GmbH: See—  
Schwarz, Hans-Dieter; Pietzarka, Friedrich W.; Lichtenthaler, Werner; and Muhlhaus, Ludwig, 4,681,157, Cl. 165-145.000.
- Ujiie, Seiichi: See—  
Fujishige, Masao; Yokokawa, Harumi; Ujiie, Seiichi; and Dokiya, Masayuki, 4,681,626, Cl. 75-68.00A.
- Ulriksson, Bengt A.; and Fletcher, Lawrence, to Weinschel Engineering Co., Inc. Noise suppression in an I-F substitution loop, 4,682,060, Cl. 307-543.000.
- Ulug, Mehmet E., to General Electric Company. Implicit preemptive lan, 4,682,324, Cl. 370-85.000.
- Ulug, Mehmet E., to General Electric Company. Method and apparatus for maintaining a dynamic logical ring in a token passing lan, 4,682,326, Cl. 370-89.000.
- Umemura, Toshikazu; Masumoto, Isamu; and Iha, Yukihiro, to Mitsubishi Gas Chemical Company, Inc. Process for producing oxy-methylene copolymer, 4,681,927, Cl. 528-232.000.
- Umezaki, Kazunori: See—  
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- Unidynamics Corporation: See—  
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- Weitmann, Heinz; and Keller, Alfred, to Weitmann & Konrad GmbH & Co. KG. Process for continuous density measurement. 4,680,965, Cl. 73-445.000.
- Weitmann & Konrad GmbH & Co. KG: See—  
Weitmann, Heinz; and Keller, Alfred, 4,680,965, Cl. 73-445.000.
- Welch, James A., Sr. Storage and inventory control system for keys. 4,681,504, Cl. 414-268.000.
- Weldmatic Patents, Inc.: See—  
Kosch, Delmar D., 4,681,277, Cl. 242-156.200.
- Well Improvement Specialists, Inc.: See—  
Guidry, John P.; and Gavranovic, Lee Roy C., 4,681,163, Cl. 166-278.000.
- Wells, Gregory J., to Varian Associates, Inc. Method and apparatus for sample confirmation in gas chromatography. 4,682,027, Cl. 250-291.000.
- Wendel, Armin: See—  
Ghycky, Miklos; Imberge, Paul-Robert; and Wendel, Armin, 4,681,617, Cl. 71-86.000.
- Werner, Jean J., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Echo canceller. 4,682,358, Cl. 379-411.000.
- Werner, Margrit: See—  
Beck, Walter; Berger, Siegfried; and Werner, Margrit, 4,681,562, Cl. 604-54.000.
- Wertz, Ronald D., to Ball Corporation. Method and apparatus for stabilizing angle of acceptance of multiple-beam interferometer means in optical measuring system. 4,681,448, Cl. 356-352.000.
- Westinghouse Electric Corp.: See—  
Mallory, Charles W.; Watts, Ralph E.; Paladino, Joseph B.; Razor, John E.; Lilley, Arthur W.; Winston, Steven J.; and Stricklin, Billy C., 4,681,706, Cl. 252-633.000.
- Veronesi, Luciano; Obermeyer, Franklin D.; and Chrise, James R., 4,681,728, Cl. 376-209.000.
- Weston, Harry, to Hydral Company. Rotatable ball valve apparatus and method. 4,681,133, Cl. 137-315.000.
- Westphalen, Jurgen: See—  
Wadepful, Jost; and Westphalen, Jurgen, 4,680,900, Cl. 51-430.000.
- Wetzler, Dallas G.; and Conley, Ralph R., to United States of America, Air Force. Heat resistant short nozzle. 4,681,261, Cl. 239-265.190.
- Wheeler, Dale K.: See—  
Abbratozzato, Salvatore R.; Walter, Richard T.; and Wheeler, Dale K., 4,682,066, Cl. 310-154.000.
- White Castle System, Inc.: See—  
Brabb, James D.; and Simpson, Dennis L., 4,681,265, Cl. 239-665.000.
- White Consolidated Industries, Inc.: See—  
Mawby, Harold S.; and Harris, Duane H., 4,680,943, Cl. 62-300.000.
- Rummel, Raymond W.; and Crystal, Anthony A., 4,680,948, Cl. 68-3.00R.
- White, Harold R.; and Doncer, Alex J., to Alar Engineering Corporation. Air flotation clarifier. 4,681,682, Cl. 210-221.200.
- White, Larry; and Ingels, Luis. Pressure-sensing toothbrush holder. 4,680,825, Cl. 15-105.000.
- White, William T.: See—  
Daniels, Julia G.; Ledbetter, Frank E., III; Clemons, Johnny M.; Penn, Benjamin G.; and White, William T., 4,680,897, Cl. 51-281.00R.
- Whitehead, Graham K.; and Taylor, Kenneth, to British Telecommunications public limited company. Integrated circuit chip carrier. 4,682,270, Cl. 361-401.000.
- Whitesides, Michael G.: See—  
Hardy, Kenneth J.; and Whitesides, Michael G., 4,681,853, Cl. 435-288.000.
- Whitten, Charles E.; and Pews, R. Garth, to Dow Chemical Company. The 1-acyl-1-(2-pyridinyl)semicarbazides. 4,681,943, Cl. 546-306.000.
- Wiberg, Olle, to Esselte Almanacksforlag AB. Arrangement for holding and filing documents, papers and the like. 4,681,474, Cl. 402-75.000.
- Widhopf, Martin, to Anton Steinecker Maschinenfabrik GmbH. Boiler for boiling mash or wort. 4,681,066, Cl. 122-234.000.
- Wiedeck, Hans-Norbert: See—  
Arciszewski, Bernhard; and Wiedeck, Hans-Norbert, 4,681,482, Cl. 404-35.000.
- Wiedermann, Rolf: See—  
Haas, Peter; Weber, Hans-Ulrich; Sommerfeld, Claus-Dieter; Gier-sig, Manfred; and Wiedermann, Rolf, 4,681,903, Cl. 521-167.000.
- Wieggers, Wilhelmus J.: See—  
Sprecker, Mark A.; Wieggers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,681,976, Cl. 560-126.000.
- Wieland, Dieter; Aly, Abou; and Riess, Hartmut, to Andreas Stihl. Motor-driven chain saw. 4,680,862, Cl. 30-381.000.
- Wiktor, Dominik M. Catheter arrangement having a blood vessel liner, and method of using it. 4,681,110, Cl. 128-343.000.
- Wilhelm Hegenscheidt GmbH: See—  
Feldewert, Herbert, 4,680,846, Cl. 29-168.000.
- Wilke, Richard; and Korthaus, Helmut. Circulating-ball drive. 4,680,982, Cl. 74-424.80R.
- Wilkinson, Trevor A. Multidirectionally adjustable vibrato device. 4,681,010, Cl. 84-298.000.
- Will, Fritz G.: See—  
Niedrach, Leonard W.; and Will, Fritz G., 4,681,673, Cl. 204-415.000.
- Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Sewing machine and method for controlling the motion of a workholder. 4,681,048, Cl. 112-262.300.
- Willenbacher, Erich: See—  
Kirch, Otto; and Willenbacher, Erich, 4,681,051, Cl. 112-306.000.
- Wm. C. Staley Machinery Corporation: See—  
Sardella, Louis M., 4,681,311, Cl. 271-11.000.
- William F. Cosulich Associates, P.C.: See—  
Dvirka, Miro; Psihos, George J.; and Cosulich, Joseph J., 4,681,045, Cl. 110-345.000.



Williams, Edward L., to Becton, Dickinson and Company. Moisture-controlled glass microscope slide package. 4,681,218, Cl. 206-204.000.

Williams, John; and Robson, Michael J., to Imperial Chemical Industries PLC. Process for the preparation of an enantiomeric pair of isomers of cyfluthrin. 4,681,969, Cl. 558-407.000.

Williams, Richard D. Construction material. 4,680,907, Cl. 52-309.170.

Williams, Tim A., to Motorola, Inc. Logarithmic arithmetic logic unit. 4,682,302, Cl. 364-768.000.

Willis, Donald H.: See—

Wierthner, Hubert: See—

Himmelsberger, Alois; Pavlovic, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, 4,681,339, Cl. 280-633.000.

Wyant, James A. Towing package. 4,681,240, Cl. 221-48.000.

Wyckoff, Charles W. Sheet material marker surface for roadways and the like. 4,681,401, Cl. 350-105.000.

Xerox Company: See—

Vees, Frederick; and Drummond, Todd, 4,681,049, Cl. 112-262.300.

Xerox Corporation: See—

Bean, Lloyd F.; Forbes, Richard L., II; Swift, Joseph A.; and Thorp, Bruce E., 4,681,426, Cl. 355-15.000.

Cooper, Thomas F., 4,681,310, Cl. 270-53.000.

Elchinger, Gilbert M.; Mutschler, Edward C., Jr.; and Behun, Eugene, 4,682,183, Cl. 346-75.000.

Gabor, Andrew, 4,681,469, Cl. 400-157.200.

Grushkin, Bernard, 4,681,829, Cl. 430-109.000.

Harvey, Raymond A., 4,681,312, Cl. 271-207.000.

Ya-man Ltd.: See—

Yamazaki, Iwao; Nakamichi, Yuji; Abe, Keizo; and Okudera, Tatsuya, 4,682,221, Cl. 358-107.000.

Yabe, Hideo: See—

Suzuki, Yoshio; Sonoda, Hiroto; and Yabe, Hideo, 4,681,184, Cl. 180-141.000.

Yabe, Kiyoshi: See—

Kondo, Tadashi; and Yabe, Kiyoshi, 4,681,993, Cl. 200-153.05C.

Yagi, Isaburo: See—

Hyodo, Masakatsu; and Yagi, Isaburo, 4,681,783, Cl. 428-36.000.

Yagi, Kenji: See—

Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichiro; and Atsumi, Morihiro, 4,681,989, Cl. 200-19.00R.

Yamada, Akira; and Tokura, Go, to Canon Kabushiki Kaisha. Double-face flexible printed circuit board. 4,681,421, Cl. 354-485.000.

Yamada, Hirohide; Sakakibara, Masahiko; and Koike, Yoshiharu, to Hitachi Metals, Ltd. Ceramic substrate for a thin layer magnetic head. 4,681,813, Cl. 428-450.000.

Yamada, Kazuhiko, to Kabushiki Kaisha Toshiba. Printed circuit board and method for fabrication thereof. 4,682,271, Cl. 361-409.000.

Yamada, Kazumori: See—

Ichikawa, Yoshio; and Yamada, Kazumori, 4,682,148, Cl. 340-311.100.

Yamada, Koji: See—

Ooka, Akihiro; Okamoto, Kenji; and Yamada, Koji, 4,680,818, Cl. 5-81.00R.

Yamada, Mitsuhiro, to Dainippon Screen Mfg. Co., Ltd. System for supervising photomechanical process. 4,682,286, Cl. 364-200.000.

Yamada, Toshitaka: See—

Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.

Yamagata, Shimbun: See—

Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbun; Kubo, Yutaka; and Mizuno, Hiroto, 4,682,300, Cl. 364-571.000.

Yamagishi, Hideshi: See—

Wakayama, Naoki; Yamagishi, Hideshi; Fukakusa, Shinji; and Tomoda, Toshimasa, 4,682,036, Cl. 250-374.000.

Yamaguchi, Shunzo: See—

Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichiro; and Atsumi, Morihiro, 4,681,989, Cl. 200-19.00R.

Yamaguchi, Yasuyoshi: See—

Oba, Harutaro; Ozawa, Yasuhiko; Yamaguchi, Yasuyoshi; and Mimoto, Osamu, 4,681,422, Cl. 355-3.00R.

Yamaguchi, Yoshito: See—

Nakamura, Norihiko; Morishima, Hideki; and Yamaguchi, Yoshito, 4,681,465, Cl. 368-246.000.

Yamahara, Tohji: See—

Kanehira, Koichi; Shiono, Manzo; Fujita, Yoshiji; Nishida, Takashi; and Yamahara, Tohji, 4,681,890, Cl. 514-333.000.

Yamakawa, Tsuyoshi, to Teijin Seiki Company Limited. Elastic support members for an electric actuator. 4,682,135, Cl. 335-256.000.

Yamakawa, Yoshifumi, to Sony Corporation. Brightness and contrast adjusting apparatus. 4,682,231, Cl. 358-168.000.

Yamamoto, Kazumasa: See—

Uemura, Isamu; and Yamamoto, Kazumasa, 4,681,357, Cl. 292-336.300.

Yamamoto, Kosei; Kancysu, Akira; and Arita, Yo, to Ube Chemical Industries Co., Ltd. High-density magnesia-calcia clinker and process for production thereof. 4,681,863, Cl. 501-108.000.

Yamamoto, Shukou: See—

Ohashi, Toshio; and Yamamoto, Shukou, 4,682,208, Cl. 357-81.000.

Yamamoto, Takashi: See—

Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiko, 4,681,647, Cl. 156-172.000.

Yamamoto, Yuichi, to Terumo Kabushiki Kaisha. Drug administering apparatus. 4,681,582, Cl. 604-890.000.

Yamana, Masayuki: See—

Hisamoto, Iwao; and Yamana, Masayuki, 4,681,974, Cl. 560-87.000.

Yamanaka, Teruo; Sugimoto, Takao; and Hayakawa, Kizo. Microwave and luminous probe. 4,680,960, Cl. 73-117.300.

Yamanaka, Yukio: See—

Ichihara, Takeo; Yamanaka, Yukio; and Tsurumaru, Akihiko, 4,682,072, Cl. 313-115.000.

Yamane, Norihito: See—

Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.00B.

Yamato, Akihiro; Koike, Yuzuru; and Futa, Kyozo, to Honda Giken Kogyo Kabushiki Kaisha. Idling speed feedback control method for internal combustion engines. 4,681,075, Cl. 123-339.000.

Yamauchi, Takashi; Hayashi, Shoichi; and Sasakawa, Atsushi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing 2,6-naphthalenedicarboxylic acid. 4,681,978, Cl. 562-413.000.

Yamazaki, Daisuke: See—

Ueda, Toshitsugu; Kohsaka, Fusao; Yamazaki, Daisuke; and Akazawa, Hideo, 4,680,970, Cl. 73-702.000.

Yamazaki, Iwao; Nakamichi, Yuji; Abe, Keizo; and Okudera, Tatsuya, to Ya-man Ltd. Non-contact electro-optical displacement follower. 4,682,221, Cl. 358-107.000.

Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, to Semiconductor Energy Laboratory Co., Ltd. Electronic device manufacturing methods. 4,680,855, Cl. 29-583.000.

Yanagishita, Hitoshi: See—

Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,681,980, Cl. 585-6.300.

Yanagita, Makoto: See—

Kanda, Shoichi; Yanagita, Makoto; and Sekimoto, Yukihiro, 4,681,690, Cl. 252-8.551.

Yang, Tai-Her. Dumbbell with double cover hand protector and grasping training function. 4,681,315, Cl. 272-122.000.

Yano, Hideaki: See—

Tateoka, Masamichi; and Yano, Hideaki, 4,682,316, Cl. 369-46.000.

Yano, Naomichi; Ito, Hajime; and Tanaka, Shigeru, to Kubota, Ltd. Heat accumulating material enclosing container and heat accumulating apparatus. 4,681,154, Cl. 165-47.000.

Yasuda, Kazuo; Ando, Toshiharu; Itabashi, Yoshifumi; and Tsuchihashi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Epoxy resin composition. 4,681,904, Cl. 523-457.000.

Yasuda, Shigekazu: See—

Kubota, Kazuhisa; and Yasuda, Shigekazu, 4,681,435, Cl. 356-71.000.

Yasunobu, Isamu: See—

Shibata, Nobuhiko; Yasunobu, Isamu; Neki, Shigeo; Ohara, Kenichi; and Dohi, Takashi, 4,682,095, Cl. 318-778.000.

Yatsu, Tsutomu; Momma, Naohiro; Naito, Masayoshi; and Okamura, Masahiro, to Hitachi, Ltd. High voltage thyristor with optimized doping, thickness, and sheet resistivity for cathode base layer. 4,682,199, Cl. 357-38.000.

Yazaki, Yoshio, to ORC Manufacturing Co., Ltd. Movable light source type exposure apparatus. 4,682,277, Cl. 362-296.000.

Yazawa, Yoshiaki: See—

Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, 4,682,200, Cl. 357-41.000.

Yeh, Pochi A., to Rockwell International Corporation. Phase conjugate fiber gyroscope. 4,681,446, Cl. 356-350.000.

Yilmaz, Hamza, to General Electric Company. Insulated gate device with configured emitter contact pad. 4,682,195, Cl. 357-23.400.

Yokogawa Hokushin Electric Corporation: See—

Kobayashi, Tamotsu; Goto, Shigeru; Ohta, Hironobu; and Torimaru, Takashi, 4,680,973, Cl. 73-861.160.

Ueda, Toshitsugu; Kohsaka, Fusao; Yamazaki, Daisuke; and Akazawa, Hideo, 4,680,970, Cl. 73-702.000.

Yokokawa, Harumi: See—

Fujishige, Masao; Yokokawa, Harumi; Ujiie, Seiichi; and Dokiya, Masayuki, 4,681,626, Cl. 75-68.00A.

Yokota, Hideo: See—

Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, 4,682,237, Cl. 358-225.000.

Yokovama, Yasuyuki; Nakamura, Kiyooki; Goi, Hiroshi; and Fujioka, Koichiro, to Iwatsu Electric Co., Ltd. Photosensitive paper conveying device of a copying machine. 4,681,313, Cl. 271-273.000.

Yokoya, Hiroaki: See—

Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Kitatani, Katuzi, 4,681,832, Cl. 430-115.000.

Yokoya, Yuji: See—

Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.

Yoneda, Toshikazu: See—

Katsuno, Hisashi; Murakawa, Takashi; and Yoneda, Toshikazu, 4,681,865, Cl. 502-74.000.

York, Norman N. Apparatus for removing tree stumps. 4,681,145, Cl. 144-2.00N.

Yoshida, Hajime, to Hajime Industries Ltd. Bottle sidewall defect detector employing masking means. 4,682,023, Cl. 250-223.00B.

Yoshida, Ichiro: See—

Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichiro; and Atsumi, Morihiro, 4,681,989, Cl. 200-19.00R.

Yoshida, Kazunori: See—

Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.

Yoshida, Shohei: See—

Usami, Toshimasa; Tanaka, Toshiharu; and Yoshida, Shohei, 4,682,194, Cl. 503-215.000.

Yoshida, Susumu, to Mitsubishi Denki Kabushiki Kaisha. Light-electricity conversion semiconductor device. 4,681,982, Cl. 136-249.000.

Yoshikumi, Chikao: See—

Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.

Yoshimura, Masaaki: See—

Ohta, Koji; Yoshimura, Masaaki; and Takahashi, Mizunori, 4,681,909, Cl. 524-272.000.

Yoshimura, Yoshinari: See—

Teramae, Hiroshi; and Yoshimura, Yoshinari, 4,681,201, Cl. 192-106.200.

Yoshino, Hirobumi: See—

Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsuo; Yoshino, Hirobumi; and Shibusawa, Mitsuo, 4,682,158, Cl. 340-679.000.

Yoshitsugu, Noritada, to Toyota Jidosha Kabushiki Kaisha. Automatically fastening seatbelt assembly. 4,681,346, Cl. 280-804.000.

Young, Colin G. Automatic fuel tank anti B.L.E.V.E. safety apparatus and system. 4,680,937, Cl. 62-54.000.

Young, Peter L., to Optical Materials, Inc. Method and apparatus for making electrical connections utilizing a dielectric-like metal film. 4,681,778, Cl. 427-96.000.

Young, Raymond W.: See—

Lund, Eric W.; and Young, Raymond W., 4,682,310, Cl. 368-278.000.

Young, Rodney C.: See—

Brown, Thomas H.; Mitchell, Robert C.; Smith, Ian R.; and Young, Rodney C., 4,681,883, Cl. 514-212.000.

Yuki, Heimer; and Okamoto, Yoshio, to Daicel Chemical Industries, Ltd. Polymerizable, optically active polymer and process for preparing polymerizable polymer. 4,681,919, Cl. 525-292.000.

Yurczyk, Roger F.: See—

Glenn, Gary S.; Rajpaul, Vinod K.; and Yurczyk, Roger F., 4,681,602, Cl. 55-21.000.

Zabrodsky, Vladimir: See—

Brychta, Ondrej; and Zabrodsky, Vladimir, 4,681,100, Cl. 128-204.250.

Zahavi, Joseph: See—

Halliwell, Michael J.; and Zahavi, Joseph, 4,681,774, Cl. 427-53.100.

Zahner, John C.: See—

Graven, Richard G.; and Zahner, John C., 4,681,674, Cl. 208-59.000.

Zammarchi, Gino: See—

Lombard, Claude; Brisset, Jean-Paul; Catier, Gerard; Marais, Jean-Luc; and Zammarchi, Gino, 4,682,104, Cl. 324-208.000.

Zborowski, David G., to Caterpillar Inc. Method and apparatus for tensioning frictionally driven, ground engaging belts. 4,681,177, Cl. 180-9.560.

Zechall, Martin: See—

Kirschner, Michael; Rapp, Gunter; and Zechall, Martin, 4,682,049, Cl. 307-268.000.

Zenith Electronics Corporation: See—

Kadlec, Joseph, 4,682,226, Cl. 358-148.000.

Zerfass, Hans-Rainer; and Giesen, Franz-Josef, to Goetze AG. Impregnated, soft, flat gasket and manufacturing method. 4,681,800, Cl. 428-283.000.

Zerpner, Dieter; Streck, Roland; and Haag, Horst G., to Huels Aktiengesellschaft. Adhesion promoters for the production of vulcanizates having a favorable filler/elastomer bond. 4,681,961, Cl. 556-428.000.

Zibis, Peter: See—

Bulst, Wolf-Eckhart; Lindemann, Gertrud; and Zibis, Peter, 4,682,130, Cl. 333-195.000.

Ziegler, Gunther: See—

Wahling, Werner; and Ziegler, Gunther, 4,680,984, Cl. 74-574.000.

Zilinskas, Gene. Racket having unique string mount. 4,681,319, Cl. 273-73.00D.

Zimmerman, Sheldon B.: See—

Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., 4,681,846, Cl. 435-124.000.

Zimmermann, Gert, to F. Zimmermann & Co. Device for counting and sorting coins belonging to a set of coins. 4,681,204, Cl. 194-317.000.

Ziogas, Phoivos D.: See—

Huynh, Anh N.; and Ziogas, Phoivos D., 4,682,266, Cl. 361-235.000.

Zoleski, Benjamin H.; Crawford, Wheeler C.; and Sung, Rodney L., to Texaco Inc. Marine crankcase lubricant. 4,681,694, Cl. 252-51.50R.

Zuccarelli, Hugo. Process for forming an acoustic monitoring device. 4,680,856, Cl. 29-594.000.

Zupanovich, John D.: See—

Walker, Jerry L.; and Zupanovich, John D., 4,681,737, Cl. 422-16.000.

Zurilla, Ronald W.; and Huff, John, to Ford Motor Company. Alkaline resistant phosphate conversion coatings. 4,681,641, Cl. 148-6.15Z.

Zweifel, Hans: See—

Fischer, Walter; Finter, Jurgen; and Zweifel, Hans, 4,681,950, Cl. 549-27.000.

501 USM Corporation: See—

Moran, Michael J.; and Kemnitz, Tadeusz, 4,681,176, Cl. 177-114.000.



# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF JULY, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Di Peri, Leonard J. Modular dry-air evaporative cooler. Re. 32,461, Cl. 62-314.000.
- Hitachi, Ltd.: See—  
Yoshinaga, Yoichi; Ueda, Shinjiro; and Nishida, Hideo, Re. 32,462, Cl. 415-211.000.
- Leggett, Archie L., Jr. to R & L Enterprises, Inc. Diskette punch with attached gage. Re. 32,460, Cl. 30-363.000.
- Nishida, Hideo: See—  
Yoshinaga, Yoichi; Ueda, Shinjiro; and Nishida, Hideo, Re. 32,462, Cl. 415-211.000.
- R & L Enterprises, Inc.: See—  
Leggett, Archie L., Jr., Re. 32,460, Cl. 30-363.000.
- Ueda, Shinjiro: See—  
Yoshinaga, Yoichi; Ueda, Shinjiro; and Nishida, Hideo, Re. 32,462, Cl. 415-211.000.
- Yoshinaga, Yoichi; Ueda, Shinjiro; and Nishida, Hideo, to Hitachi, Ltd. Centrifugal fluid machine. Re. 32,462, Cl. 415-211.000.

# LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

- Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., to Dyonics, Inc. Surgical instrument suitable for closed surgery such as of the knee. B1 4,203,444, 7-21-87, Cl. 604-22.000.
- Chapman, Emmett H. Method of playing stringed musical instrument. B1 4,142,436, 7-21-87, Cl. 84-1.160.
- Don Badische Company: See—  
Gusack, James A.; Stephens, Bernard B.; and Stevens, James A., B1 3,762,220, Cl. 73-160.000.
- Dyonics, Inc.: See—  
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., B1 4,203,444, Cl. 604-22.000.
- Gusack, James A.; Stephens, Bernard B.; and Stevens, James A., to Don Badische Company. Continuous evaluation of yarn crimp. B1 3,762,220, 7-21-87, Cl. 73-160.000.
- Johnson, Lanny L.: See—  
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., B1 4,203,444, Cl. 604-22.000.
- Lex Tex Ltd.: See—  
Scrugg, Ernest P. R., B1 3,472,011, Cl. 57-290.000.
- McHugh, Edward H.: See—  
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., B1 4,203,444, Cl. 604-22.000.
- Scrugg, Ernest P. R., to Lex Tex Ltd. Treatment of artificial yarns and threads. B1 3,472,011, 7-21-87, Cl. 57-290.000.
- Sjostrom, Douglas D.: See—  
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., B1 4,203,444, Cl. 604-22.000.
- Stephens, Bernard B.: See—  
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- Albertini, Rocco D.; McClellan, Arthur W.; Kokoszka, Stephen A.; and Girtten, Patrick C., to Baldt Incorporated. Anchor. 290,947, 7-21-87, Cl. D12-215.000.
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- Bajo, Ricardo. Festooned pinata. 290,977, 7-21-87, Cl. D21-59.000.
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- Devino, Vincent A., to Grumman Aerospace Corporation. Aircraft flight instrument. 290,937, 7-21-87, Cl. D10-67.000.
- Diamond, Harvey E. Overflow cavity and cover for bathtub. 290,995, 7-21-87, Cl. D23-69.000.
- Dikoff, Joseph K. Golf tool. 290,985, 7-21-87, Cl. D21-234.000.
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- Erickson, Fredrick J., to Ehco, Inc. Barbeque grill. 290,923, 7-21-87, Cl. D7-337.000.
- Fenne, Kenneth R., to Pittway Corporation. Flashlight. 291,010, 7-21-87, Cl. D26-46.000.
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- Gaskins, Jean. Tongue scraper. 291,001, 7-21-87, Cl. D24-10.000.
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- Gem Top Mfg. Inc.: See—  
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- Gemmell, Roderique S., to Radiation Concepts, Inc. Portable x-ray film printer for imprinting patient information or the like on unexposed portion of x-ray film. 290,998, 7-21-87, Cl. D24-2.000.
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- Grum, Matthew W. Pet enclosure bag for pest eradication, transportation and security. 291,014, 7-21-87, Cl. D30-1.000.
- Grumman Aerospace Corporation: See—  
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- Hanback, Francis J. Ultralight aircraft. 290,951, 7-21-87, Cl. D12-322.000.
- Harding, David R., to Micro Component Technology, Inc. Electronic component vertical stack feed apparatus for use in printed circuit assembly machines. 290,962, 7-21-87, Cl. D15-199.000.
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- Herrera, Freddy. Beverage can holder. 290,922, 7-21-87, Cl. D7-70.000.
- Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet spout. 290,992, 7-21-87, Cl. D23-32.000.
- Hill, Michael W. Clock design. 290,936, 7-21-87, Cl. D10-25.000.
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- Hill, Royce W., to Micro Plastics, Inc. Circuit board support. 290,930, 7-21-87, Cl. D8-354.000.
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- Hledin, Peter C. Catamaran type boat. 290,948, 7-21-87, Cl. D12-310.000.
- Hoover, Thomas W. Work table for a knitting machine or the like. 290,915, 7-21-87, Cl. D6-477.000.
- Huckstep, Ronald L. Knee prosthesis. 291,003, 7-21-87, Cl. D24-33.000.
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- Irbby, Daniel L. Cover for a vehicle brake fluid reservoir. 290,944, 7-21-87, Cl. D12-155.000.
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- Kawata, Yoshiaki; Yamamoto, Masaki; Uematsu, Toyoyuki; Tsubaki, Hiroyuki; and Itoh, Yutaka, to Matsushita Electric Industrial Co., Ltd. Combined telephone, clock, radio and television receiver. 290,958, 7-21-87, Cl. D14-79.000.
- Keilman, Michael R.; and West, Richard L., to Baxter Travenol Laboratories, Inc. Pooling container for parenteral fluids and the like. 291,004, 7-21-87, Cl. D24-56.000.
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Reisinger, Ludwig; and Westphal, Dennis, to CertainTeed Corporation. Window component extrusion. 291,008, 7-21-87, Cl. D25-74.000.

Rich, Beverly C. Receiving tray for a printer. 290,968, 7-21-87, Cl. D18-22.000.

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Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., to Conair Corporation. Telephone stand for a handset transceiver. 290,955, 7-21-87, Cl. D14-62.000.

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Saito, Toshiaki; Ishii, Koji; and Doi, Tetsuyuki, 290,966, Cl. D18-13.000.

Sabo, Brian D.: See—  
Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., 290,969, Cl. D18-22.000.

Saito, Toshiaki; Ishii, Koji; and Doi, Tetsuyuki, to Ryobi Ltd. Printing machine. 290,966, 7-21-87, Cl. D18-13.000.

Satalof, Stuart L.; and Weiner, Steven I. Piston valve assembly oil shield. 290,965, 7-21-87, Cl. D17-13.000.

Sato, Akito, to Pilot Ink Co., Ltd. Toy cow. 290,979, 7-21-87, Cl. D21-148.000.

Scarboro, Clark T., to Bayliner Marine Corporation. Cruising yacht. 290,949, 7-21-87, Cl. D12-315.000.

Scepter Manufacturing Co. Ltd.: See—  
Lates, Kornel, 291,018, Cl. D34-46.000.

Scholl, Inc.: See—  
Schornstein, Michael M.; and Blissett, Malcolm G., 290,900, Cl. D2-293.000.

Schornstein, Michael M.; and Blissett, Malcolm G., to Scholl, Inc. Sandal. 290,900, 7-21-87, Cl. D2-293.000.

Selig, Julie A., to 'totes', incorporated. Umbrella handle. 290,905, 7-21-87, Cl. D3-16.000.

Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., to American Greetings Corporation. Toy bear figure. 290,980, 7-21-87, Cl. D21-159.000.

Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., to American Greetings Corporation. Toy bear figure. 290,981, 7-21-87, Cl. D21-159.000.

Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., to American Greetings Corporation. Toy bear figure. 290,982, 7-21-87, Cl. D21-159.000.

Sharp Corporation: See—  
Ooie, Yoshihisa, 290,959, Cl. D14-94.000.

Shimano Industrial Company Limited: See—  
Myojo, Seiji, 290,988, Cl. D22-141.000.

Sklaar, Michael E.; and Berkowicz, Michael Z. Speaker enclosure. 290,953, 7-21-87, Cl. D14-33.000.

Smith, Stephen W.; and Ziegler, William H., Jr., to Brown Group Recreational Products, Inc. Knock-down tricycle. 290,940, 7-21-87, Cl. D12-113.000.

Spangler, Anthony G.: See—  
Hill, Charles P.; and Spangler, Anthony G., 290,992, Cl. D23-32.000.

Spindle, Michael J.: See—  
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,980, Cl. D21-159.000.  
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,981, Cl. D21-159.000.  
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,982, Cl. D21-159.000.

Steadman, Alan E.; and Burridge, Christopher A., to Denroy Plastics Limited. Hairbrush. 290,910, 7-21-87, Cl. D4-136.000.

Stiner, Roy: See—  
Robbins, Richard J.; and Stiner, Roy, 290,987, Cl. D22-141.000.

Strandengen, Einar, to A/S Grorud Jernvarefabrik. Slideable, resilient guide block for windows. 290,928, 7-21-87, Cl. D8-349.000.

Strickland, Allen. Boat accessory extrusion. 290,950, 7-21-87, Cl. D12-317.000.

Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., to Minolta Camera K.K.; and Minnesota Mining & Manufacturing Co. Remote controller for a printer. 290,969, 7-21-87, Cl. D18-22.000.

Taylor, Mark L. Training harness for track and field athletes. 290,983, 7-21-87, Cl. D21-191.000.

Ten Eyck, Richard E.; and Israel, Gary P., to Brunswick Corporation. Spinning fishing reel. 290,989, 7-21-87, Cl. D22-141.000.

Thermal Concepts, Inc.: See—  
Bingham, Grady A., 290,996, Cl. D23-136.000.

Thomas, Suzanne, to Accessories by Us, Inc. Combined carrying bag for infant accessories and changing mat. 290,908, 7-21-87, Cl. D3-71.000.

Tong, James K.; and Peterson, Robert L., to Pensa, Inc. Shoe upper. 290,901, 7-21-87, Cl. D2-314.000.

Torrens, Derald R.; and Torrens, Joann. Horse muzzle. 291,015, 7-21-87, Cl. D30-33.000.

Torrens, Joann: See—  
Torrens, Derald R.; and Torrens, Joann, 291,015, Cl. D30-33.000.

'totes', incorporated: See—  
Selig, Julie A., 290,905, Cl. D3-16.000.

Tsubaki, Hiroyuki: See—  
Kawata, Yoshiaki; Yamamoto, Masaki; Uematsu, Toyoyuki; Tsubaki, Hiroyuki; and Itoh, Yutaka, 290,958, Cl. D14-79.000.

Tsumurai, Yasuo: See—  
Utsuki, Toshiyuki; Kouno, Shuichi; Yanagisawa, Kazunori; and Tsumurai, Yasuo, 290,997, Cl. D23-155.000.

Uematsu, Toyoyuki: See—  
Kawata, Yoshiaki; Yamamoto, Masaki; Uematsu, Toyoyuki; Tsubaki, Hiroyuki; and Itoh, Yutaka, 290,958, Cl. D14-79.000.

Unitek Corporation: See—  
Botich, Michael J., 291,000, Cl. D24-10.000.

Utsuki, Toshiyuki; Kouno, Shuichi; Yanagisawa, Kazunori; and Tsumurai, Yasuo, to Hitachi, Ltd. Electric fan. 290,997, 7-21-87, Cl. D23-155.000.

Weilow, Gerth. Extrusion. 291,009, 7-21-87, Cl. D25-75.000.

Weiner, Steven I.: See—  
Satalof, Stuart L.; and Weiner, Steven I., 290,965, Cl. D17-13.000.

West, Richard L.: See—  
Kellman, Michael R.; and West, Richard L., 291,004, Cl. D24-56.000.

Westphal, Dennis: See—  
Reisinger, Ludwig; and Westphal, Dennis, 291,007, Cl. D25-74.000.  
Reisinger, Ludwig; and Westphal, Dennis, 291,008, Cl. D25-74.000.

Wilkinson Sword Limited: See—  
Pittaway, Alan K.; and Harrison, Christopher R. B., 290,925, Cl. D8-5.000.

Williams, Charles G. D. Handle for packages or the like. 290,935, 7-21-87, Cl. D9-434.000.

Witham, Frederick G. Combined shoulder rest for a telephone handset and an adapter therefor. 290,956, 7-21-87, Cl. D14-65.000.

Wong, Ting W.: See—  
Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., 290,955, Cl. D14-62.000.

Xyvision, Inc.: See—  
Price, John, 290,952, Cl. D13-35.000.

Yamagishi, Seiichi: See—  
Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., 290,969, Cl. D18-22.000.

Yamaguchi, Kaname, to Daiwa Seiko, Inc. Fishing reel spool. 290,986, 7-21-87, Cl. D22-137.000.

Yamamoto, Masaki: See—  
Kawata, Yoshiaki; Yamamoto, Masaki; Uematsu, Toyoyuki; Tsubaki, Hiroyuki; and Itoh, Yutaka, 290,958, Cl. D14-79.000.

Yanagisawa, Kazunori: See—  
Utsuki, Toshiyuki; Kouno, Shuichi; Yanagisawa, Kazunori; and Tsumurai, Yasuo, 290,997, Cl. D23-155.000.

Zaruba, John V.; Conti, Rino; and Morrison, Howard J., to Marvin Glass & Associates. Ice cream sandwich maker or the like. 290,920, 7-21-87, Cl. D7-43.000.

Ziegler, William H., Jr.: See—  
Smith, Stephen W.; and Ziegler, William H., Jr., 290,940, Cl. D12-113.000.

Zimmerman, James B. Dental tray rack. 291,002, 7-21-87, Cl. D24-31.000.



# CLASSIFICATION OF PATENTS

ISSUED JULY 21, 1987

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2	CLASS 34	CLASS 56	862.33	4,680,976	464	4,681,038	1 R	4,681,091
2	1	7	CLASS 74	4,680,979	193	4,681,039	6	4,681,093
4,680,812	23	251	7 E	4,680,980	3	4,681,040	10	4,681,094
4,680,813	116	263	422	4,680,981	355	4,681,041	24.1	4,681,095
4,680,814	143	290	424.8 R	4,680,982	1.11	4,681,042	33	4,681,096
4,680,815	31	27	474	4,680,983	19	4,681,043	77	4,681,097
CLASS 4	CLASS 36	CLASS 59	574	4,680,984	35	4,681,044	204.23	4,681,099
240	35 B	39.3	785	4,680,985	90	4,681,045	204.25	4,681,100
663	44	329	866	4,680,986	287.15	4,681,046	303 B	4,681,103
CLASS 5	117	368	CLASS 60	4,680,987	304	4,681,047	303 R	4,681,101
81 R	67	375	4,680,926	4,680,988	309	4,681,048	303.1	4,681,102
86	236	447	4,680,927	4,680,989	6	4,681,049	303.17	4,681,104
413	237	605	4,680,928	4,680,990	153	4,681,050	305	4,681,105
421	471	608	4,680,929	4,680,991	24.1	4,681,051	305.1	4,681,106
451	66	652	4,680,930	4,680,992	345	4,681,052	305.17	4,681,107
CLASS 8	CLASS 40	CLASS 62	CLASS 75	4,680,993	346	4,681,053	305.18	4,681,108
111	5	3	0.5 B	4,680,994	162	4,681,054	305.19	4,681,109
115.68	471	23	10.19	4,680,995	262.3	4,681,055	305.2	4,681,110
128 R	CLASS 42	45	28	4,680,996	278	4,681,056	305.3	4,681,111
489	66	114	53	4,680,997	306	4,681,057	305.4	4,681,112
620	19.2	155	68 A	4,680,998	347	4,681,058	305.5	4,681,113
86 A	57.1	184	118 R	4,680,999	348	4,681,059	305.6	4,681,114
CLASS 10	100	256	246	4,680,999	349	4,681,060	305.7	4,681,115
104.165	CLASS 44	300	CLASS 81	4,680,999	350	4,681,061	305.8	4,681,116
105	1 SR	314	3.37	4,680,999	351	4,681,062	305.9	4,681,117
147 R	15 R	342	57.29	4,680,999	352	4,681,063	305.10	4,681,118
319	4,681,598	514 R	437	4,680,999	353	4,681,064	305.11	4,681,119
CLASS 16	58	CLASS 65	456	4,680,999	354	4,681,065	305.12	4,681,120
90	4,680,888	1	487	4,680,999	355	4,681,066	305.13	4,681,121
114 A	4,680,889	18.1	CLASS 82	4,680,999	356	4,681,067	305.14	4,681,122
241	92	114	1 C	4,680,999	357	4,681,068	305.15	4,681,123
CLASS 17	CLASS 48	CLASS 66	36 B	4,680,999	358	4,681,069	305.16	4,681,124
23	55	64	CLASS 83	4,680,999	359	4,681,070	305.17	4,681,125
25	4,680,890	117	37	4,680,999	360	4,681,071	305.18	4,681,126
CLASS 19	280	CLASS 68	71	4,680,999	361	4,681,072	305.19	4,681,127
244	374	3 R	80	4,680,999	362	4,681,073	305.20	4,681,128
CLASS 24	CLASS 51	14	98	4,680,999	363	4,681,074	305.21	4,681,129
16 PB	5 R	86	404.4	4,680,999	364	4,681,075	305.22	4,681,130
117	50 R	92	782	4,680,999	365	4,681,076	305.23	4,681,131
150 FP	170 R	93	862	4,680,999	366	4,681,077	305.24	4,681,132
237	215 UE	103	CLASS 84	4,680,999	367	4,681,078	305.25	4,681,133
442	281 R	108	1.1	4,680,999	368	4,681,079	305.26	4,681,134
CLASS 26	293	CLASS 70	1.16	4,680,999	369	4,681,080	305.27	4,681,135
89	4,680,898	14	1.28	4,680,999	370	4,681,081	305.28	4,681,136
4,680,839	4,680,899	86	293	4,680,999	371	4,681,082	305.29	4,681,137
CLASS 29	4,680,900	92	313	4,680,999	372	4,681,083	305.30	4,681,138
25.35	4,680,901	93	422 S	4,680,999	373	4,681,084	305.31	4,681,139
33 M	126.4	103	CLASS 89	4,680,999	374	4,681,085	305.32	4,681,140
33 P	4,680,902	108	1.815	4,680,999	375	4,681,086	305.33	4,681,141
116 R	127.8	117	1.816	4,680,999	376	4,681,087	305.34	4,681,142
156.4 R	169.12	118	8	4,680,999	377	4,681,088	305.35	4,681,143
157 R	4,680,903	130	29	4,680,999	378	4,681,089	305.36	4,681,144
168	4,680,904	160	33.04	4,680,999	379	4,681,090	305.37	4,681,145
173	4,680,905	161	138	4,680,999	380	4,681,091	305.38	4,681,146
173	4,680,906	166	CLASS 91	4,680,999	381	4,681,092	305.39	4,681,147
213 R	4,680,907	167	178	4,680,999	382	4,681,093	305.40	4,681,148
252	4,680,908	168	471	4,680,999	383	4,681,094	305.41	4,681,149
426.3	4,680,909	169	488	4,680,999	384	4,681,095	305.42	4,681,150
433	4,680,910	170	CLASS 92	4,680,999	385	4,681,096	305.43	4,681,151
461	4,680,911	171	1 G	4,680,999	386	4,681,097	305.44	4,681,152
571	4,680,912	172	55	4,680,999	387	4,681,098	305.45	4,681,153
576 B	4,680,913	173	56	4,680,999	388	4,681,099	305.46	4,681,154
583	4,680,914	174	57	4,680,999	389	4,681,100	305.47	4,681,155
594	4,680,915	175	58	4,680,999	390	4,681,101	305.48	4,681,156
596	4,680,916	176	59	4,680,999	391	4,681,102	305.49	4,681,157
610 SG	4,680,917	177	60	4,680,999	392	4,681,103	305.50	4,681,158
611	4,680,918	178	61	4,680,999	393	4,681,104	305.51	4,681,159
804	4,680,919	179	62	4,680,999	394	4,681,105	305.52	4,681,160
CLASS 30	4,680,920	204	63	4,680,999	395	4,681,106	305.53	4,681,161
296 A	4,680,921	445	64	4,680,999	396	4,681,107	305.54	4,681,162
363	4,680,922	597	65	4,680,999	397	4,681,108	305.55	4,681,163
381	4,680,923	628	66	4,680,999	398	4,681,109	305.56	4,681,164
511	4,680,924	651	67	4,680,999	399	4,681,110	305.57	4,681,165
CLASS 33	4,680,925	661	68	4,680,999	400	4,681,111	305.58	4,681,166
26	4,680,926	702	69	4,680,999	401	4,681,112	305.59	4,681,167
143 L	4,680,927	718	70	4,680,999	402	4,681,113	305.60	4,681,168
356	4,680,928	730	71	4,680,999	403	4,681,114	305.61	4,681,169
391	4,680,929	861.16	72	4,680,999	404	4,681,115	305.62	4,681,170
503	4,680,930	861.38	73	4,680,999	405	4,681,116	305.63	4,681,171
533	4,680,931	861.41	74	4,680,999	406	4,681,117	305.64	4,681,172
540	4,680,932	862.07	75	4,680,999	407	4,681,118	305.65	4,681,173
	4,680,933	862.09	76	4,680,999	408	4,681,119	305.66	4,681,174
	4,680,934		77	4,680,999	409	4,681,120	305.67	4,681,175
	4,680,935		78	4,680,999	410	4,681,121	305.68	4,681,176
	4,680,936		79	4,680,999	411	4,681,122	305.69	4,681,177
	4,680,937		80	4,680,999	412	4,681,123	305.70	4,681,178
	4,680,938		81	4,680,999	413	4,681,124	305.71	4,681,179
	4,680,939		82	4,680,999	414	4,681,125	305.72	4,681,180
	4,680,940		83	4,680,999	415	4,681,126	305.73	4,681,181
	4,680,941		84	4,680,999	416	4,681,127	305.74	4,681,182
	4,680,942		85	4,680,999	417	4,681,128	305.75	4,681,183
	4,680,943		86	4,680,999	418	4,681,129	305.76	4,681,184
	4,680,944		87	4,680,999	419	4,681,130	305.77	4,681,185
	4,680,945		88	4,680,999	420	4,681,131	305.78	4,681,186
	4,680,946		89	4,680,999	421	4,681,132	305.79	4,681,187
	4,680,947		90	4,680,999	422	4,681,133	305.80	4,681,188
	4,680,948		91	4,680,999	423	4,681,134	305.81	4,681,189
	4,680,949		92	4,680,999	424	4,681,135	305.82	4,681,190
	4,680,950		93	4,680,999	425	4,681,136	305.83	4,681,191
	4,680,951		94	4,680,999	426	4,681,137	305.84	4,681,192
	4,680,952		95	4,680,999	427	4,681,138	305.85	4,681,193
	4,680,953		96	4,680,999	428	4,681,139	305.86	4,681,194
	4,680,954		97	4,680,999	429	4,681,140	305.87	4,681,195
	4,680,955		98	4,680,999	430	4,681,141	305.88	4,681,196
	4,680,956		99	4,680,999	431	4,681,142	305.89	4,681,197
	4,680,957		100	4,680,999	432	4,681,143	305.90	4,681,198
	4,680,958		101	4,680,999	433	4,681,144	305.91	4,681,199
	4,680,959		102	4,680,999	434	4,681,145	305.92	4,681,200
	4,680,960		103	4,680,999	435	4,681,146	305.93	4,681,201
	4,680,961		104	4,680,999	436	4,681,147	305.94	4,681,202
	4,680,962		105	4,680,999	437	4,681,148	305.95	4,681,203
	4,680,963		106	4,680,999	438	4,681,149	305.96	4,681,204
	4,680,964		107	4,680,999	439	4,681,150	305.97	4,681,205
	4,680,965		108	4,680,999	440	4,681,151	305.98	4,681,206
	4,680,966		109	4,680,999	441	4,681,152	305.99	4,681,207
	4,680,967		110	4,680,999	442	4,681,153	306.00	4,681,208
	4,680,968		111	4,680,999	443	4,681,154	306.01	4,681,209
	4,680,969		112	4,680,999	444	4,681,155	306.02	4,681,210
	4,680,970		113	4,680,999	445	4,681,156	306.03	4,681,211
	4,680,971		114	4,680,999	446	4,681,157	306.04	4,681,212
	4,680,972		115	4,680,999	447	4,681,158	306.05	4,681,213
	4,680,973		116					

630	4,681,654	328	4,681,206	497	4,682,013	291	4,682,027	295	4,681,324	261	4,682,069
632	4,681,655	333	4,681,207			327.2	4,682,028	345	4,681,325	334	4,682,070
645	4,681,686	341	4,681,208	CLASS 220		330	4,682,029				
657	4,681,657	392	4,681,209	70	4,681,237	338	4,682,030	CLASS 277			
		468.2	4,681,210	260	4,681,238	345	4,682,031	108	4,681,326	108	4,681,378
134	4,681,149	789	4,681,211	408	4,681,239	352	4,682,032	242	4,681,380	242	4,681,380
		803.2	4,681,212			358.1	4,682,033	297	4,681,379	297	4,681,379
		803.9	4,681,213	CLASS 221		363 R	4,682,034	333	4,681,381	333	4,681,381
		819	4,681,214	48	4,681,240		4,682,035				
156	4,681,658	843	4,681,215	124	4,681,241	370	4,682,036	CLASS 312			
360.1	4,681,659					374	4,682,037	43	4,682,071		
		CLASS 163		CLASS 200		548	4,682,038	115	4,682,072		
5	4,681,150	5 A	4,681,987	41	4,681,242		4,682,039	414	4,682,073		
		16 B	4,681,994	83	4,681,243		4,682,040	444	4,682,074		
		17 R	4,681,988	144.5	4,681,244		4,682,041	466	4,682,075		
		19 R	4,681,989	643	4,681,245		4,682,042				
		48 KB	4,681,990			560	4,682,043	CLASS 313			
		61.45 R	4,681,991			571	4,682,044	43	4,682,071		
		82 E	4,681,992			578	4,682,045	115	4,682,072		
		153 SC	4,681,993				4,682,046	414	4,682,073		
				CLASS 222			4,682,047	444	4,682,074		
				41	4,681,242		4,682,048	466	4,682,075		
				83	4,681,243		4,682,049				
				144.5	4,681,244		4,682,050	CLASS 315			
				643	4,681,245		4,682,051	4	4,682,076		
							4,682,052	14	4,682,077		
							4,682,053	86	4,682,078		
							4,682,054	186	4,682,079		
							4,682,055	209 R	4,682,080		
							4,682,056	219	4,682,081		
							4,682,057		4,682,082		
							4,682,058		4,682,083		
							4,682,059		4,682,084		
							4,682,060		4,682,085		
							4,682,061		4,682,086		
							4,682,062		4,682,087		
							4,682,063				
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							4,682,141				

CLASS 338	172	4,682,142	5	4,681,433	CLASS 362	18	4,682,273	CLASS 375	121	4,681,502	68	4,681,788
	307	4,682,143	45	4,681,434		61	4,682,274		144	4,681,503	93	4,681,789
CLASS 340			71	4,681,435		191	4,682,275		268	4,681,504	96	4,681,790
			121	4,681,436		294	4,682,276		744 R	4,681,505		4,681,791
			129	4,681,437		296	4,682,277		786	4,681,506	102	4,681,792
48		4,682,144	143	4,681,438	CLASS 363			CLASS 376		4,681,507	138	4,681,793
52 H		4,682,145	154	4,681,439		58	4,682,278		116	CLASS 415	188	4,681,794
77		4,682,146	218	4,681,440					161	4,681,508	209	4,681,795
286 R		4,682,147	222	4,681,441					168	4,681,509	212	4,681,796
311.1		4,682,148	237	4,681,442	CLASS 364				211	Re.32,462	215	4,681,797
347 DA		4,682,149	246	4,681,443		141	4,682,279				220	4,681,798
347 DD		4,682,150	318	4,681,444		191	4,682,280				220	4,681,799
		4,682,152	346	4,681,445		200	4,682,281		CLASS 416		283	4,681,800
347 SY		4,682,151	350	4,681,446			4,682,282		131	4,681,511	288	4,681,802
507		4,682,153	351	4,681,447			4,682,283		132 B	4,681,512	348	4,681,803
572		4,682,154	352	4,681,448			4,682,284				349	4,681,804
573		4,682,155	364	4,681,449			4,682,285		CLASS 417		391	4,681,805
603		4,682,156	367	4,681,450			4,682,286		2	4,681,513	402.21	4,681,806
605		4,682,157	373	4,681,451			4,682,287		213	4,681,514	403	4,681,807
679		4,682,158	375	4,681,452		406	4,682,288		218	4,681,515	413	4,681,811
709		4,682,159	394	4,681,453		414	4,682,289		259	4,681,516	425.5	4,681,808
729		4,682,160	402	4,681,454			4,682,290		300	4,681,517	428	4,681,809
731		4,682,161	445	4,681,455			4,682,291		395	4,681,518	429	4,681,810
799		4,682,162			CLASS 357	424	4,682,292				432	4,681,812
805		4,682,163				426	4,682,293		152	4,681,519	450	4,681,813
825.03		4,682,164	23.4	4,682,195		431.05	4,682,294				457	4,681,814
825.23		4,682,167	30	4,682,196			4,682,295		CLASS 419		458	4,681,815
825.5		4,682,165	36	4,682,197			4,682,296		8	4,681,733	463	4,681,816
		4,682,166	38	4,682,198			4,682,297		9	4,681,734	549	4,681,817
							4,682,298				577	4,681,787
825.65		4,682,168	41	4,682,200			4,682,299		CLASS 420		607	4,681,818
928		4,682,170	42	4,682,201			4,682,300				697	4,681,819
975		4,682,171	45	4,682,202			4,682,301				698	4,681,820
			51	4,682,203			4,682,302		CLASS 422			CLASS 429
							4,682,303		16	4,681,737	121	4,681,821
15		4,682,172					4,682,304		28	4,681,738	191	4,681,822
51		4,682,173	53	4,682,205			4,682,305		37	4,681,739	218	4,681,823
160		4,682,174	59	4,682,206			4,682,306		78	4,681,740		
165		4,682,175	74	4,682,207	CLASS 358		4,682,307		100	4,681,741		CLASS 430
175		4,682,176	81	4,682,208			4,682,308		102	4,681,742	24	4,681,824
176		4,682,177					4,682,309		140	4,681,743	57	4,681,825
202		4,682,178							173	4,681,744	65	4,681,826
					CLASS 365	222	4,682,306				83	4,681,827
								CLASS 383			97	4,681,828
755		4,682,179	19	4,682,209					239	4,681,746	109	4,681,829
769		4,682,180	29	4,682,210				CLASS 400			110	4,681,830
789		4,682,181	31	4,682,213					277	4,681,747	114	4,681,831
			41	4,682,211	CLASS 366				279	4,681,748	115	4,681,832
			44	4,682,212		46	4,681,456		326	4,681,749	175	4,681,833
			55	4,682,214		84	4,681,457		339	4,681,750	270	4,681,834
			75	4,682,215		149	4,681,458		359	4,681,745	367	4,681,838
1.1		4,682,182			CLASS 367				584	4,681,751	386	4,681,835
75		4,682,183				21	4,682,307				434	4,681,836
140 R		4,682,184				31	4,682,308		CLASS 424		504	4,681,837
		4,682,185				146	4,682,309					CLASS 431
		4,682,186						CLASS 401			74	4,681,529
		4,682,187							10	4,681,753	89	4,681,530
154		4,682,190							47	4,681,754	181	4,681,531
								CLASS 402			183	4,681,532
									78	4,681,758	208	4,681,533
									80	4,681,759	290	4,681,534
								CLASS 403				CLASS 432
									95	4,681,756	48	4,681,535
									125	4,681,757	59	4,681,536
									451	4,681,752	242	4,681,537
									453	4,681,752		
								CLASS 404				CLASS 433
									456	4,681,755		
												CLASS 434
									12	4,681,520		
									36	4,681,521		
									72 S	4,681,522		
									168	4,681,523		
									376 R	4,681,524		
									527	4,681,525		
									532	4,681,526		
									546	4,681,527		
									562	4,681,528		
												CLASS 435
	</											



[illegible]

## CLASSIFICATION OF DESIGNS

D2—	293	290,900	43	290,920	D12—	113	290,940	102	290,960	159	290,980	10	291,000					
	314	290,901	47	290,921		142	290,941		107	290,961			291,001					
	320	290,902	70	290,922		147	290,942	D15—	199	290,962		31	291,002					
		290,903	337	290,923		155	290,943	D16—	45	290,963	191	290,983	33	291,003				
	602	290,904	391	290,924			290,944		123	290,964	219	290,984	56	291,004				
D3—	16	290,905	D8—	5	290,925		156	290,945	D17—	13	290,965	234	290,985	64	291,005			
	25	290,906		14	290,926		205	290,946	D18—		290,966	D22—	137	290,986	D25—	69	291,006	
	38	290,907		30	290,927		215	290,947			290,967		141	290,987		74	291,007	
	71	290,908		349	290,928		310	290,948		22	290,968			290,988		291,008		
D4—	115	290,909	354	290,929		315	290,949			290,969			290,989		75	291,009		
	136	290,910			290,930		317	290,950		23	290,970	D23—	1	290,990	D26—	46	291,010	
D6—	347	290,911	373	290,931		322	290,951	D19—	65	290,971	25	290,991			104	291,012		
	367	290,912	499	290,932	D13—	35	290,952		90	290,972	32	290,992			138	291,013		
	390	290,913	D9—	385	290,933	D14—	33	290,953		92	290,973	35	290,993			D28—	1	291,014
	474	290,914	413	290,934		61	290,954	D20—	38	290,974	65	290,994			D30—	1	291,015	
	477	290,915	434	290,935		62	290,955	D21—	25	290,975	69	290,995			33	291,016		
	583	290,916	D10—	25	290,936		65	290,956		59	290,976	136	290,996		D32—	73	291,018	
	589	290,917		67	290,937		68	290,957			290,977	155	290,997		D34—	31	291,017	
	603	290,918	D11—	3	290,938		79	290,958		82	290,978	D24—	2	290,998		46	291,018	
D7—	38	290,919		81	290,939		94	290,959		148	290,979		8	290,999	D99—	28	291,019	

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

01 :	4,680,897	4,681,103	4,681,563	08 :	4,680,867	4,681,263	4,681,575
	4,680,994	4,681,104	4,681,569		4,680,883	4,681,434	4,681,613
	4,681,437	4,681,111	4,681,574		4,681,278	4,681,504	4,681,644
	4,681,640	4,681,119	4,681,583		4,681,424	4,681,534	4,681,682
	4,681,948	4,681,136	4,681,584		4,681,430	4,681,559	4,681,687
	4,682,282	4,681,139	4,681,585		4,681,448	4,681,568	4,681,778
02 :	4,680,880	4,681,142	4,681,611		4,681,606	4,681,589	4,681,786
	4,681,222	4,681,152	4,681,621		4,681,798	4,681,635	4,681,845
04 :	4,680,815	4,681,155	4,681,651		4,682,248	4,681,649	4,681,874
	4,680,866	4,681,156	4,681,656		4,682,354	4,681,684	4,681,939
	4,680,893	4,681,175	4,681,718	09 :	4,681,223	4,681,689	4,681,970
	4,681,089	4,681,218	4,681,741		4,681,307	4,682,057	4,682,111
	4,681,238	4,681,232	4,681,742		4,681,385	4,682,059	4,682,136
	4,681,390	4,681,242	4,681,760		4,681,386	4,682,160	4,682,151
	4,681,515	4,681,247	4,681,769		4,681,392	4,682,165	4,682,226
	4,681,652	4,681,253	4,681,787		4,681,408	4,682,356	4,682,284
	4,681,711	4,681,255	4,681,795		4,681,485	4,681,252	4,682,360
	4,682,054	4,681,259	4,681,849	13 :	4,681,610	4,681,334	4,680,844
	4,682,081	4,681,260	4,681,853		4,681,677	4,681,518	4,680,985
	4,682,163	4,681,290	4,681,889		4,681,685	4,681,761	4,681,041
	4,682,174	4,681,291	4,681,949		4,681,724	4,681,933	4,681,044
05 :	4,681,777	4,681,298	4,681,947		4,681,884	4,681,990	4,681,137
	4,682,147	4,681,302	4,682,006		4,681,959	4,682,169	4,681,189
06 :	Re.32,461	4,681,319	4,682,015		4,682,010	4,680,859	4,681,196
	4,680,813	4,681,322	4,682,025	16 :	4,682,022	4,681,447	4,681,326
	4,680,816	4,681,324	4,682,027		4,682,065	4,682,255	4,681,355
	4,680,821	4,681,329	4,682,039	17 :	4,682,162	4,680,841	4,681,356
	4,680,848	4,681,337	4,682,043		4,682,185	4,680,842	4,681,768
	4,680,853	4,681,354	4,682,053		4,682,187	4,680,896	4,682,157
	4,680,871	4,681,370	4,682,058		4,682,292	4,680,908	4,682,299
	4,680,918	4,681,371	4,682,061		4,682,339	4,680,915	4,680,885
	4,680,923	4,681,378	4,682,070		4,682,363	4,680,916	4,680,948
	4,680,927	4,681,387	4,682,078	10 :	4,681,345	4,680,934	4,681,061
	4,680,931	4,681,407	4,682,091		4,681,443	4,680,947	4,681,177
	4,680,936	4,681,415	4,682,121		4,681,751	4,680,980	4,681,292
	4,680,940	4,681,446	4,682,125		4,681,831	4,681,000	4,681,381
	4,680,956	4,681,449	4,682,143		4,681,834	4,681,040	4,681,603
	4,680,971	4,681,463	4,682,149		4,681,852	4,681,056	4,682,123
	4,680,977	4,681,469	4,682,201		4,681,918	4,681,071	4,682,267
	4,680,993	4,681,472	4,682,246	11 :	4,681,054	4,681,073	4,682,283
	4,681,004	4,681,479	4,682,252		4,682,035	4,681,106	4,682,079
	4,681,010	4,681,494	4,682,257	12 :	Re.32,460	4,681,134	4,681,107
	4,681,013	4,681,497	4,682,276		4,680,886	4,681,208	4,681,125
	4,681,014	4,681,499	4,682,281		4,680,890	4,681,305	4,681,126
	4,681,015	4,681,542	4,682,318		4,680,891	4,681,317	4,681,788
	4,681,016	4,681,545	4,682,336		4,680,911	4,681,335	4,682,141
	4,681,027	4,681,547	4,682,340		4,680,998	4,681,398	4,682,266
	4,681,031	4,681,550	4,682,343		4,681,055	4,681,416	4,680,882
	4,681,038	4,681,552	4,682,344		4,681,088	4,681,444	4,681,158
	4,681,057	4,681,553	4,682,345		4,681,097	4,681,476	4,681,162
	4,681,059	4,681,557	4,682,346		4,681,109	4,681,507	4,681,173
	4,681,084	4,681,560	4,682,352		4,681,132	4,681,570	4,681,217
	4,681,098	4,681,561	4,142,436		4,681,135	4,681,572	4,681,450

24 :	4,681,564 4,680,820 4,680,898 4,680,899 4,681,064 4,681,072 4,681,094 4,681,264 4,681,311 4,681,353 4,681,439 4,681,590 4,681,706 4,681,739 4,681,762 4,681,850 4,681,855 4,681,864 4,682,060 4,682,066 4,682,126 4,682,179 4,680,837 4,680,972 4,681,009 4,681,030 4,681,085 4,681,092 4,681,171 4,681,234 4,681,250 4,681,308 4,681,320 4,681,399 4,681,401 4,681,427 4,681,431 4,681,451 4,681,544 4,681,566 4,681,601 4,681,605 4,681,612 4,681,650 4,681,736 4,681,780 4,681,789 4,681,810 4,681,839 4,681,859 4,681,920 4,681,943 4,681,956 4,681,995 4,682,001 4,682,007 4,682,032 4,682,092 4,682,112 4,682,116 4,682,146 4,682,159 4,682,269 4,682,338 4,682,362 4,203,444 4,680,845 4,680,894 4,680,943 4,680,959 4,681,012 4,681,148 4,681,178 4,681,212 4,681,244 4,681,304 4,681,351 4,681,362	4,681,363 4,681,366 4,681,405 4,681,509 4,681,555 4,681,558 4,681,641 4,681,660 4,681,714 4,681,808 4,681,860 4,681,893 4,681,908 4,681,941 4,681,972 4,681,992 4,682,000 4,682,088 4,680,889 4,681,049 4,681,225 4,681,293 4,681,344 4,681,367 4,681,516 4,681,770 4,681,790 4,681,801 4,681,812 4,681,830 4,681,914 4,682,329 4,681,006 4,681,361 4,681,365 4,680,814 4,681,239 4,681,261 4,681,297 4,681,567 4,681,586 4,682,155 4,680,864 4,680,904 4,681,277 4,681,299 4,682,348 4,681,541 4,682,113 4,681,187 4,681,316 4,681,573 4,681,901 4,682,086 4,680,828 4,680,941 4,680,962 4,681,110 4,681,122 4,681,275 4,681,349 4,681,380 4,681,397 4,681,412 4,681,471 4,681,538 4,681,548 4,681,622 4,681,674 4,681,676 4,681,692 4,681,716 4,681,756 4,681,759 4,681,766 4,681,773 4,681,792 4,681,821	4,681,846 4,681,873 4,681,879 4,681,886 4,681,894 4,681,898 4,681,921 4,681,928 4,681,930 4,681,937 4,681,958 4,681,962 4,681,976 4,681,985 4,682,029 4,682,055 4,682,075 4,682,128 4,682,153 4,682,180 4,682,213 4,682,230 4,682,347 4,682,358 4,682,359 4,680,825 4,681,643 4,681,717 4,680,840 4,680,852 4,680,863 4,680,884 4,680,895 4,680,914 4,680,917 4,680,996 4,681,025 4,681,032 4,681,045 4,681,053 4,681,086 4,681,087 4,681,117 4,681,197 4,681,216 4,681,233 4,681,248 4,681,310 4,681,348 4,681,383 4,681,396 4,681,426 4,681,428 4,681,440 4,681,467 4,681,481 4,681,576 4,681,624 4,681,630 4,681,638 4,681,654 4,681,657 4,681,670 4,681,673 4,681,694 4,681,698 4,681,710 4,681,721 4,681,727 4,681,753 4,681,765 4,681,772 4,681,775 4,681,803 4,681,823 4,681,828 4,681,829 4,681,840	4,681,906 4,681,913 4,681,915 4,681,949 4,681,954 4,681,963 4,681,973 4,682,020 4,682,056 4,682,064 4,682,068 4,682,083 4,682,102 4,682,106 4,682,134 4,682,176 4,682,195 4,682,222 4,682,236 4,682,262 4,682,324 4,682,326 4,682,366 4,681,091 4,681,102 4,681,176 4,681,309 4,681,537 4,681,551 4,681,604 4,681,705 4,681,805 4,681,878 4,681,996 4,682,129 4,682,183 4,681,358 4,680,824 4,680,836 4,680,849 4,680,868 4,680,910 4,681,081 4,681,096 4,681,203 4,681,213 4,681,262 4,681,265 4,681,510 4,681,532 4,681,578 4,681,579 4,681,580 4,681,616 4,681,661 4,681,663 4,681,696 4,681,703 4,681,704 4,681,708 4,681,709 4,681,715 4,681,722 4,681,747 4,681,750 4,681,774 4,681,793 4,681,868 4,681,897 4,681,907 4,681,916 4,681,917 4,681,926 4,681,929 4,681,968 4,682,082 4,682,150 4,682,164	40 :	4,682,325 4,681,165 4,681,169 4,681,266 4,681,675 4,681,758 4,681,854 4,681,866 4,681,869 4,682,064 4,680,907 4,682,083 4,681,186 4,681,360 4,681,414 4,681,496 4,682,304 4,680,869 4,680,903 4,680,905 4,680,957 4,680,978 4,680,995 4,681,091 4,681,102 4,681,289 4,681,295 4,681,296 4,681,303 4,681,314 4,681,382 4,681,402 4,681,511 4,681,534 4,681,577 4,681,600 4,681,625 4,681,629 4,681,658 4,681,691 4,680,700 4,681,728 4,681,731 4,681,737 4,681,763 4,681,779 4,681,802 4,681,807 4,681,811 4,681,814 4,681,815 4,681,867 4,681,899 4,681,911 4,681,924 4,681,940 4,681,964 4,681,986 4,682,021 4,682,046 4,682,168 4,681,571 4,681,042 4,681,060 4,681,723 4,681,597 4,681,128 4,681,224 4,681,332 4,681,598 4,682,234 4,680,930 4,681,037 4,681,101 4,681,140 4,681,145 4,681,159 4,681,160	4,681,161 4,681,163 4,681,164 4,681,166 4,681,167 4,681,168 4,681,193 4,681,195 4,681,219 4,681,220 4,681,245 4,681,325 4,681,466 4,681,490 4,681,546 4,681,609 4,681,653 4,681,655 4,681,666 4,681,743 4,681,804 4,681,957 4,681,965 4,682,084 4,682,145 4,682,154 4,682,181 4,682,223 4,682,224 4,682,225 4,682,235 4,682,238 4,682,302 4,682,308 4,682,369 4,682,370 4,681,318 4,681,782 4,681,221 4,680,831 4,680,860 4,680,879 4,681,124 4,681,257 4,681,372 4,681,539 4,681,581 4,681,738 4,681,818 4,682,328 4,682,330 4,682,367 3,762,220 4,680,909 4,680,938 4,681,112 4,681,285 4,681,286 4,681,395 4,681,512 4,681,602 4,681,870 4,682,272 4,680,851 4,680,887 4,681,678 4,681,033 4,681,144 4,681,215 4,681,270 4,681,520 4,681,981 4,682,103 4,682,288 4,682,310 4,681,410 4,682,156
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## DESIGN PATENTS

01 :	290,917	290,983	290,992	290,999	290,991	42 :	290,940
05 :	290,929	290,995	291,006	291,001	290,939	45 :	290,947
06 :	290,930	291,000	290,923	290,952	290,990	47 :	290,942
	290,906	291,011	290,936	290,948	290,996	48 :	290,900
	290,916	291,019	290,987	291,015	290,905		290,915
	290,921	290,918	290,989	290,965	290,934		290,922
	290,927	290,918	291,007	290,919	290,978		290,975
	290,933	290,960	291,008	290,955	290,980		291,017
	290,935	290,998	290,961	290,976	290,981	49 :	290,964
	290,943	290,950	291,013	290,977	290,982	52 :	290,985
	290,944	290,920	290,907	291,014	290,901	53 :	290,913
	290,951	290,973	290,968	290,908	290,902		290,949
	290,962	291,004	290,970	290,937	290,945		291,002
	290,971	291,010	290,984	290,953	290,956	55 :	291,016
	290,974	290,911					

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OFFICIAL GAZETTE of the  
UNITED STATES PATENT AND TRADEMARK OFFICE  
July 28, 1987                      Volume 1080                      Number 4

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## PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee: . . . . .	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed: . . . . .	520.00
—Corresponding prior U.S. national application filed: . . . . .	350.00
—Supplemental search fee, per additional invention . . . . .	140.00
European Patent Office as Searching Authority . . . . .	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority . . . . .	370.00
—Additional examination fee, per additional invention . . . . .	125.00
—Searching Authority not the USPTO . . . . .	570.00
—Additional examination fee, per additional invention . . . . .	190.00
International fees	
Basic fee: . . . . .	485.00
Basic Supplemental fee (for each page over 30): . . . . .	10.00
Designation fee for the first 10 national or regional offices: . . . . .	120.00
Designation fee for 11th and subsequent designations: . . . . .	No Charge
Handling fee . . . . .	150.00
Supplement to the handling fee . . . . .	150.00

## U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA . . . . .	170.00	340.00
USPTO was neither ISA nor IPEA . . . . .	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4) . . . . .	25.00	50.00
—For each independent claim in excess of 3 . . . . .	17.00	34.00
—For each claim in excess of 20 . . . . .	6.00	12.00
—For each application containing a multiple dependent claim . . . . .	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1 . . . . .	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1 . . . . .	26.00	26.00

DONALD J. QUIGG,  
Assistant Secretary and  
Commissioner of Patents  
and Trademarks.  
June 2, 1987.

## Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 24, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,461,043 through 4,462,114  
Reissue Patents based on the above identified patents.  
No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."  
The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

## 37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . \$ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:  
By a small entity (§1.9(f)) . . . . . \$ 225.00  
By other than a small entity . . . . . \$ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . \$ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:  
By a small entity (§1.9(f)) . . . . . \$ 55.00  
By other than a small entity . . . . . \$ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . \$ 500.00"

Notice of Expiration of Patents  
Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MAY 10, 1987,  
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,382,302	06/249,171	5/10/83
4,382,315	06/193,133	5/10/83
4,382,318	06/218,812	5/10/83
4,382,324	06/217,047	5/10/83
4,382,337	06/336,921	5/10/83
4,382,340	06/282,387	5/10/83
4,382,343	06/226,398	5/10/83
4,382,345	06/269,484	5/10/83
4,382,358	06/302,614	5/10/83
4,382,359	06/229,015	5/10/83
4,382,363	06/270,893	5/10/83
4,382,391	06/268,840	5/10/83
4,382,400	06/223,587	5/10/83
4,382,404	06/276,712	5/10/83
4,382,411	06/230,185	5/10/83
4,382,416	06/235,115	5/10/83
4,382,417	06/227,172	5/10/83
4,382,418	06/278,039	5/10/83
4,382,424	06/325,477	5/10/83
4,382,428	06/271,680	5/10/83
4,382,434	06/271,838	5/10/83
4,382,437	06/279,854	5/10/83
4,382,439	06/265,974	5/10/83
4,382,440	06/244,904	5/10/83
4,382,443	06/265,093	5/10/83
4,382,449	06/278,652	5/10/83
4,382,459	06/291,189	5/10/83
4,382,465	06/324,023	5/10/83
4,382,475	06/265,334	5/10/83
4,382,478	06/278,077	5/10/83
4,382,481	06/230,978	5/10/83
4,382,482	06/263,372	5/10/83
4,382,518	06/231,562	5/10/83
4,382,520	06/218,539	5/10/83
4,382,529	06/216,569	5/10/83
4,382,535	06/216,006	5/10/83
4,382,537	06/287,459	5/10/83
4,382,539	06/271,392	5/10/83
4,382,543	06/275,331	5/10/83
4,382,554	06/303,367	5/10/83
4,382,567	06/227,380	5/10/83
4,382,572	06/226,622	5/10/83
4,382,577	06/270,865	5/10/83
4,382,587	06/246,032	5/10/83
4,382,588	06/251,768	5/10/83
4,382,600	06/254,323	5/10/83
4,382,601	06/235,527	5/10/83
4,382,609	06/321,502	5/10/83
4,382,613	06/219,265	5/10/83
4,382,616	06/263,567	5/10/83
4,382,624	06/216,099	5/10/83
4,382,633	06/237,623	5/10/83
4,382,634	06/275,084	5/10/83
4,382,663	06/257,409	5/10/83
4,382,664	06/297,328	5/10/83
4,382,714	06/241,403	5/10/83
4,382,722	06/230,419	5/10/83
4,382,724	06/259,290	5/10/83
4,382,726	06/262,651	5/10/83
4,382,731	06/302,838	5/10/83
4,382,737	06/240,788	5/10/83
4,382,744	06/246,462	5/10/83
4,382,746	06/265,546	5/10/83
4,382,757	06/249,954	5/10/83
4,382,759	06/269,410	5/10/83
4,382,763	06/290,225	5/10/83
4,382,793	06/329,264	5/10/83
4,382,801	06/330,745	5/10/83
4,382,814	06/286,931	5/10/83
4,382,815	06/287,349	5/10/83
4,382,816	06/287,442	5/10/83
4,382,833	06/296,227	5/10/83
4,382,841	06/316,075	5/10/83
4,382,852	06/326,454	5/10/83
4,382,853	06/326,464	5/10/83
4,382,857	06/325,318	5/10/83
4,382,875	06/364,009	5/10/83
4,382,899	06/329,676	5/10/83
4,382,901	06/404,065	5/10/83
4,382,944	06/307,838	5/10/83
4,382,947	06/319,767	5/10/83
4,382,948	06/361,653	5/10/83
4,382,973	06/308,709	5/10/83
4,382,998	06/271,479	5/10/83
4,383,002	06/297,393	5/10/83
4,383,004	06/255,263	5/10/83
4,383,014	06/361,151	5/10/83
4,383,021	06/347,510	5/10/83
4,383,059	06/304,645	5/10/83

Patent Number	Serial Number	Issue Date
4,383,061	06/277,453	5/10/83
4,383,127	06/283,148	5/10/83
4,383,139	06/239,346	5/10/83
4,383,140	06/218,652	5/10/83
4,383,141	06/310,636	5/10/83
4,383,145	06/284,406	5/10/83
4,383,148	06/223,808	5/10/83
4,383,186	06/349,464	5/10/83
4,383,202	06/219,002	5/10/83
4,383,204	06/242,779	5/10/83
4,383,247	06/277,447	5/10/83
4,383,286	06/367,009	5/10/83
4,383,307	06/259,998	5/10/83
4,383,313	06/238,575	5/10/83

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

**4,527,852**, Re. S.N. 055,088, Filed May 28, 1987, Cl. 339/97P, MULTIGAUGE INSULATION DISPLACEMENT CONNECTOR AND CONTACTS THEREFOR, Helen Dechelette, Owner of Record: *Inventor*, Attorney or Agent: Louis A. Hecht, Ex. Gp.: 322

**4,577,774**, Re. S.N. 056,611, Filed June 1, 1987, Cl. 220/66, BUCKLE RESISTANCE FOR METAL CONTAINER CLOSURES, Tuan A. Nguyen, Owner of Record: *Ball Corp., Muncie, Ind.*, Attorney or Agent: Gilbert E. Alberding, Ex. Gp.: 241

**4,589,704**, Re. S.N. 059,077, Filed June 8, 1987, Cl. 303/6M, AIR BRAKE WITH COLLET LOCKED PUSH ROD AND AIR SUPPLY SYSTEM, John M. Graham, Owner of Record: *Inventor*, Attorney or Agent: Thomas F. Smegal, Jr., et al., Ex. Gp.: 314

**4,590,765**, Re. S.N. 058,261, Filed June 4, 1987, Cl. 60/585, HYDRAULIC CYLINDER MODULAR STRUCTURE, Keith V. Leigh-Monstevens, Owner of Record: *Automotive Products Plc, Leamington Spa., England*, Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 341

**4,610,582**, Re. S.N. 056,784, Filed June 2, 1987, Cl. 409/163, ROLLER HOLD DOWN DEVICE, James R. Amos, et al., Owner of Record: *Stanwich Industries, Inc., Greenwich, Conn.*, Attorney or Agent: James Van Santen, et al., Ex. Gp.: 322

**4,617,303**, Re. S.N. 059,254, Filed June 3, 1987, Cl. 514/238, 7-AMINOZOLO PYRIMIDINES AND FUNGICIDES CONTAINING THESE, Karl Eicken, et al., Owner of Record: *BASF Aktiengesellschaft, Ludwigshafen, Germany*, Attorney or Agent: Herbert B. Keil, et al., Ex. Gp.: 125

**4,617,429**, Re. S.N. 054,877, Filed May 26, 1987, Cl. 381/68.6, HEARING AID, Gaspare Bellafiore, Owner of Record: *Inventor*, Attorney or Agent: Elliott A. Saltier, et al., Ex. Gp.: 261

**4,640,287**, Re. S.N. 055,252, Filed May 29, 1987, Cl. 128/460, RELEASABLE FASTENING MEANS AND METHOD FOR CLOTHING ITEMS, PARTICULARLY CAPS, BRASSIERS, AND NURSING BRASSIERS, Raymond G. Anderson, et al., Owner of Record: *Inventor*, Attorney or Agent: Edmund J. Sease, et al., Ex. Gp.: 247

## REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

## No Publications This Issue.

Patent and Trademark Office  
Board of Patent Appeals and Interferences Vacancies

The Board of Patent Appeals and Interferences will be filling a number of Examiner-in-Chief vacancies over the next several months. Positions are available in chemical, electrical, and mechanical technologies. Persons interested in being considered for these vacancies are invited to submit individual applications for each of the following vacancy announcements:

PTO-87-A6-chemical technology, PTO-87-A7-electrical technology, and PTO-87-A8-mechanical technology. There is no deadline for submitting applications. However, candidates are urged to apply as soon as possible since applications will be accepted only until the positions are filled.

Excerpts from the vacancy announcements describing the duties of the position, qualification requirements, factors to be used in evaluating candidates, and necessary application materials are listed below.

**Duties:** Serves as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office. As an Examiner-in-Chief, participates in the Board's appellate and administrative responsibilities and exercises independent judgment on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner, and may be responsible for conducting interlocutory proceedings in interference and for determining questions of priority of invention and patentability between interference parties. Appeals filed in accordance with 35 USC 134 and interferences declared in accordance with 35 USC 135 involve complex legal and technical questions. The Board of Patent Appeals and Interferences has the sole power to:

- (1) hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents, for reissue of patents, and for reexamination of patents;
- (2) to declare and to conduct proceedings in interferences; and
- (3) to determine priority of invention.

Final decisions of the Board, if unfavorable to an applicant, or to a party to an interference, may be appealed to the United States Court of Appeals for the Federal Circuit or civil action may be taken in accordance with 35 USC 145, or 35 USC 146.

**Qualification requirements:** In addition to a technical degree, candidates must possess:

- (1) A minimum of five years of comprehensive patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office;
- (2) A law degree and membership in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution;

- (3) A high degree of demonstrated competence in chemical, electrical, or mechanical technology;
- (4) A high degree of demonstrated competence and knowledge of interference law and practice;
- (5) Demonstrated ability to determine whether or not tests which are submitted in evidence are technically sufficient to prove the question at hand;
- (6) Demonstrated ability to write clearly, and to write logically developed opinions;
- (7) Demonstrated ability to use legal and technical background to evaluate testimony of witnesses;
- (8) Demonstrated ability to deal effectively with people within and outside the Patent and Trademark Office; and
- (9) Comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

**Factors which will be considered in evaluating qualified candidates:** Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals and questionnaire responses.

Interested candidates should submit the following:

- (1) Personal Qualifications Statement, SF-171;
- (2) Merit Program Interest Statement, CD-261 (PTO employees only);
- (3) Current supervisory appraisal on your agency's form or on CD-362 (letters of reference for outside candidates);
- (4) Annual narrative performance rating, or equivalent;
- (5) Examiner-in-Chief Questionnaires; and
- (6) Samples which evidence your writing ability.

Questions concerning this notice and requests for application materials should be directed to Ms. Suzanne Waddill, Office of Personnel, One Crystal Park, Suite 700, Arlington, Va., telephone (703) 557-3631.

Feb. 3, 1987.  
DONALD W. PETERSON,  
*Deputy Assistant Secretary  
and Deputy Commissioner of  
Patents and Trademarks.*

## Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding

sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Wine Diversions, Ltd., Denver, Colo., Reg. No. 1,214,140, for the mark "THE WINE GAME AND DESIGN", Canc. No. 15,999.

ERMA S. BROWN,  
*Administrator  
of the Trademark Trial  
and Appeal Board.*  
For MARGARET M. LAURENCE,  
*Assistant Commissioner  
for Trademarks.*

## Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

California Network Systems, Milpitas, Calif., Reg. No. 1,377,037, for the mark "COMCARD", Canc. No. 15,949.

Carlos Cruz, dba Love Girl, West New York, N.J., Reg. No. 1,269,569, for the mark "LOVE GIRL", Canc. No. 16,137.

Washmobile Corp. of New Jersey, Union, N.J., Reg. No. 848,991, for the mark "SPARKY AND DESIGN", Canc. No. 15,943.

North Shore Manufacturing Co., Duluth, Minn., Reg. No. 637,768, for the mark "NORTH SHORE", Canc. No. 16,231.

ERMA S. BROWN,  
*Administrator  
of the Trademark Trial  
and Appeal Board.*  
For MARGARET M. LAURENCE,  
*Assistant Commissioner  
for Trademarks.*



## Status of PTO Services

The following is an update of the status of PTO services for June 1987:

Service Item	FY 1987 Goal (Calendar Days*)	Monthly Average (Calendar Days*)
Filing Receipts:		
Patents	22	35
Trademarks	30	49
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	14 Hours
Window Coupons	5	1
Mail Coupons	12	4
Letter Orders	16	11
Certified Copies:		
Trademark Registrations	21	31
Applications-As-Filed	17	15**
File Wrapper/Contents	N/A	33
Walk-up Certification	1	2
Trademark Search Library:		
Filing Pending Marks	21	42
Filing Reg. Certificates	Issue Date	Issue Date
Assignments:		
Patents	20	30
Trademarks	20	30
Receipt Date of Trademark Documents Returned		Apr. 30, 1987***
Receipt Date of Patent Documents Returned		May 28, 1987
Avg. Days from Issue Fee Payment to Issue Date	90-100	92
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	95% on Issue Date	94% on Issue Date
Trademark Copies Available	95% on Issue Date	99% on Issue Date

\* Unless otherwise noted.

\*\* The 5% of orders for which fiche are not on site are not included in calculations.

\*\*\* For efficiency of microfilm processing, trademark assignments are batched by month for recordation. Documents are returned after quality review of the month's batch of microfilm. Also see Improvements to Services.

## IMPROVEMENTS TO SERVICES

Until recently, trademark assignments containing more than 99 properties were pulled from the normal processing pipeline and handled separately. This was being done since the automatic typewriters used to record the information must be reset to accommodate for more than 99 properties. However, this procedure has resulted in delays in recording such assignments, and in their being processed well after other assignments with earlier receipt dates. This backlog is now being addressed and will be processed by the end of July. All trademark assignments, regardless of the number of properties, are now being processed in date order.

## HELPFUL HINTS

- *Correspondence with Certificate of Mailing Delivered by Commercial Carrier* — The benefits of 37 CFR 1.8 or 1.10 apply only to documents delivered to the PTO by the U.S. Postal Service.

A number of instances have been uncovered where individuals are certifying that documents were deposited with the U.S. Postal Service when, in fact, the documents were hand-carried or delivered to the PTO via commercial mail service, e.g., "Federal Express," "DHL," "Purolator," "Air Borne," "UPS," etc. In those instances where documents include a certificate of mailing under 37 CFR 1.8 or 1.10, but were delivered to the PTO by other than the U.S. Postal Service, Mail Room personnel are placing a notice indicating that fact on the correspondence involved to alert PTO personnel that the benefits of 37 CFR 1.8 or 1.10 do not apply.

THERESA A. BRELSFORD,  
Assistant Commissioner  
for Administration.

July 6, 1987.

## PATENT NOTICES

## Certificates of Correction for the Week of July 28, 1987

Re. 32,359	4,626,331	4,646,509	4,656,904
4,111,727	4,626,904	4,646,791	4,656,959
4,348,218	4,627,436	4,646,829	4,657,179
4,382,197	4,627,707	4,647,116	4,657,420
4,434,790	4,628,938	4,647,803	4,657,481
4,451,574	4,628,951	4,648,063	4,657,989
4,501,206	4,631,262	4,648,087	4,658,024
4,543,324	4,631,530	4,648,261	4,658,053
4,553,597	4,632,066	4,649,628	4,658,256
4,565,456	4,632,583	4,650,132	4,658,737
4,565,686	4,632,811	4,650,483	4,659,044
4,578,393	4,632,965	4,650,752	4,659,200
4,592,439	4,633,200	4,651,319	4,659,202
4,593,196	4,633,212	4,651,596	4,659,228
4,596,407	4,633,269	4,651,652	4,659,473
4,598,131	4,633,567	4,651,805	4,659,526
4,598,775	4,633,791	4,651,824	4,659,818
4,602,658	4,635,310	4,651,859	4,659,915
4,606,082	4,636,474	4,652,219	4,660,251
4,606,807	4,639,671	4,652,333	4,660,424
4,610,399	4,639,962	4,652,398	4,661,263
4,613,695	4,640,542	4,652,939	4,661,284
4,615,383	4,641,391	4,653,061	4,661,328
4,615,680	4,642,064	4,653,546	4,661,724
4,616,470	4,642,848	4,653,667	4,662,425
4,616,540	4,643,141	4,653,851	4,662,557
4,619,481	4,643,369	4,654,025	4,662,672
4,622,963	4,643,444	4,654,080	4,662,676
4,623,432	4,644,318	4,654,129	4,662,735
4,623,697	4,646,079	4,654,244	4,663,030
4,624,317	4,646,118	4,654,886	4,664,346
4,624,555	4,646,281	4,655,782	4,664,575
4,624,841	4,646,335	4,655,952	

# Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
	Denver Public Library	(303) 571-2122
Colorado	Newark: University of Delaware Library	(302) 451-2965
Delaware	Washington: Howard University Libraries	(202) 636-5060
Dist. of Columbia	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Florida	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Georgia	Moscow: University of Idaho Library	(208) 885-6235
Idaho	Chicago Public Library	(312) 269-2865
Illinois	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
North Carolina	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
Ohio	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

\*Collection organized by subject matter.

## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 20, 1987

### PATENT EXAMINING GROUPS

Actual Filing Date of Oldest  
New Case Awaiting Action

#### CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-06-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-06-86

#### ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	4-18-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	6-13-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-10-85

#### MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-14-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	9-25-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	1-29-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during June 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,514,784 to 3,518,700, inclusive  
Plant Patents ..... Numbers 2,970 to 2,976 inclusive



## REEXAMINATIONS

JULY 28, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,351,753 (733rd)**  
**LIQUIFIED NORMALLY SOLID POLYOXYALKYLENE BLOCK COPOLYMERS**  
 Thomas M. Kaneko, Trenton, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.  
 Reexamination Request No. 90/001,112, Oct. 6, 1986.  
 Reexamination Certificate for Patent No. 4,351,753, issued Sep. 28, 1982, Ser. No. 200,118, Oct. 24, 1980.  
 Int. Cl.<sup>4</sup> B01F 17/00; C08K 5/05; C07C 43/11; C08L 63/00  
 U.S. Cl. 252-357

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 10-18 is confirmed.

Claim 1 is cancelled.

Claim 2 is determined to be patentable as amended.

Claims 3-9, dependent on an amended claim, are determined to be patentable.

New claims 19 and 20 are added and determined to be patentable.

2. A liquid composition of matter consisting essentially of from about 15 to 90 percent by weight of a normally solid nonionic polyoxyalkylene block copolymer, 15 to 80 percent by weight ethylene glycol and 0 to 30 percent by weight water.

**B1 4,423,244 (734th)**  
**PROCESS FOR THE PREPARATION OF THE D-2-(6-METHOXY-2-NAPHTHYL)-PROPIONIC ACID**  
 Vincenzo Cannata, Borgo Nuovo di Pontecchio Marconi, and Giancarlo Tamerlani, Pontecchio Marconi, both of Italy, assignors to Alfa Chemicals Italiana S.p.A., Milan, Italy  
 Reexamination Request No. 90/001,017, May 30, 1986.  
 Reexamination Certificate for Patent No. 4,423,244, issued Dec. 27, 1983, Ser. No. 362,679, Mar. 29, 1982.  
 Claims priority, application Italy, Apr. 1, 1981, 3385 A/81  
 Int. Cl.<sup>4</sup> C07C 65/105  
 U.S. Cl. 562-466

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

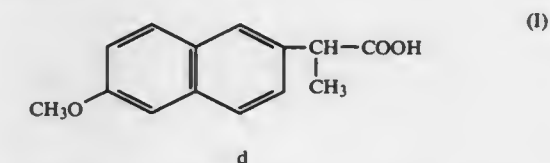
The patentability of claims 11, 12, 13 and 14 is confirmed.

Claim 2 and 4 are cancelled.

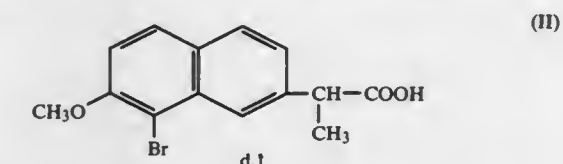
Claim 1 is determined to be patentable as amended.

Claims 3, 5-10 and 13, dependent on an amended claim, are determined to be patentable.

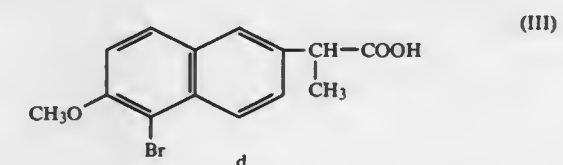
1. A process for preparing the d-2-(6-methoxy-2-naphthyl)-propionic acid of formula I



which consists of (1) reacting a mixture of d- and l-2-(5-bromo-6-methoxy-2-naphthyl)-propionic acids of formula II



with N-methyl-D-glucamine in a solvent system selected from mixtures of toluene and methanol [in various volumetric ratios.] wherein the mixture of toluene and methanol in said step (1) is a 4/1 or 3/1 (v/v) mixture, in the presence of an optically inactive organic or inorganic base, at a temperature between about room temperature and about 65° C., whereby the N-methyl-D-glucamine salts of the d- and l-isomers of said compound of formula II are formed, letting the less soluble N-methyl-D-glucamine salt of the d-isomer precipitate, separating said salt from the reaction mixture, (2) reacting said salt with a strong mineral acid, whereby the compound d-2-(5-bromo-6-methoxy-2-naphthyl)-propionic acid of formula III



is obtained, and (3) catalytically hydrogenating said compound of formula III in an alkaline medium at a temperature between about room temperature and about 100° C. for a period of time varying from 1 to about 4 hours, whereby the bromine atom in the 5-position is replaced by hydrogen and isolating said compound of formula I from the reaction mixture.

# REISSUES

JULY 28, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

## Re. 32,463 METHOD OF AND APPARATUS FOR TELEMETERING INFORMATION FROM A POINT IN A WELL BOREHOLE TO THE EARTH'S SURFACE

John H. Westlake, Calgary; Clifford H. Leach, Penticton, and Clifford L. Alnsworth, Calgary, all of Canada, assignors to Norton Christensen, Inc., Salt Lake City, Utah

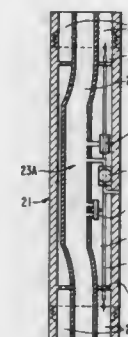
Original No. 4,078,620, dated Mar. 14, 1978, Ser. No. 664,745, Mar. 8, 1976. Application for reissue Nov. 6, 1979, Ser. No. 92,087

Claims priority, application United Kingdom, Mar. 10, 1975, 09787/75

U.S. Cl. 175—48

Int. Cl.<sup>4</sup> E21C 7/06

2 Claims



25. A method of telemetering information from a point in a well borehole to the earth's surface by utilizing a drill string extending into the borehole, and thereby defining a borehole annulus, a drill bit on one end of the drill string having at least one restrictive nozzle therein, a drilling fluid pump connected to the other end of the drill string, an assembly connected in the drill string and having an unobstructed passage therethrough, a bypass passageway in the assembly directly communicating the unobstructed passage to the borehole annulus and a motorized valve in said bypass passageway, the method comprising the steps of continuously pumping drilling fluid under pressure through the drill string, through the unobstructed flow passage and out through the drill bit nozzle, detecting at a point in the borehole the information to be telemetered, translating and transmitting said information into digital signals, using said digital signals in operating said valve to plurally decrease and increase the fluid pressure in the drilling string by plurally opening and closing the valve in the bypass passageway in a coded decimal format thereby venting a portion of the drilling fluid directly into the borehole annulus and bypassing the drill bit nozzle with said portion of fluid while maintaining continuous unobstructed drilling fluid flow through the assembly and continuous flow through the drill bit nozzle, detecting the decreases and increases in the drilling fluid pressure while continuously circulating the drilling fluid and decoding and displaying at the surface the results of the decreases and increases in drilling fluid pump pressure.

26. In a well drilling system which includes a hollow drill string within a borehole thereby defining a borehole annulus, a drill bit on one end of said hollow drill string, at least one drilling fluid restrictive nozzle in said bit, a drilling fluid circulation system including a surface pump and a source of drilling fluid, and conduit means operatively connecting said pump to said source of drilling fluid and to the other end of said hollow drill string; the improvement comprising in combination, a down-hole assembly having means connecting the assembly in the drill string, a continuous unobstructed passage through said assembly in communication with said drill string, a bypass passageway in said assembly directly communicating the unobstructed passage in the assembly

to the borehole annulus and bypassing said drill bit nozzle, a motorized valve in the bypass passageway for controlling fluid flow directly to the associated borehole annulus when the valve is open and to shut off said last mentioned flow when said valve is closed, at least one information responsive transducer operatively connected to said assembly, means in said assembly to translate information received by said transducer into means to plurally open and close said valve in a coded decimal sequence thereby plurally decreasing and increasing the drilling fluid pressure in said sequence, means remote from said assembly to detect said decreases and increases in drilling fluid pressure, means operatively connected to said detecting means to decode said detected decreases and increases in drilling fluid pressure and means at the surface to display the decoded information.

## Re. 32,464 THIN FILM RECORDING AND METHOD OF MAKING

Harry E. Aine, 30600 Page Mill Rd., Los Altos, Calif. 94022

Original No. 4,411,963, dated Oct. 25, 1983, Ser. No. 280,844, Jul. 6, 1981. Continuation of Ser. No. 691,285, Jan. 4, 1985, abandoned, which is a division of Ser. No. 280,844, Jul. 6, 1981, Pat. No. 4,411,963, which is a division of Ser. No. 736,814, Oct. 29, 1976, Pat. No. 4,277,540, which is a continuation-in-part of Ser. No. 139,887, May 3, 1971, Pat. No.

Int. Cl.<sup>4</sup> B21D 39/00

U.S. Cl. 428—622

29 Claims

23. In a method for protecting a magnetic recording disc of the type having a disc-shaped substrate coated with a continuous, non-particulate film of magnetic recording medium, the steps of: exciting a gaseous atmosphere at subatmospheric pressure with an electrical discharge; sputtering carbon within said excited gaseous atmosphere at subatmospheric pressure; and depositing a film of the sputtered carbon onto the coated substrate and tightly adhering the sputtered carbon film to the coated substrate in overlaying relationship with the film of magnetic recording medium to form a tightly adherent wear-resistant carbon film on the coated substrate for causing the magnetic recording disc to be wear-resistant.

## Re. 32,465 AZA PENEM COMPOUNDS

Adriano Afonso, Essex County, and Frank Hon, Bergen County, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

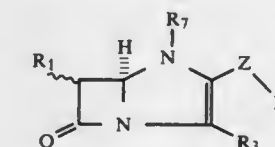
Original No. 4,431,658, dated Feb. 14, 1984, Ser. No. 387,726, Jun. 11, 1982. Division of Ser. No. 230,774, Feb. 2, 1981, Pat. No. 4,347,183. Application for reissue May 29, 1985, Ser. No. 738,702

Int. Cl.<sup>4</sup> C07D 487/04; A61K 31/415

U.S. Cl. 514—210

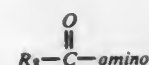
3 Claims

1. A compound having the following structural formula:

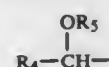


wherein R<sub>1</sub> is [hydrogen;] lower alkyl; [R<sub>8</sub>-C-amino]





wherein  $\text{R}_8$  is lower alkyl, lower alkyl substituted by one or more of one or two ring carbocyclic aromatic groups, lower alkoxy, phenoxy, alkenyl of 2 to 6 carbon atoms, alkynyl of 2-6 carbon atoms, cycloalkyl of 4-6 carbon atoms, unsubstituted or substituted heteroaryl selected from pyridyl, furanyl, thienyl, isoxazolyl, quinoxalyl, isothiazolyl, imidazolyl, indolyl, triazolyl, thiadiazolyl and tetrazolyl or heteroaryl lower alkyl wherein the heteroaryl [contains one or two hetero atoms selected from oxygen, nitrogen or sulfur] group is as defined above and wherein the substituents in the heteroaryl group are from 1 to 3 lower alkyl groups, wherein said  $\text{R}_8$  substituents are optionally substituted by hydroxy, thiol, loweralkylthio, lower alkyl, lower alkoxy, halogen, cyano, carboxy, nitro, amino, aminoloweralkyl or haloloweralkyl; or



wherein  $\text{R}_4$  is hydrogen, lower alkyl, phenyl substituted by lower alkyl, lower alkoxy or halogen, [heteroaryl wherein the heterocyclic ring is an aromatic heterocyclic containing a hetero atom selected from sulfur, oxygen or nitrogen,] pyridyl, furanyl or thienyl, and  $\text{R}_5$  is hydrogen or an O-protecting group;

$\text{R}_2$  is lower alkyl, phenyl substituted by lower alkyl, lower alkoxy or halogen, alkylaryl, aminoloweralkyl, an N-protected amino-lower alkyl, hydroxy lower alkyl, an O-protected hydroxyloweralkyl, thio lower alkyl, an  $\alpha$ -amino acid ester, an  $\alpha$ -(N-protected) amino acid ester or a lower alkyl carboxylic acid ester;

$\text{R}_3$  is nitrile, tetrazole, or  $-\text{COOR}_6$  wherein  $\text{R}_6$  is lower alkyl, loweralkyltrihalogenomethyl, phenyl substituted by lower alkyl, lower alkoxy or halogen, allyl, a metabolisable ester, hydrogen, or an alkali metal cation;

Z is sulfur, oxygen  $[-(\text{CH}_2)_n-]$  wherein n is 1 or 2,] or  $\text{NR}_7$

wherein  $\text{R}_7$  is hydrogen, lower alkyl, phenyl substituted by lower alkyl, lower alkoxy or halogen,



wherein [R8]  $\text{R}_8$  is as defined above, or an N-protecting group; and the pharmaceutically acceptable salts thereof.

Re. 32,466

# HEAT-SENSITIVE COLOR-FORMING RECORDING MATERIAL AND PROCESS FOR PREPARATION THEREOF

Nobuhiro Miyakawa, Esaka, Japan, assignor to Mita Industrial Co Ltd., Osaka, Japan

Original No. 4,459,336, dated Jul. 10, 1984, Ser. No. 506,227, Jun. 23, 1983. Division of Ser. No. 346,772, Feb. 8, 1982, abandoned. Application for reissue Jun. 30, 1986, Ser. No. 880,431

Claims priority, application Japan, Feb. 9, 1981, 56-16820; Feb. 9, 1981, 56-16821

Int. Cl.<sup>4</sup> B41M 5/18

U.S. Cl. 503-208

6 Claims

1. A heat-sensitive color-forming recording material which comprises a recording layer comprising a particulate phenolic color developer and a particulate leuco pigment, which are dispersed in a binder independently from each other, wherein the phenolic color developer and/or leuco pigment is present in the form of compatible solid particles with a substantially inactive organic solid medium selected from the group consisting of sterically hindered phenol compounds, said organic solid medium having a melting or softening point lower than that of the phenolic color developer and/or leuco pigment and said organic solid medium is present in said compatible solid particles in an amount [2 to 250 times as large as] of 0.2 to 250% by weight, based on the amount of the phenolic color developer and/or leuco pigment on the weight base.

## PATENTS

GRANTED JUL. 28, 1987

### ERRATA

For CLASS	See PATENT NO.
053-298 .....	4,682,463
439-092 .....	4,682,828
439-083 .....	4,682,829
439-224 .....	4,682,830
439-294 .....	4,682,831
439-589 .....	4,682,832
439-377 .....	4,682,833
439-267 .....	4,682,834
439-395 .....	4,682,835
439-426 .....	4,682,836
439-344 .....	4,682,837
439-598 .....	4,682,838
439-598 .....	4,682,839
439-874 .....	4,682,840
358-260 .....	4,682,869
380-054 .....	4,682,954
260-513 .....	4,683,100
261-146 .....	4,683,101
523-412 .....	4,683,273
525-329 .....	4,683,286
379-396 .....	4,683,351
328-133 .....	4,683,437
323-288 .....	4,683,438
324-249 .....	4,683,535

# PATENTS

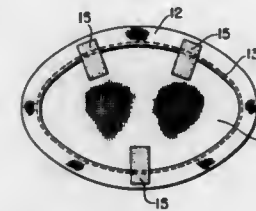
GRANTED JULY 28, 1987

## GENERAL AND MECHANICAL

**4,682,371**  
**PROTECTIVE EYE PATCH**  
 Carolyn R. Heltman, 84 Gallows Hill Rd., West Redding, Conn.  
 06896

Filed Oct. 6, 1986, Ser. No. 916,742  
 Int. Cl.<sup>4</sup> A61F 9/00, 13/12

U.S. Cl. 2—15

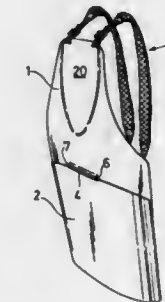


1. An aesthetically and medically improved eye patch of the character shown and described which comprises, an enclosing substantially rigid continuous frame member of lightweight material such as aluminum or plastic, said frame member defining a central opening and having a pair of opposed substantially planar front and back faces and connecting inner and outer edges, fabric-like covering material securely mounted on said frame member and having an inwardly extending portion secured in position on one planar face of said frame member as a sole closing-off means for the central opening, relatively short length adhesive tabs having one adhesive side adapted to be secured in a substantially balanced spaced-apart relation on said covering material to extend substantially diagonally inwardly from the back planar face of said frame along a back face of the covering material, said tabs projecting only inwardly towards the central opening of said frame and having an opposite adhesive side to mount and adhesively secure the patch in alignment with and about surrounding bone structure of a wearer that defines his or her eye socket in such a manner that the frame member will extend in a substantially horizontal shape-conforming relation about the eye socket of the wearer, that the covering material will have and retain a desired relation with respect to the eyelid of the wearer, and that said adhesive tabs will be invisible from the outside of the patch in its mounted relation.

**4,682,372**  
**PROTECTIVE APRON**  
 Lars-Eric Peterson, Roslagsgatan 50-52C, S-113 53 Stockholm, and Jan Söderlind, Smålandsgatan 41, S-186 00 Vallentuna, both of Sweden

Filed Dec. 15, 1986, Ser. No. 942,085  
 Int. Cl.<sup>4</sup> A41B 13/10

U.S. Cl. 2—51



1. A chest, belly and crutch protective apron comprising an

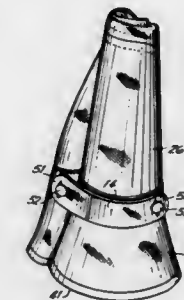
6 Claims

upper and a lower panel consisting of a puncture-resistant material, said panels being curved to conform with the wearer's body, said upper and lower segments being arranged one above the other in a substantially overlapping relationship by hinge means, wherein said hinge means comprises an elongate indentation provided in the upper panel and extending transversely to the longitudinal axis of the apron, lug means which are provided at the upper portion of the lower panel and spaced apart a distance corresponding to the distance between generally flat end walls delimiting the extension of said indentation in said transverse direction and pivot pin means extending through openings provided in said end walls and said lugs, so as to pivotally connect said upper and lower panels to each other, and harness means to support said apron on the wearer.

**4,682,373**  
**COLLAPSIBLE HAT CONSTRUCTION**  
 Abram Baran, 568 Broadway, New York, N.Y. 10013  
 Filed Aug. 23, 1982, Ser. No. 410,606  
 Int. Cl.<sup>4</sup> A42B 1/20

U.S. Cl. 2—175

2 Claims



1. In a collapsible hat including a crown element, a brim element, and a band element interconnecting said crown and brim elements, the improvement comprising: said band element having at least two snap fastener components mounted on an outer surface thereof in spaced relation, an auxiliary strap member having first and second ends, said first end having means for attachment to said outer surface of said band element, said second end having a corresponding snap fastener component selectively engageable with each of said above mentioned snap fastener components, whereby: said hat in erected condition may support said strap in overlying relation relative to the said outer surface of said band element by engagement with one of said snap fastener components on said band element; said hat being collapsed by first folding said crown, band and brim elements to curvilinear planar condition, and subsequently winding the same to furled condition, in which condition said strap element is engaged with the other of said snap fastener components to maintain said furled condition.

**4,682,374**  
**PROTECTIVE EAR COVERING**  
 Joseph Gelser, P.O. Box J, Pocono Lake, Pa. 18347  
 Filed Mar. 5, 1986, Ser. No. 838,479  
 Int. Cl.<sup>4</sup> A41D 21/00

U.S. Cl. 2—209

6 Claims

1. A protective ear covering intended to be worn as a pair in combination with the goggle strap of conventional ski goggles, said ear protector comprising:  
 (a) a case sized to overfit a wearer's ear, said case being generally elliptical in longitudinal cross section and in-



cluding a hollow inner portion to overfit a wearer's ear, said case including a wedge-shaped riser and a flattened top, said top thereby forming generally an inclined plane with said riser to cause said case portion touching the user's head behind the ear to rise to accommodate the ear's outward projection;

(b) a deformable gasket circumscribing said case's inner edge and extending outward therefrom;



- (c) at least one vent extending through said case to provide ventilation and to allow sound to penetrate; and,
- (d) a self-fastening, adjustable attachment strap, said attachment strap sized to at least surround the width of said goggle strap and attached to said case top exterior proximate its midpoint.

4,682,375

## SOFA-BED ASSEMBLY

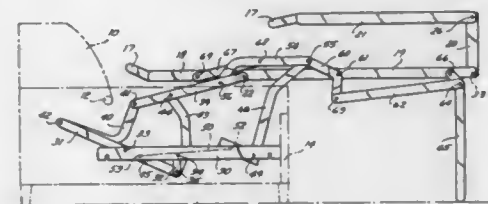
L. Robert Pokorny, Wading River, N.Y., assignor to Louis Pokorny Company, Inc., Ronkonkoma, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,218

Int. Cl.<sup>4</sup> A47C 17/00, 17/04

U.S. Cl. 5—13

6 Claims



1. In a sofa-bed assembly having a stationary bracket with respect to a sofa body and a series of sections pivoted to one another in succession, the sections being foldable between a collapsed sofa condition and an extended bed condition, and the sections including an upper horizontal section having an upper surface defining the seating level of the sofa when the sections are in collapsed condition,
- a supporting linkage pivotally connecting the sections to the bracket for constraining the sections to fold and unfold in accordance with a predetermined pattern of movement, the supporting linkage including:
- a control link pivotally connected directly to one of the sections, and
- two pivot links, each pivot link being directly pivotable about an axis fixed with respect to the stationary bracket and each pivot link being pivotally connected directly to the control link,
- the supporting linkage being located in its entirety below the

plane containing the upper surface of the upper horizontal section when the sections are in their collapsed condition.

4,682,376

## DELIVERY BED

Mats Feldt, Liatorp, Sweden, assignor to Landstingens Inkops-central Llc, Ekonomisk Forening, Solna, Sweden

Division of Ser. No. 786,284, Oct. 10, 1985, Pat. No. 4,615,058.

This application Aug. 6, 1986, Ser. No. 893,684

Claims priority, application Sweden, Oct. 10, 1985, 8500388

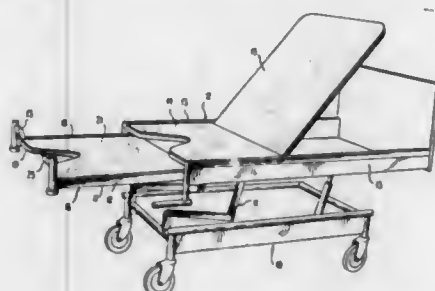
The portion of the term of this patent subsequent to Oct. 7, 2003,

has been disclaimed.

Int. Cl.<sup>4</sup> A61G 7/00

U.S. Cl. 5—60

1 Claim



1. A delivery bed having a raisable and lowerable overlying bed structure and side-pieces for supporting a seat part and a raisable back-rest, and further including a frame structure which can be slidably moved lengthwise of the bed relative to the seat part and which incorporates an elongated plate-like element intended to form a leg-support capable of being extended from an inwardly inserted position to a plurality of extended positions, said frame having mounted thereon a support roller rotatable about a horizontal axis perpendicular to the length of the bed, and means on said frame structure defining a plurality of downwardly opening recesses, said recesses being spaced apart in a direction lengthwise of the bed and being selectively individually engageable over said roller in said plurality of extended positions thereby to support said frame structure in a selected one of said positions against sliding movement lengthwise of said frame, said frame structure being raisable and lowerable relative to said roller to an extent such that when raised, the frame structure can slide lengthwise of the bed with said roller out of engagement with all of said recesses, and when lowered can roll on said roller until said roller enters one of said recesses.

4,682,377

DEVICE FOR TRANSFERRING IMMOBILE PERSONS

Peter S. Reich, Brooklyn, N.Y., assignor to Design Mobility, Inc., Brooklyn, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,256

Int. Cl.<sup>4</sup> A61G 7/08, 7/10

U.S. Cl. 5—86

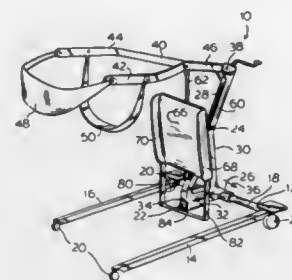
5 Claims

1. A device for lifting and lowering invalid patients and for transferring them from one location to another comprising:
- a base supported on roller means so as to be readily movable from one location to another;
- an upright member mounted on and extending upwardly from said base;
- a lever arm connected at one end adjacent the upper portion of the upright member by means of a horizontal pivot so as to be rotatably shiftable in a vertical plane only and terminating at its outer end in a pair of horizontally spaced end portions, said end portions normally being spaced outwardly from the upright member in a generally horizontal direction;
- means for attaching a sling between the said end portions by

engagement around the back of a patient at a location beneath his armpits;

lifting and lowering mechanism associated with the said upright member;

a drive rod having pivotal connection at its upper end to the lever arm at a point intermediate the length thereof and extending downwardly therefrom into connection with the lifting and lowering mechanism; and



- a knee and leg engaging plate member mounted on the drive rod intermediate the length thereof in facing relation to the end portions of the lever arm
- whereby when a sling attached to said end portions is engaged around the back of a seated patient at a point beneath the level of his armpits and the lifting and lowering mechanism is actuated to lift the patient, the patient is moved above seated position and is held against rotation so that he can be transferred from one location to another.

4,682,378

## BODY SUPPORT, SUCH AS A MATTRESS

Franciscus G. Savenije, Schalkhaar, Netherlands, assignor to Auping b.v., Netherlands

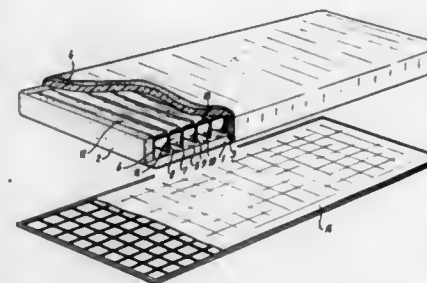
Continuation-in-part of Ser. No. 634,026, Jul. 24, 1984, abandoned. This application Feb. 26, 1985, Ser. No. 705,694

Claims priority, application Netherlands, Aug. 2, 1983, 8302733

Int. Cl.<sup>4</sup> A47C 23/08, 27/00

U.S. Cl. 5—239

18 Claims



1. A body support device having a primary axis parallel to the direction of a center line of a human body which the support device is adapted to support comprising:
- a plurality of interconnected tubular chambers adapted to be filled with a fluid medium arranged parallel to one another and perpendicular to the primary axis; and
- means for controlling deflection of a body in contact with an upper surface of the support device in accordance with the volume-to-weight ratios of the various parts of the human body which the body support device is adapted to support, said deflection-controlling means comprising separate elongated members of varying deflectability located at the upper surfaces of said tubular chambers, each member arranged parallel to the longitudinal axis of the tubular chamber with which it is associated, said elongated members formed from an elastic material, the modu-

lus of elasticity of some of said elongated members differing from that of other elongated members.

4,682,379

## MATTRESS PAD AND FITTED BED SHEET

Jeffrey S. Dugan, Matthews, N.C., assignor to Springs Industries, Inc., Fort Mill, S.C.

Filed Dec. 4, 1985, Ser. No. 805,319

Int. Cl.<sup>4</sup> A47G 9/02

U.S. Cl. 5—500

15 Claims



1. A fitted bed sheet and mattress pad combination comprising:
- a bed sheet with an approximately rectangular top ply for mounting in overlying arrangement over one surface of an approximately rectangular mattress, and foot, head and opposite side skirts extending from the foot, head and opposite side edge portions of said top ply for fitting about the foot, head and side surfaces of the mattress, said skirts each including a lower edge portion,
- a mattress pad in underlying relationship with respect to the top ply of said bed sheet, said mattress pad being of a width approximately the same as the width of the top ply of said bed sheet and of a length longer than the length of the top ply of said bed sheet, the foot and head portions of said mattress pad extending beyond the top ply of said bed sheet into underlying relationship with the foot and head skirts of said bed sheet for fitting about the foot and head surfaces of the mattress, said foot and head portions of said mattress pad each including a lower edge portion substantially aligned with the lower edge portions of the foot and head skirts of said bed sheet, respectively,
- first connecting means extending along each side edge portion of the mattress pad and holding said bed sheet and said mattress pad together along the opposite side edge portions of said mattress pad and along the opposite side edge portions of the top ply of said bed sheet, and
- second connecting means holding the foot and head portions of said mattress pad to the foot and head skirts of said bed sheet respectively along their aligned lower edge portions.

4,682,380

## BOX FOR BEEKEEPING FOR THE CREATION OF A BEE COLONY, CHANGE OF QUEEN FROM A HIVE IN ACTIVITY AND PARTIAL RESTRICTION OF BROOD REARING

Alain Martin, 25 boulevard de l'Europe, 69600 Oullins, France

Filed Jan. 13, 1986, Ser. No. 818,118

Claims priority, application France, Jan. 14, 1985, 85 00616

Int. Cl.<sup>4</sup> A01K 49/00

U.S. Cl. 6—9

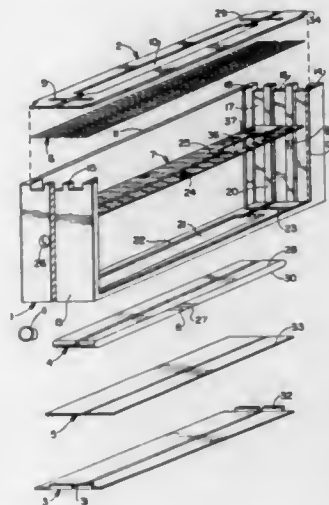
10 Claims

1. A box for beekeeping, for creating a small colony of bees, for changing a queen bee from one hive in activity and for partially restricting brood rearing or laying, wherein said box is a parallelepipedic enclosure adapted to be fitted into a superhive, or into an upper honey chamber, or into a hive body as a substitute for frames normally disposed in said body or said superhive, said box comprising:
- at least four walls;
- a fixed bottom;
- a removable cover, said fixed bottom and removable cover

each comprising an opening whose dimensions are such that they allow at least the passage of the queen and, if necessary, the mixing in less than twelve hours of the bee colony formed or introduced into said box with a second colony;

at least two slots disposed on each side of said opening, said slots being located adjacent or against two opposite walls of said at least four walls and having a length greater than a width of said opening;

a plurality of parallel, vertical frames fitted into said enclosure and being spaced apart from one another and from said fixed bottom by a distance sufficient to permit the bees and the queen to circulate;



at least one entrance on at least one of said at least four walls, said entrance being obturated when the box is placed in position in the hive and said entrance being located opposite the free space between two frames disposed in said box;

netting whose mesh is less than three millimeters, said netting being adapted to be disposed between the cover and a top portion of the frames disposed inside the box and whose dimensions correspond to interior dimensions of said box; and

a removable flap for obturating said opening and said slots in the bottom of said box.

4,682,381

## SPIKE FORMING METHOD

Chalmer Jordan, Saegertown; Lee Connor, and Robert Lybarger, both of Meadville, all of Pa., assignors to Saegertown Manufacturing Corporation, Saegertown, Pa.

Filed Jan. 31, 1986, Ser. No. 824,502

Int. Cl.<sup>4</sup> B21K 1/44; B21G 3/00

U.S. Cl. 10—63

15 Claims

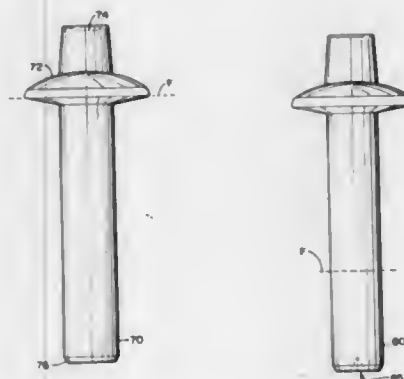
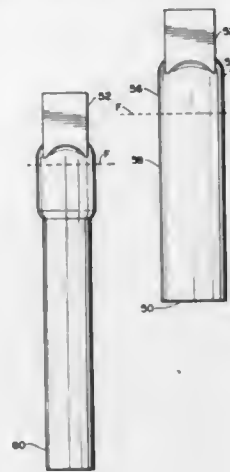
1. A method for forming a cylindrical workpiece having a first diameter into a blank spike which is subsequently provided with threads, said method comprising the steps of:

introducing the workpiece into a first die and forming in said first die a first stage spike having a cylindrical shank and a tool receiving end, said shank having upper and lower portions of said first diameter;

introducing the first stage spike into a second die and forming a second stage spike in said second die by reducing the lower portion of the shank of the first stage spike to a second diameter less than the first diameter of the upper portion of the shank while maintaining said upper shank portion unworked during said second die forming step; and

introducing the second stage spike into a third die and form-

ing a third stage spike in said third die by compressing the upper portion of the shank of the second stage spike to



form a collar between said tool receiving end and said lower portion of said shank.

4,682,382

## WEATHER SEAL FOR A LOADING DOCK PIT

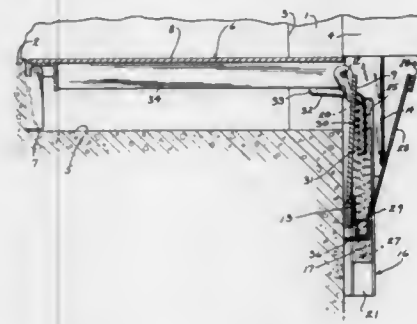
Mark A. Bennett, Milwaukee, Wis., assignor to Kelley Company Inc., Milwaukee, Wis.

Filed Jan. 6, 1986, Ser. No. 816,348

Int. Cl.<sup>4</sup> E01D 1/00

U.S. Cl. 14—71.3

16 Claims



1. A weather seal associated with a dockboard mounted in a pit of a loading dock, said dock having a front vertical face disposed beneath said pit, said dockboard including a ramp having a rear end hinged to said dock and also including a lip hinged to the forward end of said ramp and movable between a downwardly hanging pendant position and an extended

position, said weather seal comprising guide means disposed on the front face of the loading dock, a frame mounted for vertical movement in said guide means, biasing means connected to said frame for biasing the frame to an upper position, a substantially rigid self-supporting panel connected to the frame for flexing movement in a direction toward and away from said dock face and having a portion disposed to be engaged by the bed of a vehicle as the vehicle backs toward the loading dock, and actuating means operably connected to the frame and disposed to be engaged by the dockboard for moving the frame and panel downwardly against the force of said biasing means, said panel providing a seal for the pit.

4,682,383

## COMBINATION JOINT RAKE AND JOINTER

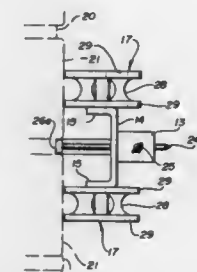
Michael Brenish, 317 Edmund Ave., Paterson, N.J. 07502, and Frank Herzig, 64 Douglas Dr., Towaco, N.J. 07082

Filed Apr. 7, 1986, Ser. No. 848,579

Int. Cl.<sup>4</sup> E04F 21/17

U.S. Cl. 15—105.5

12 Claims



1. A combination joint rake and jointer tool for raking and smoothing mortar in the joints of brickwork, said tool for removing excess mortar and for smoothing the remaining mortar comprising:

an elongated tool body having a medial portion forming a handle therefor;

sled bar means for smoothing mortar attached at both ends of said handle, said sled bar means having curved end portions extending from the handle and a runner portion therebetween; and

a rake and carriage assembly attached at one end of said elongated tool body comprising, in turn:

a rake and carriage support attached to one end of said elongated tool body;

a pair of wheels attached to said support with one of said pair on each side of the support for supporting the tool body and sled bar means during travel across the face of said brickwork;

an adjustable rake attached to and extending from said support being adjustable to a predetermined depth in said joints; and,

attachment means for securing said adjustable rake to said support;

whereby upon application, said tool simultaneously rakes the joint with said adjustable rake and smooths said joint with said runner in a single movement of the tool along the joint between two courses of brick.

4,682,384

## VACUUM GENERATING SYSTEM FOR HAND-HELD VACUUM CLEANER

Joseph M. Pahl and Werner W. Kochte, both of East Cleveland, Ohio, assignors to The Scott & Fetzer Company, Twinsburg, Ohio

Filed Oct. 5, 1983, Ser. No. 539,103

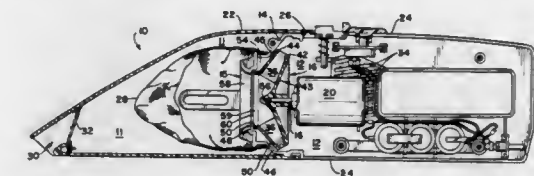
Int. Cl.<sup>4</sup> A47L 5/24

U.S. Cl. 15—344

13 Claims

1. In a hand-held vacuum cleaner, a vacuum generating system comprising fan housing means dividing said cleaner

into a vacuum side and a pressure side, a fan mounted in said fan housing means, the front of said fan communicating with said vacuum side, the rear of said fan communicating with said pressure side, said fan having backwardly curved arcuate blades that extend from an inner imaginary circle at their radially innermost extremities outwardly to an outer imaginary circle at their radially outermost extremities, each blade having an axis or axes of curvature that is or are parallel to the central axis of the fan, said axes of curvature being spaced from their corresponding blades a distance or distances greater than the radial distance between said inner and outer imaginary circles and less than the radius of said outer imaginary circle, each of said blades intersecting at its opposite side edges respectively with (1) a rear shroud that includes an annular sloping wall portion that is relatively shallowly angled rearwardly as it extends radially outwardly from said inner imaginary circle to an outer edge that is radially inward of said outer imaginary circle and (2) a front shroud that includes an annular sloping wall portion that is relatively more sharply angled rearwardly as it extends radially outwardly from a location radially outward of said inner imaginary circle to an outer edge that is



coincident with said outer imaginary circle, annularly continuous portions of said fan housing means being positioned in closely spaced facing relation with corresponding portions of said front shroud including a substantial part of said sloping wall portion to provide slip seal means, the rearward end of said slip seal means being radially outward of its forward end such that it provides a centrifugal pumping action to counteract air leakage around the fan from the pressure side to the vacuum side, central spinner means faired into said annular sloping wall portion of said rear shroud, venturi throat means faired into the radially inner portion of said annular sloping wall portion of said front shroud so as to avoid abrupt angular changes in the surfaces encountered by air flowing into the fan, an upstream portion of the venturi throat means being stationary and separated from rotating structure associated with said fan by a circular gap, said upstream portion and associated rotating structure being of generally the same inside diameter adjacent said gap and smoothly increasing in diameter axially forwardly and axially rearwardly respectively, of said gap, said gap being served by said slip seal means which counteracts the tendency for air to leak from the pressure side of the fan back around the fan and through said gap.

4,682,385

## METHOD AND APPARATUS FOR AUTOMATICALLY SUSPENDING SAUSAGES FROM A BAR

Minoru Kasai, Kanagawa; Takao Oka; Munenori Takamagari, both of Hiroshima; Chiyoji Shibata, Kanagawa, and Minoru Nakamura, Tokyo, all of Japan, assignors to Fukutome Meat Packers, Ltd., Hiroshima and Hitec Co., Ltd., Tokyo, both of, Japan

Filed Oct. 25, 1985, Ser. No. 791,348

Claims priority, application Japan, Oct. 25, 1984, 59-161936[U]; May 30, 1985, 60-117423

Int. Cl.<sup>4</sup> A22C 15/00

U.S. Cl. 17—45

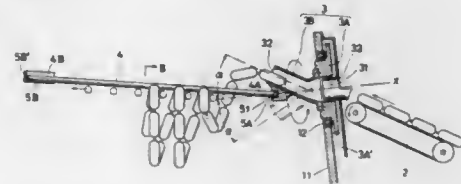
21 Claims

1. A method of suspending a chain of linked sausages in loops from a bar or smoke stick, said bar having a rearward portion and a forward portion comprising the steps of: continuously discharging the chain of linked sausages while forming the chain into loops of sausages at a particular location;



positioning said bar on support members adjacent to said location with said bar being stationary at least in its axial direction from said rearward to said forward portion; suspending said loops of sausages at said rearward portion of said bar, the rearward portion of said bar being situated inside the loops; applying a pushing force to each loop for successively moving each loop suspended from the bar toward the forward portion of the bar while maintaining a spacing between mutually adjacent one's of the loops; and removing said bar from said support members with said loops suspended therefrom after finishing said suspension of sausages.

20. An apparatus for suspending a chain of linked sausages in loops from a bar or smoke stick, said bar having a rearward portion and a forward portion, comprising:



loop forming means for receiving said chain of linked sausages and for forming said chain of sausages into loops, said chain of sausages being suspended by said loop forming means in successive loops from the rearward portion of the bar;

bar supporting means for detachably supporting said bar to be stationary at least in the axial direction from said rearward to said forward portion and having a support portion for supporting said bar with the rearward portion of the bar disposed inside the loops into which said chain of sausages is formed; and

transfer means for successively moving each loop suspended from said bar toward the forward portion of the bar while maintaining a spacing between mutually adjacent ones of said loops.

4,682,386

## POULTRY BREAST FILLETING SYSTEM

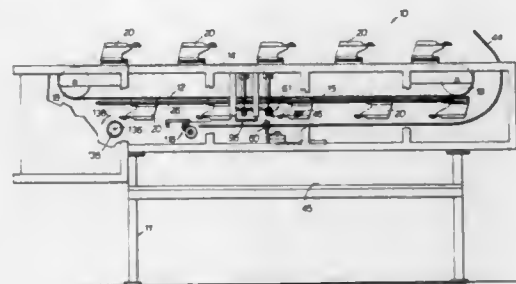
Jacobus E. Hazenbroek; Bastiaan Verrijp, both of Numansdorp, Netherlands, and William L. Wallbridge, Sheffield, England, assignors to Systemate B.V., Numansdorp, Netherlands

Continuation-in-part of Ser. No. 630,658, Jnl. 13, 1984, Pat. No. 4,593,432. This application Jun. 9, 1986, Ser. No. 872,172

Int. Cl.<sup>4</sup> A22C 21/00, 17/04

U.S. Cl. 17-46

6 Claims



1. Filleting apparatus for removing the fillets from previously eviscerated poultry carcasses of which the legs, the wings and the skin have been removed already, said apparatus comprising a frame, a conveyor mounted on and movable about said frame, a plurality of carcass carriers mounted on said conveyor at spaced intervals and movable along a path about said frame, each said carcass carrier including a carcass moulding portion that is sized and shaped to approximately fit

the previously eviscerated body cavity of a poultry carcass so that the body cavity of a poultry carcass can be mounted on and carried along the path by each carcass carrier with the moulding portion maintaining the shape of the body cavity and a pair of protrusions for engaging the wing sockets of the skeletal structure of the carcass to hold the carcass on the carcass carrier, at least one meat removing implement mounted along the path of said carcass carrier formed with a shape that corresponds to the profile of the skeletal structure of the poultry carcasses, whereby when a poultry carcass is carried by a carcass carrier adjacent the meat removing implement the meat of the carcass is separated from the skeletal structure of the carcass.

4,682,387

## APPARATUS AND METHOD FOR STRIPPING CASING FROM SAUSAGES

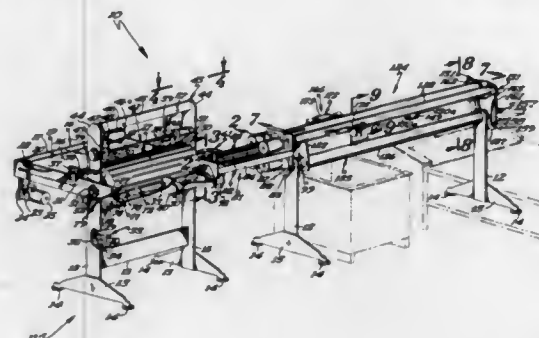
Lyndon R. Leloing, Austin, Minn., assignor to Geo. A. Hormel & Co., Austin, Minn.

Filed Oct. 14, 1986, Ser. No. 918,324

Int. Cl.<sup>4</sup> A22C 11/00, 13/00

U.S. Cl. 17-49

14 Claims



11. A continuous method of mechanically removing the casings from elongate casing-enclosed sausage sticks comprising:

sequentially moving the sausage sticks through a predetermined path of travel, each sausage stick being horizontally disposed during said travel and each sausage stick having a front and rear end, interrupting the travel of the sausage sticks and severing the front end of each sausage stick with a cutting medium, continuing said travel of the sausage sticks in which each sausage stick is moved, front end first, while maintained in a horizontal position, mechanically engaging the front edge portions of the casing of each sausage stick with a casing stripping medium during said travel to restrain the front end of the casing as the sausage stick is moved in said path of travel to thereby peel the casing from the front end of the sausage stick, mechanically gripping the decased front end of the sausage stick with a movable gripping medium and moving the gripping medium and sausage stick in said predetermined path of travel while the casing is restrained by the casing stripping medium to thereby completely peel the casing from the sausage stick, and mechanically ejecting the decased sausage from the gripping medium.

4,682,388

## TEXTILE FLOCK FEED CONTROL SYSTEM AND METHOD

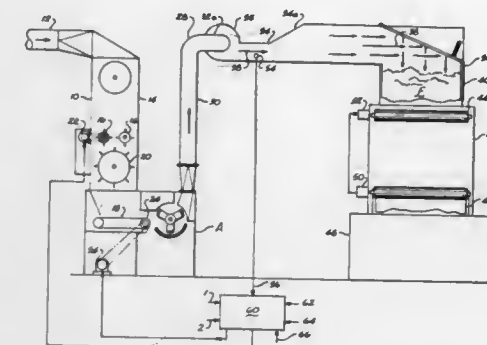
Akiva Pinto, Gastonia, N.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Filed Aug. 22, 1986, Ser. No. 898,985

Int. Cl.<sup>4</sup> D01H 5/38; D01G 15/40

U.S. Cl. 19-105

17 Claims



1. A control system for textile processing apparatus such as carding machines and the like, said system including a textile fiber delivery means for delivering fiber in transport air to an associated textile machine, and controllable fiber input means for introducing fiber into the delivery system at a controlled rate, said control system comprising:

fiber sensing means for sensing a function of fiber quantity conditions in said fiber delivery means generating a fiber quantity signal proportional to said fiber quantity conditions;

control means receiving said fiber quantity signal and generating a control signal for controlling said fiber input means to vary the rate of fiber introduction into said fiber delivery means in a predetermined ratio to said fiber quantity conditions;

said control means generating a step control signal which oscillates stepwise generally between a first fiber input rate and a second fiber input rate in response to first deviations of said fiber quantity conditions of a first magnitude; and

said control means generating a control signal which includes an integrated ramp signal having a different fiber input rate than said first and second fiber input rates in response to second deviations in said fiber quantity conditions of a second magnitude greater in magnitude than said first deviations in a manner that changes in said fiber quantity conditions requiring a nontransitory change in fiber input rate are automatically adjusted to without over-reaction to transitory or minor deviations.

4,682,389

## GARMENT CONNECTOR

Robert J. Callender, 7420 Hidden Valley Pl., Roseville, Calif. 95678

Filed Nov. 17, 1986, Ser. No. 931,107

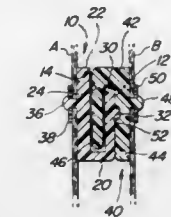
Int. Cl.<sup>4</sup> A44B 13/00

U.S. Cl. 24-599

2 Claims

1. A garment connector comprising a first block-like element having a top, a bottom, opposite sides and front and rear walls and including a cavity opening at the top and extending downwardly between the sides and walls, a second block-like element of inverted U-shaped configuration having a top bight and a pair of legs depending from the bight, one of the legs providing a back wall and the other leg providing a tongue downwardly insertable into and upwardly removable from the cavity in the first element, the tongue being spaced forwardly from the back wall a distance on the order of the thickness of the first element front wall and the tongue being further shaped

and dimensioned so as to relatively tightly fit the cavity, detent means yieldingly resisting upward separation of the second element from the first element, including cooperation engageable and disengageable portions respectively on the front wall of the first element and on the back wall of the second element, one detent portion comprising a rib integral with one element



and extending crosswise as respects the line of tongue insertion and removal and the other detent portion being a groove formed in the other element and configured to receive the rib when the detent portions are engaged, and first and second means respectively on the elements for attachment of the respective elements to separate garments.

4,682,390

## BUCKLE AND BODY RESTRAINT SYSTEM FOR A VEHICLE

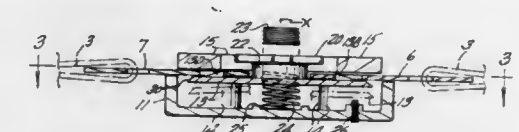
Stanley G. Parrish, 10022 SW. Terwilliger Blvd., Portland, Oreg. 97219

Continuation-in-part of Ser. No. 736,449, May 21, 1985, abandoned. This application Feb. 18, 1986, Ser. No. 830,361

Int. Cl.<sup>4</sup> A44B 11/26

U.S. Cl. 24-632

6 Claims



1. A buckle within which strap end fittings are releasably secured, said buckle comprising,

a housing including a cover plate, said housing having interior walls defining a cavity of cruciform shape closed by said cover plate, said housing defining openings into which said strap end fittings are inserted, said cover plate having a central opening, and

latch means in said cavity and including a latch plate with multiple wings each wing having a detent thereon, a resilient member centrally disposed within said cavity and biasing said latch plate to a latching position whereat the strap end fittings are engaged and retained by said detents, a control member on said latch plate having an upright axis and multiple extremities located in a recessed manner within said central opening of the cover plate, said central opening of a size permitting inclination of the control member relative its axis and axial displacement of the control member along its axis to disengage one or more detent from their respective strap end fittings, said latch plate supported in a rockable and in a slidable manner in said cavity by said resilient member with said interior housing walls confining the plate wings against lateral displacement whereby upon motion being imparted to the latch plate in an asymmetrical manner by fingertip pressure on one of said extremities one detent is disengaged from a strap end fitting or alternatively upon axial displacement of the latch plate by fingertip pressure at the center of said control member all detents are simultaneously released from fitting engagement.

4,682,391

## CABLE HARNESS ASSEMBLY APPARATUS

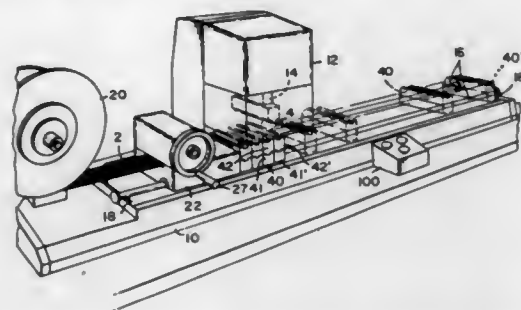
Leslie C. Hall, Jr., Camp Hill; David L. Meyer, and Brian A. Wolfe, both of Jonestown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 21, 1985, Ser. No. 768,078

Int. Cl.<sup>4</sup> H01R 43/04

U.S. Cl. 29—33 M

21 Claims



1. Cable harness assembly apparatus for applying a plurality of connectors having insulation displacing terminals to a ribbon cable, said apparatus being of the type comprising a workstation with a press having a termination ram and a plurality of connector receiving fixtures including a lead fixture which receives the connector to which the cable is first terminated, said apparatus further comprising:

rail means through said workstation and fixed relative thereto, said fixtures being independently journaled to said rail means for movement through said workstation from an upstream to a downstream side thereof, first stop means at said workstation, said first stop means being effective to stop said fixtures at said workstation sequentially as said fixtures are moved therethrough, means for moving said lead fixture downstream, second stop means for stopping said lead fixture at predetermined intervals as it is moved downstream, whereby, upon aligning a ribbon cable with the connectors in the fixtures, terminating said cable to a connector in the lead fixture, temporarily releasing said first stop means, and moving said lead fixture downstream, said lead fixture will draw said cable through the workstation until the lead fixture is stopped.

4,682,392

## ANVIL INSERT FOR FASTENER MACHINE

William G. Revere, Jr., Atlanta, Ga., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Sep. 23, 1985, Ser. No. 779,371

Int. Cl.<sup>4</sup> B23B 11/00

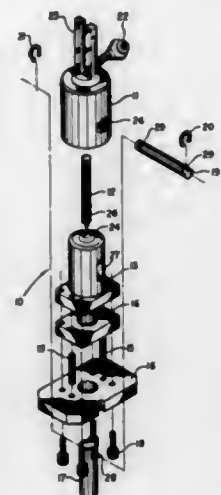
U.S. Cl. 29—34 B

6 Claims

1. In an apparatus for drilling, countersinking, inserting and forming the head of a rivet in a workpiece, said apparatus comprising an upper ram assembly for holding a workpiece, drilling and countersinking holes in said workpiece and inserting rivets therein for head formation and a lower anvil assembly for holding the workpiece and forming the head on a rivet inserted in said hole by said upper ram assembly, the cooperative function of said upper ram assembly and said lower ram assembly requiring that the drilling, countersinking, inserting and head forming functions be performed along a common longitudinal axis, the improvement comprising:

- a base for holding a lower anvil body in a fixed relationship with said upper ram assembly;
- anvil insert means having a longitudinal axis that is common with the longitudinal axis of the upper ram assembly so that drilling, countersinking, inserting and head formation functions of said apparatus are performed along said longitudinal axis; and
- a lower anvil body mounted on said base and adapted to receive an anvil insert means and hold said anvil insert

means in a fixed relationship with said upper ram assembly, said lower anvil body comprising a substantially cylindrical body having an inner bore adapted to receive



4,682,393

## SUPPORT ROLLER

Gregory O. C. Corkery, High Ridge, Mo., assignor to Arundale, Inc., St. Louis, Mo.

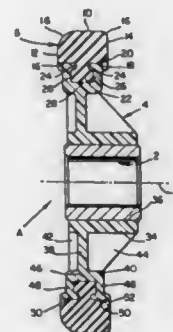
Division of Ser. No. 616,913, Jun. 4, 1984, Pat. No. 4,567,633.

This application Nov. 25, 1985, Ser. No. 801,467

Int. Cl.<sup>4</sup> B21B 31/00

U.S. Cl. 29—130

13 Claims



1. A support roller comprising: a hub formed in a molding operation from a plastic polymer which shrinks upon cooling from a plastic condition in which it is molded to the solid condition in which it exists in the hub, the hub having a rim provided with side faces and radially outwardly presented friction surfaces that extend generally axially with respect to the axis of rotation, one of the friction surfaces for the hub rim being located between two of the other friction surfaces and being smaller in diameter than the other two friction surfaces, whereby the tire projects radially inwardly past the other two friction surfaces in the form of a root which prevents the tire from being displaced laterally off of the rim, the other two friction surfaces being generally adjacent to respective side faces of the rim; and a tire formed from an elastomeric material and circumferentially surrounding the hub at its rim, the tire having side faces which have substantial flat areas that are

parallel and flush with the side faces of the hub rim where the tire surrounds the rim, so that the flat areas of the side faces for the tire form radially outwardly directed continuations of the side faces on the rim without surface interruption, and a plurality of radially inwardly presented contact surfaces which are against the outwardly presented friction surfaces of the hub rim, the tire being under tension in the circumferential direction and having its inwardly presented contact surfaces bearing snugly against the outwardly presented friction surfaces of the hub rim, the tension in the tire existing by virtue of the tire having served as a portion of a mold cavity in which the hub is molded and having been expanded under an outwardly directed force applied by the plastic polymer during the molding of the hub.

4,682,394

## BEDDING AND SEATING PRODUCT HAVING DOUBLE TWIST COIL SPRING AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

Thomas J. Wells, Carthage, Mo., and Angelo Serafini, East Boston, Mass., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

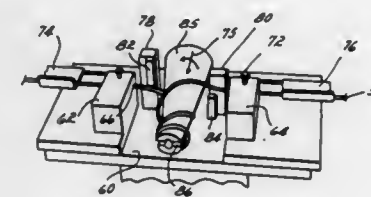
Division of Ser. No. 769,947, Aug. 27, 1985, Pat. No. 4,639,957.

This application Sep. 15, 1986, Ser. No. 907,675

Int. Cl.<sup>4</sup> B21F 35/02

U.S. Cl. 29—173

7 Claims



1. A method of manufacturing a double twist coil spring for use in a bedding or furniture product, which method comprises,

inserting the middle section of a straight length of wire into a rotatable mandrel such that the end sections of the wire extend outwardly from opposite sides of the mandrel, restraining said end sections of said wire against rotation while rotating said mandrel and said middle section of said wire and while effecting axial movement of said middle section relative to said end sections so as to progressively wrap said end sections about said mandrel and create a coil spring having a diametrically extending middle section and a pair of end sections coiled in the same rotational direction from opposite ends of said middle section, and increasing the velocity of said axial movement of said mandrel relative to the velocity of said rotational movement over a major portion of the length of said axial movement so as to create a helical double twist coil spring of increasing pitch over a major portion of the length of said coil.

4,682,395

## DEVICE FOR PUSHING WHEEL FLANGE HUBS AND SPLINED FLANGE HUBS OF MOTOR VEHICLES OUT OF A SHAFT BEARING

Horst Klann, Terra Wohnpark 12, 7730 Villingen-Schwenningen 24, BRD, Fed. Rep. of Germany

Filed Aug. 1, 1986, Ser. No. 892,483

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530726

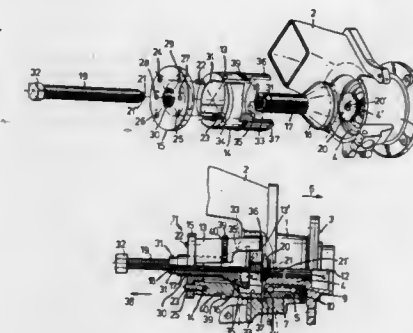
Int. Cl.<sup>4</sup> B23P 19/04, 19/00

U.S. Cl. 29—261

6 Claims

1. A device for pushing wheel flange hubs and splined flange hubs of motor vehicles out of a shaft bearing which is press-fitted in a bearing cylinder and which has a bearing cylinder with at least one bearing face having an annular groove for the

accommodation of a snap ring, comprising a pressure transmitting part, a threaded spindle supported by the bearing cylinder and disposed on said bearing cylinder, a supporting member resembling an annular disc having a threaded tap hole, two spreader sectors comprising approximately cylindrical cup-like parts arranged diametrically opposite to each other having their one ends anchored so that it can swivel and be on said supporting member and be radially adjustable, said spreader sectors being further provided at their out surface of end portions which extend away from said supporting member with anchoring projections which are insertable in a form closing fashion in the annular groove of said bearing cylinder, said



spreader sectors being spreadable apart, the spindle having an exterior which is threaded and a bore which is threaded and opened at one end supported on the bearing cylinder having one end adjacent the bearing cylinder with a spreading cone, said spreader sectors being disposed around said spindle and being spreadable by said spreading cone which is located between said bearing cylinder and said spreader sectors, said spindle being threaded into the tapped threaded hole of said supporting member and having an end disposed away from the bearing cylinder which has a wrench engagement head, and a pressure screw having one end which has a pressure transmitting part engaged into the threaded interior bore of said spindle having an outer end with a wrench engagement head.

4,682,396

## CENTERING/POSITIONING APPARATUS FOR WAFER AND VACUUM CHUCK

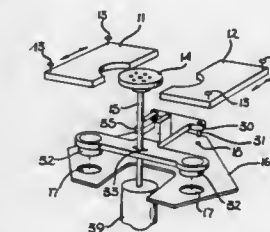
Mark Leonov, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 730,374, May 3, 1985, Pat. No. 4,659,094. This application Jun. 9, 1986, Ser. No. 872,022

Int. Cl.<sup>4</sup> G01B 3/30

U.S. Cl. 29—271

4 Claims



1. A device for defining a desired location for a shaft/motor assembly located in a housing having a plurality of fixed openings comprising:

- a rigid member having a first and second end;
- a first cross member orthogonally disposed on said first end; said first cross member having a pair of first projections thereon, said first projections demountably engaging a first pair of fixed openings in said housing;
- a second cross member orthogonally disposed on said sec-



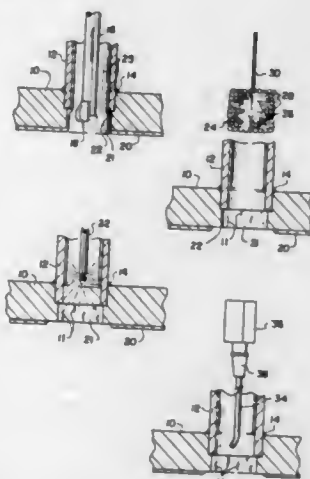
ond end; said second cross member having a pair of second projections thereon; said second projections demountably engaging a second pair of fixed openings in said housing;  
said second cross member defining a first aperture there-through for retaining said shaft of said shaft/motor assembly, said first aperture coincident with said desired location when said projections engage said fixed openings; whereby said shaft/motor assembly may be easily placed at said desired location.

4,682,397

# HIGH TEMPERATURE PRESSURE VESSEL INSPECTION PROCEDURE

George H. Harth, III, Wadsworth; Gregory P. Zolton, II, Fairlawn, and Robert L. Copen, Norton, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.  
Filed Feb. 28, 1986, Ser. No. 834,720  
Int. Cl.<sup>4</sup> B23Q 17/00; B21C 43/00  
U.S. Cl. 29—407

8 Claims



1. A method for inspecting a tube header bore in a tube header, which has a scale layer deposited thereon, comprising: rotating a first honing brush having flexible bristles with hard abrasive tips of a coarse grit in said header bore to remove said scale layer and to expose a clean surface inside said bore;  
visually inspecting said clean surface of said bore;  
applying a dye to said clean surface of said bore for highlighting any surface defects in said clean surface;  
etching at least one line into said scale layer prior to rotating said first honing brush in said bore;  
rotating a second honing brush having flexible bristles with hard abrasive tips of a relatively finer grit in said header bore after honing with said first brush, said tube header comprising a tube extending partly into said header bore and leaving an exposed portion of said header bore, the inner diameter of said tube being less than that of said exposed portion of said bore, said honing brushes being inserted through said tube for engaging said exposed portion of said bore; and,  
cutting off a portion of said tube at a location spaced from said header.

4,682,398

# METHOD FOR REMOVING FORD IGNITION PIN TYPE CYLINDERS

Frank Markisello, 91-10 Liberty Ave., Ozone Park, N.Y. 11417  
Filed Jun. 23, 1986, Ser. No. 877,189  
Int. Cl.<sup>4</sup> B23P 19/02, 19/00; E05B 15/16; B23B 39/00  
U.S. Cl. 29—426.4

1 Claim



1. A method of removing an ignition lock cylinder having a hard disc, from Ford motor vehicles made between 1976 to present, which comprises:

- remove wing nut from said ignition lock,
- removing two detent pins from face of ignition cylinder,
- placing the guide pin portions of the guide tool into said ignition lock cylinder, having two detent holes in face of cylinder,
- insert cutter into the guide hole in block, drilling until stop on the cutter comes into contact with the guide block,
- remove said cutter from guide hole in guide block,
- remove said pin portion of said guide block, from said pin holes of said ignition lock cylinder,
- removing said hard steel disc from said ignition lock cylinder,
- insert shim into shear line of said ignition lock cylinder, while raking pins through the key way,
- when said shim is shimmed into the cylinder up to the stop of the shim, turn cylinder core to the on position and push the cylinder locking pin in,
- slide the cylinder out and install new cylinder.

4,682,399

# METHOD AND TOOL FOR REMOVING THE NUT WHICH SECURES A FAUCET TO A SINK

Glenn A. Heimbach, 287 E. 7th St., Bloomsburg, Pa. 17815  
Filed Jan. 21, 1986, Ser. No. 820,103  
Int. Cl.<sup>4</sup> B23P 19/02

U.S. Cl. 29—426.4

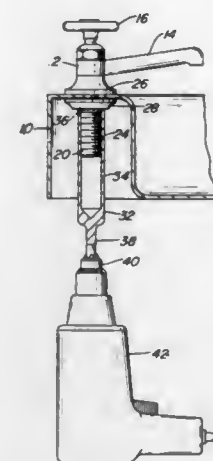
1 Claim

1. A method of removing the nut which is in threaded engagement with the exterior threads on the inlet end of a faucet, which is located on the underside of a sink and which secures the faucet to the sink comprising:

- providing a one piece tool having at one end a hollow cylindrical portion having a substantially constant cross section with a wall section of about 1/16 of an inch terminating in cutting teeth and at the other end a reduced solid portion, said hollow cylindrical portion having an inside diameter slightly larger than the outside diameter of said exterior threads on said inlet end of said faucet and also having a length longer than the length of said exterior

threads on said inlet end of said faucet, passing without threaded engagement said hollow cylindrical portion over said exterior threads.

- placing said reduced solid portion of said tool within the holding chuck of a power drill and closing said chuck to secure said tool to said chuck,



- positioning said tool such that said inlet end of said faucet is within said hollow cylindrical portion of said tool, and
- circularly cutting said nut about a circle adjacent the outside diameter of said exterior threads of said inlet end of said faucet to free said nut from said inlet end of said faucet by forcing said cutting teeth of said tool against said nut while rotating said tool by means of said power drill.

4,682,400

# TERMINATING APPARATUS

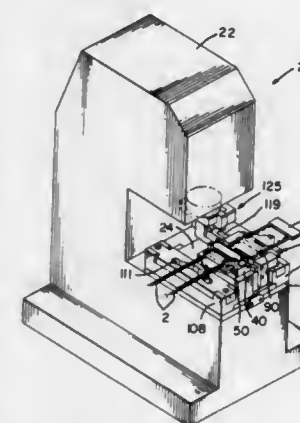
Daniel T. Casey, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 4, 1985, Ser. No. 795,036

Int. Cl.<sup>4</sup> H01R 43/04

U.S. Cl. 29—564.7

11 Claims



1. Apparatus for mass terminating conductors to an electrical connector of the type comprising a housing preloaded with a plurality of terminals connected to a carrier strip, each terminal having a conductor receiving portion exposed from the housing, comprising:

- a press having a ram and an upper tooling package aligned above a termination station, said upper tooling package being vertically movable by means of the ram towards and away from the terminating station,
- a lower tooling package movable to and from said termination station, said lower package comprising housing support means, anvil means which support the exposed con-

ductor receiving portions of the terminal, a shear cooperable with said anvil means to shear said carrier strip on descent of said ram, and terminal loading means above said shear, said terminal loading means being vertically aligned with said terminals by descent of said upper tooling package, and

means for advancing said terminal loading means toward said housing support means to load said terminals into said housing during movement of said lower tooling package from said termination station.

4,682,401

# MULTIPLE PROCESSING MACHINE

Hirata Tadashi, Yamato; Satou Yoshirou, Atsugi, and Tsutsui Yoshimitsu, Hatano, all of Japan, assignors to Amada Company, Limited, Japan

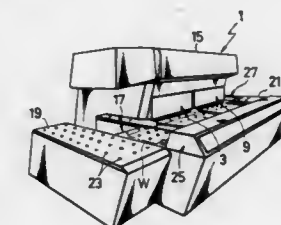
Filed May 15, 1984, Ser. No. 610,478

Claims priority, application Japan, May 19, 1983, 58-086634

Int. Cl.<sup>4</sup> B23G 3/155

U.S. Cl. 29—568

9 Claims



1. A multiple processing machine for performing a variety of punching and forming operations on sheet-like workpieces comprising:

- a frame including first, second and third vertically disposed support plates;
- first ram-operated means for punching a sheet-like workpiece;
- a first eccentric shaft mounted between said first and second support plates for driving said punching means;
- second ram-operated means positioned adjacent said first ram-operated means for impact forming the sheet-like workpiece;
- a second eccentric shaft mounted between said second and third support plates for driving said impact forming means;
- a first carriage provided on said frame for moving the sheet-like workpiece toward and away from said punching means and said impact forming means; and
- a second carriage mounted on said first carriage and movable generally perpendicular thereto for positioning the sheet-like workpiece relative to said punching means and said impact forming means;
- a bolster provided on said frame beneath said second ram-operated means for support of a lower forming tool;
- a plurality of lower tool rollers supported by said bolster;
- means for moving said lower tool rollers with respect to said bolster between a raised position to contact and support said lower tool and a lowered position in which said lower tool is supported by said bolster;
- a tool changing apparatus provided on said frame adjacent said second ram-operated means for support of a lower forming tool, said tool changing apparatus having means for storing said lower tool; and
- means provided on said frame for exchanging said lower tool between said bolster and said tool changing apparatus.

4,682,402

# **SEMICONDUCTOR DEVICE COMPRISING POLYCRYSTALLINE SILICON RESISTOR ELEMENT** Yasutaka Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

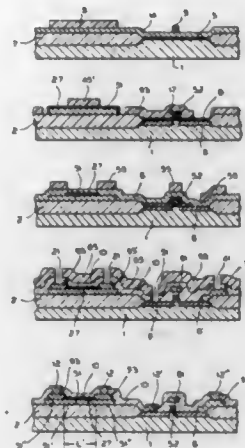
Filed May 15, 1984, Ser. No. 610,827

Claims priority, application Japan, May 16, 1983, 58-85280

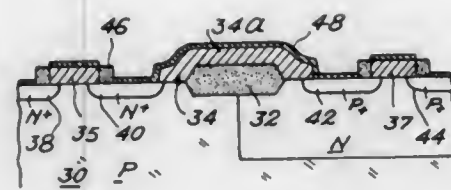
Int. Cl.<sup>4</sup> H01L 21/441, 29/04

U.S. Cl. 29—571

3 Claims



E. forming insulating strips on sides of the gates adjacent to the substrate; and



F. depositing a second conductive coating on the entire device except the insulating strips thereby to form interconnections at said interconnection areas.

1. A method of manufacturing a semiconductor device having a polycrystalline silicon resistor element, said method comprising the steps of forming a first insulating film on a semiconductor substrate, forming a first conductive layer made of a first polycrystalline silicon pattern on said first insulating film for providing said resistor element, forming an island-like pattern of a second polycrystalline silicon layer on a first portion of said first polycrystalline silicon pattern, forming a second insulating film over said first and second polycrystalline silicon layers, opening an aperture in said second insulating film by a reactive ion etching step to expose a part of said island-like pattern of said second polycrystalline silicon layer, forming a wiring layer in contact with the upper surface of said island-like pattern, through said aperture and controlling the resistance of said first conductive layer by reducing the thickness of a portion of said first polycrystalline silicon pattern adjacent to said first portion after forming said first polycrystalline silicon pattern on said first insulating film.

4,682,403

# **METHOD FOR INTERCONNECTING THE ACTIVE ZONES AND GATES OF CMOS INTEGRATED CIRCUITS** Joël Hartmann, Claix, and Pierre Jeuch, Seyssins, both of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Filed Mar. 25, 1985, Ser. No. 715,512

Claims priority, application France, Mar. 30, 1984, 84 05052

Int. Cl.<sup>4</sup> H01L 21/90, 21/441, 21/443, 29/62

U.S. Cl. 29—571

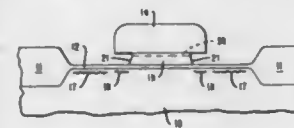
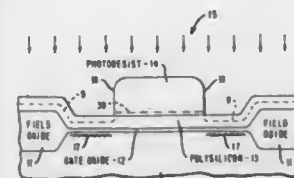
7 Claims

1. A method for interconnecting active zones of a CMOS device formed in a semiconductor substrate, comprising successively the following:

- depositing a first conductive coating on the entire surface of the substrate;
- forming on the first conductive coating a mask pattern defining the locations of the interconnection areas and the locations of gates of the CMOS device, and etching the remaining conductive coating;
- forming said active zones by doping the substrate;
- removing the mask pattern;

1. In a process for forming a MOS integrated circuit on a substrate having device active regions, the sequence comprising:

- forming a silicon layer which is approximately 150–200 nanometers thick over the device active regions;
- forming a mask over the silicon defining first edge boundaries of first source and drain regions;
- subjecting the structure to a relatively high energy implant dose for penetrating the silicon layer to form one of an n<sup>+</sup>



4,682,404

# **MOSFET PROCESS USING IMPLANTATION THROUGH SILICON**

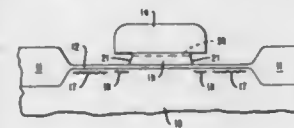
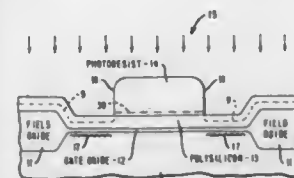
Gayle W. Miller, Colorado Springs, Colo.; Nicholas J. Szluk, Albuquerque, N. Mex.; George Maheras, and Werner A. Metz, Jr., both of Fort Collins, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 23, 1986, Ser. No. 922,221

Int. Cl.<sup>4</sup> H01L 21/00

U.S. Cl. 29—571

6 Claims



or a p<sup>+</sup> implant in the surface-adjacent substrate region of the first source and drain region at the first edge boundary; etching the silicon layer in the presence of the mask to pattern the silicon to a gate electrode of selected lateral dimensions recessed a predetermined dimension beneath the first edge boundaries of the mask; removing the mask; subjecting the structure to a relatively low energy implant of the same conductivity type as the high energy implant to form lightly doped regions self-aligned with the first source and drain regions and the gate electrode; and applying a thermal cycle to activate the implanted species and drive-in the implanted species.

having a greater dopant concentration than the dopant concentration of said first region; etching a groove in said semiconductor material, said groove extending through said second region, said groove having a flat bottom; forming a third region of a second conductivity type opposite said first conductivity type within said first region but surrounding said second region, said third region extending below the bottom of said groove, at least part of said third region being formed to extend below the bottom of said groove after said step of etching said groove; and depositing a layer of electrically conductive material in said groove, said electrically conductive material forming an electrical contact with said second and third region in said groove.

4,682,406

Patent Not Issued For This Number

4,682,405

# **METHODS FOR FORMING LATERAL AND VERTICAL DMOS TRANSISTORS**

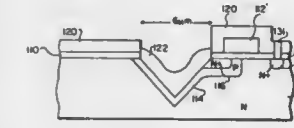
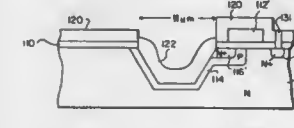
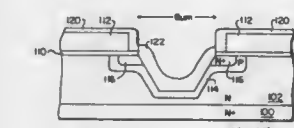
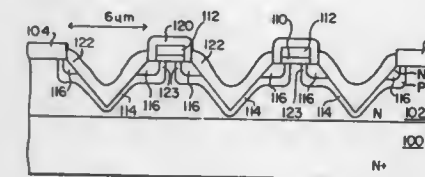
Richard A. Blanchard, Los Altos, and James D. Plummer, Mt. View, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Filed Jul. 22, 1985, Ser. No. 757,582

Int. Cl.<sup>4</sup> H01L 21/425, 21/465

U.S. Cl. 29—571

12 Claims



1. A method for forming a transistor comprising the steps of: forming a gate on a first region of semiconductor material, said first region having a first conductivity type; forming a second region having said first conductivity type within said semiconductor material, said second region

4,682,407

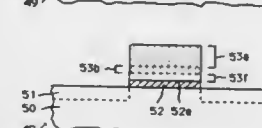
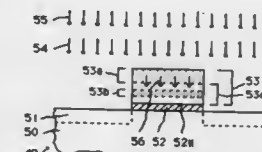
# **MEANS AND METHOD FOR STABILIZING POLYCRYSTALLINE SEMICONDUCTOR LAYERS** Syd R. Wilson; Richard B. Gregory, both of Phoenix, and Charles J. Varker, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 21, 1986, Ser. No. 821,095

Int. Cl.<sup>4</sup> H01L 29/04, 21/425, 21/265

U.S. Cl. 29—576 B

25 Claims



1. A method for controlling dopant migration in polycrystalline semiconductor layers, comprising:

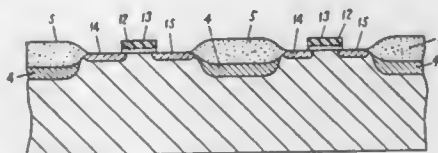
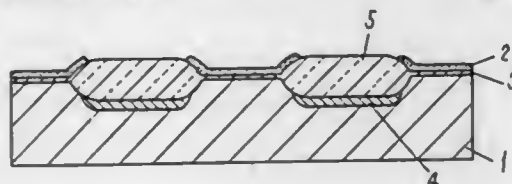
- providing a substrate;
- forming a polycrystalline semiconductor layer of a first thickness on said substrate, wherein said polycrystalline semiconductor layer has grains therein separated by grain boundaries;
- implanting oxygen or nitrogen or mixtures thereof into a first zone of said polycrystalline semiconductor layer to a dose in the range from more than 10<sup>14</sup> to less than 10<sup>17</sup> ions/cm<sup>2</sup>, wherein said first zone has a second thickness



less than said first thickness and a peak implant concentration located at a predetermined distance below the outward surface of said polycrystalline semiconductor layer and a implant concentration at said outward surface less than said peak concentration;  
heating said polycrystalline semiconductor layer to migrate said oxygen or nitrogen or mixtures thereof to said grain boundaries;  
thereafter implanting a conductivity enhancing dopant into a second zone of said polycrystalline semiconductor layer; and  
heating said polycrystalline semiconductor layer to activate said dopant so that it is electrically active.

**4,682,408**  
**METHOD FOR MAKING FIELD OXIDE REGION WITH SELF-ALIGNED CHANNEL STOP IMPLANTATION**  
Koji Takebayashi, Takatsuki, Japan, assignor to Matsushita Electronics Corporation, Kadoma, Japan  
Filed Apr. 1, 1986, Ser. No. 846,736  
Claims priority, application Japan, Apr. 1, 1985, 60-68727  
Int. Cl.<sup>4</sup> H01L 21/76, 21/94, 21, 72  
U.S. Cl. 29—576 W

4 Claims

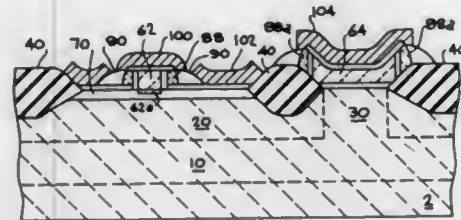


1. Method for making semiconductor device comprising the steps of:

- forming a film of silicon dioxide on a semiconductor substrate of one conductivity,
  - forming a film of silicon nitride on said film of silicon dioxide,
  - selectively removing said film of silicon nitride to make an opening to expose surface of said film of silicon oxide,
  - forming a coating of a silicon oxide derivative on all the surface of said substrate,
  - heat-treating the substrate thereby to change said coating to film of silicon dioxide,
  - implanting ions of said one conductivity into said substrate through said films of silicon dioxide thereby to form an ion implanted region,
  - removing said film of silicon dioxide changed from said coating,
  - selectively oxidizing said substrate by using said film of silicon nitride as a mask, to form selectively oxidized region as isolation region having channel stopper region only under said selectively formed oxide film.
2. Method for making semiconductor device in accordance with claim 1,  
said silicon oxide derivative is silanol film which consists of silanol as chief ingredient.

**4,682,409**  
**FAST BIPOLAR TRANSISTOR FOR INTEGRATED CIRCUIT STRUCTURE AND METHOD FOR FORMING SAME**  
Mammen Thomas, San Jose, and Matthew Weinberg, Mountain View, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.  
Filed Jun. 21, 1985, Ser. No. 747,517  
Int. Cl.<sup>4</sup> H01L 21/28  
U.S. Cl. 29—591

7 Claims



1. A method for making an improved vertical bipolar transistor for an integrated circuit structure characterized by improved gain and higher speed while permitting size reduction in both horizontal and vertical directions by the formation of a shallow emitter region and the substantial elimination of an extrinsic base region comprising:

- (a) forming an integrated circuit structure having a doped buried collector layer in a silicon substrate with an epitaxial layer formed thereon over said buried layer and isolation oxide portions formed in said substrate to separate said vertical bipolar transistor from adjacent active devices as well as to separate the collector region from the emitter/base regions;
- (b) forming an intrinsic base region in said epitaxial layer;
- (c) forming a layer of doped polysilicon over said structure;
- (d) masking said polysilicon to define at least an emitter region and removing the remainder of said polysilicon to leave a raised polysilicon emitter contact portion;
- (e) forming an oxide layer over said structure and, at the same time, forming a shallow emitter region in said structure by the following steps:
  - (1) growing a thin oxide protective coating over said silicon by heating the silicon to temperature and for a time period sufficient to diffuse dopant from said raised polysilicon emitter contact portion into said intrinsic base region in said epitaxial layer of said substrate to form a shallow emitter region having a depth of less than 1000 Å; and
  - (2) depositing sufficient additional oxide over said thin protective coating to provide a total oxide layer having a thickness of about 2500–5000 Å; whereby said additional thickness of oxide does not result in further diffusion of said emitter region into said structure;
- (f) removing portions of said oxide layer by reactive ion etching to leave oxide spacers portions on the sidewalls of said raised polysilicon emitter contact portion;
- (g) forming a metal silicide contact for said intrinsic base region on said portion of said epitaxial layer exposed by removal of said oxide layer;
- (h) forming an insulation layer over said structure;
- (i) planarizing said insulation layer to expose said raised polysilicon emitter contact portion; and
- (j) forming the remaining contacts to said bipolar transistor through said insulating layer;

whereby the provision of a shallow emitter region in said structure and the substantial elimination of an extrinsic base region by said metal silicide base contact permits the vertical dimension of said transistor to be reduced and the elimination of diffusion from an extrinsic base region into said emitter region and the provision of said oxide spacers between said raised polysilicon emitter contact portion and said metal silicide

cide permit the horizontal dimension of said transistor to be reduced.

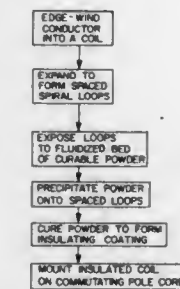
**4,682,410**  
**PROCESS OF MAKING A DYNAMO ELECTRIC MACHINE**

Helmut Kreuzer, and Klaus-Peter Meier, both of Schwieberdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Division of Ser. No. 409,561, Aug. 19, 1982, abandoned. This application Apr. 19, 1985, Ser. No. 724,799  
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147221

Int. Cl.<sup>4</sup> H02K 15/02

U.S. Cl. 29—596

5 Claims

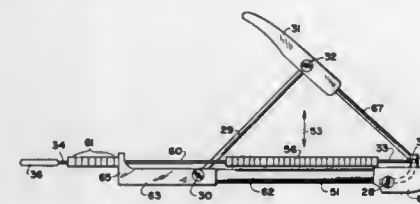


1. Method of making a commutating pole, for use in a vehicular-type dynamo electric machine, comprising the steps of:

- winding a strip of conductor (6), having essentially rectangular cross-sectional configuration, on edge;
- permitting the completed edge-wound winding to resiliently expand to form spaced spiral winding loops having major surfaces facing one another;
- exposing said expanded spaced spiral loops to a fluidized bed in which a powder, comprising a curable, hardenable insulating material, is suspended, said powder precipitating on the conductor forming the winding loops;
- hardening or curing said powder precipitated on the winding loops to form a coalesced insulating coating on each of said facing major surfaces of said spiral winding loops; and
- mounting the thus-insulated edge-wound winding on a commutating pole core (4) of said dynamo electric machine.

**4,682,411**  
**WIRE IDENTIFYING SLEEVE APPLICATOR**  
Herbert Tones, Jr., Rte. 3, Box 1160, Callahan, Fla. 32011  
Filed Aug. 21, 1986, Ser. No. 898,630  
Int. Cl.<sup>4</sup> B23P 19/02  
U.S. Cl. 29—745

14 Claims

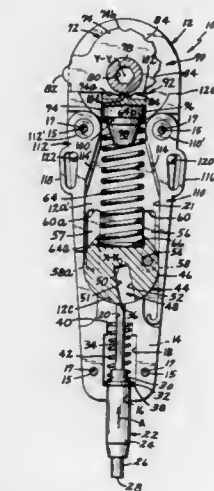


1. A tool for applying identification sleeves to electric wires including a sleeve mandrel and a mandrel stripper, said sleeve mandrel comprising an elongated thin straight rod having a loading end and a discharge end and adapted to have identification sleeves threaded onto said rod, said mandrel stripper comprising a plurality of telescoping tubular members having a retainer affixed to one end of said telescoping tubular members for anchoring the loading end of said mandrel and a stripping guide affixed to the other end of said telescoping tubular

members adapted to encircle said mandrel adjacent the discharge end thereof, said mandrel having at said loading end fastening means for attachment to said retainer and at said discharge end a plurality of springy lengthwise fingers; and means to move said stripping guide linearly along said mandrel until said guide extends beyond said springy fingers.

**4,682,412**  
**INSERTION TOOL**  
George B. Pfeffer, Minnetonka, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.  
Filed Feb. 19, 1986, Ser. No. 830,979  
Int. Cl.<sup>4</sup> B23P 19/02  
U.S. Cl. 29—750

9 Claims



1. A tool comprising:  
a manually engageable handle;  
an impact receiver having a force receiving end and a force transmitting end, said receiver carried on said handle and slideable in a predetermined direction extending between said ends;  
an impactor carried on said handle on a side of said impact receiver opposing said force receiving end and slideable in said predetermined direction between a rest position and a displaced position, said impactor pivotally movable about a pivot axis between a load position and a fire position with said impactor presenting a first surface opposing said force receiving end in force transmitting relation when in said load position and presenting a second surface opposing said force receiving end in force transmitting relation when in said fire position, said second surface spaced away from said first surface on a side of said first surface away from said force receiving end;  
first urging means for yieldably urging said impactor toward said force receiving end and toward said load position;  
means for pivoting said impactor about an axis laterally spaced from said second surface against urging of said first urging means to said fire position as said impactor is moved to said displaced position;  
second urging means for yieldably urging said impact receiver away from said impactor; and  
said impactor including a pivot surface cooperating with a fixed opposing surface secured to said handle to define said pivot axis.

**4,682,413**  
**METHOD OF EXTRACTING INSULATED WIRES FROM A SHIELDED CABLE**

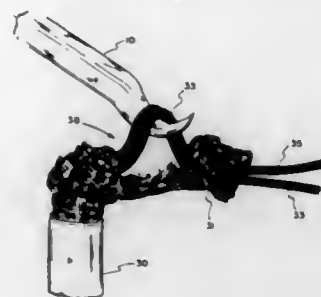
Ron F. Keller, San Jose, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Dec. 22, 1986, Ser. No. 944,914

Int. Cl.<sup>4</sup> H01R 43/00

U.S. Cl. 29—825

10 Claims



1. A method of extracting a portion of an insulated wire from within a braided wire shielded cable with a minimum of damage to the wire insulation, said method comprising:  
stripping a section of outer insulation covering one end of said cable exposing a predetermined portion of said braided wire shield;  
sliding said exposed portion of said braided wire shield back against the edge of remaining outer insulation causing a portion of said braided wire shield to distend and thereby loosening some of said braided wires comprising the shield;  
separating some of said loosened braided wires to form an aperture in said shield and thereby exposing a section of said insulated wire;  
bending said cable at said aperture to further expose said insulated wire;  
inserting the rounded tip of an elongated tool between said insulated wire and said shield causing said wire to separate from said shield, said elongated tool having an arcuately-shaped tapered head with a substantially elliptical tip portion;  
using said insulated wire as the axis of rotation, continuously pushing and rotating a greater portion of said tool head between said insulated wire and said shield, while also twisting said tool with a side-to-side motion, when said insulated wire reaches the body of the tool, pulling said insulated wire out of said aperture removing it from said braided wire shield.

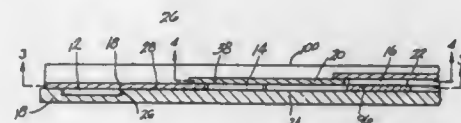
**4,682,414**  
**MULTI-LAYER CIRCUITRY**  
Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 413,046, Aug. 30, 1982. This application Jun. 24, 1985, Ser. No. 747,589

Int. Cl.<sup>4</sup> H05K 3/32

U.S. Cl. 29—840

12 Claims



1. A process of forming multi-layer circuitry adapted to incorporate electronic elements, comprising the steps of:  
providing a metallic substrate formed of a first material and providing a first metallic layered conductive circuit pattern and a second metallic layered conductive circuit pattern each formed of said first material, said first material having a third coefficient of thermal expansion, said

third coefficient of thermal expansion being from about  $165 \times 10^{-7}$  to about  $170 \times 10^{-7}$  in/in/°C;  
providing said metallic substrate with at least a first recess extending from a surface thereof, said recess and said surface being adapted to receive at least a first and second electronic element, respectively;  
providing said first metallic layered conductive circuit pattern with at least a first cavity therein for receiving said second electronic element, with said first metallic layered conductive circuit pattern being capable of being electrically connected to said first electronic element;  
disposing a layer of first dielectric material on said surface of said metallic substrate;  
overlying said layer of first dielectric material with said first metallic layered conductive circuit pattern  
overlying a portion of said first metallic layered conductive circuit pattern with said second metallic layered conductive circuit pattern;  
disposing a layer of second dielectric material between said first and second metallic layered conductive circuit patterns thereby electrically insulating said first and second metallic layered circuit patterns from each other;  
selecting said first and second dielectric materials from the group consisting of glass and ceramic, said first and second dielectric materials having first and second coefficients of thermal expansion, respectively, each of at least about  $160 \times 10^{-7}$  in/in/°C., said first and second coefficients of thermal expansion of the first and second dielectric materials being closely matched to the third coefficient of thermal expansion of said first material; and  
bonding said first layer of dielectric material to said substrate and said first conductive circuit pattern, while bonding said second layer of dielectric material to said first and second conductive circuit patterns, thereby essentially eliminating thermal stress in the multi-layer circuitry caused by thermal cycling.

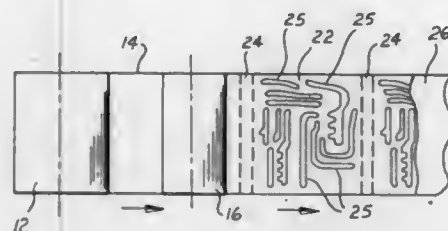
**4,682,415**  
**METHOD OF MAKING PRINTED CIRCUITS**  
Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Oct. 28, 1985, Ser. No. 791,841

Int. Cl.<sup>4</sup> H05K 3/20

U.S. Cl. 29—846

7 Claims



1. A method of fabricating printed circuits comprising providing a conductive pattern producing means which can impart electrically conductive material in a given circuit pattern composed of a plurality of independent conductive paths, passing a strip of electrically nonconductive material in cooperative association with said means to cause said given pattern to be repeatedly imparted to separate successive zones of the strip thereby forming a succession of identical printed circuit zones separated from each other along said strip, and then coiling the strip to form a coiled supply of printed circuits for subsequent use as desired, and further including the steps of uncoiling the coiled strip and joining it to a more rigid backing, creating a desired hole pattern in each printed circuit passing through both the strip and the backing, and of severing the

strip between successive zones to form separated individual printed circuits.

**4,682,416**  
**METAL CUTTER**  
Kazimir Stolf, 46 Wimbledon Avenue, Narrabeen, N.S.W. 2101, Australia

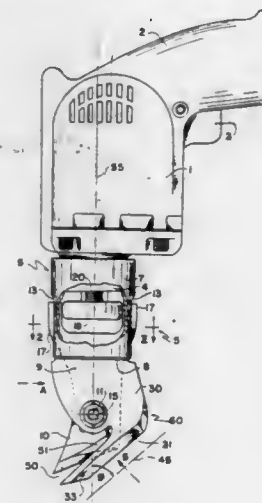
PCT No. PCT/AU84/00143, § 371 Date Mar. 22, 1985, § 102(e) Date Mar. 22, 1985, PCT Pub. No. WO85/00541, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 25, 1984, Ser. No. 723,951

Claims priority, application Australia, Jul. 26, 1983, PG0482 Int. Cl.<sup>4</sup> B26B 15/00

U.S. Cl. 30—228

9 Claims



1. A power driven portable head for a sheet metal cutter working on the guillotine principle as set forth above, having two blades pivoted to move relative to one another one of which is fixed to the head the other being mounted to oscillate about the pivot axis during operation of the head, the fixed blade having a leg portion attached to the head and, at its free end a foot extending laterally away from the plane of the leg portion, a straight edge on the foot adjacent the leg portion being formed with a first shearing face displaced laterally away from the plane of the leg portion on its side opposite to that at which the movable blade is pivotally mounted, the movable blade having one end portion adjacent the head arranged to be oscillated about the pivot axis by a portable rotational drive applied to the head, and its other end portion shaped to pass beneath the free end of the leg portion and to terminate in a second shearing face which co-operates with the first shearing face both said first and second shearing faces lying in a plane spaced from but parallel to the plane of the leg portion.

**4,682,417**  
**SPLITTING TOOL**  
Frederick L. Henslin, 619 Hallowell La., and Clarence Perkins, 4547 Murphy Ave., both of Billings, Mont. 59101

Filed May 5, 1986, Ser. No. 859,337

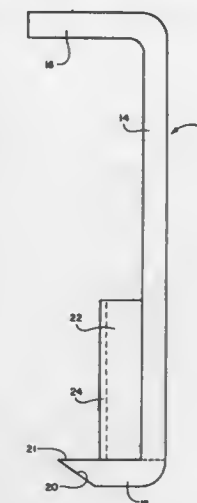
Int. Cl.<sup>4</sup> B26B 29/00

U.S. Cl. 30—294

2 Claims

1. A splitting device for splitting open a carcass or wood and the like comprising:  
a straight shank;  
the shank being bent at one end thereof to form a handle which extends in a transverse direction from the shank;  
a foot member secured to the other end of the shank, which foot member extends in the transverse direction;  
the foot member being rounded on the bottom surface and further having a flat top surface, the foot member further tapering in the transverse direction at the bottom thereof

to a smaller dimension at the edge of the foot furthest from the shank;  
an elongate cutting blade member having a trailing edge which has the same lateral dimension as the cross-sectional dimension of the shank, the cutting blade member being secured to the shank adjacent and above the foot



member, the cutting blade member further having a leading cutting edge which faces in the transverse direction (.); and  
an elongate striker bar having a bore at one end shaped to receive the handle and having a length such that when the striker bar receives the handle, the other end of the striker bar rests on the top surface of the foot member.

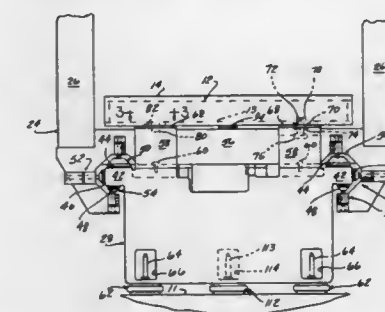
**4,682,418**  
**COORDINATE MEASURING MACHINE**  
John J. Tuss, Englewood, and Robert D. Donaldson, Centerville, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Jul. 7, 1986, Ser. No. 882,572

Int. Cl.<sup>4</sup> G01B 7/03

U.S. Cl. 33—1 M

10 Claims



1. A coordinate measuring machine (10) with an improved table-base structure, said machine (10) of the type including a base (28); a generally rectangular table (12) having a planar upper surface (14) means (58a, 58b,) supporting said table on said base, a bridge (24) having upstanding side members (26) extending above and alongside said table; an upper cross member (22) connecting the upper ends of said upstanding side members (26) and a lower cross member (56) connecting the lower ends of said upstanding members (26) and passing beneath said table (12); guide means (42) mounting said bridge for guided movement along a first horizontal axis; a carriage (20) supported on said bridge (24) for movement along a second



horizontal axis orthogonal to said first axis; and a probe (18) supported for vertical movement on said carriage (20); the improvement comprising:

an elongated table extension member (84) affixed to one side of said table (12) and extending away in a direction parallel to said first axis, with an extension member support (96) fixed to said base and located beneath the outer end of said table extension member (84), said extension member support comprising additional means supporting said table (12) on said base (28).

4,682,419

## NECKTIE-TYING GAUGE

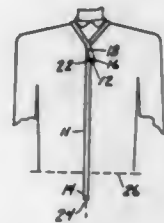
Leo E. Lynch, 1738 Virginia St., Racine, Wis. 53406

Filed Nov. 12, 1985, Ser. No. 797,201

Int. Cl.<sup>4</sup> G01B 3/00

U.S. Cl. 33—613

2 Claims



1. An improved gauge to aid in tying neckties into proper alignment comprising:

a long narrow flexible non-garment piece of predetermined fixed length and suitable for temporary draping around one's neck, said piece having a proximal end and a distal end;

at least two snap-type end fasteners permanently affixed to the piece immediately adjacent to the proximal end;

at least two snap-type middle fasteners for selective cooperative engagement with one of said end fasteners, said middle fasteners being permanently affixed to the piece at a predetermined intermediate position spaced from the end fasteners by a distance more than the circumference of one's neck, the end and middle fasteners being joinable without additional fastener means; and

the middle fasteners spaced apart by a short distance such that each of them when joined to one of the end fasteners provides proper tie end and crossover positions for a particular selection of knot, and the end fasteners spaced apart by a short distance whereby the gauge is adaptable for use by men of differing neck circumferences, whereby with the fastening means joined and the piece hanging along one's shirtbutton line the distal end and the attachment point serve as references for proper necktie positioning and initial crossover in tying.

4,682,420

## CENTER HEIGHT GAGE FOR CUT-OFF TOOLS

Bradley Teets, Budd Lake, N.J., assignor to Iscar Ltd., Nahariya, Israel

Filed Dec. 8, 1986, Ser. No. 938,807

Int. Cl.<sup>4</sup> G01B 5/24

U.S. Cl. 33—626

7 Claims

1. A gage for measuring the center height of a cylindrical workpiece comprising:

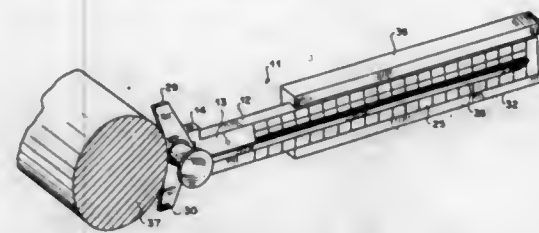
(a) a body having an arcuate face portion with a plurality of sequential numbers thereon indicating a value of diameter of said workpiece;

(b) a plurality of substantially vertical lines on said face portion, each line corresponding to each one of said sequential numbers;

(c) a horizontal centerline extending across said face portion;

(d) a plurality of horizontal indicator lines extending above and below said centerline, each line indicating a value

corresponding to a distance above or below the center height of said workpiece; and



(e) an indicator pivotably mounted on said body comprising an indicator arm positioned along said horizontal centerline and a pair of feeler arms spaced apart a predetermined angle.

4,682,421

## METHOD FOR DETERMINING THE AZIMUTH OF A BOREHOLE

Johannes C. M. van Dongen, and Leo B. Maekiaho, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

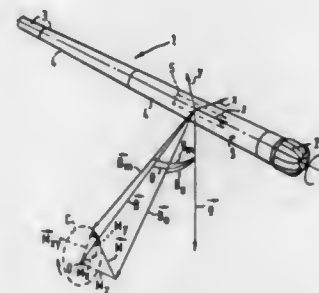
Filed Feb. 26, 1986, Ser. No. 832,948

Claims priority, application United Kingdom, Feb. 26, 1985, 8504949

Int. Cl.<sup>4</sup> E21B 47/02

U.S. Cl. 33—302

9 Claims



1. A method for eliminating the influence of drill string magnetization on an azimuth measurement made by a magnetometer package fixedly mounted to a drill string, said method comprising:

rotating the drill string;

measuring a cross-axial component  $B_m$  of a magnetic field  $B$  for various rotational orientations of the drill string;

determining a portion of the measured cross-axial component  $B_m$  produced by a cross-axial drill string magnetization  $M_{xy}$ ;

utilizing the cross-axial drill string magnetization  $M_{xy}$  to eliminate its influence on azimuth measurements.

4,682,422

## BOWLERS' HAND-DRYING BAG

Bob Harris, 7396 Van Buren St., Ventura, Calif. 93003

Filed Jul. 15, 1986, Ser. No. 885,668

Int. Cl.<sup>4</sup> F26B 5/16

U.S. Cl. 34—9

8 Claims

1. A bowler's aid for drying the bowling hand, comprising: a container bag made from tricot knitted fabric having a gauge of between 28 and 36, said fabric being made of 100% manmade fibers having a yarn size of between 15 and 45 denier, said bag being substantially closed off and providing minute pores through which may escape a dust contained in said bag;

and fuller's earth sericitic contained in said container bag for

escape through said minute pores when said container bag is shaken and vibrated, whereby when said bag is held in a hand and shaken, a fine dust is caused to effuse through said pores to dry the hand from moisture.

4,682,423

## CENTRIFUGAL DRIER DRUM FOR WET GRANULAR MATERIAL

Pierre Gaget, La Mure, France, assignor to Charbonnages de France, Paris, France

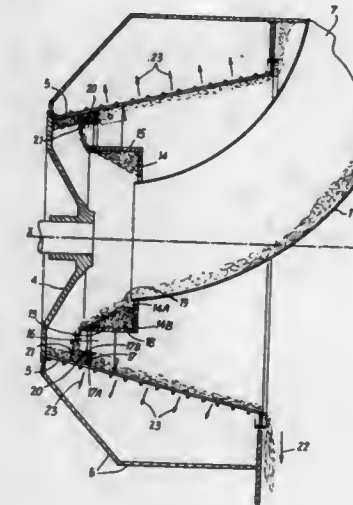
Filed Apr. 23, 1986, Ser. No. 854,896

Claims priority, application France, Apr. 26, 1985, 85 06402

Int. Cl.<sup>4</sup> F26B 17/30

U.S. Cl. 34—58

11 Claims



1. Centrifugal drier drum comprising a peripheral drying wall arranged for rotation about an axis, an entry part within the drum for receiving material to be dried, and a plurality of supports fixing the entry part within the drum, the entry part having an impact zone and the peripheral drying wall having a projection zone at which material is received, wherein at least one of said impact and projection zones, an annular retaining space is defined and is arranged during operation to retain from the circulating material to be dried on the travel path thereof a quantity of said material such that the retained material defines a surface onto which the further incoming material to be dried is projected.

4,682,424

## CLOTHES DRYING APPARATUS

Arillian Irving, 5813 Bonlevue, #1135, Dallas, Tex. 75241

Filed Oct. 16, 1986, Ser. No. 919,799

Int. Cl.<sup>4</sup> F26B 9/06

U.S. Cl. 34—151

7 Claims

1. A clothes drying apparatus comprising:

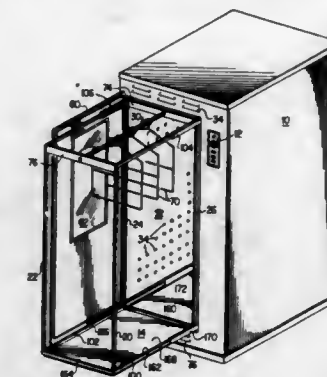
a cabinet structure having an interior;

a hanger rod assembly;

a drip assembly, wherein said hanger rod assembly and drip pan assembly are slidably mounted within said interior of said cabinet structure so that said hanger rod assembly and said drip pan assembly each have a first position located within said cabinet structure and each have a second position located partially outside of said cabinet structure; and

further comprising a means connecting said hanger rod assembly and said drip pan assembly so that said hanger rod assembly and said drip pan assembly may be moved from their first positions to their second positions in a

coordinated fashion, where said drip pan assembly remains in a location substantially beneath said hanger rod



assembly when said rod and drip pan assemblies are in their first positions and their second positions.

4,682,425

## ADAPTERS FOR GOLF SHOES

Ronald G. Simmons, Rte. 8, Box 224, Russellville, Ala. 35653

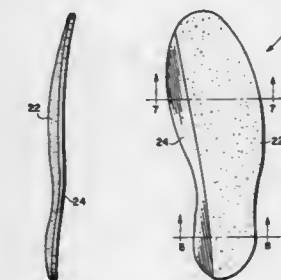
Continuation-in-part of Ser. No. 824,451, Jan. 31, 1986,

abandoned. This application Jun. 30, 1986, Ser. No. 880,283

Int. Cl.<sup>4</sup> A43B 13/40, 13/38, 5/00

U.S. Cl. 36—44

6 Claims



1. An insole for golf shoes comprising:

a first insole portion formed to have heel and sole areas to fit within a golf shoe, said first insole portion having a uniform thickness; and

a second resilient insole portion attached to said first insole portion having a non-uniform thickness in which said second insole portion increases the thickness of said insole along a lateral edge thereof, said thickness having a first maximum adjacent the ball of the foot area of said insole, tapering to zero thickness at the toe area, to a minimum thickness at an instep area, and to zero thickness along a line spaced apart from a medial edge of said insole, and a second maximum along the lateral edge of the heel area of said insole and tapering to zero thickness along said line and to said minimum thickness at said instep area.

4,682,426

## SKI BOOT TIGHTENING DEVICE

Jean-Louis De Marchi, Duingt, France, assignor to Salomon S.A., Annecy, France

Filed May 29, 1986, Ser. No. 867,988

Claims priority, application France, May 31, 1985, 85 08207

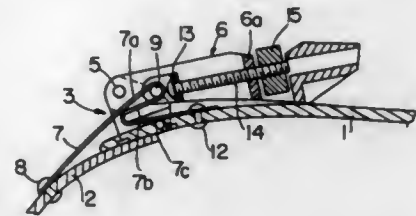
Int. Cl.<sup>4</sup> A43C 11/00; A43B 5/04

U.S. Cl. 36—50

14 Claims

1. Device for tensioning a flexible element assuring a connection between two parts, applicable particularly to the closure and tightening of a ski boot on the foot of a skier, about a

transverse axis, said lever controlling the tensioning of said flexible element which is attached at its respective ends to said two parts, wherein said flexible element passes around a first, movable counter-element (9) carried by said tensioning lever



(6), forming a first loop (7a, 7b), then passes around a second, fixed counter-element (11; 16; 27; 31), forming a second loop (7b, 7c,) said flexible element (7) and said two counter-elements (9; 11; 16; 27) constituting the equivalent of a clamp.

4,682,427

### TRENCH-DIGGER IMPLEMENT CARRIED BY A LATERALLY EXTENDING BOOM AND DRIVE THEREFOR

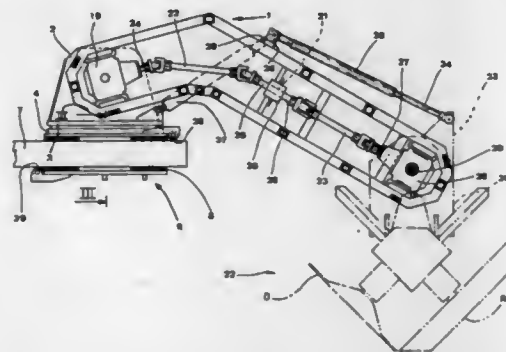
Giuliano Dondi, Mirandola, Italy, assignor to Pietro Dondi & Figli S.r.l., Modena, Italy

Filed Jul. 18, 1985, Ser. No. 756,226

Int. Cl.<sup>4</sup> E02F 5/08

U.S. Cl. 37-91

2 Claims



1. A trench digger implement carried by a laterally-extending boom and provided with a drive transmission having universal joints, comprising a boom (1) having a box structure mounted on a slewing ring (3') and rotatable for positioning about a vertical axis by way of a hydraulic ram (40), said slewing ring being carried by a longitudinal trolley (6) actuated by a hydraulic ram (11), wherein the boom is hinged at a rear end thereof connected to the trolley about an axis disposed transversely with respect to a longitudinal axis of the boom and driven from a power take-off (18) of a tractor (16) through a telescopic drive cardan shaft (17) having two universal joints, said implement (32) being suspended from and hinged about an axis also disposed transversely at a forward end of the boom to which said implement is connected, said boom being raised by a pair of longitudinal hydraulic rams (37), a penetrating angle defined between the rotational axis of the implement and the ground being adjusted by a longitudinal hydraulic ram (35); and further comprising two right angle drive gear units located at the rear end (19) and forward end of the boom, respectively, one inside each end of the laterally-extending boom; a first of said gear units (19) being provided with a transverse input shaft (29) located at a side of said gear unit facing the power take-off of the tractor and driven by said power take-off by way of said telescopic drive cardan shaft with said universal joints, and with a longitudinal output shaft (24); a second of said gear units

(28) being provided with a longitudinal input shaft (27) and a transverse output shaft (30) which extends in the opposite direction to the input shaft of the first gear unit and drives the shaft with said universal joints driving in turn the input shaft of the implement gearbox; the boom being further provided with a longitudinal intermediate shaft (21) journaled rotatably in the boom, one end (25) of which connects by way of a drive shaft with said universal joints (22) to the longitudinal output shaft of the first gear unit, and the other end (26) of which connects by way of a drive shaft with said universal joints (23) to the input shaft of the second gear unit.

4,682,428

### RAILWAY BALLAST RENEWAL MACHINE FOR TUNNELS

Ivo Cicin-Sain, Bussigny-Lauss, Switzerland, assignor to Danieli & C. Officine Meccaniche SpA and ITI/CLM Impianti Tecnici Industriali SpA, both of Buttrio, Italy

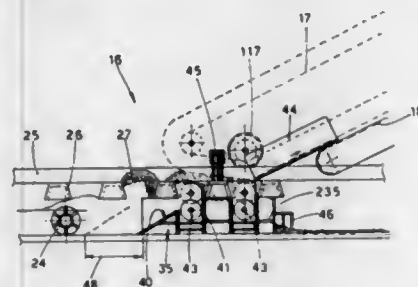
Filed May 20, 1986, Ser. No. 865,127

Claims priority, application Italy, May 24, 1985, 83371 A/85

Int. Cl.<sup>4</sup> E02F 5/22

U.S. Cl. 37-104

20 Claims



1. A railway ballast renewal machine for renewing a railway road bed having rails attached to spaced sleepers embedded in metalling, comprising:

- a frame;
- a scarifier to loosen the metalling around the sleepers;
- a work unit to grip the rails and remove the metalling;
- a riddle to sort the metalling; and
- a means to spread retained metalling;

wherein said work unit comprises gripping means to grip the rails and removal means to lift out the metalling through spaces between successive sleepers of the railway road-bed.

4,682,429

### TROUSERS-PRESS

Cornelis E. G. Okkerse, Hoornbruglaan 36, Rijswijk, Netherlands

Filed Dec. 31, 1985, Ser. No. 815,009

Claims priority, application Netherlands, Jan. 3, 1985, 8500012

Int. Cl.<sup>4</sup> D06F 71/12

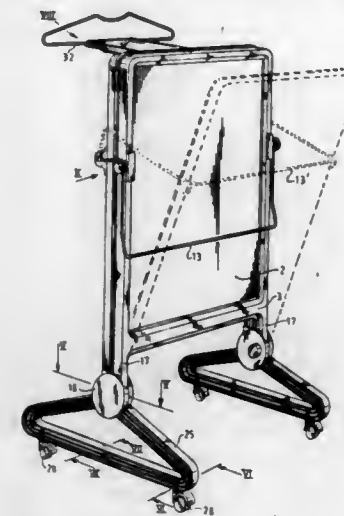
U.S. Cl. 38-36

6 Claims

1. A trouser press comprising:

- (a) a substantially upright first press plate;
- (b) a second press plate pivotally movable relative to said first press plate;
- (c) means for clamping said press plate together;
- (d) a plurality of support frames comprising upright sides and transverse top and bottom portions;
- (e) each of said press plates being mounted within one of each said support frames;
- (f) a pair of frame hinge arms extending below said bottom transverse portion and forming a continuation of said upright portions;
- (g) said frame hinge arms being coupled to a hinge support

which is in the shape of a casing, said casing being provided with a first space for receiving a hinge arm of the



one frame, and a second space for pivotally receiving the hinge arm of the other frame.

4,682,430

### PRICE CHIP SUPPORT STRIP

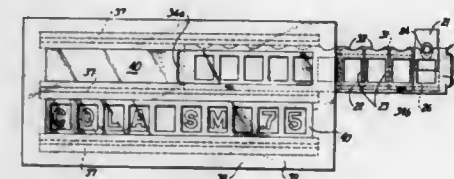
Charles F. Ramsay, Knoxville, Tenn., assignor to Plasti-Line, Inc., Knoxville, Tenn.

Filed Mar. 27, 1986, Ser. No. 844,672

Int. Cl.<sup>4</sup> G09F 3/20

U.S. Cl. 40-5

7 Claims



1. A utilized elongated substantially rigid support strip for price chips or the like comprising,

- a front panel portion which is elongated and substantially rectangular and provided along its length with a plurality of equidistantly spaced equal size price chip display openings, the front panel portion having a substantially flat front face and being provided on its rear side with a plurality of top-to-bottom extending spaced parallel ribs of equal thickness rearwardly of the front panel portion, said ribs being disposed on opposite sides of said price strip display openings, said front panel portion being further provided in its rear side with a pair of parallel longitudinal ledges of the same thickness as said ribs rearwardly of the front panel section, said ledges defining top and bottom longitudinal edges of the front panel portion,

a rear elongated flat substantially rectangular panel portion which is substantially coextensive lengthwise with the front panel portion and engaging the rear faces of said ribs and extending across the ribs, the rear panel portion having display openings corresponding in number, size and spacing with the display openings of the front panel portion and being in substantial registration therewith, the rear panel portion being of lesser height than the front panel portion and having top and bottom longitudinal parallel edges spaced respectively below and above the corresponding longitudinal edges of the front panel portion in parallel relationship thereto and below and above said ledges of the front panel portion, the front and rear panel portions defining rectangular price chip pockets

within the support strip between said ribs and ledges, the front panel portion having finger recesses in its top longitudinal edge with one such recess adjacent to the top portion of each price chip pocket, whereby the upward removal of each price chip from its pocket is facilitated, and

pairs of projections formed on the front face of the rear panel portion above and below said display openings and being engageable with price chips being held in said pockets to position the price chips normally against the rear of the front panel portion and within the margins of said pockets which are defined by said ribs and ledges.

4,682,431

### HOSPITAL ARM BAND

William M. Kowalchuk, Downsview, Canada, assignor to Moore Business Forms, Inc., Grand Island, N.Y.

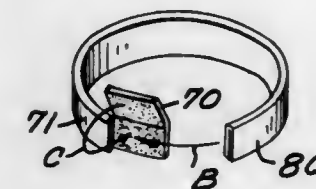
Filed May 23, 1985, Ser. No. 737,087

Claims priority, application Canada, Jun. 13, 1984, 456435

Int. Cl.<sup>4</sup> G09F 3/14

U.S. Cl. 40-21 C

9 Claims



2. An identification band blank comprising: an elongated strip of material having side edges and a centrally disposed longitudinal axis, said strip having a top surface receiving data on at least a part thereof, and a bottom surface covered with a permanent pressure sensitive adhesive; and means extending from one side edge of said strip to said longitudinal axis for separating one longitudinal half of said strip into a relatively short tab portion and a relatively long body portion; said body portion foldable about said longitudinal axis so that the adhesive surface of said body portion overlies and is bondable to the adhesive surface of the other longitudinal half of the strip to form a band portion, wherein said band portion is bendable to bring its free end into overlapping relationship with the adhesive surface opposite said tab portion and is bondable thereto, and said tab portion is foldable about said longitudinal axis with its adhesive surface overlying and being bondable to said free end of the band portion to produce a closed loop with said data receiving surface.

4,682,432

### SELF-SUPPORTING ELEMENT FOR MOSAIC DISPLAY PANEL

Frank S. Taylor, St-Eustache, and Claude Bourdon, Boisbriand, both of Canada, assignors to Monitroulk Ltee, Boisbriand, Canada

Filed Jun. 28, 1985, Ser. No. 749,645

Int. Cl.<sup>4</sup> G09F 13/04

U.S. Cl. 40-573

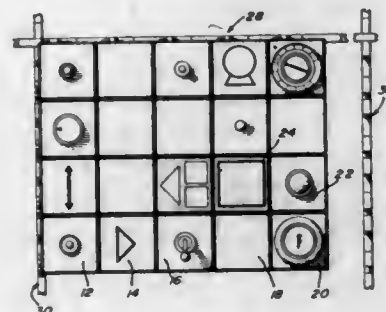
22 Claims

1. A light assembly for mounting to a synoptic mosaic panel structure formed of an arrangement of vertical and horizontal rails and of an arrangement of inter-engaged self-supporting hollow blocks, said block arrangement being mounted to said rail arrangement, said assembly comprising:

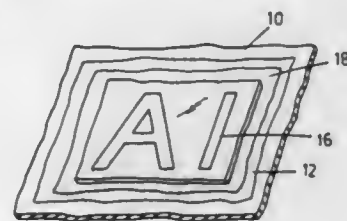
- (a) a tile adapted to be mounted to one end of one of said hollow blocks, said tile having at least one transparent surface portion
- (b) light-conducting means received in said one hollow block extending from said one end to an opposite end thereof;



- (c) light-diffusion means at one end of said light-conducting means;
- (d) a second hollow block adapted to be mounted rearwardly of said one hollow block at said opposite end thereof;
- (e) baffle means in said second hollow block dividing said block in two or more chambers;
- (f) light coloring means at the opposite end of said light-conducting means, displaying a geometrical pattern of colored areas, each area corresponding in shape to the cross-sectional area of an associated chamber disposed in registry therewith; and
- (g) light source means in each said chamber whereby light emitted from one of said source means is colored by the registered area of said light coloring means associated therewith, transmitted through said light-conducting means to said diffusion means, and emerges through said transparent surface portion of said tile.



4,682,433  
FABRIC SIGN PANEL  
Johann Stilling, 1141 Royal York Road, Apt. A1001, Islington, Ontario, Canada  
Filed Mar. 28, 1985, Ser. No. 717,318  
Int. Cl.<sup>4</sup> G09F 19/00  
U.S. Cl. 40—615 1 Claim

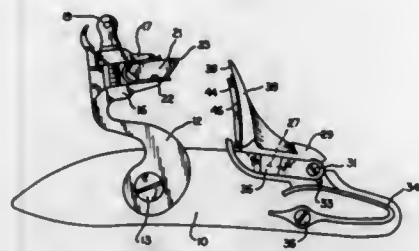


1. A method of applying graphics to a vinyl fabric panel, for use as a sign or the like and comprising the steps of:
- applying to a panel of vinyl fabric material, an undercoating layer in a liquid state, said undercoating layer comprising a vinyl solvent based transparent coating, said undercoating layer being applied in at least the region where said graphics are to be located, as allowing said undercoating layer to dry;
- forming graphics on a transfer panel, said transfer panel incorporating a water soluble release material, and applying water to said transfer panel, whereby to release said graphics from said transfer panel, and deposit the same on said undercoating layer, and thereafter removing said transfer panel, and drying said graphics, and,
- applying and outercoating layer over said graphics and said undercoat layer, said outercoating layer comprising a transparent vinyl solvent based coating material in a liquid state, and allowing said outercoating layer to cure.

4,682,434  
FLINTLOCK IGNITION MECHANISM  
Thomas J. Wurm, 1041 Winchell Rd., Aurora, Ohio 44202  
Filed Aug. 7, 1986, Ser. No. 893,982  
Int. Cl.<sup>4</sup> F41C 27/00

U.S. Cl. 42—51

11 Claims

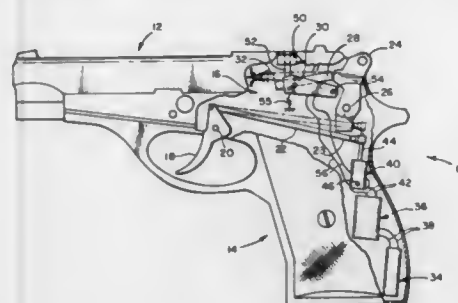


1. In a flintlock firearm having a lockplate, a hammer pivotally mounted on said lockplate, a flint carried on said hammer, a pan adapted to receive a priming charge and a frizzen constructed and positioned to be struck a blow by said flint on firing, the improvement comprising a pyrophoric element mounted on said frizzen and engageable by said flint on firing, whereby said flint abrades particles from said element and drives them into said pan.

4,682,435  
SAFETY SYSTEM FOR DISABLING A FIREARM  
James Heltzel, Rte. 1, Box 351, Mauertown, Va. 22644  
Filed Mar. 14, 1986, Ser. No. 839,616  
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.  
Int. Cl.<sup>4</sup> F41C 17/00, 17/04

U.S. Cl. 42—70.01

9 Claims



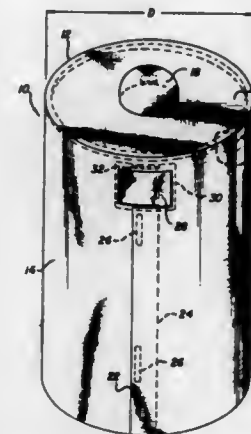
1. A safety system for selectively disabling a firearm comprising:
- a mechanical linkage by which the firearm is fired by movement of a trigger, said mechanical linkage including a link element;
- a link mounting means for mounting said link element for movement between a position wherein said mechanical linkage is interrupted and a position wherein said mechanical linkage is functional;
- a link moving means for moving said link element between the interrupted position and the functional position, said moving means being normally biased to move said link element to and hold said link element in the functional position; and
- a remotely controlled actuating means for actuating said link moving means including (a) a transmitter means for selectively transmitting a disabling signal, said transmitter means being designed to be carried by the operator of the firearm, and (b) a receiver means located adjacent said link moving means for receiving the signal from said

transmitter means and for operating said link moving means.

4,682,436  
FOLD-AWAY BLIND  
John R. Ritson, 359 Friendship Cir., Winston-Salem, N.C. 27106  
Filed Jan. 7, 1986, Ser. No. 816,784  
Int. Cl.<sup>4</sup> A01M 31/02

U.S. Cl. 43—1

11 Claims



1. A portable blind for camouflaging a person while in the wilderness, said blind comprising:
- a substantially circular flexible spring frame having a first diameter when said blind is in a utilization configuration, said frame being twistable into substantially circular segments having diameters less than said first diameter and which are placeable proximate one another when said blind is in a storage configuration;
- means for supporting said spring frame upon a head of a person comprising a cap which is wearable on a person's head and a circular top, said cap having a discontinuous band with connection means at end portions of said band whereby said connection means facilitates adjustment of said cap to various head sizes, said top having an opening proximate its center sufficiently large to accommodate said cap therein, said cap being attached to said top at said opening, said cap and said top being attached along a portion of said band other than said end portions, the outer circumference of said circular top being attached to said circular frame; and,
- a flexible side wall attached to said frame, said side wall extending downwardly from said frame and spaced apart from a person when said blind is in said utilization configuration.

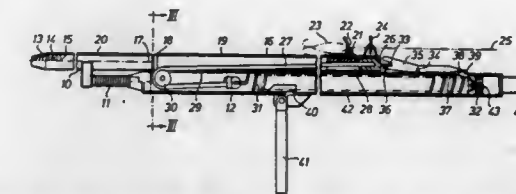
4,682,437  
FISHING DEVICE  
Magnus W. Akerberg, Storgatan 77, S-576 00 Vetlanda, Sweden  
PCT No. PCT/SE84/00273, § 371 Date May 23, 1986, § 102(e)  
Date May 23, 1986, PCT Pub. No. WO86/01075, PCT Pub. Date Feb. 27, 1986  
PCT Filed Aug. 9, 1984, Ser. No. 852,956  
Int. Cl.<sup>4</sup> A01K 91/02

U.S. Cl. 43—19

12 Claims

1. Fishing device comprising a rod (10, 16) with a coiling or spinning reel (61) and with a guide extending along the rod, and a driving slide (26) guided by the guide, for carrying along a lure (23) on a line (25) running out from the coiling or spinning reel, and projecting means (26, 27, 31) with a rubber cord (27) secured to the driving slide, said cord being stretched between the driving slide and a point (30) spaced in front of the rear end of the guide, when the driving slide is displaced to the rear end of the guide where the driving slide can be arrested by holding means (33, 35), for chocklike displacement of the driv-

ing slide by means of the stretched rubber cord from the rear end of the guide towards said point when the driving slide is released from the holding means, the lure being projected and the line being withdrawn from the coiling or spinning reel, characterized in that the guide is arranged in the rod (10, 16) proper with said point (30) located between the ends of the



guide and that a carriage (21) for supporting the lure (23) is arranged as a separate element displaceable in the guide, to be carried along in front of the driving slide (26) at the displacement thereof under the bias of the stretched rubber cord (27) and to continue by inertia towards an abutment (15) arranged at the free end of the rod, at termination of the movement of the driving slide at said point.

4,682,438  
FIGHTING CHAIR AND ROD HOLDER  
Martin Arrow, Hampton Bays, N.Y., assignor to Sanity Marine Products, Hampton Bays, N.Y.  
Filed Nov. 17, 1986, Ser. No. 931,424  
Int. Cl.<sup>4</sup> A01K 97/10

U.S. Cl. 43—21.2

9 Claims



1. An apparatus for holding a fishing rod comprising:
- a receiver for receiving the butt of a fishing rod;
- means to allow said receiver to move forward and back and from left to right; and,
- rotational means mounted in said rod receiver for engaging a slot in the butt of said fishing rod and for permitting said rod to rotate around its long axis while supported in said receiver.

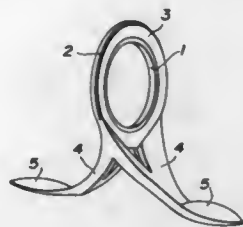
4,682,439  
FISHINGLINE GUIDE FOR FISHING ROD  
Koi Inoue; Youki Go, and Yoshihiro Naeki, all of Tokyo, Japan, assignors to Daiwa Seiko Inc., Tokyo, Japan  
Filed Mar. 5, 1985, Ser. No. 708,515  
Claims priority, application Japan, Mar. 19, 1984, 59-52879  
Int. Cl.<sup>4</sup> A01K 87/04

U.S. Cl. 43—24

4 Claims

1. A fishing guide for a fishing rod, comprising:
- an intermediate-layer ring made of a thermoplastic synthetic

resin in which reinforcing fibers are mixed, said intermediate-layer ring being formed integrally between an inner ring made of a hard, abrasion-resistant material, such as a metal or ceramics, and a metallic outer ring, and inclined supporting parts and installing parts continuously formed integrally on the lower region of said intermedi-



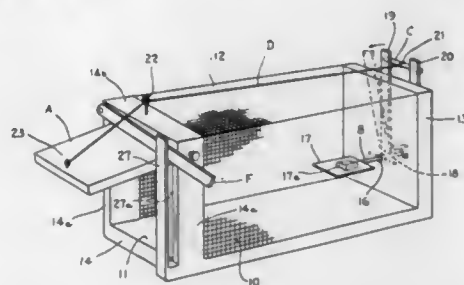
ate-layer ring on both sides in such a manner that said inclined supporting parts and said installing parts securely encompass at least a portion of said outer ring, as well as in such a manner that said supporting parts do not extend over the entire outer circumferential surface of said intermediate-layer ring lower region.

#### 4,682,440 ANIMAL TRAP

Robert F. Hunter, 119 Bowie St., Abbeville, S.C. 29260  
Filed Dec. 17, 1986, Ser. No. 942,616  
Int. Cl.<sup>4</sup> A01M 23/18

U.S. Cl. 43—61

4 Claims



1. A small animal trap having a cage with a bottom, a top, a back, an open front and sides joining the top, bottom and back, said small animal trap comprising:
  - a trap door hingedly affixed to the top of the cage at the front thereof, said trap door having a front bottom edge;
  - a pair of upright posts carried exteriorly of the back of the cage;
  - a lever pivotally mounted in the back of said cage at the center of the lever and balanced therein, said lever having a first end in the cage with a tray thereon for bait and a spaced opposite second end movably positioned between the pair of posts;
  - a trip rod extending between said first pair of posts;
  - a cord having a first end affixed adjacent the front bottom edge of said trap door and a spaced opposite second end affixed to said trip rod; and
  - linkage means moved responsive to movement of said opposite second end of said lever dislodging said trip rod from between said posts.

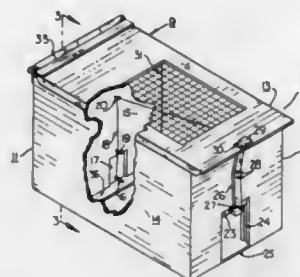
#### 4,682,441

##### ANIMAL TRAP

William A. Straver, 3540 Vienna Dr., Aptos, Calif. 95003  
Filed May 14, 1986, Ser. No. 863,005  
Int. Cl.<sup>4</sup> A01M 23/20

U.S. Cl. 43—61

6 Claims



1. An animal trap for any size animal, comprising an enclosure of suitable dimensions for the animal desired to be captured, consisting of a floor, two side walls, a rear wall, and a front wall with entrance opening; a top, closing lid hingedly attached to the rear wall, a front, sliding trapdoor, and a dividing partition with bait opening, dividing the trap into two compartments, a front entrance compartment and a smaller rear bait compartment; a triggering mechanism entirely contained within the trap, comprised of a strand of string, wire or other suitable material stretched vertically across the bait opening and attached by a loop to a pin at the bottom of the bait opening in such a manner that the animal cannot reach the bait in the bait compartment without disturbing the strand by either biting through it or dislodging the loop from the pin, with the other end of the strand guided through a keeper, hook or eyelets along the face of the dividing partition and along the bottom side of the lid to the trapdoor; a trapdoor suspended from the strand and inserted into channels on either side of the entrance opening so as to allow it to slide downward when the tension on the strand is released by the animal severing or dislodging the strand from the pin, closing the entrance to the trap.

#### 4,682,442

##### DOOR EDGE GUARD AND METHOD

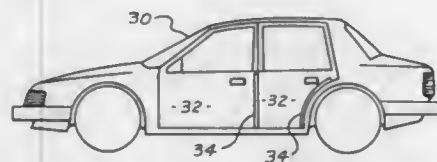
Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Mar. 4, 1986, Ser. No. 836,041

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.  
Int. Cl.<sup>4</sup> B60J 5/00

U.S. Cl. 49—462

20 Claims



1. In combination with the trailing edge of a swinging closure, a self-retaining insulating metal edge guard fitted onto said trailing edge comprising an elongate metal channel having in transverse view inner and outer legs extending from a generally semi-circular base, said inner and outer legs serving to apply self-retention forces to opposite sides of said trailing edge, said channel being formed from a metal strip of uniform thickness, non-metallic insulating material disposed on said metal channel in covering relation to said legs and base including a covering relation wherein direct contact of the metal of the channel with said trailing edge is prevented by said non-

metallic insulating material, and ridges formed in said legs in at least one of said channel and said non-metallic insulating material to project laterally of said legs and thereby form laterally projecting protuberances, said ridges being disposed such that said legs apply self-retention forces to opposite sides of said trailing edge via said ridges, and in which said legs include straight segments immediately contiguous said ridges and located proximally in said legs relative to said ridges.

#### 4,682,443

##### REMOVABLE SELF-CONTAINED FLOOD PROTECTION DEVICE AND METHOD OF INSTALLATION

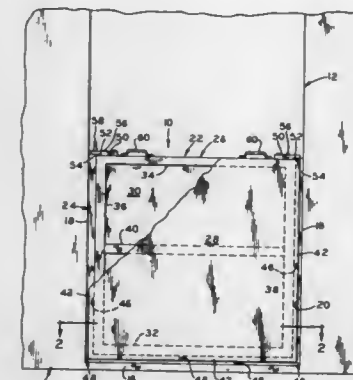
Elmer W. Demo, 13723 Lower Huntington Rd., Roanoke, Ind. 46783

Filed May 21, 1986, Ser. No. 866,201

Int. Cl.<sup>4</sup> E05B 7/18

U.S. Cl. 49—466

4 Claims



1. A removable, temporary flood protection device for installation in a doorway having a bottom doorsill and two spaced-apart door jams upwardly extending from opposite ends of the doorsill which doorsill and door jams cooperate to define a lower portion of a doorway opening above said doorsill and between said door jams, said flood protection device comprising:

an inner core having a bottom beam, a top beam spaced apart and generally parallel side beams and, said beams rigidly interconnected in a generally rectangular configuration; front and rear water resistant panels attached to and enclosing said bottom, top and spaced apart side beams, said panels having peripheral edges extending outwardly from said bottom beam and each of said side beams to define a continuous outwardly-opening channel extending along said bottom and sides of said core;

an outer resilient sealing means extending along and seated in said channel, which sealing means contacts said doorsill and door jams to seal said lower portion of said doorway and secure said protection device in said doorway; wherein said resilient sealing means is an inflatable tube which includes an inflation valve adjacent one of its opposite ends at said top of said core.

#### 4,682,444

##### MICROFINISHING APPARATUS AND METHOD

Norman R. Judge, Dewitt; Edward E. Judge, Jr., and Arthur G. Reiser, both of Lansing, all of Mich., assignors to Industrial Metal Products Corporation, Lansing, Mich.

Continuation-in-part of Ser. No. 608,201, May 7, 1984, abandoned. This application Oct. 8, 1985, Ser. No. 785,498

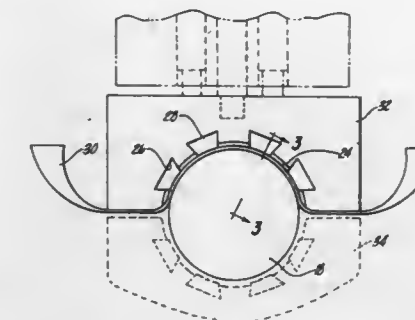
Int. Cl.<sup>4</sup> B24B 1/00, 29/04

U.S. Cl. 51—154

25 Claims

1. A machine for microfinishing an outside curved surface of a workpiece, comprising:
  - abrasive coated tape,
  - a shoe assembly having means for holding said tape and

having a rigid surface forming a predetermined surface shape related to a desired workpiece surface shape, said rigid surface contacting and pressing said tape into contact with said workpiece surface, said rigid surface defining an included angle between the boundaries of contact between said tape and said shoe of greater than 135° and less than 180° relative to the center of said curved workpiece surface,



means for causing relative rotation between said workpiece and said shoe assembly, and  
an arm which supports said shoe assembly such that relative movement between said workpiece surface and said tape occurs as said workpiece is rotated relative to said shoe assembly.

#### 4,682,445

##### CERAMIC CENTER FOR MACHINE TOOLS

Katsuhiro Ono, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

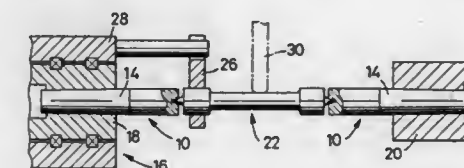
Filed Jul. 29, 1985, Ser. No. 760,039

Claims priority, application Japan, Aug. 8, 1984, 59-166785

Int. Cl.<sup>4</sup> B24B 41/04

U.S. Cl. 51—236

19 Claims



1. A ceramic center for a machine tool, said machine tool performing a machining or grinding operation upon a rotating workpiece, said ceramic center comprising a sintered ceramic mass having a bearing portion at a first axial end thereof for supporting said workpiece at one end on its axis of rotation, said sintered ceramic mass having a fracture toughness of at least 3.5 MN/m<sup>3/2</sup> at room temperature, and a density of at least 90% of theoretical density.

#### 4,682,446

##### APPARATUS AND METHOD FOR SEATING CARBON BRUSHES IN MOTORS OR THE LIKE

Bobbie L. Woodall, P.O. Box 1025, and Jerry H. Nuttall, P.O. Box 272, both of Springerville, Ariz. 85938

Filed Oct. 28, 1986, Ser. No. 923,892

Int. Cl.<sup>4</sup> B24B 1/00; B24D 3/00

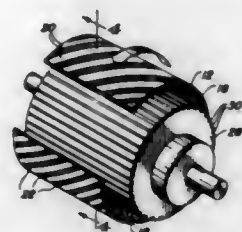
U.S. Cl. 51—281 R

11 Claims

8. A method of receiving the brushes of a motor or the like to conform the surface of said brushes to the contour of said motor commutator, comprising:
  - securing the sheet of seating material to said commutator,



said sheet having alternating strips of pressure sensitive adhesive and abrasive disposed thereon;



placing said brushes in contact with said seating material; and rotating said commutator.

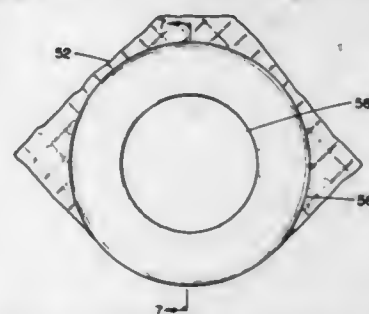
4,682,447

## LIGHTWEIGHT TARPAULIN

Paul V. Osborn, Webster, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 640,714, Aug. 14, 1984, Pat. No. 4,580,372. This application Jan. 3, 1986, Ser. No. 815,975 Int. Cl.<sup>4</sup> E04B 1/34, 1/345; A43C 5/00; B65D 55/00 U.S. Cl. 52—3

5 Claims



1. A lightweight tarpaulin for superposition over an object or on a surface area, said tarpaulin comprising:
  - (a) a tarpaulin body portion of a flexible sheet material constituted essentially of a fiber-reinforced polyethylene film, said sheet material having a plurality of apertures formed therein and spaced along the periphery of said body portion; and
  - (b) a plurality of flat, disc-shaped plastic grommets each constituted of a rigid high-density polyethylene, each said grommet having a circular central opening therein and being adhesively fastened to at least one surface of said flexible sheet material such that the circular opening of the grommet is in superimposed alignment with respectively one of said apertures in said sheet material.

4,682,448  
SHELTER

Brian J. Healey, Charlestown, Mass., assignor to Fiberlock Technologies, Inc., Cambridge, Mass.

Filed Mar. 21, 1986, Ser. No. 842,672

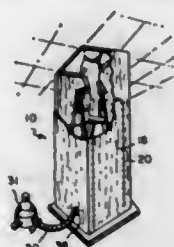
Int. Cl.<sup>4</sup> E04B 1/347; E04H 15/02

U.S. Cl. 52—63

1 Claim

1. A mobile isolation module in the form of a cubicle enclosure of rectangular, horizontal and vertical cross section comprising a bottom wall, a top wall and quadrilaterally-disposed side walls which collectively define a closed chamber, one of said side walls containing a rectangular opening for entrance into the chamber, a panel of corresponding rectangular configuration disposed in said opening, zipper fastener means connecting the panel within said opening to provide access through said opening to the enclosure and to seal the enclosure when in use, means providing an opening in the top wall for exit from the chamber at the top, comprising quadrilaterally-arranged panels formed in the top wall of triangular configura-

tion, the adjacent sides of which are diagonal to the top and the apices of which meet at the center of the top, zipper fastening means joining the adjacent edges of the panels such as to enable variably disconnecting the adjacent edges of the panels to provide an opening at the top of adjustable size, vacuum generating means connected to the chamber through one side wall to enable lowering the pressure therein, a mobile platform, an adjustable frame comprised of quadrilaterally-disposed posts



fixed at their lower ends to the platform upon which the enclosure is disposed, said frame being adjustable heightwise to a height corresponding to the height of the ceiling and said side wall panels being comprised of flexible material of a sufficient length heightwise of the module to be extended by adjustment of the frame to the ceiling height and means for mobilizing the platform and, hence, the module, comprising casters mounted to the platform at the four corners.

4,682,449

## RETRACTABLE STADIUM ROOF SYSTEM WITH RECTANGULAR OPENING

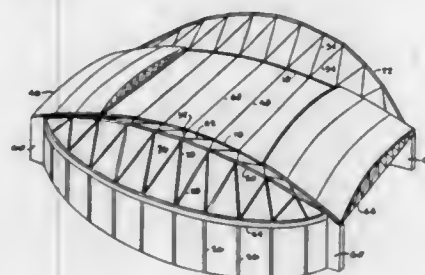
Horst L. Berger, 18 Chestnut Dr., Hastings-on-Hudson, N.Y. 10706

Filed Sep. 30, 1986, Ser. No. 913,520

Int. Cl.<sup>4</sup> E04B 7/16

U.S. Cl. 52—66

1 Claim



1. A retractable roof structure for covering a field having a first axis and a second axis comprising:
  - two tracks which in plan view are parallel to each other and to the first axis and in elevational view along the first axis are convex and form an arc of a circle;
  - two arches which in plan view are convex and circumscribe the tracks such that each track is along a chord of a respective arch, and in elevational view along the first axis also are convex but have curvatures greater than those of the tracks, to thereby extend above the tracks;
  - a substantially rigid, laterally extending edge ring which in plan view generally follows the arches and in elevational view along the first axis extends along chords of the arches and tracks;
  - a support for raising the edge ring above grade;
  - two sets of substantially rigid arch support struts which extend up from the edge ring to the respective arches;
  - two sets of track suspending cables which extend down from the arches to the respective tracks;
  - two fixed roof portions which extend from the edge ring to the respective tracks;

two retractable roof panels having runners which in plan view overlap the tracks and match the curvature of the tracks in elevational view along the first axis, wherein the roof panels are convex in elevational view along the second axis;

a set of tie cables extending between the two tracks; and means for selectively moving the roof panels toward and away from each other along the tracks to thereby close or open the roof of the structure.

4,682,450

## COMBIMATE POLYHEDRA

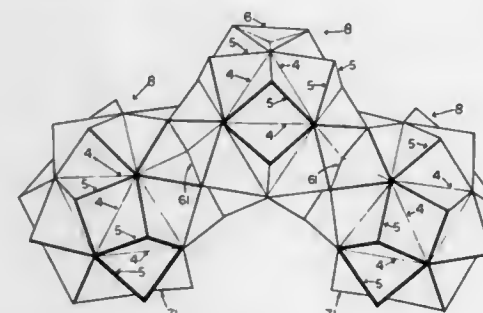
Gary C. Diamond, 671 Landfair #9, Los Angeles, Calif. 90024

Filed Jul. 30, 1985, Ser. No. 760,541

Int. Cl.<sup>4</sup> C04B 1/32

U.S. Cl. 52—81

3 Claims



1. A three dimensional, space enclosing structure or space enclosing, rigid structural framework comprising, at least three six-sided polyhedrons, said six-sided polyhedrons having six equal triangular sides, said six-sided polyhedrons being formed of the joining of two four-sided polyhedrons, said four-sided polyhedrons having an equilateral triangular base of edge length x and having three additional edges of length approximately 0.7x, said three six-sided polyhedrons being joined to each other at least along one of their edges of length x, one edge of length approximately 0.7x of two of said three polyhedrons being located in a coplanar orientation with each other.

4,682,451

## PROTECTIVE COVER FOR WINDOW SILLS

Terence H. Hubble, New Malden, United Kingdom, assignor to P & H Enterprises Limited (Musical Products), New Malden, United Kingdom

Filed Mar. 14, 1986, Ser. No. 839,623

Claims priority, application United Kingdom, Mar. 18, 1985, 8506936

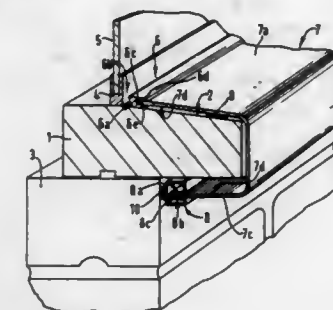
Int. Cl.<sup>4</sup> E06B 1/70

U.S. Cl. 52—97

17 Claims

1. A protective cover for a window sill comprising:
  - an elongate keeper strip member fixedly mountable along and on or immediately adjacent an upper surface of the sill where the upper surface meets a superposed structural member;
  - an elongate anchor strip member fixedly mountable against or immediately adjacent an undersurface of the sill where the undersurface meets a subjacent structure, the keeper strip member and the anchor strip member each including a recess along the length thereof which, in use, faces forwardly of the sill;
  - an elongate cover member having upper, front, and lower walls shaped so as to embrace the exposed portion of the sill, said upper and lower walls having respective free edge portions; and

detent means formed on said free edge portions of said upper and lower walls for maintaining said free edge portions in



engagement with said keeper strip member and said anchor strip member, respectively.

4,682,452

## HANGER ASSEMBLY

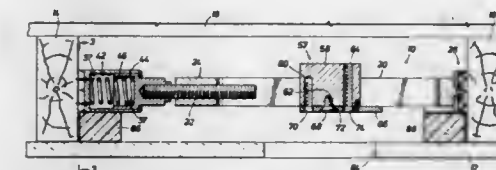
Clarence E. Propp, Rt. 3, Box 490, College Station, Tex. 77840, and J. Russell Kerr, 19 Cargill La., Bryan, Tex. 77801

Filed Oct. 18, 1985, Ser. No. 788,952

Int. Cl.<sup>4</sup> E04H 12/34; F16M 13/00

U.S. Cl. 52—118

2 Claims



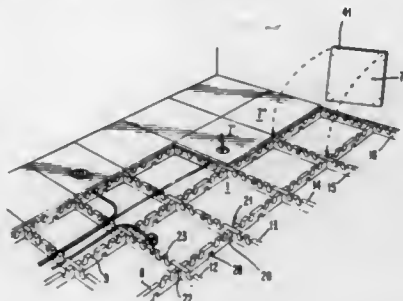
1. In a hanger assembly for supporting a load such as an electrical fixture from ceiling joists, a fixture support unit comprising:
  - a pair of parallel support beams having a slot between same, said support beams being positioned with an opening facing the direction of said load;
  - a T-shaped slide bar having a horizontal portion resting upon said parallel beams, said slide bar further having a plurality of internally threaded cylindrical holes passing therethrough;
  - a retaining plate having a plurality of holes corresponding to said plurality of threaded cylindrical holes;
  - a retaining screw passing through one of said holes in said retaining plate and into a threaded hole in said slide bar for securing said slide bar at a selected position within said slot;
  - an electrical box;
  - a threaded support rod for adjusting said electrical box to a proper height, said support rod being inserted through a second hole of said plurality of retaining plate holes, threadedly engaging a second corresponding hole of said plurality of threaded cylindrical holes, and being adjusted to said proper height;
  - a first lock nut for securing said support rod at said proper height;
  - a threaded anti-torque rod for countering any rotational forces acting on said electrical box caused by said fixture, said anti-torque rod being inserted through a third hole of said plurality of retaining plate holes, threadedly engaging a third corresponding hole of said plurality of threaded cylindrical holes, and being adjusted to said proper height;
  - a second lock nut for receiving said anti-torque rod at said proper height;
  - means for attaching said electrical box to said support and anti-torque rods; and
  - means for attaching said fixture to said electrical box.

**4,682,453**  
**FLOOR CONSTRUCTION SUITABLE FOR**  
**INSTALLATION IN ROOMS CONTAINING**  
**SWITCHGEAR, COMPUTERS, AND LIKE ELECTRICAL**  
**APPARATUS, AND A METHOD FOR PRODUCING SUCH**  
**A FLOOR CONSTRUCTION**

Klas Holmgren, Tulegatan 45, 113 53 Stockholm, Sweden  
 Filed Oct. 1, 1985, Ser. No. 782,730  
 Claims priority, application Sweden, Oct. 2, 1984, 8404923  
 Int. Cl.<sup>4</sup> E04B 5/48

U.S. Cl. 52-126.2

8 Claims



1. A floor construction, suitable for rooms having a supporting foundation and containing electrical equipment, comprising at least one right-angled slab having slab edge portions, a plurality of mutually parallel, elongated, longitudinally extending first joists and a plurality of mutually parallel, elongated second joists which are located at right angles to the first joists, said first and second joists defining at least one quadrangular cavity, said first and second joists having upper edge portions adjacent each cavity, said right-angled slab covering said cavity so as to form a floor surface, each slab supported along said slab edge portions by said upper edge portions of said first and second joist sections, the first joists provided with a plurality of first recesses spaced at a predetermined distance apart along said first joists; the second joists provided with a plurality of second recesses spaced at a predetermined distance apart along said second joists; said first and second joists each provided with third recesses for channeling pipes, electrical cables and the like, said first and third recesses reducing flexural resistance of said first joists so that said first joists are adapted to rest conformingly against a support foundation, the second and third recesses reducing flexural resistance of the second joists so that said second joists are adapted to rest conformingly against a supporting foundation, said first and second recesses adapted to mutually co-act so as to locate the upper edge portion of the first joist and the upper edge portion of the second joist in a common plane; at least one slab provided with means for locking the slab with said joists so that horizontal movement of the slab in said common plane is prevented, whereby said floor-structure may be locked together.

**4,682,454**  
**STANDING SEAM ROOF ASSEMBLY COMPONENTS**  
 Harold G. Simpson, Mustang, and Leo E. Neyer, Edmond, both of Okla., assignors to Harold Simpson, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 745,320, Jun. 14, 1985. This application Feb. 24, 1986, Ser. No. 832,748

Int. Cl.<sup>4</sup> E04B 7/18

U.S. Cl. 52-200

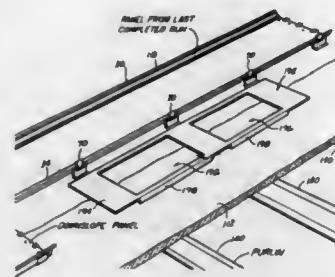
9 Claims

1. A method of installing a utility opening assembly in a building roof assembly in which standing seam roof panels interlocked in side by side disposition over roof support structural members, comprising:

placing a backup frame on the roof support structural members at a selected access opening location, the backup frame having at least one access opening therein;

installing a roof panel over the backup frame in the progres-

sive installation of the roof assembly by interconnecting the roof panel with adjacently disposed roof panels; removing a portion of the overlying roof panel at the access opening of the backup frame; and



securing a utility member to the backup frame over the access opening to sealingly cover the access opening and to unitize the secured member to the overlying roof panel.

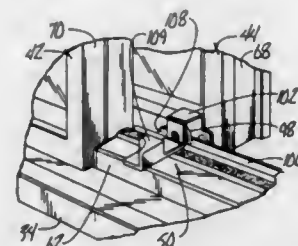
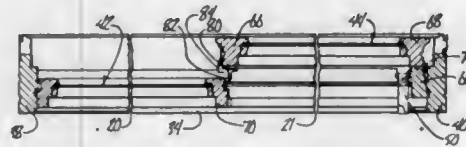
**4,682,455**  
**SLIDING WINDOW CONSTRUCTION**  
 Mario V. Klompenburg, Pella, Iowa, assignor to Rolscreen Company, Pella, Iowa

Filed Oct. 16, 1984, Ser. No. 661,380

Int. Cl.<sup>4</sup> E05D 15/20

U.S. Cl. 52-207

41 Claims



1. A window assembly in a window frame, said frame including a head, a sill, and opposite jambs, said assembly comprising: first and second sashes each having interior and exterior surfaces, a top, a bottom, and opposite first and second sides extending between said top and said bottom;

said first sash being laterally movable within said window frame between a closed position and an open position wherein said first sash is substantially in a non-planar position relative to said second sash;

track means extending along one of said sill or head of said window frame;

first track follower means connected to one of said top or said bottom of said first sash adjacent said first side thereof and cooperating with said track means for supporting and guiding said first sash during lateral movement between said open and closed positions; and

said track means having an opening therein for releasing said track follower means for cooperation therewith only when said first sash is in said open position such that said first sash is pivotal about a vertical axis adjacent said second side thereof between said open position and a maintenance position.

**4,682,456**  
**CELLULAR FLOORING SYSTEM AND METHOD OF**  
**USING SAME**

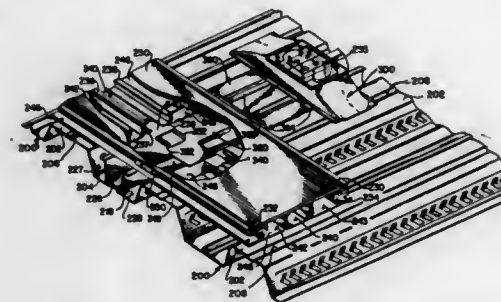
Thomas W. Hartman, Pittsburgh, and Thomas G. Ryan, Bethel Park, both of Pa., assignors to Cyclops Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 517,366, Jul. 26, 1983, Pat. No. 4,593,506, which is a continuation-in-part of Ser. No. 441,052, Nov. 12, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 829,911

Int. Cl.<sup>4</sup> E04B 5/48

U.S. Cl. 52-221

8 Claims



1. In a cellular flooring system of the type having a plurality of longitudinally extending parallel conduits provided on a first horizontal level, at least a portion of said conduits being formed by portions of corrugated metal decking sheets, and an overlying trench unit having a length and supported by said decking sheets on a second horizontal level disposed vertically above said first level, said trench unit having a plurality of adjacent parallel passageways crossing over and extending transversely with respect to said conduits and creating a region where the passageways and conduits are juxtaposed the improvement which comprises:

(a) said trench unit having a base portion extending substantially the length of the trench with a generally rectangular opening therein extending substantially throughout the region where the passageways and conduits are juxtaposed to allow for communication and for substantially unrestricted vertical access between the passageways and conduits and;

(b) separate isolating means in the form of a substantially flat plate member adapted to be positioned within the rectangular opening and to be removably attached to said trench unit in a substantially coplanar relationship with said base portion said isolating means having a shape whereby said isolating means partially covers said rectangular opening and acts as a complete isolating barrier between some, but not all, of the juxtaposed passageways and conduits and said isolating means provides at least one uncovered portion of said rectangular opening to allow for isolated access between at least one passageway and at least one conduit.

**4,682,457**  
**OPEN OFFICE LANDSCAPE SYSTEM**

Richard O. Spencer, 18 Vlejo, Irvine, Calif. 92714

Filed Aug. 15, 1985, Ser. No. 766,099

Int. Cl.<sup>4</sup> E04H 1/00

U.S. Cl. 52-239

8 Claims

1. An open office partition system comprising:

a panel receiving base having means for leveling a panel receiving channel of said receiving base and having a plurality of projecting pins formed in said panel receiving channel;

a partition wall received upon said projecting pins formed in said panel receiving channel attaching said partition wall to said receiving base, said partition wall consisting of a plurality of modular panels, each of which comprises:

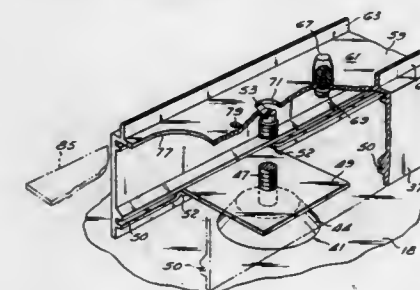
a lower panel retention channel having a first and a second end,

a first vertical panel wall support channel attached to and extending from said first end of the lower panel retention channel,

a second vertical panel wall support channel attached to and extending from said second end of the lower panel retention channel, said first and said second vertical support channels each having a laterally open vertical chase formed therein,

a top raceway channel attached to and connecting said first and said second vertical support channels at the extending end thereof, said raceway channel having an open top electrical raceway formed therein,

at least one intermediate brace attached to and extending from said vertical support channel to said second vertical support channel, and



an outer panel covering attached to the channel members forming an outer skin for the modular panel;

a plurality of connection clips for connecting vertical support channels of adjacent modular panels at preselected angles with respect to one another such that said laterally open vertical chases form closed vertical passageways between adjacent panels, the modular panels connected in a manner maintaining the continuity of said open raceway channel permitting an electrical network to be retained therein; and

an electrical network received within at least a portion of said top electrical raceway and said vertical chase, whereby a continuous electrical network may be created as part of the partition wall by the selective placement of the modular panels, and said wall placement may proceed subsequent to a leveling of the base receiving channel.

**4,682,458**  
**DRY LAID FLOORS**  
 Ian H. Sparrow, Bottesford, England, assignor to Trent Jetfloor Limited, Hovingham, England

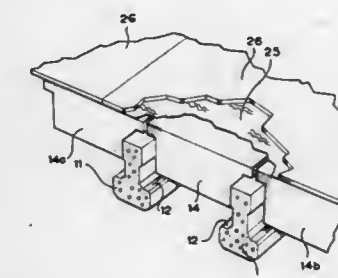
Continuation of Ser. No. 546,363, Oct. 27, 1983, abandoned.

This application Jan. 29, 1986, Ser. No. 824,296

Int. Cl.<sup>4</sup> E04C 1/00

U.S. Cl. 52-309.8

8 Claims



1. A dry-laid floor comprising a plurality of elongated sup-



port beams arranged in parallel, spaced apart relationship in a horizontal plane; the distance between adjacent beams being not more than about 900 mm, prefabricated blocks of foamed polystyrene resting on said beams and bridging the gaps between adjacent ones of said beams, the thickness of each said block of foamed polystyrene extending above said beams being not less than about 100 mm so as to form a substantially rigid load bearing surface that spans the spaces between said beams, said blocks of foamed polystyrene forming a substantially flat continuous upper surface suitable for supporting hard flooring surface, and a hard flooring surface resting on and supported by said blocks of foamed polystyrene.

4,682,459

## FLOORING SYSTEM

Debra A. Stephenson, 210 Crystal Ave., Crystal Falls, Mich. 49920

Filed Apr. 15, 1986, Ser. No. 852,242

Int. Cl.<sup>4</sup> E04F 13/08

U.S. Cl. 52—390

18 Claims



1. A flooring system comprising a foundation, a first substantially rigid layer including a plurality of elongate sheets arranged in a first plurality of parallel courses overlying said foundation, a plurality of resilient pads affixed to said first elongate sheets and disposed between said first rigid layer and said foundation, a layer of resilient material overlying said first rigid layer, a second substantially rigid layer including a second plurality of elongate sheets arranged in a second plurality of parallel courses over said resilient layer, a third substantially rigid layer including a third plurality of elongate sheets arranged in a third plurality of parallel courses over said second rigid layer, and a plurality of floorboards overlying said third rigid layer.

4,682,460

## OPEN WEB STRUCTURAL SUPPORT MOUNTING BRACKET AND LENGTH ADJUSTABLE WEB MEMBER

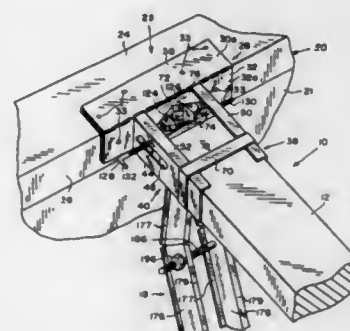
William R. Reetz, Boise, Id., assignor to Trus Joist Corporation, Boise, Id.

Filed Apr. 16, 1986, Ser. No. 852,732

Int. Cl.<sup>4</sup> E04H 12/18; E04C 3/292

U.S. Cl. 52—632

18 Claims



1. A structural support apparatus of the open web type comprising,  
an upper chord member;  
a lower chord member;  
a plurality of web-members interconnecting said chord

members and including at least one length adjustable end web member;

mounting bracket means for mounting the top of the upper chord member at substantially the same level as an end support to which the bracket means is attached, said bracket means extending laterally of said upper chord member length and adapted to be secured at the top of said end support for transferring load from the structural support apparatus to the end support;

said bracket means including outwardly extending chord receiving means for receiving and supporting an end of the upper chord member whereby said bracket means enables the top of the structural support apparatus to be mounted flush with the top of the end support, said receiving means being adapted to receive different length upper chord members;

connection means for connecting the bracket means to said length adjustable end web member; and

adjustment means for adjusting the length of said end web member by an adjustment movement transverse to said length.

4,682,461

## SUPPORT FOR REINFORCING BAR

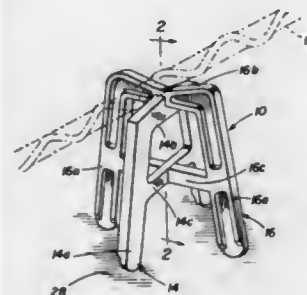
Billy G. Sizemore, West Carrollton, Ohio, assignor to Winston C. Sizemore, Franklin and Charles P. Sizemore, West Carrollton, both of, Ohio, part interest to each

Filed Mar. 31, 1986, Ser. No. 846,036

Int. Cl.<sup>4</sup> E04C 5/16

U.S. Cl. 52—689

5 Claims



1. A chair support structure for use in supporting a reinforcing bar during a concrete pouring procedure comprising smaller and larger plastic elements each shaped substantially as a letter A with diverging legs, an upper cross member, and a lower cross member, the smaller element being adapted to fit through an opening defined between the cross members of the larger element in a relatively tilted position, and the respective cross members being formed with complementary central notches whereby the smaller element may be swung laterally into vertical position relative to the larger element with the respective notches being interengaged to lock the elements together in a cruciform configuration with the lower cross members preventing the legs from spreading outwardly when supporting a weight.

4,682,462

## SWATHER WITH SWINGING HITCH

Gerald T. Johnson, Sr., R.R. Box 76, Kulm, N. Dak. 58456

Filed Oct. 4, 1985, Ser. No. 784,237

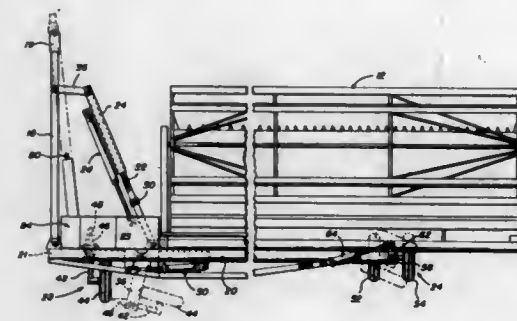
Int. Cl.<sup>4</sup> A01B 73/00

U.S. Cl. 56—228

11 Claims

1. A pull-type agricultural implement such as a swather having an elongate frame mounting a power-driven work member, such as a swather reel, a movable first wheel assembly adjacent one end of the frame, a movable second wheel assembly adjacent the other end of the frame, an adjustable hitch

assembly at said one end of the frame for changing the configuration of the implement in relation to a towing vehicle as between a working field position wherein the implement is pulled in a direction substantially perpendicular to the length of the frame, and a transport position wherein the implement is pulled in a substantially lengthwise direction, and power means for moving the respective wheel assemblies between field and transport positions, the hitch assembly comprising a hitch pole pivotally connected at one end of the pole to a part of the frame at said one end thereof, the hitch pole having means at its other end for connection to a towing vehicle, a telescoping assembly pivotally interconnected between the frame and the hitch pole, a first hydraulic cylinder for providing telescopic extending and retracting movements of the telescoping assembly effective to adjust the angle of the hitch pole relative to the frame as between field and transport positions, the power



means comprising a second hydraulic cylinder for moving the first wheel assembly between the field and transport positions, and a third hydraulic cylinder for moving the second wheel assembly between the field and transport positions, said first wheel assembly comprising a castoring wheel and locking means for preventing the wheel from castoring when in the field position, said castoring wheel comprising a bracket mounted for pivotal movement on the frame under control of the second cylinder, a wheel-carrying shaft rotatably mounted in the bracket, said locking means comprising a latch element on the shaft, and a complementary latch element on the frame, the respective latch elements interengaging when the bracket is pivoted to field position to hold the shaft against rotation, and the elements disengaging when the bracket is pivoted to transport position to allow rotation of the shaft and castoring of the wheel.

4,682,463

## APPARATUS FOR FORMING AND ATTACHING A FLEXIBLE FOIL SEALING DISK

Istvan Foldesi, Laval, Canada, assignor to Montreal Milling Cutter Company, Canada

Filed Sep. 3, 1985, Ser. No. 771,933

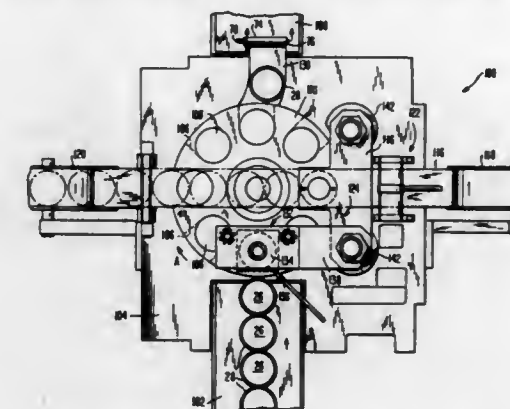
Int. Cl.<sup>4</sup> B65B 7/28

U.S. Cl. 53—298

3 Claims

1. Apparatus for forming and attaching a flexible foil sealing disk to an open mouth container, said apparatus comprising:  
means for feeding a continuous web of flexible metal foil from a supply reel past a flexible foil sealing disk forming station;  
a die cutting assembly at said flexible foil sealing disk forming station, said die cutting assembly including a cutting die and a die plate, said cutting die and said die plate being operable to form said flexible foil sealing disks from said foil web;  
a rotatable wheel having a plurality of spaced openings, each of said spaced openings receiving a flexible foil sealing disk formed at said disk forming station and transferring said formed flexible foil sealing disks from said die cutting assembly to a heat sealing station, said die cutting assembly and said heat sealing station being positioned adjacent

each other around the periphery of, and above said rotatable wheel;  
reciprocable heat sealing head at said heat sealing station, said heat sealing head passing through each of said spaced openings in said rotatable wheel, heating a heat activated adhesive film on said flexible foil sealing disk, and transferring said flexible foil sealing disk from said rotatable wheel to said open mouth container to tack-adhere said flexible



foil sealing disk to said container mouth said heat sealing head and said cutting die being connected for concurrent reciprocation; and  
spaced, rotatable star wheels coaxially mounted with, and rotating with said rotatable wheel for delivering containers to said heat sealing station and for removing said containers and attached flexible foil disks from said heat sealing station.

4,682,464

## RAKE

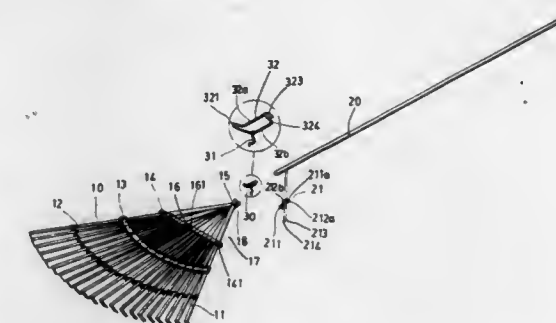
Han-Ching Sun, No. 43, Ts-An Road, Tien Chung Chen, Chang-hua Hsien, Taiwan

Filed Jan. 21, 1986, Ser. No. 823,093

Int. Cl.<sup>4</sup> A01D 7/00

U.S. Cl. 56—400.17

4 Claims



1. An improved rake comprising:  
a drag portion having a plurality of prongs which is set transversely at one end and convergent at the other end of said drag portion;  
a clamping bar provided on said drag portion at said convergent end for clamping said plurality of prongs, wherein said clamping bar further includes a pin at its center;  
a handle portion connecting to said convergent portion of said drag portion;  
a fork member provided at one end of said handle portion including a forked end which is engaged with said pin of said clamping bar; and  
an engaging means provided between said drag portion and said handle portion for connecting said two portions,

including a clip member for clipping and a U-shaped member for holding said convergent end of said drag portion with said handle portion, wherein said clip member is constituted by a single length of wire which is formed with two leg portions with two inwardly bent portions at one end of said clip member and a curved portion which is extended upward at an angle to the plane of said two leg portions at the other end of said clip member.

4,682,465

**FALSE-TWIST TEXTURED YARN OF POLYAMIDE**  
Teiryō Kojima; Heichiro Matsuda, and Masaru Tokizane, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

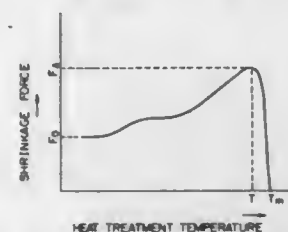
Filed Dec. 7, 1984, Ser. No. 679,305

Claims priority, application Japan, Dec. 7, 1983, 58-229936

Int. Cl.<sup>4</sup> D02G 3/02

U.S. Cl. 57-247

5 Claims



1. A false-twist textured yarn composed of a continuous polyamide filament yarn, characterized in that the maximum value  $F$  (g) of the shrinkage force under dry heat and a heat treatment temperature  $T$  (°C.), at which said maximum shrinkage force value  $F$  is attained, are defined by the following equations:

$$0.20 \text{ g/D} \leq F/D \leq 0.08 \text{ g/D, and}$$

$$T_m \leq T \leq T_m - 25$$

wherein  $D$  is the titre of the textured yarn represented by denier, and  $T_m$  is the melt-breakage temperature of said polyamide filament represented by °C. and that the crimp recovery CR of the yarn is 15% or more.

4,682,466

# DEVICE TO DOFF YARN PACKAGES ON RING SPINNING MACHINES

Roberto Meroni; Danny Lant, both of Pordenone; Fabio Lancero, Milan, and Umberto Gerin, Pordenone, all of Italy, assignors to S. Bigagli & C. SpA, Prato, Italy

Filed Mar. 20, 1986, Ser. No. 841,782

Claims priority, application Italy, Mar. 26, 1985, 83349 A/85

Int. Cl.<sup>4</sup> D01H 9/04, 9/02, 9/18

U.S. Cl. 57-274

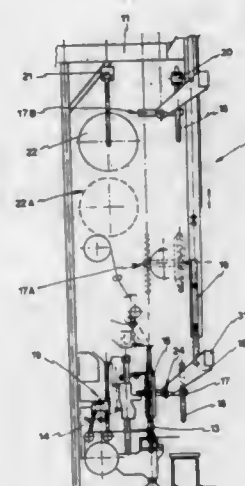
10 Claims

1. A device to doff yarn packages from a ring spinning machine having a spindle shaft, and automatically replace yarn packages with empty tubes, comprising:

- a conveyor for supplying empty tubes and removing yarn packages, located above the spindle shaft;
- a horizontal shaft;
- a gripper rotatably mounted on said horizontal shaft, comprising a first element to engage said tubes and a second element to engage said yarn packages;
- means for rotating said gripper 180° about the horizontal shaft in order to bring either of the engagement elements in alignment with the spindle shaft of said ring spinning machine;
- a first position where said gripper can either remove yarn

packages from or deposit empty tubes on the spindle shaft of the ring spinning machine;

a second position located above the first engagement position where said gripper can either deposit yarn packages onto the conveyor or engage empty tubes from the conveyor; and



means for moving said gripper between said upper engagement position and said lower engagement position; wherein during operation, said device is located above the spindle shaft of the ring spinning machine.

4,682,467

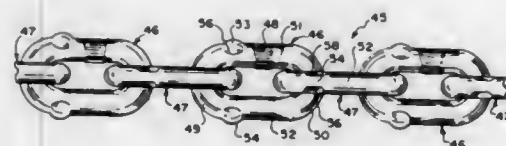
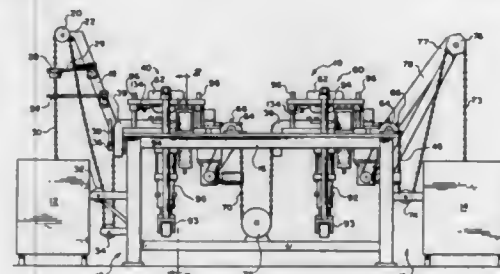
**CHAIN FORMING METHOD AND APPARATUS**  
Ronald G. Waltemyer, and Royce L. Brown, both of York, Pa., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 13, 1985, Ser. No. 701,851

Int. Cl.<sup>4</sup> B21L 15/00

U.S. Cl. 59-30

26 Claims



1. A method for producing oriented, one-way links from a stock chain of the type including oval shaped links each having first and second rounded ends and parallel spaced straight side sections formed in a continuous loop having an interior space and an exterior surface, said method comprising the steps of:

- moving the chain to a first forming station;
- forming protuberances in each straight side section adjacent the first end of at least a single first link at said first station, the protuberances extending laterally outwardly from the exterior surface of at least one first link;

moving the chain to a second forming station; rotating the chain; forming protuberances on each straight side section adjacent the first end of at least a single second link orthogonal to the first link at said second station the protuberances extending laterally outwardly from the exterior surface of at least one second link; and repeating the above step until all links of the chain have protuberances formed thereon.

4,682,468

# NON-CATALYTIC METHOD FOR REDUCING THE NO EMISSIONS OF GAS TURBINES

Anthony M. Dean, Hampton; Anthony J. DeGregoria, Flemington; James E. Hardy, Lebanon, and Richard K. Lyon, Pitts-town, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

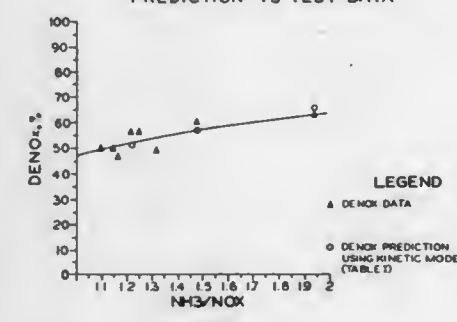
Continuation-in-part of Ser. No. 550,398, Nov. 10, 1983, Pat. No. 4,507,269. This application Mar. 22, 1985, Ser. No. 715,120

Int. Cl.<sup>4</sup> F02C 7/00

U.S. Cl. 60-39.02

8 Claims

DENO<sub>x</sub>  
PREDICTION VS TEST DATA



1. In a gas turbine which operates at superatmospheric pressures and which contains: (a) a combustor in which primary air and fuel are introduced, (b) combustion effluents at a temperature from about 975° K. and 1600° K. and containing NO and at least 0.1 volume percent oxygen, (c) a source of secondary air for diluting and cooling the combustion effluents, and (d) turbine blades; the improvement which comprises: (i) reducing the total amount of NO emitted from the gas turbine by contacting the combustion effluents prior to passage through the turbine blades with ammonia; (ii) replacing at least a portion of the secondary air with inert gas; and (iii) determining the temperature of the combustion effluent, the residence time, and the amount of ammonia employed by the solution of a set of simultaneous equations derived from the kinetic model of Table I hereof.

4,682,469

**COMPRESSOR POWER UNIT FUEL FLOW CONTROL**  
Frederick C. Maynard, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 4, 1985, Ser. No. 784,400

Int. Cl.<sup>4</sup> F02C 9/26

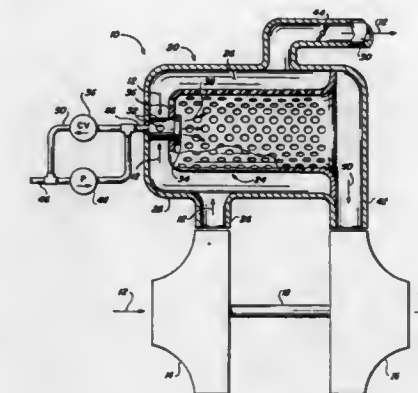
U.S. Cl. 60-39.06

8 Claims

1. A method of controlling fuel flow through a nozzle positioned in a combustor receiving pressurized combustion air from a source thereof, said method comprising the steps of:

- (a) supplying fuel at an essentially constant pressure to the nozzle; and
- (b) altering the fuel pressure drop across the nozzle solely by varying the air pressure within the combustor to thereby selectively vary the fuel flow through the nozzle, the combustor having a liner adapted to receive fuel discharged from the nozzle and pressurized combustion air, and wherein said altering step (b) is performed by varying

the air pressure within the liner in a manner maintaining the absolute pressure ratio of the fuel supply pressure to



the liner interior pressure within a predetermined range from about 1.1 to about 1.3.

4,682,470

**CATALYTIC CONVERTER FOR EXHAUST GASES**  
Gerald Shaff, Chelsea, Mich., assignor to Echlin, Inc., Branford, Conn.

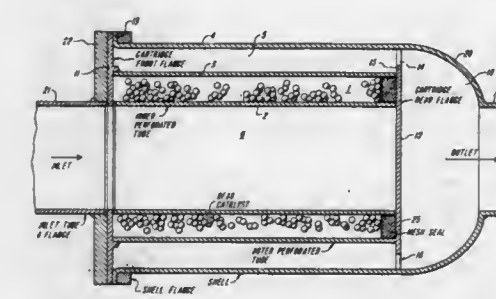
Continuation of Ser. No. 601,249, Apr. 17, 1984, abandoned.

This application Feb. 3, 1986, Ser. No. 825,202

Int. Cl.<sup>4</sup> F01N 3/28

U.S. Cl. 60-299

5 Claims



1. A catalytic converter comprising an annular catalyst bed containing catalyst beads and defined by coaxial inner and outer louvered tubes, an outer shell coaxial with said catalytic bed, means forming a gas flow path through said converter wherein said catalyst bed is interposed between an upstream flow portion and a downstream portion of said gas flow path with said upstream portion defined in part by the inner surface of said inner louvered tube and said downstream portion defined in part by the outer surface of said outer louvered tube and the inner surface of said outer shell, and means forming an outlet in said downstream portion having a cross-sectional area that is no greater than the cross-sectional area of said upstream portion, said outlet means comprising a flange that defines the rear wall of said catalyst bed and projects radially beyond said outer louvered tube, toward said outer shell, and into said downstream portion, thereby constricting said flow path, said flange including a plurality of radial tabs that engage the inner surface of said shell, thereby further constricting and defining the flow path between the flange and the outer shell.



# 4,682,471 TURBOCOMPRESSOR DOWNHOLE STEAM-GENERATING SYSTEM

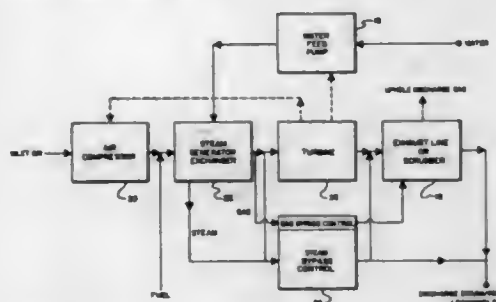
William R. Wagner, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 798,350, Nov. 15, 1985, abandoned, which is a continuation of Ser. No. 591,718, Mar. 21, 1984, abandoned. This application Sep. 11, 1986, Ser. No. 906,680

Int. Cl.<sup>4</sup> F01K 21/04; E21B 36/00

U.S. Cl. 60—649

2 Claims



1. A downhole steam-generating system comprising: an air compressor; a steam generating unit, including: a combustor for combusting fuel with the compressed air from said compressor thereby producing combustor exhaust products; and steam conversion means, in indirect heat-exchange relationship with said combustor, for converting water which is fed into said steam-conversion means into steam; a turbine which is rotated by said combustor exhaust products and steam from said steam-generating unit, the rotational motion of the turbine being mechanically coupled to the air compressor to drive said air compressor; and control bypass means associated with said steam generating unit and turbine for regulating the relative amounts of the combustor exhaust product and steam delivered to said turbine from said steam generating unit, wherein said air compressor and turbine form an integral turbocompressor unit, said turbocompressor unit, steam-generating unit and control bypass means being located downhole during operation of the steam-generating system.

# 4,682,472 COUPLING DEVICE FOR TUBES, TUBULAR ELBOWS AND END PLATES OF THERMOELECTRIC DEVICES

Jean-Francois Huard, Pont-A-Mousson, France, assignor to Tunzini Nessi Entreprises d'Equipements, Ruell Malmaison, France

Filed Aug. 23, 1985, Ser. No. 768,713

Claims priority, application France, Aug. 27, 1984, 84 13330

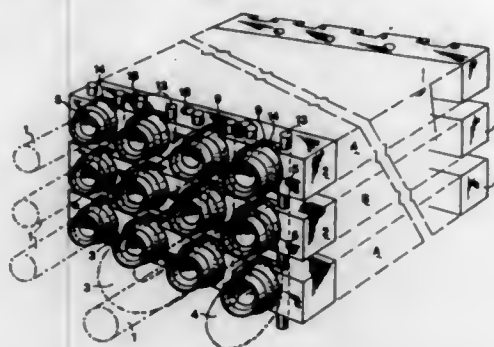
Int. Cl.<sup>4</sup> F25B 21/02; H01L 35/28

U.S. Cl. 62—3

12 Claims

1. A coupling assembly for providing coupling between a tube, a tubular elbow and an end plate, in a thermoelectric device of the type comprising a plurality of thermoelements cooperating with heat exchangers comprising a plurality of tubes in alternate superimposed layers in which respective warm and cold fluids flow, at least one of said fluids being a liquid flowing through a said tube cooperating thermally with at least one thermoelement, said tubes being supported in said alternate superimposed layers by a said end plate located near each of the extremities of said tubes, the tubes extending through the end plates, said coupling assembly comprising a coupling member coupled to an extremity of each tube, and a tubular elbow member for providing connection between an extremity of a first said tube and an extremity of a second said

tube, said elbow member being connected to the coupling member coupled to the first tube and to the coupling member coupled to the second tube, each said tube being received in a said coupling member and extending at least partially there-through, said coupling member being received in a counter-sunk recess in said end plate and including a groove means in



the external surface thereof, and said coupling assembly further comprising means, comprising a pair of straight, elongate pins disposed in parallel relationship, for cooperating with said groove means of said coupling member to provide locking of said coupling member in said countersunk recess in said end plate so as to prevent translation of said coupling member.

# 4,682,473 ELECTRONIC CONTROL AND METHOD FOR INCREASING EFFICIENCY OF HEATING AND COOLING SYSTEMS

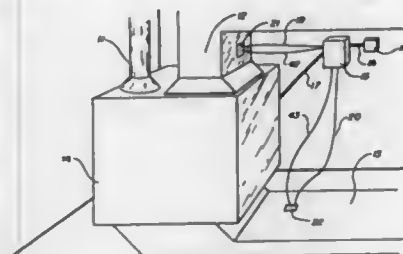
Charles F. Rogers, III, 10 Moraga Dr., Chico, Calif. 95927  
Division of Ser. No. 722,516, Apr. 12, 1985, Pat. No. 4,607,787.

This application Apr. 30, 1986, Ser. No. 858,378

Int. Cl.<sup>4</sup> F25D 17/06

U.S. Cl. 62—89

5 Claims



1. A method of increasing efficiency of a cooling system having a compressor, cooling coils, an inlet whereby air enters said cooling system, an outlet whereby air exits said cooling system, a fan which circulates air through said cooling system and a control for turning a said compressor and said fan on and off, comprising: positioning a first temperature sensing means in said outlet; measuring the time said compressor is on during normal operation of said cooling system in cooling a room from a first temperature to a second temperature; when cooling is again required, cycling said compressor on for a fractional period of said time said compressor is on during normal operation and off for a sufficient time for the head pressure of said compressor to equalize and continuing to operate said fan while said compressor is on and while said compressor is off until said room reaches a desired temperature; turning said fan off whenever said outlet reaches a third temperature before said room reaches said desired temperature, and

continuing said cycling until said room reaches said desired temperature.

# 4,682,474 TEMPERATURE RESPONSIVE BAFFLE CONTROL CIRCUIT FOR A REFRIGERATOR

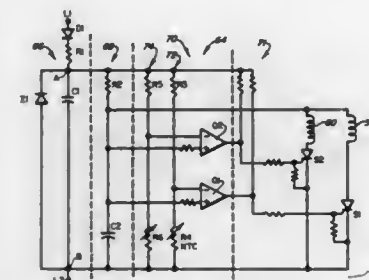
Donald E. Janke, Benton Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 28, 1986, Ser. No. 889,963

Int. Cl.<sup>4</sup> F25D 17/04; F24F 7/00

U.S. Cl. 62—187

18 Claims



1. A control for a refrigeration apparatus having air cooling means and a compartment to be cooled by air delivered thereto from the air cooling means, said control comprising: means defining an air flow passage between said air cooling means and said compartment; baffle means for selectively opening or closing said air flow passage; first and second alternatively operable solenoid means for moving said baffle means to selectively open and close said air flow passage; temperature sensing means for sensing the temperature in said compartment and generating a voltage corresponding to the sensed temperature; set point means for generating a voltage corresponding to a desired temperature; timer means repeatedly generating a voltage representing a cycle time; circuit means for comparing said voltage generated by said temperature sensing means with the voltage generated by said timer means, and comparing the voltage generated by said set point means with the voltage generated by said timer means, for selectively energizing either said first or said second solenoid coil once during each generated cycle time; and means for resetting said timer means to start a new cycle when said timer means voltage exceeds either said set point means voltage or said temperature sensing means voltage.

# 4,682,475 ICE MAKING APPARATUS

Kenneth L. Nelson, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Division of Ser. No. 694,612, Jan. 24, 1985, Pat. No. 4,574,593, which is a continuation-in-part of Ser. No. 570,610, Jan. 13, 1984, Pat. No. 4,576,016. This application Mar. 7, 1986, Ser. No. 837,411

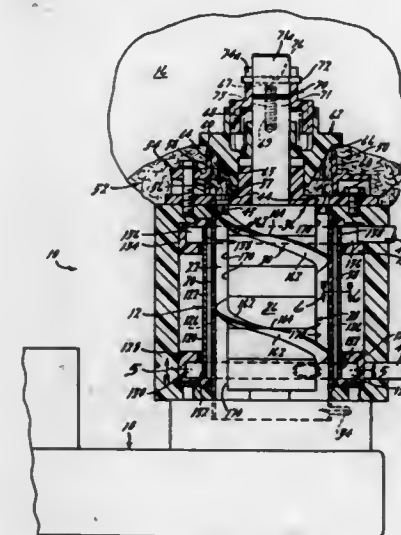
Int. Cl.<sup>4</sup> F25C 1/14

U.S. Cl. 62—354

31 Claims

1. In an ice-making apparatus including a housing defining a substantially cylindrical freezing chamber, refrigeration means adjacent the freezing chamber, means for supplying ice make-up water to the freezing chamber, an axially-extending auger rotatably mounted in the freezing chamber, the improvement wherein said auger includes a central body portion, at least one flight portion extending in a generally spiral path along at least a substantial part of the axial length of the periphery of said central body portion with the outer edges of said flight portion

being adapted to be disposed closely adjacent the inner surface of the housing in order to scrape ice particles therefrom as said auger is rotated, said flight portion being defined by at least a pair of axially adjacent discontinuous flight segments generally circumferentially spaced from one another and extending in a generally spiral direction along a part of said generally spiral path, said adjacent pair of said discontinuous flight segments being spirally misaligned relative to one another in order to



form a spiral non-uniformity therebetween, said spiral misalignment and said circumferential spacing of said adjacent discontinuous flight segments tending to break up the mass of ice particles scraped from the inner surface of the housing as said auger is rotated, said adjacent pair of discontinuous flight segments being interconnected by an interconnecting flight segment, said interconnecting flight segment extending in a direction generally transverse to said discontinuous flight segments.

# 4,682,476 THREE-PHASE HEAT PUMP

Didier Payre; Georges Crozat, and Bernard Spinner, all of Perpignan, France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

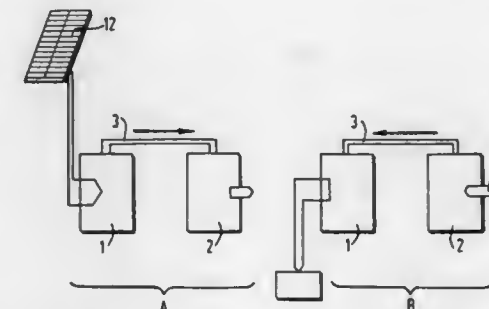
Filed Jun. 25, 1984, Ser. No. 623,964

Claims priority, application France, Jul. 1, 1983, 83 10955

Int. Cl.<sup>4</sup> F25B 17/08

U.S. Cl. 62—480

23 Claims



1. In a thermochemical heat pump enabling the transfer of calories from a first heat source (1, 4) to a second heat source (2, 5), using a reactive medium, the improvement comprising that the exchange of calories between one of the two sources and said reactive medium takes place by means of a reaction between a gas and a liquid phase, wherein the liquid phase is

selected from a liquid phase present in the group consisting of (1) a solid and a liquid solution saturated with said solid and (2) two non-miscible liquids, said reaction being monovariant.

4,682,477

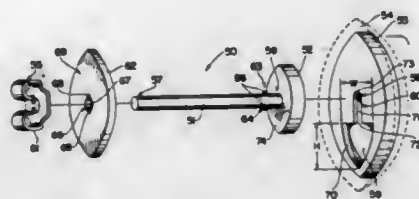
**CONVERTIBLE PIERCED-EARLOBE EARRING**  
Marilyn L. Vaillancourt, Old Never Sink Rd., Danbury, Conn. 06811

Filed Nov. 22, 1985, Ser. No. 800,746

Int. Cl.<sup>4</sup> A44C 7/00

U.S. Cl. 63—12

13 Claims



1. A convertible pierced-earlobe earring comprising:
  - (a) an elongate post having first and second ends and manufactured from a non-allergenic material and adapted to be passed through an earlobe;
  - (b) a substantially flat, decorative end member, manufactured from a non-allergenic material, and disposed at the first end of the post in a plane substantially perpendicular to the longitudinal axis of the post;
  - (c) an ornamentation adaptor member having ornamentation associated therewith and disposed adjacent the decorative end member, including means for releasably securing the ornamentation adaptor member to the decorative end member; the releasable securing means including a cavity disposed within the ornamentation adaptor member for receiving the decorative end member therein and retaining means having a transversely opening slot formed therein and extending along the rear side of said decorative end member when the decorative end member is received in the cavity with said post received in said slot for engaging an adjacent portion of the post; and
  - (d) means for locking the post and ornamentation adaptor members, having the decorative end member received therein, with respect to the earlobe, the locking means being disposed adjacent the second end of the post and manufactured from a nonallergenic material, whereby the visual appearance of the earring may be altered through use of different ornamentation associated with the ornamentation adaptor member.

4,682,478

**DEVICE FOR MAKING A NEW TYPE OF YARN**  
Gilbert Gauthier, Loire, France, assignor to Moulinsages Henri Lacroix, France

Filed Apr. 11, 1985, Ser. No. 721,922

Claims priority, application France, Apr. 24, 1984, 84 06620

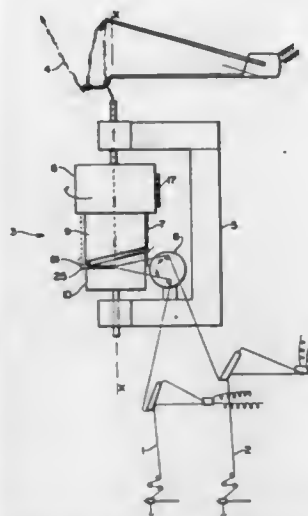
Int. Cl.<sup>4</sup> D04B 31/02

U.S. Cl. 66—81

3 Claims

1. A device for obtaining novelty yarns from at least two elementary yarns, said elementary yarns being connected to each other by a chain of stitches constituted by at least one of the two yarns, comprising, mounted on a common support disposed between the source of supply of the elementary yarns and the means for winding the novelty yarn formed:
  - a rotatable hollow spindle having an internal channel inside which passes the yarn made, said spindle supporting and rotating at least one knitting needle, said needle comprising a nose which is always in the same plane during the rotation of said spindle;

means for presenting at least one of the elementary yarns in the nose of the needle during the rotation of said spindle;



a fixed assembly for casting off stitches formed on said needle and guiding the novelty yarn obtained inside the internal channel of the hollow spindle.

4,682,479

**SEAMLESS KNIT COMPOSITE GARMENT BLANK AND METHOD**

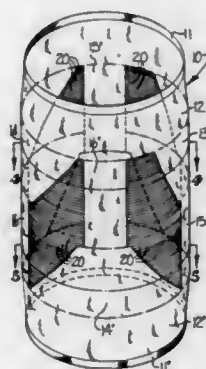
Bruce M. Pernick, 74-10 88th St., Glendale, N.Y. 11385

Filed Sep. 16, 1986, Ser. No. 907,808

Int. Cl.<sup>4</sup> A41B 9/00

U.S. Cl. 66—176

6 Claims



5. A method of knitting an elongate seamless knit composite garment blank including first and second individual garment blanks having portions in intermingling relationship, said method including the steps of

- (a) knitting a plurality of successive complete courses and forming a panty portion of said first individual garment blank,
- (b) knitting a plurality of successive partial courses in spaced-apart relationship and on opposite sides of said panty portion and forming fashioned front and rear sections of said first garment blank,
- (c) and while simultaneously knitting successive partial courses in spaced-apart relationship and between the partial courses forming said front and rear panels of said first garment blank and forming fashioned front and rear sections of said second garment blank, and while not knitting between said front and rear panels of both blanks whereby opposite ends of said simultaneously knit partial courses of said front and rear panels of said second garment blank are

- spaced from opposite ends of said simultaneously knit partial courses of said front and rear panels of said first garment blank, and
- (d) knitting a plurality of successive complete courses inter-knit with said front and rear fashioned sections of said second individual garment blank and forming a panty portion of said second individual garment blank.

4,682,480

**WARP-KNIT, WEFT-INSERTED FABRIC WITH SUBSTRATE AND METHOD AND APPARATUS TO PRODUCE SAME**

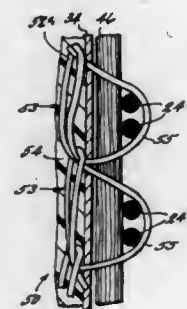
Julius Schnegg, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 4, 1985, Ser. No. 784,555

Int. Cl.<sup>4</sup> D04B 23/08

U.S. Cl. 66—192

11 Claims



1. A warp knit fabric comprising a substrate, plural warp yarns laid on a face of said substrate, plural weft yarns laid over said warp yarns and perpendicular to the warp direction, and plural stitch wales spaced-apart along the warp-wise direction of said fabric and being stitched through said substrate to hold said weft and warp yarns in position on said substrate; the stitch loops of the stitch wales disposed on one side of said substrate, and the stitch underlap disposed over said warp and weft yarns.

4,682,481

**PERSONAL LOCKING DEVICE**

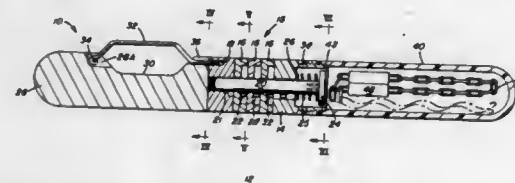
Gary S. Dimmick, Oakmont, and Scott Lockerman, Sewickley, both of Pa., assignors to Lockman Products Company, Inc., Pittsburgh, Pa.

Filed Jan. 13, 1986, Ser. No. 874,220

Int. Cl.<sup>4</sup> E05B 73/00

U.S. Cl. 70—14

8 Claims



1. A personal locking device comprising,
    - a safety pin,
    - a lock having a housing with a pin receiving recess formed to be axially aligned with said safety pin,
    - a lock element slidably received within said lock housing, said lock element being movable axially relative to said lock housing between a locked position and an unlocked position.
- said lock element having affixed thereon a safety pin housing, said safety pin retained by said pin housing for movement between an open position and a closed position wherein

said safety pin end is axially aligned with said pin receiving recess, and

said lock element and said lock housing coacting with said pin housing so that when said pin is in the closed position on said lock housing and said lock element is in the locked position the end of said pin is received within said pin receiving recess to thereby lock said pin in a closed position.

4,682,482

**DEADBOLT LOCK**

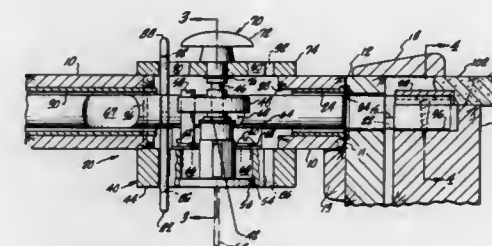
Marvin Z. Hall, 4535 E. Prieto Rd., Altadena, Calif. 91001

Filed Apr. 11, 1986, Ser. No. 850,957

Int. Cl.<sup>4</sup> E05B 65/06

U.S. Cl. 70—129

20 Claims



1. A deadbolt mechanism for a door having first and second opposed sides, the mechanism comprising:
  - (a) an elongated cylindrical bolt having a first transverse arcuate depression therein;
  - (b) means for guiding the bolt in the door between the first and second sides, the bolt being moveable from an extended position to a retracted position;
  - (c) a spindle unit having a cam for selectively engaging the first depression, the cam being rotatable between an engaged position securing the bolt in the extended position, and a released position permitting movement of the bolt; and
  - (d) handle means on the bolt for moving the bolt between the extended and retracted positions, the handle means protruding at least one side of the door.

4,682,483

**PERMUTATION LOCK**

Hans U. Werner, Solingen, Fed. Rep. of Germany, assignor to S. Franzen Sohne GmbH &amp; Co. KG, Solingen, Fed. Rep. of Germany

Filed Sep. 9, 1986, Ser. No. 905,234

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540533

Int. Cl.<sup>4</sup> E05B 37/02

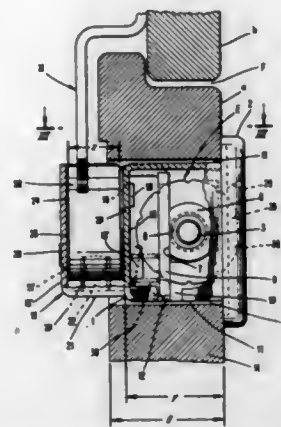
U.S. Cl. 70—312

11 Claims

1. In a permutation lock adapted to secure a hasp, said lock comprising a main housing having a front plate with a plurality of windows, a permutation setting mechanism including manually actuatable setting elements protruding through the windows, a plurality of rotary members operably connected to said setting elements, said rotary members each including an interruption on its outer periphery, a movable spring-biased locking element engageable with said rotary members in such manner that said locking element is situated in a locking position if any of said setting elements is off-combination and in an unlocking position if all of said setting elements are on-combination, a movable spring-biased locking bolt arranged for rotation between a locking position for securing the hasp and an unlocking position for releasing the hasp, said locking element when in its locking position preventing said bolt from moving from its locking position to its unlocking position, an ancillary housing connected to said main housing at a rear end thereof opposite said front plate, said bolt and its biasing spring being mounted in said ancillary housing, one of said main and ancillary housings including a wall between said locking bolt



and said locking element, said locking element including a lock portion arranged to project through an opening defined by a



region not covered by said wall, when said locking element is in its locking position, in order to prevent rotation of said bolt from its locking position to its unlocking position.

4,682,484

## TUMBLER PLATE CYLINDER LOCK

Ching-Hsuan Yeh, 4th Floor, No. 19, Lane 187, Nei Hu Road, Sec. 3, Taiwan, Taipei, Taiwan

Filed Apr. 15, 1986, Ser. No. 852,443

Int. Cl.<sup>4</sup> E05B 29/08

U.S. Cl. 70—364 R

3 Claims



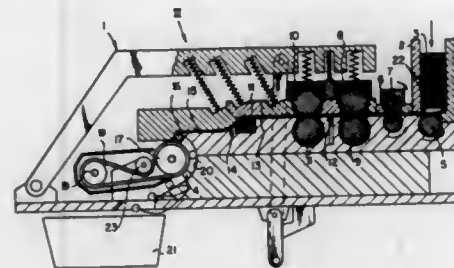
1. A tumbler plate cylinder lock comprising:
  - a housing having a first center bore and being provided with a plurality of longitudinal slots around the inner peripheral wall thereof;
  - a cylinder rotatably mounted into said first center bore and being provided with a second center bore;
  - a plurality of locking members snugly mounted within said second center bore, each of said locking members having a center opening and two extensions extending longitudinally and outwardly from said center opening, one side wall of each of said center openings being provided with a projection extending along the longitudinal axis thereof and having a length corresponding to the depth of a depression formed on the outer periphery surface of a shank of a key adapted to lock and open said cylinder lock;
  - guide means for spacing and guiding said locking members; and
  - a plurality of arciform shaped spring members, each spring member being interconnected between each two of said locking members to urge said pair of locking members in opposite directions to move along said guide means and cause one extension of a corresponding locking member to engage with a respective one of said longitudinal slots to prevent said cylinder from turning relative to said housing.

4,682,485  
**METHOD OF FORMING A CYLINDRICAL SLEEVE**  
 André A. F. L. Vanhille, Boechout, Belgium, assignor to Sobeml N.V., Lint, Belgium  
 Filed Oct. 15, 1984, Ser. No. 660,883  
 Claims priority, application Netherlands, Oct. 20, 1983, 8303615

Int. Cl.<sup>4</sup> B21D 11/00, 51/00

U.S. Cl. 72—133

9 Claims



1. The method of making a cylindrical sleeve from a plate of predetermined width, thickness and length so that the plate presents opposite side surfaces and opposite end edges, which comprises the steps of:
  - feeding the plate lengthwise while confined in its thickness dimension and terminating the confinement of the plate in its thickness direction while initiating deformation of the plate into final cylindrical form by progressively forcing one side surface of the emerging plate along an arcuate path of a length of at most one half the length of the plate and having a radius substantially equal to the radius of the sleeve to be formed; and
  - continuing the feeding of the plate until the opposite end edges of the plate are in substantially contiguous relation and the cylindrical sleeve has been formed.

4,682,486

## AMORPHOUS ALLOY TOROIDS

Fred Luborsky, Schenectady, and Daeyong Lee, both of Scotia, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1981, Ser. No. 303,339

Int. Cl.<sup>4</sup> B21C 47/00; H01F 7/06

U.S. Cl. 72—148

1 Claim



1. A method for providing an amorphous alloy non-circular toroid having improved soft magnetic properties comprising the steps of:
    - obtaining an amorphous alloy in a ribbon form; and
    - spirally winding said ribbon under tension to form a winding having a preselected number of turns
- by wrapping said ribbon in successive turns over at least two (2) spatially removed pole pieces with progressively less tension in said turns to minimize radially acting compressive stress over the volume of the toroid while maximizing

the curvature of said pole pieces; to minimize radially acting compressive stress in portions of the turns surrounding the pole pieces and thereby provide an amorphous alloy non-circular toroid having improved soft magnetic properties with a maximized packing fraction.

4,682,487

## METHOD FOR RECONDITIONING SPOT WELDING ELECTRODES

Werner Kaeseler, Meisenweg 8, D-3507 Baunatal-Altenritte, Fed. Rep. of Germany

Continuation of Ser. No. 591,923, Mar. 21, 1984, abandoned.

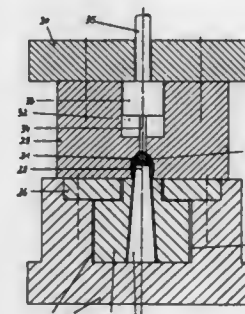
This application Feb. 14, 1986, Ser. No. 829,569

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310423

Int. Cl.<sup>4</sup> B21D 22/00; B23K 11/30, 35/00

U.S. Cl. 72—354

1 Claim



1. Method in two stages for reconditioning used spot welding electrodes having bores comprising in the first stage the steps of introducing a first punch having a head which has a slightly smaller external cross-section than the desired internal cross-section of the bore of the reconditioned electrode into a bore of a worn out electrode so that said head projects slightly less than the depth of the desired bore of the reconditioned electrode, pressing said worn out electrode by means of said first punch into a first die having a die bore of a slightly wider cross-section than the desired reconditioned electrode, during which pressing step the die being self-aligning to the electrode, and moving a slidably mounted concave front end die portion in the die bore and pressing said die portion against the worn out electrode to reform it to a desired shape, said method in the second stage further comprising the steps of introducing a second punch having a head which has the same cross-section and length as the desired bore of the reconditioned electrode into the bore of the electrode prepared in said first stage, and pressing said prepared electrode by means of said second punch into a second die corresponding in shape to the desired reconditioned electrode while the second die is self-aligning to the electrode.

4,682,488

## APPARATUS FOR FORMING SLIT FIN COILS

John R. McManus, Marcellus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 10, 1985, Ser. No. 690,435

Int. Cl.<sup>4</sup> B21D 9/07

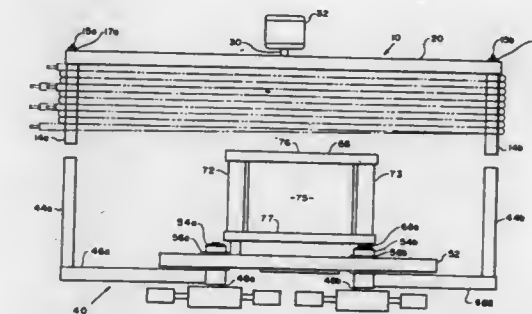
U.S. Cl. 72—387

2 Claims

1. Apparatus for forming a slit fin heat exchanger from a flat coiled, two row coil comprising:
  - a platen means having a planar portion and a plurality of cylindrical portions with at least one of said cylindrical portions being tangent to said planar portion;
  - a pair of spaced, cylindrical parallel mandrels spaced from and rotatable about a pair of spaced, adjustable, fixed parallel axes which are initially between and in a common plane with said mandrels and axially spaced from said platen means to prevent said axes from overlying said

platen means and with said common plane initially bisecting said mandrels into upper and lower portions and being always fixedly spaced from and parallel to said planar portion;

at least a portion of said mandrels extending axially beyond said fixed parallel axes so as to initially overlie a plane defined by said planar portion of said platen means and said bisected mandrels extending on either side of said common plane to initially define a first plane tangent to said lower portions of said mandrels and parallel to and intermediate said common plane and said planar portion, and a second plane tangent to said upper portions of said mandrels and parallel to said first plane and on the opposite side of said common plane as said first plane with said



first and second planes defining the location of a two row coil placed on said mandrels; and means for rotating said mandrels about said axes in opposite directions such that they move toward said platen means and each other such that said upper and lower portions of said mandrels which initially defined said first plane and said second plane sequentially become coplanar with said planar portion and then move past whereby a flat coiled, two row coil placed on said mandrels will be moved into contact with said planar portion of said platen means to cause nesting of the two rows of the coil with further rotation of said mandrels moving the coil into contact with said cylindrical portions to cause further forming of the coil.

4,682,489

## PROCESS FOR INCREASING THE FATIGUE STRENGTH OF COMPONENTS WITH DIFFERENT SHAPES OR DESIGNS

Hans Bauerle, Spitzwegstr. 13; Hansgeorg Peste, Am Schimmelberg 55, both of D-7080 Aalen 1, and Erwin Pohlner, Ahornweg 2, D-7099 Adelfmannsfelden, all of Fed. Rep. of Germany

Filed Nov. 12, 1985, Ser. No. 797,232

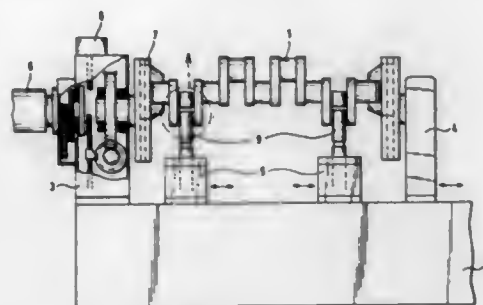
Int. Cl.<sup>4</sup> B21K 1/08

U.S. Cl. 72—460

5 Claims

1. Apparatus for increasing the fatigue strength of components, comprising:
  - (a) a base supporting a basic member,
  - (b) a bearing surface on the basic member for supporting a component,
  - (c) a clamp member mounted on and spaced from the basic member for interposing a component between them,
  - (d) resilient connector means interconnecting the basic member and clamp member for urging the clamp member resiliently toward the basic member for clamping a component therebetween,
  - (e) snap die means on the basic member movable toward and

away from a clamped component for cold forming the latter, and



(f) percussion drive means on the base engaging the snap die means for moving the latter to impact a component to be cold formed thereby.

4,682,490

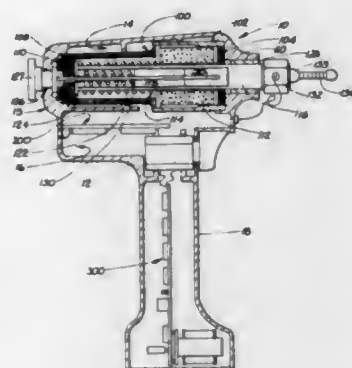
## IMPACT TEST INSTRUMENT

Roger A. Adelman, 1562 Wittlun Pl., Cincinnati, Ohio 45224, and David A. Corelli, 6527 Fountains Blvd., West Chester, Ohio 45069

Filed Jan. 31, 1985, Ser. No. 696,956  
Int. Cl.<sup>4</sup> G01M 3/30; G01M 7/00

U.S. Cl. 73-12

14 Claims



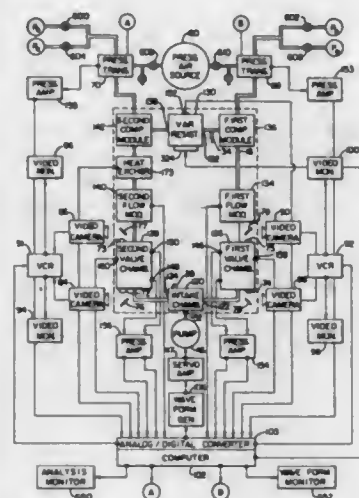
1. An impact test instrument for structural testing, comprising:

- (a) a housing;
- (b) movable means at least partially disposed in said housing for imparting a controlled and repeatable impact to an external structure whose position is stationary relative to said housing, said movable means including a force transducer for detecting the amplitude-time signature characteristics of the impact between the movable means and the external structure; and
- (c) pulse means responsive to an a.c. electrical source for triggering the movement of said movable means and initiating impact between said movable means and the external structure, said pulse means being adjustable to vary the total electrical energy of the application of a half wave of the a.c. power source to the movable means, said pulse means providing an isolated pulse having a maximum predetermined repetition rate whereby isolated impact can be imparted to a repeatedly precise location on said external structure.

4,682,491  
APPARATUS AND METHOD FOR TESTING  
PROSTHETIC HEART VALVES  
Murphy L. Pickard, 3250 Pierce St., Wheatridge, Colo. 80030  
Filed Feb. 19, 1986, Ser. No. 830,854  
Int. Cl.<sup>4</sup> G01M 19/00

U.S. Cl. 73-37

42 Claims



1. Apparatus adapt to test prosthetic heart valves under flow conditions of a fluid through a flow channel simulating a circulatory system into which the valves are to be used, comprising: an intake chamber for receiving said fluid having a fluid inlet, a first intake orifice and a second intake orifice; a first test chamber in fluid communication with said first intake orifice and defining a first test portion of said flow channel, said first test chamber including a first mounting fixture moveably received therein and having a first cavity adapted for securing a first heart valve whereby the first heart valve may be selectively moved from a passive position out of the flow channel and into a first test position interposed in said flow channel, said first mounting fixture having first dynamic sealing means for maintaining a fluid seal with said first test chamber as the first mounting fixture moves therein;
- a second test chamber in fluid communication with said second intake orifice and defining a second test portion of said flow channel, said second test chamber including a second mounting fixture moveably received therein and having a second cavity adapted for securing a second heart valve whereby the second heart valve may be selectively moved from a passive position out of the flow channel and into a second test position in said flow channel, said second mounting fixture having first dynamic sealing means for maintaining a fluid seal with said second test chamber as the second mounting fixture moves therein;
- a restriction chamber defining a restrictive portion of said flow channel and having first and second restriction chamber flow orifices, said restriction chamber including restriction means for selectively varying resistance to the flow of the fluid through the restriction chamber;
- first conduit means for interconnecting said first restriction chamber flow orifice and said first test chamber for fluid flow therebetween and defining a first conduit portion of said flow channel;
- second conduit means for interconnecting said second restriction chamber flow orifices and said second test chamber for fluid flow therebetween and defining a second conduit portion of said flow channel;
- first fluid pressure compensation means in fluid communication with the flow channel in said first conduit portion for selectively applying pressure to fluid therein and having a

first compensation reservoir adapted to receive excess fluid in the flow channel;

second fluid pressure compensation means in fluid communication with the flow channel in said second conduit portion for selectively applying pressure to fluid therein and having a second compensation reservoir adapted to receive excess fluid in the flow channel; and

pump means for cyclically pumping fluid alternately by a power stroke and a recovery stroke, said fluid being pumped during the power stroke through said fluid inlet towards said first and second test chambers whereby one of said first and second heart valves passes the fluid therethrough while the other one of said first and second heart valves resists fluid flow, fluid being pumped during the power stroke accumulating under pressure in said first and second compensation reservoirs, and during the recovery stroke whereby said one of the heart valves closes and the other one of the heart valves opens so that said first and second fluid pressure compliance means force fluid through the other one of heart valve back into said intake chamber, said restriction means being selectively adjustable to permit flow of a volume of fluid over a time period of one pump cycle which volume is equal to the volume of fluid displaced by the power stroke of the pump;

said intake chamber, said first and second test chambers, said restriction chamber, and said first and second conduit means forming the flow channel containing fluid for circulation therethrough.

4,682,492  
MEANS AND METHOD FOR DETECTING LEAKS IN  
TANKS

Marion C. Green, 1999 Amlidon, Suite 208, Wichita, Kans. 67203  
Filed Jul. 8, 1985, Ser. No. 752,841  
Int. Cl.<sup>4</sup> G01M 3/04

U.S. Cl. 73-49.2

20 Claims

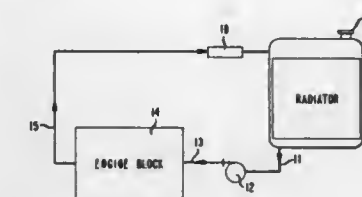


1. A system for detecting leaks in a tank means, or the like, comprising an excavation basin means in a ground having a surface and including a periphery and defining a generally saucer-like formation with a basin surface which slopes from said periphery;
- a tank means supported by said excavation basin means, said tank means having a permeation barrier means extending from the periphery of the basin excavation and supported by and conforming to the basin surface of the saucer-like formation, an impervious corrosion curtain means integrally bound to said permeation barrier means at the periphery of the basin and defining an upright side wall of the tank means, particulate matter means supported by said permeation barrier means, a liquid-impervious liner means continuously extending from the top of and down said corrosion curtain up-right side wall and across the top of the particulate material that is being supported by the permeation barrier means;
- a liquid-leakage receiver means positioned in said particulate matter;
- a monitor conduit means bound to said receiver means and piercing the barrier means and extending under the excavation basin means outwardly therefrom beyond the periphery of said excavation basin;
- and a leak-check tube means attached to said monitor conduit means under the ground and projected upwardly therefrom beyond the surface of the ground.

4,682,493  
COOLING SYSTEM MONITOR  
Martin Tenenbaum, Hartsdale, N.Y., assignor to Dakten Products Corp., Bronx, N.Y.  
Continuation of Ser. No. 532,368, Sep. 15, 1983, abandoned. This application Aug. 1, 1986, Ser. No. 892,894  
Int. Cl.<sup>4</sup> G01M 15/00

U.S. Cl. 73-118.1

7 Claims

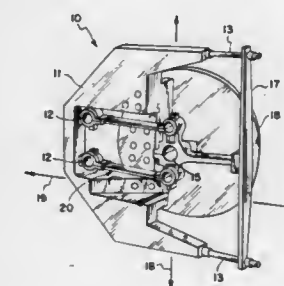


7. Apparatus for monitoring the cooling system of a liquid-cooled internal combustion engine having a radiator and a conduit in fluid communication with an upper section of the radiator, said apparatus comprising:
  - (a) a housing adapted to be connected in line with the conduit at the same level as the upper section of the radiator such that liquid may flow through said housing;
  - (b) means for providing a visual indication of the level of liquid within the upper section of the radiator;
  - (c) means for indicating the rate of flow of said liquid in said housing;
  - (d) means for indicating the pressure of said liquid in said housing; and
  - (e) means for indicating the temperature of said liquid in said housing.

4,682,494  
AIRFOIL FLUTTER MODEL SUSPENSION SYSTEM  
Wilmer H. Reed, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.  
Filed Jul. 30, 1986, Ser. No. 890,575  
Int. Cl.<sup>4</sup> G01M 9/00

U.S. Cl. 73-147

11 Claims



1. A wind tunnel model suspension system for testing flutter comprising:
  - a mounting bracket assembly for attaching the suspension system to the outside of a wind tunnel;
  - a drag-link assembly having a forward end pivotally attached to said mounting bracket assembly and having a rearward end configured for attachment of an airfoil test model;
  - pitch springs attached to said drag-link assembly allowing pitch oscillation at low stiffness;
  - plunge springs attached to said drag-link assembly providing a low stiffness system that will accommodate large steady lift forces without the need for large static spring deflections to counteract such forces;
  - a compression spring attached to said drag-link assembly and



acting in opposition to said plunge springs so as to allow adjustment of plunge stiffness; whereby an airfoil may be tested at various angles-of-attack and airloads while maintaining low resistance to pitch and plunge flutter modes.

4,682,495

## TESTING DEVICE FOR PILOT VALVES

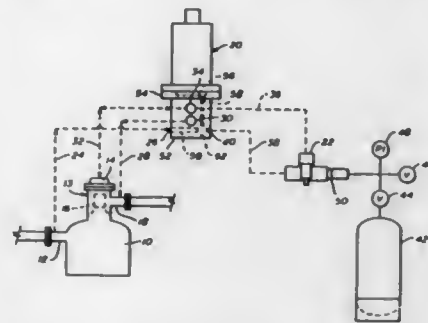
Michael D. McNeely, Katy, Tex., assignor to Anderson, Greenwood & Company, Houston, Tex.

Filed May 14, 1986, Ser. No. 863,080

Int. Cl.<sup>4</sup> F16K 37/00; G01M 19/00

U.S. Cl. 73-168

15 Claims



1. In a fluid system having a non-flowing pilot valve for controlling a main pressure relief valve having a dome and pressure responsive element therein, the pilot valve having a fluid inlet sensing chamber including a fluid inlet line thereto, a fluid outlet chamber, and an intermediate fluid chamber between said inlet and outlet chambers in fluid communication with the dome of the main relief valve;

a fluid testing device for testing the functioning of said pilot valve in controlling the main relief valve, said testing device comprising:

a body having a test fluid inlet adapted to be connected to a test fluid pressure source for supplying test fluid to the testing device;

a fluid responsive shuttle valve member positioned within said fluid inlet line to the fluid inlet sensing chamber of said pilot valve, said shuttle valve exposed on opposite sides thereof to operating fluid pressure from said inlet line and test fluid pressure from said test inlet, said shuttle valve member movable by the higher fluid pressure between one position permitting fluid flow between the operating fluid pressure source and the fluid sensing chamber while blocking fluid flow from said test inlet, and a second position permitting fluid flow from the test inlet to the sensing chamber while blocking fluid flow from the operating fluid pressure source; and

a separate valve element between the test inlet and said shuttle valve member being actuated at a predetermined high test fluid pressure from the test inlet thereby to simulate the action of the pressure responsive element in the dome of said pressure relief valve.

4,682,496

## FLOW RATE DETECTING APPARATUS HAVING SEMICONDUCTOR CHIPS

Kazuhiko Miura, Aichi; Tadashi Hattori; Yukio Iwasaki, both of Okazaki; Tokio Kohama, Nishio, and Kenji Kanehara, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 10, 1985, Ser. No. 690,245

Claims priority, application Japan, Jan. 18, 1984, 59-7591

Int. Cl.<sup>4</sup> G01F 1/68

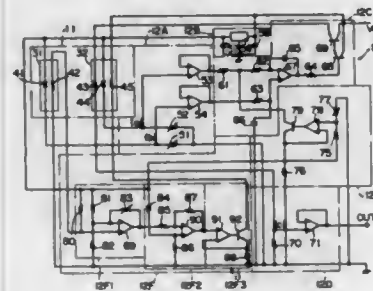
U.S. Cl. 73-204

7 Claims

1. A flow rate detecting apparatus comprising:  
a first semiconductor structure, arranged at a first position in a flow path to be flow rate detected, including a first temperature detection element for detecting ambient air

temperature, and a first temperature control heater constituted by a diffusion resistance portion of said semiconductor structure for heating air in the vicinity of said first heater and providing a voltage signal in response to ambient air temperature;

a second semiconductor structure, arranged at a second position in said flow path downstream of said first semiconductor structure, including a second temperature control heater producing heat by a flow of current therein, said second temperature control heater having a resistance that is a function of ambient air temperature, a preliminary heater controlled to generate heat in response to a change of voltage across said first temperature control heater, and a second temperature detection element for detecting heat generated by said second temperature control heater and



said preliminary heater, said second temperature control heater and said preliminary heater being constituted by diffusion resistance portions of said second semiconductor structure;

a first current conduction control means for controlling current conduction through said preliminary heater so as to maintain constant heat generation by said preliminary heater;

a second conduction control means for controlling current conducting through said second temperature control heater on the basis of the temperature detected by said first and second temperature detection elements; and output means for outputting a signal that is a function of the state of current conduction through said second temperature control heater which signal provides an indication of flow rate.

4,682,497

## ULTRASONIC IMAGING APPARATUS

Hiroshi Sasaki, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

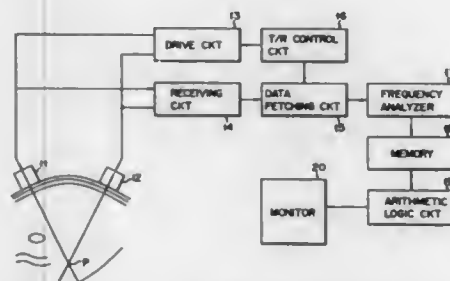
Filed Mar. 3, 1986, Ser. No. 835,195

Claims priority, application Japan, Mar. 4, 1985, 60-43248

Int. Cl.<sup>4</sup> G01N 29/04

U.S. Cl. 73-602

9 Claims



1. An apparatus for examining the characteristics of a target P within an object comprising:  
first and second ultrasonic transducers spaced apart by a preselected distance for converting electrical signals into

ultrasonic pulses and for converting received ultrasonic echoes into electrical echo signals;  
means coupled with said first ultrasonic transducer for causing said first ultrasonic transducer to emit an ultrasonic pulse along a first beam axis toward a target P within the object;

receiving means coupled with said first and second ultrasonic transducers for receiving a first echo signal corresponding to the ultrasonic pulse reflected from said target P along the first beam axis and a second echo signal corresponding to the ultrasonic pulse scattered at the target P and travelling along a second beam axis which intersects at a predetermined angle with the first beam axis and extends to said second transducer; and

comparing means coupled with said receiving means for comparing the first echo signal and the second echo signal and obtaining from the comparison angular dependency characteristic of the scattering of pulses at the target P, free from the influence of attenuation and scattering along the path to and from the target P.

4,682,498

## SURFACE TESTING APPARATUS

Ing. H. Kreiskorte, Dortmund, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Essen, Fed. Rep. of Germany

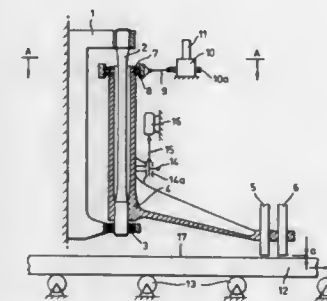
Filed Jun. 24, 1986, Ser. No. 877,846

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524106

Int. Cl.<sup>4</sup> G01N 29/00

U.S. Cl. 73-618

10 Claims



1. A surface testing apparatus comprising: at least one sensor (5, 6, 104, 205, 305) for testing a surface (17), carrier means (4, 103, 204, 301) for carrying said sensor, means for reciprocatingly moving said carrier such that said sensor is reciprocatingly moved over said surface, said moving means being constructed as a vibratory system having a natural frequency and including said carrier, and an exciter means (14, 14a, 15 or 21, 22, 23, 24, 25, respectively) for operating said vibratory system at or in the neighborhood of its natural frequency such that said sensor is moved over said surface with said natural frequency or with a frequency in the neighborhood thereof.

4,682,499

## PRESSURE TRANSMITTER

Gerald S. Baker, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed May 9, 1986, Ser. No. 861,457

Int. Cl.<sup>4</sup> G01L 7/16

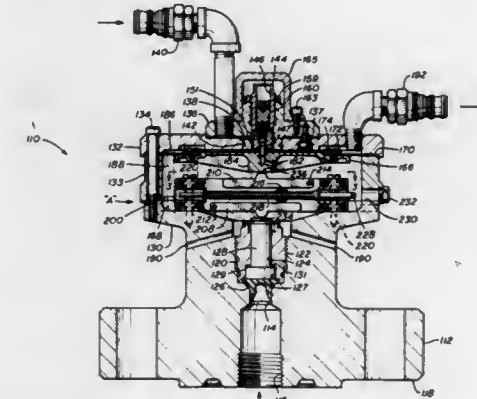
U.S. Cl. 73-701

4 Claims

1. A pressure transmitter comprising  
a body having a bore therethrough,  
a bonnet secured to said body in covering relationship to one end of said bore,  
pressure responsive means mounted in said bore and extending beyond the end thereof which is covered by said bonnet,

pressure responsive means carried by said bonnet having a pressure output,  
means for delivering signal pressure to the end of said bore not covered by said bonnet,  
means for delivering a supply of fluid pressure to said bonnet pressure responsive means, and

means interposed between the extending end of said body pressure responsive means and said bonnet pressure responsive means to adjust the force transmitted to the bonnet pressure responsive means from said body pressure responsive means to calibrate the range of said bonnet pressure responsive means output,



said adjusting means includes

a spacer ring secured between said body and said bonnet, a frame supported within said spacer ring,  
a pair of levers pivotally mounted to said frame with one lever in engagement with the extending end of said body pressure responsive means and the other lever in engagement with the bonnet pressure responsive means,  
a movable cylinder between said levers, and  
means for moving said cylinder along said levers to change their effective lever arms.

4,682,500

## PRESSURE SENSITIVE ELEMENT

Kazutaka Uda, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

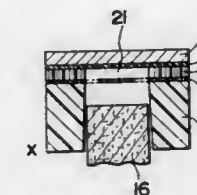
Filed Apr. 7, 1986, Ser. No. 848,930

Claims priority, application Japan, Apr. 11, 1985, 60-78003

Int. Cl.<sup>4</sup> G01L 7/08, 9/00

U.S. Cl. 73-705

4 Claims



1. A pressure sensitive element which comprises:

a pair of light reflecting thin films formed through a thin film producing process and composing a Fabry-Pérot resonator which is arranged so as to face a light transmitting system; and  
a pressure deforming member laminated on said light reflecting thin films;  
wherein an optical path difference is formed in accordance with an interval of an air gap located between said pairs of light reflecting thin films, said interval of said air gap

changing by the deformation of said pressure deforming member.

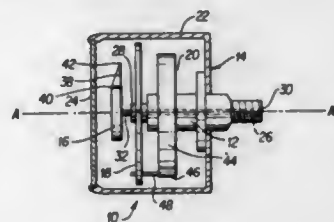
4,682,501

# TEMPERATURE COMPENSATED BOURDON TUBE GAUGE

Thomas Walker, 15608 Pamela, Silver Spring, Md. 20904  
Filed Apr. 11, 1985, Ser. No. 721,838  
Int. Cl.<sup>4</sup> G01L 7/04, 19/04

U.S. Cl. 73-708

11 Claims

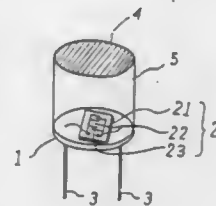


1. A temperature-compensated Bourdon tube gauge for indicating a parameter of a pressurized fluid, comprising:
  - a support structure, including an axis;
  - a Bourdon tube having a fixed open end connected to receive said pressurized fluid and affixed to said support structure and having a free closed end;
  - an indicating member, connected to said free end of said Bourdon tube so that movement of said free end causes a corresponding movement of said indicating member relative to said support structure, said indicating member comprising a pointer which is movable in rotation about said axis by the free end of said Bourdon tube;
  - a dial member having a parameter scale disposed adjacent and extending along the path of motion of said indicating member, said dial member being pivotally connected to said support structure for rotary movement about said axis; and
  - temperature-responsive means for moving said dial member about said axis in accordance with a temperature sensed by the temperature-responsive means such that said indicating member indicates said parameter on said scale, wherein said temperature-responsive means comprises
    - a bimetallic element having a fixed end attached to said support structure and a free end which is movable along a predetermined path in accordance with a temperature sensed by the bimetallic element,
    - a cam which is affixed to said support structure and which includes a curved cam surface extending about said axis,
    - a lever extending across said cam surface from an input end to an output end,
    - restraining means for maintaining said lever in contact with said cam surface, and
    - connecting means for connecting the lever input end to the free end of said bimetallic element and the lever output end to said dial element so that movement of the free end of said bimetallic element produces a corresponding movement of said dial member about said axis, said cam surface serving as a fulcrum for said lever, the position of said fulcrum varying along the length of the lever in accordance with the position of the free end of said bimetallic element and the shape of said cam surface.

4,682,502

# PRESSURE SENSOR

Shuji Miyoshi, and Masaya Hijikigawa, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan  
Filed Aug. 12, 1985, Ser. No. 764,568  
Claims priority, application Japan, Aug. 22, 1984, 59-175610  
Int. Cl.<sup>4</sup> G01L 7/06, 7/08, 9/02  
U.S. Cl. 73-723 9 Claims



1. A pressure sensor comprising an air-tight container, having water vapor enclosed therein, which elastically deforms depending upon a variation in the external pressure to result in a variation in the content volume thereof, said container including a rigid base member and a further portion air-tightly connected to said base member and being at least partially elastically deformable in response to a variation of the external pressure; a moisture sensor disposed within said further portion of said container; and a moisture detector which electrically detects a variation in the amount of moisture to be absorbed by said moisture sensor depending upon the internal partial pressure of water vapor in said container due to the elastic deformation of said container.

4,682,503

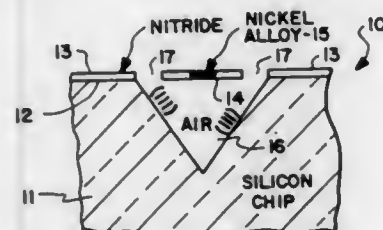
# MICROSCOPIC SIZE, THERMAL CONDUCTIVITY TYPE, AIR OR GAS ABSOLUTE PRESSURE SENSOR

Robert E. Hlgashl, Bloomington; Steven D. James, Edina; Robert G. Johnson, Minnetonka, and Ernest A. Satren, Bloomington, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 16, 1986, Ser. No. 863,892  
Int. Cl.<sup>4</sup> G01L 21/12

U.S. Cl. 73-755

20 Claims



8. A microbridge absolute pressure sensor for air or gas comprising:
  - a silicon microbridge having formed thereon a thin film layer of silicon nitride, said chip having its surface lying in a (100) plane, said chip having a <110> direction along said plane,
  - an elongated V-shaped groove anisotropically etched into said silicon from said surface, said elongated groove having elongated edges oriented in said <110> direction, said microchip having an elongated silicon nitride bridging element which has its long edges parallel and proximate to said groove elongated edges, the bridging element having on it a sensor element, said bridging element being attached to said layer at diagonally opposite segments of the long edges,
  - an electrically resistance sensor strip formed in said bridging

element and extending the length of said bridging element, said strip being adapted to be heated by current flowing therethrough to raise the temperature of said bridging element.

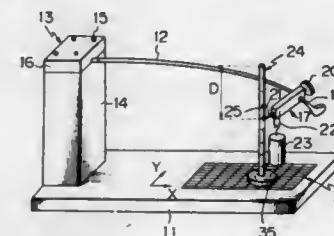
4,682,504

# DEVICE FOR MEASURING A STIFFNESS OF A GOLF-CLUB SHAFT

Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan  
Filed Jul. 30, 1986, Ser. No. 890,589  
Claims priority, application Japan, Jul. 31, 1985, 60-167421  
Int. Cl.<sup>4</sup> G01N 3/20, 3/00

U.S. Cl. 73-854

8 Claims



1. A device for measuring a stiffness of a golf-club shaft, comprising:
  - a clamp means for holding one end of said golf-club shaft to be measured so that when said one end of said shaft is held by said clamp means, a longitudinal axis of said shaft is located substantially perpendicular to a vertical axis of said clamp means, and the other end of said shaft remote from said clamp means is unsupported;
  - a pointer member having a tip end and a root portion, said root portion being detachably attached to said golf-club shaft at a position adjacent to said unsupported end of said shaft in such a manner that when said root portion is attached to said shaft, said tip end is located substantially on a horizontal plane with said root portion thereof perpendicular to longitudinal axis of a said golf-club shaft;
  - a counterweight detachably attached to said tip end of said pointer member for supplying a predetermined flexure and torsion load to said golf-club shaft through said pointer member; and
  - a vertical displacement measuring means for measuring the amount of a vertical displacement of said tip end of said pointer member produced by a torsion and flexure of said golf-club shaft when said predetermined load of said counterweight is applied to said golf-club shaft through said pointer member.

4,682,505

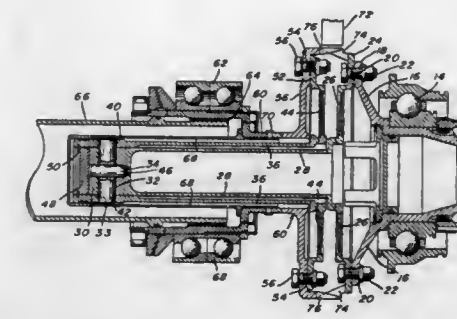
# COMPACT TORQUE MEASUREMENT SYSTEM

Pierre Morissette, Alexander W. Stewart, both of St. Lambert, and Keith H. Taylor, Candiac, all of Canada, assignors to Pratt & Whitney Canada Inc., Longueuil, Canada  
Filed Dec. 13, 1985, Ser. No. 808,480  
Int. Cl.<sup>4</sup> G01L 3/10

U.S. Cl. 73-862.34

4 Claims

1. A torque measuring device adapted to be connected to an output shaft of an engine, the torque measuring device comprising at least first and second shaft members, the first shaft member adapted to be coupled at one end thereof to the output shaft of the engine, the second shaft member being tubular and concentric with the first shaft member, with one end of the second shaft member fixedly connected to the other end of the first shaft member, the other end of the second shaft member being adjacent said one end of the first shaft member, and a third shaft member coupled at one end thereof to the other end of the second shaft member, and the third shaft member being tubular and concentric with the first and second shaft members and being adapted to be coupled with an input shaft of means



the input shaft of the means to be driven, and detection means associated with the one end of the first shaft member and the other end of the second shaft member to measure the relative phase displacement thereof and thus the magnitude of torque.

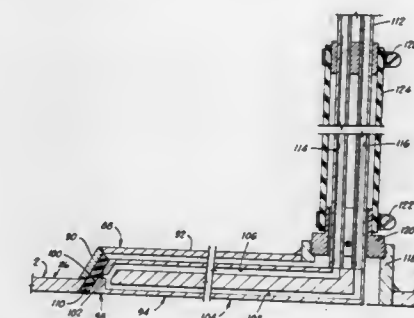
4,682,506

# AUTOMATIC MATERIAL SAMPLER

Dennis A. Wienck, and Danny K. Mints, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.  
Filed Nov. 6, 1985, Ser. No. 795,394  
Int. Cl.<sup>4</sup> G01N 1/02

U.S. Cl. 73-863.54

8 Claims



1. An apparatus for sampling material flowing through a pressurized conduit, comprising:
  - housing means for receiving therethrough a pressurized flow of the material as the material flows through the conduit, said housing means including cross-section defining means for defining a full cross-sectional sample area, and connector means for connecting said cross-section defining means to the conduit so that the cross-sectional sample area defined by said cross-section defining means is aligned with the cross-section of the conduit; and
  - sampler means, connected with said housing means, for collecting a full cross-sectional sample of the material as the material flows through said cross-section defining means of said housing means under pressure, said sampler means including:
    - a collection member disposed in said housing means having an elongated inlet element with inlet means for receiving a portion of the flowing material;
    - movement means for moving said collection member from a location outside the full cross-sectional sample area of the material across the full cross-sectional flow sample area of the material, so that said inlet means receives a portion of said flowing material as it passes thereacross; and
    - a flow line connected to said collection member, said flow line having a first sample flow channel and a first purge channel defined therein;



said inlet element of said collection member having a second sample flow channel defined therein in communication with said inlet means and said first sample flow channel, and a second purge channel defined therein in communication with said inlet means and said first purge channel.

7. An apparatus for sampling material flowing through a pressurized conduit, comprising:

a substantially cylindrical housing means for receiving there-through a pressurized flow of the material as the material flows through the conduit, said housing means including cross-section defining means for defining a full cross-sectional sample area in a non-concentric position with respect to the axis of said substantially cylindrical housing means, and connector means for connecting said cross-section defining means to the conduit so that the cross-sectional sample area defined by said cross-section defining means is aligned with the cross-section of the conduit; and sampler means, connected with said housing means, for collecting a full cross-sectional sample of the material as the material flows through said cross-sectional defining means of said housing means under pressure, said sampler means including:

a collection member disposed in said housing means including a shaft disposed substantially along said axis of said housing means and a plurality of vanes connected to said shaft and extending substantially radially therefrom in spaced relation to each other so that any two adjacent vanes define an area which includes the cross-sectional area of the pressurized flow of the material, each of said vanes including a wiper member at the outermost radial extent thereof in contact with the inner substantially cylindrical wall of said housing means;

rotational movement means for rotating the shaft of said collection member whereby said vanes are moved from a location outside the full cross-sectional sample area of the material, across the full cross-sectional, pressurized flow sample area of the material; and sample receiving means including a flow line communicating with the interior of said housing means through the substantially cylindrical wall thereof and located in a circumferentially offset position from said full cross-sectional sample area, and a sample container means for receiving said material from said flow line.

4,682,507

#### MATERIAL SAMPLING APPARATUS

Michael S. Terrell, Charlotte, N.C., assignor to Duke Power Company, Charlotte, N.C.

Filed Jul. 16, 1984, Ser. No. 631,086

Int. Cl.<sup>4</sup> G01N 1/12, 1/20

U.S. Cl. 73—863.57

9 Claims



1. An apparatus for removing a sample from a moving stream of a material flowing in a predetermined direction through a conduit and delivering said sample to a deposit location outside said conduit, said apparatus comprising:

a. valve means disposed in said conduit for collecting said material sample, said valve means including a fixed valve housing defining an interior sample collection chamber, a port in said housing facing in an upstream direction relative to said direction of material conveyance for passage therethrough into said collection chamber of a portion of said material as said sample, and a valve member selectively movable relative to said collection chamber between positions opening and closing said port for permit-

ting and preventing passage of said material through said port;

b. discharge conduit means communicating with said collection chamber and extending therefrom to said deposit location for conveying said sample thereto; and

c. means for directing a pressurized fluid through said material collection chamber and into said conduit means for expelling said material sample from said collection chamber and carrying said sample through said conduit means, whereby said sample is collected and conveyed to said deposit location without manual handling of said sample to aid in preventing escape thereof.

4,682,508

#### INLET VALVE FOR PROBE APPARATUS

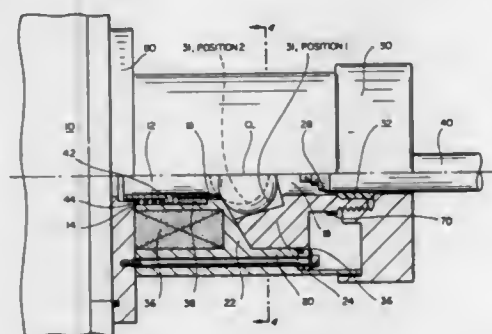
Urs Steiner, Sunnyvale; James Hurst, San Jose, and J. Alan Schler, Menlo Park, all of Calif., assignors to Finnigan Corporation, San Jose, Calif.

Filed Mar. 6, 1986, Ser. No. 840,513

Int. Cl.<sup>4</sup> F16K 31/06

U.S. Cl. 73—866.5

9 Claims



9. A method for probe analysis wherein an apparatus includes a vacuum chamber, a forechamber, an access inlet between said chambers, and an entry inlet preceding the forechamber, said chambers and inlets forming a channel, including a magnetic body comprising the steps of:

evacuating said vacuum chamber so that a pressure differential is developed between said vacuum chamber and said forechamber;

actuating an electromagnet means to move said magnetic body to a first position to seal the access inlet and thereby close the channel between said chambers;

inserting a sampling device or probe device into said entry inlet;

evacuating said forechamber to reduce said pressure differential so that the magnetic body moves to a second position away from said access inlet by gravity force, thereby opening the channel between said chambers; and

fully inserting said device through said forechamber and access inlet and into said vacuum chamber for conducting a desired analysis.

4,682,509

#### ADJUSTABLE HANDLEBAR FOR BICYCLE

Kikuzo Takamiya, Kitamoto, and Hideyuki Ishibashi, Ageo, both of Japan, assignors to Bridgestone Cycle Co., Ltd., Tokyo, Japan

Division of Ser. No. 486,869, Apr. 20, 1983, abandoned. This application Jun. 6, 1985, Ser. No. 742,224

Claims priority, application Japan, Apr. 22, 1982, 58-66356; Apr. 22, 1982, 58-66357; May 27, 1982, 58-88771; Mar. 2, 1983, 59-32923

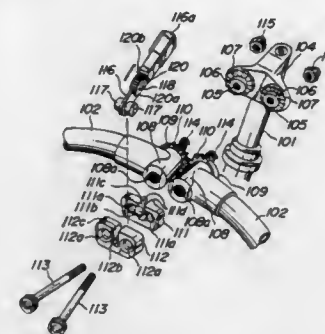
Int. Cl.<sup>4</sup> B62K 21/16

U.S. Cl. 74—551.4

8 Claims

1. An adjustable handlebar for a bicycle, comprising two handlebar members whose adjacent ends are pivotally sup-

ported by two fasteners extending from an upper portion of a handlebar stem, gear teeth formed on said adjacent ends of the handlebar members and in mesh with each other such that when one of said handlebar members is pivotally moved about one of said fasteners, the other handlebar member is also pivotally moved about the other fastener, anchoring means provided between engaging surfaces of said upper portion of said handlebar stem and of said adjacent ends of said handlebar members for anchoring said handlebar members, and a cam and cam follower assembly having a lever for engaging and disengaging said anchoring means, said cam and cam follower assembly comprising a cam holder adjacent to and in front of



said adjacent ends of said handlebar members, and a retainer plate adjacent to and in front of said cam holder, said cam holder and retainer plate including opposed recesses to form in their adjacent portions a cam fitting cylindrical space, said fasteners passing through said cam holder and said retainer plate so as to permit said holder and plate to slide thereon when the fasteners are loosened, and a cam lever formed at one end with ellipsoid-shaped cams extending in lateral directions and received in said cam fitting cylindrical space to move said cam holder away from said retainer plate when said ellipsoid-shaped cams are rotated in said cylindrical space by moving said cam lever.

4,682,510

#### HIGH TORQUE DRIVE MEANS FOR TWO CLOSELY SPACED SHAFTS WHICH ARE ALSO SUBJECTED TO STRONG AXIAL THRUSTS AND APPLICATION THEREOF TO A DOUBLE SCREW EXTRUDER

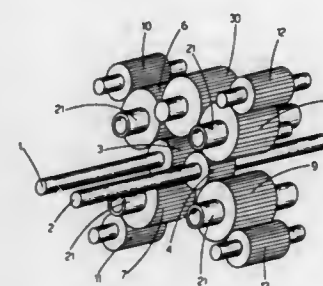
Stefano De Bernardi, Busto Arsizio, Italy, assignor to Bausano & Figli S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 599,100, Apr. 11, 1984, abandoned. This application Jun. 21, 1984, Ser. No. 622,828

Int. Cl.<sup>4</sup> F16H 37/06

U.S. Cl. 74—665 N

15 Claims



1. An apparatus for rotationally driving two closely spaced shafts, comprising:

a driven gear on each shaft, each said driven gear being driven by two separate drive gears;

a separate drive means for driving each respective drive

gear, each said separate drive means including a motor means;

synchronizing means for constraining each of said two closely spaced shafts to rotate at the same speed; and said synchronizing means comprises an idler gear, said idler gear engaging a corresponding terminating gear, each said terminating gear being driven by said drive means, and a first pair of said terminating gears driving a first driven gear and a second pair of said terminating gears driving a second driven gear.

4,682,511

#### GEAR ASSISTED CONTINUOUSLY VARIABLE TRANSMISSION

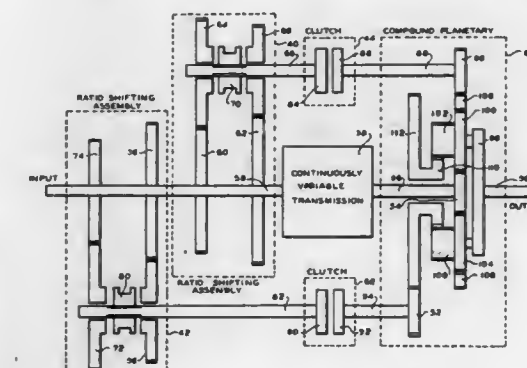
Ernest C. Wittke, 585 Bloomfield Ave., Apt. 40, W. Caldwell, N.J. 07006

Filed Oct. 18, 1985, Ser. No. 788,869

Int. Cl.<sup>4</sup> F16H 37/06

U.S. Cl. 74—681

10 Claims



1. A transmission system comprising:

a plurality of power transmission paths;

a continuously variable speed ratio transmission in one of said paths having a first input means adapted to be driven by an external prime mover, and a first output means;

a first ratio changing mechanism having a second input means adapted to be driven by said prime mover and having a second output means;

a second ratio changing mechanism having a third input means adapted to be driven by said prime mover and having a third output means, at least one of said ratio changing mechanisms having a plurality of selective ratios other than zero selectively engageable in a respective path;

a compound planetary mechanism including fourth, fifth and sixth input means, and a fourth output means providing an output from said transmission system, said first output means being coupled to said fourth input means, said second output means being coupled to said fifth input means, and said third output means being coupled to said sixth input means;

first coupling means for selectively engaging and disengaging one of said paths between said prime mover and said fifth input means, and second coupling means for selectively engaging and disengaging another of said paths between said prime mover and said sixth input means; and control means for disengaging one of said first and second coupling means in one of said paths when the other of said coupling means is engaged in the other of said paths, said control means providing a selection of ratios of said first and second ratio changing mechanisms such that the ratio of said continuously variable transmission can be alternately decreased and increased respectively with alternate successive ratios of said first and second ratio changing mechanisms without resetting of said continuously variable transmission ratio during the changing of said ratios.

4,682,512

**POWER TRAIN FOR HEAVY LIFT HELICOPTERS**

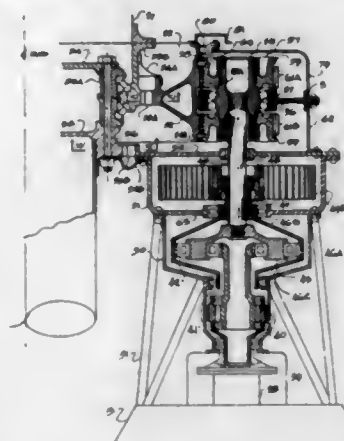
Carlton G. Peterson, P.O. Box 27345, Tempe, Ariz. 85282

Filed Sep. 30, 1985, Ser. No. 781,336

Int. Cl.<sup>4</sup> F16H 57/00, 37/06

U.S. Cl. 74—410

27 Claims



1. An ultra lightweight mechanical shaft-horsepower type power transmission for use in supporting and driving heavy lift helicopters comprising:

- a rotatable power output ring gear;
- bearingless mounting means solely supporting said rotatable power output ring gear at the pitch diameter of its teeth;
- propulsion means parallel and radially disposed with the rotatable axis of said ring gear and operably coupled in load bearing and driving relationship to said rotatable power output ring gear via said mounting means; and
- said mounting means providing multiple power inputs to said rotatable power output ring gear in order to provide multiple torque load paths thereto.

4,682,513

**REPAIR KIT FOR DETENT CABLES**

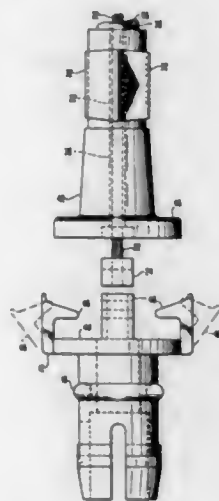
Leonard J. Reeder, 8055 Greenleaf Ter. - Apt. T1, Glen Burnie, Md. 21061

Filed Jun. 24, 1985, Ser. No. 747,575

Int. Cl.<sup>4</sup> F16C 1/26

U.S. Cl. 206—223

2 Claims



1. A repair device for a detent cable, comprising, a substitute detent cable end, said substitute detent cable end having a lower portion and an upper portion, said lower portion of said detent cable end being configured substantially like the lower portion of an original detent

cable end, said upper portion of said detent cable end having an interface flange means and a plurality of equally spaced connector tab means, said interface flange means, said interface flange means being formed integral with said lower portion of said substitute detent cable end and having a periphery, said plurality of connector tab means being spaced apart around the periphery of said interface flange means and being flexibly hinged to and formed integral with said interface flange means, said plurality of equally spaced, connector tab means flexibly hinged to said interface flange means being snapped into a position which rigidly affixes said substitute detent cable end to a remainder of a detent cable end that is being repaired, said interface flange means having an upper interface surface; a replacement O-ring, said replacement O-ring being removably affixed to said lower portion of said substitute detent cable end; and

a sealant means, said sealant means being suitably applied to said upper interface surface of said interface flange means wherein said lower portion of said substitute detent cable end consists of a main body means and a plurality of finger-like tab means, said plurality of finger-like tab means being formed integral with said main body means, said main body means having a passageway formed therethrough, said interface flange means having a centrally located aperture formed therein, said passageway in said main body means communicating with said aperture in said interface flange means, said main body means having a channel-like depression formed externally therearound, and said replacement O-ring being removably located in said channel-like depression.

4,682,514

**TOE CLIP FOR BICYCLE PEDALS**

Mario Jona, Rubano, Italy, assignor to Campagnolo S.p.A., Rubano, Italy

Continuation of Ser. No. 663,683, Oct. 18, 1984, abandoned.

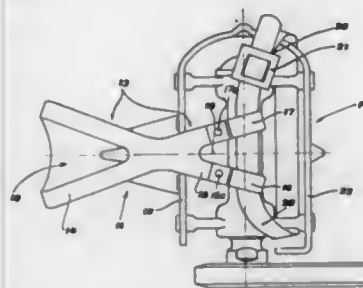
This application Jun. 9, 1986, Ser. No. 873,140

Claims priority, application Italy, Oct. 28, 1983, 23406/83[U]

Int. Cl.<sup>4</sup> G05G 1/14

U.S. Cl. 74—594.6

1 Claim



1. A toe clip for bicycle pedals, comprising a flexible metal lamina adapted to be fixed on one side of a bicycle pedal cage, said lamina extending first forward and outwardly and then having a portion extending backwardly, the backwardly extending portion of the lamina ending in two spaced-apart eyelets, and a flexible strap extending through said eyelets, said backwardly extending portion of the lamina having a substantially X-shaped configuration comprised by two forwardly extending legs that diverge forwardly from each other and two rearwardly extending legs that diverge rearwardly from each other, each said eyelet being disposed at the rear end of a respective one of said rearwardly extending legs and extending along only a rear portion of the length of its associated said rearwardly extending leg, each said eyelet being closed at its forward end by a separate fastener that is disposed intermediate the length of the associated said rearwardly extending leg.

4,682,515

**GEAR TRAIN FOR FOUR RANGE****HYDROMECHANICAL STEERING TRANSMISSION**

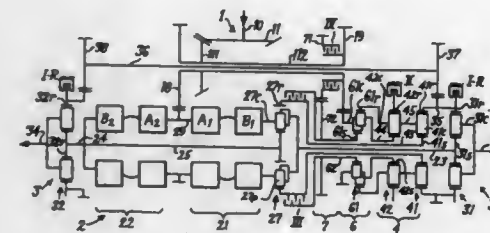
Bradley O. Reed, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 11, 1984, Ser. No. 659,680

Int. Cl.<sup>4</sup> F16H 47/04

U.S. Cl. 74—687

3 Claims



1. In a synchronous shifting, multi-range, split output, hydromechanical transmission having:

- a mechanical input drive train;
- a mechanical transmission output drive;
- a variable hydrostatic component driven by said input drive train for producing a variable speed hydrostatic output;
- two power path mechanisms for transmission of power to said transmission output drive including:
- a first power path mechanism responsive to said hydrostatic component for transmitting said variable speed hydrostatic output to said transmission output drive, and
- a range change mechanism constituting the second power path mechanism of the split output transmission for causing the transmission to operate selectively through said first power path mechanism in a first range or through both said power path mechanisms in two additional ranges having torque ratios distinct from each other and from that of said first range, said range change mechanism including:

- a third range differential gear set having one element responsive to said mechanical input train so as to be driven mechanically at a constant speed and a second element responsive to said variable speed hydrostatic output to cause said third range set to produce an initial third range hydromechanical product on a third element of said third range set,
- a second range differential gear reduction set responsive to said first and third elements of said third range set for receipt of a mechanical input for producing a second range reduced constant mechanical speed as an initial portion of a second range product and for passing said initial third range product, and
- a three element higher range differential gear combining set responsive to said second range reduction set and to said variable hydrostatic component for combining either said second range reduced mechanical speed or said initial third range product with said variable speed hydrostatic output to produce a second range and a third range final product;

friction devices for selectively activating and inactivating elements of said range change mechanism to cause said transmission to operate in three distinct ranges; and output gear means constituting a part of said transmission output train for producing a transmission output responsive to inputs received from either or both of said two power path mechanisms causing said transmission to be a split output transmission;

184-024 O.G.-87-3

the improvement wherein:

said range change mechanism also includes mechanical transfer means responsive to the said mechanical input drive train and activating means for selectively supplying an additional mechanical input to said second element of said third range differential gear set to drive the transmission in an additional fourth range.

4,682,516

**VEHICULAR TRANSMISSION WITH ADDITIONAL LOW SPEED**

Kiyokazu Okubo, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1985, Ser. No. 785,461

Claims priority, application Japan, Oct. 9, 1984, 59-211905

Int. Cl.<sup>4</sup> F16H 37/08

U.S. Cl. 74—701

12 Claims

1. A vehicular transmission comprising a main speed change mechanism having plural gear trains capable of being established selectively between parallel input and output shafts and a sub speed change mechanism having a reduction gear train for providing a speed lower than the speed of the lowest gear train of said main speed change mechanism, said sub speed change mechanism having an intermediate shaft and a counter shaft parallel with said input and output shafts, a counter input gear in mesh with a gear mounted on said input shaft at all times rotatably supported on said intermediate shaft, a counter output gear in mesh with a gear mounted on said output shaft at all times and supported by said counter shaft, said reduction gear train being capable of selectively connecting between said counter input gear and said counter output gear, and a synchronizing mechanism disposed for selectively establishing said reduction gear train.

4,682,517

**VARIABLE SPEED DRIVE—APPARATUS AND METHOD OF FABRICATING THE APPARATUS**

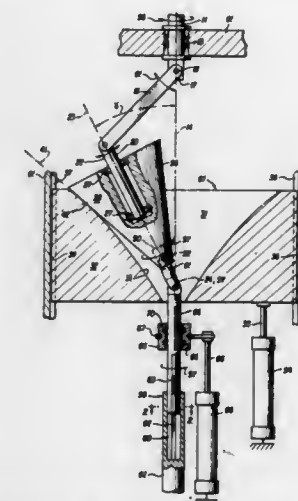
John H. Francis, Charlestown, W. Va., and Roy E. Van Der Linden, Frederick, Md., assignors to Frederick Manufacturing Company, Inc., Frederick, Md.

Filed Jan. 16, 1985, Ser. No. 691,863

Int. Cl.<sup>4</sup> F16H 15/50, 15/16

U.S. Cl. 74—796

8 Claims



1. Apparatus for varying in substantially infinitely small increments the speed ratio of an output shaft relative an input shaft as long as the torque transmitted from one shaft to another remains below a selected torque; the apparatus comprising: means for axially aligning the output shaft and the input shaft with a first axis;



a track member extending laterally of the first axis and having a curvilinear surface converging toward the first axis; a conical member rotating about an axis coincident to a second axis and having a conical surface diverging from a first end of the conical member adjacent the apex thereof toward a second end of the conical member, the conical surface engaging the curvilinear surface of the track member;

linkage means for connecting the axis of the conical member adjacent the second end of the conical member to the input shaft while holding the conical surface in engagement with the curvilinear surface the linkage means including a bearing member journaled with the cone and a link pivoted to both the bearing member and input shaft, wherein the conical member rolls on the curvilinear surface about the second axis as the input shaft rotates;

means for connecting the conical member to the output shaft adjacent the first end of the conical member, wherein the output shaft rotates as the conical member rolls;

means for moving the second end of the conical member laterally with respect to the track member while moving the entire conical member axially, whereby the conical surface engages the curvilinear surface of the track member at various locations thereon and the ratio of the output speed with respect to the input speed is changed;

means for maintaining the apex of the cone in coincidence with the first axis while the cone rolls on the curvilinear surface wherein the cone does not slip with respect to the first surface as the cone transmits rotation from the input shaft to the output shaft as long as the torque is less than the selected torque.

4,682,518

# METHOD AND APPARATUS FOR CONTROLLING HYDRAULICALLY-OPERATED POWER TRANSMITTING SYSTEM INCLUDING CONTINUOUSLY VARIABLE TRANSMISSION

Mitsuru Takada; Hiroshi Itoh, both of Toyota; Shigeki Hiramatsu, Okazaki, and Tadashi Tamura, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan.

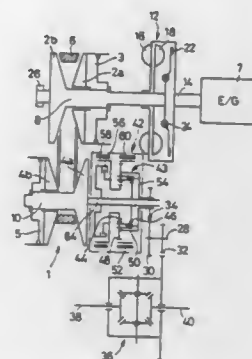
Filed Oct. 21, 1985, Ser. No. 789,709

Claims priority, application Japan, Oct. 24, 1984, 59-221957; Nov. 2, 1984, 59-230330

Int. Cl.<sup>4</sup> B60K 41/16

U.S. Cl. 74-867

12 Claims



1. A method of controlling a hydraulically-operated power transmitting system for an automotive vehicle, the power transmitting system including a continuously variable transmission and an auxiliary transmission coupled to the continuously variable transmission, the auxiliary transmission having a plurality of speed-range positions, said method comprising the steps of:

controlling a speed ratio of said continuously variable transmission and selectively placing said auxiliary transmission

in one of said plurality of speed-range positions, according to varying parameters of the vehicle; detecting simultaneous operations of said continuously variable transmission and said auxiliary transmission, which consist of a shift-down action of said auxiliary transmission during a shift-down operation of said continuously variable transmission, and a shift-up action of said auxiliary transmission during a shift-up operation of said continuously variable transmission; and upon detection of said simultaneous operations, restraining a change in said speed ratio of said continuously variable transmission while said auxiliary transmission is in said shift-down action or said shift-up action.

4,682,519

# HYDRAULIC FLUID PRESSURE CONTROL DEVICE FOR A CONTINUOUSLY VARIABLE AUTOMOBILE TRANSMISSION PROVIDING A QUICK SPEED CHANGE RATIO INCREASE

Mitsuhiko Okada, and Hiroshi Ito, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

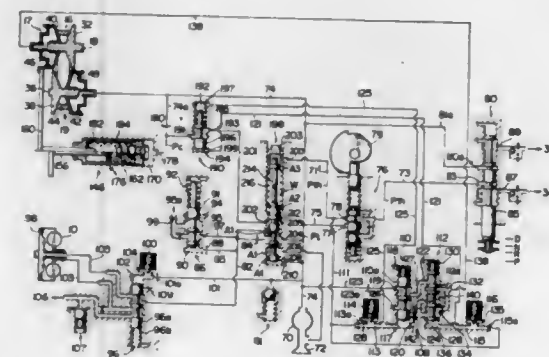
Filed Nov. 9, 1984, Ser. No. 669,885

Claims priority, application Japan, Nov. 11, 1983, 58-210993

Int. Cl.<sup>4</sup> F16H 55/56

U.S. Cl. 74-868

7 Claims



1. A control device for a continuously variable belt transmission device comprising a driving pulley assembly including an axially fixed pulley member and an axially movable pulley member, a driven pulley assembly including an axially fixed pulley member and an axially movable pulley member, an endless belt assembly which is fitted in a power transmitting manner around said driving pulley assembly and said driven pulley assembly in V-shaped grooves thereof to provide power transmission therebetween at a speed change ratio, and first and second pressure chambers for said driving and driven pulley assemblies respectively, each of said driving and driven pulley assemblies altering, according to supply of hydraulic fluid pressure thereto, the axial distance between said respective axially fixed and axially movable pulley members so as to alter the effective pulley radius of said respective one of said driving and driven pulley assemblies, said control device comprising:

a speed change speed control device which selectively either supplies, holds or drains an actuating fluid pressure to, in or from said first pressure chamber for said driving pulley assembly, said draining of said actuating fluid pressure from said first pressure chamber being selectively effected at at least two different rates;

a control pressure generating valve which generates a control pressure which decreases along with increase in said speed change ratio;

a line pressure generating valve, which receives supply of said control pressure from said control pressure generating valve, and which generates a line pressure and supplies said line pressure to said second pressure chamber for said

driven pulley assembly, said line pressure decreasing along with increase in said control pressure generated by said control pressure generating valve;

a cutoff valve which, when, said speed change speed control device is draining said actuating fluid pressure from said first pressure chamber for said driving pulley assembly, at a higher rate of said at least two different rates prevents transmission of said control pressure from said control pressure generating valve to said line pressure generating valve; and

means for providing fluid connection of said control pressure generating valve and said line pressure generating valve with said cutoff valve.

4,682,520

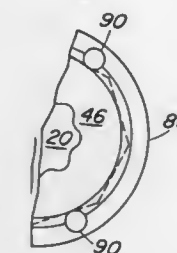
# MECHANICALLY LOCKABLE FASTENER ASSEMBLY Warren E. Gray, Woodland Hills, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Nov. 15, 1984, Ser. No. 671,823

Int. Cl.<sup>4</sup> F16B 29/00, 35/04, 39/22

U.S. Cl. 81-471

13 Claims



1. A non-removable fastener assembly for passing through holes in workpieces comprising

a bolt, a nut, and a driving tool,

said bolt having a head at one end and a shaft extending from the head and threaded over a portion of its length,

said nut having a head end and a threaded bore therethrough for engaging the threaded part of the bolt shaft,

said bolt and nut being constructed and arranged for clamping workpieces tightly together permanently under a predetermined a clamp up load when the nut is driven by the tool,

said bolt shaft having a first portion thereof next to said head for passing through the workpieces, a second portion which is unthreaded, and a third threaded portion extending from the second portion to the end of the shaft respectively,

means for forming a plurality of generally axial rotation resisting recesses arranged around the circumference of the shaft and along the second portion,

said nut having a first interior portion of axial length approximately the same as the second portion of the bolt shaft and having no threads therein so that said unthreaded first interior portion of the nut and said unthreaded second portion of the bolt shaft do not threadedly engage each other,

said nut having a second interior portion which is threaded for engaging the third threaded portion of the bolt shaft, said nut further having a first exterior portion adjacent at the head end thereof and extending the same axial length along said nut as the second interior unthreaded portion of the shaft, said nut first exterior portion being polygonal in cross section, and a second exterior portion extending from the first portion to the other end of the nut, said second portion having a cross section smaller than said first nut exterior portion, said nut being constructed for being driven up to specification load and thereafter swaged into intimate contact with the recesses of the bolt shaft by a nut driver,

said nut driver having a bore therein for accepting the nut, said bore having a first section extending from one end the

same axial length as the first exterior portion of the nut and having an internal cross section larger than the nut, and a second section extending from the first section inwardly, said second section being circularly cylindrical and larger than the second section of the nut so as not to engage the same,

swaging means embedded in the sidewall of the interior of the driver first section for engaging at least two faces of the first exterior portion of the nut so that the driver can take up on the bolt shaft until the respective threaded portions and shaft are cooperatively and fully engaged and the nut abuts and clamps the workpiece with said predetermined force,

thereafter further turning of the driver deforms the material of the first section of the nut into the grooves of the second section of the shaft of the bolt, continuing turning of the driver causing the swaging means to deform each of the nut apexes in turn until the driver turns freely and can be thereafter removed for reuse,

said driver rotational motion being the sole mechanism for taking up the nut to specification tightness and for deforming the nut securely into the bolt shaft.

2. A removable fastener system for passing through holes in workpieces comprising

a bolt having a head at one end and a shaft extending from the head and threaded over a portion of its length,

a nut having a head end and a threaded bore therethrough for engaging the threaded part of the bolt shaft,

said bolt and nut being constructed and arranged for clamping workpieces tightly together permanently under a predetermined a clamp-up load when the nut is taken up on the bolt,

said bolt shaft having a first portion thereof next to said head for passing through the workpieces,

a second portion which is unthreaded, and a third threaded portion extending from the second portion to the end of the shaft respectively,

said bolt shaft further formed with a plurality of generally axial rotation resisting recesses arranged around the circumference of the bolt shaft and along the second portion, said nut having a first interior portion of axial length approximately the same as the second portion of the bolt shaft and having no threads therein so that said unthreaded first interior portion of the nut and said unthreaded second portion of the bolt shaft do not threadedly engage each other,

said nut having a second interior portion which is threaded for engaging the third threaded portion of the bolt shaft, said nut further having a first exterior portion adjacent the head end thereof and extending the same axial length along said nut as the second interior unthreaded portion of the bolt shaft, said nut first exterior portion having driver engaging surfaces including a flat and apexes, and a second exterior portion extending from the first portion to the other end of the nut, said second portion having a cross section smaller than said first nut exterior portion, whereby said bolt and nut can be taken up to specification by a rotatable nut driver having swaging means embedded in the sidewall thereof for engaging the flat of the first exterior portion of the nut so that the driver can take up the nut on the bolt shaft until the respective threaded portions and shaft are cooperatively and fully engaged and the nut abuts and clamps the workpiece to the bolt head with said predetermined force, thereafter further turning of the driver causes the swaging means to deform and swage the material of the first section of the nut into the recesses of the second section of the shaft of the bolt, and continuing turning of the driver causing the swaging means to deform each of the nut apexes in turn until the driver turns freely and can be thereafter removed for reuse, said driver rotational motion being the sole mechanism for taking up the nut to specification tightness and for deforming the nut into the bolt shaft to secure the same.



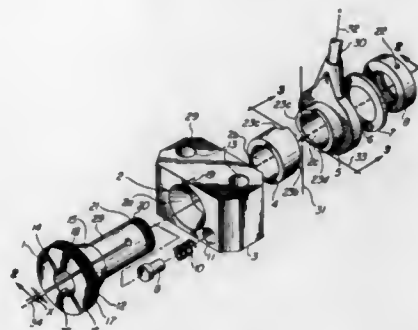
4,682,521

**QUICK CHANGE, ADJUSTABLE TOOL HOLDER**  
Oswaldo A. Duenas, 13711 Olympic Ave., Costa Mesa, Calif. 92626

Filed Feb. 10, 1986, Ser. No. 827,951  
Int. Cl.<sup>4</sup> B23B 29/04

U.S. Cl. 82—36 R

5 Claims



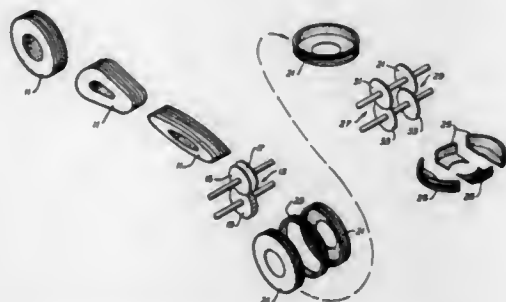
1. A quick change, adjustable tool holder comprising: a manually adjustable collet tool holder, said collet having a multiplicity of longitudinal slots, a manually adjustable knurled flange, a straight barrel section terminating at the end opposite said flange in a shoulder and threading means, and a bore for holding a tool eccentric to said barrel; said collet held rotatably in a body block with said block further comprising a fastening means to a machine tool rest, and an internal, fixed cam surface concentric with said barrel; said fixed cam surface cooperatively engaged with a mating, rotatable concentric cam surface integral with a collar concentrically surrounding said barrel and penetrating said body block; said collar and said collet being held in a rotatable assembly in said body block by a locking ring secured against said shoulder by said threading means on said end of said collet, said collar having a handle attached thereto; whereby rotating said rotatable cam surface by means of said handle attached to said collar in cooperative engagement with said fixed cam surface opens said collet to allow manual adjustment of said collet or closes said collet to fix the position of said collet.

4,682,522

**SHEARING METHOD AND MACHINE FOR SEGMENTING SCRAP TIRES**  
Randel L. Barclay, 5616 Carpenter Rd., Stockton, Calif. 95205  
Filed Oct. 29, 1986, Ser. No. 924,289  
Int. Cl.<sup>4</sup> B26D 7/06, 7/08

U.S. Cl. 83—19

21 Claims



1. An apparatus for shearing tires comprising,

compression means for exerting a flattening force on a circumferential periphery of a tire, first shearing means communicating with said compression means for receiving a flattened tire therefrom and having at least two rotary mounted circular shears disposed to shear the flattened tire about the circumferential periphery to form at least two annular tire segments, and second and third shearing means communicating with the first shearing means adapted to accept an annular tire segment therefrom, said second and third shearing means sharing a parallel pair of common axes and each having a pair of counterrotating shears disposed to shear said annular tire segment perpendicular to an axis extending through the center of the tire segment, the third shearing means spaced apart from the second shearing means by a distance less than the outer diameter of said annular tire segment, said second and said third shearing means combining to shear an annular tire segment into four arcuate parts.

19. A method of shearing automotive tires of the type having tread about a circumferential periphery and a center defining a tire axis comprising, flattening a tire by circumferential pressure thereby bringing opposed tread regions into proximity, shearing the flattened tire about its circumferential periphery, thereby forming two annular tire sections, and shearing each annular tire section into at least two pieces by cutting across the tire tread.

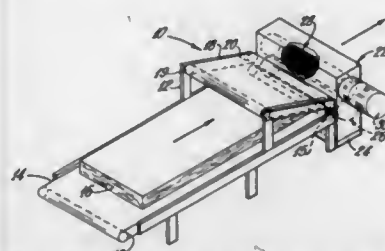
4,682,523

**METHODS OF MAKING GLASS WOOL BLOWING INSULATION**

Alan R. Johnson, Sylvania, and Richard C. Yawberg, Grand Rapids, both of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio  
Continuation of Ser. No. 697,698, Feb. 4, 1985, abandoned, which is a continuation of Ser. No. 532,880, Sep. 16, 1983, abandoned. This application Jan. 6, 1986, Ser. No. 816,484  
Int. Cl.<sup>4</sup> B26D 7/08

U.S. Cl. 83—19

1 Claim



1. A process of making pieces of glass wool, suitable to be blown into attics as thermal insulation, from an elongated generally laminar resiliently compressible glass wool blanket having an original thickness in an unrestrained condition and being made of glass fibers bonded with thermoset resin, said process comprising feeding the blanket longitudinally through a compressing station wherein it is resiliently compressed from its original thickness to a smaller thickness, and feeding the compressed blanket longitudinally between a rotating backup roll and a cooperative rotating cutting roll from one side of the rolls, the cutting roll including a supporting cylinder, a plywood blade-mounting cylinder mounted on the supporting cylinder, a plurality of circular cutting blades each having a plurality of shank portions spaced from each other and disposed substantially completely around an inner periphery of the blade, a plurality of straight cutting blades each having a plurality of shank portions spaced from each other and disposed substantially completely along a length of the blade, and a plurality of resiliently compressible plugs, the circular cutting blades respectively being separately mounted on the plywood cylinder circumferentially thereof, being distributed

substantially throughout the length thereof, being spaced equally from each other axially thereof by a distance smaller than said original thickness of the blanket, and having their shank portions mounted respectively in slits extending substantially all the way through a wall thickness of the plywood cylinder, the straight cutting blades respectively being separately mounted on the plywood cylinder axially thereof, being distributed throughout the circumference thereof, being spaced equally from each other circumferentially thereof by a distance smaller than said original thickness of the blanket, having their shank portions mounted respectively in slits extending substantially all the way through the wall thickness of the plywood cylinder, and being arranged in a crossing and interlocking relationship with the circular cutting blades, and the resiliently compressible plugs being mounted on the plywood cylinder, being disposed respectively in spaces defined by the cutting blades, and having outer surfaces radially within but substantially flush with cutting edges of the blades, whereby the compressed blanket is cut into columns, the columns are compressed respectively against the resiliently compressible plugs and confined temporarily in the spaces defined by the cutting blades and radially within the cutting edges of the blades, and the plugs are compressed against the plywood cylinder as the blanket passes between the backup roll and the cutting roll, and the columns are expelled from the cutting roll by the resiliently compressed plugs upon passing to the other side of said rolls, the spacing of the circular cutting blades from each other and the spacing of the straight cutting blades from each other being sufficiently small to provide columns sufficiently slender as to delaminate, due to their laminar structure, into smaller pieces at random upon being conveyed away from said rolls.

4,682,524

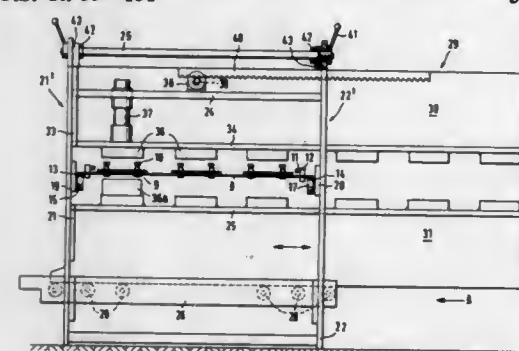
**APPARATUS FOR CUTTING STACKS OF FLAT WORKPIECES**

Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmüller & Hölscher, Lengerich, Fed. Rep. of Germany  
Filed Aug. 26, 1985, Ser. No. 769,330

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432385

Int. Cl.<sup>4</sup> B26D 5/02; B26F 1/04  
U.S. Cl. 83—151

5 Claims



1. Apparatus for cutting stacks of flat workpieces, particularly of making undershirt-shaped bags from stacked tubular film sections made of thermoplastic material and formed with side gussets and with top and bottom end seam welds, said apparatus comprising: a machine frame, a carriage movably supported in the machine frame, punch-and-die sets mounted in the carriage and including punches associated with drive means for moving said punches up and down when some of said punch-and-die sets are operated, and die plates fixed to the carriage for cooperation with the punches, a movable conveyor carried by the machine frame for intermittently feeding the stacks between and for removing them from the punches and dies, a plurality of punch-and-die sets and punch drive means arranged in a row in the carriage, guide means for guiding the carriage for reciprocation in the machine frame in a direction which is laterally transverse to the direction of

travel of the conveyor, and securing means for securing the carriage in one of two operating positions in the machine frame,

at least one of said plurality of punch-and-die sets is in an operating position and is operated within the machine frame while at least one other of said plurality of punch-and-die sets protrudes laterally from and outside the machine frame so that they can be replaced or reground.

4,682,525

**HYDRAULIC SAW FRAME WITH EXTERNAL SEALING MEANS**

Roettger Jansen-Herfeld, Remscheid, Fed. Rep. of Germany, assignor to Richard Jansen GmbH, Remscheid, Fed. Rep. of Germany

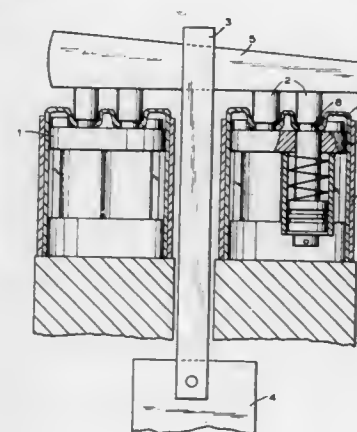
Filed Apr. 24, 1986, Ser. No. 856,772

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514728

Int. Cl.<sup>4</sup> B27B 3/34

U.S. Cl. 83—751

4 Claims



1. A hydraulic saw frame including a frame body, a movable member supporting one end of at least saw blade, at least one stretching device arranged on said frame body and including a plurality of hydraulic cylinder and piston units arranged in a row to act on said movable member, and elastic sealing sheet enclosing all cylinder and piston units of said stretching device, said sealing sheet having a center portion secured to respective pistons of said hydraulic units and a peripheral portion secured to said frame body, said sealing sheet being elastically deformable over the length of displacement of said pistons.

4,682,526

**ACCOMPANIMENT NOTE SELECTION METHOD**

Robert J. Hall, 20756 Tribune St., Chatsworth, Calif. 91311; George R. Hall, 13613 Huston St., Sherman Oaks, Calif. 91423, and Jack C. Cookerly, 26916 Barbacoa Pl., Saugus, Calif. 91350

Continuation-in-part of Ser. No. 274,606, Jun. 17, 1981, Pat. No. 4,508,002. This application Jun. 15, 1984, Ser. No. 621,326

Int. Cl.<sup>4</sup> G10F 1/00

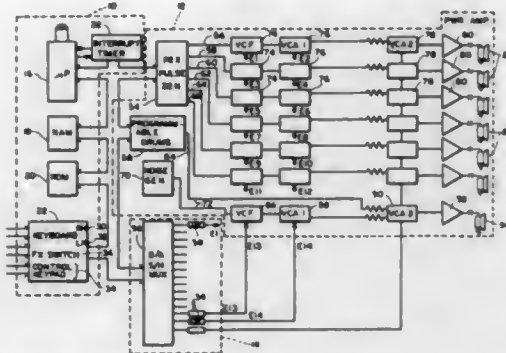
U.S. Cl. 84—1.03

19 Claims

5. In a method for providing musical accompaniment in response to the playing of an accompaniment-type musical instrument, the improvement comprising the steps, accomplished by the instrument itself, of: storing a plurality of possible voicings of an accompaniment chord, each of said voicings being representative of an ordered group of notes; defining a preselected acceptable tonal range for the notes of said voicings;



determining which of said voicings have notes which fall within the acceptable range;



randomly selecting one of the voicings from those having notes which fall within the acceptable range; and sounding the chord according to the selected voicing.

4,682,527

PEG DROPS

Michael J. Pagliaro, 219 Sprain Rd., Scarsdale, N.Y. 10583  
Filed Dec. 10, 1986, Ser. No. 940,104

Int. Cl.<sup>4</sup> G10G 7/00

U.S. Cl. 84—305

4 Claims

1. Peg drops for stringed musical instruments comprising 300–600 ml. of isopropyl alcohol, 100–199 ml. of tincture of green soap, 100–199 ml. of glycerin and between 21 and 43 g. of violin rosin.

4,682,528

ACTIVE PROTECTION SYSTEM

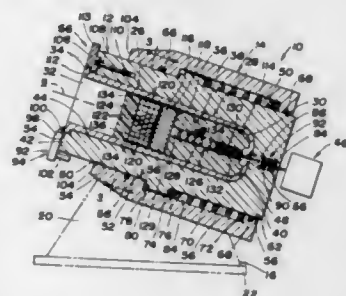
Johann F. Wohler, Troy, Mich., assignor to General Dynamics Land Systems, Inc., Warren, Mich.

Filed Feb. 25, 1985, Ser. No. 704,665

Int. Cl.<sup>4</sup> F41F 1/00, 19/00, 19/14

U.S. Cl. 89—1.3

10 Claims



1. An active protection system comprising: a support a launch tube mounted on the support for recoil movement relative to said support; said launch tube having a closed rear end and an open muzzle end; said launch tube having a round inner bore that has a slight inward taper for substantially the entire distance from the open muzzle end thereof to the closed rear end to facilitate loading of a cartridge having a case with an outer surface that tapers inwardly from an open muzzle end thereof to a closed rear end of the case; a firing mechanism at the closed rear end of the launch tube for firing a cartridge loaded in the launch tube; a recoil mechanism for controlling recoil movement of the launch tube on the support; and a support cartridge control mechanism at the open muzzle end of the launch tube for securing the loaded cartridge in the launch tube prior to firing and for releasing and ejecting the fired

cartridge in response to recoil movement of the launch tube upon firing.

8. An active protection system comprising: a support; a launch tube mounted on the support for recoil movement relative to said support; the launch tube having a closed rear end of a rounded shape and an open muzzle end; the launch tube having a round inner bore that has a slight inward taper for substantially the entire distance from the open muzzle end thereof to the closed rear end to facilitate loading of a cartridge having a case with an outer surface that tapers inwardly from an open muzzle end thereof toward a closed rear end of the case; a fluid dampened spring recoil mechanism for controlling recoil movement of the launch tube on the support; a firing mechanism at the closed rear end of the launch tube for firing a cartridge loaded in the launch tube; and a cartridge control mechanism at the open muzzle end of the launch tube for securing the cartridge in the launch tube prior to firing and for releasing and ejecting the fired cartridge in response to recoil movement of the launch tube upon firing.

4,682,529

MODULAR DEVICES FOR LOADING CARTRIDGES ON BOARD AIRCRAFT

Didier A. Duclos, Maisons Alfort, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

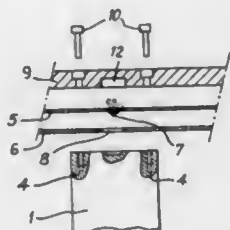
Filed Dec. 6, 1984, Ser. No. 678,856

Claims priority, application France, Dec. 7, 1983, 83 19579

Int. Cl.<sup>4</sup> F41F 5/02

U.S. Cl. 89—1.51

5 Claims



1. A modular device for carrying by an aircraft load launching cartridges, such cartridges each having a base provided with threaded holes for its securing and electric detonators for initiating the load ejection, said modular device comprising:

- a box with internal dividing walls which define housings for the cartridges said box bearing means for its quick securing to the aircraft;
- an insulating plate rigid with said box and disposed along the cartridge bases, said insulating plate having holes formed to register with said electric detonators of the cartridge bases;
- a printed circuit disposed along said insulating plate, this printed circuit having resilient contact studs adapted to engage said electric detonators through said holes of the insulating plate;
- a support for a coding circuit, connected to said printed circuit and receiving a removable coding element;
- a connector adapted to connect said printed circuit to an electronic control equipment of the aircraft;
- a support plate provide with holes registering with said threaded holes of the cartridge bases and recesses for clearing said contact studs of the printed circuit; and
- fixing bolts adapted to pass through the holes of the support plate and of the cartridge bases for pressing said insulation plate and said printed circuit between the cartridge bases and the support plate.

4,682,530

AIRBORNE STORES ARMING TRIGGER UNIT AND METHOD OF PREVENTING UNDESIRABLE ARMING

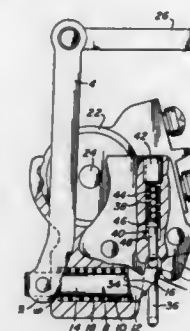
James R. Brown, Gary S. Lane, and Wallace H. Larson, all of Jamestown, N. Dak., assignors to Western Gear Corporation, Jamestown, N. Dak.

Filed May 30, 1986, Ser. No. 869,390

Int. Cl.<sup>4</sup> F41F 65/02; F14F 5/02

U.S. Cl. 89—1.55

16 Claims



12. A method of preventing the undesired release of an armed airborne store having an arming lanyard with a loop encircling a lanyard pin which pin is movable between and into latched and unlatched positions with respect to such loop comprising:

biasing a member for movement in a direction transversely of the path of movement of such a lanyard pin, moving said member into a position to prevent said pin from returning to the latched position thereof once said pin has moved out of the latched position, and reestablishing the bias on said member while permitting said pin to move into the latched position thereof.

4,682,531

APPARATUS AND METHOD FOR REGULATING THE RATE OF CHANGE OF FLOW OF A FLUIDIZED MEDIUM

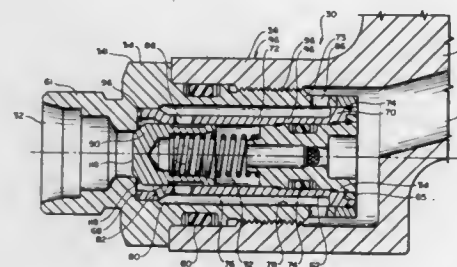
John D. Mayer, King County, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1985, Ser. No. 815,369

Int. Cl.<sup>4</sup> F15B 11/08, 13/04

U.S. Cl. 91—446

17 Claims



1. A control valve for controlling a rate of change of fluid flow from a fluid source to hydraulic motor means to prevent the motor means from exceeding a maximum acceleration rate during start up, said control valve comprising:

- a valve body having an inlet in communication with said fluid source, an outlet in communication with said motor means, and first and second passageways in communication with said outlet;
- flow limiting means including a flow control member biased in a manner to restrict the flow of fluid to said outlet through said first and second passageways, said flow control member movable in a first direction against

said bias in response to a pressure differential between said inlet and said outlet to communicate said inlet with said first passageway in a manner to allow a predetermined rate of fluid flow through said first passageway which causes said motor means to accelerate to a first speed at a rate which does not exceed said maximum start up acceleration rate; and

c. said flow control member being movable further in said first direction at a controlled rate in response to an increase in said pressure differential to communicate said inlet with said second passageway after said motor means has accelerated to said first speed, in a manner that a rate of fluid flow from said inlet through said second passageway to said outlet increases in response to said further movement of said flow control member in said first direction to cause said motor means to accelerate from said first speed to a second speed at a rate which does not exceed said maximum start up rate.

4,682,532

VARIABLE-STROKE CONSTANT-COMPRESSION-RATIO REVERSIBLE RADIAL PUMP

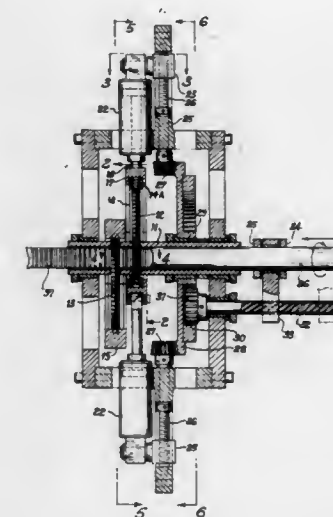
Erik E. Erlandson, 12814 Amaranth Street, San Diego, Calif. 92129

Filed Jan. 7, 1985, Ser. No. 689,367

Int. Cl.<sup>4</sup> F01B 31/14

U.S. Cl. 92—13.7

4 Claims



1. A variable-stroke reversible pump comprising:

a variable-throw eccentric comprising a tubular input shaft having a diametrical threaded hole, a threaded splined adjustment shaft which is screwed into the threaded hole in said input shaft, a hollow connecting-rod journal moving in a plane perpendicular to said tubular input shaft, having bearing races which are anchored at diametrically opposed points in said journal, said bearing races mounting the opposite ends of said adjustment shaft;

a slidable rack gear mounted within said tubular input shaft and operating on the splines of said adjustment shaft for rotating said adjustment shaft while said variable-throw eccentric moves in continuous angular motion;

at least one piston mounted slideably in a closed-fitting cylinder capped by a cylinder head; and

a connecting rod coupling said piston to said connecting-rod journal.

4,682,533

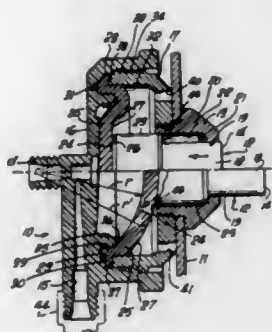
# VANDAL RESISTANT AND TAMPER PROOF PNEUMATIC PUSH BUTTON ASSEMBLY FOR MOVING A VOLUME OF FLUID

V. Walter Hafner, Whittier; Ron T. Hahn, Fullerton, and Keith D. Marshall, Whittier, all of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Jan. 28, 1986, Ser. No. 823,393  
Int. Cl.<sup>4</sup> F01B 19/00; F16J 3/00

U.S. Cl. 92—98 R

29 Claims



1. A push button assembly mounted in a wall for moving a volume of fluid out of and into a port, said assembly comprising:

- a housing having at least one port for the passage of fluid, said housing having a circular ridge formed on the floor thereof, said circular ridge surrounding a floor area and having a sealing surface located on the exterior of the circular ridge and a sealing groove formed about the periphery of the circular ridge, and said port having an inner terminus which is located in said floor area;
- a diaphragm sealing element affixed to said housing, said diaphragm sealing element having a circular, pressure-applying surface located about the periphery of said circular ridge;
- a rubber, circular, domed diaphragm mounted in said housing, and the base of said diaphragm lying along the outer periphery of said circular ridge, and said diaphragm having an outwardly extending contact ring and a downwardly extending sealing ridge, the outer periphery of the contact ring being surrounded by the housing and the circular pressure-applying surface of the diaphragm sealing element and the domed portion of said diaphragm positioned above the floor area, said diaphragm having sufficient thickness so that although it is deformable, it readily returns to its original shape and wherein said housing has two additional circular sealing surfaces in addition to the sealing surface on the circular ridge, said additional sealing surfaces being positioned around the periphery of the circular ridge, the first sealing surface being directly adjacent the outer edge of said ridge and facing upwardly and the second sealing surface being formed about the exterior of the first sealing surface and at a higher level, also facing upwardly, and wherein the outwardly extending contact ring of said diaphragm is positioned on the upper surface of the second sealing surface, and the downwardly extending sealing ridge of the diaphragm fitting within the sealing groove of the housing so that an airtight seal is formed at the contact ring;
- a wall for mounting the push button assembly, said wall having an inner surface and an outer surface, said wall having a hole formed therein;
- an escutcheon member affixed to said housing, said escutcheon member having a widened escutcheon portion which abuts the outer surface of the wall, said escutcheon member having a chamber for housing a push button member and having a passageway extending through the escutcheon portion; and
- push button means having a piston portion held in the cham-

ber of said escutcheon member, the terminal portion thereof contacting the domed diaphragm and a button portion which extends through the passageway of the escutcheon member to permit the operation thereof from the outer surface of the wall, whereby when the button portion is pushed, the terminal portion of said push button means depresses said domed diaphragm forcing the fluid within said dome through the port, and when said button is released, said domed diaphragm returns to its original shape thereby pulling fluid back in through said port.

4,682,534

# HYDRAULIC SERVO FOR FRICTION COUPLING ELEMENT OF AUTOMATIC TRANSMISSION

Koji Sumiya, Nishio; Takenori Kano, Anjo; Seltoku Kubo, and Kazuaki Watanabe, both of Toyota, all of Japan, assignors to Aisin-Warner Limited and Toyota Jidosha Kabushiki Kaisha, both of, Japan

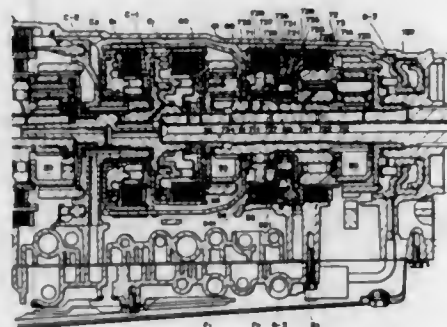
Filed Jul. 29, 1985, Ser. No. 759,826

Claims priority, application Japan, Jul. 31, 1984, 59-161897

Int. Cl.<sup>4</sup> F01B 31/00

U.S. Cl. 92—130 R

2 Claims



1. A hydraulic servo for a friction coupling element in an automatic transmission including a casing, said hydraulic servo, comprising:

- an annular drum having a first cylinder, a second cylinder, and a side wall connecting said first and second cylinders all integrally formed together as a single piece by press forming, said first cylinder having a plurality of splines on its outer cylindrical surface and being fixed to the interior of the casing through said splines and said second cylinder having a plurality of splines on its inner cylindrical surface;
- a press-formed third cylinder joined to the side wall of said annular drum by a fully encircling weld;
- a piston fitted between said first cylinder and said third cylinder; and
- biasing means provided between said third cylinder and said second cylinder for returning said piston.

4,682,535

# GUIDE HOUSING FOR THE LINEARLY MOVING OUTPUT ELEMENT OF A CYLINDER ACTUATOR

Kurt Stoll, Lenzhalde 72, D-7300 Esslingen, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,680

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411823

Int. Cl.<sup>4</sup> F16J 15/18

U.S. Cl. 92—165 PR

8 Claims

1. A guide housing and linearly drivable element adapted for connection with a load, comprising: a cylindrical barrel forming part having a cylindrical barrel bore extending axially therethrough, at least one pedestal platform body running along the axial length of said barrel forming part and made as one piece therewith, a piston movable axially in said barrel

4,682,537

# COFFEE MAKING APPARATUS INCORPORATING METERED DISPENSING

Malcolm R. Snowball, St. Leonards-on-Sea, and Cecil Hayes, Hastings, both of England, assignors to W. M. Still & Sons Limited, East Sussex, England

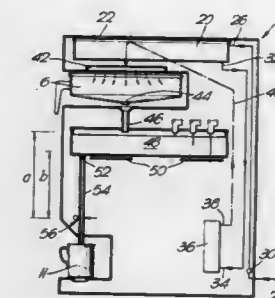
Filed Oct. 10, 1985, Ser. No. 786,211

Claims priority, application United Kingdom, Mar. 27, 1985, 8507974

Int. Cl.<sup>4</sup> A47J 31/00

U.S. Cl. 99—282

6 Claims



therein parallel to said barrel bore, said groove being open to the outer face of said pedestal platform body along the axial length of said pedestal platform body, a guide rod extending in said groove and parallel to said piston rod, said guide rod being fixed to said piston rod for movement with said piston rod, and a strut fixed to said guide rod and slideable along said opening of said groove for movement along said groove with movement of said guide rod and piston rod.

1. An apparatus for making tea and coffee beverages, said apparatus including coffee and tea infusing means, a beverage storage tank arranged to receive a beverage formed in said infusing means, said tank having a bottom outlet, a beverage dispensing outlet positioned below said tank outlet, a flexible conduit connected to said tank outlet and extending to said beverage dispensing outlet and beverage dispensing control means, said control means comprising a pair of abutments spaced apart and positioned on one side of said flexible conduit, a control member normally positioned intermediate said abutments adjacent to and on another side of said flexible conduit and being movable into a portion of the space separating the said two abutments so as thereby to compress one side of the dispensing conduit against the other side of the dispensing conduit and to deflect the said conduit through an arcuate path, and means operable on said control members whereby the dispensing conduit is either fully open or fully closed.

4,682,536

# ARRANGEMENT FOR DETERMINING AMBIENT TEMPERATURE IN A MOTOR VEHICLE

Peter Nolting, Buehlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

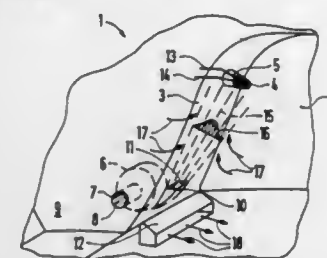
Filed Feb. 3, 1986, Ser. No. 825,243

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504842

Int. Cl.<sup>4</sup> B60H 1/00

U.S. Cl. 98—2.01

13 Claims



1. An arrangement for determining ambient temperature in a compartment of a motor vehicle including a regulated source of heated air, the source communicating with the compartment through a first duct, comprising an air blower for sucking air from the compartment at a location remote from said first duct and blowing an air stream into the compartment through a second duct, and a temperature sensor arranged in said air stream at a relatively large distance from said first and second ducts.

4,682,538

# PROCESSING OF CURD

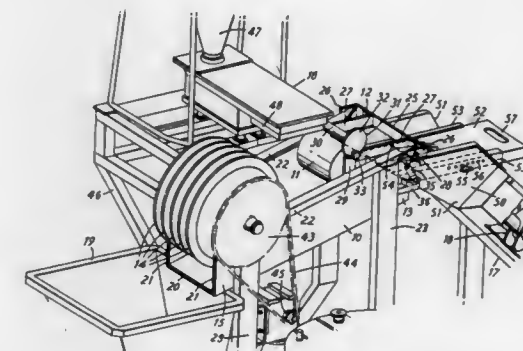
Alfred Zahlaus, Modena, Italy, assignor to Alfa-Laval Cheese Systems Limited, Somerset, England

Filed Nov. 5, 1985, Ser. No. 795,312

Claims priority, application Italy, Nov. 9, 1984, 23512 A/84

Int. Cl.<sup>4</sup> A01J 25/00

12 Claims



1. Apparatus for processing curd in the manufacture of cheese by the addition of salt to curd, which comprises a trough having a base for supporting a moving stream of curd having a width substantially equal to the width of said trough



and a variable depth, a roller, inserted above said curd stream, bearing upon the surface of said stream and rotatable by movement of said stream, means for providing a first signal corresponding to the height of the roller above the base of the trough and therefore to the depth of the curd stream, means for providing a second signal corresponding to the rotational speed of said roller, dispensing means for dispensing salt into said curd stream and means responsive to said two signals for regulating the rate at which salt is dispensed from said dispensing means.

#### 4,682,539 CAN CRUSHER

Earl C. Bramblett, 705 Bullett Ave., SE., Roanoke, Va. 24013, and Warren E. Clem, Rt. 1, Box 887, Vinton, Va. 24179  
Filed Jul. 29, 1981, Ser. No. 287,904  
Int. Cl. B30B 9/32

U.S. Cl. 100—265

1 Claim



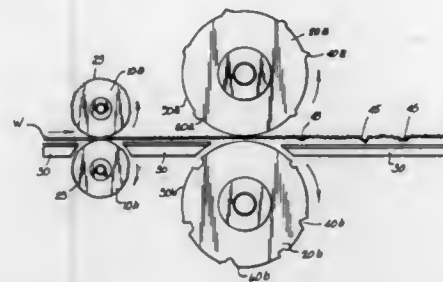
1. A manually operated device specifically for compacting aluminum throw-away beverage cans, the device comprising: a relatively heavy tramping element made of cast iron and having a top portion and a substantially planar, circular bottom surface; wherein the bottom surface is used for crushing cans upon application of a manually applied vertical impulse to the tramping element, wherein the bottom surface has a diameter approximately twice that of the beverage cans, and wherein there is a lateral groove extending across the bottom surface for venting air from cans that are crushed; the tramping element further having a projecting sleeve extending from the top portion, which projecting sleeve defines a socket that projects down into the tramping element in a direction normal to the planar surface, aligned holes through the sleeve communicating with the socket for inserting fastening pins; an elongated wooden handle having a connecting end secured in the socket of the tramping element and extending perpendicular to the planar bottom surface of the tramping element, in a direction away from the planar bottom surface, pin-type fastening means extending through the holes and through the elongated wooden handle to fasten the handle to the tramping element, said elongated handle having a free end opposite said connecting end, which free end is held in one hand of the person using the device to suspend the tramping element over singular cans, whereby the weight of the tramping element suspended by the elongated handle has a plumb-line effect which positions the tramping element over the can thereby helping to aim the tramping element and to insure that the manual impulse applied has an almost completely vertical force component.

#### 4,682,540 METHOD FOR EMOSSING A NON-REPEATING DESIGN

Robert J. Eastman, and Mark P. Tandy, both of Littleton, Colo., assignors to Manville Corporation, Denver, Colo.  
Filed Jun. 12, 1986, Ser. No. 873,571  
Int. Cl. B44B 5/00

U.S. Cl. 101—32

7 Claims



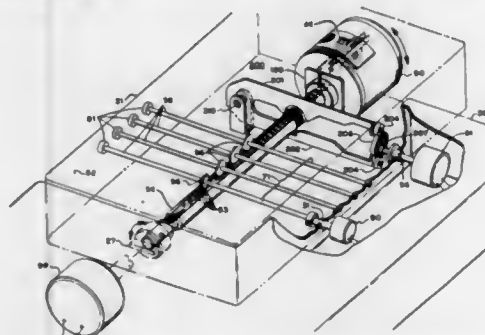
1. A method for producing a non-repeating design on a web of material, said method comprising: providing a first and second pair of opposed rollers, each pair having an embossing pattern on the surface of at least one roller, passing the web of material between the first pair of rollers and then between the second pair of rollers, the first pair of rollers embossing a repeating pattern on the web and the second pair of rollers reembossing portions of the web; and varying the speed of rotation of the second pair's embossing rollers while maintaining the speed of rotation of the first pair's embossing rollers constant such that said repeating pattern is interrupted and said non-repeating design is produced.

#### 4,682,541 POSTAL MAILING SYSTEM HAVING AN ADAPTABLE POSTAGE METER

Philip Pollak, Jr., Westport, and Keith E. Schubert, West Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.  
Continuation of Ser. No. 592,679, Mar. 23, 1984, abandoned.  
This application Nov. 7, 1985, Ser. No. 798,343  
Int. Cl. B41L 47/46; B41J 1/20

U.S. Cl. 101—91

2 Claims



1. A postal metering system comprising a postage meter adapted to be connected to a low-speed mailing machine wherein the low-speed mailing machine includes one receiving member extending outwardly from its surface, the low-speed mailing machine having means for controlling the one receiving member, the postage meter of this system comprising: a print drum member, a plurality of rotatable print value members located within the drum member, a rod member extending into the drum member, the rod member having a plurality of

rack members located axially therein, the rack members being located within the same longitudinal plane, one end of the rack members engaging each of the value members, a plurality of crossover shaft members extending perpendicularly across the rod member, each of the plurality of shaft members having a gear located therein, each gear engaging one of the plurality of rack members, one of the shaft members engaged by the one receiving member of the mailing machine receiving member when the postage meter is attached to the low-speed mailing machine, the controlling means comprising means for rotating the drum member to align each rack member with the gear being actuated by the one receiving member for serial setting of the print value members.

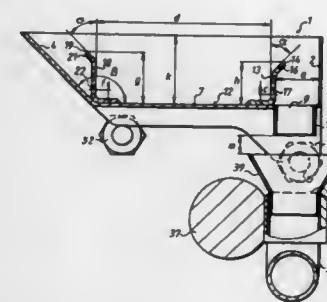
#### 4,682,542 WATER FOUNTAIN FOR A DAMPENING UNIT

Erich G. Wieland, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany  
Filed May 8, 1986, Ser. No. 860,978  
Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519294

U.S. Cl. 101—148

Int. Cl. B41F 7/32

9 Claims



1. A removable water fountain and dampening unit for an offset rotary printing machine, said water fountain and dampening unit comprising:

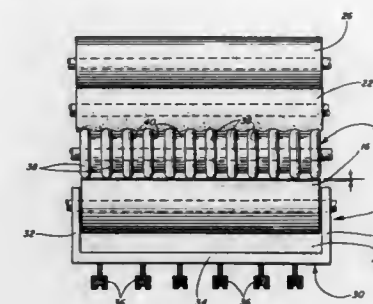
- a front wall, a rear wall and spaced side walls, said front, rear, and side walls extending generally upwardly from a floor to define a dampening fluid receiving reservoir in said removable water fountain;
- spaced, generally parallel inlet and outlet dams extending between said spaced side walls;
- means for supplying dampening fluid to said water fountain reservoir from a dampening fluid circulation system and means for returning unused dampening fluid to said dampening fluid circulation system from said fountain reservoir, said means for supplying said dampening fluid to said water fountain reservoir including a dampening fluid inlet feed line positioned above, and spaced from said water fountain reservoir, said means for returning said unused dampening fluid from said water fountain reservoir to said dampening fluid circulation system including a drainage tube secured in said floor of said water fountain;
- a drainage pipe in said dampening fluid circulation system, said drainage pipe having a funnel in an opening thereof, a mouth portion of said funnel being positioned beneath, and spaced from said drainage tube to receive said unused dampening fluid from said drainage tube and to return said unused dampening fluid to said dampening fluid circulation system, said funnel and said drainage pipe being of greater cross section at all points than an outlet cross section of said drainage tube; and
- means for supporting said removable water fountain in said offset rotary printing machine for quick, connection free removal and reinstallation of said water fountain in said dampening unit.

#### 4,682,543 INK OR MOISTURE ROLLER FOR DUPLICATING MACHINES

Stanley Witczak, Chicago, and Earl L. Gasner, Schaumburg, both of Ill., assignors to AM International, Inc., Chicago, Ill.  
Filed Dec. 9, 1985, Ser. No. 806,793  
Int. Cl. B41F 31/06, 31/26

U.S. Cl. 101—350

5 Claims



1. An ink feeding system for a duplicating machine comprising, in combination, an ink fountain having a fountain roller rotatable in the fountain, a transfer roller journaled parallel to the fountain roller and spaced therefrom, and a pickup roller journaled parallel to the fountain and transfer rollers with the surface of the pickup roller in contact with the transfer roller and slightly spaced from the fountain roller, said surface being formed by a plurality of spaced circular ribs defining a pattern of generally parallel ridges and valleys along the pickup roller normal to the axis thereof, said ribs being on the order of 0.010 inch high and 0.125 inch wide, with the ribs spaced on the order of 0.125 inch.

#### 4,682,544 CHEMILUMINESCENT LIGHT CONTAINER

Anthony Koroscil, Escambia; Walter A. Smithy, Santa Rosa, both of Fla., and Paul A. Delgado, Oxnard, Calif., assignors to American Cyanamid Company, Stamford, Conn. and Del Manufacturing, Oxnard, Calif.  
Filed Dec. 26, 1985, Ser. No. 813,344  
Int. Cl. F42B 4/26

U.S. Cl. 102—336

6 Claims

1. A hollow container adapted for insertion into a device for use in creating a signal and having fitted into the hollow space thereof ingredients, in the following sequence, consisting essentially of

- (a) a fuse of percussion cap,
- (b) a propellant,
- (c) a chemiluminescent light activator solution,
- (d) a chemiluminescent light fluorescer solution,
- (e) a non-reactive enhancer capable of absorbing or adsorbing the reaction product produced upon contact of (c) and (d) which occurs upon detonation of said fuse or cap and
- (f) a sealing means.

#### 4,682,545 AMMUNITION ROUND

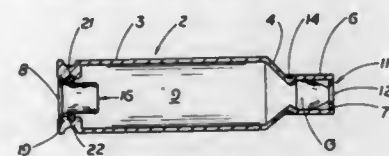
Thomas M. Jett, Jr., P.O. Box 167-B, R.R. 3, Litchfield, Ill. 62056  
Filed May 13, 1986, Ser. No. 862,698  
Int. Cl. F42B 5/02

U.S. Cl. 102—430

3 Claims

1. An ammunition round, comprising: a re-usable one-piece cartridge casing including a cylindrical body portion, a tapered intermediate portion, and a narrower neck portion, said neck portion and said body portion defining a nose opening and a base opening respectively at opposite ends of said casing, said casing defining

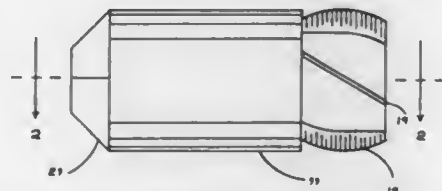
an internal chamber extending longitudinally between said opposite ends;  
 said base opening having a groove formed in it;  
 a lead pellet including a flat nose portion and an integral concave skirt portion extending rearwardly therefrom, said skirt portion being of sufficient thickness to withstand the explosive force to be exerted thereon without separation and being sized in length and diameter to engage said cylindrical neck portion of said cartridge casing snugly with said flat nose portion adjacent said nose opening of said cartridge casing, said cartridge casing having two spaced substantially opposed displaced indentations formed in said casing wall adjacent the juncture of said



neck and tapered intermediate portion of said casing to provide a stop for the trailing edge of the skirt portion of said pellet; and  
 a cylindrical primer means having a protruding rim at the trailing end thereof, said cartridge casing having a recessed end defining said base opening to receive said protruding rim of said primer means, said cartridge casing having a peripheral groove disposed in the internal wall of the body portion thereof adjacent said base opening, and re-usable resilient O-ring disposed in said groove to engage said cylindrical wall of said primer means when disposed in said base opening, said O-ring sealing said primer and said cartridge and permitting easy insertion and removal of said primer means.

#### 4,682,546 PROJECTILE

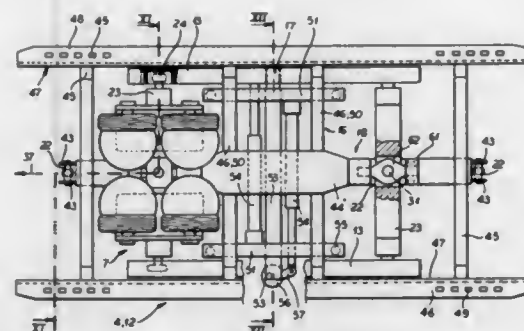
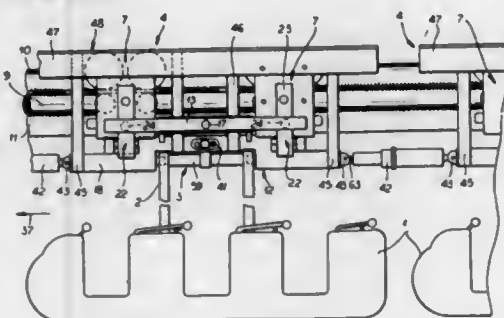
Milija M. Chovich, 141-5th Ave. N., So. St. Paul, Minn. 55075  
 Filed Oct. 2, 1986, Ser. No. 914,293  
 Int. Cl.<sup>4</sup> F42B 9/20  
 U.S. Cl. 102—529 1 Claim



1. A projectile which will self-destruct at a predetermined range and which will not ricochet upon striking a solid object, said projectile comprising:  
 a hull having a slotted nose cone;  
 payload cavities formed within said hull, said payload cavities being filled with a liquid payload;  
 a plurality of rotors disposed within said payload cavities;  
 a retaining bolt extending at least part of the length of said hull through said payload cavities, said bolt extending through openings at the anterior and posterior ends of said hull;  
 a retaining nut disposed within said nose cone, said nut holding said shaft in position at the anterior end of said bolt;  
 two or more fins formed around a hub at the posterior end of said retaining bolt, said fins forming angles with the horizontal axis of said projectile such that said fins rotate more slowly than said hull, thus allowing said retaining bolt to unscrew from said retaining nut while said projectile is in flight.

#### 4,682,547 AMUSEMENT RIDE WITH VEHICLES SUPPORTED BY UNIVERSALLY HINGED WHEEL GROUPS

Anton Schwarzkopf, Münsterhausen, Fed. Rep. of Germany, assignor to Firma Schwarzkopf GmbH, Münsterhausen, Fed. Rep. of Germany and Intamin Corporation, Vaduz, Liechtenstein  
 PCT No. PCT/EP84/00021, § 371 Date Oct. 1, 1984, § 102(e) Date Oct. 1, 1984, PCT Pub. No. WO84/03052, PCT Pub. Date Aug. 16, 1984  
 Continuation-in-part of Ser. No. 507,898, Jun. 24, 1983, Pat. No. 4,520,732. This PCT application Jan. 31, 1984, Ser. No. 667,472  
 Claims priority, application Fed. Rep. of Germany, Feb. 1, 1983, 3303279  
 Int. Cl.<sup>4</sup> B61B 3/00; B61F 5/38  
 U.S. Cl. 104—53 12 Claims

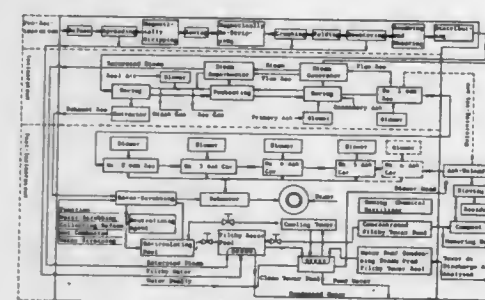


1. An amusement ride comprising:  
 rail means defining a closed travel path;  
 a plurality of carriages provided with running rollers and guide rollers riding on said rail means, each of said carriages comprising:  
 a respective carriage frame formed with longitudinal members running generally in a direction of travel of the carriage along said rail means, and transverse members extending transversely to said longitudinal members and connected thereto, said longitudinal members including at least one lower longitudinal member of a bridge configuration with a raised middle part, and at least two wheel groups spaced apart along and affixed to the respective carriage frame and each provided with a common support and with respective sets of said running rollers and said guide rollers journaled on the respective support and riding on said rail means;  
 a respective passenger carrying vehicle connected to each of said carriages whereby each carriage is individual to one of said passenger carrying vehicle and each of said passenger carrying vehicles is carried by only one of said carriages;  
 a respective plurality of support rods suspending each of said passenger carrying vehicles from a respective one of said carriages;  
 articulation means including a shaft rotatable about a respec-

tive axis extending in said direction, and positioned below each said raised middle part for pivotally supporting at least a pair of said rods for swinging movement about the respective said axis extending in said direction, each of said pairs of rods being connected to said shaft; and damping means including at least one linearly effective oscillation damper mounted on said frame, and means for transforming rotation of said shaft into linear displacement of said damper for damping oscillation of said vehicle about the respective said axis.

#### 4,682,548 REFUSE DISPOSING METHOD AND THE APPARATUS THEREOF

Chen H. Peng, 2nd Floor, No. 36, Chi-Li 1st Street, Chung-Li City, Taoyuan, Hsien, Taiwan  
 Continuation-in-part of Ser. No. 550,397, Nov. 10, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 725,388  
 Int. Cl.<sup>4</sup> F23G 5/02  
 U.S. Cl. 110—222 27 Claims

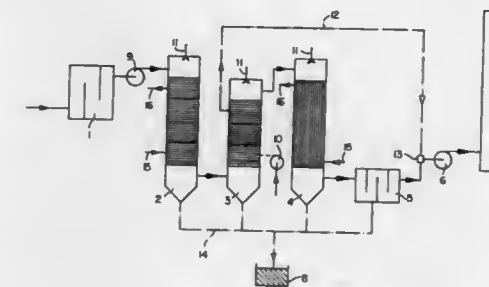


1. A refuse disposing method comprising the steps of:  
 (a) gathering the refuse at a first place;  
 (b) spreading said refuse from said place;  
 (c) magnetically stripping ferruginous materials from said refuse at step (b);  
 (d) sawing said refuse into smaller ones;  
 (e) magnetically restripping ferruginous materials contained in said refuse;  
 (f) crushing said refuse;  
 (g) folding said refuse;  
 (h) dewatering said refuse;  
 (i) re-sawing and shearing said refuse into smaller ones;  
 (j) evenly distributing said refuse at a said second place;  
 (k) burning said refuse at a combustion chamber with said refuse acting as fuels;  
 (l) drying said refuse at said second place by the heat generated in said combustion chamber;  
 (m) preheating said refuse before it is in said combustion chamber by the heat generated in said combustion chamber;  
 (n) oxidizing the difficult-to-oxidize residue in said refuse at a plurality of ash cars;  
 (o) water-scrubbing a flue gas obtained from said second place; and  
 (p) preparing a fertilizer by mixing together a water after used in step (o) and an ash obtained from said ash cars.  
 6. An apparatus for refuse disposing comprising:  
 a refuse gathering means for gathering therein a refuse;  
 a refuse spreading means for spreading said refuse from said gathering means;  
 a refuse magnetically stripping means for stripping ferruginous materials from said refuse from said spreading means;  
 a refuse burning means for burning said refuse;  
 said burning means includes:  
 a combustion chamber;  
 a chain grate stoker, mounted in said combustion chamber, for conveying said refuse for being burnt thereon;  
 a steam generator, mounted in said combustion chamber, for

generating steam by the heat of the hot gas obtained from said combustion chamber;  
 said refuse gathering means is a hopper for receiving therein a refuse;  
 a drying means, for drying said refuse before it is preheated in said preheating chamber, which includes:  
 a drying chamber having an upper drying chamber connected to said preheating chamber and a lower drying chamber; and  
 a grate-like member disposed in said drying chamber for separating said upper and lower drying chambers, carrying said refuse thereon to be dried by said hot gas after which is used to generate said steam and preheat said refuse and having a plurality of openings for passing said hot gas from said upper drying chamber into said lower drying chamber.

#### 4,682,549 METHOD AND AN ARRANGEMENT FOR PURIFYING AND RECOVERING HEAT ENERGY FROM FLUE GASES FROM REFUSE INCINERATION

Lars Hall, Lidingö, Sweden, assignor to Ragn-Sellsforetagen AB, Sweden  
 Filed Jan. 21, 1986, Ser. No. 820,733  
 Claims priority, application Sweden, Jan. 23, 1985, 8500314  
 Int. Cl.<sup>4</sup> F23J 11/00  
 U.S. Cl. 110—345 6 Claims



1. A method of purifying by cooling flue gases from refuse incineration and of recovering heat energy therefrom, wherein said cooling is carried out in three steps, comprising  
 a first step of cooling said flue gases with water within a first glass and plastic cooler means, said cooling in said first step being carried out at approximately 80° C.,  
 a second step of cooling the outflow of said first cooler with air within a second glass and plastic cooler means, said cooling in said second step being carried out at a temperature of substantially 55°-65° C. and close above the water dew point of the flue gas, said second step including varying the amount of air used for the cooling to be about 40% to 80% of the total volume of flue gas in dependence upon the period of the year, and of heating the resulting air to about 40°-50° C.,  
 a third stage of cooling the outflow of said second cooler with water within a third alloyed steel cooler means, wherein the flue gases are additionally cooled to about 35°-45° C. so as to heat the cooling water to about 30°-35° C.,  
 and transferring the heat energy of said cooling water to a district heating system by means of a heat pump.

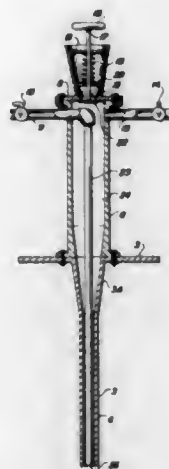


4,682,550

# **HAND-HELD APPARATUS AND METHOD FOR LOOSENING, AERATING AND FERTILIZING SOIL PLANT ROOTS**

Stanley E. Joy, 6611 W. 69th Way, Arvada, Colo. 80003  
Filed Sep. 27, 1985, Ser. No. 780,973  
Int. Cl.<sup>4</sup> A01C 15/02

U.S. Cl. 111-7.1



1. An apparatus for treating the roots of plants, the apparatus comprising in combination:

- (a) an upper generally cylindrical housing including a radial flange at the lower end thereof;
- (b) first tubular means for insertion into a predrilled hole in soil near the roots of the plant for controllably conducting highly pressurized air into the predrilled hole to loosen the soil and produce voids and cracks therein said first tubular means including a downwardly tapered portion and an annular flange portion at the upper end thereof;
- (c) means supported by said housing for controllably placing fertilizer or other chemical treatment material in the path of the highly pressurized air to allow the highly pressurized air to force the fertilizer or chemical treatment material through the first tubular means and into the voids and cracks;
- (d) second tubular means for insertion into the predrilled hole simultaneously with the first tubular means for controllably conducting pressurized water or treatment liquid into the voids and cracks to dissolve the fertilizer or chemical treatment material in the voids and cracks, moisten the soil around the voids and cracks and carry dissolved nutrient or treatment chemicals to the roots before the apparatus is removed from the predrilled hole;
- (e) means rigidly connecting the annular flange means on the upper end of the first tubular means to said housing radial flange, an annular plate means associated with said connecting means for supporting the entire weight of an operator in order to hold the first tubular means in the predrilled hole when the highly pressurized air is being conducted through the first tubular means into the bottom of the predrilled hole, said annular plate means also limiting the depth of insertion of the first tubular means into the predrilled hole and providing a sealing of the tapered portion on the first tubular means to the mouth of the predrilled hole; and
- (f) means for supplying the highly pressurized air with sufficient pressure that and if the soil is sufficiently tightly packed and the operator stands on the operator weight supporting means, the highly pressurized air lifts the apparatus and the operator standing thereon slightly above the ground, releasing some of the air pressure, whereby the apparatus and operator thereon then fall downward until the annular plate means rests on the ground, re-sealing the mouth of the predrilled hole, thereby causing repetitive

surging in the pressure of the highly pressurized air being forced into the soil, thereby effectively aiding in the loosening of the soil.

4,682,551

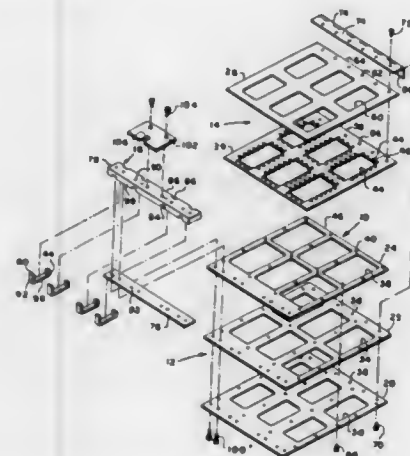
# **MULTI-EMBLEM CLAMPING DEVICE**

George M. Toman, Chicago, Ill., assignor to Meistergram, Inc., Greensboro, N.C.

Filed Apr. 30, 1985, Ser. No. 728,927  
Int. Cl.<sup>4</sup> D05B 31/00; D06C 3/08

U.S. Cl. 112-103

4 Claims



1. A device for holding material in registration during the sewing process comprising:

- means for receiving the material to be held in registration, said receiving means supporting the material and having at least one aperture therein; and
- means for grippingly engaging the material around the outer periphery thereof, said engaging means having at least one aperture therein in alignment with said at least one aperture in said receiving means permitting the passage of a sewing instrument therethrough during the sewing process, said engaging means including a plurality of projections directed inwardly toward the center of said at least one aperture therein, each of said projections having an end positioned substantially perpendicularly to the plane of said engaging means and engageable with the material, said plurality of projections being formed and positioned so as to apply a substantially even compressive force to the material.

4,682,552

# **DISPLACEABLE APPARATUS FOR PROCESSING PALLETS IN AN AUTOMATIC SEWING MACHINE**

Donald F. Herdeg, South Hamilton, and Lawrence P. Ciccia, Medford, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Jun. 12, 1986, Ser. No. 873,741

Int. Cl.<sup>4</sup> D05B 21/00; D05C 9/04

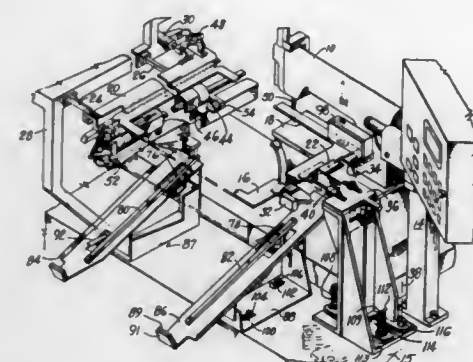
U.S. Cl. 112-121.12

11 Claims

1. Apparatus for processing workpieces prearranged within pallets in an automatic sewing machine system, said apparatus comprising:

- a set of means for receiving opposing edges of a pallet, at least one of said receiving means being rotatably attached to a structural mount, said structural mount being pivotally attached to a base of the automatic sewing machine system so as to allow said structural mount to be pivotally displaced from its normal position;
- means, located below said set of receiving means, for automatically attaching a pallet, dropped from said receiving means, to a means for automatically positioning the prear-

ranged workpiece within the pallet relative to a sewing needle so as to produce a sewn workpiece; means for dropping the front edge of the pallet containing the sewn workpiece from said means for automatically positioning the prearranged workpiece; and



means for receiving the dropped pallet whereby the dropped front of the pallet slides downwardly so as to allow the rear edge of the pallet to thereafter drop from said means for automatically positioning the prearranged workpiece.

4,682,553

# **SEWING MACHINE WORKPIECE EDGE ALIGNMENT APPARATUS**

Jean-Marie Bachmann; Jacques Pion, both of St. Julien-les-Villas, and Jean-Pierre Raisin, Troyes, all of France, assignors to Institut Textile de France, Boulogne Billancourt, France

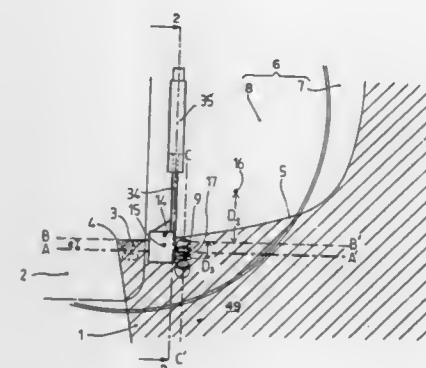
Filed Feb. 14, 1986, Ser. No. 829,836

Claims priority, application France, Feb. 21, 1985, 85 02519; Jul. 26, 1985, 85 11509

Int. Cl.<sup>4</sup> D05B 19/00, 27/14

U.S. Cl. 112-121.12

21 Claims



1. In an installation for linear treatment of a workpiece, such as stitching, along a line of which the direction remains substantially parallel to an edge of a supple workpiece such as a textile piece, of the type comprising:

- a fixed linear treatment machine having a fixed point of treatment, such as a sewing machine said machine including a feed dog and a presser foot;
- a drive device for drawing said feed dog and presser foot for displacing, with respect to the treatment machine, the zone of the workpiece being treated, along a predetermined line axis of treatment;
- a worktable extending around said drive device, said table being located substantially at the level of said point of

treatment, and being adapted to support the workpiece during treatment thereof;

a correction device comprising a detecting device for detecting the presence of the workpiece and recentering means controlled by said detection device for displacing the workpiece substantially transversely with respect to the line of treatment and in an appropriate direction, as a function of the position of the workpiece, so that said workpiece is treated by the treatment machine along a line extending substantially parallel to the edge of the workpiece, said recentering means comprising two distinct means including:

- at least one active guide, placed in the vicinity of the drive device of the treatment machine, upstream thereof in the direction of displacement of the workpiece during treatment, said active guide being rotated to move the workpiece thereby ensuring the displacement of that part of the workpiece located near the point of treatment, substantially transversely with respect to the line of treatment;
- and a movable support, displaced from the active guide, presenting a movable flat surface lying in the same plane as the worktable, controlled by drive means for displacing said movable flat surface, said movable support being moved for ensuring the displacement of the upstream part of the workpiece,
- and the active guide and the drive means of the movable support being selectively controlled, together or independently of each other, by the instructions given by the detection device.

4,682,554

# **METHOD AND APPARATUS FOR PERFORMING SEWING OPERATIONS UTILIZING SEWING MACHINE HAVING MEANS TO ADJUST TERMINAL STITCH PITCH AND SEW CONSECUTIVE PATTERNS**

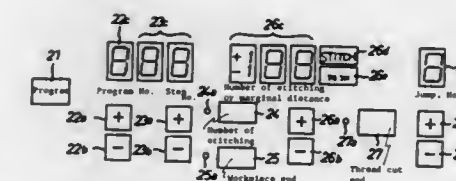
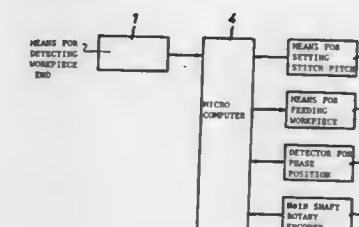
Sumio Goto; Jiro Ishibashi, and Masakazu Nemoto, all of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Jun. 2, 1986, Ser. No. 869,678

Claims priority, application Japan, May 31, 1985, 60-119592  
Int. Cl.<sup>4</sup> D05B 19/00, 27/22

U.S. Cl. 112-262.1

2 Claims



2. A method for performing sewing operations on a workpiece using a sewing machine capable of adjusting stitch pitch to terminate the last stitching at a predetermined margin distance by calculating a number of stitches with original pitch and the adjusted pitch which is shorter than the original pitch when a workpiece end sensor detects the workpiece end, said method comprising the steps of: storing stitch data corresponding to a plurality of different stitch patterns;

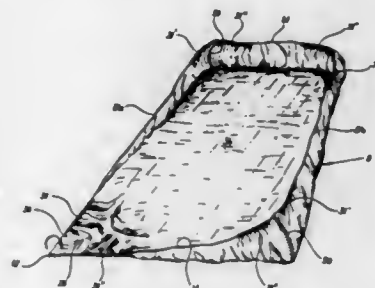
detecting the end of a stitching cycle;  
selecting the stitch data corresponding to a subsequent stitch pattern from the stored stitch data when the end of a stitching cycle is detected;  
calculating the stitch pitch by referring to said selected stitch data corresponding to a subsequent stitch pattern; and  
adjusting stitch pitch.

4,682,555

**PROCESS FOR THE MANUFACTURE OF FITTED ELASTIC BEDSHEETS OR SIMILAR SEAT COVERS**  
Joe Bierbaum, Borken; Siegfried Henze, Hobenroth; Karl Müs-sig, Bad Königshofen, and Hans Ziegler, Grossbardorf, all of Fed. Rep. of Germany, assignors to Texpa Arbter Maschinen-bau GmbH, Saal, Fed. Rep. of Germany  
Filed Nov. 28, 1986, Ser. No. 935,840  
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542445

Int. Cl.<sup>4</sup> D05B 1/00, 97/00  
U.S. Cl. 112—262.1

6 Claims

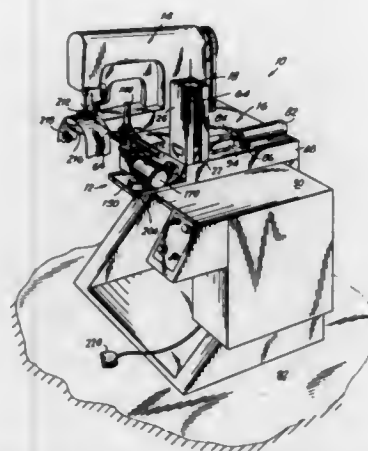


1. Process for the manufacture of fitted elastic bedsheets or similar seat covers, in which rectangular pieces of cloth are cut in segments from a strip of cloth, of which the corners are separated by approximately rectangular punches, and then in turn two adjacent cut edges are connected by a seam, and in which, furthermore, stretched elastic bands or the like are sewn in stretched-out state in or on the corresponding piped edges of the pieces of cloth, which in slackened state cause a drawing together of the cloth with formation of folds or wrinkles, characterized by:

- application of markings on the strip of cloth for determination of the attachment areas for the stretched elastic bands, the transverse cutting lines on the strip of cloth and the seam at each corner to be cut from a piece of cloth;
- sewing of the stretched elastic bands on or in the edges of the strip of cloth, while this is being held in a flat state;
- cutting of the individual pieces of cloth from the strip of cloth;
- sewing of the stretched elastic bands on or in the two edges of the pieces of cloth which correspond to the edges of the cut while the pieces of cloth are held flat;
- diagonal folding at each corner of a piece of cloth, so that the folded cloth segments lie flat one atop the other and the two adjacent edges of the cloth are flush at each corner;
- sewing together of the folded segments of cloth at each corner of a piece of cloth along the markings for the seam; and
- separation of the folded segments of cloth from the cloth corners to the side along each seam.

4,682,556  
**SMALL PART FEEDING AND INSERTING SYSTEM**  
Charles Block, North Bellmore, N.Y., assignor to Joseph Galkin Corporation, Hicksville, N.Y.  
Filed Sep. 23, 1986, Ser. No. 910,592  
Int. Cl.<sup>4</sup> D05B 21/00, 97/00  
U.S. Cl. 112—265.1

1 Claim



1. A method of joining a first object to a second object, the steps comprising, in combination:  
positioning a first object within said joining zone,  
causing a second object to be moved to a pickup zone,  
moving transfer clamp means to said pickup zone,  
causing said transfer clamp means to accept and hold said second object,  
causing said transfer clamp means to transfer said second object from said pickup zone to an insertion zone,  
causing said transfer clamp means to insert said second object into a joining zone,  
clamping a left side of said second object against said first object positioned within said joining zone,  
causing said transfer clamp means to release said second object and to move from said joining zone, and  
joining said first and second objects.

4,682,557

**SAILING WING**

Thomas A. Magruder, 5932 Jordan Ave., El Cerrito, Calif. 94530, and Robert L. Crowell, Rte. 6, P.O. Box 473-B, Boone, N.C. 28607

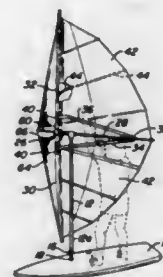
PCT No. PCT/US85/02407, § 371 Date Dec. 5, 1985, § 102(e) Date Dec. 5, 1985

Continuation-in-part of Ser. No. 661,782, Oct. 17, 1984, abandoned. This PCT application Dec. 5, 1985, Ser. No. 817,846

Int. Cl.<sup>4</sup> B63H 9/04

U.S. Cl. 114—39

12 Claims



1. A sailing apparatus comprising:  
a hull adapted to support a sailor,  
a wing having an axis of symmetry generally aligned with a

direction of wing flight with the wing movable with respect to the axis in roll, pitch and yaw directions,  
a mast,  
a lower joint connecting the mast to the hull for pivotal movement of the mast with respect to the hull in the pitch and roll directions, and  
an upper joint connecting the wing to the mast for pivotal movement of the wing with respect to the mast in the roll direction but constrained against relative movement in the pitch direction with respect to the mast whereby the wing can be rolled between port and starboard tack positions through an intermediate life position whereby the hull can be lifted from the water,  
one of the joints providing relative movement in the yaw direction.

4,682,558

**UNDERWATER SCOURING APPARATUS**

Gerrit Broersz, Schoonhoven, Netherlands, assignor to John Meade, United Kingdom

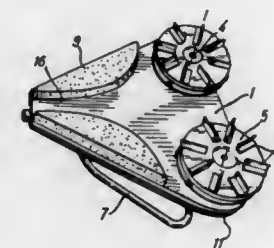
Filed Oct. 4, 1985, Ser. No. 784,172

Claims priority, application United Kingdom, Oct. 6, 1984, 8425322

Int. Cl.<sup>4</sup> B63B 59/06

U.S. Cl. 114—222

9 Claims



1. Underwater scouring apparatus comprising a flexible sheet, mounting means for supporting said flexible sheet, and a plurality of rotatably drivable scouring tools each mounted on said sheet for movement with said sheet, each tool moving independently with respect to one another, said sheet having sufficient flexibility to allow said sheet to conform to a surface of a workpiece and said mounting means being configured to allow said sheet to conform to said surface of said workpiece and to allow said tools to independently pass over an irregularity in said surface of said workpiece in response to the application of pressure to said apparatus.

4,682,559

**GAS DRIVEN ANCHOR AND LAUNCHING SYSTEM THEREFOR**

Emanuel Schnitzer, and Leonard E. Williams, Jr., both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Jan. 21, 1986, Ser. No. 820,650

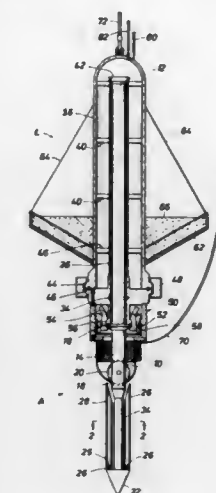
Int. Cl.<sup>4</sup> B63B 21/26

U.S. Cl. 114—295

11 Claims

1. An anchor comprising  
a pressure storage section having a pressure vessel, an inlet for introducing gas under pressure therein, and a central tube open at its upper end within said pressure vessel and open at its lower end to the exterior of said pressure vessel,  
a groove around the interior of said central tube near its open lower end,  
a seal positioned within said groove in said central tube,  
a projectile section having a rod with a cone on its lower end, the upper portion of said rod positioned within said central tube and having a diameter to be in sealing engage-

ment with said seal as said rod is moved axially through said central tube, and



a remotely controlled collet connector releasably securing said projectile section to said pressure storage section.

4,682,560

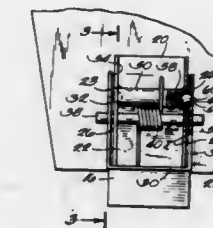
**HIGH FORCE RELEASE AND RESET MECHANISM FOR SUPPORTING A STRUCTURE FROM A BOAT HULL**  
M. Jeremy Lieb, Waukegan, and Raymond D. Collis, Round Lake, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 8, 1985, Ser. No. 752,647

Int. Cl.<sup>4</sup> B63B 49/00

U.S. Cl. 114—343

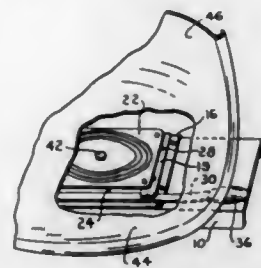
12 Claims



8. Apparatus for pivotally mounting a structure on a boat hull, said apparatus comprising a first hinge member adapted to be fixed to the boat hull and including a surface, a second hinge member adapted to support the structure and including a surface adjacent said surface of said first member, means for pivotally connecting said second hinge member to said first hinge member about a generally horizontal axis for movement between a first position and a second position, and detent means for releasably holding said second hinge member in one of said positions and including an aperture in said surface of one of said first and second hinge members, a ball carried by the other of said first and second hinge members for horizontal movement relative to said first and second hinged members, and spring means extending in generally parallel relation to said horizontal axis for resiliently biasing said ball toward receipt in said aperture in said one of said first and second hinge members.



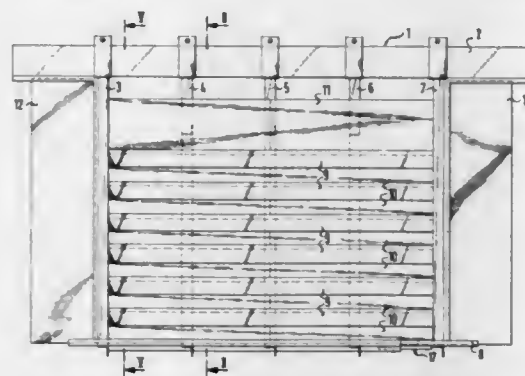
**4,682,561**  
**QUICK ATTACH AND RELEASE BASE**  
 Danny R. Jentry, 12373 Third St., SE., Fort Myers, Fla. 33905  
 Filed Jan. 17, 1985, Ser. No. 745,062  
 Int. Cl.<sup>4</sup> B63B 17/00  
 U.S. Cl. 114—363



1. A seat for a boat of the fishing and canoe classes having spaced side walls, a thwart board connecting the side walls of the boat, a quick attach and release base comprising a thin base member adapted to be secured to the thwart board, spaced parallel guides secured to the base member and providing an open ended slot, an upper seat support member adapted to slidably project into the open ended slot, a pivoted lock and release arm adapted to overlie the open end of the slot to releasably clamp the seat support member in the slot, a handle to manipulate the lock and release arm, a non-rotatable turntable support member clampingly engaged to the seat support member, a rotatable turntable engaging the non-rotatable support member, a pivot between the non-rotatable support member and the rotatable turntable members, and a seat secured to the rotatable turntable member.

**4,682,562**  
**HOLDING DEVICE FOR METAL SECTIONS WHICH ARE TO BE COATED IN TWO COLORS**  
 Uwe Hell, Trappenkamp, Fed. Rep. of Germany, assignor to Hell GmbH & Co., Trappenkamp, Fed. Rep. of Germany  
 PCT No. PCT/DE85/00185, § 371 Date Jan. 28, 1986, § 102(e) Date Jan. 28, 1986, PCT Pub. No. WO85/05573, PCT Pub. Date Dec. 19, 1985  
 PCT Filed May 30, 1985, Ser. No. 845,138  
 Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420453

Int. Cl.<sup>4</sup> B05C 13/00, 13/02  
 U.S. Cl. 118—500

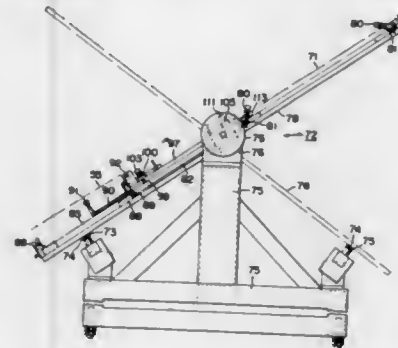


1. A holding and masking device for holding and masking items which are to be coated with two colors, said device comprising a frame having a top cross member, a bottom cross member spaced from said top cross member, a plurality of spaced bearers extending between said cross members and supported thereby, a plurality of support arms extending outwardly, and loosely supported by said bearers, outer ends of said support arms, at least a pair of spaced masks supported by said outer ends of said support arms for receiving and holding at least one item, said masks and said item forming a continuous

wall, whereby said masks isolate both sides of said item from each other for receiving different color treatments.

**4,682,563**  
**JIG FOR SUPPORTING ARRAY OF ARTICLES TO BE SOLDERED AND DEVICE FOR TRANSFERRING ARTICLES TO JIG**  
 Tsugunori Masuda, Hidaka, and Shoji Muto, Sayama, both of Japan, assignors to Kabushiki Kaisha Tamura Selsakusho, Tokyo, Japan  
 Continuation-in-part of Ser. No. 489,068, Apr. 27, 1983, abandoned. This application Oct. 11, 1985, Ser. No. 786,650  
 Int. Cl.<sup>4</sup> B05C 13/02

U.S. Cl. 118—503



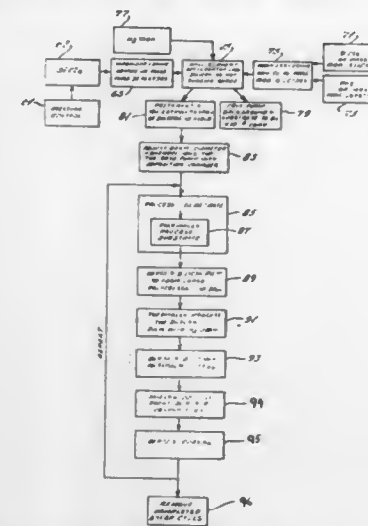
1. A jig for arraying and supporting a multiplicity of articles to be soldered, characterized by comprising: a frame having frame members and adapted to be secured to a conveyor holder of a soldering line; pairs of rod shaped lower supporting wires extended between said frame members and adapted to support the lower side of respective articles; pairs of rod shaped upper supporting wires arranged above said lower supporting wires in parallel with the latter along both side surfaces of respective articles, one end of each of said upper supporting wires being passed loosely through a hole formed on said frame member; a gate member secured on the other end of each of said upper supporting wires and movable up and down with respect to said frame member; and article receiving ports formed in said frame member opposite to said gate member.

**4,682,564**  
**MAGNETOPLASMA DYNAMIC PROCESSOR, APPLICATIONS THEREOF AND METHODS**  
 Gordon L. Cann, 17751-F Sky Park East, Irvine, Calif. 92714  
 Continuation-in-part of Ser. No. 210,241, Nov. 25, 1980, abandoned. This application Jul. 11, 1983, Ser. No. 512,728  
 Int. Cl.<sup>4</sup> B05B 5/02

U.S. Cl. 118—620

1. An apparatus for depositing materials in layers by using a plasma beam electromagnetically accelerated in a vacuum comprising:  
 (a) a vacuum chamber and associated vacuum pumping apparatus;  
 (b) a magnetoplasma dynamic plasma generator, the plasma generator further comprising cathode means anode means a cathode magnet located in substantially surrounding relation to said cathode means; a trimmer magnet located in substantially surrounding relation to said anode means; a focusing magnet, at least part of which is located beyond the anode means with respect to the cathode means;  
 (c) a shielded plasma generator support structure, the support structure supporting the plasma generator within the vacuum chamber;  
 (d) a means to supply the plasma generator with electric power, the electric power being primarily direct current and the power enabling the plasma generator to create a plasma;  
 (e) a target surface, the target surface being located beyond the focusing magnet with respect to the cathode and anode; and

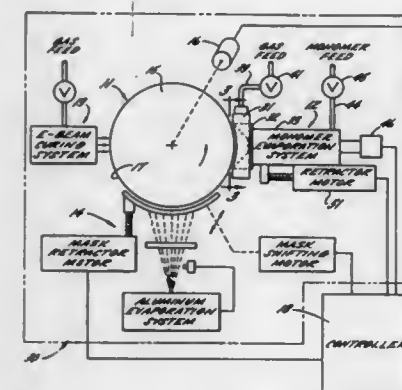
(f) means for injecting one or more of a plurality of materials at a location within said vacuum chamber so as to facilitate



tate the creation of a plasma stream;  
 (g) said plasma stream impinging upon said target surface.

**4,682,565**  
**VAPOR NOZZLE WITH GAS BARRIER BARS**  
 Philip H. Carrico, Greenfield Center, N.Y., assignor to SFE Technologies, San Fernando, Calif.  
 Continuation of Ser. No. 672,529, Nov. 19, 1984, abandoned.  
 This application Jan. 16, 1986, Ser. No. 820,572  
 Int. Cl.<sup>4</sup> G23C 14/00

U.S. Cl. 118—719



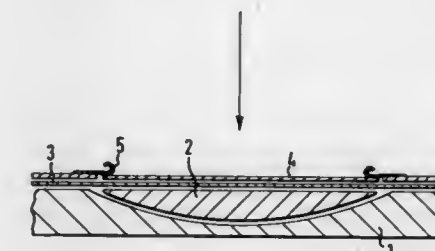
1. A nozzle structure for depositing vaporized material on a relatively moving surface comprising, in combination, a frame fixed with respect to said surface, a plurality of bars fixed on said frame in parallel relation so as to closely overlie said surface, said bars having internal passages and elongated delivery openings from said passages adjacent said surface, a nozzle block having nozzle walls closely fitted between said bars and defining elongated openings facing said surface, means for delivering vaporized material to said nozzle block for depositing material on said surface from said nozzle block openings, and means for delivering inert gas to said internal passages so that inert gas barrier regions are created on the sides of the material being deposited.

6. Apparatus for continuously producing under vacuum a monolithic multi-layer capacitor on a substrate surface comprising means for forming a layer of electrode material on a surface within a predefined electrode forming zone, means for forming a coating of dielectric material on a surface within a predefined dielectric forming zone, said means for forming a coating of dielectric material including a first nozzle closely overlying the substrate surface at said dielectric forming zone, and a pair of second nozzles adjacent either side of said first

nozzle for creating an inert gas wall on either side of the dielectric forming zone, and means for repeatedly passing the substrate surface carrying said layers and coatings through the two zones in sequence so that two different portions of the surface are simultaneously within their respective zones so as to produce alternate layers and coatings of electrode and dielectric on the substrate surface.

**4,682,566**  
**EVACUATED EQUIPMENT**  
 Derek Aitken, East Molesey, England, assignor to Applied Materials, Inc., Santa Clara, Calif.  
 Continuation of Ser. No. 136,677, Apr. 2, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,659  
 Claims priority, application United Kingdom, Apr. 6, 1979, 7912217

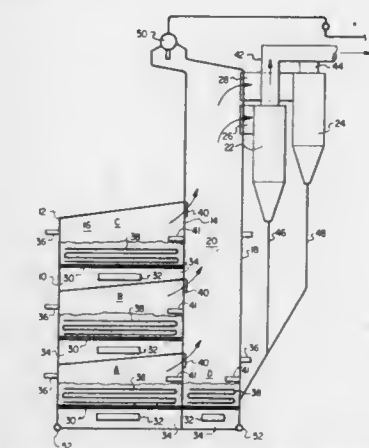
Int. Cl.<sup>4</sup> F28F 23/00  
 U.S. Cl. 118—724



1. In combination, in evacuable equipment for processing components under vacuum, the improvement, in securing heat transfer between one part of the equipment and another part or between a part of the equipment and a component being processed therein, comprising a body of thermally conductive fluid in thermal contact with said first mentioned part of the equipment and confined by a flexible diaphragm disposed for separable, direct, surface-conforming thermal contact with said other part or component.

**4,682,567**  
**FLUIDIZED BED STEAM GENERATOR AND METHOD OF GENERATING STEAM INCLUDING A SEPARATE RECYCLE BED**  
 Juan A. Garcia-Mallol, Morristown, and Michael G. Alliston, Denville, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed May 19, 1986, Ser. No. 864,349  
 Int. Cl.<sup>4</sup> F22B 1/02  
 U.S. Cl. 122—4 D



1. A steam generator comprising a furnace section, means in said furnace section for receiving a plurality of vertically spaced beds of particulate fuel material, means for introducing air into said beds to fluidize said beds and promote the combustion of said fuel material, means for introducing additional fuel to each of said beds, the effluent gases from each of said beds

rising upwardly into the areas above said beds, one boundary wall of said furnace section having openings therein for permitting the discharge of effluent gases from said areas above said beds, a heat recovery enclosure disposed adjacent said furnace section, said boundary wall serving as a common wall between said furnace section and said enclosure so that said enclosure receives said discharged effluent gases, means for receiving a bed of particulate fuel material in said enclosure extending to the side of the lowest of said vertically spaced beds, means for introducing air into said bed in said enclosure to fluidize and promote the combustion of said fuel material in said latter enclosure, means for adding additional fuel material to said fluidized bed in said enclosure, the effluent gases from said enclosure combining with the effluent gases from said furnace section, the height of said enclosure being greater than that of said furnace section so that the effluent gases in said enclosure pass upwardly through said enclosure for a distance greater than the height of said furnace section, means disposed adjacent said enclosure for receiving said combined effluent gases from said latter gases, and means for injecting the separated solid particles into the fluidized bed in said enclosure.

4. A method of operating a steam generator comprising the steps of establishing at least one bed of particulate material including fuel in a furnace, introducing air into said bed at a predetermined velocity to fluidize and promote the combustion of said material, adding additional particulate material including fuel to said bed, discharging effluent gases from said fluidized bed through a boundary wall of said furnace, said boundary wall serving as a common wall between said furnace and a heat recovery enclosure for receiving said discharged effluent gases, establishing a bed of particulate material including fuel in said enclosure, introducing air into said bed in said enclosure to fluidize and promote the combustion said fuel material in said enclosure, adding additional fuel material to said fluidized bed in said enclosure, combining in said enclosure the effluent gases from said bed in said enclosure and the effluent gases from said furnace, passing said combined gases through said enclosure for a distance which exceeds the height of said furnace section, separating the entrained solid particles from said combined gases, injecting the separated solid particles into the fluidized bed in said enclosure, and controlling the amount of material in said fluidized bed in said enclosure relative to said fluidizing velocity so that the combined gases in said enclosure are saturated with said material.

4,682,568

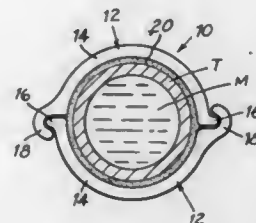
**REFRACTORY SHIELD FOR SUPERHEATER TUBES**  
Kenneth E. Green, Auburn; Donald K. Johnson, and Roger W. Woodruff, both of Holden, all of Mass., assignors to Norton Company, Worcester, Mass.

Filed Jun. 5, 1986, Ser. No. 871,004

Int. Cl.<sup>4</sup> F22B 15/00, 25/00, 37/10

U.S. Cl. 122-235 C

15 Claims



1. A refractory shield for protecting superheater tubes against attack by the products of combustion comprising: a pair of elongated molded and fired refractory half shields of predetermined identical interchangeable interlocking size and shape adapted when one of the half shields is rotated 180° and extended longitudinally relative to the other half shields to be slid axially together and interlocked together solely thereby without additional fasten-

ing means, surround and shield the superheater tube, each half shield having:

an elongated refractory sidewall portion of predetermined axial length and thickness between opposite ends thereof extending circumferentially between and to diametrically opposite refractory tongue and grooved side wall portions of predetermined axially engageable interlocking shape; an elongated tongue of predetermined shape, width and radial length projecting radially outwardly from the tongue sidewall portion; and

an elongated internal groove projecting radially outward in the grooved side wall portion and of predetermined interlocking shape, sufficient width and radial depth to accept an elongated tongue of the other one of the pair of half shields assembled and locked together against relative rotation solely by axially inserting the tongues into the grooves.

4,682,569

**OSCILLATORY MOTION APPARATUS**

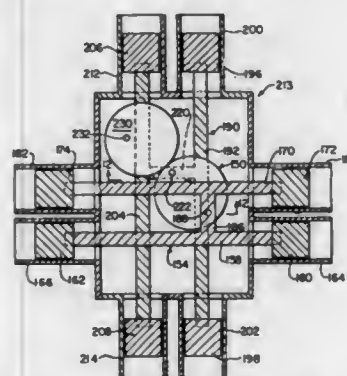
Alfred H. Stiller, and James E. Smith, both of Morgantown, W. Va., assignors to West Virginia University, Morgantown, W. Va.

Division of Ser. No. 706,153, Feb. 27, 1985, Pat. No. 4,641,611, which is a continuation-in-part of Ser. No. 628,748, Jul. 6, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 832,324

Int. Cl.<sup>4</sup> F02B 75/22

U.S. Cl. 123-55 A

7 Claims



1. Oscillatory motion apparatus comprising first rod means mounted for oscillating movement in a first direction, second rod means mounted for oscillating movement in a second direction, first trammel gear means pivotally secured to said first rod means by first pivot means, said first trammel gear means pivotally secured to said second rod means by second pivot means, whereby coordinated oscillating movement of said first rod means and said second rod means will effect responsive rotational and translational movement of said trammel gear means, said first pivot means being relatively spaced from said second pivot means, said first rod means having a first connecting rod connected to a second connecting rod by a first crossover member, said second rod means having a third connecting rod connected to a fourth connecting rod by a second crossover member, eccentrically mounted output gear means having an axially fixed mounting, operatively associated with said trammel gear means for effecting rotational movement responsive to rotation and translation of said trammel gear means, and said output gear means having an output gear and a rotatable output shaft positioned coaxially with the eccentric mounting of said output gear, whereby the rotational component of the movement of said trammel gear means will effect rotation of said output shaft.

4,682,570

**INTERNAL COMBUSTION ENGINE (JV-1)**

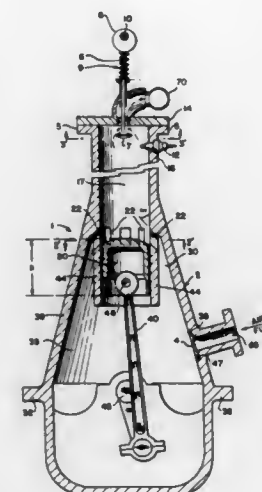
John Velencei, Daly Rd., Far Hills, N.J. 07931

Filed Nov. 26, 1984, Ser. No. 674,945

Int. Cl.<sup>4</sup> F02B 33/04

U.S. Cl. 123-73 PP

9 Claims



1. An internal combustion engine cylinder assembly comprising an elongated cylinder having substantially vertically disposed interior walls defining an elongated firing chamber therein; piston means housed within said firing chamber and adapted for vertical reciprocation within said firing chamber; gas inlet channels in the lower portion of said firing chamber; a crankcase housing having a gas compression chamber disposed therein; a reed valve means pivotally secured to the inner walls of said gas compression chamber and adapted for passing fuel/air mixtures into the gas compression chamber upon the depressuring thereof; a cylinder closure means positioned at the upper end of said cylinder defining the upper end of said firing chamber and being provided with exhaust gas valve means, adapted for cyclic opening and closing to alternatively permit the removal of exhaust gases from said firing chamber and the pressuring of said fresh fuel/air mixtures in said firing chamber; fuel ignition means for igniting a compressed fuel/air mixture in said firing chamber; at least a portion of said elongated cylinder inner walls extending downwardly into said gas compression chamber and adapted to house at least a portion of said piston means therein during the full downstroke of said piston means; the upper portion of said crankcase housing having inwardly sloping walls to define a substantially uniformly converging gas space in the upper portion of said gas compression chamber annularly about said downwardly extending cylinder portion, said gas inlet channels providing direct gaseous communication between said firing chamber and said converging gas space, and said piston means being arranged to cyclically open and close said gas inlet channels to control said gaseous communication; said piston means cooperating with said exhaust valve means and said fuel ignition means for controlling the pressurization and charging of fresh fuel/air mixtures into said firing chamber from said converging gas space and the compression of said fuel/air mixtures and the ignition thereof in said firing chamber to generate power and to remove from said firing chamber the thus generated exhaust gases.

4,682,571

**EXHAUST GAS RECIRCULATION SYSTEM FOR CRANKCASE SCAVENGED TWO CYCLE ENGINE**

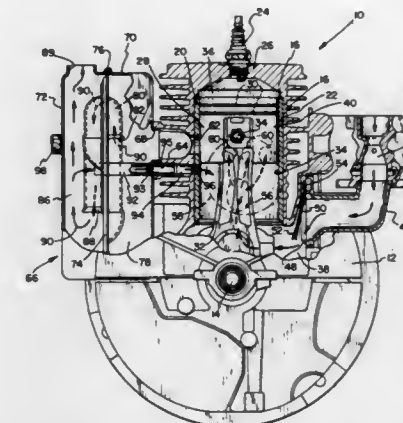
Vernon R. Kaufman, Cedarburg, and Miles S. Geringer, Milwaukee, both of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Dec. 17, 1985, Ser. No. 810,063

Int. Cl.<sup>4</sup> F02B 33/04

U.S. Cl. 123-73 A

18 Claims



6. A two cycle crankcase scavenged engine comprising: a cylinder having a piston reciprocally disposed therein, said piston and cylinder forming a combustion chamber, a crankcase, an exhaust port opening into said combustion chamber, exhaust system means connected to said exhaust port for conducting exhaust gas away from said engine and cooling the exhaust gas, means for forming an air-fuel mixture and introducing the mixture into said crankcase through an intake opening, a transfer passage connecting said crankcase to said combustion chamber, an exhaust recirculation port opening into said crankcase, and exhaust gas recirculation means connected to said exhaust system means for recirculating exhaust gas into said crankcase through said recirculation port.

4,682,572

**HIGH EFFICIENCY PERFORMANCE KINETIC OCCLUDE SYSTEM WITH ROTARY VALVE**

Samuel Hepko, Rte. 1, Box 2170-1, Branson, Mo. 65616

Division of Ser. No. 649,699, Sep. 12, 1984, Pat. No. 4,592,312.

This application Feb. 10, 1986, Ser. No. 828,755

Int. Cl.<sup>4</sup> F01L 7/10; F02F 3/26

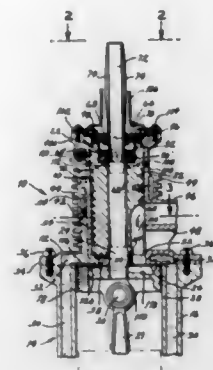
U.S. Cl. 123-80 BB

5 Claims

1. In an internal combustion engine including at least one cylinder, a piston reciprocal in the cylinder, valve apparatus, and a shaft carried centrally by and extending above the face of the piston for operation of the valve apparatus, the improvement characterized by the piston defining a face, the piston including first and second regions, the first region including a recess and the second region being flat, the recess having a central portion recessed relatively deeply into the face of the piston and surrounding the shaft, the recess being C-shaped in plan and substantially concentric about the center of the piston face and concentric also with respect to the shaft, the first region defining the major extent of the surface area of the



piston face and tapering uniformly upwardly in opposite directions on opposite sides of the shaft to opposite side edges of the



second region, the second region defining in plan view a V-shaped configuration having its apex substantially at the shaft.

4,682,573

# VALVE GEAR FOR USE IN A FOUR CYCLE ENGINE

Tetsuzo Fujikawa, Kobe; Makizo Hirata, and Shinichi Tamba, both of Kakogawa, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

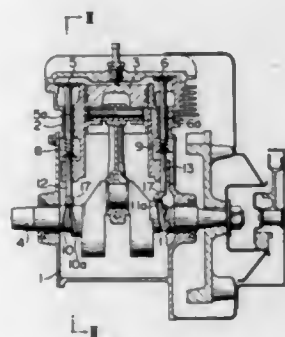
Continuation of Ser. No. 578,631, Feb. 9, 1984, abandoned. This application May 9, 1986, Ser. No. 862,170

Claims priority, application Japan, Feb. 15, 1983, 58-24442

Int. Cl.<sup>4</sup> F01L 1/32

U.S. Cl. 123-90.2

1 Claim



1. A valve gear for use in a four-cycle engine having a crank shaft, an air-intake valve having a stem, and an exhaust valve having a stem comprising:

(a) guide means formed by closed-curve grooves making two rounds of the outer surface of said crank shaft with one intersection on the way for controlling the movement of said air-intake valve and said exhaust valve of said engine upon rotation

(b) slider means connected to operate each said valve stem under guidance of said guide means, said slider means including:

a vertically elongated rod portion supported for rotary rocking and reciprocating lifting and dropping movement relative to and along the axis of a corresponding valve stem and having an upper end surface engaging a lower end surface of the corresponding valve stem;

rocking means for reciprocating said rod portion and positively rotating carried thereby said rod portion in two directions opposite to each other upon rotation of the crank shaft, the engagement between the upper end surface of each rod portion and the lower end surface of each valve stem producing rotation of the valve stem in one

direction during a lifting phase and in the opposite direction during a dropping phase, the amplitude of rotation produced during the lifting phase being greater than the amplitude of rotation produced during the dropping phase, whereby the valve stem and valve carried thereby are rotated incrementally in the one direction upon rotation of the crank shaft;

said rocking means comprising:

a horizontal arm portion extending from one end of said elongated rod portion and rockable about a vertical axis of said slider means; and

a ball rotatably supported on the tip of said arm portion and guided by said guide means providing a low friction connection with said guide means as said crank shaft rotates to produce rocking movement of said horizontal arm portion and reciprocating and rotary rocking movement of said vertically elongated rod portion to operate each of said valves.

4,682,574

# ELECTROMAGNETICALLY-ACTUATED POSITIONING SYSTEM

Peter Kreuter, Josef-Ponten Str. 38, Aachen, Fed. Rep. of Germany

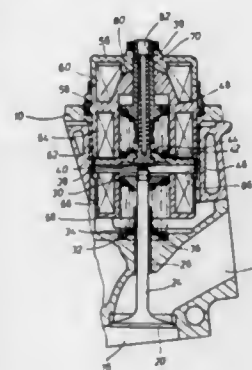
Filed Apr. 11, 1986, Ser. No. 850,937

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513107

Int. Cl.<sup>4</sup> F01L 9/04; H01F 7/08

U.S. Cl. 123-90.11

8 Claims



1. An improved guide and centering system for an electromagnetically-actuated positioning mechanism of spring-loaded valve-type reciprocating actuators in displacement machines, comprising in operative combination:

(a) means for reciprocatingly actuating a valve member, said reciprocating actuator means being movable between two discrete, mutually-opposite operating positions;

(b) said reciprocating actuator means comprising a rod member having an electromagnetically attractable anchor plate member secured adjacent one end thereof, said actuator means being disposed to permit said valve member to move from a first, closed operating position to a second, open operating position;

(c) said reciprocating actuator means being biased toward said second open position by at least one spring member having opposed ends;

(d) one end of said spring being receivingly engaged by a support member acting as one seat for said spring member;

(e) means for adjusting the position of said spring support member, said adjusting means comprising a tubular sleeve member having said support member mounted medially thereof; and

(f) said sleeve member being adapted to reciprocatingly receive said actuator rod member so that as said spring position is adjusted, said rod guides said sleeve, and as said

actuator means actuates said valve member said sleeve guides said rod.

4,682,575

# LOW FRICTION HIGH SPEED ROCKER ARM

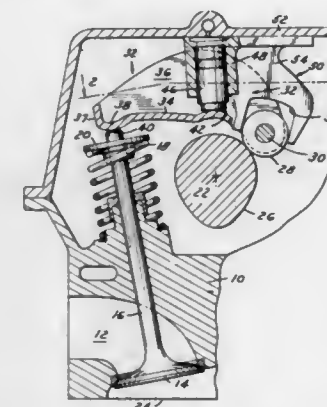
Aladar O. Simko, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 31, 1986, Ser. No. 846,386

Int. Cl.<sup>4</sup> F01L 1/18

U.S. Cl. 123-90.44

7 Claims



1. A valve train for an internal combustion engine comprising, a camshaft mounted close above the cylinder head face of the engine, a one-piece essentially U-shaped rocker arm mounted above the camshaft for an arcuate movement and defined by a bottom wall integral with a pair of laterally spaced upstanding side walls, the bottom wall having a cylindrical fulcrum surface projecting upwardly therefrom, a lash adjuster fixedly supported above the rocker arm against lateral movement and having a lower surface engaging the cylindrical fulcrum surface with a contact establishing a pure rolling motion without friction of the rocker arm upon the lash adjuster lower surface, a reciprocatingly mounted valve stem engaging one end of the rocker arm for reciprocation of the valve, the other end of the rocker arm rotatably supporting a dual function roller engagable with a cam lobe on the camshaft for arcuate pivoting of the rocker arm about its fulcrum upon rotation of the camshaft, support means supporting the roller for both an arcuate movement of its axis of rotation along a predetermined path providing a pure rolling motion of the rocker arm about its fulcrum upon the lash adjuster surface and confining the roller and arm in a manner preventing longitudinal sliding movement of the rocker arm fulcrum surface relative to the lash adjuster surface.

4,682,576

# INTAKE SYSTEM FOR DIESEL CYCLE ENGINES

Saburo Nakamura, Higashihiroshima; Shigeru Sakurai; Takumi Nishida, both of Hiroshima, and Masanori Sahara, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 6, 1985, Ser. No. 741,884

Claims priority, application Japan, Jun. 10, 1984, 59-85942[U]

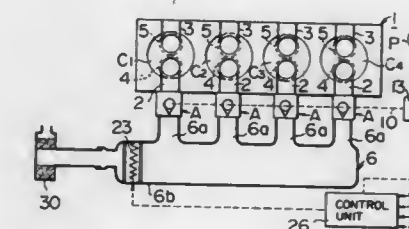
Int. Cl.<sup>4</sup> F02M 35/10, 31/02

U.S. Cl. 123-179 A

24 Claims

1. An intake system for diesel cycle engines comprising intake passage means leading through intake port means to combustion chamber means, timing suction pressure responsive valve means provided in said intake passage means for closing said intake passage means in a beginning period of intake stroke wherein the intake port means is opened to said combustion chamber means and opening the intake passage means in the remainder period of the intake stroke, characterized by the fact that said valve means includes a valve member which is movable between a closed position wherein it closes

the intake passage means and an open position wherein it opens the intake passage means, biasing means for biasing the valve member toward said closed position, said valve member having a first surface which is subjected in said closed position to a pressure in said intake passage means upstream the valve means and a second surface which is subjected in said closed position to a pressure in the combustion chamber means so that a difference between the pressures on the first and second surfaces of the valve member assists the biasing means biasing the valve member to the closed position, valve actuator means comprising suction pressure chamber means defined at least partly by pressure responsive movable member, means connecting said movable member with said valve member so that a movement of the movable member is transmitted to the valve member and communicating passage means for communicating said suction pressure chamber means with said intake passage means downstream the valve means so that a suction



pressure produced in said intake passage means downstream the valve means in the intake stroke is introduced into the suction pressure chamber means to cause a movement of the movable member for moving the valve member under said suction pressure from the closed position to the open position after said beginning period of the intake stroke and maintaining the valve member at the open position at least until bottom dead center of the intake stroke.

20. An intake system for diesel cycle engines which includes intake passage means leading to combustion chamber means, timing valve means provided in said intake passage means for closing said intake passage means in an initial period of intake stroke and opening said intake passage means in an intermediate period of the intake stroke until at least bottom dead center, heating means provided in said intake passage means upstream the timing valve means, and operating means for operating the heating means and making the timing valve means operative under a low engine temperature.

4,682,577

# METHOD AND APPARATUS FOR REDUCING NOX IN INTERNAL COMBUSTION ENGINE

Kenji Kato, Sizuoka; Tokuta Inoue, Mishima; Kiyoshi Nakaniishi, and Soichi Matsushita, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 29, 1985, Ser. No. 696,172

Claims priority, application Japan, Feb. 28, 1984, 59-37423

Int. Cl.<sup>4</sup> F02D 41/10, 43/04

U.S. Cl. 123-492

11 Claims

1. A method of reducing the amount of nitrogen oxides in an internal combustion engine, comprising the steps of:

(a) calculating a basic fuel injection duration;

(b) calculating an amount of variation in an intake pipe pressure;

(c) judging whether or not said amount of variation in the intake pipe pressure is larger than a predetermined value;

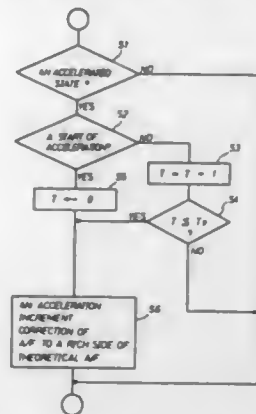
(d) measuring an elapsed time from said amount of variation exceeding said predetermined value;

(e) judging whether or not said elapsed time is longer than a predetermined time;

(f) controlling the air/fuel ratio to be greater than a stoichiometric air/fuel ratio in response to said basic fuel injection duration both: (1) when said amount of variation in the

intake pipe pressure is below said predetermined value, and (2) when said amount of variation in the intake pipe pressure is larger than said predetermined value and said elapsed time is longer than said predetermined time;

(g) only when said amount of variation in the intake pipe pressure is larger than said predetermined value and said elapsed time is below said predetermined time, adding said basic fuel injection duration to an incremental injection duration as a final injection time; and



(h) controlling the air/fuel ratio in accordance with said final injection time when said amount of variation in the intake pipe pressure is greater than said predetermined value and said elapsed time is shorter than said predetermined time, said incremental injection duration causing said final injection time to produce an air/fuel ratio which is smaller than said stoichiometric air/fuel ratio.

4,682,578

## INFRARED RADIANT HEATER

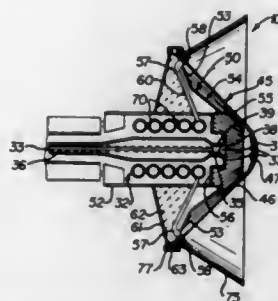
Gerhard Schmidt, Edmonton, Canada, assignor to Flour City Architectural Metals, Division of E.G. Smith Construction Products, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 658,385, Oct. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 554,207, Nov. 22, 1983, abandoned. This application Oct. 17, 1986, Ser. No. 920,579

Int. Cl. F24C 3/00

U.S. Cl. 126-91 R

23 Claims



1. An infrared radiant heating apparatus for use in heating articles rapidly and efficiently by infrared radiation absorption, said apparatus comprising a support frame, a heat absorbing and radiating heater mounted on said support frame, said heater including an inner heat cone and an outer heat cone spaced apart from each other and joined together along their outer peripheries to define a combustion chamber therebetween, said outer heat cone having an exposed convex conical surface and being formed of a heat absorbing and radiating material, said heater further including a fuel pipe extending to a nozzle which extends through said inner heat cone and opens into said combustion chamber, a shroud surrounding said fuel

pipe, a cylindrical jacket surrounding and spaced apart from said shroud and joined at one end to said inner heat cone, a helical exhaust pipe disposed within said jacket and surrounding said shroud, said inner cone having a plurality of exhaust ports therethrough along its outer periphery, with each of said exhaust ports connected to said helical exhaust pipe by a tubular pipe, means for channeling combustion and exhaust gases from said combustion chamber along the inner surface of said outer cone and to said exhaust ports, and burner means including means for supplying fuel to said fuel pipe and means for supplying air through the space between said jacket and said shroud and to said nozzle, whereby hot gases pass through said tubular pipes and through said helical exhaust pipe and the incoming combustion air passes over said helical exhaust pipe and is preheated thereby from the transfer of heat.

4,682,579

## CONDENSATE OVERFLOW CONTROL FOR FURNACE

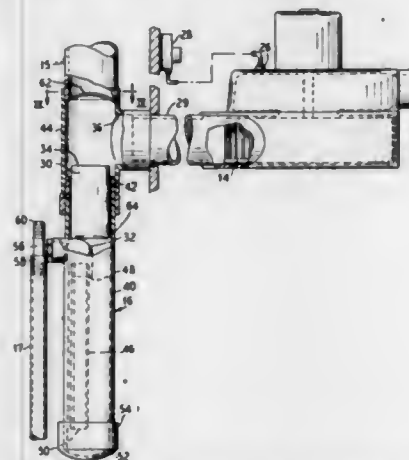
Davis L. Bigham, Franklin, Tenn., assignor to Hell-Quaker Corporation, LaVergne, Tenn.

Filed Feb. 21, 1986, Ser. No. 831,981

Int. Cl. F24H 3/02; F04B 10/00

U.S. Cl. 126-110 R

17 Claims



1. In a domestic forced air condensing furnace including a blower for forcing all of the combustion products and condensate to an outlet conduit, said outlet conduit connected to a condensate trap and a vent, and a pressure sensor to detect the negative pressure created by the blower and a decrease in the negative pressure caused by a vent blockage, the improvement comprising:

a float means positioned in said condensate trap arranged to block said outlet conduit when the condensate in said trap increases to an undesirable level and to remain clear of said outlet conduit when said condensate level is below said undesirable level;

whereby, said pressure sensor will detect a rise in the condensate level when it reaches said undesirable level due to blockage of said outlet conduit by said float means.

7. In a domestic forced air furnace having a burner including a heat exchanger for receiving the products of combustion from said burner which extracts sufficient heat from the combustion products to cause the formation of condensate, a blower, and conduit means for connecting the heat exchanger to the blower to pass all of the combustion products and condensate from the heat exchanger to the blower and the blower passing all the combustion products and condensate therethrough to an outlet conduit and then to a vent and condensate trap, respectively, said condensate trap having drainage means associated therewith, and a pressure sensor to detect the negative pressure created by the blower and a decrease in the negative pressure caused by a vent blockage, the improvement comprising:

a float means positioned in said condensate trap arranged to move between a normal operating position clear of said outlet conduit and a raised position in response to an undesirable rise in the level of condensate in said condensate trap, said raised position of said float means blocking said outlet conduit;

whereby the outlet to said vent will be blocked and said pressure sensor will sense the blockage caused by the rise in the condensate level.

4,682,580

## EXHAUST SYSTEM FOR A COOKING APPARATUS

Shigeaki Fukumoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

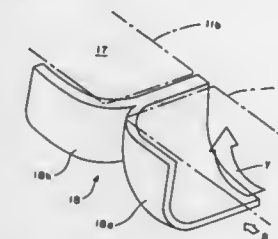
Filed Feb. 10, 1986, Ser. No. 827,826

Claims priority, application Japan, Mar. 12, 1985, 60-35720[U]

Int. Cl. F23J 11/00

U.S. Cl. 126-299 D

9 Claims



1. A cooking apparatus comprising  
a horizontal duct with inlets at both ends thereof, said duct being so connected as to admit exhaust gas thereinto through said inlets and to cause said admitted exhaust gas to travel inside said duct toward each other, said duct having a horizontal outlet and a vertical outlet, and  
a structure disposed inside said duct and supported rotatably around a horizontal axis, said structure serving at a first angular position around said axis to deflect said exhaust gas approximately by 90 degrees toward said horizontal outlet, said structure serving at a second angular position around said axis to deflect said exhaust gas approximately by 90 degrees toward said vertical outlet.

4,682,581

## SECONDARY CIRCULATION SYSTEM

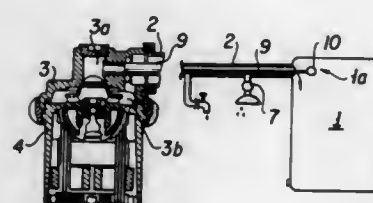
Karsten Laing, 3970 Honeycutt St., San Diego, Calif. 92109; Doerte Laing, and Birger Laing, both of Hofener Weg 35, 7148 Remseck 2-Aldingen, Fed. Rep. of Germany

Filed Feb. 13, 1986, Ser. No. 828,985

Int. Cl. F24H 1/00

U.S. Cl. 126-362

5 Claims



1. Circulation system for secondary circulation in a domestic hot water system composed of a distribution pipe, a circulation pipe for secondary circulation, and a pump with a pumphousing having the two openings for inlet and outlet of water, which together form a loop, whereby both ends of the loop communicate with the heat source, e.g. a tank characterized in that

the circulation pipe (9), having an inner diameter of about 1/4 inch, is situated within the distribution pipe (2), the first end of the circulation pipe (9), communicates with the pump (3,4),

the second end of the circulation pipe (9) communicates with the hot region of the heat source (1) (e.g. the upper level of a tank),

between the first end of the circulation pipe (9) and one opening of the pumphousing a valve (22, 23) is arranged, the other opening of the pump housing communicates with the interior of the heat source (1) via a tube (28), between said tube (28) and said other opening of the pump housing a valve (26, 27) is arranged,

one of the two valves (22, 23, 26, 27) being a checkvalve, preventing backflow through the pump housing caused by pressure difference between the second end of the circulation pipe (9) and the distribution pipe (2).

4,682,582

## SOLAR ENERGY COLLECTOR AND SUN MOTOR UTILIZING SAME

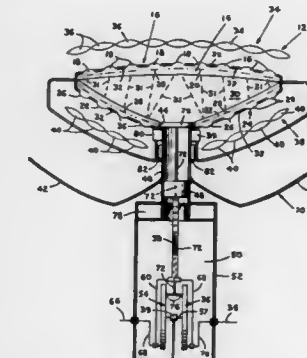
Attila Zsida, Ridgewood, N.Y., assignor to Christiane Grams, Ridgewood, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,195

Int. Cl. F24J 2/08

U.S. Cl. 126-440

14 Claims



1. A solar energy collector comprising a lens system having a convex outer light receiving face and having a series of condensing lens elements, each having a focal plane, said focal planes of said lens system collectively defining a focal surface, and metal element means located in said focal surface, said focal surface located within the material of said lens system and said metal element means being embedded within the material of said lens system.

4,682,583

## INFLATABLE ARTIFICIAL SPHINCTER

John H. Burton, 13110 Greenwood Rd., Minnetonka, Minn. 55343, and Brad G. Staehle, 17220 Creek Ridge Pass, Minnetonka, Minn. 55345

Filed Apr. 13, 1984, Ser. No. 600,107

Int. Cl. A61B 17/00

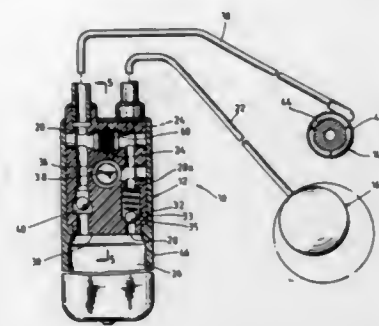
U.S. Cl. 128-1 R

8 Claims

1. An artificial sphincter, comprising:  
inflatable fluid operated occlusion means for occluding a body passage;  
a fluid reservoir;  
a flow passage adapted to provide restricted fluid communication between said occlusion means and said reservoir, said passage arranged such that fluid tends to drain from said reservoir into said occlusion means through said passage;  
a pump means in fluid communication with said occlusion means for selectively transferring fluid from said occlu-



sion means to said reservoir to deflate said occlusion means so that the body passage may be opened; and shaft at a distal end having an integral frusto conical portion converging towards the distal extremity, and said shaft having



locking means, located along said flow passage, for selectively occluding the flow of fluid from said reservoir to said occlusion means through said flow passage.

4,682,584

## DENTAL CARE INSTRUMENT

Wolfgang Pose, Eppendorfer Landstrasse 44, D-2000 Hamburg 20, Fed. Rep. of Germany

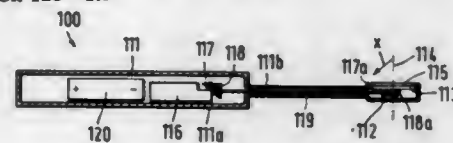
Filed Sep. 23, 1985, Ser. No. 779,129

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1984, 8431762; Nov. 6, 1984, 8432394; European Pat. Off., Feb. 28, 1985, 85102257.4; Fed. Rep. of Germany, Sep. 3, 1985, 8525069

Int. Cl.<sup>4</sup> A61B 17/52

U.S. Cl. 128-1.3

5 Claims



1. A dental care instrument comprises a bar-like handle configured in the form of a housing, part of said housing having an elongate handle and another portion of said housing having a chamber, a magnet arranged in a position in said chamber such that when the part of the housing that contains said chamber and said magnet is inserted into an oral cavity and given a predetermined movement the magnet will produce a magnetic field to neutralize energy emissions from substances in said oral cavity, characterized in that a rotating disk is arranged on an axis at a right angle to the lengthwise dimension of said handle, said magnet comprises at least one bar magnet on said disk, and driving means by which the aforesaid disk may be rotated in a plane which can be continuously modified with respect to the horizontal.

4,682,585

## OPTICAL SYSTEM FOR AN ENDOSCOPE

Siegfried Hiltbrandt, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Feb. 5, 1986, Ser. No. 826,187

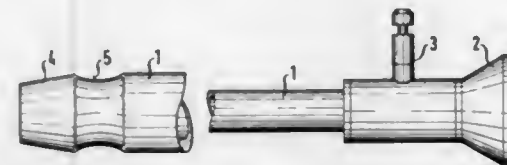
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506464

Int. Cl.<sup>4</sup> A61B 1/00

U.S. Cl. 128-4

11 Claims

1. An optical system for an endoscope comprising a shaft receiving optical guide elements, said shaft being insertible through guide means into a bodily cavity for examination, said



at least one peripheral constriction at a proximal side of the conical portion.

4,682,586

## AUTOMATIC EXPOSURE CONTROL DEVICE FOR ENDOSCOPE

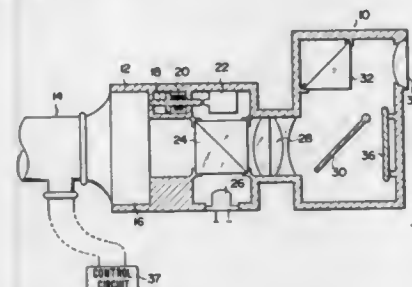
Kazumasa Matsuo, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 54,881, Jul. 5, 1979. This application Oct. 4, 1984, Ser. No. 657,476

Int. Cl.<sup>4</sup> A61B 1/06

U.S. Cl. 128-6

2 Claims



1. In combination, an endoscope having an image transmitting optical system and an eyepiece section at one end of the image transmitting optical system, a plurality of recesses located at the eyepiece section, the positions and numbers of said recesses representing in combination the size of a diameter of said image transmitting optical system which is indicative to said endoscope, and a camera for the endoscope, said camera having an attachment section for attachment to the eyepiece section of said endoscope for photographing an image whose size is determined by the diameter of said image transmitting optical system, signal generating means having a plurality of actuators provided at the attachment section of said camera and normally biased to extend toward the endoscope, said plurality of actuators each being independently reversed-biased if an end of the actuator does not coincide with a recess of the endoscope when the endoscope is attached to said camera to communicate the size of a field of view of said endoscope corresponding to the diameter of said image transmitting optical system to said camera and produce a correction signal corresponding to a combination of a bias state of said actuators, light receiving means provided within said camera for producing a light receiving signal corresponding to an amount of light reflected from a predetermined area of a film surface, and exposure means connected to said signal generating means and light receiving means for determining an exposure value in accordance with the light receiving signal and the correction signal.

4,682,587

## COMPOUND FORCE SACRO-LUMBAR SUPPORT BELT

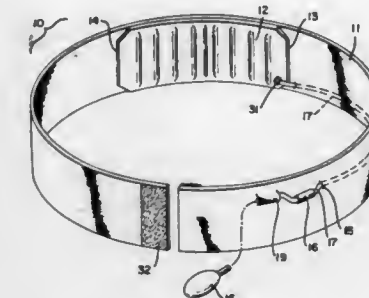
James D. Curlee, Mechanicsburg, Pa., assignor to Pneumedic Corp., Palmerton, Pa.

Filed May 7, 1985, Ser. No. 731,392

The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> A61F 5/01, 5/04

U.S. Cl. 128-78



1. A compound force sacro-lumbar support belt comprising an inflatable envelope, said envelope being divided into a multitude of intercommunicating, parallel ribs disposed perpendicular to the longitudinal axis of said belt, means to introduce fluid to said envelope and to retain said fluid within said envelope, upon introduction of fluid said envelope shrinking along its length and said ribs contacting the wearer and providing lines of pressure in the sacro-lumbar region, said envelope being constructed of a material having relatively no stretchability compared to the amount of shrinkage, said shrinkage and said ribs being the only means of support to the sacro-lumbar region, means to secure said envelope to said wearer, said means to secure being two flexible straps.

4,682,588

## COMPOUND FORCE THERAPEUTIC CORSET

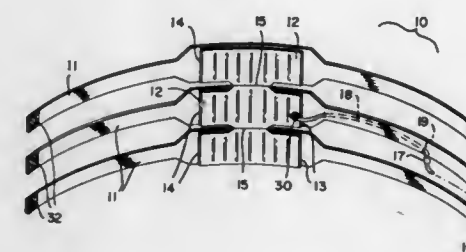
James D. Curlee, Mechanicsburg, Pa., assignor to Pneumedic Corp., Palmerton, Pa.

Filed May 7, 1985, Ser. No. 731,394

The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> A61F 5/01, 5/04

U.S. Cl. 128-78



1. A compound force sacro-lumbar support corset comprising at least two inflatable envelopes, each of said envelopes being divided into a multitude of intercommunicating, parallel ribs disposed perpendicular to the longitudinal axis of said corset, means to introduce fluid to said envelopes and to retain said fluid within said envelopes, upon introduction of fluid, said envelopes shrinking along their lengths and said ribs contacting the wearer and providing lines of pressure in the sacro-lumbar region, said envelopes being constructed of a material having relatively no stretchability compared to the amount of shrinkage, said shrinkage and said ribs being the only means of

support to the sacro-lumbar region, means to secure said envelopes to said wearer, said means to secure being flexible straps.

4,682,589

## PENILE PROSTHESIS

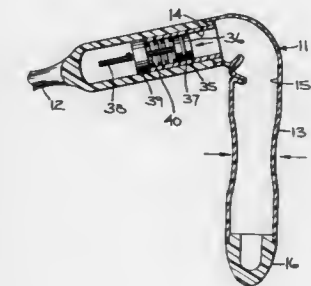
Roy P. Finney, Bayport, Fla., assignor to Medical Engineering Corporation, Racine, Wis.

Continuation-in-part of Ser. No. 459,776, Jan. 21, 1983, which is a division of Ser. No. 313,729, Oct. 22, 1981, Pat. No. 4,378,792, which is a division of Ser. No. 150,231, May 15, 1980, Pat. No. 4,318,396, and Ser. No. 680,746, Dec. 12, 1984, Pat. No. 4,622,958. This application Dec. 18, 1985, Ser. No. 810,420

Int. Cl.<sup>4</sup> A61F 2/26

U.S. Cl. 128-79

2 Claims



1. A valveless self-contained penile implant consisting essentially of an elongated, hollow, non-distensible cylinder having a flexible collapsible portion at one end for implanting into a corpus cavernosum of a pendulous penis and a relatively rigid other end for implanting in the root end of said corpus, pressurizing fluid substantially filling said hollow cylinder; a spring actuated, extendable piston closely fit in a longitudinal bore at the other end of said cylinder, said piston being extendable to transfer pressurizing fluid from the bore into said flexible, collapsible portion to thereby fill it and make it rigid; and means for maintaining the spring actuated piston in a non-extended state until it is desired to transfer the fluid into the flexible collapsible portion.

4,682,590

## METHOD OF INSERTING INTRAMEDULLARY COUPLED PIN

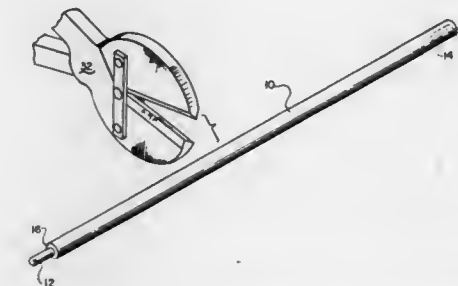
Kody R. Kothmann, Rte. 9, Box 73M, Lubbock, Tex. 79423

Continuation-in-part of Ser. No. 595,812, Apr. 2, 1984. This application Nov. 5, 1985, Ser. No. 795,473

Int. Cl.<sup>4</sup> A61F 5/04

U.S. Cl. 128-92 YZ

4 Claims



1. The method of immobilizing a fractured tubular bone having a marrow cavity using: two rods joined at a coupling which locks the rods into a pin which can only be unlocked by pulling the rods axially apart, said pin having two ends, one end on each rod; COMPRISING THE STEPS OF:

choosing a pin diameter which will fit snugly into the marrow cavity, cutting the end from each rod so with each rod inserted into the marrow cavity with the cut end against the cancellous bone that the coupling of each rod is at the fracture, inserting each rod into the fractured bone, and joining the rods at the coupling to form the pin.

4,682,591

## RESUSCITATOR/VENTILATOR

Norman S. Jones, Leighton Buzzard, England, assignor to Paenpac Limited, London, England

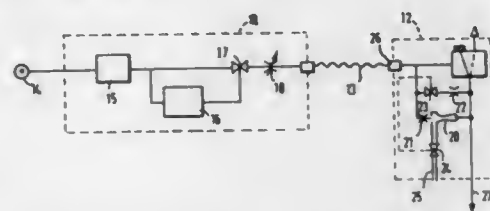
Filed Apr. 30, 1986, Ser. No. 857,936

Claims priority, application United Kingdom, May 2, 1985, 8511170

Int. Cl.<sup>4</sup> A61M 16/00

U.S. Cl. 128—204.25

7 Claims



1. In a gas-powered resuscitator/ventilator device comprising a control unit having a high-impedance flow-regulation restriction and means for providing undiluted primary gas pulse flow therefrom, a patient valve connected to said restriction and including first means having a specific impedance for delivering said undiluted primary gas pulse flow to a patient at a predetermined rate, the improvement comprising said patient valve also including a diluent gas entrainment mixer that when operative dilutes the primary gas pulse flow received from the control unit, the patient valve including second means operative with the entrainment mixer to jointly provide a flow impedance to the primary gas pulse flow such that the primary gas pulse flow combined with the entrained diluent gas flow is delivered to the patient at substantially the same predetermined rate as the undiluted primary gas pulse flow and means for selectively connecting either the first or second means to a patient.

4,682,592

## METHOD AND DEVICE FOR ACHIEVING REVERSIBLE MALE STERILIZATION

Knate E. Thorsgard, 3415 20th Ave. South, Apt. #210, Grand Forks, N. Dak. 58201

Filed Jan. 28, 1985, Ser. No. 695,188

Int. Cl.<sup>4</sup> A61B 19/00

U.S. Cl. 128—303 R

1 Claim



1. A contraceptive device for achieving reversible male sterilization comprising in combination:

- (a) an elongated hollow tube having an outside diameter allowing it to be inserted into the urethra;
- (b) an expandable elongated elastic cap attached to one end of said elongated hollow tube and forming a fluid tight seal with said elongated hollow tube;
- (c) a plug attached to the other end of said elongated hollow tube forming a fluid tight seal with said elongated hollow tube and said elongated elastic cap;
- (d) a flexible spring within said elongated hollow tube said flexible spring extending within said elongated elastic cap

and holding it as an extension of said elongated hollow tube;

- (e) a valve within said plug allowing selective ingress and egress of fluid; and;
- (f) means cooperating with said valve to insert fluid within said tube to expand said elongated elastic cap to occupy the lumen and to prevent the passage of the sperm.

4,682,593

## ADJUSTABLE BREAST BRIDGE FOR USE IN MULTIPLE-PLANE INTERSTITIAL BREAST IMPLANTS

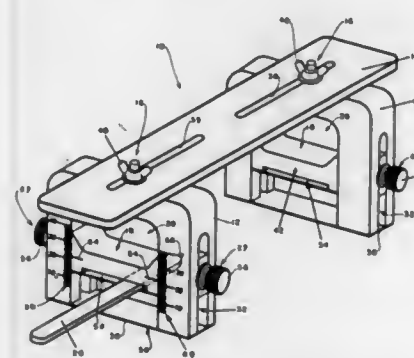
Douglas W. Johnson, 8265 Riding Club Rd., Jacksonville, Fla. 32216

Filed Oct. 20, 1982, Ser. No. 435,514

Int. Cl.<sup>4</sup> A61B 17/00

U.S. Cl. 128—303 R

9 Claims



1. In a breast bridge for use in multiple-plane interstitial radioisotope breast implants, said bridge including a pair of upright support members, a transverse span member and means for mounting said span member to corresponding upper ends of said upright support members, the improvement comprising:

- (a) at least one of said upright support members including a pair of laterally spaced-apart upright legs defining a channel therebetween, said legs of said at least one upright support member being bifurcated so as to define respective longitudinal guideways therein which are aligned with one another and extend through said legs so as to open away from said channel at outer opposite sides as well as into said channel at inner facing sides of said legs;
- (b) means for receiving a marking tool being mounted to said at least one of said support members within said channel thereof for movement along spaced-apart upright legs of said support member toward and away from a lower end of said support member, said marking tool receiving means having outwardly-protruding guides on the opposite lateral ends thereof which extend into, and are slidable along, said guideways of said legs of said at least one support member; and
- (c) means for adjustably securing said marking tool receiving means at any desired position along said support member, said means for adjustably securing said marking tool receiving means being mounted to said guides of said latter means at the outer sides of said legs and engagable with said outer leg sides for retaining said marking tool receiving means at any desired position along said support member.

4,682,594

## PROBE-AND-FIRE LASERS

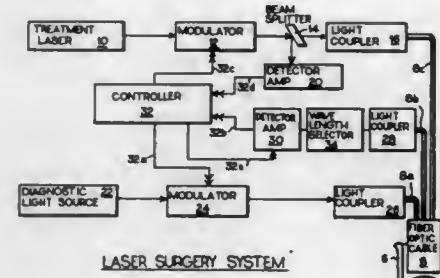
Walter Y. W. Mok, Palo Alto, Calif., assignor to MCM Laboratories, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 710,431, Mar. 11, 1985. This application Oct. 18, 1985, Ser. No. 788,949

Int. Cl.<sup>4</sup> A61B 17/35

U.S. Cl. 128—303.1

8 Claims



1. The method of destroying atheromatous plaque within an artery of a patient comprising the steps of initially administering to the patient a non-toxic atheroma-enhancing reagent which causes the plaque to have a characteristic optical property when illuminated with a given radiation, introducing a catheter system including fiberoptic cable means into the artery such that the distal end thereof is operatively opposite the plaque site, introducing into the proximal end of said fiberoptic cable means said given radiation, photoelectrically sensing at said proximal end said characteristic optical property to generate a control signal and directly under the control of said control signal transmitting via said cable means from said proximal end to said distal end, periodically occurring laser pulses until said characteristic optical property is no longer sensed.

4,682,595

## ILLUMINANCE DOSAGE DEVICE

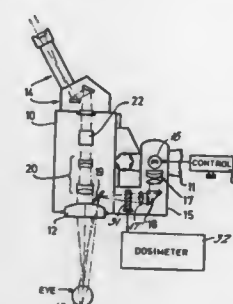
Peter G. Hoerenz, Hartsdale, N.Y., and Gerhard Mueller, Aalen, Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heldenheim/Brenz, Fed. Rep. of Germany

Division of Ser. No. 715,408, Mar. 25, 1985. This application Apr. 11, 1986, Ser. No. 850,686

Int. Cl.<sup>4</sup> A61B 17/36

U.S. Cl. 128—303.1

8 Claims



1. A dosimeter for use in limiting retinal exposure to field illumination in the course of an ophthalmic surgical procedure, said dosimeter comprising sampling means including a light detector producing an electrical-signal output responsive to a sampled fraction of the illumination, field-dosage integrating means including a clock timer and connected to the electrical-signal output of said detector, said integrating means integrating detector output as a function of time of illumination, presettable signal means for providing a predetermined reference signal value representing a predetermined maximum tolerable

dosage level of integration value, and indicator means differentially responsive to said reference signal value and to the instantaneous integration value to produce a difference signal value which is indicative of remaining tolerable dosage.

4,682,596

## ELECTROSURGICAL CATHETER AND METHOD FOR VASCULAR APPLICATIONS

Thomas O. Bales, Coral Gables, and Kevin W. Smith, Miami, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed May 22, 1984, Ser. No. 612,879

Int. Cl.<sup>4</sup> A61B 17/35

U.S. Cl. 128—303.14

39 Claims



1. An electrosurgical plaque-resolving or tissue-eroding device having a distal end which is insertable within and along the lumen of a blood vessel and manipulated therethrough to a desired position without causing undue trauma where the device is operated to thermally resolve atherosclerotic plaque buildup or erode tissue in the blood vessel to re-establish desired blood flow through the blood vessel or to remove tissue therefrom, said device comprising: an elongate flexible hollow tubular body having a distal end, a proximal end, and a diameter smaller than the diameter of the vessel into which said device is inserted; first passage means within said tubular body for supplying a flushing fluid to the site where plaque or tissue is resolved or eroded; second passage means within said tubular body for evacuating, such as by suction, debris at the site of resolving plaque or eroding tissue from the site; a hollow tip member mounted at said distal end of said flexible hollow tubular body; an electrode adjacent to and in operative association with said hollow tip member for resolving plaque or eroding tissue, said tip member being beveled or rounded at the distal end of said device; means for supplying a high-frequency electrical current to said electrode for cutting tissue or coagulating body fluid; and means for sensing, from time to time, the amount of plaque or tissue at the site in the blood vessel.

4,682,597

## SCLERAL DISSECTOR

William D. Myers, 5855 Wingerd Ct., Birmingham, Mich. 48010

Filed Jul. 15, 1985, Ser. No. 754,943

Int. Cl.<sup>4</sup> A61F 17/32

U.S. Cl. 128—305

6 Claims



1. A scleral dissector comprising: an elongated handle, a substantially planar cutting blade secured to and extending laterally outwardly from one end of the handle, a substantially planar guide,



means for attaching said guide to said handle so that said guide is spaced from said blade and so that said guide and said blade both lie in planes which are substantially parallel to each other and transverse with respect to the axis of the handle, said guide having a surface facing the blade which is adapted to abut against the outer surface of the sclera of an eyeball during a scleral dissection.

4,682,598

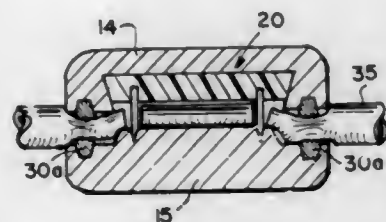
## VASECTOMY INSTRUMENT

Dan Beraha, 912 Woodbriar Ct., Fort Walton Beach, Fla. 32548  
Filed Aug. 23, 1984, Ser. No. 643,496

Int. Cl.<sup>4</sup> A61B 17/12

U.S. Cl. 128—305

21 Claims



10. A surgical instrument for applying a pair of spaced apart ligating clips onto a tubular vessel and excising a segment of the vessel therebetween, comprising:  
a disposable cutter block having a pair of spaced apart cutting blades, each blade having a cutting edge;  
a pair of open ligating clips;  
a first jaw adapted to receive said cutter block;  
a second jaw opposing said first jaw and having a receiver surface for receiving said cutting edges of said cutter blades when said first and second jaws are closed, said first and second jaws having an open position and a closed position;  
said first and second jaws having spaced apart grooves, said pair of open ligating clips disposed in said grooves with said first and second jaws in said open position;  
handle means attached to said first and second jaws for closing said jaws to said closed position thereby closing said pair of clips onto a tubular vessel within said jaws and excising a segment of the vessel between said clips.

4,682,599

## BASKET FORCEPS ASSEMBLY FOR ENDOSCOPE

Yutaka Konomura, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

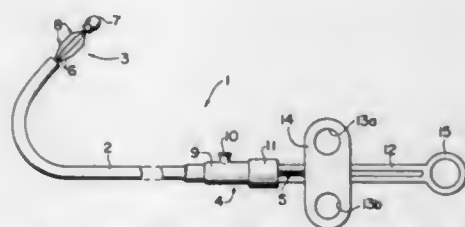
Filed Apr. 19, 1985, Ser. No. 725,092

Claims priority, application Japan, Apr. 25, 1984, 59-61845[U]; Apr. 27, 1984, 59-63432[U]

Int. Cl.<sup>4</sup> A61B 17/22

U.S. Cl. 128—328

13 Claims



1. A basket forceps assembly for use with an endoscope, comprising:  
a flexible hollow sheath which can be passed through an

insertable portion of an endoscope, said sheath having a front end, a hollow interior and an exterior;  
a basket formed of a plurality of resilient wires, said basket being disposed so as to be movable into and out of the front end of said sheath and being adapted to hold foreign matter grasped therein;  
a human actuable operating means connected to said basket so as to enable an operator to move said basket into and out of the front end of said sheath; and  
a front end tip which is secured to said basket and adapted to tightly fit the front end of said sheath when said basket has been fully retracted into said sheath, said front end tip including a base that is fully disposed within said sheath when said basket is fully retracted into said sheath;  
said front end tip having a passage formed therein which maintains communication between the hollow interior and the exterior of said sheath at a location forward of said base when the front end tip is tightly fitted into the front end of said sheath.

4,682,600

## NON-INVASIVE METHOD AND APPARATUS FOR IN SITU DISINTEGRATION OF BODY CALCULI

Werner Haas, Uttenreuth; Wolfgang Kneuper, and Manfred Pfeiler, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

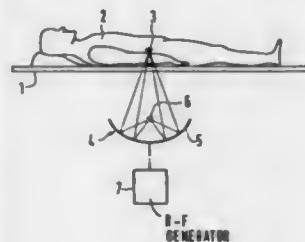
Filed Jul. 1, 1985, Ser. No. 750,141

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425897

Int. Cl.<sup>4</sup> A61B 17/22

U.S. Cl. 128—328

5 Claims



1. A method for non-body invasive disintegration of a calculus in the body of a patient comprising the steps of:  
supporting the patient on a patient support bed;  
generating electromagnetic radiation; and  
focusing said electromagnetic radiation at said calculus in said patient.

4,682,601

## ELECTRONIC DEVICE FOR CURATIVE STIMULATION OF THE BODY

Antonio Tagliavini, Via del Canzi 26, Milano, Italy

Filed Jan. 14, 1985, Ser. No. 691,306

Claims priority, application Italy, Jan. 24, 1984, 20627/84[U]

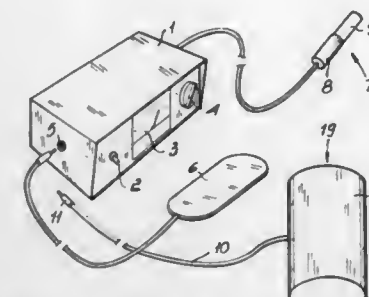
Int. Cl.<sup>4</sup> A61N 1/36

U.S. Cl. 128—422

1 Claim

1. A portable electronic device for curative stimulation of the body, comprising a box-like enclosure; a free running multivibrator in said box-like enclosure for generating stimulating electric pulses, said free running multivibrator having a multivibrator output; a decoupling transistor connected to said multivibrator output and having a decoupling transistor output; an amplifier transistor connected to said decoupling transistor output and having an amplifier transistor output, a pulse transformer having a primary and a secondary, said pulse transformer primary being connected to said amplifier transistor output and said pulse transformer secondary having an output; said output of said pulse transformer secondary being

coupled to sockets on said enclosure; electrode means to be coupled to said sockets for picking up said stimulating electric pulses; means for presetting the amplitudes of said stimulating electric pulses and for simultaneously presetting the frequencies thereof, said stimulating electric pulses having an ampli-



tude which increases as the frequency thereof increases, the ratio of the value of said frequency in Hertz and of the value of said amplitude in volt being slightly greater than 3, the frequency range of said output pulses extending from 150 to 300 Hz and the amplitude range of said output pulses extending from 45 to 90 V.

4,682,602

## PROBE FOR MEDICAL APPLICATION

Otto Prohaska, Ann Arbor, Mich., assignor to Ottosensor Corporation, Los Angeles, Calif.

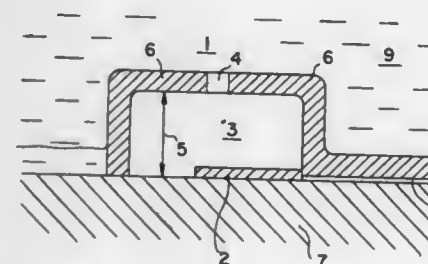
Continuation-in-part of Ser. No. 373,207, Apr. 29, 1982, abandoned. This application Jun. 24, 1985, Ser. No. 748,231

Claims priority, application Austria, May 7, 1981, 2029/81

Int. Cl.<sup>4</sup> A61B 5/00, 5/04; A61N 1/05

U.S. Cl. 128—635

24 Claims



1. A probe for registering or influencing tissue activities and properties of chemical samples comprising a substrate having a supporting surface; means including a cover layer having a thickness of 0.5 to 10  $\mu\text{m}$ . carried on the supporting surface of said substrate, said means and a portion of the supporting surface of said substrate forming a chamber which is bounded on one side by the supporting surface and on an opposed side by a wall of said cover layer which is spaced from the supporting surface by not more than about 30  $\mu\text{m}$ ., the chamber being closed except for an aperture in the last-named wall which enables communication between the chamber and the exterior of the probe; an electrode or transducer which is substantially less than 30  $\mu\text{m}$ . in thickness carried on the supporting surface of said substrate inside the chamber; means including a conductor mounted on the probe, inside the chamber, and operable to conduct a signal between said electrode or transducer and registering or influencing circuitry.

4,682,603

## APPARATUS AND METHOD FOR RECORDING MONOPHASIC ACTION POTENTIALS FROM AN IN VIVO HEART

Michael R. Franz, Warburghof 12, 3000 Hannover 61, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,697

Int. Cl.<sup>4</sup> A61B 5/04

U.S. Cl. 128—642

25 Claims



1. An apparatus for measuring monophasic action potentials in an in vivo beating heart, comprising:  
a probe having a tip portion;  
a first electrode mounted on a terminal free end of said tip portion, said first electrode having a portion exposed to ambient;  
a second electrode spaced along said tip portion from said first electrode for supplying a reference potential signal; and  
means on said probe which is spring loaded for holding said first electrode in contact with tissue of a beating heart with a positive force of approximately 20–30 g without causing macroscopic damage to said heart tissue and orienting said probe such that said second electrode is spaced from said heart tissue.

4,682,604

## COINCIDENCE COUNTING EMISSION TOMOGRAPHIC PROBE: METHOD AND APPARATUS

Alain L. Fymat, Pasadena; Wai-Nang P. Lee, Van Nuys, and Moses A. Greenfield, Sherman Oaks, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 25, 1985, Ser. No. 705,916

Int. Cl.<sup>4</sup> A61B 6/00

U.S. Cl. 128—659

17 Claims



1. A nuclear medicine apparatus for analyzing particular characteristics of a body organ into which radiopharmaceuticals have been introduced, said radiopharmaceuticals causing a plurality of internally generated radioactive emissions from said organ, said apparatus comprising:  
a plurality of pairs of adjacent radiation detector means,

each pair of detector means being capable of detecting at least two different internally generated radioactive emissions, of respectively different energy levels, from said organ and generating a plurality of separate electrical signals, each of said separate signals generated in response to a different detected emission; and

electronic means coupled to said detector means, said electronic means responsive to coincident reception of said two separate electrical signals, representative of said different detected emissions;

means for processing and analyzing the levels of the coincident reception, coupled to the output of said electronic means, said processing and analyzing means positioned at least every 45 degrees around, the organ being monitored throughout along an arc of at least 180 degrees; whereby the maximum and minimum intensity of angular radiation may be determined.

4,682,605

# LIQUID CRYSTAL MATRIX FOR EXTENDED RANGE HIGH RESOLUTION TEMPERATURE MAPPING

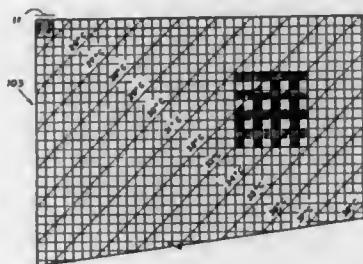
Kent C. Hoffman, Cockeysville, Md., assignor to Murray Electronics Associates Limited, Hunt Valley, Md.

Filed Oct. 2, 1985, Ser. No. 783,093

Int. Cl.<sup>4</sup> A61B 10/00

U.S. Cl. 128—736

31 Claims



1. An apparatus for measuring and visually displaying temperature gradients over an extended temperature range as color-coded contours of constant temperature, said apparatus comprising:

- a first plurality of arrayed discrete deposits of liquid crystals sensitive in a first temperature range;
- a second plurality of arrayed discrete deposits of liquid crystals sensitive in a different second temperature range;
- said first and second pluralities of discrete deposits of liquid crystals being separate from one another but disposed in co-located respective sub-arrays on a common substrate to form a composite overall array of said discrete deposits in a common liquid crystal layer which responds with said color-coded contours over an extended temperature range corresponding to a combination of said first and second temperature ranges;
- said discrete deposits being of sufficiently small size and being of sufficiently large number to directly present color-coded contours of constant temperature wherein a predetermined color produced by a blended color mixture of said first and second arrayed deposits represents a corresponding predetermined temperature.

4,682,606

# LOCALIZING BIOPSY APPARATUS

Vincent H. DeCaprio, 6 Payne Rd., Elmsford, N.Y. 10523

Filed Feb. 3, 1986, Ser. No. 825,546

Int. Cl.<sup>4</sup> A61B 10/00

U.S. Cl. 128—754

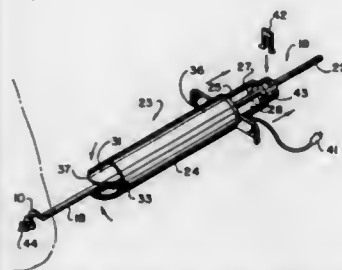
10 Claims

1. An apparatus for localizing and excising a mass from a patient's tissue comprising:

- a surgical needle having first and second ends, and said first

end of said surgical needle being insertable into said mass of said patient's tissue;

- a cork screw means having a hollow central shaft, a worm element attached to a first end of said shaft and a removable handle connected to a second end of said shaft, said cork screw means fitting over said surgical needle and said worm element encircling and localizing said mass when said cork screw means is inserted into said patient's tissue;
- a guiding extension rod having first and second ends, and said first end of said guiding extension rod being connected to said second end of said hollow central shaft of said cork screw means when said removable handle is removed;



- a cutting instrument having an outer barrel and an inner cylinder concentrically accommodated inside said outer barrel, a pair of arcuate cutting jaws being attached to a first end of said outer barrel and a first end of said inner cylinder, said inner cylinder having a channel through which said cork screw means and said guiding extension rod extend, movement of said outer barrel relative to said inner cylinder causing said arcuate cutting jaws to close and to cut said mass from said patient's tissue, and said mass, said guiding extension rod and said cork screw means being removable through said channel of said inner cylinder of said cutting instrument after said mass is cut from said patient's tissue.

4,682,607

# WIRE GUIDE

Vincent L. Vaillancourt, Livingston, and Stephen Kocanowski, Middlesex, both of N.J., assignors to VLV Associates, East Hanover, N.J.

Filed Dec. 2, 1985, Ser. No. 803,719

Int. Cl.<sup>4</sup> A61M 25/00

U.S. Cl. 128—772

12 Claims



- 1. A wire guide for a catheter comprising a length of stranded wire having a flexible section of a diameter of from about 0.008 inches to 0.062 inches extending to a distal end and a rigid section extending from said flexible section to a proximal end and a nose at said distal end of said wire.

4,682,608

# APPARATUS FOR MEASURING VISCOELASTIC PROPERTIES OF SKIN IN VIVO

Jean P. De Rigal, Claye Souilly; Jean-Luc M. Leveque, Le Raincy; Laurent B. Rasseigneur, Thorigny S/Marne, and Marie-Jeanne Losch, Stains, all of France, assignors to "L'Oreal", Paris, France

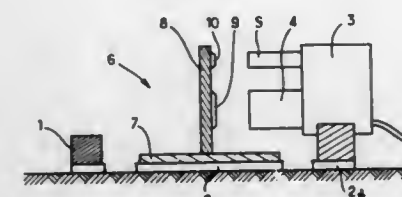
Continuation of Ser. No. 648,690, Sep. 10, 1984, abandoned. This application Jul. 2, 1986, Ser. No. 881,572

Claims priority, application France, Sep. 13, 1983, 83 14548

Int. Cl.<sup>4</sup> G10N 3/38

U.S. Cl. 128—774

7 Claims



1. In apparatus for measuring in vivo at least one viscoelastic property of skin in a region of the skin, the said apparatus comprising:

- (a) a movable assembly;
  - (b) means for fixing the movable assembly to the region of skin to be tested;
  - (c) a base;
  - (d) an electromagnetic exciter carried by said base and intended to subject the movable assembly and the region of skin to a sustained vibration relative to the base in a direction substantially parallel to the region of skin to which the movable assembly is to be fixed;
  - (e) an electronic circuit incorporating means for feeding the electromagnetic exciter with low-frequency current, and a proximity sensor for detecting the vibrations of the movable assembly and for producing an image signal of these vibrations;
  - (f) means for displaying and/or recording the change of the image signal as a function of the exciter feed frequency, in order to determine the resonance frequency of the assembly subjected to the sustained vibration, and to deduce therefrom at least one viscoelastic property of skin;
- the improvement wherein:
- (g) the base is a guard formed by a frame of a nonmagnetic material, said frame extending in a plane and including a side, said electromagnetic exciter including an electromagnetic coil having an axis extending parallel to said plane of said frame and perpendicular to said side of said frame, said side of said frame supporting said electromagnetic exciter;
  - (h) said fixing means include double-sided adhesive tape for fixing the frame removably on the skin whereby the skin bounded within the frame in the region of skin to be subjected to the sustained vibration;
  - (i) the movable assembly including a vibrating mass intended to be fixed within the frame;
  - (j) the fixing means further include further double-sided adhesive tape having one face adhered to said vibrating mass and the other face adapted to be adhered on the skin to be measured; and
  - (k) the vibrating mass further carries a bead of a magnetic material which is positioned for co-operating with the exciter when the first mentioned and further double-sided adhesive tapes are fixed to the skin and the guard and the vibrating mass are fixed on the tapes;
- said vibrating mass incorporating (a) a plate fixed to the double-sided adhesive tape, and (b) at least one mounting fixed to the plate said mounting extending substantially perpendicular to said plate and carrying said magnetic bead, and said frame enclosing an interior space and said

electromagnetic exciter extending in overhanging relationship with a portion of said interior space of said frame.

4,682,609

# CERVICAL-DILATION METER

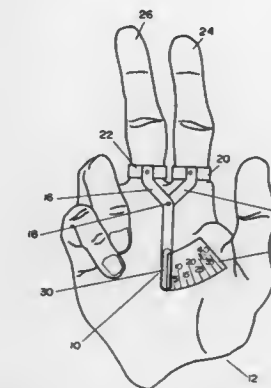
Natan Parsons, 71 Babcock St., Brookline, Mass. 02146

Filed Nov. 25, 1985, Ser. No. 801,640

Int. Cl.<sup>4</sup> A61B 5/10

U.S. Cl. 128—775

6 Claims



1. For measuring the cervical dilation during the initial stages of labor, a dilation meter comprising:

- A. first and second pivot arms pivotably mounted to each other for pivoting with respect to each other about a common pivot axis extending through pivot points on the pivot arms;
- B. first and second rings provided on the first and second pivot arms, respectively, and spaced from the pivot points on the respective pivot arms, the rings being adapted to fit simultaneously on the bases of adjacent fingers of a user; and
- C. calibrated measurement means for providing a quantitative indication of the lateral extension of the tips of fingers whose bases are positioned in the rings, the measurement means comprising:
  - i. a scale on the first pivot arm having a plurality of spaced scale indicia indicating different degrees of cervical dilation, and
  - ii. an indicator positioned with respect to the scale to indicate the indicium that indicates the cervical dilation that corresponds to the lateral extension of the tips of the fingers whose bases are positioned in the rings.

4,682,610

# WATER PIPE

Kenneth W. Freelain, 1630-A Beekman Pl., NW., Washington, D.C. 20009

Filed Dec. 6, 1985, Ser. No. 805,803

Int. Cl.<sup>4</sup> A24F 1/30

U.S. Cl. 131—173

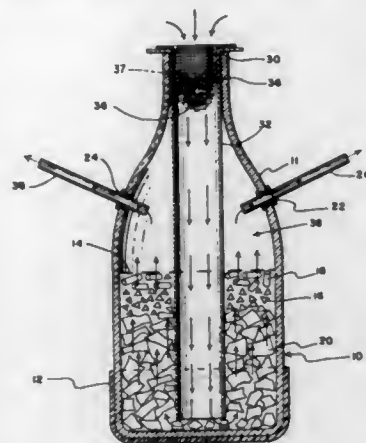
9 Claims

1. A water pipe having an opening in a top of a bottle having a liquid containing a chamber beneath an upper air portion of the bottle for utilizing a liquid in the liquid containing chamber of the bottle to cool smoke from a smoking material, further comprising

- a metal cylinder extending from the open top of the bottle downwardly beneath a liquid level of the liquid in the liquid containing chamber to near the inside bottom of the bottle,
- smoke withdrawal means in fluid communication with the upper portion of the bottle for withdrawal of smoke from the bottle,
- a metal screen disposed within the metal cylinder defining an upper cavity for supporting the smoking material, pieces of solid material disposed within the liquid containing



chamber, which pieces are dimensionally stable during use and some of which pieces have a density greater than the liquid and some which pieces have a density less than the liquid, the pieces being present in the liquid containing chamber are so constructed and arranged to create a tortuous path of



the smoke drawn through the liquid and thus improve impacting contact between the liquid and the smoke by it being purified thereby aiding in the removal of carcinogens and other materials which may be harmful to the smoker by accomplishing such action upon the smoke before the smoke enters the mouth and lungs of the smoker.

4,682,611

# PORTABLE CIGARETTE SAFETY ASH TUBE AND EXTINGUISHER

Wuu Chiu-Rong, c/o Y. L. Yang P.O. Box 865, Kaohsiung, Taiwan

Filed Apr. 18, 1985, Ser. No. 724,812

Int. Cl.<sup>4</sup> A24F 3/02, 7/02, 47/00

U.S. Cl. 131—256

2 Claims



1. A portable cigarette ash tube in combination with a cigarette holder and an extinguisher comprising an outer tubular body having a first end and a second end; a mouthpiece incorporating said cigarette holder being removably connectable to the first end of said outer tubular body; an inner tubular body having a first and second end; a cone shaped blade scratcher being secured to the first end of said inner tubular body; said scratcher having its cone blade being within said inner tubular body and pointing in the direction of said inner tubular body second end; said outer tubular body having its respective second end telescopically fit over said second end of said inner tubular body; said tubular bodies rotatable about a common longitudinal axis with respect to each other; whereby when said mouthpiece is removed an open ash tube end is formed which serves for the escape of ashes produced when the tubular bodies are connected to said mouthpiece and said scratcher

rotates down onto the ember end of a lit cigarette extinguishing said cigarette.

4,682,612

# NOVEL PROCESS AND ARTICLE FOR PREPARING ARTIFICIAL NAILS

James T. Giullano, Ft. Lauderdale, Fla., assignor to Zotos International, Inc., Darien, Conn.

Filed Aug. 12, 1983, Ser. No. 522,536

The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> A45D 40/30

U.S. Cl. 132—73

27 Claims



1. Article for preparing artificial nails comprising, in combination:

- (1) an organic solvent-free photocurable liquid composition which, upon exposure to actinic radiation, can cure to provide a hard flexible water-insoluble plastic;
- (2) a form comprising a liquid-impermeable flexible sheet material adapted to engage a digit and having an area adapted to receive said liquid composition in a defined configuration; and
- (3) a source of actinic radiation which, upon exposure thereto of said digit having said form containing said composition in engagement therewith, can provide a hard plastic artificial nail.

4,682,613

# LOOSE FILL MEDIA CLEANING APPARATUS

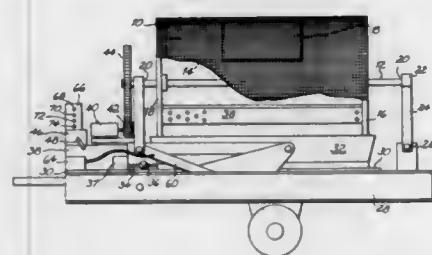
Anthony DeLoach, Sarasota, Fla., assignor to Water Equipment Services, Inc., Sarasota, Fla.

Filed Jul. 23, 1986, Ser. No. 888,386

Int. Cl.<sup>4</sup> B08B 3/06

U.S. Cl. 134—58 R

17 Claims



1. Loose fill media cleaning apparatus comprising: a foraminated hollow cylinder having a shaft extending along its longitudinal axis; an imperforate disk positioned at each end of said cylinder providing end walls for said cylinder and support for said cylinder; a first bearing at one end of said shaft and a second bearing at the other end of said shaft for supporting said shaft for rotation about its axis; said cylinder having a loose fill media filling port with a closure in the cylinder wall, and said cylinder having in said disk at said one end a loose fill media removing port with a closure; first bearing support means having a laterally extending bearing support beam with a leg depending from each end of said beam whereby an area for access to said loose fill

removing port is provided between said depending legs and below said beam; an apparatus support base; pivotal support means pivotally connecting said depending legs of said first bearing support means to said apparatus support base; hoist means for moving said second bearing between a position where it is at the same level as said first bearing and a position where it is elevated above said first bearing; a liquid holding and collecting pan positioned below said cylinder on said apparatus support base; a liquid storage tank on said support base; first pump means for transferring liquid from said liquid holding and collecting pan to said liquid storage tank; second pump means for delivering liquid from said liquid storage tank at elevated pressure; propulsion means for rotating said cylinder on said shaft at a relatively slow speed; and switch means for controlling the operation of said hoist means, said first and second pump means, and said propulsion means whereby an operator can control the times for operation.

4,682,614

# WAFER PROCESSING MACHINE

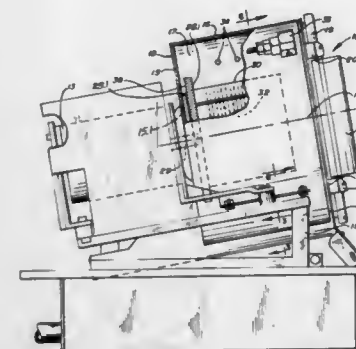
James M. Silvernail, Maple Plain, and Dallas J. Schneider, Cologne, both of Minn., assignors to FSI Corporation, Chaska, Minn.

Filed Jul. 26, 1985, Ser. No. 759,426

Int. Cl.<sup>4</sup> B08B 3/02

U.S. Cl. 134—99

12 Claims



1. A centrifugal processing machine for spray processing with liquid and gaseous fluids silicon wafers and the like in the manufacture of integrated circuit chips, comprising

a housing defining a processing chamber and having a high speed rotor means in the housing to mount and revolve such wafers in one direction about a rotation axis, the housing having an access means to accommodate the insertion and removal of such wafers for loading and unloading the rotor means, means for introducing the liquid and gaseous fluids into the housing, the housing having a smoothly contoured peripheral wall with an elongate portion extending along the rotor axis, said elongate portion having an offset with an elongate drain slot therein and facing circumferentially of the peripheral wall in said one direction, and shroud means on the exterior of the peripheral wall and enclosing said elongate portion and offset and communicating with the drain slot to receive the liquid and gaseous fluids discharged through the slot for delivery to a drain.

4,682,615

# RINSING IN ACID PROCESSING OF SUBSTRATES

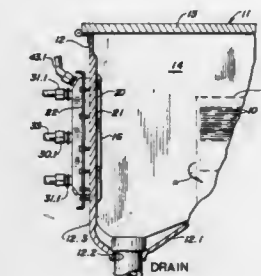
Don C. Burkman, Excelsior; David D. Schumacher, Plymouth, and Charlie A. Peterson, Waconia, all of Minn., assignors to FSI Corporation, Chaska, Minn.

Filed Jul. 2, 1984, Ser. No. 626,702

Int. Cl.<sup>4</sup> B08B 3/08

U.S. Cl. 134—102

8 Claims



1. In a chemical processing system for chemical processing of wafer substrates in the production of electronic devices by sequential application of various liquid chemicals and application of rinsing water between the various chemicals, improved process apparatus comprising

confining means defining a closed chamber to accommodate multiple processing steps for the substrate and having support means carrying such wafer substrates in the chamber for processing, a spray head means in the chamber to direct liquid spray into the chamber for application to the substrates, the spray head means having a liquid chemical supply passage and liquid chemical spray orifices communicating with the chemical supply passage, the spray head means also having a rinsing water supply passage and water spray orifices communicating with the water supply passage and being spaced from said chemical spray orifices, a chemical supply line connected with the chemical supply passage, liquid chemical source means including a valved connection with the chemical supply line and supplying liquid chemical thereto, a rinsing water source means having separate valved connections to the chemical supply line and to the water supply passage respectively, a water flow control restriction between the chemical supply line and the rinsing water source means, whereby to facilitate purging the chemical supply line, chemical supply passage and chemical spray orifices of liquid chemical by restricted flow of water as water is also supplied to the water supply passage and water spray orifices for rinsing the wafer substrate, and drain means including a drain valve having a discharging connection to a drain and having an inlet connection to the chemical supply passage of the spray head means for draining liquid from the chemical supply passage and the chemical supply line and for allowing free flow of rinsing water and diluted chemicals from the chemical passage and chemical line and to divert quantities of the rinsing water from the chemical spray orifices while allowing a dribble of flow through the orifices without being cast from the orifices into the substrates.

4,682,616

**UMBRELLA WITH A MECHANISM FOR LOCKING AND  
RELEASING A SLIDER**Tilman Schultes, Solingen, Fed. Rep. of Germany, assignor to  
Kortebach Verwaltungs- und Beteiligungsgesellschaft mbH  
& Co., Solingen, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,144

Claims priority, application Fed. Rep. of Germany, Sep. 7,  
1985, 3531952Int. Cl.<sup>4</sup> A45B 25/14, 25/08

U.S. Cl. 135—38

5 Claims



1. In an umbrella of the kind having a stick; a handle at a lower end of said stick; a canopy framework which is adapted to support a canopy and which is opened and closed by means of a slider which slides to and fro along said stick; and manually releasable latching means for fixing said slider in the closed position of said canopy framework, said means comprising a latching member engagable in a notch; the improvement wherein said notch is provided in a guide sleeve of said slider and said latching member comprises a bolt which is carried by said handle and has a ring part surrounding said guide sleeve in said closed position and engagable with said notch; said bolt being slidable transversely to the axis of said stick against spring action for disengagement thereof from said guide sleeve.

4,682,617

**SHORTENABLE UMBRELLA HAVING A TELESCOPIC  
STICK**Tilman Schultes, Solingen, and Klaus Stiller, Langenfeld, both  
of Fed. Rep. of Germany, assignors to Kortebach Verwaltungs-  
und Beteiligungsgesellschaft mbH & Co., Solingen,  
Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,194

Claims priority, application Fed. Rep. of Germany, Sep. 7,  
1985, 3531951Int. Cl.<sup>4</sup> A45B 25/14

U.S. Cl. 135—38

9 Claims



1. A shortenable umbrella having a telescopic stick compris-

ing at least lowermost and next lowermost stick parts and a latch for latching said stick parts in a mutually extended position; a crown fixed to one end of said stick; a hollow handle fixed to said lowermost stick part; a slider having a release actuator therefor and being slidable on said stick; and a framework adapted to support a canopy and comprising spokes and struts hinged to and carried by said crown and slider; said hollow handle receiving said slider and release actuator upon shortening of said stick when said framework is closed and after release of said latch; wherein said latch is releasable by final sliding of said slider along said stick towards said handle when, in the course of final closing of said framework and, in use, a canopy supported thereby, are manually bundled around, and compressed towards, said stick.

4,682,618

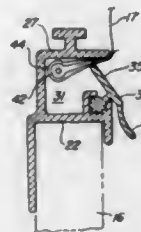
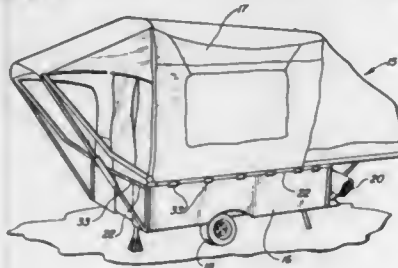
**CANVAS RETAINING ASSEMBLY FOR CAMPING  
TRAILER**David J. Zwick, Stoystown, Pa., assignor to The Coleman Com-  
pany, Inc., Wichita, Kans.

Filed Jun. 24, 1985, Ser. No. 748,238

Int. Cl.<sup>4</sup> E04H 15/08, 15/64; A41F 1/00

U.S. Cl. 135—89

12 Claims



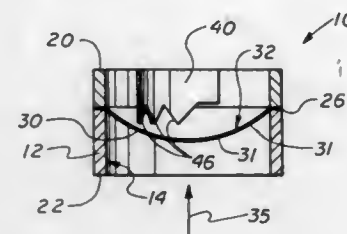
1. A canvas retaining assembly for a camping trailer, the camping trailer having a trailer body including at least one side wall, the canvas retaining assembly comprising a canvas canopy covering the trailer body, an elongated channel mounted on the top of the side wall and having a top wall and a side opening below the top wall, the canvas canopy having a bottom edge portion which extends through the side opening in the channel and a generally flat portion which extends upwardly from the edge portion and which engages the top wall of the channel, and a latch pivotally mounted on the channel adjacent the mouth of the side opening therein and having a latching portion which extends from the pivot axis of the latch into the side opening in the channel, the latch being pivotable between an unlatched position in which the latching portion is spaced from said top wall of the channel a distance sufficiently to permit the edge portion of the canvas to be inserted laterally into and withdrawn laterally from the channel through said side opening and a latching position in which the latching portion is spaced from said top wall of the channel a distance less than the thickness of the edge portion and the edge portion is positioned in the side opening in the channel inwardly of the pivot axis of the latch so that the edge portion wedges between

4,682,619

**REVERSE-BUCKLING RUPTURE DISK**Miner Clift, and Bill Engelhardt, both of P.O. Box 1327, Broken  
Arrow, Okla. 74012Continuation of Ser. No. 510,568, Jul. 5, 1983, abandoned. This  
application Apr. 14, 1986, Ser. No. 851,441Int. Cl.<sup>4</sup> F16K 17/14

U.S. Cl. 137—68.1

10 Claims



1. A rupture disk assembly comprising:
  - a. a cylindrical housing with an inner cylindrical wall defining a central bore for conveying flow;
  - b. a frangible concave-convex disk supported at its edge portions by the housing, closing the bore, the disk being designed to resist pressure on the convex side up to a predetermined pressure and then collapsing after the predetermined pressure is reached; and
  - c. an elongated U-shaped knife blade comprising a flat blade body with an upstream leading edge and a downstream trailing edge that are spaced from the wall of the bore and a plurality of serrated teeth lining the leading edge, for perforating the disk when it collapses, the ends of the blade being connected to the inner surface of the housing means downstream of the disk.

4,682,620

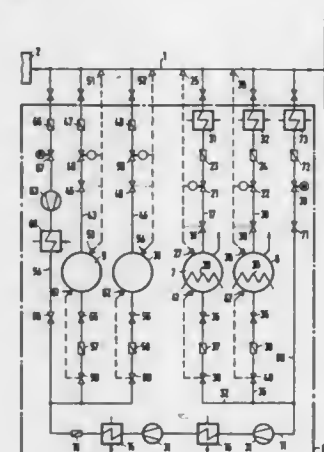
**CLEAN-GAS CONTINUOUS-FLOW INTERMEDIATE  
STORAGE OR ACCUMULATOR PLANT**Konrad Goebel, Erlangen, and Ulrich Schiffrers, Eckental, both  
of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,627

Claims priority, application Fed. Rep. of Germany, Jun. 20,  
1984, 3422885Int. Cl.<sup>4</sup> G05D 16/00; F17D 1/20

U.S. Cl. 137—110

14 Claims



1. Clean-gas continuous-flow intermediate storage plant

having at least one high-pressure accumulator, at least one low-pressure accumulator and at least one pressure-increasing compressor connected therein, and having a connection with a gas distribution line, the low-pressure accumulator being constructed for a range of operation below a minimum pressure of the gas distribution line, and the high-pressure accumulator being constructed for a range of operation above a maximum pressure of the gas distribution line, comprising an input line to the low-pressure accumulator, and an output line from the high-pressure accumulator both connected to the gas distribution line, a connecting line connecting the low-pressure accumulator and the high-pressure accumulator to one another and having the at least one pressure-increasing compressor inserted therein, and valves built into the input line to the low-pressure accumulator and the output line from the high-pressure accumulator as well as into an output line from the low-pressure accumulator and an input line to the high-pressure accumulator and respective pressure sensors connected to said valves for controlling said valves, the pressure sensor connected to the respective valve in said input line to the low-pressure accumulator being connected to the gas distribution line and being constructed for opening the respective valve in said input line to the low-pressure accumulator at pressures above a given maximum pressure in the gas distribution line, the pressure sensor connected to the respective valve in said output line from the high-pressure accumulator being connected to the gas distribution line and being constructed for opening the respective valve in said output line from the high-pressure accumulator at pressures below a given minimum pressure in the gas distribution line.

4,682,621

**MODULATOR VALVE**Graham V. Kipling, Agincourt, Canada, assignor to Diesel  
Equipment Limited, Toronto, Canada

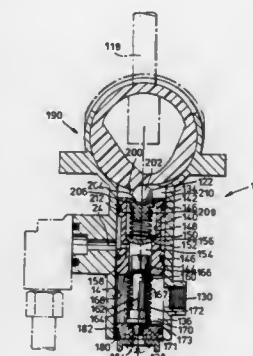
Continuation of Ser. No. 748,442, Jun. 25, 1985, abandoned.

This application Dec. 1, 1986, Ser. No. 936,942

Int. Cl.<sup>4</sup> G05D 16/10

U.S. Cl. 137—116.3

1 Claim



1. A pneumatic modulator valve comprising:
  - (a) a housing having a cylinder formed therein, said cylinder having first and second ends and a longitudinal axis extending therebetween,
  - (b) an air inlet passage opening into said first end of said cylinder and an air outlet passage opening from said second end of said cylinder,
  - (c) a modulator member slidably mounted in said cylinder for axial movement along said cylinder between a valve closing position and a valve opening position, said modulator member having a bore extending longitudinally thereof, a plug mounted in said bore and dividing it into a recess which opens toward said first end of said cylinder and a modulator chamber disposed toward said second end of said cylinder said modulator chamber having a



modulator output passage opening into said second end of said cylinder.

(d) an air input passage formed in said modulator member and communicating between said air inlet passage of said housing and said modulator chamber;

(e) a valve member slidably mounted on said modulator member for movement in the direction of the longitudinal axis of said cylinder between an extended position and a retracted position, said valve member having a proximal end and a distal end, said valve member having a valve closure head located in said modulator chamber for closing said output passage of said modulator when said valve member is in said extended position and to open said output passage of said modulator when said stem is moved towards its retracted position relative to said modulator member;

(f) a first biasing spring located externally of said modulator chamber and arranged to bear against said valve member and said modulator member to urge said valve member toward its extended position with respect to said modulator member;

(g) valve arresting means retained at said second end of said cylinder against movement with respect to said cylinder for arresting the movement of said valve member while permitting continued movement of said modulator member towards said second end of said cylinder thereby to open said modulator passage to permit air to flow through said valve;

(k) modulator means in said housing for movement between a valve closing position and a valve opening position, said modulator control means comprising an actuator cam member mounted for rotation about an axis extending at right angles to said longitudinal axis, a second compression spring mounted in said recess of said modulator member and having one end bearing against said plug, a support member mounted at the other end of said second compression spring, a contact member seated on said support member and bearing against said cam;

(l) a manually engageable lever mounted on said actuator cam for use in moving said cam to cause it to displace the modulator member toward said second end of said cylinder to an extent sufficient to move the modulator member relative to the valve member after the movement of the valve member has been arrested by the arresting means until the first valve closure member is spaced from the modulator member to open said modulator output passage, said modulator member being free to reciprocate to and fro in said cylinder to balance the pressure in said second end of said cylinder with respect to the load applied by said first biasing means to modulate the air flow through said valve.

4,682,622

## PRESSURE REGULATING VALVE

Kent Weber, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 11, 1985, Ser. No. 807,608

Int. Cl.<sup>4</sup> G05D 16/00; F16K 31/126

U.S. Cl. 137-154

9 Claims

1. A liquid pressure regulating valve for a two phase thermal management system, comprising:

a valve body having a liquid inlet port, a regulated liquid outlet port for supplying a liquid to be partially vaporized to a variable degree into both a liquid and a vapor state, with the degree of vaporization being dependent upon a variable heat load applied to said liquid downstream of said outlet port, and a vapor pressure sensing port;

a first valve member adapted to move between an open position and a closed position to open and close said liquid inlet port;

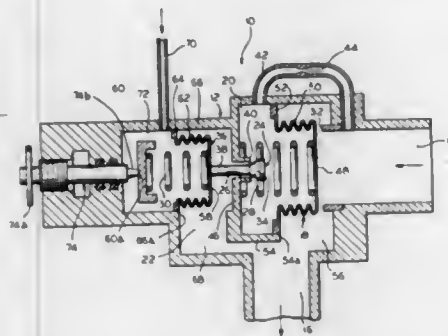
a first pressurized liquid chamber communicating directly with said liquid inlet port through a liquid conduit having a restriction therein, said first pressurized liquid chamber

being disposed such that liquid pressure therein tends to close said first valve member;

a second pressurized liquid chamber communicating directly with said regulated liquid outlet port, said second pressurized liquid chamber being in selective communication with said first pressurized liquid chamber;

a second valve member adapted to move between an open position and a closed position to open and close a liquid passage between said pressurized liquid chambers;

said second pressurized liquid chamber being disposed such that liquid pressure therein tends to close said second valve member; and



a pressurized vapor chamber communicating directly with said vapor pressure sensing port, said vapor pressure sensing port communicating directly with said vapor produced by partial vaporization of said liquid in said two phase thermal management system, said pressurized vapor chamber being disposed such that vapor pressure therein tends to open said second valve member;

said first and second valve members being automatically positioned in relation to said respective open and closed positions to maintain a preselected pressure in said regulated liquid outlet port.

4,682,623

## TOOL FOR REMOVAL OF DEBRIS FROM PIPE CONTAINING GAS UNDER PRESSURE

Jerome Scherer, 1020 N. Missouri, Cape Girardeau, Mo. 63701

Filed Jan. 2, 1987, Ser. No. 83

Int. Cl.<sup>4</sup> F16K 51/00; B08B 9/04

U.S. Cl. 137-317

13 Claims



1. A tool for removal of debris from a transmission pipe containing a gas under pressure, comprising, a tube means, said tube means having an opening at one end, and which end and

its opening are provided for disposition into the pipe containing the gas under pressure, and functioning to discharge any debris contained within the pipe through its coneyance with the pressurized gas as it releases through the tube means, a pipe connector attaching with said pipe, a reducer securing with said pipe connector, a fitting securing within said reducer, a movable and universal mounting means seated within said fitting, said tube slidably mounted within said mounting means, whereby the shifting of said tube means within said mounting means, providing for a universal movable arrangement of the said tube and its opened end for alignment with any proximate debris within and along the bottom of the said pipe and effecting its removal through its entrainment within any pressurized gas discharged through the said tube means.

4,682,624

## SELF-DRILLING VALVE

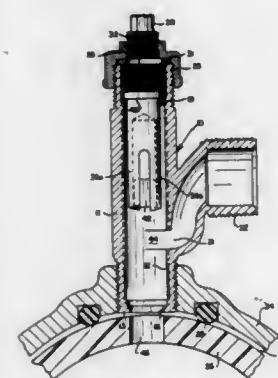
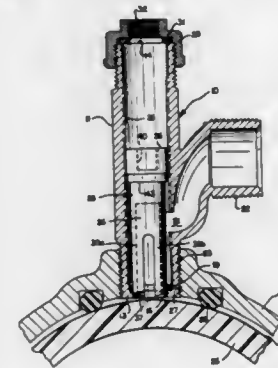
Clarence C. Turner, Marion, Ind., assignor to The Ford Meter Box Company, Inc., Wabash, Ind.

Filed Aug. 13, 1986, Ser. No. 895,959

Int. Cl.<sup>4</sup> F16K 43/00; F16L 55/10

U.S. Cl. 137-318

13 Claims



12. A fitting for tapping into a plastic water main comprising a housing threaded at its forward end for mounting in a saddle, said housing providing a through passage having a valve seat at its forward end and threaded from said valve seat to its rearward end, a second passage in said housing open to said first passage intermediate its ends, a cutter providing a threaded head at its rearward end mating with said threads of said first passage, said cutter also providing a shank extending forwardly from said head providing cutting edges at the forward end thereof for cutting through a plastic water main, said shank providing a tubular forward end for receiving a coupon cut from the wall of a water main, and seal and guide means formed of a seal material, said seal and guide means being positioned in said valve seat adjacent the forward ends of said cutter laterally positioning said forward end prior to and dur-

ing cutting into a water main, said seal and guide means retracting along with said cutter when said cutter moves rearwardly along said passage to provide communication between said forward end and said second passage, said seal and guide means being positioned in said valve seat and providing a fluidtight joint between said cutter and said forward end of said housing when said cutter is fully extended.

4,682,625

## SPRINGLOADED SHUTOFF VALVE APPARATUS

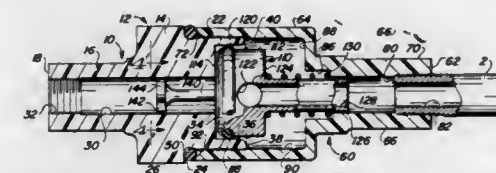
Gilman G. Christopher, 924 W. 11th Pl., Mesa, Ariz. 85201

Filed Aug. 4, 1986, Ser. No. 892,327

Int. Cl.<sup>4</sup> F16K 15/02

U.S. Cl. 137-538

7 Claims



1. Valve apparatus for a fluid, comprising, in combination: first housing means;

first bore means in the first housing means, including a first valve bore having a first diameter, a first guide bore communicating with the first valve bore through which fluid flows to the first valve, and a first shoulder between the first valve bore and the first guide bore;

second housing means secured to the first housing means; second bore means in the second housing means, including a second valve bore communicating with the first valve bore and having a second diameter which is greater than the first diameter of the first valve bore, a spring bore communicating with the second valve bore, and

a second guide bore communicating with the spring bore; and valve means movable in the first and second housing means, including

a valve element movable in the first and second valve bores between a closed position in the first valve bore and an open position in the second valve bore,

a first face on the valve element against which fluid pressure may bear to urge the valve element to the open position and which, when disposed on the first shoulder, defines a fully closed position,

a guide rod secured to the first face and extending into the first guide bore for guiding the valve element as the valve element moves in the first and second valve bores, a second face on the valve element against which fluid back pressure may bear to urge the valve element to its closed position in the first valve bore,

a guide tube secured to the second face and extending into the second guide bore for guiding the valve element as it moves in the first and second valve bores,

a fluid bore in the guide tube through which fluid flows, spring means disposed about the guide tube and extending into the spring bore and between the second face and the spring bore for urging the valve element to its off position in the first valve bore,

passage means extending through the valve element and communicating with the fluid bore through which fluid flows to the fluid bore when the valve element is at least partially out of the first valve bore and into the second valve bore, and

sealing means extending circumferentially about the valve element between the first face and the passage means for sealing the valve element when the sealing means and the adjacent portion of the valve element is disposed in the first valve bore to prevent the flow of fluid from the

first and second valve bores into the passage means and the fluid bore.

4,682,626

## SINGLE-LEVER WATER MIXER FITTING

Konrad Bergmann, Wittlich, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

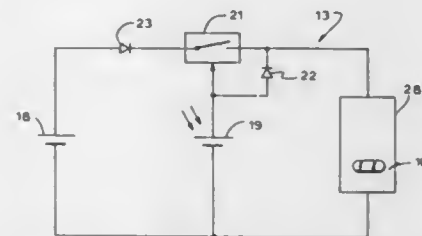
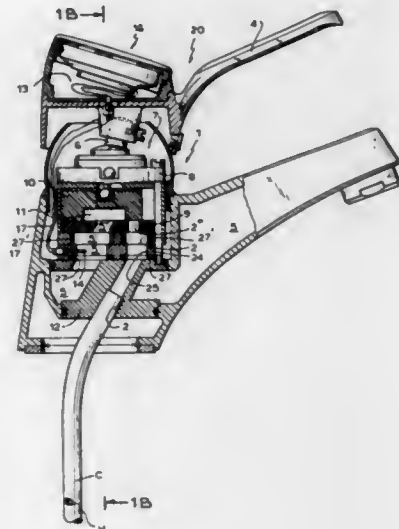
Filed Mar. 4, 1986, Ser. No. 835,916

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1985, 3507559; Mar. 12, 1985, 3508680; Apr. 16, 1985, 3513549

Int. Cl.<sup>4</sup> F16K 37/00; H01H 35/00

U.S. Cl. 137—551

15 Claims



1. A water mixer fitting, of the single-handle type, having hot and cold water inlets in fluid communication with a water discharge passage, said discharge passage including a mixing chamber in which mixed hot and cold water is discharged through a water outlet opening in said discharge passage, said mixer fitting comprising:

- valve means, operably coupled to said handle, for controlling water volume and for proportioning hot and cold water through said discharge passage;
- a temperature sensor, operably coupled to said water discharge passage, and being in fluid communication therewith;
- an indicator means mounted on said fitting and including a numeric temperature display electrically connected to a temperature measuring circuit and said temperature sensor;
- said temperature measuring circuit including a battery as a first power source and at least one solar cell as a second power source, and having switching means for selectively operating said first and second power sources, said second power source being operable only above a given predetermined light intensity.

### 4,682,627 MANIFOLDING SYSTEMS FOR GAS CONTAINERS

Graham H. B. Cooper, Halley, Near Witney, and John A. Williams, Brize Norton, both of England assignors to Super-gas Ltd, United Kingdom

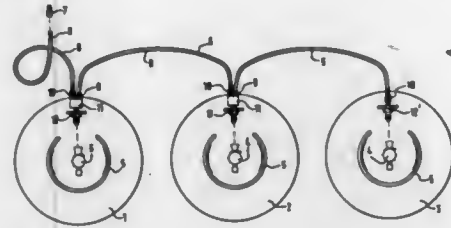
Filed May 7, 1985, Ser. No. 731,647

Claims priority, application United Kingdom, May 23, 1984, 8413203

U.S. Cl. 137—572

Int. Cl.<sup>4</sup> F17C 1/00

9 Claims



1. A manifold system for plurality of gas containers, containing gas under pressure or liquefied gas similarly under pressure, enabling gas to be supplied to an outlet, comprising a plurality of hoses for connecting said outlet with said gas containers serially, each hose including a pressurized gas flow, non-return valve at its end nearer to said gas outlet and including a pressurized gas excess-flow actuated shutdown valve at its other end.

### 4,682,628 FAUCET SYSTEM

Stephen A. Hill, 8 Heatherbrae Avenue, South Caulfield, Victoria, Australia

PCT No. PCT/AU84/00056, § 371 Date Dec. 13, 1984, § 102(e) Date Dec. 13, 1984, PCT Pub. No. WO84/04145, PCT Pub. Date Oct. 25, 1984

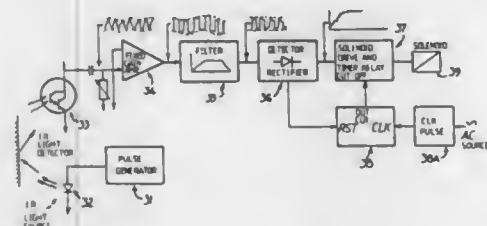
PCT Filed Apr. 11, 1984, Ser. No. 690,194

Claims priority, application Australia, Apr. 13, 1983, PF8861; Aug. 30, 1983, PG1144

Int. Cl.<sup>4</sup> F16K 31/02

U.S. Cl. 137—624.11

13 Claims



1. A sensing and valve operating means for remotely controlling a faucet, comprising:

- (a) means to sense the presence of an object near a faucet outlet,
- (b) means to energize a solenoid in response to the presence of the object,
- (c) means to calculate the time when the solenoid is energized,
- (d) means to remove the energy from the solenoid after a predetermined time interval, notwithstanding that the means to sense the presence of an object is sensing an object, and
- (e) means for rendering inoperative said means to energize until after the object is removed from near the faucet outlet.

4,682,629

## ELECTROMAGNETIC PROPORTIONAL VALVES

Horst Deininger, Horsteln, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation of Ser. No. 712,192, Mar. 15, 1985, abandoned.

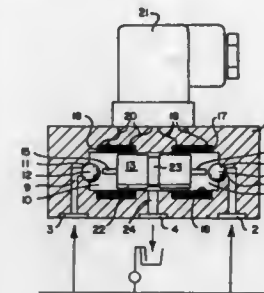
This application Jun. 23, 1986, Ser. No. 877,269

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409643

U.S. Cl. 137—625.4

Int. Cl.<sup>4</sup> F15C 3/06

2 Claims



1. An electromagnetic proportional valve comprising a housing, a bore in said housing, an inlet at each end of said bore, conduit means connecting each inlet to sources delivering fluid at constant flow rates, an exhaust outlet intermediate the ends of said bore, an electromagnetic coil adjacent each end and surrounding said bore, an armature in said bore movable longitudinally thereof, groove means on said armature communicating between said inlet and said outlet to equalize the pressure on opposite ends of the armature, valve means between said armature and each inlet, electrical proportional control means connected to each coil for selectively energizing said coils to move the armature to apply force against one or the other of said valve means at each inlet wherein flow will be restricted at the inlet of said one or the other valve means, thereby proportionally controlling pressure within the conduit means associated with the inlet being restricted.

4,682,630

## HIGH PRESSURE NOZZLE DAM

Glen E. Schukei, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

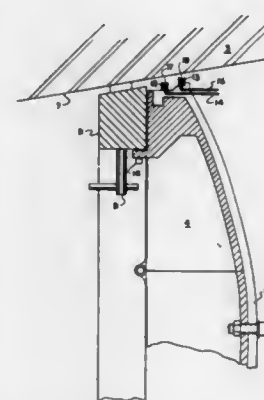
Filed Aug. 10, 1984, Ser. No. 639,564

The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.

Int. Cl.<sup>4</sup> F16L 55/12

U.S. Cl. 138—89

4 Claims



1. A dam for mounting in an internally tapered surface of an adjacent conduit having a large diameter portion and a small diameter portion through which fluids flow, including:

a metallic ring positioned at the tapered surface on a plane at right angles to the axis of the conduit;  
a dam structure formed of rigid hinged sections and including a dome positioned on the surface of the ring with the dome extending toward the large diameter portion of the tapered surface; and  
a plurality of release screws spaced around the ring and extending beyond the outside diameter of the ring into engagement with the internally tapered surface of the conduit to maintain a space between the ring and the tapered surface to allow release and removal of the ring after the screws have been wedged into the surface of the conduit by extreme pressure on the dam.

4,682,631

## SEALING APPARATUS FOR A VALVE BODY OPENING

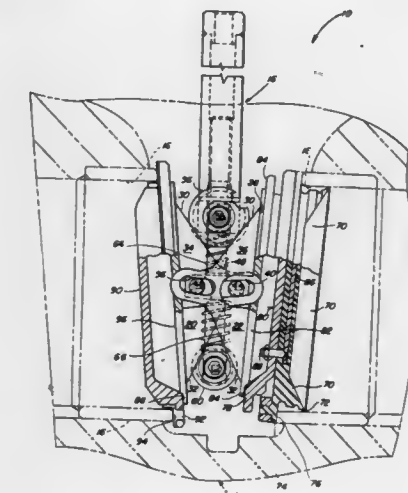
John F. Wilger, Honolulu; Stephen Orillo, Jr., Mililani Town, and Gregory S. Nakano, Pearl City, all of Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1986, Ser. No. 848,422

Int. Cl.<sup>4</sup> F16L 55/12

U.S. Cl. 138—94

18 Claims



1. An apparatus for sealing the pressure side opening of a gate valve body comprising:

- a pair of plates;
  - means joining the plates for lateral and pivotal movements with respect to one another;
  - each of the plates having an outside edge;
  - means associated with the outside edge of one of the plates for engaging the nonpressure side of the gate valve body;
  - means associated with the outside edge of the other plate for sealing the pressure side opening of the gate valve body;
  - each plate having a top camming surface and a bottom camming surface, the top camming surfaces of the plates being angled toward one another and the bottom camming surface of the plates being angled toward one another; and
  - means engaging the top and bottom camming surfaces of the plates for laterally spreading the plates,
- whereby the sealing means can be forced into sealing engagement with the pressure side opening of the gate valve body.



4,682,632

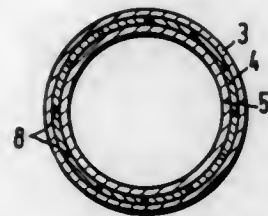
## CRACK STOPPING IN PIPELINES

Wolfgang Wiedenhoff, Muelheim; Adolf W. Gaertner, Neuss; Gert Vogt, Meerbusch, and Claus Weisgerber, Muelheim, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,829

Int. Cl.<sup>4</sup> F16L 9/04

U.S. Cl. 138—178



1. A steel pipe to serve as crack stopper and to be inserted into a gas pipeline having respectively the same inner diameter the same outer diameter as the pipe, said pipe having front faces for butt welding to elements of the pipeline; the improvement comprising:

said pipe having outer or internal notches or texture changes arranged spaced apart along a plurality of helical lines, the notches or texture changes on any one of the helical lines being spaced apart on said one helical line, the helical lines having a pitch angle from 35 to 70 degrees to the axis, said notches or texture changes being arranged on these lines such that any hypothetical or geometrical axial line in a radial level of these notches or texture changes traverses at least one of the notches or texture changes which overlap accordingly as seen in an axial direction; said notches or texture changes individually being at least 10 but not more than 100 times longer than wide, and having rounded ends, further having a depth or radial dimension which is between about 1/10 and 3/5 of the wall thickness of the pipe.

4,682,633

## DEVICE FOR SCREENING FLUFF FROM ENTERING A SHED

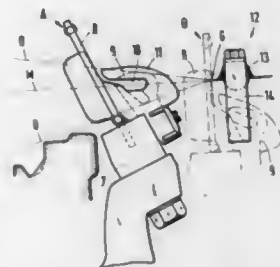
Franz Eisenlohr, Tuttwil, Switzerland, assignor to Salzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 27, 1985, Ser. No. 814,190

Claims priority, application European Pat. Off., Feb. 5, 1985, 85 810042

Int. Cl.<sup>4</sup> D03D 49/00

U.S. Cl. 139—1 C



1. In a weaving machine having a weft yarn entry zone for picking of a weft yarn into a shed, a device for screening out fluff in said entry zone, said device including at least one screening plate having an opening for passage of a picked weft yarn therethrough;

at least one stationary cleaning element cooperable with said screening plate to screen fluff from entering said shed; and said screening plate being movable relative to said cleaning element to scrape fluff from between said plate and said element.

4,682,634

## LIFTING BEAM FOR SHED FORMING DEVICE IN A WEAVING LOOM

Joseph Palau, Les Perris, FR-74410 Dingt, and Dario Bassi, 44

Rue des Treilles, FR69960 Corbas, both of France

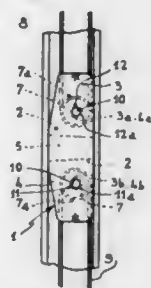
Filed Aug. 14, 1986, Ser. No. 896,268

Claims priority, application France, Aug. 23, 1985, 85 12818

Int. Cl.<sup>4</sup> D03C 13/00

U.S. Cl. 139—85

10 Claims



1. A lifting beam apparatus for the shed forming device in a weaving loom comprising a fork joint having oppositely oriented cheeks, openings through each of said cheeks, a pair of pulley means and having a web portion mounted to a central pivot pin means, said openings providing bearing means for selectively receiving one of said pivot pin means of said pulley means therein so that said pulley means are rotatably mounted in spaced relationship within said oppositely oriented cheeks, said cheeks having inner surfaces, said openings being surrounded on said inner surfaces of each cheek with a truncated boss having a central face which is co-axial with said openings, said web portion of each of said pulleys resting against said central face.

4,682,635

## METHOD AND APPARATUS FOR MANUFACTURING WOVEN SLIDE FASTENER STRINGER

Masaatsu Ofusa, Toyama, and Toshio Ishihama, Osaka, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

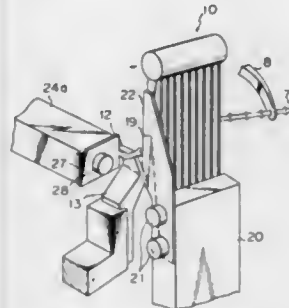
Filed Apr. 26, 1984, Ser. No. 604,376

Claims priority, application Japan, May 2, 1983, 58-78034

Int. Cl.<sup>4</sup> D03D 49/00

U.S. Cl. 139—116

7 Claims



1. An apparatus for manufacturing a slide fastener stringer comprising a loom equipped with a reed for guiding the warp sheets and a first carrier for inserting a filling, characterized in that an arm having a hook for engaging a monofilament for

forming fastener elements is swingingly disposed on one side of the warp sheets between two defined positions, namely a first position at which the hook is situated substantially adjacent a fell and a second position at which the hook is situated remote from the fell, and in that there is disposed on the other side of the warp sheets in said loom a second carrier having a guide hole at a distal end thereof through which said monofilament for forming fastener elements is passed and confined from a source on said other side of the warp sheets, wherein the hook occupies said second position, said second carrier goes across the warp sheets and advances said monofilament to a position outside the hook to be engaged by said hook, said reed including a forming plate secured thereto for deforming said monofilament engaged by said hook into said fastener element, and a stringer guide at the downstream end of said fell for guiding the fastener stringer formed by said apparatus, said stringer guide having a support plate at the upstream end thereof for supporting a fastener element head portion when said monofilament is deformed into said fastener element, said support plate being oriented substantially at right angles to the direction in which said fastener stringer is guided.

4,682,636

## METHOD AND DEVICE FOR PRODUCING A TEXTILE WEB BY PNEUMATIC WEFT PICKING OR INSERTION

Josef Derichs, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

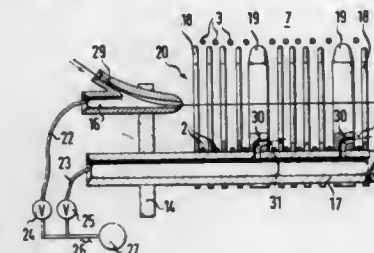
Filed Aug. 1, 1985, Ser. No. 761,612

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428387

Int. Cl.<sup>4</sup> D03D 47/30

U.S. Cl. 139—435

10 Claims



1. Method of producing a textile web by pneumatic weft insertion which comprises generating a flow of hot air having a temperature of at least 45° C. and bringing a weft thread in contact with the flowing hot air during the insertion of the weft thread.

4,682,637

## LINEAR WEAVING MACHINE

Wilbur J. Strohm, Jr., 2817 Via Segovia, Palos Verdes Estates, Calif. 90274

Filed Jul. 8, 1985, Ser. No. 752,652

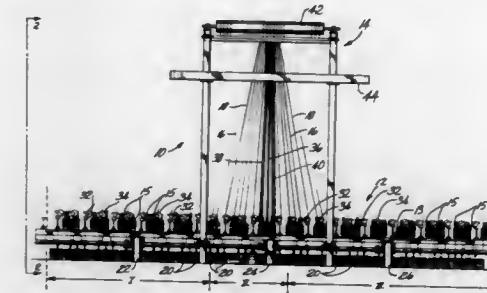
Int. Cl.<sup>4</sup> B21F 27/02

U.S. Cl. 140—9

37 Claims

18. An apparatus for making wire mesh fencing comprising: a plurality of supply spools of strand wire located at a first stage; a plurality of strands of linearly aligned spools of wrap wires positioned above the supply spools with the longitudinal axis of each spool being vertically oriented; a first shuttle and transfer means located at the first stage; a plurality of receptacles for receiving each of the spools of wrap wires, said receptacles being mounted on the first shuttle and transfer means; drive means for pulling the strand wires upwardly through the first stage to a second weaving stage and for pulling the wrap wires from the interior of the wrap wire spools upwardly from the first stage to the second stage; a second shuttle and transfer means located at the second

weaving stage which moves in synchronism with the first shuttle and transfer mechanism whereby the wrap-wire spools may be moved back and forth along the line of alignment in a weaving pattern about the strand wires on



the first shuttle and transfer mechanism with the second shuttle and transfer mechanism to cause the individual wrap wires to be interwoven and wrapped around the individual strand wires, creating a predetermined geometric-shaped pattern of fencing.

4,682,638

## STUMP-EXTRACTING TOOL

André Becker, 54 rue Saint Vincent, Bulligny, 54170 Colombey Les Belles, France

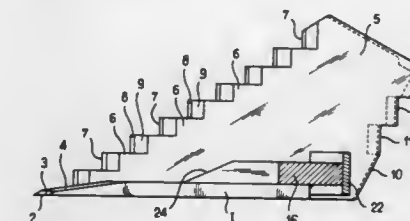
Filed Apr. 9, 1985, Ser. No. 721,845

Claims priority, application France, Apr. 13, 1984, 84 05900

Int. Cl.<sup>4</sup> A01G 23/08

U.S. Cl. 144—2 N

11 Claims



1. A stump-extracting tool comprising a flat spur (1) of substantial length having a forward cutting edge (2) at one end and a cutter-blade (5) transverse to the plane of the spur (1), the cutter-blade (5) being provided with a series of stair-step teeth (6) having each respectively a forward cutting edge (7) perpendicular to the plane of the spur (1).

4,682,639

## APPARATUS FOR CUTTING VENEER PIECES INTO EQUAL SECTIONS

Shigeki Takeda, Tokyo, and Sachio Maekawa, Okazaki, both of Japan, assignors to Hashimoto Denki Co., Ltd., Takahama, Japan

Filed Dec. 20, 1985, Ser. No. 811,751

Claims priority, application Japan, Aug. 26, 1985, 60-187050

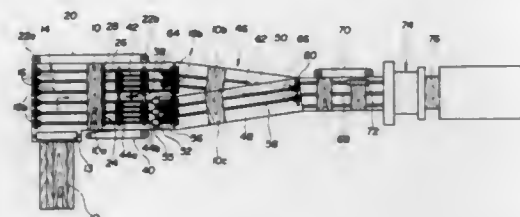
Int. Cl.<sup>4</sup> B27B 1/00

U.S. Cl. 144—2 R

9 Claims

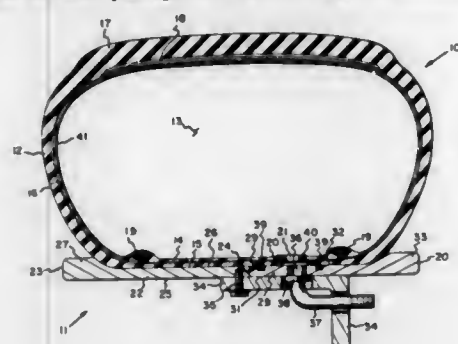
1. An apparatus for cutting into equal sections a veneer piece having a longitudinal dimension in a direction of fibers thereof and having at one of the shorter edges thereof an irregular surface, said apparatus comprising: a main conveyer arranged for feeding the veneer piece in a feed direction transverse to the longitudinal dimension thereof; means for forwarding the veneer piece along the longitudi-

nal dimension thereof from a mass of veneer pieces onto said main conveyor;  
 a straightening unit for controlling the orientation of the veneer piece on said main conveyor in such a manner that the fibers and the longitudinal dimension of the veneer piece precisely extend transverse to said feed direction of said main conveyor, said straightening unit including a plurality of retractable stoppers capable of projecting from said main conveyor to stop the veneer piece for a predetermined time;



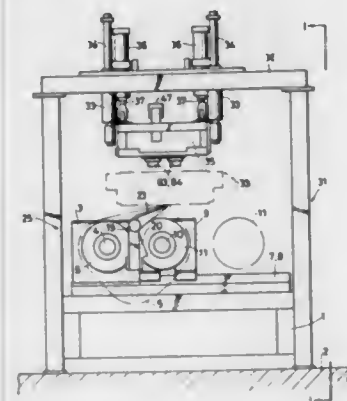
a pair of guide belts extending along opposite sides of said main conveyor for preventing a change of the orientation of the veneer piece straightened by said straightening unit;  
 a cutter disposed in said main conveyor at a position downstream of said straightening unit, said cutter being so arranged as to cut the veneer piece into sections along said feed direction thereof; and  
 a multiple conveyor system to transport the sections of the cut veneer piece at different points in time to a single feeder for conveying the sections to means for forming seam plates.

circumferential surface; said annular base region and said rib having an air inlet passageway therethrough communicating



with said closed inflation chamber and the radially inner circumferential surface of said rib.

**4,682,641**  
**SYSTEM FOR MANUFACTURE OF HIGH-LUG TIRES**  
 Tadashi Watanabe, and Shunichi Inoue, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan  
 Filed Apr. 9, 1985, Ser. No. 721,513  
 Claims priority, application Japan, Apr. 9, 1984, 59-70531  
 Int. Cl.<sup>4</sup> B29D 30/68  
 U.S. Cl. 157-13 7 Claims



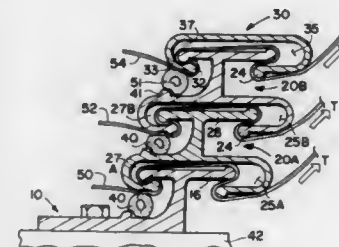
**4,682,640**  
**CIRCUMFERENTIAL CONDUIT MEANS FOR INFLATING A CLOSED TORUS TIRE**  
 Robert E. Berger, North Canton; Richard L. Crossman, and William F. Conley, both of Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio  
 Filed Jun. 21, 1982, Ser. No. 390,108  
 Int. Cl.<sup>4</sup> B60C 5/00  
 U.S. Cl. 152-405 10 Claims

1. A closed torus tire comprising: a carcass defining a closed inflation chamber, said carcass having an annular base region with a radially inner mounting surface having a rib extending radially inwardly therefrom and circumferentially thereabout, a plurality of axially spaced apart roll-restraining hoops adjoining said annular base region, said rib having a radially inner

1. An apparatus for manufacturing a high-lug tire, comprising: support means for supporting an unvulcanized tire from inside thereof and for moving said unvulcanized tire in a circumferential direction; a cutter assembly for partially cutting off the tread of the unvulcanized tire; and drive means for moving said cutter assembly to form a quasi pattern of grooves in said tread which are in substantially complementary relation to the shaping surface of a vulcanizing mold, wherein said support means comprises a pair of rotatable parallel rollers inserted in the unvulcanized tire parallel to an axis thereof; a

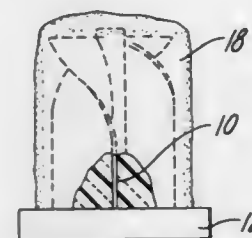
shifter mechanism for moving said rollers with respect to each other; and a substantially flat support plate arranged for surface-to-surface contact with an inner surface of a flat portion of the unvulcanized tire when it is tensioned between said rollers as they are moved apart from each other.

**4,682,642**  
**FASTENER FOR PLASTIC FILM SHEETING**  
 Rodney C. Hogshead, III, 1331 Carlton St., Longwood, Fla. 32750, and Giles Van Duyne, Jr., 3042 Holliday Ave., Apopka, Fla. 32703  
 Filed Dec. 9, 1985, Ser. No. 806,391  
 Int. Cl.<sup>4</sup> A47H 13/00  
 U.S. Cl. 160-392 14 Claims



1. A device for fastening a flexible sheet to a structure comprising:  
 a base member having means for attachment to a structure, said base member having an elongated rigid base portion and a T-shaped portion integral with said base portion in which a planar T-crossbar portion is essentially parallel with said base portion, said T-crossbar portion having a long section and a short section thereof; and  
 a cap member having an elongated planar surface, a first longitudinal edge of said planar surface having a first 180° lip defining a first channel, the depth of said first channel essentially that of the length of said long section of said T-crossbar portion and a second 180° lip defining a second channel having a depth essentially that of the length of said short section of said T-crossbar portion, said cap member adapted to be disposed with said long section of said T-crossbar portion within said first channel and said short section of said T-crossbar portion within said second channel with a flexible sheet captivated therebetween.

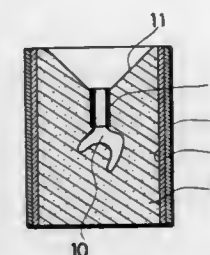
**4,682,643**  
**METHOD OF PRODUCING MOLDED PARTS AND CASTING PATTERN THEREFOR**  
 David L. Bernhardt, Canton, Mich., and Neno T. Nenov, Williamsville, N.Y., assignors to Nu Con Corporation, Livonia, Mich.  
 Continuation-in-part of Ser. No. 543,775, Oct. 20, 1983, abandoned. This application Oct. 3, 1985, Ser. No. 783,761  
 Int. Cl.<sup>4</sup> B22C 9/04  
 U.S. Cl. 164-34 8 Claims



1. A method of making a plurality of identical molded parts, comprising the steps of:

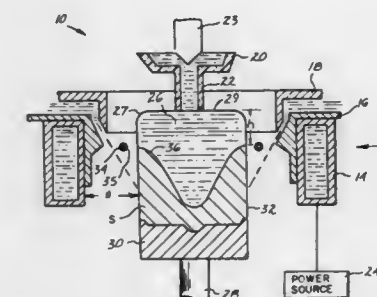
(a) forming a first plastic pattern corresponding to the shape and dimensions of said parts;  
 (b) encasing said first pattern in a first mold;  
 (c) removing said first pattern from said first mold to provide a mold cavity;  
 (d) charging said first mold with a quantity of flowable material which sets up to form a resilient, pliable second pattern;  
 (e) separating said second pattern from said first mold;  
 (f) forming a second mold by casting material around said second pattern;  
 (g) removing said second pattern from said second mold;  
 (h) charging said second mold with a quantity of molding material;  
 (i) breaking said second mold to remove the part molded therewithin; and  
 (j) then, repeating Steps (f) through (i) to produce additional parts.

**4,682,644**  
**MOLD FOR USE IN DENTAL PRECISION CASTING**  
 Masato Ueno, Hiroshima, Japan, assignor to Kyocera Kabushiki Kaisha, Kyoto, Japan  
 Filed Dec. 6, 1983, Ser. No. 558,496  
 Claims priority, application Japan, Dec. 6, 1982, 57-214372; Jun. 28, 1983, 58-117723  
 Int. Cl.<sup>4</sup> B22C 9/04, 9/08  
 U.S. Cl. 164-359 31 Claims



1. A mold for use in dental precision casting, said mold comprising a sprue and a dental precision casting mold investment, said investment containing a closed ended cavity in flow communication with said sprue, said sprue comprising a heat resisting ceramic tubular body.

**4,682,645**  
**CONTROL SYSTEM FOR ELECTROMAGNETIC CASTING OF METALS**  
 Peter J. Kindlmann, Guilford, and Brian G. Lewis, Branford, both of Conn., assignors to Olin Corporation, New Haven, Conn.  
 Filed Mar. 3, 1986, Ser. No. 835,848  
 Int. Cl.<sup>4</sup> B22D 27/02, 11/18  
 U.S. Cl. 164-453 32 Claims



1. An apparatus including:



means for electromagnetically containing a head of molten material and for forming said molten material into a solid product having a desired shape;

said solid product emerging from said containing and forming means in a desired casting direction;

a boundary between said molten material head and said solid product comprising a liquid-solid interface;

said head of molten material having a height comprising a distance measured in said casting direction along an outer surface of said molten material head from said liquid-solid interface to an upstream surface of said molten material;

said containing and forming means comprising a containment inductor and means for applying a current and a voltage to said inductor to thereby generate and apply a magnetic field to contain said molten material and to form said molten material into said desired shape;

a sense loop positioned between an inner surface of said inductor and an outer surface of at least one of said molten material head and said solid product in a plane substantially transverse to said casting direction; and

said sense loop being positioned along an axis parallel to said casting direction at a location in the range of from about a point substantially equal to said height of said molten metal head downstream of said liquid-solid interface to a point substantially equal to about one-half of said height of said molten metal head upstream of said interface.

4,682,646

# CONTINUOUS CASTING MOLD FOR SELECTIVELY CASTING STRANDS OF DIFFERENT WIDTHS AND THICKNESSES AND A METHOD FOR OPERATING THE CONTINUOUS CASTING MOLD

Antoo Hulek, Linz, Austria, assignor to Voest-Alpine, Linz, Austria

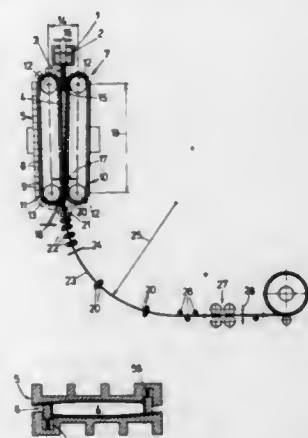
Filed Aug. 29, 1985, Ser. No. 770,847

Claims priority, application Austria, Sep. 10, 1984, 2892/84

Int. Cl.<sup>4</sup> B22D 11/06

U.S. Cl. 164—481

23 Claims



1. A continuous casting mold for selectively casting strands of different widths and thicknesses, comprising two first plate-shaped sidewalls having facing surfaces arranged opposite each other and defining a mold cavity at two opposite sides, each of said two first sidewalls having a recess at a single side edge of said first sidewalls' respective facing surface,

two second sidewalls each having a rear face and each of said second sidewalls being arranged so as to be sunk in one of said recesses with said second sidewalls' respective rear face bearing in a respective first sidewall said side-

walls, the second sidewalls having front faces pressable against and in facing relationship to the facing surface of said first sidewalls so as to form a peripherally closed mold cavity.

4,682,647

# INDICATOR DEVICE FOR A HEAT EXCHANGER

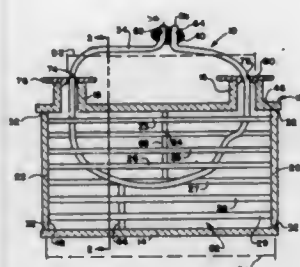
Robert Sleep, 4304 Autumn Leaves Dr., Tampa, Fla. 33624

Filed Feb. 7, 1986, Ser. No. 827,258

Int. Cl.<sup>4</sup> F28F 7/00

U.S. Cl. 165—11.1

23 Claims



1. An indicator device for a heat exchanger for indicating that the heat exchanger has been disassembled, cleaned, inspected, reconditioned and subsequently rebrazed, said device comprising in combination:

an elongate housing, defining an inlet and an outlet port;

a first and a second tube plate with said plates being spaced axially within said housing;

a plurality of heat exchanger tubes extending through and between said plates;

first sealing means disposed between said plates and said tubes for sealing said tubes relative to said plates;

second sealing means disposed between said tube plates and said housing for sealing said tube plates within said housing;

an elongate flexible means having a first and second end with said first end of said flexible means being threaded into one of said inlet and said outlet ports and extending around at least one of said tubes and being threaded out of one of said inlet and said outlet ports; and

an indicator means extending around said first end and said second ends of said flexible means for sealingly connecting together said end of said flexible means for indicating that the heat exchanger has been disassembled, cleaned, inspected, reconditioned and subsequently reassembled and rebrazed.

4,682,648

# TEMPERATURE OFFSET CONTROL SYSTEM

Morton Fried, 706 Bolton Rd., Far Rockaway, N.Y. 11691

Filed Dec. 29, 1982, Ser. No. 454,428

Int. Cl.<sup>4</sup> G05D 23/00; F24F 11/00

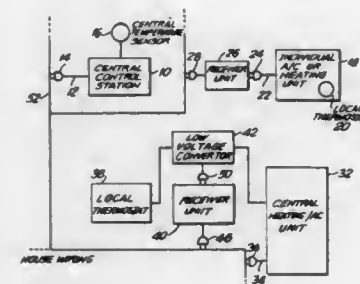
U.S. Cl. 165—12

14 Claims

1. A temperature offset control system for controlling the operation of both heating and air conditioning systems simultaneously contained within the same premises each of which is set by local thermostats to operate at an appropriate temperature, said offset control system comprising:

a central control station having means for presetting an offset temperature range, means for sensing the temperature at a central location, means for comparing the sensed temperature with the offset temperature range, means responsive to the comparison for producing a control signal indicative of whether the sensed temperature is within said offset temperature range or beyond said offset temperature range, and means for transmitting said control signal onto the standard energy lines servicing the premises; and

a receiving station respectively associated with each heating and air conditioning system, said receiving stations each comprising means for receiving the same transmitted control signal from the energy lines, and switch means for controlling the energization of the respective system in response to the received control signal, wherein said heating systems and associated local thermostat are disabled by said control signal when said control signal originates from a sensed temperature above the lower end of the offset temperature range, and said air conditioning systems and associated thermostats are disabled by the same control signal when said control signal originates



from a sensed temperature below the upper end of the offset temperature range;

wherein said central control station comprises control switching means having an ON mode for producing a turn ON signal, and OFF mode for producing a turn OFF signal and an OFFSET mode for producing said control signal responsive to the particular output of the comparing means, and timer means permitting automatic timed switching between any two of said three modes, and further comprising means for checking the previous signal sent and only sending a signal entered on said central control station changing a previous signal sent.

4,682,649

# AUXILIARY AIR CONDITIONING, HEATING AND ENGINE WARMING SYSTEM FOR TRUCKS

J. Rex Greer, 4404 18th St., Lubbock, Tex. 79416

Filed Jun. 2, 1986, Ser. No. 869,607

Int. Cl.<sup>4</sup> F02N 17/06; B60H 1/32

U.S. Cl. 165—43

17 Claims

1. An air conditioning, heating and engine warming system for trucks and like vehicles comprising:

an engine including a block connected to a radiator;

an engine and truck air conditioning and heating system including a truck compressor, a condenser, refrigerant lines extending from the truck compressor to at least one air conditioning unit and extending from the air conditioning unit to the condenser and back to the truck compressor, and heater conduits extending from the engine block to at least one heating unit and extending back to the engine block;

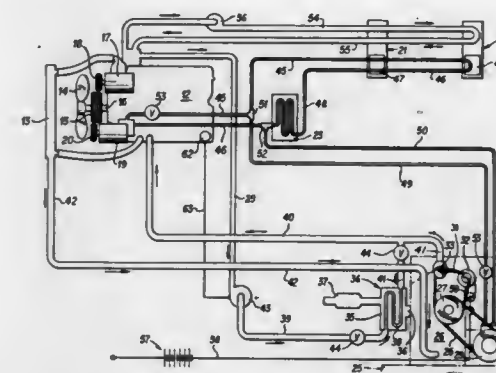
an auxiliary power plant on the truck including an auxiliary engine, alternator, coolant system including a water pump and an air conditioning compressor each driven by the auxiliary engine, and a heat exchanger having a chamber located immediately adjacent the auxiliary engine for receiving hot exhaust gases therefrom and having a liquid

heating coil within said chamber in heat transfer relationship with the exhaust gases,

a first coolant conduit coupled from the engine block to one side of the heating coil of the heat exchanger and a second coolant conduit coupled directly back to the engine block, said second coolant conduit being additionally coupled to the other side of said heating coil,

a circulating pump connected in the first conduit between the engine block and the heating coil;

the return of heated water to the engine block from said second conduit acting to warm the engine block and thus aid starting of the truck engine in cold weather when the auxiliary power plant is operated;



additional refrigerant lines coupling the compressor of the auxiliary power plant to refrigerant lines connecting said air conditioning unit and said condenser whereby refrigerant can be independently supplied to the truck air conditioning system from the compressor of the auxiliary power plant when said auxiliary power plant is operated; and means in the refrigerant lines between the truck compressor and said one air conditioning unit and between the compressor of the auxiliary power plant and said one air conditioning unit for restricting back flow of refrigerant between the two said compressors.

4,682,650

# HEAT EXCHANGER OF THE TUBE BANK TYPE, IN PARTICULAR FOR AN AUTOMOTIVE VEHICLE

Michel Potier, Rambouillet, France, assignor to Valeo, Paris, France

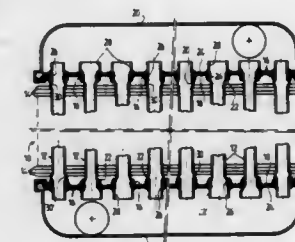
Filed Sep. 11, 1985, Ser. No. 774,996

Claims priority, application France, Sep. 25, 1984, 84 14723

Int. Cl.<sup>4</sup> F28F 9/02

U.S. Cl. 165—173

8 Claims



1. A tube-bank heat exchanger, in particular for an automotive vehicle, including a pair of headers with multiple tubes therebetween, said tubes having substantially coextensive first ends and substantially coextensive second ends, said headers having multiple holes defined therethrough, the first and second tube ends being received through and extending beyond the corresponding headers and being mounted in a fluid-tight manner in the holes of the headers, the first and second ends of each tube being substantially identical, selected ones of said

tubes having their tube ends outwardly enlarged solely beyond the corresponding headers and defining abutment shoulders retaining the selected tubes within the holes of the headers against outward withdrawal of the headers therefrom, the remainder of said tubes being outwardly enlarged solely inward of the hole-received ends thereof and inward of the corresponding headers to define bulges retaining the headers against inward movement of said headers relative to the tubes, said bulges and said abutment shoulders being located immediately adjacent the opposed sides of the corresponding headers and preventing any displacement of said headers with respect to said tubes.

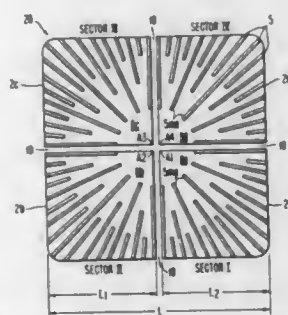
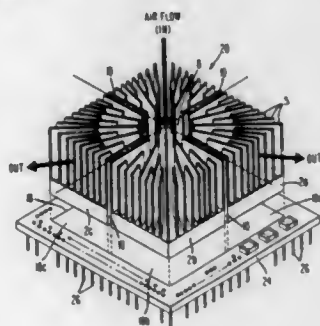
4,682,651

## SEGMENTED HEAT SINK DEVICE

Paul G. Gabuzda, Laguna Beach, Calif., assignor to Burroughs Corporation (now Unisys Corporation), Detroit, Mich.  
Filed Sep. 8, 1986, Ser. No. 904,442  
Int. Cl.<sup>4</sup> F28F 7/00

U.S. Cl. 165—80.3

11 Claims



10. A heat sink having a four sector configuration of four duplicate square baseplate units each placed in close non-touching juxtaposition to form a central orifice area for diverting air flow across radially oriented fins outward past the periphery of each sector, the combination comprising:

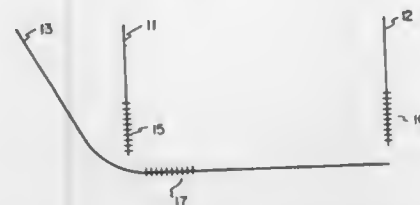
(a) said four duplicate square baseplate units holding vertical fin elements of variable length to form said four sectors and wherein the inner apex of each sector includes an area devoid of fins to form said central orifice area.

4,682,652  
PRODUCING HYDROCARBONS THROUGH  
SUCCESSIVELY PERFORATED INTERVALS OF A  
HORIZONTAL WELL BETWEEN TWO VERTICAL  
WELLS

Wann-Sheng Huang, and Margaret A. Hight, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.  
Filed Jun. 30, 1986, Ser. No. 880,393  
Int. Cl.<sup>4</sup> E21B 43/24

U.S. Cl. 166—263

12 Claims



1. A method for producing hydrocarbons from a portion of an underground formation bounded by at least two substantially vertical wells and at least one substantially horizontal well, comprising:

injecting a thermal fluid into the formation through a first substantially vertical well;  
producing fluids from a substantially horizontal well located within the underground formation,  
said horizontal well extending from an area near the first vertical well to the vicinity of a second substantially vertical well penetrating the formation,  
said horizontal well produced fluids only being produced from a first perforated interval in the horizontal well in the vicinity of the first vertical well;  
ceasing production from the first perforated interval of the horizontal well and producing fluids from a second perforated interval of the horizontal well which is farther from the first vertical well than the first perforated interval;  
continuing to move the production of fluids through the horizontal well to perforated intervals successively farther away from the first vertical well than the preceding production perforated intervals;  
after fluids have been produced through a perforated interval in the vicinity of the second vertical well, producing fluids through the second vertical well.

4,682,653  
STEAM RECOVERY PROCESSES EMPLOYING STABLE  
FORMS OF ALKYLAROMATIC SULFONATES

Howard P. Angstadt, Media, Pa., assignor to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 782,158, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 596,476, Apr. 3, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 832,185

Int. Cl.<sup>4</sup> E21B 43/22, 43/24

U.S. Cl. 166—303

5 Claims

1. A method for the recovery of oil from a subterranean reservoir which comprises injecting steam and a dialkylaromatic sulfonate surfactant into the reservoir, and producing oil displaced by said surfactant and steam, said surfactant being comprised of a mixture of para- and meta-isomers of said dialkylaromatic sulfonate, wherein the amount by weight of the para-isomer in the mixture has been increased relative to the amount of meta-isomer sufficient to provide an increase in the hydrolytic stability of said mixture.

4,682,654

## ENZYMATICALLY-TREATED GUAR GUMS

Walter H. Carter, and Vinai K. Srivastava, both of Dalton, Ga., assignors to Millmaster Onyx Group, Inc., New York, N.Y.  
Division of Ser. No. 736,667, May 22, 1985. This application

Oct. 9, 1986, Ser. No. 917,032

Int. Cl.<sup>4</sup> E21B 43/26

U.S. Cl. 166—308

1 Claim

1. In a method of recovering oil from an oil bearing formation by fracturing thereof, the step of inserting into said formation, at high pressure, an aqueous composition comprising guar gum in water, the guar gum having been first coated and impregnated, while in the solid particulate state, with an aqueous solution of a hydrolytic enzyme.

4,682,655

## SLOTTED HOUSING HAVING MULTIPLE SEATS FOR SUPPORTING AND LOCATING SUBMERSIBLE PUMPS IN DEEP WELLS

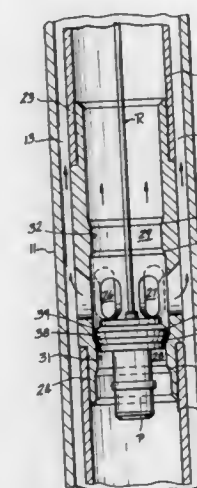
Olegario Rivas, San Antonio, Venezuela, assignor to Intevep, S.A., Caracas, Venezuela

Filed Sep. 22, 1986, Ser. No. 910,016

Int. Cl.<sup>4</sup> E21B 43/12

U.S. Cl. 166—369

6 Claims



1. In a fluid product pumping system for deep fluid well formations including a well casing surrounding fluid product tubing string to define an annular space between the casing and the tubing string,

a method of creating a valve action in the tubing string comprising the steps of:

forming at least one through aperture in the product tubing string,

lowering the tubing string into the well until the aperture reaches the region of the surface of the fluid to be pumped,

sealing a lower region of said annular space to isolate the formation,

supporting a submersible pump having a housing on a rod string within the product tubing string in a pumping relationship with said fluid, and utilizing the pump housing in cooperation with said tubing string to control fluid flow of product from said pump through said aperture by selectively positioning said pump housing above and below said aperture such that when the pump housing is below the aperture the product flows through the tubing string and through the annular space simultaneously and when the pump housing is above the aperture the product flows solely through said tubing string.

5. A fluid product pumping system for fluid wells comprising:

a well casing;

a fluid production tubing string within the casing spaced

from the casing to define an annular space between the casing and the tubing string;

a slotted housing in series with and forming a part of the tubing string, said slotted housing defining a hollow cylindrical body having at least one aperture leading from the interior of the tubing string to the annular space, said body having on the interior surface thereof a first seat means below said at least one aperture, a second seat means above said at least one aperture and a third seat means above said second seat means;

a submersible pump supported movably within said body; and

rod means for moving said pump relative to said aperture for selectively positioning said pump on said first seat means and said second seat means to effect a valving action wherein the product flows through said annular space when said pump is on said first seat means and said product flows through said tubing string when said pump is positioned on said second seat means.

4,682,656

## COMPLETION APPARATUS AND METHOD FOR GAS LIFT PRODUCTION

Fleming A. Waters, Coppell, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 20, 1986, Ser. No. 876,700

Int. Cl.<sup>4</sup> E21B 23/02, 33/119, 34/10, 43/12

U.S. Cl. 166—372

9 Claims



1. Well completion apparatus comprising, in combination:

a well packer comprising a mandrel, anchoring and sealing means for anchoring said mandrel in a well casing and sealing therebetween, said mandrel having a longitudinal bore communicating with the casing annulus above the packer and below the packer;

a production seal unit having an annular coupling collar disposed for sealing engagement against the packer mandrel bore and a production stinger conduit for insertion into said packer mandrel bore, said stinger conduit having a bore defining a flow passage for formation fluid produced from said well, the annulus between the production stinger conduit and the packer bore defining an annular flow passage for conduit lift gas from the upper casing annulus into the lower casing annulus; and,

said production seal unit including a coupling head having a production flow passage and a lift gas flow passage, said annular coupling collar being mounted onto said coupling head for insertion into the packer mandrel bore, said coupling collar carrying an annular seal for sealing the casing upper annulus with respect to the packer mandrel bore.



9. A method for producing a gas-lift well of the type having a casing and a well packer anchored in said casing comprising the steps:

- running a string of production tubing including a stinger conduit into said well with said production stinger conduit extending through a flow passage bore in said packer, the bore of said stinger conduit defining a flow passage for conducting formation fluid through said packer, and the annulus between said packer bore and said stinger conduit defining an annular flow passage for conducting lift gas from the well casing annulus above the packer into the well casing annulus below the packer;
- pressurizing the well casing annulus above the packer with lift gas;
- discharging pressurized lift gas from the well casing annulus above the packer through a surface controllable safety valve into the annulus between the production stinger conduit and the packer bore;
- conducting lift gas through said packer annulus and discharging it into the lower casing annulus;
- discharging lift gas from the lower casing annulus into the production tubing through a gas lift valve attached to the production tubing at a location below the fluid level of the well; and,
- conducting formation fluid from said well through said production stinger conduit.

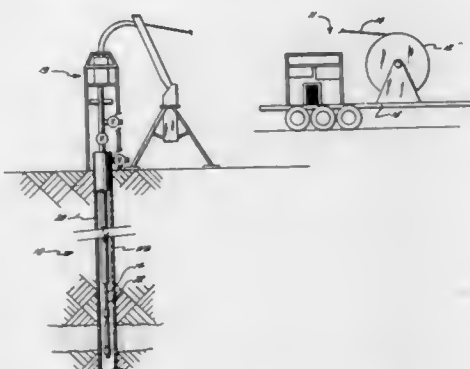
4,682,657

#### METHOD AND APPARATUS FOR THE RUNNING AND PULLING OF WIRE-LINE TOOLS AND THE LIKE IN AN OIL OR GAS WELL

James B. Crawford, P.O. Box 30636, Lafayette, La. 70503  
Division of Ser. No. 701,572, Feb. 14, 1985, Pat. No. 4,612,984.  
This application Sep. 22, 1986, Ser. No. 910,418  
Int. Cl.<sup>4</sup> F21B 17/20

U.S. Cl. 166—385

7 Claims



1. A method for running tools in an oil or gas well on coil tubing, comprising:

- a. running an elongated small diameter tubing string with an unobstructed open flow bore from a coil stored on a reel down an oil/gas well forming a work string;
- b. securing as fluid conveying tool carrier to the distal end of the coil tubing string so that fluid can circulate from the coil tubing on the reel through the unobstructed open flow bore and into the tool carrier;
- c. introducing pressurized gas into the well through the unobstructed open flow bore of the tubing so that it circulates through the tubing and then the tool carrier; and
- d. supporting a tool assembly with the tool carrier so that tension in the excess of 14,000 lbs. can be applied to the tool assembly with the coil tubing work string for operating a tool supported by the tool carrier using pressure applied to the tool assembly and tool carrier with the tubing work string.

#### 4,682,658 TILLING APPARATUS FOR PREPARING A RIDGE AND FURROWED FIELD

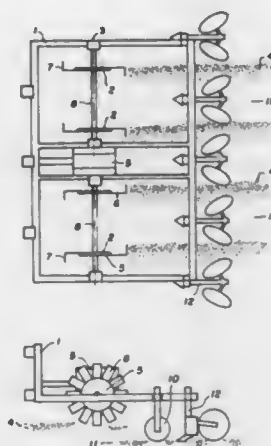
Ward W. Erickson, 55 Boundary Street, Moree New South Wales, 2400, Australia

Filed Sep. 13, 1985, Ser. No. 775,611

Claims priority, application Australia, Sep. 17, 1984, PG7166  
Int. Cl.<sup>4</sup> A01B 33/02, 49/02

U.S. Cl. 172—73

13 Claims



1. A tilling apparatus for preparing a ridge and furrowed field for planting with each ridge having a top and each furrow a bottom, said apparatus comprising:

- a frame adapted to be drawn in a given direction by a tractor;
- a plurality of laterally spaced apart driven hoeing means mounted on said frame to rotate in a direction opposing the drawing direction of the apparatus about an axis substantially normal to said drawing direction;
- each of said hoeing means being adapted to be aligned with a ridge line over which the frame is to be drawn;
- the hoeing means having a bottom of rotation adapted to be positioned so as to be higher than the furrow bottom;
- a plurality of lister means mounted to said frame aft of said hoeing means;
- each of said lister means being spaced laterally from each of said hoeing means, such that one of said lister means is adapted to be aligned with each furrow, and centered between adjacent ridges, over which the frame is to be drawn, when said hoeing means are each aligned with a ridge line; and
- said lister means and said hoeing means being displaced vertically relative to each other with the lister means having a bottom lower than the lowest position of the hoeing means bottom of rotation whereby the hoeing means is adapted to remove the tops or crests of said ridges and any vegetation growing therein and said lister means is adapted to reach the bottom of said furrows to thereby reform the ridge and furrowed field by clearing the furrows and reforming the tops of the ridges with soil displaced from the furrows.

4,682,659

#### GROUND PIERCING ATTACHMENT FOR TRACTORS

Wekko R. Holopainen, R.F.D. #1, Box 69A, Mohawk Trail, Shelburne, Mass. 01370

Continuation-in-part of Ser. No. 614,471, May 25, 1984, abandoned. This application Apr. 29, 1986, Ser. No. 857,073  
Int. Cl.<sup>4</sup> E21B 7/26

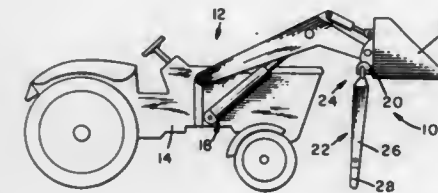
U.S. Cl. 175—19

9 Claims

8. Ground piercing attachment for a tractor having a material handling bucket which is mounted on the tractor for move-

ment relative to the tractor, said bucket having a rear surface, said attachment comprising:

- (a) a bracket which is fixed to the lower portion of the rear surface of the bucket of a tractor,
- (b) an elongated bar,
- (c) a ring which is fixed to the top end of the bar, and
- (d) a horizontal support fixed to said bracket and extending freely through said ring, so that the axis of said ring is



parallel with the front to back axis of the tractor, so that said bar is suspended from said support element and pivoted about said axis, whereby when the bucket is raised to a sufficient height so that the bottom end of the bar is positioned above the ground, and whereby subsequent lowering of the bucket causes the bar to be driven into the ground to form a posthole upon removal of the bar from the ground.

4,682,660

#### HYDRO-DRILL WITH CIRCULAR IMPRESSION

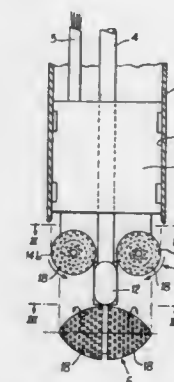
Hervé Barthelemy, La Celle Saint Cloud, and Yves Legendre, Balloy, both of France, assignors to Soletanche, Nanterre, France

Filed Dec. 12, 1985, Ser. No. 808,311

Claims priority, application France, Dec. 13, 1984, 84 19053  
Int. Cl.<sup>4</sup> E21B 10/26

U.S. Cl. 175—96

10 Claims



1. A device for producing generally circular boreholes in the ground comprising

- a body having an upper and lower pair of bits,
- a driving means for driving each bit in said pairs of bits in a direction opposite to the direction of rotation of the other bit in said pair
- said bits having a means for breaking up the soil and wherein said lower pair of bits is capable of rotating in opposite directions by said driving means around two parallel horizontal axes, each of said lower pair of bits having the external shape of a volume of revolution the generatrix of which consists of a circular arc corresponding to the circular cross section of the borehole and wherein said upper pair of bits are above said lower pair of bits and rotate in opposite directions about two parallel horizontal axes which parallel axes are not parallel the axes of said lower pair of bits, each of said upper pair of bits having the

external shape of a volume of revolution the generatrix of which consists of a circular arc corresponding to the circular cross-section of the borehole.

4,682,661

#### DRILLING APPARATUS

Philip M. Hughes, 31 Marlborough Drive, Tytherington, Macclesfield, Cheshire, and Michael W. McHugh, 3 Sulby Road, Thorplands, Northampton, both of Great Britain

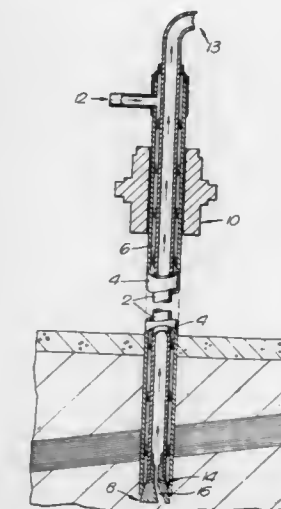
Filed Mar. 29, 1984, Ser. No. 594,562

Claims priority, application United Kingdom, Mar. 31, 1983, 8309016

Int. Cl.<sup>4</sup> E21B 17/18, 21/10, 21/12

U.S. Cl. 175—215

8 Claims



1. A boring head for duo-pipe drilling apparatus of the type comprising concentric inner and outer pipes defining an annular passage therebetween for transmitting pressurised fluid to the boring head, the boring head comprising:

- a body having a coupling end and a cutting end;
- a passage for material return extending through the body from the cutting end to the coupling end, said passage having an inlet at the cutting end displaced relative to the intended axis of rotation of the boring head and extending radially across substantially the full radius of the boring head, and an exit at the coupling end which is coaxial with the intended axis of rotation of the boring head;
- means at the cutting end comprising at least one cutting tooth having an elongate attacking edge substantially perpendicular to said axis and overlying said inlet, said tooth having a forward portion bevelled rearwardly from said edge for mechanically displaying material cut by said at least one cutting tooth into said inlet as said boring head is rotated;
- fluid supply galleries in said body opening into said passage for material return for directing fluid towards the exit of said passage to flush cut material in said passage to the exit;
- the coupling end of the boring head being adapted for connection to a duo-pipe system such that the annular passage for pressurised fluid of the duo-pipe system is in communication with the fluid supply galleries and the inner pipe of the duo-pipe system is in communication with the exit of the passage for material return.

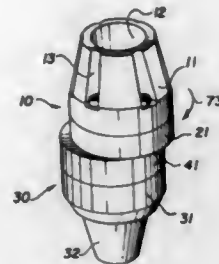
# 4,682,662 DRILL ADAPTER

Vladimir Vancura, Brudsporregränd 6, S-162 45 Vällingby, Sweden

Filed Apr. 25, 1985, Ser. No. 727,224  
Int. Cl.<sup>4</sup> E21B 10/26, 17/00

U.S. Cl. 175—320

4 Claims



1. A soil and rock drill adapter for connection between a rotatable drill rod and drill bit such as to enable the drill bit to be positioned eccentrically in relation to the longitudinal axis of the drill rod, said adapter comprising two mutually connected parts arranged one above the other and abutting each other in a plane extending at right angles to the longitudinal axis of the drill rod and provided with means which enable mutual adjustment of said adapter parts between an eccentric position and a centric position relative to said axis and wherein each of said adapter parts includes an end piece and a journal plate, and wherein the journal plates are pivotally connected together by means of a pivot means and pivot-restricting means, and are firmly connected to associated end pieces by means of screw fastener means.

# 4,682,663

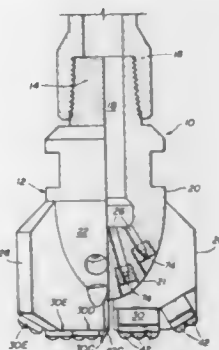
## MOUNTING MEANS FOR CUTTING ELEMENTS IN DRAG TYPE ROTARY DRILL BIT

Jeffery E. Daly, Cypress, and Percy W. Schumacher, Houston, both of Tex., assignors to Reed Tool Company, Houston, Tex.

Filed Feb. 18, 1986, Ser. No. 830,399  
Int. Cl.<sup>4</sup> E21B 10/46

U.S. Cl. 175—329

13 Claims



1. In a drag type rotary drill bit having a bit body defining an exterior face;  
at least one unitary integral hard metal holder secured directly to said bit body, said holder being elongate and having a projecting end portion extending from said face of the bit body; and  
a plurality of polycrystalline diamond compact cutting elements mounted directly on the projecting end portion of said holder, each cutting element having a cutting edge projecting from said holder for engaging in cutting relation, a formation to be cut, each of the cutting edges of the plurality of cutting elements for said holder being in a

cutting plane extending generally radially of the axis of rotation of the bit, said holder providing reinforcement and rigidity to said cutting elements in resisting stresses resulting from the cutting operation.

# 4,682,664

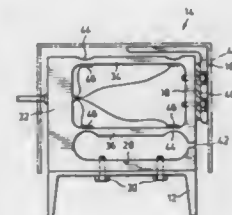
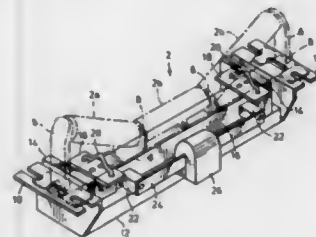
## LOAD SENSING SYSTEMS FOR CONVEYOR WEIGH SCALES

Charles W. Kemp, Arlington, Tex., assignor to Canadian Corporate Management Co., Ltd., Toronto, Canada

Filed Jul. 31, 1985, Ser. No. 761,173  
Int. Cl.<sup>4</sup> G01G 11/14, 3/08; G01L 25/00

U.S. Cl. 177—16

12 Claims



1. A conveyor belt weighbridge comprising support means for supporting a section of a conveyor belt run, said support means extending transversely of a line of travel of said run, a frame member extending transversely relative to the conveyor belt run for supporting the weighbridge in a fixed relationship to said line of travel, and transversely spaced cantilever strain gauge bridge units between the frame member and opposite ends of the support means, said units being responsive to vertical components of forces applied thereto by the support means, said units providing the sole support for said support means, the support means being supported by the units vertically above the frame member.

# 4,682,665

## PORTABLE LOW PROFILE MECHANICAL SCALES

Brad J. Young, 48 Fort Clark Estates, Benwood, W. Va. 26031

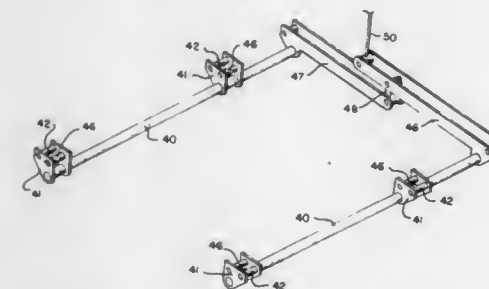
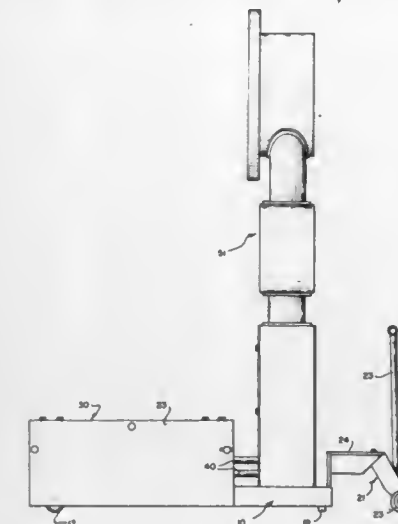
Filed Aug. 20, 1986, Ser. No. 898,329  
Int. Cl.<sup>4</sup> G01G 19/08, 21/08

U.S. Cl. 177—139

6 Claims

1. A portable low profile mechanical scale comprising a carriage having a pair of spaced apart side frame members, each having wheel means at one end and ground support means adjacent the other end, spacer means extending between said side frame members substantially at ground level holding said side frame members in spaced apart parallel relation, wheeled lift means at said other ends of the side frame member for lifting said other ends to raise the ground support means, a pair of torsion bars above said side members at two different parallel levels, one adjacent each side frame and supported thereon by triangular link means fixed to the torsion bars at one end and supported on the side members at the other, weigh bed means movable vertically between said side frame members and pivoted to said link members between the torsion bar and support on the side frame members, lever means on each torsion bar adjacent said wheel lift means extending transversely

toward each other, one above the other, link means connecting said lever means midway between said side frame members and ing opposed side walls and a cab structure, the improvement comprising:



connector means on the end of the lever above the other for connection to a weight indicating mechanism.

# 4,682,666

## OPERATOR COMPARTMENT ASSEMBLY

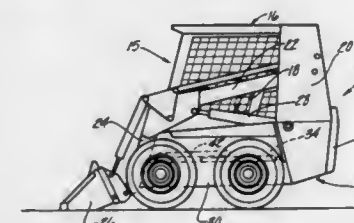
Maurice Klee, Burlington, Iowa; Robert T. Peterson, Gladstone, Ill.; Gary L. Cochran, Burlington, Iowa; James E. Dawson, Burlington, Iowa, and Robert M. Anderson, Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Dec. 31, 1984, Ser. No. 687,794

Int. Cl.<sup>4</sup> B62D 25/10

U.S. Cl. 180—89.13

12 Claims



1. In a front end loader including a base frame assembly having opposed side members, an engine compartment adjacent one end of said base frame assembly, vertical members extending above said base frame assembly adjacent said one end thereof, and an operator's compartment mounted on said base frame assembly with the operator's compartment includ-

means associated with said opposed compartment side walls and said opposed base frame side members for permitting said operator's compartment to be moved longitudinally along said opposed base frame side members from a closed position wherein said operator's compartment is substantially in engagement with said vertical members to a forward position wherein said operator's compartment does not obstruct access to the base frame assembly for servicing or repair work; and  
wherein each base frame side member including a first guide means and each said compartment side wall including a second guide means, first contact means on said base frame side member cooperating with said second guide means and second contact means on said compartment side wall cooperating with said first guide means whereby said first and second contact means permitting relative movement between said first and second guide means.

# 4,682,667

## POWER TRAIN CONTROL METHOD FOR SLIP PREVENTION

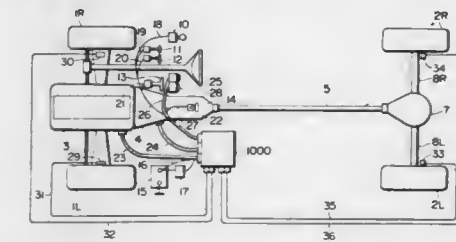
Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 12, 1984, Ser. No. 680,881

Claims priority, application Japan, Dec. 14, 1983, 58-234143  
Int. Cl.<sup>4</sup> B60K 31/00

U.S. Cl. 180—197

2 Claims



1. A method of controlling an automotive vehicle having a driving wheel driven by a power train and a non-driving wheel, the power train including an engine and a transmission, the method comprising the steps of:

detecting a peripheral speed of the driving wheel and generating a first peripheral speed indicative signal indicative of said peripheral speed of the driving wheel;  
detecting a peripheral speed of the non-driving wheel and generating a second peripheral speed indicative signal indicative of said peripheral speed of the non-driving wheel;  
determining a ratio of a difference between said first and second peripheral speed indicative signals to said first peripheral speed indicative signal and generating a slip rate indicative signal indicative of the value of said determined ratio;  
determining from the slip rate indicative signal a deviation of the value of said determined ratio from a predetermined target slip rate value and generating a deviation indicative signal indicative of said determined deviation; and  
controlling the power train in response to said deviation indicative signal such that an output torque produced by the power train is varied in a direction as to decrease said deviation indicative signal toward zero whereby said indicative value of said slip rate indicative signal is kept at said predetermined target slip rate value,  
wherein said controlling step comprises the steps of:  
causing the power train to increase the output torque produced thereby when said deviation indicative signal indicates that the indicative value of said slip rate indicative signal is lower than predetermined target slip rate value; and



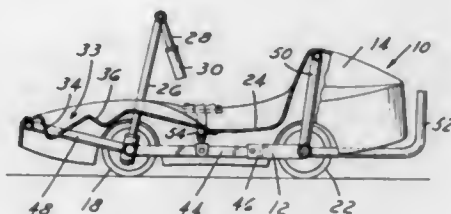
causing the power train to decrease the output torque produced thereby when said deviation indicative signal indicates that the indicative value of said slip rate indicative signal is higher than said predetermined target slip rate value.

4,682,668  
GO-CART

Michael E. Salmon, 2622 Makin, Flint, Mich. 48504, and Paul W. Hunkele, 1506 Williamsburg, Flint, Mich. 48507  
Filed Jan. 20, 1985, Ser. No. 747,169  
Int. Cl.<sup>4</sup> B62D 61/12

U.S. Cl. 180-209

26 Claims



1. A motorized vehicle comprising:
  - a chassis having a longitudinal axis, and a front and rear transverse axis each of which have two ends and are perpendicular to the longitudinal axis;
  - a pair of spindle assemblies each having two ends, the first end pivotally affixed to the chassis at opposite sides of the first transverse axis and pivotable about a steering axis having positive chamber, and the second end projecting outwardly therefrom;
  - a pair of steerable front wheels each freely rotatably attached to a spindle assembly second end whereby when the wheels and spindle assembly are steered during a turning maneuver the inside wheel moves downwardly and the outside wheel moves upwardly causing the load borne by the inside rear wheel to significantly reduce independent of vehicle speeds;
  - a pair of rear wheels rotatably affixed to opposite ends of an elongated rear axle, the axle cooperating with the chassis, rotatable about the rear transverse axis;
  - a motor affixed to the chassis and coupled to the rear axle for driving the vehicle; and
  - wherein the vehicle has a wheel base which is less than or equal to the vehicle's track.

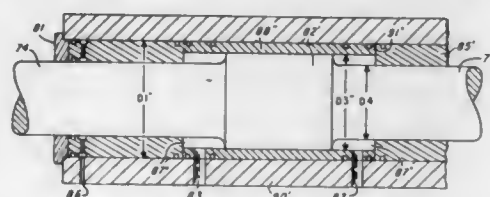
4,682,669

# TRANSPORTABLE HYDRAULIC SEISMIC TRANSDUCER

Richard M. Weber, Prosper, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Continuation of Ser. No. 465,399, Feb. 10, 1983, abandoned.  
This application Feb. 18, 1986, Ser. No. 830,487  
Int. Cl.<sup>4</sup> G01V 1/09; H04R 11/00

U.S. Cl. 181-114

4 Claims



1. A transportable hydraulic seismic transducer comprising:
  - (a) a transport means for transporting the hydraulic seismic transducer;

- (b) a pad for imparting elastic waves to the underlying ground;
- (c) a seismic energy source attached to the transport means and to the pad, the source having a reaction mass with a single diameter cylindrical bore extending entirely there-through, an actuator rod comprising a piston and at least one piston rod having a diameter less than said piston located within the bore, and at least one bushing premachined before insertion into the bore, fixed within the bore and having an inside diameter of a size to provide a bearing surface for the piston rod;
- (d) a cylindrical liner premachined before insertion into the bore, fitted within the bore, having an inside diameter of a size to accommodate the piston, wherein the piston is ringless and the liner is comprised of a bushing material; and
- (e) hydraulic system means operatively connected to the seismic energy source for causing the source to vibrate at desired frequencies.

4,682,670

# PORTABLE ADJUSTABLE ACOUSTIC ABSORBER

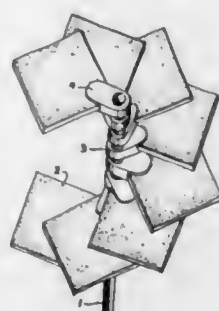
Lawrence Lerner, Beverly Hills, and Stephen P. Diskin, Los Angeles, both of Calif., assignors to Mega/ERG, Incorporated, Beverly Hills, Calif.

Filed Jul. 28, 1986, Ser. No. 890,813

Int. Cl.<sup>4</sup> E04B 1/82

U.S. Cl. 181-287

4 Claims



1. A portable adjustable absorber comprising: a plurality of sound absorbent panels; an equal plurality of connecting means capable of grasping at one or more points along their peripheries and of supporting rigidly outward in substantially cantilevered fashion said plurality of panels, and formed with a suitable circular opening for attachment; a central support means characterized by a cylindrical shaft of a diameter corresponding to that of the opening in each connecting means such that a stack of connecting means with absorbent panels attached thereto may be assembled and be freely rotatable about the axis of said central support means, thus forming an adjustable and collapsible helix of both variable pitch and exposure of surface area of absorptive material by rotation of said panels with respect to one another through any angle, therefore permitting control of total sound absorption, or the collapsing of the helix into a compact prismatic profile when all of said absorptive panels are stacked forming an overall minimum dimension of the device for storage or transport; and base means for support and positioning of the entire device as desired adjacent to any interior environmental enclosure surface.

4,682,671

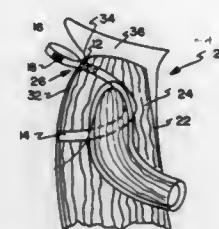
# SAFETY HARNESS

Gary M. Hengstenberger, 948 Impala Dr., Akron, Ohio 44319; John I. Montavon, 1000 Jean Ave., Akron, Ohio 44310, and David C. Fuller, Akron, Ohio, assignors to Gary M. Hengstenberger and John I. Montavon, both of Akron, Ohio  
Filed Feb. 24, 1986, Ser. No. 832,326  
Int. Cl.<sup>4</sup> A65B 35/00

U.S. Cl. 182-3

14 Claims U.S. Cl. 187-126

5 Claims



1. Safety apparatus, comprising:
  - a continuous loop of material connected to itself at a point to define a first larger loop and a second smaller loop;
  - a jacket receiving said continuous loop of material;
  - loop passes wherein said jacket around a back portion of said jacket and said smaller loop extends out from said jacket and is maintained at a neck portion of said jacket; and
  - wherein said larger loop passes from said back portion of said jacket to a front portion of said jacket below a point where arms extend from said jacket, said larger loop thence returning to said neck portion of said jacket.

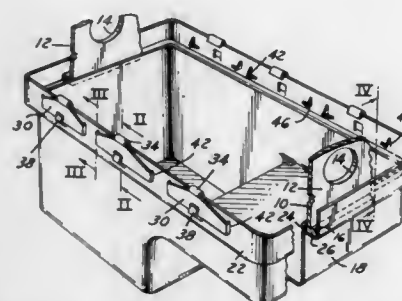
4,682,672

# SNAP-ON OIL PAN

Alvin H. Berger, Wyandotte, and Roy E. Diehl, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.  
Filed Apr. 21, 1986, Ser. No. 854,286  
Int. Cl.<sup>4</sup> F16N 31/00

U.S. Cl. 184-106

11 Claims



1. A clip-on type oil pan for attachment to the bottom edge of the skirt of an engine block, the edge including a horizontal ledge extending circumferentially around and outwardly from the skirt, the pan being formed adjacent its upper portion with a trough shaped portion with vertical side walls adapted to receive the ledge therein for attachment of the pan thereto, and fastening means for flexibly securing the pan to the ledge, the fastening means including slot means in the outermost wall of the trough-shaped portion, and flexible retaining means secured to the pan and partially insertable through the slot means above the ledge, the retaining means having a portion thereof resting on the ledge supporting the pan therefrom and locking the pan to the block.

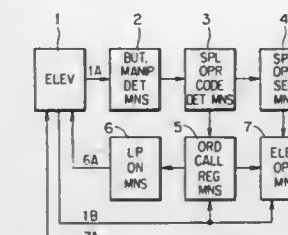
4,682,673

# ELEVATOR CONTROL APPARATUS

Yasukazu Umeda, Kasugai, and Shintaro Tsuji, Nagoya, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 21, 1986, Ser. No. 820,222

Claims priority, application Japan, Jan. 21, 1985, 60-8671  
Int. Cl.<sup>4</sup> B66B 1/20



1. An elevator control apparatus comprising a destination floor call registration device installed in an elevator cage and carrying a plurality of buttons corresponding to a plurality of floors, button manipulation detection means for detecting manipulation of each of said plurality of buttons, special operation code detection means for determining the presence of a request for a special operation when manipulations of preset ones of said plurality of buttons are registered in a predetermined sequence within a predetermined period of time, special operation setting means for activating the requested special operation when said special operation code detection means has determined the presence of the request for special operation, and ordinary call registration means for performing ordinary call registration and operation when said special operation code detection means has not determined the presence of the request for special operation.

4,682,674

# APPARATUS FOR LIMITING BACK PRESSURE IN AN EXHAUST-TYPE ENGINE SUPPRESSOR

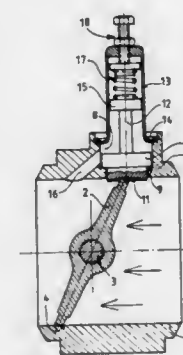
Alfred Schmidt, Burgstrasse 11, Pottenstein/Oftr., Fed. Rep. of Germany (8573)

Filed Aug. 7, 1985, Ser. No. 763,216

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430028  
Int. Cl.<sup>4</sup> F02D 9/06; F01N 7/00; F16K 3/00

U.S. Cl. 188-273

3 Claims



1. Apparatus for limiting back pressure in an exhaust-type suppressor comprising a butterfly-type throttle valve pivotally mounted about a valve pivot in an engine exhaust pipe of circular cross-section, such that the throttle valve can be moved from an open position to a closed position, the throttle valve having a rim and assuming an oblique attitude when in the closed position, a valve bore communicating with the

exhaust pipe at a location which is circumferentially spaced and longitudinally offset from the valve pivot so as to correspond with a location occupied by an end face portion of the throttle valve rim remote from the pivot when the valve is in closed position, a valve poppet slidable in the bore, and a spring disposed outwardly of the exhaust pipe with respect to the poppet for urging the poppet inwardly toward the throttle valve and permitting movement of the poppet outwardly in response to a back pressure of predetermined value being created in the exhaust pipe so as to provide a bypass around the throttle valve, the poppet valve having a concave end face which conforms in curvature to the curvature of the exhaust pipe.

4,682,675

## VARIABLE RATE SHOCK ABSORBER

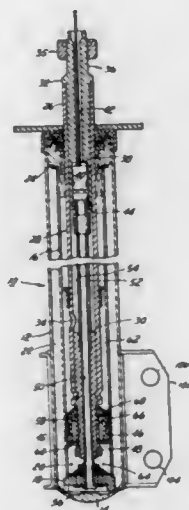
William C. Eddy, Jr., West Bloomfield, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 25, 1985, Ser. No. 801,657

Int. Cl.<sup>4</sup> F16F 9/46

U.S. Cl. 188—299

15 Claims



1. A variable rate shock-absorber of the type having an enclosed working cylinder, an external housing circumscribing the working cylinder and one end thereof to form a fluid reservoir, a piston disposed in the working cylinder dividing the interior of the working cylinder into an upper and lower working chamber, means provided at the end of the working cylinder connecting the lower working chamber with the reservoir, and a hollow piston rod slidably received in the other end of the working cylinder, said piston rod having one end connected to the piston and the opposite end extending external to the working cylinder, the variable rate shock-absorber characterized by:

- a telescoping cylinder disposed in said working cylinder having one end in fluid communication with the reservoir and the other end slidably received into the interior of said hollow piston rod; and
- solenoid valve means disposed in the hollow piston rod and connected to the other end of said telescoping cylinder, said solenoid valve means having an inlet port in fluid communication with said upper working chamber and an outlet port in fluid communication with the reservoir through the interior of said telescoping cylinder, said solenoid valve means responsive to an electrical input signal to switch between an open state enabling a fluid flow between said inlet and outlet ports and a closed state inhibiting a fluid flow between said inlet and outlet ports.

4,682,676

## ELECTROMAGNETIC POWDER CLUTCH WITH TWO POWDER GAPS

Kiyohito Murata, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

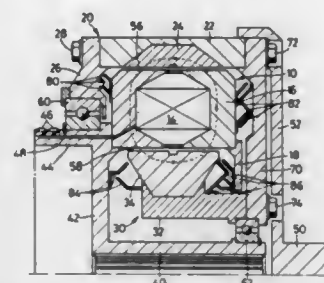
Filed Oct. 15, 1985, Ser. No. 787,757

Claims priority, application Japan, Oct. 26, 1984, 59-226174; Jan. 10, 1985, 60-2037[U]; Jan. 10, 1985, 60-2038[U]

Int. Cl.<sup>4</sup> F16D 37/02, 27/02

U.S. Cl. 192—21.5

5 Claims



1. An electromagnetic powder clutch of double-gap type comprising:

- an annular driven rotary member incorporating therein a solenoid coil and having a portion which is made of a magnetic material and which surrounds said solenoid coil;
- a connecting member made of a non-magnetic material;
- first and second driving rotary members disposed radially outwardly and inwardly of said annular driven rotary member, respectively, and connected to each other by said connecting member, said first driving rotary member and said driven rotary member cooperating to define a first powder gap therebetween, and said second driving rotary member and said driven rotary member cooperating to define a second powder gap therebetween, said first and second powder gaps accommodating therein first and second masses of magnetic powder, respectively, said first and second driving rotary members including radially inner and radially outer portions made of a magnetic material, respectively, said radially inner and outer portions of the first and second driving rotary members being opposite to radially outer and inner surfaces of said driven rotary member, respectively; and
- a labyrinth device disposed to separate said first and second annular powder gaps from each other.

4,682,677

## FREE WHEEL WITH SELF-CENTERING CAGE

Olivier Messag, Antony, France, assignor to SKF Compagnie D'Applications Mecaniques, Clamart, France

Filed Aug. 20, 1985, Ser. No. 767,532

Claims priority, application France, Sep. 11, 1984, 84 13926

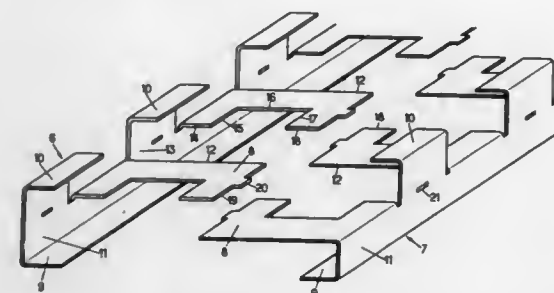
Int. Cl.<sup>4</sup> F16D 41/07

U.S. Cl. 192—41 A

7 Claims

1. A self-centering free wheel of the type incorporating a plurality of cams (3) for jamming abutment between the inner surface of a bore (2) and the outer surface of a shaft (1) disposed within said bore, and comprising
- a cage (5) comprising two identical half cages (6,7) disposed between said shaft and said bore surface, and supporting said cams therein,
  - a spring (4) within said cage for simultaneously providing a tilting torque to said cam while radially retaining said cams within said cage, each of said half cages having bearing surfaces (9) on one side thereof for bearing against the surface of the shaft (1) and having bearing surfaces (10) on the other side thereof for bearing against the surface of said bore (2) and to transmit a radial force from one surface to the other surface,
  - each of said half cages including an intermediate cylindrical

envelope (8) having a diameter which is intermediate the diameter of said shaft and of said bore, said intermediate cylindrical envelope (8) on each of said half cages having notches, said notches being arranged to form a plurality of rectangular openings in said cylindrical envelope when said half cages are fitted together by axial movement to form said cage (5), each of said rectangular openings having edges which are located on both of said half cages,



said spring (4) disposed between said cylindrical envelope (8) and bearing surface 9 of said cage, each of said cams supported in one of said rectangular openings in said cylindrical envelope when said half cages are fitted together, said spring engaging and retaining said cams within said cage, said cams within said rectangular openings comprising means for axially locking said half cages together.

4,682,678

## GEARING UNITS FOR USE WITH MINING EQUIPMENT

Willy Kussel, Werne, and Werner Bohle, Lüdinghausen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalia, Lunen, Fed. Rep. of Germany

Continuation of Ser. No. 563,487, Dec. 20, 1983, abandoned.

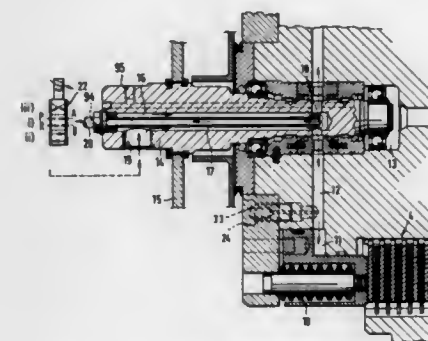
This application Dec. 30, 1985, Ser. No. 815,307

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248084

Int. Cl.<sup>4</sup> F16D 25/063, 43/21

U.S. Cl. 192—56 F

5 Claims



1. A gearing unit comprising:
- (a) an input shaft;
  - (b) an output shaft;
  - (c) gearing for drivably interconnecting the input shaft to the output shaft;
  - (d) a releasable clutch incorporated in the gearing and normally interconnecting said input shaft to said output shaft;
  - (e) said clutch including a chamber for receiving pressure fluid for releasing said clutch;
  - (f) a hollow, fixed spigot means projecting into one of said shafts adjacent said chamber and including means defining

separate fluid flow paths leading to and from said chamber;

- (g) a rapid acting electromagnetic switchable valve device operatively coupled to said spigot means in close vicinity to said chamber and operable to cause pressure fluid to circulate to and from said chamber via said fluid flow paths;
- (h) means responsive to switching of said valve device to a first state for creating an initial pre-determined lower circulating pressure fluid flow to the release chamber when the clutch is operating to couple said input shaft to said output shaft via said pressure fluid flow paths to insure that a pre-determined lower pressure prevails within said chamber;
- (i) a load sensor which provides an electrical signal depending on the load transmitted through the gearing; and
- (j) means for actuating the valve device to shift said valve device to a second state in response to said signal in event of excessive loading to cause said circulating pressure fluid flow to increase in pressure and said chamber to be exposed to a higher threshold pressure to release said clutch and disconnect said output shaft from said input shaft and to cause said clutch release to occur in a time not more than 25 milliseconds.

4,682,679

## VISCIOUS DRIVE WITH VARIABLE PUMP ACTION

Arthur E. H. Elmer, Nailsworth, England, assignor to Kysor Industrial Corporation, Cadillac, Mich.

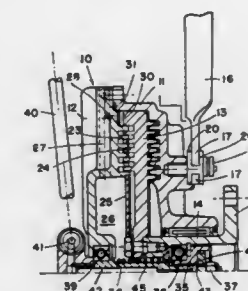
Filed Mar. 3, 1986, Ser. No. 835,732

Claims priority, application United Kingdom, Apr. 9, 1985, 8509041; Jun. 21, 1985, 8515790

Int. Cl.<sup>4</sup> F16D 35/00, 43/25

U.S. Cl. 192—58 C

6 Claims



1. A viscous fluid transmission including a rotary casing and a rotary element within the casing, the casing and the rotary element being connected respectively to two drive shafts, a quantity of viscous fluid within the casing, means for pumping the fluid from its normal position in the casing into a holding reservoir or other displaced zone so as to reduce the quantity of fluid in contact with the rotary element and hence the transmitted torque, means for varying the pumping action to modify the quantity of fluid in the casing; said pumping means including cooperating elements on the casing and the rotary element, said pumping means being modified by movement of the rotary element relative to the casing in an axial direction.



4,682,680

# FRICTION CLUTCH WITH MANUALLY DISCONNECTABLE RELEASE MEANS

Robert J. Ball, Leamington Spa, England, and John J. Winters, Edmonds, Wash., assignors to Automotive Products plc, Leamington Spa, England

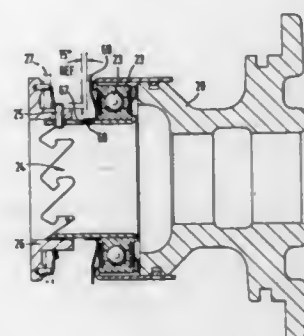
Filed Jun. 7, 1985, Ser. No. 742,699

Claims priority, application United Kingdom, Jun. 7, 1984, 8414507

Int. Cl.<sup>4</sup> F16D 19/00

U.S. Cl. 192-98

19 Claims



1. A friction clutch for a vehicle comprising: a friction plate; means to press said friction plate in a first direction parallel to the clutch axis; clutch release means for applying clutch release forces in a withdrawal direction opposed to said first direction, said clutch release means including a first member and a second member which applies clutch release forces to said first member, one of said members having a recess, the other of said members having a projection, said projection being receivable in said recess upon relative movement in an axial direction between said members, said recess being defined between a lead-in surface extending at an angle to the said axial direction and a location surface transverse to said axial direction and providing an axial location for said projection, a retainer surface adjacent said traverse space, said retainer surface being arranged to inhibit disengagement of said projection from said recess on application of said clutch release forces; whereby interengagement of said first and second members by relative axial movement therebetween will cause said projection and lead-in surface to interengage and effect relative rotation between said members until said projection fully engages said recess whereupon subsequent movement of said second member axially in the withdrawal direction will cause the projection to engage said location surface and enable clutch release forces to be transmitted to the first member from said second member through said location surface.

4,682,681  
ESCALATOR

Katsuya Teranishi, Katsuta; Kazuhira Ozima, Kasama; Cyuichi Saito, Katsuta, and Hiroyasu Ogawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1986, Ser. No. 843,619

Claims priority, application Japan, Mar. 27, 1985, 60-60790; Mar. 28, 1985, 60-61987; Jun. 12, 1985, 60-126108; Jun. 28, 1985, 60-140350

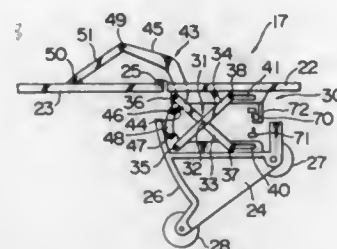
Int. Cl.<sup>4</sup> B66B 23/12

U.S. Cl. 198-333

7 Claims

1. An escalator having a body frame and a plurality of staircase steps connected in an endless manner and supported by said body frame, wherein at least one of said plurality of staircase steps is made for a wheel chair loading staircase step, said wheel chair loading staircase step comprising: a main tread board movable upwardly; a sub-tread board supported by said main tread board; means for lifting said main tread board and said sub-tread board; electric drive means for driving said lifting means; and means for automatically moving said sub-

tread board relative to said main tread board to provide a combined planar tread surface of said wheel chair loading



staircase step in accordance with an upward movement when said lifting means is driven by said drive means to lift said main tread board and said sub-tread board upwardly.

4,682,682

# FEEDING CONVEYOR FOR FEEDING ARTICLES LATERALLY ONTO ANOTHER CONVEYOR, PARTICULARLY A SORTING CONVEYOR

Karl H. Hartlepp, Ronde, Denmark, assignor to Kosan Crisplant A/S, Aarhus N., Denmark

Continuation of Ser. No. 639,405, Aug. 10, 1984, abandoned.

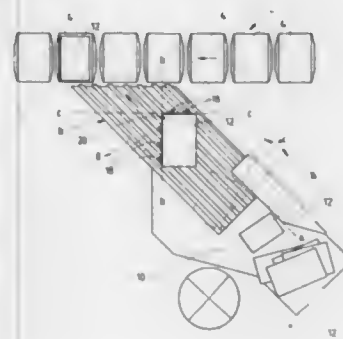
This application Sep. 22, 1986, Ser. No. 909,923

Claims priority, application Denmark, Aug. 11, 1983, 3654-83

Int. Cl.<sup>4</sup> B65G 47/24

U.S. Cl. 198-368

5 Claims



1. A feeding conveyor for feeding articles laterally onto another conveyor, particularly a sorting conveyor, by a movement obliquely inwardly and forwardly towards the latter conveyor, in an intermediate area of the feeding conveyor there is arranged a generally V-shaped stop means comprising an operationally unitary structure for temporarily stopping as well as centering and lining up of articles in conjunction with the action of said feeding conveyor, said V-shaped stop means being movable towards and retractable away from its stop position as a unit for releasing the centered and lined up article for transfer thereof to the sorting conveyor.

4,682,683

# METHOD AND APPARATUS FOR REMOVING IMPROPERLY ORIENTED ARTICLES FROM A MOVING ARTICLE

Charles E. Ackley, Sr., Sarasota, Fla., and Charles E. Ackley, Jr., Tuckerton, N.J., assignors to R. W. Hartnett Company, Philadelphia, Pa.

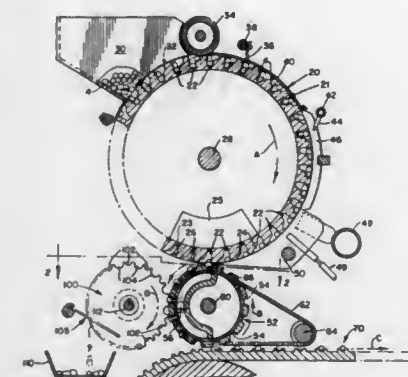
Continuation-in-part of Ser. No. 939,066, Sep. 1, 1978, Pat. No. 4,437,559. This application Mar. 16, 1984, Ser. No. 590,201

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.<sup>4</sup> B65G 47/24

U.S. Cl. 198-380

5 Claims



1. Apparatus for arranging individual ones of a plurality of substantially similar articles in a regularly spaced moving two-dimensional array, positioning those individual articles substantially uniformly in the array and transporting the array to a work station, comprising:

- (a) means for storing a plurality of said articles;
- (b) rotatable drum means for removing said articles from said storage means;
- (c) means for positioning said articles uniformly with respect to one another while moving on a curved surface of said rotatable drum, at positions in an arrangement, corresponding to said array;
- (d) means for removing improperly positioned articles from said positions within said arrangement corresponding to said array while moving along a curved path defined by a rotating cylindrical drum;
- (e) means, receiving said arranged articles after said improperly positioned articles have been removed, for transporting said articles, in said spaced two-dimensional arrangement defining said array, to a work station.

4,682,684

# METHOD AND AN ARRANGEMENT FOR THE FEEDING OF OBJECTS

Stig A. Löthman, Veberöd, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Continuation of Ser. No. 335,597, Dec. 30, 1981, abandoned.

This application Jun. 26, 1985, Ser. No. 749,115

Claims priority, application Sweden, Jan. 19, 1981, 8100247

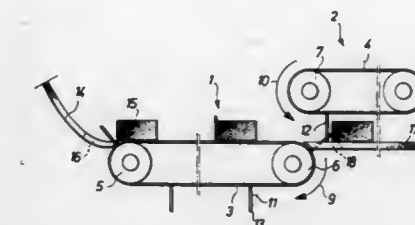
Int. Cl.<sup>4</sup> B65G 47/31

U.S. Cl. 198-461

18 Claims

1. A method for transferring an object from a first conveyor moving at a first speed to a second conveyor moving at a second speed which is higher than said first speed, comprising: providing said first conveyor with a pair of pulleys of predetermined radius; said first conveyor comprising a flat run and an arcuate run that extends over said pair of pulleys; spacing the second conveyor with respect to the first conveyor; contacting the object with an urging element positioned on

the first conveyor to push the object at the speed of the flat run of the first conveyor; providing the urging element with a contact surface at an end displaced from the conveyor belt; increasing the linear speed of a free end portion of the urging element by tipping the urging element forwardly as it passes around the arcuate run of the first conveyor;



providing the urging element with a predetermined length which is greater than the predetermined radius of one of said pair of pulleys; accelerating the object by contacting the object with said contact surface of the urging element during the increase of speed; and contacting the object with a portion of the second conveyor after the object has been accelerated by the urging element.

4,682,685

# CONVEYOR IN PLASTIC WORKING MACHINE

Hiroyasu Yamada, Kawagoe; Motoatsu Shiraishi, Sakado; Ken Tazou, Hidaka; Mitsuki Nakamura, Niiza; Ryoichi Kageyama, Sayama; Akira Namiki, Tokorozawa, and Masaru Sasagawa, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 692,800, Jan. 18, 1985, Pat. No. 4,625,540.

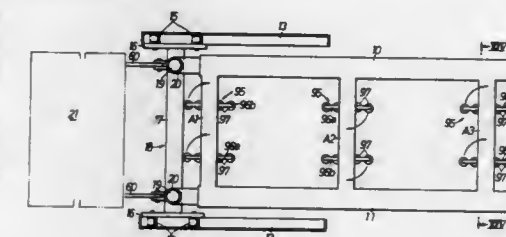
This application May 22, 1986, Ser. No. 866,018

Claims priority, application Japan, Jan. 20, 1984, 59-8097; Nov. 6, 1984, 59-233968; Nov. 6, 1984, 59-233969; Nov. 12, 1984, 59-238101; Nov. 12, 1984, 59-238102

Int. Cl.<sup>4</sup> B65G 25/04

U.S. Cl. 198-621

4 Claims



1. In a working machine having pairs of lower dies and upper dies disposed at a plurality of working stations, respectively, for cooperatively working a workpiece at the respective stations, the stations being set at intervals in a direction of conveyance of the workpiece,

a conveyor comprising:  
a pair of transfer bars disposed at opposite lateral sides of each working station of said plurality of working stations and extending parallel to each other in the conveying direction, said pair of transfer bars being connected together by a plurality of arms which are bridged laterally between said bars against relative movement to the bars and being movable vertically as well as in the conveying direction by respective driving means; and  
a handling mechanism disposed on each arm for holding the workpiece;  
wherein the handling mechanism comprises holding means for holding the workpiece, a horizontal rod attached with

said holding means and rotatable substantially on a horizontal plane between a projecting state in which the rod is substantially perpendicular to the associated arm and an enclosed state in which the rod is substantially parallel with the associated arm, and a shaft for rotatably carrying the horizontal rod on the arm, said shaft being driven by a driving means to effect rotating movement of the rod, whereby during operation of the conveyor, the horizontal rod of the handling mechanism is moved to the projecting state for holding and releasing the workpiece by said holding means, thereby allowing, in cooperation with the operation of said transfer bars, the workpiece to be conveyed in sequence from working station to working station.

4,682,686

## ARTICULATED BELT CONVEYOR

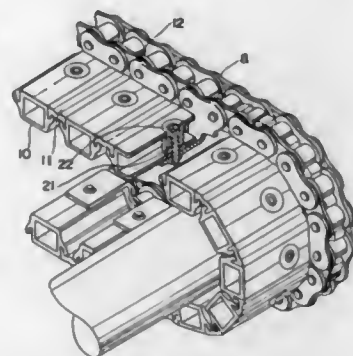
Kouzou Ueda, Yamato; Daisuke Nagumo, Osaka; Hirotsugu Shuto, Kobe, and Hiroaki Kariyama, Takasago, all of Japan, assignors to Kyokuto Kaihatsu Kogyo Co., Ltd., Hyogo, Japan  
Filed Jan. 2, 1986, Ser. No. 815,999

Claims priority, application Japan, Jan. 16, 1985, 60-6144; Jun. 14, 1985, 60-130390

Int. Cl.<sup>4</sup> B65G 15/30

U.S. Cl. 198—844

15 Claims



1. A conveying apparatus which comprises:
  - a pair of sprockets provided at front and rear ends thereof;
  - a pair of endless chains passed around said sprockets at opposite sides thereof;
  - a plurality of support members arranged at regular intervals, each having a box-like cross section and extending in a direction perpendicular to the direction in which said support members travel for supporting objects to be carried on its upper support surface;
  - a plurality of fastening members for fastening said support members to said chains;
  - a connecting means for connecting said support members to said fastening members;
  - a pair of holding portions disposed on front and rear faces of each of said support members; and
  - a plurality of covering members each securely connected between adjacent support members and forming a continuous surface with the upper support surface of each of said adjacent support members, each covering member being connected at front and rear ends thereof to said holding portions of adjacent support members for covering each gap defined therebetween.

4,682,687

PINTLE CHAIN INCLUDING SELF-RETAINING PIN  
James W. Legee, Greendale; Robert E. Stacey, Waukesha, and Russell H. C. Uttke, Greendale, all of Wis., assignors to Rexnord Inc., Brookfield, Wis.

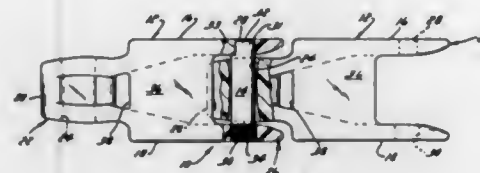
Continuation of Ser. No. 378,373, May 14, 1982, abandoned.

This application Feb. 1, 1985, Ser. No. 697,196

Int. Cl.<sup>4</sup> B65G 17/06

U.S. Cl. 198—852

1 Claim



1. In a conveyor chain of the type comprising a plurality of pintle links and a plurality of metal pins connecting said links together, each link being of a polymeric material and comprising first and second sidebars and a barrel portion connecting said sidebars at a first end; said barrel portion having a bore for receiving one of said pins; said first and second sidebars having second ends spaced wide enough apart to receive the barrel portion of an adjacent link; each sidebar having an aperture at its second end, such that two adjacent links are pivotally connected by means of one of said pins which is received by the bore in the barrel of one link and by the apertures in the second ends of the sidebars of the other link, the improvement comprising:

the entire length of the aperture through the first sidebar has the same diameter and shape and the entire length of the aperture through the second sidebar has the same diameter and shape such that both sidebars are recess free around the apertures;

each of said pins being substantially cylindrically shaped and having first and second ends which are entirely contained and terminate within the apertures of said first and second sidebars, respectively, whereby smooth link sides are provided without placing the pin ends in sidebar recesses; said second end of each pin having a knurled outer surface adapted to frictionally engage the surface of said aperture in said second end of said second sidebar to hold said pin against axial movement relative to said first sidebar;

the aperture in the second end of the second sidebar being substantially cylindrical and sized to receive said knurled end of said pin with an interference fit;

the aperture in the second end of the first sidebar having a noncylindrical shape;

the first end of each pin including noncylindrical means having an interference fit in the aperture of the second end of the first sidebar for preventing rotation of the knurled surface of the second end of the pin in the aperture in the second end of the second sidebar and the grinding away of the polymeric material of the second sidebar by the metal knurled surface; and

said first sidebar including an inner surface adjacent said aperture in said first sidebar and facing said second sidebar and spaced from said second sidebar, said first end of said pin including a shoulder engageable with said first sidebar inner surface when said first end of said pin is housed in said aperture in said first sidebar.

4,682,688

## SECURED CONTAINER AND LOCKING DEVICE FOR SAME

Günter H. Budert, Giengen/Brenz, Fed. Rep. of Germany, assignor to Firma Georg Knoblauch, Giengen/Brenz, Fed. Rep. of Germany

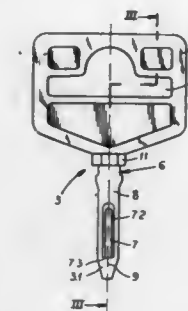
Filed Dec. 10, 1985, Ser. No. 807,453

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 8501735[U]

Int. Cl.<sup>4</sup> A45C 13/10

U.S. Cl. 206—1.5

7 Claims



1. A locking device for locking two parts of a container together, said parts of said container having aligned openings through which said device can be inserted to retain said parts in a closed position relative to one another, said device comprising:

a handle adapted to be gripped by a user desiring to open and close said container, said handle being wider than said openings so that said handle remains external of said container when said device is inserted in said openings;

a shank connected to said handle and of a length generally equal to a thickness of said container traversed by said device in a locking position of said device in said openings;

a detent connected to said shank and having at least one stop surface extending transverse to said shank and engageable with an inner wall of said container for retaining said device against withdrawal from said openings, and surfaces converging away from said handle to facilitate insertion of said detent through said openings, thereby enabling said stop surface to engage said wall; and

an elongated blade-shaped tongue extending away from said detent in line with said shank and formed with an outwardly projecting yieldable barb converging toward said tongue away from said handle and having a deflectable end turned toward said handle but spaced from said detent by a bridge piece of said tongue whose length is greater than said thickness and which can be cut through so that, upon withdrawal of said detent from said container, enough of said bridge piece is exposed outside said container to permit said bridge piece to be cut through, whereby a tongue portion carrying said barb can fall into said container but said detent remains on said handle to permit reinsertion of said detent into said container to relock the same.

4,682,689

## DUAL COMPARTMENT CONTAINER

Joseph J. Pereira, West Redding, Conn.; Malcolm E. Taylor, Pelham, and Bernard Sawaf, Nashua, both of N.H., assignors to Clairol Incorporated, New York, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,651

Int. Cl.<sup>4</sup> B65D 25/08, 1/04

U.S. Cl. 206—222

10 Claims

1. A dual-compartment container for containing a different substance in each compartment, and for isolating said substances until the container is ready for use, comprising:

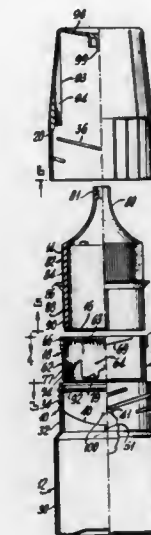
a first container having a cylindrical, threaded neck portion;

a second container rotatably and sealingly secured within

said neck portion, the bottom end of said second container sealed by a membrane;

a cap for threadably engaging said neck portion;

means interposed between said cap and said second container for enabling common rotation in a predetermined direction;



- a substantially annular knife member interposed between said first and second containers for piercing said membrane upon rotation of said cap in said predetermined direction and consequent rotation of said second container relative to said first container;
- means for translating rotary motion of said cap to longitudinal motion of said knife member relative to said second container.

4,682,690

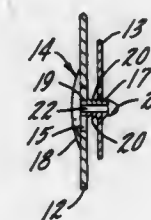
DISPLAY PRODUCT AND PACKAGE COMBINATION  
James J. Tiffany, Roscoe, Ill., assignor to Newell Co., Freeport, Ill.

Filed May 15, 1986, Ser. No. 863,571

Int. Cl.<sup>4</sup> B65D 73/00

U.S. Cl. 206—305

3 Claims

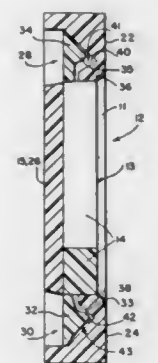
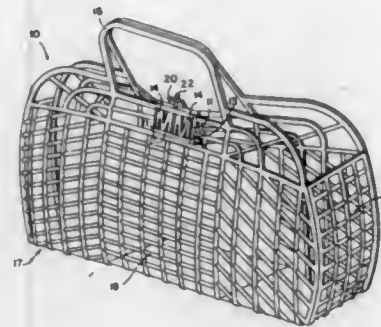


1. In combination:
  - a display package and
  - a product to be displayed,
 said display package having a support member arranged to be located behind the product to be displayed when the package and product are assembled for display, said product having a wall which forms part of the product and so arranged as to lie in opposing relationship to the support member of the display package when the package and product are assembled for display, support structures which provide at least three point support for the product when said product is separated from the display package and placed upon a supporting surface,

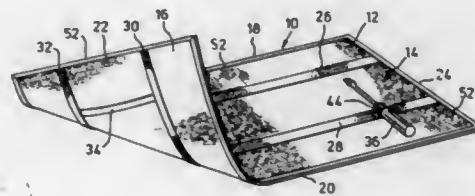


said support structures extending outwardly from the said product wall whereby the product, when placed on the supporting surface, is located a given distance from the supporting surface,  
 first aperture means in the support member of the display package and second aperture means in the product wall, said first and second aperture means being axially aligned with one another when the package and product are assembled for display,  
 fastener means received in the first and second aperture means and arranged to maintain the package and product in fixed, spaced relationship to one another when the package and product are assembled for display,  
 the outermost extremity of the fastener means extending outwardly beyond the product wall a distance up to and including a distance greater than the distance the support structures extend outwardly from said product wall when the product has been removed from the package when there is no change in the spatial relationship between the fastener means and the product,  
 said fastener means having insertion means which enable the fastener means to be moved toward the product to a position in which the outwardmost extremity of the fastener means is located closer to the product wall than the support structures.

4,682,692  
**CARRIER WITH INDICIA MOUNTING MEANS**  
 Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512  
 Filed Apr. 22, 1986, Ser. No. 856,442  
 Int. Cl.<sup>4</sup> B65D 33/00  
 U.S. Cl. 206-459 3 Claims



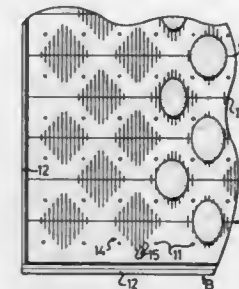
4,682,691  
**ROLL-UP VELCRO TOOL CARRIER**  
 Johan R. Spiering, 105 Queen Anne Road, Toronto, Ontario M8X 1T3, Canada  
 Filed Apr. 7, 1986, Ser. No. 848,804  
 Int. Cl.<sup>4</sup> B65D 85/20  
 U.S. Cl. 206-373 8 Claims



1. In combination:  
 a substantially rectangular sheet of flexible material having two opposed surfaces, a pair of side edges and a pair of end edges, the longer dimension of the sheet being such as to allow the sheet to be rolled up to surround a plurality of implements,  
 at least one strip of a first adhesive material secured to one surface of said sheet substantially parallel to the pair of side edges, said strip being narrower than the rectangular sheet,  
 for each strip of said first adhesive material, a strip of a second adhesive material secured to the other surface of said sheet in juxtaposition to its respective strip of first adhesive material,  
 each adhesive material being of a type to be more pressure engageable to the other adhesive material than to itself the two adhesive materials being disengageable from each other by pulling apart, and  
 a plurality of pieces of said second adhesive material each said piece being pressure engageable to the strip of first adhesive material on the rectangular sheet and each having means for attachment to implements.

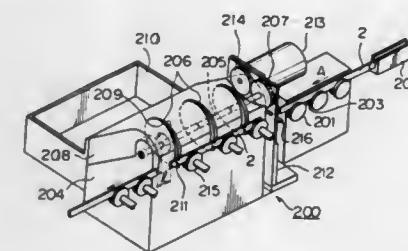
1. In a carry-all or pocketbook having at least one wall and defining an interior space for carrying miscellaneous articles, the improvement comprising:  
 an indicia bearing region integrally molded of flexible or semi-flexible plastic with said carry-all and forming a unitary part thereof, said indicia bearing region constituting means for removably carrying identifying indicia therein, including a recess having a back supporting wall and defined by a generally rectangular frame or border, said rectangular frame or border including opposite side walls and top and bottom walls, said top and bottom walls having interlocking means for releasably retaining upper and lower extensions of identifying indicia, said interlocking means comprising a generally V-shaped channel; and identifying indicia formed of semi-flexible plastic having retaining means including upper and lower retaining elements for mating with said V-shaped channels, said removably inserted into said recess supported by said back wall and with said retaining elements being retained within said generally V-shaped channels, said retaining elements each having a gently sloping wall permitting easy insertion into said V-shaped channels, and an opposite sharply sloping wall making removal from said V-shaped retaining channels more difficult than insertion.

4,682,693  
**PACKAGING TRAY HAVING FLEXIBLE ZONES IN A SUPPORTING LAYER**  
 Michael S. Moffitt, 1874 S. 900, East Bountiful, Utah 84010, and Brian L. Roberts, 4616 Lanark Rd., Salt Lake City, Utah 84124  
 Filed Feb. 4, 1986, Ser. No. 825,914  
 Claims priority, application New Zealand, Feb. 5, 1985, 211041  
 Int. Cl.<sup>4</sup> B65D 85/34  
 U.S. Cl. 206-583 6 Claims



1. A packaging tray for supporting articles within recesses, for use in a carton having a base, comprising:  
 a supporting layer,  
 supporting means associated with said supporting layer for spacing said supporting layer from said base of said carton,  
 a plurality of flexible zones in said supporting layer, each comprising a plurality of parallel slits in said supporting layer, dividing said supporting layer within each flexible zone into a plurality of parallel strips, said flexible zones having ends and sides, said parallel slits extending from end to end of said flexible zones, said slits and said strips being progressively shorter toward the sides of said flexible zones, and  
 elongation means associated with said strips permitting the length of said strips from end to end of said flexible zones to increase under the pressure supported articles.

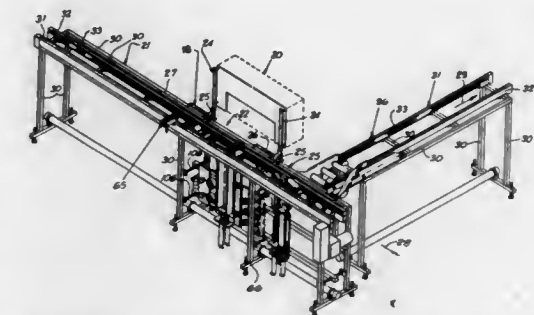
4,682,694  
**METHOD AND DEVICE FOR REMOVING DEFECTIVE PRODUCTS**  
 Takahiro Kumazawa, Anjo; Yoshihiro Nakamura, Tokoname, and Yoshimitsu Yamaguchi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan  
 Filed Jul. 2, 1985, Ser. No. 751,238  
 Claims priority, application Japan, Jul. 6, 1984, 59-138968  
 Int. Cl.<sup>4</sup> B07C 5/36  
 U.S. Cl. 209-559 12 Claims



1. A device for removing a defective product from a path through which products are continually fed comprising:  
 means for feeding products along the path,  
 sensor means for detecting a defective product, and outputting a signal denoting a defect in either the trailing half of

a first product or the leading half of an adjacent second product,  
 remover means for taking the defective product from the path by removing said first and second adjacent products upon receipt of said signal from said sensor means, said remover means obtaining a number which is a quotient obtained by dividing the distance between said remover and said sensor, by the length of a normal product, said remover means counting the number of products and taking the defective product when the number of products that has passed said remover means is equal to the quotient number obtained by said remover means.

4,682,695  
**AUTOMATED KEYBOARD TESTING**  
 Ralph D. Hasenbaig, 8635 Rudnick Ave., Canoga Park, Calif. 91304  
 Filed Mar. 30, 1984, Ser. No. 595,435  
 Int. Cl.<sup>4</sup> B07C 5/344  
 U.S. Cl. 209-571 21 Claims



1. A conveyor system for transporting keyboards for automatic testing by a keyboard testing mechanism comprising feed conveyor means for moving keyboards to a test station where the keyboard can be tested, the keyboard testing mechanism being located at said test station, discharge conveyor means whereby keyboards passed by the keyboard test mechanism are distinguished from keyboards rejected by the keyboard test mechanism, means at said testing station for bringing the keyboard and the keyboard mechanism into a testing relationship and thereafter removal of said relationship whereby the keyboard is permitted to move to the discharge conveyor means, wherein the testing relationship is achieved by relatively closer physical adjacency than during the normal keyboard travel on the conveyor means and by effecting a positive electrical connection between the keyboard and the keyboard testing mechanism thereby to permit keyboard testing and thereafter the removal of the testing relationship permits relative physical removal and electrical separation of the keyboard from the keyboard testing mechanism, and wherein the relative position of the keyboard and the testing mechanism is controlled by a movable gripper mechanism, such gripper mechanism being physically movable between discreet different heights, and the gripping mechanism being adapted to support the keyboard at the test station,  
 including stop means for stopping travel of a keyboard along the conveyor system upstream of the keyboard test mechanism, such that a keyboard being tested is separated from the upstream keyboard,  
 wherein the stop means includes means for engaging frictionally the keyboard adjacent to the keyboard side and thereby effect such stopping action,  
 wherein the gripper mechanism includes a substantially T-piece mechanism, the main limb of the T-piece being vertically disposed and the cross limb of the T-piece being substantially horizontally disposed, and pneumatic means for raising and lowering the T-piece gripping mechanism, wherein the cross-limb of the T-piece provides as its leading

end, barrier means against which the keyboard can physically abut and through which electrical contact is established with the keyboard testing mechanism, and pivoted abutting means at the trailing end of the cross-limb of the T-piece such abutting means being movable between a retracted position over which the keyboard can proceed, and an extended position positively urging the keyboard forwardly against the barrier means at the leading end of the cross-limb.

4,682,696

## ADJUSTABLE BOOKRACK

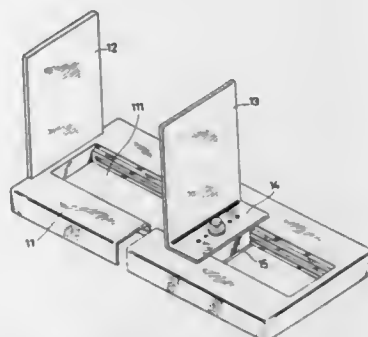
Muh-Chuan Sheu, No. 642, Chang-Cheng Road, I-Chia Village, Jen-Teh Hsiang, Tainan Hsien, Taiwan

Filed Mar. 27, 1986, Ser. No. 844,789

Int. Cl.<sup>4</sup> A47B 65/00

U.S. Cl. 211-43

4 Claims



1. An adjustable bookrack comprising:

- a base including a guideway provided in an upper surface thereof, said guideway having a first frictional surface;
- a stationary upright end wall mounted securely at one end of said base;
- a movable upright end wall disposed detachably on said guideway of said base;
- a gliding member secured to the underside of said movable upright end wall and slidable on said guideway of said base, said gliding member having a chamber;
- a braking member releasably disposed under said gliding member, having a second frictional surface opposing said first frictional surface;
- means for biasing said braking member toward said gliding member so as to impel said second frictional surface against said first frictional surface;
- said biasing means comprising a compression spring disposed within said chamber, an actuator member passing through said compression spring and said chamber to form a handle extending out of said chamber at an upper end thereof, and a stop member secured to said actuator above said compression spring within said chamber for obstructing said spring, said actuator member engaging with said braking member at a lower end; and
- at least one rolling element interposed between said guideway of said base and said gliding member so as to reduce the friction therebetween.

4,682,697

## CARPET SAMPLE DISPLAY DEVICE

Melvin Cohen, 2 Brighton Ave., Passaic, N.J. 07055

Filed May 27, 1986, Ser. No. 866,692

Int. Cl.<sup>4</sup> A47F 7/16

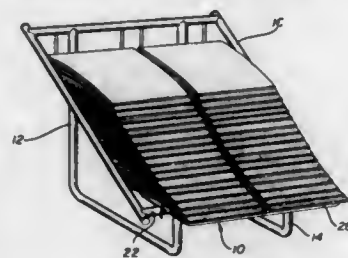
U.S. Cl. 211-45

13 Claims

- 1. A display device for a plurality of carpet samples comprising:
  - a base;
  - a rectangular frame slopingly mounted in the top portion of said base, said frame having a back frame member, a front

frame member, and a pair of side frame members, said back frame member when assembled thereto, being elevated substantially above said front frame member;

- a plurality of bottom support rails interconnecting the medial portions of said front and said back frame members
- said bottom support rails having a rear portion descending substantially vertically from said back frame member, having a middle portion disposed substantially parallel to said side frame members, and having a front portion ex-



tending substantially horizontally to said front frame member; and,

- a plurality of sample-holding compartments mounted thereon, each said compartment forming a pigeonhole for one of said carpet samples with said samples being arrayed in a waterfall display;
- whereby each carpet sample in one of said compartments has a displayed edge portion which protrudes beyond the end of the adjacent carpet sample in the adjacent rearward compartment.

4,682,698

## TOOL HOLDER

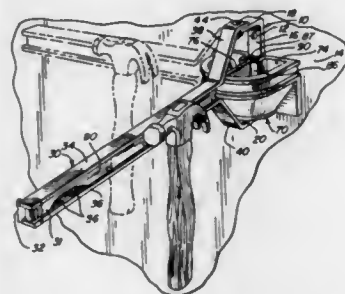
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsch Company, Skokie, Ill.

Filed Mar. 4, 1986, Ser. No. 835,938

Int. Cl.<sup>4</sup> A47F 7/00

U.S. Cl. 211-70.6

9 Claims



1. An apparatus for holding ferromagnetic hand tools for convenient storage, said apparatus comprising:

- a mounting member for being attached to a generally vertical surface, such as a wall or the like, said mounting member including a bracket having a generally planar mounting plate for being disposed against said wall, said bracket having an outwardly projecting upper portion and an outwardly projecting lower portion spaced below said upper portion, said mounting member also including attachment means for attaching said bracket to said wall;
- a generally elongate support frame extending from said mounting member, said support frame defining at least two oppositely facing sides, said support frame having a pair of spaced-apart arms at one end engaging said mounting member, said spaced-apart arms defining between them a receiving region, each said arm extending to one of said bracket projecting portions;

mounting means for pivotally mounting said support frame to said mounting member to accommodate swinging movement of said support frame for providing access to either of said two sides, said mounting means including (1) a connecting pin journaled in said bracket projecting upper portion and one of said arms and (2) a connecting pin journaled in said bracket projecting lower portion and the other of said arms;

a tray removably disposed on said bracket projecting lower portion in said receiving region between said arms, said tray having a configuration to accommodate the movement of said arms during the swinging movement of said support frame; and

an elongate magnet carried by said support frame and extending to each side of said support frame for magnetically attracting and holding said hand tools.

4,682,699

## WASTE RECYCLING KIT

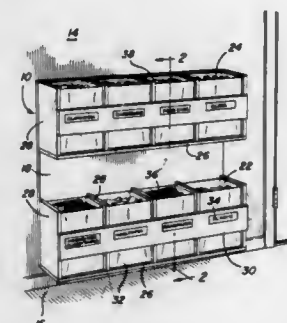
Holmes E. Ertley, 699C Friar Ct., Lakehurst, N.J. 08733

Filed Aug. 29, 1984, Ser. No. 645,661

Int. Cl.<sup>4</sup> A47F 7/00

U.S. Cl. 211-71

4 Claims



1. A waste recycling kit comprising a supporting rack for positioning at a convenient location adjacent a source of trash, said rack including a plurality of vertically opening compartments with each compartment including indicia designating that compartment receiving a predetermined category of trash, and a disposable bag oriented in each compartment for receiving trash designated for that compartment whereby the categorized trash may be removed from the rack along with the bag to facilitate its transport to a recycling facility, an exteriorly mounted container dimensioned to receive a plurality of bags and a cover for said container to protect and retain the bags with categorized trash therein for pickup by a vehicle and personnel, said container being located in-ground adjacent curb side, and a plurality of removable containers in said in-ground containers, each removable container including a bail handle and dimensioned to receive a single bag.

4,682,700

## SAFETY CLOSURE AND CONTAINER PACKAGE

Gary Montgomery, and Gene Hawkins, both of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Aug. 21, 1986, Ser. No. 898,908

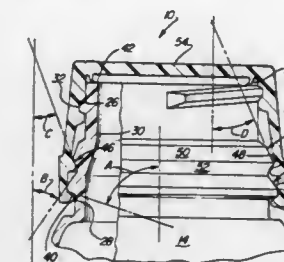
Int. Cl.<sup>4</sup> B65D 55/02

U.S. Cl. 215-216

7 Claims

1. A child resistant threaded package comprising, in combination: a container having a threaded neck and an outwardly extending retention flange on said neck below said threads, said flange having an upwardly and inwardly directed surface extending from an apex into said neck and an abrupt inwardly directed lower surface, extending downwardly from said apex at an angle of 45° to 90° towards said neck; and a closure cap with an annular skirt having complementary threads for engaging said container threads and an inwardly projecting retention bead below said threads having a minimum diameter less than

said container flange apex, said flange and bead being so spaced from said threads that as said cap is threaded onto said container neck, said cap retention bead is gradually expanded as it moves axially along said upper flange surface so that the



smaller diameter bead snaps over the larger diameter flange apex and upon retrograde rotation of said cap in an opening direction, said bead will coact with said lower flange surface to resist removal, providing a child resistant feature requiring more force for removal than application.

4,682,701

## TAMPER-PROOF CONTAINER

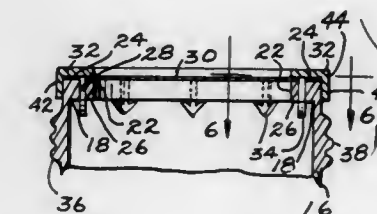
Gary P. Katz, 10 Stockton Rd., Silver Spring, Md. 20901

Filed Jun. 9, 1986, Ser. No. 871,849

Int. Cl.<sup>4</sup> B65D 41/50

U.S. Cl. 215-230

21 Claims



1. A tamper-proof container, comprising:

- a bottom wall;
- at least one sidewall defining an outer surface and projecting upwardly from said bottom wall to form an upper edge;
- a first annular ring member integral with said upper edge of said sidewall and defining an open mouth area of said container, said first ring member further defining an upper flat annular surface contiguous with said open mouth area, a lower annular surface and a plurality of openings extending between said upper and said lower annular surfaces;
- a thin tearable sheet member located across said open mouth area and positioned onto said upper annular surface;
- a second annular ring member defining a plurality of barb-shaped prongs, said second ring member positioned against said sheet on said upper annular surface with said prongs projecting through said sheet and said openings to grippingly engage said lower annular surface; and
- means in operative relationship with said sidewall for removably capping said open mouth area.

4,682,702

## TAMPER INDICATING CLOSURE

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Jun. 27, 1986, Ser. No. 879,487

Int. Cl.<sup>4</sup> B65D 41/32

U.S. Cl. 215-232

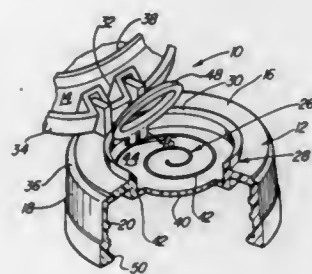
16 Claims

1. A tamper indicating dispensing closure for use with a



container having a neck with means for attachment to said closure comprising, in combination:

- a base cap having a top with a dispensing orifice therein and a depending cylindrical skirt having complementary means for attachment to said container;
- a lid for closing said dispensing orifice;
- a hinge joining said base cap and lid for swinging said lid from a closed position covering said orifice to an open position for dispensing the contents of said container through said orifice; and
- a removable sealing disc extending across said orifice below said lid in its closed position, said disc including:



- a spiral weakening groove in the face of said disc extending from the periphery inwardly towards the center of said orifice to define between adjacent turns of the spiral groove a tear strip; and
- a pull tab attached to said tear strip adjacent one end thereof; whereby said sealing disc can be removed as a spiral tear strip by gripping said pull tab and lifting it away from said container, and the initial packaged integrity of the container can be checked by swinging said lid open and observing the condition or absence of said sealing disc.

4,682,703

## STOPPER FOR MEDICAL CONTAINER

Masaaki Kasai, Fnji, and Kenji Ishikawa, Tokyo, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 855,342

Claims priority, application Japan, Apr. 25, 1985, 60-87622  
Int. Cl. B65D 39/00

U.S. Cl. 215-247

7 Claims



1. A stopper for a medical container which can be pierced with a needle, which stopper is characterized by at least part of the portion of the stopper which comes into contact with a piercing needle during the removal of said piercing needle therefrom is formed of a material containing a highly water absorbable macromolecular compound.

4,682,704

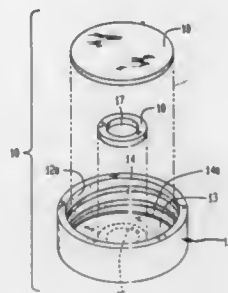
## FLOATING CAP SEAL

Ronald N. Kessler, Girard, and Myron E. Ullman, Canfield, both of Ohio, assignors to Boardman Molded Products, Inc., Youngstown, Ohio

Continuation-in-part of Ser. No. 862,455, May 12, 1986, abandoned. This application Nov. 17, 1986, Ser. No. 931,025  
Int. Cl. B65D 53/04

U.S. Cl. 215-329

19 Claims



1. A floating cap seal for closing a nonplanar bottle opening, comprising:

- a screw cap having a generally planar bottom wall and an adjacent vertically extending circular internally threaded wall forming a cavity;
- a thin, flat, resilient circular seal having a diameter substantially equal to the diameter of the cavity and lying within the cavity near the bottom thereof; and
- a circular ring having a height of at least about 0.062 inches, said ring having a smaller exterior diameter than the bottle opening, said ring being generally center located between said bottom wall and said circular seal to space said circular seal from said bottom wall, and said seal being adapted to freely rotate relative to said screw cap upon engagement with an upper edge of a bottle opening; whereby said ring, sandwiched between said circular seal and said bottom wall, defines a rotatable floating seal to effect sealing of said non-planar bottle opening.

4,682,705

## INTERNAL LID FOR A LIQUID CONTAINER

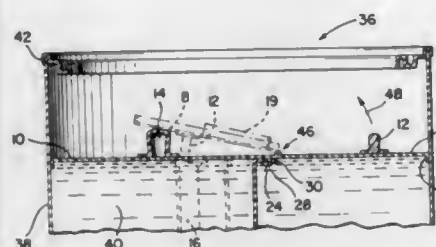
James D. Hurwitz, 6014 Broad Branch Rd., NW., Washington, D.C. 20015

Filed Jun. 19, 1986, Ser. No. 876,001

Int. Cl. B65D 25/10

U.S. Cl. 220-93

19 Claims



1. A lid for protecting the liquid contents of a container, said lid comprising:

- a body being sufficiently flexible so that when said body is inserted into a container through an opening located at the top of the container which is smaller than the dimensions of the remainder of the container, said body will be deformed to pass through said opening and resume its original configuration within the container to rest on top of liquid contents of the container forming a seal with the

internal sides of the container to protect the liquid contents of the container from contact with air above said body, and

said body including two portions joined together by hinge means for folding of one portion relative to the other portion so that said one portion rests above said other portion while said other portion rests on top of the liquid contents of the container,

handle means mounted on a top surface of said one portion of said body for removing said body from said container and for lifting said one portion to fold said one portion over said other portion,

said one portion including a projecting rib extending from a bottom surface of said one portion for removing a liquid from a brush as the brush is moved across said projecting rib when said one portion is folded over said other portion to gain access to the liquid contents.

4,682,707

## CONTAINER HAVING A TAMPER PROOF LID

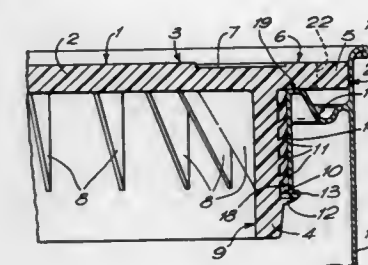
Keith E. Wiles, Norfolk, England, assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 748,512, Jun. 25, 1985, abandoned. This application Feb. 14, 1986, Ser. No. 831,924  
Claims priority, application United Kingdom, Jan. 11, 1985, 8500701; Feb. 18, 1985, 8504132

Int. Cl. B65D 39/00

U.S. Cl. 220-307

6 Claims



4,682,706

## TAMPER INDICATOR FOR USE WITH A RECLOSABLE CONTAINER ASSEMBLY

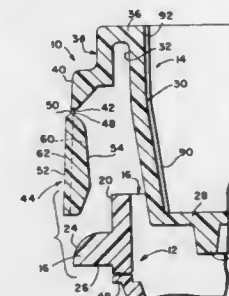
Frank C. DeVore, Orange, and Marcos A. Argudo, Chino, both of Calif., assignors to Tri Plas, Inc., Ontario, Calif.

Filed Jun. 20, 1986, Ser. No. 876,391

Int. Cl. B65D 41/32

U.S. Cl. 220-276

11 Claims



1. A tamper indicator for use with a reclosable container assembly which includes a container having a locking ledge thereon and a closure member having a skirt thereon which engages the locking ledge to attach the closure member to the container, the tamper indicator comprising:

- a tear-off strip means attached to the skirt for locking the closure member to the locking ledge, including
- (1) an inner surface having a portion thereof adapted to engage the locking ledge,
- (2) an outer surface on a side of said tear-off strip means opposite to said inner surface, and
- (3) a plurality of spaced apart grooves defined in said tear-off strip means inner surface to be located at a plurality of positions about the circumference of the container when the closure member and said tear-off strip means are assembled with the container, and
- (4) web means covering said grooves so that grooves are not present in said tear-off strip means outer surface whereby said tear-off strip means outer surface forms an essentially uninterrupted and continuous surface, said web means being adapted to break whenever any part of said tear-off strip means inner surface is moved for disengagement from the locking ledge for producing a discontinuity in said tear-off strip means outer surface and providing an indication of attempted or actual opening of a closed container.

4,682,708

## INSULATED SHIPPING CONTAINER

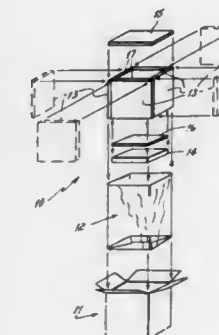
Jerry S. Pool, High Point, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Oct. 15, 1981, Ser. No. 311,337

Int. Cl. B65D 90/04

U.S. Cl. 220-460

8 Claims



1. An improved lightweight insulated shipping container for cold or hot storage having low thermal conductivity comprised of:

a box having a bottom, side walls and a top, said top cooperating with said side walls to form a closure for said box, an insulated layer located interiorly to said box, said interior layer being composed of at least three panels of open-celled flexible and resilient foam, said panels being sized to fit the interior contours of said bottom, side walls, and top, said panels forming an insulative storage compartment in said box,

a vapor barrier surrounding and enclosing said insulative storage compartment and located exteriorly to said panels.

4,682,709

## COIN-OPERATED VENDING MACHINE

John H. Brandes, Atlanta; Eddie W. King, Marietta, and Don S. Summerville, Snellville, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

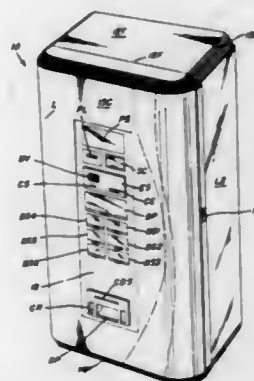
Filed Jun. 22, 1984, Ser. No. 623,123

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> G07F 7/04, 9/02

U.S. Cl. 221—2

4 Claims



1. A vending machine for beverage containers comprising:
  - (a) a frame having front, side and rear faces;
  - (b) a bowed sign panel substantially covering the front face and extending outwardly therefrom, said sign panel being fabricated from transparent material and having translucent display fields formed thereon, said bowed sign panel having a substantially flat, central portion along the entire vertical length thereof and curved side portions extending from said flat portion to the side faces of said frame;
  - (c) illumination means disposed behind said bowed sign panel for backlighting the same, said illumination means including one elongated cylindrical light source disposed behind each curved side portion, said light source having substantially the same curvature as the curved side portions, the light sources extending vertically behind substantially the entire vertical length of the curved side portions, and an elongated, cylindrical light source extending vertically behind the flat, central portion of said sign panel for illuminating said central panel;
  - (d) a control panel disposed within the central portion of the bowed sign panel; and
  - (e) a discharge port for presenting said beverage containers to customers through said bowed sign panel.

# 4,682,710 MULTI-STATION VISCOUS LIQUID DISTRIBUTION SYSTEM

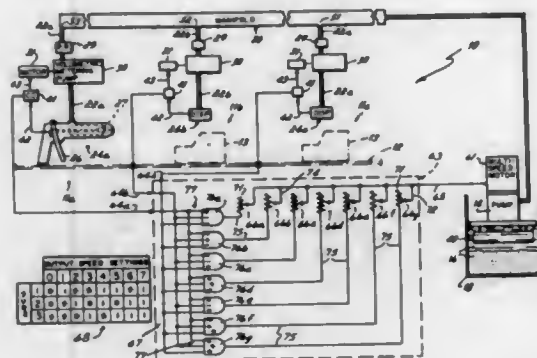
Herman E. Turner, Jr., and Robert D. Glowacki, both of Elyria, Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Apr. 15, 1986, Ser. No. 852,368

Int. Cl.<sup>4</sup> B67D 5/08

U.S. Cl. 222—63

20 Claims



11. A system for dispensing multiple discrete streams of high viscosity liquids from a common liquid source comprising:
  - a distribution manifold,
  - a plurality of extrusion guns, each of said guns being independently operable to dispense said liquid in a stream onto a workpiece when activated,
  - a plurality of connector lines, each of said connector lines having an input end connected to said distribution manifold and a discharge end connected to a different one of said guns,
  - a multi-speed primary pump connected between said source and said distribution manifold for supplying said liquid to said distribution manifold at high pressure,
  - a motor and motor speed control means for effecting different discrete speeds of said multi-speed primary pump in response to each different combinations of guns activated at any time so that the dispensing rate of the guns remains substantially the same as different combination of guns are activated.

4,682,711

# METHOD AND APPARATUS FOR SEALING WELDED SEAMS OF AUTOMOBILES

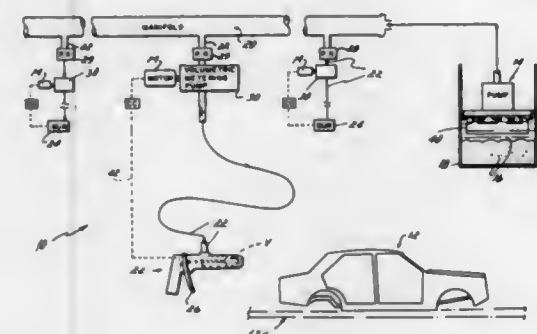
Alan B. Reighard, Hamburg, Mich., and Larry Soutar, Marietta, Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Apr. 8, 1985, Ser. No. 720,695

Int. Cl.<sup>4</sup> B67D 5/00

U.S. Cl. 222—75

8 Claims



1. A system for dispensing viscous sealant material onto a welded seam of an automobile, which system comprises

a distribution manifold extending generally parallel to an automobile production line,

a plurality of extrusion guns,

a plurality of drop lines, each of said drop lines having upper ends connected to said distribution manifold and lower ends connected to one of said extrusion guns,

a primary pump for supplying sealant to said distribution manifold,

a plurality of volumetric metering pumps, one of said volumetric metering pumps being motor driven and operatively connected to each one of said drop lines so as to accurately control the rate of flow of sealant from said distribution manifold to one of said extrusion guns, and

a plurality of pressure regulators, one of said pressure regulators being located in each of said drop lines between said distribution manifold and one of said volumetric metering pumps.

4,682,712

# DEVICES FOR THE PREPARATION OF A MIXTURE FROM AT LEAST TWO FLUIDS WITH A DEFINITE MIXTURE RATIO

Franz Böhnensieker, Vom Stein-Strasse 27, D-4734 Harsewinkel, Fed. Rep. of Germany

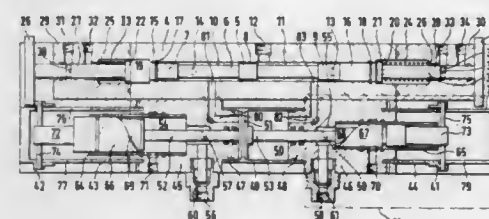
Filed Dec. 5, 1984, Ser. No. 678,586

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1983, 3343935

Int. Cl.<sup>4</sup> B67D 5/52

U.S. Cl. 222—137

7 Claims



1. Device for the preparation of a mixture with a definite mixture ratio from a basic fluid and at least one additional fluid, with a metering arrangement consisting of a control unit to feed the pressurized basic fluid alternately to one or the other side of a main piston moving in a master cylinder between two limit positions, so that the main piston is moved from one limit position to the other limit position, thereby expelling a definite quantity of basic fluid from the master cylinder into a mixing vessel, and a connecting device to connect the main piston so at least one metering piston which moves in an associated metering cylinder with an inlet for the additional fluid and an outlet that connects with the mixing vessel and which is located between a position where the volume of the metering chamber formed in the metering cylinder is minimal and a position where the volume of the metering chamber formed in the metering cylinder is maximum, all in accordance with the movement of the main piston from one limit position to the other limit position, whereby movement of the metering piston in the direction increasing the metering chamber causes the additional fluid to be fed into the latter, whilst movement of the metering piston in the direction reducing the metering chamber causes the additional fluid collected therein to be expelled into the mixing vessel, and where the metering piston is arranged to slide axially between two adjustable limit positions on the connecting device in order to set the volume of the metering chamber, and

the connecting device comprises a piston rod which extends through the metering piston and which has one free end wherein one of the limit positions is defined by the interaction of a fixed stop element close to the outer end of the piston rod with a first stop face at the metering piston and the other limit position by the interaction of the outer end of the piston rod with a second stop face at the metering

piston whose axial position is adjustable in relation to the first stop face.

4,682,713

# PRESSURIZED FLUID REMOTE-DISPENSER AND ASSEMBLY INCLUDING THE SAME

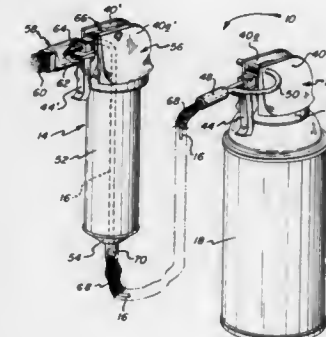
Clarence Clapp, Milford, Conn., assignor to Microcare Chemical Corporation, Farmington, Conn.

Filed Feb. 22, 1985, Ser. No. 704,376

Int. Cl.<sup>4</sup> B65D 83/14; A46B 11/02

U.S. Cl. 222—153

14 Claims



1. A pressurized fluid remote-dispensing assembly comprises a base unit defining a chamber containing fluid under pressure, a remote fluid dispenser and a flexible supply tube connecting the base unit and the remote dispenser in fluid flow communication;

- (a) the base unit further comprising (i) release means having a discharge opening therein through which fluid is discharged from the base unit, (ii) a displaceable member component of a fluid supply valve assembly, said assembly being moveable with the displaceable member from a normally closed valve position to an open position in which the supply valve releases pressurized fluid from said discharge opening, and (iii) support means having therein a locking seat positioned adjacent the displaceable member;
- (b) the supply tube having a supply end and a delivery end and being dimensioned and configured to have its supply end sealingly inserted into the discharge opening and its delivery end connected to the remote dispenser, the supply tube thereby serving to conduct fluid content of the base unit from the discharge opening thereof to the remote dispenser; and
- (c) locking means secured to the supply tube adjacent the supply end thereof and dimensioned and configured to be releasably received within the locking seat to thereby retain the displaceable member and the fluid supply valve in its open position, and to be disengaged from the locking seat to release the displaceable member and the fluid supply valve for return to the closed valve position upon disengagement of the supply tube from the discharge opening.

4,682,714

# NOZZLE CONSTRUCTION AND METHOD OF MAKING THE SAME

Chester W. Wood, Milford, Ohio, assignor to Dover Corporation, New York, N.Y.

Filed Nov. 12, 1985, Ser. No. 796,817

Int. Cl.<sup>4</sup> B67B 5/00; B21D 39/20; F16L 13/14

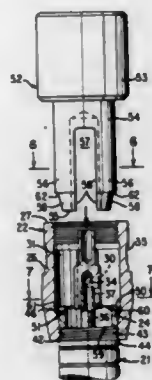
U.S. Cl. 222—153

15 Claims

1. In a nozzle construction for dispensing fuel and the like and comprising a spout member having opposed ends one of which is threaded, and an adaptor member having a threaded part threaded to said one end of said spout member whereby



said spout member and said adaptor member are disposed in a predetermined threaded condition thereof, said adaptor member having an opening means therein that defines an internal peripheral surface means thereof, part of said internal peripheral surface means comprising said threaded part of said adaptor member, said one end of said spout member being externally threaded and having been threaded into said opening means of said adaptor member to said predetermined threaded condition thereof, the improvement wherein one of said members has a portion thereof deformed into a locking position with the other of said members to tend to prevent relative threading movement between said members from said predetermined threaded condition thereof, said one member that has said portion thereof deformed into said locking position thereof comprising said spout member, said portion of said spout member that has been deformed into said locking position thereof comprising part of said one end thereof, said adaptor member having locking abutment means, said portion of said one end of said spout member having been deformed into said locking position so as to be adjacent said abutment means, said abutment means of said adaptor member having opposed shoulders respectively disposed substantially parallel with the longitudinal axis of said opening of said adaptor member, said portion of said one end of said spout member having been deformed so as to be in rotational alignment with said opposed shoulders, said one end of said spout member having a free peripheral edge means, said portion of said one end of said



spout member comprising part of said free peripheral edge means thereof, said free peripheral edge means having slit means on opposite sides of said abutment means, said portion of said free peripheral edge means comprising parts thereof defined in part by said slit means whereby a non-deformed portion of said free peripheral edge means is adjacent said abutment means and is disposed between said slit means.

3. In a method of making a nozzle construction for dispensing fuel and the like and comprising the steps of providing a spout member that has opposed ends one of which is threaded, providing an adaptor member that has a threaded part, threading said adaptor member and said one end of said spout member together whereby said spout member and said adaptor member are disposed in a predetermined threaded condition thereof, forming said adaptor member to have an opening means therein that has opposed ends and that defines an internal peripheral surface thereof, forming part of said internal peripheral surface to comprise said threaded part of said adaptor member, and forming said one end of said spout member to be externally threaded whereby said step of threading causes said one end of said spout member to be threaded into one of said ends of said opening means of said adaptor member to said predetermined threaded condition, the improvement comprising the step of deforming a portion of one of said members into a locking position with the other of said members to tend to prevent relative threading movement between said members from said predetermined threaded condition thereof, said step of deforming said portion of said one member into said locking position thereof comprising the step of swaging said portion

after said step of threading said members together to said predetermined threaded condition thereof, said step of swaging comprising the step of inserting a swaging tool in the other of said ends of said opening means and against said portion of said one member with a force that causes said portion of said one member to be swaged into said locking position thereof.

#### 4,682,715 DETACHABLE SHOE-LURE DISPENSER

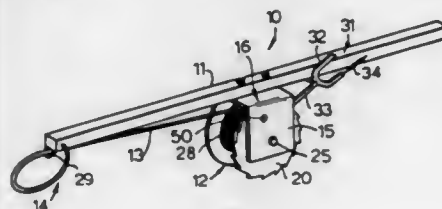
Richard R. Reeves, Star Rte. 1, Box 36A, Kinder, La. 70648  
Filed Jul. 23, 1986, Ser. No. 888,520  
Int. Cl.<sup>4</sup> B67D 5/64; A01M 00/00  
U.S. Cl. 222—175 5 Claims



1. A detachable shoe accessory for dispensing animal lure directly onto the ground during walking activities comprising: a container for housing animal lure, said container having a means for regulating the flow of lure onto an elongated, flexible, absorbent applicator, said container molded so as to fit the heel of a shoe and constructed so as to provide a slotted wing extending along the front and on each side of the container through which the harness for attaching the container to the shoe is placed, said container also having a threaded female connector molded in the bottom and rear for attaching the applicator connector; a harness for attaching the accessory to the heel of a shoe, said harness being formed by straps made of elastic material; an elongated, flexible, absorbent applicator capable of communicating the minute amount of lure released from the container directly onto the ground during walking activities; an applicator connector, being a conduit having male threads for attaching to the container on one end and having male threads for attaching to the removable, tubular, storage cover on the other end, said applicator connector shaped so as to secure one end of the elongated, flexible, absorbent applicator by the insertion and a pin; and a removable, tubular cover or sheath of a size and shape to encase the said applicator during storage or non-use.

#### 4,682,716 GRIPPING APPARATUS

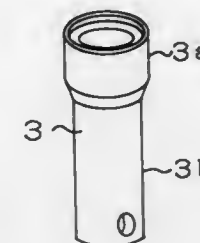
Peter Morellini, P.O. Box 188, Ingham, Queensland 4850, Australia  
PCT No. PCT/AU84/00261, § 371 Date Aug. 13, 1985, § 102(e) Date Aug. 13, 1985, PCT Pub. No. WO85/02807, PCT Pub. Date Jul. 4, 1985  
PCT Filed Dec. 19, 1984, Ser. No. 774,590  
Claims priority, application Australia, Dec. 19, 1983, PG2901  
Int. Cl.<sup>4</sup> B67D 3/00 3 Claims



1. Apparatus adapted to be associated with a container of the type having a flexible discharge spout to control the discharge

#### 4,682,718 NOZZLE FOR CONTINUOUS CASTING OF MOLTEN STEEL

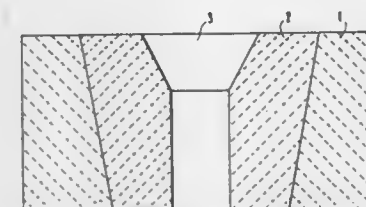
Kuniaki Watanabe, and Hideo Suzuki, both of Tokyo, Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan  
Continuation-in-part of Ser. No. 523,914, Aug. 16, 1983, abandoned. This application Nov. 12, 1985, Ser. No. 797,369  
Int. Cl.<sup>4</sup> B22D 41/08  
U.S. Cl. 222—591 8 Claims



of granular material therefrom, said apparatus comprising an elongated member defining a handle portion at one end adapted to be gripped by one hand of a user, a flexible line having one end secured to the opposite end of said elongated member, said line passing freely through a guide at said opposite end of said elongated member to define a loop in said line adapted to be disposed in use about said discharge spout, a reel assembly supported on said elongated member intermediate the ends thereof, said reel assembly including a reel supported for rotation about an axis extending transversely of said elongated member, said line being secured at its opposite end to said reel so as to be wound in or let out upon rotation of said reel in opposite directions to thereby vary the size of said loop, biasing means associated with said reel and adapted to urge said reel to rotate in a first direction to wind in said line and thus reduce the size of said loop, a ratchet wheel fixed for rotation with said reel, a pawl assembly mounted adjacent said handle portion of said elongated member, biasing means associated with said pawl assembly to normally urge said pawl assembly into engagement with said ratchet wheel to prevent rotation of said reel in said first direction, said pawl assembly including an actuator portion located adjacent said handle portion so as to be releasably actuable by the hand of the user gripping the handle portion to effect controlled disengagement of said pawl assembly from said ratchet wheel so as to permit said reel under the influence of its biasing means to correspondingly rotate in said first direction to reduce the size of said loop and thereby selectively constrict in use the cross section of said discharge outlet of said container.

#### 4,682,717 NOZZLES FOR CASTING ALUMINUM-KILLED STEELS

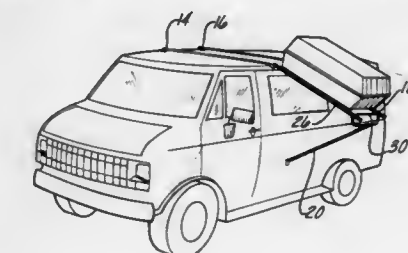
Emilio Marino, and Raffaele Mastromarino, both of Rome, Italy, assignors to Deltasider SpA, Piombino, Italy  
Filed Jul. 6, 1984, Ser. No. 628,282  
Claims priority, application Italy, Jul. 27, 1983, 48759 A/83  
Int. Cl.<sup>4</sup> B22D 41/00 2 Claims



1. A nozzle for casting aluminium-killed steel, which is in two separate coaxial parts, the outermost of which consists essentially of a refractory material selected from the group consisting of zirconia and magnesite and having an axial cavity therethrough, the innermost part, housed in said cavity, being of calcium-oxide based refractory and having a passage therethrough for liquid steel and consisting essentially of between 90 and 99% (by weight) of calcium hydroxide with at least one compound selected from the metal oxides Fe<sub>2</sub>O<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub> and TiO<sub>2</sub> and the chlorides CaCl<sub>2</sub>, NaCl and LiCl, in quantities between 1 and 10% by weight, said mixture being pelletized, dried at 100°-150° C. and then baked at 800°-1600° C. after which it is crushed, the crushed material then being further mixed with between 3 and 20% by weight of at least one compound selected from the metal oxides MgO, Fe<sub>2</sub>O<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, Cr<sub>2</sub>O<sub>3</sub> and MoO<sub>3</sub> and the chlorides CaCl<sub>2</sub>, NaCl and LiCl and with organic binder and carrier compounds selected from oil, paraffin, kerosene, lower alcohols and resins in quantities between 1 and 5% by weight.

#### 4,682,719 VEHICLE TOP CARRIER

M. Eric Ernst, Grosse Pointe Park, and Walter L. Jewett, Huntingtonwoods, both of Mich., assignors to Pivot Manufacturing Company, Detroit, Mich.  
Filed Jan. 30, 1984, Ser. No. 574,892  
Int. Cl.<sup>4</sup> B60R 9/00 8 Claims



1. A vehicle top carrier comprising: guide members rigidly mounted on top of the vehicle; a carrier frame mounted on the guide members for movement from a generally horizontal transport position atop the vehicle to an inclined position displaced from the vehicle; and a support arm assembly pivotally mounted at each of its terminal ends respectively to the carrier frame and to a vertical surface on the vehicle, the support arm assembly including means for shortening the effective distance

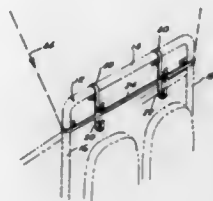
between the terminal ends of the support arm, thereby to produce a further inclination of the carrier frame.

#### 4,682,720 GUN RACK

Charles C. Lucas, Rte. 7, Box 362, Meridian, Miss. 39301  
Continuation of Ser. No. 687,824, Feb. 19, 1985, abandoned.  
This application Oct. 16, 1985, Ser. No. 787,992  
Int. Cl.<sup>4</sup> B60R 7/00

U.S. Cl. 224—311

2 Claims



1. A gun rack particularly suitable for placement onto a roll bar of a vehicle, the roll bar having at least a horizontally disposed roll member supported intermediate a pair of vertically disposed support members, the gun-rack comprising:

- a pair of rigid, vertically disposed frame members in parallel relation and extending to a distance upward at least to the height of the horizontally disposed roll member of the roll bar, each frame member having an upper end;
- at least one rigid horizontally disposed mounting member intersecting and secured between and to the vertically disposed frame members, and having ends which extend out beyond each respective vertically disposed frame member a distance at least to each vertically disposed support member of the roll bar;
- loop means contained on each end portion of the horizontally disposed frame member for loopingly engaging around each vertically disposed support member of the roll-bar, said loop means comprising a hook having an end formed on each respective horizontal member end;
- loop means contained in the upper ends of the vertically disposed frame members for loopingly engaging the horizontally disposed roll member and supporting the gun rack therefrom, said loop means comprising a hook having an end formed on each respective upper end;
- attachment means engaged on the end of the horizontally disposed member and comprising a hinge which allows it to pivot to the end of the hooks when the attachment means is in a first closed position and to disengage the ends of the hooks when the attachment means is in the open position; and
- means extending from the vertically disposed frame member for mounting a weapon thereupon; and g. means for supporting guns.

#### 4,682,721

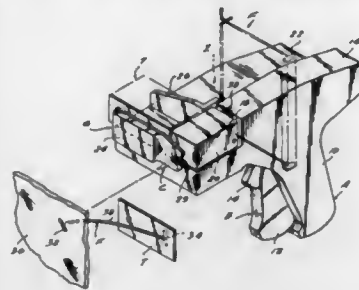
**TAG DISPENSING AND ATTACHING APPARATUS**  
Daniel Duchin, Wantagh, L. I., N.Y., assignor to Monarch Marking Systems, Inc., Dayton, Ohio  
Division of Ser. No. 553,080, Nov. 18, 1983, Pat. No. 4,610,385.  
This application Dec. 20, 1985, Ser. No. 811,902  
Int. Cl.<sup>4</sup> B31F 7/00

U.S. Cl. 227—67

16 Claims

1. Tag attaching apparatus, comprising: a housing including a manually engageable handle and means for mounting a stack

of tags, actuating means disposed at the handle and mounted on the housing for movement relative to the housing, a hollow needle through which a fastener is dispensed, means for mounting the needle to the housing for movement between an original position and an extended position, means for moving a fastener through said needle including means for moving the needle mounting means from the original position to the extended position in response to actuation of the actuating means,



means for causing said fastener moving means to move the fastener through the needle in response to further actuation of the actuating means, wherein the means for moving a fastener through the needle includes a plunger movable between retracted and extended positions, means for feeding a fastener to the needle, and means for preventing operation of the fastener feeding means until the plunger has substantially completely returned to its retracted position.

#### 4,682,722

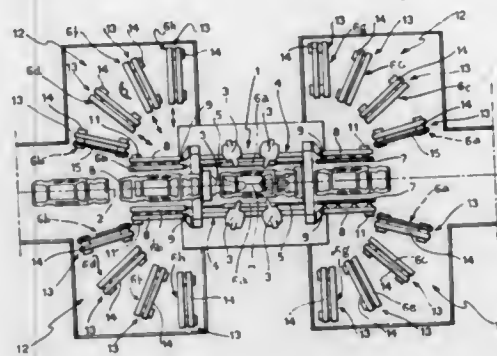
**WELDING SYSTEMS FOR MOTOR VEHICLES BODIES**  
Piero Bossotto, and Mario Brandino, both of Turin, Italy, assignors to Comau S.p.A., Italy

Filed Feb. 27, 1986, Ser. No. 834,215

Claims priority, application Italy, Feb. 28, 1985, 67213 A/85  
Int. Cl.<sup>4</sup> B23K 37/04

U.S. Cl. 228—41

2 Claims



1. System for welding motor vehicle bodies constituted by pressed sheet metal elements, adapted to operate automatically on at least two different types of body, comprising:

- a welding station;
- a conveyor line for conveying through the welding station a loosely preassembled motor vehicle body;
- means for accurately positioning the underbody part of said loosely preassembled body precisely at said welding station;
- a plurality of pairs of side gates on the two sides of the conveyor line;
- a series of positioning tools carried by each pair of side gates for accurately positioning the various parts of the body relative to said underbody part, the positioning tools carried by each pair of side gates being adapted to the configuration of a corresponding type of body;
- longitudinal guide means provided at the two sides of the

conveyor line, said side gates being movable parallel to the conveyor line on said longitudinal guide means into or away from an operative position to allow the rapid replacement of the pair of side gates located in said operative position at the welding station, in dependence on the type of body to be welded, each pair of side gates being also movable between a spaced apart condition for the introduction of the body to be welded to the welding station, and a relatively close condition in which the positioning tools engage the body and locate the various parts thereof in the welding configuration;

means for welding the body; and

a store of auxiliary pairs of side gates having positioning tools corresponding to further different types of body, wherein the longitudinal guide means have separate end guide portions, wherein movable support means are provided for carrying said end guide portions, wherein the movable support means include gate-like support structures, each gate-like support structure being rotatable about a vertical axis between a first position in which the respective end guide portion is parallel to the conveyor line, so that it can receive a side gate when the latter is brought away from its operative position and a series of further positions for the transfer of the side gate to and from the store by the gate-like support structure, wherein the store of auxiliary pair of side gates includes a series of fixed structures located adjacent to each gate-like support structure, for supporting the auxiliary side gates in substantially radial planes relative to the axis of articulation of the respective gate-like structure, each of said fixed structures having a guide member which is aligned with the guide portion of the respective gate-like support structure when the latter is located in the corresponding transfer position, and wherein each gate-like support structure is provided with means for rotating it about its articulation axis.

#### 4,682,723

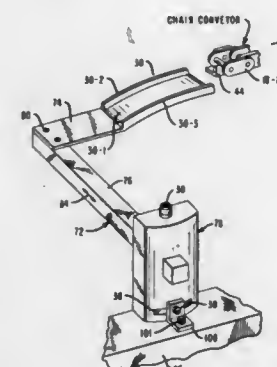
**MASK FOR WAVE SOLDERING MACHINE**  
Dennis W. Grummett, Kitchener, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 16, 1986, Ser. No. 874,759

Int. Cl.<sup>4</sup> B23K 3/00

U.S. Cl. 228—39

12 Claims



1. A wave soldering machine comprising:

- a soldering station having means for presenting a wave of molten solder for soldering operations;
- transporting means for transporting work to be soldered along a feeding line into operative contact with said wave of molten solder;
- said work having at least one portion which is to be free of operative contact with said wave of molten solder as said work is moved through said soldering station by said transporting means;

a soldering mask; and  
positioning means for positioning said soldering mask between said wave of molten solder and said one portion of said work;  
said soldering mask having a general trough-like shape which displaces said wave of molten solder to enable said one portion of said work to be moved through said soldering mask and said soldering station free of operative contact with said wave of molten solder.

#### 4,682,724

#### WELDING APPARATUS

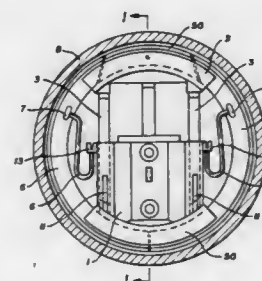
Helmut Hahn, 4096 Glanford Avenue, Victoria, British Columbia, Canada V8Z 4A2

Filed Sep. 8, 1986, Ser. No. 904,881

Claims priority, application Canada, Mar. 12, 1986, 502712  
Int. Cl.<sup>4</sup> B23K 5/22

U.S. Cl. 228—50

20 Claims



1. A welding backup shoe apparatus comprising:  
a double-acting fluid cylinder having a piston rod extending from it;  
a first retainer shoe attachable to the piston rod;  
a second retainer shoe opposed to the first retainer shoe;  
a first backup shoe to be received by the first retainer shoe;  
at least two other backup shoes to be received by the first retainer shoe and by the second retainer shoe;  
the backup shoe being arcuate externally to be a close fit within a pipe of a predetermined internal diameter;  
guide means attached to the first retainer shoe, slidably engaging the second retainer shoe to guide the movement of the retainer shoes relative to each other;  
release means attached to the cylinder to abut the first backup shoe; and  
cables to attach the at least two other backup shoes to the cylinder.

#### 4,682,725

#### PROCESS OF REPLACING A SLEEVE MOUNTED WITHIN A PIPE

Alain Martin, Lyons, and Philippe Maillard, Marcy l'Etoile, both of France, assignors to Framatome & Cie., Courbevoie, France

Filed Mar. 7, 1985, Ser. No. 709,270

Claims priority, application France, Mar. 8, 1984, 84 03581  
Int. Cl.<sup>4</sup> B23K 31/06

U.S. Cl. 228—119

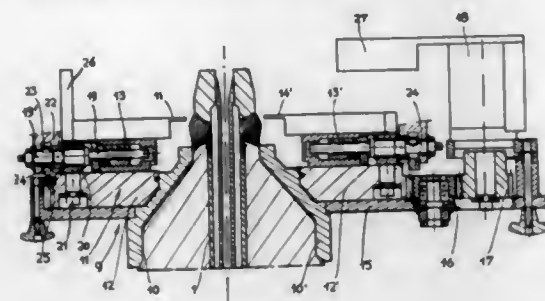
3 Claims

1. Process of replacing a sleeve mounted within a pipe connected to an element (2) by one of its ends and having an internal wall to which said sleeve is welded at one of its ends, said sleeve being kept spaced from the internal wall of the pipe by blocks at its other end, comprising the steps of

- (a) making a pair of cross cuts in said pipe (1, 1'), one at least of said two cross cuts being made in a part of said pipe situated opposite to the connection between said pipe and said element (2) with respect to the weld (5a, 5'a) of said sleeve (5, 5') onto said pipe (1, 1');
- (b) removing both the resulting cut section of said tube and said sleeve (5, 5');



- (c) machining chamfers on free ends of said pipe (1, 1');  
 (d) checking the position and the geometry of said blocks (6, 6'); and  
 (e) welding to the chamfered edges of said pipe the corresponding ends of a new section of pipe, onto the internal



wall of which one of the ends of a new sleeve (5, 5') has previously been welded, said new sleeve having been machined in accordance with the position and the geometry of said blocks (6, 6') as determined in step (d), so that there is minimum play between said blocks (6, 6') and said free end of said sleeve (5, 5').

4,682,726

## PENTAGONAL DODECAHEDRON

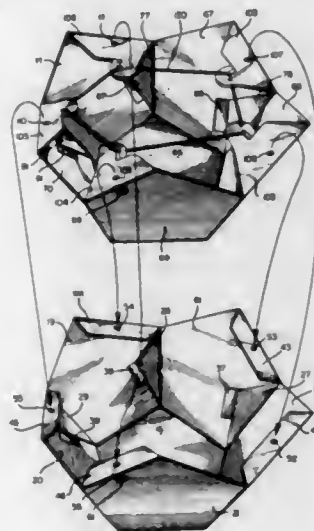
Fred Drueck, Jr., 4941 W. Henderson, Chicago, Ill. 60641

Filed Oct. 20, 1986, Ser. No. 920,686

Int. Cl. B65D 5/36

U.S. Cl. 229-108

6 Claims



1. A collapsible, self-erecting closed hollow structure in the form of a pentagonal dodecahedron formed from a pair of integral blanks of paperboard each of which is cut and scored to form a pentagonal central wall having a pentagonal wall affixed to each of its respective side edges, each of said pentagonal walls of one of said blanks having a foldable attachment flap integrally affixed to a radial edge thereof, each of said pentagonal walls of the other one of said blanks having a foldable hook flap having a hook integrally formed therewith integrally affixed to a radial edge thereof; said attachment flaps and said hook flaps being foldable to overlie its associated pentagonal flap, means for securing the respective ones of said attachment

flaps to said hook flaps for rotation therebetween when one of said blanks is disposed atop the other one of said blanks with said attachment flaps and hook flaps disposed between them, elastic means secured under tension to said hooks of said hook flaps, said elastic means normally pulling said hook flaps toward one another and thereby erecting said closed hollow structure.

4,682,727

## UTILITY TOTE CONTAINER

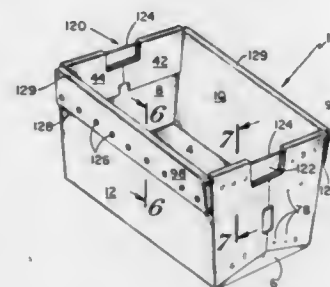
Mark S. Stoll, Deephaven, Minn., assignor to Liberty Diversified Industries, Inc., Minneapolis, Minn.

Filed Mar. 4, 1986, Ser. No. 836,059

Int. Cl. B65D 5/30

U.S. Cl. 229-915

7 Claims



1. A material handling container comprising:
  - a receptacle portion formed from a single sheet of semirigid material which is cut, scored, and folded to form a generally rectangular base platform from which a pair of substantially upright opposed side walls and a pair of substantially upright opposed end walls extend, said side and end walls being hingedly connected to said base platform and defining an open top when folded to a generally upright position;
  - a pair of end panels at each end of said receptacle portion hingedly connected to the opposite ends of each of said side walls along generally vertically extending score line connections, each pair of said end panels being folded over the adjacent one of said end walls in abutting, parallel relation therewith;
  - a pair of foldover panels at each end of said receptacle portion hingedly connected to the upper ends of each of said end panels along score lines traversing the upper ends of each of said end panels, said foldover panels being folded downwardly and inwardly thereover with the surface of said foldover panels substantially parallel to the surface of said end panels and secured by attachment means to said end walls therebetween;
  - a pair of outer flaps defined by score lines extending lengthwise of said side walls adjacent the top extremities thereof and hingedly connected thereto, said outer flaps being folded downwardly to form upper stacking shoulders defined by said score lines along the top edges of said side walls; and
  - a pair of inner flaps defined by score lines extending lengthwise of the outer edges of said outer flaps and substantially parallel therewith and hingedly connected thereto, each said inner flap being folded upward between the outer flap to which said inner flap is connected and the adjacent side wall, to form lower stacking shoulders, whereby the lower stacking shoulders rest on said upper stacking shoulders when a plurality of said utility tote containers are nested one inside the other.

4,682,728

## METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE AND FLOW RATE OF A FLUID

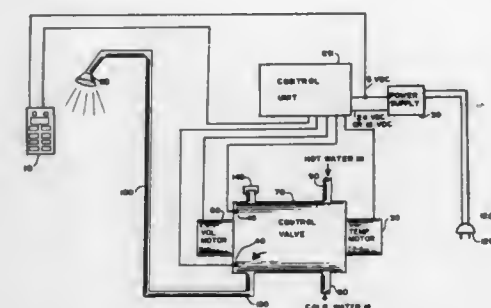
Martin S. Oudenhoven, 9436 W. Wesley Ave., Lakewood, Colo. 80227, and Frank Ruskey, 3510 Lee St., Wheatridge, Colo. 80033

Filed Aug. 27, 1985, Ser. No. 769,890

Int. Cl. G05D 23/185

U.S. Cl. 236-12.12

8 Claims



1. An apparatus for a system including a source of cold water under pressure, a source of hot water under pressure, and a water outlet, for controlling the temperature and volume rate of discharge of water flowing out of said water outlet, said apparatus comprising:

data entry means for entering volume rate data indicating a desired volume rate and for entering temperature data indicating a desired temperature;  
 temperature sensing means for sensing the temperature of said flowing water and for producing a measured temperature signal indicative of the sensed temperature;  
 control means, responsive to said data entry means and said temperature sensing means, for producing a volume rate control signal in accordance with said volume rate data, and for producing a temperature control signal in accordance with said temperature data and said measured temperature signal;

a control valve means including a cold water port adapted to be connectable to said source of cold water under pressure, a hot water port adapted to be connectable to said source of hot water under pressure, and an outlet port adapted to be connectable to said water outlet, and connected to said control means, for mixing said hot and cold water in a predetermined ratio to form mixed water having said desired temperature in response to said temperature control signal and for permitting said mixed water to flow through said outlet port at a predetermined volume rate corresponding to said desired volume rate in response to said volume rate control signal, said control valve means comprising a mixing chamber; a first valve member in fluid communication with said hot water port, said cold water, and said mixing chamber, and arranged to admit hot water from said hot water port and cold water from said cold water port into said mixing chamber in said predetermined volume ratio according to an angular position of said first valve member; a first stepper motor responsively connected to said control means and mechanically coupled to said first valve member to control the angular position of said first valve member in accordance with said temperature control signal; a second valve member in fluid communication with said outlet port and said mixing chamber, and arranged to permit water mixed in said mixing chamber to flow from said mixing chamber to said outlet port at said predetermined volume rate according to an angular position of said second valve member; and a second stepper motor responsively connected to said control means and mechanically coupled to said second valve member to control the angular position of

said second valve member in accordance with said volume rate control signal;  
 first means coupled to said first valve member for sensing the angular position of said first valve member and generating a first angular position signal indicative of the sensed angular position of said first valve member; and  
 second means coupled to said second valve member for sensing the angular position of said second valve member and generating a second angular position signal indicative of the sensed angular position of said second valve member, wherein said control means produces said temperature control signal further in accordance with said first sensed angular position and produces said volume rate control signal further in accordance with said second sensed angular position.

4,682,729

## SNOWMAKING MACHINE WITH COMPRESSED AIR DRIVEN REACTION FAN

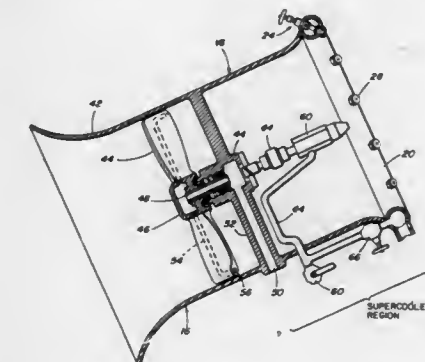
D. Mark Doman, and William R. Moss, both of Salt Lake City, Utah, assignors to The Dewey Electronics Corporation, Oakland, N.J.

Continuation-in-part of Ser. No. 740,738, Jun. 3, 1985, abandoned. This application Dec. 16, 1985, Ser. No. 809,532

Int. Cl. F25C 3/04

U.S. Cl. 239-2.2

11 Claims



1. A method for making snow which includes:
  - creating ice nuclei;
  - forming water droplets;
  - forming an airstream and flowing said airstream through a housing;
  - supercooling said airstream approximately 2° F. lower than ambient by the expansion of compressed air;
  - flowing the supercooled airstream into the water droplets and ice nuclei;
  - commingling in the supercooled airstream, the ice nuclei and the water droplets to form an ice nuclei-water droplet mixture;
  - discharging the mixture to ambient to form snow-like crystals.

4,682,730

## DISTRIBUTOR OR DRIPPER FOR THE MICRO-IRRIGATION OF SOILS

Pierre A. Smeyers, Brussels, Belgium, assignor to Raymond J. Nakachian, Saudi Arabia, a part interest

Division of Ser. No. 580,998, Feb. 16, 1984, Pat. No. 4,623,094.

This application Apr. 22, 1986, Ser. No. 854,623

Claims priority, application Belgium, Feb. 22, 1983, 210175

Int. Cl. A01G 25/02; B05B 1/32

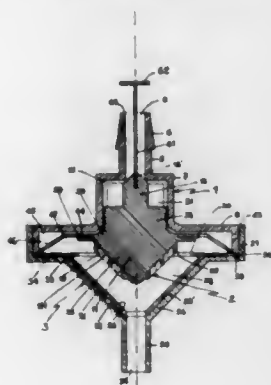
U.S. Cl. 239-109

25 Claims

1. A distributor or dripper for the micro-irrigation of soils comprising:
  - a housing for an inner chamber, said chamber having a first

portion provided with an inlet for connection to a conduit of irrigation liquid and a first seat adjacent said inlet, and a second portion downstream of said first portion and provided with an outlet and a second seat adjacent said outlet, said second portion having a frusto-conical wall near the outlet;

a closing member which is movable in said chamber between at least a first position adjacent said first seat, a second position adjacent said second seat and a third position between said first and second positions; first and second members disposed in said chamber, said first and second members being separated from one another in said first position of said closing member so that the irriga-



tion liquid in said chamber can freely flow toward the outlet, said first and second members meeting to form a filter which allows a flow of irrigation liquid toward the outlet, but retains particles contained in said liquid, when said closing member is in its third position, and one of said first and second members flexing during movement of said closing member from said third position to said second position to allow movement of said closing member from said third position to said second position while maintaining said filter; and

means for returning said closing member to said first position when the pressure of the irrigation liquid is lower than a predetermined value.

4,682,731

## EASY CLEAR SPRAY NOZZLE

John D. Bolton, 5 Shiloh Cir., Irvine, Calif. 92714

Continuation-in-part of Ser. No. 514,694, Jul. 18, 1983, abandoned. This application Feb. 1, 1985, Ser. No. 702,572

Int. Cl.<sup>4</sup> B05B 15/02

U.S. Cl. 239—119

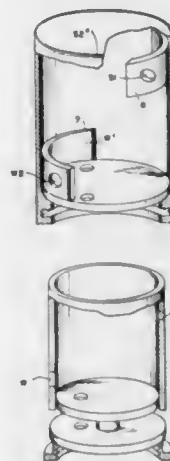
1 Claim

1. An apparatus for unblocking a spray nozzle plugged with debris consisting of, in combination:

a fixed plate with a central axle, a first hole in said plate confluent with a source of pressurized spraying material, an inner chamber, having an inner cavity, said inner chamber including a base plate, with a second hole therein intended to conduct pressurized spray material into the inner cavity of said inner chamber, said inner chamber base plate fixed on said central axle, and said inner chamber having a spray nozzle opening, and an opening intended to eliminate debris, characterized herein as a debris flushing outlet,

an outer chamber, including a base plate aligned on said central axle, and rotatably fixed to said axle, said outer chamber base plate having third and fourth holes intended to conduct pressurized spray material across the outer chamber base plate of said outer chamber, said outer chamber being substantially larger than said inner chamber, and more or less enclosing said inner chamber, there

being a confluent space between said inner chamber, a cavity connecting upper and lower spaces defined by the inner chamber disposed in said outer chamber, said outer chamber having a plurality of inwardly projecting lands, exactly fitting to and sealing said inner chamber, thereby sealing off the openings for spraying and debris flushing when said lands are placed over those openings, and said outer chamber having an outer chamber port that is sealed from the central cavity by one of said inwardly projecting lands, but which permit material to pass out of said outer chamber, and wherein said hole and land are so placed that when the outer chamber is rotated over and around the inner chamber on the central axle, to one position, characterized herein as spray position, spray material passes through said first hole in the fixed plate, through said third hole in the base plate of the outer chamber, through said second hole in the base plate of the inner chamber, into the inner chamber cavity, through said inner chamber cavity, and out of said inner chamber through the spray nozzle opening, and to the outside through said outer chamber port, and in this position said fourth hole is out of alignment and does not permit spray material to enter or to pass through the space between the chambers, and the outer chamber has a port aligned over



said spray nozzle opening which permits said pressurized spray material to pass to the outside, and said debris flushing outlet is sealed off by an outer chamber inwardly projecting land which is placed over it by the rotation of said outer chamber into said spray and when said outer chamber is rotated on said axle, over and around the inner chamber, and left in a second position, characterized herein as debris flushing position, said first and fourth holes now align and said inwardly projecting land is moved off the said debris flushing outlet, and said debris flushing outlet is now aligned by said outer chamber port, thereby permitting material to escape to the outside, and said outer chamber encloses but does not block said inner chamber spray nozzle opening, and said pressurized spray material is forced through said first and fourth holes, into the space and cavity between the inner and outer chambers, and flows into the spray nozzle, taking debris with it and unblocking said spray nozzle opening, travels through and across the inner chamber cavity and out said debris flushing hole, and through said outer chamber port chamber to the outside, and in this said debris flushing position the holes designated as second and third holes are out of alignment and no pressurized spray material passes through them.

4,682,732

## SPRINKLER WITH IMPROVED RISER SEAL

Joseph J. Walto, Chaska, Minn., assignor to The Toro Company, Minneapolis, Minn.

Continuation of Ser. No. 744,306, Jun. 13, 1985, Pat. No. 4,609,146, which is a continuation of Ser. No. 530,349, Sep. 8, 1983, abandoned. This application May 1, 1986, Ser. No. 857,985

Int. Cl.<sup>4</sup> B05B 15/10; F16J 15/32

U.S. Cl. 239—123

7 Claims



1. A sprinkler for sprinkling a liquid comprising:
  - a housing having a main body portion and a removable top, a hollow interior extending through said main body portion and removable top, and a seal element receiving area located adjacent its upper end;
  - a riser mounted in the hollow interior of said housing for reciprocating motion between an extended sprinkling position and a retracted non-sprinkling position, said riser having an exterior surface along its length and said housing having an interior surface at its upper end between which a gap is defined for permitting the reciprocating motion of said riser relative to said housing;
  - spring means for biasing said riser to said retracted position; and
  - a riser seal element comprised of an elastic material and being held in said seal element receiving area, an inner portion of said seal element extending into said gap to form a seal along a substantially line contact with said exterior surface of said riser for preventing the entry of extraneous material through the gap, said seal element making said line contact at a distance below the top surface of said removable top, said distance being approximately equal to the spacing of said gap, said inner portion of said seal element being flexible between an upwardly slanted normal position during which said line contact is made and a downwardly flexed position during the downward motion of said riser to wipe the exterior surface of said riser of extraneous material.

4,682,733

## THRUST REVERSER

Arnold C. Newton, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Nov. 12, 1985, Ser. No. 797,017

Claims priority, application United Kingdom, Dec. 13, 1984, 8431556

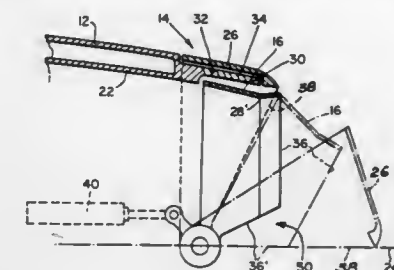
Int. Cl.<sup>4</sup> F02K 1/62

U.S. Cl. 239—265.39

2 Claims

1. A thrust reverser suitable for use on a gas turbine engine comprising a first pair of half doors and a second pair of half doors, said second pair of half doors having fully scarfed downstream edges, said first pair of half doors nesting within said second pair of half doors when non operative and having downstream edges which include relatively small scarfed portions, said first pair of half doors, when all of the half doors are in a non thrust reversing position, defining a greater portion of

a nozzle throat with said small scarfed portions reducing side spillage of efflux, the first and second half doors being interconnected on a common axis for arcuate movement into posi-



tions where respective pairs abut each other along their scarfed edges and in operation on a gas turbine engine achieve reversal of the thrust therefrom without axial spillage of efflux.

4,682,734

## SPRAYING DEVICE HAVING CONTROLLED ADDITIVE FLUID FEED AND A TELESCOPING SPRAY TUBE ASSEMBLY

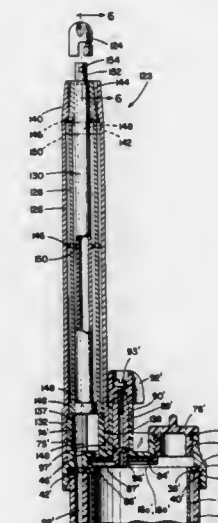
Rudy R. Proctor, Costa Mesa, and Fred M. Reinstein, Encino, both of Calif., assignors to Turbo Tek Enterprises, Inc., Los Angeles, Calif.

Filed Mar. 20, 1985, Ser. No. 713,824

Int. Cl.<sup>4</sup> B05B 7/26, 9/04; A62C 31/02; E03B 7/07

U.S. Cl. 239—315

34 Claims



25. A hand-held telescoping spray tube assembly, which comprises:

an outer tube having a flow passage therethrough and having inner and outer ends;

at least one additional inner tube having a flow passage therethrough and having inner and outer ends, the inner tube being reciprocally mounted in the outer tube and being extendable outwardly relative to the outer tube;

surface means on the inner end of the inner tube responsive to pressure caused by fluid flowing through the tube assembly, to cause the inner tube to move in the outer tube outwardly relative to the outer tube;

movement limiting means on the outer end of the outer tube cooperable with the surface means on the inner end of the inner tube for limiting outward movement of the inner tube in the outer tube; and

an annular seal of circular cross section surrounding the



inner tube and disposed between opposed surfaces of the inner tube and the outer tube so that the seal rolls on the opposed surfaces of the outer tube and the inner tube as the inner tube reciprocates in the outer tube, with the seal being rollable into an intermediate position between the surface means on the inner tube and the movement limiting means on the outer end of the outer tube when the inner tube is retracted, and rollable against the movement limiting means when the inner tube is extended, said seal providing continuous fluid-tight sealing engagement between the inner tube and the outer tube throughout the reciprocating movement of the inner tube between its extended and retracted positions in the outer tube.

4,682,735

# ELECTROSTATIC FIELD INDICATOR LIGHT FOR ELECTROSTATIC NOZZLES

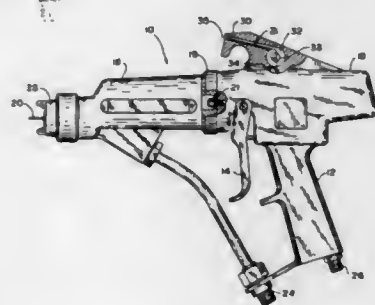
Gordon V. Mommsen, Brooklyn Center, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Jun. 29, 1983, Ser. No. 508,887

Int. Cl.<sup>4</sup> G01R 29/12; B05B 5/02

U.S. Cl. 239—690

13 Claims



1. A light indicator apparatus for attachment to a high voltage electrostatic field generating device, comprising a two-terminal voltage breakdown gaseous light indicating means for generating light illumination in response to a predetermined voltage applied to one of said terminals, said light indicating means being attached to said device, one of said terminals being connected to the common voltage return path of said electrostatic field generating device, and the other of said terminals being unconnected, but having an end of said terminal physically positioned in the region of said high voltage electrostatic field.

4,682,736

# EXTRACTOR IRRIGATION WOBBLE TUBE SYSTEM

Gregory J. Wieck, Chico Rte., Box 43, Enterprise, Oreg. 97828

Continuation of Ser. No. 216,541, Dec. 15, 1980, abandoned.

This application Jan. 13, 1983, Ser. No. 457,654

Int. Cl.<sup>4</sup> B05B 3/18

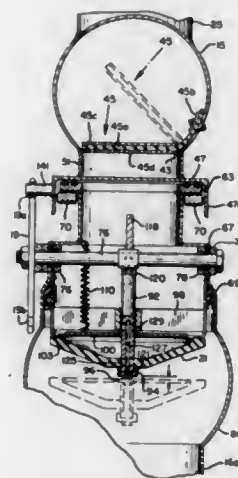
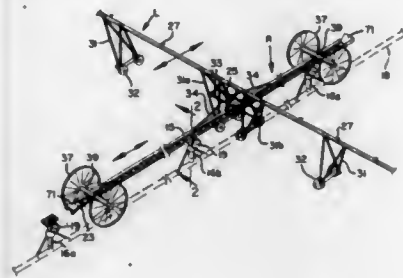
U.S. Cl. 239—736

4 Claims

1. An assembly for an irrigation system, said assembly comprising:

a standpipe adapted for connection to a supply of water, said standpipe having a stationary lower portion, and having an upper portion with an upwardly facing outlet, valve means in said standpipe, an extractor tube adapted to be carried along and to be brought into engagement with the upper portion of said standpipe for extracting water therefrom, and common means for actuating said valve means and for

supporting the upper portion of said standpipe on the lower portion in a manner to facilitate adjustable or adapt-



ive movement of said upper portion relative to said extractor tube.

4,682,737

# METHOD AND APPARATUS FOR PREVENTING CLOGGING OF POWDERY GRANULES IN LIGHT POWDERY GRANULE TREATING SYSTEM

Kyushichi Ono, Higashine, Japan, assignor to Asahi Breweries Ltd., Tokyo, Japan

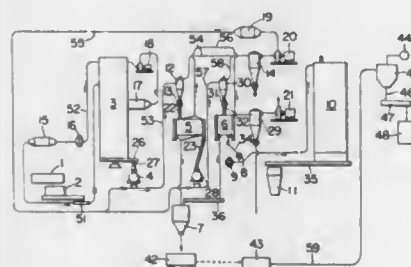
Division of Ser. No. 666,523, Oct. 30, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,140

Claims priority, application Japan, Jul. 30, 1984, 59-157644

Int. Cl.<sup>4</sup> B02C 25/00

U.S. Cl. 241—34

1 Claim



1. An apparatus for treating hops, which comprises: a first crusher for crushing hops, and a first motor for driving said crusher; a bucket conveyor connected to said first crusher for conveying crushed hops therefrom, and a second motor for driving said bucket conveyor; a hopper for receiving crushed hops from said bucket conveyor,

said hopper having a discharge opening at its lower end and a sloping wall extending upwardly from said discharge opening, said sloping wall being adapted to support a layer of crushed hops that moves therealong toward said discharge opening; a first limit switch associated with said hopper for controlling operation of said first and second motors, a first sensing lever connected to said first limit switch to actuate said first limit switch, a hollow ball connected to said first sensing lever, said ball being disposed close to said sloping wall for sensing the thickness of the layer of crushed hops thereon and causing said first sensing lever to actuate said first limit switch to turn off said first and second motors when the layer exceeds a predetermined thickness; a first screw feeder having an inlet connected to said discharge opening of said hopper for receiving crushed hops from said discharge opening, said first screw feeder having an outlet for discharging crushed hops therefrom; a first pneumatic conveyor connected to said outlet of said first screw feeder for conveying crushed hops from said first screw feeder and cooling said crushed hops; a storage tank and means connecting said storage tank to said first pneumatic conveyor so that said storage tank receives the crushed hops from said first pneumatic conveyor, said storage tank having an outlet at its lower end; a stirring device in said storage tank close to the outlet thereof, and a third motor for driving said stirring device; a second screw feeder having an inlet connected to the outlet of said storage tank for receiving crushed hops therefrom, said second screw feeder having an outlet for discharging the crushed hops, and a fourth motor for driving said second screw feeder; a first conduit extending downwardly from the outlet of said second screw feeder; a second sensing lever extending into said first conduit and connected to said second limit switch to actuate said second limit switch, a hollow ball connected to said second sensing lever and disposed inside said first conduit, so that when said first conduit becomes clogged with crushed hops, said second limit switch is actuated to turn off said third and fourth motors; a second crusher having an inlet and means connecting said inlet of said second crusher to said first conduit so that said inlet of said second crusher receives crushed hops from said first conduit, said second crusher being adapted for further crushing the hops; a second pneumatic conveyor connected to said second crusher for conveying crushed hops from said second crusher and cooling said crushed hops; a cyclone and means connecting said cyclone to said second pneumatic conveyor so that said cyclone receives the crushed hops from said second pneumatic conveyor and separates air therefrom, said cyclone having an outlet at its lower end; a second conduit connected to and extending downwardly from the outlet of said cyclone; a third limit switch associated with said second conduit for controlling operation of said third and fourth motors, a third sensing lever extending into said second conduit and connected to said third limit switch to actuate said third limit switch, a hollow ball connected to said third sensing lever and disposed inside said second conduit, so that when said second conduit becomes clogged with crushed hops, said third limit switch is actuated to turn off said third and fourth motors; a shaking sieve having an inlet and means connecting said inlet of said shaking sieve to said second conduit so that said shaking sieve receives crushed hops from said second conduit, said shaking sieve comprising means for separating the crushed hops into first undersize and first oversize fractions; a third crusher for crushing the first oversize fraction; a third pneumatic conveyor connected to said third crusher for conveying hops from said third crusher; a rotary sieve connected to said third pneumatic conveyor for receiving hops from said third pneumatic conveyor, said rotary sieve comprising means for separating said hops into second undersize and second oversize fractions; means for combining said first and

second undersize fractions; a second storage tank for receiving the combined undersize fractions of the hops; a vacuum mucker and a vacuum pump therefor for drawing the combined undersize fractions from said second storage tank, a fifth motor for driving said vacuum pump, said vacuum mucker having an openable damper, said vacuum mucker having an outlet at its lower end; a third screw feeder having an inlet connected to the outlet of said vacuum mucker for receiving hops therefrom and having an outlet for discharging the hops; a third conduit connected to and extending downwardly from the outlet of said vacuum mucker; a fourth limit switch associated with said third conduit for controlling operation of said fifth motor, a fourth sensing lever extending into said third conduit and connected to said fourth limit switch to actuate said fourth limit switch, so that when said third conduit becomes clogged with crushed hops, said fourth limit switch is actuated to turn off said fifth motor; and a pelletizer for receiving the hops from said third screw feeder, and comprising means for pelletizing the hops.

4,682,738

# GRINDING MILL

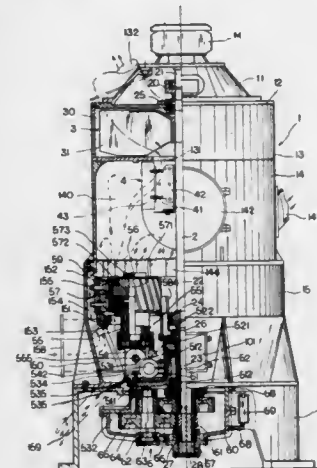
Shien F. Chang, 350 Fifth Ave., Ste. 2822, New York, N.Y. 10118

Filed Nov. 20, 1985, Ser. No. 799,904

Int. Cl.<sup>4</sup> B02C 23/28

U.S. Cl. 241—56

16 Claims



1. A grinding mill comprising a mill cylinder, a vertically mounted main shaft coupled at the upper end to a motor mounted atop the mill cylinder to be driven thereby and extending along the axis of the mill cylinder, and means mounted in descending order on the main shaft including a finished product conveying means, a classifying means, a grinding roller means and a decelerating means, a fixed sleeve fixed on the bottom of the mill cylinder to support a rotary bushing by means of bearings, a centrifugal device fixed to the upper end of the rotary bushing, a roller seat fixed likewise to the upper end of the rotary bushing and extending downwardly and radially, a plurality of roller shafts hinged at the lower end to the roller seat so as to pivot relative to the axis of the rotary bushing, and a corresponding plurality of grinding rollers detachably mounted on the upper end of each roller shaft.

4,682,739

**DEVICE FOR PROJECTING SOLID PARTICLES FOR A VACUUM CENTRIFUGAL GRINDER**

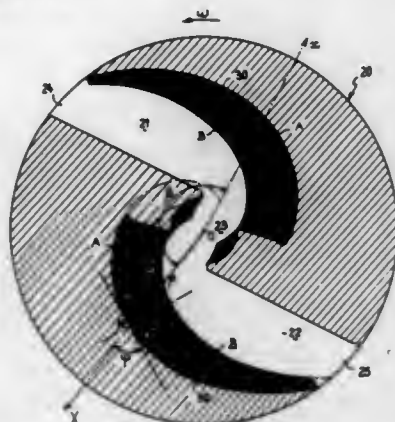
Gérard Sevelinge, Montceau les Mines, France, assignor to Framatome, Courbevoie, France

Filed Feb. 10, 1986, Ser. No. 827,586

Claims priority, application France, Feb. 15, 1985, 85 02234  
Int. Cl.<sup>4</sup> B02C 19/00

U.S. Cl. 241—275

3 Claims



1. Device for projecting solid particles for a vacuum centrifugal grinder, comprising a rotationally driven distributor wheel (20) for projecting at a high speed onto a target (8) a granular material introduced into a central feed chamber (23) placed on the axis of the said wheel, a plurality of channels (21, 22) being arranged within the wheel at right angles to its axis and opening outwards via ejection orifices (24, 25) onto the periphery of the wheel, producing the attachment of a single, uninterrupted stable self-protective layer (30) formed by the particles themselves over the entire length of said channel, wherein the face for guiding the particles in each channel (21, 22) has a curvature (A) extending in the direction of rotation of the distributor wheel (20), and whose outline is calculated as a function of the friction coefficients of the materials in contact, and is determined so that the following formula

$$\Psi + \phi \geq (\pi/2)$$

where  $\Psi$  determines the angle formed by the tangent to the curve and the vector radius at the point in question, and  $\phi$  determines the angle whose tangent is equal to the friction coefficient, applies to any point of said curvature.

4,682,740

**SHREDDER FOR LEAVES AND OTHER LIKE YARD AND GARDEN REFUSE**

Anthony Conigliaro, Sherborn; Arthur St. Hilaire, Reading, and Sal G. De Yoreo, Andover, all of Mass., assignors to Armatron International, Inc., Melrose, Mass.

Filed Aug. 27, 1986, Ser. No. 901,047

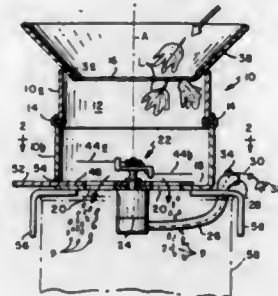
Int. Cl.<sup>4</sup> B02C 18/12

U.S. Cl. 241—282.1

9 Claims

1. A shredder comprising:  
a container;  
a shredding mechanism including a head mounted within said container for rotation about a vertical axis, said head having flexible elements extending radially outwardly therefrom;  
motor means for rotatably driving said head to thereby cause said flexible elements to follow a rotational path;  
said container being open at the top to define a loading port through which material may be received for shredding by said shredding mechanism, said loading port being arranged concentric to said vertical axis at a location di-

rectly overlying substantially the entire rotational path of said flexible elements; and  
said container being closed at the bottom by a bottom wall having a discharge port therein through which the thus



shredded material may be removed from said container, said discharge port being defined by a plurality of openings directly underlying the rotational path of said flexible elements and angularly spaced one from the other around said vertical axis.

4,682,741

**APPARATUS FOR UNWINDING FLEXIBLE FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS, ARRIVING CONTINUOUSLY, ESPECIALLY IN IMBRICATED FORMATION**

Werner Honegger, Tann-Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Division of Ser. No. 728,219, Apr. 29, 1985, Pat. No. 4,601,436.

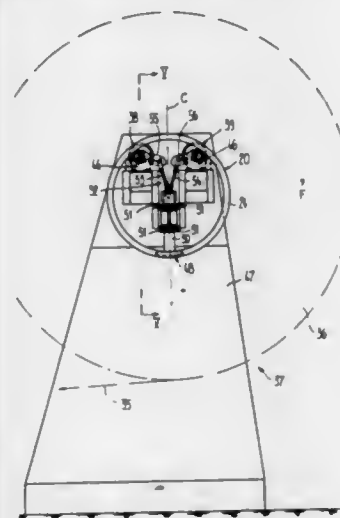
This application Apr. 14, 1986, Ser. No. 852,721

Claims priority, application Switzerland, May 9, 1984, 2267/84

Int. Cl.<sup>4</sup> B65H 16/04, 75/02

U.S. Cl. 242—55

16 Claims



1. An apparatus for unwinding flexible, substantially flat products, especially printed products, wound together with a winding strap into a wound package from such a wound package, comprising:

- a substantially hollow and substantially cylindrical winding core;
- a support arrangement for rotatably and releasably supporting said core;
- said core being constructed as an annular friction wheel; said annular friction wheel being structured for deposition upon and lifting from said support arrangement;

said annular friction wheel having an inner side and a longitudinal axis;  
said annular friction wheel containing at said inner side a traction surface coaxial with said longitudinal axis;  
said annular friction wheel comprising side flanges extending inwardly towards said longitudinal axis for laterally delimiting said traction surface;  
said support arrangement comprising freely rotatable support wheels;  
said traction surface bearing upon said freely rotatable support wheels; and  
a braking member structured for operatively engaging said core.

4,682,742

**APPARATUS AND METHOD FOR LOADING TAPE INTO A CASSETTE**

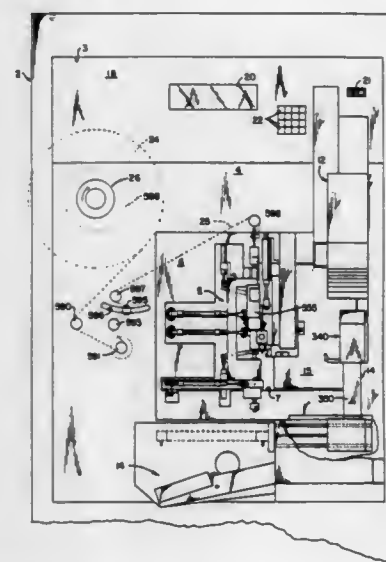
George M. Woodley, Shrewsbury, Mass., and William S. Bakes, Somersworth, N.H., assignors to King Instrument Corporation, Westboro, Mass.

Filed Jan. 6, 1986, Ser. No. 816,629

Int. Cl.<sup>4</sup> B31F 5/06; B65H 21/00

U.S. Cl. 242—56 R

30 Claims



1. A shift block assembly for use in splicing tape to leaders comprising:

- means defining a fixed axis;
- a first block mounted for rotational and axial movement on said axis;
- a second block mounted for rotational movement on said axis;
- a third block mounted for rotational and axial movement on said axis; and
- first, second and third selectively operable tape holding means for holding a tape in position on each of said first, second and third blocks respectively.

25. A shift block assembly for use in splicing tape to leaders comprising:

- a shaft;
- means mounting said shaft for rotational and longitudinal movement with respect to a fixed axis;
- a first block rotatably and slidably supported by said shaft, said first block having a first guideway for receiving a first tape and means for holding said first tape in said guideway by suction;
- a second block attached to said shaft so as to move therewith when said shaft rotates or shifts axially on said axis; said second block having a second guideway for receiving a second tape and means for holding said second tape in said guideway by suction;
- a third block rotatably and slidably mounted on said shaft,

4,682,743

**APPARATUS FOR AUTOMATICALLY MOUNTING A WEB ROLL ON A MILL ROLL STAND**

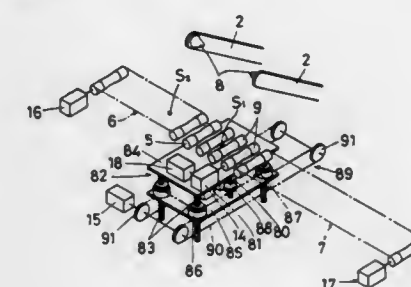
Masateru Tokano, Nishinomiya; Tetsuya Sawada, Kyoto, and Yoshihiro Ishii, Yao, all of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Division of Ser. No. 642,719, Aug. 24, 1984, Pat. No. 4,586,673, which is a continuation of Ser. No. 431,086, Sep. 30, 1982, abandoned. This application Feb. 12, 1986, Ser. No. 829,092

Int. Cl.<sup>4</sup> B65H 16/06, 19/30

U.S. Cl. 242—58.6

1 Claim



1. An apparatus for automatically mounting a roll of web material on a mill roll stand having at least one pair of roll supports, said apparatus comprising:

- a first driving means for moving said roll supports toward and away from each other,
- a second driving means for moving said web roll in a vertical direction,
- a third driving means for moving said web roll in a direction parallel to the axis of said roll supports,
- a fourth driving means for moving said web roll in a direction transverse to the axis of said roll supports;
- a first pulse generator for generating a signal which is proportional to the amount of rotation of said second driving means;
- a second pulse generator for generating a signal which is proportional to the amount of rotation of said third driving means; and
- a control means for providing signals to said first, second, third, and fourth driving means so as to control said third driving means on the basis of a comparison of the signal from said second pulse generator with the width of said web roll, and so as to move said web roll to a position halfway between but sideways of said roll supports, and so as to control said fourth driving means to move the web roll for a predetermined horizontal distance between the axis of the web roll and the axis of said roll supports, and simultaneously control said second driving means on the basis of comparison of the signals from said first pulse generator with the diameter of said web roll so as to move said web roll in a vertical direction, and so that the axis of said roll supports will be in alignment with the center hole in said web roll, and so as to control said first driving means so as to move said roll supports toward each other until they are inserted into said center hole of the web roll, wherein the web roll is supported by said roll supports.



4,682,744

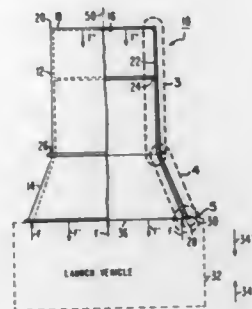
## SPACECRAFT STRUCTURE

Raj N. Gounder, Robbinsville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 8, 1985, Ser. No. 720,941

Int. Cl.<sup>4</sup> B64G 1/10

U.S. Cl. 244—158 R



1. A spacecraft construction adapted to be attached to a launch vehicle comprising:

a tubular cylindrical structure; and

a tubular frusto-conical structure continuous with and extending from said cylindrical structure, said structures having aligned longitudinal axes;

said structures being adapted to receive spacecraft payload and engine and comprising a continuous homogeneous microstructure formed of reinforcing fibers in a metal matrix, said microstructure having a wall thickness which increases from the extended end of said cylindrical structure remote from said frusto-conical structure to the extended edge of said conical structure remote from said cylindrical structure, the edge at the thickest wall end being adapted to be attached to said launch vehicle.

4,682,745

## PRELOADABLE VECTOR SENSITIVE LATCH

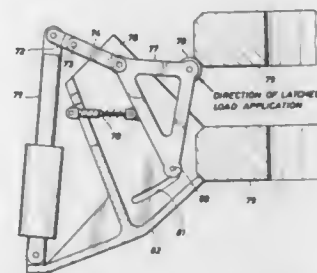
William R. Acres, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 3, 1985, Ser. No. 783,888

Int. Cl.<sup>4</sup> B64G 1/64

U.S. Cl. 244—161

14 Claims



1. A preload vector sensitive latch, comprising: a housing, a main link slidably and pivotally connected directly to the housing, a yoke member, a free link directly connected to both the main link and the yoke member, and actuator means connected between the yoke member and the housing for changing the yoke position and for applying a force on the yoke to preload the latch.

4,682,746

## CONTROL FORCE GENERATOR

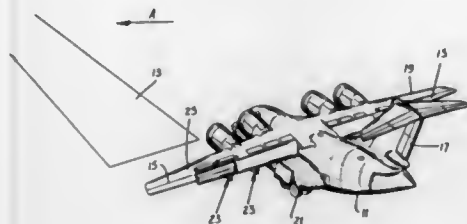
Andrew S. W. Thomas, Marietta, Ga., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Dec. 5, 1984, Ser. No. 678,347

Int. Cl.<sup>4</sup> B64C 21/00, 5/06

10 Claims U.S. Cl. 244—207

1 Claim



1. A control force generator for furnishing a control force for an aircraft having wings and at least one engine, the generator comprising:

(a) a source of compressed fluid;

(b) a pair of substantially symmetrical, spaced, aerodynamic surfaces forming a vane having a given chord length and span as well as leading and trailing edges, said vane being affixed beneath the wing of the aircraft substantially perpendicular thereto and being positioned so that the forward 25% vane chord passes approximately through the forward 35% chord of the wing;

(c) a fluid discharge slot for discharging the compressed fluid from the trailing edge of the vane;

(d) a plenum adjacent to the discharge slot for connecting the fluid discharge slot to the source of compressed fluid;

(e) a fluid control surface, positioned adjacent the fluid discharge slot, for forming first and second Coanda effect circulation control ports, each having a given width  $h$ , the control surface extending beyond the trailing edge of the vane and having a substantially rounded trailing edge forming a single Coanda surface with a given radius  $r$ ; and

(f) control port selection means for selectively discharging the compressed fluid from the plenum to one of control ports, the control port selection means comprising:

(1) support means for rotatably supporting the fluid control surface for rotation about its longitudinal axis;

(2) a wedge-shaped sealing means for sealing a control port, the sealing means being affixed to the fluid control surface and positioned within the undivided plenum; and

(3) means for moving the fluid control surface about its rotational axis, so that when the control surface is rotated the wedge-shaped sealing means abuts one side of the plenum, and the sealing means forms a fluid seal with respect to the control port next to the side of the plenum abutted to permit discharge of the compressed fluid from the other port;

whereby the fluid discharged from a selected control port becomes attached to a portion of the Coanda surface adjacent the selected port and is deflected substantially tangentially to the Coanda surface resulting in a downstream deflection of the fluid flow through which the vane is traveling so that lift is produced by the aerodynamic surface adjacent the attached control port to provide a control force.

4,682,747

## UTILITY INSULATED CROSS-ARM

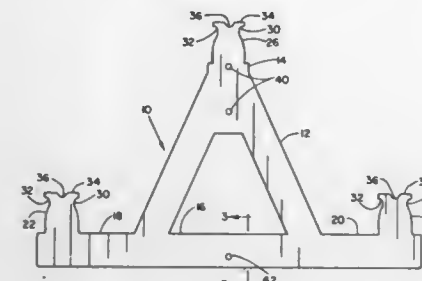
Halm C. King, Jr., and Nancy King, both of Star Rte. 2, Box 43J, Hwy. 90 W., Del Rio, Tex. 78840

Filed Apr. 24, 1986, Ser. No. 855,836

Int. Cl.<sup>4</sup> F16L 3/22

U.S. Cl. 248—68.1

18 Claims



1. A utility insulated cross-arm for supporting electrical wires from a utility pole comprising:

a triangular frame having a base and a peak, said triangular frame being constructed from an insulative material;

left and right horizontal cross-arms integral with said triangular frame and constructed from an insulative material, located at the base of said triangular frame, said horizontal cross-arms each having an upper surface;

an upper support member integral with and located at said peak of said triangular frame and constructed from an insulative material;

attachment means for attaching said electrical wire to said upper support member; and

mounting means for mounting said triangular frame to said utility pole, said mounting means comprising of a plurality of holes located along a vertical centerline of said triangular frame, for bolting said triangular frame to said utility pole.

4,682,748

## ONE-PIECE CLIP-SHAPED HOLDER FOR ELONGATED ARTICLES

Kurt Freudenmann, and Heiner Wiese, both of Hamburg, Fed. Rep. of Germany, assignors to ITW Ateco, Norderstedt, Fed. Rep. of Germany

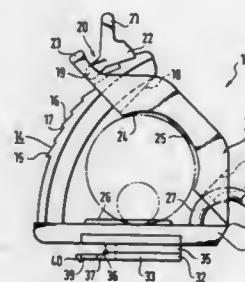
Filed Nov. 8, 1985, Ser. No. 796,420

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445935

Int. Cl.<sup>4</sup> F16L 3/12

U.S. Cl. 248—73

5 Claims



1. A one-piece clamp device for fixing elongated articles comprising:

a base portion having a means for connecting said base portion to a support member on one side thereof;

an upstanding bracket located on the side opposite to said one side of said base portion and at one end thereof;

a first hinge means for continuously pivotally connecting

said upstanding bracket to said one end of said base portion;

an upstanding toothed member integral with said base portion on its side opposite said means for connecting at its end opposite said bracket having several teeth integrally formed on one of its sides;

means for engaging said teeth on the distal end of said bracket; and

a second auxiliary hinge means for continuously pivotally connecting said bracket to said one end of said base and for providing a fixed stop of said bracket in its open position.

4,682,749

## ADJUSTABLE COPYHOLDER WITH ARTICULATED ARMS

Fritz Sträter, Unterm Bamberg 1, D-5882 Meinerzhagen, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,452

Claims priority, application European Pat. Off., Oct. 28, 1985, 85113678.8

Int. Cl.<sup>4</sup> E04G 3/00

U.S. Cl. 248—284

18 Claims



14. A copyholder for flat sheets comprising a base rotatable about a vertical axis:

an articulated arm swingably mounted on said base at a first horizontal axis defined by a pivot joint, said arm having two segments connected pivotally together at another pivot joint having a second horizontal axis, each of said pivot joints comprising:

inner and outer parts coaxial with one another at the respective axes and relatively rotatable,

an arc-segmental brake shoe disposed between said parts and formed as an interrupted ring having opposing ends,

a spreader between said opposite ends of said shoes and mounted on said inner part for rotation between positions in which said ends are spread apart to urge said brake shoes against said outer part and in which said ends approach each other when said brake shoes are released from engagement with said outer part; and

spring means for biasing said spreaders into said position wherein said ends are spread apart;

a copy support plate pivotally connected to said arm at an end thereof furthest removed from an end of said arm mounted on said base;

a handle on said plate; and

at least one traction element operatively connected to said handle and to said spreaders for rotating said spreaders against the force of said spring means to disengage said brake shoes from the respective outer parts.

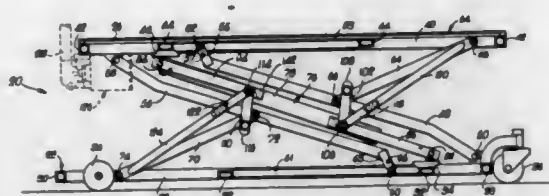
4,682,750

**LOW PROFILE EXTENSIBLE SUPPORT PLATFORM**  
Steven M. Rudolph, David City, and Donald J. Maxwell, Lincoln, both of Nebr., assignors to Eldos Corporation, David City, Nebr.

Filed Sep. 26, 1986, Ser. No. 913,008  
Int. Cl.<sup>4</sup> F16M 13/00

U.S. Cl. 248—421

9 Claims



1. A low profile extensible support platform assembly comprising:

- a base extending generally in a reference plane;
- platform means extending generally in a plane substantially parallel to said reference plane and defining a work supporting surface;
- a first pair of spaced linkages each pivotally connected to said base and shiftably coupled to said platform means;
- a second pair of spaced linkages each pivotally connected to said platform means and shiftably connected to said base, each of said first pair of linkages and each of said second pair of linkages being elongated and presenting an intermediate region;
- a first pair of link means each pivotally coupled to said intermediate region of one of said first pair of linkages and each pivotally connected to said platform means;
- a second pair of link means each pivotally coupled to said intermediate region of one of said second pair of linkages and each pivotally connected to said base;
- said first pair of linkages during shifting movement along said platform means and said second pair of linkages during shifting movement along said base being swingable in an arc about said base and said platform means respectively for moving said platform means either toward or away from said base while retaining said platform means in substantially coplanar relationship with said base as said first pair of link means swings in an arc about said first pair of linkages and said platform means and as said second pair of link means swings in an arc about said second pair of linkages and said base;
- extensible means having a first end portion and a second end portion selectively movable along an axis toward and away from said first end portion;
- an elongated swivel member pivotally coupled to one of said end portions of said extensible means for swinging movement about the latter;
- torque arm means pivotally interconnecting said swivel member and an adjacent pair of one of said first and second pairs of link means;
- said torque arm means being positioned to exert a torque on an adjacent pair of said link means as said second end portion of said extensible means is moved away from said first end portion of said extensible means to exert tension on said swivel member and thereby said torque arms means, and to cause said first link means and said second link means to swing in an arc about said first pair of linkages and said second pair of linkages respectively; and
- stop means connected to one of said platform means and said base and engageable with one of said second end portion and said first end portion of said extensible means respectively for supporting said extensible means during engagement therewith and for opposing rotation of said extensible means about an axis transverse to its axis of extensible movement as said second end portion of said extensible means is moved away from said first end portion, to thereby simultaneously increase the tension on said swivel

member and assist said torque arm means in exerting a torque on said adjacent pair of link means, and for simultaneously causing said first pair of linkages and said second pair of linkages to swing about said base and said platform means correspondingly to move said platform means away from said base as may be desired.

4,682,751

**BATTERY MOUNTING DEVICE**

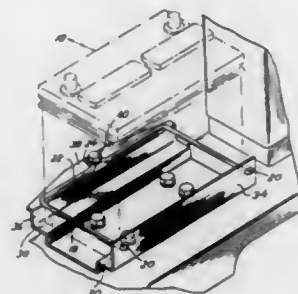
Attila J. Tamas, Portage, Mich., assignor to Clark Equipment Company, South Bend, Ind.

Filed Mar. 3, 1986, Ser. No. 835,482

Int. Cl.<sup>4</sup> A47B 97/00

U.S. Cl. 248—503

11 Claims



1. A battery mounting device for vehicles having a battery case with at least one transversely extending projection at each of two opposed sides thereof, said projections being near the bottom of said battery case, comprising a support tray supporting said battery case and adapted to be secured to a rigid member, said support tray including two only upwardly extending operative flanges, said operative flanges being located at the other opposed sides of the battery case and adapted to support said other opposed sides, and a U-shaped member surrounding said battery case on three sides thereof and engaging one of said battery tray flanges at the open side of said U-shaped member, said battery case projections being engaged by the legs of said U-shaped member, the other of said flanges having a ledge means, and means adapted to connect the base of said U-shaped member to said ledge and being adjustable to rigidly engage said U-shaped member with said battery case and said support tray.

4,682,752

**HOLDING FIXTURE FOR A PIPE-LINE**

Bruno Pischzik, Randpark North, South Africa, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 18, 1985, Ser. No. 799,094

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1984, 3443648; May 13, 1985, 3517688

Int. Cl.<sup>4</sup> F16L 3/20

U.S. Cl. 248—550

11 Claims

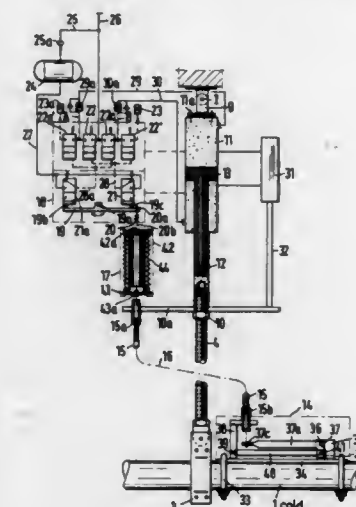
1. A holding fixture for a pipe-line, said holding fixture comprising:

- (a) a thermally conductive base (34) which, in use, is in thermal contact with a pipe-line (1) extending in a first direction;
- (b) a first mounting (35) projecting from a first point on said thermally conductive base (34);
- (c) a second mounting (38) projecting from a second point on said thermally conductive base (34);
- (d) a control rod (40) having a first end pivotally mounted (39) on said second mounting (38) and a second end, said control rod (40) extending at least substantially in said first direction and being at least substantially thermally isolated from the pipe-line (1) during use of said holding fixture;
- (e) an angle lever (37) having a fulcrum (36) pivotally

mounted on said first mounting (35), a first arm (37b) that is pivotally connected to said second end of said control rod (40), and a second arm (37a), whereby said angle lever (37) pivots about its fulcrum (36) in response to torque exerted on said first arm (37b) due to thermally induced changes in the distance between said first and second points on said thermally conductive base (34);

(f) a first Bowden cable 16 having a first end attached to said second arm (37a) of said angle lever (37) and a second end;

(g) a tilting lever (19) having a fulcrum (19a) that is fixed relative to said thermally conductive base (34) and at least one arm that is pivotable relative to said fulcrum (19a) and



that is connected to said second end of said first Bowden cable (16);

- (h) first means (11,12,13) for moving the pipe-line (1) back and forth in a direction perpendicular to said first direction;
- (i) second means (21) for causing said first means (11,12,13) to move the pipe-line (1) in a first way in response to an angular movement of said tilting lever (19) in a first sense; and
- (j) third means (21a) for causing said first means (11,12,13) to move the pipe-line (1) in a second way in response to an angular movement of said tilting lever (19) in a second sense.

4,682,753

**VIBRATION ABSORBING MOUNTINGS**

Michael Clark, Coventry, England, assignor to Dunlop Limited, United Kingdom

Filed Oct. 29, 1984, Ser. No. 665,945

Claims priority, application United Kingdom, Nov. 12, 1983, 8330254; Aug. 3, 1984, 8419910

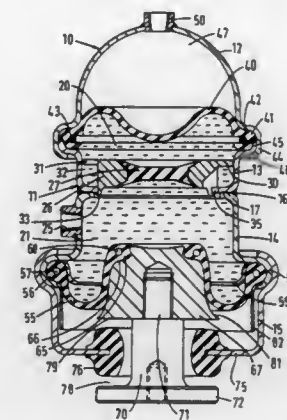
Int. Cl.<sup>4</sup> F16F 13/00

U.S. Cl. 248—562

6 Claims

1. A vibration absorbing mounting comprising a reinforced elastomeric rolling-lobe end diaphragm sealed to a housing and a piston engaging the central region of the end diaphragm, the housing comprising a pair of liquid-filled chambers which communicate with one another through a restricted passage-way and which are separated from one another by an intermediate elastomeric diaphragm of sufficient thickness to provide substantial spring stiffness, a first chamber of said liquid-filled chambers being adjacent the end diaphragm, and a second of said liquid-filled chambers being bounded at one side by the said intermediate elastomeric diaphragm and at the other side

by a separator diaphragm, the housing also comprising a gas chamber for containing gaseous pressure arranged to act on the



side of the separator diaphragm remote from the second liquid-filled chamber.

4,682,754

**TURBINE PEDESTAL**

Sakae Ebata, and Nobuaki Ohshima, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

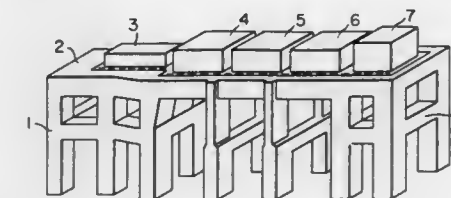
Filed Mar. 31, 1982, Ser. No. 363,838

Claims priority, application Japan, Apr. 3, 1981, 56-49454

Int. Cl.<sup>4</sup> F16M 11/00

U.S. Cl. 248—639

12 Claims



1. A turbine pedestal comprising a deck and a plurality of posts for supporting the deck which in turn supports turbines and a generator, wherein the improvement resides in that: said posts each include an outer tubular frame formed of concrete reinforcing steel plate, and concrete deposited on the inner side of said outer frame so that said plates are a substantial part of the design concrete reinforcement of said posts; and

a foundation including a plurality of steel plates arranged parallel to each other in predetermined spaced relation in horizontal planes, said outer frame of each post being firmly secured to each of two of said steel plates, and a plurality of vertically extending spacer elements secured between the steel plates.



4,682,755

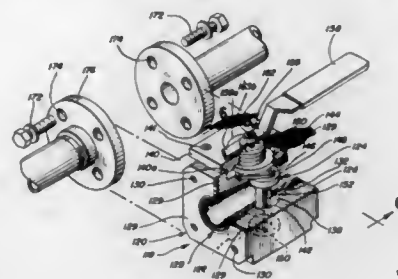
**MECHANICAL CONTROL SYSTEM IN FLOW DEVICES**  
Robert E. Bernstein, Framingham, and Alan E. Nelson, Franklin, both of Mass., assignors to Larad Equipment Corporation, Medfield, Mass.

Continuation-in-part of Ser. No. 769,783, Aug. 23, 1985, Pat. No. 4,630,635, which is a continuation of Ser. No. 441,613, Feb. 11, 1983, abandoned. This application Jan. 24, 1986, Ser. No. 822,038

Int. Cl.<sup>4</sup> F16K 31/524; F16L 55/14

U.S. Cl. 251—4

24 Claims



1. A pinch valve for use in a conduit system comprising: a hollow housing having openings at opposite ends; an elongated sleeve disposed inside said housing and defining a fluid flow path, said sleeve having a longitudinal axis generally parallel to such fluid flow path; and a mechanical valve actuating device, said device including a first pinch member and a second pinch member, said pinch members disposed within said housing at opposite sides of said sleeve, at least of said pinch members including a rotatable drive element and a shank, said rotatable drive element being rotatable about an axis of rotation which is transverse to and offset laterally from said longitudinal axis, said shank being disposed beside said sleeve and eccentrically attached to the respective drive element for movement transverse to said sleeve along an arcuate path as that drive element is rotated for pinching and releasing the sleeve; said one of said pinch members being mounted such that said shank moves generally normal to said sleeve as it begins pinching of said sleeve and then along such an arcuate path which becomes generally parallel to the axis of said sleeve as the sleeve is closed thereby; whereby the transverse pinching movement of said shank decreases relative to the rotational movement of said drive element as said sleeve is pinched by said one of said pinch members.

4,682,756

**HYDRAULICALLY OPERATED SELF-CLOSING TWO-WAY SEAT-TYPE VALVE**

Manfred Härtwig, Ostfildern, and Georg Rausch, Lohr, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Jul. 15, 1986, Ser. No. 886,541

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1985, 3525331

Int. Cl.<sup>4</sup> F16K 31/122

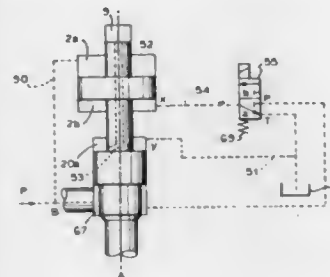
U.S. Cl. 251—63.5

2 Claims

1. In a hydraulically operated self-closing two-way valve, particularly a built-in valve, comprising a housing (15) having an inner opening and a valve seat at said inner opening; a piston-shaped locking body (12) received in said opening and cooperating with said valve seat and having a guide portion (12a) and a seat portion (21), said guide portion being of greater diameter than that of said seat portion; a cover (1) mounted on said housing and having a recess; a hydraulically loadable actuating piston (3) received in said recess and being operative for actuating said locking body, said actuating piston being of diameter greater than that of said guide portion (12a), said actuating piston having, at a side thereof which faces away

from said closing body, a piston-shaped extension (5) which is guided in said cover and limits in said cover a chamber (9), said locking body having between said guide portion and said seat portion a ring-shaped surface (60), said actuating piston having at a side thereof facing away from said locking body, a circular surface (62), said ring-shaped surface and said circular surface being loaded with a pump pressure, said actuating piston further having at a side thereof facing said locking body a surface (63) which is selectively loadable with a pump pressure or a low pressure, the improvement comprising:

- (a) said actuating piston having at the side thereof facing said locking body an additional piston-shaped extension (4) which is connected to said locking body in a locking fashion;



- (b) a separation wall (6) formed between said piston and said locking body, said additional extension being guided in said separation wall;
- (c) said additional extension limiting between said locking body and said separation wall and said chamber (9) a further chamber (20a) which is loaded with the pressure lower than the pump pressure;
- (d) said piston-shaped extension and said additional extension being of the same diameter and having a common axial bore (52) also extending through said piston; and
- (e) said additional extension having radial bores (53) connected to said axial bore while said axial bore and said radial bores connect said further chamber (20a) with said chamber (9).

4,682,757

**SECONDARY BACKSEAT FOR GATE VALVE**

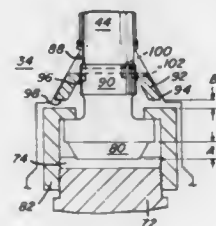
William S. Shelton, Houston, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Jul. 18, 1986, Ser. No. 886,695

Int. Cl.<sup>4</sup> F16K 41/14

U.S. Cl. 251—77

25 Claims



1. A gate valve comprising:

- a valve body having a flow passage extending therethrough and a valve chamber intersected by the flow passage;
- a valve closure element slideably mounted within the valve chamber for movement between open and closed positions relative to the flow passages;
- a bonnet assembly secured to said valve body having a central bore communicating with the valve chamber, the central bore having a longitudinal axis and a coaxial frus-

4,682,759

**RELIEF VALVE FOR HYDRAULIC SYSTEMS**

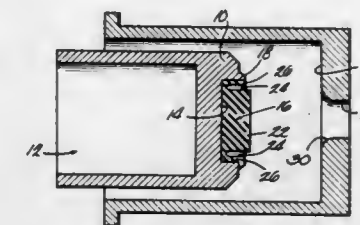
Charles B. Hall, Ingleside, and Martin J. Mondek, Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 20, 1983, Ser. No. 543,947

Int. Cl.<sup>4</sup> F16K 1/36

U.S. Cl. 251—210

7 Claims



- to-conical counterbore portion adjacent the valve chamber providing a bonnet backseat surface;
- a valve stem connected to said valve closure element and extending coaxially through the central bore of said bonnet assembly, said valve stem being axially movable to move for said slideably-mounted valve closure element between open and closed positions of the fluid flow passages of the gate valve;
- means for backseating said valve stem on the bonnet backseat surface in response to axial movement of said valve stem, said backseating means including a metal seal ring having a frusto-conical outer sealing surface, the metal seal ring being slideably mounted on said valve stem within the valve chamber, the slideable seal ring having a first axial position on said valve stem whereby initial contact is made between the seal member and said bonnet backseat portion in response to axial movement of said valve stem, the slideable seal ring being movable to a second axial position on said valve stem in response to further axial movement of said valve stem to establish a metal-to-metal seal between said valve stem and said bonnet assembly; and
- means for repositioning the metal seal ring from the second axial position to the first axial position about said valve stem in response to opposite axial movement of said valve stem.

4,682,758

**DISK/STEM CONNECTION APPARATUS FOR BUTTERFLY VALVE**

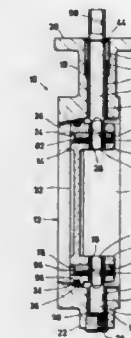
William B. Scobie, and Michael L. Wagberg, both of Houston, Tex., assignors to Keystone International, Inc., Houston, Tex.

Filed Mar. 5, 1986, Ser. No. 836,541

Int. Cl.<sup>4</sup> F16K 1/22

U.S. Cl. 251—84

19 Claims



1. A valve comprising:
- a valve body defining a flow passage therethrough and an annular seat in surrounding relationship to said flow passage;
- a closure assembly mounted within said valve body for movement between open and closed positions to control the flow of fluid through said passage, said assembly comprising at least one valve stem rotatably mounted in said housing and extending into said passage along a diameter thereof, a closure element having a circumferential profile matable with said annular seat, and means for mounting said closure element on said at least one valve stem including at least one hub fixed to said closure element and defining a bore receiving said at least one valve stem therein, at least two threaded passages intersecting said bore in general opposition, and at least two threaded members each threadedly received in a respective one of said passages to engage from opposite sides of said stem whereby adjusting said threaded members changes the relative positioning of said closure element with respect to said valve stem and said valve seat.

4,682,760

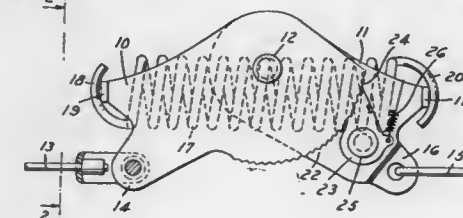
**CONSTANT FORCE CABLE SELF ADJUSTING DEVICE**  
John M. Baumgarten, Saline, Mich., assignor to Acco Babcock Inc., Fairfield, Conn.

Filed Sep. 18, 1986, Ser. No. 909,220

Int. Cl.<sup>4</sup> B21F 9/10; B60G 11/14; F16C 1/22

U.S. Cl. 254—199

3 Claims



1. A constant force self adjusting cable control device comprising
- a first member and a second member pivoted to one another about a pivot point,
- a tension spring connected to the first and second members and yieldingly urging the first and second members in a direction to cause movement about the pivot point,
- a cable attached to each of the first and second members, said cables being axially aligned such that the axis of the tension spring and the axis of the cables are parallel,
- the angular displacement between the points of attachment of the spring and the cable on one member and the pivot point forming an angle equal to the angle of the point of attachment of the spring and the cable of the other member and the pivot point whereby substantially constant tension is provided on each of the cables, and
- a one-way latch which automatically releases when there is any slack in the cables thereby permitting relative movement between the two members until the tension on the cables is re-established.

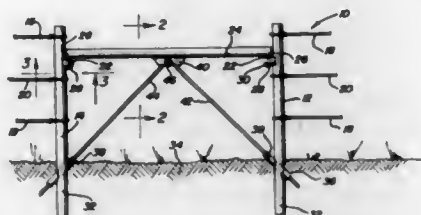
4,682,761

**CORNER AND IN-LINE FENCE POST STRESS AND BRACING SYSTEM**

Robert L. Hanneken, Box 110, Rte. 1, Verona, Mo. 65769  
 Filed Sep. 4, 1985, Ser. No. 772,523  
 Int. Cl.<sup>4</sup> E04H 17/02

U.S. Cl. 256—36

9 Claims



1. A fence construction comprising a pair of spaced apart, upright fence posts having upper and lower end portions, an outer surface and their lower end portions embedded in the ground, an upper horizontal brace extending between and anchored to the upper end portions of said posts at an elevation spaced appreciably above the ground, a pair of guide members mounted to said posts at generally ground level, a pair of elongated, longitudinally straight and oppositely inclined braces extending between a longitudinal mid-portion of said horizontal brace and said guides with the lower ends of said inclined braces guidingly engaged with said guide members for longitudinal shifting thereto and projecting downwardly and outwardly from said outer surface and into the ground and the upper ends of said inclined braces anchored to the longitudinal mid-portion of said horizontal brace, said guide members and the lower ends of said inclined braces including locking means releasably securing said lower ends of said inclined braces in a relative position with said guide members.

4,682,762

**FENCE SYSTEM WITH ONE-PIECE POSTS**

Carl W. Lekavich, 1645-3 W. Sepulveda, Torrance, Calif. 90501  
 Continuation-in-part of Ser. No. 495,438, May 17, 1983,  
 abandoned. This application Apr. 18, 1984, Ser. No. 601,109  
 Int. Cl.<sup>4</sup> E04H 17/14

U.S. Cl. 256—65

35 Claims



1. A one-piece fence post comprised of a rigid tubular member folded in a region between its ends to form first and second longitudinally abutting portions, a first pair of inwardly facing adjacent indentations formed in the respective first and second portions in the folded region to define a first transverse rail-receiving passage, a second pair of inwardly facing adjacent

indentations formed in the respective first and second portions between the folded region and the ends of the member to define a second transverse rail-receiving passage, and means for directly attaching the first and second abutting portions together.

4,682,763

**FLEXIBLE MOUNTING**

Kenichi Kazaoka, Nagoya; Hiroshi Okazaki, Toyota, and Yasuhisa Inaba, Handa, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

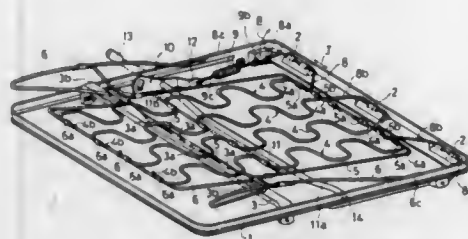
Filed Mar. 25, 1985, Ser. No. 715,403

Claims priority, application Japan, Mar. 26, 1984, 59-59094;  
 Mar. 29, 1984, 59-62041

Int. Cl.<sup>4</sup> F16F 3/00, 25/00; A47C 3/00, 7/02

U.S. Cl. 267—89

6 Claims



1. An adjustable cushion support comprising:  
 a cushion;  
 a frame member for supporting said cushion;  
 spring means mounted on said frame member for directly supporting said cushion;  
 holding means connecting said spring means to said frame member for flexibly holding said spring means; and  
 control means mounted on said frame member and connected to said spring means for adjusting the holding pressure applied to said spring means, said control means including:  
 enforcement means pivotally supported on said frame member for pushing said spring means upward, said enforcing means having a first arm portion connected to said spring means and a second arm portion;  
 biasing means connected to said second arm portion for maintaining the holding pressure applied by said enforcement means to said spring means; and  
 an operating lever mounted on said frame member and having a control arm connected to said biasing means and movably positioned along said frame member to control the inclination of said biasing means, thereby regulating the holding pressure applied to said spring means, said operating lever also having arresting means for affixing said operating lever to said frame member.

4. An adjustable cushion support comprising:  
 a cushion;  
 a frame member for supporting said cushion and having a front portion and a rear portion;  
 bar means extending between opposite sides of said frame member proximate said front portion;  
 support means mounted on said frame member between said front portion and said rear portion for flexibly supporting a load imposed thereon, said support means including:  
 spring means for directly supporting said cushion;  
 forward holding means connecting said spring means to said bar means for holding said spring means to support said cushion and for limiting movement between said support means and said frame member; and  
 rearward holding means connecting said spring means to said rear portion for holding said spring means to support said cushion and for limiting movement between said support means and said frame member;  
 control means mounted on said frame member and con-

nected to said support means for adjusting the holding pressure applied to said spring means, said control means including:

a rotatable operating lever;  
 plate means connected to said frame member and operatively connected to said operating lever for movement therewith;  
 biasing means extending between said plate means and said support means for maintaining the holding pressure applied to said spring means depending upon the inclination of said biasing means; and  
 engagement means formed along said plate means for adjusting the inclination of said biasing means in response to said operating lever, thereby regulating the holding pressure applied to said spring means.

4,682,764

**CELERY PEELING HOLDER**

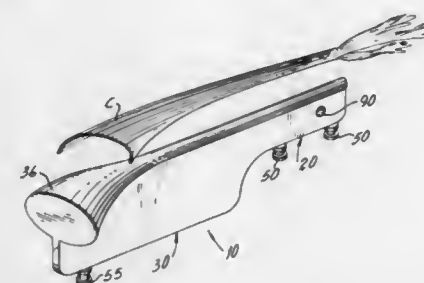
Juan E. Renaud, 9170 Fountainbleau Blvd., Apt. 103, Miami, Fla. 33172

Filed Mar. 27, 1986, Ser. No. 844,945

Int. Cl.<sup>4</sup> B25B 1/00

U.S. Cl. 269—3

3 Claims



1. A holder for celery having a wide and a narrow end, comprising:  
 A. an elongated handle member that includes an underside and including first post means mounted to said underside and, further including first rubber band means including a hole substantially on each end and so arranged and constructed to be removably mounted to said first post means and placed around the narrow end of said celery; and  
 B. an elongated support member for said celery integrally built on one end of said handle member and having a convex headed termination on the end of said support member opposite to said handle member and said headed termination having a shape that substantially follows the concave contour of the inner walls of said celery on its wide end.

4,682,765

**WELDING JIG APPARATUS**

Jack Mainville, 25 Goffe St. North, Meriden, Conn. 06450

Filed Dec. 19, 1985, Ser. No. 811,106

Int. Cl.<sup>4</sup> B25B 1/20

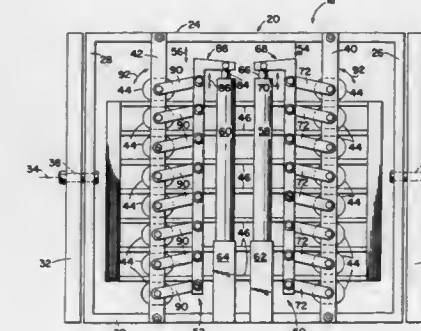
U.S. Cl. 269—41

3 Claims

1. Welding jig apparatus for holding a plurality of bar stock workpieces in an intersecting and aligned relationship to form a metal grating structure, each of the bar stock workpieces extending lengthwise for a substantially greater distance than its height and having a predetermined thickness and further having a first planar face at one side of the workpiece and defined by the length and height and a second planar face disposed opposite the first face at the other side of the bar, said apparatus comprising:  
 a base;  
 a work surface supported by said base and including two longitudinal side members and two end members, each of said end members being positioned transversely between said side members in a spaced relationship and connected

together to define a rectangular shaped work surface, said work surface further being arranged for limited pivotal movement about an axis extending transversely between said end members and generally along a line midway between and parallel to said side members;

clamping means comprising a plurality of radial clamping cams, each of said cams being elongated along its length and extending generally perpendicularly from said work surface and in a common direction, each of said cams further having four cam surface along its length wherein first and second surfaces are arcuate shaped and oppositely disposed from one another and third and fourth cam surfaces are flat faced and oppositely disposed from one another and each cam having an axis of elongation, said cams further being located transversely between said two side members and forming two rows of cams, said rows being spaced apart and generally parallel to said end members and to each other and each cam in one row having a cam opposite itself in the other row with the axes of elongation of the oppositely disposed cams defining an associated common line and each of said axes of elongation being parallel to one another, each of said cams further being arranged for rotation about an axis extending lengthwise through the center of the cam;



linkage means comprising a driving bar and connecting bars, one end of said connecting bar being pivotally coupled to said driving bar and the other end of said connecting bar being fixedly connected to said cam, each of said connecting bars associated with a row of cams being substantially simultaneously with one another each of said cams in a said row between a nonclamping and a clamping position when said driving bar is operated between a first and second position, said cams being rotated to said nonclamping position for locating a workpiece between two adjacent cams in a row, said cam flat faces parallel to one another for accepting a workpiece placed between them, said cams being rotated to said clamping position for holding the workpieces in a spaced apart, parallel relationship with one another, said cam arcuate shaped surfaces of two adjacent cams engaging with the workpieces surface to clamp the workpiece in the desired position;  
 motor means coupled to the linkage means for operating said driving bar between said first and second positions, and rotating means for tilting said work surface about the pivot axis to one of a number of intermediate work positions to facilitate the welding of intersecting pieces of bar stock into said grating structure.



4,682,766

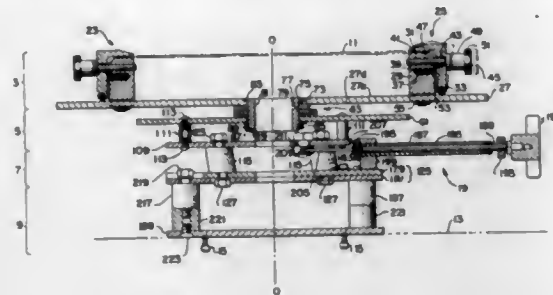
## X-Y-Z ROTATION POSITIONING SYSTEM USING FLEXIBLE MOUNTINGS

Vincent Barkley, Arlington, Va., assignor to Pace, Incorporated, Laurel, Md.

Filed Aug. 6, 1985, Ser. No. 762,843  
Int. Cl. B23Q 1/18

U.S. Cl. 269—71

34 Claims



1. A workpiece positioning apparatus for adjusting the position of a workpiece relative to a tool, said workpiece positioning apparatus comprising:

- workpiece holding means, having an axis of rotation, for releasably holding a workpiece, said workpiece holding means rotatable about said axis;
- first support means for rotatably supporting said workpiece holding means for rotation about said axis, said first support means movable substantially transversely of said axis;
- second support means for resiliently supporting said first support means for movement substantially transversely of said axis, said second support means yieldably resisting relative movement between said first support means and said second support means, said second support means movable substantially transversely of said axis;
- third support means for resiliently supporting said second support means for movement substantially transversely of said axis, said third support means yieldably resisting relative movement between said second support means and said third support means, said third support means fixedly positionable relative to said tool;
- rotation actuation means, operatively connected to said workpiece holding means and said first support means, for rotating said workpiece holding means about said axis of rotation relative to said first support means;
- first translation means, operatively connected to said first support means and said second support means, for moving said first support means, relative to said second support means, in a first direction substantially transverse to said axis of rotation;
- second translation means, operatively connected to said second support means and said third support means, for moving said second support means, relative to said third support means, in a second direction substantially transverse to said axis of rotation, said second direction substantially transverse to said first direction.

4,682,767

## APPARATUS FOR FOLDING AND DELIVERING SHEET MATERIAL

Francis J. Littleton, 182 McNair Rd., Buffalo, N.Y. 14221  
Filed Aug. 23, 1985, Ser. No. 768,897

Int. Cl. B41C 1/00

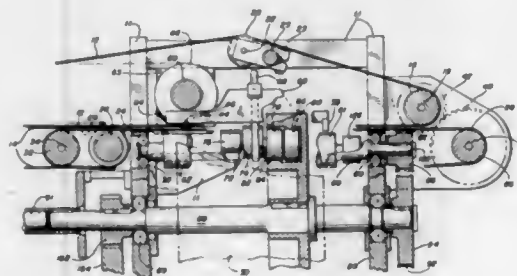
U.S. Cl. 270—45

5 Claims

1. An apparatus for folding individual sheets in a stream of spaced incoming sheets traveling at an initial lineal speed, comprising a slow-down section for decelerating each sheet, a chopping section downstream of the slow-down section for receiving the decelerated sheets from the slow-down section, successively forming a fold in the sheets, and directing the folded sheets to a delivery section; and a delivery section

downstream of the chopping section for receiving folded sheets from the chopping section and delivering the sheets to a desired station; wherein

- a. the slow-down section comprises a first slow-speed conveyor means having a lineal speed substantially less than said initial lineal speed of the incoming sheets, a first snubber means spaced apart from the face of the first slow-speed conveyor means, the incoming sheets being received between the first snubber means and the face of the first slow-speed conveyor means, and means for driving the first snubber means in synchronism with the arrival of the sheets so as to press the tail of each incoming sheet into engagement with the first slow-speed conveyor means, which thereafter transports the sheets to the chopping section;
- b. the chopping section comprises a support means for receiving and supporting a sheet arriving from the slow-speed section and including a slot oriented in a predetermined relation to the position of a sheet received and supported by the support means, a chopper plate, means for controllably reciprocating the chopper plate through



the slot between a first position above the support means and a second position below the support means, thereby engaging and initiating a fold in a sheet received and supported by the support means, and nip means positioned below the slot in the support means for receiving the leading edge of the folded sheet from the chopper plate, pressing the sheet to complete the fold in the sheet, and directing the folded sheet to the delivery section; and

- c. the delivery section comprises a second slow-speed conveyor means having a lineal speed less than the lineal speed of the sheets supplied to the delivery section by the chopping section and a second snubber means spaced apart from a face of the second slow-speed conveyor means, the sheets from the chopping section being received between the second snubber means and the face of the second slow-speed conveyor means, and means for driving the second snubber means in phase with the arrival of the tail of the sheets so as to press the tail of each sheet onto the second slow-speed conveyor means to slow the sheet to the speed of the second slow-speed conveyor means.

4,682,768

## BILL RECEIVING/DISPENSING APPARATUS

Koujiro Iida, Kagamigahara; Yasuo Yoshioka, Gifu; Hiroshi Ogawa, Inazawa; Kiyoshi Haruno, and Tsugio Ohgashi, both of Aichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP84/00473, § 371 Date Jun. 5, 1985, § 102(e) Date Jun. 5, 1985, PCT Pub. No. WO85/01820, PCT Pub. Date Apr. 25, 1985

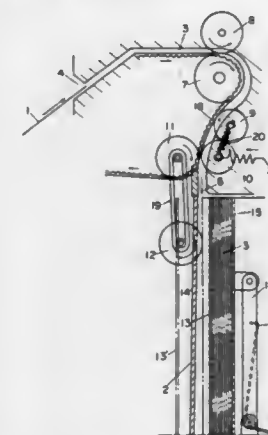
PCT Filed Oct. 5, 1984, Ser. No. 744,488

Claims priority, application Japan, Oct. 11, 1983, 58-188522; Oct. 11, 1983, 58-188523

Int. Cl. B65H 3/46

U.S. Cl. 271—3.1

6 Claims



1. A bill receiving/dispensing apparatus comprising:

- a passage with a conveying device for conveying a bill inserted through a slot;
- a bill storing device communicating with said passage for storing bills conveyed in a first direction by said conveying device in a neatly arranged stack; said conveying device being configured to rotate forwardly to convey bills to said storing device and reversely to convey stored bills to said slot when bills are paid out from said bill storing device; and
- a reversing roller for rotating reversely relative to a bill conveying direction of said conveying device, said reversing roller being provided in said passage and disposed at a position facing said conveying device in the vicinity of said bill storing device, said reversing roller causing only a single bill at a time to be completely extracted from said bill storing device and conveyed to said slot by said conveying device.

4,682,769

## SHEET SUPPLYING APPARATUS

Reiji Murakami, Yokohama; Shinichi Hashimoto, Fujisawa; Mamoru Shimono, Yokohama, and Fumito Ide, Zama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 22, 1984, Ser. No. 643,275

Claims priority, application Japan, Aug. 26, 1983, 58-155753

Int. Cl. B65H 3/06

U.S. Cl. 271—10

2 Claims

1. A sheet supplying apparatus for supplying a sheet from a stored location, comprising:

- sheet storing means for storing sheets;
- pickup means for picking up sheets from said sheet storing means one by one, said pickup means including a substantially semi-cylindrical pickup roller which is rotatable about a fixed axis and which has a contact surface which contacts a sheet to be picked up and a flat noncontact surface as a part of a peripheral surface thereof, said flat surface being smaller in area than an area of a plane passing through the center of the pickup roller;
- register means for aligning the sheet picked up by said

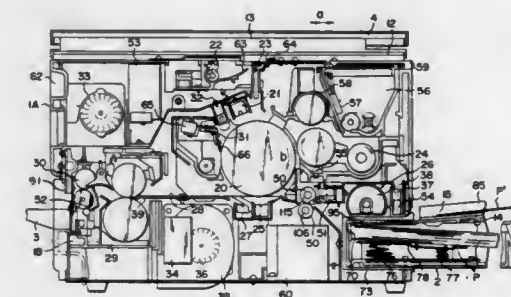
pickup roller and for supplying the picked up sheet to the sheet feed location, said register means including a pair of rotatable register rollers which contact each other at a nip portion thereof;

guide means for guiding the picked up sheet along said flat surface of the pickup roller into said nip portion between the register rollers; and

driving means for: first, rotating only said pickup roller to pick up the sheet and to transport the sheet to a location where the leading edge of the picked up sheet abuts against the nip portion of said register rollers, next, stopping the rotation of the pickup roller while keeping the trailing edge of the sheet engaged with said pickup roller thereby ensuring that alignment of the sheet is maintained, and next rotating simultaneously the pickup roller and at least one of the register rollers to supply the aligned sheet to the sheet feed portion;

wherein said driving means includes:

- a first drive shaft on which said pickup member is mounted, said first drive shaft being arranged to rotatably support said pickup member;
- a first drive gear mounted on said first drive shaft;
- first clutch means, arranged between said first drive shaft and said first drive gear, for controlling transmission of a driving force from said first drive gear to said first drive shaft;
- a second drive shaft on which one of said pair of register rollers is mounted, said second drive shaft being arranged to rotatably support said one of said pair of register rollers;
- a second drive gear mounted on said second drive shaft;



second clutch means, arranged between said second drive shaft and said second drive gear, for controlling transmission of a driving force from said second drive gear to said second drive shaft;

connecting means for connecting said first drive gear and said second gear so as to transmit the driving force therebetween;

a drive source for driving at least one of said first drive gear and said second drive gear;

first controlling means for controlling a timing of transmission of the driving force by said first clutch means; and second controlling means for controlling a timing of transmission of the driving force by said second clutch means; and

wherein said first clutch means includes:

- an arbor fitted and fixed around said first drive shaft;
  - a spring wound around said arbor and having one end fixed on said arbor; and
  - a sleeve formed to surround said spring, said sleeve being fixed on said first drive gear, the other end of said spring being stopped by said sleeve wherein said sleeve has said first and second engaging projections which are spaced apart from each other at a predetermined angular interval along a circumferential direction thereof, and
- said first clutch means does not transmit the driving force from said first drive gear to said first drive shaft when a first or second engaging projection is stopped, and said first clutch means transmits the driving force when said

first or second engaging projection is not stopped, and wherein said first controlling means includes:

- a solenoid; and
- a swingable stop lever, disposed in a vicinity of said solenoid, for engaging with said first engaging projection when said solenoid is energized to attract the stop lever and engaging with said second engaging projection when said solenoid is deenergized.

4,682,770

# OUTPUT DEVICE IN A PRINTING MECHANISM FOR SINGLE DOCUMENTS SEPARATED FROM A PERFORATED CONTINUOUS-FORM PAPER WEB

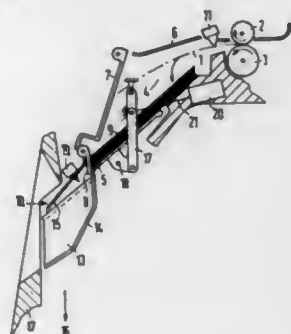
Josef Dempf, Klosterlechfeld, and Erich Moser, Taufkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany  
Filed Jan. 22, 1986, Ser. No. 820,803

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502515

Int. Cl.<sup>4</sup> B65H 43/08

U.S. Cl. 271-176

7 Claims



1. An output device in a printing mechanism for single documents separated from a perforated continuous-form paper web wherein the documents are transported into an output stacker after the printing and parting operation, the operation being enabled by user-associated authorization cards which are insertable into a badge reader, comprising: a collection stacker, which is not accessible from the exterior of said mechanism, for collecting all documents of a user preceding said output stacker, being situated above said output stacker, a retention mechanism provided at the output of said collecting stacker, a document supporting surface projecting into said output stacker and at least two braking elements resiliently supported on said supporting surface being provided in said collecting stacker, said retention mechanism being situated such that the output of said collecting stacker that said documents slide into said output stacker given an opened retention mechanism, said retention mechanism opening after the arrival of the last document with respect to the individual user and initiating further transport of all documents contained in said collecting stacker into said output stacker in common.

4,682,771

# MASSAGE-FUNCTIONAL PEDAL STRUCTURE

San B. Jean, 81-1, Hsin Hsing Rd., Toucheng Jenn, I-LAN Shiana, Taiwan

Filed Sep. 18, 1985, Ser. No. 777,452

Int. Cl.<sup>4</sup> A63B 21/00

U.S. Cl. 272-73

12 Claims

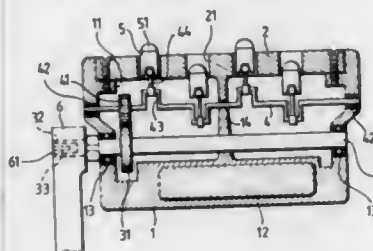
1. A pedal for a rotary crank exercise apparatus which has a massaging effect on a user's foot comprising:

- a pedal body having an opening on one end thereof, said opening extending inwardly of said pedal body to define a hollow interior;
- a rotating shaft rotatably mounted in said interior of said pedal body, said shaft having a gear connected thereto in said interior of said pedal body and means on an end of

said rotating shaft for attachment to a crank arm of an exercising apparatus;

at least one crank shaft rotatably mounted in said pedal body, each said crank shaft having a pinion engaging said gear of said rotating shaft for imparting rotation to each said crank shaft when said rotating shaft is rotated, each said crank shaft having a plurality of offset portions within said interior of said pedal body;

a face board having a plurality of through-holes each of which corresponds to one of said offset portions, said face board mounted in said opening of said pedal body;



a plurality of elongated cylinders each of which is slidably disposed in a respective through-hole of said face board; and

a plurality of links each of which is pivotally connected at one end thereof to a respective elongated cylinder and at the other end thereof to a corresponding one of said offset portions, each of said links having a length which causes a corresponding elongated cylinder to reciprocate from positions above and below an outer surface of said face board when said rotating shaft is rotated to thereby produce a massaging effect on the sole of a user's foot.

4,682,772

# PLAYGROUND EQUIPMENT INCLUDING VANDAL RESISTANT MECHANICAL ASSEMBLY

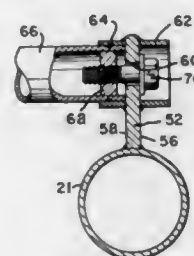
Gerald P. Skalka, Washington, D.C., assignor to Victor Stanley, Inc., Dunkirk, Md.

Filed May 30, 1985, Ser. No. 740,053

Int. Cl.<sup>4</sup> A63B 9/00

U.S. Cl. 272-113

18 Claims



1. A mechanical assembly providing a vandal resistant connection between first and second structural members comprising:

a front lower lug plate extending rearwardly from said first structural member and having first and second parallel surfaces between which a bolt receiving opening extends; open-ended tubular sleeve means extending outwardly both from said first and second parallel surfaces in surrounding relation to said bolt receiving opening;

said second structural member comprising a front lower hollow tube having an outer diameter no greater than the inner diameter of said open-ended tubular sleeve members so as to matingly fit therein with one end facing one of said parallel surfaces and plug means positioned internally of said front lower hollow tube inwardly of said one end

thereof and including a threaded bore in alignment with said bolt receiving opening; and

bolt means extending through said bolt receiving opening and threadably received in said threaded bore and having a bolt head fully enclosed within said tubular sleeve means and engaged with the other of said parallel surfaces for providing a fixed connection between said first and second structural members.

4,682,773

# BASEBALL TRAINING BAT

Gino Pomilia, 111 Palm Ave., Corte Madera, Calif. 94925

Continuation of Ser. No. 554,027, Jan. 23, 1984, abandoned, which is a continuation of Ser. No. 323,726, Nov. 23, 1981, abandoned, and Ser. No. 121,999, Feb. 19, 1980, abandoned. This application May 28, 1985, Ser. No. 737,907

Int. Cl.<sup>4</sup> A63B 69/40

U.S. Cl. 273-26 B

31 Claims



1. A bat comprising an elongated hollow tubular member having opposite ends said elongated hollow tubular member being between 32 and 36 inches in length and between 48 and 55 ounces in weight, and, said hollow tubular member having a central cavity and including a handle portion adapted to be gripped by a batter and a shaft portion extending from said handle portion and providing a striking surface for a thrown ball, means within said central cavity for reinforcing said hollow tubular member against bending, the handle portion having a generally uniform diameter along its length, said shaft portion having a diameter along the length thereof which is substantially equal to that of the diameter of said handle portion, the weight to length ratio of said bat being substantially constant along the length of said bat, and the diameter of said shaft portion being substantially uniform along the length thereof so that the striking surface for said bat is of uniform diameter from the handle portion through the end of said shaft portion remote from said handle portion and so that said striking surface is smaller in diameter than that of a conventional bat having a flared striking surface.

4,682,774

# COLLAPSIBLE, RE-COMBINATIVE MARTIAL-ARTS WEAPON

Stephen M. Holy, Urbana, Ill., assignor to Joseph Arvidson; Sharon K. Wells and Thomas E. Skoza, all of Champaign, Ill.

Filed Oct. 31, 1985, Ser. No. 793,271

Int. Cl.<sup>4</sup> A63B 59/00

U.S. Cl. 273-84 R

6 Claims

1. A knockdown, re-combinative martial-arts weapon comprising in combination:

an elongated center component having a first end compris-

ing a first coupling element thereof, and a second end comprising a second coupling element thereof, each said coupling element allowing attachment of the respective end of said center component to an end of another component having a mating coupling element thereof;

a first elongated end-piece component having a first end comprising a third coupling element thereof for mating engagement with another end of a different component, and a second end remote from said first end;

at least one flexible-link component having a first end comprising a fourth coupling element for attachment to an end of one of said first elongated end-piece component and said elongated center component, and a second end remote from said first end; said flexible-link component comprising a flexible, elongated member that is capable of winding around an object at which it was thrown, said flexible, elongated member comprising one end secured to said fourth coupling element, and another end remote from said one end;

whereby said components may be interchangeably arranged to form different martial-arts weapons;

said flexible-link component comprising a fifth coupling element, said another end of said flexible, elongated mem-



ber being secured to said fifth coupling element, such that said flexible-link component is capable of being connected between one end of said center component and one end of said end-piece component, so that said end-piece component and said center component may be moved relative to each other about said flexible, elongated member of said flexible-link member;

said fourth coupling element of said flexible-link component comprising at least a partially-hollow interior on the face thereof facing said fifth coupling element when said flexible-link component is extended linearly along a line, said one end of said flexible elongated member being attached within said hollow interior; said fourth coupling element having an opening at the end thereof; and said fifth coupling element comprising a projecting portion for mating engagement in said opening of said fourth coupling element, so that said flexible member may be hidden and stored in said hollow interior of said fourth coupling element when said projecting portion is inserted into said opening, and may be alternatively exposed and extended for use by which said end-piece component and said center component may be given relative movement therebetween via the adjacent ends connected to the ends of said flexible-link component.

4,682,775

# GOLF SWING TRAINING DEVICE

John M. Wood, 4849 35th St., San Diego, Calif. 92116

Filed Feb. 24, 1986, Ser. No. 832,065

Int. Cl.<sup>4</sup> A63B 69/36

U.S. Cl. 273-186 A

5 Claims

1. A golf swing training device comprising:

a primary clamp assembly for attaching the training device

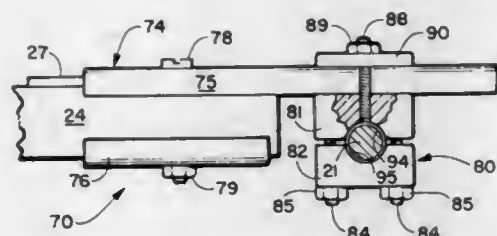


to the shaft of a golf club such as an iron or a wood, said primary clamp assembly having a front end, a rear end, a top surface and a bottom surface, said primary clamp assembly having a top block member and a bottom block member, the bottom surface of said top block member and the top surface of said bottom block member having mating semi-cylindrical channels in them for receiving the shaft of a golf club;

an elongated training arm having a predetermined length at least 16 inches long, said training arm being formed of a rigid material;

a secondary clamp assembly having a channel shaped top bracket and channel shaped bottom bracket and one end of said training arm being clamped between them; and

an elongated connecting plate having its rear end rigidly



attached to the top surface of said channel shaped top bracket and its front end pivotally mounted to the top surface of said primary clamp assembly, means for locking said front end of said elongated connecting plate at predetermined angles so that the free end of said elongated training arm would be in close proximity to an area slightly below the right knee of a right handed golfer as he addresses the golf ball with his club face square to the proposed direction of flight of the ball, the free end of said elongated training arm being free to travel past the golfer's right knee so long as the face of his club head is square or closed, but will cause the free end of said elongated training arm to strike his leg below his knee if the club head reaches the ball with its face oriented in an open position which would cause the ball to travel in a trajectory known as a slice.

4,682,776

**USER WORN ARM BEND CONTROL DEVICE**

William Mitchell, 618 S. Seventh St., Delavan, Wis. 53115, and Herbert Langston, 501 E. 32nd, Apt. 1211, Chicago, Ill. 60616

Filed Nov. 6, 1985, Ser. No. 795,327

Int. Cl. A63B 69/36

U.S. Cl. 273—189 A

14 Claims

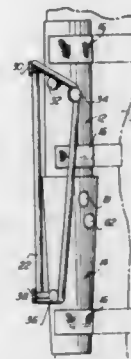
1. An arm-straightening and locking device with automatic releasing means for bowlers and golfers, comprising:

a first, upper shell-portion for placement about the upper, rear portion of an arm;

a second, lower shell-portion for placement about the lower, rear portion of an arm of a bowler or golfer;

means for pivotally connecting the lower end of said first shell-portion to the upper end of said second shell-portion to allow relative rotation therebetween, such that said shells may be in rectilinear alignment in a first relative orientation, and may be positioned at an angle relative to each other in a second relative orientation;

biasing means operatively connected with each of said first and second shell-portions for urging in a first relative orientation where they are in a substantial rectilinear



alignment, and for urging in a second state thereof said first and second shell-portions away from said first relative rectilinear orientation toward said second relative orientation where said shell-portions are positioned at an angle with respect to each other, such that at the point of follow-through said shell-portions are allowed to have relative rotational movement upon the application of sufficient force to cause said biasing means to take said second state thereof; and

means for mounting said biasing means in said first state and said second state, and for allowing movement of said biasing means between said first and second states.

4,682,777

**BOARD GAME**

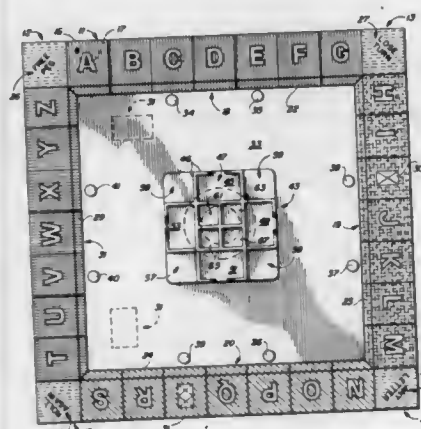
Thomas J. Wood, 2249 W. Villa Maria, Phoenix, Ariz. 85023

Filed Jul. 10, 1986, Ser. No. 883,925

Int. Cl. A63F 3/00

U.S. Cl. 273—243

20 Claims



15. A word/definition/spelling board game apparatus comprising:

a generally rectangular game board having four corner spaces and four sets of seven playing spaces each disposed

sequentially between opposite corner spaces, each of said four sets of player spaces having a different and distinct characteristic color and each of said player spaces bearing indicia means, wherein 26 of said player spaces bear a different and distinct alphabetical letter of one of the 26 letters of the alphabet and the remaining two of said player spaces bearing a first and second special symbol means respectively;

four player pieces each having a different and distinct characteristic color corresponding to the different and distinct characteristic colors of the four sets of the player spaces, respectively;

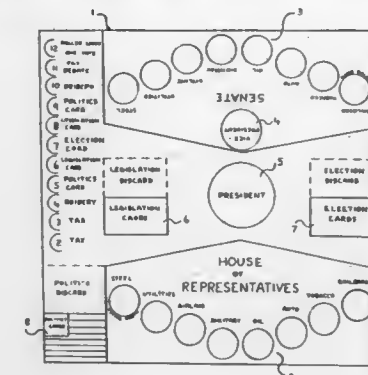
four sets of marker means, each set of marker means including a different and distinct characteristic color corresponding to the colors of said player pieces;

four sets of cover tiles, each of said sets of cover tiles having a different and distinct characteristic color corresponding to the colors of said player pieces; and

a deck of playing cards including four sub-decks each having a different and distinct characteristic color corresponding to the colors of said four player pieces, each of the cards within a given colored set including a plurality of definitions on one side thereof and the plurality of properly spelled words corresponding to said definitions on the other side of said card, the predetermined number of definitions and words on each card being dependent upon the particular number of letters of the alphabet on a particular side of the board corresponding to said different and distinct characteristic color; and

chance means for determining the number of spaces a player piece moves on a given turn, the player space on which the player piece lands on a given turn having its different and distinct characteristic color of that given set of player spaces used to decide the color of card selected for that player, and the definition selected depending upon the first letter of the word to be defined on said card corresponding to the particular letter indicated on the player space on which the player piece is located on that turn.

indicia thereon corresponding to said second indicia on said board so that upon manipulation of said second die, the players



will be directed to one of the instructions on the board associated with one of the second indicia.

4,682,779

**EXPLOSIVELY DRIVEN LATCH/SEAL DEVICE**

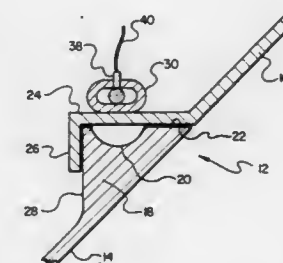
Robert A. Feight, 22331 Covello St.; Vance W. Jaqua, 6916 Shoup Ave., both of Canoga Park, Calif. 91303, and Joseph Trom, Jr., 63 N. Locust Ave., Agoura, Calif. 91301

Filed Aug. 10, 1984, Ser. No. 639,556

Int. Cl. B23K 31/02; F16J 15/46; F16L 39/00

U.S. Cl. 277—34.3

16 Claims



4,682,778

**POLITICAL GAME UTILIZING DIE WITH INTERCHANGEABLE FACES**

Wayne H. Willis, 2420 Albany Ave., Loveland, Colo. 80537, and Keith M. Willis, 8 W. Olive St., Marshalltown, Iowa 50158

Filed Mar. 13, 1986, Ser. No. 839,262

Int. Cl. A63F 3/00

U.S. Cl. 273—257

3 Claims

1. A board game for a plurality of players comprising: a game board, a plurality of cards and at least two dice; said game board having indicia located thereon representing a Senate voting area and a House of Representatives voting area, each voting area having associated therewith a plurality of representations of different industries, each of said industries being represented by a different first indicia, said game board further including a plurality of second indicia, each of said second indicia having associated therewith instructions for the players during play of the game; said plurality of cards having indicia thereon representing various opportunities for election and various advantageous or detrimental instructions to the players during play of the game; said at least two dice comprising a first die and a second die, said first die having a plurality of faces, each of said faces having indicia thereon corresponding to said first indicia on said board, said first indicia on said faces of said first die being removably attachable such that said first die can display various combinations of said first indicia dependent upon the number of players playing the game, said second die having a plurality of faces with each face having

1. Means for latching and sealing the forward end of an extendible, mating, section and the rear end of an associated, fixed, mating section after full extension of the extendible section comprising:

an axially extending flange affixed to the front end of the extendible section and having an inner surface;

a radially extending projection affixed to the rear end of the fixed section and having an outer surface adjacent to the inner surface of the extendible section, said projection being formed with a recess therein opening inward from said outer surface;

a deformable member in close proximity to the recess, said member defining a container;

explosive means contained within said deformable member; and

means for detonating said explosive means to expand the deformable member, the expansion causing a seal to occur

between the flange and the projection whereby the two are locked together and sealed in the recess area.

4,682,780

# ROD CHUCKING DEVICE FOR A PERFORATOR FOR PERFORATING A PIG IRON DISCHARGE OPENING IN A BLAST FURNACE

Kenichiro Kurama, Hiroshima, and Michiyasu Shibata, Yokohama, both of Japan, assignors to Mazda Motor Corporation, Hiroshima and Nippon Kokan Kaisha, Tokyo, both of Japan

PCT No. PCT/JP85/00205, § 371 Date Feb. 10, 1986, § 102(e) Date Feb. 10, 1986, PCT Pub. No. WO85/04904, PCT Pub. Date Nov. 7, 1985

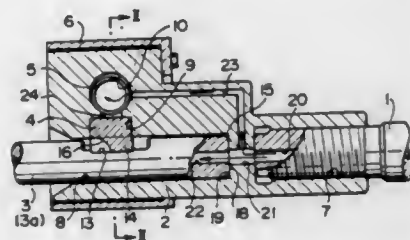
PCT Filed Apr. 16, 1985, Ser. No. 824,706

Claims priority, application Japan, Apr. 16, 1984, 59-56327

Int. Cl.<sup>4</sup> B23B 31/06; C21C 3/48

U.S. Cl. 279—79

7 Claims



1. A rod chucking device for a perforator for perforating a pig iron discharge in a blast furnace, said rod chucking device comprising

- a rod insert hole formed in a front portion of said socket for mounting a perforating rod, said perforating rod being inserted into said rod insert hole,
- a cotter for securing said perforating rod, said cotter being slidably mounted in a cotter hole formed in said socket perpendicularly to said rod insert hole so that said perforating rod is adapted to be locked in said socket, said cotter being disposed movably between an engage position and a disengage position,
- a spring for urging said cotter towards said engage position,
- a rod connecting hole for connecting said impact rod with said socket, said rod connecting hole being in communication with a spring mount hole through an air passage so that air supplied from said impact rod is injected into said spring mount hole through said air passage to chill said spring.

4,682,781

## SLED SKIS

James Dickens, 28 Westland St., Hartford, Conn. 06120  
Filed Feb. 20, 1986, Ser. No. 831,933

Int. Cl.<sup>4</sup> B62B 13/04

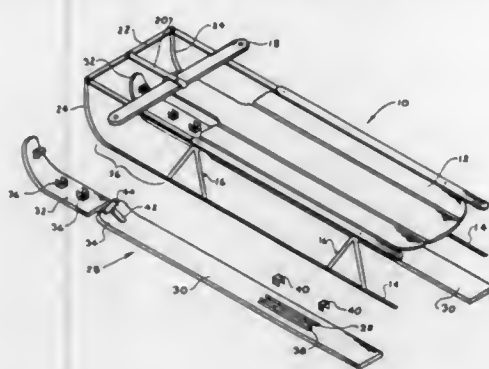
U.S. Cl. 280—22

3 Claims

1. In a snow sled comprising a platform supported by two essentially parallel sled rails, a portion of each sled rail being actuated by a steering means and defining a bendable steering portion and a non-steering portion, the steering portion of each sled rail being upwardly curved at a forward end thereof, the improvement comprising:

- a pair of sled skis adapted for attachment to the sled rails, said sled skis being wider than the sled rails;
- wherein each of said sled skis includes two separate and unattachable pieces, a first piece having a curve corresponding to the bendable steering portion of each sled rail and being attachable to said sled rail steering portion, and a second piece corresponding to and being attachable to the non-steering portion of each sled rail;

wherein said second piece of said sled ski has an upwardly curved portion at a forward end thereof; and including a recessed slot extending longitudinally through the central



portion of said upwardly curved portion of said second piece said recessed slot adapted to receive said sled rail therein and means for releasably retaining said sled rail within said recessed slot.

4,682,782

# SHOPPING CART WITH IMPROVED BABY SEAT

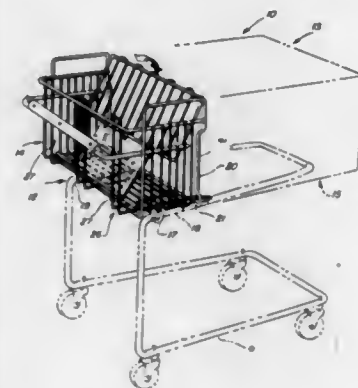
Frank Mills, Rockford, Ill., assignor to Tote-Card Company, Rockford, Ill.

Continuation of Ser. No. 754,705, Jul. 15, 1985, abandoned. This application Nov. 7, 1986, Ser. No. 928,716

Int. Cl.<sup>4</sup> B62B 3/00

U.S. Cl. 280—33.99 B

20 Claims



1. In a shopping cart having a wheeled frame and a basket carried on the frame and defining a horizontal rear seat portion and an upright rear wall having leg holes for passing rearwardly therethrough the legs of a baby sitting on said rear seat portion in a baby seat at the rear of the basket, the improvement comprising:

- wall means;
- mounting means swingably mounting said wall means to said basket for disposing the wall means to selectively define
  - (a) a seat back upstanding from said rear seat portion for supporting the back of a baby sitting in said baby seat space with the legs of the baby extending rearwardly through said leg holes, and
  - (b) a downwardly hanging leg hole closure for closing said leg holes with said baby seat space opening forwardly in said basket whereby the entire basket may be used to receive objects and passage of such objects rearwardly through said leg holes from the basket is effectively prevented, said mounting means comprising a first panel pivotally connected to said basket forwardly closely spaced from said rear wall, and said wall

means comprising a second panel pivotally connected to said first panel to lie against said rear wall when disposed to close said leg holes, said first panel being inclined rearwardly upwardly from the said rear seat portion and said second panel hanging downwardly from said upwardly inclined first panel between said first panel and said rear wall of the basket when said wall means and mounting means are in the leg hole closing disposition.

4,682,783

## WHEEL CHAIR

Rainer Kuschall, Basel, Switzerland, assignor to Paratec AG, Basel, Switzerland

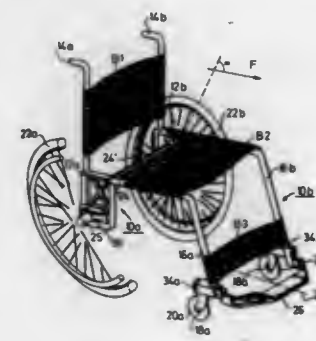
Filed Oct. 17, 1983, Ser. No. 542,655

Claims priority, application Switzerland, Oct. 20, 1982, 6097/82

Int. Cl.<sup>4</sup> A47C 4/28; A61G 5/02; B62M 1/14

U.S. Cl. 280—242 WC

25 Claims



1. A foldable wheelchair movable along a predetermined direction of movement,

- comprising in combination
- first and second side frames,
- drive wheels and travelling wheels rotatably supported on said side frames, and
- folding means extending between said side frames, movable between a folded position and an unfolded position, and including

first and second pivoting means, said first and second pivoting means each including two rods, said rods of said first pivoting means being substantially U-shaped, said rods of said first and second pivoting means being pivotable towards one another in a scissor-like manner about a respective center axis extending approximately along said direction of movement, each pivoting means having ends facing away from its respective center axis, and

at least one stop means operative in the unfolded position of said folding means, said stop means being encountered by at least one of said rods, said stop means including at least one crossbar secured to both sides of one rod at an end thereof remote from said respective center axis so as to abut in the unfolded position of said folding means onto the other of said rods,

each side frame defining first and second pivot axes, extending substantially parallel to said center axes,

the ends of said first pivoting means being pivotable about corresponding of said first pivot axes, and the ends of said second pivoting means being pivotable about corresponding of said second pivot axes,

said center axis of said first pivoting means and said first pivot axes being substantially aligned in a first plane, said center axis of said second pivoting means and said second pivot axes being substantially aligned in a second plane when said folding means is in said unfolded position, said pivoting means being arrestable in said unfolded position, thereby rigidly connecting said side frames to one another.

184—024 O.G.—87—6

4,682,784

# WHEELCHAIR WITH VARIABLE RATIO PROPULSION

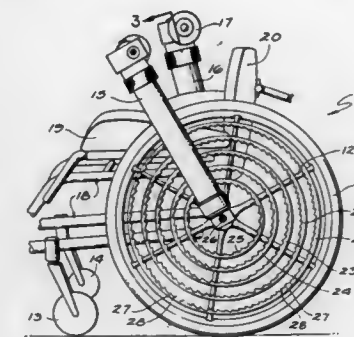
Jack E. Anderson, 17787 Owen St., Fontana, Calif. 92335

Filed May 19, 1986, Ser. No. 864,472

Int. Cl.<sup>4</sup> B62M 1/14

U.S. Cl. 280—242 WC

20 Claims



1. A user propelled wheelchair or the like having a pair of relatively large driven wheels each mounted on and independently rotatable about an axle supported by the frame of said wheelchair, comprising:

first means including a plurality of concentric ratchet rings rigidly mounted in radially spaced relationship on said wheels;

second means including a pair of levers pivoted about said axles, one of said levers being installed on each side of said wheelchair for propelling said wheelchair by backward and forward pumping action of said levers;

third means including a plurality of pawls associated with each of said levers, said pawls being arranged such that only one pawl is operatively associated with a corresponding one of said ratchet rings at any one time, said ratchet rings having a sawtooth surface pattern such that said operative pawl slides over said ratchet ring during one directional sense of said lever pumping action and engages said sawtooth surface to impart a torque thereto during the other sense of said long pumping action; and user controlled means for selecting the one of said pawls in operative relationship with a corresponding ratchet ring for effecting change of the torque ratio between said levers and said driven wheels.

4,682,785

## CROSS-COUNTRY SKI BINDING

Roland Jungkind, Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG, Herzogenaurach, Fed. Rep. of Germany  
PCT No. PCT/DE85/00052, § 371 Date Oct. 22, 1985, § 102(e) Date Oct. 22, 1985, PCT Pub. No. WO85/03643, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 22, 1985, Ser. No. 796,018

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406439; Jul. 20, 1984, 3426856

Int. Cl.<sup>4</sup> A63C 9/00

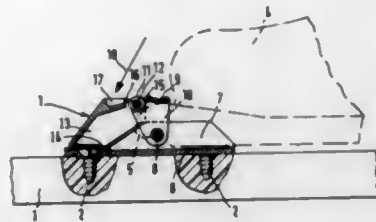
U.S. Cl. 280—615

10 Claims

1. A cross country ski binding for cross-country ski boots having a forwardly extended front sole end portion, which is formed as a downwardly directed hook means, comprising a base plate mountable on a ski, a pair of side jaws extending upwardly from said base plate on opposite sides thereof for holding said front sole end portion therebetween, engagement means for cooperation with said hook means, a transverse member mounted in said side jaws and transversely extending therebetween, a U-shaped stirrup member having a web portion extending parallel with respect to said transverse member and having a pair of limb portions each projecting from a respective end of said web portion and having a free end by means of which said stirrup member is pivotally mounted on



said transverse member, spring means for urging said stirrup member into a position wherein said front sole end portion, when engaged with said engagement means, is clamped between said web portion and said base plate, and a thrust member pivotably connected to said stirrup member at one end and



bearing on a portion of said base plate at the other end to be pivotable about an axis extending parallel to said web portion with said thrust member moving in the longitudinal direction of said ski and pivoting about said axis when said stirrup member is pivoted about said transverse member.

#### 4,682,786 SAFETY SKI BINDING

Henri Peyre, Nevers, France, assignor to Ste Look, French Societe Anonyme, Nevers, France

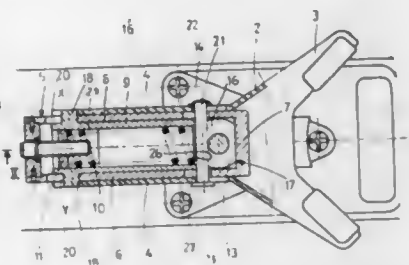
Filed Sep. 20, 1985, Ser. No. 778,244

Claims priority, application France, Oct. 4, 1984, 84 15229; Jul. 24, 1985, 85 11302

Int. Cl.<sup>4</sup> A63C 9/00

U.S. Cl. 280—628

7 Claims



1. A safety ski binding comprising a boot-retaining jaw unit for securing either the toe end or the heel end of a ski boot, said boot-retaining jaw unit being mounted on a rotary body for upward pivotal displacement relative to said rotary body, said rotary body being in turn rotatably mounted on a pivot which is perpendicular to the ski and being maintained in a normal position thereof by a resilient mechanism comprising two flat faces which are formed on said pivot in opposite directions and against which a bearing surface formed on said rotary body and a piston housed within said rotary body are applied respectively by a single spring, said boot-retaining jaw unit being maintained in a normal position thereof by a cross-pin whose ends are in contact with guide ramps carried by said boot-retaining jaw unit, wherein:

- the first face against which said rotary body is applied is smaller in width than the flat face against which said piston is applied;
- said flat face against which said rotary body is applied is oriented in the direction opposite to the ski-boot location;
- the pivotal axis of said boot-retaining jaw unit is carried by said piston;
- said cross-pin is interposed between said piston and said pivot; and
- said guide ramps being sized, shaped, and positioned to produce a forward movement of said boot-retaining jaw unit upon upward pivotal displacement of said boot-

retaining jaw unit by virtue of the fact that said cross-pin bears on said guide ramps.

#### 4,682,787 STEERING UNIT AND CONTROL LEVER CONSOLE FOR A VEHICLE

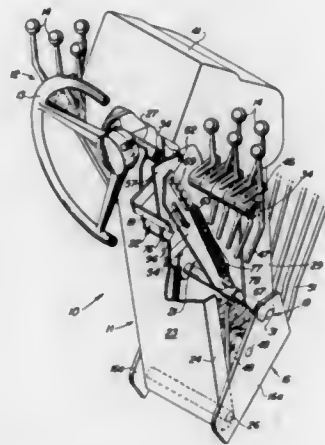
Martin L. Ruhter, and Allan F. Loney, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 21, 1986, Ser. No. 821,387

Int. Cl.<sup>4</sup> B62D 1/18

U.S. Cl. 280—775

11 Claims



1. A steering unit and control lever console for a vehicle comprising:
  - pedestal means for supporting the vehicle steering unit and at least one vehicle control lever;
  - platform means pivotally mounting said pedestal means in an upward position on the vehicle for movement about a transverse axis to adjust the position of said pedestal means;
  - locking means pivotally mounted on said platform means for locking said pedestal means against pivotal movement upon movement of said pedestal means to an adjusted position; and
  - release means for disengaging said locking means whereby said pedestal means is pivotally movable to an adjustable position,
  - handle means pivotally secured to said pedestal means and protruding forwardly therefrom and disposed below the steering unit.

#### 4,682,788 STEERING COLUMN SUPPORT STRUCTURE FOR A VEHICLE STEERING MECHANISM

Toshiteru Yoshimura, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 17, 1985, Ser. No. 809,753

Claims priority, application Japan, Dec. 21, 1984, 59-270471

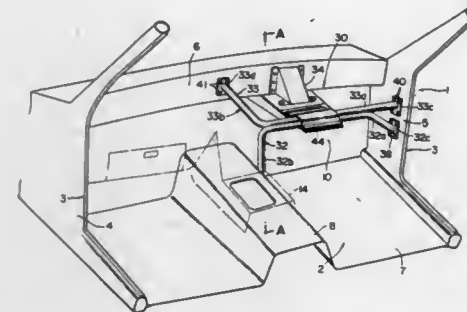
Int. Cl.<sup>4</sup> B62D 1/16

U.S. Cl. 280—779

9 Claims

1. A vehicle steering column support structure including cowl side panels extending at the opposite sides of a vehicle body forwardly from door hinge pillars, a cowl inner panel extending transversely of the vehicle body and having opposite ends secured to the cowl side panels, respectively, a first support member in the form of a hollow rod, said first support member having a first portion connected at one end with one of the cowl side panels and extending along said cowl inner panel substantially to a transverse center portion of the vehicle body, said first support member having a second portion integrally formed with said first portion to extend downward from the other end of the first portion and having a lower end se-

cured to a floor panel of the vehicle body, a second support member in the form of a hollow rod, said second support member having a first portion secured at one end to said one cowl side panel and extending along said cowl inner panel substantially to a transverse center portion of the vehicle body, said second support member having a second portion integrally formed with said first portion to extend forward from the other end of the first portion of the second support member and having a forward end secured to the cowl inner panel, the first portions of the first and second support members being



arranged in substantially parallel relationship with each other, bracket means connecting said first portion of the first support member and said first portion of the second support member with a steering column assembly to support the steering column assembly by said first portions of the first and second support members, said bracket means including a first bracket member connecting together said first portion of the first support member and said first portion of the second support member, and a second bracket member connecting the steering column with said first bracket member.

#### 4,682,789 SEAT BELT FORWARDING DEVICE

Kazuo Higuchi; Takayuki Sugama; Hisakazu Okuhara, all of Utsunomiya, and Kiichi Sasaki, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

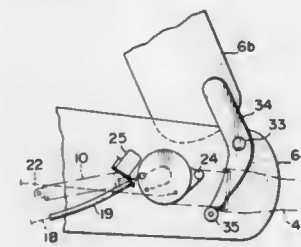
Filed Nov. 4, 1985, Ser. No. 794,634

Claims priority, application Japan, Nov. 2, 1984, 59-231765

Int. Cl.<sup>4</sup> B60R 22/02

U.S. Cl. 280—801

1 Claim



1. A seat belt forwarding device for facilitating the fastening of a seat belt by rotating a rotary arm carrying an end of the seat belt in a forward direction, in conjunction with a walk-in type seat, comprising:

- a rotary unit for forwardly rotating the rotary arm in response to a closing action of a door and backwardly rotating the rotary arm in response to an opening action of the door; and
- said rotary unit controlling the backwardly inclined position of the rotary arm in such a manner that the rotary arm may be positioned along a seat back when the seat back is in its upright position and substantially along a floor behind the seat when the seat back is in its forwardly inclined position, wherein said rotary unit comprises a cam means provided in a lower portion of the seat back for coopera-

tion with a base end of the rotary arm, wherein said cam members comprises a roller supported by a lower end of a reclining plate serving as a hinge member between a main body of the seat and the seat back.

#### 4,682,790 WEBBING RETAINING STRUCTURE

Mitsuaki Katsuno; Toshio Gyoda; Hideki Tanaka; Kunihiro Harumoto; Noritada Yoshitsugu, and Kenji Matsui, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

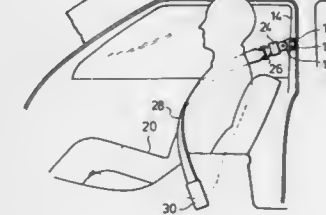
Filed Mar. 27, 1986, Ser. No. 844,585

Claims priority, application Japan, Mar. 29, 1985, 60-46252; Mar. 12, 1986, 61-35733

Int. Cl.<sup>4</sup> B60R 21/00

U.S. Cl. 280—801

23 Claims



1. A webbing retaining structure for use in an automatic seatbelt system for a vehicle so designed that one end portion of an occupant restraining webbing which is closer to the outside of the vehicle is moved in the longitudinal direction of the vehicle when an occupant enters or leaves the vehicle, thereby automatically fastening said webbing to the occupant's body, said structure being adapted for supporting said end portion of said webbing on the body of the vehicle, and comprising:

- a first support member for retaining said end portion of said webbing;
- a second support member secured to the vehicle body and pivotally supporting said first support member; and
- retaining means including a projection provided on either one of said first and second support members and a plurality of recesses provided in the other of the two so as to be spaced around the axis of rotation of the support member such that said projection selectively enters said recesses solely by the application of torque to said first support member, said projection and said recesses facing each other in a direction parallel to the axis for rotation of the first support member, whereby the angle at which said webbing is supported by the vehicle body can be discretely adjusted by changing the positional relationship between said projection and said recesses.

#### 4,682,791 DEFLECTION DEVICE FOR A SAFETY BELT ARRANGEMENT HAVING PROGRESSIVE BELT CLAMPING

Hans-H. Ernst, Sülzfeld, Fed. Rep. of Germany, assignor to Britax-Kolb GmbH & Co., Dachau, Fed. Rep. of Germany  
PCT No. PCT/EP85/00050, § 371 Date Oct. 24, 1985, § 102(e)  
Date Oct. 24, 1985, PCT Pub. No. WO85/03676, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 14, 1985, Ser. No. 793,698  
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406946; Apr. 3, 1984, 3412383

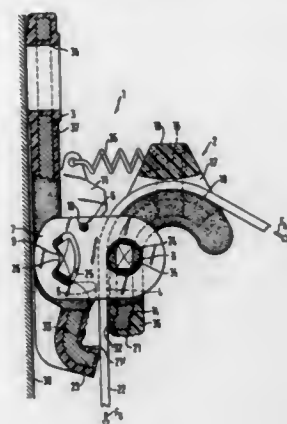
Int. Cl.<sup>4</sup> B60R 22/36

U.S. Cl. 280—806

24 Claims

1. Deflection device for a safety belt preferably for mounting on the B and C columns of vehicles having means for direct

locking of the belt by clamping and for receiving the loading in the case of an accident, characterised in that a two-stage arresting device is provided in such manner that on the occurrence of the usual locking not caused by an accident after exceeding of a predetermined deceleration a first arresting action in the form of a clamping not damaging to the belt takes place by



tilting movement of a resiliently biased deflection element to bring two preclamping surfaces at least one of which is of a deformable material into mutual engagement with the belt, which in the case of an accident causing a higher deceleration transfers into a second arresting action having a more fully effective belt clamping for secure and substantially slip-free load absorption.

4,682,792

# BINDER FOR ARTICLES SUCH AS BOOKS AND CASSETTES

Graham Simmons, 13, Oriole Way, Larkfield, Maidstone, Kent ME20 6LN, England

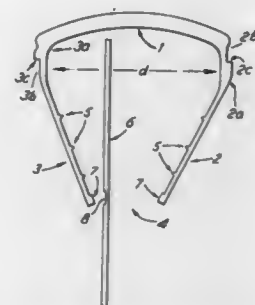
Filed Apr. 10, 1986, Ser. No. 849,987

Claims priority, application United Kingdom, Apr. 11, 1985, 8509281

Int. Cl.<sup>4</sup> B42D 17/00, 3/12, 5/00; B42F 7/00

U.S. Cl. 281—45

7 Claims



1. A binder, to embrace and grip an article such as a book or cassette, comprising a resiliently-bendable generally planar front wall of width greater than that of the article to be embraced, two integral resiliently-bendable side walls extending rearwardly each from a respective lateral extremity of the front wall, said side walls being when unconstrained convergent towards their free edges, one said side wall having formed within the thickness thereof an external recess bounded by a plane inward-facing shoulder facing in the direction of the free ends of said side walls, the other said side wall having formed within the thickness thereof an external recess bounded by a plane outward-facing shoulder facing in the direction of said front wall, said shoulders generally and substantially coplanar with said front wall and at the same spacing from a line of join of the respective side wall and the front wall, whereby

a first such binder may be moved relative to a second such binder in a direction perpendicular to the plane of the front wall so as to cause the inward facing shoulder of the first such binder to abut the outward facing shoulder of the second such binder and locate the binders in alignment in a linear row.

4,682,793

# MULTI-PART MAILER FORM ASSEMBLY

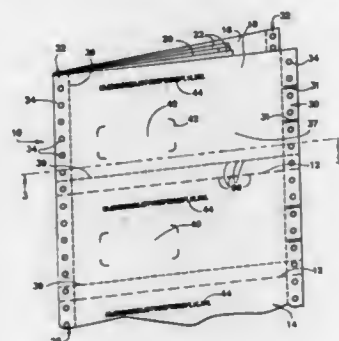
Gerard F. Walz, 928 Quail Hill Rd., Fallbrook, Calif. 92028

Filed Mar. 5, 1986, Ser. No. 836,249

Int. Cl.<sup>4</sup> B41L 1/20; B65D 27/00, 27/10

U.S. Cl. 282—11.5 A

19 Claims



1. A multi-part mailer assembly, comprising:

a series of superimposed continuous sheets having at least one aligned marginal side edge along which the sheets are adhesively secured together and copy producing means interposed between the sheets for reproducing information applied to the front sheet on all the underlying sheets, the outer front sheet of the assembly being of paper and the rear sheet being of card material;

the sheets having corresponding spaced transverse tear lines in registry with one another for separating the sheets into individual multi-part forms;

the assembly having lines of pin feed perforations extending along its opposite outer marginal side edges through all the sheets at those side edges for feeding the assembly through a printing machine;

the assembly having an outer longitudinal tear line extending adjacent the secured marginal side edge for separating the sheets from each other and from the line of pin feed perforations at that edge;

each multi-part form of the assembly having at least three separable superimposed parts preprinted with predetermined indicia, the three parts including form lengths of a front sheet comprising an address sheet for insertion in a window envelope, a rear sheet comprising a return postcard for separation from the other sheets and for securing to the exterior of an item to be mailed for completion and return by the recipient of the mailed item, and an intermediate sheet comprising a sender's receipt for retention by the sender of a mailed item, the front sheet of each said form having a designated address area on its outer front face and the intermediate and rear sheets having front faces facing the rear of said front sheet which are marked with a corresponding address area in registry with the address area on the front sheet;

the rear and intermediate sheets of the assembly having additional tear lines for separating a predetermined detachable area of the rear and intermediate part of each form from the remainder of that part, the predetermined area of the intermediate and rear parts carrying the designated address area on their front faces and the rear part having an outer, rear face facing away from the remainder of the form carrying a designated return address area on its detachable area; and

the rear sheet having longitudinal strips of adhesive applied

along the rear, outer face outside said predetermined area for detachably securing the predetermined area of the rear part of each form to an outer face of an item to be mailed, the outer face of the rear sheet further having peeloff longitudinal cover strips removably covering the adhesive strips.

4,682,794

# SECURE IDENTIFICATION CARD AND SYSTEM

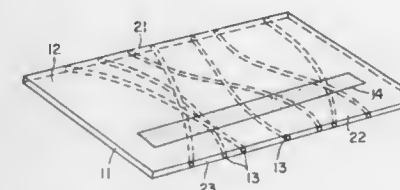
George D. Margolin, Newport Beach, Calif., assignor to Photon Devices, Ltd., Sherman Oaks, Calif.

Filed Jul. 22, 1985, Ser. No. 757,385

Int. Cl.<sup>4</sup> B42D 15/00

U.S. Cl. 283—82

3 Claims



1. An identification card comprising an essentially planar member having first and second edges, said member including a plurality of optical fibers at least some of which have first and second ends which intersect said first and second edges respectively at random.

4,682,795

# TENSION ACTUATED UNCOUPLER

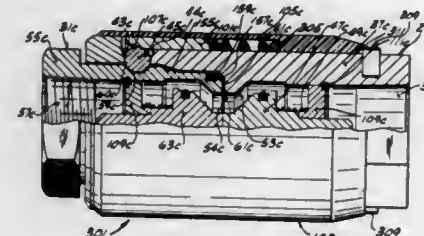
Charles Rabushka, 1359 Whispering Pines, St. Louis, Mo. 63141, and Layton J. Repogle, Berkeley, Mo., assignors to Charles Rabushka, St. Louis, Mo.

Continuation-in-part of Ser. No. 761,865, Aug. 2, 1985, which is a continuation-in-part of Ser. No. 619,120, Jun. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 465,242, Feb. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 401,083, Jul. 23, 1982, abandoned. This application Jan. 23, 1986, Ser. No. 821,808

Int. Cl.<sup>4</sup> F16L 35/00

U.S. Cl. 285—1

2 Claims



1. A tension actuated uncoupler installable in a line for permitting the flow of a fluid therethrough when coupled and for uncoupling at least a portion of said line from another portion thereof in the event a tension load above a predetermined limit being applied to said line, said uncoupler comprising a female quick disconnect fitting secured to one of said line portions and a male quick disconnect fitting secured to the other portion of said line with the male fitting being sealably secured within said female fitting when said male and female fittings are coupled together thereby to permit the flow of fluid through said line, a plurality of apertures in said female fitting, a plurality of securing balls carried by said female fitting, one said ball in a respective aperture, said balls being engagable with said male fitting for positively holding the fittings together in coupled relation, said balls being movable radially inwardly and outwardly between a retaining position in which

said balls hold the fittings together in coupled relation and a clear position for permitting uncoupling of the fitting, cam means on said male fitting cammingly engagable with said balls for effecting radial movement of said balls toward their said clear position upon application of a tension load said fittings, a retainer movable axially relative to said female fitting from a retaining position in which said balls are engagable with said male fitting for holding said fittings in coupled relation and a retracted position permitting said balls to move radially thereby to permit uncoupling of said fittings, said retainer having a retainer cam surface for being cammingly engaged by said balls for axial movement of said retainer relative to said female fitting toward its retracted position upon a tension load being applied to said fittings, spring means resiliently biasing said retainer in axial direction toward its retaining position, seal means carried by one of said fittings sealably engagable with the other fitting, a cover carried by said female fitting surrounding said spring and said retainer, said cover having an inner shoulder thereon with said spring being interposed between said shoulder and said retainer, said cover being axially movable on said female member between an operative position in which said spring exerts an operative biasing force on said retainer such that said tension load above said predetermined limit is required to effect uncoupling of said fittings and a released position in which said spring is at least partially relaxed so as to facilitate coupling of said fittings, at least one protrusion constituting cover holding means extending out from said female fitting and engaging said cover to prevent axial movement of said cover relative to said female fitting by said spring when said spring exerts its operative biasing force on said retainer, and said cover having a slot therein for accommodating said protrusion such that when said slot is in register with said protrusion, said cover is free to move axially relative to said female fitting from its operative to its released position.

4,682,796

# FUEL LINE ADAPTOR

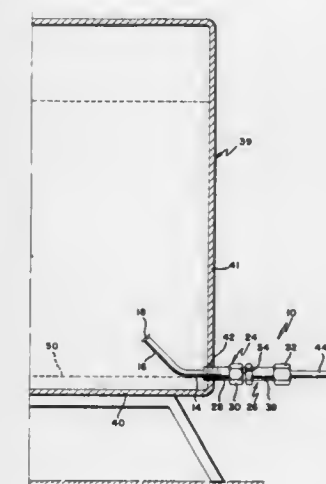
R. Alan Parrow, 53 Montana Dr., Holden, Mass. 01520, and Francis W. DiAntonio, 26 Fairview Dr., Leicester, Mass. 01524

Filed Apr. 29, 1986, Ser. No. 857,044

Int. Cl.<sup>4</sup> F16L 35/00

U.S. Cl. 285—39

7 Claims



1. Fuel line adaptor for a fuel line having a standard pipe fixture and a fuel tank having a bottom wall, a front wall and an outlet opening in the front wall adjacent the bottom wall, said adaptor comprising:

(a) a first coupling element which is adapted to be sealably connected with said outlet opening and having a bore



which extends horizontally when said first coupling element is connected with said outlet opening.

- (b) a second coupling element which is adapted to be connected with said first coupling element and adapted to be connected to the pipe fixture of said fuel line, said second coupling element having a bore which extends horizontally when said second coupling element is connected with said first coupling element;
- (c) a feed tube which has an outer end, an outlet opening at said outer end, an inner end portion one end of which is connected to the end opposite said outlet opening and an inlet opening at said inner end, said inner end, said outer end being adapted to extend horizontally through the bores of said first and second coupling elements and through the outlet opening of the tank, said outer end having a central axis and being rotatable about said axis relative to said first and second coupling elements prior to complete coupling of said first and second coupling elements and said outer end being prevented from rotating about said axis when said first and second coupling elements are completely coupled, said inner end extending at a substantial angle relative to said outer end so that said inlet opening is located at a substantial distance above the outlet opening of the tank when said outer end extends through the outlet opening of the tank and is rotated about said axis to a position where said inner end extends from said outer end at an upward angle, and
- (d) means for preventing said rotation about said axis and for forming a seal between said feed tube and said first and second coupling elements when said first and second coupling elements are connected together for complete coupling.

4,682,797

# CONNECTING ARRANGEMENT WITH A THREADED SLEEVE

Knut Hildner, Schriesheim, Fed. Rep. of Germany, assignor to Friedrichsfeld GmbH Keramik-und Kunststoffwerke, Mannheim, Fed. Rep. of Germany

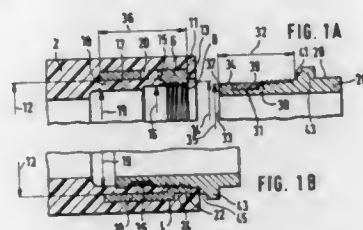
Filed Jun. 25, 1986, Ser. No. 878,247

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523388

Int. Cl.<sup>4</sup> F16L 47/00

U.S. Cl. 285—40

25 Claims



1. A connecting arrangement between a threaded sleeve of synthetic plastic material and a tube portion having a pipe thread thereon, wherein said threaded sleeve comprises an insert nut with an internal thread and an inner synthetic plastic ring which is engaged by the pipe thread of said tube portion, wherein said tube portion comprises a supplemental sealing ring, and wherein said synthetic plastic ring comprises a first sealing region within said insert nut spaced from an axial end face of said plastic ring and having an inner diameter smaller than the outer diameter of said pipe thread on said tube portion, and a second sealing region within said insert nut axially adjoining said first sealing region through a radial step and having an inner diameter smaller than the inner diameter of said first sealing region and smaller than the outer diameter of said sealing ring, said pipe thread of said tube portion sealingly engaging said first sealing region, and said sealing ring of said tube portion sealingly engaging said second sealing region of

said synthetic plastic ring when said tube portion is connected to said threaded sleeve.

4,682,798

# HOSE COUPLING

Heinz Sauer, Ronneburg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 691,902, Jan. 16, 1985,

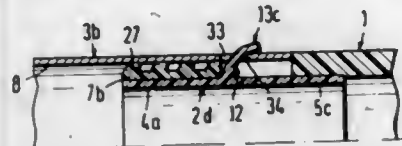
abandoned. This application Jul. 21, 1986, Ser. No. 887,236

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401902; Dec. 8, 1984, 3444817

Int. Cl.<sup>4</sup> F16L 55/00

U.S. Cl. 285—174

20 Claims



1. A coupling comprising a pipe having a first end portion; a hose having a second end portion; a tubular connector having a first section surrounded by said first end portion and a second section in sealing engagement with said second end portion, said second section being arranged to share axial movements of said second end portion; a sealing element interposed between said first section and said first end portion to establish and maintain a fluidtight seal therebetween while permitting at least some axial movement of said first end portion and said first section relative to each other; and at least one latching device for releasably locking said connector to said pipe, said latching device including a mobile first portion which is rigid with said connector and a second portion which is movable into and from engagement with said pipe, said first end portion having an opening and said latching device extending into said opening.

4,682,799

# LATCH LOCK MECHANISM

Graham J. Luker, Arncliffe, Australia, assignor to Efcu Manufacturing Company Pty, Limited, Australia

PCT No. PCT/AU84/00213, § 371 Date Jun. 10, 1985, § 102(e) Date Jun. 10, 1985, PCT Pub. No. WO85/01771, PCT Pub. Date Apr. 25, 1985

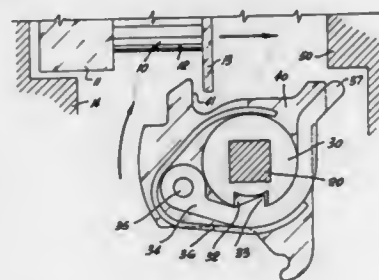
PCT Filed Oct. 19, 1984, Ser. No. 758,673

Claims priority, application Australia, Oct. 19, 1983, PG1926

Int. Cl.<sup>4</sup> E05C 21/00

U.S. Cl. 292—169.15

7 Claims



1. A latch lock comprising:  
a latch bolt connected for movement between a latching position and a retracted position,  
a first part connected to be rotated by a door handle,  
a second part connected to drive said latch bolt between said positions, and  
clutch means connected between said first and second parts for transmitting rotation of said first part by the door

handle to said second part to move said latch bolt to the retracted position when engaged and allowing free rotation of said first part by the door handle when disengaged.

4,682,800

# LATCH ASSEMBLY

Charles B. Lovelace, Jr., Upland, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

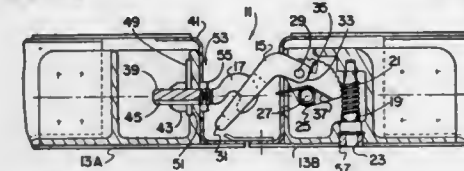
Continuation of Ser. No. 550,827, Nov. 14, 1983, abandoned.

This application Jun. 25, 1985, Ser. No. 748,649

Int. Cl.<sup>4</sup> E05C 5/02

U.S. Cl. 292—247

3 Claims



1. An adjustable over-center latching assembly having an open and a closed position comprising:

- (a) a manually operated worm shaft provided with a worm, said shaft being rotated in a first direction to move said assembly to an open position and in a second direction to move said assembly to a closed position;
- (b) a segmented gear meshing with and operated by said worm, said segmental gear having a first shaft defining a first pivot axis about which said gear rotates;
- (c) a latching member pivotally connected to said segmental gear by a second shaft defining a second pivot axis about which said latching member pivots;
- (d) engaging means at the distal end of said latching member and a shoulder at the proximal end of said latching member;
- (e) a lug on the face of said segmental gear for engaging said shoulder of said latching member as said segmental gear is rotated to said open position;
- (f) biasing means for biasing said latching member towards said closed position;
- (g) a keeper for engagement with and disengagement from said latching member; and
- (h) adjusting means for adjusting the distance of the latch keeper relative to said latching member;

whereby rotation of said manually operated worm shaft in said first direction causes said segmental gear to pivot about said first pivot axis to move said second shaft over dead center of said first shaft to thereby begin to release the load on said keeper, such that continued rotation of said manually operated shaft in said first direction relieves all of the link load and causes said lug to engage said shoulder of said segmental gear thereby overcoming the bias of said biasing means and rotating said latching member about said second shaft and out of engagement with said keeper.

4,682,801

# ELECTROMAGNET ACCESS CONTROL CIRCUIT

Robert C. Cook, Redondo Beach, and Sasson Toeg, Beverly Hills, both of Calif., assignors to Securtron-Magnalock Corp., Torrance, Calif.

Filed Aug. 31, 1984, Ser. No. 646,626

Int. Cl.<sup>4</sup> E05C 17/56

U.S. Cl. 292—251.5

16 Claims

1. A high speed electromagnetic door control circuit comprising:

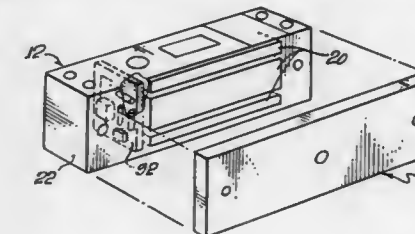
an electromagnet lock assembly means for holding a door closed solely by magnetic force, said electromagnetic lock assembly means including a strike plate or armature and electromagnet means for exerting a pull in the order of 800 pounds or more on the strike plate, said electromagnet lock assembly including means for mounting said strike

plate and the electromagnet means on a door and in a mating location on a door frame, respectively, with the strike plate and the electromagnet means directly engaging one another as the door is swung closed;

high speed double-throw, double-pole relay switch means for alternately connecting said electromagnet to a first or a second circuit, said relay switch means having a speed of operation in the order of a few milliseconds or less;

means for supplying rectified current to said electromagnet means in one direction through said first circuit;

a large capacitor means for discharging through said electromagnet means in the opposite direction via said second circuit to fully cancel out the residual magnetism which would otherwise be present after turning said electromagnet off;



means for charging said large capacitor means up to the voltage applied to said electromagnet means when said electromagnet means is being energized through said first circuit; and

circuit means for operating said relay switch means to switch said electromagnet means from said first circuit to said second circuit within a few milliseconds from the time when the power to the system is cut off;

whereby an opposite voltage from said capacitor means equal in magnitude to that normally applied to said electromagnet means, is applied to the electromagnet means to fully reverse the magnetic domains included in it and permanently prevent residual magnetism build-up.

4,682,802

# LOCK MECHANISM AND A SPRING AND CAM ASSEMBLY THEREFOR

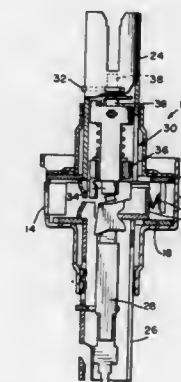
Jon M. Smallegan, San Mateo, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Oct. 10, 1985, Ser. No. 785,987

Int. Cl.<sup>4</sup> E05B 9/04

U.S. Cl. 292—337

8 Claims



1. A lock mechanism comprising:  
(a) inside and outside spindles;  
(b) a lock plunger assembly movably disposed within said

inside spindle between locked and unlocked dispositions thereof;

(c) a spring and cam assembly within said outside spindle for moving said lock plunger assembly from said locked to said unlocked disposition;

(d) a knob catch coupled to said outside spindle, and retractable thereinto, for releasably latching a knob to said outside spindle;

and means disposed within said outside spindle for obstructing said catch to prevent retraction thereof;

wherein said obstructing means is movably disposed, within said outside spindle, between a first positioning thereof in which it is obstructively in traverse of said knob catch to prevent retraction of the latter, and a second positioning thereof in which it is displaced from said knob catch; and said assemblies comprise means cooperative for moving said obstructing means from one of said first and second positionings to the other thereof.

4,682,803

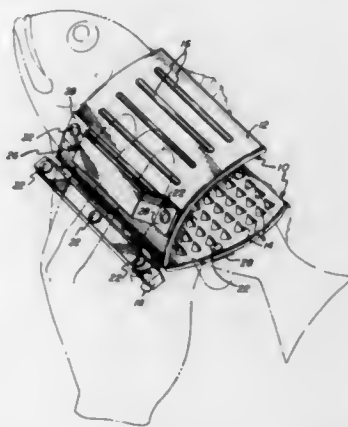
FISH TONGS

Kenneth C. Andrews, 905 Barnside Ave., East Hartford, Conn. 06108

Filed Jun. 19, 1986, Ser. No. 876,128  
Int. Cl. B25G 7/12

U.S. Cl. 294-25

5 Claims



1. A hand-held, pincer-like device for assisting in grasping a fish, comprising: a pair of substantially identical rigid panels connected to one another along one edge by a hinge member and freely pivotable thereabout, said panels having friction-enhancing elements on the interior surfaces thereof and being curved to conform generally to the body of a fish held therebetween, said hinge member being comprised of a pair of relatively rigid bar portions and flexible web sections, one of said web sections connecting an associated one of said bar portions to one of said panels, each of said connected bar portions, web sections and panels being integrally formed as a single piece from a synthetic resinous material; and engaging means on both of said panels adapted to overlie and engage the thumb and fingers of one of the user's hands thereunder with said hinge member disposed along his palm, said engaging means comprising a laterally extending, relative rigid strip on the exterior of each of said panels, each of said strips being spaced transversely from said hinge member and having an elongated central section spaced from the surface of said panel to receive the ends of the user's thumb and fingers inserted thereunder, whereby said panels can be displaced from one another to open said device by a spreading action of the user's thumb and fingers.

4,682,804

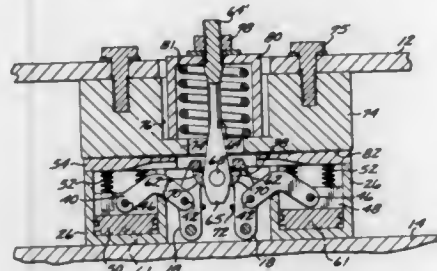
RELEASABLE COUPLING ASSEMBLY

William B. Palmer, Palos Verdes Estates, and Henry Fink, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Apr. 23, 1984, Ser. No. 603,042  
Int. Cl. B64D 1/12; B66C 1/28

U.S. Cl. 294-82.26

17 Claims



1. A releasable coupling assembly for controlled retention and release of a releasable structure with respect to a base structure, comprising:

a pair of latches mounted with respect to the base structure in spaced relation and for pivoting movement about generally parallel axes;

a locking shaft mounted with respect to the releasable structure and having an outboard end for projection from the releasable structure to a position generally between said latches;

a pawl mounted generally at the outboard end of said locking shaft for rotation about an axis generally in parallel with the rotational axes of said latches, said pawl supporting a pair of tabs projecting generally in opposite directions for respective locking engagement with said latches when the shaft outboard end is positioned generally therebetween;

means for normally retaining said latches in locked positions for locked engagement with said tabs and for moving said latches to unlocked positions disengaged from said tabs; and

means for biasing said locking shaft toward a normal position with the outboard end thereof retracted from a position generally between said latches, thereby urging said pawl to rotate when only one of said latches is moved to the unlocked position, the rotation of said pawl disengaging the remaining engaged tab and allowing the releasable structure to separate from the base structure.

4,682,805

GRASPING FINGER POSITION SENSOR FOR A ROBOT SYSTEM

Robert W. Reynolds, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

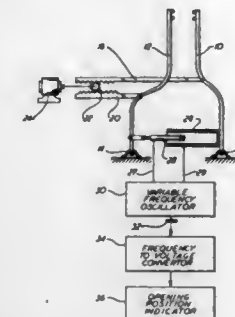
Filed Feb. 18, 1986, Ser. No. 830,163  
Int. Cl. B25J 15/08, 19/02

U.S. Cl. 294-86.4

7 Claims

1. In a robot system having at least one finger element which is movable in opposition to at least one cooperating finger element to grasp an object to be manipulated, a drive mechanism coupled to said movable finger element, a position sensing means for sensing the position of said movable finger element in relation to said cooperating finger element, said position sensing means comprising a variable reactance device including two cooperating reactance elements, at least one of said reactance elements being movable with respect to the other one of said reactance elements and being mechanically coupled to said movable finger element for movement therewith, the other one of said reactance elements being mechanically coupled to said cooperating finger element, the relative movement between said reactance elements being effective to vary the

reactance of said variable reactance device, an oscillator circuit connected with said variable reactance device, the frequency of said oscillator circuit being variable in response to



the variation in the reactance of said variable reactance device to thereby provide a frequency output signal which represents a measure of the position of said movable finger element with respect to said cooperating finger element.

4,682,806

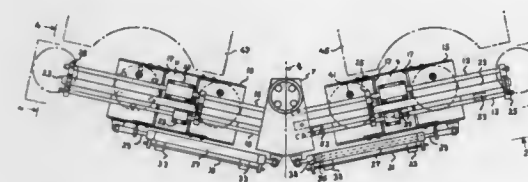
QUADRUPLE GRIPPER

Bradley S. Thomas, Plymouth, and David J. Kargetta, Orlando, both of Fla., assignors to General Electric Company, Charlottesville, Va.

Filed Jan. 2, 1985, Ser. No. 688,214  
Int. Cl. B66C 1/00

U.S. Cl. 294-88

6 Claims



1. A quadruple gripper for attachment to a wrist flange of an industrial robot, the gripper comprising:

a central base for mounting to the wrist flange;

first and second pairs of carriage rods attached to and extending from opposing sides of said base;

first and second symmetrically arranged carriage assemblies mounted on said carriage rods, each of said carriage assemblies including a carriage member having a substantially flat floor portion and a pair of linear bearings attached to said floor portion and having apertures for slidably receiving a corresponding one of said carriage rods whereby said carriage assemblies are enabled to slide longitudinally of said rods;

first and second pairs of grippers, each of said grippers being mounted to a corresponding one of said carriage assemblies; and

actuator means for slidably moving each of said carriage assemblies over the extent of said carriage rods whereby each gripper of a pair of grippers can be positioned for manipulation of a component at any point within the extent of said rods.

4,682,807

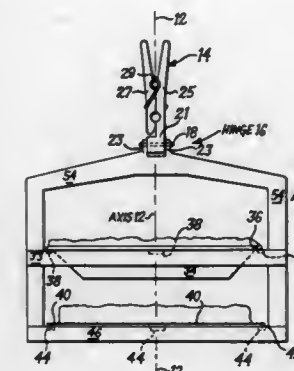
BAKED GOODS COOLING FRAME

Edward P. Mulligan, 310 Weeks St., Bennington, Vt. 05201  
Filed Mar. 31, 1986, Ser. No. 846,014

Int. Cl. A47G 19/08

U.S. Cl. 294-161

6 Claims



1. A baked goods cooling frame comprising:

(a) at least one holding means for holding one baking plate containing hot baked goods;

(b) a handle means, connected to said at least one holding means, for pendently attaching to and suspending said holding means from an approximately horizontally-mounted elongated element, said handle means having a spring loaded clamp for being clamped over and broadly gripping said elongated element, said handle means including a hinge means for hingedly connecting said holding means to said handle means, said hinge means including a hinge pin that is orthogonal to the direction of an elongated element to which said clamp may be attached so that said plate is held in a horizontal position regardless of the degree by which said elongated element deviates from an exactly horizontal position.

4,682,808

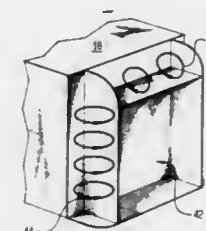
VEHICLE DRAG REDUCER

Alan J. Bilanin, 62 Battle Rd., Princeton, N.J. 08540  
Filed Jul. 24, 1985, Ser. No. 758,405

Int. Cl. B62D 35/00

U.S. Cl. 296-1 S

16 Claims



1. An apparatus for reducing drag at the trailing end of a blunt body having a front end, a trailing end, a top surface, and a first and a second sidewall surface, said apparatus comprising:

first vortex capturing means connected to said trailing end for capturing and stabilizing a first vortex having an axis substantially parallel to the plane of said first sidewall surface, said first vortex capturing means including a first panel means attached to said trailing end and having a long axis substantially parallel to the plane of said first sidewall surface;

second vortex capturing means attached to said trailing end for capturing a second vortex having an axis substantially



parallel to the plane of said second sidewall surface, said second vortex capturing means including a second panel means attached to said trailing end and having a long axis substantially parallel to the plane of said second sidewall surface;

third vortex capturing means connected to said trailing end for capturing a third vortex having an axis substantially parallel to the plane of said top surface, said third vortex capturing means including a third panel means attached to said trailing end and having a long axis substantially parallel to the plane of said top surface; and,

fourth panel means attached to the lower portion of said trailing end and having a long dimension substantially parallel to the plane of said top surface, said fourth panel means defining one end of said first and second vortex capturing means.

#### 4,682,809 CAR BODY

Heinrich Huss, Liebigstrasse 2, D 6054 Rodgau 6, Fed. Rep. of Germany

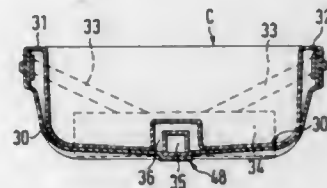
Filed Dec. 5, 1985, Ser. No. 805,292

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444377

Int. Cl.<sup>4</sup> B62D 29/04

U.S. Cl. 296—31 P

20 Claims



1. An extremely torsion-resistant body construction for a small, lightweight passenger vehicle comprising:
  - an elongated shell of highly impact resistant plastics material, said shell having a continuous base and upwardly extending side walls integrally formed with said base;
  - a metal chassis secured to said shell, said chassis including weight receiving and stiffening means disposed between opposite side walls of and in contact with said base of said shell, said weight receiving and stiffening means comprising an open metal box having a bottom, upstanding walls and an opening between upper ends of said upstanding walls, said bottom of said box being secured to said base of said shell to form an integrated composite structure therewith; and
  - wheel support means secured to said chassis and extending outwardly through said opposite side walls of said shell for supporting wheels having axes of rotation which lie in a vertical plane passing through said box.

#### 4,682,810

#### WHEELED STRETCHER IN WHICH THE PLANE ON WHICH THE PATIENT LIES IS ADAPTABLE IN HEIGHT

Michel Zarka, Tours, France, assignor to Contact Securite - Societe d'Exploitation, Villeneuve La Garenne, France

Filed Oct. 16, 1985, Ser. No. 787,907

Claims priority, application France, Oct. 18, 1984, 84 15998

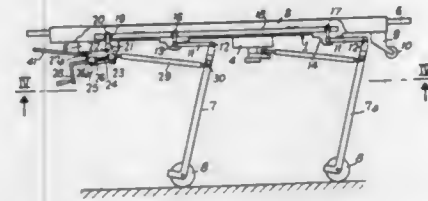
Int. Cl.<sup>4</sup> B62H 3/02

U.S. Cl. 296—20

15 Claims

1. A wheeled stretcher in which the plane on which the patient lies is adjustable in height, comprising a frame on which is fixed a top element and which rests on the ground via two pairs of inclined legs provided with wheels, each pair of legs is connected to the frame by at least a connecting rod and a bar articulated by one of their ends, on the frame and by their other

end, on the pair of legs so as to form a deformable quadrilateral, said connecting rod being connected to means for adjust-



ing the top element in height, and said bar being connected to means for controlling the inclination of the legs.

#### 4,682,811

#### VAN BODY USED WITH CONTAINER CAR, FREIGHT CAR AND TRUCK

Yukito Ooguro, Fukuyama, Japan, assignor to Sanyo Mikawa Body Corp., Japan

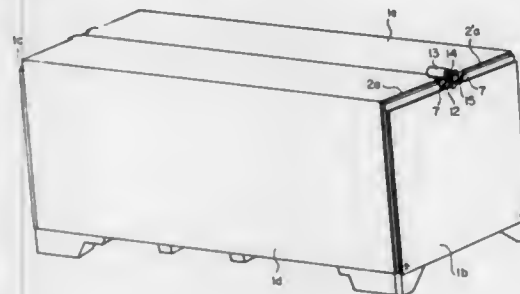
Filed Nov. 5, 1985, Ser. No. 795,143

Claims priority, application Japan, Nov. 5, 1984, 59-233886; Feb. 19, 1985, 60-31714

Int. Cl.<sup>4</sup> B60J 7/16

U.S. Cl. 296—181

3 Claims



1. A van body comprising opposing inverse L-shaped side frames located at the front and rear of a floor, the upper ends of the opposing inverse L-shaped frames contacting each other in the top center and separated from each other when closing and opening, the lower ends thereof being pivotally connected to the front and back of said floor and shields bridging the inverse L-shaped frames on the same side, said shields being pivotally connected to the upper ends of the inverse L-shaped frames and means for closing and opening the inverse L-shaped frames and shields to effect the vane opening and closing operations at the upper edges.

#### 4,682,812

#### MOTOR VEHICLE BODY SIDE WALL

Oskar Hurten, Cologne; Hans Vogt, Overath, and Paul Stutenkemper, Pulheim, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 11, 1986, Ser. No. 873,037

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521607

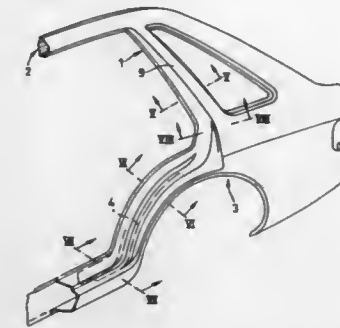
Int. Cl.<sup>4</sup> B62D 25/08

U.S. Cl. 296—195

6 Claims

1. A body side wall for motor vehicles of the type including a rear side door opening bounded in part by the vehicle roof, the vehicle floor sill and a rear pillar which essentially comprises a side wall inner panel, a side wall outer panel, and reinforcement panel means defining a box support positioned adjacent the front part of the rear wheel housing, characterized in that the reinforcement panel means comprises a one-piece reinforcement panel formed to have a U-shaped cross-section

and positioned adjacent the door opening, extending from the vehicle roof frame along the rear pillar and the front part of the wheel housing to the sill portion of the vehicle body floor, the reinforcement panel being connected to the side wall inner panel and the side wall outer panel to form a continuous box



support extending from the roof frame to the sill; and that in the region of the front part of the wheel housing the one-piece reinforcement panel forms two box supports extending in parallel, partly curvilinear fashion along the periphery of the wheel housing through attachment to the side wall outer panel.

#### 4,682,813

#### UNDERSEAT TACKLE CONTAINER

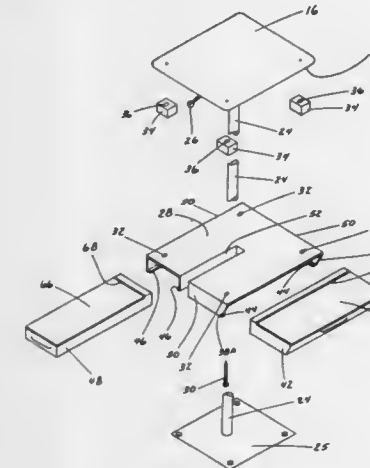
Robert D. Fohr, 9100 Racine Ave., and Jeffrey E. Tieze, 3529-90th St., both of Sturtevant, Wis. 53177

Filed May 2, 1986, Ser. No. 858,690

Int. Cl.<sup>4</sup> A47C 7/62

U.S. Cl. 297—192

20 Claims



1. A tackle container assembly mountable below a deck-mounted pedestal seat having a seat lower surface and a pedestal plate centrally mounted thereon with a pedestal post extending therefrom, comprising:
  - an upper principal member extending on either side of said pedestal, said upper principal member having a lateral opening extending from one edge toward the center of the upper principal member to accommodate the pedestal;
  - means to secure the upper principal member with respect to the seat lower surface;
  - means depending from the upper principal member on either side of said pedestal to support container means on either side of said pedestal in position spaced from the deck, whereby substantial accessible storage space is available while still allowing the feet of someone in the seat to readily be placed beneath the seat on the deck against the pedestal post.

#### 4,682,814

#### TILTING SEAT AND BACK CHAIR, PARTICULARLY TILTING DESK CHAIR

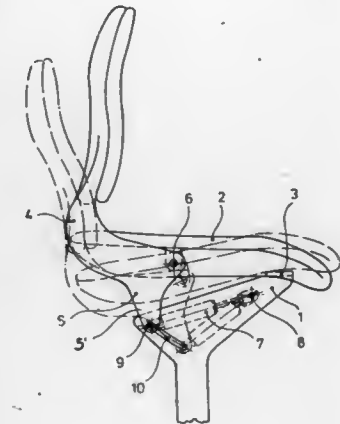
Eckard Hansen, Margrethen, Switzerland, assignor to Provenda Marketing AG, Herisau, Switzerland

Filed Nov. 1, 1984, Ser. No. 667,278

Int. Cl.<sup>4</sup> A47C 1/032

U.S. Cl. 297—300

21 Claims



1. Chair having a tilting seat and tilting back, especially tilting desk chair, including
  - a support structure (1);
  - a seat (2) having a forward and a rear edge zone;
  - front connection means (3) pivotally connecting the forward edge zone of the seat to the support structure (1);
  - a chair back (4) having an upper portion and a lower portion;
  - an attachment arm (5) extending from the lower portion of the chair back (4) to a zone beneath the seat, and having two spaced pivot connection means (6, 9);
  - a first pivot connection means (6) being located adjacent to or below the seat and positioned forwardly of a plane containing the upper portion of the chair back and pivotally connecting the attachment arm (5) and the seat (2);
  - a second pivot connection means (9) being located below the level of the seat and below said first connection means coupled to a guide means;
  - said guide means (10, 10') coupling the attachment arm (5) to the support structure (1) for changing the inclination of the chair back (4) with respect to the support structure, while simultaneously changing the position of the seat (2) with respect to the support structure (1);
  - lockable positioning-and-force means (7) attached to the support structure (1) and coupled to the arm (5) in the region of the second pivot connection means (9) and selectively providing a force on the seat (2) and on the chair back (4) to bias the back in an upright position, or permit locking of the seat and the chair back in a position of inclination selected by a user,
  - and wherein the guide means (10, 10') is coupled to the attachment arm (5) and hence to the chair back (4) at a position spaced from said first pivot means (6),
  - said guide means further being coupled to the support structure (1) for guiding the movement of the attachment arm (5) and hence relating, via said first pivot means (6), conjoint tilting movement of the seat (2) and of the chair back (4) as determined by the guide means,
  - the attachment arm (5) forming a rigid connection between said first and said second spaced pivot connection means (6, 9) and providing a coupling between the chair back (4) and the seat (2) while permitting said conjoint tilting movement of the seat and of the chair back.

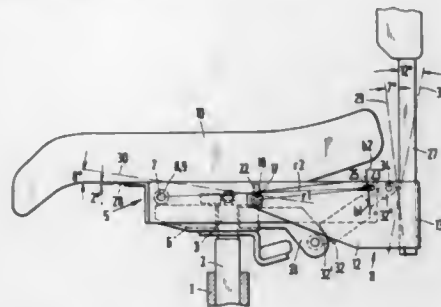
# 4,682,815 CHAIR

F. Martin Steifensand, Sperbersloher Str. 124, D-8501 Wendelstein, Fed. Rep. of Germany  
Filed Mar. 13, 1986, Ser. No. 839,156

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1985, 8511034[U]

U.S. Cl. 297—300 Int. Cl.<sup>4</sup> A47C 3/00

12 Claims



## 1. A chair comprising:

- (a) a pedestal base;
- (b) a support member mounted on the pedestal base;
- (c) a seat carrier connected at a forward end portion thereof to the support member for pivotal movement about a stationary first horizontal axis;
- (d) a backrest carrier connected to the support member for pivotal movement about a second horizontal axis, and to a rearward end portion of the seat carrier for pivotal movement about a third horizontal axis;
- (e) the seat and backrest carriers being pivotable together relative to the support member within a pivotal range and in a direction between a work position and a rest position, wherein the backrest carrier traverses a greater pivot angle between the work and rest positions than the seat carrier;
- (f) force storage means disposed between the support member and the backrest carrier for biasing the backrest carrier in an upward and forward direction towards the work position; and
- (g) the first, second and third horizontal pivot axes being disposed in parallel to each other and substantially within a single plane, whereby during pivotal movement of the seat and backrest carriers relative to the support member within the pivotal range, a first radius described between the second and third horizontal axes and a second radius described between the first and third horizontal axes define substantially congruent circular arcs at the third horizontal axis.

# 4,682,816 EASY CHAIR

Henry Massonnet, FR-01760 Nuriex-Volognat, France  
Filed Jul. 7, 1986, Ser. No. 882,262

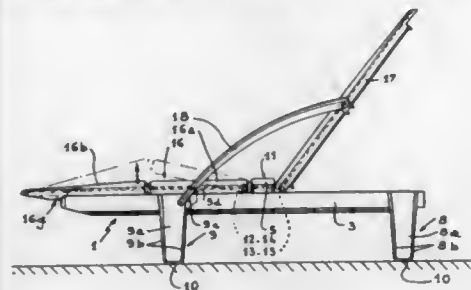
Claims priority, application France, Jul. 9, 1985, 85 10691

U.S. Cl. 297—359 Int. Cl.<sup>4</sup> A47C 1/02

9 Claims

1. An easy chair comprising a generally horizontal frame having side and first and second end portions, first and second pairs of depending legs extending from said side portions of said frame, said first pair of said legs being positioned adjacent said first end portion and said second pair of said legs being spaced toward said second end portion of said frame, a seat means extending between said side portions of said frame and being fixedly secured thereto, a backrest means pivotally connected to said frame, a pair of armrests having first and second end portions, said first end portions of said armrests being pivotally connected to said backrest means, said second ends of said armrests extending into contact with said second pair of

legs, support means associated in said second pair of legs for adjustable supporting said second ends of said armrests therein,



and leg rest means mounted to said frame and spaced from said backrest means.

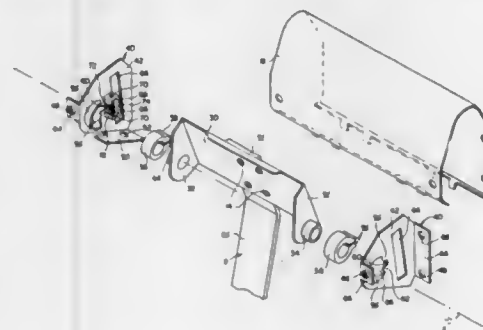
# 4,682,817 ADJUSTABLE HEAD RESTRAINT FOR VEHICULAR SEATS

Elmer C. Freber, St. Louis, Mo., assignor to Marquette Tool & Die Company, St. Louis, Mo.

Filed Jan. 24, 1985, Ser. No. 694,613

U.S. Cl. 297—408 Int. Cl.<sup>4</sup> A47C 7/36; B60N 1/00

17 Claims



1. A head restraint for use on the backrest of a seat for an automotive vehicle, said head restraint comprising: a generally upright post; a cushion supported on the post; and pivot means located between the post and the cushion for connecting the cushion with the post such that the cushion can pivot on the post about a generally horizontal axis of rotation, the pivot means including a first member attached firmly to the post, a second member in the cushion, and a split bushing located generally between the first and second members, one of the members having a spindle attached rigidly to and projecting from that member concentric to the axis of rotation such that it does not rotate relative to the post, the split bushing being around the spindle and having a pair of lugs which are separated at the split in the bushing such that the bushing will contract slightly when the lugs are urged together, the other member having a seat and a clamp which together receive the bushing and prevent the other member from moving radially or turning with respect to the bushing, the clamp being located externally of both the bushing and its lugs and having clamping elements between which the lugs of the bushing fit with the clamping elements being against the lugs, the clamp also having a screw located remote from the lugs on the bushing for urging the clamping elements together when the screw is turned in the correct direction, whereby the bushing contracts to increase the frictional resistance between the bushing and spindle so that a greater torque is required to change the angular position of the cushion on the post.

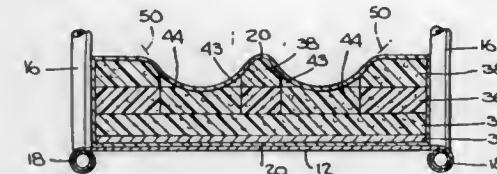
# 4,682,818 PRESSURE DISTRIBUTION PAD ASSEMBLY FOR WHEELCHAIRS

Theodore R. Morell, 59-29 174th St., Fresh Meadows, N.Y. 11365

Filed Aug. 14, 1986, Ser. No. 896,631

U.S. Cl. 297—452 Int. Cl.<sup>4</sup> A47C 7/02

14 Claims



1. A modifiable pressure distribution pad assembly for a wheelchair comprising:

- (A) a bottom pad of resilient foam material of high density;
- (B) at least one upper pad of resilient foam material of an intermediate density less than said high density, said upper pad being supported by said bottom pad and having at least one cutout defining an opening therethrough;
- (C) filler foam material frictionally mounted as an insert in at least one of said openings of at least one of said upper pads and removable therefrom, said filler foam material having a low density less than said intermediate density; and
- (D) a cover enclosing said pads, said cover permitting removal of said upper pad and associated filler foam material therefrom so that said filler foam material in one opening can be separated from said upper pad and replaced in said one opening by filler foam material of a different density prior to return of said upper pad and associated filler foam material to said cover.

# 4,682,819 METHOD AND APPARATUS FOR DRILLING HARD MATERIAL

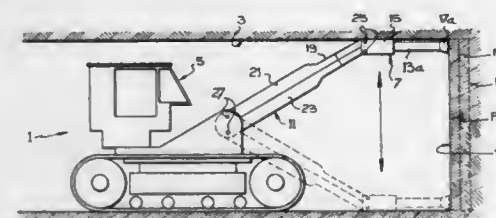
Roger Masse, 131, rue Roussin, Thetford Mines, Quebec, Canada G6G 1N6

Filed Mar. 12, 1984, Ser. No. 588,741

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

U.S. Cl. 299—10 Int. Cl.<sup>4</sup> E21C 25/00, 41/00

9 Claims



1. A method for impact drilling a hole in a front of hard material such as rock, comprising the steps of: positioning a plurality of impact tools having rock fragmenting heads parallel to one another in a line; incrementally spacing adjacent ones of the impact tools such that the impact tools are longitudinally incrementally spaced to extend different distances toward the front; laterally spacing the impact tools in said line by a distance greater than an area of direct impact of the rock fragmenting heads; actuating the impact tools as incrementally spaced and reciprocating the impact tools back and forth substantially perpendicular to said line; advancing the impact tools longitudinally toward the front during said reciprocating, and thereby fragmenting the

hard material by striking the front directly with the impact tools along a plurality of spaced-apart paths extending in parallel lines of incrementally different depths in the front of hard material, each of the impact tools fragmenting a path by direct impact with the front across a lateral width along the line with a gap free of direct impact remaining between the impact heads and between adjacent paths followed by the impact heads; and, simultaneously fragmenting material at the gap by shear of said hard material between said paths, due to said incremental spacing.

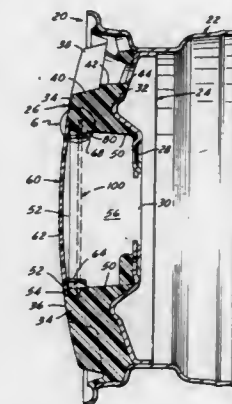
# 4,682,820 VEHICLE WHEEL WITH AN ORNAMENTAL PLASTIC OVERLAY

Robert J. Stalter, Bowling Green, Ohio, assignor to Motor Wheel Corporation, Ohio

Filed Oct. 16, 1985, Ser. No. 788,156

U.S. Cl. 301—37 P Int. Cl.<sup>4</sup> B60B 7/02

12 Claims



1. In a composite styled wheel including in combination a metallic portion comprising a wheel mounting disc and a rim secured to said disc and adapted to receive a tire thereon, and a plastic portion comprising an ornamental overlay disposed adjacent and covering at least part of the outboard face of said metallic portion, said overlay comprising a body of plastic material permanently affixed to said metallic portion, the outboard face of said body being exposed to view from the outboard side of said wheel having a contour differing from the contour of the covered part of the outboard face of said metallic portion and adapted to provide decorative contour over at least part of the metallic portion of said wheel, said covered part of said metallic portion comprising said disc and said disc having a central aperture and wheel mounting fastener holes therein, said overlay having aperture means including an internal annular surface registering coaxially with said central aperture and holes in said disc and defining a central cavity in said body adapted to receive wheel hub and mounting parts therein, the improvement wherein said aperture means comprises retainer means secured to said body and being spaced radially outwardly from said cavity annular surface, said overlay material engulfing said retainer means so as to at least partially embed said retainer means in said overlay to thereby hide said retainer means from view and assist in securement thereof to said body, said body and said retainer means having cooperative detent means disposed in the vicinity of the outboard face of said body encircling the outboard entrance to said body cavity and adapted to yieldably releasably engage a center ornament hub cap or the like for removable attachment of the same to said body to close the outboard end of said body cavity.





axis for unrestricted access to the space between said shelves.

4,682,826

# ANTI-THEFT SHOP DISPLAY CASE

Jacques Mestdagh, Lovervall, Belgium, assignor to Figos, Societe Anonyme, Belgium

Filed Jun. 18, 1985, Ser. No. 746,024

Claims priority, application Belgium, Dec. 6, 1984, 2/60560

Int. Cl.<sup>4</sup> A47F 1/00

U.S. Cl. 312—42

3 Claims



1. An anti-theft shop display case assembly comprising:
  - (a) a display case;
  - (b) a plurality of horizontal supporting bars disposed within the display case;
  - (c) a plurality of rectangular-shaped magazines for containing supplies of vertically stacked articles, the magazines being displaceable within and vertically removable from the display case;
  - (d) each magazine including a top opening for loading the articles therein, four vertical walls, a dispensing opening at the bottom of one vertical wall, and a plurality of hooks for engaging the supporting bars;
  - (e) the dispensing openings being positioned in a linear array when the magazines are disposed within the display case;
  - (f) a lockable closure including a vertically displaceable horizontal bar for preventing access to the dispensing openings;
  - (g) a locking means including a vertically displaceable locking bar for preventing vertical removal of the magazines, and a chassis carried by the display case coupling the horizontal and locking bars for joint vertical movement; and
  - (h) means for vertically displacing the chassis between an open position wherein access to the dispensing openings is permitted, and a closed position wherein the horizontal bar is disposed across the linear array of dispensing openings for preventing access thereto and the locking bar is disposed across the top openings of the magazines for preventing their vertical removal.

4,682,827

# COMBINATION TOY BOX-DRAFTING TABLE

Eldon D. Woodward, 1118 E. Avenue J-2, Lancaster, Calif. 93534

Filed Aug. 26, 1985, Ser. No. 769,403

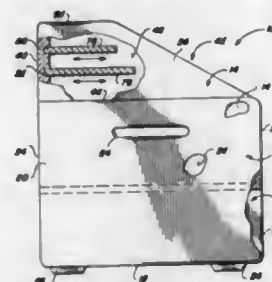
Int. Cl.<sup>4</sup> A47B 27/00

U.S. Cl. 312—231

11 Claims

1. An improved combination toy storage box and drafting table, said box-table comprising, in combination:
  - (a) a storage box having interconnected upstanding front, rear and side walls and a generally horizontal closed bottom connected thereto and an open top defining a central storage space;
  - (b) a drafting table resting on said top of said box and releasably connected thereto, said table including a pair of spaced upraised sidewalls, and an upraised rear wall, interconnected thereto and to a closed top, said table having an open bottom and a central storage cavity, said

table top including an upwardly and rearwardly sloped front drafting portion connected to an about horizontal rear portion, said entire table being dimensioned so as to be nestable within a portion of the central storage space of



said box without prior disassembly of said entire table for transportation therein; and,  
(c) access means in at least one of said box and table for access to at least one of said central storage space and storage cavity.

4,682,828

# BUS BAR BRIDGED PC BOARD FOR TRANSITIONAL TERMINATION OF MULTIPLE CABLES AND METHOD

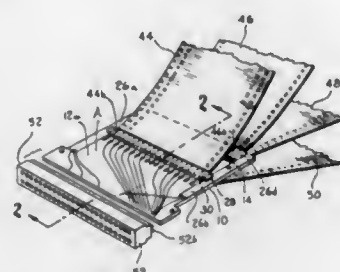
Douglas E. Piper, Greenville, and Michael D. Black, Mauldin, both of S.C., assignors to 501 Woven Electronics Corporation, Mauldin, S.C.

Filed Dec. 6, 1985, Ser. No. 806,347

Int. Cl.<sup>4</sup> H01F 4/66

U.S. Cl. 439—92

16 Claims



6. A transitional printed circuit board for transitionally terminating a plurality of electrical transmission cables, each of which includes a plurality of ground and signal wires comprising:
  - a nonconductive electrical substrate;
  - said substrate having a connector end adapted for receiving a terminal connector, an opposed rear end, a first side integral with said connector and rear ends, and a second opposing side integral with said connector and rear ends;
  - a first ground plane formed on one side of said substrate adjacent the periphery of said substrate;
  - first electrical contact means for making electrical connection with the signal wires of a first electrical transmission cable;
  - second electrical contact means for making connection with the signal wires of a second electrical transmission cable;
  - electrical trace means interconnecting said first and second electrical contact means;
  - a plurality of electrical pads disposed across said substrate adjacent said connector end;
  - a second ground plane superimposed above said electrical trace means generally parallel to said substrate in a manner that shorting of electrical signals transmitted along said electrical trace means is effectively prevented.
  - electrical termination means formed on said substrate adja-

cent said connector end adapted for connection to said terminal connector; and  
electrical trace means connecting said second land means and said electrical termination means.

4,682,829

# SURFACE MOUNT SOCKET FOR DUAL IN-LINE PACKAGE

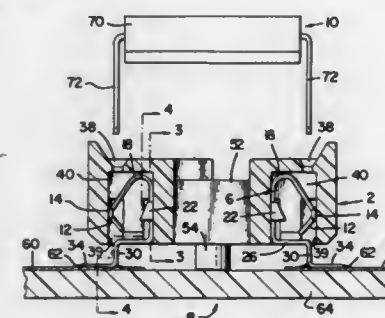
John P. Kunkle, Clemmons, and Donald W. McClune, Winston-Salem, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 13, 1985, Ser. No. 744,180

Int. Cl.<sup>4</sup> H01R 23/72

U.S. Cl. 439—83

6 Claims



1. A multicontact surface mount dual in-line package socket for interconnecting a dual in-line circuit element package having a plurality of external leads, insertable into the socket, to the surface of a printed circuit board, to establish electrical and mechanical interconnection to surface mounting pads, having solder paste predeposited thereon, in a high temperature surface mount soldering operation, comprising:
  - a plastic insulative housing having a plurality of lead-receiving cavities arranged in two parallel rows and extending therethrough between an upper and a lower housing surface, each of said cavities communicating with said lower surface by a respective opening; and
  - a plurality of stamped and formed terminals, disposed in respective said lead-receiving cavities each said terminal having:
    - a first flexible cantilever section adjacent a first end thereof and disposed within a said lead-receiving cavity, the first section comprising means for establishing electrical contact to an associated lead of a circuit element package, received into the lead-receiving cavity from said upper housing surface;
    - a second terminal section contiguous with the first terminal section extending axially within the lead-receiving cavity along an inner wall thereof, the second section having terminal retention elements thereon in engagement with the insulative housing and comprising means to anchor the terminal in the lead-receiving cavity;
    - a third terminal section contiguous with the second terminal section, the second terminal section being between the first terminal section and the third terminal section, the third terminal section extending across and within said lower surface cavity opening of said cavity perpendicular to the second terminal section and towards the outer side of the housing;
    - a fourth terminal section contiguous with the third terminal section, the third terminal section being between the second terminal section and the fourth terminal section, the fourth terminal section extending perpendicular to the third terminal section and extending below said lower housing surface; and
    - a fifth terminal section adjacent the second end of the terminal and extending perpendicular to the fourth terminal section outwardly from said housing and spaced from said lower housing surface and parallel thereto, the fifth terminal section comprising means for

establishing a solder connection to a corresponding surface mounting pad of a printed circuit board, each second terminal section being anchored to said insulative housing by said terminal retention elements and each fifth terminal section being fixed to said printed circuit board by a solder joint providing two rigidly secured points after the package socket is secured to said printed circuit board with each said third terminal section being slightly smaller than said lower surface cavity opening so as to be free of interference therewith, and  
that portion of each said terminal between said terminal retention elements and said fifth terminal section including each third and fourth section comprises a compliant member flexible along two orthogonal axes and flexible in torsion about a third orthogonal axis parallel to said rows, each terminal section being formed by bending said terminal about an axis parallel to the plane of the stamped terminal blank to form a more compliant member along the two orthogonal axes, whereby said terminals can move to absorb the differential expansion between said printed circuit board and said plastic insulative housing without disrupting the solder connections between the fifth terminal sections and the corresponding surface mounting pads.

4,682,830

# SWITCH TERMINAL

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Continuation of Ser. No. 643,377, Aug. 23, 1984, abandoned.

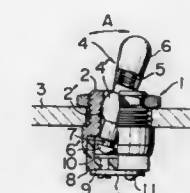
This application Apr. 8, 1986, Ser. No. 851,074

Claims priority, application Japan, Aug. 26, 1983, 58-131842[U]

Int. Cl.<sup>4</sup> H01R 27/00

U.S. Cl. 439—224

5 Claims



1. A switching terminal comprising
  - a cup-shaped insulating member;
  - a rotatable switch terminal member located on said insulating member and having means extending outwardly therefrom for electrically connecting said terminal member to an electric circuit;
  - means to obtain different orientations of said terminal member including
    - said switch terminal member having a first pair of diametrically opposing holes and a second pair of diametrically opposing holes spaced in an angular direction of approximately 90° from said first pair of holes,
    - a stationary contact penetrating said insulating member through one hole of said pair of holes and electrically connected to said means for electrically connecting said switch terminal member to an electric circuit by way of said switch terminal member,
    - a projection formed on said insulating member through the other one hole of the same said pair of diametrically opposing holes;
    - a spring biased plunger on the opposite side of said cup shaped insulating member positioned to contact said stationary contact when the switching terminal is in a conducting position;



and means to complete the electrical circuitry of the switching terminal from said spring biased plunger whereby said stationary contact and said projection can be received by a selected one of said pairs of diametrically opposing holes to obtain different orientations of said terminal member relative to said insulating member and a line of direction of operation of said plunger.

4,682,831

**MULTIPLE-CONTACT CONNECTOR ASSEMBLY**

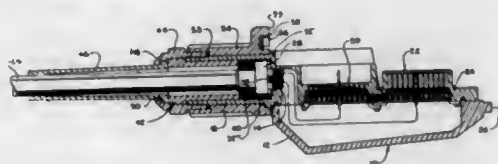
William O. McNeel, Royel F. Montieth, and Stephen E. Scott, all of Houston, Tex., assignors to Litton Resources Systems, Inc., Alvin, Tex.

Filed Mar. 12, 1982, Ser. No. 357,459

Int. Cl.<sup>4</sup> H01R 25/00, 4/70

U.S. Cl. 439-294

5 Claims



1. A hermaphroditic, multicontact connector half assembly for sealably receiving any one of a number of different multiconductor jacketed cables of divers diameters, said connector half assembly including a box-like case having walls, for receiving therein a set each of male and female connector contacts and a fanout of the individual wires of the multiconductor cable that are to be connected to said contacts, the connector-half assembly comprising:

- a cable entry port in a first wall of the case for receiving an end of a multiconductor cable, the entry port including first locking means on the outer surface of the first wall and a hollow elongated neck having inner and outer walls surrounding the entry port and the first locking means;
- an anchor molded to said cable near an end thereof, adapted for insertion in said neck, the anchor having a front face that bears a second locking means matable with said first locking means for engagement with said first locking means, said anchor including a rear collar having a fixed outer diameter regardless of the diameter of said cable;
- a sphincter snugly seated around the collar of said cable anchor; and
- means for compressing said sphincter to force said sphincter to expand radially in sealing engagement between the inner wall of said hollow neck and the rear collar of said anchor.

4,682,832

**RETAINING AN INSERT IN AN ELECTRICAL CONNECTOR**

Stephen Punako, Bainbridge; David O. Gallusser, Oneonta, both of N.Y., and Warren R. Williams, Jr., Montrose, Pa., assignors to Allied Corporation, Morris Township, N.J.

Filed Sep. 27, 1985, Ser. No. 781,156

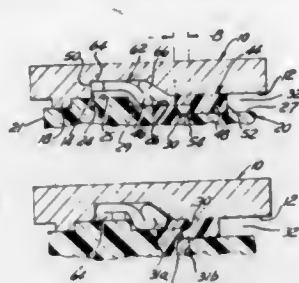
Int. Cl.<sup>4</sup> H01R 11/00

U.S. Cl. 439-589

12 Claims

1. In an electrical connector assembly of the type including a cylindrical shell having an annular groove in its inner wall, a cylindrical insert disposed within said shell and having an outer periphery encircled by said groove with the inner wall and the outer periphery being dimensioned so as to form an annular passageway extending coaxially therebetween, and retention means for retaining the insert within said shell, said retention means comprising a cylindrical retention member of deformable material including a scalloped forward end portion thereof interferingly fit in the annular passageway between the shell and the insert, said retention means characterized in that a leading edge of each said scallop is curled backwardly and folded into overlapping relation onto itself whereby the

curled overlapped scallops of the forward end portion are radially wedged interferingly in the annular groove and in



the annular passageway and lock the leading edges there-within.

4,682,833

**ALIGNMENT AND CONNECTION MECHANISM**

Joerg U. Ferchau, Morgan Hill, and Victor D. Trujillo, Fremont, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

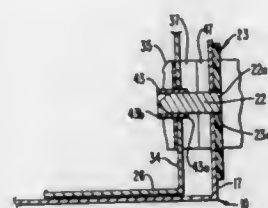
Continuation of Ser. No. 702,109, Feb. 15, 1985, abandoned.

This application Aug. 21, 1986, Ser. No. 898,878

Int. Cl.<sup>4</sup> H01R 13/64

U.S. Cl. 439-377

4 Claims



1. In an assembly, including a cabinet formed to have at least one drawer-receiving cavity, a drawer configured for removable insertion in the cavity, and at least a pair of connector parts respectively associated with the cabinet and the drawer, an alignment system to provide blind-matable connection of the connector parts to establish electrical connection therebetween when the drawer is inserted in the cavity, the alignment system comprising:

- a pair of mounting means, for respectively mounting each of the connector parts to the cabinet and the drawer at locations that place the connector parts in interconnecting engagement when the drawer is inserted in the cavity, each mounting means having formed therein at least a pair of apertures, each connector part being mounted on the mounting means and accurately positioned with respect to the apertures formed in the respective mounting means;
- alignment means respectively formed on the cabinet and the drawer, and being engageable with each other to align a portion of the cabinet to a portion of the drawer, the alignment means having extensions which are received by the apertures when the pair of mounting means are in place, thereby accurately positioning the connector parts with respect to their corresponding alignment means and with each other.

4,682,834

**MULTIPLE CONTACT ZERO INSERTION FORCE CONNECTOR**

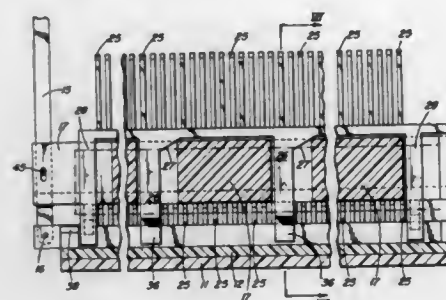
Robert B. Dunn, Gloucester, and Bruce Wiltshire, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 7, 1985, Ser. No. 699,424

Int. Cl.<sup>4</sup> H01R 13/62

U.S. Cl. 439-267

16 Claims



1. A multiple contact connector comprising:
  - an elongate housing;
  - a plurality of cantilever spring contacts mounted in said housing, in at least one linear array;
  - an elongate actuating member mounted for reciprocal longitudinal movement in said elongate housing;
  - interengaging formations on said elongate housing and said elongate actuating member;
  - a deflectable locking member extending down from a top surface of said elongate housing adjacent to each end of the housing;
  - a laterally extending cam member on one side of each locking member;
  - an aperture adjacent each end of said actuating member, extending through said actuating member, said locking members extending through said apertures;
  - the arrangement such that on reciprocal longitudinal movement of said actuating member said interengaging formations move said actuating member also reciprocally in a direction normal to said longitudinal movement, to move said spring contacts out of a contact position and return said spring contacts to a contact position, said actuating member also engaging with said cam member on each locking member to deflect said locking members laterally on movement of said spring contacts out of a contact position.

4,682,835

**INSULATION DISPLACING TERMINAL WITH CANTILEVER SPRING CONTACT MEMBERS**

Sharanjit S. Aujla, Kanata; George Debortoli, and Remo Contardo, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 721,259, Apr. 8, 1985, abandoned. This application Nov. 26, 1986, Ser. No. 935,135

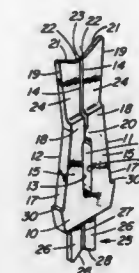
Int. Cl.<sup>4</sup> H01R 11/20

U.S. Cl. 439-395

9 Claims

1. An insulation displacing terminal comprising:
  - a base;
  - two cantilever spring contact members having a relatively wide transverse width and a relatively narrow thickness and extending up from said base, the contact members having top edges and opposed inner edges between which a conductor is pushed, the intersections of said top edges and said opposed inner edges defining insulation slicing edges;
  - each contact member having a lower portion and an upper portion, the lower portions having upwardly and inwardly inclined outer edges and the upper portions having

upwardly and outwardly inclined outer edges, the upper and lower portions congruent at a neck section; a slot extending between the inner edges of the lower portions and a swage on one of said contact members on the inner edge thereof, the swage positioned immediately above said slot and spacing said inner edges of said upper portions slight apart;



said upper portions defining a conductor receiving part; and said upper portions being of a reduced cross-sectional thickness relative to the thickness of said lower portions for at least a major part of the distance from said top edges toward said neck section.

4,682,836

**ELECTRICAL CONNECTOR AND CABLE TERMINATION APPARATUS THEREFOR**

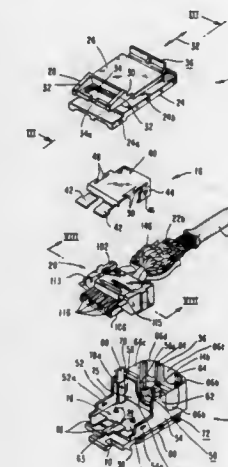
Peter Noorily, Bridgewater, and Joseph P. Slachetka, Ringoes, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Oct. 7, 1985, Ser. No. 785,312

Int. Cl.<sup>4</sup> H01R 4/24

U.S. Cl. 439-426

19 Claims



1. A shielded electrical connector, comprising:
  - an electrically insulative housing;
  - an electrically conductive shield supported by said housing; and
  - a cable termination sub-assembly for electrically terminating insulated conductors of an electrical cable exteriorly of said housing and for subsequent attachment to said housing, comprising:
    - (a) an electrically insulative contact holder, said holder insulatively supporting a plurality of electrical contacts each having an insulation displacement portion and a terminal portion;
    - (b) an electrically insulative conductor holding block, said block including a plurality of conductor retention means for receiving and holding said cable conductors

therein, said block further supporting insulatively a pair of electrically conductive shorting elements, each element including a pair of spaced, exposed terminals, said conductor retention means in said block adapted to dispose conductors therein individually into electrical engagement with said insulation displacement portions of said contacts upon joining said contact holder and said block, each terminal on each shorting element being disposed to contact a terminal portion of a different, unique electrical contact to thereby commonly electrically connect two different pairs of electrical contacts; and

(c) means for cooperatively maintaining said holder and said block in joined relation.

4,682,837

## EIGHT CONDUCTOR MODULAR PLUG

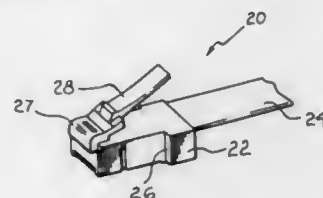
Stephen M. Thomas, Torrington, and Ronald Nitowski, Nantucket, both of Conn., assignors to The Siemon Company, Waretown, Conn.

Continuation of Ser. No. 634,818, Jul. 26, 1984, abandoned. This application Nov. 20, 1985, Ser. No. 799,781

Int. Cl.<sup>4</sup> H01R 13/639

U.S. Cl. 439—344

2 Claims



1. In an eight position modular plug for telephonic and related equipment including an insulating housing having eight contacts therein, each contact being connected to a wire, each of said contacts and wires being substantially mutually parallel to each other throughout the insulating housing, the housing having a front face, the front face including a plurality of apertures to permit access between the eight contacts and a modular jack, the housing having an upper surface with a locking means thereon which is associated with the front face, the housing having a rear face with a unitary insulating lead extending therefrom, the unitary lead surrounding the eight wires, the improvement comprising:

means for allowing insertion of said front face of said housing into either a six or eight position modular jack, said means for allowing insertion comprising a pair of oppositely disposed stepped-in portions extending from said front face along the sides of said housing wherein at least a portion of said housing is capable of insertion into a six or eight position modular jack.

4,682,838

## MULTIPOLAR PLUG

Klaus-Peter Achtnig, Herrman Herfort, and Ganther Hegner, all of Berlin, Fed. Rep. of Germany, assignors to KRONE GmbH, Berlin, Fed. Rep. of Germany

Filed Dec. 5, 1985, Ser. No. 805,450

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446622

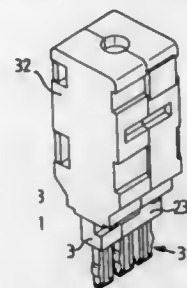
Int. Cl.<sup>4</sup> H01R 9/00

U.S. Cl. 439—598

8 Claims

1. A plug comprising a housing; a one-piece synthetic plastic insert including a retaining section captured in said housing and a second section having a first part which is confined in said housing and a second part which is located outside said housing, said second section having first and second sides; and at least one electric sheet metal elongated contact member at each side of said second section, each of said contact members having a first portion located on said first part and confined in

said retaining section, said contact members further having second and third longitudinally extending marginal portions respectively anchored in the first and second parts of the second section and being partially embedded in the respective



sides of said second section, with the retaining section disposed between the second and third portions of the contact members and with said second portions being confined on said first part in said housing.

4,682,839

## MULTI-ROW MODULAR ELECTRICAL CONNECTOR

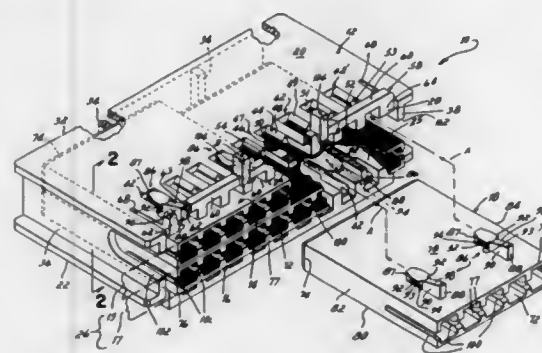
J. Robert Bryce, Fairport, N.Y., assignor to Crane Electronics, Inc., Cincinnati, Ohio

Filed Jan. 30, 1986, Ser. No. 824,156

Int. Cl.<sup>4</sup> H01R 13/506

U.S. Cl. 439—598

42 Claims



1. A modular electrical connector comprising:

a cell having an upper wall and a lower wall defining a receiving area between planar and parallel respective inner surfaces of the upper and lower walls;

a plurality of modules each adapted to carry electrical contacts between planar and parallel first and second module walls, each said module receivable in the receiving area and positionable such that when received in the receiving area, each said first module wall is adjacent a cell wall inner surface and each said second module wall is spaced from both said cell walls;

securement means on the cell walls and each said first module wall for cooperatively, tridimensionally securing each said module to the cell and to a said adjacent cell wall inner surface when the module is received in the receiving area, said securing of each said module being independent of whether any other said module is secured to the cell.

4,682,840

## ELECTRICAL CONNECTION AND METHOD OF MAKING SAME

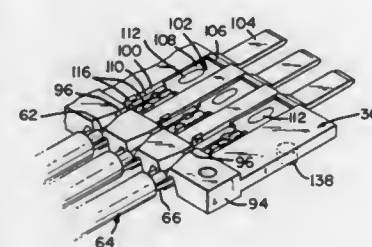
Joseph L. Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 769,552, Aug. 26, 1985, Pat. No. 4,602,831, which is a continuation of Ser. No. 536,017, Sep. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 442,472, Nov. 17, 1982, abandoned, which is a continuation of Ser. No. 670,662, Nov. 13, 1984, abandoned. This application Apr. 16, 1986, Ser. No. 852,672

Int. Cl.<sup>4</sup> H01R 4/02, 11/28

U.S. Cl. 439—874

8 Claims





4,682,843

## OPTICAL WAVEGUIDE JUNCTION AND METHOD OF MAKING SAID JUNCTION

Hans F. Mahlein, Unterhaching; Herbert Michel, Munich; Achim Reichelt, Unterhaching, and Gerhard Winzer, Putzbrunn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany  
Filed Feb. 27, 1984, Ser. No. 583,911

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310587

Int. Cl.<sup>4</sup> G02B 6/26, 6/42

U.S. Cl. 350—96.15

5 Claims



1. In an optical waveguide junction for an optical transmission line having a lead-in and a lead-out aligned fiber pair with a partially pervious layer arranged between the lead-in and lead-out aligned fibers and diagonally to their axis and a fiber branching off laterally from the lead-in and lead-out aligned fibers at the level of the partially pervious layer, wherein

the lead-in and an optical transmission line fiber are monomode fibers, the core diameter of the transmission line fiber being no larger than the core diameter of the lead-in fiber, while the lead-out fiber, which continues from the partially pervious layer and also the branching fiber are multimode fibers and, further, the core diameter of the lead-out aligned fiber, which continues from the partially pervious layer, is larger than the core diameter of the lead-in aligned fiber feeding the partially pervious layer, and wherein

the junction operates as a wave-length demultiplexer which is located at the output end of the optical-fiber transmission line for unidirectional multi-channel transmission for demultiplexing operations, with the branching fiber of the demultiplexer being fed from the frequency-selective partially pervious layer, the lead-in aligned fiber being integral with or coupled to a fiber of the transmission line, which transmission line fiber has a core diameter no larger than that of the branching fiber of the demultiplexer.

4,682,844

## DEVICE FOR DIVERTING THE DIRECTION OF LIGHT TRAVELLING THROUGH AN OPTICAL CONDUCTOR

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,548

Claims priority, application Japan, Sep. 26, 1983, 58-178928

Int. Cl.<sup>4</sup> G02B 6/26

U.S. Cl. 350—96.15

8 Claims



7. A light diverting and switching device connected in cascade between one transparent cylindrical optical conductor at a light source side and another transparent cylindrical optical

conductor at a light emission side comprising a plurality of light diverting and switching portions connected in series between said one and another optical conductors for diverting and picking up a part of light transmitted through said optical conductors, wherein each of said light diverting and switching portions comprises a first transparent cylindrical member having one surface formed on a horizontal plane at the light source side and another surface formed on a plane inclined with respect to said horizontal plane, a second transparent cylindrical member having one surface formed on said inclined plane connected with the inclined another surface of said first cylindrical member and another surface formed on a horizontal plane at the light emission side, the second transparent cylindrical member being further provided with a circular hole elongated in a horizontal direction toward said inclined surfaces, a third transparent cylindrical member for diverting light installed to move back and forth in said circular hole of said second cylindrical member and having an edge surface formed on an inclined plane parallel to the inclined one surface of said second cylindrical member, and a fourth transparent cylindrical member connected with said first cylindrical member and having a connecting surface disposed at a position to receive reflected light from said another inclined surface of said first transparent cylindrical member such that said fourth transparent cylindrical member thereby receives said diverted light, each third cylindrical member having a cross-sectional area, the cross-sectional area of each third cylindrical member being greater than the cross-sectional area of an immediately prior third cylindrical member with respect to the direction of light propagation from the light source side to the light emission side.

4,682,845

## APPARATUS FOR TRANSMITTING OPTICAL IMAGE

Yoshitoshi Itoh, Ome; Katsubiro Mizuno, Tokyo, and Atomi Noguchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

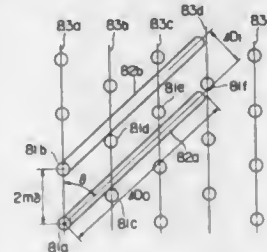
Filed Jun. 28, 1984, Ser. No. 625,593

Claims priority, application Japan, Jun. 30, 1983, 58-116978; Sep. 1, 1983, 58-158950

Int. Cl.<sup>4</sup> G02B 6/32

U.S. Cl. 350—96.18

5 Claims



1. An apparatus for transmitting an optical image comprising:

an image guide means which is formed by bundling optical fibers and transmits lights;

an objective lens system, arranged on the side of an edge surface of said image guide means, for forming an image of an object which is observed onto said edge surface of said image guide means;

first dispersive device means which cooperates with said objective lens system and disperses a location of the image formed on said image guide edge surface in accordance with wavelengths of lights, said first dispersive device means being arranged by being rotated by a constant angle with respect to the edge surface of said image guide means around an optical axis of said objective lens system as a center in the manner such that images at end surfaces of the respective optical fibers which form said image guide means do not overlap mutually, said images being able to

be formed on the surface of the object observed through said objective lens system;  
an ocular lens system, arranged on the side of a rear edge surface of said image guide means, for projecting the lights which are transmitted onto said rear edge surface through said image guide means onto a screen; and  
second dispersive device means which are transmitted through said image guide means onto the rear edge surface thereof in accordance with wavelengths, thereby synthesizing the image on the screen, said second dispersive device means being arranged by being rotated by a constant angle in the same direction as said first dispersive device means with regard to the rear edge surface of said image guide means around an optical axis of said ocular lens system as a center.

4,682,846

## HERMETIC HIGH PRESSURE FIBER OPTIC BULKHEAD PENETRATOR

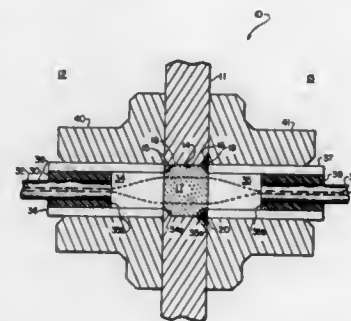
Steven J. Cowen, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 19, 1981, Ser. No. 322,808

Int. Cl.<sup>4</sup> G02B 6/32

U.S. Cl. 350—96.18

8 Claims



1. An apparatus assuring the transmission of optical data through a wall separating a first optical fiber disposed in a first medium from a second optical fiber disposed in a higher pressure second medium comprising:

a bore provided in the wall being shaped with an annular cut at one end and having a rim extending therein at its opposite end;

an essentially cylindrically-shaped glass plug sized to fit in the bore and configured with a ring-shaped recess on one end to rest on the rim and further configured with an annular recess on its opposite end for providing an optically transparent window;

means disposed between the cylindrically-shaped glass plug in its annular recess and in the annular cut in the one end of the bore for hermetically sealing the first medium from the second medium;

a first one-quarter pitch graded refractive index rod lens disposed between the end of the first optical fiber and the cylindrically-shaped glass plug for collimating optical data therethrough; and

a second one-quarter pitch graded refractive index rod lens disposed between the end of the second optical fiber and the cylindrically-shaped glass plug and being aligned with the first one-quarter pitch graded refractive index rod lens, for collimating optical data therethrough.

4,682,847

## CONNECTOR FOR RELEASABLE CONNECTION OF A FIRST AND A SECOND APPARATUS

Robert H. Moore, Mickleover, and Paul Morgan, Duffield, both of United Kingdom, assignors to John Davis & Son (Derby) Limited, Derby, United Kingdom

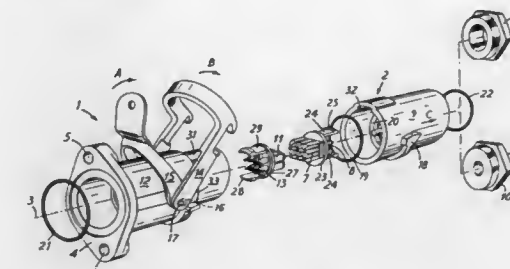
Filed Nov. 7, 1984, Ser. No. 669,239

Claims priority, application United Kingdom, Nov. 8, 1983, 8329734

Int. Cl.<sup>4</sup> G02B 6/36, 7/26

U.S. Cl. 350—96.20

8 Claims



1. A connector for releasably connecting a first apparatus to a second apparatus, the connector comprising:

first and second parts, said parts being arranged for slidable interengagement along a common axis, separate resilient means located between the first and second parts acting in a sense to urge the parts apart, engagement means on the second part,

a handle pivotally supported on the first part for pivotal movement about a second axis extending generally perpendicular to the common axis,

a stirrup member pivotally supported on the handle for pivotal movement about a third axis lying spaced from but extending generally parallel to the second axis, said stirrup means being arranged to engage the engagement means with the handle in an open state, the third axis lying to one side of a plane extending parallel to the first axis and containing the second axis, while with the handle in a closed state the third axis lies to the other side of the said plane, thereby causing progressive pivotal movement of the handle from the open to the closed state in a first sense about the second bar axis initially drawing said two parts together and then allowing limited movement of said parts apart under the force of the resilient means so that said resilient means will urge said handle in said first sense.

4,682,848

## UNDERWATER-MATEABLE OPTICAL FIBER CONNECTOR

James L. Cairns, Mims, and Dennis K. Ferbas, Titusville, both of Fla., assignors to Lockheed Corporation, Burbank, Calif.

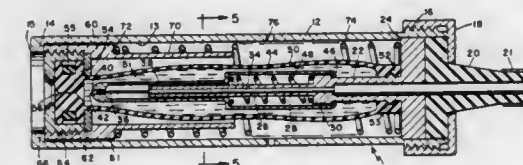
Continuation-in-part of Ser. No. 657,223, Oct. 3, 1984,

abandoned. This application Oct. 1, 1985, Ser. No. 789,445

Int. Cl.<sup>4</sup> G02B 6/38

U.S. Cl. 350—96.21

48 Claims



1. An underwater mateable fiber optic connector, comprising:

a first unit with a hollow casing for receiving the end of a first optical fiber and including:

support means in said casing for supporting said first optical fiber end;  
 hollow probe means movable in said casing for being moved to a retracted position with respect to said support means exposing said first optical fiber end or to an extended position with respect to said support means sheathing said first optical fiber end; and  
 a first interior chamber within said casing for containing said probe means and having a first fluid-resistant seal movable in said casing and penetrable by said probe means for being moved to an extended position away from said probe means and a retracted position penetrated by and exposing said probe means; and  
 a second unit with a body for receiving the end of a second optical fiber and for fitting to said first unit casing when said units are joined, and including:  
 first stop means in said body for moving said first seal to its retracted position when said units are joined;  
 a second interior chamber in said body with a second fluid-resistant seal penetrable by said probe means when said units are joined and said first seal is in its retracted position;  
 second stop means in said second chamber for, when said units are joined and said probe has penetrated said first and second seals, moving said probe means to its retracted position; and  
 an alignment means in said second chamber for, when said units are joined, holding said second optical fiber end and for receiving from said support means said first optical fiber end in optical alignment with said second optical fiber end.

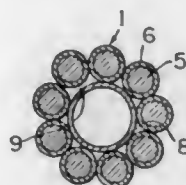
4,682,849

## OPTICAL FIBER JUNCTION AND METHOD OF MAKING SAME

Nobuo Kowata, and Naoshige Sasano, both of Sagamihara, Japan, assignors to Showa Electric Wire & Cable Co. Ltd. Continuation of Ser. No. 663,597, Dec. 3, 1984, abandoned, which is a division of Ser. No. 416,585, Sep. 10, 1982, Pat. No. 4,497,643. This application Feb. 19, 1986, Ser. No. 831,079 Claims priority, application Japan, Sep. 16, 1981, 56-145776 Int. Cl.<sup>4</sup> G02B 6/40; C03B 23/20

U.S. Cl. 350—96.22

3 Claims



1. A method of making an optical fiber junction device in which light is equally distributed through a plurality of optical fibers, comprising the steps of:  
 providing a central inner pipe or rod of glass with an axial tapered portion having a reduced diameter;  
 arranging a plurality of optical fibers around an outer periphery of said inner pipe or rod, said plurality of optical fibers being spaced from said outer periphery of said inner pipe or rod at said axial tapered portion;  
 fixing said plurality of optical fibers in position around said outer periphery of said inner pipe or rod;  
 externally heating said optical fibers and said central inner pipe or rod so as to cause said plurality of optical fibers to deform into conformity with said axial-tapered portion of said central pipe or rod of glass to form a thermally fused assembly having radially arranged cores of sectorial cross section;  
 elongating said thermally fused assembly by stretching said assembly in opposite directions; and  
 cutting said assembly at a location which has an outside

diameter of a single optical fiber and splicing said single optical fiber to said assembly.  
 2. An optical fiber junction device fabricated by the steps of claim 1.

4,682,850

## OPTICAL FIBER WITH SINGLE ULTRAVIOLET CURED COATING

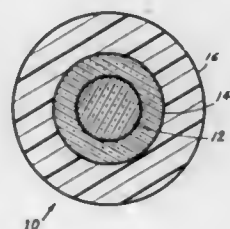
John S. White, Roanoke; A. Dahlgren Vaughan, Salem, and Francis I. Akers, Roanoke, all of Va., assignors to ITT Corporation, New York, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,080

Int. Cl.<sup>4</sup> G02B 6/44

U.S. Cl. 350—96.23

11 Claims



1. An optical fiber comprising a core and a cladding formed of similar materials, the core having a higher index of refraction than the cladding, and a single layer of ultraviolet cured resin having a thickness of at least 50 microns around said cladding, said single layer of ultraviolet cured resin exhibiting a tensile modulus in the range of about 1,000 psi to 10,000 psi, said fiber having attenuation losses of less than about 0.5 decibels/kilometer at room temperature and at -40° C. Celsius when transmitting light at about 1,300 or about 1,550 nanometers and otherwise being buffered by said single layer in a manner similar to a double coated optical fiber.

4,682,851

## SOFT AND TOUGH RADIATION-CURABLE COATINGS FOR FIBER OPTIC APPLICATION

Robert E. Ansel, Hoffman Estates, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 170,148, Jul. 18, 1980. This application Feb. 23, 1984, Ser. No. 582,705

Int. Cl.<sup>4</sup> G02B 6/00

U.S. Cl. 350—96.34

4 Claims

1. Optical glass fiber coated with a radiation-cured film of a radiation-curable liquid coating composition which cures to form a soft and tough coating, said radiation-curable liquid coating composition comprising, a polyurethane, polyamide or polyurea oligomer having (1) a molecular weight in the range of about 2000 to about 8000; (2) amide, urea or urethane groups in an amount of one such group for every 300 to 900 units of weight, and (3) polyalkylene polyether, polyalkylene polysulfide or polyalkylene polyester groups in which the alkylene moiety contains from 2-6 carbon atoms, said polyether, polysulfide or polyester constituting from about 40% to about 90% by weight of said oligomer, each end of said oligomer being terminated with a monoethylenically unsaturated addition polymerizable group, from 20% to 50%, based on the total weight of the composition, of a radiation-curable monoethylenically unsaturated monomer having a  $T_g$  below about 10° C., and from about 2% to about 20%, based on the total weight of the composition, of a monoethylenically unsaturated monomer having a strong capacity for hydrogen bonding.

4,682,852

REFLECTIVE SHEETING TECHNOLOGY  
Victor Weber, 2701 N. Margaret St., North St. Paul, Minn. 55109

Filed Jul. 23, 1984, Ser. No. 633,409

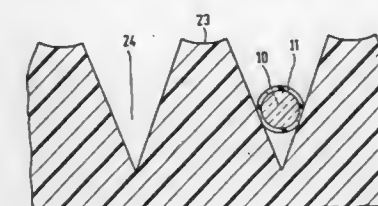
Int. Cl.<sup>4</sup> G02B 5/12

U.S. Cl. 350—105

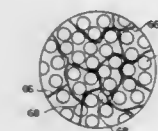
12 Claims



the screen, grooves being present between the successive ribs, in which grooves light-absorbing thread-like elements are



disposed, characterized in that the light-absorbing elements are made from glass fibres.



1. A reflex light reflector comprising a laminate of water-insoluble layers including an internal specular-reflecting metal layer sealed between water-insoluble layers and formed in situ by vapor deposition of metal to a sufficient thickness to constitute a continuous opaque electrically conductive film, and a monolayer of microsphere lens elements of a diameter within the range of 10 to 200 microns overlying the metal layer and bonded by resinous bonding material in optical relationship thereto for reflex light reflection, wherein

said metal layer is characterized by being multiply fractured in a random pattern of crack lines resembling the cracking pattern of a dried mud flat such that it consists of a multiplicity of non-overlapping patches of metal with adjacent patches having a crack line therebetween, each fractionally separated from others sufficiently to obstruct electrical conductivity between patches and thereby render said metal layer highly resistant to electrolytic corrosion, said crack lines of said metal layer being not so frequent as to form a discrete patch of metal under each said lens element, said patches of metal being of varied area size with each patch having an area size sufficient to underlie at least one up to about thirty of said lens elements, each said patch not exceeding 1000 microns in its longest dimension, with each said patch having at least one depression therein and each said depression being optically associated with a said lens element in a manner such that each lens element overlies a said depression, said laminate being further characterized by having over 80% of said lens elements thereof overlying patches having at least two and no more than twenty said lens elements optically entirely within the perimeter edges of individual said patches of metal.

4,682,853

## TRANSMISSION PROJECTION SCREEN AND METHOD OF MANUFACTURING SAME

Dirk J. Broer; Renso J. M. Zwiers, and Cornelis M. G. Jochem, all of Elmdhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 26, 1986, Ser. No. 844,051

Claims priority, application Netherlands, Jan. 10, 1986, 8600043

Int. Cl.<sup>4</sup> G03B 21/60

U.S. Cl. 350—128

14 Claims

1. A transmission projection screen comprising a transparent substrate having a front surface which is provided with mutually parallel ribs from which light issues during operation of

4,682,854

## LENS BARREL INCORPORATING A MOTOR

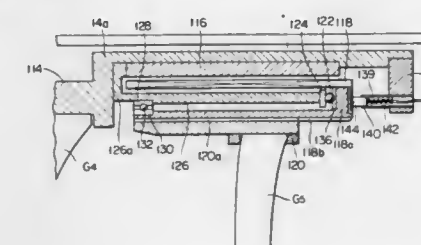
Ryoichi Hanamori, and Hiroshi Yamamoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Filed Jan. 2, 1985, Ser. No. 688,365

Claims priority, application Japan, Jan. 10, 1984, 59-2429; Jan. 10, 1984, 59-1577[U]; Jan. 11, 1984, 59-2198[U]; Jan. 11, 1984, 59-2199[U]

Int. Cl.<sup>4</sup> G02B 7/04

U.S. Cl. 350—255

5 Claims



1. A lens barrel incorporating a motor, comprising:  
 a fixed tube member;  
 a hollow cylindrical coil member arranged within said fixed tube member, said coil member being rotatable around an optical axis;  
 a fixed hollow permanent magnet and a fixed hollow yoke member respectively arranged on opposite sides of said coil member;  
 a commutator arranged on an end surface of said cylindrical coil member, said commutator rotating in conjunction with the rotation of said coil member;  
 a brush assembly arranged at a position opposing said commutator, said brush assembly in electrical contact with said commutator and being adapted to supply energy to said coil member;  
 a first movable member secured to said coil member, said first movable member having a first helicoid formed thereon, and being adapted to rotate in conjunction with the rotation of said coil member;  
 a second movable member having a second helicoid thereon for engaging said first helicoid, said second movable member being adapted to move parallel with the optical axis as by the lens barrel in response to the rotation of said first movable member; and  
 a lens construction secured to said second movable member so as to move in conjunction with the movement of said second movable member.



4,682,855

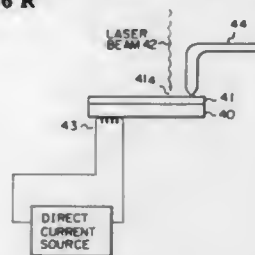
LASER-LIGHT ABSORBER AND METHOD FOR  
ABSORBING LASER LIGHT

Tatsutoku Honda; Michiyuki Endo, both of Ibaraki; Saburo Wakamatsu, Tokyo, and Yoshio Kudo, Saitama, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology and Showa Denko Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,221  
Int. Cl.<sup>4</sup> G02B 5/00, 27/00

U.S. Cl. 350—276 R

12 Claims



1. A laser-light absorber comprising a metal body and a flame-sprayed film essentially consisting of a ceramic metal oxide applied on said metal body, whereby laser-light is absorbed by said absorber to an extent of at least about 90%.

4,682,856

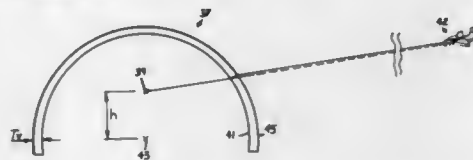
CONTOURED TRANSPARENCY PROVIDING REDUCED  
OPTICAL DISTORTION AND METHOD FOR MAKING  
IT

David W. Holdridge, Fullerton, Calif., assignor to Swedlow, Inc., Garden Grove, Calif.

Filed Sep. 4, 1984, Ser. No. 646,930  
Int. Cl.<sup>4</sup> G02B 5/00; G02C 7/02

U.S. Cl. 350—319

22 Claims



1. A contoured transparency providing low optical distortion of light passing through any portion of it and received at an adjacent, fixed low distortion location, the transparency comprising a sheet of transparent material formed to have a selected contour with a concave side and a convex side each portion of the sheet having a single degree of curvature corresponding substantially to the shape of a cylinder or cone, wherein the sheet has two orthogonal axes across its surface and a thickness that varies along both such axes in a prescribed fashion, such that light passing obliquely through any portion of the sheet at non-perpendicular horizontal and vertical impingement angles and received at a particular fixed low distortion location in the space adjacent to the sheet's concave side is substantially undistorted.

4,682,857

LIQUID CRYSTAL HOT SPOT DETECTION WITH  
INFINITESIMAL TEMPERATURE CONTROL

Peng Tan, 20674 Acadia Ct., Cupertino, Calif. 95014

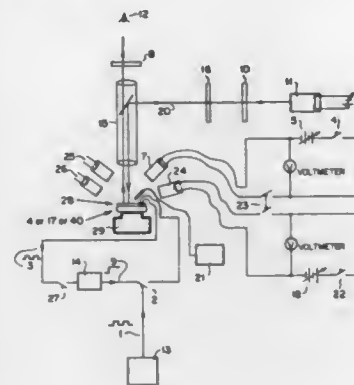
Filed Apr. 2, 1985, Ser. No. 718,866  
Int. Cl.<sup>4</sup> G01R 31/22

U.S. Cl. 350—331 T

11 Claims

11. A new use of liquid crystal for detecting hot spot on die or wafer with a hot spot detection method, said liquid crystal comprises:

- 4 CYANO-4'HEXYL-BIPHENYL, trade name is K-18 nematic liquid crystal; or
- 4 CYANO-4'PENTYL-BIPHENYL, trade name is K-15 nematic liquid crystal; or
- 4 CYANO-4'HEPTYL-BIPHENYL, trade name is K-21 nematic liquid crystal; or
- 4 CYANO-4'OCTYL-BIPHENYL, trade name is K-24 nematic liquid crystal; or



- 4 CYANO-4'NONYL-BIPHENYL, trade name is K-27 nematic liquid crystal; or
- 4 CYANO-4'DECYL-BIPHENYL, trade name is K-30 nematic liquid crystal; or
- 4 CYANO-4'UNDERDECYL-BIPHENYL, trade name is K-33 nematic liquid crystal; or
- 4 CYANO-4'DODECYL-BIPHENYL, trade name is K-36 nematic liquid crystal.

4,682,858

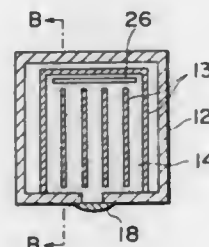
LIQUID CRYSTAL DEVICE HAVING  
REDUCED-PRESSURE REGION IN COMMUNICATION  
WITH FERROELECTRIC LIQUID CRYSTAL

Junichiro Kanbe, Yokohama; Shinjiro Okada, Kanagawa; Tooru Takahashi, Tokyo, and Yujiro Ando, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1985, Ser. No. 763,712  
Claims priority, application Japan, Aug. 20, 1984, 59-171529;  
Dec. 7, 1984, 59-258566; Dec. 13, 1984, 59-263663  
Int. Cl.<sup>4</sup> G02F 1/13

U.S. Cl. 350—334

42 Claims



1. A liquid crystal cell comprising a pair of substrates disposed with a gap therebetween; a liquid crystal injection port; a liquid crystal injected through the liquid crystal injection port and enclosed in the gap between the substrates to form a liquid crystal layer region; spacer members disposed on at least one of the substrates to regulate the thickness of the liquid crystal layer region; and a reduced pressure space in communication with said liquid crystal layer region.

18. A liquid crystal cell comprising: a cell structure comprising a pair of substrates disposed with a gap therebetween, a plurality of spacer members disposed between the substrates to

maintain the gap, and a ferroelectric liquid crystal enclosed in the cell structure; at least one of the substrates being flexible and said spacer members being disposed with a spacing  $a$  (mm) from each other satisfying the relationship

$$\frac{a^4}{Et^3} > 0.32$$

wherein  $E$  denotes the modulus of elasticity ( $\text{Kg.f./mm}^2$ ) of the flexible substrate and  $t$  denotes the thickness (mm) of the flexible substrate.

33. A liquid crystal device comprising:

- a non-flexible first substrate provided with a first group of electrodes, a first driving circuit connected to said first group of electrodes and a second driving circuit,
- a flexible second substrate provided with a second group of electrodes, and
- a ferroelectric liquid crystal disposed between the first and second substrates; said second electrode group connected to said second driving circuit, said first and second driving circuits being respectively connected to an external controlling circuit.

4,682,859

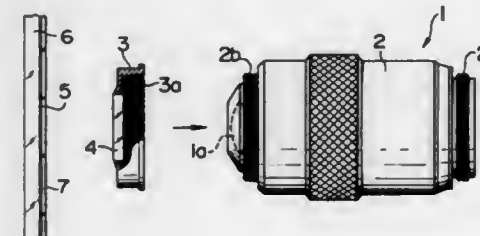
## OBJECTIVE LENS FOR MICROSCOPE

Takayosi Togino, Tokyo; Yuko Kobayashi, and Ken Yonekubo, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 4, 1985, Ser. No. 707,603  
Claims priority, application Japan, Jul. 5, 1984, 59-100683[U]  
Int. Cl.<sup>4</sup> G02B 2/02

U.S. Cl. 350—414

11 Claims



1. A microscope lens system for viewing an object which may be covered by a transparent cover glass, comprising:

- a lens barrel having an objective lens therein;
- at least one transparent planar parallel plate having a predetermined optical path length;
- said objective lens being designed for the combined optical path lengths of a respective one of said at least one parallel plate and any cover glass placed upon the object viewed by the lens system; and
- mounting means for detachably mounting said respective parallel plate on said lens barrel, whereby said respective parallel plate may be conveniently replaced by another respective parallel plate of different optical path length than said predetermined optical path length to prevent an aberration in image in the objective lens which would result from the use of a cover glass on the object being viewed of different thickness than said cover glass used with said first-mentioned parallel plate.

4,682,860

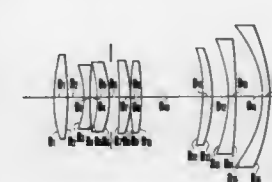
## ULTRASMALL SIZE ZOOM LENS

Kazuo Tanaka, Tokyo, and Akira Tajima, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 381,463, May 24, 1982, abandoned, and a continuation-in-part of Ser. No. 550,998, Nov. 10, 1983, abandoned, which is a continuation of Ser. No. 243,209, Mar. 12, 1981, abandoned. This application Feb. 7, 1985, Ser. No. 699,026  
Claims priority, application Japan, Mar. 14, 1980, 55-32524;  
Jun. 4, 1981, 56-86188

Int. Cl.<sup>4</sup> G02B 9/64, 15/14

U.S. Cl. 350—423

8 Claims



1. A photographic zoom lens of ultrashort total length comprising:

- a first lens group having a positive refractive power and positioned at the object side of the zoom lens;
- a second lens group having a negative refractive power and positioned closer to the image side than the first lens group, said object side being the long conjugate and said image side being the short conjugate;
- an air separation between said first lens group and said second lens group, said air separation being variable to effect zooming;
- said first lens group having at least two positive lenses and at least one negative lens;
- said second lens group having at least one positive lens and at least one negative lens; and
- both said first lens group and said second lens group being arranged for moving toward the object side during zooming from the wide angle end to the telephoto end.

4,682,861

## PROJECTION LENS

Jun Hosoya, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 747,029  
Claims priority, application Japan, Jun. 25, 1984, 59-130635;  
Jul. 27, 1984, 59-132297; Jul. 27, 1984, 59-132298  
Int. Cl.<sup>4</sup> G02B 9/34, 13/18

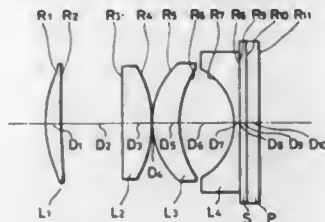
U.S. Cl. 350—432

6 Claims

1. A projection lens for projecting an image onto a screen, comprising:

- a first lens having a positive refracting power;
- a second lens having a positive refracting power and a convex surface which is located at the side of said second lens nearer to the image and which has a larger curvature than that at the side of said second lens nearer to the screen;
- a third lens which consists of a meniscus lens having a concave surface located at the side of said third lens nearer to the image; and
- a fourth lens having a concave surface which is located at the side of said fourth lens nearer to the screen and which has a larger curvature than that at the side of said fourth

lens nearer to the image, said first to fourth lenses being arranged, respectively, from a side of the screen in the order named, the combined refracting power of said second and third lenses being larger than the refracting



power of said first lens, at least one nonspherical surface being provided in said first lens, and at least one other nonspherical surface being provided in said second, third and fourth lenses.

4,682,862

## PROJECTION LENS

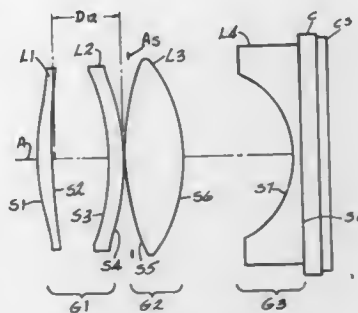
Jacob Moskovich, Cincinnati, Ohio, assignor to U.S. Precision Lens Incorporated, Cincinnati, Ohio

Continuation-in-part of Ser. No. 820,553, Jan. 17, 1986. This application Aug. 22, 1986, Ser. No. 899,477

Int. Cl.<sup>4</sup> G02B 13/18, 9/34, 9/60, 9/62

U.S. Cl. 350—432

42 Claims



1. A projection lens for a cathode ray tube having a semi-field angle of essentially thirty degrees or greater which consists of a first lens unit of weak positive power, a second lens unit including a biconvex glass element, and a third lens unit having a strongly concave image side surface and which contributes to correction of field curvature, and a meniscus corrector lens element having at least one aspheric surface and positioned to said second lens unit less than 0.1 percent of the equivalent focal length of the lens and having a surface convex to said second lens unit and contributing to correction of oblique spherical aberration, said meniscus corrector lens element having an axial optical power

$$0.05 > K_M/K_0 > -0.23$$

where  $K_M$  is the optical power of said meniscus lens elements at the optical axis and  $K_0$  is the optical power of the overall lens.

4,682,863

## ULTRA-WIDE ANGLE MICROGRAPHIC LENS

John J. Simbal, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 26, 1985, Ser. No. 769,441

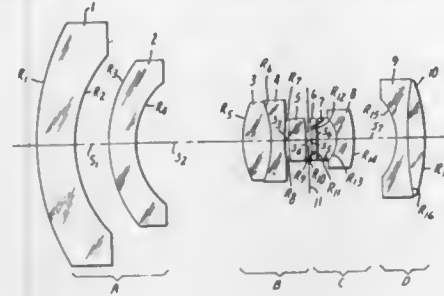
Int. Cl.<sup>4</sup> G02B 9/64

U.S. Cl. 350—463

2 Claims

1. An ultra-wide angle micrographic lens comprises ten lens elements comprising four groups of lenses airspaced from one another, a first

group comprising a pair of airspaced meniscus lens elements of converging power, a second group comprising a cemented doublet and a biconvex singlet, the third group comprising a plano-concave singlet and a cemented dou-



blet, and a fourth group comprising a cemented doublet, an aperture stop is located between the second and third groups, and said lens elements have a ratio of thickness to diameter equal to or exceeding ten percent.

4,682,864

## METHOD AND APPARATUS FOR SIMULTANEOUSLY OBSERVING A TRANSPARENT OBJECT FROM TWO DIRECTIONS

Toshikaki Kakii, Koichiro Matsuno, both of Kanagawa; Osamu Kawada, Ibaraki; Ryoze Ito, and Eiji Nakamura, both of Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone Corporation and Nippon Kogaku K.K., both of Tokyo, Japan

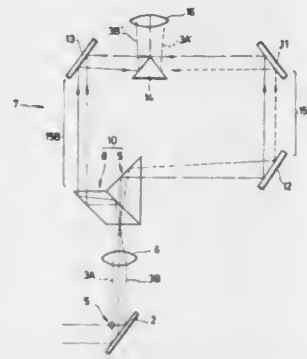
Filed Aug. 29, 1985, Ser. No. 770,558

Claims priority, application Japan, Aug. 31, 1984, 59-180788

Int. Cl.<sup>4</sup> G02B 21/18

U.S. Cl. 350—511

17 Claims



13. Apparatus for observing a transparent object from two directions comprising:

a light source for illuminating said object;

reflecting means for reflecting light from said source so that said light passes through said object in a first direction to form a first beam path containing a first image of said object and for reflecting light from said source having already passed through said object in a second direction to form a second beam path containing a second image of said object;

a single objective lens, said first and second beam paths passing through said single objective lens;

a first prism for reflecting said second beam path and transmitting said first beam path to cause said first and second beam paths to be separated;

means for combining said first and second beam paths so that

said first and second images form adjacent halves of a single field of vision; and means, optically disposed between said prism and said combining means, for causing the length of said second beam path to be different from that of said first beam path to cause said first and second images to be formed at the same position.

4,682,865

## CONCAVE MIRROR APPARATUS AND METHOD OF CONSTRUCTION

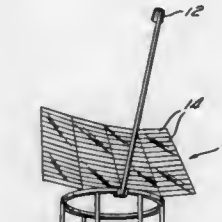
William E. Rogers, Haynersville, and David N. Borton, Troy, both of N.Y., assignors to Power Kinetics, Inc., Troy, N.Y.

Filed Jan. 31, 1986, Ser. No. 825,050

Int. Cl.<sup>4</sup> G02B 5/10, 7/18

U.S. Cl. 350—607

31 Claims



1. An apparatus comprising:

a mirror having first, second and third elongate strip portions in substantially parallel relationship to each other, and spaced from each other with said third elongate strip portion located between said first and second elongate strip portions; and

an apparatus for mounting said mirror comprising first and second members for supporting said mirror along said first and second elongate strip portions, respectively, said mounting apparatus including means, affixed to said third elongate strip portion, for applying force to said third elongate strip portion of said mirror to displace the portion of said mirror which is between said first and second strip portions relative to said first and second strip portions and thereby cause said mirror to curve about a first bending axis, said applying means comprising (1) a member having an elongate strip portion affixed to said third elongate strip portion of said mirror, and (2) means for bending said member to curve about a second bending axis orthogonal to said first bending axis, said bending means causing said mirror to curve about said second bending axis and thereby assume a concave shape.

4,682,866

## HEAD-BORNE BINOCULAR INDIRECT OPHTHALMOSCOPE WITH INTEGRATED TELESCOPE

David Volk, 3336 Kersdale Rd., Pepper Pike, Ohio 44124

Filed Nov. 8, 1984, Ser. No. 669,345

Int. Cl.<sup>4</sup> A61B 3/10

U.S. Cl. 351—205

13 Claims



1. A head-borne binocular indirect ophthalmoscope containing a single centered light source slightly above the usually horizontal level of the bilateral symmetrical observing system of the ophthalmoscope, for directing a beam of light toward a hand-held indirect ophthalmoscopy lens, a low powered columnating lens located symmetrically in front of medial right

and left oblique flat front surface mirrors which meet at an angle of 90° in a central usually vertical edge, each of said mirrors at an angle of 45° to the usually vertical center plane of symmetry of said ophthalmoscope, a pair of identical strong positive aspheric right and left telescope objective lenses with the front surface of each objective lens facing obliquely its respective medial oblique mirror, the optical axis of each of said objective lenses intersecting its respective medial oblique mirror at an angle of 45° with respect to a normal to the mirror, a second pair of lateral right and left flat oblique mirrors in oblique relation to the back surface of each objective lens, each of said lateral oblique mirrors at an angle of substantially 47° with respect to said center plane of symmetry of said ophthalmoscope the optical axes, and the axial chief rays along said optical axes, of said right and left objective lenses being coaxial and each intersecting its lateral oblique mirror at an angle of incidence of substantially 47° to then be reflected at an angle of reflection of substantially 47° so that each redirected optical axis of each objective lens is substantially 94° its original direction, to then become the optical axis and axial chief ray of each of the identical right and left ocular lenses of said telescopes, each lateral oblique mirror and its associated objective and ocular lenses forming a unit with the objective and ocular lenses fixed in coaxial position with respect to said mirror so that the optical axes of said objective and ocular lenses of said unit always intersect at a point on said lateral oblique mirror at an angle of substantially 94°, the secondary focus of each of said objective lenses coinciding with the primary focuses of its corresponding ocular lens.

4,682,867

## APPARATUS FOR THE SELF-EXAMINATION OF THE HUMAN EYE

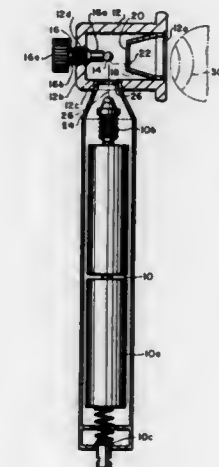
Herbert L. Gould, 90 Greenridge Ave., White Plains, N.Y. 10605

Filed Apr. 2, 1985, Ser. No. 718,873

Int. Cl.<sup>4</sup> A61B 3/02

U.S. Cl. 351—223

13 Claims



1. Apparatus for the self-examination of the human eye comprising:

(a) light source means for generating a beam of light along a given axis;

(b) an opaque disc with an off center pin hole having an axis orthogonal to said given axis of said light source means;

(c) sphere reflecting means positioned at the intersection of said orthogonal axes for orthogonally reflecting a beam of light from said light source means onto one side of said opaque disc and surrounding said off center pin hole; and

(d) support means for supporting said light source means, said opaque disc and said sphere reflecting means in said orthogonal axes relationship whereby a pin point of light is transmitted from said off center pin hole to a space on the other side of said opaque disc.



4,682,868

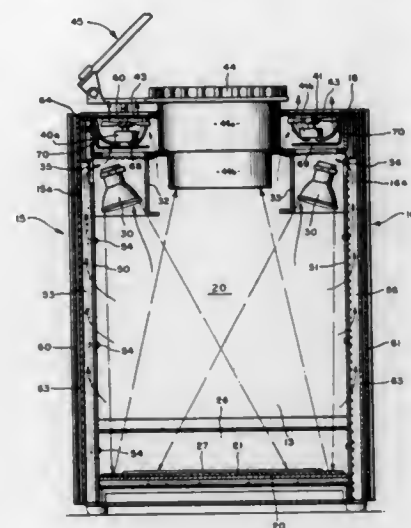
**THERMAL MANAGEMENT SYSTEM FOR AN EPISCOPIC IMAGE PROJECTOR**

Emile J. Constantin, Chicago, and Stephen Gryglas, Long Grove, Ill., assignors to Constantin Systems, Inc., Chicago, Ill.

Filed May 31, 1985, Ser. No. 739,828  
Int. Cl.<sup>4</sup> G03B 21/06

U.S. Cl. 353-58

14 Claims



1. In an opaque projector having a housing, an interior illumination chamber defined within the housing by a top, a base, and generally vertically extending sidewalls including a front wall, a back wall, and a pair of lateral sidewalls, a light source for illuminating an object placed within the illumination chamber, the light source generating heat and heated air within the illumination chamber when in use, the improvement in a thermal management system for the projector comprising:

lamps mounted adjacent the top of the projector, said lamps comprising said light source and being generally aimed toward the base, heat sink panels for absorbing heat generated by the light source within the illumination chamber, said heat sink panels mounted within the illumination chamber and in spaced relation to respective opposed sidewalls, each heat sink panel defining an air plenum between said heat sink panel and its respective sidewall, each said air plenum being open to said illumination chamber, said heat sink panels being respectively mounted in spaced relation to said front and back walls, said heat sink panels extending along substantially the entire inboard facing surface of said front and back walls, each said air plenum being open to said illumination chamber along at least one vertically extending side of a respective heat sink panel and

fan means for exhausting heated air from the illumination chamber, said fan means being mounted on the housing and drawing air through said air plenums to cool said heat sink panels.

4,682,869

**IMAGE PROCESSING SYSTEM AND METHOD**

Masaharu Itoh, Fujisawa; Taketoshi Yokemura, and Hiroshi Yanagisawa, both of Yokohama, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1984, Ser. No. 686,578

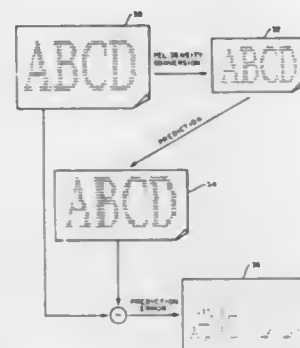
Claims priority, application Japan, Dec. 28, 1983, 58-245622  
Int. Cl.<sup>4</sup> H04N 1/40

U.S. Cl. 358-260

5 Claims

1. A system for communicating an image between devices having resolutions which may vary, the system comprising:

means for receiving an input image from a first device having a first resolution level;  
means for converting the input image into an image representing a lower level of resolution and a set of correction information representing a difference between the input image and a predicted image;  
means for determining if the converted lower level of resolution is a fixed base level of resolution and for repeating the converting and determining steps if said lower level is not the fixed base level, said repeated conversion step using the image representing the lower level of resolution as the input image;



means for storing image data representing the base level and each set of correction information generated; and  
means for regenerating an image at a second resolution for use in a second device having a second resolution which may differ from that of the first device including means for recalling the image data representing the base level and means for recalling a set of correction information, means for using the image data and the correction information to generate a higher level image and, if the higher level image is not equal to the second resolution, for repeating the use of image data and another set of correction data until the second resolution is reached.

4,682,870

**APPARATUS FOR ENCODING A FILM CARTRIDGE USED IN A PARTICULAR TYPE CAMERA**

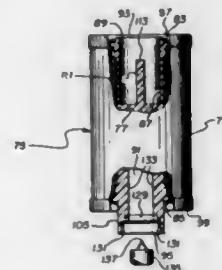
William C. Atkinson, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 13, 1986, Ser. No. 817,960

Int. Cl.<sup>4</sup> G03B 17/26, 13/10

U.S. Cl. 354-275

18 Claims



said shaft member including means for fracturing said fracturable element as the shaft member is received in said coaxial hole, whereby an indication will be provided that said cartridge was used in said camera.

4,682,871

**APERTURE VALUE INFORMATION SWITCHABLE LENS BARREL**

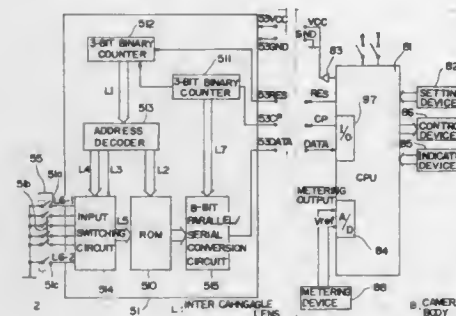
Tsuneyo Metabi, Izumi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 2, 1986, Ser. No. 902,886

Claims priority, application Japan, Sep. 2, 1985, 60-194154  
Int. Cl.<sup>4</sup> G03B 7/091, 17/00

U.S. Cl. 354-400

24 Claims

**1. A lens barrel comprising;**

information means for generating lens information, said information means including a first information unit for generating nominal aperture value information inherently stored therein, and a second information unit for generating effective aperture value information variable with image magnification,

information selecting means connected to said information means for selecting between said nominal aperture value information and said effective aperture value information, and

information transmitting means for transmitting information selected by said information selecting means outwardly of said lens barrel.

4,682,872

**SIGNAL PROCESSING APPARATUS FOR A SEMICONDUCTOR POSITION SENSING DEVICE**

Ryoichi Suzuki, Yokohama; Hideo Taka, Tokyo, and Shuichi Tamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,088

Claims priority, application Japan, Nov. 11, 1983, 58-211901  
Int. Cl.<sup>4</sup> G03B 3/00; G01C 3/10

U.S. Cl. 354-403

13 Claims

1. A signal processing apparatus for a semiconductor position sensing device having two output terminals, comprising:

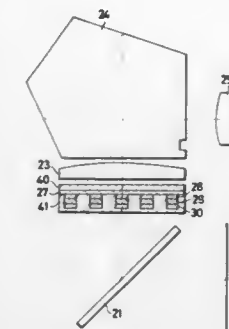
(a) variable impedance means connected to at least one terminal of said output terminals;

(b) impedance varying means connected to said variable impedance means for varying an impedance of said variable impedance means;

(c) detecting means functionally connected to said two output terminals for producing a third output signal based on first and second output signals from said position sensing device; and

(d) output means connected to said detecting means for producing fourth output signal representing a position of an incident light to said position sensing device in accordance with the impedance of said variable impedance means when said third output signal represents that said

first output signal and said second output signal are in a predetermined relationship as said impedance varying



means varies the impedance of said variable impedance means.

4,682,873

**PHOTOMETRIC DEVICE FOR CAMERA**

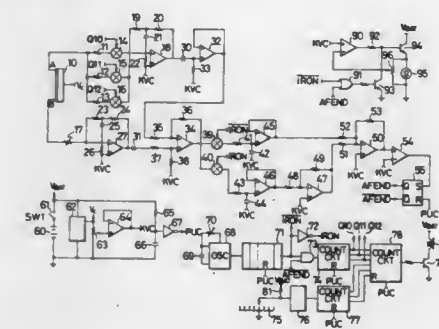
Hiroshi Ohmura, Saitama; Tokuchi Tsunekawa, Kanagawa; Shyuichi Kiyohara, Kanagawa, and Takashi Kawabata, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 770,162

Claims priority, application Japan, Aug. 31, 1984, 59-182155;  
Aug. 31, 1984, 59-182161; Aug. 31, 1984, 59-182162  
Int. Cl.<sup>4</sup> G03B 7/099

U.S. Cl. 354-478

14 Claims



1. A photometric device usable in a single lens reflex camera having a viewfinder system into which an object light from a photo-taking lens is introduced, comprising:

a photo-electric conversion element construction for measuring object light, said photo-electric conversion element construction comprising a transparent substrate and a photo-electric converter sandwiched between a transparent electrode and an opaque electrode laminated on the substrate, wherein said photo-electric conversion element construction is disposed in the optical path of said viewfinder system, and said transparent electrode, said photo-electric converter said opaque electrode and said transparent substrate are laminated in the recited order in the direction of incidence of the object light from said photo-taking lens.

4,682,874

## PARTICLE LEVEL INDICATOR

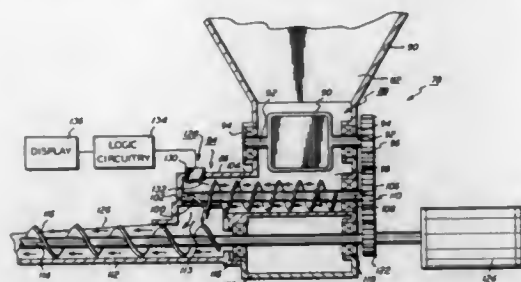
Joseph Fantuzzo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1981, Ser. No. 322,801

Int. Cl. G03G 15/08

U.S. Cl. 355-3 DD

13 Claims



1. An apparatus for indicating the depletion of particles being dispensed into a development system, including: means for storing a supply of particles therein; means for discharging particles into the development system; means for transporting particles from said storing means to said discharging means; and non-magnetic means, positioned in said transporting means for detecting the exhaustion of particles in said transporting means.

4,682,875

## IMAGE FORMING SYSTEM HAVING EXTERNAL SIGNAL GENERATING MEANS

Tadashi Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

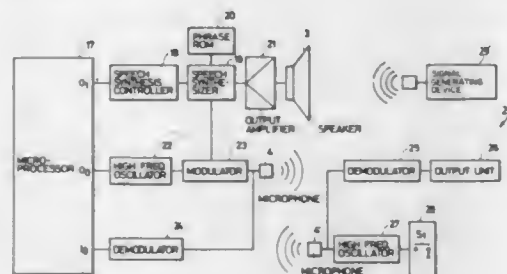
Filed Dec. 30, 1985, Ser. No. 814,685

Claims priority, application Japan, Jul. 21, 1982, 57-125721; Jul. 21, 1982, 57-125722

Int. Cl. G03G 15/00

U.S. Cl. 355-3 R

4 Claims



1. An image forming system comprising: an image forming apparatus; a plurality of signal generating devices for generating respective inquire signals to said image forming apparatus, while said apparatus is supplied with power, wherein the respective inquire signals are for inquiring as to the states of said apparatus; means for receiving the respective inquire signals from each of said plurality of signal generating devices; means for recognizing which one of said signal generating devices has generated a respective inquire signal received by said receiving means; and means for transmitting an answer signal, responsive to the respective inquire signal received by said receiving means, to said one of said signal generating devices recognizing by said recognizing means, the answer signal indicating the states of said apparatus, wherein each of said signal generating devices includes means for receiving an answer signal and means for informing an operator of the states of said apparatus in response to the answer signal.

nized by said recognizing means, the answer signal indicating the states of said apparatus, wherein each of said signal generating devices includes means for receiving an answer signal and means for informing an operator of the states of said apparatus in response to the answer signal.

4,682,876

## INFORMATION RECORDING APPARATUS

Yasumasa Ohtsuka, and Masaharu Ohkubo, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

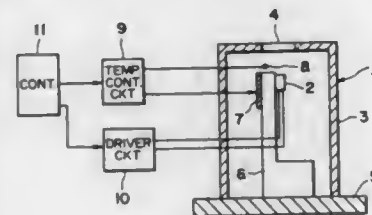
Filed Feb. 20, 1986, Ser. No. 831,182

Claims priority, application Japan, Feb. 20, 1985, 60-031796

Int. Cl. G03G 15/00

U.S. Cl. 355-3 R

5 Claims



1. An information recording apparatus, comprising: a semiconductor light source responsive to an information signal to be recorded to produce information light; a photosensitive member for receiving the information light produced by said semiconductor light source; means for supplying to said semiconductor light source an electric current  $I_0$  having a current level lower than a light emitting threshold current  $I_{th}$  of said semiconductor light source before said semiconductor light source is driven in accordance with the information signal to be recorded, so that said semiconductor light source heats itself by the application of the current  $I_0$ .

4,682,877

## ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH A SELECTING MEANS OF MAGNIFICATION CHANGING ELEMENTS

Katsuyoshi Fujiwara, Osaka; Yoshihisa Miwa, Nara, and Shochiro Yoshinara, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 23, 1985, Ser. No. 768,705

Claims priority, application Japan, Aug. 31, 1984, 59-183256

Int. Cl. G03G 15/00

U.S. Cl. 355-3 R

1 Claim

1. An electrophotographic copying apparatus comprising in combination an original document size detecting means for detecting size of an original document placed on an original document platform, a selecting means of various magnification changing elements which calculates and selects, on the basis of the size of said original document detected by said original document size detecting means and a predetermined size of copy paper or a predetermined magnification ratio, a proper magnification ratio when the size of said copy paper is predetermined, or a proper size of copy paper when the magnification ratio is predetermined, and an indicating means which indicates the necessity to change the direction of placement of said original document such that the magnification ratio is larger or the image forming area does not exceed the size of the copy paper in the case when either or both of said original document and/or copy paper are capable of being placed in such a manner that a longitudinal direction thereof is brought in either a crossing or parallel relation with respect to an exposure scanning direction.

4,682,878

## FIXING DEVICES FOR ELECTROPHOTOGRAPHIC APPARATUS

Tatsuji Takizawa, Nobutaka Noda, and Hideaki Takigawa, all of Tokyo, Japan, assignors to Katsuragawa Denki Kabushiki Kaisha, Tokyo, Japan

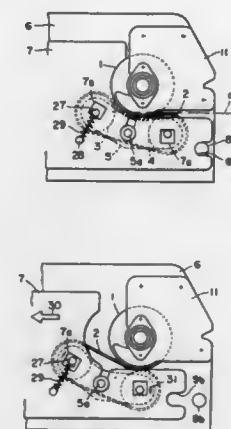
Filed Apr. 24, 1986, Ser. No. 855,428

Claims priority, application Japan, Apr. 30, 1985, 60-93232

Int. Cl. G03G 15/20

U.S. Cl. 355-3 FU

11 Claims



1. In a fixing device of the type comprising a fixing roller heated by heating means, and pressure applying means for fixing a toner image formed on a copying medium while the same is being clamped between said fixing roller and said pressure applying means to be conveyed in contact with said fixing roller, the improvement wherein:

said pressure applying means is mounted on a supporting member slidable with respect to a stationary member supporting said fixing roller, and said fixing device further comprising: positioning means for setting said supporting member at a predetermined position with respect to said stationary member, and clamping means for clamping said supporting member at a predetermined position of said stationary member.

4,682,879

## ELECTROPHOTOGRAPHIC COPIER

Itsuro Katoh, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

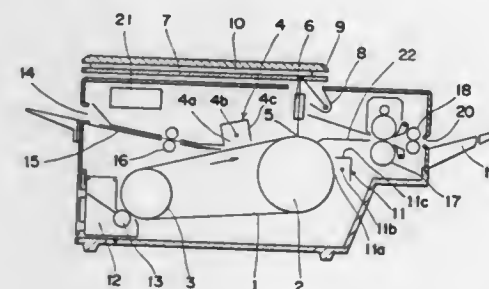
Filed Jul. 29, 1985, Ser. No. 759,734

Claims priority, application Japan, Jul. 31, 1984, 59-163224; Jul. 31, 1984, 59-163225

Int. Cl. G03G 15/00

U.S. Cl. 355-3

5 Claims



1. An electrophotographic copier for implementing an electrophotographic copying process, comprising in combination: a photoconductor; a charging means for uniformly charging said photoconductor;

tor and for transferring an image to be developed on said photoconductor to a copy paper; an exposing means for exposing said charged photoconductor to an optical image at an exposure site of an exposure station to form a latent electrostatic image thereon, said exposing means being juxtaposed to said charging means at a distance such that dark decay of said photoconductor before exposure is substantially eliminated; a developing means which develops said latent image with toner particles; an illuminating means positioned after said exposure means; a fixing means which fixes said transferred toner particles in an imagewise manner to said copy paper; a cleaning means which cleans said photoconductor, a feeding means which carries said copy paper to said charging means during the image transfer phase of said copying process; and a means for controlling the feeding means to transport a copy paper to the charging means synchronously with the movement of said photoconductor so as not to interfere with exposing of a complete optical image to said photoconductor by said exposing means said photoconductor, charging means, exposing means and fixing means being adjusted to said feeding means such that copy paper with the transferred image thereon passes said exposure station after completion of exposure of said optical image; said copy paper following a path so as to be transported over said exposure site to said fixing means.

4,682,880

## MULTICOLOR IMAGE RECORDING METHOD AND DEVICE UTILIZING A SINGLE IMAGE TRANSFER TO THE RECORDING MATERIAL

Haruo Fujii, Yokohama; Yutaka Inaba, Kawaguchi, and Yujiro Ando, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

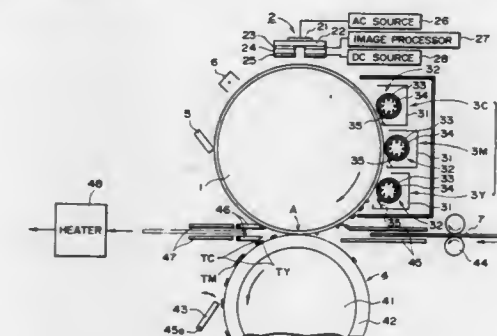
Filed Sep. 10, 1985, Ser. No. 774,490

Claims priority, application Japan, Sep. 13, 1984, 59-190537

Int. Cl. G03G 15/01

U.S. Cl. 355-4

9 Claims



1. An image recording method, comprising: a first step of forming an electrostatic latent image on a rotatable latent image bearing member; a second step of supplying a developer to the electrostatic latent image to form a visualized image on the latent image bearing member; a third step of transferring by pressure the visualized image from the latent image bearing member to a rotatable visualized image bearing member press-contacted to the latent image bearing member, through a nip formed between the latent image bearing member and the visualized image bearing member, the visualized image bearing member having a surface roughness larger than that of the latent image bearing member; a fourth step of repeating said first, second and third steps to form on the visualized image bearing member a multi-color image which consists of plural visualized images and



which corresponds to one final image to be recorded, wherein when said second step is repeated, a visualized image is formed with a developer of a color which is different from a color with which the first mentioned second step is performed; and

a fifth step of transferring by pressure all at once the multi-color image to a recording material by passing the recording material through the nip formed between the latent image bearing member and the visualized image bearing member bearing the multi-color image.

4,682,881

# APPARATUS FOR PRODUCING AN ELECTROPHOTOGRAPHIC PRINT

Shoji Komatsubara; Yukio Hatabe; Tooru Horikawa, all of Shigaken; Sadao Murasawa, Hyogoken, and Hajime Murakami, Shigaken, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto and Ishihara Sangyo Kaisha Ltd., Osaka, both of Japan

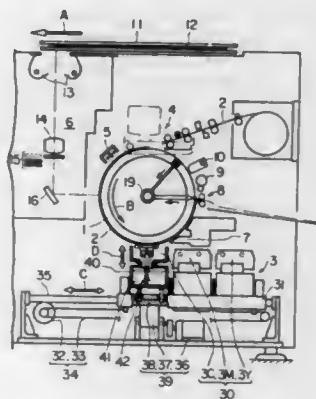
Filed Nov. 1, 1985, Ser. No. 794,185

Claims priority, application Japan, Nov. 22, 1984, 59-247672

Int. Cl.<sup>4</sup> G03G 15/10

U.S. Cl. 355—10

9 Claims



1. An apparatus for producing an electrophotographic print on a photosensitive receptor movable through a plurality of predetermined stations so as to produce an electrostatic latent image on the photosensitive receptor, the apparatus comprising: a rotary drum having a peripheral surface defining an image forming section and a non-image forming section, the photosensitive receptor being placeable on the image forming section of the drum surface; a developing unit having at least one developing station for supplying a developer to the photosensitive receptor on the drum so as to make the electrostatic latent image visible; means for collecting the used developer from the photosensitive receptor, the collecting means being provided axially of the drum in the non-image forming section of the peripheral surface and including a suction opening on the drum surface connected to a sucking means provided externally of the drum, the suction opening being formed as a groove extending crosswise of the drum surface; and a developer absorbent material provided in the suction opening.

4,682,882

# IMAGE RECORDING APPARATUS

Wabei Tokuda, and Atushi Takagi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 645,402, Aug. 29, 1984, abandoned.

This application Jun. 4, 1986, Ser. No. 870,424

Claims priority, application Japan, Sep. 5, 1983, 58-161948

Int. Cl.<sup>4</sup> G03G 15/06, 27/00

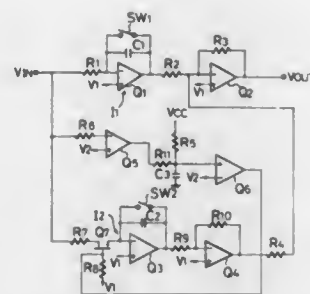
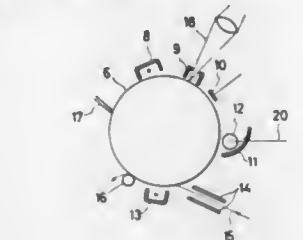
U.S. Cl. 355—14 D

16 Claims

9. An image recording apparatus comprising: image recording means for image recording on a recording member according to an original;

detecting means for detecting the image density of the original; and

control means for controlling the image recording conditions of said image recording means in response to data released from said detecting means;



wherein said control means is adapted to correct the data released from said detecting means in the event that the image density exceeding a predetermined value continues over a predetermined width.

4,682,883

# PHOTOGRAPHIC COLOR ENLARGING OR COPYING APPARATUS

Werner Delueg, Vahrn, and Mario Gandini, Milland/Brixen, both of Italy, assignors to Durst Phototechnik GmbH, Bozen, Italy

PCT No. PCT/EP85/00520, § 371 Date Jun. 6, 1986, § 102(e)

Date Jun. 6, 1986, PCT Pub. No. WO86/02176, PCT Pub.

Date Apr. 10, 1986

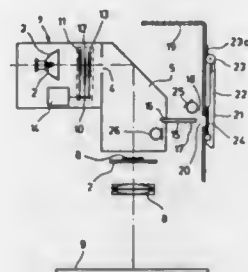
PCT Filed Oct. 4, 1985, Ser. No. 879,107

Claims priority, application Italy, Oct. 8, 1984, 4875 A/84

Int. Cl.<sup>4</sup> G03B 27/80

U.S. Cl. 355—38

8 Claims



1. A photographic color enlarging or copying apparatus having a measuring device for determining the density in the colors red, green and blue of a test copy that is made from a selected reference original, a device for storing the measured results with respect to a target copy and means for the automatic modifying of the exposure conditions in the enlarging apparatus as a function of an existing difference of the measuring results between the test and the target copy, wherein the measuring device has light-guiding means (15) for illuminating

a measuring surface outside the path of the copying rays with light from the copying light source of the enlarging apparatus and photoelectric measuring sensors (25) are aligned with the measuring surface so that they receive measuring light reflected by the measuring surface and wherein the light measuring values of the reflected light are related to measuring values of the intensity of the light of the copying light source.

4,682,884

# MECHANISM FOR ADJUSTING THE STARTING POSITION OF SLIDING TABLE OF AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Akihiko Taniguchi; Takahiro Fukunaga, both of Nara, and Eiichi Shimizu, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

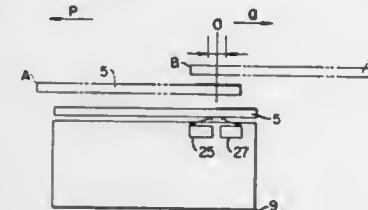
Filed Dec. 9, 1985, Ser. No. 806,491

Claims priority, application Japan, Jan. 8, 1985, 60-1325[U]

Int. Cl.<sup>4</sup> G03B 27/48, 27/50, 27/70

U.S. Cl. 355—51

4 Claims



1. In an electrophotographic copying machine comprising a document-carrying table which is movable along given directions at least between an initial position and an exposure position and a source unit which includes in a unitized structure a lamp light source and a mirror serving to initially reflect the reflected light from a document to be copied, the position of said source unit being adjustable at the time of assembly of said copying machine, the improvement wherein said copying machine further comprises an attachment member which is adjustable in said directions independently of said source unit and serves to adjust the distance between said initial position and said exposure position, and means for detecting said starting position of said table, said detecting means being secured to said attachment member.

4,682,885

# ILLUMINATION APPARATUS

Makoto Torigoe, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 729,056, Apr. 30, 1985, abandoned.

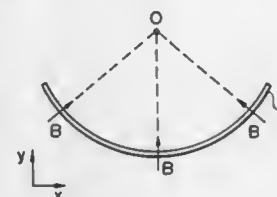
This application Sep. 30, 1986, Ser. No. 913,619

Claims priority, application Japan, May 2, 1984, 59-87879

Int. Cl.<sup>4</sup> G03B 27/54

U.S. Cl. 355—67

12 Claims



1. An apparatus for illuminating an object, comprising: means for producing a light beam; means having an arcuate slit aperture, for restricting an area of illumination; means for receiving the light beam produced by said light producing means to establish Kohler illumination for said

restricting means, said Kohler illumination establishing means including a light integrator having a plurality of elements each having cylindrical parts extending in parallel in one direction, at least two of said elements being arranged so that the directions in which the cylindrical parts thereof respectively extend are different, and means for forming an image of said restricting means, illuminated in Kohler fashion by said Kohler illumination establishing means, at a predetermined position with respect to the object.

4,682,886

# DISTANCE MEASURING DEVICE

Masamichi Toyama, Tokyo; Naoya Kaneda, and Kazuo Fujibayashi, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 476,241, Mar. 17, 1983. This

application Aug. 20, 1986, Ser. No. 898,864

Claims priority, application Japan, Mar. 24, 1982, 57-46572;

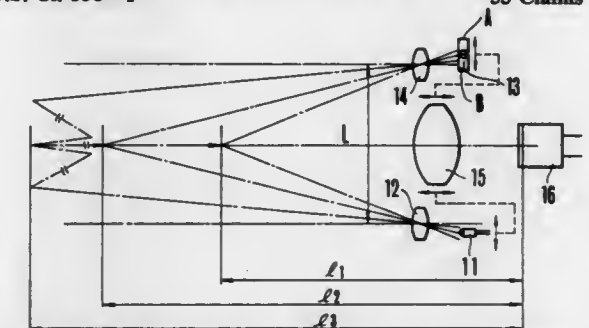
Mar. 31, 1982, 57-53013; Mar. 31, 1982, 57-53014; Mar. 31,

1982, 57-53015; Apr. 7, 1982, 57-57719

Int. Cl.<sup>4</sup> G01C 3/00; G03B 3/00

U.S. Cl. 356—1

53 Claims



1. A distance measuring device for measuring a distance to an object, comprising: an imaging optical system for forming an image of said object at a predetermined position; light projecting means for projecting light toward said object within a first plane containing the optical axis of said imaging optical system and said light projecting means; and light receiving means for receiving light reflected from said object within a second plane containing the optical axis of said imaging optical system and said light receiving means, said first plane and said second plane being non-coplanar; and a computing circuit responsive to said light receiving means to produce a signal related to the distance.

4,682,887

OPTICAL ASSAY FOR STORED HUMAN PLATELETS

Brian J. Bellhouse, The Lodge, North Street, Islip, Oxfordshire, and John W. Stairmand, Wirral, both of England, assignors to Brian J. Bellhouse, Islip, England

Filed Oct. 30, 1984, Ser. No. 666,390

Claims priority, application United Kingdom, Oct. 31, 1983, 8328979

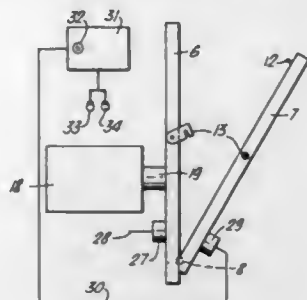
Int. Cl.<sup>4</sup> G01N 33/48

U.S. Cl. 356—39

4 Claims

1. A device for use in a blood platelet monitoring assembly of the kind comprising at least one translucent pack of blood platelets comprising: means for periodically agitating the pack to cause platelets in the pack to flow, said means for agitating including first and second surfaces between which the pack of platelets is adapted to be gripped; light source means in one of said surfaces for irradiating the pack with light and causing light to be transmitted through the pack in a given direction; photoelectric means in the other of said surfaces in a position

opposite to said light source means for collecting the light transmitted in said given direction and producing an electrical signal having an AC component with an amplitude equal to the difference between minimum and maximum levels of transmitted light, said AC component having a frequency equal to the frequency of periodic agitation, and



means responsive to said signal for extracting the AC component thereof, comparing the amplitude of the AC component with a reference datum and generating a visual display indicating one of acceptability or non-acceptability of the viability of the pack.

4,682,888

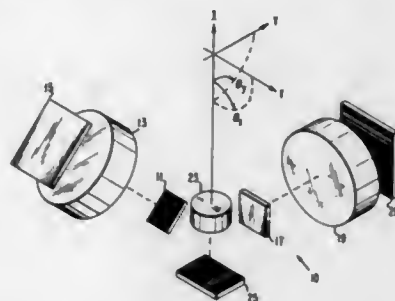
**SPECTRAL ANALYZER AND DIRECTION INDICATOR**  
Jerome M. Welner, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 26, 1984, Ser. No. 686,363

Int. Cl.<sup>4</sup> G01N 21/01; G01J 3/36; G01B 11/26

U.S. Cl. 356—73

17 Claims



1. A spectral analyzer and direction indicator system for receiving collimated or essentially collimated incident radiation comprising:

first optical means responsive to the collimated or essentially collimated incident radiation for providing first optical diffraction information which is a function of spectral content and incidence direction of the collimated or essentially collimated incident radiation;

second optical means responsive to the collimated or essentially collimated incident radiation for providing second optical diffraction information which is a function of spectral content and incidence direction of the collimated or essentially collimated incident radiation;

detector means illuminated by said first and second optical diffraction information for providing, as a function of the locations on said detector means illuminated by said first and second optical diffraction information, detected information for identifying as to the collimated or essentially collimated incident radiation both the spectral content and a first angular incidence direction;

third optical means for providing non-diffracted optical information which is a function of incidence direction of

the collimated or essentially collimated incident radiation; and  
further detector means illuminated by said non-diffracted optical information for providing, as a function of locations on said further detector means illuminated by said third optical information, detected information indicative of a second angular incidence direction of the collimated or essentially collimated incident radiation.

4,682,889

**REFRACTOMETER FOR MEASURING THE REFRACTIVE INDEX OF A LIQUID**

Alan L. Harmer, Plan Les Ouates, Switzerland, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

PCT No. PCT/CH84/00122, § 371 Date Apr. 2, 1985, § 102(e)

Date Apr. 2, 1985, PCT Pub. No. WO85/00886, PCT Pub.

Date Feb. 28, 1985

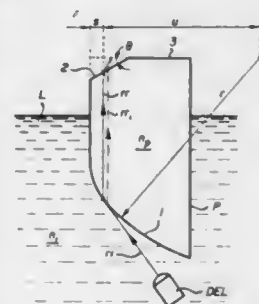
PCT Filed Jul. 31, 1984, Ser. No. 720,411

Claims priority, application Switzerland, Aug. 3, 1983, 4215/83

Int. Cl.<sup>4</sup> G01N 21/41

U.S. Cl. 356—135

4 Claims



1. A refractometer for measuring a refractive index of a liquid to be measured, substantially independently of its temperature range, comprising:

a prism having a plurality of faces, at least one of the faces being in contact with the liquid to be measured;

light source means for directing a light beam through the prism to be incident upon, and pass through the one face and to be incident upon and pass through another face which is in contact with another medium, the one and the other faces of the prism traversed by the said beam forming corresponding non-right-angles with incident beams at the one and another faces;

wherein the other medium has a refractive index variation as a function of a temperature thereof which is lower than a refractive index variation of the liquid to be measured; and a measuring scale structure, disposed in a location in which refracted light beams, refracted when passing from the liquid into the prism and when passing from the another face into the another medium, are substantially convergent;

the refractive index of the liquid varying as a function of a temperature range simultaneously affecting the liquid and the prism having one face in contact therewith.

4,682,890

**MICROSAMPLE HOLDER AND CARRIER THEREFOR**

Everly C. de Macario, Delmar; Robert J. Jovell, Albany, and Alberto J. L. Macario, Delmar, all of N.Y., assignors to Health Research, Incorporated, Albany, N.Y.

Filed May 31, 1985, Ser. No. 739,969

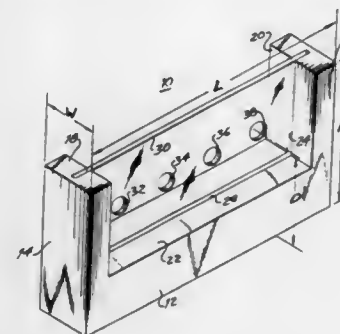
Int. Cl.<sup>4</sup> G01N 21/03; C12M 1/18

U.S. Cl. 356—244

32 Claims

1. Apparatus for use in a horizontal beam spectrophotometer in place of a conventional cuvette support that normally is used with said spectrophotometer and that carries a plurality of

cuvettes and includes one or more windows through which the beam passes to samples in said cuvettes; said apparatus comprising a carrier formed as a generally rectangular base having opposite ends, a bottom surface, a top wall and a slot in the top wall thereof, a pair of arms secured to said opposite ends of said base and extending upwardly from said top wall such that the height of said carrier from the top of either arm to the bottom surface of said base is substantially equal to the height of the conventional cuvette support, each arm having an inner wall that faces the inner wall of the other arm and in which is disposed a slot aligned with and meeting the slot in the top of



said base and extending substantially the length of said arm; and a microsample holder formed as a plate having a number of retaining elements for retaining drops of samples to be analyzed by said spectrophotometer, said plate being insertable in the slots of said carrier to position the plate on said base such that when said carrier is loaded into said spectrophotometer the retaining elements assume substantially the same position as the windows of said conventional cuvette holder.

23. A microsample holder for retaining at least one drop of liquid sample, comprising a thin, flat plate; and at least one circular opening in said plate having a diameter on the order of 3 mm for retaining said liquid sample therein.

4,682,891

**MICROCIRCLE SYSTEM**

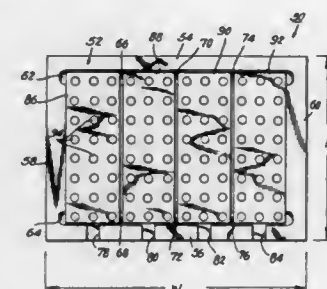
Everly C. de Macario, Delmar; Robert J. Jovell, Albany, and Alberto J. L. Macario, Delmar, all of N.Y., assignors to Health Research, Incorporated, Albany, N.Y.

Continuation-in-part of Ser. No. 739,969, May 31, 1985. This application Sep. 13, 1985, Ser. No. 775,582

Int. Cl.<sup>4</sup> G01N 21/03; C12M 1/20

U.S. Cl. 356—244

31 Claims



1. Apparatus for use in a conventional microtitration plate support in place of a microtitration plate that has a plurality of microwells, said apparatus comprising a generally rectangular base including a frame having plural sides, the frame being of height h substantially equal to the height of said conventional microtitration plate, length l substantially equal to the length of said conventional microtitration plate, and width w substantially no greater than the width of said conventional microti-

tration plate; a pair of support ledges extending toward the interior of said frame from opposite sides of said frame; and at least one tile formed as a thin sheet of material having an array of thin, flat retaining dishes for retaining drops of liquid samples, said tile having edge portions supportable on said pair of support ledges of said frame.

4,682,892

**METHOD AND APPARATUS FOR SPECKLE-SHEARING INTERFEROMETRIC DEFORMATION ANALYSIS**

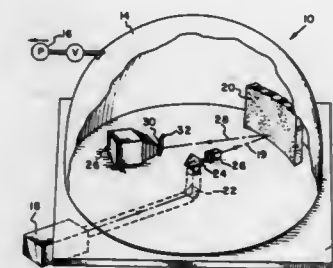
Surendra K. Chawla, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 407,687, Aug. 13, 1982, abandoned. This application Aug. 30, 1985, Ser. No. 770,937

Int. Cl.<sup>4</sup> G01B 9/02

U.S. Cl. 356—353

10 Claims



1. An apparatus for generating an interferogram for detection of subsurface voids, separations and nonuniformities of pneumatic tires comprising:

(a) a means for generating a beam of coherent light to illuminate and reflect light off of said pneumatic tire;

(b) a camera, including a photographic media and a converging lens comprising a double convex lens having one-half of one of its surfaces covered by a transparent plate having flat parallel sides oriented at a predetermined angular inclination with respect to an axis of the lens and an end contacting the surface of the double convex lens at its mid-point, said transparent plate adapted to displace laterally some of the light reflected from the pneumatic tire, and the converging lens adapted to receive light and focus it onto the photographic media to expose and record a focused image of interference fringes formed from two images of said tire, displaced with respect to one another and having a major portion of their areas overlapping; and

(c) a means for viewing the focused image of the pneumatic tire with interference fringes comprising a white light adapted to pass through a collimating lens for illuminating a first surface of the developed photographic media, that was exposed in said camera, such that said interference fringes appear on an opposite surface of said photographic media when viewed from a vantage point that is offset from the central axis of the collimating lens.

4,682,893

**OPTICAL INTERFEROMETER WITH DISPERSION DEVIATOR**

Errico Armandillo, Frascati; Gianemilio Salvetti, and Giampiero Giullani, both of Rome, all of Italy, assignors to Comitato Nazionale per la Ricerca e per lo Sviluppo dell'Energie, Nucleare e delle Energie Alternative - ENEA, Rome, Italy

Filed Apr. 30, 1985, Ser. No. 729,114

Claims priority, application Italy, Apr. 30, 1984, 48112 A/84

Int. Cl.<sup>4</sup> G01B 11/02; H01S 3/08

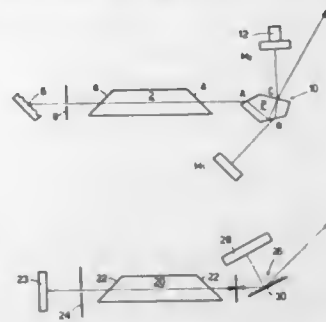
U.S. Cl. 356—356

14 Claims

1. An interferometer comprising a diffraction grating and first and second mirrors, said components being so disposed that the light beam incident on the grating surface splits into a



first reflected part and one or more diffracted parts and that the diffracted part of a given order constitutes part of the interferometer transmitted beam while said first reflected part incides orthogonally on said first mirror and reflecting thereby re-incides on the grating surface where it splits into a second reflected part as a constituent part of the interferometer reflected beam and into more diffracted parts of which one, of the above



given order, orthogonally incides on said second mirror and is reflected thereby, re-inciding on the grating surface where it splits into a third reflected part as constituent part of the interferometer transmitted beam and into one or more diffracted parts of which one, of the above given order, orthogonally incides on said first mirror whereby the latter part begins again the path already traveled.

4,682,894

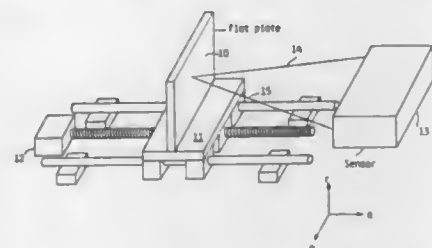
## CALIBRATION OF THREE-DIMENSIONAL SPACE

Richard Schmidt, Huntington; Howard Stern, Greenlawn; Alex Mauro, Wheatley Heights, and Joseph Ross, Fort Salonga, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,253  
Int. Cl. G01B 11/00

U.S. Cl. 356—375

16 Claims



1. A method of calibrating three-dimensional measurement sensors comprising the steps of: placing a first flat plate in a sensor volume to be calibrated; adjusting said first plate surface to be orthogonal to a horizontal centerline of the sensor; translating said first plate along said sensor centerline while recording distance traveled; associating said distances with measured depth by said sensor; determining deviations from orthogonality of said translation relative to said first plate surface and correcting said measured depth accordingly; removing said first plate and placing a second flat plate in said sensor volume with said second plate surface at a first predetermined angle to said translation direction sloping vertically and parallel horizontally to said first plate surface; translating said second plate along said sensor centerline while recording distance traveled; associating said distances with measured height by said sensor in accord with vertical slope; determining deviations from said first predetermined angle and said horizontal parallelism of said second plate surface and correcting said measured height accordingly; removing said second plate and placing a third flat plate in said sensor volume with said third plate surface at a second predetermined angle to said translation direction

sloping horizontally and parallel vertically to said first plate surface; translating said third plate along said sensor centerline while recording distance traveled; associating said distances with measured lateral distance by said sensor in accord with horizontal slope; determining deviations from said second predetermined angle and said vertical parallelism of said third plate surface and correcting said measured lateral distance in accordance with said deviations.

4,682,895

## FIBER OPTIC PROBE FOR QUANTIFICATION OF COLORIMETRIC REACTIONS

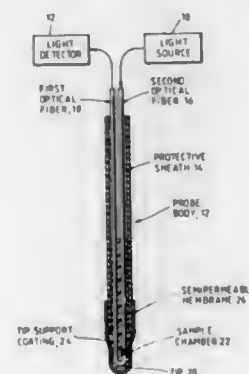
David Costello, College Station, Tex., assignor to Texas A&M University, College Station, Tex.

Filed Aug. 6, 1985, Ser. No. 763,019

Int. Cl. G01J 3/50

U.S. Cl. 356—402

17 Claims



1. An optical probe for colorimetric measurement, comprising:

- (a) an optical fiber, having an outer diameter and having light input and output ends for accepting the mounting of optical couplers to enable the transmission of light through said optical fiber, said optical fiber being doubled and having a sharp, 180° bend at a point along its length so as to form a tip, the bend radius of said sharp 180° bend being approximately equal to or less than the outer diameter of said optical fiber, said optical fiber having a small slice extracted from it at a point along its length spaced away from the tip so as to separate said optical fiber into two sections, each section having a face, the respective face of one section linearly displaced from the face of the other section, said displacement of said faces forming an optical gap;
- (b) a tip support coating, said tip support coating covering the tip and further extending back along and covering the doubled length of said optical fiber for a distance beyond the optical gap, said tip support coating having a sample chamber which opens on the surface of said tip support coating and which extends into the interior of said tip support coating so as to expose the faces of said optical fiber at the optical gap;
- (c) a colorimetric substance, said colorimetric substance filling the sample chamber, said colorimetric substance being permeable to a chemical of which properties are to be colorimetrically measured; and
- (d) a semipermeable membrane, said semipermeable membrane being applied to the surface of said tip support coating so as to cover the opening of the sample chamber.

4,682,896

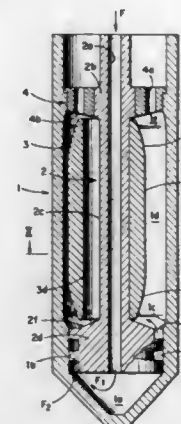
## DEVICE FOR GENERATING VIBRATIONS

Esref Halilović, D. Tucović a 141, 11000 Beograd, Yugoslavia  
Filed Dec. 31, 1985, Ser. No. 814,971

Claims priority, application Yugoslavia, Mar. 4, 1985, 329/85  
Int. Cl. B01F 11/00

U.S. Cl. 366—120

4 Claims



1. Device for generating vibrations, having a housing of a circular cross-section with a stationary shaft coaxial with it, on which stationary shaft there is suspended a sleeve-shaped working body, which is urged in swinging/rolling motion by means of a compressed fluid which, when exhausted, leaves the inside of the housing in axial direction, said housing including a cover, wherein the stationary shaft (2) is shaped as a hollow shaft and is provided at its free end with a cylindrical collar section (2d), which is pressed into the housing (1) to divide the inside thereof into an auxiliary chamber (1a) and a main working chamber (1c, 1d, 1e), which chambers communicate by at least one coil chamber (2e) which is provided on a mantle surface of the cylindrical collar section (2d), the inner radial surface of which is tapered and stimulates the working body (3), whose (axial) length is smaller than that of the working chamber (1c, 1d, 1e), to be suspended on the shaft (2).

4,682,897

## LIGHT SCATTERING MEASURING APPARATUS

Kenji Saito, Tokyo; Ken Eguchi, Yokohama; Haruki Kawada, Kawasaki; Yoshinori Tomida, Yokohama; Yukuo Nishimura, Sagami-hara, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1985, Ser. No. 804,108

Claims priority, application Japan, Dec. 10, 1984, 59-259072; Dec. 10, 1984, 59-259073; Dec. 10, 1984, 59-259074; Dec. 10, 1984, 59-259075; Dec. 10, 1984, 59-259076

Int. Cl. G01N 21/41, 25/72

U.S. Cl. 374—45

17 Claims



1. A scattered light measuring apparatus, usable to measure the light scattering properties of an object to be examined, said apparatus comprising:  
light applying means for applying intermittent light to the object to be examined,  
a photosensitive medium having an absorbing layer on a detector disposed along and out of contact with the surface of the object to be examined, said absorbing layer

being capable of absorbing scattered light intermittently emitted from the surface of the object to be examined depending on the physical properties of the object when exposed to said intermittent light and converting the absorbed scattered light into a molecular vibrational energy signal,

energy signal detecting means for detecting the energy signal produced in said photosensitive medium, and molecular vibration measuring means for measuring the molecular vibrational energy by synchronizing the detected energy signal with a reference frequency signal from said light applying means.

4,682,898

## METHOD AND APPARATUS FOR MEASURING A VARYING PARAMETER

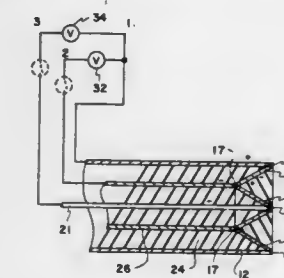
John E. Janssen, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 6, 1985, Ser. No. 741,775

Int. Cl. G01K 7/04

U.S. Cl. 374—179

4 Claims



1. A system for measuring a varying parameter comprising in combination:

- a thermopile having a first and a second circumferential junction, one point junction, and means to thermally insulate said first circumferential junction relatively to said other two junctions; said first circumferential junction producing a first output signal;
- said second circumferential junction and said point junction producing a second output signal;
- means for periodically sampling said first and second output signals; and
- means responsive to said first and second output signals at the beginning and end of a sample;
- said responsive means producing an output signal which is a function of the difference between a change in said first output signal between the beginning and end of said sample period and the change in said second output signal between the beginning and end of said sample period.

4,682,899

## FEED BEAM FOR A ROCK DRILL

Lars G. R. Andersson, Örebro, and Stefan H. G. Schörling, Arboga, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 728,594, Apr. 29, 1985, abandoned.

This application May 16, 1986, Ser. No. 865,935

Claims priority, application Sweden, Apr. 27, 1984, 8402315

Int. Cl. F16C 29/02

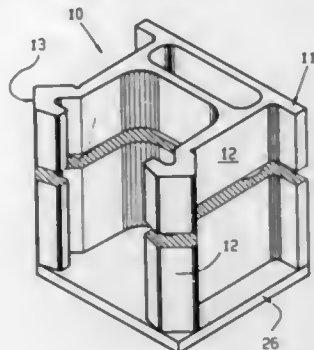
U.S. Cl. 384—41

10 Claims

1. Apparatus for guiding the sliding movement of an object in contact therewith, comprising:

- an elongated beam having a transverse cross-section which includes a shaped peripheral surface bounded at its ends by retaining portions angled with respect to said peripheral surface, said shaped peripheral surface comprising two flat surfaces joined at a first angle to each other and a bent plate having an inner surface shaped to substantially

conform to said shaped surface of the beam and bounded at its ends by edge means angled with respect to said inner surface, said shaped surface of the plate comprising two flat surfaces joined at a second angle to each other, said first and second angles being, respectively, between 60° and 120°,



said edge means being suitably angled relative to said retaining portions to enable said bent plate to be snapped onto said elongated beam and for resiliently grasping said retaining portions to fixedly secure the bent plate to the beam so that the respective shaped surfaces are in contact to thereby position an outer surface of said bent plate to serve as the guide for said sliding movement.

4,682,900

## THRUST BEARING UNDERSPRING

Alston L. Gu, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 19, 1985, Ser. No. 811,972

Int. Cl.<sup>4</sup> F16C 32/06

U.S. Cl. 384-105

42 Claims



## 1. A fluid thrust bearing comprising:

- a thrust runner;
- a thrust plate to rotatably support the thrust runner; and
- a compliant foil bearing operably disposed between said thrust runner and said thrust plate and mounted on said thrust plate, said compliant foil bearing including a thrust disk having a plurality of converging surface individual compliant foils disposed towards said thrust runner and a foil stiffener disk disposed between the thrust disk and the thrust plate, the foil stiffener disk including a plurality of integral tabs formed from said foil stiffener disk and extending towards said thrust disk in the direction of rotation of said thrust runner with an individual tab generally disposed in a supporting relationship towards an individual foil on said thrust disk and said tabs divided into at least two prongs having a generally arcuate curvature.

4,682,901  
BALL BEARING APPARATUS HAVING SNAP FIT FEATURE

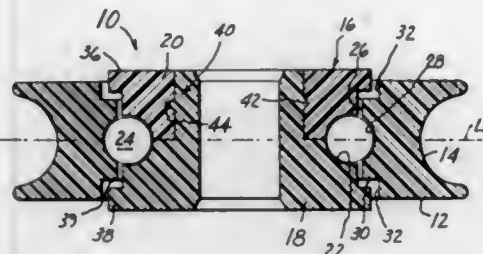
Peter Hauber, 9001 N. Glenoaks, Sun Valley, Calif. 91352

Filed Sep. 29, 1982, Ser. No. 426,806

Int. Cl.<sup>4</sup> F16C 43/04, 13/00, 33/60

U.S. Cl. 384-539

10 Claims



1. In ball bearing apparatus comprising a plurality of discrete anti-friction bearing elements, an outer ring defining a first curved bearing surface on its inner periphery, and an inner ring adapted to axially trap said outer ring and having a first section of an inside diameter adapted to encircle and engage a shaft and a second section of relatively larger diameter and adapted to encircle said first section encircling said shaft and without engaging said shaft said sections jointly defining a second curved bearing surface opposite said first bearing surface, apparatus locking means comprising a radially disposed, cooperating rib and groove structure on said inner ring sections, said structure being formed coaxial and parallel to the locus of said bearing surfaces and axially spaced therefrom, said sections being locally radially deflectable in the region of said structure in snap-fit section-joining relation at said locking structure.

4,682,902

## WRITING PLOTTING APPARATUS WITH KEYBOARD

Hiroshi Onoda, and Kenji Mizuno, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 675,287, Nov. 27, 1984, abandoned.

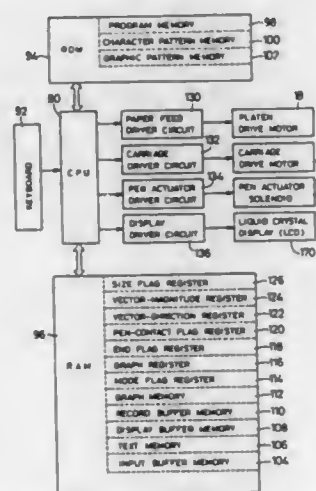
This application Feb. 7, 1986, Ser. No. 827,198

Claims priority, application Japan, Nov. 30, 1983, 58-225838; Nov. 30, 1983, 58-225839

Int. Cl.<sup>4</sup> B41J 3/04

U.S. Cl. 400-18

14 Claims



## 1. An integral writing/plotting recording apparatus, comprising:

- a main housing;
- a keyboard mounted to said main housing and having char-

acter keys corresponding to characters, function keys, and mode selecting means for selecting one of a writing mode and a plotting mode, said character keys including letter keys corresponding to letters, and numeral keys corresponding to numerals, said function keys including a start key;

- a paper feeding device mounted to said housing for feeding a sheet of paper;
- a carriage mounted to said housing for supporting a writing instrument, such that the carriage is movable in a direction substantially perpendicular to a feeding direction of said sheet of paper;
- a carriage driving device for reciprocating said carriage in said substantially perpendicular direction;
- a writing-instrument driving device for moving said writing instrument between a first position in which the writing instrument is in contact with said sheet of paper, and a second position in which the writing instrument is held away from the sheet of paper;
- a character pattern memory within said housing for storing sets of character data representative of patterns of said characters;
- a graphic pattern memory within said housing for storing sets of graphic pattern data respectively representative of a plurality of graphic patterns selected from the group consisting of a bar graph, a broken-line graph and a circular graph, said plurality of graphic patterns being selected by said numeral keys;
- a graph memory within said housing for storing numerical graph data which is entered through said numeral keys and which is plotted in the selected graphic pattern; and
- control means within said housing for receiving input data from said keys and mode selecting means of said keyboard and controlling said paper feeding device, carriage driving device and writing-instrument driving device, responsive to said input data including said numerical graph data, according to the following steps:

- (a) waiting for entry of first input data through said keyboard;
- (b) determining if the apparatus is already in said plotting mode;
- (c) if the apparatus is not already in said plotting mode, determining if said mode selecting means has been operated to select said plotting mode and, if so, establishing said plotting mode;
- (d) when said first input data is entered, and if the apparatus is already in said plotting mode or if said plotting mode has been established by said mode selecting means, checking if the first input data is a first set of numerical data entered through at least one of said numeral keys and, if so, reading in from said graphic pattern memory the set of graphic pattern data which corresponds to a graphic pattern designated by said first set of numerical data;
- (e) when second input data is entered after said first set of numerical data has been entered, checking if the second input data is another set of numerical data and, if so, storing said another set of numerical data as said numerical graph data in said graph memory;
- (f) repeating step (e) until said start key has been operated;
- (g) if said start key has been operated in said plotting mode, controlling said paper feeding device, said carriage driving device and said writing-instrument driving device to print a graph according to the set of graphic pattern data which has been read in, and said numerical graph data stored in said graph memory; and
- (h) if the apparatus is not already in said plotting mode, and if said mode selecting means has not been operated to select said plotting mode, performing in a writing mode by reading in from said character pattern memory the sets of character pattern data corresponding to the character keys operated, and controlling said paper feeding device, carriage driving device and writing-instrument driving device so as to print said characters on said sheet of paper.

4,682,903

## THIN LINE PRINTER TYPING HEAD

Kazuhiro Agata, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

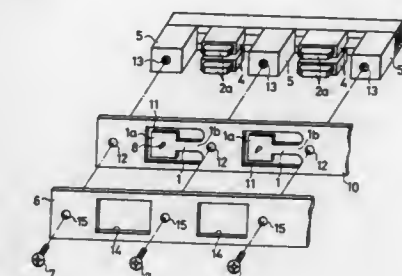
Filed Apr. 1, 1985, Ser. No. 718,387

Claims priority, application Japan, Mar. 30, 1984, 59-62840; May 31, 1984, 59-111623

Int. Cl.<sup>4</sup> B91J 3/10

U.S. Cl. 400-121

7 Claims



## 1. A thin line printer typing head comprising:

- a yoke assembly including a yoke, a magnet mounted on said yoke and a plurality of coils mounted on said yoke;
- means defining a plurality of horizontally extending leaf springs, each spring extending from a fixed end to a free end mounting a hammer pin and displaceable by actuation of an associated coil, said defining means having a flat spring plate with portions removed to define said springs with aid fixed and free ends of said springs together extending in a horizontal line, said spring plate surrounding said spring free ends;
- means for mounting said yoke assembly to said leaf springs defining means; and
- a horizontally extending clamp plate for clamping said leaf spring and said yoke assembly together, said clamp plate having apertures surrounding said leaf springs.

4,682,904

## PAPER FEED MECHANISM FOR PRINTER

Masato Yoshimura, and Ryouhei Ohsaki, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

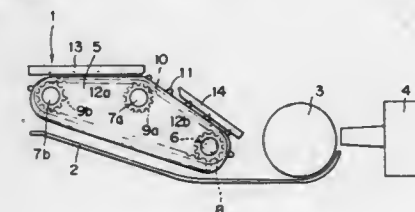
Filed Jul. 23, 1985, Ser. No. 758,075

Claims priority, application Japan, Jul. 23, 1984, 59-110277[U]

Int. Cl.<sup>4</sup> B41J 11/30

U.S. Cl. 400-616

4 Claims



## 1. A paper feed mechanism for feeding continuous paper having perforations defined at equal intervals in each of side margins thereof, comprising:

- (a) a pin tractor unit having an upper side and a lower side opposite to and below said upper side, said pin tractor unit including a toothed drive pulley and toothed idler pulleys and an endless tractor belt trained around said toothed pulleys, said belt having a plurality of pins projecting on an outer peripheral surface of said belt for fitting in the perforations in the continuous paper, and teeth formed on an inner peripheral surface of said belt and held in meshing engagement with said toothed pulleys;





screw spreader adapted to have its lower end face at a level below a level of said road surface; a first screed adapted to have its lower end face at a level below a level of said road surface; a second screw spreader; and a second screed such that they are disposed in the order recited from the front toward the rear of said second working truck.

#### 4,682,910 MARKING SYSTEM

Edmund D. Hollon, 130 Frontier Ave., and Blake D. Hollon, 1941 Park Dr., both of Douglas, Wyo. 82633  
Filed May 13, 1986, Ser. No. 862,823  
Int. Cl.<sup>4</sup> E02B 7/40

U.S. Cl. 404-94

13 Claims



1. A marking system for indicating the location of successively-spaced lanes on a running track having a predetermined width and a selected degree of curvature, said system comprising:

- locating means positioned at a pivot point radially inward at a fixed distance from the innermost ones of said lanes to be marked on said running track;
- an elongated boom assembly disposed laterally across said track, said assembly carrying a plurality of lane-marking devices individually spaced successively along its length in correspondence with the respective positions of said lanes;
- means supporting said boom assembly for a movement along said track;
- propulsion means coupled to one end portion of said boom assembly for propelling said one end portion along said track and around said pivot point;
- aligning means associated with the other end portion of said boom assembly for enabling aligning movement of said other end portion of said boom assembly relative to said locating means to maintain said boom aligned lengthwise on a radius defined between the outermost end of said boom assembly and said pivot point;
- and elongated alignment means for coupling one of said end portions to said locating means while enabling radially aligning movement of said other end portion.

#### 4,682,911 SECONDARY CONTAINMENT SYSTEMS ESPECIALLY WELL SUITED FOR HYDROCARBON STORAGE AND DELIVERY SYSTEMS

Jack Moreland, Dolton, Ill., assignor to MPC Containment Systems, Ltd., Chicago, Ill.

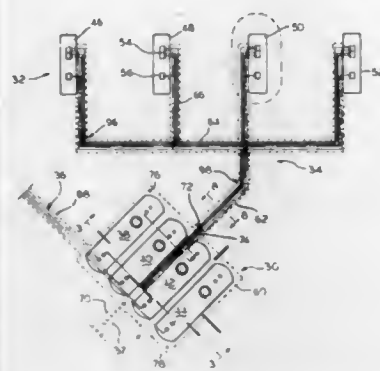
Continuation-in-part of Ser. No. 586,782, Mar. 6, 1984, abandoned. This application Mar. 8, 1985, Ser. No. 709,597  
Int. Cl.<sup>4</sup> B65G 5/00

U.S. Cl. 405-53

41 Claims

1. A secondary containment system comprising a sheet of membrane material which is large enough to line at least a portion of a collection and containment pit along with trenches radiating therefrom, said trenches being graded to drain into the pit, there being a substantial amount of membrane bulk which enables it to bunch in at least an area of said pit and to provide sufficient slack to conform to irregularities on the walls and floor of the lined portion of the pit and trenches whereby localized stresses do not occur at places where the membrane bridges projections formed by the irregularities, corners, or the like, anchoring means independent of said membrane and surrounding at least part of the perimeter of

said pit, means for attaching said anchoring means to the membrane to secure it and thus provide a shoring for walls of the pit by restraining movement of said membrane if there should be a cave-in of the pit for a period of time which is at least long



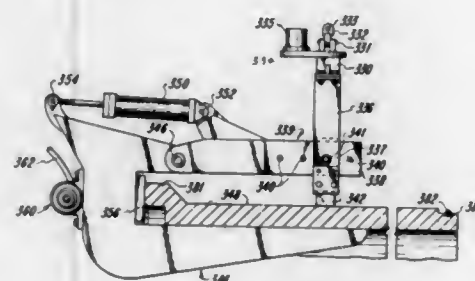
enough for workers to escape if there should be a cave-in; and means for closing and joining at least some sections of said membranes to preserve the integrity of a seal formed thereat in order to form a secondary containment enclosure.

#### 4,682,912 PIPE LAYING APPARATUS

John T. Henry, P.O. Box 1472, Ft. Collins, Colo. 80522  
Continuation-in-part of Ser. No. 56,456, Jul. 10, 1979, Pat. No. 4,362,435. This application Dec. 9, 1980, Ser. No. 214,500  
Int. Cl.<sup>4</sup> F16L 1/02

U.S. Cl. 405-154

4 Claims



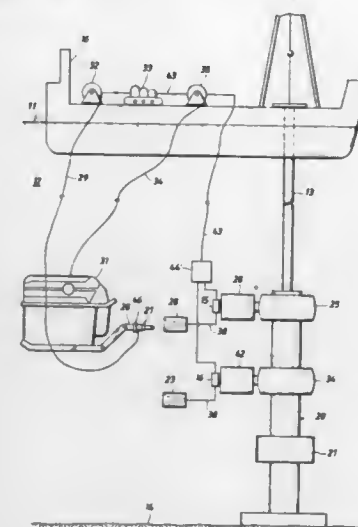
1. Apparatus for laying and joining successive sections of pipe, comprising:
  - a vehicle movable over a course along which said pipe is to be laid;
  - a crane carried on said vehicle and having an outer end portion movable both vertically and horizontally relative to said course;
  - a controllable grapple mounted from said outer end portion and engageable with a section of said pipe, operation of said grapple together with said crane enabling a section of said pipe to be picked up, moved into position over and deposited along said course;
  - a vibrator mechanically coupled to said grapple for inducing vibration into said grapple and from said grapple into a section of pipe carried thereby as an end of that carried section is slidably mated with another section of said pipe lying along said course;
  - and in which said grapple includes a generally horizontal finger, a jaw spaced below said finger and having a size and shape to be inserted within the section of pipe for carrying the same and an element joining one end of said jaw to one end of said finger, said vibrator being affixed to said element.

#### 4,682,913 HYDRAULIC STAB CONNECTOR

Howard L. Shatto, and Theodore L. Agon, both of Houston, Tex., assignors to Shell Offshore Inc., Houston, Tex.  
Filed Aug. 28, 1986, Ser. No. 901,915  
Int. Cl.<sup>4</sup> F16L 1/04

U.S. Cl. 405-169

6 Claims



1. An apparatus for use in combination with a subsea equipment assembly located beneath the surface of a body of water having fluid conduit devices said apparatus comprising:

- receptacle means supported by said subsea equipment assembly having a chamber and fluid conduit means defined therein, and being in fluid communication with said devices,
- first probe body means having first and second shoulder means portions, said first shoulder means being formed at the end of the first probe body means entering said receptacle first and said second shoulder means axially displaced from said first shoulder means at a selected distance therefrom, said probe body means being enlarged in diameter at the top of said second shoulder means,
- fluid conduit means carried by at least a portion of said first probe body means for supplying fluid from a source means outside said first probe body means to said fluid conduit means carried by said receptacle,
- aligning means carried by said receptacle for positioning said first probe body means into said receptacle so that the longitudinal axis of said throughbore of said receptacle is aligned parallel to the longitudinal axis of said first probe body means in their operative position, wherein said aligning means includes two portions, the first portion of said receptacle causing coaxial alignment of said first probe body means, and a second portion at the entry-end of said receptacle, and
- holding means carried by said first probe body means at one end thereof and adapted to be engaged when inserting the other end of the first probe body means into said receptacle.

#### 4,682,914 HYDRAULIC TRENCH SUPPORT

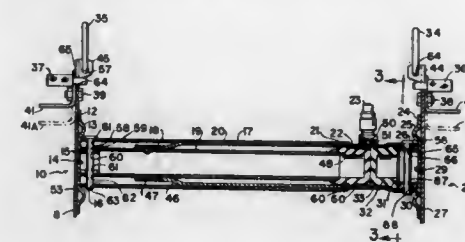
Isamu Aihara, 3-5, 3-chome, Nagaremach, Hirano-ku, Osaka, and Tsuneo Yoshimura, 13-10, Nihombashi-Odemmacho, Chuo-ku, Tokyo, both of Japan  
Filed Dec. 23, 1985, Ser. No. 811,998  
Int. Cl.<sup>4</sup> E02D 17/08

U.S. Cl. 405-283

5 Claims

1. A hydraulic trench support comprising: an expandable hydraulic assembly having a cylinder having an interior passage terminating in first and second open

ends and defining an annular snap ring groove near said first end of said cylinder and a taper spaced from and extending inwardly from said snap ring groove, a snap ring expandably fitted within said snap ring groove, a cylinder head defining a tapered portion fitted within said first end of said cylinder and maintained in a fixed position within said interior passage by the cooperation of said tapers in one direction and by said snap ring in the other direction, a hollow piston rod within said cylinder interior passage having first and second ends, a piston attached to said first end of said piston rod, and means for transferring a fluid under pressure into or out of said interior passage between said piston and said cylinder head;



- a first base having a first substantially planar load bearing surface and a first cylindrical cross-sectioned boss removably coupled to said second end of said piston rod, a first flange coupled to said first load bearing surface and extending in the opposite direction of said first boss, and first hanger means for attaching a supporting line to exert a lifting force upon said first base;
- a second base having second substantially planar load bearing surface and a second cylindrical cross-sectioned boss removably coupled to said first end of said cylinder, a second flange coupled to said second load bearing surface and extending in the opposite direction of said second boss, and second hanger means for attaching a supporting line to exert a lifting force upon said second base.

#### 4,682,915 METHOD AND APPARATUS FOR CONTINUOUS GRAVIMETRIC METERING AND PNEUMATIC FEEDING OF POURABLE MATERIAL

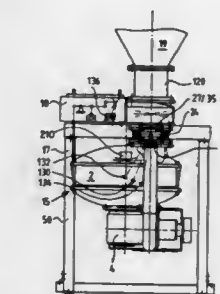
Hans W. Häfner, Aichach Walchshofen, Fed. Rep. of Germany, assignor to Pfister GmbH, Augsburg, Fed. Rep. of Germany  
Filed Dec. 19, 1985, Ser. No. 811,075

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520551

Int. Cl.<sup>4</sup> B65G 53/66

U.S. Cl. 406-31

28 Claims



1. A method for ensuring proper operation of an apparatus for continuous gravimetric metering and pneumatic feeding of pourable material, including a rotor provided with laterally closed feeding pockets and tightly arranged in a housing for rotation about an essentially vertical axis, said housing being provided with a charging station and a discharging station and



connections for ducts for connecting a pneumatic feeding system, and being hinged for pivotal movement about an essentially horizontal axis at a support means, and a force measuring means is connected between said housing and said support means and to an evaluation means for controlling the angular speed of said rotor, said method comprising the steps of: rotating said rotor; applying varying pressure at said charging station and said discharging station; determining any unbalance of said rotor; and adjusting and fixedly securing the position of said essentially horizontal axis in respect of said support means based upon the determined unbalance of said rotor.

4,682,916

## CUTTING INSERT ARRANGEMENT

Leonard A. Briese, 5039 Browneed La., Rancho Palos Verdes, Calif. 90274

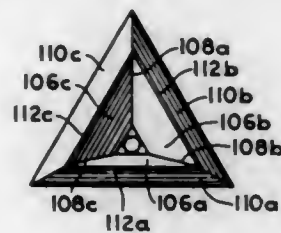
Division of Ser. No. 600,806, Apr. 16, 1984, Pat. No. 4,621,955.

This application Jun. 23, 1986, Ser. No. 877,291

Int. Cl.<sup>4</sup> B23B 27/22; B23C 5/02; B26D 1/00

U.S. Cl. 407—113

68 Claims



1. A cutting insert comprising, in combination: a body member, having an outer peripheral surface, a central axis, a median plane substantially perpendicular to said central axis, a first end section extending in a first direction from said median plane and a second end section extending in a second direction, substantially opposite said first direction from said median plane; said first end section having: a first inner cutting surface tapering outwardly from said central axis in regions adjacent said median plane toward said outer peripheral surface; said outer peripheral surface in said first end section defining a first outer flank surface tapering inwardly from regions adjacent said median plane in said first direction toward said central axis; and said first flank surface intersecting said first inner cutting surface to define a first cutting edge; whereby, said body member has a substantially increasing thickness from said first cutting edge toward said median plane.

4,682,917

## SPADE BIT WITH FLUTED SHOULDERS

A. Graves Williams, III, Wilmington, and Ronald L. Thackston, Hillsboro, both of Ohio, assignors to The Irwin Company, Wilmington, Ohio

Filed Jan. 24, 1986, Ser. No. 822,234

Int. Cl.<sup>4</sup> B23B 51/00

U.S. Cl. 408—212

10 Claims

1. In a spade boring bit of the type comprising a shank; a blade on the shank, said blade having parallel opposite faces with outer sides which are parallel to the axis of the shank; a central point extending axially from said blade; shoulders extending outwardly from said point toward said outer sides; said point having two converging sides leading from said shoulders and meeting at a tip, said point having a point flute adjacent each side thereof, each such point flute extending from the tip

of the point to the respective shoulder; the improvement comprising,

cutting spurs projecting forwardly from the shoulders, each spur having an outer edge which is a continuation of the outer side of the blade and which is parallel to said axis, and an inner edge which forms a point with the said outer edge of the spur; and



a shoulder flute formed in each of said parallel opposite faces of said blade and adjacent the shoulder, each shoulder flute intersecting and extending outwardly in its respective face from the respective point flute perpendicular to the axis of said shank and toward the respective spur, said outer edges of said spurs being sharp, said shoulder flutes terminating at the spurs so that the shoulder flutes do not extend across the spurs to the outer sides of the blades.

4,682,918

## KEYLESS IMPACTING CHUCK

Bernhard Palm, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

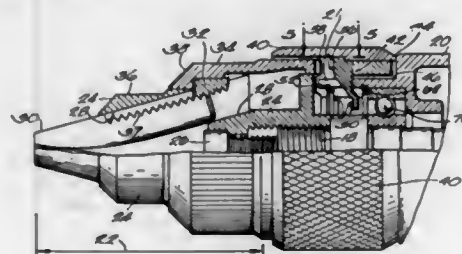
Continuation-in-part of Ser. No. 601,078, Apr. 16, 1984,

abandoned. This application Mar. 4, 1985, Ser. No. 707,593

Int. Cl.<sup>4</sup> B23B 31/10

U.S. Cl. 408—241 R

8 Claims



1. In combination with a drill chuck of the type having a chuck body mounted on and rotatable with the drive spindle projecting from the gear case of a power drill, a collar mounted on said body for rotation with and with respect to said body, said body supporting three jaws on inclined axes, a threaded connection between said collar and said jaws whereby said jaws move on said inclined axes in response to relative rotation between said collar and said body, the improvement comprising, means for holding said collar against rotation with said chuck body, said means including a sleeve mounted on said gear case for axial movement toward and away from said collar between first and second positions, interference members on said collar and said sleeve operative when engaged to prevent rotation of said collar whereby rotation of said body causes said jaws to grip or release the shank of a tool, and spring means biasing said sleeve to one of said positions.

4,682,919

## PORTABLE POWERED PIPE WORKING MACHINE

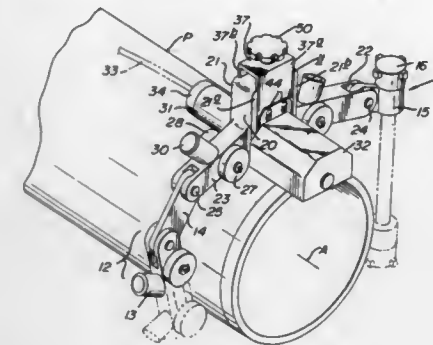
Joseph T. Mitchell, Waterford, Pa., assignor to Reed Manufacturing Company, Erie, Pa.

Filed May 5, 1986, Ser. No. 859,829

Int. Cl.<sup>4</sup> B26B 27/00

U.S. Cl. 409—179

11 Claims



1. In a portable powered pipe cutter including movable cutting means adapted to engage and be moved about the outer periphery of a pipe to be cut, and adjustable link means connected to said movable cutting means and encircling said pipe, said adjustable link means being movable with said movable cutting means about the periphery of the pipe for permitting said movable means to be advanced manually in a guided path orthogonal to the longitudinal axis of the pipe, the improvement wherein said movable cutting means comprises:

a carriage having an upstanding protrusion with an inverted U-shaped configuration providing a downwardly open recess adapted to confront the outer periphery of the pipe and to extend outward therefrom, said carriage having a pair of arms extending in opposite directions from said protrusion, said arms being aligned with said adjustable link means and lying in the path of movement thereof about the pipe, each arm having an end connected to said adjustable link means and having means between said end and said protrusion rotatably engaging the pipe surface, rotary means disposed in said recess and extending transverse to the path of movement of the carriage and hence lengthwise of the pipe,

a yoke movably mounted on said carriage protrusion for mounting said rotary means for movement inwardly and outwardly of said pipe in said transverse relation relative to said recess and the confronting peripheral pipe surface, said yoke including a base extending across said protrusion and a pair of flanges depending therefrom on opposite sides of said protrusion in sliding engagement therewith for guiding said yoke relative to said protrusion, adjustable means on said carriage and yoke for displacing said yoke relative to said carriage, tool means adapted to be connected to said rotary means to one side of said carriage for operating on the pipe, and coupling means adapted to connect said rotary means to a source of power, whereby operations can be conducted on the pipe by rotating the carriage thereabout.

4,682,920

## ROTATING AIR BEARING

James E. Rodgers, Kenton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Mar. 26, 1986, Ser. No. 644,094

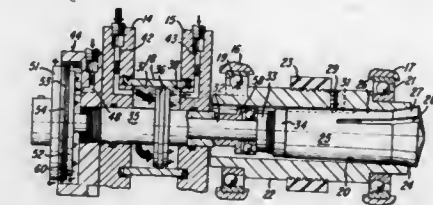
Int. Cl.<sup>4</sup> B23C 1/02; F16C 39/06

U.S. Cl. 409—231

13 Claims

1. In a machine or like tool, a shaft adapted for rotary and axial shifting motions, intermediate support means for said shaft, said shaft extending in opposite directions from said support means, a fluid bearing for one extended end of the shaft

including a bearing housing recessed to provide a fluid reservoir, and a piston-like bearing recessed in said housing and mounted on to move with said shaft, said bearing having a peripheral portion in an approaching relation to an interior surrounding wall of said housing whereby substantially to hold said housing and said shaft in a centered relation and whereby to define a wall of said reservoir, and a pressure fluid distributing and operating system including means for admitting pres-



sure fluid to said reservoir, and means for reciprocating said bearing housing in an axial sense, the fluid in said reservoir being allowed to escape to ambient surroundings around the periphery of said piston-like bearing for an essentially frictionless contact of said peripheral portion with said housing wall and being used as a resilient link in actuating said shaft in one axial direction, said bearing housing being supported from said intermediate support means to be free of rotation with said shaft.

4,682,921

## INSIDE-TUBE SCARFING TOOL

Lester J. Blaho, Ambridge, Pa., assignor to Pittsburgh Tube Company, Monaca, Pa.

Filed Nov. 8, 1985, Ser. No. 796,650

Int. Cl.<sup>4</sup> B23D 1/08

U.S. Cl. 409—299

6 Claims



1. A scarfing tool for inside the tube scarfing comprising:
  - a. an elongated body having a cutting tool mounted thereon and adapted for connection to an impeder rod said elongated body having an axis running therethrough and parallel therewith;
  - b. first and second roller rotatably positioned at substantially opposing ends of said elongated body and adapted for contact with the inner surface of the tube to be scarfed;
  - c. a thrust roller pivotably mounted on the side of said body opposite from said first and second rollers for positioning said cutting tool adjacent the area to be scarfed, said thrust roller being retracted inside the elongated body when not actuated;
  - d. first and second hydraulic means having associated piston means, said first piston means contacting said thrust roller causing said thrust roller to pivot and press against the inside of the tube thus positioning said cutting tool adjacent the area to be scarfed when actuated, said first and second hydraulic means each having an axis parallel to the axis of the elongated body, with said first piston means moving in parallel to the axis of the elongated body when actuated;
  - e. a biasing means connected to and biased against said second piston means; and
  - f. a source of hydraulic fluid connected to said first and second hydraulic fluid means for actuating said first and second piston.

4,682,922

**VEHICLE WHEEL SUPPORT AND FASTENING DEVICE**

Jean-Luc Andre, Dangolsheim, and Christian Flity, Illkirch, both of France, assignors to Lohr S.A., Henggenbieten, France

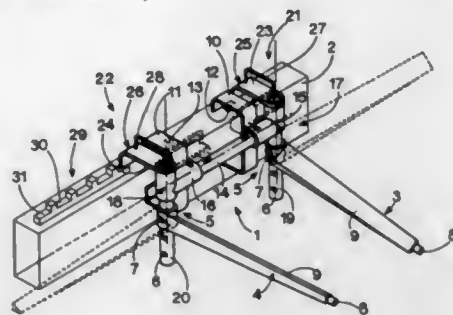
Filed Oct. 2, 1985, Ser. No. 783,201

Claims priority, application France, Nov. 19, 1984, 84 17710

Int. Cl.<sup>4</sup> B60P 3/07

U.S. Cl. 410—30

10 Claims



1. Device adapted to accommodate at least one wheel of a vehicle, particularly for use and installation in car-carriers, comprising in combination

an elongated side rail constituting a vehicle loading level, a carrying trolley slidably arranged on said elongated side rail, said carrying trolley having pivotally mounted thereon a pair of elongated sustaining arms normally extending at a slight convergence to, but nearly parallel with one another in an operative position thereof, and being spaced from one another by a predetermined distance, but being pivotably foldable through respective angles of about 90°, so as to extend in parallel with said elongated side rail.

4,682,923

**DEVICE FOR LOCKING A CONTAINER**

Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwälder Eisenwerk Gerhard GmbH, Fed. Rep. of Germany

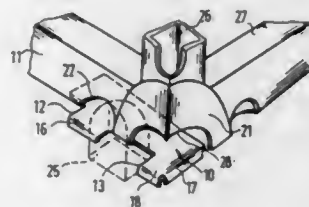
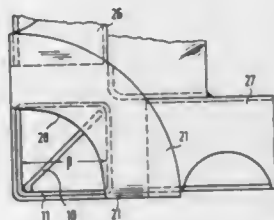
Filed Jan. 16, 1986, Ser. No. 819,366

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501969

Int. Cl.<sup>4</sup> B60P 7/13

U.S. Cl. 410—90

25 Claims



1. A device for locking a container to locking members, the container including lower frame elements of hollow section

and lower corner fittings each formed with a corner opening, said device comprising a locking piece movable within a respective one of said lower frame elements between a retracted non-use position in said hollow section in an in-use position, said locking piece including a portion adapted to extend outwards through the corner opening of the respective corner fitting when in said in-use position, said portion having a cut-out for engaging a respective locking member.

4,682,924

**SELF-LOCKING NUT DEVICE AND METHOD**

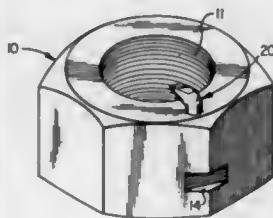
Jack R. Kerr, 1912 Peyco Dr. North; Gerald L. Dunsmore, and Thomas V. Shelton, both of 1916 Peyco Dr. North, all of, Arlington, Tex. 76017

Filed Jun. 4, 1985, Ser. No. 741,152

Int. Cl.<sup>4</sup> F16B 39/32

U.S. Cl. 411—329

11 Claims



1. A method for fabricating a self-locking nut, including the steps

forming, in an annular nut body having a threaded bore, a small bore at one side thereof parallel to the thread axis of said threaded bore and opening to at least one face of said nut body;

forming an L-shaped anti-reversing pin from an elongated shaft of quarter hard stainless steel welding rod;

forming a locking recess on one leg of said pin, spaced longitudinally from said other leg facing away from the direction of said other leg;

mounting said anti-reversing pin on said nut body with said one leg of said pin confined in said small bore, and with said other leg of said pin extending toward said threaded bore for interference engagement with a mating bolt;

flowing metal of said nut body into said small bore and into engagement with said locking recess, to secure that portion of said pin to said nut body;

said other leg and the adjacent portion of said one leg thereby being oscillatable relative to said nut body between alternative anti-reversing positions relative to a mating bolt.

4,682,925

**TACK STRIP**

Thomas A. Shields, Bourne, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Apr. 11, 1985, Ser. No. 722,152

Int. Cl.<sup>4</sup> F16B 15/00; A47G 27/04

U.S. Cl. 411—461

1 Claim

1. A tack strip for securing upholstery fabric to an underlying frame structure comprising:

a. a strip of flexible metal material having a longitudinally extending centrally located fold forming upper and lower angularly disposed flanges;

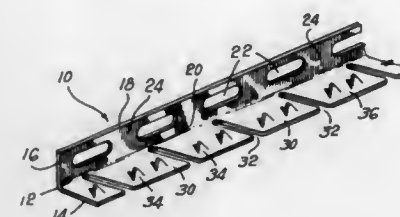
b. said lower flange having a continuous straight edge portion adapted to be aligned with a straight marginal edge of the frame structure;

c. said lower flange also including a plurality of equally spaced elongated openings along the longitudinal extend to said lower flange with spaced solid portions of said lower flange therebetween; said openings adapted to re-

ceive a staple fastener to secure said spaced solid portions and thus said lower flange to the frame structure;

d. said upper flange having a plurality of equally spaced slots extending to said fold to form a plurality of spaced tab members therebetween; each of said tab members having a width substantially greater than the width of the spacing therebetween and having spaced prongs;

e. said prongs being formed out of the surface of said tab members toward said lower flange, the fabric being adapted to be placed over said tab members and gripped by said prongs; said tab members being adapted to be progressively formed about said fold against said lower



flange to sandwich the fabric between said upper and lower flanges of the tack strip; and,

f. said prongs being angularly disposed out of the surface of said tab members in the direction of said fold so that upon forming said tab members about said fold, said prongs will abut the surface of said lower flange and form back toward the surface of said tab members to securely attach the fabric against the surface of said tab members;

g. and wherein the spacing of said prongs from said fold is approximately equal to the spacing of said openings from said fold so that said prongs will interlock with the staple to pinch the fabric therebetween.

4,682,926

**CEILING PANEL PLACING MACHINE**

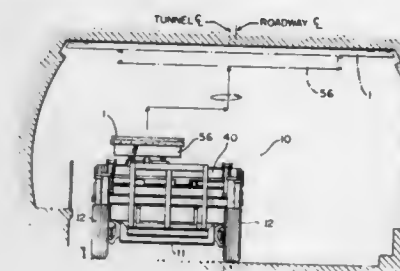
Sam W. Chambers, Meridian; Charles R. Spencer, and Wade E. Miller, both of Boise, all of Id., assignors to Morrison-Knudsen Company, Inc., Boise, Id.

Filed Jan. 2, 1986, Ser. No. 815,715

Int. Cl.<sup>4</sup> E04G 21/14

U.S. Cl. 414—11

10 Claims



1. A machine for elevating and placing panels, comprising:

a frame supported by wheels permitting horizontal transport of said machine between panel receiving and panel placing positions, said frame including guides for guiding vertical elevation of said panels;

a plurality of outriggers, mounted upon said frame extendible downwardly to elevate, at a panel placing location, said frame and said wheels, and to partially advance said panel vertically toward placement;

a first elevating stage including sleeve members, slidably mounted upon said frame guides, said stage elevatable on said guides to partially advance said panel vertically toward placement, said first stage framework including

longitudinal and upper transverse, with respect to said machine, supporting members;

elevating means affixed to said frame and attached to the first elevating stage to advance said stage vertically;

a second elevating stage having sleeve members slidably mounted on said guide sleeve members of said first elevating stage, said second stage having longitudinal and transverse supporting members;

elevating means, affixed to transverse members between said first and second stages, for elevating said second stage vertically along said first stage guides;

a first carriage, mounted on and slidably adjustable along said second stage longitudinal members, for shifting said panel into an approximate longitudinal placement location;

a second carriage, mounted on and slidably adjustable upon a transverse member of said first carriage, for shifting said panel transversely to said machine and into cantilevered transverse alignment with the center line of said panel placement, said carriage including a substantially centrally mounted, rotationally adjustable turntable bearing; and a panel-supporting table rotatably mounted upon said second carriage bearing, said table receiving panels in longitudinal alignment with said machine and rotating said panels into alignment for panel placement location, wherein the elevating stages elevate the panel to its placement level and the carriages shift and rotate said panel into transverse, end-to-end alignment for placement.

4,682,927

**CONVEYOR SYSTEM**

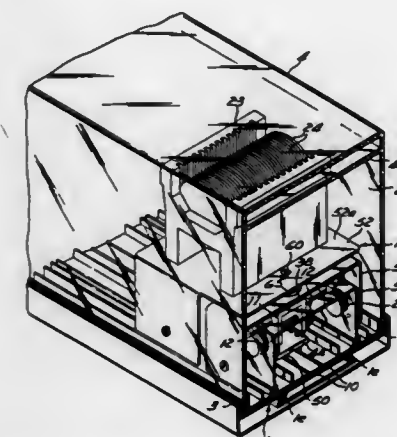
Peter R. Southworth, Mission Viejo, and Gregory R. Baxter, Orange, both of Calif., assignors to Nacom Industries, Incorporated, Tustin, Calif.

Continuation-in-part of Ser. No. 517,278, Jul. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 419,201, Sep. 17, 1982, Pat. No. 4,540,326. This application Nov. 16, 1984, Ser. No. 672,349

Int. Cl.<sup>4</sup> B65G 35/00

U.S. Cl. 414—217

28 Claims



1. Apparatus for transporting a cassette of semiconductor wafers, from a first clean room, having a specified maximum number of particulate contaminants for a given volume of space, to a second clean room, comprising:

a first elevator station in said first clean room, said first elevator station including a housing enclosing both a chamber and a load receiving stall, both of which have a controlled environment;

first mechanical transfer means for extending into said stall and withdrawing the load to an elevator position within the chamber, said transfer means being laterally movable to releasably engage said load;



an elevator in said first elevator station for moving said first transfer means and the load to a desired level; conveying means in a controlled environment for receiving the load from said first transfer means and for conveying said load to a second transfer means for withdrawing said load from the conveying means, said conveying means comprising:

an elongated, track-like support having a pair of inner tracks on the upper side of the support; means on said support located between said inner tracks for conducting electrical power; a driver cart riding on said inner tracks; an electric motor included with the driver cart; an electrical power pickup on the driver cart for transferring electricity from the power conducting means to the electric motor; a generally U-shaped inner cover supported in an inverted orientation on said track-like support to form, with the support, an inner tunnel through which said driver cart can travel, said support having means spaced outwardly from said inner tracks to sealingly cooperate with the lower edges of the side legs of said cover;

a pair of outer tracks on said support including a track on each side spaced outwardly from but in close proximity to the means on the support for receiving the lower legs of said cover;

a driven cart having a generally U-shaped support structure positioned in an inverted orientation with an upper support surface and depending side legs, and having wheels rotatably mounted on the lower ends of said structure side legs, the driven cart wheels being aligned to ride on said outer tracks, with the side legs of the driven cart structure being spaced outwardly from the side legs of the inner cover to straddle and enclose the inner cover and the driver cart, said driven cart including an upper wall of the inner cover, said upper support surface being adapted to support a wafer cassette, remote from the wheels on said driven cart;

magnetic means on said driver cart extending outwardly in close proximity to the inner surface of said inner cover, and magnetic means on said driven cart structure extending closely adjacent to the outer surface of said inner cover and aligned with the magnetic means on said driven cart so that sufficient magnetic force can be exerted by the magnetic means on the driver cart to cause the driven cart to follow the motion of the driver cart;

an outer, generally U-shaped cover supported in an inverted orientation and fitting over the driven cart and the space to be occupied by said cassette on top of the driven cart so that the outer cover in combination with the inner cover and said support forms an outer tunnel through which said driven cart can travel, said support being formed with means on its upper surface spaced outwardly from said outer tracks for sealingly cooperating with the lower ends of the side legs of the outer cover;

a second elevator station in said second clean room, including a housing having a controlled environment and further including said second transfer means;

an unload stall and a second elevator cooperating with said second transfer means to move the load to the level of said unload stall and move the load into said unload stall; and means for controlling the operation of the transfer means, the elevators and the conveying means to transfer a load from one elevator station to the other.

4,682,928

# WAFER TRANSFER APPARATUS

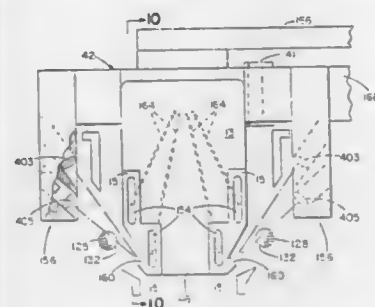
Richard F. Foulke, Carlisle, and Steven M. Lord, Malden, both of Mass., assignors to Proconics International, Inc., Woburn, Mass.

Division of Ser. No. 381,292, May 24, 1982, Pat. No. 4,493,600. This application Nov. 2, 1984, Ser. No. 667,550

Int. Cl.<sup>4</sup> B65G 65/00

U.S. Cl. 414-416

3 Claims



1. Apparatus for transferring semiconductor wafers, comprising

a wafer-pickup element with at least two openings each located closer to the edge of a wafer than to the wafer's center,

means for providing a below-atmospheric pressure or vacuum at said openings for the purpose of adhering a wafer to said wafer-pickup surface, and

individual pressure sensors connected to vacuum lines extending to each said opening, whereby wafers may be picked up with greater certainty as to the locations of their edges with respect to said pickup element, and initial contact of any one opening with a wafer can be sensed by a change in the output of that opening's pressure sensor.

4,682,929

# DEVICE FOR TAKING OUT SHEET ROLLS AND MOUNTING SHEET ROLL CORES

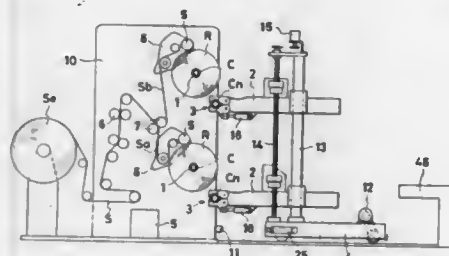
Hiroshi Kataoka, 3686, Sangawacho, Iyomishima-shi, Ehime 799-04, Japan

Filed Feb. 3, 1986, Ser. No. 825,756

Int. Cl.<sup>4</sup> B65H 19/30

U.S. Cl. 414-589

5 Claims



1. A sheet winder with a slit, in which sheet winder a strip-like sheet is slit by a slit into a plurality of slit sheets to be supplied to respective take-up shafts disposed at take-up positions and taken up on cores supported on said take-up shafts, said sheet winder comprising:

(a) take-up shaft withdraw and restoring means for effecting withdraw of each take-up shaft from its take-up position in the axial direction of the shaft and for restoring the shaft to its take-up position;

(b) a movable sheet roll support movable in a direction normal to the axis of each take-up shaft at the take-up position so as to be moved to a sheet roll acceptance

position, a take-up shaft supply position, and a waiting position;

(c) a vertical guide post provided on said movable sheet roll support;

(d) at least one sheet roll holder capable of being raised and lowered along said vertical guide post and having an end portion extending toward a sheet take-up position;

(e) a sheet roll support base disposed for movement back and forth along said at least one sheet roll holder;

(f) core holding means provided on an end portion of said at least one sheet roll holder for holding a core parallel to the take-up shaft;

(g) means for positioning and driving said movable sheet support; and

(h) means for raising and lowering said at least one sheet roll holder.

4,682,930

# APPARATUS FOR UPWARD AND DOWNWARD MOVEMENT OF AN ARM IN A ROBOT SYSTEM FOR TAKING OUT INJECTION MOLDED AND DIE CASTING PRODUCTS

Kiyoji Hachisu, Maebashi, Japan, assignor to Ichikoh Engineering, Ltd., Maebashi, Japan

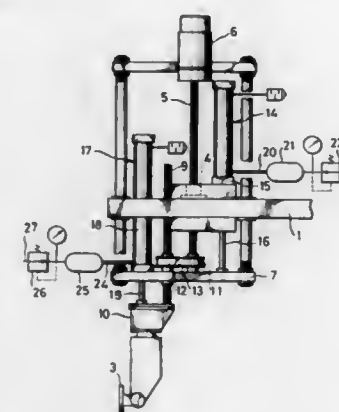
Filed Oct. 15, 1985, Ser. No. 787,238

Claims priority, application Japan, Jun. 5, 1985, 60-120620

Int. Cl.<sup>4</sup> B66F 9/00; F16H 25/12

U.S. Cl. 414-589

4 Claims



1. An apparatus for upward and downward movement of an arm in a robot system for taking out injection molded and die casting products, comprising:

a chuck;

a frame for connection to the arm;

means upwardly and downwardly movably supported by the frame for supporting the chuck;

drive equipment supported on the frame comprising a motor and means for upwardly and downwardly moving the chuck;

a first pneumatic cylinder having a volume and including a casing attached to the frame, a piston rod connected to the means upwardly and downwardly movably supported by the frame for supporting the chuck, and a rod end side; a first surge tank having a volume larger than the first pneumatic cylinder volume and being connected to the rod end side of the first pneumatic cylinder;

a compressed air source for supplying upward pressure to the pneumatic cylinder;

a first reducing valve without relief means connected between the first surge tank and compressed air source;

wherein the means upwardly and downwardly movably supported by the frame for supporting the chuck comprises a lift frame supporting the chuck, an intermediate frame having the piston rod of the first pneumatic cylinder connected thereto, means for transmitting relative movement between the lift frame and intermediate frame, a

second pneumatic cylinder having a volume and including a housing attached to the intermediate frame, a piston rod connected to the lift frame, and a rod end side, a second surge tank having a volume larger than the second pneumatic cylinder volume and being connected to the rod end side of the second pneumatic cylinder, and a second reducing valve without relief means connecting the second surge tank and the compressed air source; and

wherein the motor is nonrotatably but axially movably supported on the frame, and the means for upwardly and downwardly moving the chuck comprises a ball nut rotatably but axially unmovably supported on the frame, a first ball screw inserted axially movably but nonrotatably in the ball nut, the first ball screw having a first end connected to the output shaft of the motor and a second end rotatably but axially unmovably supported on the intermediate frame, a second ball screw rotatably and axially movably inserted in the intermediate frame, the second ball screw having a first end fixed to an end of the lift frame, and means for connecting the first and second ball screws with respect to each other in a synchronously rotatable manner.

4,682,931

# LIFT TRUCK CLAMP FOR HANDLING STACKED LOADS OF DIFFERENT SIZES

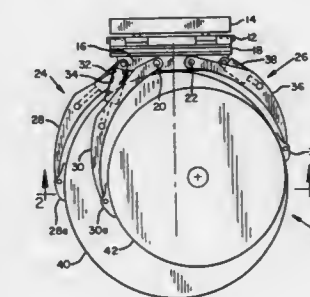
Marshall K. House, Portland, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Filed Sep. 22, 1986, Ser. No. 909,961

Int. Cl.<sup>4</sup> B66F 9/18

U.S. Cl. 414-623

16 Claims



1. A load-handling clamp adapted to be mounted upon the lifting apparatus of a lift truck, comprising:

(a) a frame adapted to be mounted upon said lifting apparatus so as to be selectively movable vertically by said lifting apparatus;

(b) first and second selectively openable and closable opposing clamping assemblies mounted upon said frame, the first clamping assembly comprising at least a pair of clamp arms movably separately from each other relative to said frame selectively toward and away from the second clamping assembly;

(c) a pair of fluid power actuators, each associated with a respective clamp arm, for moving said clamp arms separately from each other selectively toward and away from the second clamping assembly;

(d) a source of pressurized fluid connected to said pair of fluid power actuators for selectively causing said actuators to move said clamp arms toward said second clamping assembly by the supply of respective flows of fluid to said actuators;

(e) flow-regulating means connected to said pair of actuators for regulating said respective flows of fluid so as to cause the respective movements of said pair of clamp arms, in a direction toward said second clamping assembly, to be simultaneous with each other; and

(f) override means for overriding said flow-regulating

means, automatically in response to the attainment of a predetermined clamping force by one of said pair of clamp arms, by permitting the other of said pair of clamp arms to move in a direction toward said second clamping assembly without simultaneous movement in said direction by both of said pair of clamp arms.

4,682,932

## INDUSTRIAL ROBOT

Shigeru Yoshino, Kodaira, Japan, assignor to Silver Selko Limited, Kodaira, Japan

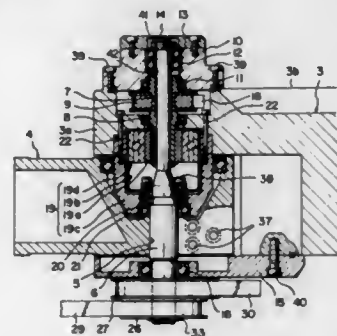
Filed Aug. 14, 1984, Ser. No. 640,696

Claims priority, application Japan, Aug. 18, 1983, 58-126840[U]

Int. Cl.<sup>4</sup> B25J 17/00

U.S. Cl. 414-744 A

7 Claims



1. An industrial robot of the type which includes a first arm having one end supported for pivotal motion about a first vertical axis, a second arm having one end supported for pivotal motion about a second vertical axis at the other end of said first arm, and a motor for pivoting said second arm, comprising:

- a shaft providing said second axis;
- means for supporting said shaft for rotation at a fixed vertical position at said the other end of said first arm;
- means for removably securing said shaft to said one end of said second arm;
- a speed reduction gear for transmitting rotation of said motor to said shaft at a reduced speed;
- said speed reduction gear being a harmonic speed reduction gear including a flex spline secured to said shaft, a circular spline secured to said first arm, and a wave generator operatively connected to said motor for engaging said flex spline with said circular spline at consecutive different circumferential positions during rotation of said wave generator, and
- further comprising a sleeve supported for rotation relative to said first arm and about said shaft, said wave generator being secured to said sleeve, and a pulley secured to said sleeve and operatively connected to said motor for transmitting rotation of said motor to said wave generator of said speed reduction gear.

4,682,933

## LABYRINTHINE TURBINE-ROTOR-BLADE TIP SEAL

William R. Wagner, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 661,950, Oct. 17, 1984, abandoned. This application May 14, 1986, Ser. No. 865,924

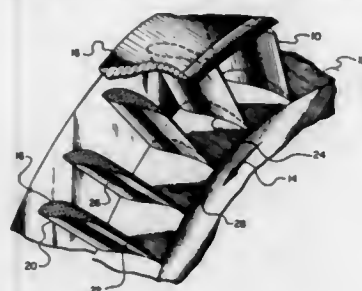
Int. Cl.<sup>4</sup> F01D 5/20

U.S. Cl. 415-172 A

5 Claims

1. A method for minimizing a fluid leakage flow rate across a rotor blade tip during operation of a rotor blade assembly having a casing, a rotor positioned within the casing, at least one rotor blade attached to the rotor, the rotor blade having a leading edge, a trailing edge, a tip including a tip surface spaced from the casing by a gap, a root portion, a pressure side

and a suction side, a fluid flow across the blade tip from the pressure side to the suction side, the method comprising:



- (i) determining a fluid flow relationship between a fluid leakage flow rate across the blade tip surface, a fluid leakage flow area on the tip surface, and the gap between the casing and the tip surface according to the formula

$$\frac{w}{A} = \frac{\sqrt{2g\rho\Delta P}}{\sqrt{C_1 N + C_2}} \quad (1)$$

where:

w=leakage flow rate,  
A=leakage flow area between a shroud and a tip surface area (delta x chord fraction),  
g=gravitational constant (32.2 ft. per sec.<sup>2</sup>),  
ΔP=chordwise pressure differential (suction to pressure side),  
ρ=leakage fluid density,

C<sub>1</sub>, C<sub>2</sub>=flow constants for a given gap distance,

N=number of recesses on a tip surface area,

- (ii) deriving a number of recesses based on the derivative values of C<sub>1</sub> and C<sub>2</sub> of formula (1),
- (iii) machining the recesses into the blade tip surface in conformity with formula

$$1 \leq D/Z \leq 3 \quad (a)$$

wherein D is the recess depth and Z is the recess width, and the formula

$$1 \leq Z/\delta \leq 30 \quad (b)$$

wherein δ is the gap value between the casing and the blade tip surface and Z is as above,

- (iv) establishing suction vortices within each recess,
- (v) diverting at least a portion of the fluid flowing from the pressure side to the suction side into each recess; and
- (vi) minimizing the fluid flow across the blade tip surface.

4,682,934

## WHEEL ANTI-ROTATION MEANS

Victor J. Knorowski, Rexford; Charles R. Hean, Clifton Park, and Ronald J. Placek, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 6, 1985, Ser. No. 806,072

Int. Cl.<sup>4</sup> F01D 5/06

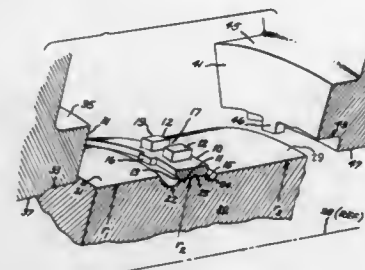
U.S. Cl. 416-198 A

30 Claims

1. In an axial fluid flow turbine, anti-rotation means for securing a wheel to be disposed about a first surface portion of a rotatable shaft of the turbine, said anti-rotation means for preventing rotation of the wheel with respect to the shaft, said anti-rotation means comprising:

- locking means including an annular member surrounding said shaft, said locking means discrete from yet irrotatably affixed to a second surface portion of the shaft; and
- wherein the second surface portion has a predetermined

axial expanse and further wherein said annular member includes a radially inner surface for irrotatably engaging the second surface portion, wherein the radially inner surface of the annular member axially extends beyond both axial ends of the second surface portion; and,



restraining means affixed to said locking means, said restraining means for fixedly engaging a portion of the wheel, whereby rotation of the wheel with respect to the shaft is prevented.

4,682,935

## BOWED TURBINE BLADE

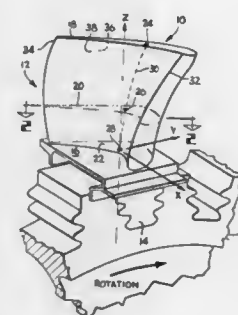
Jack R. Martin, Bedford, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Dec. 12, 1983, Ser. No. 560,718

Int. Cl.<sup>4</sup> F01D 5/12

U.S. Cl. 416-223 A

9 Claims



1. A blade for a gas turbine engine comprising an airfoil portion including a leading edge, a trailing edge, an intermediate section, and a non-linear stacking axis effective for introducing a compressive component of bending stress, exceeding a compressive yield strength of said blade, in said trailing edge and said leading edge of said intermediate section due to centrifugal force acting on said blade.

4,682,936

## FUEL SUPPLYING PUMP

Ryozo Suzuki; Jun Shiraga; Shingo Iwai, and Tetuo Okashiro, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1986, Ser. No. 823,098

Claims priority, application Japan, Jan. 29, 1985, 60-17096

Int. Cl.<sup>4</sup> F04B 21/08

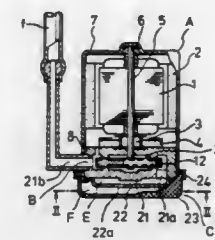
U.S. Cl. 417-366

3 Claims

1. A fuel supplying pump, to be disposed within a fuel tank on a bottom thereof to be driven by electric driving means, comprising

- a pump casing having a center axis and a suction port, an end cover having a center axis and a suction port, and
- a fuel filtration element disposed under said end cover with a gap F between said end cover and said fuel filtration element,

said suction port of said end cover and said suction port of said pump casing each being disposed on a radial line



extending from said center axis at a position removed from said center axis, said radial lines being angularly separated.

4,682,937

## DOUBLE-ACTING DIAPHRAGM PUMP AND REVERSING MECHANISM THEREFOR

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

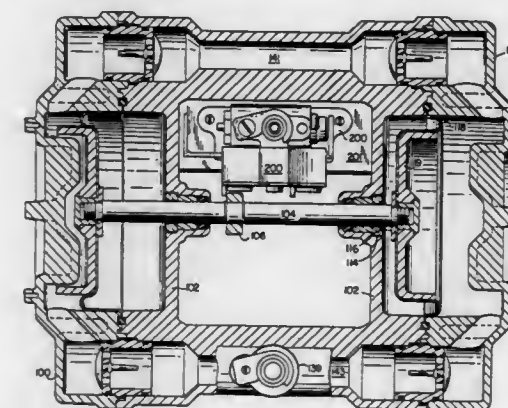
Division of Ser. No. 574,310, Jan. 26, 1984, Pat. No. 4,634,350, which is a division of Ser. No. 320,584, Nov. 12, 1981, Pat. No. 4,436,493, which is a continuation-in-part of Ser. No. 77,544, Sep. 21, 1979, abandoned. This application Jan. 28, 1986, Ser. No. 823,216

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.<sup>4</sup> F04B 43/06

U.S. Cl. 417-393

16 Claims



1. A reciprocating pump and reversing mechanism therefor comprising in combination:

- (a) a pump housing including a pair of laterally spaced-apart chambers each of which has a diaphragm member therein dividing each chamber into a driving section and a discharge section, each of said discharge sections having an inlet port and an outlet port and each of said driving sections having inlet-outlet port means;
- (b) said diaphragm members being interconnected by a shaft mounted in said housing for reciprocating movement, whereby said shaft moves with said diaphragm members such that as the driving section of one chamber expands, forcing its discharge section to contract, the driving section of the other chamber contracts while its discharge section expands;
- (c) protrusion means fixedly connected to said shaft and extending transversely therefrom for use in coupling the movement of said shaft to the movement of the below-recited valve actuating member;
- (d) said housing also including a fluid outlet manifold interconnecting said outlet ports of said discharge sections, a fluid inlet manifold interconnecting said inlet ports of said discharge sections, and driving fluid manifold means for



- feeding driving fluid to and from said inlet-outlet port means of said driving sections;
- (e) inlet and outlet valves in said housing in fluid communication with said fluid inlet and outlet manifolds, respectively, for controlling the flow of fluid to be pumped to and from each of said discharge sections;
- (f) control valve means including valve housing means for housing said control valve means, said valve housing means being connected to said pump housing and including reciprocable spool valve element means in said valve housing means and being in fluid communication with said driving fluid manifold means and being movable between two alternate positions for alternately directing driving fluid to one of said two driving sections, while also alternately allowing driving fluid to flow from the other one of said two driving sections, said spool valve element means having first contact surface means for being contacted by the below-recited valve actuating member;
- (g) a valve actuating member mounted for reciprocating movement between two control valve-actuated end positions, said valve actuating member having second contact surface means positioned adjacent said first contact surface means of said spool valve element means for alternately snap contacting said first contact surface means to alternately snap said spool valve element means back and forth between its two positions, said valve actuating member also having third contact surface means for use in coupling the movement of said shaft to the movement of said valve actuating member, coupling means including said protrusion means and said third contact surface means for operatively coupling said protrusion means to said valve actuating means for alternately initiating each reciprocating stroke of said valve actuating member as said shaft reciprocates, the completion of each of said reciprocating strokes of said valve actuating member being carried out by the below-recited snap-acting means;
- (h) snap-acting means, including at least one pin, a helicoidal compression spring at least partially surrounding said pin and a pin mounting element, for completing the movement of said valve actuating member from one of its two positions to the other initiated by said coupling means, said pin mounting element being pivotably secured for at least partial rotation about an axis stationary with respect to one of said valve actuating member and said housing, said pin being slidably mounted to said pin mounting element for sliding motion in a direction perpendicular to said axis; and
- (i) wherein said pin mounting element is in the form of a tubular socket for receiving an end of said pin and at least a portion of said compression spring.

4,682,938

## GEAR PUMP BEARINGS

R. Michael Riordan, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 26, 1985, Ser. No. 813,591  
Int. Cl. F04C 2/18; B23P 13/04, 15/14

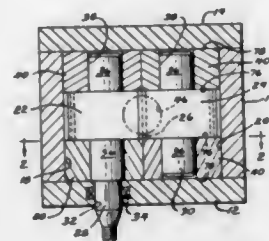
U.S. Cl. 418-1

7 Claims

1. In a method of making a gear pump having a housing with an interior chamber defined by two intersecting cylindrical bores whose axes are parallel and which are to respectively receive (a) one of a pair of meshed gears, with each gear having an associated shaft, and (b) a cylindrical bearing for the associated shaft with the bearings for the shafts having facing and engaging flats adjacent the area at which the gears mesh, the steps of:

closely maintaining to a desired tolerance the distance between the flat of each bearing and the rotational axis of the shaft defined by the bearing; and

providing such reliefs only diametrically opposite said flats as may be required to fit said gears, bearings and shafts to



said chamber at the interfaces of said bores and said bearings remote from said flats.

4,682,939

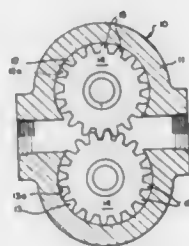
## GEAR PUMP OR MOTOR WITH TOOTH TIPS OF DISSIMILAR METAL

John D. Petro, Hubbard, Ohio, assignor to Commercial Shearling, Inc., Youngstown, Ohio

Filed Mar. 25, 1986, Ser. No. 843,675  
Int. Cl. F03C 2/08; F04C 2/18

U.S. Cl. 418-178

9 Claims



1. A gear pump or motor structure comprising a housing having a chamber, a pair of gears having intermeshing teeth running wiping contact with the chamber, said teeth having tips of a separate dissimilar harder metal from that of the gear teeth and the chamber surface with a non-smooth surface finish on said teeth tips whereby said chamber working surface is wiped to a smooth clean surface in operation.

4,682,940

## DOUBLE-MOLDED VULCANIZING PRESS

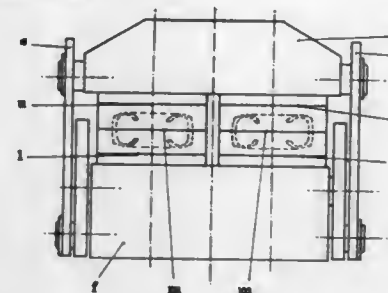
Augusto Pizzorno, Milan, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Milan, Italy

Filed Dec. 20, 1985, Ser. No. 811,407

Claims priority, application Italy, Dec. 21, 1984, 24220 A/84  
Int. Cl. B29C 35/02

U.S. Cl. 425-34 R

8 Claims



1. A molding and/or vulcanizing press that is provided with two adjacent sites for containing two corresponding vulcanizing molds, each mold comprising at least two opposite sections, a lower and an upper section respectively, that are reciprocally shiftable axially, defining a cavity inside which a product is molded and/or vulcanized, with each section being mounted on corresponding upper and lower tables, said press comprising a frame including a base, provided with two housing seats for said lower tables, a beam to which said upper tables are connected, two shoulders connecting said beam to said base through fixtures that allow for shifting of said beam with respect to said base for realizing at least the opening and shutting of said molds and for exercising a thrust upon each pair of opposed sections, sufficient for keeping said molds shut by contrasting the pressure acting inside said molds during each working cycle, and support means for coupling said molds to said press, said support means being respectively integral with said beam and said base and interposed between said beam and said upper table and between said base and said lower table, said support means being provided with coupling surfaces for coupling with corresponding matching surfaces provided on said tables, said upper and lower tables being mounted on said frame, freely shiftable with respect to said beam and base, said coupling surfaces of said support means being shaped so as to allow relative shifting of each closed and pressurized mold, with respect to said frame.

4,682,941

## FLATTENING AND TAKE-OFF APPARATUS FOR PROVIDING A PLASTIC FILM WEB FROM A BLOWN TUBULAR FILM

Hartmut Upmeyer, and Rudolf Peters, both of Lengerich, Fed. Rep. of Germany, assignors to Windmüller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Jun. 10, 1986, Ser. No. 872,574

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1985, 3520914

Int. Cl. B29C 53/10

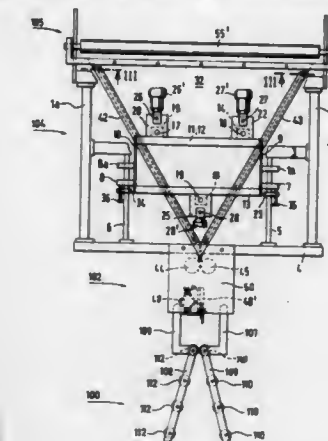
U.S. Cl. 425-72 R

11 Claims

1. A flattening and take-off apparatus for a tubular plastic film extruded from a stationary film extrusion head, said apparatus comprising:

- flattening means positioned downstream of the film extrusion head for flattening a tubular film;
- a pair of rotatable pinch rolls positioned downstream of said flattening means and having their axes in parallel relationship for receiving flattened tubular film therebetween;
- cutting means positioned between said pinch rollers and said flattening means for longitudinally cutting said flattened film along one lateral edge thereof to define a pair of juxtaposed film portions connected at an opposite lateral edge of said flattened tubular film;

- unfolding means positioned downstream of said pinch rollers for receiving said cut flattened film and for progressively turning each of said juxtaposed film portions in opposite directions about said opposite lateral edge until the juxtaposed film portions are substantially coplanar to



- provide a substantially flat web, said unfolding means including an edge contact member in contact with said opposite lateral edge of said film, and outwardly diverging elongated edge members about which respective ones of said juxtaposed film portions are adapted to pass; and
- adjusting means for adjusting the position of said unfolding means relative to the axis of said tubular film.

4,682,942

## DRY FORMED-WEB EMBOSSED APPARATUS

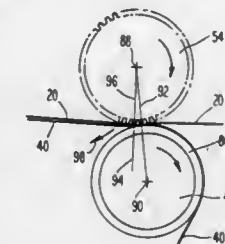
Joel P. Gotchel, Glen Mills, Pa.; Henry J. Norton, Wilmington, Del.; Rudolf Neuenschwander, Swarthmore, and Daniel J. Stango, Newtown Square, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 12, 1985, Ser. No. 764,907

Int. Cl. B29C 59/02

U.S. Cl. 425-103

18 Claims



1. Apparatus for transferring and conveying a dry-formed nonwoven web through an embossing nip comprising:

- a stable, inelastic, porous endless belt having an upper surface for receiving and conveying the web;
- means for moistening the web while it is on the belt;
- a heated embossing roll;
- an anvil roll, located beneath the embossing roll, forming the embossing nip with the embossing roll, the embossing roll being mounted with respect to the anvil roll so that the web and the belt passes directly under the center of the embossing roll before passing directly over the center of the anvil roll;
- means for guiding the web and belt into the embossing nip so that the web and belt partially wraps the embossing roll before entering the embossing nip whereby air in the web is forced through the porous belt; and
- means for driving the belt, embossing roll and an anvil roll at a speed greater than 300 feet per minute.

4,682,943

## INJECTION MOLDS FOR THE MANUFACTURE OF COMPOSITE BODIES

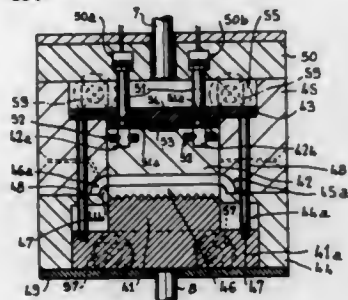
Jacques Schomblond, Montagnieu, France, assignor to Cartier Industrie, Thyez, France

Filed Mar. 20, 1986, Ser. No. 841,969

Claims priority, application France, Mar. 22, 1985, 85 04518  
Int. Cl.<sup>4</sup> B29C 45/04

U.S. Cl. 425—130

12 Claims



1. An injection molding apparatus for making composite bodies comprising a mold having a generally hollow die element having upper and lower surfaces, a cover extending across said upper surface of said die element and a hollow punch means generally axially aligned with and engaging said lower surface of said die element so as to create an open laterally extending cavity therebetween, an upper, middle and lower block means movably mounted within said die element, connector means normally urging said middle block means into abutting relationship to said upper block means for concurrent movement therewith, means for simultaneously moving said upper and lower block means axially with respect to said die element and said punch means, means for selectively limiting the concurrent movement of said middle block means with said upper block means so as to space said middle block means from said upper block means to form a first cavity within said die element between said middle and lower block means which is closed from said open laterally extending cavity, first injection means for introducing a first plastic material into said first cavity, said means for selectively limiting the concurrent movement of said middle block means with said upper block means being selectively movable so as to urge said middle block means into engagement with said upper block means after said first material has been introduced into said first cavity, said means for simultaneously moving said upper and lower block means being shiftable so as to move said upper, middle and lower block means away from said cover means to thereby form a second cavity between the first plastic material and said middle block means and within said die element, said second cavity being in open communication with said laterally extending cavity, and means for injecting a second plastic material into said second cavity so as to interface with said first plastic material.

4,682,944

## ELECTRICALLY HEATED INJECTION NOZZLE AT THE END OF A HOT RUNNER

Walter Muller, Battenberg, Fed. Rep. of Germany, assignor to Ewikon Entwicklung und Konstruktion GmbH &amp; Co. KG, Herford, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,477

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417220

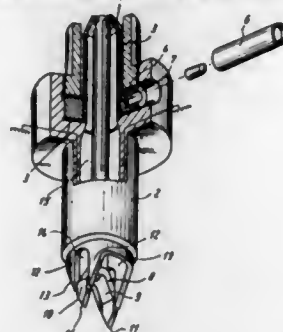
Int. Cl.<sup>4</sup> B29C 45/20

U.S. Cl. 425—549

14 Claims

1. In an electrically heated injection nozzle for a hot runner, having a central heating rod, an annular jacket component around the rod forming an annular channel through which injected plastic flows, wherein the heating rod extends through the center of the jacket component and terminates in an end portion which is received in a supply aperture of an associated mold cavity and wherein the end portion of the heating rod,

which extends into the supply aperture, is part of an electric-resistance heating system, the improvement wherein: the end portion of the heating rod comprises a fork-shaped member having fork shanks with free ends terminating in points each of



which extends at least into the vicinity of the supply apertures and wherein the jacket component has at least one jacket tongue for each shank jacket tongue terminating in a point and connected to one shank.

4,682,945

## THERMAL INSULATING AND EXPANSION ASSEMBLY FOR INJECTION MOLDING MACHINE

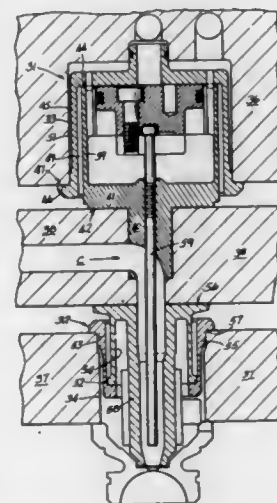
Robert D. Schad, Toronto, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Continuation-in-part of Ser. No. 630,970, Jul. 16, 1984, Pat. No. 4,588,367. This application Oct. 3, 1985, Ser. No. 783,580

Int. Cl.<sup>4</sup> B29F 1/03

U.S. Cl. 425—549

10 Claims



1. In a pressure molding machine having a floating manifold disposed between two spaced abutments, said manifold having at least one conduit communicating with and contacting a nozzle set in one of said abutments, means for sealing the manifold relative to said nozzle comprising: thermal expansion manifold support assemblies disposed between the manifold and mating abutments, each thermal expansion assembly having a first expansion element in contact with said manifold and spaced from an adjacent abutment, and a second thermal expansion element in contact with a mating abutment, and spaced from said manifold, said second expansion element being a tubular body having a first flange extending radially outwardly from one end thereof and a second flange extending radially inwardly from an opposite end thereof, said first flange contacting said adjacent abutment at a first region of contact, said first expansion element having a pair of opposite ends and being seated in the second expansion

element with one end of the first element contacting the second flange at a second region of contact, and an opposite end of the first element being free of contact with said second expansion element, said opposite end of the first element being in contact with the manifold, whereby compressive stress in said elements resulting from thermal expansion is distributed to both elements thereby precluding the tendency of said elements to buckle or collapse under stress while minimizing the transfer of heat to said abutments.

4,682,946

## CARBURETION TYPE BURNING APPARATUS

Toshio Kasada, Ojima, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

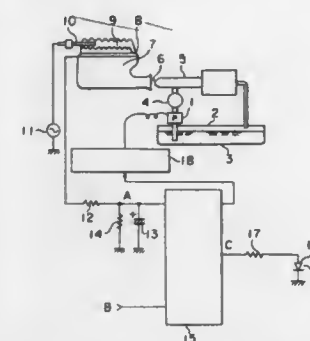
Filed Oct. 2, 1985, Ser. No. 783,106

Claims priority, application Japan, Oct. 11, 1984, 59-213139

Int. Cl.<sup>4</sup> F23N 5/26

U.S. Cl. 431—14

6 Claims



1. A carburetion type burning apparatus having a carburetion chamber for evaporating liquid fuel which comprises a timer for counting time from the initiation of burning operation, an ion current detecting device positioned in the flames for measuring an ion current in the flames (if) at the time after a predetermined time counted by said timer in which the ion current in flames is stabilized, a judging device for judging existence or non-existence of an abnormal burning state by comparing the measured ion current (if) and a predetermined open threshold value of ion current which causes abnormal burning condition, a burning quantity controlling device for controlling the quantity of fuel to be burned in response to the output from said judging device and an alarming device for generating an alarm when said judging device provides judgment of abnormal condition.

4,682,947

## DECORATIVE CANDLES

Clement H. Luken, Jr., Highland Heights, and Donald V. Kinsman, Fort Thomas, both of Ky., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 776,711, Sep. 16, 1985, abandoned. This application Aug. 5, 1986, Ser. No. 893,423

Int. Cl.<sup>4</sup> F23D 3/16

U.S. Cl. 431—288

11 Claims

1. A pillar candle which upon burning leaves a decorative and aesthetically pleasing free-standing shell having a filigree or lace-like pattern comprised of a flat cotton wick having from 27 to 45 plies and having a thickness in the range of 0.042–0.058 inches and width in the range of 0.079–0.118 inches and centrally located within a solid fuel cylinder and extending axially from the base and through the opposite end of said cylinder; said fuel cylinder having a diameter of 2 to 3½

inches with the ratio of wick size to candle diameter ranging from 12 to 19 plies per inch and comprised of a fatty acid



composition having a titer from 50° C. to 66° C. and wherein the predominant fatty acids are stearic acid and palmitic acid.

4,682,948

## METHOD AND APPARATUS FOR PRODUCING CEMENT CLINKER INCLUDING WHITE CEMENT

Sidney M. Cohen, Allentown, Pa., assignor to Fuller Company, Bethlehem, Pa.

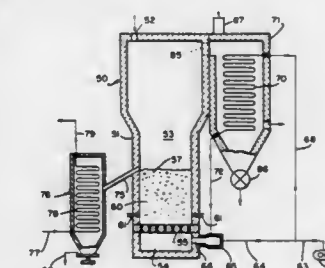
Division of Ser. No. 655,820, Oct. 1, 1984, Pat. No. 4,595,416.

This application Mar. 3, 1986, Ser. No. 835,664

Int. Cl.<sup>4</sup> F27B 15/00; F22B 1/00

U.S. Cl. 432—58

2 Claims



1. Apparatus for producing cement clinker comprising: a feed preparation system including means for combining cement forming raw materials with carbon bearing material, a binder and water to form a mixture and for forming the mixture into nodules, means for drying the nodules and means for sizing the nodules; a vessel having a gas permeable grid dividing the vessel into a lower plenum chamber and an upper material chamber; means for supplying the sized nodules to the upper material chamber; means for supplying air under pressure to said lower plenum chamber for passage upwardly through the gas permeable grid for establishing and maintaining a fluidized bed of nodules within the upper material chamber; means for supplying additional fuel to the upper material chamber for combustion together with the carbon bearing material within the nodules for maintaining the fluidized bed at cement clinkering temperature; said upper material chamber having an outlet for cement clinker and an outlet for spent combustion gas; a heat exchanger flow connected to the outlet for cement clinker for cooling cement clinker discharged from the upper material chamber including means for supplying ambient air thereto for heat exchange with the cement clinker whereby the cement clinker is cooled and the ambient air is heated;



means for supplying the heated ambient air to the means for drying the nodules; and  
 a heat exchanger flow connected to the outlet for spent combustion gas of the vessel including means for supplying ambient air thereto for indirect heat exchange with the spent combustion gas whereby the spent combustion gas is cooled and the ambient air is heated and an outlet for heated ambient air flow connected to said means for supplying air to the lower plenum chamber;  
 said means for forming the mixture of cement forming raw material, carbon bearing material, water and a binder into nodules is an extruder and said means for drying the nodules is a tray dryer flow connected to the heat exchanger for cooling cement clinker.

4,682,949

# TOOL HOLDER FOR ULTRASONIC ENDODONTIC APPARATUS

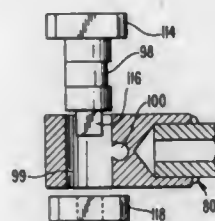
George E. Warrin, North Merrick, N.Y., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Jul. 12, 1985, Ser. No. 754,175

Int. Cl.<sup>4</sup> A61C 5/02

U.S. Cl. 433—81

28 Claims



1. An ultrasonic endodontic apparatus for use with an endodontic tool having a mounting shaft and a working surface comprising:

- an ultrasonic dental handpiece adapted to deliver vibratory energy and a flow of irrigation fluid;
- a tool support assembly adapted to be connected to said handpiece and having a tool mounting head adapted to receive said vibratory energy and said flow of irrigation fluid from said handpiece;
- said head including a tool mounting bore therein adapted to receive the mounting shaft of the endodontic tool;
- an eccentric cam positioned generally in said head for tightly clamping the mounting shaft of the endodontic tool in said head;
- said eccentric cam being adapted to move the mounting shaft in said tool mounting bore so that the mounting shaft is inserted further into said tool mounting bore as said eccentric cam is tightened in a given direction;
- said eccentric cam terminating in a flange at each end thereof;
- said flanges being adapted to rotate said eccentric cam to thereby clamp the tool in said head;
- and a wrench adapted to engage both of said flanges and to pivot about said head while engaged therewith to thereby clamp the tool in said head.

4,682,950

# DEVICE AND METHOD OF BONDING AND VENEERING DENTAL MATERIAL TO A TOOTH

William B. Dragan, 85 Burr St., Easton, Conn. 06612

Filed Oct. 30, 1985, Ser. No. 792,803

Int. Cl.<sup>4</sup> A61C 5/04

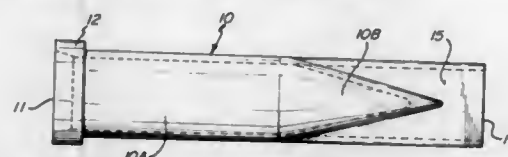
U.S. Cl. 433—90

10 Claims

1. A disposable dental syringe tip for packaging, dispensing and applying a dental tooth veneering material directly to a tooth comprising

- a plastic disposable nozzle having a generally cylindrical body portion defining a reservoir adapted to receive a predetermined amount of dental veneering material;
- a discharging tip portion terminating in a discharge orifice;

said body portion having a full open end opposite said discharge orifice;  
 a laterally extending external flange circumscribing said full open end;  
 said cylindrical body portion converging toward said discharge orifice to define a conically shaped intermediate portion disposed between said cylindrical body portion and said discharge orifice, said conically shaped intermediate portion being axially disposed relative to said cylindrical body portion;  
 said discharging tip portion defining a generally flat and broad rectangularly shaped discharge orifice.



a piston disposed in said body portion for sealing said full open end;  
 said piston being displaceably disposed in said body portion, said piston having a wiper portion for engaging the interior surface of said cylindrical body portion, and  
 said piston having a conically shaped tip end adapted to complement the intermediate conically shaped portion of said nozzle tip.  
 said piston being slidably disposed within said body portion for ejecting the dental material therefrom when displaced, whereby substantially all of the material disposed in said nozzle tip can be expressed therefrom when said piston has been fully displaced within said cylindrical body portion.

4,682,951

# ADJUSTABLE SINUS LIFT IMPLANT

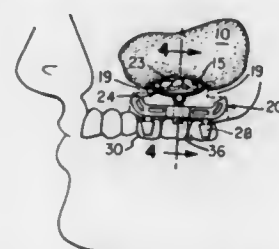
Leonard I. Linkow, 1530 Palisade Ave., Fort Lee, N.J. 07024

Filed May 28, 1986, Ser. No. 868,121

Int. Cl.<sup>4</sup> A61C 8/00

U.S. Cl. 433—173

22 Claims



4,682,956

# **APPARATUS AND METHOD FOR LEARNING ABOUT THE RELATIONSHIPS AND PERSONALITIES OF A GROUP OF TWO OR MORE PERSONS**

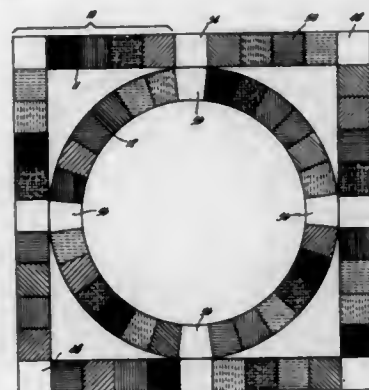
Leonard Krane, 1855 Sunset Plaza Dr., Los Angeles, Calif. 90069

Filed Nov. 27, 1985, Ser. No. 802,778

Int. Cl.<sup>4</sup> G09B 19/00; A63F 3/00

U.S. Cl. 434—237

20 Claims



1. A method for learning about the relationships and personalities of a group of two or more persons, comprising: choosing a first person and a second person from the group of persons; allowing the first person to select which of the first and second persons is to be a participant; selecting a plurality of questions from among a set of pluralities of questions at least in part according to a color personality as revealed by a sequential selection of a plurality of colors and selection by the first person of physical indicia that match or relate to the first person's color personality, the plurality of questions being directly identified with the physical indicia selected by the first person; selecting one of the plurality of questions to be answered, the selection being related to a color personality or preference of the participant; if the participant is the first person, recording a secret answer of the second person to the selected question whereas if the participant is the second person, recording the secret answer of the first person to the selected question; revealing the answer of the participant; and comparing the answer of the participant with the secret answer.

4,682,957

# **TELECONFERENCING AND TEACHING METHOD AND APPARATUS**

Gordon W. Young, P.O. Box 8551, Salt Lake City, Utah 84108

Filed Feb. 24, 1986, Ser. No. 832,358

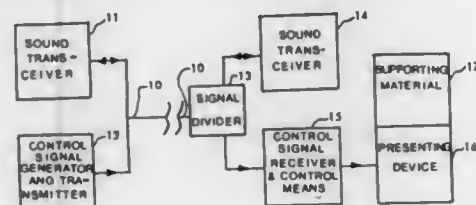
Int. Cl.<sup>4</sup> G09B 5/10

U.S. Cl. 434—307

20 Claims

1. A teleconferencing and teaching system, enabling the live presentation of a program with supporting material from an originating location to at least one remote location being connected to the originating location by standard voice grade telephone service, comprising a device for presenting supporting material for the presentation located at the at least one remote location; a package of supporting material for the presentation prepared and supplied in advance of the presentation to the at least one remote location and adapted to be

presented by said presenting device; means at the originating location for producing signals representative of the audio presentation made at the originating location and for transmitting such signals by a single line of the standard telephone service to the at least one remote location; means at the originating location for producing control signals representative of the desired operation of the presenting device and for transmitting such signals during the presentation by the same single line of the standard telephone service to the at least one remote location; means at the at least one remote location for receiving the signals from the single telephone line; means in series with the means for receiving signals from the telephone line for decoding the control signals and for determining when control signals are present; amplifier means for amplifying signals fed



to it; delay means electrically in parallel with the decoding means and in series with the amplifying means to delay the signals through the delay means a period of time at least equal to the time required for the decoding means to determine when a control signal is present; blocking means electrically in series between the delay means and the amplifier means and operative in response to a determination by the decoding means that a control signal is present to block transmission of the control signal to the amplifier means; speaker means for converting signals from the amplifier means to audio sound that can be heard at such at least one remote location; means at the at least one remote location for receiving the signals representative of the desired operation of the presenting device and for operating the device during the presentation in response to said signals.

4,682,958

# **DATA ENTRY TERMINAL AND MEMORY MODULE THEREFOR**

William H. Slavik, Palos Hills; William P. Carlson, Hanover Pk.; George L. Cepynsky, Woodridge; Paul G. Dussault, Barrington; Steven E. Margison, Downers Grove, and James A. Wolf, Jr., Deerfield, all of Ill., assignors to NuVatec, Inc., Downers Grove, Ill.

Filed Jan. 30, 1985, Ser. No. 696,571

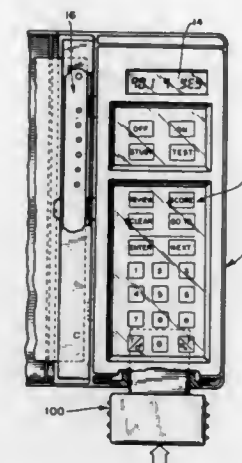
Int. Cl.<sup>4</sup> G09B 7/00

U.S. Cl. 434—335

8 Claims

1. A portable data entry terminal for storing a plurality of user generated responses, said terminal comprising: a keyboard comprising means for generating keyboard entries in response to user activation of the keyboard; a display; a computer responsive to the keyboard entries and coupled to drive the display; a removable, portable read/write memory module readily connected to and removed from the computer, said memory module comprising both means for storing information indicative of a selected format for a set of questions, and means for storing a plurality of user responses to the set of questions; means, included in the computer and responsive to the stored information, for configuring the keyboard for the format of the set of questions, said configuring means comprising means for disabling selected keyboard entries in response to the stored information to enforce user compliance with the selected format;

means, included in the computer, for storing the user responses to the set of questions in the memory module; and



means, included in the computer, for storing a selected code in the memory module when the memory module has been used to store at least one of the user answers in order to indicate that the memory module has been used.

4,682,959

# **FINE TRIM ADJUSTMENT FOR MANUALLY TILTED OUTBOARD MOTOR**

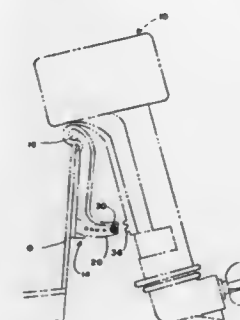
Howard S. MacGregor, 19 Glendale Dr., Kissimmee, Fla. 32741

Filed Oct. 28, 1985, Ser. No. 792,103

Int. Cl.<sup>4</sup> B63H 5/12

U.S. Cl. 440—53

10 Claims



1. A mounting bracket arrangement for boat powered by an outboard motor having an elongate shaft housing, such that very slight increases in the tilt angle of the motor are made possible, said arrangement comprising a transom bracket means adapted to be mounted on the transom of a boat, said transom bracket means including a pair of stern brackets mounted in equally spaced relation on the transom of a boat, with the lower portions of said stern brackets each containing a spaced series of trim adjustment holes, with each hole in one of said stern brackets being in alignment with a corresponding hole in the other of said stern brackets, an elongate pin adapted to extend through any selected, aligned pair of spaced holes in said stern brackets, with a portion of the shaft housing of the outboard motor defining a saddle member designed to contact a portion of said elongate pin at a location between the inner walls of said stern brackets, with said elongate pin withstanding a substantial part of the forward thrust applied by said saddle member when the outboard motor is delivering power, the boater being able to apply fine grain corrective forces for trimming the boat when the boat is at rest by placing a sleeve of preascertained wall thickness over said pin, said sleeve only slightly increasing the effective diameter of the elongate pin,

and thus only slightly increasing the distance between the center of said elongate pin and said saddle member, thereby only slightly increasing the tilt angle of the motor with respect to the transom of the boat, and resulting in improved performance and improved handling of the boat at selected speeds after the correct sleeve of proper thickness is fitted.

4,682,960

# **TROLLING MOTOR MOUNT**

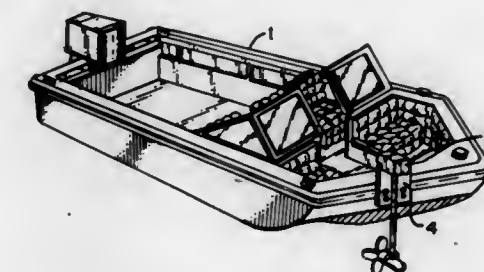
Gregory L. Hendrickson, 607 N. Second St., Mankato, Minn. 56001

Filed Sep. 12, 1985, Ser. No. 775,502

Int. Cl.<sup>4</sup> B63H 5/12

U.S. Cl. 440—53

3 Claims



1. An apparatus for attaching a motor to a boat, comprising: (a) a mounting plate perforated by at least two vertical slots; (b) an external threaded cylinder having a first end and a second end, wherein the interior of the cylinder contains a longitudinal bore having a first diameter adjacent to the first end of the cylinder and having a second diameter adjacent to the second end of the cylinder, the first diameter being smaller than the second diameter such that the transition between the first diameter and the second diameter forms a bearing surface within the cylinder; (c) a cap inserted into the second end of the cylinder such that a cavity is formed within the cylinder between the cap and the bearing surface; (d) a shaft passing through each of the vertical slots of the mounting plate, the shaft being slidably mounted within the cylinder, the shaft having a first end formed as a head and having a second end formed as a thrust block, the thrust block residing within the cavity; (e) a spring mounted within the cavity, such that the spring exerts an expansive force against the thrust block, thereby biasing the head of the shaft toward the cylinder.

4,682,961

# **TILT DEVICE FOR BOAT PROPULSION MACHINE**

Ryoji Nakahama, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

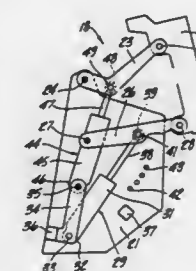
Filed Mar. 22, 1985, Ser. No. 715,165

Claims priority, application Japan, Mar. 26, 1984, 59-56268

Int. Cl.<sup>4</sup> B63H 21/26

U.S. Cl. 440—61

25 Claims



1. A hydraulic tilt and trim arrangement for a marine out-



board drive having a housing carrying propulsion means and a base adapted to be affixed to the transom of an associated watercraft or the like, means supporting said housing from said base for movement of said housing relative to said base from a tilted, trimmed down position through a tilted down, trim up position and to a tilted, trimmed up position, a trim fluid motor having an operative pivotal connection at one end to said base and an operative pivotal connection at its other end to said housing, said trim fluid motor being operable through a stroke of a first length for moving said housing relative to said base from said tilted, trim down position to any of a plurality of tilted down, trim up trim positions, a tilt fluid motor having an operative pivotal connection at one end thereof to said base and an operative pivotal connection at the other end thereof to said housing, said tilt fluid motor being operable through a first stroke portion for applying fluid pressure to said base and said housing for effecting trim pivotal movement of said housing relative to said base, means for pressurizing said trim fluid motor and said tilt cylinder motor for actuating said trim fluid motor and said tilt fluid motor so that said trim fluid motor and said tilt fluid motor act in parallel relation to effect movement of said housing relative to said base through the full range of trim positions, said tilt fluid motor having a total operative stroker greater than said first stroke portion for effecting movement of said housing relative to said base from said tilted down, trimmed up position to said tilted, trimmed up position upon continued movement thereof, and means associated with said trim fluid motor for permitting movement of said housing and said base relative to each other for movement of said housing to said tilted, trimmed up position without restriction from said trim fluid motor.

4,682,962

## METHOD OF MANUFACTURING A CATHODE RAY TUBE

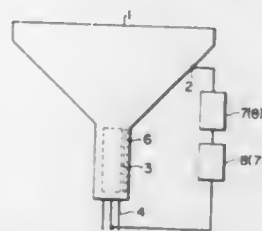
Katsuhiko Hata; Hisao Ohashi; Keiji Honda, and Takahiko Yamakami, all of Aichi, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 657,124, Oct. 3, 1984, abandoned. This application Jul. 24, 1986, Ser. No. 886,958

Claims priority, application Japan, Oct. 7, 1983, 58-188857 Int. Cl.<sup>4</sup> H01J 9/44

U.S. Cl. 445—5

2 Claims



1. A method of performing a knocking treatment to a cathode ray tube having low and high voltage electrodes comprising a first step of applying an alternating voltage between said low and high voltage electrodes and a third step of applying a superimposed voltage comprising a high direct current voltage and an alternating voltage to said low and high voltage electrodes with the positive potential of said superimposed voltage being connected to said high voltage electrodes and wherein said alternating voltage is a half wave rectified voltage, the high value of said superimposed voltage is in the range of 50 to 70 kilovolts and the ratio of the alternating to the direct voltage is in the range of 4:1 to 0.5:1, and a second step of applying a direct current voltage between said low and high voltage electrodes which occurs between said first and third or said third and first step.

4,682,963

## HIGH VOLTAGE PROCESSING OF CRT MOUNTS

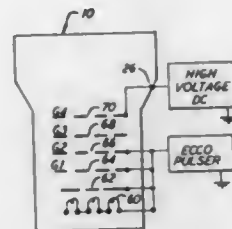
Kenneth J. Daldry; Martin Fischman, and Charles H. Rehkopf, all of Seneca Falls, N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Mar. 20, 1985, Ser. No. 713,939

Int. Cl.<sup>4</sup> H01J 9/00

U.S. Cl. 445—5

9 Claims



1. A method for high voltage conditioning the mount of a cathode ray tube, the mount comprising a plurality of elements including at least one thermionic cathode and associated heater for emitting a stream of electrons, and a series of electrodes for forming and focusing such electrons into a beam, the electrodes including an anode, at least one focusing electrode adjacent to and rearward of the anode, and at least one electrode rearward of and adjacent to the focusing electrode, the method comprising:

impressing a positive high voltage DC potential on the anode, while at the same time impressing a high frequency pulsed AC potential on at least the electrode rearward of the focusing electrode, and allowing the focusing electrode to float electrically, the voltage of the AC potential being less than that of the DC potential by an amount sufficient to induce arcing in the gaps between the anode and the focusing electrode, and between the focusing electrode and the adjacent rearward electrode.

4,682,964

## IONIZATION DETECTOR

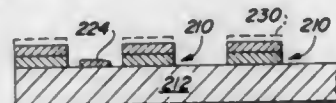
Douglas S. Steele, Fairfield; Francis H. Little, Cincinnati; Joseph J. Sostarich, Fairfield, and Douglas E. Ingram, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 565,671, Dec. 27, 1983, Pat. No. 4,570,071. This application Feb. 25, 1986, Ser. No. 832,980

Int. Cl.<sup>4</sup> G01T 1/18

U.S. Cl. 445—28

2 Claims



1. A method for improving signal response of a linear array radiation detector, the detector comprising an insulative substrate supporting a plurality of elongated closely spaced conductive strips, each of the strips serving as a detector element, the method comprising the steps of:

blowing clean, moisture-free air over the detector elements at a velocity sufficient to dislodge entrapped particles and contaminants; heating the detector elements and insulative substrate to evaporate moisture on the detector; and coating the detector elements and substrate with an electrically neutral moisture resistant material.

4,682,965

## METHOD FOR MANUFACTURING AN ELECTRON BEAM SELECTION ELECTRODE

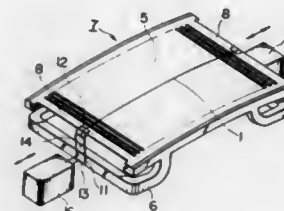
Hisao Kume, Aichi; Tokihiro Nishihara, Chiba, both of Japan; Hiroharu Shirasaka, San Diego, Calif.; Kenichi Kanehira, Tokyo, and Koji Saita, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 678,038

Claims priority, application Japan, Dec. 8, 1983, 58-232064 Int. Cl.<sup>4</sup> H01J 9/16

U.S. Cl. 445—37

6 Claims



1. A method for manufacturing an electron beam selection electrode for a color cathode ray tube, said electrode having a pair of spaced arm members, a plurality of grid elements respectively attached to and extending between said arm members, a pair of spaced end members parallel to said grid elements also extending between said arm members, a pair of support elements respectively disposed below and spaced from each end member, and a damper wire, said method comprising the steps of:

arranging a damper wire of predetermined length between a pair of spaced fixing members with opposite ends of said damper wire extending over a first end of each of said fixing members;

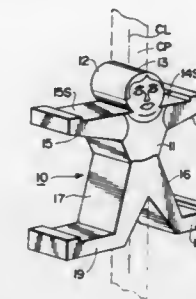
covering each opposite end of said damper wire and each first end of said fixing members with respective thin film tapes;

welding each of said ends of said damper wire and said thin film tapes respectively to said first ends of said fixing elements to provide a damper assembly;

arranging the wire of said damper assembly over said grid elements by engaging a portion of said first ends of said fixing elements respectively with said end members and with a second opposite end of each of said fixing members extending downwardly to one of said support members;

rigidly attaching said second ends of said fixing members respectively to said support elements; and

disengaging the first ends of said fixing elements from said respective end members thereby tensioning said damper wire across said grid elements to suppress mechanical vibration of said grid elements.



4,682,967

## MULTI-PURPOSE BUILDING BLOCK

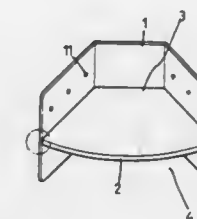
Ching-Ho Kao, Fl. 7-2, No. 11, Yung Fu Road, Tainan, Taiwan

Filed Sep. 13, 1985, Ser. No. 775,743

Int. Cl.<sup>4</sup> H63H 63/06

U.S. Cl. 446—113

3 Claims



1. A multi-purpose building block unit for a building block set wherein each block unit comprises:

(a) a generally vertically extending supporting partition wall defining a pair of opposite distal edges, the supporting partition wall defining a concave shape having an open side and comprising a generally planar base segment and two generally planar side segments extending from opposite sides of the base segment, the side segments forming an angle of 60° to 90° therebetween;

(b) a generally horizontally extending partition plate attached to the supporting partition wall and extending across the concave shape so as to divide the block unit into upper and lower compartments, the partition plate defining a single, continuous edge extending between the distal edges of the supporting partition wall; and

(c) at least one row of holes defined by the supporting partition wall in the upper compartment, the holes adapted to engage fastening means to fasten a plurality of the block units together to form a multiplicity of combinations.

4,682,968

## FIGURE TOY WITH RAPIDLY RETRACTABLE TRAP ELEMENT

Richard Droller, Prospect, and Richard I. Farrington, New Britain, both of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 21, 1986, Ser. No. 832,812

Int. Cl.<sup>4</sup> A63H 3/00

U.S. Cl. 446—268

18 Claims

1. A toy having a manually extensible and retractable element, comprising:

a body with an internal cavity having two spaced passages thereto;

a spool assembly contained within said body cavity and

4,682,966

## BALANCING FIGURE TOY BUILDING BLOCKS

Neil Kagan, 3412 Cypress Dr., Falls Church, Va. 22042

Filed Sep. 19, 1986, Ser. No. 909,330

Int. Cl.<sup>4</sup> A63H 33/00

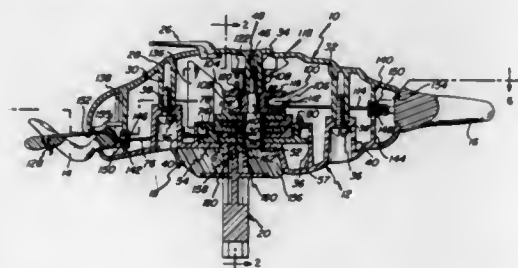
U.S. Cl. 446—101

22 Claims

1. A toy figure block comprising a profile having distinct arms, legs, head and torso portions, said figure having sufficient thickness that it will stand in a variety of orientations on

comprised of a plurality of components including a first, relatively large diameter spool and a second, relatively small diameter spool, said spools being mounted for rotation about a common axis and each having an engagement element thereon, said engagement elements being configured and disposed for operative interengagement in first and second rotatably displaced relationships so as to prevent relative rotation of said spools therebeyond in both directions, and to permit substantially free relative rotation thereof through an arc between the points of interengagement;

- a first flexible line having an inner end portion wound upon said first spool, and having an outer end portion extending through one of said passages outwardly of said body;
- a second flexible line having an inner end portion wound upon said second spool in the direction opposite to the direction of winding of said first line inner end portion, and having an outer end portion extending outwardly of said body through the other of said passages, the effective length of said inner end portion of said second line being lesser than that of said first line; and
- a biasing member operatively connected between said body and said second spool, rotation of said second spool, by



extension of said second line to unwind said inner end portion thereof, energizing said biasing member so as to cause it to exert an opposite rotational force upon said second spool;

whereby, with said engagement elements of said spools operatively interengaged in said first relationship, and with said inner end portion of said first line so wound that unwinding thereof will cause said first spool to rotate in one direction with said elements moving toward said second relationship, said first line can be extended from said body to cause said first spool to rotate in said one direction and relative to said second spool through said arc and into said second relationship of said elements, with said second spool remaining substantially stationary, and whereby said second line can thereafter be extended from said body to rotate said second spool and, through interengagement of said elements, said first spool in the direction opposite to said one direction, to thereby rewind said first line inner end portion upon said first spool, such extension of said second line also energizing said biasing member and conditioning said member to rewind said inner end portion of said second line upon said second spool and to return said second spool to its position in said first and second relationships.

4,682,969

## RECONFIGURABLE VEHICLE-ROBOT TOY

Terrence A. Choy, Redondo Beach, and Harold A. Hartleben, Boyle Heights, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

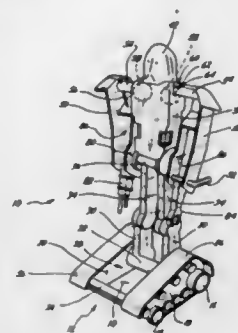
Filed Sep. 27, 1985, Ser. No. 781,607  
Int. Cl.<sup>4</sup> A63H 13/00, 17/21

U.S. Cl. 446-279

12 Claims

1. A toy comprising:
  - a base member having two sides and a bottom forming a compartment;

lower leg members each having one end thereof rotatably coupled to one of said two sides;  
upper leg members each having one end thereof rotatably coupled to the other end of one of said lower leg members, said lower and upper leg members capable of being rotated and moved to a position within said compartment;



- a torso member simulating a robotic humanoid head and trunk rotatably coupled to the other end of each of said upper leg members; and
- side arm means operably coupled to said torso member for selective simulating a pair of arms for said robotic humanoid head and trunk and a front end of a vehicle.

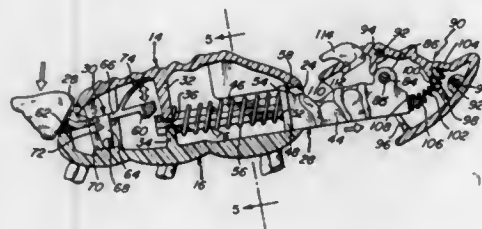
4,682,970

FIGURE TOY WITH EXTENSIBLE HEAD PORTION  
Craig Dubois, Granby, Conn., and Brian Fontaine, Southbridge, Mass., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 6, 1986, Ser. No. 826,845  
Int. Cl.<sup>4</sup> A63H 3/36

U.S. Cl. 446-309

10 Claims



1. A toy figure having an extensible and thrusting head, comprising:
  - a generally hollow body having forward and rearward end portions;
  - a neck member mounted within said body for sliding movement between first and second positions substantially along a first axis between said end portions thereof, said neck member having an outer portion which protrudes from said forward end portion of said body in said first position of said member, and which projects further outwardly in said second position thereof;
  - a head member mounted upon said outer portion of said neck member for pivotal movement about a second axis, which is generally transverse to said first axis, between first and second positions, said head member having a constraining element thereon which contacts said body in said first position of said neck member to constrain said head member to said first position thereof, and which is spaced from said body in said second position of said neck member to free said head member from such constraint;
  - means for biasing said head and neck members toward said respective second positions thereof;
  - latch means for retaining said neck member in said first

position and operable to release said neck member for extension to said second position thereof; and  
means for providing access externally of said body for effecting release of said latch means; whereby, upon release of said latch means said neck member and said head member will be extended and thrust, respectively, from said first to said second positions thereof by said biasing means.

4,682,971

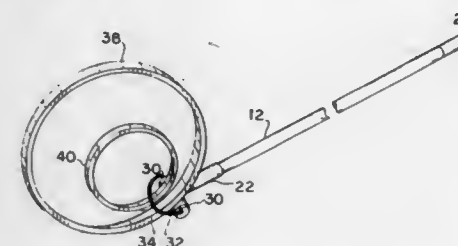
## STICK AND HOOP TOY

Leo Washington, 2612 Grenada Cir. West, St. Petersburg, Fla. 33712

Filed May 27, 1986, Ser. No. 866,930  
Int. Cl.<sup>4</sup> A63H 33/02

U.S. Cl. 446-450

1 Claim



1. A hoop toy of the type including a single handle, plural hoops, and means for preventing the hoops from rolling away from the handle, comprising:

- a single, elongate handle member;
- a single, "D"-shaped hoop-retaining yoke member secured to a distal end of said handle member;
- plural hoop members of differing diameters being positioned within the confines of said yoke member;
- said hoop members being independently formed with respect to each other and thus being substantially nonengageable with each other;
- said yoke member having a straight portion positioned rearwardly of said plural hoop members so that said plural hoop members at any given time will have portions thereof slideably engaged by said straight portion simultaneously when said toy is in operation;
- said yoke member having a curved portion positioned forwardly of said portions of said plural hoop members to retain said hoop members within the confines of said yoke member;
- said plural hoop members being positioned in lateral relation to one another when the toy is in operation;
- and a specific later relationship of the plural hoops with respect to one another being changeable by the operator of the toy by manipulation of said handle member when said hoop members are rolling in a uniform direction.

4,682,972

COVER PLATE FOR UNIVERSAL JOINT ASSEMBLY  
Armin Olschewski, Schweinfurt, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,821

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447275

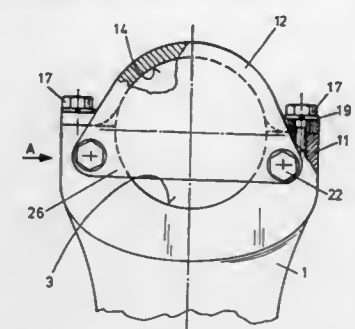
Int. Cl.<sup>4</sup> F16D 3/26, 3/40

U.S. Cl. 464-130

1 Claim

1. In a universal joint assembly consisting of a cross piece (2) having at least one pin (7) supported in a bearing bushing (5), the bearing bushing having a bottom section (6) and an adjacent adjacent sleeve section (4); a fork having a least one fork arm (1) extending therefrom and terminating in an edge section (11), the edge section having a recess (3) machined therein which receives the bearing bushing and support surfaces (13) disposed on opposite sides of the recess; a cover plate (12)

removably attached to the fork arm to support and hold the bearing bushing in the recess, the cover plate comprising a strap (20) having flange sections (15) connected to the support surfaces by means of screw fasteners (17), an elongated mounting section (25) extending across the bottom section of the bearing bushing and having a terminal section (25a) connected



to the fork arm by means of a screw fastener (33), and a pair of leaf spring sections (34) disposed on opposite sides of the mounting section and having a shorter length than the mounting section, the leaf spring sections press elastically inwardly against the bottom section of the bearing bushing with a predetermined pretension in the longitudinal direction.

4,682,973

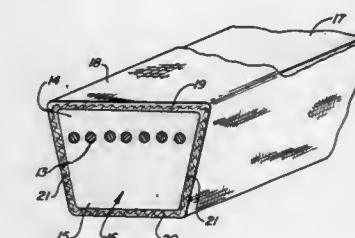
V-BELT FOR HIGH LOAD POWER TRANSMISSION  
Kunihiro Fujita, Nishinomiya, and Hideaki Tanaka, Kobe, both of Japan, assignors to Mitsubishi Belting Ltd., Nagata, Japan

Filed Mar. 21, 1986, Ser. No. 842,152

Int. Cl.<sup>4</sup> B65G 15/34

U.S. Cl. 474-263

13 Claims



1. In a power transmission V-belt for transmitting a high load, said V-belt comprising a belt body having an inner compression section and an outer tension section, and longitudinally extending tensile elements embedded in said V-belt between said sections, the improvement comprising

the portion of said V-belt in which said tensile elements are embedded comprising hard rubber having short reinforcing fibers distributed therein and oriented longitudinally of the V-belt and present in the ratio of less than 5 parts to 100 parts of rubber by weight.

4,682,974

## SLIP CASE PACKAGE

Robert J. Sun, 1409 Ferry St., Easton, Pa. 18042  
Filed May 20, 1985, Ser. No. 735,834

Int. Cl.<sup>4</sup> B31B 1/88

U.S. Cl. 493-55

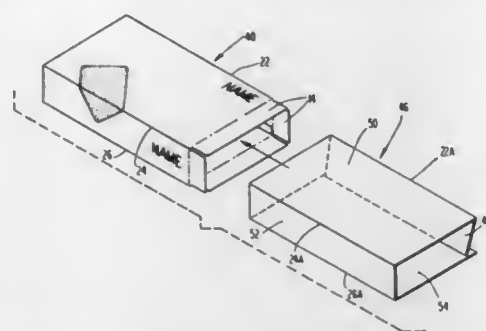
4 Claims

1. A method of making a slip case package for containing small articles, said package including a sleeve member and a drawer being slideably received therein, said method comprising:
  - providing a blank of relatively lightweight cardboard hav-



ing a body portion with a plurality of end flaps projecting therefrom, said blank having graphic designs formed thereon;

forming said blank into a partially assembled sleeve member, said body portion of said blank defining a central cavity in said partially assembled sleeve member, said partially assembled sleeve member having at least one open end with said plurality of end flaps associated with said at least one open end projecting from said open end providing a reinforcing member having the shape of said central cavity and sized to fit within said central cavity;



inserting said reinforcing member within said central cavity through said at least one open end;  
securing said reinforcing member within said central cavity by folding said end flaps into said cavity at said open end over an end of said reinforcing member in order to complete the assembly of said sleeve member;  
providing a drawer dimensioned to fit within said cavity; and  
slideably engaging said drawer within said sleeve member.

4,682,975

# MACHINE AND METHOD FOR SETTING-UP BASKET STYLE ARTICLE CARRIERS

Johannes A. Heijnen, Bergen Op Zoom, Netherlands, assignor to The Mead Corporation, Dayton, Ohio  
Filed Apr. 28, 1986, Ser. No. 856,890  
Claims priority, application United Kingdom, Apr. 27, 1985, 8510755

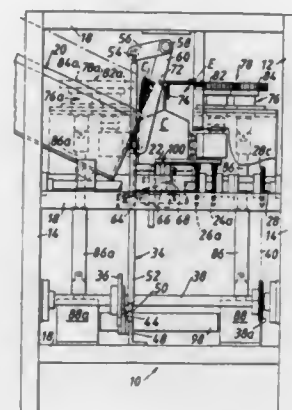
Int. Cl.<sup>4</sup> B31B 1/12, 1/78

U.S. Cl. 493—123

4 Claims

1. A machine for erecting collapsed basket style article carriers of the type having opposed side-and end walls, medial longitudinal partitions and a base panel to be engaged with retaining elements provided adjacent both end walls so as to maintain the carrier in erected condition, which machine comprises means for withdrawing from a supply and depositing the carriers in flat collapsed condition one after the other in a feed path, means for feeding each carrier to an erecting station at which means are provided for moving apart opposing side walls of the carrier to bring it into set-up condition, locking means operable to sequentially move said base panel into engagement with the retaining elements at the trailing and leading end of the carrier, said locking means comprising a main locking arm movable in a direction opposite to the feed direction of the carrier and effective to move the trailing end of said base panel into engagement with the retaining element at the trailing end of the carrier, a secondary locking arm arranged to subsequently move the leading end of said base panel into a position in which it can move into engagement with the retain-

ing element at the leading end of the carrier, said secondary locking arm being mounted for pivotal movement relative to



4,682,976

# APPARATUS FOR MAKING EASY OPEN AND RECLOSABLE BAGS

Andrew McG. Martin, 3 Arlington St., Boston, Mass. 02116;  
Kenneth C. Meyers, West Newton, and Daniel F. Pawling, Newton, both of Mass., assignors to Andrew McG. Martin, Boston, Mass.

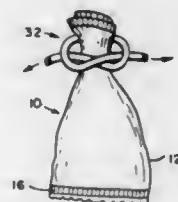
Division of Ser. No. 600,419, Apr. 16, 1984, Pat. No. 4,609,107.

This application May 23, 1986, Ser. No. 846,364

Int. Cl.<sup>4</sup> B31B 1/64

U.S. Cl. 493—206

6 Claims



1. Apparatus for making a series of sealed bags from a tube of flexible material which tube has a longitudinal axis, the improvement comprising

- A. a set of complimentary sealing jaws, said jaws having
- (1) first and second counterfacing corrugated surfaces defining a bag bottom sealing portion, and a bag top sealing portion, respectively, for sealing together the opposite walls of said tube to form the bottom seal of one bag and the top seal of an adjacent bag, said corrugations extending parallel to the tube axis so that the seals including corrugations which extend parallel to said axis,
  - (2) third counterfacing surfaces between said first and second counterfacing surfaces for forming a mold chan-

nel in said tube walls which extends generally perpendicular to said tube axis, and

- (3) means between said third counterfacing surfaces and one of said first and second counterfacing surfaces for forming a series of perforations through said tube walls between one of said seals and said mold channel therein; and

B. means for moving the jaws into contact, with the tube walls extending between them.

4,682,977

# APPARATUS FOR FOLDING SPACED SEGMENTS OF WEB MATERIAL

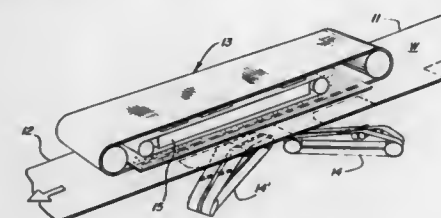
Gerald W. Buxton, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jul. 21, 1986, Ser. No. 887,218

Int. Cl.<sup>4</sup> B05B 1/14

U.S. Cl. 493—358

7 Claims



1. Apparatus for folding spaced segments of flexible web material comprising a relatively elongated frame, means on said frame for advancing a web along a linear path, said web having upper and lower opposite surfaces,

means in said web path for generally transversely cutting said web partway across from a longitudinally extending edge at longitudinally spaced lines to develop foldable flap portions each having a longitudinally extending free edge, a vacuumized continuously moving belt means down stream in said path from said cutting means for selectively gripping said upper surface of said web except for said flap portions,

a frictionalized continuously moving belt system aligned in said path with said vacuumized belt means for engaging said lower surface of said web, said frictionalized belt system being arranged at an angle to said path to progressively fold said flap portions while said web material is advancing in said path and having its speed related to the speed of said advancing means by the secant of said angle, said frictionalized belt system including gripper means for folding each flap portion commencing adjacent said longitudinally extending free edge and generating a line of folding moving progressively inward from said longitudinally extending free edge.

4,682,978

# DUAL LUMEN CANNULA

Geoffrey S. Martin, Mississauga, Canada, assignor to Vas-Cath of Canada Limited, Mississauga, Canada

Filed May 15, 1985, Ser. No. 734,225

Claims priority, application Canada, May 24, 1984, 454986

Int. Cl.<sup>4</sup> A61M 5/00

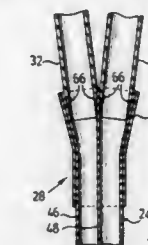
U.S. Cl. 604—43

3 Claims

1. A dual lumen cannula comprising:

a flexible elongate tubular portion consisting of a tubular wall separated by an integral septum into similar extraction and return lumens, the cannula having a generally tapered leading end to facilitate insertion and blood extraction and blood return openings communicating with respective extraction and return lumens in proximity to the leading end, the extraction and return lumens terminating at an other end of the tubular portion at similar conically-shaped inner surfaces, each inner surface adapted to receive ends of respective blood extraction and

blood return tubes, each said end of the tubes having a generally conically shaped outer surface and the walls of each end narrowing towards a tip which has minimal wall



thickness so that the interiors of the respective tubes and lumens form substantially smooth surfaces to minimize blood damage.

4,682,979

# COLON WASHING METHODS AND APPARATUS

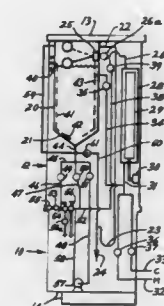
Jimmy J. Girouard, P.O. Box 1401, Groves, Tex. 77619

Filed Jun. 17, 1985, Ser. No. 744,958

Int. Cl.<sup>4</sup> A61M 31/00

U.S. Cl. 604—48

10 Claims



1. Apparatus for use in washing the colon of a person, comprising an elevated tank having a bottom outlet, means for filling said tank with water, said tank having an overflow drain at an upper level, a cross conduit having at one end a flow connection to an implement for delivering water into a person's colon, a solenoid operated shut-off valve and a check valve in series in said cross conduit, a manifold connected to said bottom outlet of said tank and having valve controlled first, second and third branches, said first branch being connected to said cross conduit between said check valve and said solenoid valve to permit flow of water from said tank to said cross conduit in by-pass relation to said solenoid operated valve, said second branch being connected to said cross conduit upstream of said check valve and said solenoid operated valve, and said third branch being connected to the inlet of a pump, the outlet of which is connected to said cross conduit at a point upstream of said check valve and said solenoid operated valve whereby water may be transmitted from said tank to said implement by gravity through said first and second branches or by said pump through said third branch.

4,682,980

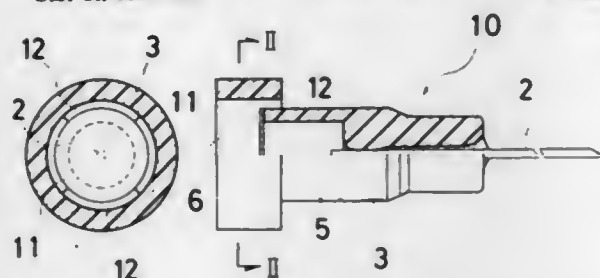
## PUNCTURE NEEDLE ASSEMBLY

Tatsuo Suzuki, Yokohama, Japan, assignor to Terumo Corporation, Tokyo, Japan  
Continuation of Ser. No. 706,906, Mar. 1, 1985, abandoned, which is a division of Ser. No. 409,598, Aug. 19, 1982, abandoned. This application Aug. 8, 1986, Ser. No. 894,724  
Claims priority, application Japan, Aug. 19, 1981, 56-129577;  
Dec. 8, 1981, 56-198235

Int. Cl.<sup>4</sup> A61M 5/00

U.S. Cl. 604—122

9 Claims



1. A method for inserting a puncture needle assembly into a relatively deep blood vessel, said puncture needle assembly comprising a puncture needle having a point and being provided with a through bore, a transparent or translucent puncture needle hub fixed to the end of said puncture needle opposite to said point; and an air vent plug adapted to be detachably connected to said puncture needle hub in a liquid-tight manner; said air vent plug having a pressing surface at the most distal end surface thereof opposite to said puncture needle and adapted to be engaged by a hand of a user for transmitting a puncture force from a hand of a user in the axial direction of said puncture needle via said pressing surface, said pressing surface being ring-like and defining an opening which is open to the atmosphere, and said air vent plug having a side peripheral wall adjacent said pressing surface; said air vent plug including means adapted to form, when it is connected to said puncture needle hub, a passage providing communication between said through bore of said puncture needle and the atmosphere, said passage being opened to the atmosphere through at least one side opening recessed from said pressing surface and opening into the side peripheral wall of said air vent plug, said at least one side opening being sized so as to be left uncovered by any part of the hand of the user when said puncture force is applied by said hand to said pressing surface at said distal end of the air vent plug; and an air-permeable blood-tight member disposed in said passage at the upstream side from said at least one side opening, said through bore of said puncture needle being in communication with the atmosphere through said air-permeable blood-tight member and said at least one side opening in said air vent plug;

said method comprising the steps of:

holding said puncture needle assembly in the hand of a user; putting a portion of the hand of the user on said pressing surface of said air vent plug; thrusting, by the user's hand, the puncture needle assembly via an applied thrusting force on said air vent plug in the

axial direction of said puncture needle assembly to transmit a puncture force from the user's hand to said air vent plug and hence to said puncture needle while leaving open and uncovered said at least one side opening of said air vent plug; and

directing the puncture needle of said puncture needle assembly to puncture the blood vessel responsive to said thrusting by the user.

4,682,981

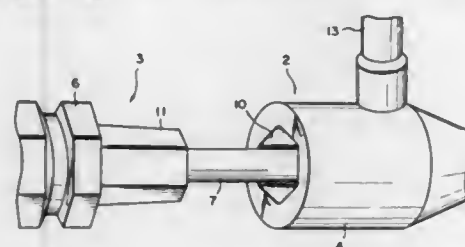
## MEDICAL DEVICE

Tatsuo Suzuki, Machida, and Atsushi Matsumoto, Fuji, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 5, 1985, Ser. No. 762,613

Claims priority, application Japan, Aug. 7, 1984, 59-165452  
Int. Cl.<sup>4</sup> A61M 29/00

U.S. Cl. 604—158

5 Claims



1. A medical device, comprising:

a first elongated hollow cylindrical member;

a first hollow hub member fixed to a proximal end of said first cylindrical member, the interior of said first hub member communicating with the interior of said first cylindrical member;

a second elongated hollow cylindrical member detachably insertable into said first cylindrical member;

a second hollow hub member fixed to a proximal end of said second cylindrical member, the interior of said second hub member communicating with the interior of said second cylindrical member;

first means for preventing relative axial movement of said first and said second cylindrical members, including a first annular rib formed on the outer surface of said second hub member, and a second annular rib formed on the inner surface of said first hub member, said first rib being located to position beyond said second rib to prevent said axial movement when said second cylindrical member is inserted into said first cylindrical member; and

second means for preventing relative circumferential rotation of said first and said second cylindrical members, including a female polygonal prism surface defining the inner surface of said first hub member, and a male polygonal prism surface defining the outer surface of said second hub member, said male prism being fitted into said female prism to prevent said rotation when said second cylindrical member is inserted into said first cylindrical member.

## CHEMICAL

4,682,982

ANTISTATIC N-HIGHER MONO ALKYL AND MONO ALKENYL NEOALKANAMIDES, PROCESSES FOR MANUFACTURING THEREOF, ANTISTATIC COMPOSITIONS CONTAINING SUCH AMIDES, AND PROCESSES FOR DECREASING ACCUMULATIONS OF STATIC CHARGES ON LAUNDRY

Robert J. Steltenkamp, Somerset, and Michael A. Camara, Jackson, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,871

Int. Cl.<sup>4</sup> D06M 13/38; C07C 103/34

U.S. Cl. 8—137

19 Claims

12. A detergent composition comprising a deterative proportion of a synthetic organic detergent and a proportion, which is antistatic characteristic imparting to laundry during washing of N-higher monoalkyl neoalkanamide or N-higher monoalkenyl neoalkanamide or a mixture thereof, wherein the higher alkyl and higher alkenyl or mixture thereof are of numbers of carbon atoms in the range of 8 to 20, and the neoalkano moiety is of 5 to 16 carbon atoms.

4,682,983

TRANSFER SHEET FOR THE THERMAL DRY IMPRESSION OF CELLULOSE FIBERS

Wolfgang Mehl, Geneva, Switzerland, assignor to Sipa Holding S.A., Glarus, Switzerland

Continuation of Ser. No. 598,286, Mar. 7, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 842,592

Claims priority, application Switzerland, Jul. 12, 1982, 4225/82

Int. Cl.<sup>4</sup> B41M 5/02, 3/12; D06P 1/16

U.S. Cl. 08—468

13 Claims

1. A transfer sheet for the heat transfer printing of textile materials which contain cellulosic fibers pre-treated for swelling, said sheets consisting essentially of an inert, flexible substrate having a release coating on at least one surface thereof, said release coating carrying a dyestuff-containing coating or design, wherein the dyestuff-containing coating or design is a mixture containing

(a) a binder containing at least one high molecular, organic, film forming substance having a softening point between 50° and 150° C., said binder selected from the group consisting of naturally occurring resins, maleate resins, phenolic resins, urea resins, polymerized unsaturated hydrocarbons, epoxy resins, polyimide resins and rosin modified resins, and

(b) at least one disperse or vat dyestuff, said dyestuff does not sublimate in conventional heat transfer printing, said dyestuff having an optical absorptivity not exceeding 0.3 when in a boiling, saturated solution in 0.1 molar aqueous sodium carbonate and

(i) that the dyestuff is transferred from a transfer paper normally used in heat transfer printing, at a rate of not more than 40% by weight when said transfer sheet is pressed against the textile material under a contact pressure of 5 kPa and maintained under atmospheric air pressure for 30 seconds at 200° C., the textile material being swollen with water and whose swollen state has been preserved after drying by a polyglycol or a polyglycol derivative, and

(ii) that the dyestuff is transferred at a rate of more than 60% by weight when said transfer sheet is pressed against the textile material under a contact pressure of 50 kPa, and at an atmospheric air pressure of 10 kPa, for 30 seconds at 230° C.

4,682,984

## DIESEL FUEL ADDITIVE

Alan H. Epler, 3303 Rock Springs St., Cheyenne, Wyo. 82001  
Filed Sep. 2, 1983, Ser. No. 529,109

Int. Cl.<sup>4</sup> C01L 1/02

U.S. Cl. 44—56

10 Claims

1. A liquid additive for a liquid fuel, selected from the group

consisting of gasoline, diesel oil, and heating oil consisting essentially of:

(a) kerosene,

(b) an anhydrous aliphatic ether, and

(c) a liquid aromatic hydrocarbon selected from the group consisting of xylene, naphthalene and mixtures thereof, the kerosene, ether and hydrocarbon being present in a respective volumetric ratio of about 9:1:1.

4,682,985

## GASIFICATION OF BLACK LIQUOR

Arthur L. Kohl, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

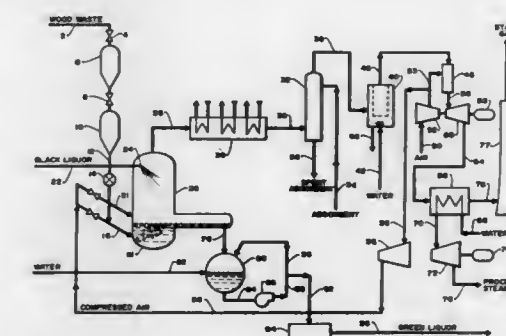
Continuation-in-part of Ser. No. 699,498, Feb. 8, 1985, which is a continuation of Ser. No. 486,274, Apr. 18, 1983, abandoned.

This application Sep. 23, 1985, Ser. No. 779,321

Int. Cl.<sup>4</sup> C10J 3/00

U.S. Cl. 48—197 R

7 Claims



1. A process for treating a concentrated aqueous black liquor carbonaceous material and alkali metal sulfur compounds to form a combustible gas and a sulfide-rich melt comprising:

(a) providing a gasifier vessel maintained at a pressure of from about 1 to 50 atmospheres and containing a relatively shallow molten salt pool at its bottom within a sump equipped with an overflow discharge, said vessel having (i) a black liquor drying zone at its upper parts, (ii) a black liquor solids gasification zone located below the drying zone, and (iii) a molten salt sulfur reduction zone comprising said molten salt pool;

(b) introducing into the top of said drying zone the concentrated aqueous black liquor containing carbonaceous material and alkali metal sulfur compounds;

(c) evaporating water from said concentrated aqueous black liquor in said drying zone by direct contact of said aqueous black liquor with the hot gas rising from the gasification zone to produce dried black liquor solids, which fall into said gasification zone, and a cooled combustible gas container water vapor said combustible gas being at a temperature below the melting point of entrained droplets of the molten salt causing solidification of said droplets;

(d) introducing a first portion of an oxygen-containing gas into the gas space in the gasification zone located below the drying zone immediately above the molten salt pool to partially oxidize and gasify a fraction of the carbonaceous material in said dried black liquor solids falling through said zone to form a hot combustible gas;

(e) introducing a second portion of said oxygen-containing gas beneath the surface of said molten salt pool in an amount sufficient to cause gasification of essentially all carbonaceous material entering the pool from the gasification zone but not sufficient to create oxidizing conditions in the pool, the formed gas rising from said pool, the total amount of said first and second portion of oxygen-containing gas constituting between 25 and 55% of the amount of oxygen-containing gas required for complete combustion



of the black liquor feed and representing the total amount of oxygen-containing gas fed to said gasifier vessel;  
(f) withdrawing said cooled combustible gas having a higher heating value of at least about 90 Btu/scf (dry basis) from an upper portion of said drying zone; and  
(g) withdrawing from said overflow discharge in the molten salt reduction zone a melt in which the sulfur content is predominantly in the form of alkali metal sulfide.

4,682,986

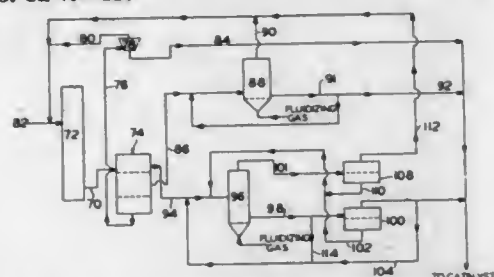
# PROCESS FOR SEPARATING CATALYTIC COAL GASIFICATION CHAR

Wei-Kuo Lee, Bridgewater, N.J., and Hin-Wan Wong, Houston, Tex., assignors to Exxon Research and Engineering, Florham Park, N.J.

Filed Nov. 29, 1984, Ser. No. 866,504  
Int. Cl.<sup>4</sup> C10J 3/00, 3/54

U.S. Cl. 48—210

13 Claims



1. A catalytic coal gasification process including the separation of chars containing soluble catalysts produced by the catalytic coal gasification process comprising the steps of:

- separating the chars by size into three portions, a first char portion having the largest average diameter, a second char portion having the middle average diameter, and a third char portion having the smallest average diameter;
- subjecting the third char portion to a separation to recover a carbon-rich lighter fraction which is recycled to the catalytic coal gasification process and a carbon-lean heavier fraction suitable for treatment in a soluble catalyst recovery process;
- subjecting the second char portion to fluidization with an inert gas to recover a carbon-rich lighter fraction which is recycled to the catalytic coal gasification process and a carbon-lean heavier fraction suitable for treatment in a soluble catalyst recovery process;
- subjecting the first char portion to fluidization in the presence of host solids with an inert gas to recover a carbon-rich lighter fraction containing host solids and a carbon-lean heavier fraction containing host solids;
- separating the carbon-rich lighter fraction made from the first char to produce a carbon rich recycle char which is recycled to the catalytic coal gasification process and host solids; and
- separating at least a portion of the carbon-lean heavier fraction made from the first char to produce solids suitable for treatment in a soluble catalyst recovery process and host solids.

4,682,987

# METHOD AND COMPOSITION FOR PRODUCING HARD SURFACE CARBIDE INSERT TOOLS

William J. Brady, 1767 Wishingwell Dr., Creve Coeur, Mo. 63141, and Harlan U. Anderson, 45 Johnson St., Rolla, Mo. 65401

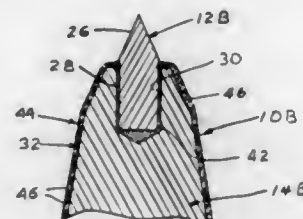
Continuation-in-part of Ser. No. 254,998, Apr. 16, 1981, abandoned. This application Jul. 15, 1985, Ser. No. 755,316  
Int. Cl.<sup>4</sup> B24D 3/00

U.S. Cl. 51—293

40 Claims

1. A heavy duty cutting tool of the type subjected to large

impact forces in performing such cutting functions as trenching, boring, drilling, sawing, plowing, crushing and the like as in industrial mining and like operations, said cutting tool including a tempered steel body and having primary cutting means thereon and a wear surface extending away from said primary cutting means, and a hard surface coating applied to



said primary cutting means and said wear surface, said hard surface coating comprising a metal alloy composition having a high nickel content in the range of 45–75 weight percent and a substantial amount in the range of 5–25 weight percent of a glass-forming fluxing agent, and said coating being fused to said tool body at a temperature in the range of 1830°–1925° F. with a resultant hardness in the range of 55–68 Rockwell C.

4,682,988

# PHENOLIC RESIN BONDED GRINDING WHEELS

Kesh S. Narayanan, Holden, and Gordon E. Hickory, Upton, both of Mass., assignors to Norton Company, Worcester, Mass.

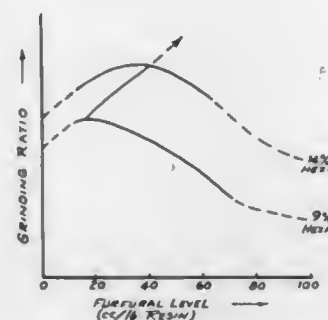
Continuation-in-part of Ser. No. 06/442,547, Nov. 18, 1982, abandoned, which is a continuation of Ser. No. 06/170,383, Jul. 21, 1980, abandoned. This application Oct. 25, 1983, Ser. No. 545,321

Int. Cl.<sup>4</sup> C09K 3/14

U.S. Cl. 51—298

7 Claims

SCHEMATIC DIAGRAM OF GRINDING RATIO VS FURFURAL CONTENT AT VARIOUS MEHA LEVELS



1. A phenolic resin bonded grinding wheel with an improved grinding ratio in which hexamethylenetetramine is the curing agent and furfural is the wetting agent applied, at least in part, to the abrasive grain in the preparation of the wheel mix, said furfural being used in an amount of from 20 to 60 cubic centimeters per pound of resin, the furfural being incorporated in the wheel formulation in an increasing amount as the amount of hexamethylenetetramine curing agent in the resin increases from 12% to 20% by weight, the relationship of

the amounts of furfural to hexamethylenetetramine being approximately  $F=H+35$  where F is the amount of furfural expressed in cubic centimeters per pound of resin and H is the amount of hexamethylenetetramine expressed in weight percent of the powdered resin.

4,682,989

# METHOD OF RECOVERING VOLATILE FOAMING AGENT FROM PREFORMED BEADS OF POLYOLEFIN RESINS

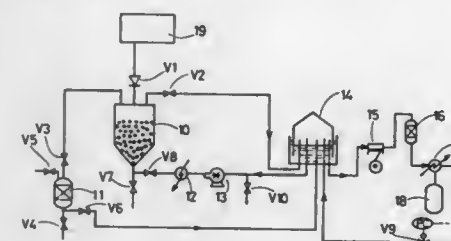
Hirofumi Maeda, Takatsuki, Japan, and Narubiko Akamatsu, Berchem, Belgium, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1985, Ser. No. 789,672

Claims priority, application Japan, Oct. 23, 1984, 59-222524  
Int. Cl.<sup>4</sup> B01D 53/14

U.S. Cl. 55—23

4 Claims



1. A method of recovering a volatile foaming agent from preformed beads of polyolefin resin, which comprises heating polyolefin resin beads containing a volatile foaming agent, thereby obtaining preformed beads; contacting said preformed beads with circulating heated air; causing the volatile foaming agent contained in the preformed beads to escape into the circulating heated air, while suppressing the contraction of the preformed beads, and recovering said volatile foaming agent from said circulating heated air by liquefaction.

4,682,990

# METHOD AND APPARATUS FOR CLEANING WATERY VENTILATING AIR CONTAINING LIQUIDS WHICH HAVE BEEN GASIFIED DURING COOLING OR LUBRICATION OF CONVERTING MACHINES, PARTICULARLY ROLLING MILLS

Per-Olof Kagström, and Lars Abrahamsson, both of Finpång, Sweden, assignors to Gränges Aluminium Aktiebolag, Lidingö, Sweden

PCT No. PCT/SE83/00030, § 371 Date Sep. 28, 1983, § 102(e) Date Sep. 28, 1983, PCT Pub. No. WO83/02569, PCT Pub. Date Aug. 4, 1983

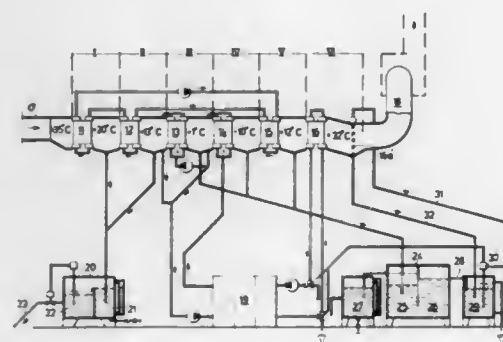
PCT Filed Jan. 28, 1983, Ser. No. 545,385

Claims priority, application Sweden, Jan. 29, 1985, 8200500

Int. Cl.<sup>4</sup> B01D 5/00; F24F 3/14

U.S. Cl. 55—80

11 Claims



1. A method of cleaning humid ventilating air containing

cooling or lubricating liquids which have been gasified during cooling or lubrication of converting machines, particularly rolling mills, comprising: cooling the ventilating air in at least one stage to a temperature below the condensing point of the gasified cooling or lubricating liquids and of the water in the ventilating air so that said gasified liquids and said water contained in the ventilating air condense; collecting the condensed cooling or lubricating liquids and the condensed water; separating at least a substantial portion of the condensed cooling or lubricating liquids from said water; and returning the condensed water mixed with any remaining condensed cooling or lubricating liquids to the cleaned and dried ventilating air produced after said step of cooling to cause same to be absorbed by the ventilating air.

4,682,991

# METHOD AND APPARATUS FOR SCRUBBING FLUE GAS WITH FLOWABLE ABSORBING MATERIAL PURSUANT TO THE AIR FLOW ATOMIZATION PRINCIPLE

Klaus Grethe, and Hubert Steven, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

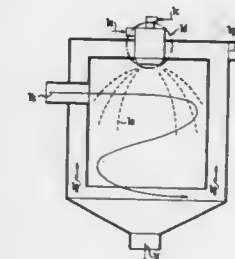
Filed Feb. 7, 1986, Ser. No. 827,787

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504167

Int. Cl.<sup>4</sup> B01D 3/26, 53/18

U.S. Cl. 55—84

19 Claims



1. A method of scrubbing flue gas that is charged with noxious material, with scrubbing being accomplished via flowable absorbing material in a gas-scrubbing unit having an atomizing device with at least one independent nozzle that has an outlet and in which, pursuant to the air flow atomization principle, the absorbing material, as atomizing material, is atomized in parallel flow with a gas, as an atomizing medium, to form a fine droplet stream while at the same time the atomizing material and the atomizing medium are intensively mixed; said method includes the steps of:

- providing each nozzle with edge means having two sides;
- introducing atomizing material into a given nozzle in such a way that said material forms a film on one side of said edge means;
- splitting each atomizing medium stream into two partial streams;
- passing one of said partial streams through a given nozzle in such a way that it passes over said film of atomizing material on one side of said edge means in the direction toward said outlet of said nozzle, so that said film of atomizing material is forced toward said outlet, where said film is atomized, via said edge means, as it passes thereover, to form a fine droplet stream; and
- passing the other of said partial streams through said given nozzle on that side of said edge means remote from said film of atomizing material, and mixing this other partial stream with said fine droplet stream.

13. An apparatus for scrubbing flue gas that is charged with noxious material, with scrubbing being accomplished via flowable absorbing material in a gas-scrubbing unit having an atomizing device with at least one independent nozzle that has an

outlet and in which, pursuant to the air flow atomization principle, the absorbing material, as atomizing material, is atomized in parallel flow with a gas, as an atomizing medium, to form a fine droplet stream while at the same time the atomizing material and the atomizing medium are intensively mixed; each nozzle also has inlet means for said atomizing material and for said atomizing medium; each nozzle further comprises:

edge means ending adjacent said nozzle outlet and having two sides; said nozzle has first opening means, disposed remote from said nozzle outlet, for supplying atomizing material to one of said sides of said edge means; said nozzle has second opening means, also disposed remote from said nozzle outlet, for supplying a first partial stream of atomizing medium to that side of said edge means that is supplied with said atomizing material; said nozzle also has a third opening means for supplying a second partial stream of atomizing medium to the other side of said edge means.

4,682,992

## MICROBICIDAL COATED BEADS

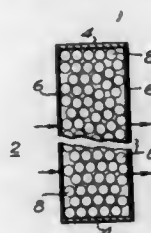
Alfred E. Fuchs, Denville, N.J., assignor to Potters Industries, Inc., Hasbrouck Heights, N.J.

Filed Jan. 25, 1984, Ser. No. 624,350

Int. Cl.<sup>4</sup> B01D 19/00

U.S. Cl. 55—279

20 Claims



1. A composition consisting essentially of discrete and separate minute and inorganic spheroidal particles coated with surface hindered microbicidal agents which microbicidal agents are firmly bound to the surface of the inorganic particles to provide a dry microbicidal coating on each of said particles.

4,682,993

## FLUID FILTER SYSTEM WITH REPLACEABLE FILTER ELEMENT

Christian A. Todd, Denver, and William D. Hart, Louisville, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

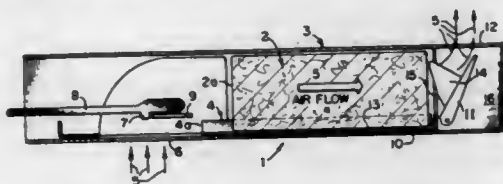
Continuation of Ser. No. 562,386, Dec. 16, 1983, abandoned.

This application May 1, 1985, Ser. No. 729,377

Int. Cl.<sup>4</sup> B01D 46/44

U.S. Cl. 55—314

3 Claims



1. A fluid filter system having a replaceable filter element and comprising:  
a housing plenum having:  
a first interior chamber with an entrance port and an exhaust port located therein; and  
a second interior chamber, in communication with the first chamber through an interconnecting passage, having an exhaust port located therein; and  
means for positioning the filter element in the housing plenum

num in a first position between the entrance port and the exhaust port in said first interior chamber and for moving the filter element to a second position between the entrance port and the interconnecting passage, said means for positioning the filter element having:

means constructed so as to prevent fluid flow through the exhaust port in said first interior chamber, and said system further comprises;

means constructed and arranged so as to be moved by said means for positioning for preventing fluid flow through the interconnecting passage whenever the filter element is not in the second position, said means for preventing fluid flow through the interconnecting passage positioned and arranged so as to be moved to an open position by said means for preventing fluid flow through the exhaust port in said first interior chamber whereby said interconnecting passage is open when the exhaust port in said first interior chamber is closed.

4,682,994

## PROCESS AND APPARATUS FOR FORMING OPTICAL FIBER PREFORM

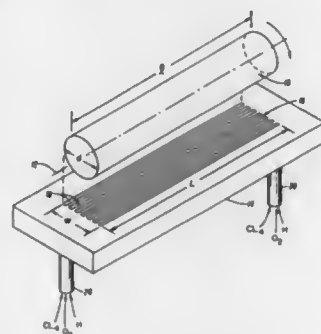
Robert J. Mansfield, Stow, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 16, 1985, Ser. No. 809,018

Int. Cl.<sup>4</sup> C03B 19/06, 37/027

U.S. Cl. 65—3.12

6 Claims



1. A method for fabricating elongated optical fiber preforms, comprising the steps of:

supporting an elongated cylindrical substrate member for rotation about the longitudinal axis thereof, the substrate member having a length dimension and an exterior diameter dimension; and

forming and directing a homogeneous stream of silica precursor gases and a fuel gas towards the exterior of said substrate member, the fuel gas heating the precursor gases to a temperature range sufficient to effect reaction of the precursor gases to form a stream of silica particles, the stream of silica particles having approximately the same width as the exterior diameter of the substrate member and a length many times greater than its width.

4,682,995

## METHOD FOR THE MANUFACTURE OF GLASS BODIES BY EXTRUSION

Rolf Clasen, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1986, Ser. No. 836,925

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511450

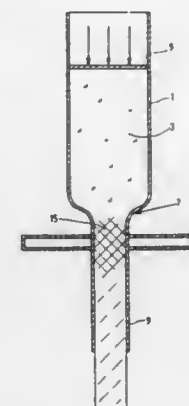
Int. Cl.<sup>4</sup> C03B 37/016

U.S. Cl. 65—18.1

11 Claims

1. A method for the manufacturing of glass bodies, said method comprising:

- forming a thixotropic suspension of silicon dioxide particles in a dispersing liquid;
- converting said thixotropic suspension to a state of minimum viscosity;
- charging an extruding press closed at its outlet with said thixotropic suspension while said suspension is in a state of minimum viscosity;



- heating said suspension, while in said extruding press to a temperature below the boiling point of said dispersing liquid to thereby cause linking of silicon dioxide particles dispersed in said suspension and solidification of said suspension;
- opening said extruding press and extruding a dimensionally stable green body formed of said solidified suspension from said press and
- purifying and sintering said green body.

4,682,996

## PARISON FORMATION IN THE MANUFACTURE OF HOLLOW ARTICLES OF GLASSWARE

Thomas V. Foster, Doncaster; Stanley P. Jones, Tickhill, Nr. Doncaster, both of England, and David L. Alderson, Simsbury, Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

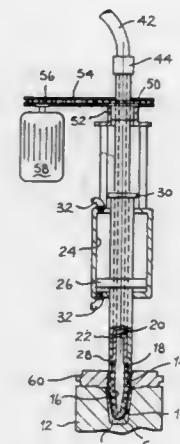
Filed Jan. 23, 1986, Ser. No. 821,636

Claims priority, application United Kingdom, Jan. 26, 1985, 8501991

Int. Cl.<sup>4</sup> C03B 11/06

U.S. Cl. 65—25.1

17 Claims



1. A method of forming parisons in the manufacture of hollow articles of glassware, the method comprising forming each parison by introducing a gob of molten glass into a mould cavity having the shape desired for the external surface of the parison, and moving a plunger into the mould cavity to cause

the molten glass to conform to the shape of the cavity, wherein the method also comprises forming a layer of gas between a surface portion of the plunger and the molten glass so that, as the plunger moves into the cavity, the glass is pushed into shape by the layer of gas, and rotating the plunger while it is in the mould cavity about a longitudinal axis thereof.

8. A plunger arrangement for use in forming parisons in the manufacture of hollow articles of glassware, the arrangement comprising a plunger, moving means for moving the plunger into a mould cavity, forming means for forming a layer of gas between a surface portion of the plunger and molten glass in the mould cavity, and means for rotating the plunger while it is in the mould cavity about a longitudinal axis thereof.

4,682,997

## PROCESS AND APPARATUS FOR BENDING GLASS PLATES IN A HORIZONTAL POSITION

Friedrich Halberschmidt, Herzogenrath; Heinz-Josef Reinhold, Aachen; Norbert Schwarzenberg, Herzogenrath, all of Fed. Rep. of Germany; Herbert Radermacher, Faeren, Belgium; Kurt Blank; Josef Audi, both of Aachen, Fed. Rep. of Germany, and Luc Vanaschen, Eupen, Belgium, assignors to Saint Gobain Vitrage, Courbevoie, France

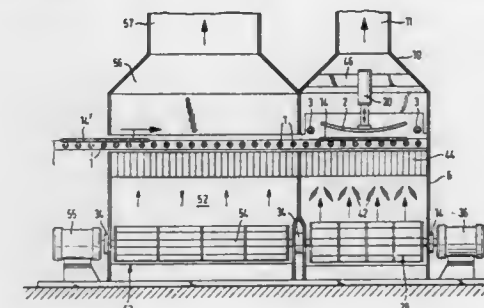
Filed Jul. 10, 1985, Ser. No. 753,501

Claims priority, application France, Jul. 13, 1984, 84 11148

Int. Cl.<sup>4</sup> C03B 23/02

U.S. Cl. 65—106

23 Claims



1. A process for bending plates of a thermoplastic material such as glass or the like into a desired shape in a substantially horizontal position, wherein a substantially horizontal conveyor carries the plates from a reheating furnace into a bending station where the plates are lifted by a hot upward gas current and applied against an upper surface above the conveyor, and then lowered onto a carrier below the upper surface which carries the plates to a cooling station, comprising the steps of curving the upper surface to have the configuration into which the plates are to be bent,

adjusting volume of flow and pressure of the hot upward gas current to a high level to apply plates against the upper surface so as to bend them, and after said bending, reducing the flow and pressure of the gas current to a lower level to lower the plates and place them on the carrier, said gas current still supporting a substantial part of the weight of the plates while the plates are on the carrier.

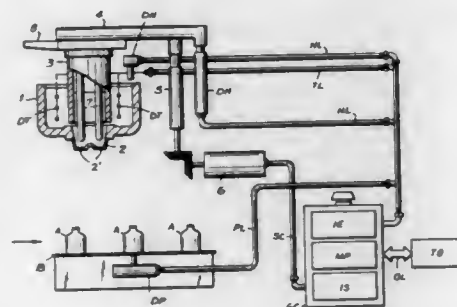
11. Apparatus for bending a plate of a thermoplastic material such as glass or the like in a one step operation into a final shape while in a substantially horizontal position, comprising a bending station, conveyor means in substantially horizontal disposition extending into the bending station, said conveyor means adapted to support said plate for movement to said bending station, carriage means movable into said bending station for receiving said plate after it is bent to said final shape, and movable out of said bending station with said plate, a bending surface mounted in the bending station above and



facing the conveyor means, said surface having a curvature to determine the final shape of the plate to be bent, means for moving said bending surface in opposite directions toward and away from said conveyor means, blower means comprising at least a first cross flow blower mounted in the bending station below the conveyor means and plate in the bending station for delivering an upward gas current to lift the plate from said conveyor means and apply it against said surface, said blower means providing sufficient gas lifting pressure in application of said plate against said surface whereby the upward gas current acts against the plate to bend the plate to the desired, final shape, and evacuation means in said bending station above the conveyor means for receiving and evacuating gases blown from said blower means from said bending station.

**4,682,998**  
ELECTRONIC SYSTEM FOR AUTOMATICALLY CONTROLLING THE WEIGHT OF GLASS GOBS IN A MOLTEN GLASS FEEDER  
Ignacio L. Ayala-Ortiz, Garza Garcia, Mexico, assignor to Vitro Tec Fidelcomiso, Monterrey, Mexico  
Filed Sep. 9, 1986, Ser. No. 905,710  
Claims priority, application Mexico, Sep. 9, 1985, 206561  
Int. Cl.<sup>4</sup> C03B 7/08

U.S. Cl. 65—164



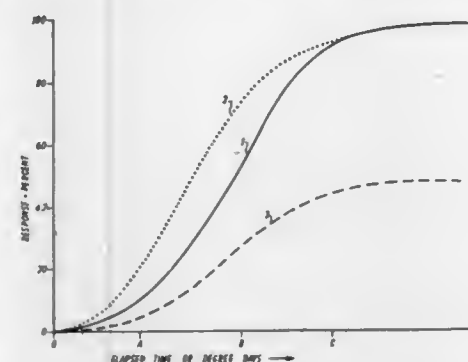
1. An electronic system for automatically controlling the weight of the glass gobs in a molten glass feeder of the type which includes, a feeder bowl which has feeder orifice; a rotating tube in the feeder bowl, aligned with the orifice and mounted on a mechanism that controls its rotation and height with respect to the orifice, in order to homogenize the glass in the feeder bowl and regulate the passage of the glass toward the orifice; at least a reciprocating plunger in the tube which is aligned with the orifice and mounted on a reciprocating mechanism which imparts and controls its reciprocating movement in order to push out a predetermined amount of glass toward the orifice; and at least a pair of reciprocating blades placed facing each other underneath the orifice and mounted on a reciprocating mechanism for cutting the glass gobs off the glass flow that comes out from the orificen and wherein the system comprising: a weight detector, a tube position detector coupled to said tube, and a temperature detector and a glass level detector placed at the feeder bowl, all of which provide representative signals of the weight of the finished articles, of the height of the tube with respect to the orifice, of the glass temperature and of the level of the glass in the feeder bowl; a data processor which receives and processes the signals of the detectors in order to compare the weight of the finished articles with the predetermined weight for the same and relate the weight deviations with the temperature, the glass level and the height of the tube, so as to provide height compensation signals to the tube mechanism in order to permit the adequate passage of the glass toward the orifice in order to obtain the predetermined weight for the articles; and an operator panel interconnected with the data processor in order to provide and obtain the information from the same.

**4,682,999**  
METHODS FOR ENHANCING THE PRODUCTIVITY OF PLANTS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.  
Continuation-in-part of Ser. No. 793,699, Oct. 31, 1985. This application Dec. 11, 1985, Ser. No. 808,018  
Int. Cl.<sup>4</sup> C05C 9/00

U.S. Cl. 71—28

54 Claims



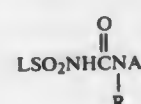
1. A method for enhancing a selected physiological response of plants other than beets and sugarbeets which comprises contacting the foliage of said plants during about the first half of the grand response period for said physiological response with a solution comprising dissolved biuret in an amount and under conditions sufficient to introduce into said plant a non-phytotoxic amount of biuret sufficient to enhance said selected response.

**4,683,000**  
HERBICIDAL SULFONAMIDES  
W. Christian Petersen, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Filed Dec. 22, 1983, Ser. No. 564,379  
Int. Cl.<sup>4</sup> C07D 403/12; A01K 47/36

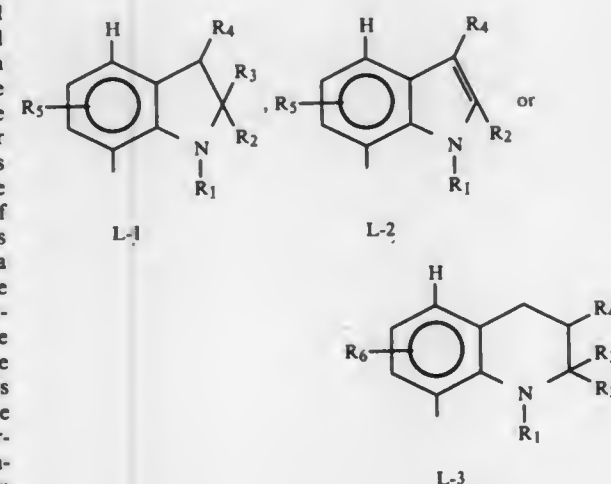
U.S. Cl. 71—92

16 Claims

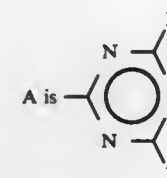
1. A compound having the formula:



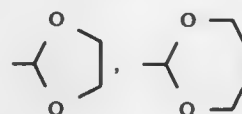
wherein



R is H or CH<sub>3</sub>;  
R<sub>1</sub> is H, C<sub>1</sub>-C<sub>3</sub> alkyl or C<sub>3</sub> alkenyl;  
R<sub>2</sub> is H, C<sub>1</sub>-C<sub>3</sub> alkyl, CO<sub>2</sub>R<sub>7</sub> or CON(CH<sub>3</sub>)<sub>2</sub>;  
R<sub>3</sub> is H or CH<sub>3</sub>;  
R<sub>4</sub> is H or CH<sub>3</sub>;  
R<sub>5</sub> is H, CH<sub>3</sub>, CH<sub>2</sub>CH<sub>3</sub>, F, Cl, Br, OCH<sub>3</sub>, OCF<sub>2</sub>H, SCH<sub>3</sub>, SCF<sub>2</sub>H or CF<sub>3</sub>;  
R<sub>7</sub> is CH<sub>3</sub> or CH<sub>2</sub>CH<sub>3</sub>;



X is Cl, Br, C<sub>1</sub>-C<sub>2</sub> alkyl, C<sub>1</sub>-C<sub>2</sub> alkoxy, OCF<sub>2</sub>H or CF<sub>3</sub>;  
Y is H, NH<sub>2</sub>, NHCH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub>, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkyl substituted with 1-3 atoms of (a), F, (b) Cl or (c) Br, CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>OC<sub>2</sub>H<sub>5</sub>, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>2</sub> alkylthio, C<sub>3</sub>-C<sub>4</sub> alkenyloxy, C<sub>3</sub>-C<sub>4</sub> alkynyloxy, OCH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, OCH<sub>2</sub>CH<sub>2</sub>F, OCH<sub>2</sub>CH<sub>2</sub>Cl, OCH<sub>2</sub>CH<sub>2</sub>Br, OCH<sub>2</sub>CF<sub>3</sub>, CH(OCH<sub>3</sub>)<sub>2</sub>, CH(OC<sub>2</sub>H<sub>5</sub>)<sub>2</sub>,



or OCF<sub>2</sub>H;  
Z is CH;  
provided that  
(1) when R<sub>3</sub> is CH<sub>3</sub>, then R<sub>2</sub> is H or CH<sub>3</sub>;  
(2) when R<sub>4</sub> is CH<sub>3</sub>, then R<sub>2</sub> is other than H; and  
(3) when X is Cl or Br, then Y is NH<sub>2</sub>, NHCH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub>, CH<sub>3</sub>, OCH<sub>3</sub> or OCF<sub>2</sub>H.

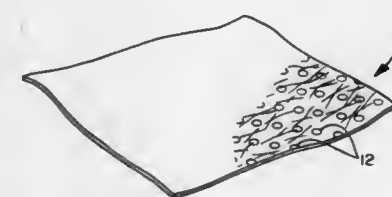
**4,683,001**  
ONE STEP DRY-AND-SHINE POLISHING CLOTH  
David T. Floyd; Garry L. Shanklin, both of Outagamie County; Gordon E. Lynch, Winnebago County, and Gary H. Meltner, Winneconne, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 23, 1985, Ser. No. 768,905

Int. Cl.<sup>4</sup> C09G 1/00

U.S. Cl. 106—3

27 Claims



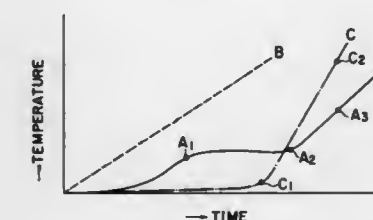
1. A drying and polishing wipe that simultaneously dries and polishes a wet surface comprising an absorbent cloth partially filled in discontinuous areas with a polishing composition comprising a mixture of saponified and nonsaponified waxes, silicone oil and detergent or soap wherein said cloth having discontinuous areas of polishing composition will provide a hydrophobic covering in said discontinuous areas thereby causing said wipe to not absorb water in said discontinuous areas but said wipe will absorb water in areas other than said discontinuous areas.

**4,683,002**  
LIQUID COMPOSITION AND METHOD FOR RECORDING  
Konoe Mirua; Hiroshi Takimoto, both of Yokohama; Toshio Kaneko, Machida; Tokuya Ohta, Yokohama; Masatsune Kobayashi, Yokohama, and Tsuyoshi Eida, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Nov. 6, 1985, Ser. No. 795,416  
Claims priority, application Japan, Nov. 8, 1984, 59-234204  
Int. Cl.<sup>4</sup> C09D 11/00; G01D 9/00, 15/18

A-1 U.S. Cl. 106—20 17 Claims  
1. A liquid composition comprising a water-soluble dye, wherein said composition has a total concentration of iron and silicon at 9 ppm or less.

**4,683,003**  
PROCESS FOR PRODUCTION OF CELLULAR CONCRETE  
Sota Nakano, Tokyo, and Masaaki Ozawa, Niiza, both of Japan, assignors to Misawa Home Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 15, 1985, Ser. No. 723,253  
Claims priority, application Japan, Jul. 30, 1984, 59-159958  
Int. Cl.<sup>4</sup> C04B 7/02

U.S. Cl. 106—86 9 Claims



1. In a process for production of cellular concrete which comprises: mixing a first aqueous slurry of a cement compound comprising calcium silicate as a main hydraulic mineral component, a second aqueous slurry of a rapid-hardening cement compound comprising calcium aluminate as a main hydraulic mineral component, and an aqueous foamed liquid to prepare a foamed slurry of a rapid-hardening cement compound; molding said foamed slurry; and then subjecting the resulting molded article to high-temperature and high pressure hydrothermal curing, the improvement wherein a first cement-setting retarder consisting essentially of an alkali metal salt of a hydroxycarboxylic acid is dissolved in said first aqueous slurry, and a second cement-setting retarder consisting essentially of a combination of a hydroxycarboxylic acid or an alkali metal salt thereof with an alkali metal salt of an inorganic weak acid is dissolved in said second aqueous slurry to provide successively an initial setting period, an exotherm-dwell period in which the setting of said foamed slurry of said rapid-hardening cement compound is substantially stopped and a subsequent setting period.

**4,683,004**  
FOAMABLE COMPOSITIONS AND PROCESSES FOR USE THEREOF

Errol D. Goddard, Haworth, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 20, 1985, Ser. No. 767,813

Int. Cl.<sup>4</sup> A61K 7/02, 7/06; C08L 1/26

U.S. Cl. 106—170 38 Claims

1. A foamable composition comprising water; foam stabilizer consisting essentially of a non-ionic cellulose ether having a sufficient degree of non-ionic substitution selected from the class consisting of methyl, hydroxyethyl and hydroxypropyl to cause the ether to be water-soluble, the cellulose ether being further substituted with a long chain alkyl radical having 10 to 24 carbon atoms in an amount between about 0.2 weight percent and the amount which renders the cellulose ether less than

1% by weight soluble in water; and means for providing gas in the composition for foam generation therein.

4,683,005

# ROAD ASPHALT COMPOSITIONS CONTAINING HYDROCRACKED PITCH

Marc-André Poirier, Sarnia, Canada, assignor to Mines and Resources Canada, Ottawa and Petro Canada Inc., Calgary, both of, Canada

Continuation-in-part of Ser. No. 664,398, Oct. 19, 1984, abandoned. This application Apr. 8, 1986, Ser. No. 849,411

Int. Cl.<sup>4</sup> C08L 95/00

U.S. Cl. 106—273 R

4 Claims

1. A paving grade asphalt composition having an ASTM penetration value of at least 85 at 25° C. and a solubility in trichloroethylene of at least 99.0% comprising a blend of:

(a) a petroleum pitch having a boiling point above 524° C. obtained as a residue in the hydrocracking of hydrocarbon oils to a pitch conversion of at least 80% and containing up to 10% by weight saturates, about 10–30% by weight aromatics, about 15–30% by weight resins and about 30–55% by weight asphaltenes and

(b) as a diluent therefor an unprocessed distillation residue having a minimum initial boiling point of 370° C. obtained from a bitumen from tar sands, or heavy oils, the pitch being present in the composition in an amount of at least 25% by weight of the total composition.

4,683,006

# BUILDING MATERIALS

Bryan J. Walker, Bedford, England, assignor to 501 Granulite Limited, Oxfordshire, England

PCT No. PCT/GB85/00158, § 371 Date Feb. 12, 1986, § 102(e) Date Feb. 12, 1986, PCT Pub. No. WO85/04649, PCT Pub. Date Oct. 24, 1985

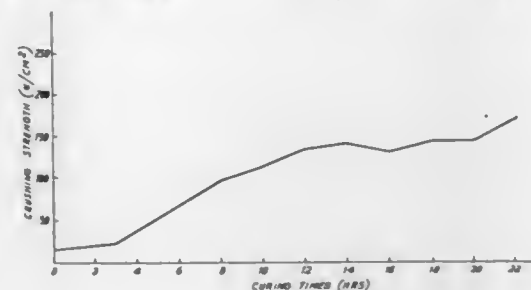
PCT Filed Apr. 11, 1985, Ser. No. 817,744

Claims priority, application United Kingdom, Apr. 12, 1984, 8409468

Int. Cl.<sup>4</sup> C04B 14/00

U.S. Cl. 106—288 R

10 Claims



1. A building material in pellet form, the material being formed from pulverized fly ash and not more than 5% by weight of added lime (calculated as CaO), the pellets being internally bonded by a pozzolanic bond comprising mechanical bonds formed by crystallites of ettringite and amorphous calcium silicate, calcium aluminate or calcium aluminosilicate or mixtures thereof.

# TITANIUM DIOXIDE DISPERSIONS AND PROCESSES FOR THEIR PRODUCTION

Carl Horowitz, Brooklyn; John M. Ryan, Woodhaven; Mohan L. Sanduja, Flushlag, all of N.Y.; Kenneth K. Sugathan, Piscataway, N.J., and Paulose P. Thottathil, Brooklyn, N.Y., assignors to Forsythe Cosmetic Group, Ltd., Lawrence, N.Y.

Continuation of Ser. No. 581,653, Feb. 21, 1984, abandoned.

This application Jun. 25, 1985, Ser. No. 748,692

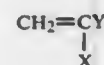
Int. Cl.<sup>4</sup> C09C 1/36

U.S. Cl. 106—308 M

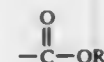
14 Claims

1. A stable dispersion comprising:

(1) titanium dioxide; and (2) nitrocellulose grafted directly to a polymer or copolymer consisting of monomers of the formula

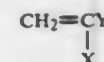


wherein Y is CH<sub>3</sub> or H and X is

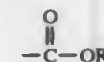


or —OR, and R is alkyl, allyl or phenyl.

2. A process for preparing a stable dispersion for use as a lacquer, which comprises: (1) preparing a dispersion of nitrocellulose; (2) contacting the dispersion with one or more of the monomers selected from the group consisting of

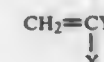


wherein Y is CH<sub>3</sub> or H and X is

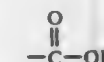


or —OR, and R is alkyl, allyl or phenyl; (3) initiating graft polymerization of the monomer directly onto the nitrocellulose through a free hydroxyl group of the nitrocellulose; and (4) adding titanium dioxide to the resulting dispersion.

3. A process for preparing a stable dispersion for use as a lacquer, which comprises: (1) preparing a dispersion of nitrocellulose and titanium dioxide; (2) contacting the dispersion with one or more of the monomers selected from the group consisting of



wherein Y is CH<sub>3</sub> or H and X is



or —OR, and R is alkyl, allyl or phenyl; and (3) initiating graft polymerization of the monomer directly onto the nitrocellulose through a free hydroxyl group of the nitrocellulose.

4,683,008

# METHOD FOR CLEANING HARD SURFACES

James F. Betts, Akron, Ohio, assignor to Sparkle Wash, Inc., Bedford Heights, Ohio

Filed Jul. 12, 1985, Ser. No. 754,860

Int. Cl.<sup>4</sup> B08B 3/02, 3/08; C11D 3/075

U.S. Cl. 134—27

8 Claims

1. A method of cleaning substrates which comprises treating the substrate with an acidic aqueous solution having a pH below about 6.5 comprising at least amphoteric or nonionic detergent, and subsequently washing said treated substrate with an alkaline detergent comprising an aqueous solution of from about 10 to 50 parts by weight of an alkoxylated nonionic surfactant, about 10 to 90 parts by weight of an anionic detergent having at least 12 carbon atoms per molecule selected from the group consisting of sulfonates and sulfates, about 5 to 90 parts by weight of a metal salt of a lower molecular weight polycarboxylic acid, about 1 to 30 parts by weight of a water-soluble tertiary amine oxide and an effective amount of at least one alkaline metal hydroxide to maintain the aqueous solution at a pH greater than 7.5.

4,683,009

# BOTTLE DRYING APPARATUS

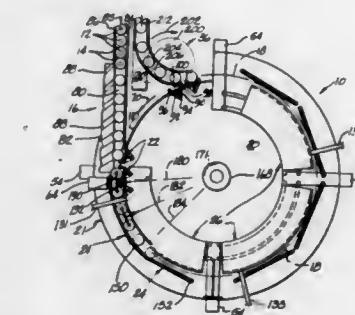
Frank L. Shriver, Lakewood, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Apr. 1, 1985, Ser. No. 718,213

Int. Cl.<sup>4</sup> B08B 3/04

U.S. Cl. 134—30

23 Claims



18. An apparatus for high speed production drying of polystyrene bottles, interior surfaces or the like having a generally cylindrical configuration with a tapering upper shoulder portion, and a neck portion defining a central bottle the apparatus comprising:

(a) a plurality of cylindrical sleeves having a diameter slightly greater than the maximum diameter of the bottles to be dried and having a height approximately equal to the shoulder height of the bottles, said cylindrical sleeves each having a base surface for supporting a bottom surface of a bottle thereon, an open upper end enabling insertion of a bottle into said sleeve in approximately coaxial relationship therewith, an inner centering and shock absorber means for centrally positioning and holding the bottle within said cylindrical sleeve and absorbing shocks and an opening in a lower portion thereof to facilitate removal of heating water therefrom;

(b) generally horizontally disposed sleeve infeed means for feeding said plurality of sleeve means and a plurality of bottles mounted in upright relationship therein into a drying path conveyor, said sleeve infeed means including a horizontal feed track and a horizontally disposed screw positioned parallel to said feed track, said screw having a spiral groove with a surface adapted to engage exterior surfaces of said sleeve means for producing spaced apart horizontal displacement of said sleeve means along said horizontal feed track;

(c) horizontally disposed drying table means rotatable about a central vertical axis for receiving said sleeve means in spaced apart relationship from said infeed means and for

conveying said sleeve means and associated bottles through a drying path;

(d) horizontally disposed takeoff means for sequentially removing said sleeve means and associated bottles from said drying table means, said takeoff means comprising a horizontally disposed rotatable takeoff table positioned adjacent said drying table means and rotatable at a speed whereby the tangential peripheral speed of said drying table means is approximately equal to the tangential peripheral speed of said takeoff table;

(e) a plurality of circumferentially, equally spaced apart bracket means fixedly mounted on an outer peripheral portion of said rotatable drying table means and adapted to receive said sleeve means from said sleeve infeed means, said bracket means having at least two arm portions defining a radially outwardly opening enclosure and having rollers disposed thereon for allowing relative rotational movement of said sleeve means within said bracket means;

(f) resilient band means positioned proximate the periphery of said drying table means in generally tangential relationship therewith in frictionally contacting relationship with said sleeve means, said drying table mean being rotatable relative said band means whereby said sleeve means are rotatable within said bracket mean by said frictional contact with said band means;

(g) weir means for dispensing a uniform flow of heated water from an arcuate lip portion thereof positioned above said drying wheel, said lip portion being disposed such that said heated water flow is directed onto the shoulder portion of bottles positioned in said sleeve means at a position thereon outwardly of the bottle openings whereby said heated water heats the bottle without entering the bottle openings;

(h) drain channel means disposed below said table means beneath said bracket means for draining water flowing from said weir means;

(i) a plurality of air jet directing means fixedly mounted on said drying table means and operatively associated with said bracket means for directing a drying airflow into a bottle positioned in a sleeve engaged by said bracket means;

(j) manifold means fixedly mounted at a central position on said drying table means and connected in fluid communication with said air jet directing means for providing uniform pressure airflow to said air jet means; said manifold means being operatively attached to a heated, pressurized air source by an air duct and rotating seal;

(k) drive means for driving said infeed screw, said drying table means and said takeoff table in operatively synchronized relationship.

4,683,010

# COMPACTED WIRE SEAL AND METHOD OF FORMING SAME

Hans J. Hartmann, Woonsocket, R.I., assignor to ACS Industries, Inc., Woonsocket, R.I.

Filed Oct. 1, 1985, Ser. No. 782,499

Int. Cl.<sup>4</sup> C23C 8/14

U.S. Cl. 148—6.35

8 Claims

1. A method of forming a compacted wire ring seal comprising:

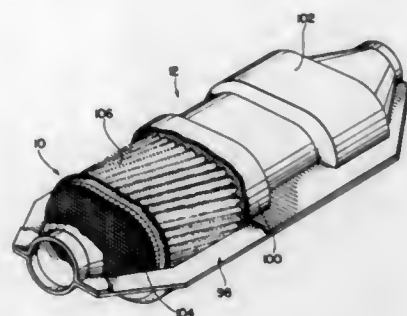
a. knitting a metal wire to form a tubular sock of a predetermined dimension;

b. rolling said sock on itself to form a knitted-wire ring;

c. heating said knitted-wire ring in an atmosphere containing oxygen to anneal the wire therein and to form metal oxides on the surfaces of said wire, said oxides comprising at



least approximately  $0.025 \text{ m}^3$  of oxide per  $\text{cm}^2$  of wire surface; and



d. compressing said knitted-wire ring to form a compacted wire-ring seal comprising at least approximately 45% by volume of wire and oxide.

4,683,011

# HIGH PENETRATION, HIGH SPEED, AGGLOMERATED WELDING FLUX

Robert J. Weaver, Mentor; Ronald F. Young, Willoughby, and Dennis D. Crockett, Mentor, all of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed Aug. 28, 1986, Ser. No. 901,136

Int. Cl.<sup>4</sup> B23K 35/34

U.S. Cl. 148—26

4 Claims

1. An agglomerated flux for electric arc welding comprised of fluorides selected from the group of calcium, sodium, potassium, barium, aluminum, magnesium, strontium and lithium and oxides selected from the group of aluminum, magnesium, silicon, strontium, titanium, calcium, zirconium, manganese and potassium wherein calcium oxide is present in amounts of from 11% to 25% and titanium dioxide is present in amounts of from 18% to 30% expressed as a percent of the total weight.

4,683,012

# MAGNETIC THIN FILM

Kazushi Yamauchi; Muneyuki Ogata; Tomio Kobayashi; Makoto Kabota, and Tatsuo Kumura, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,342

Claims priority, application Japan, Apr. 18, 1984, 59-76434

Int. Cl.<sup>4</sup> C04B 35/00

U.S. Cl. 148—301

21 Claims



1. A magnetic thin film formed by physical vapor deposition and having a composition represented by the following formula:



wherein a, b, c and d each represents a weight percent of the respective elements and satisfies the following relations of

$$70 \leq a < 95$$

$$2 \leq b \leq 10$$

$$4 \leq c \leq 15$$

$$0.2 \leq d \leq 4$$

$$a + b + c + d = 100,$$

said film having a thickness more than 10 Å and less than 100 microns.

4,683,013

# METHOD FOR PRODUCING A SHADOW MASK FOR A COLOR CATHODE RAY TUBE

Kenzaburo Iijima, and Yoshihori Hayashi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Nov. 12, 1985, Ser. No. 796,917

Claims priority, application Japan, Nov. 24, 1984, 59-248461

Int. Cl.<sup>4</sup> H01F 1/02

U.S. Cl. 148—102

3 Claims

1. A method for producing a shadow mask for a colour cathode ray tube, comprising the steps of:

forming a plate from a spinodal decomposition type magnet alloy which contains 5 to 15 wt% of Co, 20 to 35 wt% of Cr and Fe in balance;

subjecting said plate to solution treatment;

subjecting said plate to a primary aging which is at a maximum temperature of  $660^\circ \text{C} \pm 5^\circ \text{C}$ . and brought to termination at a cooling speed of  $80^\circ \text{C} \pm 10^\circ \text{C}/\text{Hr}$ ;

subjecting said plate to a secondary aging which is at a temperature of  $635^\circ \text{C} \pm 5^\circ \text{C}$ , brought to termination at a cooling speed of  $8^\circ \text{C}$  to  $20^\circ \text{C}/\text{Hr}$  and terminated at a temperature of  $560^\circ \text{C} \pm 10^\circ \text{C}$ ; and thereafter

shaping said plate into a curved configuration of said shadow mask and forming an aperture therethrough for passage of an electron beam.

4,683,014

# MECHANICAL STRESS IMPROVEMENT PROCESS

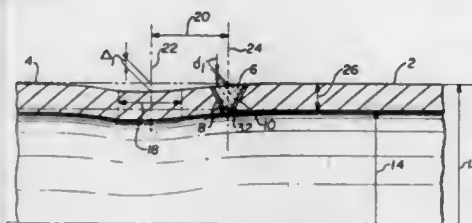
Jan S. Porowski, Pittsburgh; William J. O'Donnell, Bethel Park; Manu L. Badlani, Pittsburgh, and Edward J. Hampton, Murrysville, all of Pa., assignors to O'Donnell & Associates, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1986, Ser. No. 845,863

Int. Cl.<sup>4</sup> C21D 7/02

U.S. Cl. 148—131

15 Claims



1. A process for removing the residual tensile welding stresses in the inner layer of the weld metal and the heat-affected zone of steel piping elements that have been butt-welded to each other end-to-end by means of a circumferential compressive stresses in said piping elements by applying a radial load inwardly on a section of at least one said piping elements away from said weld such that the distance from the

midplane of said section of said piping element upon which said radial load is applied to the weld midplane is equal to about two to about 12 times the thickness of said piping element upon which said radial load is applied, the distance from the edge of said section of said piping element upon which said radial load is applied that is adjacent said weld to the weld midplane being at least equal to about one-half the wall thickness of said piping element upon which said load is applied, the amount of said radial load being applied being sufficient to permanently reduce the outside diameter at the midplane of said section of said piping element in the range of about 0.2 to about 2.0 percent, the percent of permanent contraction of said steel piping at the midplane of said section upon which said radial load is applied being greater than the permanent contraction of said steel piping at the weld, midplane, said inner layer at the weld location assuming a concave configuration as a result of said application of said radial load.

4,683,015

# METHOD OF FORMING FLEXIBLE FASTENER ELEMENTS AND SECURING THEM TO A TRAVELING WEB

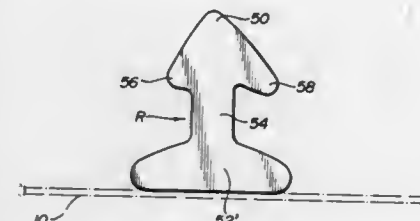
Kevin J. Wagers, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 9, 1985, Ser. No. 753,100

Int. Cl.<sup>4</sup> B29D 5/00

U.S. Cl. 156—66

11 Claims



1. A method of forming a ribbed plastic fastener element for use on a reclosable plastic container comprising the steps of melt processing a thermoplastic resin to form a flowable molten plastic resin and extruding said molten plastic resin from a die to form a rib element, said rib element upon exiting from said die having a tip and a concave tail, said tip and tail being connected together by an upstanding stem, the ratio of the overall height of said fastener element to the length of said tail being approximately 1:1.

4,683,016

# PROCESS FOR FORMING A TWO PART CLOSURE

Herbert V. Dutt, Sarasota, Fla.; Istvan Foldesi, Laval, Canada, and Paul A. Santostasi, Sarasota, Fla., assignors to Sun Coast Plastics, Inc., Fla. and Montreal Milling Cutter and Company, Inc., Quebec, Canada

Filed Sep. 3, 1985, Ser. No. 771,952

Int. Cl.<sup>4</sup> B29C 65/02; B32B 31/12, 31/20; B65D 51/20

U.S. Cl. 156—69

7 Claims

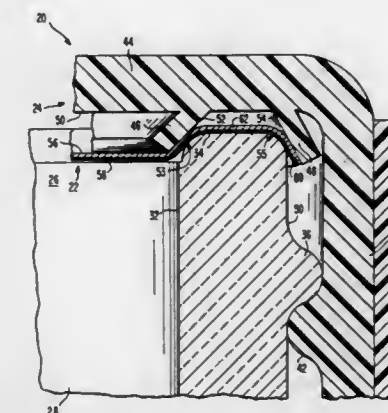
1. A process for forming a two part closure on a container having an open mouth defined by an upper, generally planar mouth rim that extends between inner and outer edges of spaced inner and outer neck walls, respectively, said process comprising:

forming a flexible foil sealing disk having a diameter slightly larger than the diameter of said container mouth and further having an annular skirt portion at its edge; attaching said flexible foil sealing disk atop said container mouth and in engagement with said mouth rim and with said annular skirt portion of said flexible foil sealing disk overlying an upper portion of said outer neck wall of said container;

subsequently positioning a linerless closure cap having

downwardly extending spaced inner and outer sealing flanges on said container mouth with said spaced inner and outer sealing flanges engaging an interposed peripheral portion of said flexible foil sealing disk, and with an inner surface of said downwardly extending outer sealing flange contacting said annular skirt portion of said flexible foil sealing disk and causing said annular skirt to contact said outer neck wall of said container, and with an outer surface of said downwardly extending inner sealing flange contacting said flexible foil sealing disk and causing said sealing disk to contact an upper portion of said inner neck wall of said container; and

securing said closure cap to said container and moving said spaced inner and outer sealing flanges downwardly along



said upper portions of said inner and outer neck walls, said downwardly moving outer sealing flange placing said annular skirt portion of said flexible foil sealing disk into tight sealing engagement with said outer neck wall, said downwardly moving inner sealing flange exerting a downward force on a central portion of said flexible foil sealing disk positioned within said container mouth and drawing said central portion of said flexible sealing disk within said container mouth taut, said spaced inner and outer sealing flanges further cooperating as they are moving downwardly to pull said peripheral portion of said flexible foil sealing disk overlying said mouth rim into intimate, positive sealing contact across said mouth rim and to draw said peripheral portion of said flexible sealing disk taut.

4,683,017

# METHOD AND APPARATUS FOR FORMING A LOOP WITH END-GRIPPED STRAP

Janusz Figiel, Chicago; Donald Tremper, Mt. Prospect, and Peter Lems, Wilmette, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Nov. 25, 1985, Ser. No. 801,605

Int. Cl.<sup>4</sup> B32B 31/16

U.S. Cl. 156—73.1

26 Claims

1. A method for forming a loop of strap for encompassing an article, said method comprising the steps of:

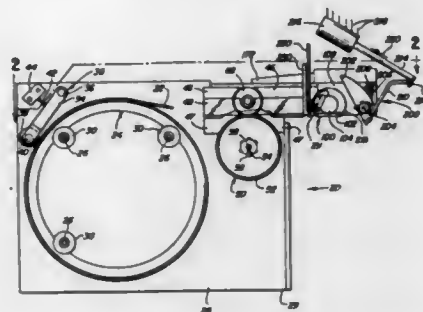
(a) feeding a length of strap to orient a segment between two spaced-apart gripping members;

(b) gripping said strap segment with said gripping members by effecting relative movement between said gripping members to a clamping orientation to clamp said strap segment between said gripping members;

(c) while continuing step (b), moving both of said gripping members together in the clamping orientation in a closed path to form a primary loop in said strap around at least one of said gripping members; and

(d) while continuing step (b), feeding said strap to expand said primary loop to an expanded loop having a larger size for accommodating said article.

11. Apparatus for forming a loop of strap for encompassing an article with the loop, said apparatus comprising:  
a frame and two gripping members mounted on said frame for movement together in a closed path;  
means for effecting relative movement between said gripping members to a clamping orientation to clamp a segment of said strap between said gripping members;



means on said frame for moving said two gripping members together in said closed path, while fixed relative to each other in the clamping orientation with said strap segment clamped between said two gripping members, to form a primary loop in said strap around at least one of said gripping members; and  
strap drive means for feeding said strap to expand said primary loop to an expanded loop having a larger size for accommodating said article.

4,683,018

#### COMPOSITE MATERIAL MANUFACTURE BY SHAPING INDIVIDUAL SHEETS FOLLOWED BY CONSOLIDATING THE SHEETS

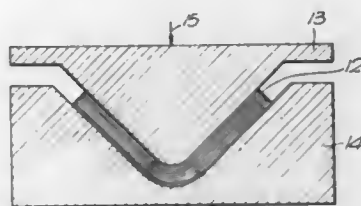
David T. Sutcliffe, and David J. Barraclough, both of Derby, England, assignors to Rolls-Royce plc, London, England  
Filed Nov. 20, 1985, Ser. No. 799,861

Claims priority, application United Kingdom, Dec. 6, 1984, 8430891

Int. Cl.<sup>4</sup> B32B 31/20

U.S. Cl. 156—196

7 Claims



1. A method of manufacturing a composite materials comprising the steps of stacking a plurality of alternate layers of uncured epoxy resin impregnated fibre and thin elastic release film, raising the temperature of said stacked layers to a level insufficient to cure said resin occurs, and applying sufficient pressure to said stack by opposed correspondingly shaped formers so that said stacked layers are deformed from a planar condition and move laterally with respect to one another and are formed into the shape defined by said correspondingly shaped formers, allowing said stacked layers to cool and subsequently discontinuing said applied pressure, separating said layers of said stack and removing said thin elastic release films therefrom, restacking said partially cured resin impregnated fibre layers on a former corresponding in shape therewith and applying sufficient pressure to said layers to fully consolidate them and at such a temperature and for such a time that the final curing of said resin occurs.

6. A method of manufacturing a composite material as

claimed in claim 1 wherein said resin impregnated layers are tacked together after said re-stacking.

4,683,019

#### METHOD OF FORMING REFRACTORY COATING ON STEEL FRAME

Hideo Motoki, Ibaraki, Japan, assignor to Shikoku Kaken Kogyo Kabushiki Kaisha, Osaka, Japan

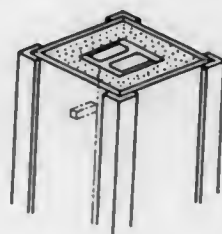
PCT No. PCT/JP83/00425, § 371 Date Aug. 1, 1985, § 102(e) Date Aug. 1, 1985, PCT Pub. No. WO85/02430, PCT Pub. Date Jun. 6, 1985

PCT Filed Dec. 2, 1983, Ser. No. 768,534

Int. Cl.<sup>4</sup> E04B 1/94

U.S. Cl. 156—293

4 Claims



1. A method for forming a refractory coating on a steel column or steel beam serving as a structural member of a building, the method comprising the steps of (1) adhering panels directly or indirectly to the surface of the steel column or steel beam with provision for a hollow space between the surface of the steel column or steel beam and the panels and (2) pouring a pasty self-hardening refractory composition into the hollow space in which the composition hardens into a layer integrally united with the panels and the steel column or steel beam, wherein the self-hardening refractory composition comprises:

- (A) at least one water-soluble alkali silicate,
- (B) a hardener for the water-soluble alkali silicate, and
- (C) at least one material selected from the group consisting of a material containing bound water and a material capable of absorbing heat when heated.

4,683,020

#### APPARATUS FOR STORING AND FEEDING TIRE BEADS

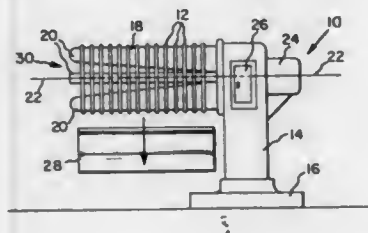
Steven J. Portalupi, Akron, and Robert S. Riggs, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 31, 1985, Ser. No. 761,181

Int. Cl.<sup>4</sup> B29D 30/08; B65G 15/12

U.S. Cl. 156—403

11 Claims



1. Apparatus for storing and feeding annular beads conveyed to said apparatus in a rack member which supports said beads in a separated condition comprising: (a) a conveyor assembly having a plurality of continuous conveyors positioned around a central axis and extending in an axial direction for positioning of said beads in said separated condition over said conveyor

assembly with radially inner surfaces of said beads placed around said conveyor assembly;

(b) means to move each of said conveyors radially outward of said central axis for urging each of said conveyors into gripping engagement with said beads to maintain said beads in said separated condition while said rack member is being removed; and

(c) means for driving all of said plurality of continuous conveyors simultaneously and intermittently toward the same end of said assembly to feed said beads one at a time to a transfer apparatus while maintaining the remainder of said beads in said separated condition.

4,683,021

#### TIRE BUILDING DRUM

Joseph F. Stalter, deceased, late of Mogadore, Ohio (by Bernadette M. Stalter, executrix), and Gilbert M. Feller, Ingeldorf, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

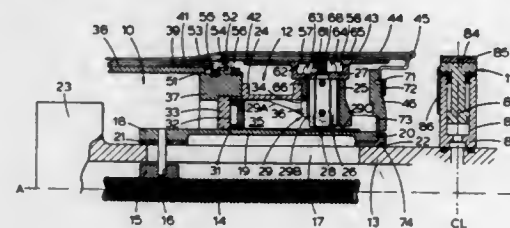
Filed Nov. 4, 1985, Ser. No. 794,883

Claims priority, application European Pat. Off., Nov. 26, 1984, 84630178.6

Int. Cl.<sup>4</sup> B29D 30/24

U.S. Cl. 156—415

12 Claims



1. A tire building drum having a center shaft, and a pair of end drum assemblies mounted axially slidable on the center shaft, each of said end drum assemblies comprises:

- a sleeve mounted co-axially on the center shaft and slideable along the shaft,
- an annular housing mounted on the sleeve and forming a co-axial annular chamber around the sleeve,
- an annular expansion means mounted co-axially on the annular housing for radial movement relative to the sleeve,
- an annular piston axially slideable in the co-axial annular chamber to effect a radially outward force and movement of the annular expansion means,
- ramp means associated with the annular piston and engageable with the annular expansion means to move the annular expansion means radially of the sleeve in response to axial movement of the piston, said ramp means including a cam surface comprising two portions, an inclined radially outer portion, and a convex radially inner portion.

9. A tire building drum having a center shaft; a pair of co-axial end drum assemblies each mounted axially slidable on the center shaft for axial movement towards and away from each other, the end drum assemblies each providing a generally cylindrical surface for supporting a cylindrical tire carcass band, and including a radially expandable bead seating means; and annular inflatable bladders which when uninflated form substantially cylindrical tire building surfaces around the end drum assemblies,

- said inflation bladders comprising an inside shoulder bladder adjacent to and extending axially inwards of the bead seating means, an outside shoulder bladder adjacent to and extending axially outwards of the bead seating means,
- a first turn-up bladder also located adjacent the axially outer side of the bead seating means and completely enveloping the outside shoulder bladder,
- and a second turn-up bladder located axially outside the first turn-up bladder, and when said bladders are uninflated lying radially inwardly of the first turn-up bladder.

4,683,022

#### AUTOMATIC DEVICE FOR PREPARING PAPER ROLLS FOR WEB PASTING

Takemi Watanabe, Toyonaka, and Noriyuki Shiba, Tokyo, both of Japan, assignors to Kabushiki Kaisha Kaneda Kikai Seisakusho, Tokyo, Japan

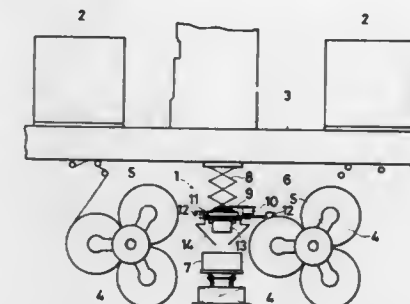
Filed Apr. 24, 1986, Ser. No. 855,298

Claims priority, application Japan, Apr. 26, 1985, 60-92074; Jun. 7, 1985, 60-86670[U]; Aug. 22, 1985, 60-128316[U]

Int. Cl.<sup>4</sup> B31F 5/06; B65H 19/18

U.S. Cl. 156—505

7 Claims



1. A device in a printing system for preparing paper rolls held on a reel stand for web pasting which comprises:

- a folding support capable of being extended and folded vertically that supports in suspension the remainder of said device for preparing paper rolls for web pasting;
- an arm held by said folding support, whose foremost end is capable of being moved in directions both parallel to and perpendicular to the axis of a paper roll on the reel stand;
- a vacuum suction cup device held by said arm for lifting up the outermost web of the paper roll;
- a cutter device held by said arm for cutting the outermost web of the paper roll;
- an adhesive tape-attaching device held by said arm for adhesively attaching adhesive tapes for web pasting to the leading web end of the paper roll;
- a table assembly positioned under said arm and held by said folding support;
- a web edge fastening strip-attaching device positioned under said table assembly and held by said folding support for adhesively attaching one end portion of a fastening strip to the inner side of the leading web end of the paper roll; and,
- a paper roll-pressing device for adhesively attaching the other end portion of said web edge fastening strip to the outer surface of the paper roll.

4,683,023

#### TAPE ATTACH MACHINE

Paul J. Sokolovsky, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 6, 1986, Ser. No. 836,941

Int. Cl.<sup>4</sup> B32B 31/04

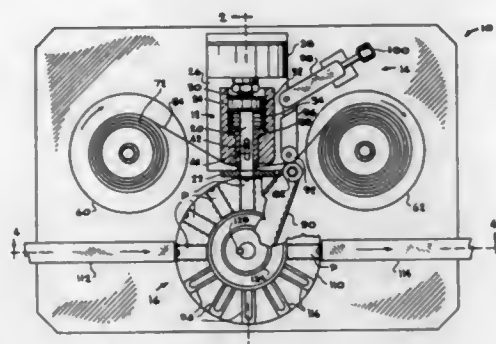
U.S. Cl. 156—518

7 Claims

1. An apparatus for applying adhesive material onto the end of a semiconductor device package, said apparatus comprising:  
a punch assembly mounted to reciprocate along a straight horizontal line, said punch assembly including a shearing member and a shaft having a resilient tip;  
an inlet conveyor which moves the semiconductor device packages end-to-end;  
a carousel which receives the packages singly from the inlet conveyor and rotates the packages into horizontal alignment with the punch;  
an outlet conveyor which receives the packages singly and moves them end-to-end from the carousel;  
a die having a port with dimensions sufficient to receive the shaft therethrough;



means for feeding a ribbon of adhesive material between the punch assembly and the die; and



means for reciprocating the punch assembly so that the shearing member contacts the die to cut the layer from the ribbon, and thereafter the shaft applies said layer to the end of the semiconductor device.

4,683,024

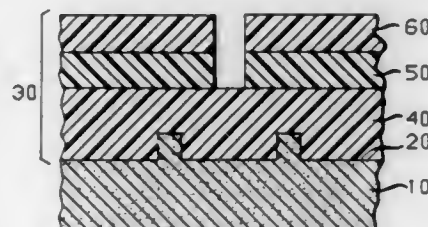
# DEVICE FABRICATION METHOD USING SPIN-ON GLASS RESINS

David A. Miller, Seaside Park; Joseph M. Moran, Berkeley Heights, and Gary N. Taylor, Bridgewater, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 4, 1985, Ser. No. 697,645  
Int. Cl.<sup>4</sup> B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—643

7 Claims



1. A method for fabricating a device, comprising the steps of:

- forming a resist on a substrate surface, said resist comprising a first region overlying said substrate, a second region overlying said first region, and a patterned third region overlying said second region;
- etching said second region with a second-region etchant while using said third region as an etch mask, said second-region etchant being produced by forming a plasma in a fluorine-containing gas;
- removing said fluorine-containing gas, introducing a first-region etchant, and etching said first region with said first-region etchant while using said second region as an etch mask; and
- completing the fabrication of said device, characterized in that

said forming step includes the step of spin-depositing said second region, said second region including material substantially resistant to lateral etching by fluorine-containing etchant species present during the etching of said first region, the composition and/or thickness of said second region being chosen so that said third region is substantially unaffected by exposure to said second-region etchant during the time required to etch said second region with said second-region etchant, and the pattern etched

into said third region is substantially identical to the pattern existing in said first region.

4,683,025

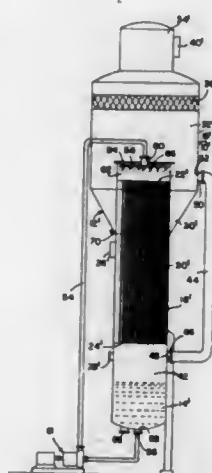
# METHOD AND APPARATUS TO CONVERT A LONG TUBE VERTICAL EVAPORATOR TO A FALLING FILM EVAPORATOR

A. Roland Flores, Mountainside, N.J., assignor to The Graver Company, Union, N.J.

Filed Feb. 10, 1986, Ser. No. 828,226  
Int. Cl.<sup>4</sup> B01D 1/22, 3/06

U.S. Cl. 159—2.1

10 Claims



1. A method of converting a long tube vertical evaporator apparatus to a falling film evaporator apparatus wherein said long tube vertical evaporator apparatus includes a heat exchanger chamber having a plurality of heat exchange tubes positioned therein vertically extending between an upper tube sheet and a lower tube sheet, said heat exchanger chamber having a vapor inlet for directing vapor therein; a bottom chamber extending below said heat exchanger chamber in fluid communication with the lower ends of said heat exchange tubes, said bottom chamber having a feed inlet for directing feed liquid therein and upwardly through said heat exchange tubes; and a vapor separation chamber positioned around and above an upper portion of said heat exchanger chamber in fluid communication with the upper ends of said heat exchange tubes, said vapor separation chamber having a vapor outlet at an upper portion thereof and a product outlet at a lower portion thereof; comprising the steps of:

- (a) extending said bottom chamber so as to define a flash chamber intermediate said bottom chamber and said heat exchanger chamber and repositioning said feed inlet to feed liquid directly into said flash chamber into contact with falling liquid and vapor from the heat exchange tubes;
- (b) establishing a pathway for directing vapor formed in said flash chamber into said vapor separation chamber through a vapor riser conduit having a first end connected to said flash chamber and a second end connected to said vapor separation chamber;
- (c) establishing a pathway for recirculating liquid from said bottom chamber through a recirculation conduit having a first end connected to said bottom chamber and a second end connected to an upper portion of heat exchanger chamber and distributing same over the upper ends of said heat exchange tubes; and
- (d) closing off said product outlet at said vapor separation chamber and establishing a product outlet in communication with said bottom chamber.

4. In an evaporator apparatus including a heat exchanger chamber having a plurality of heat exchange tubes positioned

therein which extend vertically between an upper tube sheet and a lower tube sheet, said heat exchanger chamber having a vapor inlet for directing vapor therein; and a vapor separation chamber positioned above said heat exchanger chamber, said vapor separation chamber having a vapor outlet at an upper portion thereof; the improvement comprising: a flash chamber positioned directly below said lower tube sheet in fluid communication with said heat exchange tubes, said flash chamber having a feed inlet for directing feed liquid therein; a bottom chamber positioned below said flash chamber in fluid communication therewith; a vapor riser conduit positioned externally of said heat exchanger chamber having a first end in fluid communication with said flash chamber and a second end in fluid communication with said vapor separation chamber for directing vapor formed in said flash chamber therethrough and into said vapor separation chamber; and a recirculation conduit positioned externally of said heat exchanger chamber having a first end in fluid communication with said bottom chamber and a second end in fluid communication with a distribution chamber positioned directly above said upper tube sheet in fluid communication with said heat exchange tubes, said recirculation conduit having recirculation means for circulating liquid from said bottom chamber therethrough into said distribution chamber and downwardly through said heat exchange tubes.

cover can be removed for inspection of the evaporator surfaces without structural disassembly of the rotor.

4,683,027

# METHOD AND APPARATUS IN A PAPER MACHINE FOR REGULATING PRESSURE IN THE SPACE BETWEEN A HEADBOX LIP BEAM AND BREAST ROLL

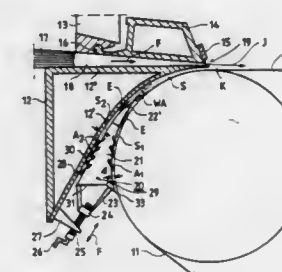
Kari Pitkärvi, Jyväskylä, Finland, assignor to Valmet Oy, Finland

Filed Oct. 24, 1985, Ser. No. 790,853

Claims priority, application Finland, Oct. 25, 1984, 844203  
Int. Cl.<sup>4</sup> D21F 1/02

U.S. Cl. 162—199

17 Claims



4,683,026

# THIN LAYER EVAPORATOR

Vaclav Feres, Haid- und Neu-Str. 14, D-7500 Karlsruhe 1, Fed. Rep. of Germany

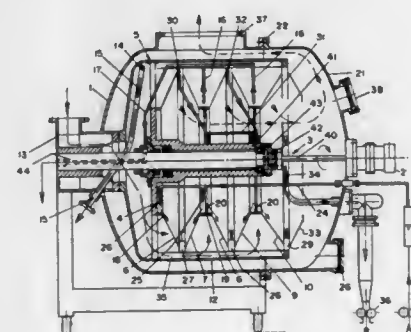
Filed May 8, 1985, Ser. No. 732,166

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3418982

Int. Cl.<sup>4</sup> B01D 1/22

U.S. Cl. 159—6.1

2 Claims



1. In a thin layer evaporator having a container, a removable container cover, a drive shaft projecting into the container, a rotor fixed to the drive shaft and having a conical outwardly spreading evaporator surface defining an inwardly lying evaporator chamber, a heating chamber separated from the evaporator chamber, means for discharging liquid to be evaporated at the inner periphery of the conical evaporator surface of the rotor for spreading the liquid in a thin film outwardly therefrom over the conical surface toward the outer periphery of the evaporator surface and means including a draw-off pipe for removing the resulting concentrated liquid from the outer periphery of the evaporator surface, the improvement comprising: the removable container cover being disposed at the one side of the container and the drive shaft projecting into the container from the opposite side, a stationary hollow spindle (44) projecting into the container and the rotor (5) from said opposite side of the container, the drive shaft being formed in two parts, the first part (40) extending through the hollow spindle, and the second part including a hollow shaft (41) rotatably mounted on the outside of the hollow spindle and connected at one end with the first part (40) of the drive shaft within the spindle by means of an interconnecting flange (49) and at the other end (4) with the rotor whereby the container

1. In a paper machine, a method for maintaining pressure induced in a wedge-shaped space at a desired level, the wedge-shaped space being defined between a wall of a headbox lip beam or the like and a breast roll over which a forming wire passes, comprising the steps of providing a blow box in the wedge-shaped space, the blow box including a curved side wall which substantially follows the contour of the breast roll and which defines a first gap space with the breast roll; and directing air or gas jets from the blow box through nozzle openings in said curved side wall into and through the first gap space in a direction opposite to a direction in which the forming wire moves on the breast roll so that by means of the air jets, air is ejected from the wedge-shaped space to maintain the pressure therein at a desired level.

7. In a paper machine including a headbox having a headbox lip beam, and a breast roll on which a forming wire passes, said breast roll and a wall of said headbox lip beam defining a wedge-shaped space between them, apparatus for maintaining the pressure induced in said wedge-shaped space at a desired level, comprising:

blow means situated in said wedge-shaped space for directing air or gas jets from: said wedge-shaped space in a direction opposite to a direction in which the forming wire moves on said breast roll, said blow means comprising a blow box including a curved first side wall which substantially follows the contour of the breast roll and which defines a first gap space with the breast roll, said first side wall having nozzle opening means formed therein through which said air jets are directed through said first gap space, whereby by means of the air jets, air is ejected from said wedge-shaped space to maintain the pressure therein at a desired level.

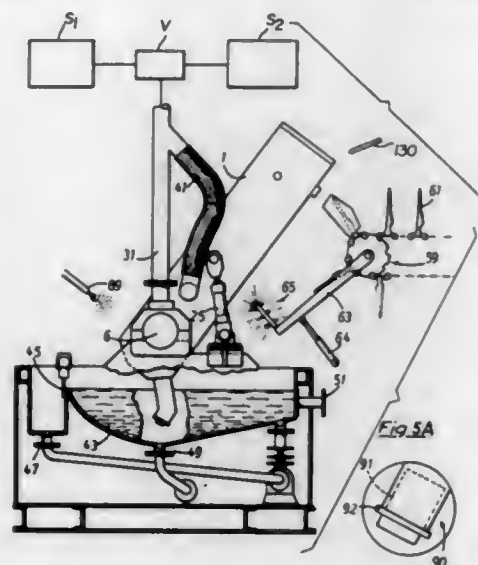
4,683,028  
MOULDING

Martin Waller, Geoffrey Farrell, both of Bolton; Kenneth W. Mills, deceased, late of Freckleton; by Margaret Mason, executor, and by Geoffrey A. Shindler, executor, both of Manchester, all of England, assignors to Vernon and Company (Pulp Products) Limited, Lancashire, England  
Filed Feb. 6, 1985, Ser. No. 698,888  
Claims priority, application United Kingdom, Feb. 10, 1984, 8403507

Int. Cl.<sup>4</sup> D21J 7/00

U.S. Cl. 162-275

29 Claims



1. Apparatus for vacuum forming articles from a fibrous slurry the arrangement comprising:  
a plurality of moulds, each mould formed by at least first and second mould members;  
each mould comprising a fluid permeable member supported by part of each mould member and forming a moulding surface on said mould member defining the shape of the article to be vacuum formed;  
a chamber in each mould member connected to the fluid permeable member;  
a port in each mould member for application of suction to said chambers;  
an inlet in each of said moulds for admitting fibrous slurry to be vacuum formed into the mould and onto the moulding surface;  
means linking the mould members and controlling the opening and closing thereof in a non-linear manner;  
transport apparatus movable in an endless path, said moulds being mounted on said transport apparatus;  
suction means for applying suction to said moulds;  
a slurry tank for containing fibrous slurry;  
conveying apparatus for receiving moulded articles from the moulds  
means for opening said moulds to release the moulded articles onto conveyor apparatus;  
means for closing the said mould members prior to conveyance to the slurry tank by said transport apparatus;  
said conveyor apparatus comprising retaining pins which receive said moulded articles, said conveyor apparatus being movable in synchronism with said transport apparatus; and  
means for oscillating said transport apparatus in synchronism with the movement of said moulds to position each mould in turn over a retaining pin and for displacing said mould relative to the retaining pin for onward movement towards the slurry tank.

4,683,029  
CIRCULAR SOLVENT EXTRACTOR

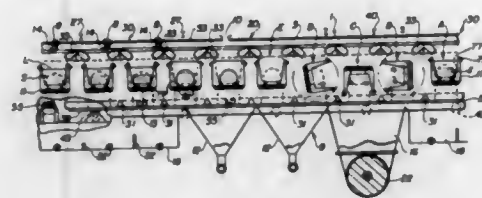
John F. Oyler, Pittsburgh; Jerry D. Brand, Alliquippa, and Richard Zavada, Pittsburgh, all of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Sep. 20, 1985, Ser. No. 778,545

Int. Cl.<sup>4</sup> B01D 11/02

U.S. Cl. 196-14.52

17 Claims



1. A circular solvent extractor apparatus suitable for processing a finely divided, abrasive feed stock material, such as tar sands and the like, said apparatus comprising:  
circular trackway means;  
continuous ring-shaped, inner and outer sidewalls positioned for travel on the circular trackway means, said inner and outer sidewalls having upper and lower edges and forming a continuous, annular chamber therebetween;  
a plurality of spaced-apart structural spoke means extending between the inner and outer sidewalls to structurally interconnect the sidewalls for coupled travel;  
motive means for moving the sidewalls about the circular trackway means;  
stationary hood means positioned above the upper edges of the sidewalls;  
a plurality of spaced-apart cells positioned within the annular chamber and each cell having a longitudinal axis extending along a radius of the circular solvent extractor apparatus, each cell having opposed inner and outer vertical end walls located adjacent the inner and outer sidewalls, respectively, vertical sides interconnecting the end walls and a liquid permeable bottom comprising a fine mesh screen element, said end walls, interconnecting vertical sides and bottom adapted to form a containment space for a bed of feed stock material within each of said spaced-apart cells, and means for supporting the end walls of each cell onto a respective sidewall for coupled travel with the sidewalls;  
stationary drain trough means positioned beneath the cells, sealing means circumferentially coacting between the stationary hood means and the upper edges of the sidewalls and between the stationary drain trough means and the lower edges of the sidewalls to substantially seal the annular chamber from ambient atmosphere;  
feed means extending through the stationary hood means in a feeding zone of said extractor apparatus for introducing feed stock material to be treated into the cells to form a contained bed of feed stock material within each of said cells;  
solvent distribution means extending through the stationary hood means in a process zone of said extractor apparatus for introducing a liquid solvent into the cells to permit the solvent to percolate downwardly through each of the contained beds of feed stock material and exit the permeable cell bottoms with an extracted product removed from said feed stock material; and  
said means for supporting the end walls of each of the cells includes means for rotating each cell about its longitudinal axis in a discharge zone of said extractor to invert the cells at least 180° and dump the treated beds of material therefrom and to return the dumped cells to an upright position prior to entry into said feeding zone.

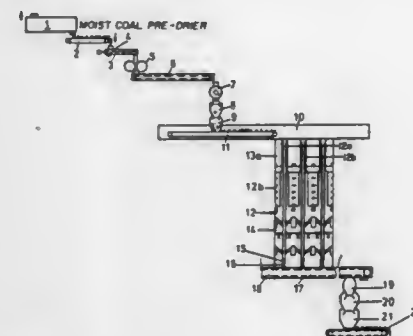
4,683,030  
METHOD FOR CARBONIZING COLD-COMPACTED BRIQUETTES

Heinrich Weber, Lenastr. 2, 4350 Recklinghausen; Kurt Lorenz, Habichtstr. 65, 4320 Hattingen, and Horst Dungs, Am Dangelbruch 21, 4690 Herne, all of Fed. Rep. of Germany  
Continuation of Ser. No. 458,278, Jan. 17, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 719,879

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202161

Int. Cl.<sup>4</sup> C10B 47/18, 53/08, 57/02

U.S. Cl. 201-6



1. A method of forming and carbonizing cold-compacted briquettes using a continuously operating preheater and a continuously operating indirectly heated vertical carbonization shaft oven having an upper vertical metal walled first stage for receiving a falling charge of briquettes, and spanning about one-half of the height of the shaft oven, an intermediate vertical ceramic material walled second stage for receiving the falling charge of briquettes from the first stage and a lower cooling stage for receiving the falling charge of briquettes from the second stage comprising:  
grinding coal and/or peat material;  
mixing the coal and/or peat material with binder to form a mixture;  
cold-compacting the mixture to form briquettes;  
pre-heating the briquettes in the continuously operating preheater to dry and harden the briquettes;  
charging the dried and hardened briquettes into the first stage of the shaft oven;  
indirectly heating the briquettes in the first stage of the shaft oven to an average temperature of about 480° to 500° C. by passing hot gases next to metal walls of the first stage on a side of the metal walls opposite from the briquettes to drive off substantially all volatile material from the briquettes in the first stage;  
removing dust from the volatile material as it passes the metal walls of the first stage;  
supplying the indirectly heated briquettes from the first stage to the second stage of the shaft oven;  
indirectly heating the briquettes in the second stage to a temperature up to 1,000° C. by burning volatile material and air in the second stage to produce hot gases and passing the hot gases thus produced next to ceramic material walls of the second stage on a side of the ceramic walls opposite from the briquettes for carbonizing the briquettes in the second stage;  
supplying the briquettes from the second stage to the cooling stage;  
cooling the briquettes in the cooling stage;  
discharging the volatile material expelled in the first stage at a temperature of about 280° to 350° C.;  
heating the preheater using discharged hot gases from the first stage;  
passing the volatile material from the briquettes in the first stage, through the metal walls of the first stage and past the hot gases in the first stage in a manner which isolates the volatile material from the hot gases;

supplying the volatile material with air to the second stage for forming the hot gases in the second stage;  
supplying the hot gases from the second stage to form the hot gases of the first stage; and  
removing gases expelled from the briquettes in the second stage mainly containing hydrogen in the cooling stage and partly circulating said gases containing hydrogen in the cooling stage for directly cooling the briquettes.

4,683,031  
HOT COKE RECEIVING DEVICE

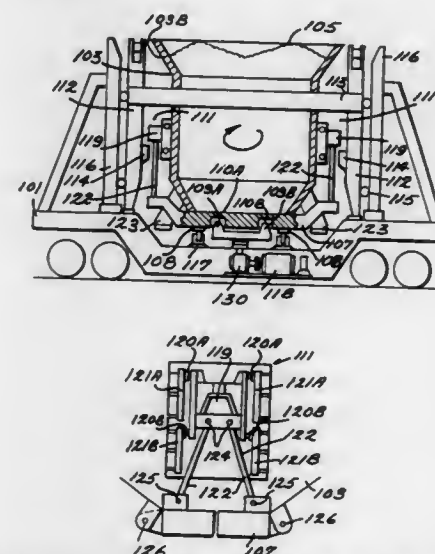
Sboji Kutsumura, Hokkaido, and Toshiaki Isonaga, Shiga, both of Japan, assignors to Nippon Steel Corp., Hokkaido and Fujicar Manu. Co. Ltd., Shiga, both of Japan  
Division of Ser. No. 653,768, Sep. 24, 1984. This application Mar. 13, 1986, Ser. No. 839,287

Claims priority, application Japan, Sep. 26, 1983, 58-148667; Jun. 1, 1984, 59-81779; Jun. 1, 1984, 59-81780; Aug. 17, 1984, 59-171293; Aug. 17, 1984, 59-171294

Int. Cl.<sup>4</sup> C10B 39/12, 39/14

U.S. Cl. 202-227

3 Claims



1. In a hot coke receiving device of a type having a coke bucket body which has a discharge gate provided at the bottom thereof, and having the coke bucket body turnably mounted on a bucket car, wherein the improvement comprises:  
a ring-like horizontal frame surrounding the outer periphery of the coke bucket body without contact therebetween, said frame being connected to the discharge gate by means of a pair of rods and a pair of pins;  
a pair of outwardly projecting trunnions disposed at opposing points on the said ring-like horizontal frame;  
a support frame surrounding said coke bucket body, a pair of vertical hanger beams secured at opposing positions on said support frame near but spaced from the positions of said trunnions;  
each said vertical beam having a projecting block which engages with a said trunnion when said hanger beams are moved vertically.

4,683,032  
COKE OVEN DOORS FOR HORIZONTAL CHAMBER COKE OVENS

Wolfgang Becker, Herne, and Heinz Tewes, Gelsenkirchen-Buer, both of Fed. Rep. of Germany, assignors to Ruhrkohle Aktiengesellschaft, Essen, Fed. Rep. of Germany  
Continuation of Ser. No. 524,921, Aug. 19, 1983, abandoned. This application Mar. 4, 1985, Ser. No. 708,097

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301877; Apr. 2, 1983, 3312072

Int. Cl.<sup>4</sup> C10B 25/06, 25/16

U.S. Cl. 202-248

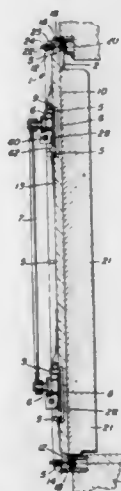
16 Claims

1. A coke oven door in combination with a horizontal cham-



ber type coke oven having an oven chamber, said coke oven door comprising vertical door arrangement which comprises:

- a door member to retain an oven filling inside said oven chamber, said door member having a sealing element;
- a door frame having an opening and a portion with a sealing surface, said door member having a closed position when abutting said door frame, and an open position when away from said door frame;
- said door member having a longitudinal axis;
- a door stopper attached to the door member, said door stopper serving as a substantially heat insulating barrier and being disposed to protrude into the oven chamber sufficiently, to keep the oven filling at a predetermined distance from said door member in said closed position;
- a separate force transmittal unit for transmitting force around said door member and for forcing said sealing element against said door frame in said closed position;
- at least one connecting joint means being disposed for supporting said door member when said door member is moved to said open position, said at least one connecting joint means joining said door member and said force transmittal unit, said supporting being provided through said at least one connecting joint means, said at least one connecting joint means having a first element means and a second element means, said second element means being in a co-operative relationship and making contact with said first element means for supporting said door member in



said open position, said first element means being connected to be supported by said force transmittal unit when said door member is in said open position, said second element means being connected to support said door member when said door member is in said open position, said force transmittal unit having means for preventing said door member in said closed position from moving in a direction away from said door frame;

said sealing element having a portion which is disposed to make contact with said sealing surface of said door frame in said closed position;

locking means for providing bearing forces on said force transmittal unit at least to assist in sealing said sealing surface of said door frame with said sealing element of said door member;

said first element means and said second element means of said connecting joint means each having at least one surface directly facing at least one surface of the other element means;

said at least one facing surface of said first element means and said at least one facing surface of said second element means forming a gap therebetween along all parts of said facing surfaces such that said first element means and said second element means are non-touchingly disposed from one another in said closed position, whereby heat transfer between said first element means and said second element means because of said gap is minimized in said closed position; and

at least a portion of said at least one facing surface of said first element means making said contact, between said first and said second element means, with at least a portion of said at least one facing surface of said second element means when said door member is in said open position.

4,683,033

# PURIFICATION OF IODINE-CONTAINING MIXTURES AND COMPOSITIONS USEFUL THEREFOR

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 749,361, Jun. 27, 1985, Pat. No. 4,599,472.

This application Jan. 24, 1986, Ser. No. 821,930

Int. Cl.<sup>4</sup> B01D 3/34

U.S. Cl. 203—38

6 Claims

1. A process for the preparation by distillation of essentially colorless hydrocarbon product which is substantially free of color-forming impurities, which process comprises:

- (a) adding 0.02 to 0.10 wt % of a metal, M, to a solution comprising:
  - (i) a hydrocarbon product having 8–30 carbon atoms, and
  - (ii) at least one color-forming impurity selected from the group consisting of:

I<sub>2</sub>, and

R—t,

wherein R is H or an organic radical having 1–30 carbon atoms, inclusive; wherein said color-forming impurity and said metal interact under distillation conditions to form a complex, M<sub>n</sub>, wherein n is equal to the valence of the metal M, and wherein the complex M<sub>n</sub> is non-volatile and essentially non-decomposable under distillation conditions,

- (b) subjecting the resulting mixture to distillation conditions, and thereafter

- (c) recovering essentially colorless hydrocarbon product as the overhead fraction from said distillation.

4,683,034

# PROCESS FOR SEPARATING DIMETHYL ISOPHTHALATE AND DIMETHYL ORTHOPHTHALATE FROM THEIR MIXTURE WITH DIMETHYL TEREPHTHALATE

Rolf Bader, Dietzenbach; Hartmut Last, Offenbach am Main; Manfred Mayer, Niedernhausen; Siegfried Rittner, Mörfeld-Walldorf, and Edgar Wetzlar, Heusenstamm, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,767

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1984, 3430555

Int. Cl.<sup>4</sup> B01D 9/00; C07C 67/52

U.S. Cl. 203—43

16 Claims

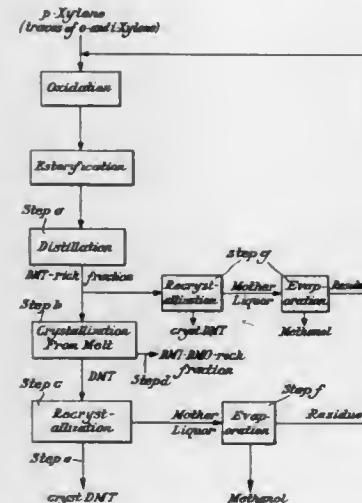
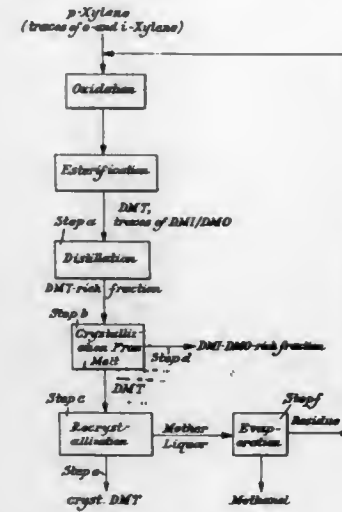
1. A process for separating dimethyl isophthalate (DMI) and dimethyl orthophthalate (DMO) and other by-products from their mixture with dimethyl terephthalate (DMT), formed in the oxidation of p-xylene followed by esterification with methanol, which comprises:

- (a) distilling the esterification product to obtain a solid DMT-rich fraction;
- (b) recrystallizing the DMT-rich fraction obtained in step (a) from methanol to obtain crystalline DMT and mother liquor;
- (c) recovering the crystalline DMT obtained in step (b);
- (d) evaporating the methanol from the mother liquor of step (b) to obtain a solid residue composed mainly of DMI, DMT and DMO;
- (e) melting the residue obtained in step (d) and then cooling the resulting melt, without the DMT content in the melt

reaching the eutectic content to crystallize DMT, to obtain DMT and a DMI-DMO-rich fraction;

(f) recovering the DMT obtained in step (e); and

ically detecting the soluble reduced form of the electrochemically active compound which was produced in situ and corre-



- (g) at least partially removing the DMI-DMO-rich fraction, obtained in step (e).

4,683,035

# METHOD FOR IN SITU CORROSION DETECTION USING ELECTROCHEMICALLY ACTIVE COMPOUNDS

Barry E. Huot, Aurora; Harvey M. Herro, Naperville, both of Ill.; Kyu-Hwa Lee, Kyungnam, Rep. of Korea, and Morris Mindick, Downers Grove, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 3, 1986, Ser. No. 825,703

Int. Cl.<sup>4</sup> G01N 27/46

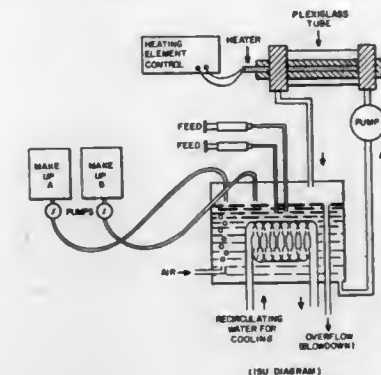
U.S. Cl. 204—1 T

3 Claims

1. A method for determining the corrosion rate of metals in contact with a liquid system which is capable of causing corrosion of such metals which comprises adding to the liquid system a soluble electrochemically active compound having a reduction potential more positive than the metal in contact with the liquid system and then monitoring the system thus treated with the electrochemically active compound by analyt-

1. A method for metallizing a non-metallic surface, without prior electroless metal plating, by electroplating the non-metallic surface in a vessel provided with a counter-electrode and containing an electroplating bath solution comprising in ionic form a metal (B) to be electroplated, said non-metallic surface being provided with a conductive connector area, said connector area being located outside of and abutting the non-metallic surface area to be electroplated, said abutting connector area being employed as an electrode during electroplating, characterized by the steps comprising:

- (a) forming a plurality of discrete metallic sites on said non-metallic surface, each of said sites comprising metal (A), said metal (A) being different from said metal (B);
- (b) exposing said non-metallic surface including at least a portion of said connector area to the electroplating bath solution, said solution having a defined conductivity and further comprising at least one component (C) which allows deposition of said metal (B) on said metallic sites comprising or consisting of metal (A), at a rate which is faster compared to the deposition rate of said metal (B) on surfaces consisting of, or formed by, the species of the electrodeposited metal (B), with the proviso that component (C) does not comprise pyrophosphate anion;
- (c) applying a potential between the connector area and the counter-electrode which is sufficient to: (1) initiate elec-



lating the amount of the reduced form with the amount of corrosion.

4,683,036

# METHOD FOR ELECTROPLATING NON-METALLIC SURFACES

Denis M. Morrissey, Glen Cove; Peter E. Takach, Garden City South, and Rodolph J. Zeblicky, Hauppauge, all of N.Y., assignors to Kolimorgen Technologies Corporation, Dallas, Tex.

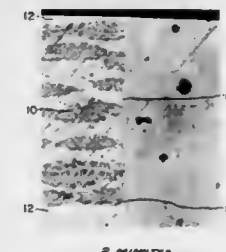
Continuation-in-part of Ser. No. 501,167, Jun. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 394,442, Jul. 1, 1982, abandoned.

This application Nov. 21, 1985, Ser. No. 800,360

Int. Cl.<sup>4</sup> C25D 5/54

U.S. Cl. 204—15

37 Claims



troplating of metal (B) on the exposed portion of the connector area and (2) allow electroplating of metal (B) on neighboring metallic sites, the application of said potential initiating electroplating of metal (B) on the connector area and on said neighboring metallic sites, the electroplating of metal (B) on the connector area covering the connector area with metal (B);

- (d) continuing the application of said potential until all of said neighboring metallic sites are covered with metal (B), the rate of forming metal (B) deposits on said neighboring metallic sites being greater than the electrodeposition rate of metal (B) on surfaces consisting of or formed by the species of metal (B), the greater rate of electrodeposition of metal (B) on said neighboring metallic sites continuing until all of said sites are covered with metal (B); and
- (e) continuously electroplating metal (B) on the exposed portion of said connector area and on said electroplated sites to produce an electrically conductive continuous film of metal (B) having a thickness of at least 0.5 microns.

4,683,037

### DIMENSIONALLY STABLE ANODE FOR MOLTEN SALT ELECTROWINNING AND METHOD OF ELECTROLYSIS

J. J. Duruz, Geneva, Switzerland, assignor to Eltech Systems Corporation, Boca Raton, Fla.

Filed May 16, 1986, Ser. No. 864,057

Claims priority, application European Pat. Off., May 17, 1985, 85810235.3

Int. Cl.<sup>4</sup> C25C 7/02, 3/12

U.S. Cl. 204—64 R

14 Claims

1. In an electrowinning cell having a substrate with a coating comprising an oxyfluoride of cerium providing enhanced resistivity against reducing as well as oxidizing cell environments up to temperatures of 1000° C. and higher, characterized by the coating further comprising at least one doping compound of an element selected from the group consisting of yttrium, lanthanum, praseodymium and other rare earth metals, the concentration of the doping compound(s) in the coating being less than 10 w % of the cerium constituents in the coating, the coating having a continuous coherent structure thereby providing a substantially impervious layer on the substrate.

4,683,038

### PROCESS FOR PREPARING CERIC SULPHATE

Klaus H. Oehr, Surrey, Canada, assignor to B.C. Research Council, Vancouver, Canada

Continuation-in-part of Ser. No. 199,351, Oct. 21, 1980, Pat. No. 4,313,804. This application Nov. 13, 1981, Ser. No. 321,085

The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.

Int. Cl.<sup>4</sup> C25B 1/00

U.S. Cl. 204—93

7 Claims

1. A process for preparing ceric sulphate in solution that comprises electrolyzing an at least saturated solution of cerous sulphate at an anodic current density in the range 100 to 400 mamp/cm<sup>2</sup>, a cathode current density in the range 1000 to 4,500 mamp/cm<sup>2</sup> and with vigorous agitation in the presence of dilute sulphuric acid.

4,683,039

### MEMBRANE PERVAPORATION PROCESS

Zbigniew Twardowski, Mississauga, and James D. McGilvery, Etobicoke, both of Canada, assignors to Tenneco Canada Inc. (ERCO division), Irlington, Canada

Filed Dec. 24, 1985, Ser. No. 813,078

Int. Cl.<sup>4</sup> C25B 1/26; C02F 1/44

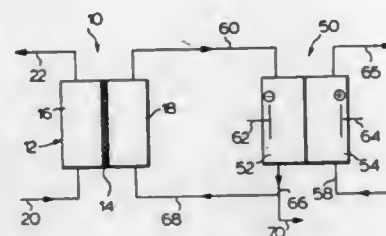
U.S. Cl. 204—95

15 Claims

1. A method for the formation of an aqueous solution of chlorine dioxide, which comprises:
- providing a donor medium comprising chlorine dioxide in a first chamber of a transfer zone having a gaseous chlorine

dioxide-permeable and aqueous medium-impermeable membrane separating said first chamber from a second chamber in said transfer zone, and

providing a recipient aqueous medium in said second chamber and passing gaseous chlorine dioxide through the



membrane by pervaporation from said first chamber to said second chamber to be dissolved in said recipient aqueous medium while said membrane prevents the passage of aqueous medium between said first chamber and said second chamber.

4,683,040

### PROCESS FOR ELECTROLYSIS OF SODIUM CHLORIDE

Maomi Seko, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 836,417, Sep. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 745,196, Nov. 26, 1976, abandoned, which is a continuation of Ser. No. 556,288, Mar., 1975, abandoned. This application Jul. 13, 1982, Ser. No. 397,783

Claims priority, application Japan, Mar. 7, 1974, 49-25718

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.<sup>4</sup> C25B 1/14

U.S. Cl. 204—98

18 Claims

1. A process for the electrolysis of an aqueous sodium chloride solution which comprises passing an electric current through said solution in an electrolytic cell separated into an anode chamber and a cathode chamber by a perfluorocarbon cation exchange membrane, while charging an aqueous sodium chloride solution which has been purified to a calcium content of less than 1 p.p.m. into the anode chamber, said membrane comprising a perfluorocarbon copolymer having pendant carboxylic acid groups, said membrane having an ion exchange capacity of carboxylic acid groups of from 0.5 to 2.1 milliequivalents per gram of dry resin.

4,683,041

### PROCESS FOR ELECTROLYSIS OF SODIUM CHLORIDE

Maomi Seko, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 836,417, Sep. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 745,196, Nov. 26, 1976, abandoned, which is a continuation of Ser. No. 556,288, Mar. 7, 1975, abandoned. This application Jul. 13, 1982, Ser. No. 397,785

Claims priority, application Japan, Mar. 7, 1974, 49-25718

The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.

Int. Cl.<sup>4</sup> C25B 1/14

U.S. Cl. 204—98

65 Claims

1. A process for the electrolysis of an aqueous sodium chloride solution which comprises passing an electric current through said solution in an electrolytic cell separated into an anode chamber and a cathode chamber by a cation exchange membrane consisting essentially of perfluorocarbon polymer having pendant carboxylic acid and sulfonic acid groups, said membrane having an ion exchange capacity of sulfonic and

carboxylic acid groups of from 0.5 to 4.0 milliequivalents per gram of dry resin, the ion exchange capacity of the carboxylic acid groups being from 0.05 to 1.5 milliequivalents per gram of dry resin.

4,683,042

### METHOD AND APPARATUS FOR CONTINUOUS ANNULAR ELECTROCHROMATOGRAPHY

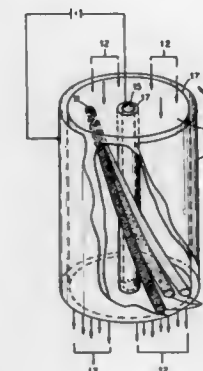
Charles D. Scott, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 29, 1986, Ser. No. 857,228

Int. Cl.<sup>4</sup> G01N 27/26, 27/28

U.S. Cl. 204—180.1

16 Claims



1. A method for separation of solutes in an aqueous sample, comprising the steps of:

(a) imposing an electrical potential gradient radially through a rotatable annulus comprised of an adsorbent material, said annulus having a first and a second end; then

(b) introducing, at a predetermined point at said first end of said annulus, a fluid sample comprising at least one separable constituent while continuously rotating said annulus, such that said predetermined point is stationary relative to the rotating annulus; and thereafter

(c) eluting said sample from said second end of said annulus such that said constituent is collected at said second end at a radial position  $r$  which is determined as a function of  $r_f$ ,  $\theta$ ,  $V_e$  and  $\omega$ , where

$\theta$ =angular displacement of said constituent in said annulus;

$r_f$ =distance of said predetermined point from the center of said annulus;

$V_e$ =electrophoretic mobility of said constituent in said adsorbent material; and

$\omega$ =rotational speed of said annulus.

4,683,043

### CUBIC BORON NITRIDE PREPARATION

Carl W. Melton; Dale G. Thompson; Larry F. Vassamillet, and Charles E. Wickersham, all of Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 21, 1986, Ser. No. 820,863

Int. Cl.<sup>4</sup> C23C 14/34

U.S. Cl. 204—192.15

8 Claims

1. A method for deposition of cubic boron nitride on a substrate, which method comprises the steps of:

(a) supporting a substrate on an rf biased electrode in a near vacuum at a base pressure below approximately  $30 \times 10^{-6}$  torr whereby oxygen levels in deposited coatings are restricted to below 20 atomic percent,

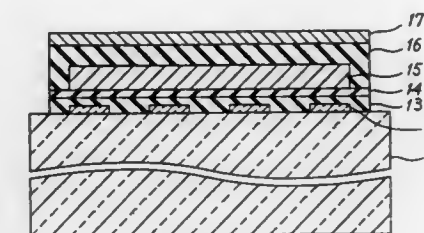
(b) heating the substrate to at least 130° C.,

(c) introducing a noble gas to a partial pressure not exceeding  $20 \times 10^{-3}$  torr,

(d) introducing nitrogen to a partial pressure not exceeding  $5 \times 10^{-3}$  torr,

(e) cathodically sputtering a BN source,

(f) during cathodic sputtering of the BN source, cathodically sputtering a metal dopant source consisting of a metal



selected from Groups IA, IVA, VA, VIIA, IB, IIB, IIIB, IVB, and VB of the periodic table such that dopant is deposited at less than 1.5 atomic percent, whereby a cubic boron nitride coating is deposited on the substrate.

4,683,044

### METHOD OF MANUFACTURING AN ELECTROLUMINESCENT PANEL WITHOUT ANY ADVERSE INFLUENCE ON AN UNDERLYING LAYER

Yasumoto Shimizu, and Takeo Matsudaira, both of Tokyo, Japan, assignors to 501 Hoya Corporation, Tokyo, Japan

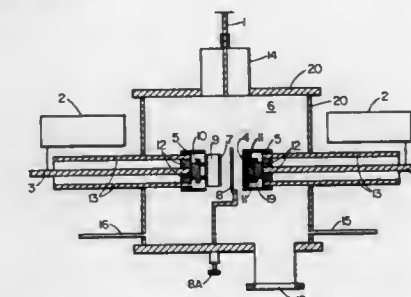
Filed Jun. 26, 1986, Ser. No. 879,050

Claims priority, application Japan, Jun. 26, 1985, 60-139894; Jun. 26, 1985, 60-140780

Int. Cl.<sup>4</sup> C23C 14/00

U.S. Cl. 204—192.26

9 Claims



1. A method of manufacturing an electroluminescent panel which comprises a transparent substrate, a transparent electrode member on said transparent substrate, a back electrode member opposite to said transparent electrode member, an electroluminescent layer between said transparent electrode member and said back electrode member, a first dielectric layer between said transparent electrode member and said electroluminescent layer, and a second dielectric layer between said electroluminescent layer and said back electrode member, preselected at least one of said first and said second dielectric layers being divisible into a first partial dielectric film near to said transparent electrode layer and a second partial dielectric film further from said transparent electrode layer than said first partial dielectric film, the method comprising the steps of:

preparing a pellet of a composition which essentially consists of silicon and oxygen;

depositing said first partial dielectric film in a nonoxidization atmosphere by the use of said pellet; and

depositing said second partial dielectric film on said first partial dielectric film to form said preselected one of the first and the second dielectric layers.



4,683,045

## PARTIAL PLATING DEVICE

Yasuto Murata; Janichi Tezuka, both of Kanagawa, and Kenji Yamamoto, Tokyo, all of Japan, assignors to Electroplating Engineers of Japan, Limited, Tokyo, Japan

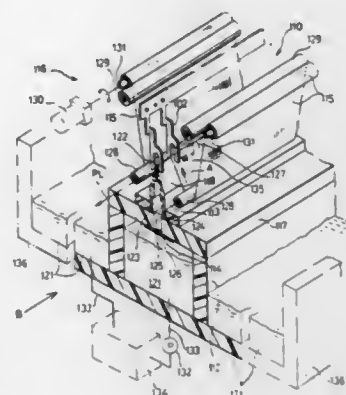
Filed Oct. 29, 1986, Ser. No. 924,657

Claims priority, application Japan, Dec. 16, 1985, 60-281217

Int. Cl.<sup>4</sup> C25D 17/00

U.S. Cl. 204—206

4 Claims



1. In plating devices for electroplating minute portions of plural connector terminals, 102 which are formed as a fork each on a continuous band-like member and each of which having a pair of target portions 104 to be plated that are opposing to each other by positioning a plating solution supply section located along the pass-line of the target portions and interposed therebetween and moving the connector terminals in contact with or in the vicinity of the plating solution supply section, a plating device characterized in that said plating solution supply section 111 includes a support member 113 which is shaped substantially like an arrowhead at its top portion 119 with slanted guide planes on both sides, has an opening 122 for allowing the plating solution to seep out at the tip 120 of the top portion and a passage 123 communicating with said opening for supplying the plating solution; an anode 126 which is disposed in or near the passage of the support; a net member 115 which covers the top portion of the support at its tip as well as the surface in the vicinity, can be wound up in the direction intersecting the pass-line and forms a plating solution supply section 127 at a location corresponding to said pass-line; and a winding means 116 which comprises guide rollers 128 for imparting tension to the net member so that the member comes in close contact with the top portion of the support at its tip as well as the surface in the vicinity and drive rollers 131 which wind up and pay out the net member freely.

4,683,046

## REDUCTION POT FOR THE PRODUCTION OF ALUMINUM

Wilhelm Scharpey, Essen, Fed. Rep. of Germany, and Rudolf Pawlek, Sierre, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 17, 1986, Ser. No. 840,594

Claims priority, application Switzerland, Mar. 22, 1985, 1275/85

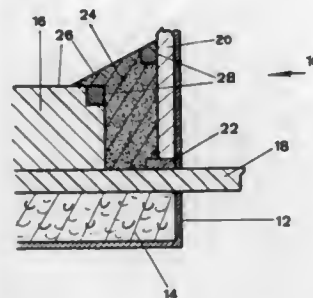
Int. Cl.<sup>4</sup> C25C 3/08

U.S. Cl. 204—243 R

6 Claims

1. An aluminum reduction cell having an outer steel shell, thermal and electrical insulation, and an inner lining comprising at least a floor formed of a plurality of carbon blocks and sidewalls, the improvement which comprises a gap sealant at least in the region of the transition between the carbon blocks of the floor and the floor and sidewalls so as to prohibit penetration of the contents of the reduction cell into the inner lining

of the reduction cell, the gap sealant comprises a pourable material characterized by a melting point of greater than 1000°



C., a density of greater than 2.7 g/cm<sup>3</sup> and a high degree of resistance to molten electrolyte and molten aluminum.

4,683,047

## BUSBAR ARRANGEMENT FOR ALUMINIUM ELECTROLYTIC CELLS

Richard F. Bolvin, Quebec; Jean-Paul R. Hani, and Vinko Potocnik, both of Jonquiere, all of Canada, assignors to Alcan International Limited, Montreal, Canada

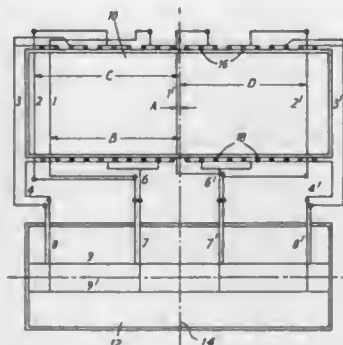
Filed Dec. 27, 1985, Ser. No. 814,207

Claims priority, application European Pat. Off., Dec. 28, 1984, 84309126.5

Int. Cl.<sup>4</sup> C25C 3/08, 3/16

U.S. Cl. 204—243 M

9 Claims



1. An asymmetric arrangement of busbars for conducting the electric current from collector bars spaced longitudinally of an aluminum electrolytic reduction cell, which cell is arranged transversely in a row of cells and in which cell a magnetic field is induced by one or more neighbouring rows of cells including a magnetically dominating row, to an anode beam of the next downstream cell, at least part of the current from upstream collector bar ends being carried by busbars extending underneath the cell to the downstream side thereof and any remaining current from the upstream collector bar ends being carried by busbars extending round the ends of the cell to the downstream side thereof,

wherein the busbars extending underneath the cell are arranged asymmetrically in relation to the transverse axis of the cell, at least one of such busbars being displaced longitudinally of the cell towards the end of the cell facing the magnetically dominating row, the extent of such displacement being such as to counteract the magnetic field induced in the cell by the neighbouring row or rows of cells.

4,683,048

## METHOD OF MANUFACTURING ION SELECTIVE ELECTRODE PAIR

Sadao Yamada; Takeshi Takayama; Osamu Seshimoto, and Akira Yamaguchi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

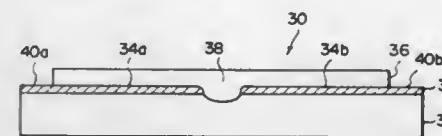
Filed May 16, 1985, Ser. No. 734,974

Claims priority, application Japan, May 18, 1984, 59-100317

Int. Cl.<sup>4</sup> G01N 27/46

U.S. Cl. 204—416

9 Claims



1. A method of manufacturing an ion selective electrode pair comprising the steps of:

forming a conductive layer on an insulating base; dividing said conductive layer into at least two portions electrically isolated from each other by simultaneously cutting and removing at least a part of the material of the conductive layer with a cutting tool selected from the group consisting of a slotter tool bit, a fluting tool bit and a cutting-off cutter to form a groove; and then forming an ion selective layer on said conductive layer.

4,683,049

## OXYGEN SENSOR ASSEMBLY

Toyohi Nakajima, Shiki, and Toshiyuki Mieno, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

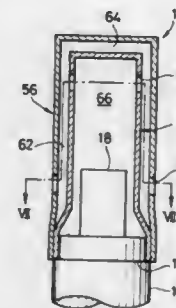
Filed Dec. 9, 1985, Ser. No. 806,469

Claims priority, application Japan, Jan. 26, 1985, 60-9827[U]

Int. Cl.<sup>4</sup> G01N 27/46

U.S. Cl. 204—428

2 Claims



1. An oxygen sensor comprising:

(1) an oxygen sensing unit sensitive to oxygen in an oxygen-containing gas and operative to produce an output signal having a magnitude proportional to the concentration of oxygen in the oxygen-containing gas when contacted by a stream of the gas and having a sensor cell element made of a first active plate of an oxygen-ion conductive solid electrolyte and a first pair of electrodes sandwiching said active plate, a pump cell element made of a second active plate of an oxygen-ion conductive solid electrolyte and a second pair of electrodes sandwiching said active plate, said first and second active plates confronting a restricted region into which said oxygen-containing gas is introduced and means for applying a pump voltage across said second pair of electrodes to obtain an electric signal having a magnitude related to said first pair of electrodes, said signal being said output signal, and

(2) a dual-shell housing structure having a longitudinal direction and comprising an outer shell and inner shell enclosed within the outer shell and spaced inwardly from

4,683,050

## MILD HYDROCRACKING WITH A CATALYST CONTAINING AN INTERMEDIATE PORE MOLECULAR SIEVE

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 711,452, Mar. 13, 1985, and a continuation-in-part of Ser. No. 715,510, Mar. 22, 1985, Pat. No. 4,600,493, each is a continuation-in-part of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271, and a

continuation-in-part of Ser. No. 699,919, Feb. 8, 1985, Pat. No. 4,610,973, which is a continuation of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271. This application Aug. 22, 1985, Ser. No. 768,487

Int. Cl.<sup>4</sup> C10G 47/12, 47/20

U.S. Cl. 208—110

32 Claims

1. A process for mild hydrocracking a hydrocarbon feedstock comprising contacting said feedstock containing feed components boiling above 700° F. under conditions of elevated temperature and pressure less than about 1,500 p.s.i.g. with a particulate catalyst comprising at least one active hydrogenation metal component selected from the group consisting of Group VIB and Group VIII metals in combination with (1) a dispersion of silica-alumina in a matrix consisting essentially of alumina and (2) a crystalline intermediate pore molecular sieve comprising a silicoaluminophosphate having a pore size between about 5 and 7 angstroms, said conditions yielding about a 10 to about a 50 volume percent conversion of said feed components boiling above 700° F. to product components boiling at or below 700° F.

25. A process for mild hydrocracking a hydrocarbon feedstock comprising said feedstock containing feed components boiling above 700° F. under conditions of elevated temperature and pressure less than about 1,500 p.s.i.g. with a particulate catalyst comprising at least one active hydrogenation metal component selected from the Group consisting of Group VIB and Group VIII metals in combination with (1) a dispersion of silica-alumina in a matrix consisting essentially of alumina and (2) an intermediate pore molecular sieve comprising a crystalline silica having a pore size between about 5 and 7 angstroms, said conditions yielding about a 10 to a 50 volume percent conversion of said feed components boiling above 700° F. to product components boiling at or below 700° F.

4,683,051

# CATALYTIC CONVERSION WITH BORON TRIFLUORIDE TREATED ZEOLITE

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 787,943, Oct. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 701,313, Feb. 13, 1985, Pat. No. 4,567,310, which is a continuation-in-part of Ser. No. 526,764, Aug. 26, 1983, abandoned, which is a continuation of Ser. No. 355,419, Mar. 8, 1982, abandoned. This application May 6, 1986, Ser. No. 860,362

Int. Cl.<sup>4</sup> C10G 11/05, 45/64, 47/20

U.S. Cl. 208—111

9 Claims

1. A process for dewaxing feedstock comprising hydrocarbon compounds to dewaxed conversion product which comprises contacting said feedstock with a catalyst composition comprising a crystalline zeolite having been modified by the method comprising contacting said zeolite having a silica-to-alumina mole ratio of from about 30 to about 300 and a Constraint Index of from about 1 to about 12 with gaseous boron trifluoride in the absence of alumina-containing binder and under a combination of conditions of temperature, contact time and pressure, said combination of conditions being effective to reduce the activity of the zeolite for cracking normal hexane as measured by the alpha test conducted at 538° C.

4,683,052

# METHOD FOR NON-OXIDATIVE HYDROGEN REACTIVATION OF ZEOLITE DEWAXING CATALYSTS

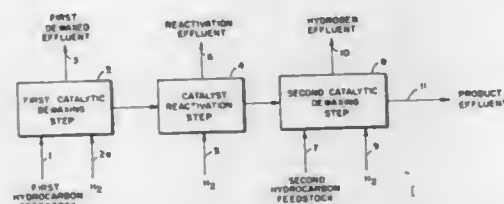
Thomas F. Degnan, Jr., Yardley, Pa., and George R. Landolt, Audubon, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 743,463, Jun. 11, 1985, abandoned. This application Jan. 9, 1986, Ser. No. 817,372

Int. Cl.<sup>4</sup> B01J 29/38, 38/10; C10G 45/62, 45/64

U.S. Cl. 208—111

19 Claims



1. A method for non-oxidatively hydrogen reactivating a coked dewaxing catalyst comprising palladium, an inorganic oxide binder and a zeolite component having a constraint index ranging from about 1 to 12 and a silica to alumina molar ratio of at least about 12, which method comprises contacting said coked dewaxing catalyst with hydrogen at a hydrogen pressure less than about 7000 kPa (1000 psig), whereby maximum rate of coke removal from the catalyst is effected at less than 500° C.

4,683,053

# HEMODIALYSIS DEVICE

Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,808

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416955

Int. Cl.<sup>4</sup> B01D 13/00

U.S. Cl. 210—86

7 Claims

1. A hemodialysis apparatus comprising: a dialyzer having a membrane, a first chamber, and a second chamber separated from said first chamber by said membrane, said first chamber for coupling into a dialyzing

liquid path, and said second chamber for coupling into a blood path;

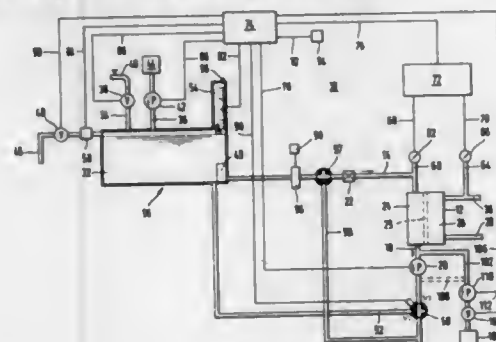
a dialyzing liquid source;

a suction pump disposed in the dialyzing liquid path downstream from the dialyzer for controlling transmembrane pressure in the dialyzer;

a restrictor means disposed in the dialyzing liquid path upstream of the dialyzer;

a changeover valve having a first outlet, a second outlet, and an inlet coupled to receive dialyzing liquid downstream from said suction pump;

a discharge port coupled to said first outlet;



volume-measuring means for measuring volume of ultrafiltrate liquid;

means for determining the transmembrane pressure in the dialyzer;

control means, said control means being coupled at least to the transmembrane pressure determining means for controlling the suction pump in response to transmembrane pressure; and

a return line coupled to said second outlet of said first changeover valve and connected to the dialyzing liquid source for returning the dialyzing liquid to the dialyzing liquid source in a closed circuit.

4,683,054

# APPLIANCE FOR PURIFYING WATER

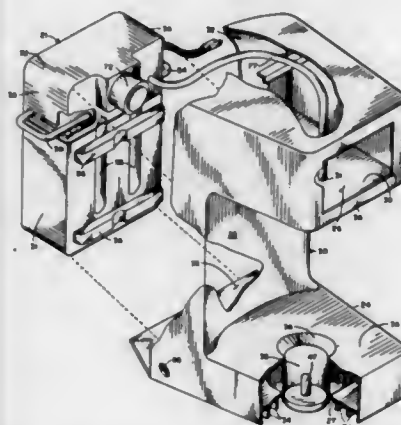
William E. Turnbull, 1920 Canyon Dr., Coeur d'Alene, Id. 83814

Filed Jun. 23, 1986, Ser. No. 877,497

Int. Cl.<sup>4</sup> C02F 9/00

U.S. Cl. 210—91

7 Claims



1. A portable self-contained purifying appliance for potable water comprising, in combination:

a body having an elongate horizontal lower arm for support on a supporting surface with a vertical portion extending upwardly from one end thereof to support an upper arm extending perpendicularly to the upright and over the

lower arm at a spaced distance thereabove, said body having

means in the lower arm to carry a container support, a chamber defined in the upright portion to releasably receive a purification cartridge, and water input means to input water to a purification cartridge, including solenoid valve means to regulate the flow of input water;

a container support carrying a water container, said support having a medial depending support cylinder slidably carried for vertical motion within a channel defined in the lower arm, said container support being biased to an upper position and having a three position sensitive switch to sense the conditions of no container being supported, an unfilled container being supported, and a filled container being supported;

a purification cartridge releasably carried within the purification cartridge chamber defined in the body upright, said purification cartridge defining three adjacent, sequentially intercommunicating chambers, the said first chamber carrying a mechanical filter and a particulated carbon filter, the second chamber carrying an osmotic filter and the third chamber carrying a particulated carbon filter, and having means to pass water from the third cylinder to the container carried by the body structure; and means of removing saline water from the unfiltered side of the osmotic filter carried in said second chamber; and

associated electrical control circuitry to open the solenoid valve of the water input means only when a water container be in supported position on the container support and be not full, timing circuitry to determine the lapse of time of operation of the solenoid valve of the water input means and annunciate passage of a predetermined time, and circuitry to sense and annunciate the electric resistivity of water in the appliance to determine operational efficiency of the device.

4,683,055

# FILTER FOR DIESEL FUEL

Franz-Ulrich Bosch, Stuttgart; Willi Müller, Sulz-Sigmarswangen; Hans Schacht, and Max Straubel, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

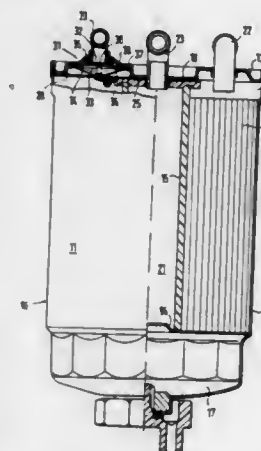
Filed Apr. 30, 1985, Ser. No. 728,850

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3422979

Int. Cl.<sup>4</sup> B01D 27/08, 35/00

U.S. Cl. 210—120

9 Claims



1. A conduit filter for diesel fuel to be mounted between a diesel fuel tank and a diesel fuel injection pump and comprising a housing accommodating a filter element; a first connection means and a second connection means, said first connection means being a feeding connection to the tank and said second

4,683,056

# COLD TRAP APPARATUS

John Humphries, and Neil S. Morrison, both of Thurso, Scotland, assignors to United Kingdom Atomic Energy Authority, London, England

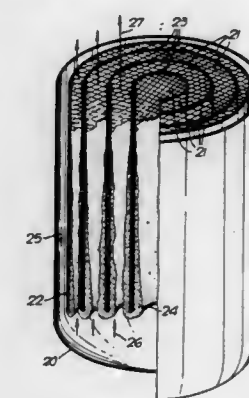
Filed Sep. 10, 1984, Ser. No. 648,934

Claims priority, application United Kingdom, Sep. 28, 1983, 8325936

Int. Cl.<sup>4</sup> B01D 8/00

U.S. Cl. 210—186

9 Claims



1. Cold trap apparatus for the purification of liquid metals, comprising a vessel through which liquid metal passes from an inlet to an outlet and which is subject to external cooling, in which the vessel includes means additional to the vessel for presenting extended surfaces across which the liquid metal is caused to flow in passing from the inlet to the outlet and in which impurities are precipitated, said additional means permitting flow from the inlet to the outlet without passing through filter means, in which said extended surfaces are presented by plural tubular enclosures open-ended at least at their



bottom ends along the surfaces of which the liquid metal flows, and in which said enclosures are nested within one another so as to provide annular gaps through which the liquid metal flows.

4,683,057

## REFILLABLE FILTER-DRIER ASSEMBLY

Richard J. Krause, Addison; Zbigniew H. Gugala, Elmhurst, and Madhukant A. Shah, Wheaton, all of Ill., assignors to Henry Valve Company, Melrose Park, Ill.

Filed Mar. 8, 1985, Ser. No. 710,010  
Int. Cl.<sup>4</sup> B01D 25/02

U.S. Cl. 210—232

6 Claims



2. In a refillable filter-drier assembly for use in treating a refrigerant including an outer sleeve-like casing having end closures at least one of which is removable and one of said end closures having a liquid outlet nipple and said casing having a liquid inlet nipple adjacent the end thereof remote from said liquid outlet nipple and,

a replaceable core with a central bore comprised of at least one section and substantially coaxially disposed within said outer casing, said core being sufficiently smaller than the interior of said casing so as to provide an annular or sleeve-like liquid-receiving space therebetween, one end of said core being the end from which treated liquid discharges through said central bore and being axially supported adjacent said casing end closure having said outlet nipple and the opposite end of said core being axially supported adjacent the other of said end closures;

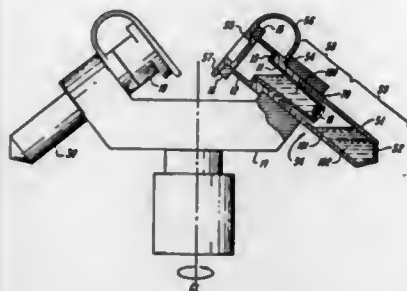
the combination with the foregoing of an annular end cage which fits over said one end of said core and which carries a filter screen which projects into the bore of said core, said annular end cage having a first plurality of laterally extending spacer lugs and a first plurality of core exterior gripping fingers projecting therefrom with the distal ends thereof having a second plurality of laterally extending spacer lugs, said first and second pluralities of spacer lugs serving to support the associated end of said core coaxially disposed in said outer casing; and an end closure cage fitting on said opposite end of said core and having a disc which fits against said opposite end of said core and closes the bore therein and having a second plurality of core exterior gripping fingers projecting from said disc, said disc having a third plurality of laterally extending spacer lugs and the distal ends of said second plurality of core exterior gripping fingers having a fourth plurality of laterally extending spacer lugs, said third and fourth pluralities of lugs serving to support the associated end of said core coaxially disposed in said outer casing.

4,683,058  
FILTER FOR CENTRIFUGE TUBE  
George F. Lyman, Cape Porpoise, Me., and Gregory Mathus, Concord, Mass., assignors to Costar Corporation, Cambridge, Mass.

Filed Mar. 20, 1986, Ser. No. 841,583  
Int. Cl.<sup>4</sup> B01D 21/36, 33/00

U.S. Cl. 210—359

14 Claims



1. A filter assembly for filtering materials by means of centrifugal force, said assembly comprising:

a centrifuge tube comprising a cylindrical tube of a first length which is closed at a lower end and open at an upper end and including an upper portion adjacent the upper end and a lower portion adjacent the lower end, the centrifuge tube further including a flexible connecting member of a predetermined length and a cap, the connecting member being attached at one end to the centrifuge tube and at the other end to the cap;

a cylindrical filter tube of a second length less than the first length adapted to be fit in axial alignment within the upper portion of the centrifuge tube and to seal the open upper end of the centrifuge tube, the filter having an opening at its upper end;

the filter tube including a means for positioning the filter tube in a predetermined position within the upper portion of the centrifuge tube;

the connecting member being adapted to secure the filter tube in the predetermined position in the centrifuge tube while the cap seals the opening at the upper end of the filter tube; and

means for separating a predetermined amount of a mixture of permeable and nonpermeable materials placed in the filter tube when the composite assembly is spun in a centrifuge such that the nonpermeable materials are retained in the filter tube and the permeable materials which pass through the filter means are collected in the lower portion of the centrifuge tube including, filter means disposed at the lower end of the filter tube for separating permeable materials from nonpermeable material.

4,683,059  
VACUUM BREAKER VALVE-DISCHARGE ELBOW ASSEMBLY FOR ROTARY DRUM FILTERS  
Richard W. LaValley, Vancouver, Wash., assignor to LaValley Industrial Plastics, Inc., Vancouver, Wash.

Filed May 24, 1985, Ser. No. 737,824

The portion of the term of this patent subsequent to Aug. 26, 2003, has been disclaimed.

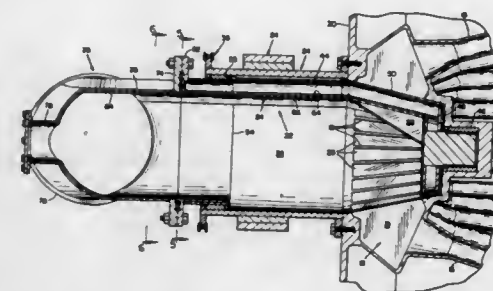
Int. Cl.<sup>4</sup> B01D 33/06

U.S. Cl. 210—404

30 Claims

1. In a rotary drum filter of the type in which internal drainage pipes deliver filtrate from filtrate channels at the drum surface to chambers of an axial valve housing at one end of the drum, with the chambers of the valve housing delivering the filtrate into a stationary valve-discharge elbow assembly for discharge from the drum, all under the influence of suction applied from a remote source of subatmospheric pressure through said discharge elbow, said valve-discharge elbow assembly comprising:

a valve member including an inlet end for insertion within the valve housing of a rotary drum filter and an outlet end, the valve member defining with rotary portions of the drum a filtrate flow passage,  
a discharge elbow including an inlet end connected to the outlet end of said valve member and an outlet end, the discharge elbow defining a continuation of said filtrate flow passage, said continuation curving smoothly from the inlet end to the outlet end of the elbow,  
the inlet end of the valve member including a valve end plug and a valve closure segment extending rearwardly of said plug for overlying a portion of the chambers of a valve



housing at any given time to block such portion from a source of subatmospheric pressure;  
the outlet end of the valve member including an annular outlet portion connected to the discharge elbow and spaced from the valve segment,  
and an extension segment extending rearwardly from the valve segment and interconnecting said valve segment and said annular outlet portion, whereby the cross sectional shape of the filtrate flow passage throughout at least a substantial portion of the length of the valve member is determined by said valve segment and said extension segment.

4,683,060

## MULTIPLE-DISC TYPE FILTERS

Mordeki Drori, 89 Zahal Street, Kiron, Israel

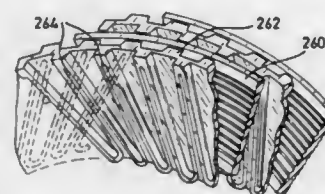
Filed Mar. 7, 1985, Ser. No. 709,372

Claims priority, application Israel, Dec. 24, 1984, 73923

Int. Cl.<sup>4</sup> B01D 29/46

U.S. Cl. 210—448

24 Claims



1. A filter including a housing having an inlet connectable to an upstream pipe, and an outlet connectable to a downstream pipe; and a stack of discs disposed within said housing for separating solid particles from a fluid flowing between said discs from the upstream side of said stack to the downstream side thereof; characterized in that said stack includes:

a plurality of co-operating filter elements defining a plurality of paired co-operating filter surfaces, including a plurality of filter discs each defining a large surface area formed with circumferentially directed grooves and a spacer disc interposed between each pair of adjacent filter discs, each spacer being structurally reinforced by periodically spaced generally radially extending lands formed in sinusoidal configuration on opposite sides thereof with oppositely tilted directions, said radial lands on a side of said

spacer disc having radial grooves formed therein and contacting only a portion of said large surface area of said filter disc and leaving the portions of the large surface area on the upstream side of the stack between radial lands not contacted thereby, said radial grooves being repeatedly traversed by said circumferentially directed grooves at the areas at which said filter discs and spacer discs contact, thereby to form:

(a) compartments on the upstream side of the stack for accumulation of solid particles; and  
(b) edge filtering passageways extending along the circumferentially directed grooves in contact with said spacer discs, which passageways define the minimum size of particles separated by the filter and extend from said compartments to the downstream side of the stack.

4,683,061

## OUTLET FOR CYCLONE SEPARATORS

Noel Carroll, Sherbrooke Road, Sherbrooke 3789, Victoria, Australia

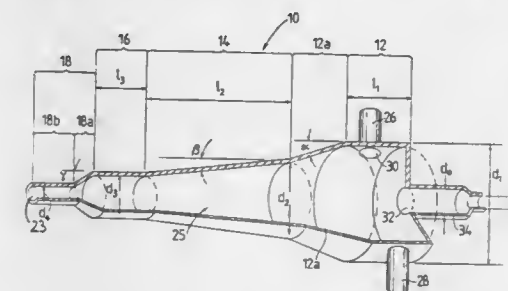
Continuation of Ser. No. 750,605, filed as PCT AU84/00164, Aug. 29, 1984, published as WO85/00990, Mar. 14, 1985, abandoned.

This application Dec. 17, 1986, Ser. No. 943,628

Int. Cl.<sup>4</sup> B04C 5/081

U.S. Cl. 210—512.1

9 Claims



1. A cyclone separator comprising elements designed, sized and arranged for treating a mixture for separating a more dense liquid component from a less dense liquid component thereof, said separator having a separating chamber with first, second and third contiguous cylindrical portions arranged in that order, the first cylindrical portion being of greater diameter than the second cylindrical portion and the third cylindrical portion being of lesser diameter than the second cylindrical portion, the second cylindrical portion being of a length which is at least ten times its diameter adjacent the first cylindrical portion, the first cylindrical portion having an overflow outlet at the end thereof opposite to said second cylindrical portion and at least one tangentially directed feed inlet and an underflow outlet at the end of said separating chamber remote from said first cylindrical portion; wherein said overflow outlet has a diameter  $d_0$ , adjacent the separating chamber, in the range  $0.0035 < d_0/d_1 < 1$  where  $d_1$  is the diameter of the first cylindrical portion, said overflow outlet presenting a stepped bore with a first bore portion adjacent the first cylindrical portion being of greater diameter than a second bore portion thereof further from the first cylindrical portion wherein said stepped bore is characterized by the provision of a passageway extending sideways from the said first bore portion to the exterior of the separator, and including valve means selectively operable to permit flow from said passageway, said passageway facilitating clearing of blockages in the overflow outlet by supply of high pressure fluid therethrough.

4,683,062

# METHOD OF CIRCULATION OF A LIQUID PHASE THROUGH A SOLID PHASE PARTICULARLY FOR BIOCATALYTICAL REACTIONS AND A DEVICE FOR REALIZATION THEREOF

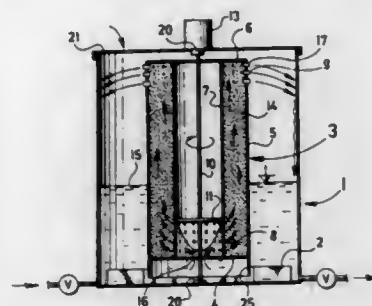
Premysl Krovak; Vladimir Behunek; Vladimir Vojtisek; Miroslav Salvet, and Pavel Hasal, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Czechoslovakia  
Filed Dec. 2, 1985, Ser. No. 803,815

Claims priority, application Czechoslovakia, Nov. 30, 1984, 9235-84; Jan. 23, 1985, 449-85

Int. Cl.<sup>4</sup> C02F 3/06; C12M 1/16, 1/18

U.S. Cl. 210-617

5 Claims



1. A method for the circulation of a liquid phase through a solid phase, comprising: rotating a part of the liquid phase so that centrifugal forces induce the rotating fluid to form at least a part of a rotating vertical liquid spindle, the spindle having an upper part, a lower part, and a central core, the central core of said spindle having the shape of at least a part of a liquid surface paraboloid, continuously supplying the lower part of said vertical liquid spindle with circulating liquid phase as a result of suction exerted by the rotating spindle, allowing said liquid phase to ascend along an upward-directed trajectory created inside the spindle to the upper part of said spindle, and allowing said liquid phase while ascending to also pass through a solid phase which is located along the upward-directed trajectory created inside said spindle, and allowing the liquid phase, after reaching the upper part of said spindle, to be drawn back into the liquid phase.

4,683,063

# METHOD FOR CARRYING OUT EXTRACTIONS IN SUBTERRANEAN WELL

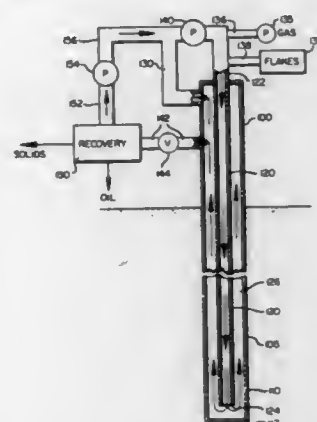
Wayne K. Rice, Wanatah, Ind., assignor to Vitamins, Inc., Chicago, Ill.

Filed May 8, 1985, Ser. No. 732,362

Int. Cl.<sup>4</sup> C02F 11/02

U.S. Cl. 210-634

8 Claims



1. A method of carrying out a high pressure extraction

wherein the extracting solvent is a liquefiable fluid which comprises:

- charging a subterranean well with said fluid;
- circulating said fluid through said well;
- injecting a material to be extracted into said fluid circulating through said well, said material containing a soluble substance to be extracted;
- carrying said material to be extracted downwardly into said well for a distance sufficient to create a static pressure head and to elevate the total pressure to at least about 2,000 psi, and cause increased solubility of said soluble substance in said material to be extracted in said fluid;
- carrying the resulting extracted residue and resulting extract upwardly in said solvent fluid; and
- recovering said extracted residue and said extract from said well.

4,683,064

# PROCESS FOR DECREASING THE NITRATE CONTENT IN WATER

Rolf O. Hallberg, Skolvägen 11A, S-13500 Tyresö, and Rudolf H. Martinell, Rågvägen 4A, S-18365 Täby, both of Sweden

PCT No. PCT/SE84/00432, § 371 Date Jul. 9, 1985, § 102(e)

Date Jul. 9, 1985, PCT Pub. No. WO85/03067, PCT Pub. Date Jul. 18, 1985

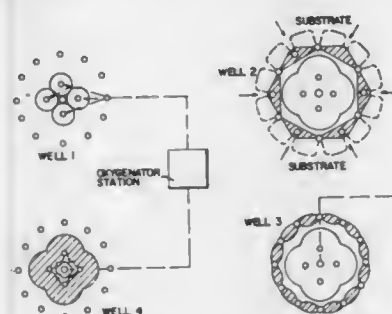
PCT Filed Dec. 17, 1984, Ser. No. 756,972

Claims priority, application Sweden, Jan. 16, 1984, 8400190

Int. Cl.<sup>4</sup> C02F 1/72

U.S. Cl. 210-605

2 Claims



1. In a process for decreasing the content of nitrate in ground water, which ground water can include infiltrated surface water, or surface water flowing through an aquifer or basin containing filter material, wherein treatment water containing denitrification organisms and/or substrate for such organisms is introduced intermittently through a number of injection wells or injection pipes arranged around an extraction well or extraction pipe for extracting purified water, the improvement which comprises, feeding said treatment water to some of the injection wells or injection pipes, while simultaneously drawing water from the remaining injection wells or injection pipes for the purpose of creating between the injection wells or injection pipes an annular denitrification zone spaced from the extraction well or extraction pipe, passing ground water through said denitrification zone and withdrawing said purified water from said extraction well or pipe.

4,683,065

# METHOD FOR REDUCTION OF COD IN WATER

Morris Sheikh, 803 Canterbury Crescent, Bloomfield Hills, Mich. 48013

Filed Jun. 18, 1985, Ser. No. 746,041

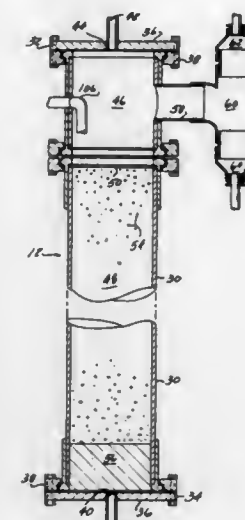
Int. Cl.<sup>4</sup> C02F 1/72

U.S. Cl. 210-668

29 Claims

1. A method for reducing chemical oxygen demand (COD) levels in water containing chemical contaminants comprising the steps of:

- (a) adding at least one oxygen source to the water;
- (b) contacting the water with a first catalyst consisting of activated alumina;
- (c) contacting the water from (b) with a catalyst selected from the group consisting of Group VIIIIB metals, Group IB metals or mixtures thereof;



- (d) reacting the chemical contaminants entrained in the water with the oxygen source in the presence of the first and second catalysts; and, then
- (e) contacting the water with an adsorptive material to adsorb any chemical contaminants which remain in the water.

4,683,066

# ANIONIC FLOCCULANT FOR DEWATERING STEEL MILL SLUDGES

Gerard R. Rose, Park Ridge; Ralph W. Kaesler, Schaumburg, and Dodd W. Fong, Naperville, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jul. 11, 1986, Ser. No. 884,833

Int. Cl.<sup>4</sup> C02F 1/56

U.S. Cl. 210-734

3 Claims

1. A method of dewatering BOF aqueous scrubbing sludges which contain large amounts of finely divided iron oxides which comprises treating these sludges with a dewatering amount of an acrylamide acrylic acid, N-substituted lower alkyl acrylamide sulfonate terpolymer which contains from 35-80 mole percent of acrylamide, from 10-60 mole percent of acrylic acid and from 1-30 mole percent of the N-substituted lower alkyl acrylamide sulfonate the lower alkyl portion of which contains from 1-6 carbon atoms, which terpolymer has a reduced specific viscosity (RSV) of at least 25, and dewatering said sludges.

4,683,067

# METHOD AND APPARATUS FOR CLEANING TOWER BASINS

Javier Aleman, 1146 Fourth St., Stone Mountain, Ga. 30083, and Kevin B. McBurney, 1470 Ashbrook Dr., Lawrenceville, Ga. 30245

Filed Aug. 30, 1985, Ser. No. 771,276

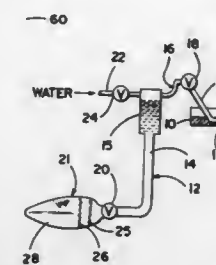
Int. Cl.<sup>4</sup> B01D 35/16, 35/28, 36/04

U.S. Cl. 210-767

12 Claims

10. A method for cleaning the basin of a cooling tower having debris-containing sludge on the bottom of said basin, while cooling water is flowing into and out of said basin, said method including the steps of: placing a cleaning tool in said tower basin with the end of said cleaning tool beneath the level of the water in said basin; establishing a siphon to provide

continuous suction on said cleaning tool, wherein said step of establishing a siphon includes the steps of filling with water to a point above the level of said water in said basin a reservoir disposed above the level of said water in said basin and a pipe means extending from said reservoir to a lower level below the level of said water in said basin, connecting said cleaning tool to a hose connected to said reservoir at a high level above said



level of water in said basin, and allowing the water to flow by gravity from said pipe means from a low level below said basin; moving said cleaning tool about said basin for utilizing said siphon to pick up and to remove said sludge from said tower basin by sucking in said sludge and some water from said basin without causing a substantial disturbance of said water; and continually replenishing the water in the basin.

4,683,068

# FRACTURING OF SUBTERRANEAN FORMATIONS

Clare H. Kucera, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Continuation of Ser. No. 316,186, Oct. 29, 1981, abandoned.

This application Oct. 20, 1984, Ser. No. 683,974

Int. Cl.<sup>4</sup> C09K 3/00; E21B 43/26, 43/16

U.S. Cl. 252-8.551

22 Claims

2. In the process for fracturing a subterranean formation penetrated by a wellbore which comprises introducing a hydraulic fracturing fluid into said formation at a flow rate and pressure sufficient to create, reopen and/or extend a fracture in said formation, the improvement comprising using an aqueous crosslinked gel as the hydraulic fracturing fluid which comprises an aqueous solvatable polysaccharide a plurality of vicinal hydroxy groups oriented sterically in a cis configuration and a molecular weight of at least about 100,000, and a crosslinking amount of a crosslinker composition consisting essentially of

- (a) a product produced by reacting by contacting
    - (i) a zirconium alkoxide corresponding to the formula  $Zr(OR)_4$  wherein each R independently is an alkyl group of from 1 to about 4 carbon atoms or an inertly-substituted such alkyl group, with
    - (ii) an alkanolamine corresponding to the formula  $R'-N(C-H_2-CH(OH)-R'')_2$ , wherein
      - (aa) R' is hydrogen or  $-CH_2-CH(OH)-R''$ , and
      - (bb) R' is hydrogen, methyl or ethyl; said process being conducted in a liquid reaction medium under substantially anhydrous conditions and using a molar ratio of a:b of from about 1:2 to about 1:3, and
  - (b) a sufficient amount of water to render the product, (a), active as a crosslinker.
3. A process for fracturing a subterranean formation penetrated by a wellbore which comprises the step of:
- (a) substantially continuously injecting
    - (i) a crosslinking amount a crosslinker composition consisting essentially of a product produced by reacting by contacting
      - (aa) a zirconium alkoxide corresponding to the formula  $Zr(OR)_4$  wherein each R independently is an alkyl group of from 1 to about 4 carbon atoms or an inertly-substituted such alkyl group, with



- (bb) an alkanolamine corresponding to the formula  $R'-(CH_2-CH(OH)-R'')_2$ , wherein
- (i)  $R'$  is hydrogen or  $-CH_2-CH(OH)-R''$ , and
- (ii)  $R''$  is hydrogen, methyl or ethyl; said process being conducted in a liquid reaction medium under substantially anhydrous conditions and using a molar ratio of a:b of from about 1:2 to about 1:3, and
- (ii) a sufficient amount of water to render the product, (i), active as a crosslinker, into
- (iii) a flowing stream of an aqueous solvatable polysaccharide having a plurality of vicinal hydroxy groups oriented sterically in a cis configuration and a molecular weight of at least about 100,000 to thereby form a flowing crosslinkable fracturing fluid
- (b) introducing said flowing crosslinkable fracturing fluid into the wellbore at a flow rate and pressure sufficient to permit said crosslinkable fracturing fluid to gel and increase in viscosity while it is passing through the borehole, and,
- (c) introducing said aqueous gelled fracturing fluid into said formation at a flow rate and pressure at least sufficient to create, reopen and/or extend a fracture in said formation.

4,683,069

**GLYCEROL ESTERS AS FUEL ECONOMY ADDITIVES**  
Phillip W. Brewster, Clinton R. Smith, and Frederick W. Gowland, all of Camlachie, Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.  
Continuation of Ser. No. 260,987, May 6, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 572,935

Int. Cl.<sup>4</sup> C10M 137/10

U.S. Cl. 252—32.7 E

4 Claims

1. A lubricating oil composition formulated for use as a crankcase lubricating oil composition for gasoline or diesel engines consisting essentially of a major amount of a mineral oil of a lubricating viscosity which has incorporated therein (i) about 0.20 weight percent of a glycerol partial ester said partial ester being a mixture of glycerol monooleate and glycerol dioleate, said mixture having weight ratio of 3 parts of glycerol monooleate to 2 parts of glycerol dioleate said ester providing a fuel economy improvement of about 1 to 3 percent when said lubricating oil composition is employed in the crankcase of said engines, (ii) an ashless dispersant, (iii) a metal detergent additive (iv) a zinc dihydrocarbyl dithiophosphate anti-wear additive and (v) an antioxidant, said dispersant, detergent, anti-wear additive and antioxidant being present in conventional amounts to provide their normal attendant functions.

4,683,070

**DETERMINATION OF METAL SOURCE IN USED OIL**  
Monroe W. Munsell, 180 Sutton Dr., Berkeley Heights, N.J. 07922, and Richard F. Finn, 64 Juniper Way, Basking Ridge, N.J. 07920

Filed Aug. 21, 1985, Ser. No. 767,744

Int. Cl.<sup>4</sup> C10M 135/10, 129/26

U.S. Cl. 252—33.4

24 Claims

1. A method of forming a motor oil to facilitate determination of the source of a primary metal in said motor oil after use in a motor engine, wherein said primary metal originates both as a component added to said oil as an additive and as a result of motor engine part wear, which method comprises the addition to said motor oil of said primary metal additive and an oil soluble tracer metal additive the sole source of said tracer metal in said oil being said tracer metal additive, said tracer metal additive and said primary metal additive being added to said motor oil in a fixed predetermined ratio to thereby permit calculating from said ratio and the amount of tracer metal in said oil after use, the amount of said primary metal in said used oil due to wear.

4,683,071

**BENZOTRIAZOLE MIXTURES, PROCESSES FOR PRODUCING THEM, AND THEIR USE AS METAL PASSIVATORS**

Franz Regens, Oristalstrasse 45, 4410 Liestal, and Peter C. Hamblin, Alemannenweg 12, 4112 Flüh, both of Switzerland  
Continuation of Ser. No. 466,823, Feb. 16, 1983, abandoned.

This application Oct. 18, 1985, Ser. No. 788,690

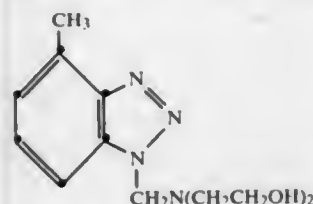
Claims priority, application Switzerland, Feb. 26, 1982, 1198/82

Int. Cl.<sup>4</sup> C07D 249/18; C10M 133/44

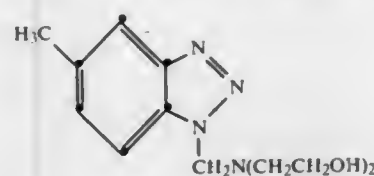
U.S. Cl. 252—49.3

3 Claims

1. A mixture of the compounds of the formulae I and II



(I)



(II)

consisting of 50 to 70 percent by weight of the compound of formula I and 50 to 30 percent by weight of the compound of formula II.

4,683,072

**TWO-COMPONENT CLEANER AND DISINFECTANT TABLET**

Bernd-Dieter Holdt, Duesseldorf; Ronald Menke, Mettmann; Gerd Praus, Krefeld, and Petra Hasselbach, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany  
Continuation-in-part of Ser. No. 561,285, Dec. 14, 1983, Pat. No. 4,578,207, which is a continuation-in-part of Ser. No. 452,943, Dec. 27, 1982, abandoned. This application Nov. 12, 1985, Ser. No. 797,362

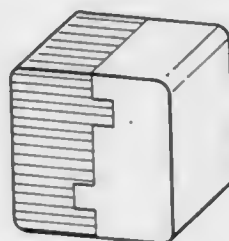
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225292

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> C11D 17/00

U.S. Cl. 252—102

11 Claims



1. A two-component cleaning and disinfecting tablet for urinals and toilet flush tanks comprising extruded component A consisting essentially of (a) 10 to 50% by weight of an alkylbenzene sulfonate, (b) 10 to 40% by weight of inorganic alkali metal salts, (c) 5 to 10% by weight of at least one plasticizer, (d) 5 to 25% by weight of at least one disintegration rate regulator selected from the group consisting of fatty acid ethanolamides, fatty acid diethanolamides and stearic acid, (e) 5 to 50%

of disinfectant selected from an active oxygen containing peroxy compound, or acid and (f) 5 to 30% by weight of a complexing agent with the sum of (e) and (f) being greater than 5% by weight and extruded component B consisting essentially of (a') 20 to 55% by weight of an alkylbenzene sulfonate, (b') 15 to 45% by weight of inorganic alkali metal salts, (c') 2 to 10% by weight of at least one plasticizer, (d') 5 to 25% by weight of at least one disintegration rate regulator selected from the group consisting of fatty acid ethanolamides, fatty acid diethanolamides and stearic acid, (e') 1 to 10% by weight of perfume and (f') 5 to 15% by weight of dye, the sum of (c') and (e') being not greater than 10% by weight, components A and B being attached together and occupying different portions of the final tablet.

4,683,073

**BUILDER FOR WASHING AGENTS**

Manfred Diehl, Zieselstrasse 7, D-6000 Frankfurt 1, Fed. Rep. of Germany

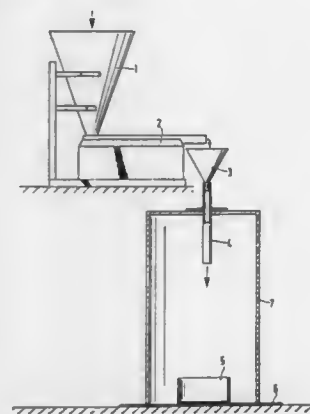
Filed Feb. 7, 1986, Ser. No. 827,056

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1985, 3504450

Int. Cl.<sup>4</sup> C11D 7/14

U.S. Cl. 252—135

5 Claims



1. A granulated washing agent builder consisting of 70 to 80 wt. % of a water insoluble silicate capable of binding calcium, the silicate being in the form of a finely divided, bound water containing, synthetically produced crystalline compound of the general formula



in that  $K_a$  is a cation exchangeable with calcium and having the valence  $n$ ,  $x$  is a number from 0.7 to 1.5,  $Me$  is boron or aluminum and  $y$  is a number from 0.8 to 6,

- 4 to 5 Wt.-% sodium sulfate
- 2 to 3 Wt.-% nonionic tenside
- 0 to 1 Wt.-% alkali
- 0.5 to 1 Wt.-% carboxymethylcellulose, methylcellulose or a mixture thereof
- balance Water.

4,683,074

**STABILITY AND COMPATIBILITY OF GLYCOSIDES IN ACID SYSTEMS**

Arshad H. Malik, and Allen D. Urfer, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Apr. 26, 1985, Ser. No. 727,647

Int. Cl.<sup>4</sup> C11D 1/66, 7/08; C23G 1/04, 1/12

U.S. Cl. 252—136

1 Claim

1. An aqueous composition having a pH of 2 or less, the composition consisting of about 12.0 weight percent of an 85.0 weight percent aqueous solution phosphoric acid, about 3.0 weight percent oxalic acid, about 8.0 weight percent sodium

4,683,075

**AZEOTROPE-LIKE COMPOSITIONS OF TRICHLOROTRIFLUOROETHANE, METHANOL, NITROMETHANE, ACETONE, AND METHYL ACETATE**  
David P. Wilson, Williamsville; Hang T. Pham, North Tonawanda; Earl A. E. Lund, West Seneca; Rajat S. Basu, Williamsville, and John W. Pelava, Kenmore, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 23, 1986, Ser. No. 888,668

Int. Cl.<sup>4</sup> C11D 7/50

U.S. Cl. 252—171

12 Claims

1. Azeotrope-like compositions comprising trichlorotrifluoroethane, methanol, nitromethane, acetone and methyl acetate.

4,683,076

**PROCESS FOR THE REMOVAL OF H<sub>2</sub>S FROM GEOTHERMAL STEAM AND THE CONVERSION TO SULFUR USING FERRIC CHELATE AND CATIONIC POLYMER**

Robert D. Lampton, Jr., and Thomas M. Hopkins, II, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

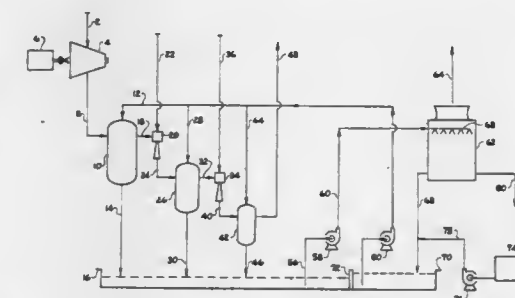
Division of Ser. No. 748,292, Jun. 24, 1985, Pat. No. 4,629,608.

This application Apr. 4, 1986, Ser. No. 848,101

Int. Cl.<sup>4</sup> C09K 3/00

U.S. Cl. 252—191

7 Claims



1. A composition comprising an aqueous solution containing sufficient soluble ferric chelate to give 3 to 15 percent iron and 0.5 to 10.0 percent by weight of one or more water soluble cationic polymeric catalysts.

4,683,077

**REMOVAL OF SMALL AMOUNTS OF WATER FROM MOISTURE CONTAINING CARBOXYLIC ACIDS, ALCOHOLS, OR PHENOLS BY CONTACTING WITH A TETRASUBSTITUTED BICYCLIC AMIDE ACETAL**  
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 641,238, Aug. 16, 1984, Pat. No. 4,605,746. This application Feb. 10, 1986, Ser. No. 827,578

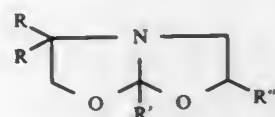
Int. Cl.<sup>4</sup> C09K 3/00

U.S. Cl. 252—194

9 Claims

1. A process for removing small amounts of water from carboxylic acids, alcohols or phenols comprising contacting a moisture-containing mixture of carboxylic acid or phenol with

a tetrasubstituted bicyclic amide acetal conforming to the formula



wherein R represents a hydrocarbon group having from 1 to 10 carbon atoms, R' represents a hydrocarbon group having from 1 to 20 carbon atoms, and R'' represents a hydrocarbon or ether group having from 1 to 20 carbon atoms and allowing the water and tetrasubstituted bicyclic amide acetal to react.

4,683,078

## DIHALOGENO-AROMATIC COMPOUND

Shigeru Sugimori, Fujisawa, Yasuyuki Goto, and Tetsuya Ogawa, both of Yokohama, all of Japan, assignors to Chisso Corporation, Japan

Filed Mar. 4, 1986, Ser. No. 836,126

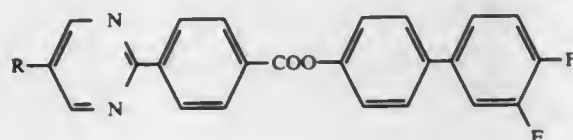
Claims priority, application Japan, Mar. 12, 1985, 60-48548

Int. Cl.<sup>4</sup> C09K 19/34, 19/30, 19/12; C07D 239/02; C07C 69/76, 69/74

U.S. Cl. 252-299.61

2 Claims

1. A difluoro-aromatic compound expressed by the formula



wherein R represents an alkyl group or an alkoxy group, each of 1 to 12 carbon atoms, or an alkoxyethyl group of 2 to 12 carbon atoms.

4,683,079

## LIQUID-CRYSTAL 4-N-PENTYLPHENYL ESTERS OF 4'-(TRANS-4"-N-ALKYLCYCLOHEX-2-ENOYLOXY)BENZOIC ACIDS

Vladimir S. Bezborodov, ulitsa Vasnetsova, 53; Viktor A. Konovalov, ulitsa Yakubova, 66, Korpus 4, kv. 26; Jury L. Ptashnikov, ulitsa Pushkina, 64, kv. 241; Vladimir M. Astafiev, ulitsa Malinina, 34, kv. 460, and Alexandr E. Petrovich, ulitsa V. Khoruzhe, 46, korpus 1, kv. 55, all of Minsk, U.S.S.R.

PCT No. PCT/SU84/00062, § 371 Date Jun. 20, 1986, § 102(e) Date Jun. 20, 1986, PCT Pub. No. WO86/02925, PCT Pub. Date May 22, 1986

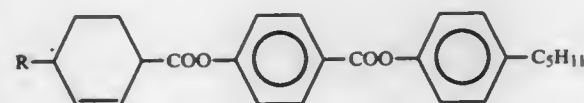
PCT Filed Nov. 14, 1984, Ser. No. 885,574

Int. Cl.<sup>4</sup> C09K 19/20, 19/06; C07C 65/03, 65/105, 51/15

U.S. Cl. 252-299.67

1 Claim

1. Liquid crystal 4-n-pentylphenyl esters of 4'-(trans-4"-n-alkylcyclohex-2-enoyloxy)benzoic acids of the general formula:



wherein R is C<sub>2</sub>H<sub>5</sub>, n-C<sub>3</sub>H<sub>7</sub>.

4,683,080  
MICROBIOCIDAL COMPOSITIONS COMPRISING AN ARYL ALKANOL AND A MICROBIOCIDAL COMPOUND DISSOLVED THEREIN

Nuno M. Rel, Boxford, and Ronald C. Wilson, Wenham, both of Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 619,092, Jun. 11, 1984. This application Apr. 22, 1985, Ser. No. 724,463

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> B01F 1/00; A01N 55/02

U.S. Cl. 252-364

6 Claims

1. A composition comprising a plasticizer suitable for use as a polymer processing aid, and from about 5% to about 20% by weight, based on the total weight of the composition, of a microbiocidal compound selected from the group consisting of phenoxarsines and phenarsazines, said microbiocidal compound being present as the solute in an aryl alkanol such that the weight ratio of the aryl alkanol solvent to microbiocidal compound is from about 3/1 to about 5/1.

4,683,081

## AQUEOUS CORROSION INHIBITOR COMPOSITIONS OF A HALF-AMIDE AND A DICARBOXYLIC ACID AMINE SALT

Karl P. Kammann, Jr., Crown Point, and Kathleen A. Troxel, Griffith, both of Ind., assignors to Ferro Corporation, Cleveland, Ohio

Filed Jun. 27, 1986, Ser. No. 879,682

Int. Cl.<sup>4</sup> C09K 3/00

U.S. Cl. 252-392

16 Claims

1. A water-soluble, rust-preventative composition, comprising:

- a partial amide of an alkanolamine and an unsaturated dicarboxylic acid having from about 10 to about 36 carbon atoms;
- an aliphatic dicarboxylic acid, having from about 8 to about 20 carbon atoms; and
- at least one alkanolamine.

4,683,082

## ONE-COMPONENT, PARTICLE-FILLED COMPOSITIONS

John E. Ehrreich, Acton, Mass., assignor to Ercon, Inc., Waltham, Mass.

Filed Mar. 27, 1985, Ser. No. 716,583

Int. Cl.<sup>4</sup> H01B 1/06

U.S. Cl. 252-506

23 Claims

1. A filler composition useful in forming stable electroconductive compositions with organic resin binder systems wherein said filler composition is formed of an electroconductive powder of metal, carbon, or iron oxide, said powders are coated with a quantity of an organotin pacifier agent effective to impart good electroconductivity- and viscosity-stabilizing properties to said systems on aging.

4,683,083

## MIXTURES OF TRICYCLO-DECANE-DERIVATIVES TOGETHER WITH THEIR PREPARATION AND USE ARE PERFUMING- AND FLAVORING MATERIALS

Ernst-Joachim Brunke, and Hartmut Struwe, both of Holzmin-

den, Fed. Rep. of Germany, assignors to Dragoco Gerberding and Co. GmbH, Holzmin-

den, Fed. Rep. of Germany

PCT No. PCT/EP84/00141, § 371 Date Jan. 10, 1985, § 102(e)

Date Jan. 10, 1985, PCT Pub. No. WO84/04520, PCT Pub.

Date Nov. 22, 1984

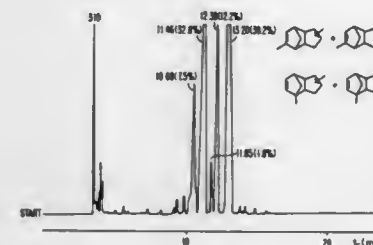
PCT Filed May 10, 1984, Ser. No. 691,567

Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317476

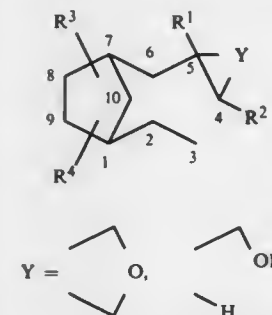
Int. Cl.<sup>4</sup> A61K 7/46; C11B 9/0

U.S. Cl. 252-522 R

10 Claims



1. A mixture of compounds of the formula:



wherein R<sup>1</sup> and R<sup>2</sup> are a methyl group or a hydrogen atom, one of the substituents being a methyl group and the other a hydrogen atom, R<sup>3</sup> and R<sup>4</sup> are a methyl group or a hydrogen atom, one of the substituents being a methyl group and the other a hydrogen atom, Y is a tetrahydrofuran system at C-4/C-5 or a substituted oxymethyl group at C-5 and a hydrogen atom at C-4, R<sup>5</sup> is a hydrogen atom or C<sub>1</sub>-C<sub>6</sub>-acyl-, C<sub>1</sub>-C<sub>6</sub>-alkyl-, C<sub>1</sub>-C<sub>6</sub>-alkenyl-, C<sub>1</sub>-C<sub>6</sub>-alkoxymethyl-, C<sub>1</sub>-C<sub>2</sub>-alkoxycarbonyl-, formylmethyl-, or di-C<sub>1</sub>-C<sub>4</sub>-alkoxyethyl group and the broken lines indicate a C—C-single bond and a C—C-double bond and or two C—C-single bonds.

4,683,084

## COMPOSITION COMPRISING A MATRIX RESIN, A FLAME RETARDING SYNERGIST, AND AN ALTERNATING COPOLYMER OF BROMINATED STYRENE AND N-BROMINATED PHENYL MALEIMIDE

Usama E. Younes, Newtown Square, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 668,458, Nov. 5, 1984, Pat. No. 4,607,081,

which is a division of Ser. No. 489,668, Apr. 28, 1983, Pat. No.

4,508,883. This application Feb. 3, 1986, Ser. No. 825,502

Int. Cl.<sup>4</sup> C09K 21/00; C08F 214/16; C08L 39/04

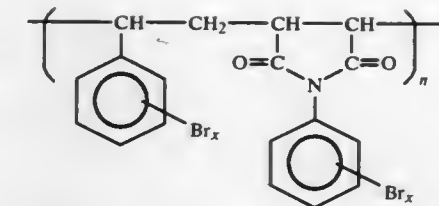
U.S. Cl. 252-609

3 Claims

1. A moldable composition comprising a matrix resin, a

flame retarding synergist, and an alternating copolymer having

the following general formula:



wherein each x separately represents an integer of from 1 to 5 and n represents an integer of from 10 to 2000, the alternating copolymer being present in an amount sufficient to improve the flame retarding characteristics of the matrix resin.

4,683,085

## POLYAZIDO ESTERS

Milton B. Frankel, Tarzana, and Edgar R. Wilson, Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

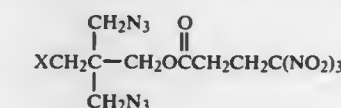
Filed Aug. 19, 1985, Ser. No. 766,459

Int. Cl.<sup>4</sup> C07C 117/00

U.S. Cl. 260-349

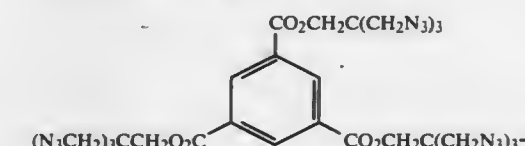
2 Claims

1. A polyazido monoester having the general formula:



wherein X is N<sub>3</sub> or ONO<sub>2</sub>.

2. A polyazido triester having the formula:



4,683,086

## AZIDO DERIVATIVES OF PENTAERYTHRITOL

Milton B. Frankel, Tarzana, and Edgar R. Wilson, Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 19, 1985, Ser. No. 766,460

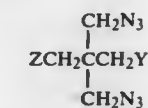
Int. Cl.<sup>4</sup> C07C 117/00

U.S. Cl. 260-349

9 Claims

1. An azido derivative of pentaerythritol having the general

structural formula:



wherein Y is selected from the group consisting of halogen, ONO<sub>2</sub> and N<sub>3</sub>, and Z is selected from the group consisting of OH and ONO<sub>2</sub>.



4,683,087

## ANTI-CANCER AGENTS AND PROCESSES FOR THEIR PREPARATION

Donald T. Witak, Mt. Vernon, and Ronald M. Glaser, Powell, both of Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

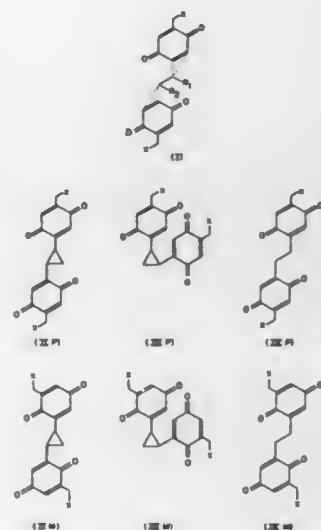
Continuation of Ser. No. 526,895, Aug. 26, 1983, abandoned.

This application Apr. 23, 1985, Ser. No. 725,167

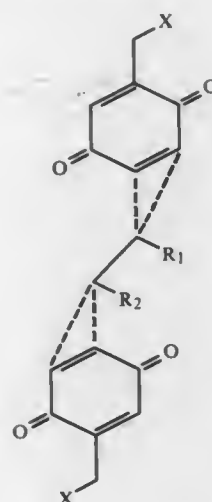
Int. Cl.<sup>4</sup> C07C 50/08, 50/06

U.S. Cl. 260—396 R

6 Claims



1. A compound of the formula



wherein  $R_1$  and  $R_2$  are each a hydrogen atom or  $R_1$  and  $R_2$  together form a methylene group, each  $X$  is a bromo, iodo or tosyloxy group and the dotted bonds indicate that the central  $-CHR_1-CHR_2-$  linkage is attached to the two phenyl rings at positions which are either meta to both  $CH_2X$  groups or para to both  $CH_2X$  groups.

4,683,088

## NICKEL/ALUMINA/SILICATE CATALYST, ITS PREPARATION AND USE

Johannes C. Oudejans, Delft; Peter Nootenboom, Oud-Beyerland; Keshab L. Ganguli, Bleiswijk, and Cornelis M. Lok, Rockanje, all of Netherlands, assignors to Internationale Octrooi Maatschappij "Octropa" BV, Rotterdam, Netherlands

Division of Ser. No. 747,439, Jun. 21, 1985, Pat. No. 4,631,265.

This application Sep. 17, 1986, Ser. No. 908,211

Claims priority, application Netherlands, Jun. 21, 1984, 8401965

Int. Cl.<sup>4</sup> B01J 21/12, 23/74; C11C 3/12; C07C 85/12

U.S. Cl. 260—409

1 Claim

1. In a process for the catalytic hydrogenation of an unsaturated organic compound selected from the group consisting of oils, fats, fatty acids and fatty nitriles, the improvement which comprises utilizing as the catalyst, a nickel/alumina/silicate catalyst in which the atomic ratio of nickel/aluminum is between 20 and 5, the nickel/silicate molar ratio between 20 and 4.5 and the active nickel surface area is between 70 and 150  $m^2/g$  nickel, said catalyst having an open porous structure with macropores of 50–500 nanometers and a mesopore structure having an average pore size between 8 and 20 nanometers.

4,683,089

## CYCLOPROPANE CARBOXYLIC ACID DERIVATIVES

Thomas Leigh, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 18, 1979, Ser. No. 86,036

Claims priority, application United Kingdom, Oct. 27, 1978, 42266/78

Int. Cl.<sup>4</sup> C07C 61/04

U.S. Cl. 260—501.16

2 Claims

1. The 1- $\alpha$ -methylbenzylamine salt of (+)-cis-3-(2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylic acid.

4,683,090

## PURIFICATION OF ORGANOSULFONYL HALIDES

Roger T. Clark, Pottstown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 25, 1982, Ser. No. 436,494

Int. Cl.<sup>4</sup> C07C 143/70

U.S. Cl. 260—543 R

4 Claims

1. A method for the purification of a liquid organosulfonyl chloride, said liquid organosulfonyl chloride having the formula  $RSO_2Cl$  wherein  $R$  is an alkyl group having from 1 to 6 carbon atoms and containing an inorganic compound of iron or copper as a contaminant, comprising passing said liquid organosulfonyl chloride through a bed of activated carbon whereby the amount of said contaminant in the liquid chloride is reduced.

4,683,091

## PROCESS FOR THE NUCLEOPHILIC SUBSTITUTION OF UNACTIVATED AROMATIC AND HETEROAROMATIC SUBSTRATES

Alden D. Josey, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 481,874, Apr. 11, 1983, which is

a continuation-in-part of Ser. No. 378,993, May 17, 1982. This

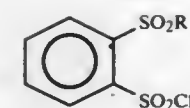
application Sep. 9, 1985, Ser. No. 773,633

Int. Cl.<sup>4</sup> C07C 143/70, 149/32

U.S. Cl. 260—543 R

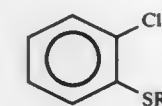
8 Claims

1. A process for preparing a sulfonyl chloride of the formula:

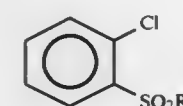


where  $R$  is lower alkyl, comprising

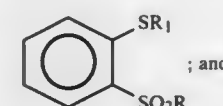
(a) contacting ortho-dichlorobenzene with an anionic nucleophile in the form of a salt of the formula  $M^+SR^-$  where  $M$  is an alkali metal in the presence of an acyclic polyethyleneglycol catalyst to produce the compound



(b) oxidizing the product of step (a) to produce the compound

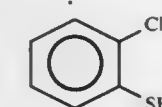


(c) contacting the product of step (b) with a salt of the formula  $M^+SR_1^-$  where  $M$  is an alkali metal and  $R_1$  is lower alkyl to produce the compound



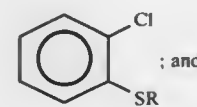
(d) chlorinating the product of step (c) in the presence of water to prepare the desired sulfonyl chloride.

6. A process for preparing a thiophenol of the formula



comprising

(a) contacting ortho-dichlorobenzene with an anionic nucleophile in the form of a salt of the formula  $M^+SR^-$  where  $R$  is a secondary or tertiary lower alkyl and  $M$  is an alkali metal in the presence of an acyclic polyethyleneglycol catalyst to produce the compound



(b) heating the product of step (a) with a strong acid.

4,683,092

## CAPSULE LOADING TECHNIQUE

Wen-Gih Tsang, Lexington, Mass., assignor to Damon Biotech, Inc., Needham Heights, Mass.

Filed Jul. 3, 1985, Ser. No. 752,384

Int. Cl.<sup>4</sup> A61K 9/36, 9/38, 9/52; B01J 13/02

U.S. Cl. 264—4.3

23 Claims

1. A composition of matter comprising a previously formed, and deflated, dehydrated capsule having an intact, selectively permeable membrane defining a substantially empty interior

volume, said membrane being expandable upon rehydration with a solute and aqueous solution at a given concentration to produce a capsule containing said solution and capable of sustained release of said solute.

4,683,093

## METHOD FOR HOLDING A MOVING FILM

Satoru Hagiwara; Kimio Satoh, both of Otsu, and Kazuo Okabe, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

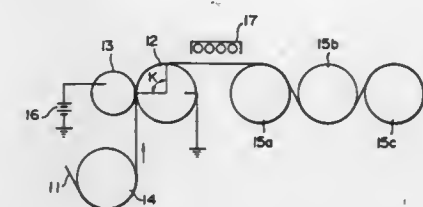
Filed Nov. 6, 1985, Ser. No. 795,457

Claims priority, application Japan, Nov. 6, 1984, 59-232467

Int. Cl.<sup>4</sup> B29C 55/06

U.S. Cl. 264—22

16 Claims



1. A method for holding a moving film comprising the steps

of: bringing each surface of at least one set of conductive rolls having conductive surfaces into contact with a front surface and a back surface of a moving film respectively, at least one of the surfaces of said set of rolls being constructed of a conductive elastomer; and holding said moving film by said surfaces of said rolls while establishing a high electric potential difference between said surfaces of said rolls.

4,683,094

## PROCESS FOR PRODUCING ORIENTED POLYOLEFIN FILMS WITH ENHANCED PHYSICAL PROPERTIES

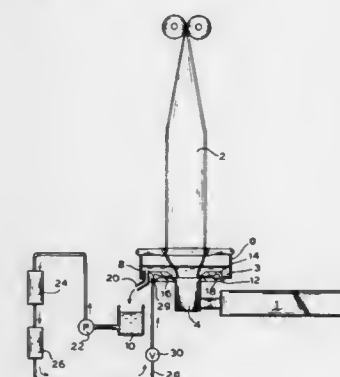
Gordon V. Sharps, Jr., Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,948

Int. Cl.<sup>4</sup> B29C 47/02, 47/90

U.S. Cl. 264—38

2 Claims



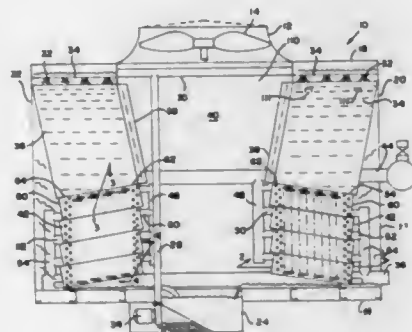
1. In a method for the production of polyethylene film by extruding molten film upwardly from an annular die in a tubular form into an extrusion zone, the improvement for providing enhanced physical properties by controlling crystalline growth comprising:

providing a water liquid quench medium maintained at a constant temperature range of from about 150° to about 200° F. in said extrusion zone immediately adjacent the





a bundle of fill sheets supported from the enclosure sidewalls adjacent an air inlet, spray distribution means to supply evaporative liquid downwardly through said bundle of fill sheets, means causing a draft of air in through the air inlet and across said fill sheets and out through said air outlet cross current to said evaporative liquid, and a plurality of fluid conduit means supported below said bundle of fill sheets in the path of said evaporative liquid, each of the fluid conduit means connected to an input manifold adjacent said air outlet to receive a fluid to be cooled and to an exit manifold adjacent said air inlet to permit the cooled fluid to exit the fluid conduit assemblies wherein the liquid draining downwardly from the fill sheets is cooled by the air flow into the air inlet, and the fluid conduit means receive the fluid to be cooled at their upper section adjacent said air outlet such that the warmest water draining from the fill first contacts the fluid conduit means which contain the warmest incoming internal fluid, and wherein said exit manifold receives cooled fluid adjacent the air inlet such that the coolest fluid falling from the fill sheet bundle contacts the portion of the fluid conduit



means containing the coolest fluid and that the coolest air entering the air inlet contacts the portion of the fluid conduit means containing the coolest fluid.

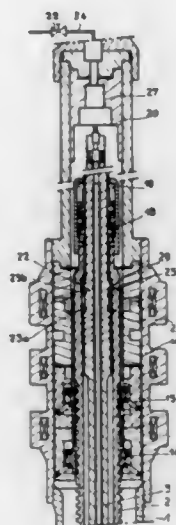
5. A method of cooling a liquid comprising the steps of providing a frame assembly with a cross draft mechanism having an air inlet side and an air outlet side, spraying liquid from nozzles at the top of said frame assembly downward to a collection sump and pumping said liquid from the sump upwardly to said nozzles, providing a sheet fill assembly under the liquid spray, and providing a coil assembly forming a heat exchanger below said sheet fill assembly, connecting an input of said coil assembly to a source of fluid to be cooled and an output of said coil assembly to an outlet to receive cooled fluid exiting the cooling tower, wherein the input of said coil assembly is located in close proximity to said air outlet side of said frame assembly and said outlet of said coil assembly is located in close proximity to said air inlet side of said frame assembly to assure that the warmest air at the outlet side of said frame assembly initially contacts the warmest fluid near the input of said coil assembly and that the coolest air at the input side of said frame assembly initially contacts the coolest fluid near the output of said coil assembly.

4,683,102  
**DEVICE FOR OPERATING A CLUSTER OF NEUTRON ABSORBER ELEMENTS IN A PRESSURIZED WATER NUCLEAR REACTOR**  
 Jean Martia, Chatillon, and René Peletan, La Varenne Saint-Hilaire, both of France, assignors to Framatome & Clé, Courbevoie, France

Filed Jun. 18, 1984, Ser. No. 621,658  
 Claims priority, application France, Jun. 17, 1983, 83 10028  
 Int. Cl.<sup>4</sup> G21C 7/00

U.S. Cl. 376—209

12 Claims



1. In a spectral shift pressurized water reactor comprising:
  - (a) a vessel,
  - (b) a core comprising a plurality of nuclear fuel assemblies, each containing a plurality of first vertical guide tubes and a plurality of second vertical guide tubes,
  - (c) a plurality of sets of control rods for controlling the power of the reactor having control rods movable within and along respective ones of the first guide tubes between a predetermined lower position and a predetermined upper position,
  - (d) a plurality of clusters of spectral shift elements for changing the neutron energy spectrum of the reactor, each of said cluster being associated to a set of control rods, having elements movable within and along respective ones of the second guide tubes of the corresponding assembly of said set of control rods and being arranged to be maintained in one of two fixed positions including a low position of maximum insertion of the elements in the core and a high position of complete withdrawal of the elements from said core,

operating means for operating said set of control rods and said clusters of spectral shift elements comprising: first operating means for operating sets of control rods up and down comprising a plurality of first vertical control shafts movable vertically between a second predetermined lower position and a second predetermined upper position and arranged to go further when forced to a higher overtopped position situated above said second predetermined upper position, each of said first vertical control shafts having a cylindrical tubular shape having a bottom end connected respectively to a corresponding set of control rods and having over the greatest portion of its length a part of a first internal diameter and over a small portion of its length a part of a second internal diameter, said second internal diameter being substantially smaller than said first internal diameter and being situated near the bottom end of said first shaft,

second operating means for operating clusters of spectral shift elements comprising a plurality of second vertical

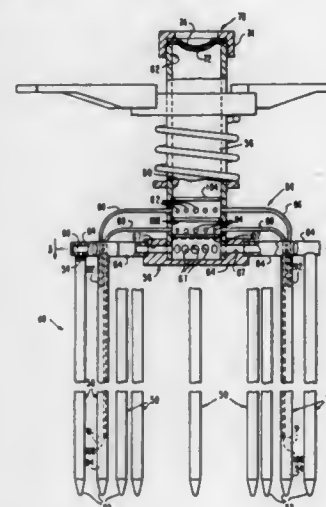
control shafts each respectively mounted coaxially inside the corresponding first shaft of the associated set of control rods, respectively connected to each cluster and movable in the internal cylindrical space of corresponding first shaft, each of said second shafts having a widened cylindrical part along a small portion of its length, said small portion constituting a piston situated near the upper part of the said second shaft and coming into position around the internal part of substantially smaller diameter of the corresponding first shaft when said first shaft has raised to its higher overtopped position, said piston comprising at its periphery at least one solid joint, radially expandable to a certain extent under a predetermined pressure and which diameter in rest condition is substantially smaller than the first internal diameter of the first control shaft and substantially similar to the second internal diameter of said first control shaft and when sollicitated by pressure is similar to said first internal diameter, said operating means further comprising pressure reduction means arranged to be connected to the internal cylindrical space of each of the first control shafts when said first shaft has raised to its higher overtopped position, and capable of moving in the high position of complete withdrawal of the elements of the cluster the corresponding second control shaft connected to said cluster of spectral shift elements under the effect of a predetermined pressure reduction created in the internal space of the first control shaft above the piston.

4,683,103  
**SPECTRAL SHIFT APPARATUS AND METHOD FOR A NUCLEAR REACTOR FUEL ASSEMBLY**  
 Randy G. Lott, Swissvale, and Frank J. Baloh, Dawson, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 12, 1985, Ser. No. 701,051  
 Int. Cl.<sup>4</sup> G21C 7/26

U.S. Cl. 376—209

20 Claims



1. For use in a fuel assembly for a nuclear reactor including an organized array of nuclear fuel rods and moderator/coolant liquid flowing along said fuel rods, a spectral shift apparatus for controlling nuclear reactivity in said assembly, said apparatus comprising:

- (a) at least one elongated hollow tubular body having opposite ends and containing a quantity of water equivalent to a predetermined small fraction of the volume of said tubular body, said body being adapted to displace a predetermined volume of said moderator/coolant liquid;
- (b) first means attached to and sealing one of said opposite ends of said tubular body; and
- (c) second means communicating with and sealing the other

of said opposite ends of said tubular body, said second means including

- (i) a member in the form of a replaceable disk being rupturable at a given pressure differential across said member,
- (ii) a baffle screen being disposed adjacent to said rupture disk so as to restrict said disk to rupturing in one predetermined direction, and
- (iii) an annular cap removably attached to said other opposite end of said tubular body for coupling said disk and screen thereto so as to seal said other end thereof.

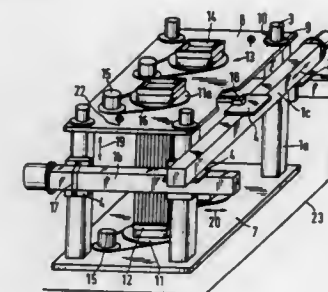
4,683,104  
**EQUIPMENT FOR THE INSPECTION OF FUEL RODS OF NUCLEAR REACTORS**  
 Rainer Scharpenberg, Waldmichelbach, Fed. Rep. of Germany, assignor to Brown Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed May 28, 1985, Ser. No. 738,687  
 Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419765

U.S. Cl. 376—251

Int. Cl.<sup>4</sup> G21C 17/00

3 Claims



1. Device for the inspection of fuel rods combined into fuel rod bundles in a fuel element of a nuclear reactor, comprising a frame for supporting a fuel element including a base plate, a cover plate and four supports in the form of four first lead-screw drive mechanisms, two mutually parallel second lead-screw drive mechanisms attached to and extending transversely to said first lead-screw drive mechanism, a third lead-screw drive mechanism jointly supported by and extending transversely to said second lead-screw drive mechanism, and an accessory carrier mechanism disposed on said third lead-screw drive mechanism and movable in a plurality of levels for entering gaps between fuel rods of the fuel element.

4,683,105  
**TESTABLE, FAULT-TOLERANT POWER INTERFACE CIRCUIT FOR NORMALLY DE-ENERGIZED LOADS**  
 Robert E. Hager, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1985, Ser. No. 793,381  
 Int. Cl.<sup>4</sup> G21C 17/00

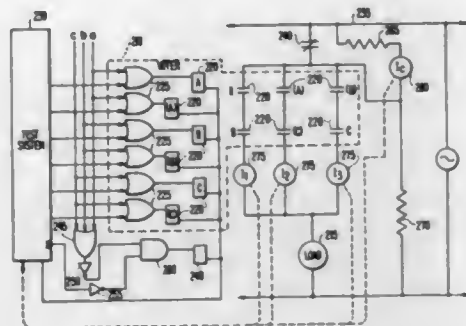
U.S. Cl. 376—259

12 Claims

10. A power interface circuit for supplying power from a power line to a normally de-energized process control apparatus in a pressurized light water nuclear power system in dependence upon three input signals, comprising:

- voter means for supplying power to the normally de-energized load when at least two of the three input signals indicates that the normally de-energized load should be activated;
- a normally closed switch, operatively connected to the power line and said voter means, for supplying power to said voter means during ordinary operation;
- a first resistor operatively connected to the power line;

a current detector operatively connected to said first resistor and said voter means;  
a second resistor operatively connected to said current detector and ground; and



current sensor means, operatively connected between said voter means and the normally de-energized load, for detecting the power supplied to the normally de-energized load by said voter means.

4,683,106

# WIRING INSTALLATION ABOVE THE COVER OF A NUCLEAR REACTOR VESSEL FOR CONNECTION OF ELECTRIC DEVICES

Serge Jahoke, Paris, France, assignor to Framatome & Cie., Courbevoie, France

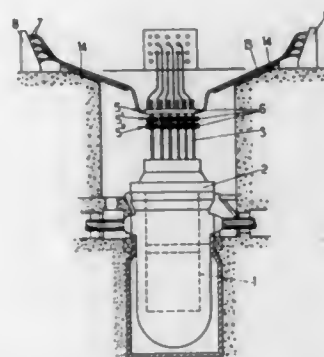
Filed Jul. 8, 1985, Ser. No. 752,426

Claims priority, application France, Jul. 6, 1984, 84 10758

Int. Cl.<sup>4</sup> G21C 17/00

U.S. Cl. 376-259

5 Claims



1. A wiring installation located in a nuclear reactor building containing a nuclear reactor vessel having a vertical axis provided with a cover for connection of electric devices of the nuclear reactor, comprising:

- a plurality of layers of fluid tight conduits located substantially above said cover and disposed perpendicularly to the said axis of the reactor vessel, the conduits in each layer being substantially parallel to each other and the conduits in one layer being disposed at an angle to the conduits in another one of said layers;
- a plurality of first cables each extending from one of said devices and terminated with a first fixed connector located above said cover, those of the first fixed connectors which correspond to similar devices having similar positions;
- a plurality of second cables each associated with one of the first cables and each having
  - a first section having two connectors at the ends thereof, one for disconnectable connection to one of said first fixed connectors and the other for disconnectable connection to a fixed lead-in connector leading into

- one of said fluid tight conduits located substantially horizontally above said cover;
- a second section inside said conduit connected at one of the ends thereof to the lead-in connector and at the other end to a fixed lead-out connector leading out from said conduit;
- a third section having two disconnectable connectors at the ends thereof for respective connection to said fixed lead-out connector and to a second fixed connector carried by a plate remote from the reactor vessel in said building;
- means for supporting said second cables between the first fixed connectors and the second fixed connectors; and
- wherein each one of said first fixed connectors is associated with one of said lead-in connectors which opens into an adjacent one of said conduits, so that all the first sections each connecting one of the lead-in connectors to one of the first fixed connectors, and corresponding to similar devices, are of the same length, while the first sections corresponding to different devices are of different lengths.

4,683,107

# METHOD AND DEVICE FOR REPLACING NEUTRON ABSORBER RODS

Günter Büro, Weinheim; Werner Kraus, and Wilfried Stindt, both of Mannheim, all of Fed. Rep. of Germany, assignors to Brown Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany

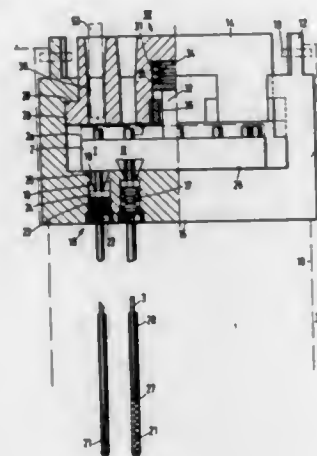
Filed Oct. 15, 1984, Ser. No. 660,895

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1983, 3337636

Int. Cl.<sup>4</sup> G21C 19/02

U.S. Cl. 376-260

8 Claims



1. Method for replacing neutron absorber rods in a storage pit, the absorber rods being mounted with their upper ends in bores formed in a mounting device and the absorber rods being movable within guide tubes of a nuclear reactor fuel assembly, including a holding device firmly attached to a fixed location of the storage pit, the holding device having holder tubes for absorber rods, which comprises:

- placing and locking the mounting device with the neutron absorber rods in the holding device;
- disconnecting the mounting device from at least one neutron absorber rod to be replaced;
- removing the mounting device with any neutron absorber rods still attached to it from the holding device;
- removing the disconnected neutron absorber rods remaining in holder tubes of the holding device for storage;
- placing new neutron absorber rods in the empty holder tubes; and
- placing the mounting device with any neutron absorber

rods still connected to it in the holding device, and connecting the mounting device to the new neutron absorber rods.

4,683,108

# LOCKING SCREW APPARATUS AND METHOD FOR UNDERWATER REMOTE REPLACEMENT

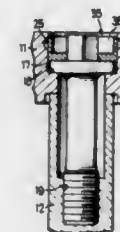
Leonard J. Balog, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1985, Ser. No. 807,143

Int. Cl.<sup>4</sup> G21C 19/00; F16B 39/10

U.S. Cl. 376-260

20 Claims



17. A method for locking in place a screw which secures together first and second structures in the internal region of a nuclear reactor core, wherein the first structure has a screw bore therethrough with a counterbore portion formed in an outer surface thereof, said method comprising the steps of: forming a lateral recess in the counterbore portion and spaced from said outer surface, providing an elongated screw having an enlarged shoulder flange and an angular drive head with a lateral width substantially less than that of the counterbore portion, disposing the screw through the screw bore in threaded engagement with the second structure and with the shoulder rotatably seated in the counterbore portion, providing a locking member having an angular opening therein and disposing it in the counterbore portion against the flange with the drive head received in the opening for engagement with the locking member to prevent rotation with respect thereto, and deforming a portion of the locking member into the recess for engagement therewith to prevent movement of the locking member with respect to the first structure.

4,683,109

# DEBRIS REMOVAL SYSTEM FOR A NUCLEAR FUEL ASSEMBLY

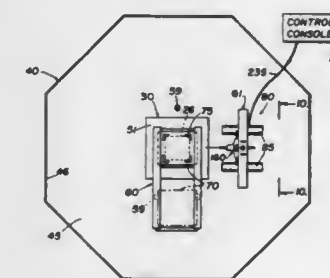
Frank W. Cooper, Jr., Monroeville, and George F. Dailey, Plum Boro., both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1985, Ser. No. 703,008

Int. Cl.<sup>4</sup> G21C 19/00

U.S. Cl. 376-261

26 Claims



24. A system for working on an elongated nuclear fuel assembly suspended vertically and submerged in a spent fuel pool having a plurality of fuel assembly racks at the bottom thereof, said system comprising: a work platform disposable in the pool and adapted to be supported on the fuel assembly racks, said platform having an opening therein disposed in

registry with a selected one of the underlying racks; guide means carried by said platform for guiding the suspended fuel assembly into said opening and the selected rack to accommodate vertical movement of the fuel assembly into and out of the rack to make different portions of the fuel assembly accessible from said platform; and tool manipulating apparatus disposable on said platform adjacent to said opening, said tool manipulating apparatus including a tool carriage, a plurality of tool holders for respectively holding a plurality of associated tools, each of said tool holders being mounted on said tool carriage for reciprocating movement with respect thereto along a predetermined axis between extended and retracted conditions, said tool carriage including selection means accommodating disposition of a selected one of said tool holders in a work configuration with respect to the associated fuel assembly, motive means for effecting movement of said tool carriage along any of three orthogonal axes including said predetermined axis for performing work with respect to the fuel assembly, yieldable means resiliently urging each of said tool holders to its extended condition with a predetermined force less than the minimum force which could damage the associated fuel assembly, whereby engagement of the fuel assembly by a tool with a force in excess of said predetermined force in response to movement of said tool carriage toward the fuel assembly along said predetermined axis causes said tool holder to move from its extended condition toward its retracted condition with respect to said tool carriage, and control means for remotely controlling operation of said motive means, said control means including means responsive to said movement of said tool holder a predetermined distance along said axis from its extended condition toward its retracted condition for generating a signal.

4,683,110

# APPARATUS AND METHOD FOR CONSOLIDATING SPENT FUEL RODS

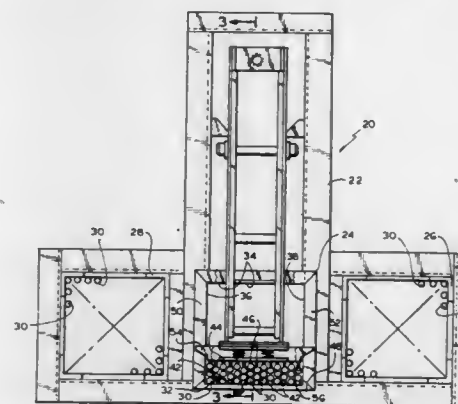
Thomas O. Baudro, Gales Ferry, and John S. Leonard, Lyme, both of Conn., assignors to Proto-Power Corporation, Groton, Conn.

Filed Jun. 14, 1985, Ser. No. 745,409

Int. Cl.<sup>4</sup> G21C 19/00

U.S. Cl. 376-261

38 Claims



1. An apparatus for consolidating spent fuel rods from spent fuel assemblies, comprising:

- a container having a front wall, a back wall, side walls connected between the front and back walls, a bottom, and a plurality of stationary flutes along the front wall, the plurality of stationary flutes defining a plurality of channels along the front wall, each channel being sized to accept a fuel rod, the flutes and the channels being stationary;
- a plurality of springs, the springs being aligned with and bearing against the flutes and the channels when no fuel rods have been inserted into the container and the springs



are located proximate the front wall, each spring being capable of maintaining a fuel rod in a preselected location in the container;

support means located within the container for supporting the springs, the support means being movable within the container in a substantially horizontal direction between the front and back walls of the container; and

positioning means for positioning the support means between the front and back walls of the container, the positioning means permitting the support means to take non-discrete positions between the front and back walls.

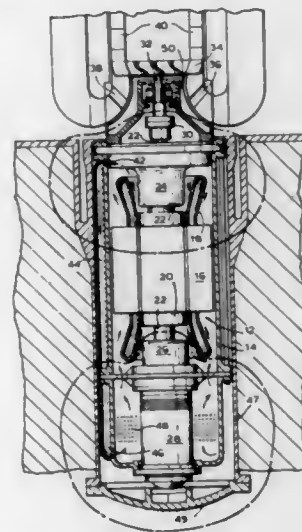
4,683,111

# **GAS CIRCULATOR FOR A NUCLEAR REACTOR AND A METHOD FOR USE THEREOF**

John L. Helm, Groton, and John S. Leonard, Lyme, both of Conn., assignors to Proto-Power Corporation, Groton, Conn.  
Filed Jan. 23, 1986, Ser. No. 821,844  
Int. Cl.<sup>4</sup> G21C 3/56

U.S. Cl. 376—391

51 Claims



1. A gas circulator for a nuclear reactor, comprising:
  - a stator;
  - a rotor having a rotor shaft with a first end and a second end;
  - an impeller attached to the first end of the rotor shaft;
  - a first radial active magnetic bearing positioned proximate the first end of the rotor shaft;
  - a first radial backup bearing positioned proximate the first end of the rotor shaft;
  - a second radial active magnetic bearing positioned proximate the second end of the rotor shaft;
  - a second radial backup bearing positioned proximate the second end of the rotor shaft;
  - an axial active magnetic bearing positioned between the first and second ends of the rotor shaft; and
  - an axial backup bearing positioned between the first and second ends of the rotor shaft;
- wherein two of the backup bearings are located within a sealed chamber.

4,683,112

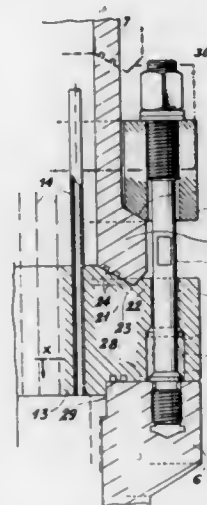
# **STEAM GENERATOR, PARTICULARLY FOR PRESSURIZED WATER NUCLEAR REACTOR**

Jean-Paul Badoux, Le Puy Saint; Jean E. Chalix, Pierrevet, and Michel Metteey, Eguilles, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France  
Filed Mar. 15, 1985, Ser. No. 712,176

Claims priority, application France, Mar. 23, 1984, 84 04563  
Int. Cl.<sup>4</sup> F22B 37/64

U.S. Cl. 376—402

1 Claim



1. A pressurized water nuclear reactor steam generator, said nuclear reactor having a reactor core, comprising a water box, in which circulates the hot water leaving the reactor core in order to then penetrate a series of heat exchange tubes, installed in a tube plate and extending within a secondary ferrule traversed by secondary water, the water box, the secondary ferrule and the tube plate being three independent dismantable assemblies, wherein the secondary ferrule is terminated in its lower part by an annular neck having on the one hand a double conical bearing surface cooperating by two O-rings with a female groove having two conical bearing surfaces hollowed from the upper surface of the tube plate and on the other hand, on its outer periphery, a conical bearing surface associated with a locking ring; the upper part of the water box is terminated by a flange provided with a planar connecting bearing surface with two interposed O-rings; on the inner surface of the tube plate; and a system of tie bolts, certain of which pass through handling brackets on the periphery of the tube plates, whilst studs installed in the flange of the water box and nuts ensure, by means of the locking ring, the assembly and tight locking of the three aforementioned independent assemblies, further, wherein the handling brackets installed on the periphery of the tube plate have recesses with conical bearing surfaces, where the conical bearing surfaces make it possible to receive conical collars equipping the studs to that, during a dismantling manipulation of the water box alone, it is possible to handle the tube plate-secondary ferrule assembly without breaking the seal thereof.

4,683,113

# **NUCLEAR FUEL ASSEMBLY**

Takaaki Mochida; Junichi Yamashita; Toshiro Yoshioka, and Michihiro Ozawa, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan  
Filed May 16, 1985, Ser. No. 734,604

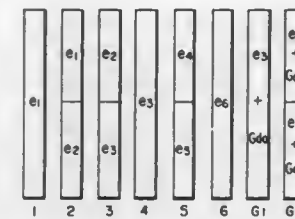
Claims priority, application Japan, May 16, 1984, 59-98429  
Int. Cl.<sup>4</sup> G21C 3/00

U.S. Cl. 376—419

20 Claims

1. A nuclear fuel assembly having a plurality of fuel rods each containing a multiplicity of fuel pellets, comprising: first

fuel rods each containing a burnable poison over substantially the entire axial length thereof, said first fuel rod having upper and lower axial regions and a greater mean enrichment in the



upper axial region thereof than that in the lower axial region thereof; and second fuel rods containing no burnable poison and having a uniform enrichment distribution over substantially the entire axial length thereof.

4,683,114

# **BURNABLE ABSORBER-CONTAINING NUCLEAR FUEL PELLETS AND FORMATION OF THE SAME**

Shih-Ming Ho, Penn Hills Township, Allegheny County, and Kenneth C. Radford, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1984, Ser. No. 678,604

Int. Cl.<sup>4</sup> G21C 3/00

U.S. Cl. 376—419

26 Claims



1. The method of forming nuclear fuel pellets having a burnable absorber combined therewith comprising:
  - combining discrete particles of a boron-containing burnable absorber and discrete particles of a boron-containing glass composition to form a coating mixture, said boron-containing glass composition comprising 20-30 percent by weight B<sub>2</sub>O<sub>3</sub>;
  - applying said coating mixture to the surface of nuclear fuel pellets;
  - heating said nuclear fuel pellets having said coating mixture on the surface thereof, to an elevated temperature sufficient to melt said boron-containing glass, and incorporate said boron-containing burnable absorber in the resultant melt while preventing reaction between the burnable absorber and the boron-containing glass; and
  - cooling said pellets.

4,683,115

# **NUCLEAR REACTOR FUEL ASSEMBLY**

Gustav Frömel, Erlangen, and Alexander Steinke, Ebermannstadt, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 643,888

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330850

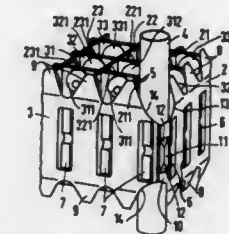
Int. Cl.<sup>4</sup> G21C 3/34

U.S. Cl. 376—439

6 Claims

1. Nuclear reactor fuel assembly having a grid-shaped spacer with square grid meshes, wherein mutually parallel rods are arranged, respectively, in a grid mesh, the spacer having flat

outer straps extending transversely to the rods and an intermediate strip extending parallel to the rods between two of the respective outer straps, the intermediate strip being inclined relative to the two outer straps, comprising a rejection rise formed at the outside of the intermediate strip and extending



outwardly and away from the grid meshes in direction of a diagonal of a grid mesh located at a corner between the two outer straps, said rejection rise being disposed transversely to the two outer straps and being inclined downwardly towards two respective ends of the intermediate strip in longitudinal direction of the rods.

4,683,116

# **NUCLEAR REACTOR**

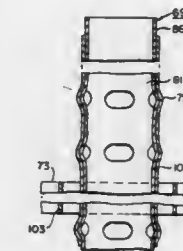
Harry M. Ferrari, Edgewood Boro, and John F. Wilson, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 9, 1985, Ser. No. 732,220

Int. Cl.<sup>4</sup> G21C 3/32

U.S. Cl. 376—447

4 Claims



1. A non-controlled nuclear fuel assembly which is not penetrated by control rods during operation of a nuclear reactor in whose core said non-controlled nuclear fuel assembly is contained; the said nuclear fuel assembly including a top nozzle, a bottom nozzle, a plurality of nuclear fuel rods extending between said nozzles, a plurality of grids extending along said fuel rods for maintaining said fuel rods positioned between said nozzles, and structural members, each of which is a hollow tube, secured to said top and bottom nozzles for forming said assembly into an integral unit, the said assembly being characterized by structural members of substantial thickness and at least certain of which contain burnable neutron absorbers.

4,683,117

# **NUCLEAR FUEL ASSEMBLY INCORPORATING PRIMARY AND SECONDARY STRUCTURAL SUPPORT MEMBERS**

William R. Carlson, Pittsburgh; Robert K. Gjertsen, Monroeville, and John V. Miller, Munhall, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 9, 1985, Ser. No. 774,126

Int. Cl.<sup>4</sup> G21C 3/32

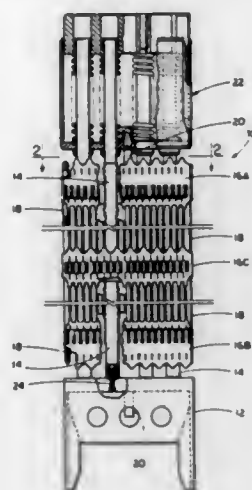
U.S. Cl. 376—449

12 Claims

1. A nuclear fuel assembly, comprising:
  - (a) an upper end structure;
  - (b) a lower end structure;
  - (c) a plurality of elongated primary structural members

extending longitudinally between and rigidly interconnecting said upper and lower end structures, said upper and lower end structures and primary structural members together forming a rigid structural skeleton of said fuel assembly;

- (d) a plurality of transverse grids being supported on said primary structural members at axially spaced locations therealong between said upper and lower end structures; (e) a plurality of fuel rods extending through and being supported by said grids between said upper and lower end



structures so as to extend in generally side-by-side spaced relation to one another and to said primary structural members; and

- (f) a plurality of elongated secondary structural members extending longitudinally between but unconnected with said upper and lower end structures, said secondary structural members extending through and rigidly interconnecting with said grids so as to extend in generally side-by-side spaced relation to one another, to said fuel rods and to said primary structural members so as to bolster the stiffness of said structural skeleton of said fuel assembly.

4,683,118

# PROCESS AND APPARATUS FOR MANUFACTURING A PRESSED POWDER BODY

Chikara Hayashi, Chigasaki, and Seichiro Kashu, Yachimata, both of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

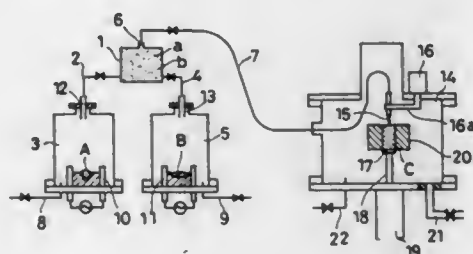
Filed Oct. 9, 1985, Ser. No. 785,683

Claims priority, application Japan, Oct. 9, 1984, 59-210366

Int. Cl.<sup>4</sup> B22F 7/00

U.S. Cl. 419-23

6 Claims



1. A process for producing a pressed powder body comprising mixing together ultrafine particles having a diameter of  $0.001 \mu\text{m}$  to  $1 \mu\text{m}$  of at least two different materials in a carrier gas and spraying the mixture of ultrafine particles in the carrier gas onto an objective surface such that there is formed by the pressure of the spraying a pressed body comprising an aggregated solid the mass of the ultrafine particles wherein the

ultrafine particles of the different materials are mixed together uniformly throughout the whole aggregated solid mass.

4,683,119

# PLATINUM GROUP METAL-CONTAINING ALLOY

Gordon L. Selman, and Richard J. Midgley, both of London, England, assignors to Johnson Matthey & Company, Limited, London, England

Division of Ser. No. 40,184, May 18, 1979, abandoned, which is a division of Ser. No. 827,748, Aug. 25, 1977, abandoned, which is a division of Ser. No. 593,250, Jul. 7, 1975, Pat. No. 4,061,495.

This application Mar. 2, 1981, Ser. No. 239,583

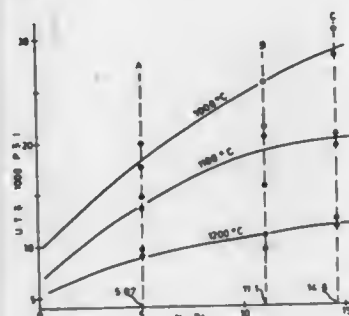
Claims priority, application United Kingdom, Jul. 8, 1974, 7430168

The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.

Int. Cl.<sup>4</sup> C22C 19/05

U.S. Cl. 420-444

5 Claims



1. An alloy consisting of:

- (a) 54-78% nickel;  
(b) 13-25% chromium;  
(c) 5-15% platinum; and  
(d) an added effective amount up to 7 weight percent of aluminum and/or an added effective amount up to 6 weight percent of titanium.

4,683,120

# BIOLOGICAL FLUID ASSAY SYSTEM

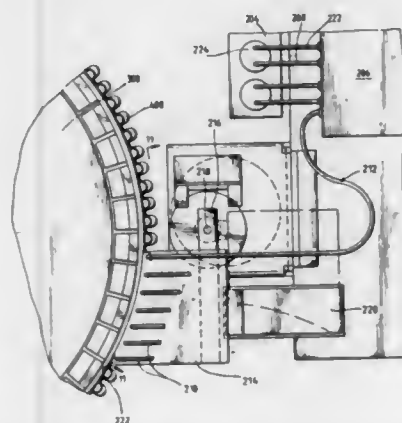
Peter M. Meserol, and Jesse L. Acker, both of Whippany, N.J., assignors to Gamma Biologicals, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 546,345, Oct. 28, 1983, abandoned. This application Oct. 18, 1984, Ser. No. 660,721

Int. Cl.<sup>4</sup> G01N 21/07, 35/06

U.S. Cl. 422-72

15 Claims



1. An apparatus for determining the reactive characteristics of a biological mixture of a specimen and a reagent comprising:

- (a) a centrifuge rotor;  
(b) an energy transmissive, flexible belt formable into a cylinder and removably mounted for movement in unison with said centrifuge rotor, said belt including a plurality of specimen containers, said specimen containers each including a flat element having an inner surface, an outer surface, an upper surface and a lower end, and an indented element having an inner surface, an outer surface, an upper end and a lower end, and having at least one smooth, outwardly, radially extending and vertically oriented indentation formed therein, the indentation vertically gradually increasing in an outwardly extending radial depth along a moderately inclined slanting segment to a smoothly curved radial apex then abruptly decreasing in radial depth along a severely inclined segment and thereafter extending upwardly along a uniformly shallow generally vertical segment to the upper end of said indented element, said flat element and said indented element being connected together with the inner surface of the flat element in contact with the inner surface of said indented element, said open upper end of said indented element forming an opening for filling said specimen containers; and  
(c) a detection system for irradiating the plurality of specimens contained within said belt and for optically measuring the reactive characteristics of the specimens.

4,683,121

# REACTOR FOR NON-ISOTHERMIC REACTIONS FOR THE PREPARATION OF HYDROCARBONS

Johan C. Goudriaan, and Maarten J. Van der Burgt, both of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

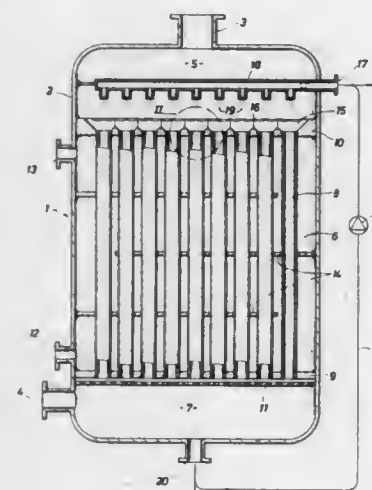
Filed May 22, 1985, Ser. No. 736,908

Claims priority, application United Kingdom, May 29, 1984, 8413596

Int. Cl.<sup>4</sup> B01J 8/06

U.S. Cl. 422-197

9 Claims



1. An apparatus for performing a chemical reaction in a reaction vessel, which reaction vessel comprises a normally vertically extending outer vessel wall, means defining a fluid collection zone situated in the bottom of said vessel, an upper tube plate situated in the upper portion of said vessel with means defining a plurality of hexagonal openings having a honeycomb configuration within said upper tube plate, a lower tube plate permeable by fluids but impermeable to solid material situated in the lower portion of said vessel, means for circulating a heat transfer medium situated intermediate said upper and lower tube plates, a fluid introduction zone having fluid inlet means comprising a plurality of inlet fluid spray nozzles situated in axial alignment with said plurality of open-

4,683,122

# GAS-LIQUID REACTOR AND METHOD FOR GAS-LIQUID MIXING

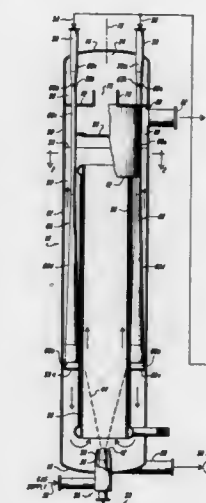
Joseph J. Concordia, Boston, Mass., and Donald R. Hall, Barrington, R.I., assignors to Herzog-Hart Corporation, Boston, Mass.

Filed Apr. 14, 1986, Ser. No. 851,725

Int. Cl.<sup>4</sup> B01F 3/04

U.S. Cl. 422-227

27 Claims



1. A gas-liquid reactor comprising:  
a vessel for containing a liquid, said vessel having a sidewall, a top and a bottom, a head space being defined between the liquid surface and the top of said vessel;  
a submerged jet nozzle positioned at the bottom of said vessel for injecting liquid and gas upwardly into the liquid in said vessel;  
at least two free jet nozzles positioned at the top of said vessel in said head space for injecting a liquid jet downwardly into the liquid in said vessel such that gas in said head space is entrained into said liquid jet and mixed into the liquid in said vessel;  
means for supplying reactive gas to said submerged jet nozzle;



means for supplying liquid to said submerged jet nozzle and said free jet nozzles;  
means for venting reacted gas from said vessel; and  
baffle means for directing reactive gas rising from said liquid surface to said head space for entrainment in said liquid jet, and for directing reacted gas rising from said liquid surface to said venting means.

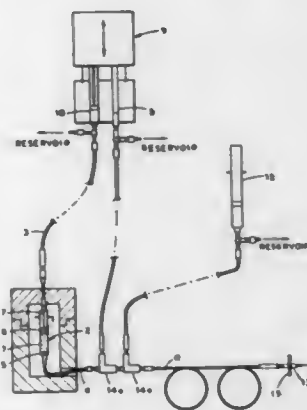
4,683,123

**OSMIUM-191/IRIDIUM-191M RADIONUCLIDE**  
Forn F. Knapp, Jr.; Thomas A. Butler, both of Oak Ridge, Tenn., and Claude Brihaye, Liege, Belgium, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 26, 1985, Ser. No. 769,519  
Int. Cl.<sup>4</sup> B01D 59/26

U.S. Cl. 423—2

25 Claims



1. An osmium-191/iridium-191m generator system comprising an adsorbent consisting essentially of activated carbon, said adsorbent being loaded with a compound containing Os-191.

4,683,124

**ACTINIDE RECOVERY PROCESS**

Anthony C. Muscatello; James D. Navratil, and Mark T. Saba, all of Arvada, Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 13, 1985, Ser. No. 744,441  
Int. Cl.<sup>4</sup> C01G 56/00

U.S. Cl. 423—6

5 Claims

1. A process for removing polymeric plutonium from aqueous solutions, comprising:  
(a) loading a solid solvent extractant on a solid inert support by melting the extractant and mixing it with the support;  
(b) contacting a feed solution containing plutonium polymer with said loaded support to remove the polymer from the solution; and  
(c) recovering the polymer from the loaded support; wherein said solid solvent extractant is selected from the group consisting of trioctylphosphine oxide, octylphenyl-N,N-diisobutylcarbamoylmethylphosphine oxide, triphenylphosphine oxide, thenoyltrifluoroacetone, crown ethers, and mixtures thereof.

4,683,125

**METHOD FOR PURIFYING AN INDUSTRIAL RAW MATERIAL GAS AND A PURIFIER FOR USE IN SAID METHOD AND A METHOD OF MANUFACTURING SAID PURIFIER**

Atsushi Yusa, Nagano, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

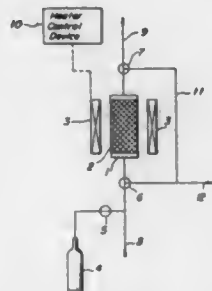
Filed Mar. 27, 1985, Ser. No. 716,446

Claims priority, application Japan, Apr. 2, 1984, 59-66453  
The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> C01B 13/00

U.S. Cl. 423—219

8 Claims



1. A method of purifying an industrial raw material gas selected from the group consisting of hydrogen, nitrogen, argon, carbon dioxide and ammonia, said raw material gas containing oxygen and water components, comprising the steps of:

- (a) preparing a purifier by:
  - (i) charging a reaction vessel with a carrier selected from the group consisting of a porous K<sup>+</sup> ion-exchange A, X or Y zeolite and porous carbon molecular sieves;
  - (ii) heating said carrier to a temperature greater than a thermal decomposition temperature of at least one gas selected from the group consisting of hydride and fluoride gases of at least one element selected from the group consisting of Si and Ge; and
  - (iii) introducing said at least one gas of said at least one element into the reaction vessel, thereby depositing a layer on said carrier of at least one substance selected from the group consisting of a hydrogenated amorphous substance and a fluorinated amorphous substance of said at least one element;
- (b) heating said purifier;
- (c) contacting the industrial raw material gas with the heated purifier to remove simultaneously said oxygen and water components from the industrial raw material gas.

4,683,126

**METHOD FOR PRODUCING ALKALINE EARTH METAL BORATE DISPERSIONS**

Kiyoshi Inoue, Hiratsuka, and Yoshiharu Nose, Yokosuka, both of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,619

Claims priority, application Japan, Mar. 8, 1985, 60-46252  
Int. Cl.<sup>4</sup> C01B 15/12, 35/12

U.S. Cl. 423—280

19 Claims

1. A method for producing an alkaline earth metal borate dispersion, consisting of two steps of:  
(I) reacting at 20°–100° C. a mixture of the following ingredients (A) to (E)  
(A) 100 parts by weight of the oil-soluble neutral sulfonate of an alkaline earth metal,  
(B) 10–100 parts by weight of the hydroxide or oxide of an alkaline earth metal,  
(C) boric acid in an amount which is 0.5–6.5 times in mol that of the ingredient (B),  
(D) 5–50 parts by weight of water and  
(E) 50–200 parts by weight of a dilution solvent and then

(II) heating the resulting reaction mixture to 100°–200° C. to remove the water.

4,683,127

**PROCESS FOR MAKING WET-PROCESS PHOSPHORIC ACID**

Friedrich Kolkmann, Brühl; Herbert Ressel, Erfstadt; Reinhard Gradl, Erfstadt, and Günther Schimmel, Erfstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 5, 1986, Ser. No. 826,289

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505247

Int. Cl.<sup>4</sup> C01B 25/16

U.S. Cl. 423—321 R

5 Claims

1. Process for preventing precipitation of Na<sub>2</sub>SiF<sub>6</sub> during mineral acid treatment of a fluorine-containing phosphate ore which is lower in aluminum content than Kola phosphate ore, the mineral acid treatment resulting in the formation of a suspension containing less than 0.3 weight-% aluminum based on the P<sub>2</sub>O<sub>5</sub> content of the suspension, the liquid phase of said suspension containing sodium ions, crude phosphoric acid, and scrubbing water recycled from subsequent purification of the crude phosphoric acid, the solid phase of said suspension containing solid material formed and retained by said mineral acid treatment, said process comprising:

adding, either to the phosphate ore or to said suspension, a quantity of an aluminum compound selected from the group consisting of aluminum hydroxide, aluminum sulfate, clay, or aluminate sufficient to increase the aluminum concentration in said suspension to 0.3–1.0 weight-%, based on the P<sub>2</sub>O<sub>5</sub> content thereof.

4,683,128

**PROCESS FOR MANUFACTURING HIGH PURITY SILICA**

Koichi Orii, Yokohama; Masashi Nishida, Hachinohe; Junsuke Yagi, and Iwao Ohshima, both of Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,773

Claims priority, application Japan, Jun. 27, 1985, 60-139145; Jun. 27, 1985, 60-139146; Feb. 5, 1986, 61-22068; Feb. 5, 1986, 61-22069

Int. Cl.<sup>4</sup> C01B 33/12

U.S. Cl. 423—338

27 Claims

1. A process for manufacturing high purity silica having an alkali metal content of 0 to 10 ppm, a chlorine content of 0 to 3 ppm and a uranium content of 0 to 3 ppb, said process comprising:

(1) a step of extruding an aqueous solution of an alkali silicate represented by the general formula:



wherein M is an alkali metal element and n is a number of moles of SiO<sub>2</sub> of 0.5 to 5, into a coagulating bath comprising a coagulant through a spinning nozzle having a bore diameter of 1 mm or less to coagulate the same, and thereby making the same into a fibrous gel, said aqueous solution having a viscosity in the range of 2 to 500 poise, and

(2) a step of treating the fibrous gel obtained with an acid-containing solution, and then washing the same with water to extract and remove impurities.

4,683,129

**PROCESS FOR THE PRODUCTION OF ADVANCED NF<sub>4</sub><sup>+</sup> SALTS**

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 5, 1981, Ser. No. 271,066

Int. Cl.<sup>4</sup> C01B 21/00

U.S. Cl. 423—351

6 Claims

1. The method of exchanging the anion in an NF<sub>4</sub><sup>+</sup> salt by ion exchange and in accordance with the following reaction:



wherein C<sub>n</sub><sup>+</sup> is a graphite cation and X<sup>−</sup> is an advanced NF<sub>4</sub><sup>+</sup> salt anion.

4,683,130

**METHOD OF GENERATING OXYGEN FOR EMERGENCY USE**

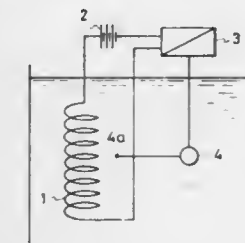
Shinji Ueno, 4-10-9, Tsuboi, Kumamoto-ski, Kumamoto-ken, and Naoki Koga, 207, 5-22-31, Hirao, Chuoh-ku, Fukuoka-sbi, Fukuoka-ken, both of Japan

Filed Mar. 31, 1986, Ser. No. 846,077

Claims priority, application Japan, Apr. 2, 1985, 60-68375  
Int. Cl.<sup>4</sup> C01B 13/00

U.S. Cl. 423—579

19 Claims



1. A method for generating oxygen for emergency use, comprising:

- (a) providing an aqueous solution of an addition compound of sodium carbonate and hydrogen peroxide;
- (b) providing an integral catalyst support body having supported on a surface thereof a layer of a catalyst which is capable, when immersed in said solution, of catalysing generation of oxygen gas, at least partly in the form of bubbles which tend to cling to said layer;
- (c) repeatedly immersing said surface of said body in said solution, and withdrawing said surface of said body from said solution so as to repeatedly initiate and terminate catalysed generation of oxygen in said solution;
- (d) while said surface of said body is immersed in said solution, actively dislodging oxygen bubbles from clinging to said layer.

4,683,131

**DIVISIBLE PHARMACEUTICAL TABLET WITH DELAYED ACTIVE INGREDIENT RELEASE**

Bernd Zierenberg, and Arun R. Gupte, both of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany  
Division of Ser. No. 751,790, Jul. 3, 1985, Pat. No. 4,595,587, which is a division of Ser. No. 591,988, Mar. 21, 1984, Pat. No. 4,547,359. This application Jan. 31, 1986, Ser. No. 824,782  
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 3314003

Int. Cl.<sup>4</sup> A61K 9/26, 9/44, 31/78

U.S. Cl. 424—467

4 Claims

1. The method of making a divisible pharmaceutical delayed active ingredient release tablet with a notched score line,

wherein the rate of release of active agent is independent of the size and nature of the total surface area, and the tablet breaks at the score line, ensuring precise dosage when broken into fragments consisting of a compressed tablet-making composition containing finely divided polyacrylate material prepared by emulsion polymerization, conventional tablet-making excipients and active ingredient molecularly dispersed in said polyacrylate material, which comprises dissolving the active ingredient together with the polyacrylate material in an organic solvent, evaporating the solvent from the solution, grinding the residual active ingredient-containing polyacrylate material at a temperature below the glass temperature to form a powder, admixing said powder with conventional tablet-making excipients, and compressing the resulting composition in a tablet making press with a scoring device into a divisible notched, score-lined pharmaceutical tablet.

4,683,132

#### COMPOSITIONS, DEVICES, AND METHODS FOR EXTENDED CONTROL OF INSECT ACTIVITY

Patricia M. Ronning, St. Paul, and Gregg A. Vandesteeg, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 30, 1982, Ser. No. 373,533

Int. Cl.<sup>4</sup> A01N 25/34; A61K 31/78

U.S. Cl. 424—409

20 Claims

1. A composition for controlling insect activity comprising (a) rough-surfaced cellulosic fibers which comprise a graft copolymer of cellulose and an ethylenically unsaturated material copolymerizable with cellulose, and (b) self-adhered to the surface of said fibers an insect control agent comprising a liquid insecticide encapsulated in a hollow capsule whose shell is permeable to said liquid insecticide.

6. A composition according to claim 1 wherein said copolymerizable material is selected from the group consisting of acrylates, methacrylates, acrylamides, and vinyls.

12. A composition according to claim 1 wherein said liquid insecticide comprises a liquid pyrethroid and said shell comprises a polyurea.

4,683,133

#### METHOD FOR TREATING PERIODONTAL DISEASE

G. Lee Southard, Fort Collins, Colo., assignor to Vipont Laboratories, Inc., Ft. Collins, Colo.

Filed Aug. 20, 1985, Ser. No. 767,606

Int. Cl.<sup>4</sup> A61K 7/16, 33/30, 31/44

U.S. Cl. 424—449

7 Claims

1. A self-administerable method for the treatment and control of periodontal disease by supragingival irrigation comprising, pumping a dilute aqueous solution of a non-toxic benzo-c-phenanthridine alkaloid salt at concentrations from about 22.5 ug/ml to about 10 mg/ml through an orifice to provide a jet stream at a rate of 250 cc/minute to 600 cc/minute and a pulsation rate of 20 to 200 cycles per second penetrating directly into periodontal pockets associated with periodontal disease, and applying the jet stream of dilute benzo-c-phenanthridine alkaloid salt solution along the margins between the teeth and gums and into the periodontal pockets of an individual with periodontal disease so as to cleanse the diseased tissues and to provide a residue of said benzo-c-phenanthridine alkaloid salt.

4,683,134

#### WATERPROOF SUNSCREEN COMPOSITIONS

Victor Palinczar, 435 Adeline St., Trenton, N.J. 08611

Filed Dec. 13, 1985, Ser. No. 808,642

Int. Cl.<sup>4</sup> A61K 7/40, 7/42, 7/44

U.S. Cl. 424—59

21 Claims

1. A water-proof sunscreen composition comprising:

A. from about 35% to about 90% by weight of monohydric alcohol;

B. from about 0.1% to about 5.0% by weight of an ethylcellulose polymer having an average ethoxyl substitution

from about 2.20 to about 2.65 and an ethoxyl content from about 44.8% to about 52.2%;

C. from about 1.0% to about 30.0% by weight of an active ultraviolet radiation absorber;

D. from about 0.1% to about 5.0% by weight of an acrylic acid crosslinked polymer having a molecular weight from about  $4 \times 10^4$  to about  $5 \times 10^5$ ; an average equivalent weight from about 72 to about 80 and a specific gravity from 1.25 to about 1.55; and

E. from about 0.1% to about 5.0% by weight of an alkaline neutralizing agent.

4,683,135

#### DSCG BINDING PROTEIN AND PROCESS FOR PREPARING SAME

Israel Pecht, Rehovot, and Nachman Mazurek, Raanana, both of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Continuation of Ser. No. 517,843, Jul. 27, 1983, abandoned. This application Mar. 20, 1986, Ser. No. 843,912

Int. Cl.<sup>4</sup> C07K 15/06, 3/28

U.S. Cl. 424—85

15 Claims

1. An essentially pure protein consisting essentially of the protein, (CBP), present in nature in membranes of basophilic cells and in mast cells, having a molecular weight of about  $60,000 \pm 2,000$  determined by SDS polyacrylamide electrophoresis an isoelectric point of about 3.9 and an amino acid composition of about 4 units of asparagine, 3 units of threonine and serine, 3 units glycine, 2 units alanine, 2 units proline, 1 unit cysteine, 2 units valine, 1 unit methionine, 1 unit isoleucine, 2 units leucine, 1 unit tyrosine, 1 unit phenylalanine, 2 units histamine, 2 units lysine and 1 unit arginine, said protein being able to build calcium and having a calcium dependent affinity to the disodium salt of 1,2 bis-(2 carboxychromon-5-yloxy)-2-hydroxy propane (DSCG).

4,683,136

#### PROTEINACEOUS ANTIGENS WITH CONFORMATION-INDEPENDENT AND CONFORMATION-DEPENDENT DETERMINANTS

David Millich, Mira Mesa, and Frank Chisari, Del Mar, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Mar. 6, 1985, Ser. No. 708,746

Int. Cl.<sup>4</sup> A61K 39/12

U.S. Cl. 424—89

8 Claims

1. A method of enhancing the humoral immune response to an S region immunogen encoded by the hepatitis B virus genome in an animal that exhibits a low response to that immunogen which method comprises introducing into said animal an effective amount of a vaccine comprising a physiologically tolerable diluent that includes dispersed therein a potentiating amount of a pre-S(2) region polypeptide encoded by said viral genome that is chemically coupled to an S region polypeptide immunogen capable of inducing a protective response in an animal that exhibits a response to an S region-containing immunogen.

4,683,137

#### TEMPERATURE SENSITIVE REASSORTANT VIRUSES AND A VACCINE AGAINST EQUINE INFLUENZA

Leroy Coggins, Cary, N.C.; Brian R. Murphy, Glen Echo, Md.; Dorothy F. Holmes, Groton, N.Y.; Lynne J. Anguish, and James H. Gillespie, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 369,319, Apr. 16, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,510

Int. Cl.<sup>4</sup> A61K 23/00, 39/12, 39/145; C12N 7/00

U.S. Cl. 424—89

9 Claims

1. A temperature-sensitive virus capable of providing an equine influenza vaccine which is a reassortant mutant virus,

formed by mating a wild-type equine influenza virus of the A<sub>1</sub> or A<sub>2</sub> subgroups with chemically mutagenized and temperature-sensitive human influenza virus having a shut off temperature in the area of 37° C. to 39° C., said reassortant virus having at least one temperature-sensitive gene and at least two but no more than six human influenza virus derived genes, and being further characterized as having the serotype of the equine influenza virus and the temperature-sensitive defects of the human virus.

4,683,138

#### LOW MOISTURE, SUGARLESS, CENTER-FILLED CHEWING GUM

Michael Glass, Fairlawn; Joseph Hobolick, Hopatcong, both of N.J., and Daniel A. Orlandi, Flushing, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 8, 1986, Ser. No. 905,373

Int. Cl.<sup>4</sup> A23G 3/30

U.S. Cl. 426—5

23 Claims

1. A sugarless center-filled chewing gum piece having an outer sugarless chewing gum shell enclosing a cavity and a sugarless liquid center-fill within said cavity, said chewing gum piece comprising:

A. a chewing gum shell containing not more than about 2% by weight thereof water; and

B. a sugarless liquid center-fill comprising:

1. about 0.2% to about 1.5% by weight of a natural or synthetic gum selected from the group consisting of carboxymethylcellulose, pectin, propylene glycol alginate, agar and gum tragacanth;

2. about 85% to about 93% by weight of a glycerin humectant; and

3. about 6% to about 12% by weight of an additional water-miscible humectant ingredient selected from the group consisting of (a) sorbitol solution or (b) sorbitol solution and propylene glycol; wherein said liquid center-fill has a water content of about 6% to about 8%, based on the total weight of the liquid center-fill, and a viscosity of about 20,000 to about 85,000 centipoises at 25° C.

4,683,139

#### PROCESS FOR PREPACKING FRESH MEAT

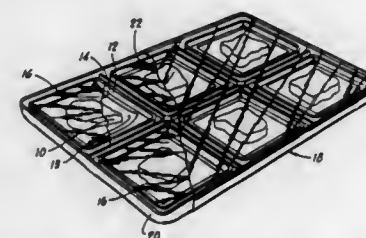
Chin S. Cheng, Oklahoma City, Okla., assignor to Wilson Foods Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 753,958, Jul. 11, 1985, abandoned. This application Dec. 9, 1985, Ser. No. 806,609

Int. Cl.<sup>4</sup> A23B 4/00, 4/02, 4/12

U.S. Cl. 426—265

15 Claims



1. A process for the pre-packing of sub-primal fresh pork cuts sized for sale to the consumer in order to enhance and extend the color shelf-life and the microbial shelf-life of the cuts, and to improve the organoleptic qualities of the cuts, without selective pre-screening based upon chemical testing to determine the pH of the cuts or other properties, which process comprises carrying out two steps in sequence as follows: contacting the fresh pork cuts with an aqueous solution which contains:

(a) a phosphate compound selected from the group of phosphate compounds which includes the alkali metal orthophosphates, the alkali metal pyrophosphates, the

alkali metal triphosphates and the alkali metal hexametaphosphates, said phosphate compound being used in an amount of from about 0.1 weight percent to about 2.0 weight percent of the fresh pork cuts so treated and contacted;

(b) a reducing compound selected from the group consisting of ascorbic acid, iso-ascorbic acid, the alkali metal salts of said acids, and reductic acid, said reducing compound being used in an amount which is from about 0.01 weight percent to about 0.1 weight percent of the total weight of the contacted and treated fresh pork cuts; and

(c) a sequestering agent selected from the group consisting of citric acid, tartaric acid, ethylenediaminetetraacetic acid, and the sodium and potassium salts of such acids, so as to place in the thus treated pork, from about 0.01 weight percent to about 0.2 weight percent of the sequestering agent; then thereafter

packaging the thus treated pork cuts in a controlled gaseous atmosphere which includes, in gaseous admixture, from about 2 percent to about 25 percent oxygen, and from about 20 percent to about 80 percent carbon dioxide, with the balance being nitrogen, whereby the properties of the thus treated and packaged fresh pork cuts are improved and remain good for a period of at least about 21 days, and so that the pork cuts have a color shelf-life of at least about 21 days, and a microbial shelf-life which is at least as long as the color shelf-life, so that there is no masking of bacterial spoilage resulting from a longer color shelf-life than microbial shelf-life, and so that all of the cuts so treated have substantially uniform shelf-life properties and substantially uniformly good organoleptic properties, regardless of the pH condition of the chops at the outset of the treatment.

4,683,140

#### PROCESS FOR MANUFACTURING AN HERB TEA FROM THE LEAVES OF GINKO, PERSIMMON AND PINE

Kwon J. Kang, 807-3 Bangbae-Dong, Kangnam-ku, Seoul, Rep. of Korea

Filed Aug. 14, 1985, Ser. No. 765,534

Int. Cl.<sup>4</sup> A23F 3/34

U.S. Cl. 426—597

7 Claims

1. A process for preparing a nutrient herb tea extract which comprises:

(a) providing a predetermined quantity of leaves from the genus Ginko, Persimmon and Pine in an aqueous environment to form an initial mixture said predetermined quantity of leaves from the genus Ginko, Persimmon and Pine being present in an amount of about 70%, 20% and 10% by weight, respectively;

(b) soaking the initial mixture in water at a temperature of about 15° C. for three hours;

(c) heating the mixture in a pressure pot at a temperature of about 100°–130° C. for about 10–15 minutes; and

(d) filtrating the aqueous mixture to produce said extract.



4,683,141

## DEHYDRATED VEGETABLES

Victor M. Lewis, and David A. Lewis, both of Rushcutters Bay, Australia, assignors to Byron Agricultural Company, Pty. Limited, Rushcutters Bay, Australia  
Continuation of Ser. No. 607,033, May 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 315,723, Oct. 28, 1981, Pat. No. 4,447,460, which is a continuation-in-part of Ser. No. 165,294, Jul. 2, 1980, abandoned. This application Mar. 2, 1986, Ser. No. 837,319

Claims priority, application Australia, Jul. 11, 1979, PD9542  
The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.<sup>4</sup> A23L 1/212, 3/34

U.S. Cl. 426—639

9 Claims

1. A dehydrated vegetable product containing 3–15% sodium chloride, not more than about 17% sugar and 6–25% water and having a water activity level of 0.45 to 0.85 at 20° C., said product containing no other additives other than flavorings, coloring substances, seasonings, preservatives, salts, nutritional supplements and anti-oxidants.

4,683,142

## RESORPTIVE SHEET MATERIAL FOR CLOSING AND HEALING WOUNDS AND METHOD OF MAKING THE SAME

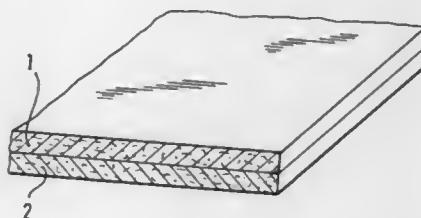
Eberhard Zimmermann, Am Braaken 16, 4400 Münster-Nienberge, and Michael Stroetmann, Kaiser-Wilhelm-Ring 36, 4400 Münster, both of Fed. Rep. of Germany  
Division of Ser. No. 486,580, Apr. 19, 1983, Pat. No. 4,606,337.  
This application Aug. 13, 1986, Ser. No. 896,160

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 3214337

Int. Cl.<sup>4</sup> A61L 15/00; A01N 1/02

U.S. Cl. 427—2

8 Claims



1. A method of making a resorptive sheet material for closing and healing wounds, consisting essentially of a glycoprotein matrix containing substances which cause and, respectively, are conducive to the coagulation of blood, including fibrinogen and thrombin, wherein the sheet material is dry and of multi-layered structure; at least one layer is free from thrombin and contains in the glycoprotein matrix thereof, the fibrinogen in a substantially homogeneously distributed form; and at least one further layer is free from fibrinogen and contains in the glycoprotein matrix thereof the thrombin in a substantially homogeneously distributed form; which process comprises adding fibrinogen to a thrombin-free, predominantly aqueous solution or suspension of the glycoprotein and processing said solution or suspension to form a sheet material layer; and applying onto the full surface of this layer at least one further layer which, in its turn, has been obtained from a further layer, fibrinogen-free and thrombin-containing solution or suspension of the same or of another glycoprotein.

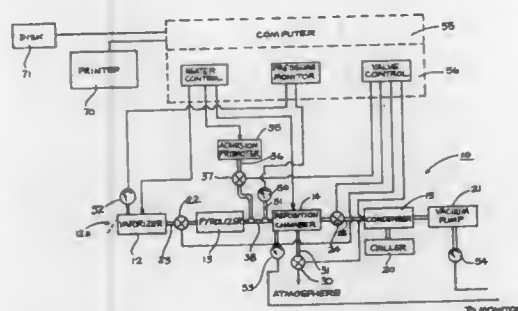
4,683,143

## METHOD AND APPARATUS FOR AUTOMATED POLYMERIC FILM COATING

John A. Riley, 905 Richmar Dr., Westlake, Ohio 44145  
Filed Apr. 8, 1986, Ser. No. 849,473  
Int. Cl.<sup>4</sup> B05C 15/00; B05D 5/12

U.S. Cl. 427—8

9 Claims



1. A method for conducting a vapor phase deposition process comprising the steps of:
  - (a) placing a workpiece within a deposition chamber and evacuating the deposition chamber;
  - (b) vaporizing a dimer in a vaporizer chamber;
  - (c) cleaving the dimer in a pyrolyzer chamber to produce a reactive vapor;
  - (d) condensing the reactive vapor onto a workpiece in the evacuated deposition chamber;
  - (e) generating control signals for routing said vapor from the vaporizer chamber to the pyrolyzer chamber and then to the deposition chamber;
  - (f) controlling vapor pressures as vapor is routed from the pyrolyzer chamber to the deposition chamber by controlling vapor temperature; and
  - (g) monitoring progress of the deposition process to apprise an operator of the status of the process; said monitoring step comprising the substeps of:
    - (i) depicting the vaporizing chamber, pyrolyzer chamber and deposition chamber and conduits connecting said chambers on a viewing screen;
    - (ii) periodically sensing temperatures of at least some of said chambers and conduits, tabulating said temperatures on the viewing screen, comparing said temperatures with predetermined upper and lower limits, and indicating whether the temperatures fall within the limits;
    - (iii) periodically sensing pressures within one or more of said chambers and conduits and tabulating said pressures on the viewing screen; and
    - (iv) presenting one or more indicators on the viewing screen co-ordinated with the generation of the control signals to indicate a progression of the vapor phase deposition process through a number of stages.

4,683,144

## METHOD FOR FORMING A DEPOSITED FILM

Yukuo Nishimura, Sagami-hara; Ken Eguchi; Hiroshi Matsuda, both of Yokohama; Masahiro Haruta, Funabashi; Yutaka Hirai, and Takashi Nakagiri, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 11, 1985, Ser. No. 722,133

Claims priority, application Japan, Apr. 16, 1984, 59-76126; Apr. 16, 1984, 59-76127; Apr. 16, 1984, 59-76130; Apr. 16, 1984, 59-76131

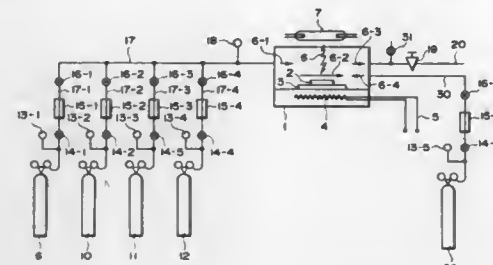
Int. Cl.<sup>4</sup> B05D 3/06

U.S. Cl. 427—35

9 Claims

1. A photolytic method for forming a deposited film, which comprises forming a gaseous atmosphere of a silane compound represented by the general formula:  $\text{Si}_n\text{H}_{2n+2}$  ( $n \geq 1$ ) and a halogen compound selected from the group comprised of  $\text{Cl}_2$ ,

$\text{Br}_2$ ,  $\text{I}_2$  and  $\text{F}_2$ , in a deposition chamber in which a substrate is arranged, and exciting and decomposing these compounds by utilization of photoenergy thereby to form the deposited film



containing silicon atoms on said substrate whereby the deposited film may be formed at substrate temperatures on the order of about 50° to 150° C., and without application of thermal energy to excite and decompose the compounds.

4,683,145

## METHOD FOR FORMING DEPOSITED FILM

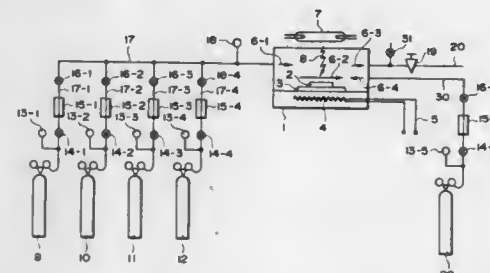
Yukuo Nishimura, Sagami-hara; Ken Eguchi; Hiroshi Matsuda, both of Yokohama; Masahiro Haruta, Funabashi; Yutaka Hirai, and Takashi Nakagiri, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 11, 1985, Ser. No. 722,134

Claims priority, application Japan, Apr. 16, 1984, 59-76128; Apr. 16, 1984, 59-76129; Apr. 16, 1984, 59-76132; Apr. 16, 1984, 59-76133; Apr. 16, 1984, 59-76134; Apr. 16, 1984, 59-76135

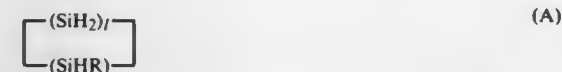
Int. Cl.<sup>4</sup> B05D 3/06

U.S. Cl. 427—36

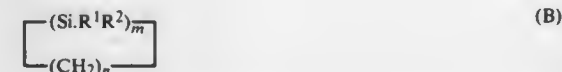
16 Claims



1. A method for forming a deposited film, which comprises forming a gaseous atmosphere of at least one silicon compound moiety selected from the group consisting of: (i) a compound of formula A and a halogen gas; (ii) a compound of formula B; or (iii) a compound of formula C, in a deposition chamber in which a substrate is arranged, and exciting and decomposing said compound by utilization of light energy thereby to form a deposited film containing silicon atoms on said substrate, wherein (a) formula A is

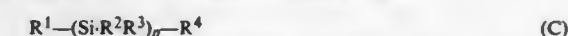


wherein l represents 3, 4 or 5; and R represents H or  $\text{SiH}_3$ ; (b) formula B is



wherein  $\text{R}^1$  and  $\text{R}^2$  independently represent H or an alkyl

group having 1 to 3 carbon atoms; m an integer of 3 to 7; and n an integer of 1 to 11; and (c) formula C is



wherein  $\text{R}^1$  and  $\text{R}^4$  independently represent a phenyl or naphthyl group which may be substituted with halogens, or an alkyl group having 1 to 11 carbon atoms;  $\text{R}^2$  and  $\text{R}^3$  independently represent H or  $\text{CH}_3$ ; and p represents an integer of 3 to 7.

4,683,146

## PROCESS FOR PRODUCING DEPOSITION FILMS

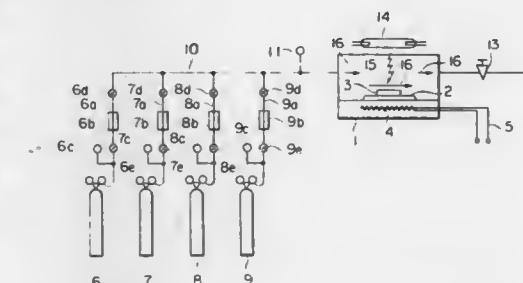
Yutaka Hirai, Tokyo; Hiroshi Matsuda; Ken Eguchi, both of Yokohama; Masahiro Haruta, Funabashi; Yukuo Nishimura, Sagami-hara, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 12, 1985, Ser. No. 722,467

Claims priority, application Japan, Apr. 16, 1984, 59-74932; Apr. 16, 1984, 59-74933; Apr. 16, 1984, 59-74934; Apr. 16, 1984, 59-74935; Apr. 16, 1984, 59-74936; Apr. 16, 1984, 59-74937

Int. Cl.<sup>4</sup> B05D 3/06

U.S. Cl. 427—54.1

22 Claims



1. A photolytic process for producing a deposition film which comprises forming a gaseous atmosphere of at least one silicon hydride compound selected from the group consisting of

(A) straight chain silicon hydrides represented by the general formula



wherein n is an integer of 5 or more;

(B) cyclic silicon hydrides unsubstituted or substituted by a linear or branched silicon hydride radical which are represented by the general formula



wherein m is 3, 4, 5 or 6; and

(C) branched chain silicon hydrides represented by the general formula



wherein p is an integer of 5 or more and q is an integer of 12 or more;

in a chamber having a substrate, and exerting light energy on the atmosphere to excite and decompose the silicon hydride compound, thereby forming a silicon-containing film on the substrate, whereby the film forming may be carried out at a substrate temperature on the order of about 50° to 150° C. and without application of thermal energy to excite and decompose the compounds.

4,683,147

## METHOD OF FORMING DEPOSITION FILM

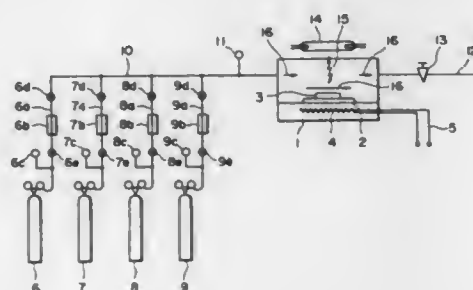
Ken Eguchi; Hiroshi Matsuda, both of Yokohama; Masahiro Haruta, Funabashi; Yukuo Nishimura, Sagami-hara; Yutaka Hirai, and Takashi Nakagiri, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 12, 1985, Ser. No. 722,468

Claims priority, application Japan, Apr. 16, 1984, 59-74922; Apr. 16, 1984, 59-74923; Apr. 16, 1984, 59-74924; Apr. 16, 1984, 59-74925; Apr. 16, 1984, 59-74926; Apr. 16, 1984, 59-74927; Apr. 16, 1984, 59-74928; Apr. 16, 1984, 59-74929; Apr. 16, 1984, 59-74930; Apr. 16, 1984, 59-74931; Apr. 16, 1984, 59-76136; Apr. 16, 1984, 59-76137

Int. Cl. B05D 3/06

U.S. Cl. 427—54.1

20 Claims



1. A photolytic method of forming a silicon-containing film deposited on a substrate, comprising the steps of forming a gaseous atmosphere of at least one silicon compound selected from the group consisting of compounds represented by general formulas (A), (B), (C), (D), (E) and (F) in a deposition chamber containing the substrate, and applying light energy to the compound sufficient to excite and decompose the compound and to deposit a film while maintaining a pressure of 0.01 to 100 Torr during the forming of said film, whereby the film may be deposited at a substrate temperature on the order of about 50° to 150° C. and without application of thermal energy to excite and decompose the compounds:

(A)  $\text{Si}_n\text{H}_m\text{X}_l$  (wherein X is a halogen atom, n is an integer of not less than 3, and m and l are integers of not less than 1 respectively,  $m+l=2n$  if l is an integer of not less than 2, a plurality of X's may represent different halogen atoms) representing a cyclic silicon compound;

(B)  $\text{Si}_a\text{X}_{2a+2}$  (wherein X is a halogen atom and a is an integer of 1 to 6) representing a chain halogenated silicon compound;

(C)  $\text{Si}_b\text{X}_{2b}$  (wherein x is a halogen atom and b is an integer of 3 to 6) representing a cyclic halogenated silicon compound;

(D)  $\text{Si}_c\text{X}_d\text{Y}_e$  (wherein X and Y are different halogen atoms, c is an integer of 3 to 6, d and e are integers of not less than 1, and  $d+e=2c$ ) representing a cyclic halogenated silicon compound;

(E)  $\text{Si}_f\text{X}_g\text{Y}_h$  (wherein X and Y are different halogen atoms, f is an integer of 1 to 6, g and h are integers of not less than 1, and  $g+h=2f+2$ ) representing a chain halogenated silicon compound; and

(F)  $\text{Si}_i\text{H}_j\text{X}_k$  (wherein X is a halogen atom, i, j and k are integers of not less than 1, and  $j+k=2i+2$ ) representing a silicon compound.

4,683,148

## METHOD OF PRODUCING HIGH QUALITY PLASMA SPRAY DEPOSITS OF COMPLEX GEOMETRY

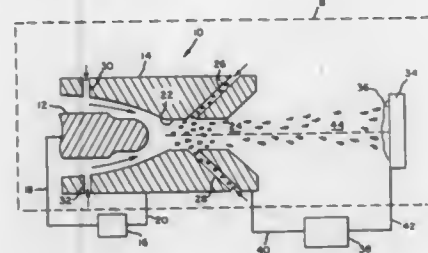
John R. Rairden, III, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 5, 1986, Ser. No. 859,536

Int. Cl. C23C 15/00

U.S. Cl. 427—34

6 Claims



1. The method of forming a dense deposit over a receiving surface of complex geometry which comprises directing a first plasma gun at a first aim point on said receiving surface of complex geometry to deposit material processed through said first gun onto a first portion of said receiving surface, simultaneously directing a second plasma gun at a different aim point of said receiving surface to deposit like material processed through said second gun onto a second portion of said receiving surface, the plasma flames from said two guns overlapping in a non-planar surface region between said aim points, the axes of said gun being at an angle to each other of greater than 20°, and said aim points being separated onto opposite or confronting surfaces of said complex geometry.

4,683,149

## FILM FORMING PROCESS

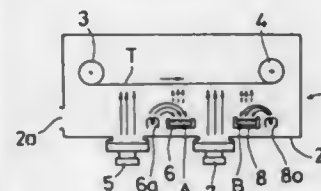
Yasuo Suzuki, and Yasunori Ando, both of Otsu, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

Division of Ser. No. 653,685, Sep. 21, 1984, Pat. No. 4,622,919. This application May 6, 1986, Ser. No. 860,119

Claims priority, application Japan, Dec. 29, 1983, 58-249803 Int. Cl. B05D 3/06

U.S. Cl. 427—38

6 Claims



1. A process for forming a film of predetermined thickness on a substrate in a vacuum chamber comprising the steps of: (i) activating the surface of the substrate by exposing the surface to ions at an accelerating voltage of 500 V to 5 kV, (ii) forming a base deposition layer on the activated substrate surface by vapor deposition, the base deposition layer having a thickness not larger than the depth to which ions can be implanted in the layer, and (iii) implanting ions in the deposition layer at an accelerating voltage of 10 kV to 100 kV; the process, when required, further including (iv) subjecting, a desired number of times, the resulting deposition layer to

(v) the step of vapor deposition or ion plating, and/or (vi) said steps (ii) and (iii), to form at least one layer over the deposition layer.

4,683,150

## COMPOSITION FOR SEALING SLIDING CONTACT SECTION

Katsumi Hirao, 21-17, Terada-cho, Ibaraki-shi, Osaka, and Toshio Miyake, 7-10-403, 1-chome, Okuda, Okayama-shi, Okayama, both of Japan

Division of Ser. No. 706,920, Feb. 28, 1985, Pat. No. 4,579,259, which is a continuation of Ser. No. 495,082, May 17, 1983, abandoned. This application Mar. 14, 1986, Ser. No. 839,572

Int. Cl. B05D 7/22; C08L 3/00

U.S. Cl. 427—239

10 Claims

1. In a method for sealing a sliding contact section, comprising filling such sliding contact section with a sealing composition in an amount effective to seal the sliding contact section, the improvement wherein said sealing composition consists essentially of:

- 1 part by weight of a polysaccharide consisting substantially of repeating maltotriose units and having an average molecular weight in the range of 10,000–10,000,000; and
- 5–200 parts by weight of a polyol bearing 2–20 carbon atoms and 2–20 hydroxyl groups.

4,683,151

## METHOD FOR APPLICATION OF REFRACTORY SPRAY MATERIAL

Setsumori Hamaguchi, and Sumio Hanaoka, both of Kitakyushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Kitakyushu, Japan

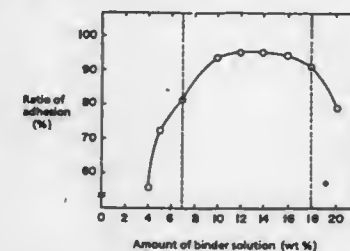
Filed Oct. 21, 1985, Ser. No. 789,795

Claims priority, application Japan, Oct. 31, 1984, 59-230938

Int. Cl. B05D 1/02

U.S. Cl. 427—397.8

1 Claim



1. A method for the application of a refractory spray material prepared by mixing a spray powder comprising 100 parts by weight of a refractory aggregate of an adjusted grain size and 0.1–3 parts by weight of a curing accelerator with 0.5–5 parts by weight of a wetting agent added thereto, which method is characterized by performing said application spraying with a nozzle while admixing said mixture with a sodium silicate solution as a binder having a viscosity in the range of 3–10 cPs at 15 degrees centigrade and containing 2–8% by weight of  $\text{Na}_2\text{O}$  and 8–20% by weight of  $\text{SiO}_2$  at a position in front of an orifice of the nozzle.

4,683,152

## APPLICATION EQUIPMENT FOR UNIFORM APPLICATION OF WATER-BASED CEMENTS

James J. Moran, Sugar Land, Tex., and Russell S. Boyes, Baton Rouge, La., assignors to NALCO Chemical Company, Oak Brook, Ill.

Filed Jan. 31, 1986, Ser. No. 824,880

Int. Cl. B05D 1/28

U.S. Cl. 427—428

1 Claim

1. An improved process for applying water-based tire tread adhesive to tire stock, said process being of a type comprising drive means for conveying said rubber stock to a Lick Roll

adhesive applicator adapted to apply said adhesive to said rubber stock, the improvement which comprises providing a supply of tire tread adhesive to a roller applicator located ahead of the Lick Roll, which roller applicator bypasses contact of the tire stock with the Lick Roll, said roller applicator being characterized as comprising a tube having through-out its length a bore adapted to receive a supply of water-based



tire tread adhesive, said roller applicator having about its surface a series of parallel spaced-apart grooves which are perpendicular to the length of the tube and which grooves contain holes communicating with the bore, and a porous fabric cover fitted around the outside of the tube, said cover being in communication with said supply of tire tread adhesive and saturated by the water-based tire tread adhesive; and transferring the tire adhesive to the tire stock.

4,683,153

## TRANSPARENT LAMINATED POLARIZING GLASSES

Serge P. P. Goepfert, Avon; Serge A. M. Renault, Montigny sur Loing; Francoise M. M. Roger, Avon; Jean-Pierre Themont, Montigny sur Loing, and Andre J. Vachet, La Genevraye, all of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 20, 1986, Ser. No. 831,311

Claims priority, application France, Aug. 13, 1985, 85 12322 Int. Cl. C09K 19/00; B32B 17/00

U.S. Cl. 428—1

10 Claims

1. A method for fabricating a transparent laminated polarizing glass consisting of a support of an inorganic or organic glass, a coating exhibiting polarizing properties disposed on one of the surfaces of the support, and an optically transparent layer adhered to the coating exhibiting polarizing properties and which protects the coating from humidity, said method comprising the following steps:

- forming parallel microgrooves in a surface of the inorganic or organic glass support prior to applying the polarizing coating thereon with the help of a slightly abrasive brushing of the support;
  - carefully washing and drying that surface of the support prior to applying the polarizing coating thereon;
  - depositing on that washed and dried surface of the support a mixture of three organic colorants corresponding to the three primary colors and exhibiting a nematic state;
  - treating the resultant polarizing coating to reduce the water solubility of the coating by immersing into an aqueous solution of inorganic salts having an acid pH;
  - treating the resultant product of Step (d) above with an aqueous solution free of organic co-solvent prepared from at least one compound chosen from among gamma-aminopropyltrimethoxysilane and gamma-aminopropyltriethoxysilane, the silane representing 0.1–10% by volume of the solution and the aqueous solution having a pH in the range of 10–11.2, this treatment being followed by a rinsing in water and a heat treatment between 80°–140° C.;
  - placing the resultant product of Step (e) above in contact with an aqueous solution of an epoxyalkyltrialkoxysilane and then rinsing in water followed by a condensation and/or partial polymerization of the epoxyalkyltrialkoxysilane; and
  - applying an optically transparent, inorganic or organic protective layer to form a barrier against humidity, that application requiring a heat treatment at elevated temperature or irradiation with ultraviolet rays.
10. A transparent laminated polarizing glass produced in accordance with claim 1.



4,683,154

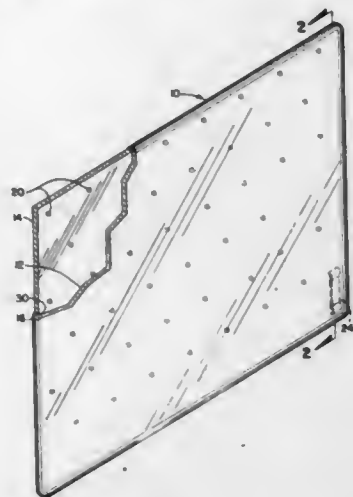
## LASER SEALED VACUUM INSULATION WINDOW

David K. Benson, and C. Edwin Tracy, both of Golden, Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 19, 1985, Ser. No. 767,218  
Int. Cl.<sup>4</sup> E06B 3/24, 7/12; B32B 17/00

U.S. Cl. 428—34

19 Claims



1. A thermal resistant panel comprising two panes of glass positioned closely spaced apart in substantially parallel relation to each other, a plurality of spherical glass bead spacers positioned between said two panes of glass to maintain the spacing while minimizing the thermal conduction between said panes, and a continuous glass joint around the periphery of said panel sealing the edges of said two panes together.

4,683,155

## DOMESTIC CONTAINER WITH HANDLE ATTACHED BY GLUING

Rudolf Majtban, Eschborn, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

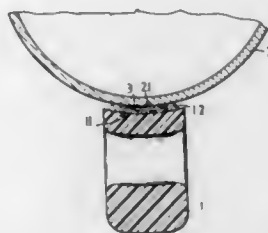
Filed Apr. 17, 1985, Ser. No. 723,994

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415120

Int. Cl.<sup>4</sup> B27N 5/02; B65D 23/12; A47G 19/14

U.S. Cl. 428—35

11 Claims



1. Domestic container with a handle fastened by gluing, characterized by the fact that contact area (1.1) of handle (1) as well as contact area (2.1) of container wall (2) is smooth and closed, and by the fact that contact area (1.1) of the handle comprises formed spacing strips or projections (1.2) whose height corresponds to the thickness of adhesive layer (3), the entire periphery of said adhesive layer (3) being exposed to open air.

4,683,156

## FLEXIBLE BLANKET

Charles M. Waters, Holly Cottage, Church Lane, Wroxham, Norfolk, United Kingdom

Filed Apr. 11, 1986, Ser. No. 850,862

Int. Cl.<sup>4</sup> B32B 3/14; E02B 3/12

U.S. Cl. 428—52

12 Claims



1. A flexible blanket for protection or stabilization of underwater structures and pipe lines, unstable beds and embankments,

said blanket comprising at least one layer, said layer comprising a plurality of separate and distinct block members spaced one from another, each separate block member having a top and bottom, and a median zone disposed between said top and bottom, each separate block member having a cross-section taken substantially perpendicular to the height dimension of the segment, which is a regular polygon, which cross-section has a maximum at said median zone and a minimum at at least one of said top and bottoms, each separate block member tapering substantially regularly from said maximum cross-section to said minimum cross-section; and

means flexibly securing each said block member to a plurality of other adjacent block members to form a layer one block member in height, such that each block member lies substantially contiguous to all its adjacent block members, at said median zone, such that the layer at the median zone is substantially continuous and flexible, said securing means securing each block member to its adjacent block member in the region of their respective median zones, said securing means being substantially flexible to allow said block members to pivot relative to one another insofar as the tapers of the block members permit; the arrangement of the tapers being such that each block member may pivot in at least two directions, said directions being mutually non perpendicular.

4,683,157

## THIXOTROPIC COATING COMPOSITIONS AND METHODS

Mark F. Mosser, 485 Washington Ave., Sellersville, Pa. 18960, and William J. Fabiny, 1105 Continental Dr., Harleysville, Pa. 19438

Division of Ser. No. 441,754, Nov. 15, 1982, Pat. No. 4,548,646.

This application Sep. 18, 1985, Ser. No. 777,364

Int. Cl.<sup>4</sup> B32B 3/02, 15/08

U.S. Cl. 428—65

9 Claims

1. A part coated with a cured coating composition which comprises (a) an acid binder aqueous solution which comprises phosphate ions and ions of the group of chromate ions or molybdate ions, (b) an acid-stable amorphous silica, and (c) a non-ionic surfactant, said silica being crosslinked with said surfactant.

4,683,158

## CARPET HAVING BOTTOM PORTIONS OF PILE COVERED WITH CARBON BLACK CONTAINING RESIN

Toshio Yasuoka, Osaka, Japan, assignor to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 724,335, Apr. 17, 1985, abandoned.

This application Apr. 23, 1986, Ser. No. 854,816

Claims priority, application Japan, Apr. 25, 1984, 59-81905

Int. Cl.<sup>4</sup> B32B 3/02, 33/00

U.S. Cl. 428—95

6 Claims

1. A carpet having a base fabric, pile yarns tufted to said base fabric and a backing layer covering a back surface of said base fabric, said backing layer comprising an olefinic polymer, said pile yarns having portions which extend into said backing layer, such portions being substantially covered with resinous material containing from 0.005 percent to 10% by weight of finely divided carbon black, said pile portions being in direct contact with the carbon black-containing resinous material.

4,683,159

## SEMICONDUCTOR DEVICE STRUCTURE AND PROCESSING

Philip J. Bohrer, Minneapolis; Robert E. Higashi, Bloomington, and Robert G. Johnson, Minnetonka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 798,725, Nov. 18, 1985, abandoned,

which is a continuation of Ser. No. 634,087, Jul. 25, 1984,

abandoned, which is a continuation-in-part of Ser. No. 429,598,

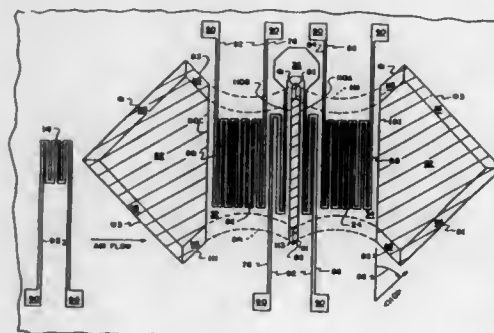
Sep. 30, 1982, Pat. No. 4,501,144. This application Jun. 17, 1986,

Ser. No. 876,651

Int. Cl.<sup>4</sup> B32B 3/14; B44C 1/22; C03C 25/06

U.S. Cl. 428—138

14 Claims



8. An composite semiconductor device, comprising:  
a semiconductor body with a first surface having a predetermined orientation with respect to a crystalline structure in the semiconductor body, the semiconductor body having a depression formed into the first surface of the body;  
a layer of thin film material covering at least a portion of the first surface; and  
a thin film member comprising the layer of material, the member having a predetermined configuration bridging the depression, the member being connected to the first surface at substantially opposing ends of the predetermined configuration, the depression opening to the first surface along an edge on each side of the member, the layer of material comprising first and second openings, the first opening being bounded in part by one edge of the member, the second opening being bounded in part by the other edge of the member, both openings also being bounded in part by a boundary connected to an edge of the member, at least one of the boundaries having a predetermined boundary configuration formed so that, when an anisotropic etch is placed on the openings to undercut the member and form the depression, there will be no substantial undercutting of the semiconductor body below the thin film material at the predetermined boundary configuration.

4,683,160

## SOLAR CELLS WITH CORRELATED ROUGHNESS SUBSTRATE

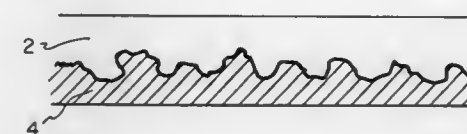
Aaron N. Bloch, Bridgewater, and Ping Sheng, Skillman, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 9, 1985, Ser. No. 732,145

Int. Cl.<sup>4</sup> B32B 3/30; H01L 31/00

U.S. Cl. 428—141

6 Claims



1. A photoconductive device comprising an active layer of semiconductor material having a pair of opposed surfaces, one of said surfaces of said active layer textured with microstructures, said microstructures corresponding to the Fourier transform of the structure factor  $S(k)$ , where  $S(k)$  has been chosen to maximize

$$\int_{\omega_-}^{\omega_+} F(\omega_k) d\omega_k$$

where

$$F(\omega_k) = I(\omega_k)A(\omega_k)S(k)N(\omega_k)$$

$F(\omega_k)$  = absorbed light intensity;

$I(\omega_k)$  = intensity of incident light;

$A(\omega_k)$  = absorption of light by the semiconductor;

$N(\omega_k)$  = density of guided mode state;

$\omega_k$  = frequency of guided mode of wave-vector  $k$ ;

$\omega_{+1}, \omega_{-1}$  = limits of the frequency range of interest.

4,683,161

## CERAMIC BODY WITH ORDERED PORES

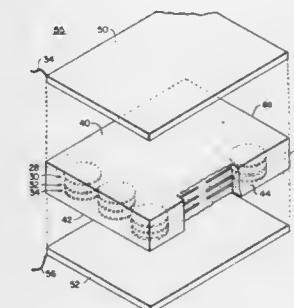
Roy W. Rice; Manfred Kahn, both of Alexandria, Va., and Damian E. Shadwell, Oxon Hill, Md., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

Filed Feb. 28, 1985, Ser. No. 706,580

Int. Cl.<sup>4</sup> B32B 3/12, 18/00

U.S. Cl. 428—178

18 Claims



1. A ceramic body comprising: a first ceramic portion; and a second ceramic portion integrally connected to said first portion; each of said first and second portions having a plurality of substantially flat pores in predetermined order, size, shape, orientation and location in at least one discrete plane which provide an anisotropic ceramic body.

4,683,162

## MICA PRODUCT

Dennis J. Sklarski, Deerfield, and Arthur F. Doyle, Portsmouth, both of N.H., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Apr. 9, 1986, Ser. No. 849,936  
Int. Cl.<sup>4</sup> B32B 3/28

U.S. Cl. 428—182

6 Claims

1. A flexible mica insulation comprising one or more layers of mica paper impregnated with about 5 percent about 25 percent by weight of a flexible silicone resin binder, said binder containing about 1 percent to about 4 percent by weight of an monoalkoxy titanate and about 0.5 percent to about 2 percent by weight of a naphthenate wherein the mica insulation has improved moisture resistance, excellent flexibility and conformability.

4,683,163

## VITREOUS SEMICONDUCTOR SUPPORTING STRUCTURE AND DEVICE REALIZED WITH SUCH A STRUCTURE

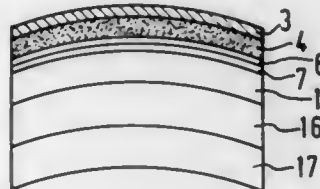
Philippe Jarry, Sucy-en-Brie; Mohamed L. Haji, Lannion; Pierre Guittard, Monthery Longpont; Bernard Guillemet, Vitry-sur-Seine, and Claude Piaget, Montgeron, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 16, 1984, Ser. No. 661,501

Claims priority, application France, Oct. 19, 1983, 83 16636  
Int. Cl.<sup>4</sup> D32B 17/06; C03C 3/14

U.S. Cl. 428—209

8 Claims



1. In combination, a vitreous support structure and a plurality of layers bonded to and supported on said support structure, said supported layers including at least one semiconductor layer consisting essentially of an n-ary III-V compound and at least one complementary layer, characterized in that:

- the at least one semiconductor layer has a coefficient of expansion which is higher than that of the at least one complementary layer; and
- the vitreous support structure comprises an arrangement of supporting layers for limiting thermally-developed stresses in the at least one semiconductor layer over a temperature range extending from ambient to the highest manufacturing temperature to which the combination is subjected, said arrangement of supporting layers including:
  - a first glass layer having a coefficient of expansion which is higher than the coefficient of expansion of the at least one complementary layer, and having a softening temperature which is higher than said highest manufacturing temperature; and
  - a second glass layer disposed between the first glass layer and the supported layers, said second glass layer having a softening temperature which is lower than the softening temperature of the first glass layer.

4,683,164

## NONWOVEN FOR MANUFACTURING FLAMEPROOF ROOFING SHEETS

Franz Kaulich, Bobingen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany  
Filed May 16, 1985, Ser. No. 734,787

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418790

Int. Cl.<sup>4</sup> B32B 27/34

U.S. Cl. 428—287

4 Claims

1. A nonwoven for manufacturing flameproof roofing sheets comprising a fleece of meltable synthetic fibers or filaments finished with a formulation which, at temperatures above 220° C., reacts to form a fire resistant, foam-like, substantially continuous layer.

4,683,165

## BINDER FOR FIBERS OR FABRICS

Martin K. Lindemann, Greenville, and Kim Deacon, Rockhill, both of S.C., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 753,685, Jul. 10, 1985, Pat. No. 4,616,057. This application Sep. 2, 1986, Ser. No. 902,696

The portion of the term of this patent subsequent to Oct. 10, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> B32B 27/00

U.S. Cl. 428—290

18 Claims

1. A nonwoven product comprising a fiber or fabric bound by a binder comprising an aqueous polymer emulsion containing a first polymer network containing an active crosslinking agent which is intertwined on a molecular scale with a second polymer network, wherein the second polymer differs from the first polymer and the first polymer comprises 5 to 95% on a solids by weight basis of the emulsion.

4,683,166

## FOAMED PLASTIC INSULATED WIRE AND METHOD FOR PRODUCING SAME

Masuo Yuto, and Yolchi Suzuki, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

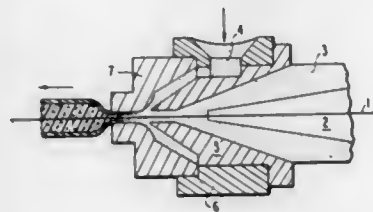
Continuation of Ser. No. 335,315, Dec. 29, 1981, which is a continuation of Ser. No. 970,021, Dec. 14, 1978

This application Apr. 1, 1986, Ser. No. 846,487

Claims priority, application Japan, Dec. 16, 1977, 52-150600  
Int. Cl.<sup>4</sup> B32B 3/26

U.S. Cl. 428—314.8

6 Claims



1. A foamed plastic insulated wire comprising a foamed plastic material insulation layer formed over a conductor, said plastic material consisting essentially of a foamed low density polyethylene made from (a) a foamable low density polyethylene having a melt flow swelling ratio greater than 55%, and (b) a chemical blowing agent, an inert gas blowing agent, or a combination thereof, said foamed low density polyethylene comprising at least 20% by weight of said insulation layer, and having a cell size of 50 microns or less.

4,683,167

## MAGNETIC IRON OXIDE PIGMENT AND RECORDING MEDIA

Lawrence M. Scott, Newark, and Gary D. Rexroat, Oakland, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Jun. 25, 1984, Ser. No. 623,910  
Int. Cl.<sup>4</sup> G11B 5/706

U.S. Cl. 428—328

17 Claims

1. A magnetic recording medium having superior saturation magnetization properties comprising:  
a magnetic particulate pigment, with superior saturation magnetization, comprising a magnetic core and an epitaxial coating, wherein said coating comprises an inner layer of cobalt(II) hydroxide enveloped by an outer layer of iron(II) hydroxide,  
at least one of said layers impregnated with a saturation magnetization enhancing amount of zinc ion.

4,683,168

## METHOD OF PRODUCING A COMPOSITE BODY

George B. Hares, and David L. Morse, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 690,172, Jan. 10, 1985, abandoned. This application Feb. 18, 1986, Ser. No. 830,276

Int. Cl.<sup>4</sup> B32B 17/06, 17/10

U.S. Cl. 428—335

10 Claims



1. A composite comprising:

- a substrate of glass or glass-ceramic having one or more differentially etchable components, the crystals of said glass-ceramic having an average size less than about 5 microns, and said substrate having an etched surface resulting from the differential etching of said surface; the etched surface on said substrate extending to a depth of between about 500–4000 Å with interconnected pores of relatively uniform diameters of about 50–30,000 Å relatively homogeneously dispersed throughout the etched surface; and
  - a non-stick, heat resistant resin bonded to said etched surface through diffusion-type adhesive interaction on a molecular scale, said resin having a thickness of at least about 15 microns.
2. The composite of claim 1 wherein the non-stick, heat resistant resin ranges from about 15 to 30 microns in thickness.

4,683,169

## METHYL METHACRYLIC COATINGS ON THERMOPLASTIC FILM

Herbert L. Curry, Mount Vernon, and Earl T. Crouch, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 4, 1985, Ser. No. 794,873

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> B32B 27/36

U.S. Cl. 428—337

5 Claims

1. A UV stable article comprising a film substrate of polycarbonate having a thickness of from about 1 to about 60 mils, and a microcrack resistant protective external coat comprising a copolymer consisting essentially of:

- methyl methacrylate units,
- from about 1/2 percent up to about 10 percent by number of other methacrylate units selected from the group consisting of ethyl methacrylate, n-butyl methacrylate, i-butyl methacrylate, or mixtures thereof, and
- from 0 percent up to 5 percent by number of other alpha-beta ethylenically unsaturated units; wherein said units are combined in such ratio to result in a copolymer material having a tensile elongation at break of greater than about 3.5 percent and a glass transition temperature greater than about 87° C.

4,683,170

## NYLON COPOLYMER AND NYLON BLENDS AND FILMS MADE THEREFROM

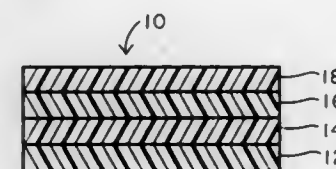
Samuel W. Tse, and Deane E. Galloway, both of Appleton, Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 626,415, Jun. 29, 1984. This application Jan. 21, 1986, Ser. No. 820,350

Int. Cl.<sup>4</sup> B32B 27/00

U.S. Cl. 428—349

41 Claims



1. A multiple layer film having two surfaces and comprising a first heat sealable layer on one surface thereof and a second nylon layer on the other surface thereof, and wherein the composition of said nylon layer is a blend of 40% to 75% by weight nylon 6 and 60% to 25% by weight of a nylon copolymer wherein the copolymer is 80% to 90% moieties of a first polymer of nylon 6 and 20% to 10% moieties of a second polymer of nylon; the overall composition of the blend comprising 2.5% to 10% moieties of said second polymer of nylon.

4,683,171

## LAMINATE AND METHOD FOR ITS PREPARATION

Kazuhiro Kuga; Hiroshi Washita, and Hiroyuki Watanabe, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,545

Claims priority, application Japan, Feb. 5, 1985, 60-19266  
Int. Cl.<sup>4</sup> A61F 13/04; B05D 3/06; B32B 27/40; C08G 18/10  
U.S. Cl. 428—354

61 Claims

1. A transparent laminate made of a transparent hard material having a soft synthetic resin layer on its surface, wherein the soft synthetic resin layer has, at its exposed surface side, a surface of a cross-linked polyurethane type resin having a self-healing property with the surface reformed by impregnating an additionpolymerizable unsaturated compound into the cross-linked polyurethane resin surface and polymerizing the impregnated compound.

32. A pre-laminated sheet of a cross-linked polyurethane type resin having, at one side, a surface reformed by the impregnation and polymerization of an addition-polymerizable unsaturated compound and having a self-healing property and, at the other side, a layer of an adhesive material.



4,683,172

METHOD FOR MAKING SAFETY OR IMPACT  
RESISTANT LAMINATESDonald G. LeGrand, Burnat Hills, and William V. Olszewski,  
Stillwater, both of N.Y., assignors to General Electric Com-  
pany, Pittsfield, Mass.Filed Aug. 14, 1984, Ser. No. 640,615  
Int. Cl.<sup>4</sup> B32B 27/36, 17/10

U.S. Cl. 428—412

5 Claims

1. A safety or impact resistant optically transparent laminate  
comprising

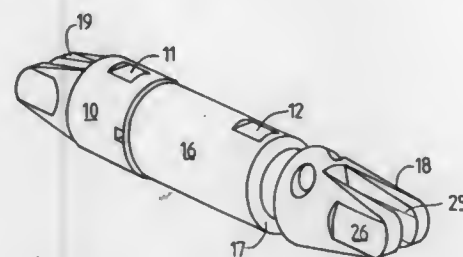
- a plurality of laminae, at least one of which is a rigid lamina
- at least one single interlayer interposed between any two of said laminae
- a sufficient number of contact or pressure sensitive adhesive layers to bond all of said laminae and said interlayers, at least one of which adhesive layers is positioned adjacent to at least one of said interlayers.

4,683,174

RAW CASTING BLANK FOR FLUID ACTUATED RAM  
ASSEMBLYRaymond G. Hillier, Queensland, Australia, assignor to Delibes  
Pty. Ltd., AustraliaFiled Oct. 4, 1985, Ser. No. 784,246  
Claims priority, application Australia, Oct. 5, 1984, PG7524;  
Nov. 13, 1984, PG8094; Jun. 14, 1985, PH1034  
Int. Cl.<sup>4</sup> B22D 25/02

U.S. Cl. 428—583

7 Claims

1. A raw casting for a fluid actuated ram assembly compris-  
ing

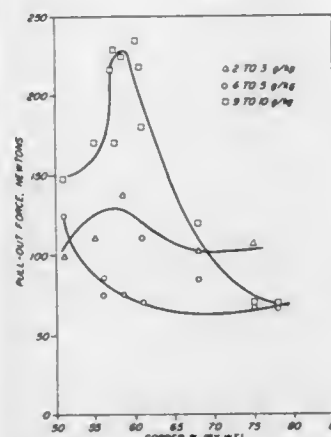
- a rear portion having a bifurcated end; and
- a barrel portion including an internal bore; and
- a front portion having a bifurcated end.

4,683,175

PROCESS FOR PRODUCING BRASS-COATED STEEL  
WIRE FOR THE TIRE CORD APPLICATIONSFrank W. Bakewell, Washington Township, Westmoreland  
County, and Charles D. Stricker, Monroeville, both of Pa.,  
assignors to Associated Materials Incorporated, Dallas, Tex.Continuation of Ser. No. 540,658, Oct. 11, 1983, abandoned.  
This application Oct. 25, 1985, Ser. No. 792,173  
Int. Cl.<sup>4</sup> B32B 15/20

U.S. Cl. 428—677

15 Claims

1. A process for producing steel wire for tire-cord by the  
sequential steps consisting essentially of:

- applying a brass-coating to said wire, said coating consisting essentially of from about 54 to about 65% copper and from about 46 to about 35% zinc, the weight of said coating being within the range of from about 2.5 to about 13.0 grams of coating per kilogram of said wire,
- heating the coated wire to a temperature of at least about 700° F. and not more than a temperature of about 1000° F. for a time sufficient to reduce the hardness of said coating to a value within the range of from about 40 to about 70 on the rockwell B scale, and
- drawing the heat-treated wire to a final thickness suffi-

4,683,173

PROCESS FOR PREPARING A CATIONIC  
AMINE-STABILIZED LATEX THERMOSETTING  
ELECTROCOAT COMPOSITION, METHOD OF  
CATHODIC ELECTROCOATING AND RESULTANT  
PRODUCTKirk J. Abbey, Seville, Ohio, assignor to The Glidden Company,  
Cleveland, OhioFiled Nov. 4, 1985, Ser. No. 794,722  
Int. Cl.<sup>4</sup> B32B 27/00; C08L 75/00

U.S. Cl. 428—425.8

10 Claims

1. In a process for preparing a cationic amine-stabilized  
electrocoating composition comprising

- 95 to 45 weight percent of a thermosetting latex polymer prepared in water by emulsion polymerization of vinyl monomers comprising non-functional monomers, monomers having functional groups adapted to cure with a latent blocked isocyanate and amine functional monomers which when ionized or neutralized with acid impart cationic properties to the latex; and
- 5 to 55 weight percent of a non-polymerizable water insoluble blocked isocyanate; wherein (a)+(b) on a solids basis total 100 percent;

the improvement which comprises conducting said emulsion  
polymerization of said vinyl monomers in the presence of a  
water insoluble non-polymerizable latent blocked isocyanate by

- forming a course preemulsion of a blocked isocyanate in water with a surfactant and either at least a portion of one or more polymerizable monomers or with a non-polymerizable solvent;
- homogenizing said course preemulsion to produce a fine emulsion having an average particle size of less than 3 microns; and
- emulsion polymerizing vinyl monomers in a reactor into which the said fine emulsion was previously batch charged or is being continuously fed over some interval of time concomitant with the emulsion polymerization.

cient to provide a reduction in cross-sectional area of at least about 60 percent,  
said heat treatment serving to significantly improve the drawability of said wire and permit a substantially continuous crack-free coating at the final wire thickness to be achieved.

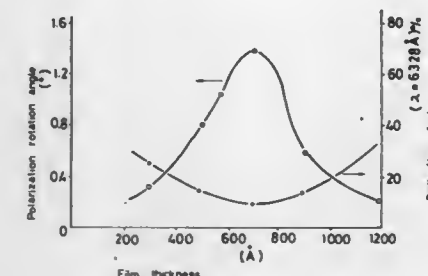
4,683,176

## OPTICAL MAGNETIC RECORDING MEMBER

Kyuzo Nakamura; Yoshifumi Ota, and Tsutomu Asaka, all of  
Yachimatamachi, Japan, assignors to Nihonshinku Gijutsu  
Kabushiki Kaisha, Kanagawa, JapanFiled Aug. 15, 1984, Ser. No. 641,119  
Claims priority, application Japan, Aug. 15, 1983, 58-148038  
Int. Cl.<sup>4</sup> G11B 7/24

U.S. Cl. 428—692

8 Claims



1. An optical magnetic recording member comprising:

- a composite semi-transparent perpendicular-type magnetic film made of a mixture of a ferromagnetic material and a dielectric material;
  - a reflection film formed on the perpendicular-type magnetic film; and
  - a transparent substrate for supporting said magnetic film and said reflection film,
- wherein the refractive index of the composite semi-transparent perpendicular-type magnetic film is larger than the refractive index of the transparent substrate,  
wherein the reflection film is made of a soft magnetic material or a metallic perpendicular-type magnetic film selected from the group consisting of Co—Cr and Tb—Fe.

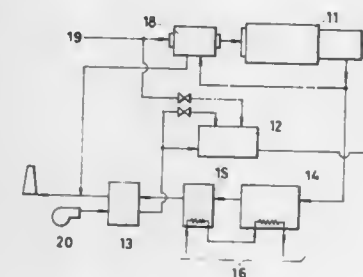
4,683,177

## POWER GENERATION SYSTEM IN FUEL CELL

Tomohiro Kinoshita; Seiichi Tanabe, and Eishiro Sasakawa, all  
of Tokyo, Japan, assignors to Mitsubishi Jukogyo Kabushiki  
Kaisha, Tokyo, JapanFiled Jul. 25, 1986, Ser. No. 889,492  
Claims priority, application Japan, Aug. 16, 1985, 60-179330  
Int. Cl.<sup>4</sup> H01M 8/06

U.S. Cl. 429—26

1 Claim

1. A power generation system in a fuel cell having an air  
preheater for preheating air for a fuel cell reaction which will  
be fed to an afterburner of a high-temperature solid electrolyte

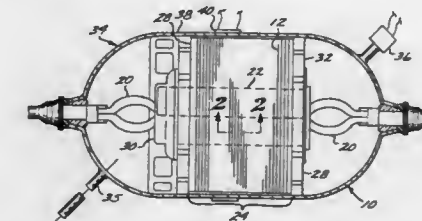
type fuel cell, characterized by disposing, between said air preheater and said afterburner, a combustor for performing an additional combustion after the temperature of the air for the reaction has been elevated by said air preheater.

4,683,178

PROCESS FOR PREVENTING ELECTRICAL STORAGE  
CELL CAPACITY LOSSSteven J. Stadnick, Redondo Beach, and Howard H. Rogers,  
Torrance, both of Calif., assignors to Hughes Aircraft Com-  
pany, Los Angeles, Calif.Filed Feb. 7, 1986, Ser. No. 827,023  
Int. Cl.<sup>4</sup> H01M 12/06

U.S. Cl. 429—101

10 Claims

1. A process for reducing the capacity loss during storage of  
a pressurized nickel-hydrogen cell comprising:  
precharging the cell prior to storage so that discharge of the  
cell is negative electrode limited, whereby an electrical  
charge remains on the nickel positive electrode when the  
hydrogen partial pressure falls to about 0 psia.

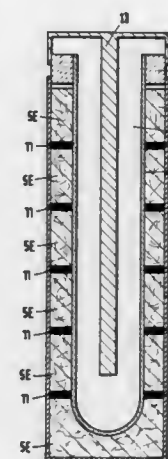
4,683,179

## ELECTROCHEMICAL STORAGE CELL

Reinhart Langpape, Schöna; Wolfgang Dörrscheidt, Helm-  
stadt; Jean-Philippe Roze, Wiesloch, and Günther Steinleit-  
ner, Schriesheim, all of Fed. Rep. of Germany, assignors to  
Brown, Boveri & Cie AG, Mannheim/Käfertal, Fed. Rep. of  
GermanyContinuation of Ser. No. 799,632, Nov. 19, 1985, abandoned.  
This application Nov. 24, 1986, Ser. No. 935,079  
Claims priority, application Fed. Rep. of Germany, Nov. 24,  
1984, 3442936

U.S. Cl. 429—104

3 Claims

1. Electrochemical storage cell of the sodium and sulfur type  
with an anode space and a cathode space which are separated  
from each other by a solid electrolyte and are bounded, at least  
in some regions, by a metallic housing, the cathode space  
containing a sulfur electrode which is made of a sulfur-impreg-

nated graphite or carbon fiber material and the cathode space is subdivided in the region of the lateral boundary surface of the solid electrolyte into at least two sectors which extend parallel to the longitudinal axis of the solid electrolyte and extend along the entire lateral boundary of the solid electrolyte and are separated from each other by spacers which are arranged radially with their narrow sides adjacent of the solid electrolyte and to the inside surfaces of the metallic housing and the region of the cathode space around the dome of the solid electrolyte is separated from the remaining region of the cathode space by a spacer arranged perpendicularly to the longitudinal axis of the solid electrolyte and wherein all the spacers are made of alpha aluminum oxide.

4,683,180

## ELECTRIC STORAGE BATTERY

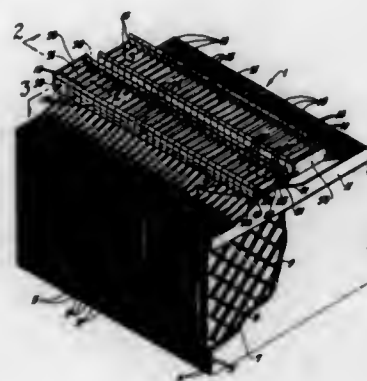
James R. Bish, Anderson; Charles P. McCartney, Jr., Yorktown, and Clarence A. Meadows, Muncie, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 5, 1986, Ser. No. 859,364

Int. Cl.<sup>4</sup> H01M 2/28

U.S. Cl. 429—130

12 Claims



1. In a galvanic cell including a stack of positive and negative polarity, lug-bearing plates alternately interleaved with one another and means for electrically joining aligned lugs into sets of like polarity, the improvement comprising: said lugs each having a root portion proximate said plate and a distal portion more remote from said plate and engaging said means; a discrete, insulating collar tightly surrounding said root portion of each said lug; and the collars of said aligned lugs abutting one another so as to space said aligned lugs apart and to insulate said joining means from the plates of opposite polarity.

4,683,181

## ELECTROCHEMICAL GENERATOR WITH COMPOSITE ELECTRODE

Michel Armand, Echirrolles; Jean-Michel Chabagno, Pau; Philippe Ricoux, Oullins, all of France; Guy Vassort, Longueuil, Canada; Michel Gauthier, Laprairie, Canada; Fernand Brochu, Longueuil, Canada, and Philippe Rigaud, Vienne, France, assignors to Societe Nationale Elf Aquitaine, Courbevoile, France and Hydro-Quebec, Quebec, Canada

Filed Apr. 24, 1985, Ser. No. 726,622

Claims priority, application France, Apr. 24, 1984, 8406416

Int. Cl.<sup>4</sup> H01M 10/36, 10/40

U.S. Cl. 429—192

16 Claims

1. An electrochemical generator capable of operating reversibly at ambient temperature, comprising:  
(1) a negative electrode;  
(2) an electrolyte constituted by a solid solution of at least one salt in solution in a macromolecular material, the said solid solution being constituted to a large extent by an

amorphous polyether structure and possessing sufficient ionic conductivity to allow operation of the generator at ambient temperature; and

(3) a composite positive electrode constituted by the agglomeration product of a solid solution of at least one of the said salt in solution in a macromolecular material essentially constituted by an amorphous polyether structure and an electrochemically active material which is at least one metal compound selected from the group consisting of  $\text{NiS}_{1.75}$ ,  $\text{NiS}$ ,  $\text{FeS}$ ,  $\text{CoS}_2$ , and  $\text{Cu}_4\text{O}(\text{PO}_4)_2$ .

4,683,182

## RECHARGEABLE ELECTROCHEMICAL APPARATUS

Toyoguchi Yoshinori, Yao; Junichi Yamaura, Osaka; Tooru Matsui, Moriguchi, and Takashi Iijima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP84/00086, § 371 Date Nov. 5, 1984, § 102(e) Date Nov. 5, 1984, PCT Pub. No. WO84/03590, PCT Pub. Date Sep. 13, 1984

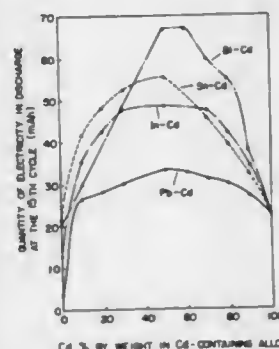
Continuation of Ser. No. 672,260, Nov. 5, 1984, abandoned. This PCT application Mar. 6, 1984, Ser. No. 873,093

Claims priority, application Japan, Mar. 7, 1983, 58-36877; Mar. 7, 1983, 58-36878; Mar. 7, 1983, 58-36880; Mar. 7, 1983, 58-36881; Aug. 29, 1983, 58-158329

Int. Cl.<sup>4</sup> H01M 10/36, 4/44

U.S. Cl. 429—194

9 Claims



1. A rechargeable electrochemical apparatus comprising a organic electrolyte containing an alkali metal in ionic form, a reversible positive electrode, and a rechargeable negative electrode, said apparatus containing no alkali metal in the metallic state, and said rechargeable negative electrode being comprised of a cadmium alloy,

wherein said cadmium alloy comprises at least 10 percent by weight of Cd and at least one metal selected from the group consisting of Sn, In, Pb and Bi,

wherein said cadmium alloy, as a result of charging said apparatus at a more noble potential than that of the metallic alkali metal, absorbs said alkali metal ions from said electrolyte to form an intermetallic compound therewith which is comprised of at least one metal of said alloy and said alkali metal, without the formation of metallic alkali metal, and

wherein said cadmium alloy, as the result of discharging said apparatus, desorbs said alkali metal from the intermetallic compound into the electrolyte as ions.

4,683,183

## METHOD OF MANUFACTURING MIM ELEMENTS IN LIQUID CRYSTAL DISPLAYS

Yoichi Ono, Shiojiri, Japan, assignor to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

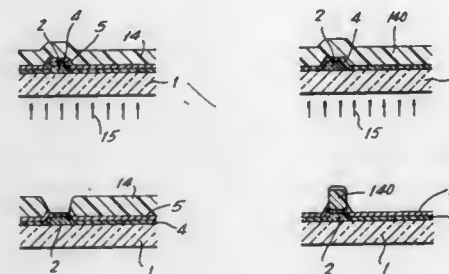
Filed Jan. 10, 1985, Ser. No. 690,226

Claims priority, application Japan, Jan. 13, 1984, 59-4609

Int. Cl.<sup>4</sup> G02F 1/03

U.S. Cl. 430—20

27 Claims



1. A method of forming a MIM element having a first metal electrode and a second metal electrode with an insulator therebetween in an electro-optic display device having first and second opposed substrates with a liquid crystal material disposed therebetween, said first substrate having at least a first row electrode formed thereon, said second substrate having at least a first column electrode formed thereon, a picture element being defined where said row and column electrodes overlap in top plan view, comprising the step of forming said MIM element having first and second electrodes with an insulator therebetween at the position where said picture element is defined on one of said first and second substrates by a photolithography process using a self-alignment method where the substrate on which said MIM element is formed is exposed from behind with radiation with said first metal electrode acting as a mask.

4,683,184

## ELECTROPHOTOSENSITIVE MEMBER HAVING ALTERNATING AMORPHOUS SEMICONDUCTOR LAYERS

Izumi Osawa, Ikeda; Isao Doi, Toyonaka, and Toshiya Natsumura, Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1985, Ser. No. 753,587

Claims priority, application Japan, Jul. 16, 1984, 59-147920

Int. Cl.<sup>4</sup> G03G 5/082

U.S. Cl. 430—57

13 Claims

1. An electrophotosensitive member which comprises on a conductive substrate, a plurality of amorphous silicon layers and a plurality of amorphous silicon:germanium layers wherein each of said amorphous silicon:germanium layers is interposed between two of said amorphous silicon layers so as not to come into direct contact with the substrate and surface and includes about 2 to 70 atomic % of germanium.

4,683,185

## ELECTROPHOTOSENSITIVE MEMBER HAVING A DEPLETION LAYER

Izumi Osawa, Ikeda; Isao Doi, Toyonaka, and Toshiya Natsumura, Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1985, Ser. No. 753,450

Claims priority, application Japan, Jul. 16, 1984, 59-147919

Int. Cl.<sup>4</sup> G03G 5/082

U.S. Cl. 430—57

11 Claims

1. An electrophotosensitive member which comprises: a substrate;

a first layer of amorphous silicon having a thickness of about 5  $\mu\text{m}$  to 30  $\mu\text{m}$ ;  
a second photoconductive layer of amorphous silicon:germanium formed on said first layer and having a thickness of about 100 angstroms to 20  $\mu\text{m}$  and including a depletion layer of amorphous silicon:germanium; and  
a third layer of amorphous silicon formed on said second layer and having a thickness of about 5  $\mu\text{m}$  to 30  $\mu\text{m}$ , said second layer being located at a distance from the surface of the substrate within a range of 20 to 80% of the total thickness of said first, second and third layers.

4,683,186

## DOPED AMORPHOUS SILICON PHOTOCONDUCTIVE DEVICE HAVING A PROTECTIVE COATING

Kunio Ohashi; Tadashi Tonegawa, both of Nara; Shoichi Nagata, Yamatokoriyama, and Masatsugu Nakamura, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan Division of Ser. No. 706,669, Feb. 28, 1985, Pat. No. 4,632,894.

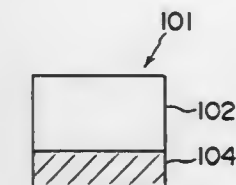
This application Oct. 10, 1985, Ser. No. 786,046

Claims priority, application Japan, Feb. 28, 1984, 59-39147; Mar. 2, 1984, 59-40938; Mar. 2, 1984, 59-40939; Mar. 5, 1984, 59-42662; Mar. 5, 1984, 59-42663; Mar. 5, 1984, 59-42664; Mar. 14, 1984, 59-49675; Mar. 14, 1984, 59-49676

Int. Cl.<sup>4</sup> G03C 5/08, 5/04

U.S. Cl. 430—84

28 Claims



1. A photoconductive device comprising:  
a conductive substrate;  
a photoconductive layer made of amorphous Si:H; and  
a surface protection layer applied on said photoconductive layer which will not deteriorate the photosensitivity or charge acceptance of said photoconductive layer;  
wherein a dopant is added to said photoconductive layer at least near an interface between said surface protection layer and said photoconductive layer, the concentration of said dopant increasing in a direction perpendicular to and toward said interface, said surface protection layer having an optical energy gap larger than that of said photoconductive layer.

4,683,187

## DRY PROCESS ELECTROSTATIC DEVELOPER COMPRISING A GENERALLY ROUND MAGNETIC CARRIER AND A FLAKE-TYPE CARRIER

Amnon Goldstein, 767 Pelhamdale Ave., Pelham, N.Y. 10803, and John F. Cooper, 9 Southwood Dr., Londonderry, N.H. 03053

Continuation-in-part of Ser. No. 674,621, Nov. 26, 1984, abandoned. This application Aug. 9, 1985, Ser. No. 764,417

Int. Cl.<sup>4</sup> G03G 13/09

U.S. Cl. 430—106.6

9 Claims

1. An electrophotographic magnetic brush developer material comprising:  
a toner material,  
a round magnetic carrier material having a generally round cross section, and  
a flake type magnetic carrier material, the proportion of round carrier material to flake carrier material by weight being in the range of from 1:5 to 5:1.



4,683,188

**ELECTROPHOTOGRAPHIC TONER CONTAINING METAL COMPLEX CHARGE CONTROL AGENT**

Nobuo Suzuki, Shobu; Kikuko Okamura; Genpei Sugiyama, both of Tokyo, and Susumu Suzuka, Yono, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan  
Filed May 14, 1986, Ser. No. 863,170

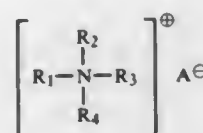
Claims priority, application Japan, May 28, 1985, 60-113165; Apr. 26, 1986, 61-95876

Int. Cl.<sup>4</sup> G03G 9/08

U.S. Cl. 430-110

5 Claims

1. A powdered electrophotographic toner containing a compound having the formula:



wherein each of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> is a hydrogen atom, an alkyl group having from 1 to 22 carbon atoms, an unsubstituted or substituted aromatic group having from 6 to 20 carbon atoms and an aralkyl group having from 7 to 20 carbon atoms, and A<sup>⊖</sup> is a molybdic acid anion, a tungstic acid anion or a heteropolyacid anion containing molybdenum or tungsten atoms.

4,683,189

**TONERS FOR SILVER HALIDE DIFFUSION TRANSFER IMAGE WITH SULFO OR CARBOXYL GROUPS**

Yoshio Idota, and Morio Yagihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Apr. 21, 1986, Ser. No. 853,835

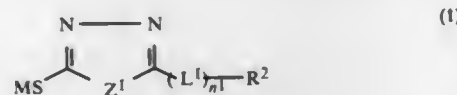
Claims priority, application Japan, Apr. 19, 1985, 60-83664; Apr. 19, 1985, 60-83665; Apr. 19, 1985, 60-83666

Int. Cl.<sup>4</sup> G03C 5/54, 5/46

U.S. Cl. 430-248

10 Claims

1. A method of forming a silver salt diffusion transfer image, comprising: developing an imagewise exposed photosensitive silver halide emulsion layer with a developing agent and a silver halide solvent in the presence of an alkali to thereby convert at least a portion of unexposed silver halide in said emulsion layer to a diffusible silver complex salt and transferring at least a portion of said silver complex salt into a silver precipitating agent-containing image receiving layer to form an image in said image receiving layer, wherein said image is formed in the presence of a compound selected from the group consisting of compounds of the following general formulae (I), (II) and (III):



wherein Z<sup>1</sup> is a sulfur atom, an oxygen atom or



R<sup>3</sup> is a hydrogen atom, a substituted or unsubstituted alkyl group with the proviso that the substituent is not a sulfo or carboxyl group, or a substituted or unsubstituted aryl group with the proviso that the substituent is not a sulfo or carboxyl group;

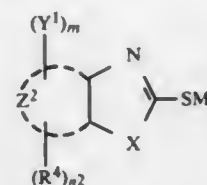
R<sup>2</sup> is an organic group containing at least one sulfo or carboxyl group;

L<sup>1</sup> is —CONR—, —NRCO—, —SO<sub>2</sub>NR—, —NRSO<sub>2</sub>—, —OCO—, —COO—, —S—, —NR—, —CO—, —SO—, —SO<sub>2</sub>—, —OCOO—, —NRCONR<sup>1</sup>—, —NRCOO—,

—OCONR—, or —NRSO<sub>2</sub>NR<sup>1</sup>—, wherein R and R<sup>1</sup>, which may be the same or different, are selected from a hydrogen atom, an alkyl group or an aryl group;

n<sup>1</sup> is 0 or 1; and

M is a hydrogen atom, an alkali metal atom, a quaternary ammonium group or a quaternary phosphonium group;



(II)

wherein X is



a selenium atom, a sulfur atom or an oxygen atom, wherein R<sup>7</sup> is a hydrogen atom or an alkyl group;

R<sup>4</sup> is a substituent group;

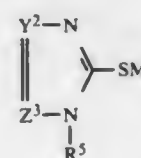
Z<sup>2</sup> is an atomic group necessary to form a carbocyclic or heterocyclic ring;

Y<sup>1</sup> is a carboxyl group or a sulfo group;

M is a hydrogen atom, an alkali metal atom, a quaternary ammonium group or a quaternary phosphonium group;

m is a whole number of 1 to 3; and

n<sup>2</sup> is a whole number of 0 to 2; and



(III)

wherein Y<sup>2</sup> and Z<sup>3</sup>, which may be the same or different, are N or CR<sup>6</sup> wherein R<sup>6</sup> is a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group;

R<sup>5</sup> is an alkyl group substituted by at least one of SO<sub>3</sub>M<sup>1</sup> or COOM<sup>1</sup> group or an aryl group substituted by at least one of SO<sub>3</sub>M<sup>1</sup> or COOM<sup>1</sup> group;

M and M<sup>1</sup>, which may be the same or different, are a hydrogen atom, an alkali metal atom, a quaternary ammonium group or a quaternary phosphonium group.

4,683,190

**PROCESS TO LOWER THE VISCOSITY OF COATING SOLUTIONS FOR THE PRODUCTION OF LIGHT-SENSITIVE REPRODUCTION MATERIALS**

Manfred A. J. Sondergeld, Muhlheim/Main; Dietmar Dudek, Oberursel, and Klaus Hossner, Rodgau, all of Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 18, 1985, Ser. No. 810,364

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1984, 3514768

Int. Cl.<sup>4</sup> G03C 1/76

U.S. Cl. 430-281

12 Claims

1. A process to lower the viscosity of coating solutions for the production of light-sensitive reproduction materials comprising

(A) dissolving in a mixture of solvents a mixture comprising the constituents:

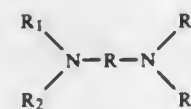
(1) at least one polymeric binder containing salt-forming groups in an amount of 20 to 90% by weight based on

the total constituents of the coating less any solvents present, and

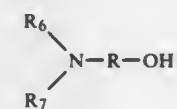
(2) at least one light-sensitive compound that, when exposed to actinic radiation in the form of a layer, changes the solubility, tackiness, or adhesion of the light-sensitive layer taken from the group consisting of light-curing systems of the addition polymerizable and photocrosslinkable types and photosoluble systems, and (B) adding to the solvent mixture

(3) at least one thixotropy-causing filler which is a silicic acid having silanol groups present at least partially in free form and an SiO<sub>2</sub> content greater than 70% by weight in an amount of up to 15% by weight of thixotropy-causing filler relative to the solids content of a dried layer, and

(4) at least one amine-containing compound to lower the viscosity of the coating solution, said amine-containing compound being of the following formulas

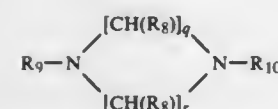


(a)



(b)

or



(c)

wherein

R is a linear saturated or unsaturated hydrocarbon chain having 2 to 12 carbon atoms in which one or more carbon atoms can be replaced by N(R<sub>5</sub>) O, S, and/or an aromatic radical, or a 5 to 8 membered aliphatic ring;

R<sub>1</sub> to R<sub>4</sub> are H, alkyl, aryl, and aralkyl, whereby R<sub>1</sub> to R<sub>4</sub> can be the same or different;

R<sub>5</sub> is R<sub>1</sub> to R<sub>4</sub>;

R<sub>6</sub> and R<sub>7</sub> are R<sub>1</sub> to R<sub>4</sub>, —(CHR<sub>8</sub>)<sub>p</sub>—OH;

p is 1 to 6;

q and r are 1 to 6 and can be the same or different;

R<sub>8</sub> is H, alkyl;

R<sub>9</sub> and R<sub>10</sub> are H, alkyl, —(CHR<sub>8</sub>)<sub>p</sub>—OH, the at least one amine-containing compound being present in an amount of 0.01 to 5% by weight relative to the solids content of a dried layer and being added to the coating solution before or after adding the thixotropy-causing filler.

4,683,191

**IMAGEABLE TONER POWDER**

Thomas C. Geisler, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Division of Ser. No. 689,706, Jan. 8, 1985, Pat. No. 4,608,329.  
This application Jun. 9, 1986, Ser. No. 871,992

Int. Cl.<sup>4</sup> G03C 5/24

U.S. Cl. 430-291

7 Claims

1. A method of forming a thermally imageable colored image on a substrate comprising the steps of

(a) forming a latent liquid image on a substrate; and

(b) contacting said liquid image with a thermally imageable toner powder of particles comprising at least 50 weight percent of a supercoolable material, at least 0.01 weight percent of a colorant, up to 20 weight percent of a binder and up to 40 weight percent of an anti-fouling agent.

4,683,192

**SILVER HALIDE PHOTOGRAPHIC EMULSIONS AND PROCESS FOR PRODUCING THEM**

Shingo Nishiyama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

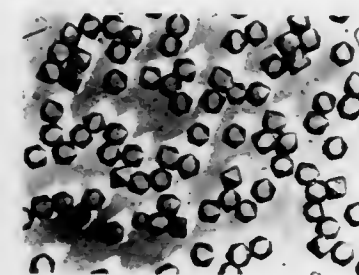
Filed Apr. 19, 1985, Ser. No. 725,285

Claims priority, application Japan, Apr. 19, 1984, 59-79160

Int. Cl.<sup>4</sup> G03C 1/02, 1/06

U.S. Cl. 430-567

7 Claims



1. A silver halide photographic emulsion containing silver halide grains the surface of which is a (110) crystal plane substantially composed of silver iodobromide.

4,683,193

**PROCESS FOR PRODUCING SILVER HALIDE PHOTOGRAPHIC EMULSION**

Mikio Ihama; Tadaaki Tani, and Hiroshi Ohnishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 21, 1985, Ser. No. 714,316

Claims priority, application Japan, Mar. 21, 1984, 59-53867

Int. Cl.<sup>4</sup> G03C 1/02, 1/19

U.S. Cl. 430-570

10 Claims

1. A process for producing a spectrally sensitized silver halide photographic emulsion comprising adding a substantially water-insoluble organic spectral sensitizing dye in an aqueous medium to an emulsion before completion of the formation of silver halide grains without using an organic solvent, wherein said substantially water-insoluble organic spectral sensitizing dye has a water solubility of 0.01% by weight or less.

4,683,194

**METHOD FOR DETECTION OF POLYMORPHIC RESTRICTION SITES AND NUCLEIC ACID SEQUENCES**

Randall K. Saiki, Richmond, and Henry A. Erlich, Oakland, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 614,957, May 29, 1984, abandoned. This application Mar. 28, 1985, Ser. No. 716,982

Int. Cl.<sup>4</sup> C12Q 1/68; C12N 15/00; C12P 19/34

U.S. Cl. 435-6

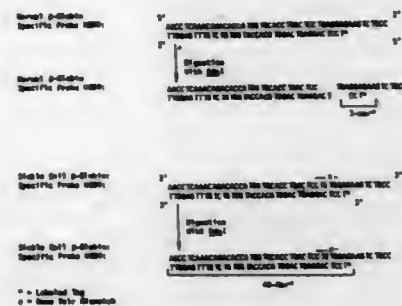
28 Claims

1. A method for detecting the presence or absence of at least one specific restriction site in a specific nucleic acid sequence comprising the steps of:

(a) hybridizing said nucleic acid sequence in solution with an oligonucleotide probe for each restriction site being detected which probe is complementary to a region in said nucleic acid sequence spanning the respective restriction site of the probe and which probe is labeled at the end which is nearer to said respective restriction site than the other end of the probe;

(b) digesting said hybridized nucleic acid sequence with a restriction endonuclease for each restriction site being detected by each probe which is capable of cleaving its respective probe at said restriction site being detected so as to produce labeled and unlabeled oligomer fragments;

- (c) separating any labeled cleaved oligomer fragments from labeled uncleaved oligomers; and



- (d) detecting the presence or absence of labeled oligomer fragments.

4,683,195

# PROCESS FOR AMPLIFYING, DETECTING, AND/OR-CLONING NUCLEIC ACID SEQUENCES

Kary B. Mullis, Kensington; Henry A. Erlich, Oakland; Norman Arnheim, Woodland Hills; Glenn T. Horn, Emeryville; Randall K. Saiki, Richmond, and Stephen J. Scharf, Berkeley, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 824,044, Jan. 30, 1986, abandoned, which is a division of Ser. No. 791,308, Oct. 25, 1985, which is a continuation-in-part of Ser. No. 716,975, Mar. 28, 1985, abandoned. This application Feb. 7, 1986, Ser. No. 828,144

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> C12Q 1/68; C12P 19/34; C12N 1/00, 15/00; G01N 33/48, 33/00, 33/566, 33/564; C07H 21/02, 21/04

U.S. Cl. 435—6 26 Claims

1. A process for detecting the presence or absence of at least one specific nucleic acid sequence in a sample containing a nucleic acid or mixture of nucleic acids, or distinguishing between two different sequences in said sample, wherein the sample is suspected of containing said sequence or sequences, which process comprises:

- (a) treating the sample with one oligonucleotide primer for each strand of each different specific sequence, under hybridizing conditions such that for each strand of each different sequence to which an oligonucleotide primer is hybridized an extension product of each primer is synthesized which is complementary to each nucleic acid strand, wherein said primer or primers are selected so as to be sufficiently complementary to each strand of each specific sequence to hybridize therewith such that the extension product synthesized from one primer, when it is separated from its complement, can serve as a template for synthesis of the extension product of the other primer;
- (b) treating the sample under denaturing conditions to separate the primer extension products from their templates if the sequence or sequences to be detected are present;
- (c) treating the sample with oligonucleotide primers such that a primer extension product is synthesized using each of the single strands produced in step (b) as a template, resulting in amplification of the specific nucleic acid sequence or sequences if present;
- (d) adding to the product of step (c) a labeled oligonucleotide probe for each sequence being detected capable of hybridizing to said sequence or a mutation thereof; and
- (e) determining whether said hybridization has occurred.

4,683,196

# METHOD AND MATERIALS FOR THE IDENTIFICATION OF LIPOPOLYSACCHARIDE PRODUCING MICROORGANISMS

Charles A. McLaughlin, Berkeley, Calif., assignor to Meru, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 560,123, Dec. 12, 1983, abandoned. This application Mar. 16, 1984, Ser. No. 590,211

Claims priority, application Canada, Dec. 12, 1983, 443090

Int. Cl.<sup>4</sup> G01N 33/569; C12N 15/00, 5/00; A61K 39/40

U.S. Cl. 435—7 38 Claims

1. An immunological reagent for the detection of two more endotoxin lipopolysaccharide/glycolipid antigen producing microorganisms comprising a monoclonal antibody specifically reactive with shared antigenic determinants of said lipopolysaccharide/glycolipid antigen said determinants being selected from the group consisting of the Lipid A region and core oligosaccharide region of said lipopolysaccharide/glycolipid antigen and said antibody being produced by a hybridoma selected from the group consisting of clones Re-1 (ATCC No. HB 8482), Re-2 (ATCC No. HB 8481), LA-4, (ATCC No. HB 8480), LA-5 (ATCC No. HB 8479) and C-2 (ATCC No. HB 8478).

4,683,197

# DETECTION METHOD FOR OCCULT BLOOD

Harald Gallati, Dornach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 397,276, Jul. 12, 1982, abandoned. This application May 6, 1985, Ser. No. 730,605

Claims priority, application Switzerland, Jul. 16, 1981, 4673/81

Int. Cl.<sup>4</sup> G01N 33/53, 33/72, 33/546

U.S. Cl. 435—7 10 Claims

1. A method for detection of occult human blood in a human stool sample comprising the steps of:

- (a) subjecting said sample to a peroxidase test whereby the peroxidative activity of hemoglobin in the presence of alcoholic hydrogen peroxide oxidizes a redox indicator, and
- (b) subsequently immunologically detecting in the same sample an immunologically detectable component of human origin selected from the group consisting of albumin and globulin.

4,683,198

# NOVEL MALTOSE DEHYDROGENASE, PROCESS FOR ITS PRODUCTION, AND ANALYTICAL METHOD USING THE SAME

Hidehiko Ishikawa; Kazuo Matsuura, and Hideo Misaki, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

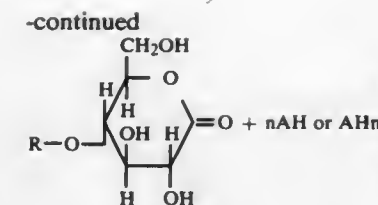
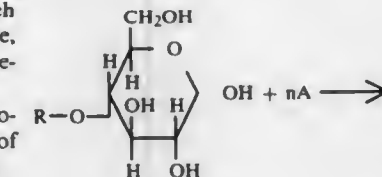
Filed Nov. 23, 1984, Ser. No. 674,009

Claims priority, application Japan, Nov. 22, 1983, 58-219792

Int. Cl.<sup>4</sup> C12Q 1/40; C12N 9/04

U.S. Cl. 435—22 22 Claims

1. An enzyme which acts on a reducing terminal of a monosaccharide or oligosaccharide without requiring NAD or NADP and which catalyzes the reaction



wherein R is a saccharide chain residue or hydrogen, A is a hydrogen acceptor other than NAD or NADP, AH or AHn is a reduced form acceptor and n is 1 or 2, said enzyme having greater substrate specificity on maltose than glucose.

4,683,199

# INTERLEUKIN-2 DEPENDENT CYTOTOXIC T-CELL CLONES

Michael Palladino, New York, N.Y., assignor to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,268

Int. Cl.<sup>4</sup> C12P 21/00; C12N 15/00, 5/00; C12R 1/91

U.S. Cl. 435—68 9 Claims

1. A method of stimulating production of the lymphokines  $\alpha$ -interferon and  $\beta$ -interferon by interleukin-2 dependent cytotoxic cultured T-cell lines comprising administering to a T-cell line selected from the group consisting of T-cell lines CTLL-RP (CRL 8201), CTLL-R8 (CRL 8202), CTLL-R9 (CRL 8203), CTLL-R11 (CRL 8204), and CTLL-R12 (CRL 8205), an amount of an antigen selected from the group consisting of Newcastle Disease Virus and Sendai Virus sufficient to cause stimulation of production of said lymphokines.

4,683,200

# MONOCLONAL ANTIBODY TO HUMAN CANCER ANTIGEN AND METHOD FOR PRODUCING SAME

Setsuo Hirohashi, 5-6 Goban-cho, Chiyoda-ku, Tokyo; Yukio Shimosato, 4-26-1 Minami-Ogikubo, Suginami-ku, Tokyo, and Masahiko Watanabe, 2-7-4 Minami-Tokiwadai, Itabashi-ku, Tokyo, all of Japan, assignors to Setsuo Hirohashi; Yukio Shimosato; Masahiko Watanabe and Nippon Kayaku Kabushiki Kaisha, all of Tokyo, Japan

Filed May 9, 1985, Ser. No. 732,406

Claims priority, application Japan, May 17, 1984, 59-97549; May 22, 1984, 59-101769

Int. Cl.<sup>4</sup> C12P 21/00; C12N 5/00, 15/00; A61K 39/00

U.S. Cl. 435—68 3 Claims

1. A method for production of a monoclonal antibody which binds to human cancer cells or human cancer tissue comprising the steps of:

- administering or implanting human cancer cells or human cancer tissue to a murine having no thymus,
- propagating the cells or tissue in the murine having no thymus,
- administering murine T cells or both murine T cells and murine B cells to the murine having no thymus,
- taking antibody-producing B cells from the murine having no thymus,
- fusing said antibody-producing B cells with murine myeloma cells to form hybridoma cells,
- selecting hybridoma cells producing an antibody which binds to the human cancer cells or human cancer tissue,
- cloning the hybridoma cells, culturing the cloned hybridoma cells, and recovering said antibody.

4,683,201

# ANTIBIOTIC A80190-PRODUCING ACTINOMADURA OLIGOSPORUS AND PROCESS

Robert L. Hamill, Greenwood, and Raymond C. Yao, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 658,976, Oct. 9, 1984, Pat. No. 4,582,822. This application Oct. 15, 1985, Ser. No. 787,564

Int. Cl.<sup>4</sup> C12N 1/20; C12P 19/60; C12R 1/03

U.S. Cl. 435—75 5 Claims

1. A process for producing antibiotic A80190 which comprises cultivating *Actinomadura oligospora* NRRL 15877, or an A80190-producing mutant thereof, in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a recoverable amount of antibiotic A80190 is produced.

4,683,202

# PROCESS FOR AMPLIFYING NUCLEIC ACID SEQUENCES

Kary B. Mullis, Kensington, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 716,975, Mar. 28, 1985, abandoned. This application Oct. 25, 1985, Ser. No. 791,308

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> C12P 19/34; C12N 15/00, 1/00; C07H 21/04, 21/02

U.S. Cl. 435—91 21 Claims

1. A process for amplifying at least one specific nucleic acid sequence contained in a nucleic acid or a mixture of nucleic acids wherein each nucleic acid consists of two separate complementary strands, of equal or unequal length, which process comprises:

- (a) treating the strands with two oligonucleotide primers, for each different specific sequence being amplified, under conditions such that for each different sequence being amplified an extension product of each primer is synthesized which is complementary to each nucleic acid strand, wherein said primers are selected so as to be sufficiently complementary to different strands of each specific sequence to hybridize therewith such that the extension product synthesized from one primer, when it is separated from its complement, can serve as a template for synthesis of the extension product of the other primer;
- (b) separating the primer extension products from the templates on which they were synthesized to produce single-stranded molecules; and
- (c) treating the single-stranded molecules generated from step (b) with the primers of step (a) under conditions that a primer extension product is synthesized using each of the single strands produced in step (b) as a template.

4,683,203

# IMMOBILIZED ENZYMES, PROCESSES FOR PREPARING SAME, AND USE THEREOF

Octavian Anton, Brussels; Robert Crichton, Louvain-la-Neuve, and Jean-Pierre Lenders, La Hulpe, all of Belgium, assignors to Redco N.V., Kapelle Op Den Bos, Belgium

Filed Mar. 27, 1985, Ser. No. 716,694

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414232; Oct. 6, 1984, 3436809

Int. Cl.<sup>4</sup> C12P 19/24; C12N 11/14

U.S. Cl. 435—94 7 Claims

1. An immobilized enzyme covalently bound to an inorganic carrier by an amino group through a bifunctional spacer, said carrier consisting of amorphous, approximately spherical silica particles obtained by the acidic hydrolysis of an approximately spherical synthetic calcium silicate having a particle size of from 20 to 120  $\mu$ m, said silica particles having an average particle size of from 15 to 80  $\mu$ m, an apparent particle volume of from 1.3 to 3  $\text{cm}^3/\text{g}$ , and a specific surface area of from 250 to 800  $\text{m}^2/\text{g}$ .



4,683,204

# PROCESS FOR PRODUCING ANTIBIOTIC A80190

LaVerne D. Boeck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 9, 1984, Ser. No. 658,977

Int. Cl.<sup>4</sup> C12P 13/00; C12N 1/20; C12R 1/03

U.S. Cl. 435—128

5 Claims

1. In the process for producing antibiotic A80190, the improvement which comprises cultivating *Actinomodura oligospora* NRRL 15878, or an A80190-producing mutant thereof, in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a recoverable amount of antibiotic A80190 is produced.

4,683,205

# METHOD FOR TRANSFORMING MICROORGANISMS

Ryoichi Katsumata; Akio Ozaki, both of Machida; Tetsuo Oka, Yokohama, and Akira Furuya, Kawasaki, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 368,034, Apr. 13, 1982, abandoned.

This application Feb. 4, 1985, Ser. No. 698,254

Claims priority, application Japan, Apr. 17, 1981, 56-58187

Int. Cl.<sup>4</sup> C12N 15/00

U.S. Cl. 435—172.3

8 Claims

1. A method for transforming microorganisms, which comprises:

- (1) selecting a microbial strain of one of the group of genera consisting of *Corynebacterium* and *Brevibacterium*;
- (2) incubating protoplasts of said microbial strain and a donor deoxyribonucleic acid selected from the group consisting of chromosomal DNAs which are stabilized after cellular introduction by recombination and plasmids in the presence of polyethylene glycol or polyvinylalcohol and at least one divalent metal cation whereby to introduce said donor deoxyribonucleic acid into said protoplasts;
- (3) regenerating said protoplasts by culturing in a hypertonic nutrient medium; and
- (4) thereafter recovering a transformed strain having a phenotype derived from said donor deoxyribonucleic acid.

4,683,206

# RECOMBINANT DNA CLONING VECTORS CONTAINING SELECTABLE GENETIC MARKERS FOR USE IN STREPTOMYCES AND RELATED ORGANISMS

James A. Mabe, and Walter M. Nakatsukasa, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

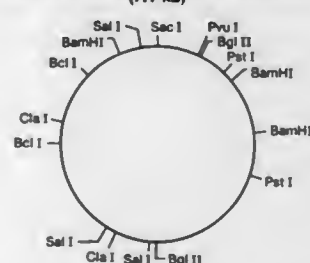
Filed Aug. 10, 1984, Ser. No. 639,632

Int. Cl.<sup>4</sup> C12N 1/20, 15/00, 1/00; C12P 21/00, 19/34; C12R 1/465, 1/485, 1/54; C07H 21/04

U.S. Cl. 435—253

24 Claims

Restriction Site Map of Plasmid pMND900 (7.1 kb)



1. A recombinant DNA cloning vector comprising:
  - (a) a functional origin of replication-containing restriction fragment of plasmid pMND900, and
  - (b) one or more DNA segments that convey resistance to at

least one antibiotic or that convey colorimetric sensitivity when transformed into a sensitive restrictionless host cell.

4,683,207

# CULTURE MONITORING SYSTEM

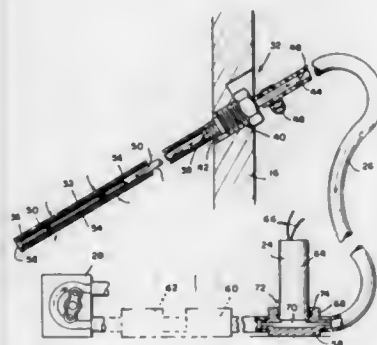
Thomas L. Waarvik, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 5, 1984, Ser. No. 678,295

Int. Cl.<sup>4</sup> C12M 1/12

U.S. Cl. 435—311

11 Claims



1. A system for continuously monitoring the chemistry of a liquid medium within a container comprising an assaying means located exteriorly of the container, a conduit connected to the assaying means and leading to the container, a probe connected to the conduit and penetrating a wall of the container, the probe including a microporous filtering element for separating a filtrate from the culture medium, the filtering element having a surface roughness less than about 50 micrometers, and means for delivering the filtrate from the probe through the conduit to the assaying means.

4,683,208

# METHOD FOR THE DETERMINATION OF BILIRUBIN

Norihito Aoyama; Akira Miike, both of Shizuoka; Mikio Okano, Nagoya, and Toshio Tatano, Numazu, all of Japan, assignors to Kyowa Medex Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,717

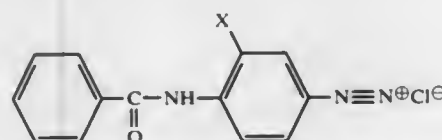
Claims priority, application Japan, Mar. 29, 1985, 60-65600

Int. Cl.<sup>4</sup> G01N 33/00, 31/00

U.S. Cl. 436—12

11 Claims

1. A method for the determination of bilirubin in a sample which comprises reacting the bilirubin with a diazonium compound represented by the formula (I)



wherein X represents halogen atom and determining the formed pigment.

4,683,209

# VIABILITY TEST DEVICE

Ibrahim A. Ismail, Mishawaka; Paul Hemmes; Mark T. Skarstedt, both of Elkhart, and Adam Zipp, Goshen, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

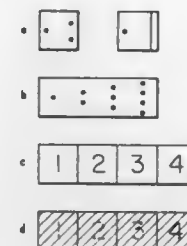
Division of Ser. No. 705,711, Feb. 26, 1985, Pat. No. 4,649,121.

This application Jul. 21, 1986, Ser. No. 887,723

Int. Cl.<sup>4</sup> G01N 31/00

U.S. Cl. 436—14

6 Claims



1. A method for preparing a viability test device, comprising the sequential steps of:

- (a) incorporating a carrier matrix substantially uniformly with a test composition which test composition is capable of providing a detectable optical response upon wetting of the test composition incorporated carrier matrix with water in the presence of the analyte to be determined;
- (b) drying;
- (c) incorporating at least a portion of the dried carrier matrix with a solution of unreacted analyte, or analog thereof, in a dried non-aqueous solvent at a analyte concentration sufficient to provide a detectable optical response in the doubly incorporated carrier matrix upon wetting of the matrix with water; and
- (d) drying.

4,683,210

# METHOD FOR MEASURING CONCENTRATIONS OF CaCO<sub>3</sub> AND CaSO<sub>3</sub> IN A SLURRY

Masakazu Onizuka; Atsushi Tatani; Takayoshi Hamada, and Setsuo Omoto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

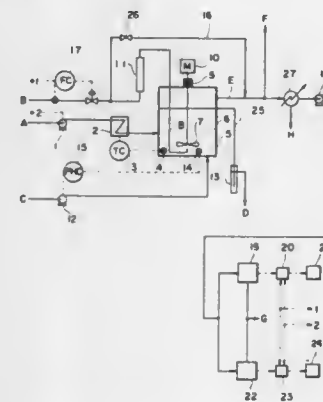
Filed Aug. 7, 1984, Ser. No. 638,552

Claims priority, application Japan, Aug. 10, 1983, 58-144894. The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> G01N 1/00, 33/00, 35/00

U.S. Cl. 436—50

18 Claims



1. A continuous method for measuring the concentration of an inorganic compound selected from the group consisting of

CaCO<sub>3</sub>, CaSO<sub>3</sub> and mixtures thereof in a slurry containing such an inorganic compound, consisting essentially of:

- continuously sampling a given amount of the slurry;
- feeding the sampled slurry at a predetermined flow rate into an agitated continuous reactor container having a bottom and which is isolated from outside air;
- maintaining the sample slurry in the reactor container at a temperature not lower than 70° C.;
- adding an acid to the reactor container to adjust the pH of the slurry therein to below 3, said acid reacting with said inorganic compound to form a reaction product and to generate a gaseous product selected from the group consisting of CO<sub>2</sub>, SO<sub>2</sub> and mixtures thereof, wherein CO<sub>2</sub> is generated when the inorganic compound is CaCO<sub>3</sub>, SO<sub>2</sub> is generated when the inorganic compound is CaSO<sub>3</sub> and a mixture of CO<sub>2</sub> and SO<sub>2</sub> is generated when the inorganic compound is a mixture of CaCO<sub>3</sub> and CaSO<sub>3</sub>;
- blowing a carrier gas into the slurry in the reactor container at a predetermined flow rate;
- withdrawing the carrier gas with the gaseous product entrained therein from the reactor container;
- measuring the concentration of the entrained gaseous product in the withdrawn carrier gas; and
- determining the concentration of said inorganic compound in the slurry from the concentration of the entrained gaseous product in the withdrawn carrier gas, the flow rate of the samples slurry and the flow rate of the carrier gas, wherein said continuous method is a high speed continuous method capable of measuring the concentration of said inorganic compound in an absorption solution used for pH control of a high speed load variation characterized desulfurization system.

4,683,211

# METHOD FOR MEASURING THE CONCENTRATION OF CaCO<sub>3</sub> IN A SLURRY

Masakazu Onizuka; Atsushi Tatani, and Takayoshi Hamada, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

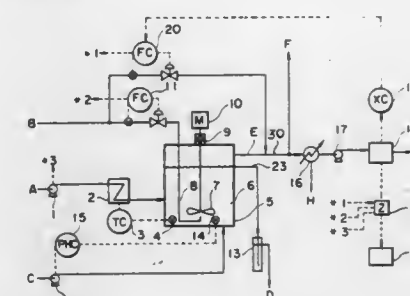
Filed Aug. 7, 1984, Ser. No. 638,512

Claims priority, application Japan, Aug. 10, 1983, 58-144895. The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> G01N 1/00, 33/00, 35/00

U.S. Cl. 436—50

8 Claims



1. A continuous method for measuring the concentration of CaCO<sub>3</sub> in a slurry containing CaCO<sub>3</sub>, the steps consisting essentially of:

- continuously sampling a given amount of the slurry;
- feeding the sampled slurry at a predetermined flow rate into an agitated continuous reactor container which is isolated from outside air;
- maintaining the sampled slurry in the reactor container at a temperature of at least 50° C.;
- adding an acid to the reactor container to adjust the pH of the slurry therein to below 4, said acid reacting with CaCO<sub>3</sub> to form a reaction product and to generate CO<sub>2</sub>;

blowing a predetermined flow rate of air into the slurry in the reactor container;  
 withdrawing gas from the reactor container wherein the withdrawn gas comprises the blown air with generated CO<sub>2</sub> entrained therein;  
 diluting the withdrawn gas with air while controlling the flow rate of the dilution air so that the CO<sub>2</sub> concentration in said diluted withdrawn gas is maintained constant;  
 determining the flow rate of the diluted withdrawn gas;  
 passing the diluted withdrawn gas with generated CO<sub>2</sub> entrained therein into a CO<sub>2</sub> analyzer;  
 measuring the concentration of entrained CO<sub>2</sub> in the diluted withdrawn gas; and  
 determining the concentration of CaCO<sub>3</sub> in the slurry from the concentration of entrained CO<sub>2</sub> in the diluted withdrawn gas, the flow rate of the diluted withdrawn gas and the flow rate of the sampled slurry, wherein said continuous method is a high speed continuous method capable of measuring the concentration of CaCO<sub>3</sub> in an absorption solution used for pH control of a desulfurization system.

4,683,212

# RANDOM ACCESS SINGLE CHANNEL SHEATH STREAM APPARATUS

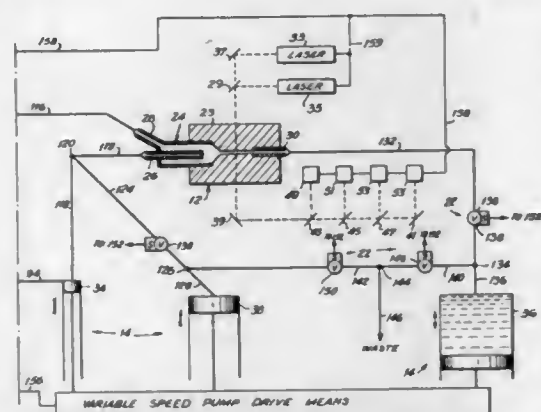
Kenneth F. Uffenheimer, Mahopac, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,639

Int. Cl.<sup>4</sup> G01N 21/05

U.S. Cl. 436—52

16 Claims



1. A method comprising, the steps of, selecting a sample fluid source from a plurality of separate sources of different sample fluids, selecting a source of a sheath fluid which is optically compatible with the sample fluid from the thusly selected sample fluid source from a plurality of separate sources of different sheath fluids which are respectively optically compatible with different ones of said different sample fluids, connecting the selected one, only, of said plurality of different sample fluid sources to sheath stream flow cell analysis means which includes a single sheath flow cell, concomitantly connecting the selected one, only, of said plurality of different sheath fluid sources to said sheath stream flow cell, both connecting steps performed under the control of control means operatively associated with each of said different sample and sheath stream fluid sources and said sheath stream flow cell, and concomitantly flowing the thusly selected optically compatible sample and sheath fluids through said sheath stream flow cell for sample fluid analysis by concomitantly differentially pumping the same from the respective sources thereof through said sheath stream flow cell.

## 4,683,213 METHOD FOR PREDICTING THE FERTILITY OF MALE MAMMALS

Roy L. Ax, Mazomanie, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 22, 1985, Ser. No. 725,569

Int. Cl.<sup>4</sup> G01N 33/53

U.S. Cl. 436—501

14 Claims

1. A method for evaluating the fertility of a test male mammal relative to the fertility of a control male mammal comprising the steps of:

- (a) collecting samples of semen from the test male and the control male; and
- (b) measuring the binding affinity of a selected glycosaminoglycan to the sperm of the semen samples by a selected means for measuring binding affinities, whereupon the fertility of the test male may be evaluated, as higher or lower than that of the control male by the degree to which the binding affinity of the glycosaminoglycan to its sperm is higher or lower than the binding affinity of the glycosaminoglycan to the sperm of the control male.

4,683,214

## NOBLE METAL-CONTAINING CATALYSTS

Phillip J. Angevine, West Deptford, and Stephen M. Oleck, Moorestown, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 647,594, Sep. 6, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 801,499

Int. Cl.<sup>4</sup> B01J 29/32

U.S. Cl. 502—66

42 Claims

1. A process for preparing a noble metal-containing zeolite catalyst which comprises crystallizing a zeolite from a forming mixture which contains an organic template, treating the as-crystallized zeolite to remove greater than about 75% by weight of said template from the zeolite, blending said zeolite with an inorganic oxide binder and a noble metal-containing solution, and extruding the blended mixture.

2. The process of claim 1 wherein said treating comprises chemical oxidation of said organic template.

3. The process of claim 2 wherein said treating comprises contacting said zeolite with sodium hypochlorite.

4. The process of claim 1 wherein said treating comprises calcining said zeolite at temperatures ranging from about 460° to 816° C.

15. The process of claim 1 wherein the noble metal is selected from the group consisting of platinum, palladium, rhodium, ruthenium, silver, rhenium, and iridium.

4,683,215

## PROCESS FOR REMOVING CONTAMINANTS FROM A LIQUID TiCl<sub>4</sub> PHASE

Jean L. Bilhou, The Hague, and Brian L. Goodall, Amsterdam, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 8, 1986, Ser. No. 860,941

Claims priority, application United Kingdom, May 22, 1985, 8513000

Int. Cl.<sup>4</sup> C08F 4/64

U.S. Cl. 502—107

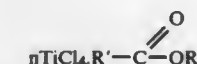
15 Claims

10. A process for preparing a solid catalyst component for 1-alkene polymerization which comprises:

- (1) reacting TiCl<sub>4</sub> with magnesium alkoxy or -aryloxychloride in the presence of a haloalkane in a liquid phase,
- (2) separating the solid product so obtained from the liquid phase,
- (3) reacting the liquid phase which is contaminated with a compound of the formula TiCl<sub>3</sub>OR with an organic acid halide of the formula



wherein R' is an aryl or alkyl group, to precipitate an addition complex of the formula



wherein n is a number of from 0.3 to 3.0,

- (4) separating the solid addition complex from the liquid phase,
- (5) slurrying the solid product of step (1) in the latter liquid phase at a temperature of at least 60° C. during at least 0.5 hours, followed by
- (6) separating the solid reaction product from the liquid phase.

4,683,216

## PROCESS FOR ACTIVATING A COMPOSITE CATALYST USEFUL FOR HYDROCARBON CONVERSION REACTIONS

Dan Farcasiu, Flemington, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 705,988, Feb. 27, 1985, Pat. No. 4,585,750, which is a continuation-in-part of Ser. No. 563,818, Dec. 21, 1983, abandoned. This application Apr. 4, 1986, Ser. No. 848,259

Int. Cl.<sup>4</sup> B01J 31/06

U.S. Cl. 502—159

10 Claims

1. A method of producing a catalyst composite of a perfluorinated-polymersulfonic acid and an anion-stabilizing agent comprising contacting the perfluorinated-polymersulfonic acid with a mixture of the stabilizing agent and its anhydride the stabilizing agent being a fluorinated carboxylic acid.

4,683,217

## IRON-ALUMINUM-PHOSPHORUS-SILICON-OXIDE MOLECULAR SIEVES

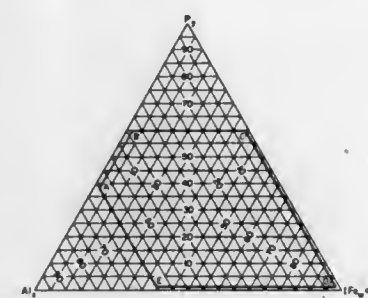
Brent M. Lok, New City; Lawrence D. Vail, New Rochelle, and Edith M. Flanigen, White Plains, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 13, 1984, Ser. No. 600,173

Int. Cl.<sup>4</sup> B01J 27/182

U.S. Cl. 502—214

26 Claims



1. Crystalline molecular sieves having framework structures of FeO<sub>2</sub>, AlO<sub>2</sub>, PO<sub>2</sub> and SiO<sub>2</sub> tetrahedral units and having a unit empirical formula:



wherein "R" represents at least one organic templating agent present, in the intracrystalline pore system; "m" represents the molar amount of "R" present per mole of (Fe<sub>w</sub>Al<sub>x</sub>P<sub>y</sub>Si<sub>z</sub>)O<sub>2</sub> and

has a value of zero to about 0.3; and "w", "x", "y" and "z" represent the mole fractions of iron, aluminum, phosphorus and silicon, respectively, present as tetrahedral oxides, each having a value of at least 0.01, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D and E of FIG. 1.

4,683,218

## CHLORINE RESISTANT SHIFT GAS CATALYST

Lynn H. Slaugh, Cypress, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 15, 1986, Ser. No. 863,271

Int. Cl.<sup>4</sup> B01J 23/02, 23/06, 23/10, 23/72

U.S. Cl. 502—302

2 Claims

1. A water gas shift catalyst composition having a high resistance to chloride poisoning which contains essentially of copper, zinc, a rare earth element and from about 5 to about 30 atomic weight percent of an alkaline earth element (basis total metals present) and which is prepared by a process comprising:

- (a) precipitating an aqueous solution of salts of copper, zinc and the rare earth element with an alkali metal or ammonium carbonate or bicarbonate precipitating agent,
- (b) collecting the precipitate of step (a),
- (c) reslurrying the precipitate of step (b) with an aqueous solution of a salt of an alkaline earth element,
- (d) precipitating the slurried solution of step (c) with an alkali metal or ammonium carbonate or bicarbonate precipitating agent,
- (e) drying and calcining the precipitate of step (d) at a temperature between about 200° C. and 400° C. and
- (f) reducing the material of step (e) in a hydrogen-containing gas at a temperature between about 175° and about 400° C.

4,683,219

## PROCESS FOR PRODUCTION OF A SYNGAS CONVERSION CATALYST

Leonard Cotton, 1 Windmill Lane, Ewell, Epsom, Surrey; Barry Nay, 15 Park Place, Woking, Surrey, GU22 7NP, and Michael J. Wilcox, Top Flat, 93 Heath Road, Weybridge, Surrey, KT13 8TS, all of England

PCT No. PCT/GB85/00330, § 371 Date Mar. 4, 1986, § 102(e) Date Mar. 4, 1986, PCT Pub. No. WO86/00885, PCT Pub. Date Feb. 13, 1986

PCT Filed Jun. 25, 1985, Ser. No. 848,401

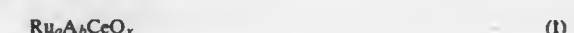
Claims priority, application United Kingdom, Jul. 25, 1984, 8418975

Int. Cl.<sup>4</sup> B01J 23/10, 23/46, 23/58

U.S. Cl. 502—304

14 Claims

1. A process for the production of a composition for use after reductive activation as a catalyst in the conversion of synthesis gas to hydrocarbons of carbon number greater than one, which composition has the formula:



wherein

- A is an alkali metal,
- x is a number such that the valence requirements of the other elements for oxygen is satisfied,
- a is greater than zero and less than 1% w/w, based on the total weight of the composition,
- b is in the range from zero to 10% w/w, based on the total weight of the composition, and
- Ce and O constitute the remainder of the composition,

which process comprises the steps of:

- (A) bringing together in solution soluble salts of the metals ruthenium and cerium and a precipitant comprising a carbonate and/or a bicarbonate and/or a hydroxide of an alkali metal or ammonium under conditions whereby there is formed a precipitate comprising ruthenium and cerium in the form of compounds thermally decomposable to their oxides, and



(B) recovering the precipitate obtained in step (A).

4,683,220

# NOVEL PHYSIOLOGICALLY ACTIVE SUBSTANCES K-26, A PROCESS FOR PREPARATION THEREOF AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

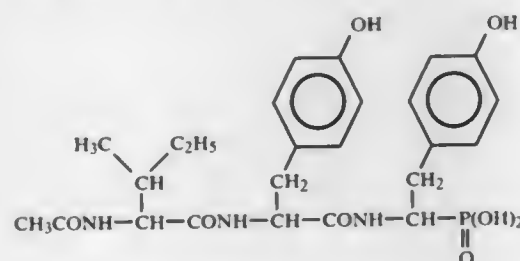
Masayuki Yamato, Machida; Hiroshi Kase, Koganei; Isao Kawamoto, Hiratsuka, all of Japan; Masaji Kasai, Rockville, Md.; Kunikatsu Shirahata, Komae, Japan; Takashi Deguchi, Mishima, Japan; Katsuchi Shuto, Shizuoka, Japan; Akira Karasawa, Shizuoka, Japan; Ryo Okachi, Shizuoka, Japan, and Kiyoshi Nakayama, Sagami, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 744,309, Jun. 13, 1985, abandoned, which is a continuation of Ser. No. 661,886, Oct. 18, 1984, abandoned, which is a continuation of Ser. No. 359,030, Mar. 17, 1982, abandoned. This application Ser. No. 26, 1986, Ser. No. 912,685

Claims priority, application Japan, Mar. 20, 1981, 56-40651  
Int. Cl.<sup>4</sup> A61K 37/64

U.S. Cl. 514-7

3 Claims

1. The compound, K-26, represented by the formula:



wherein the configuration of the isoleucine and tyrosine parts is L-form and the L-amino-2-(4-hydroxyphenyl)ethylphosphonic acid part has negative specific rotation.

4,683,221

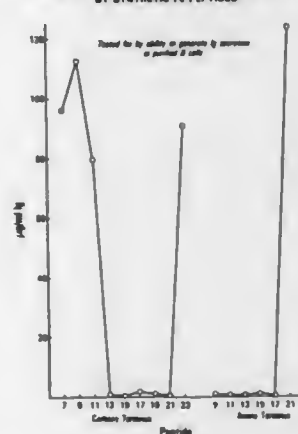
# LYMPHOCYTE-ACTIVATING POLYPEPTIDES

William O. Weigle, Del Mar; Monte O. Hobbs, Carlsbad; Edward L. Morgan; Marilyn L. Thoman, both of San Diego, and Richard A. Houghten, Solana Beach, all of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.  
Filed Jan. 9, 1986, Ser. No. 817,526  
Int. Cl.<sup>4</sup> A61K 37/02; C07K 5/10, 7/06

U.S. Cl. 514-14

15 Claims

GENERATION OF BCF FROM MOUSE SPLEEN CELLS BY SYNTHETIC F4 PEPTIDES



1. A polypeptide containing 4 to about 11 residues, and having an amino acid residue sequence, written from left to

right and in the direction from amino-terminus to carboxy-terminus, that corresponds to the formula:

(B)<sub>y</sub>-Leu-Pro-Pro-Ser-(Y)<sub>x</sub>

and the pharmaceutically acceptable non-toxic salts thereof, wherein B is the amino acid residue Thr or is a polypeptide, written from left to right and in the direction from amino-terminus to carboxy-terminus, selected from the group consisting of Tyr-Thr, Val-Tyr-Thr and Gln-Val-Tyr-Thr;

Y is the amino acid residue Arg, or is a peptide, written from left to right and in the direction from amino-terminus to carboxy-terminus, selected from the group consisting of Arg-Glu and Arg-Glu-Glu; and

b and y are each independently one or zero, such that when either or both of b and y are zero, the respective B and Y are absent, and when either or both of b and y are one, the respective B and Y are present.

4,683,222

# N-GLYCOSYLATED CARBOXAMIDE DERIVATIVES AND THEIR USE FOR INFLUENCING THE BODY'S INHERENT DEFENCES

Peter Stadler, Elkhart, Ind.; Oswald Lockhoff, Leverkusen, Fed. Rep. of Germany; Hans-Georg Opitz, Wuppertal, Fed. Rep. of Germany, and Klaus Schaller, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 481,210, Apr. 1, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 725,060

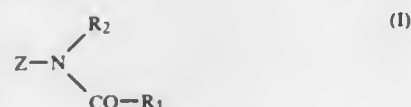
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1982, 3213650

Int. Cl.<sup>4</sup> A61K 31/70; C07H 15/12

U.S. Cl. 514-42

18 Claims

1. A compound of the formula I



wherein Z denotes a glycosyl radical selected from the group consisting of rhamnopyranosyl, 6-deoxy-6-fluoro-D-glucopyranosyl, glucuronopyranosyl, 4-amino-4-deoxy-D-glucopyranosyl, 4-lauroylamido-4-deoxy-D-glucopyranosyl, 2-olanylamido-2-deoxy-D-glucopyranosyl, 2-stearoylamido-2-deoxy-D-glucopyranosyl, galactopyranosyl, mannopyranosyl, glucopyranosyl, ribofuranosyl, arabinopyranosyl or lyxopyranosyl, D-glycero-D-glucopyranosyl, maltosyl, maltotriosyl, maltotetraosyl, lactosyl, cellobiosyl, melibiosyl, 6-O-(α- or β-ribofuranosyl)-glucopyranosyl, 2-amino-2-deoxyglucopyranosyl, 4-azido-4-deoxyglucopyranosyl, 4-stearoylamido-4-deoxy-D-glucopyranosyl, 4-dodecylamido-4-deoxy-D-glucopyranosyl, 6-hexadecanoylamido-6-deoxy-D-galactopyranosyl, 2,6-diamino-2,6-dideoxyglucopyranosyl, 6,6'-diamino-6,6'-dideoxymaltosyl, 6-amino-6,6'-dideoxylactosyl, 6-deoxymannopyranosyl, 2-deoxyribofuranosyl, fucosyl, 5-fluoro-5-deoxyribofuranosyl, 6-O-methylglucopyranosyl, 6-deoxy-6-thioglucofuranosyl, 3-deoxy-3-nitroglactopyranosyl, galacturonic acid, methyl glucuronate, glucuronamide and N-dodecylglucuronamide bonded via the anomeric carbon atom, R<sub>1</sub> denotes an optionally substituted straight or branched C<sub>9</sub>-C<sub>21</sub>-alkyl or C<sub>7</sub>-C<sub>21</sub>-alkenyl radical, and R<sub>2</sub> denotes a straight-chain or branched or C<sub>9</sub>-C<sub>21</sub>-alkyl or C<sub>7</sub>-C<sub>21</sub>-alkenyl radical, or an aralkyl radical having up to 30 C atoms in which the aryl portion is mono- or bi-cyclic carbocyclic aryl and the alkyl portion contains 1 to 4 carbon atoms, which can be substituted by halogen.

18. A method for stimulating the body's immune system defense in a warm-blooded animal which comprises adminis-

tering to said warm-blooded animal an immune system antibody increasing amount of a compound of claim 1 either alone or in admixture with an inert carrier or in the form of a medication.

4,683,223

# N<sub>6</sub>-BENZOPYRANO-AND BENZOTHIOPYRANO ADENOSINES AND METHODS OF USE

Bharat K. Trivedi, Canton, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

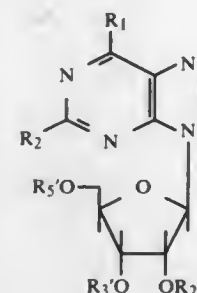
Filed Sep. 9, 1985, Ser. No. 772,984

Int. Cl.<sup>4</sup> A61K 31/70; C07H 19/67

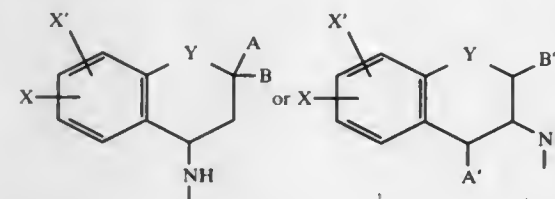
U.S. Cl. 514-46

21 Claims

1. A compound of the formula



wherein R<sub>1</sub> is of formula



wherein Y is O, S, SO, or SO<sub>2</sub>; X and X' are each independently hydrogen, lower alkyl, lower alkoxy, hydroxy, lower alkanoyl, nitro, amino, trifluoromethyl, halogen, or when taken together —O—CH<sub>2</sub>—O—; A and B are each independently hydrogen or lower alkyl; A' and B' are each independently hydrogen, lower alkyl or hydroxyl; R<sub>2</sub> is (a) hydrogen, (b) halogen, (c) NR'<sub>2</sub> where R' and R' are independently hydrogen, lower alkyl, phenyl or phenyl substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl, (d) SR where R is hydrogen, lower alkyl, or phenyl; R<sub>2</sub>, R<sub>3</sub>, and R<sub>5</sub> are independently hydrogen, lower alkanoyl, benzoyl, or benzoyl substituted by lower alkyl, lower alkoxy, halogen, or trifluoromethyl, or R<sub>2</sub> and R<sub>3</sub> together may be lower alkylidene; and wherein the compounds contain asymmetric carbon atoms in its diastereomers or mixtures thereof, or a pharmaceutically acceptable acid addition salt thereof.

18. A method for treating sleep disorders in a subject suffering therefrom comprising administering to such subject a compound as claimed in claim 1 in unit dosage form.

4,683,224

# N-FORMYL PHOSPHONAMIDOTHIOATES AS PESTICIDES

Mohamed A. H. Fahmy, Modesto, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 777,379, Sep. 18, 1985,

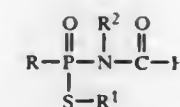
abandoned. This application Jul. 21, 1986, Ser. No. 885,161

Int. Cl.<sup>4</sup> A01N 57/02; C07F 9/44

U.S. Cl. 514-120

10 Claims

1. A compound of the formula



wherein R is alkyl or alkenyl of up to six carbon atoms, phenyl or benzyl, R<sup>1</sup> is straight-chain alkyl of three to five carbon atoms, branched-chain alkyl of three to six carbon atoms, phenyl or benzyl, and R<sup>2</sup> is hydrogen, alkyl, alkenyl or alkynyl of up to six carbon atoms, or alkyl of one to six carbon atoms substituted by phenyl; phenyl or phenyl substituted by one to three substituents selected from alkyl of one to six carbon atoms and halogen.

2. A method for killing insects and mites that comprises subjecting the insect to a lethal dosage of a compound of claim 1.

4,683,225

# O-(SUBSTITUTED) BENZYL DITHIOPHOSPHONATE INSECTICIDES

Charles G. Chavdarian, Martinez, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

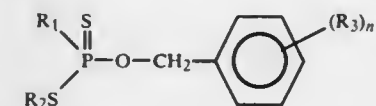
Filed Oct. 28, 1985, Ser. No. 792,087

Int. Cl.<sup>4</sup> A01N 57/06; C07F 9/40

U.S. Cl. 514-128

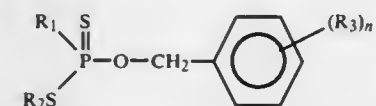
52 Claims

1. A method for controlling insects comprising applying to an insect, the locus of an insect or a locus at which insecticidal control is desired, an insecticidally effective amount of a compound having the formula



in which R<sub>1</sub> is methyl or ethyl; R<sub>2</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl; R<sub>3</sub> is halogen, C<sub>1</sub>-C<sub>4</sub> alkyl, trifluoromethyl, thio-(C<sub>1</sub>-C<sub>4</sub> alkyl) or phenoxy, and n is 0, 1 or 2; provided that if R<sub>2</sub> is methyl, then R<sub>1</sub> is methyl.

28. A compound having the formula



in which R<sub>1</sub> is methyl or ethyl; R<sub>2</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl; R<sub>3</sub> is halogen, C<sub>1</sub>-C<sub>4</sub> alkyl, trifluoromethyl, thio-(C<sub>1</sub>-C<sub>4</sub> alkyl) or phenoxy, and n is 0, 1 or 2; provided that if R<sub>2</sub> is methyl, then R<sub>1</sub> is methyl.

4,683,226

# 6-HYDROXYALKYL-2-(SUBSTITUTED-THIO)PENEM-3-CARBOXYLIC ACIDS

Stuart W. McCombie, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 62,875, Aug. 1, 1979,

abandoned, which is a continuation-in-part of Ser. No. 2,471, Jan. 10, 1979, abandoned, and a continuation-in-part of Ser. No. 91,610, Nov. 5, 1979, abandoned. This application Nov. 23, 1981,

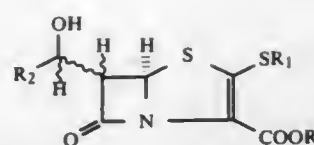
Ser. No. 324,318

Int. Cl.<sup>4</sup> C07D 499/00; A61K 31/425

U.S. Cl. 514-192

9 Claims

1. A compound represented by the formula



or a pharmaceutically acceptable salt thereof, wherein:  
R is hydrogen, an alkali metal cation or a metabolisable ester group;  
R<sub>1</sub> is amino(lower)alkyl or chloro(lower)alkylcarbonylamino(lower) alkyl;  
and R<sub>2</sub> is hydrogen or lower alkyl of from 2 to 6 carbon atoms.

4,683,227

#### ANTIBIOTIC DERIVATIVES OF 7B-[2-(THIAZOL-4-YL)ACETAMIDE]-3-CHLORO-3-CEPHEM-4-CARBOXYLIC ACIDS AND COMPOSITIONS AND METHOD OF USE THEREOF

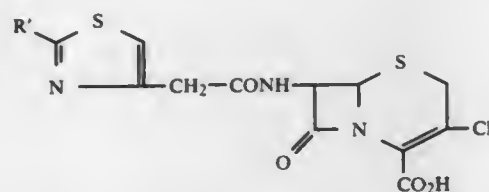
Stjepan Kukolja, Carmel, and Walter E. Wright, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 9, 1985, Ser. No. 753,291  
Int. Cl.<sup>4</sup> A61K 31/545; C07D 501/20

U.S. Cl. 514-202

9 Claims

1. The compound of the formula



wherein R' is chloro or methyl, and the pharmaceutically acceptable non-toxic salts thereof.

4,683,228

#### GUANIDINOPYRAZOLYLAMIDES, GUANIDIMOIMIDAZOLYLAMIDES, COMPOSITIONS CONTAINING THEM, AND METHOD OF USING THEM TO INHIBIT GASTRIC ACID SECRETION

Karin M. Kirkland, Wilmington, Del., and Derrick M. Mant, Stockport, England, assignors to ICI Americas Inc., Wilmington, Del. and Imperial Chemical Industries PLC, London, England

Filed Jan. 22, 1985, Ser. No. 693,179

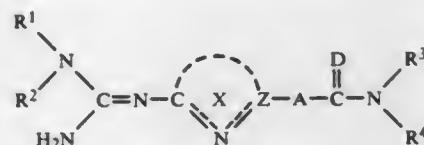
Claims priority, application United Kingdom, Jan. 24, 1984, 8401751

Int. Cl.<sup>4</sup> A61K 31/54, 31/55; C07D 419/12, 419/14

U.S. Cl. 514-211

14 Claims

1. A guanidine derivative of the formula 1:



in which

R<sup>1</sup> and R<sup>2</sup>, which may be the same or different, are hydrogen atoms or branched or unbranched 1-10C alkyl, 3-8C cycloalkyl or 4-14C cycloalkylalkyl radicals, each alkyl, cycloalkyl or cycloalkylalkyl radical being optionally substituted by one or more halogen atoms selected from fluorine, chlorine and bromine atoms, provided that at least one of R<sup>1</sup> and R<sup>2</sup> is a halogen-substituted alkyl, cyclo-

alkyl or cycloalkylalkyl radical and provided there is no halogen substituent on the carbon atom of the alkyl, cycloalkyl or cycloalkylalkyl radical which is directly attached to the nitrogen atom, or R<sup>2</sup> is a hydrogen atom and -R<sup>1</sup> is a radical of the formula II:



II

in which W is an unbranched 2-6C alkylene chain which is optionally substituted by one or two 1-4C alkyl radicals, E is an oxygen or sulphur atom, a sulphonyl or sulphonyl radical, or a radical of the formula NR<sup>6</sup> in which R<sup>6</sup> is a hydrogen atom or a 1-6C alkyl radical, R<sup>5</sup> is a hydrogen atom or an unbranched 1-6C alkyl radical which is optionally substituted by one or two 1-4C alkyl radicals, or R<sup>5</sup> and R<sup>6</sup> are joined to form, together with the nitrogen atom to which they are attached, a pyrrolidine, piperidine, morpholine, piperazine or N-methylpiperazine ring;

in ring X the dotted line is a double bond on one side of the nitrogen atom and Z is a carbon or nitrogen atom such that ring X is pyrazole or imidazole wherein said ring X may, where possible, carry one or two optional substituents, the optional substituents, on ring X being selected from fluorine, chlorine and bromine atoms and 1-6C alkyl, 1-6C alkoxy, trifluoromethyl, hydroxy and amino radicals;

-A- is a 3-8C alkylene chain which is substituted by a hydroxy radical and into which is optionally inserted, as part of the backbone of the chain, one or two groups selected from oxygen and sulphur atoms and NH and 1-6C N-alkyl radicals, provided that the shortest link between ring X and C=D is of at least 3 atoms, provided that no optional insertion is made in chain A which results in the inserted group being directly attached to C=D provided that no two insertions are directly attached one to the other, and provided that an inserted atom or radical is not attached to the carbon atom which carries the hydroxy radical;

D is an oxygen or sulphur atom;

R<sup>3</sup> is a hydrogen atom or a hydroxy, amino, 1-6C alkyl, amino, 1-6C haloalkylamino, 1-6C alkanoylamino, 1-6C alkyl, 3-8C cycloalkyl, 4-12C cycloalkylalkyl, 2-6C alkyl, 2-6C alkynyl, 1-6C haloalkyl, 1-6C alkoxy, 1-6C hydroxyalkyl, 2-10C alkoxyalkyl, 2-10C alkylthioalkyl, 1-6C aminoalkyl, 2-8C alkylaminoalkyl, 3-12C dialkylaminoalkyl, 2-8C alkanoylaminoalkyl, 8-14C benzoylaminoalkyl, 3-10C alkoxyalkyl, 2-8C carbamoylalkyl, phenyl, 7-11C phenylalkyl, heteroaryl or heteroarylalkyl radicals, wherein the heteroaryl part is a furan, thiophene, pyrrole, thiazole, oxazole, imidazole, thiadiazole, oxadiazole, triazole, pyrazole, pyridine or pyrimidine ring, wherein the alkyl part of the heteroarylalkyl radical is 1-6C and wherein, when R<sup>3</sup> is a phenyl or heteroaryl ring, that ring is optionally substituted by one or two groups selected from fluorine, chlorine, bromine and iodine atoms and 1-6C alkyl, 1-6C alkoxy, 1-6C alkylthio, 2-6C dialkylamino, 2-6C alkanoyl, trifluoromethyl, hydroxy and amino radicals;

R<sup>4</sup> is a hydrogen atom; or R<sup>3</sup> and R<sup>4</sup> are joined to form, together with the nitrogen atom to which they are attached, a 5-6- or 7-membered saturated ring which optionally contains a double bond or an additional oxygen atom, NH or 1-6C N-alkyl radical;

and a pharmaceutically-acceptable acid-addition salt thereof.

13. A pharmaceutical composition useful to inhibit gastric acid secretion comprising an effective amount of a guanidine derivative as claimed in claim 1 in association with a pharmaceutically-acceptable diluent or carrier.

14. A method of inhibiting gastric acid secretion in a warm-blooded animal comprising administering to the warm-blooded animal the pharmaceutical composition as defined in claim 13.

4,683,229

#### 6-HALO-9-ALKENYLENEOXY-3-ALKYL-2,3,4,5-TETRAHYDRO-(1H-3)-BENZAZEPINES AND THEIR USE AS SELECTIVE ALPHA-ADRENERGIC RECEPTOR ANTAGONISTS

Robert M. Demarins, Ardmore, Pa., and Francis R. Pfeiffer, Cinnaminson, N.J., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

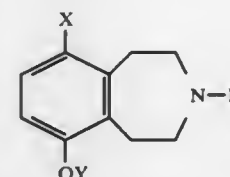
Filed Mar. 17, 1986, Ser. No. 840,621

Int. Cl.<sup>4</sup> C07D 223/16; A61K 31/55

U.S. Cl. 514-213

11 Claims

1. A compound represented by the Formula:



in which:

R is C<sub>1-5</sub> alkyl;

X is Br, Cl, F;

Y is -CH<sub>2</sub>-CH=C(CH<sub>3</sub>)<sub>2</sub>, -CH=CH-CH<sub>3</sub>, -CH=C(CH<sub>3</sub>)<sub>2</sub>, -CH=CH-CH<sub>2</sub>-CH<sub>3</sub>, or -CH=CH-CH(CH<sub>3</sub>)<sub>2</sub>;

or any pharmaceutically acceptable salt or hydrate thereof.

9. A method of producing selective alpha<sub>3</sub>-adrenoceptor antagonism in mammals that comprises administering internally to a subject in need of such antagonism an effective amount of a compound of claim 1.

4,683,230

#### BM-28121, A NEW ANTITUMOR ANTIBIOTIC

Mitsuaki Tsunakawa, Tokyo; Masataka Konishi, Kawasaki, and Takeo Miyaki, Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

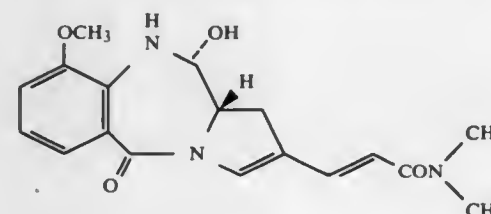
Filed Feb. 25, 1985, Ser. No. 704,973

Int. Cl.<sup>4</sup> A61K 31/55; C07D 487/04

U.S. Cl. 314-214

10 Claims

1. The antibiotic BM-28121A of the formula



3. A method for therapeutically treating an animal host affected by a bacterial infection, which comprises administering to said host an effective antibacterial dose of BM-28121A.

4,683,231

#### METHOD OF PREVENTING WITHDRAWAL SYMPTOMS ASSOCIATED WITH THE CESSATION OR REDUCTION OF TOBACCO SMOKING

Alexander H. Glassman, Teaneck, N.J., assignor to Research Foundation for Mental Hygiene, Inc., New York, N.Y.  
Division of Ser. No. 585,900, Mar. 2, 1984, Pat. No. 4,588,739.  
This application Apr. 16, 1986, Ser. No. 852,650

Int. Cl.<sup>4</sup> A61K 31/395

U.S. Cl. 514-220

7 Claims

1. A method of preventing in a human subject accustomed to smoking tobacco the withdrawal symptoms associated with the cessation or reduction of tobacco smoking comprising

administering to the subject an effective symptom preventing amount of alprazolam.

4,683,232

#### HETEROCYCLIC COMPOUNDS HAVING CARDIOTONIC USE

David Brown, Macclesfield; Robert I. Dowell, Congleton; Rodney B. Hargreaves, Poynton, and Brian G. Main, Sandbach, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 675,741, Nov. 28, 1984, Pat. No. 4,587,246, which is a division of Ser. No. 528,103, Aug. 31, 1983, Pat. No. 4,503,054, which is a division of Ser. No. 321,899, Nov. 16, 1981, Pat. No. 4,423,045. This application May 1, 1986, Ser. No. 858,126

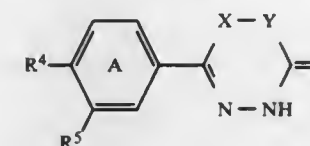
Claims priority, application United Kingdom, Nov. 14, 1980, 8036680

Int. Cl.<sup>4</sup> A61K 31/535; C07D 273/04

U.S. Cl. 514-228

5 Claims

1. A heterocyclic compound of the formula:



wherein X is -CR<sup>1</sup>R<sup>2</sup>- and Y is oxygen, wherein R<sup>1</sup>, and R<sup>2</sup>, which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms; wherein R<sup>4</sup> and R<sup>5</sup>, which may be the same or different, each is hydrogen, cyano, nitro, amino or hydroxy, or alkylthio of up to 4 carbon atoms, or has the formula:



wherein Q is a direct link, or is imino (-NH-), or is oxyalkylene of up to 4 carbon atoms, wherein Z is oxygen or sulphur and wherein R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup>, which may be the same or different, each is hydrogen, alkyl, alkenyl, cycloalkyl or alkoxyalkyl each of up to 6 carbon atoms, or aryl or arylalkyl each of up to 12 carbon atoms, or wherein R<sup>7</sup> and R<sup>8</sup> together with the adjacent nitrogen atom form a 5- or 6-membered fully-saturated heterocyclic ring, provided that R<sup>4</sup> and R<sup>5</sup> are not both hydrogen;

or wherein R<sup>4</sup> and R<sup>5</sup> are joined together such that with the benzene ring A they form a benzoheterocyclic ring wherein the heterocyclic part is a 5- or 6-membered ring containing one oxygen, sulphur or nitrogen atom, and which heterocyclic part may optionally contain an oxo substituent or an alkyl or alkanoyl substituent each of up to 6 carbon atoms;

and wherein the benzene ring A bears no further substituent or bears one or more chloro, bromo, methyl, ethyl, methoxy or ethoxy substituents;

or a salt thereof where appropriate.

5. A method for the treatment of acute or chronic heart failure in a warm-blooded animal in need of such treatment which comprises administering to said animal an effective amount of a heterocyclic compound claimed in claim 1.



4,683,233

SALTS OF 2-KETO-2H, 3H-1,2-BENZISOTHIAZOLE  
1,1-DIOXIDE AS MICROBICIDES

Herbert Salzburg; Manfred Hajek, both of Cologne; Gerd Hänssler, Leverkusen, and Varl-Heinz Kuck, Langenfeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,439

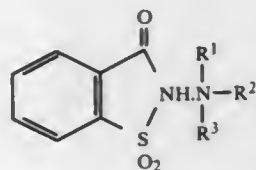
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408538; Aug. 22, 1984, 3430805

Int. Cl.<sup>4</sup> A01N 43/40, 43/60, 43/80, 43/84

U.S. Cl. 514—253

8 Claims

1. A method of combating plant pathogenic fungi and bacteria which comprises applying to such fungi or bacteria a fungicidally or bactericidally effective amount of at least one salt of 3-keto-2H,3H-1,2-benzisothiazole 1,1-dioxide of the formula

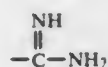


R<sup>1</sup> represents hydrogen, alkyl having 1 to 18 carbon atoms, hydroxyalkyl having 1 to 3 carbon atoms, aminoalkyl having 1 to 3 carbon atoms, carboxyalkyl having 1 to 3 carbon atoms in the alkyl part, phenyl which is optionally monosubstituted or disubstituted by nitro or chlorine, cyclopentyl or cyclohexyl, or represent pyrimidine, 4-methylpyrimidine, 1,2,4-triazole, 1,2,3-triazole, or tetrahydropyran radicals which are optionally monosubstituted to tetrasubstituted by alkyl having 1 to 3 carbon atoms or monosubstituted to tetrasubstituted by hydroxyl,

R<sup>2</sup> represents alkyl having 1 to 18 carbon atoms, hydroxyalkyl having 1 to 3 carbon atoms, aminoalkyl having 1 to 3 carbon atoms, carboxyalkyl having 1 to 3 carbon atoms in the alkyl part, phenyl which is optionally monosubstituted or disubstituted by nitro or chlorine, cyclopentyl or cyclohexyl, or represent pyrimidine, 4-methyl pyrimidine, 1,2,4-triazole, 1,2,3-triazole, or tetrahydropyran radicals which are optionally monosubstituted to tetrasubstituted by alkyl having 1 to 3 carbon atoms or monosubstituted to tetrasubstituted by hydroxyl, or

R<sup>1</sup> and R<sup>2</sup>, together with the nitrogen atom to which they are attached, form a pyrimidine, 1,2,4-triazole, 1,2,3-triazole, tetrahydropyran or tetrahydroxy tetrahydropyran radical, and

R<sup>3</sup> represents hydrogen, alkyl having 1 to 6 carbon atoms, amino, benzyl, hydroxyalkyl having 1 to 3 carbon atoms or



with the exception of the mono-, di- or triethanolamine compounds.

4,683,234

2,6-DIMETHYL-3N,5-DISUBSTITUTED-4-(SUBSTITUTED  
PHENYL)3,4-DIHYDROPYRIMIDINE COMPOUNDS  
AND A METHOD FOR TREATING DISORDERS OF  
CARDIOCIRCULAR SYSTEM

Hidetaka Cho, Ibaraki; Kazuo Aisaka, Osaka; Fumio Sato, Nagaokakyo, and Takafumi Ishihara, Toyonaka, all of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Mar. 6, 1985, Ser. No. 708,885

Claims priority, application Japan, May 19, 1984, 59-101569; May 26, 1984, 59-107004; Aug. 3, 1984, 59-163614

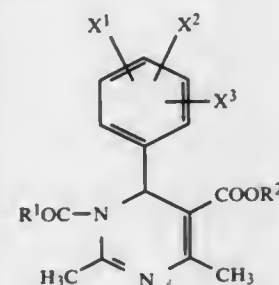
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> A61K 31/505; C07D 239/20

U.S. Cl. 514—256

13 Claims

1. A 2,6-dimethyl-3N,5-disubstituted-4-(substituted phenyl) 3,4-dihydropyrimidine compound of the formula: CHO et al—Serial No. 708,885



wherein X<sup>1</sup>, X<sup>2</sup> and X<sup>3</sup> are the same or different and are hydrogen, nitro, Br, F, Cl, cyano, trifluoromethyl, methylthio or lower alkoxy, with the proviso that when one of X<sup>1</sup>, X<sup>2</sup> and X<sup>3</sup> is nitro or cyano, the remainder are other than nitro and cyano;

R<sup>1</sup> is

(C<sub>1</sub>—C<sub>13</sub>) straight or branched alkoxy,  
(C<sub>4</sub>—C<sub>12</sub>) straight or branched alkenyloxy,  
(C<sub>5</sub>—C<sub>8</sub>) straight or branched alkynyloxy,  
(C<sub>1</sub>—C<sub>4</sub>) straight or branched alkyl,  
(C<sub>3</sub>—C<sub>6</sub>) cycloalkyl,

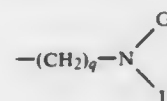
—O—(CH<sub>2</sub>)<sub>n</sub>—A wherein n is 1, 2 or 3, A is cyclopropyl, cyclobutyl, cyclopentyl or (C<sub>1</sub>—C<sub>3</sub>) haloalkyl,

—O—(CH<sub>2</sub>)<sub>m</sub>—O—B wherein m is 1, 2, 3 or 4, B is (C<sub>1</sub>—C<sub>3</sub>) alkyl, or

—O—(CH<sub>2</sub>)<sub>l</sub>—D wherein l is an integer from zero to 8, D is phenyl or substituted phenyl;

R<sup>2</sup> is

(C<sub>1</sub>—C<sub>12</sub>) straight or branched alkyl,  
—(CH<sub>2</sub>)<sub>p</sub>—E wherein p is 1, 2 or 3, E is cyclopropyl, cyclobutyl or cyclopentyl,  
(C<sub>4</sub>—C<sub>7</sub>) straight or branched alkenyl,



wherein q is 2, 3 or 4, G and J are the same or different and are phenyl, methyl, ethyl, isopropylbenzyl, phenethyl, methoxycarbonyl or ethoxycarbonyl, or

—(CH<sub>2</sub>)<sub>r</sub>—O—L wherein r is 1 or 2, L is methyl, ethyl or phenyl,

with the proviso that when R<sup>1</sup> is methoxy or ethoxy, R<sup>2</sup> is neither methyl nor ethyl, or pharmaceutically acceptable acid addition salts of said compound.

12. A method for treating disorders of the cardiovascular system in a mammal comprising administering an effective amount of a 2,6-dimethyl-3N,5-disubstituted-4-(substituted phenyl) 3,4-dihydropyrimidine compound of the formula:

4,683,236

CYCLOALKANOL ESTERS OF DIHYDROLYSERGIC  
ACID USEFUL AS 5HT<sub>2</sub> RECEPTOR ANTAGONISTS

Kathleen R. Whitten, Zionsville; William L. Garbrecht, Indianapolis; Gifford P. Marzoni, Indianapolis, and C. John Parli, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

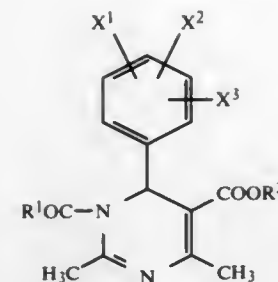
Filed Oct. 1, 1985, Ser. No. 782,337

Int. Cl.<sup>4</sup> A61K 31/48; C07D 457/04

U.S. Cl. 514—288

3 Claims

1. A method of blocking 5HT<sub>2</sub> receptors which comprises administering to a mammal having an excess of serotonin centrally or peripherally an 5HT<sub>2</sub> blocking dose of a compound of the formula



wherein

X<sup>1</sup>, X<sup>2</sup> and X<sup>3</sup> are the same or different and are hydrogen, nitro, Br, F, Cl, cyano, trifluoromethyl, methylthio or lower alkoxy, with the proviso that when one of X<sup>1</sup>, X<sup>2</sup> and X<sup>3</sup> is nitro or cyano, the remainder are other than nitro and cyano;

R<sup>1</sup> is

(C<sub>1</sub>—C<sub>13</sub>) straight or branched alkoxy,  
(C<sub>4</sub>—C<sub>12</sub>) straight or branched alkenyloxy,  
(C<sub>5</sub>—C<sub>8</sub>) straight or branched alkynyloxy,  
(C<sub>1</sub>—C<sub>4</sub>) straight or branched alkyl,  
(C<sub>3</sub>—C<sub>6</sub>) cycloalkyl,

—O—(CH<sub>2</sub>)<sub>n</sub>—A wherein n is 1, 2 or 3, A is cyclopropyl, cyclobutyl, cyclopentyl or (C<sub>1</sub>—C<sub>3</sub>) haloalkyl,

—O—(CH<sub>2</sub>)<sub>m</sub>—O—B wherein m is 1, 2, 3 or 4, B is (C<sub>1</sub>—C<sub>3</sub>) alkyl, or

—O—(CH<sub>2</sub>)<sub>l</sub>—D wherein l is an integer from zero to 8, D is phenyl or substituted phenyl;

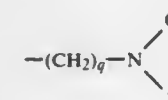
R<sup>2</sup> is

(i) (C<sub>1</sub>—C<sub>12</sub>) straight or branched alkyl,

(ii) (C<sub>4</sub>—C<sub>7</sub>) straight or branched alkenyl,

(iii) —(CH<sub>2</sub>)<sub>p</sub>—E wherein p is 1, 2 or 3, E is cyclopropyl, cyclobutyl or cyclopentyl,

(iv)



wherein q is 2, 3 or 4, G and J are the same or different and are phenyl, methyl, ethyl, isopropyl, benzyl, phenethyl, methoxycarbonyl or ethoxycarbonyl, or

(v) —(CH<sub>2</sub>)<sub>r</sub>—O—L wherein r is 1 or 2, L is methyl, ethyl or phenyl,

with the proviso that when R<sup>1</sup> is methoxy or ethoxy, R<sup>2</sup> is neither methyl nor ethyl, or a pharmaceutically acceptable acid addition salt of said compound to said mammal.

4,683,235

## ANALGESIC METHOD

Martin D. Hynes, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 705,176, Feb. 25, 1985, abandoned.

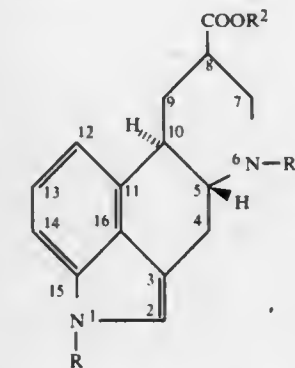
This application Jul. 25, 1986, Ser. No. 889,157

Int. Cl.<sup>4</sup> A61K 31/44, 31/135

U.S. Cl. 514—282

9 Claims

1. A method of potentiating codeine analgesia in mammals which comprises the administration to said mammal of an effective potentiating amount of fluoxetine or norfluoxetine in the time range between 24 hours before and 2 hours after the administration of codeine.



wherein R is primary or secondary C<sub>1-8</sub> alkyl, CH<sub>2</sub>-C<sub>2-4</sub> alkenyl, C<sub>3-8</sub> cycloalkyl or C<sub>3-6</sub> cycloalkyl substituted C<sub>1-5</sub> primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; R<sup>1</sup> is C<sub>1-4</sub> straight chain alkyl; and R<sup>2</sup> is C<sub>5-7</sub> cycloalkyl or keto-substituted C<sub>5-7</sub> cycloalkyl, and pharmaceutically-acceptable salts thereof.

4,683,237

FLUOROALKYL ESTERS OF DIHYDROLYSERGIC  
ACID USEFUL AS 5HT<sub>2</sub> RECEPTOR ANTAGONISTS

Gifford P. Marzoni, and William L. Garbrecht, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

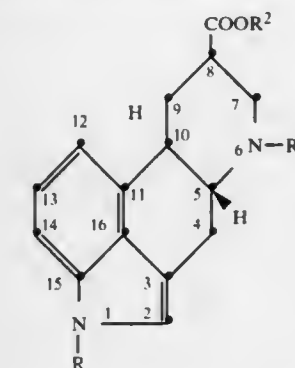
Filed Dec. 20, 1985, Ser. No. 811,802

Int. Cl.<sup>4</sup> A61K 31/48; C07D 457/04

U.S. Cl. 514—288

14 Claims

1. A compound of the formula:



wherein R is primary or secondary C<sub>1-8</sub> alkyl, C<sub>2-4</sub> alkenyl, CH<sub>2</sub>-C<sub>3-8</sub> cycloalkyl or C<sub>3-6</sub> cycloalkyl substituted C<sub>1-5</sub> primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; R<sup>1</sup> is allyl, H or C<sub>1-4</sub> straight-chain alkyl; and R<sup>2</sup> is mono, difluoro or trifluoro C<sub>2-5</sub> alkyl; and pharmaceutically-acceptable salts thereof.

4,683,238

**2,3,4,9-TETRAHYDRO BETA CARBOLINE  
DERIVATIVES, USEFUL AS ANTIHYPERTENSIVE  
AGENTS**

Gerd Schnorrenberg, Ingelheim am Rhein; Otto Roos, Schwabenheim; Walter Lösel; Ingrid Wiedemann, both of Gau-Algesheim; Wolfram Gaida, Ingelheim am Rhein, and Wolfgang Hoefke, Wiesbaden, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 572,179, Jan. 19, 1984, Pat. No. 4,555,511.

This application Jun. 27, 1985, Ser. No. 749,473

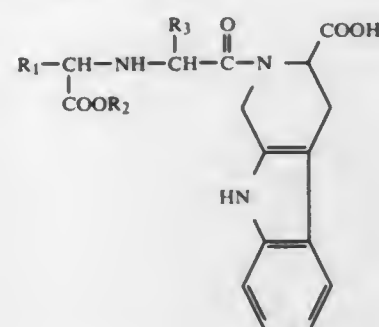
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302125

Int. Cl.<sup>4</sup> A61K 31/40; C07D 471/04

U.S. Cl. 514—292

9 Claims

1. A compound of the formula



wherein

R<sup>1</sup> is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl alkyl of 1 to 6 carbon atoms;

R<sup>2</sup> is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl alkyl of 1 to 6 carbon atoms; and

R<sup>3</sup> is hydrogen or alkyl of 1 to 6 carbon atoms; or a non-toxic, pharmacologically acceptable salt thereof.

9. The method of lowering the blood pressure of a warm-blooded animal in need thereof, which consists of perorally, parenterally or rectally administering to said animal an effective antihypertensive amount of a compound of claim 1.

4,683,239

**3-DIPHENYL SUBSTITUTED**

**OCTAHYDROINDOLIZINE ANALGESIC COMPOUNDS**  
Richard J. Carosin, Quakertown, and John R. Carson, Norristown, both of Pa., assignors to McNeilab, Inc., Fort Washington, Pa.

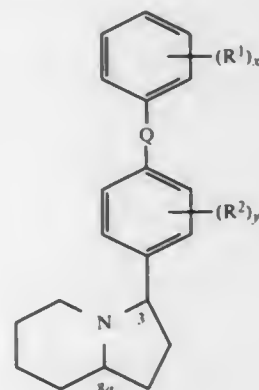
Filed Apr. 10, 1986, Ser. No. 850,632

Int. Cl.<sup>4</sup> A61K 31/445; C07D 221/04

U.S. Cl. 514—299

14 Claims

1. An octahydroindolizine of the following formula (I):



wherein

Q is —NR—, —(CH<sub>2</sub>)<sub>x</sub>—, —CH=CH—, —C=C—, —OCH<sub>2</sub>—, —SCH<sub>2</sub>—, —SO<sub>2</sub>—, —SO—, —CO—, or an oxygen or a sulfur atom;

R is hydrogen or alkyl of about 1 to 4 carbons;

R<sup>1</sup> is independently amino, alkylamino of about 1 to 4 carbons, dialkylamino of about 1 to 4 carbons in each alkyl group, —SR<sup>3</sup>, —SOR<sup>4</sup>, —SO<sub>2</sub>R<sup>5</sup>, —COOR<sup>6</sup>, —COR<sup>7</sup>, —NR<sup>8</sup>COR<sup>9</sup>, alkyl of about 1 to 4 carbons, alkoxy of about 1 to 4 carbons, haloalkyl of about 1 to 4 carbons, nitro, cyano or halo;

R<sup>2</sup> is independently alkyl of about 1 to 4 carbons, alkoxy of about 1 to 4 carbons, halo, haloalkyl of about 1 to 4 carbons, alkylthio of about 1 to 4 carbons or cyano;

R<sup>3</sup> is hydrogen or alkyl of about 1 to 4 carbons;

R<sup>4</sup> is alkyl of about 1 to 4 carbons;

R<sup>5</sup> is alkyl of about 1 to 4 carbons;

R<sup>6</sup> is alkyl of about 1 to 4 carbons;

R<sup>7</sup> is hydrogen or alkyl of about 1 to 4 carbons;

R<sup>8</sup> is hydrogen or alkyl of about 1 to 4 carbons;

R<sup>9</sup> is hydrogen or alkyl of about 1 to 4 carbons;

x is the integer 0, 1, 2 or 3;

y is the integer 0, 1, 2 or 3; and

z is the integer 0, 1, 2 or 3,

and the pharmaceutically-acceptable acid-addition salts thereof.

4,683,240

**PHARMACEUTICAL COMPOSITION CONTAINING AN  
IMIDAZOLIDINETRIONE DERIVATIVE OR  
PHARMACEUTICALLY ACCEPTABLE SALT THEREOF**  
Kazuharu Ienaga; Ko Nakamura, and Akira Ishii, all of Hyogo, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 6, 1986, Ser. No. 826,607

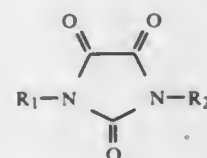
Claims priority, application Japan, Feb. 6, 1985, 60-22559

Int. Cl.<sup>4</sup> A61K 31/415

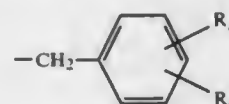
U.S. Cl. 514—390

9 Claims

1. A pharmaceutical composition for use in treating diabetes and hyperlipidemia comprising as an active ingredient an effective amount of at least one imidazolidinetriene derivative of the formula:



wherein each of R<sub>1</sub> and R<sub>2</sub>, which may be the same or different, is hydrogen, an alkyl group, a cycloalkyl group or



and each of R<sub>3</sub> and R<sub>4</sub>, which may be the same or different, is hydrogen, halogen, a nitro group, a lower alkyl group or a lower alkoxy group, or a pharmaceutically acceptable salt thereof, and an inert carrier or diluent.

4,683,241

**PHENOLIC ESTER DERIVATIVES AS ELASTASE  
INHIBITORS**

Masateru Miyano, Northbrook, and James R. Deason, Wilmette, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed May 21, 1984, Ser. No. 612,193

Int. Cl.<sup>4</sup> A61K 31/265, 31/22

U.S. Cl. 514—512

1 Claim

1. A method for promoting an elastase inhibitory anti-inflammatory effect in a mammal in need thereof comprising administering thereto an elastase inhibitory anti-inflammatory effective amount of a compound selected from the group consisting of 4-pivaloyloxybenzophenone, 4,4'-dipivaloyloxybenzophenone, 4,4'-diisopropionyloxybenzophenone, 2,4, 4'-tripivaloyloxybenzophenone, 2,2', 4,4'-tetrapivaloyloxybenzophenone, 4,4'-dipivaloyloxyazobenzene, 4-pivaloyloxy-4'-chlorobenzophenone, 4,4'-α,α-dimethylvaleroyloxybenzophenone, 3, 4, 5, 4', 5' 6'-hexapivaloyloxybenzophenone, 2,4-dipivaloyloxybenzophenone, 2,2', 4,4'-di(t-butyl)oxycarbonyloxybenzophenone, 4,4'-dipivaloyloxydiphenylether, 4,4'-dipivaloyloxydiphenylsulfone, 3-methyl-4-pivaloyloxybenzophenone, 3-allyl-4-pivaloyloxybenzophenone, 3-(1-methylallyl)-4-pivaloyloxybenzophenone, 3-(3-hydroxypropyl)-4-pivaloyloxybenzophenone, 4-isobutyryloxybenzophenone, and 4,4'-dipivaloyloxydiphenylmethane or the pharmaceutically acceptable non-toxic salts thereof.

4,683,242

**ANALGESIC AND ANTI-INFLAMMATORY  
COMPOSITIONS COMPRISING DIPHENHYDRAMINE  
AND METHODS OF USING SAME**

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Richardson-Vicks, Inc., Wilton, Conn.

Division of Ser. No. 711,525, Mar. 14, 1985, Pat. No. 4,585,783, which is a division of Ser. No. 578,288, Feb. 8, 1984, Pat. No. 4,522,826. This application Apr. 28, 1986, Ser. No. 856,414

Int. Cl.<sup>4</sup> A61U 31/19, 31/135

U.S. Cl. 514—557

26 Claims

1. A method for eliciting an enhanced analgesic and anti-inflammatory response in a mammalian organism in need of such treatment, comprising administering to such organism

(i) an analgesically and anti-inflammatorily effective amount of diflunisal or flufenisal or pharmaceutically acceptable salt thereof, and

(ii) an analgesically and anti-inflammatorily potentiating amount of diphenhydramine.

4,683,244

**SEBOSUPPRESSIVE COSMETIC PREPARATIONS  
CONTAINING ALKOXY OR ALKYL BENZYL OXY  
BENZOIC ACIDS OR THEIR SALTS**

Hinrich Moeller, and Siegfried Wallat, both of Monheim, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 10, 1986, Ser. No. 818,502

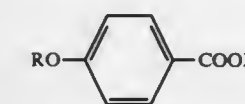
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1985, 3500972

Int. Cl.<sup>4</sup> C07C 65/00

U.S. Cl. 514—568

21 Claims

1. A sebosuppressive cosmetic composition containing a solution, mixture, or dispersion, in a base comprising at least one of water, alcohol, or oil, of an antiseborrheically effective amount of a p-alkoxy or p-alkylbenzyl oxy benzoic acid, or a salt thereof, corresponding to the following formula:



wherein R is either an alkyl group having from 6 to 18 carbon atoms, or an alkylbenzyl group wherein the alkyl moiety has from 3 to 9 carbon atoms, and X is a member selected from the group consisting of hydrogen, an alkali metal, an alkaline earth metal and ammonium.

4,683,245

**LAEVOROTATORY ANTIPODE OF MOPROLOL AS AN  
ANTIHYPERTENSIVE**

Giorgio Ferrari, and Vittorio Vecchietti, both of Milan, Italy, assignors to SIMES S.p.A. Societa Italiana Medicinali e Sintetici, Milan, Italy

Continuation-in-part of Ser. No. 371,428, Apr. 23, 1982, abandoned, which is a continuation of Ser. No. 123,770, Feb. 20, 1980, abandoned. This application Oct. 14, 1982, Ser. No. 434,362

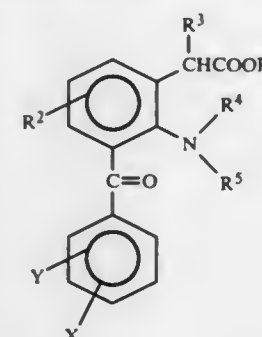
Claims priority, application Italy, Mar. 1, 1979, 20671 A/79

Int. Cl.<sup>4</sup> A61K 31/135

U.S. Cl. 514—652

3 Claims

3. A method for a long-term treatment of hypertension comprising administering to a hypertensive patient requiring said treatment an effective amount of the laevorotatory form of moprolool or of a pharmaceutically acceptable salt thereof.



wherein;

R<sup>1</sup> is hydrogen, loweralkyl or a pharmaceutically acceptable cation;

R<sup>2</sup> is hydrogen, halogen, loweralkyl or loweralkoxy;

R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are hydrogen or loweralkyl;

X is hydrogen, halogen, loweralkyl, hydroxy, loweralkoxy, nitro, trifluoromethyl or S-loweralkyl; and

Y is hydrogen, loweralkyl, loweralkoxy, nitro or trifluoromethyl; and the hydrates thereof.



4,683,246

## POLYURETHANE FOAM-FIBER COMPOSITES

Gregory B. Davis, Monkton, and Michael S. Buchanan, Baltimore, both of Md., assignors to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Filed Mar. 14, 1986, Ser. No. 839,714  
Int. Cl.<sup>4</sup> C08J 9/36; C08L 75/00

U.S. Cl. 521—54

33 Claims

1. A polyurethane foam-fiber composite structure obtained through the steps of (a) providing an admixture of flexible polyurethane foam and a fibrous material; (b) uniformly applying to said mixture of (a) a liquid flexible resinous binding agent, and (c) curing said composition of (b) so as to provide a cured foam structure; the relative amounts of materials in said foam structure being such that for each 100 parts by weight of polyurethane foam particles about 10 to 500 parts of fibrous material and about 10 to 250 parts of binding agent is employed, said fibrous material having a fiber length of from  $\frac{1}{4}$ " to  $\frac{1}{2}$ ", a density of at least 0.75, and a diameter of less than 500 microns.

4,683,247

## FOAMABLE THERMOPLASTIC COMPOSITIONS, FOAMED ARTICLES AND FOAMING METHOD BASED ON PRE-COMPOUNDED NUCLEATING AGENT-RESIN CONCENTRATE

Richard B. Allen, Dalton, Mass., and Roger W. Avakian, Braintree, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1984, Ser. No. 687,577  
Int. Cl.<sup>4</sup> C08J 9/12

U.S. Cl. 521—91

17 Claims



1. A foamable thermoplastic feedstock, comprising
  - (a) a thermoplastic matrix polymer selected from the group consisting of aromatic polycarbonates, poly (ester-carbonates), polyesters, polyetherimides and mixtures of an aromatic polycarbonate and an acrylonitrile-butadiene-styrene copolymer;
  - (b) a pre-extruded blend of (i) a carrier polymer which may be the same as or different than (a) and (b)(ii) an inorganic non-fibrous particulate foam nucleating agent; and
  - (c) a minor, effective amount of a foaming agent, the amounts of (b)(ii) and (c) being sufficient to provide a rigid, substantially uniform cellular core within a solid integral skin.

4,683,248

## CROSSLINKING OF STYRENE POLYMERS

Kurt Rauer, and Angelika Orner, both of Gunzburg, Fed. Rep. of Germany, assignors to Luperox GmbH, Gunzburg, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 782,834  
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1984, 3436877

Int. Cl.<sup>4</sup> C08J 9/06

U.S. Cl. 521—96

4 Claims

1. A process of crosslinking and foaming a homopolymer or copolymer selected from the group of polystyrenes, nucleosubstituted polystyrenes, impact-resistant polystyrenes, or mixtures thereof with the exception of p-methylstyrene homo-

polymers containing a chemically decomposing blowing agent free of amino or hydrazine groups comprising heating said homo- or copolymer at a temperature above 110° C. in the presence of 0.5 to 15% of at least one crosslinking promoter containing at least two active C—C double or C—C triple bonds in the molecule, 0.5 to 15% of at least one organic peroxide having a 10 hour half-life temperature below 106° C. (as determined in benzene) selected from the group of peresters, percarbonate esters, perketals, ether peroxides, diacyl peroxides, and ketone peroxide esters, and optionally foaming agents.

4,683,249

## AMIDINES AND A METHOD OF MANUFACTURING THE SAME

Keiichi Nakatani, Kyoto; Shohzo Ohnishi, Sakura, and Tadamasu Kurosaki, Ohtsu, all of Japan, assignors to San-Apri Kabushiki Kaisha, Kyoto, Japan

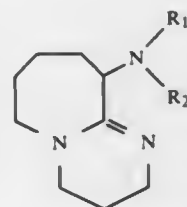
Filed Apr. 8, 1986, Ser. No. 850,448  
Claims priority, application Japan, Apr. 9, 1985, 60-76209; Jul. 15, 1985, 60-156341

Int. Cl.<sup>4</sup> C08G 18/14

U.S. Cl. 521—129

8 Claims

1. An amidine compound represented by the following formula



wherein each R<sub>1</sub> and R<sub>2</sub> is independently an alkyl group having C<sub>1</sub> to C<sub>14</sub> or benzyl group and the sum of carbon atoms is 2 to 16.

4,683,250

## ROOM-TEMPERATURE-CURABLE SILICON-MODIFIED POLYETHER COMPOSITION

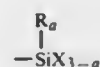
Ryuzo Mikami, Midland, Mich., assignor to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1986, Ser. No. 935,885  
Claims priority, application Japan, Dec. 27, 1985, 60-295339  
Int. Cl.<sup>4</sup> C08F 2/46

U.S. Cl. 522—33

6 Claims

1. Room temperature-curable composition comprising  
(A) 100 parts by weight of silicone-modified polyether having at its molecular chain terminals at least one unit of the formula



in which R represents a monovalent hydrocarbon group, X represents a hydrolyzable group and a is an integer with a value of 0 to 2, whose main chain is essentially composed of chemically bonded repeating units of the formula—R—O— in which R' represents a divalent alkylene group and whose molecular weight is from 500 to 15,000 and  
(B) 0.1 to 50 parts by weight of ester whose principal component is an ester of unsaturated higher fatty acid with alcohol, wherein the fatty acid has at least 10 carbon atoms in the molecule.

4,683,251

## ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION CONTAINING A PHOTSENSITIZER

Ryuzo Mikami, Midland, Mich., assignor to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,516  
Int. Cl.<sup>4</sup> C08F 2/13

U.S. Cl. 522—46

9 Claims

1. A room temperature-curable organopolysiloxane composition comprising  
(a) 100 parts by weight of an essentially straight-chain organopolysiloxane having silanol or silicon-bonded hydrolyzable groups at the molecular chain ends and having a viscosity at 25° C. in the range of 0.0001 to 1.0 m<sup>2</sup>/s,  
(b) 0.1 to 40 parts by weight of a crosslinking agent consisting of an organosilicon compound having at least two silicon-bonded hydrolyzable groups per molecule,  
(c) 5 to 400 parts by weight of a filler,  
(d) optionally a curing catalyst,  
(e) 0.1 to 50 parts by weight of an ester compound derived from unsaturated fatty acids having at least ten carbon atoms and alcohols, and  
(f) 0.01 to 20 parts by weight of a photosensitizer.

4,683,252

## PHENOLIC RESIN-POLYISOCYANATE BINDER SYSTEMS CONTAINING AN ORGANOHALOPHOSPHATE AND USE THEREOF

William R. Dunnivant, Columbus; Robert B. Fechter; John J. Gardikes, both of Worthington, and Heimo J. Langer, Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 25, 1986, Ser. No. 832,687  
Int. Cl.<sup>4</sup> C08K 5/51

U.S. Cl. 523—143

13 Claims

1. A binder composition comprising in admixture a resin component, a hardener component, and an organohalophosphate, wherein at least one halo group is directly attached to the phosphorus, said resin component including a non-aqueous phenolic resin and said hardener component comprising a polyisocyanate containing at least two isocyanate groups.

4,683,253

## RESIN MOLDING COMPOUND FOR SEALING ELECTRONIC PARTS

Yoshifumi Miyake, and Sumio Sakka, both of Hirakata, Japan, assignors to Risbo Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 12, 1986, Ser. No. 829,095  
Claims priority, application Japan, Feb. 12, 1985, 60-25921

Int. Cl.<sup>4</sup> C08K 3/22

U.S. Cl. 523—442

3 Claims

1. A resin molding compound for sealing electronic parts which comprises  
(1) a synthetic resin, and  
(2) from 100 to 600 parts per 100 parts of synthetic resin of at least one synthetic inorganic metal oxide produced by hydrolyzing a purified metal alkoxide having hydrolyzable groups, drying the resultant product, pulverizing the dried product and thermally oxidizing the pulverized product, the synthetic inorganic metal oxide having an average particle size of 0.5 to 120  $\mu$ m and said inorganic metal oxide containing radioactive elements in an amount of 1 part per billion or less and containing sodium and potassium in an amount of 1 part per million or less.

4,683,254

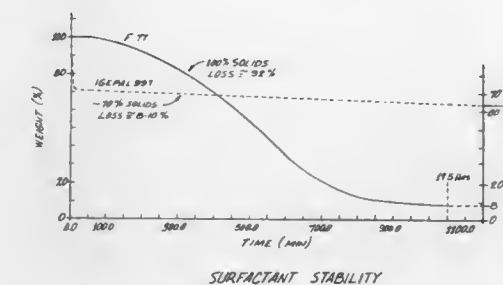
## SIZE COMPOSITIONS FOR GLASS FIBERS

Robert C. Brannon, Newark, Ohio; Donald B. Sage, Jr., Jackson, Tenn., and David G. Miller, Pataskala, Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Oct. 21, 1985, Ser. No. 789,894  
Int. Cl.<sup>4</sup> C08K 5/54

U.S. Cl. 523—503

15 Claims



1. An aqueous size composition consisting essentially of, by weight percent:

	Weight Percent
A cure, stable polyester emulsion of an unsaturated polyester emulsified with nonylphenoxypoly (ethyleneoxy) ethanol	50-55
Polyvinylacetate copolymer	40-45
Acetic acid	0-0.3
Silane	2-4
Static insensitive lubricant	0.05-2
Wax	0-3
Water	Balance

4,683,255

## POLYPHENYLENE ETHER RESIN COMPOSITION HAVING EXCELLENT FIRE RETARDANCY

Akitoshi Sugio; Masao Okabe, and Akikazu Amagai, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

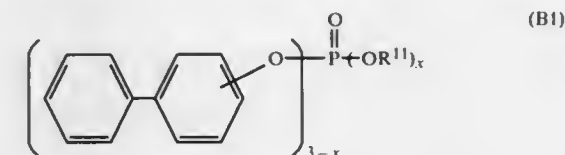
Filed Feb. 25, 1986, Ser. No. 832,756  
Claims priority, application Japan, Feb. 27, 1985, 60-37846; Feb. 28, 1985, 60-39983

Int. Cl.<sup>4</sup> C08K 5/51, 5/52

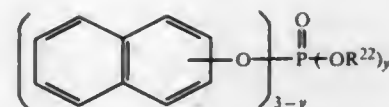
U.S. Cl. 524—151

6 Claims

1. A polyphenylene ether resin composition having excellent first retardancy comprising  
(A) a polyphenylene ether resin, and  
(B) at least one phosphate compound selected from the group consisting of biphenyl phosphate compounds represented by the following formula



wherein x is 1 or 2, and R<sup>11</sup> represents a linear or branched alkyl group having 1 to 8 carbon atoms or a phenyl group, provided that the biphenyl group and phenyl group may each be substituted by an alkyl group having 1 to 3 carbon atoms, and naphthyl phosphate compounds represented by the following formula



wherein  $y$  is 1 or 2, and  $R^{22}$  represents a linear or branched alkyl group having 1 to 8 carbon atoms or a phenyl group, provided that the naphthyl group and phenyl group may each be substituted by an alkyl group having 1 to 3 carbon atoms.

4,683,256

#### DRY EDIBLE FILM COATING COMPOSITION, METHOD AND COATING FORM

Stuart C. Porter, Hatfield, and Edward J. Woznicki, Douglassville, both of Pa., assignors to Colorcon, Inc., West Point, Pa. Division of Ser. No. 202,831, Nov. 6, 1980, Pat. No. 4,543,370, which is a continuation-in-part of Ser. No. 98,531, Nov. 29, 1979, abandoned. This application Jul. 29, 1985, Ser. No. 759,673 Int. Cl.<sup>4</sup> C08J 3/12

U.S. Cl. 524—285 33 Claims  
1. A method of making a coating dispersion for use in pharmaceuticals, confectionery and food, comprising the steps of dry mixing a powder of film forming polymer and powdered pigment particles in a blender, mixing a surfactant into a plasticizer, adding the surfactant-plasticizer mix to the blender containing the polymer-pigment mix and dry mixing until the combined mix is blended to form a dry edible film coating composition, and dispersing the dry edible film coating composition into a solvent to form a coating dispersion adapted for use as a film coating for tablets and the like.

4,683,257

#### RUBBER COMPOSITIONS FOR SOLID GOLF BALLS

Shinichi Kakiuchi, Kodaira; Tasuku Saito, and Seisuke Tomita, both of Tokorozawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 11, 1986, Ser. No. 872,879

Claims priority, application Japan, Jun. 12, 1985, 60-125968 Int. Cl.<sup>4</sup> A63B 37/00, 37/06; C08K 3/20; C08L 9/00

U.S. Cl. 524—432 5 Claims  
1. A rubber composition, for use in forming one-piece golf balls or the core of multiple solid golf balls, comprising (1) a polybutadiene having at least 10% of cis-1,4 bond, (2) an unsaturated carboxylic acid and/or a salt thereof capable of producing crosslinking in the polybutadiene, (3) an inorganic filler, and (4) an organic peroxide, wherein said polybutadiene consists essentially of a blend of (A) a polybutadiene synthesized in the presence of a nickel and/or cobalt base catalyst and having a Mooney viscosity  $ML_{1+4}(100^\circ\text{C})$  or 70 to 100 and (B) a polybutadiene synthesized in the presence of a lanthanide rare earth element base catalyst and having a Mooney viscosity  $ML_{1+4}(100^\circ\text{C})$  or 30 to 90, and wherein said components (A) and (B) are blended such that more than 50 parts by weight to 90 parts by weight of said components (A) and less than 50 parts by weight to 10 parts by weight of said component (B) are present per 100 parts by weight of said blended components (A) and (B); or wherein said polybutadiene consists essentially of a blend of (A) a polybutadiene synthesized in the presence of a nickel and/or cobalt base catalyst and having a Mooney viscosity  $ML_{1+4}(100^\circ\text{C})$  or 70 to 100 and (C) a polybutadiene synthesized in the presence of a nickel and/or cobalt base catalyst and having a Mooney viscosity  $ML_{1+4}(100^\circ\text{C})$  of 20 to 50, and wherein said components (A) and (C) are blended such that 80 to 20 parts by weight of said component (A) and 20 to

(B2)

80 parts by weight of said component (C) are present per 100 parts by weight of said blended components (A) and (C).

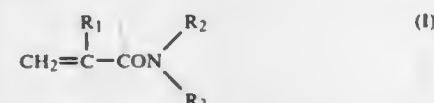
4,683,258

#### AGENT FOR ABSORBING AND RELEASING WATER VAPOR

Hiroshi Itoh, Yokohama; Toshimi Nakagawa, Fujisawa; Atsuhiko Nitta, Yokohama; Tomio Tanaka, Tokyo; Hideo Kamio, Odawara; Ryosuke Enoshita, Nagoya; Tamotu Uejima, Tohoku; Takahiro Ouchi, Tokyo; Kazuki Abe, and Sadao Kobayashi, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan Continuation of Ser. No. 724,163, Apr. 17, 1985, abandoned. This application Jan. 17, 1986, Ser. No. 820,887

Claims priority, application Japan, May 28, 1984, 59-106463; May 28, 1984, 59-106468; May 28, 1984, 59-106550; May 28, 1984, 59-106551; May 28, 1984, 59-106554 Int. Cl.<sup>4</sup> C08K 3/18

U.S. Cl. 524—434 9 Claims  
1. A process of humidity control by contacting humid gas with an agent for absorbing and releasing water vapor, said agent comprising the combination of:  
(A) from 95 to 3 wt. % of a water insolubilized product prepared from:  
(a) a homopolymer of a monomer selected from the group consisting of N-alkyl- and N-alkylene-substituted (meth)acrylamides of formula (I):



wherein  $R_1$  is hydrogen or methyl,  $R_2$  is hydrogen, methyl or ethyl, and  $R_3$  is methyl, ethyl or propyl and formula (II):



wherein  $R_1$  is hydrogen or methyl, and A is  $(-\text{CH}_2-)_n$ , wherein n is an integer of 4 to 6, or  $-(\text{CH}_2)_2-\text{O}-(\text{CH}_2)_2-$ ; (b) a first copolymer of at least two monomers selected from the group consisting of said N-alkyl- and N-alkylene-substituted (meth)acrylamides; or (c) a second copolymer of at least one monomer selected from the group consisting of said N-alkyl- and N-alkylene-substituted (meth)acrylamides and at least one monomer other than said N-alkyl- and N-alkylene-substituted (meth)acrylamides which is copolymerizable with the N-alkyl- and N-alkylene-substituted (meth)acrylamides; and (B) from 5 to 97% by wt. of a hygroscopic material selected from the group consisting of metal halides and metal perchlorates.

4,683,259

#### RESIN COMPOSITIONS COMPRISING ORGANOCCLAYS OF IMPROVED DISPERSIBILITY

Howard Goodman, St. Austell, United Kingdom, assignor to ECC International Limited, St. Austell, England Continuation-in-part of Ser. No. 765,259, Aug. 13, 1985, Pat. No. 4,631,091. This application Nov. 7, 1986, Ser. No. 928,847 Int. Cl.<sup>4</sup> C08K 3/34; C04B 14/00

U.S. Cl. 524—447 15 Claims  
1. Resin compositions comprising a resin and a readily dispersible organoclay, said organoclay being prepared by a method comprising the steps of:

- suspending a smectite clay in water to form an aqueous suspension;
- treating said aqueous suspension of the smectite clay with a solution of an inorganic salt, wherein the cation of said inorganic salt has a valency of at least 2, the concentration of the salt being such as to flocculate the smectite clay substantially completely;
- mixing the suspension of the flocculated smectite clay with a quaternary ammonium compound at least one of the four alkyl groups of which has from 10 to 24 carbon atoms; and
- dewatering the product of step (c).

4,683,260

#### CLEAR TOPCOAT COATINGS FOR WOOD

Frank A. Wickert, Olmsted Township, Lorain County, Ohio, assignor to The Glidden Company, Cleveland, Ohio Division of Ser. No. 793,188, Oct. 31, 1985, abandoned. This application Oct. 29, 1986, Ser. No. 924,280

U.S. Cl. 524—512 2 Claims  
1. A clear coating composition for application to wood and plywood paneling which comprises:

- 1 to 6 parts by volume (solids) of an aqueous emulsion consisting of a mixture of
  - a film forming aqueous acrylic polymer latex having a  $T_g$  of from about  $0^\circ\text{C}$ . to about  $30^\circ\text{C}$ . having reactive functionality adapted to cure with a crosslinking agent under baking conditions of from about  $100^\circ\text{F}$ . to about  $260^\circ\text{F}$ .; and
  - a non-film forming plastic pigment emulsion latex having a  $T_g$  greater than about  $55^\circ\text{C}$ . and present in the mixture in an amount at least 40 volume percent basis polymer solids and derived by the aqueous emulsion polymerization of ethylenically unsaturated monomer optionally containing up to 2 weight percent (basis monomer solids) of copolymerized acid monomer selected from acrylic or methacrylic acid.
- 1 part glycoluril crosslinking agent.

4,683,261

#### ACRYLONITRILE POLYMER FILM AND PROCESS FOR PREPARING SAME

Akio Inoue, and Tsuneaki Tanabe, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan Continuation of Ser. No. 775,712, Sep. 13, 1985, abandoned, which is a continuation of Ser. No. 509,253, Jun. 29, 1983, abandoned. This application May 5, 1986, Ser. No. 859,111 Claims priority, application Japan, Jul. 5, 1982, 57-116489; Jul. 8, 1982, 57-119106

U.S. Cl. 524—566 4 Claims  
1. An acrylonitrile polymer film comprising at least 85% by weight of acrylonitrile and having a tensile elongation of 28% to 55% and an impact strength of 4.2 kg.cm to 5.4 kg.cm, wherein the difference in the value of the second moment of the broad-line NMR spectrum of 20% between the film and the starting polymer powder used for the preparation thereof, or the polymer powder formed by dissolving the film and then precipitating the polymer from the solution is from 0.3 to 2 Gauss<sup>2</sup> and the infrared dichroic ratio of the nitrile groups satisfies the requirements that  $0.4 < A_x/A_z < 0.8$ ,  $0.4 < A_y/A_z < 0.8$ , and  $0.8 < A_x/A_y < 1.25$ , where  $A_x$  and  $A_y$  stand for the absorption intensities of polarized infrared rays oscillating in respective directions parallel to the surface of the film and perpendicular to each other, and  $A_z$  stands for the absorption intensity of polarized infrared rays oscillating in the direction perpendicular to the surface of the film, produced by coagulating a solution of an acrylonitrile polymer in an aqueous coagulating bath, adjusting the water content of the obtained water-containing coagulated film to from 20 to 100% by weight based on the weight of the dry polymer, stretching the film in the longitudinal direction using rolls having a surface tempera-

ture of  $65^\circ$  to  $95^\circ\text{C}$ ., then stretching the film in the transverse direction at a water content of from 10 to 40% by weight based on the weight of the dry polymer, which is lower than the water content in the longitudinal stretching step, in an atmosphere maintained at  $100^\circ$  to  $180^\circ\text{C}$ . by using a tenter.

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#### NON-DIMER ACIDIC POLYAMIDE FROM MEDIUM CHAIN DIACID HAVING IMPROVED WATER SOLUBILITY USEFUL AS FLEXOGRAPHIC/GRAVURE INK BINDER

Paul D. Whyzmuzis, Plymouth, and John M. Menke, New Brighton, both of Minn., assignors to Henkel Corp., Minneapolis, Minn.

Continuation-in-part of Ser. No. 701,903, Feb. 15, 1985, abandoned. This application Apr. 17, 1986, Ser. No. 853,090 Int. Cl.<sup>4</sup> C08G 69/20; C08D 11/02

U.S. Cl. 524—608 20 Claims  
1. A polyamide resin obtained from the reaction of  
(A) an acid component substantially free of a polymeric fat acid comprised of a medium chain dicarboxylic acid of the formula  $\text{HOOC}-R_1-\text{COOH}$  where  $R_1$  is a divalent aliphatic hydrocarbon radical containing from 10-24 carbon atoms and  
(B) an amine component comprised of a diamine of the formula



where R is a divalent aliphatic hydrocarbon radical having from 2-12 carbon atoms wherein the ratio of amine equivalents of said amine component to the carboxyl equivalents in said acid component is less than one so as to provide a resin having an acid value greater than 30 and the acid value exceeds the amine value by at least 20.

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#### METAL VESSEL HAVING CIRCUMFERENTIAL SIDE SEAM AND ADHESIVE PRIMER FOR USE IN PRODUCTION THEREOF

Kazuo Taira, Tokyo; Akihiko Morofuji; Seishichi Kobayashi, both of Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan Division of Ser. No. 544,266, Oct. 21, 1983, Pat. No. 4,556,151. This application May 7, 1985, Ser. No. 731,384

Claims priority, application Japan, Oct. 25, 1982, 57-186110; Oct. 28, 1982, 57-188140 Int. Cl.<sup>4</sup> C08L 27/06, 63/00

U.S. Cl. 525—57 7 Claims  
1. An adhesive primer for a metal vessel, which comprises a composition containing (A) 10 to 80% by weight, based on solids, of particles of a vinyl chloride resin having a polymerization degree of 800 to 4,000 and a particle size of 0.01 to 10 microns, (B) 10 to 80% by weight, based on solids, of a solvent-soluble vinyl chloride/vinyl acetate/carboxyl group- or hydroxyl group-containing vinyl unit copolymer containing carboxyl groups and/or hydroxyl groups at a concentration of 5 to 500 millimoles/100 g of the polymer, the vinyl chloride units being present in an amount of 50 to 95% by weight based on the copolymer (B) and the vinyl acetate units being present in an amount of 2 to 40% by weight based on the copolymer (B), and said copolymer (B) having a polymerization degree of 80 to 1,500 and a molecular weight lower than that of the vinyl chloride resin particles (A), and (C) 2 to 30% by weight, based on solids, of a solvent-soluble thermosetting resin having a reactivity with carboxyl groups and/or hydroxyl groups, said thermosetting resin (C) comprising (i) an epoxy resin derived from bisphenol A and epichlorohydrin and having a molecular weight of 250 to 4,000 and an epoxy equivalent of 180 to 3,500 and (ii) a phenolic resin or amino resin at a weight ratio ((i)/(ii)) of from 95/5 to 20/80, wherein said copolymer (B) and said



thermosetting resin (C) are present in a continuous phase as the dispersion medium and the vinyl chloride resin particles (A) are present as the dispersed phase dispersed in said continuous phase.

4,683,264

# HARDENABLE COATING COMPOSITION FOR POLYPROPYLENE RESINS

Keiji Urata, and Yoshio Kurome, both of Iwakuni, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan  
Continuation-in-part of Ser. No. 645,103, Aug. 28, 1984, abandoned. This application Apr. 8, 1986, Ser. No. 849,441  
Claims priority, application Japan, Apr. 23, 1984, 59-80126  
Int. Cl.<sup>4</sup> C08L 51/04, 63/02

U.S. Cl. 525—65

3 Claims

1. A hardenable coating composition for polypropylene resins which is obtained by modifying a polyolefin resin having a molecular weight of from 12,000 to 200,000, wherein said polyolefin contains from 10 to 40 or greater than 80 weight percent of propylene, with at least one unsaturated polycarboxylic acid or an anhydride of said acid, to produce a solid modified polyolefin having a saponification value of from about 6 to 60, chlorinating said solid modified polyolefin to a degree of from about 10% to 50% by weight of chlorine content to produce a chlorinated modified polyolefin, and partially crosslinking carboxyl groups or acid anhydride groups on said chlorinated modified polyolefin with an epoxy group of a compound which has at least two epoxy groups per molecule.

4,683,265

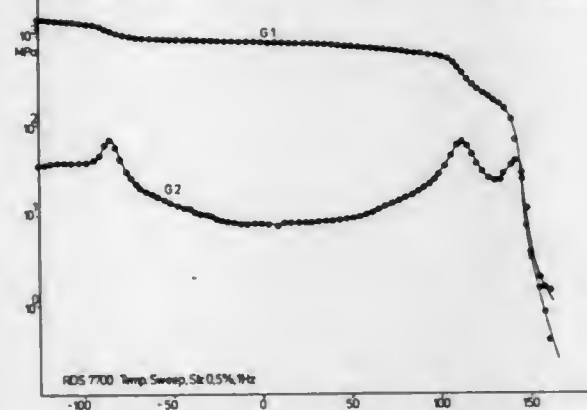
# THERMOPLASTIC MOULDING COMPOSITIONS CONSISTING OF POLYCARBONATES, GRAFT POLYMERS AND COPOLYMERS

Hans-Jürgen Kress, Krefeld; Christian Lindner; Leo Morbitzer, both of Cologne; Horst Peters; Karl-Heinz Ott, both of Leverkusen, and Jochen Schoeps, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany  
Filed Apr. 7, 1986, Ser. No. 848,587  
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1985, 3514185

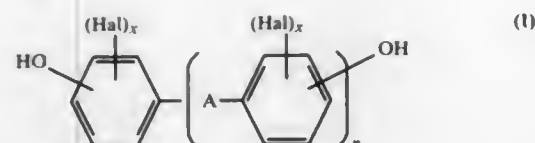
Int. Cl.<sup>4</sup> C08L 69/00

U.S. Cl. 525—67

13 Claims



1. A thermoplastic moulding composition containing (A) 20 to 80 parts by weight of an aromatic, thermoplastic polycarbonate based on diphenols of the general formula



wherein

A denotes a single bond, a C<sub>1</sub>–C<sub>5</sub>-alkylene, a C<sub>2</sub>–C<sub>5</sub>-alkyldiene, a C<sub>5</sub>–C<sub>6</sub>-cycloalkyldiene, —S— or —SO<sub>2</sub>—,

Hal denotes chlorine or bromine,

x is 0, 1 or 2 and

n is 1 or zero,

(B) 10 to 60 parts by weight of graft polymer(s) (B.1), (B.2) or both, where

(B.1) is obtainable by grafting 5 to 90 parts of a mixture of

(i) 30 to 40% by weight α-methylstyrene, 52 to 62% by weight methyl methacrylate and 4 to 14% by weight acrylonitrile, the sum of the percentages by weight being 100 in each case, onto

(ii) 95 to 10 parts by weight of a rubber having a glass transition temperature T<sub>G</sub> ≤ 10° C., and where

(B.2) is obtainable by grafting 5 to 90 parts by weight of a mixture of

(i) 50 to 95% by weight of styrene, α-methylstyrene, styrene which is substituted in the nucleus, methyl methacrylate or mixtures of these, and

(ii) 5 to 50% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures of these onto

(iii) 95 to 10 parts by weight of a rubber having a glass transition temperature T<sub>G</sub> ≤ 10° C., and

(C) 10 to 70 parts by weight of thermoplastic copolymer(s) (C.1), (C.2) or both, where

(C.1) is obtainable by copolymerisation of 30 to 40% by weight of α-methylstyrene, 52 to 62% by weight methyl methacrylate and 4 to 14% by weight acrylonitrile, the sum of the percentages by weight again being 100 in each case, and where

(C.2) is obtainable by copolymerisation of

(i) 50 to 95% by weight of styrene, α-methylstyrene, styrene which is substituted in the nucleus, methyl methacrylate or mixtures of these and

(ii) 5 to 50% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures of these,

where

1. the sum of the number of parts by weight of components (A) + (B) + (C) is always 100,

2. where polymers (B.1) and (B.2) are present simultaneously, the weight ratio of (B.1) to (B.2) is between 50:50 and 95:5,

3. where polymers (C.1) and (C.2) are present simultaneously, the weight ratio of (C.1) to (C.2) is also between 50:50 and 95:5, and

4. either (B.1) or (C.1), or both (B.1) and (C.1) must be present in the moulding composition.

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# COMPOSITIONS THICKENED THROUGH URETHANE REACTION

Anthony C. Palermo; Roger M. Christenson, both of Gibsonia, Pa., and Glenn L. Mazza, Milford, Mich., assignors to Ashland Oil, Inc., Russell, Ky.

Continuation of Ser. No. 713,122, Mar. 18, 1985, abandoned, which is a continuation of Ser. No. 500,585, Jun. 2, 1983, abandoned. This application Nov. 7, 1985, Ser. No. 796,031  
Int. Cl.<sup>4</sup> C08F 8/00; C08L 75/00

U.S. Cl. 525—123

5 Claims

1. In a method for preparing a sheet molding compound composition wherein the composition which is curable by free-radical initiated polymerization consists essentially of

(a) from 25–55 weight percent of a multifunctional acrylate or methacrylate ester of a polyol having 2–5 hydroxyl groups,

(b) from 10–25 weight percent of an active hydrogen containing polydiene polymer having a molecular weight between 1,000 and 5,000, and

(c) from 20–50 weight percent of a C<sub>1</sub>–C<sub>4</sub> alkyl ester of acrylic or methacrylic acid; the improvement which comprises incorporating into said composition a polyisocyanate in an amount sufficient to thicken said composition to a viscosity of from 2 × 10<sup>6</sup>–160 × 10<sup>6</sup> centipoise and in an amount such that the NCO to OH equivalent ratio of said composition is within the range of 0.05 to 1.5:1.

4,683,267

# THERMOPLASTIC MOULDING COMPOUNDS BASED ON POLYOXYMETHYLENE AND POLYMERIC ADIPATECARBONATE MIXED ESTERS

Christian Lindner, Cologne; Karola Bruderhans, Leverkusen; Helmut Waniczek, Cologne; Walter Uerdingen, and Helmut Hurnik, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,636

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1984, 3421864

Int. Cl.<sup>4</sup> C08L 61/02

U.S. Cl. 525—133

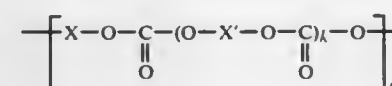
3 Claims

1. A moulding composition which comprises:

(A) from 99.99 to 60 parts, by weight, of a polyoxymethylene;

(B) from 0 to 40 parts, by weight, of an elastomer having a softening temperature below the crystallite melting point of (A) and a freezing temperature below 0° C.; and

(C) from 0.01 to 40 parts, by weight, of an aliphatic, high molecular weight adipate-carbonate mixed ester corresponding to:



wherein

X and X' represent residues of the reaction product of a polyhydric alcohol and adipic acid having a molecular weight of from 800 to 3,500;

k represents an integer of from 0 to 10; and

m represents an integer greater than 20.

4,683,268

# PRESSURE SENSITIVE ADHESIVE USING LIGHT COLOR, LOW SOFTENING POINT PETROLEUM HYDROCARBON RESINS

Mary E. Ahner, Baton Rouge, La., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 18, 1986, Ser. No. 830,410

Int. Cl.<sup>4</sup> C08L 47/00

U.S. Cl. 525—237

9 Claims

1. An adhesive composition comprising from about 20% to about 80% by weight of a copolymer and, correspondingly, from about 80% to about 20% by weight of a tackifying petroleum hydrocarbon resin having a softening point of from 0° C. to about 40° C., a number average molecular weight of from about 100 to about 600, and a Gardner color less than about 7 prepared by the aluminum chloride catalyzed Friedel Crafts polymerization of a hydrocarbon feed comprising:

(a) from about 5% to about 75% by weight of C<sub>8</sub> to C<sub>10</sub>vinyl aromatic hydrocarbon stream;

(b) from about 10% to about 35% by weight of a piperylene concentrate; and

(c) from about 25% to about 70% by weight of a C<sub>4</sub> to C<sub>8</sub>monoolefin chain transfer agent of the formula

RR'C=CHR'' where R and R' are C<sub>1</sub> to C<sub>5</sub> alkyl, and R'' is H or C<sub>1</sub> to C<sub>4</sub> alkyl group.

4,683,269

# OPAQUE BINDER SYSTEM

Igor B. Aksman, Dover, Del., assignor to Reichold Chemicals, Inc., White Plains, N.Y.

Filed Dec. 18, 1985, Ser. No. 810,422

Int. Cl.<sup>4</sup> C08L 51/00

U.S. Cl. 525—258

15 Claims

1. A method for preparing an opaque polymeric binder system consisting essentially of:

(a) emulsion polymerizing about 5 to 95% by weight of at least one monomer not having an amine moiety, selected from the group consisting of vinyl, acrylic, methacrylic, and mixtures thereof, to produce homogeneous film forming polymeric particles having a T<sub>g</sub> of less than about 45° C.;

(b) continuing the polymerization of step (a) in the presence of non-film forming hard, solid polymeric core particles having an average size of about 0.1 to 1 microns and a T<sub>g</sub> greater than about 70° C., said polymeric core particles being previously formed from at least one monomer not having an amine moiety, different from, (a) selected from ethylenically unsaturated compounds, and gradually added to the polymerization of the homogenous film forming particles, in the presence of a mixture of nonionic and anionic surfactants having weight ratios of about 2:1 to 20:1 respectively, wherein a portion of the homogeneous film forming material produced forms an encapsulating shell surrounding the core particles to produce a mixture of heterogeneous core-shell particles and said homogeneous film forming polymeric particles, and wherein the ratio of homogeneous film forming polymeric material to the polymeric material used to produce the core particles varies from about 1:9–9:1, respectively.

4,683,270

# POLYMERIC COMPOSITION AND METHOD OF PRODUCING SAME

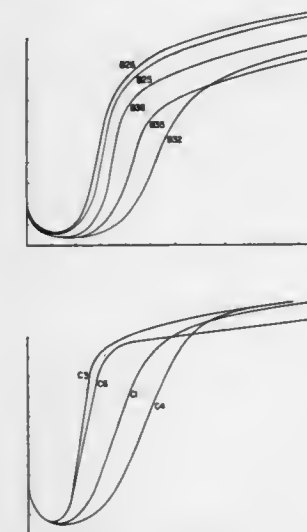
Gerald C. Hollaway, Jr., Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 693,950, Jan. 23, 1985, abandoned. This application Nov. 18, 1985, Ser. No. 798,789

Int. Cl.<sup>4</sup> C08C 19/20

U.S. Cl. 525—347

22 Claims



1. In a polymeric composition comprising a chloroprene

elastomer, octylated diphenylamine, at least one metallic oxide selected from the group consisting of ZnO and MgO, at least one organic acid, carbon black, at least one accelerator and a retarder, the improvement wherein said retarder is dimorpholino-disulfide and said composition has increased scorch safety while maintaining high ODR torque, cured tensile modulus, and dynamic quotient.

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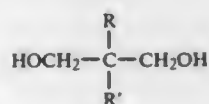
**SILICONE-ESTER POWDER COATING COMPOSITIONS**  
Ju-Chul Lin, Stroupsville; Kirk J. Abbey, Seville; Gary P. Craun, Berea, and Peter V. Robinson, Medina, all of Ohio, assignors to The Glidden Company, Cleveland, Ohio  
Continuation-in-part of Ser. No. 745,443, Jan. 17, 1985, Pat. No. 4,608,421. This application Jun. 2, 1986, Ser. No. 869,419  
Int. Cl.<sup>4</sup> C08G 65/32

U.S. Cl. 525—403

7 Claims

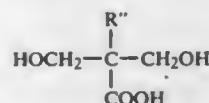
1. A siloxane ester having an acid number of from about 5 to 65, a hydroxyl number from about 5 to 225, and a tack-temperature of from about 150° F. to 220° F. comprising the reaction product, totaling 100% of:

- (a) 10 to 40 weight percent hindered glycol comprising a mixture of  
(1) a sterically protected glycol selected from the group consisting of 1,4-cyclohexane dimethanol and a glycol having the structure



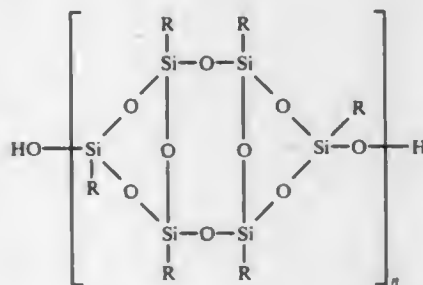
wherein R is selected from hydrogen, lower alkyl, methylol or ethylol radicals; and R' is lower alkyl, methylol or ethylol radical; and

- (2) a multifunctional glycol acid having the structure



wherein R'' is hydrogen, lower alkyl, methylol or carboxylic acid radicals; and wherein said glycol acid comprises 5–45 weight percent of said hindered glycol; and

- (b) 60 to 90 weight percent hydroxy functional silicone having at least two ester precursor silanol groups adapted to react with said hindered glycol to provide a storage stable siloxane ester powder coating having a tack-temperature of at least 150° F., said siloxane having the structure:



wherein n is an integer from 1 to 10 and R independently represents lower alkyl or phenyl groups.

4,683,272

# **POLYMER POLYOLS DERIVED FROM NOVEL DISPERSING MEDIA**

Michael Cuscudra, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,155

Int. Cl.<sup>4</sup> C08G 65/32, 18/14, 18/67; C08L 71/02

U.S. Cl. 525—404

15 Claims

1. A vinyl polymer polyol prepared by the process comprising polymerizing via a free radical initiated reaction a monomer component comprising at least one monomer in the presence of a dispersing media comprising a polyether polyol and a salt formed by reacting a polyoxyalkylene polyamine with an acid containing a polymerizable double bond.

4,683,273

# **POLYESTER AND EPOXY RESIN COATING**

Daniel Bode, Cleveland, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Filed May 27, 1986, Ser. No. 867,050

Int. Cl.<sup>4</sup> C08L 63/10

U.S. Cl. 523—412

8 Claims

1. An aqueous coating composition containing a polymeric binder comprising on a weight basis:

between 65% and 90% of an epoxy-acrylic graft copolymer, between 7% and 25% of a low molecular weight, hydroxyl functional polyester polymer, and between 2% and 10% amine derivative crosslinking resin selected from an aminoplast or phenoplast resin wherein the combination equals 100%;

said polyester polymer being a substantially linear polyester polymer having a number average molecular weight between about 250 and 2,000 and hydroxyl number between about 115 and 285;

said epoxy-acrylic graft copolymer being selected from (a) an epoxy-acrylic carbon-carbon graft copolymer produced by copolymerizing ethylenically unsaturated monomers in the presence of epoxy resin and at least 3% by weight peroxide initiator based on monomers copolymerized to produce an in-situ formed carbon-carbon graft epoxy-acrylic copolymer, or (b) an epoxy-acrylic ester graft copolymer produced by esterifying a preformed acrylic copolymer containing carboxyl groups with epoxy resin in the presence of at least 2% by weight amine based on reactants to produce an ester graft epoxy-acrylic copolymer.

4,683,274

# **PROCESS FOR PRODUCING A WATER-ABSORBENT RESIN**

Morio Nakamura, Kakogawa; Shigeji Obayashi, Akashi; Takashi Yamamoto, Himeji; Toshikazu Nakanishi, Kyoto; Hitoshi Tanaka, and Yuji Sakamoto, both of Himeji, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo, Japan

Filed May 28, 1985, Ser. No. 738,290

Claims priority, application Japan, Oct. 5, 1984, 59-210198

Int. Cl.<sup>4</sup> C08F 20/04, 2/32

U.S. Cl. 526—216

10 Claims

1. A process for producing a water-absorbent resin wherein an aqueous solution of an  $\alpha,\beta$ -unsaturated carboxylic acid and of an alkali metal salt thereof is subjected to polymerization with a radical polymerization initiator in a petroleum-based hydrocarbon solvent in the presence or absence of a crosslinking agent, characterized by using as a colloid agent, a saccharose-fatty acid ester having an HLB of 2 to 16 in an amount of 0.1 to 10% by weight based on the total of the  $\alpha,\beta$ -unsaturated carboxylic acid and the alkali metal salt thereof, the fatty acid component of the saccharose-fatty acid ester being at least one member selected from the group consisting of stearic acid, palmitic acid, lauric acid and oleic acid and the number of esters per unit of saccharose being at least one selected from mono-, di-, and tri-.

4,683,275

# **METHYLSTYRENE MALEIMIDE COPOLYMER**

Masayuki Kato; Yoshio Taguchi, both of Saitama; Chihiro Imai, Kanagawa, all of Japan, and Tokuo Makishima, deceased, late of Saitama, Japan (by Nobuko Makishima, legal representative), assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 778,597

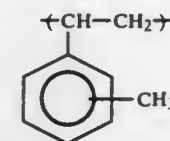
Claims priority, application Japan, Sep. 21, 1984, 59-196737

Int. Cl.<sup>4</sup> C08F 22/40

U.S. Cl. 526—262

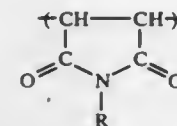
13 Claims

1. A methylstyrene copolymer consisting essentially of:  
(A) 60 to 99 mol % of the structural unit represented by the following formula:



wherein at least 80 mol % the methyl groups are at the para position;

- (B) 40 to 1 mol % of the structural unit represented by the following formula:



wherein R is a hydrogen atom, a C<sub>1</sub>–C<sub>6</sub> alkyl group, or a C<sub>6</sub>–C<sub>10</sub> aryl group.

4,683,276

# **CYANATE FUNCTIONAL MALEIMIDE THERMOSETTING COMPOSITION**

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

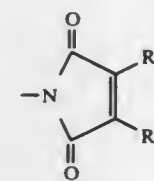
Filed Oct. 1, 1985, Ser. No. 782,644

Int. Cl.<sup>4</sup> C08F 22/40

U.S. Cl. 526—262

4 Claims

1. A composition comprising at least one thermosettable compound which contains simultaneously in the same molecule only one maleimide or substituted maleimide group which groups are represented by the formula



wherein each R and R' is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; and only one cyanate group.

4,683,277

# **METHOD FOR PREPARING VINYL TERMINATED FLUORINE-CONTAINING POLYDIORGANOSILOXANE**

Myron T. Maxson, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 2, 1986, Ser. No. 881,304

Int. Cl.<sup>4</sup> C08G 77/04

U.S. Cl. 528—21

3 Claims

1. A method for preparing a liquid polydiorganosiloxane of the average molecular formula  $\text{ViR}'_2\text{Si}(\text{OSiR}'')_n\text{OSiR}''_2\text{Vi}$

where each R is individually a monovalent saturated or aromatic hydrocarbon radical containing from 1 to 20 carbon atoms, from 50 to 100% of the R' radicals represent the radical  $\text{RfCH}_2\text{CH}_2$ — where Rf in turn represents a perfluoroalkyl radical containing from 1 to 10 carbon atoms, any remaining R' radicals being selected from the same group as R, R'' is selected from the same group as R or R', Vi represents a vinyl radical, and n represents an integer from 10 to 200 and is equivalent to a viscosity value for said polydiorganosiloxane of from  $0.2 \times 10^{-3}$  to about 0.01 m<sup>2</sup>/second at 25° C., said method comprising the steps of (1) reacting a cyclotrisiloxane of the general formula  $(\text{SiORR}')_3$  with from 1.5 to about 50 mole percent, based on said cyclotrisiloxane, of water at a temperature of from 25° to 150° C. in a closed vessel and in the presence of an amount of ammonia sufficient to generate a pressure of from 140 to 1050 kilopascals within said vessel and continuing the reaction for a time period sufficient to form a silanol terminated polymer represented by the average formula  $\text{HO}(\text{RR}'\text{SiO})_n\text{H}$ , (2) reacting each mole of said hydroxyl terminated polymer with at least one mole of a disilazane of the formula  $(\text{ViR}''_2\text{Si})_2\text{NH}$ , at a temperature of from 50 to 100° C. for a sufficient time to form said polydiorganosiloxane, and (3) isolating said polydiorganosiloxane from the reaction mixture.

4,683,278

# **ALKENYL ORGANOPOLYSILOXANE AND CURABLE COMPOSITION THEREFROM**

Toshio Suzuki, Ichihara, Japan, assignor to Toray Silicone Co., Ltd., Tokyo, Japan

Division of Ser. No. 703,639, Feb. 21, 1985, Pat. No. 4,631,321.

This application Aug. 18, 1986, Ser. No. 897,488

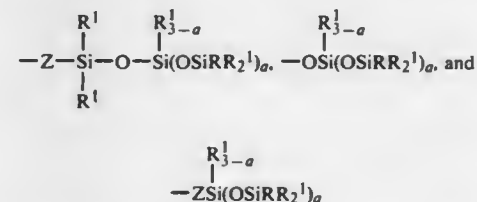
Claims priority, application Japan, Feb. 28, 1984, 59-37112

Int. Cl.<sup>4</sup> C08G 77/20

U.S. Cl. 528—32

3 Claims

1. An organopolysiloxane comprising a polymer in which at least the molecular chain ends possess groups with a general formula selected from the group consisting of



wherein R is an alkenyl group, R<sup>1</sup> is a monovalent organic group selected from the group consisting of alkyl, alkenyl, alkoxy, aryl, and halogenated alkyl, Z is an alkylene group, and a is 2 or 3.

4,683,279

# **LOW MELTING URETHANE LINKED TOLUENEDIISOCYANATES**

Barton Milligan, Coplay; William E. Starnes, Freeland; Roland E. Grandin, Alburtis, and Jeremiah P. Casey, Emmaus, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 8, 1986, Ser. No. 882,994

Int. Cl.<sup>4</sup> C08G 18/76

U.S. Cl. 528—67

24 Claims

1. A process for producing a low melting urethane linked toluenediisocyanate which comprises the steps:

- (a) reacting an isomer mix of 2,4- and 2,6-toluene diisocyanate with a short chain diol selected from the group consisting of dipropylene glycol, diethylene glycol 1,2-butanediol, 1,4-but-2-ene diol, triethylene glycol and tripropylene glycol;  
(b) maintaining a temperature sufficient to effect reaction between a first isocyanate group of said toluenediisocya-



nate and a hydroxy group of said short chain diol, but insufficient for effecting reaction with a second isocyanate group on the toluenediisocyanate ring and a hydroxy group;

(c) maintaining a stoichiometric excess of toluenediisocyanate to said diol

(d) utilizing an isomer mix such that the reaction product contains from about 45 to 90% by weight of the 2,4-isomer, and 10 to 55% of the 2,6-isomer; and (e) isolating the reaction product from the reaction medium.

4,683,280

## RADIATION CURABLE COMPOSITION

Takashi Ukachi; Keiichi Bessho, both of Yokohama; Atsushi Kumano, Kawasaki; Yoshio Matsumura, Yamato, all of Japan, and Robert E. Ansel, Hoffman Estates, Ill., assignors to DeSoto, Inc., Des Plaines, Ill. and Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,974

Claims priority, application Japan, Mar. 30, 1985, 60-67998  
Int. Cl.<sup>4</sup> C08G 18/38

U.S. Cl. 528—71

7 Claims

1. A radiation curable polymer having a molecular weight of 2,000 to 100,000 and having:

(A) at least one structural unit selected from the structural units represented by the following general formulas (I), (II) and (III) on both ends of its molecule,

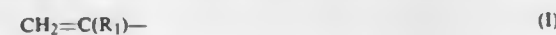
(B) at least one structural unit selected from the structural units represented by the following general formulas (IV), (V), (VI) and (VII),

(C) a structural unit represented by the following general formula (VIII),

(D) a structural unit represented by the following general formula (IX), and optionally

(E) at least one structural unit selected from the structural units represented by the following general formulas (X) and (XI),

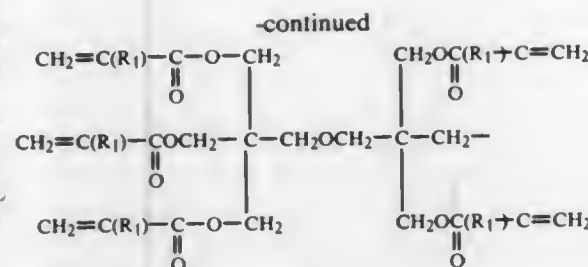
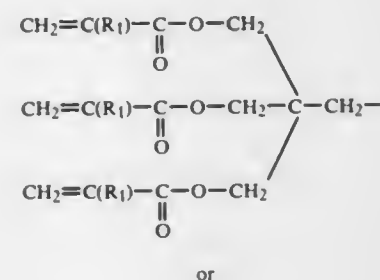
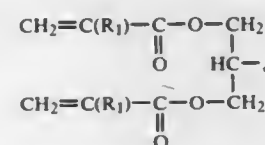
wherein the structural units of the general formulas (I) to (XI) are linked by at least one linkage selected from urethane linkage, urea linkage, N-substituted urea linkage, amide linkage and ester linkage:



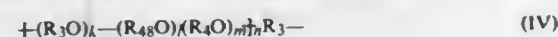
wherein  $\text{R}_1$  represents a hydrogen atom or methyl group;



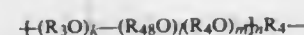
wherein  $\text{R}_1$  is as defined in the general formula (I), and  $\text{R}_2$  represents an alkylene group having 2 to 8 carbon atoms;



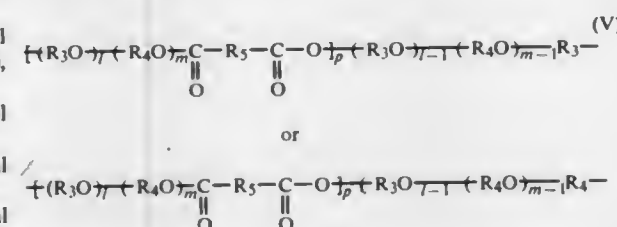
wherein  $\text{R}_1$  is as defined in the general formula (I)



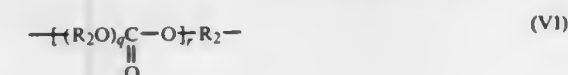
or



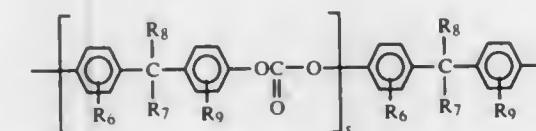
wherein  $\text{R}_3$  and  $\text{R}_4$ , which may be identical or different, represent an alkylene group having 2 to 6 carbon atoms;  $\text{R}_4$  represents a divalent organic group with 13 to 18 carbon atoms having an aromatic group;  $k$ ,  $l$  and  $m$  represent an integer of 0 to 50 but they are not 0 simultaneously; and  $n$  represents an integer of 0 to 50



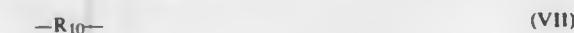
wherein  $\text{R}_3$  and  $\text{R}_4$  are as defined in the general formula (IV);  $\text{R}_5$  represents an aliphatic, alicyclic or aromatic divalent group having 2 to 8 carbon atoms;  $l$  and  $m$  are as defined in the general formula (IV); and  $p$  represents an integer of 1 to 50



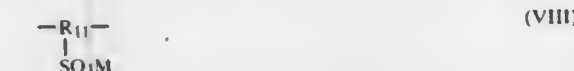
or



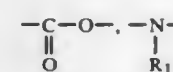
wherein  $\text{R}_2$  is as defined in the general formula (II);  $\text{R}_6$ ,  $\text{R}_7$ ,  $\text{R}_8$  and  $\text{R}_9$ , which may be identical or different, represent a hydrogen atom or an aliphatic, alicyclic or aromatic group having 1 to 8 carbon atoms;  $r$  and  $s$  represent an integer of 1 to 50; and  $q$  represents an integer of 1 to 20



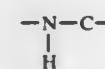
wherein  $\text{R}_{10}$  represents an aliphatic, alicyclic or aromatic divalent group having 2 to 40 carbon atoms



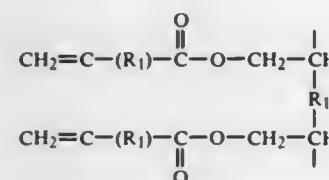
wherein  $\text{R}_{11}$  represents an aliphatic, alicyclic or aromatic trivalent group having 2 to 20 carbon atoms and optionally having, in its structure,  $-\text{O}-$ ,



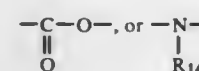
(wherein  $\text{R}_{12}$  represents a hydrogen atom or a substituted or unsubstituted aliphatic, alicyclic or aromatic group having 1 to 8 carbon atoms),



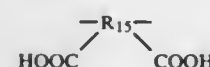
or  $-\text{SO}_2-$ ;  $\text{M}$  represents a hydrogen atom, ammonia group, alkali metal atom or alkaline earth metal atom



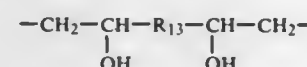
wherein  $\text{R}_1$  is as defined in the general formula (I);  $\text{R}_{13}$  represents a substituted or unsubstituted aliphatic, alicyclic or aromatic divalent group and optionally having, in its structure  $-\text{O}-$ ,



(wherein  $\text{R}_{14}$  represents a hydrogen atom or a substituted or unsubstituted aliphatic, alicyclic or aromatic group having 1 to 8 carbon atoms)



wherein  $\text{R}_{15}$  represents an aliphatic, alicyclic or aromatic tetravalent group having 2 to 20 carbon atoms



wherein  $\text{R}_{13}$  is as defined in general formula (IX).

4,683,281

## ORGANOPHOSPHITE ACCELERATORS FOR EPOXIDE CURING

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 23, 1986, Ser. No. 877,058

Int. Cl.<sup>4</sup> C08G 59/50, 59/68

U.S. Cl. 528—89

10 Claims

1. A curable epoxide composition comprising an epoxide resin, a triaryl phosphite accelerator and a poly(alkylene oxide)polyamine or an amino alkyl piperazine epoxide resin hardener.

4,683,282

## NOVEL BORON TRIFLUORIDE-POLY (ALKYLENE OXIDE) AMINE CATALYSTS FOR CURING EPOXY RESINS

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 21, 1986, Ser. No. 899,120

Int. Cl.<sup>4</sup> C08G 59/72

U.S. Cl. 528—91

12 Claims

1. A process for curing epoxide resins comprising mixing of epoxide resin with a boron trifluoride-amine complex catalyst wherein the amine moiety of said catalyst is a poly(alkylene oxide) polyamine and heating the resulting mixture at a temperature in the range of from about 100° to 200° C.

4,683,283

## LATENT ACCELERATORS FOR EPOXIDE CURING

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 23, 1986, Ser. No. 877,057

Int. Cl.<sup>4</sup> C08G 59/68

U.S. Cl. 528—93

12 Claims

1. A heat curable epoxide composition comprising an epoxide resin, a phenol carbamate accelerator and an amine hardener.

4,683,284

## OXIME CARBAMATE ACCELERATORS FOR CURING POLYEPOXIDES

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 23, 1986, Ser. No. 877,622

Int. Cl.<sup>4</sup> C08G 59/68, 59/56

U.S. Cl. 528—93

18 Claims

1. The adhesive composition comprising a mixture of  
(A) An epoxy resin and an oxime carbamate and  
(B) An amine hardener containing primary, secondary or tertiary amino or amido-amine groups.

4,683,285

## PIGMENT GRINDING VEHICLES FOR USE IN WATER-DILUTABLE PAINTS

Willibald Paar, and Helmut Hönig, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Oct. 22, 1985, Ser. No. 790,185

Claims priority, application Austria, Oct. 22, 1984, 3358/85

Int. Cl.<sup>4</sup> C08L 63/26; C08L 63/00; C25D 9/00

U.S. Cl. 528—113

33 Claims

1. Cationic binders water-soluble upon at least partial neutralization of basic groups contained therein comprising the reaction product of components (A) and (B), said component (A) being free of epoxide groups and prepared from a polyepoxide having a maximum molecular weight of 2000 and an amine containing a primary alkylamino group, said amine being present in an amount to provide from about 0.4 to 1.0 moles of primary amine groups for each mole of epoxide groups in said polyepoxide, and said component (B) being a carbonyl compound which is a member of the group consisting of aliphatic and aromatic aldehydes or ketones; said reaction product containing an oxazolidine ring formed through reaction of component (B) with component (A) and having a molecular weight of from about 500 to 4000, an oxazolidine equivalent of from about 250 to 1200, an amine value of at least 80 mg KOH/g and a proportion of aliphatic molecule segments of at least 30%.

14. A pigment paste comprising as a grinding vehicle the binder of claim 1.

18. A method of replenishing cathodically depositable paint material in a two-component replenishing process wherein the pigment component is the pigment paste of claim 14.

4,683,286

**POLYACRYLONITRILES WITH A LOW K VALUE, A PROCESS FOR THEIR PREPARATION AND THEIR SUITABLE USE**

Tibor Krakkay, Munich; Tatjana Poggi, Saal, and Ernst Schubert, Kelheim/Donau, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 636,965, Aug. 2, 1984, abandoned. This application Feb. 21, 1986, Ser. No. 832,453  
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328276

Int. Cl.<sup>4</sup> C08F 8/12

U.S. Cl. 525—329.1

2 Claims

1. A hydrolyzed polyacrylonitrile made by hydrolysis, involving heating a homopolymer or copolymer of an acrylonitrile containing at least 60% by weight of acrylonitrile units and up to 40% by weight of units copolymerizable with acrylonitrile having a K-value according to Fikentscher of 34 to 15 and a content of 180 to 900 milliequivalents sulfonate end groups which do not originate from comonomers containing sulfonate groups,

in an alkaline aqueous solution sufficient to form a hydrolysate of said polyacrylonitrile showing the following properties:

a K-value equal to said K-value according to Fikentscher in the range of 34 to 15,

sulfonic acid groups in a content in the range of 100 to 500 milliequivalents/Kg of the hydrolysate (as the Na salt) corresponding to a sulfur content of 0.3 to 1.5% by weight/kg of hydrolysate (as the Na salt).

acrylic acid units in a content (calculated as Na acrylate in the hydrolyzed product in the Na salt form) of 50 to 85% by weight.

strongly acidic groups other than sulfonic acid groups in a content of 200 to 1,500 milliequivalents/kg of hydrolyzed product (as the Na salt) and

said product having a residual nitrogen content of about 0.3 to 5% by weight, relative to the quantity of hydrolyzed product in the Na salt form.

4,683,287

**COMPOSITIONS CONTAINING A REACTIVE MONOMER DERIVED FROM A LACTONE**

Joseph V. Koleske, Charleston, W. Va., and Linda A. Domeier, Somerville, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 755,532, Jul. 16, 1985, abandoned, which is a continuation of Ser. No. 565,530, Dec. 29, 1983, abandoned, which is a continuation of Ser. No. 438,496, Nov. 2, 1982, abandoned. This application Aug. 14, 1986, Ser. No. 895,594

Int. Cl.<sup>4</sup> C08G 63/10

U.S. Cl. 528—357

19 Claims

1. A substantially liquid composition comprising:

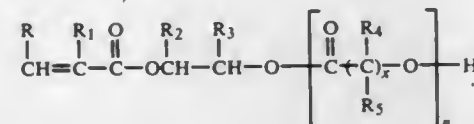
(a) 1 to 10 weight percent of a lactone,

(b) greater than 1 to about 20 weight percent of hydroxyalkyl acrylate or methacrylate,

(c) 2 or less weight percent of diacrylates,

(d) 10 or less weight percent of products resulting from Michael addition, acrylic polymerization, transesterification reactions, or other side reactions,

(e) remainder to 100 weight percent of a reactive monomer of the following formula:



wherein R, R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are independently hydrogen or methyl, R<sub>4</sub> and R<sub>5</sub> are independently hydrogen or alkyl of

from 1 to 12 carbon atoms, x is from 4 to 7, and the average value of n in the composition is 1 to 3, and  
(f) less than about 100 parts per million of catalyst, based on the total weight of the composition.

6. A process for preparing the composition of claim 1 which comprises reacting, in an atmosphere that contains oxygen, a lactone and hydroxyalkyl acrylate or methacrylate in the presence of less than about 100 parts per million of a catalyst, based on the combined weight of lactone and hydroxyalkyl acrylate or methacrylate, and less than 1000 parts per million of an inhibitor to prevent polymerization of the hydroxyalkyl acrylate or methacrylate at a temperature of from about 100° to about 140° C.

4,683,288

**POLYMER AND ITS PRODUCTION**

Motoaki Tanaka, Saitama; Yasuaki Ogawa, Osaka; Tsutomu Miyagawa, and Toshio Watanabe, both of Saitama, all of Japan, assignors to Waco Pure Chemical Ind. Inc. and Takeda Chemical Industries, Ltd., both of Osaka, Japan

Filed Jul. 3, 1985, Ser. No. 751,671

Claims priority, application Japan, Jul. 6, 1984, 59-140356

Int. Cl.<sup>4</sup> C08G 63/04

U.S. Cl. 528—361

13 Claims

1. In a method for producing a polymer or copolymer of lactic acid and/or glycolic acid by subjecting lactic acid and/or glycolic acid to a polycondensation reaction, an improvement which comprises employing a solid inorganic acid catalyst as a polycondensation catalyst, wherein the solid inorganic acid catalyst is one selected from the group consisting of acid clay, activated clay, bentonite, kaolin, talc, aluminum silicate, magnesium silicate, alumina bolia and silicic acid.

4,683,289

**NOVEL FLUORINE-CONTAINING POLYAMINOAMIDE AND PREPARATION THEREOF FROM FLUOROOXETANE AND POLYAMINE**

Yohnosuke Ohsaka, Ibaraki; Yoshio Amimoto, Takatsuki, and Yoshio Negishi, Settsu, all of Japan, assignors to Dalkin Industries Ltd., Osaka, Japan

Filed Oct. 11, 1985, Ser. No. 786,682

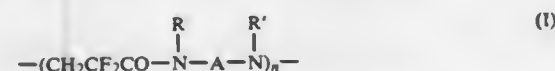
Claims priority, application Japan, Oct. 22, 1984, 59-222466; Sep. 30, 1985, 60-218449

Int. Cl.<sup>4</sup> C08G 69/42

U.S. Cl. 528—402

16 Claims

1. A polyaminoamide, having recurring units, of the formula:



wherein R and R' are the same or different and represent a hydrogen atom or a monovalent organic group and A is a divalent organic group; or where R and R' are bound together to form a cyclic group together with A and the nitrogen atom to which they are bonded and n is a positive integer greater than zero.

4,683,290

**METHOD FOR TREATING THERMOPLASTIC POLYMERS**

Richard J. Bennett, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 26, 1985, Ser. No. 813,348

Int. Cl.<sup>4</sup> B32B 5/16

U.S. Cl. 528—480

13 Claims

1. A method for devolatilizing a normally-solid thermoplastic polymer containing volatile material, comprising:

(a) forming a body of molten, normally-solid, high density heat exchange material, having a density substantially

above the density of said thermoplastic polymer and which is essentially immiscible with said thermoplastic polymer, in a contact zone, in a manner to maintain an extended surface area body of said heat exchange material, by heating said body of heat exchange material to a temperature above the melting point thereof and above the volatilization temperature of said volatile material;

(b) introducing said thermoplastic polymer containing said volatile material, in a liquid form, through a distributor means disposed in said body of heat exchange material, in a manner to form a layer of said thermoplastic polymer on the surface of said body of heat exchange material, whereby said volatile material is vaporized and said thermoplastic polymer is devolatilized; and

(c) withdrawing the thus devolatilized thermoplastic polymer from said body of heat exchange material, to form a continuously flowing layer of said thermoplastic material on said surface of said exchange material.

4,683,291

**PLATELET BINDING INHIBITORS**

Theodore S. Zimmerman; Zaverio M. Ruggeri, both of La Jolla, and Richard Houghten, Solihna Beach, all of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

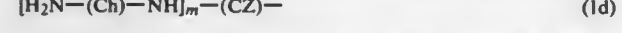
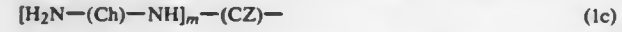
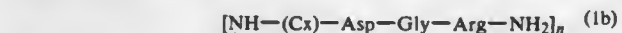
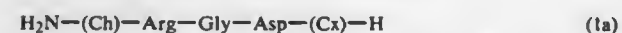
Filed Oct. 28, 1985, Ser. No. 791,872

Int. Cl.<sup>4</sup> A61K 37/02; C07C 103/52

U.S. Cl. 530—324

33 Claims

1. A peptide having one of the formulas



wherein:

(Ch) is a chain of 1 to 20 amino acid residues which contains at least 1 residue selected from the group consisting of Lys and Arg;

m and n are each 1-10, and (m+n) is 3-20;

(CZ) is a straight or branched alkyl group contained at least (m+n) carbon atoms and up to 20 carbon atoms;

(Cx) is a chain of 1 to 20 amino acid residues or a chemical bond with the proviso that (Cx) in formula (1a) does not include the amino acid residues, Cys, Thr or Ser; and each amino acid residue is in the (L) or (D) configuration.

4,683,292

**IMMUNOTHERAPEUTIC POLYPEPTIDE AGENTS WHICH BIND TO LYMPHOCYTE IMMUNOGLOBULIN FC RECEPTORS**

Gary S. Hahn, San Diego, Calif., assignor to Immunotech, Inc., San Diego, Calif.

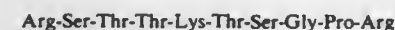
Filed Aug. 12, 1983, Ser. No. 522,602

Int. Cl.<sup>4</sup> C07K 7/06

U.S. Cl. 530—328

1 Claim

1. A peptide having an amino acid sequence



composed of L-enantiomeric amino acid residues and pharmaceutically acceptable salts thereof.

4,683,293

**PURIFICATION OF PICHIA PRODUCED LIPOPHILIC PROTEINS**

William S. Craig, San Diego, Calif., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 20, 1986, Ser. No. 920,385

Int. Cl.<sup>4</sup> C07K 3/02, 15/04

U.S. Cl. 530—359

9 Claims

1. A method for the extraction of lipophilic proteins from host cells of the genus Pichia which comprises

(a) subjecting the cells to cell breaking conditions for a time sufficient to cause breakage of substantially all of the cells, wherein said breakage is carried out in the presence of an extraction medium comprising

in the range of about 1 up to 8 molar concentration of at least one chaotropic salt, in a medium buffered at a pH suitable to maintain said lipophilic protein in a stable form, and

(b) recovering the soluble fraction obtained from step (a).

4,683,294

**PROCESS FOR THE EXTRACTION AND PURIFICATION OF PROTEINS FROM CULTURE MEDIA PRODUCING THEM**

Frans Van Wijnendaele, Ottenburg; Daniel Gilles, Genval, and Guy Simonet, Perwez, all of Belgium, assignors to Smith Kline RIT, S.A., Belgium

Filed Apr. 3, 1985, Ser. No. 719,601

Int. Cl.<sup>4</sup> A61K 39/12

U.S. Cl. 530—371

18 Claims

1. In a method for extracting and purifying a cell-bound protein from the supernatant of engineered yeast cells having produced such protein and disrupted in the presence of a non-ionic detergent, a process which comprises, as a first step, adjusting the pH of the supernatant to 6 (±0.1), adding thereto either liquid or solid polyethylene glycol up to clarification of said supernatant, and, as a second step, treating the clarified supernatant either with a bivalent metal cation or, before ultrafiltration or after eventual ultrafiltration, with ammonium sulfate for separating said protein.

4,683,295

**METHOD FOR THE PREPARATION OF ANTI-RECEPTOR ANTIBODIES**

Dennis A. Carson, Del Mar, Calif., assignor to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed May 24, 1984, Ser. No. 614,102

Int. Cl.<sup>4</sup> C07K 3/08

U.S. Cl. 530—391

17 Claims

1. A method of preparing an anti-receptor internal image antibody comprising:

(a) administering to a first animal host a receptor-containing composition in an amount sufficient to induce the production of an anti-receptor antiserum containing anti-receptor antibodies;

(b) recovering said anti-receptor antibodies from the anti-receptor antiserum of the first animal host in partially purified form;

(c) administering to a second animal host of the same species as the first animal host a ligand in an amount sufficient to induce the production of anti-ligand antiserum containing anti-ligand antibody, said ligand binding to said receptor;

(d) recovering the anti-ligand antibody from the anti-ligand antiserum of the second animal host;

(e) combining the anti-receptor antibody and the anti-ligand antibody to form a first admixture containing a first complex;

(f) separating the first complex from the first admixture;

(g) decomplexing the first complex; and

(h) isolating substantially pure internal image anti-receptor antibody.



4,683,296

## CARBAPENEM INTERMEDIATES

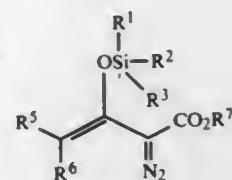
Yasutsugu Ueda, Manlius, N.Y., and Guy Roberge, St. Lambert, Canada, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 472,443, Mar. 7, 1983. This application Apr. 22, 1985, Ser. No. 725,594  
Int. Cl.<sup>4</sup> C07C 113/00

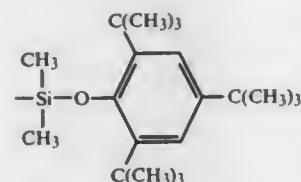
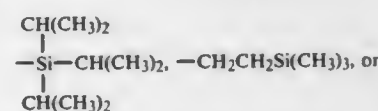
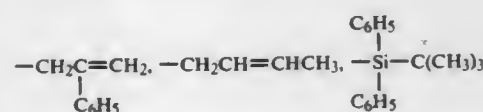
U.S. Cl. 539—558

3 Claims

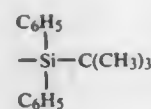
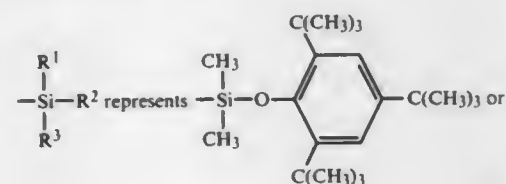
1. A process for the preparation of a compound of the formula



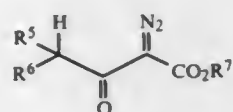
wherein R<sup>5</sup> and R<sup>6</sup> are each independently hydrogen or methyl, R<sup>7</sup> is an ester group selected from C<sub>1</sub>–C<sub>4</sub> alkyl, p-nitrobenzyl, —CH<sub>2</sub>CH=CH<sub>2</sub>, —CH<sub>2</sub>CH=CHC<sub>6</sub>H<sub>5</sub>, —CH<sub>2</sub>CH=CHCO<sub>2</sub>CH<sub>3</sub>.



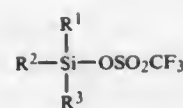
and R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are each independently C<sub>1</sub>–C<sub>4</sub> alkyl or, alternatively,



which process comprises reacting a compound of the formula



wherein R<sup>5</sup>, R<sup>6</sup>, and R<sup>7</sup> are as defined above with a silyl triflate of the formula



wherein R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are as defined above in an inert solvent and in the presence of an organic base.

4,683,297

## PROCESS FOR THE PREPARATION OF GLYCOSIDES

Tetsuji Yanami, Yoshiyuki Murai, both of Himeji, and Ryolchi Oshima, Tokyo, all of Japan, assignors to Daisel Chemical Industries Ltd., Osaka, Japan

Continuation of Ser. No. 617,353, Jun. 5, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,669

Claims priority, application Japan, Jun. 7, 1983, 58-100254; Jun. 10, 1983, 58-102711

Int. Cl.<sup>4</sup> C07H 1/00

U.S. Cl. 536—18.6

16 Claims

1. A process for the preparation of glycosides which comprises reacting a monosaccharide or a polysaccharide with a monohydric alcohol or a polyhydric alcohol in the presence of a perfluorosulfonic acid at a temperature from above the boiling point of the alcohol to not more than 230° C.

4,683,298

## PROCESS FOR THE PREPARATION OF AMINATED POLYSACCHARIDE DERIVATIVES

Mansur Yalpani, Montreal, Canada, assignor to British Columbia Research Council, Vancouver, Canada

Continuation-in-part of Ser. No. 690,664, Jan. 10, 1985, abandoned. This application Feb. 21, 1986, Ser. No. 832,462

Int. Cl.<sup>4</sup> C08B 31/00, 31/08, 37/00, 37/02

U.S. Cl. 536—45

24 Claims

1. A process for preparing an amino deoxy derivative of starch, the process comprising:

- oxidizing the starch with dimethyl sulfoxide in combination with a reagent selected from (i) acetic anhydride and (ii) acetic anhydride with paraformaldehyde; and
- subjecting the product from (a) to reductive amination.

4,683,299

## SUGAR ESTERS AND AN IMPROVED ANHYDROUS METHOD OF MANUFACTURE

Sandra Kea; Charles E. Walker, both of Lincoln, Nebr., and Eric Kline, Austin, Tex., assignors to Nebraska Department of Economic Development, Lincoln, Nebr.

Filed Aug. 10, 1984, Ser. No. 639,784

Int. Cl.<sup>4</sup> C07H 1/00

U.S. Cl. 536—119

21 Claims

1. A method for synthesizing sugar esters which comprises the steps of:

- dissolving an edible sugar in a substantially anhydrous organic acid solvent;
- adding to said solvent and said dissolved edible sugar an organic acid chloride having at least two carbon atoms to form a substantially anhydrous liquid mixture containing at least about 0.1 mole of organic acid chloride for each mole of monosaccharide moiety of sugar;
- mixing said sugar and organic acid chloride to cause an esterification reaction;
- maintaining a substantially anhydrous condition throughout the reaction; and
- recovering the sugar ester thereby produced.

4,683,300

## DEADCAT REACTION FOR MAKING 9-DEOXY-9-ISOCYANATO CLAVULANATES

John B. Harbridge, Redhill, England, assignor to Beecham Group, p.l.c., United Kingdom

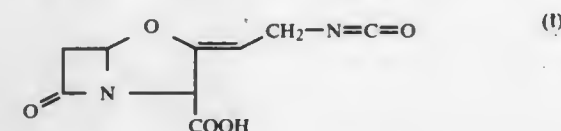
Division of Ser. No. 530,752, Sep. 9, 1983, Pat. No. 4,622,177. This application Sep. 30, 1985, Ser. No. 781,503

Int. Cl.<sup>4</sup> C07D 498/04; C07B 43/10

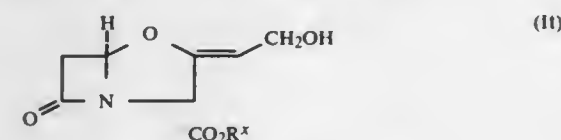
U.S. Cl. 540—348

1 Claim

1. A process for preparing a compound of formula (I):

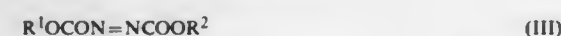


or a salt of carboxylic acid or ester thereof, which process comprises reacting a compound of formula (II):



wherein R<sup>x</sup> is a carboxy-protecting group with

- isocyanic acid;
- a compound of formula (III):



wherein R<sup>1</sup> and R<sup>2</sup> are each independently C<sub>1</sub>–C<sub>6</sub> alkyl, aryl or aryl (C<sub>1</sub>–C<sub>6</sub>) alkyl; and

- a compound of formula (IV):



wherein l, m and n are each independently 0 or 1, and R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are each independently C<sub>1</sub>–C<sub>6</sub> alkyl, aryl or aryl (C<sub>1</sub>–C<sub>6</sub>) alkyl;

and thereafter, where necessary, carrying out one or more of the following steps:

- removing the carboxy-protecting group R<sup>x</sup>; and/or
- converting a salt to the free carboxylic acid of formula (I) or to an ester, or to a different salt.

4,683,301

## CARBAPENEM ANTIBIOTICS

Choung U. Kim, Manlius, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

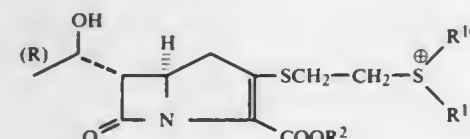
Continuation-in-part of Ser. No. 366,627, Apr. 8, 1982, abandoned. This application Oct. 2, 1984, Ser. No. 656,838

Int. Cl.<sup>4</sup> C07D 487/04; A61K 31/40

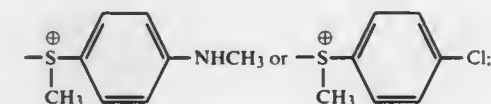
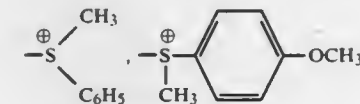
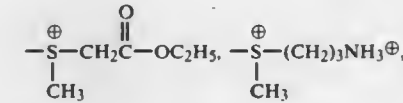
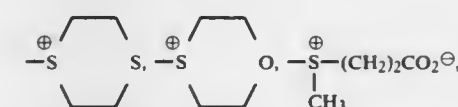
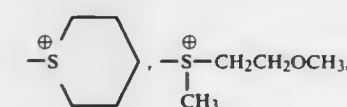
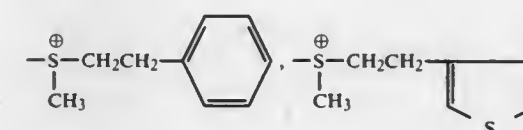
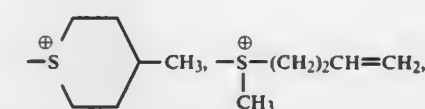
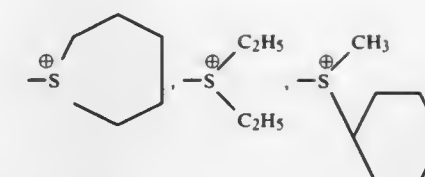
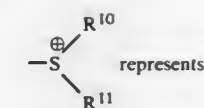
U.S. Cl. 540—350

8 Claims

1. A compound of the formula



wherein R<sup>2</sup> is hydrogen, an anionic charge or a conventional readily removable carboxyl protecting group; and



or a pharmaceutically acceptable salt thereof.

4,683,302

## AZETIDINEDIONE COMPOUNDS AS CROSSLINKERS FOR ELECTRODEPOSITED COATINGS

Shenghong A. Dai, Wallingford, and Philip W. Sherwood, Milford, both of Conn., assignors to The Dow Chemical Company, Midland, Mich.

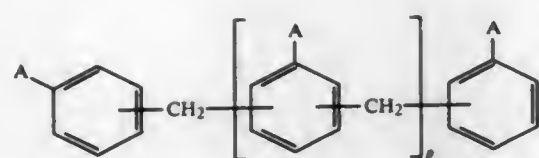
Division of Ser. No. 660,768, Oct. 15, 1984, Pat. No. 4,576,980. This application Dec. 20, 1985, Ser. No. 811,853

Int. Cl.<sup>4</sup> C07D 403/14, 403/10

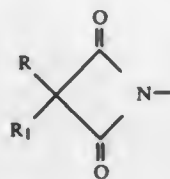
U.S. Cl. 540—356

5 Claims

1. A polymethylene poly(phenyl azetidedione) having the formula



wherein A represents an azetidinedione group having the formula



wherein R and R<sub>1</sub> when taken separately are independently selected from the group consisting of hydrogen and hydrocarbyl, and when R and R<sub>1</sub> are taken together with the carbon atom to which they are joined represent a cycloalkane having 4 to 8 ring carbon atoms, inclusive, and p represents an integer from 1 to 8, inclusive, or in the case of a mixture p has a mean value greater than 0 but less than 1.

4,683,303

#### REDUCTION PROCESS FOR THE PREPARATION OF 4-UNSUBSTITUTED AZETIDIN-2-ONES

Hans R. Pfandler, Pippinplatz 1, D-8000 Munich 71, Fed. Rep. of Germany

Filed Oct. 30, 1984, Ser. No. 666,443

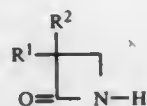
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3340006

Int. Cl.<sup>4</sup> C07D 205/08; C07B 41/08

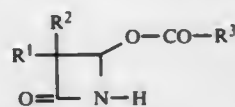
U.S. Cl. 540-362

10 Claims

1. A process for the preparation of azetidin-2-ones of the formula I:



in which (i) R<sup>1</sup> and R<sup>2</sup> independent from each other are hydrogen, an alkyl group with 1 to 7 carbon atoms or an alkoxy group with 1 to 7 carbon atoms, or (ii) in which R<sup>1</sup> is an amino group or a protected amino group, and R<sup>2</sup> is hydrogen, an alkyl group with 1 to 7 carbon atoms or an alkoxy group with 1 to 7 atoms, provided that R<sup>1</sup> and R<sup>2</sup> cannot be an organic group linked via a carbonyl group to the ring carbon atom when one of the groups R<sup>1</sup> or R<sup>2</sup> is hydrogen, and characterized in that a 4-acyloxy-azetidin-2-one of the formula II:



wherein R<sup>1</sup> and R<sup>2</sup> are as defined above and R<sup>3</sup> is selected from the group consisting of hydrogen and aliphatic, aromatic or arylaliphatic hydrocarbon radicals with up to 18 carbon atoms stable at the reaction conditions, is reacted with a complex hydride containing reactive hydride ions and of the formula:



wherein A is selected from the group consisting of Li, K, Na, Ca, Mg, Zn and (R<sup>4</sup>)<sub>4</sub>N, in which R<sup>4</sup> is a lower alkyl group; X=B or Al; Y=H, an alkyl or alkoxy group with 1-7 carbon atoms, or a cyano group; m=1,3, n=1-3, and m+n=4; and o=valence of A.

4,683,304

#### PROCESS FOR PREPARING AN ACYL-LACTAM COMPOUND

Albert A. Van Geenen, Brunssum, and Jozef J. M. Bougers, Elsloo, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Dec. 13, 1985, Ser. No. 808,560

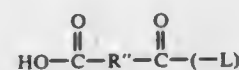
Claims priority, application Netherlands, Dec. 20, 1984, 8403862

Int. Cl.<sup>4</sup> C07D 223/10, 211/40, 209/34

U.S. Cl. 540-529

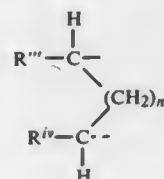
5 Claims

1. Process for preparing an acyl-lactam compound comprising: reacting the reaction product of a lactam with a dicarboxylic acid anhydride, said reaction product having the formula



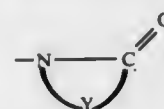
wherein

R'' is a bivalent radical having the following formula



wherein

- (i) R''' is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl, R<sup>iv</sup> is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl where R''' and R<sup>iv</sup> may jointly form a substituted or non-substituted cycloalkyl residue  
n is 0 or 1  
(-L) represents a non-opened lactam ring of the formula



wherein Y has 3-11 carbon atoms with a polyol having an equivalent weight of at least 300 up to 3,000 at a temperature of at most 150° C.

4,683,305

#### OBTAINING CAPROLACTAM BY CLEAVING OLIGOMERS OF CAPROLACTAM

Hugo Fuchs, Ludwigshafen; Uwe Brand, Lampertheim, and Helmut Buchaekert, Boehl-Iggelheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 8, 1986, Ser. No. 883,177

Int. Cl.<sup>4</sup> C07D 201/12

U.S. Cl. 540-533

4 Claims

1. A process for obtaining caprolactam by cleaving oligomers of caprolactam, wherein the oligomers, in a liquid or solid state, are introduced into a fluidized alumina bed and cleaved

at from 290° to 400° C. in the presence of steam, and, in addition to the amount of inert gas required to fluidize the alumina bed, from 0.1 to 3 times this amount of inert gas is introduced above the fluidized bed.

4,683,306

#### PROCESS FOR THE PREPARATION OF 3,4-DIHYDRO-2-SUBSTITUTED-2H-1,2-THIAZINE-CARBOXYLIC ACID 1,1-DIOXIDE DERIVATIVES

Jung J. Suh, and You H. Hong, both of Seoul, Rep. of Korea, assignors to YuHan Corporation Co., Ltd., Seoul, Rep. of Korea

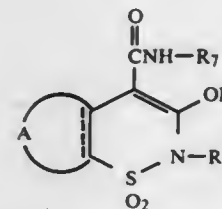
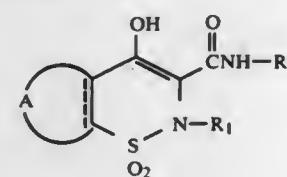
Filed Jul. 13, 1984, Ser. No. 630,393

Int. Cl.<sup>4</sup> C07D 279/02, 513/04

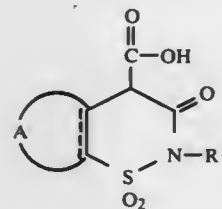
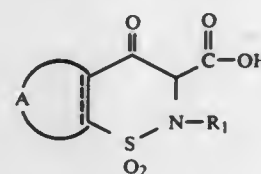
U.S. Cl. 544-33

4 Claims

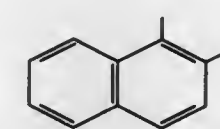
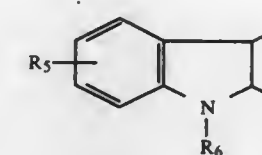
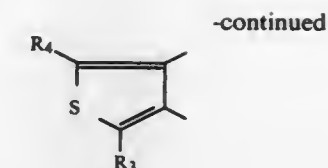
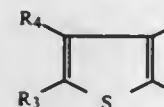
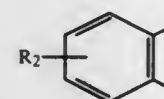
1. A process for the preparation of a partially hydrolyzed compound of formula (V) or (VI), respectively:



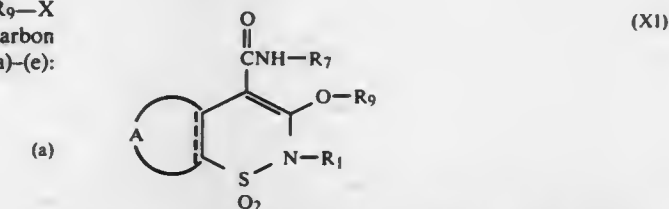
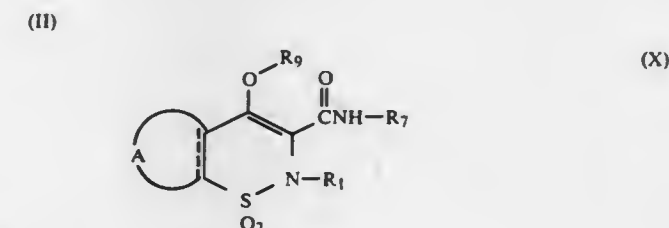
which comprises reacting a compound of the formula I or II:



with at least a 2 molar amount of the acylating agent R<sub>9</sub>-X and with R<sub>7</sub>-NH<sub>2</sub> wherein A together with the two carbon atoms to which it is attached forms one of the groups (a)-(e):

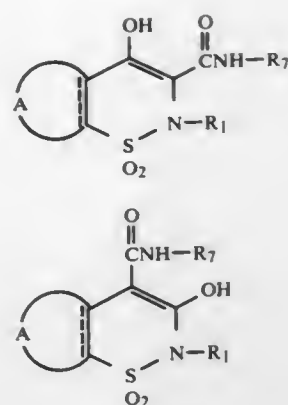


and the broken line represents the double bond in (a), (b), (d) and (e); R<sub>1</sub> is lower alkyl having from 1 to 3 carbon atoms; R<sub>2</sub> is hydrogen, halogen, nitro, trifluoromethyl, lower alkyl having from 1 to 5 carbon atoms, lower alkoxy having from 1 to 5 carbon atoms in the alkyl moiety, phenyl, or phenyl lower alkyl having from 1 to 3 carbon atoms in the alkyl moiety; R<sub>3</sub> and R<sub>4</sub> each is a hydrogen atom or a lower alkyl group; R<sub>5</sub> is hydrogen, fluorine, chlorine, bromine, methoxy, methyl, ethyl or trifluoromethyl; and R<sub>6</sub> is methyl or ethyl; R<sub>7</sub> is hydrogen, lower alkyl having from 1 to 3 carbon atoms, lower alkoxy having from 1 to 3 carbon atoms in the alkyl moiety thereof, phenyl which may be substituted by halogen, hydroxyl, lower alkyl trifluoromethyl, or lower alkoxy or phenylalkyl having from 1 to 3 carbon atoms in the alkyl moiety; and R<sub>9</sub> is trialkylacetyl having from 1 to 3 carbon atoms in the alkyl moiety, benzenesulfonyl or substituted benzenesulfonyl in which the substituent is methyl, and X is halogen, to form an N-substituted-4(or 3)-substituted-2-substituted 2H-1,2-thiazine-3(or 4)-carboxamide 1,1-dioxide derivative of the formula (X) or (XI):

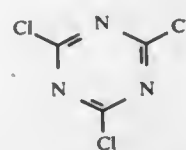


wherein the reaction temperature range is from -5° C. to ambient temperature, the total reaction time is 5 hours and in (b) which R<sub>9</sub>-X and R<sub>7</sub>NH<sub>2</sub> are simultaneously present, and further comprises partially hydrolyzing a compound of said formula (X) or (XI) in the presence of alkali and neutralizing the resulting compound with a mineral acid to give a compound of formula (V) or (VI), respectively:

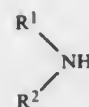




(V)  $R^2$  is hydrogen or alkyl, by reacting cyanuric chloride of the formula



(VI) with a virtually water-insoluble arylamine of the formula



at a temperature between  $0^\circ$  and  $100^\circ$  C., the improvement which comprises effecting the reaction in water at an acid pH in the presence of a virtually water-insoluble organic solvent.

4,683,307

### PROCESS FOR THE PREPARATION OF DODECAMETHYLENEBISMELAMINE

Peter Werle, Gelnhausen; Holger Focke, Bruchkoebel, and Alwin Boes, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 27, 1986, Ser. No. 833,693

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509056

Int. Cl.<sup>4</sup> C07D 251/70

U.S. Cl. 544—198

8 Claims

1. A process for the preparation of dodecamethylenebismelamine comprising reacting 2,4-diamino-6-chloro-1,3,5-triazine with 1,12-diaminododecane as reactants in an alkaline, aqueous suspension, said 1,12-diaminododecane having been dissolved in a watermiscible, organic solvent and then added to said suspension, carrying out the reaction at reflux temperature cooling the formed reaction mixture to room temperature, and separating the resulting crystallized product.

4,683,308

### PROCESS FOR THE PREPARATION OF 2-ARYLAMINO-4,6-DICHLORO-S-TRIAZINES

Andreas Günther, Cologne; James R. Malone, Dormagen; Manfred Lenthe, Odenthal, and Hans-Walter Höhl, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 820,510

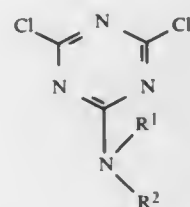
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504073

Int. Cl.<sup>4</sup> C07D 251/44

U.S. Cl. 544—211

8 Claims

1. In the preparation of a 2-arylamino-4,6-dichloro-s-triazine of the formula



in which

$R^1$  is a carbocyclic aryl radical which is optionally substituted by alkyl with 1 to 6 carbon atoms, nitro, cyano, alkoxy with 1 to 5 carbon atoms, halogen and/or halogenoalkyl with 1 to 5 carbon atoms and 1 to 5 halogen atoms, and

4,683,309

### PHENYLQUINOXALINE RESIN MONOMERS

Marilyn R. Unroe, Dayton; Bruce A. Reinhardt, New Carlisle, and Fred E. Arnold, Centerville, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

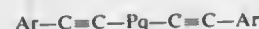
Filed Jan. 16, 1986, Ser. No. 819,334

Int. Cl.<sup>4</sup> C07D 241/42; C08F 26/06

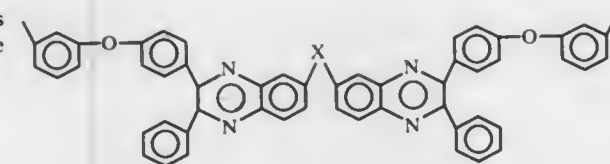
U.S. Cl. 544—353

5 Claims

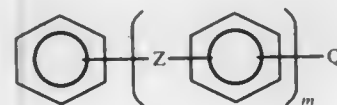
1. A phenylquinoxaline compound having the formula



wherein Pq has the formula



wherein X is a single bond, —O—, —S—, —SO<sub>2</sub>—, —CH<sub>2</sub>—, —CO—, —OC<sub>6</sub>H<sub>4</sub>O—, —OC<sub>6</sub>H<sub>4</sub>—C<sub>6</sub>H<sub>4</sub>O—, —OC<sub>10</sub>H<sub>6</sub>O— or —OC<sub>6</sub>H<sub>4</sub>SO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>O—; and wherein Ar is



wherein m is an integer having a value of 1 or 2, Z is —O— or —S—, and Q is —H, —ZC<sub>6</sub>H<sub>5</sub> or —SO<sub>2</sub>C<sub>6</sub>H<sub>5</sub>.

4,683,310

### PYRIDINE DICARBOXYLIC ESTER METAL EXTRACTANTS

Raymond F. Dalton, Cheshire; Raymond Price, Huddersfield; Peter M. Quan, Lancashire, and David Stewart, Oldham, all of England, assignors to Imperial Chemical Industries, PLC, England

Division of Ser. No. 418,833, Sep. 16, 1982, Pat. No. 4,525,330, which is a continuation-in-part of Ser. No. 341,176, Jan. 20, 1982, abandoned. This application Feb. 19, 1985, Ser. No. 702,579

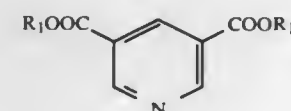
Claims priority, application United Kingdom, Feb. 3, 1981, 8103223; Aug. 26, 1981, 8126079

Int. Cl.<sup>4</sup> C07D 213/80

U.S. Cl. 546—321

8 Claims

1. A substituted pyridine which has the formula:



wherein  $R_1$  is a hydrocarbyl group containing from 5 to 36 carbon atoms, the two groups  $R_1$  may be the same or different and the two groups  $R_1$  together contain a total of from 16 to 36 carbon atoms.

4,683,311

### SPIRO[ISOXAZOLIDINE-3,2'-TRICYCLO[3.3.1.1<sup>3,7</sup>]DECANES]

Vassil S. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

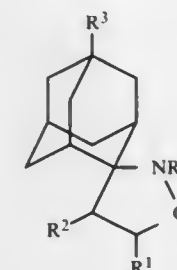
Filed Jan. 22, 1986, Ser. No. 821,292

Int. Cl.<sup>4</sup> C07D 261/02

U.S. Cl. 548—240

20 Claims

1. A spiro [isoxazolidine -3,2'-tricyclo[3.3.1.1<sup>3,7</sup>]decane]-compound having the structural formula



wherein R is a C<sub>1</sub>-C<sub>4</sub> alkyl group;  $R^1$  is a substituent selected from the group consisting of C<sub>1</sub>-C<sub>24</sub> primary alkyl, an amino C<sub>1</sub>-C<sub>4</sub> alkyl, a carboxyl, a phenyl, a C<sub>1</sub>-C<sub>4</sub> alkoxy carbonyl, a (trifluoroacetamido)C<sub>1</sub>-C<sub>4</sub> alkyl, a hydroxy C<sub>1</sub>-C<sub>4</sub> alkyl, an aminocarbonyl, a (C<sub>1</sub>-C<sub>4</sub> alkylamino) carbonyl, an [(aminocarbonyl)amino]C<sub>1</sub>-C<sub>4</sub> alkyl, a [(C<sub>1</sub>-C<sub>4</sub> alkylamino)carbonyl]amino]C<sub>1</sub>-C<sub>4</sub> alkyl, a [(phenylamino)thiocarbonyl]amino]C<sub>1</sub>-C<sub>4</sub> alkyl, a (C<sub>1</sub>-C<sub>24</sub> alkanoyloxy)C<sub>1</sub>-C<sub>4</sub> alkyl and a (C<sub>1</sub>-C<sub>24</sub> alkanoylamino) C<sub>1</sub>-C<sub>4</sub> alkyl;  $R^2$  is hydrogen or a C<sub>1</sub>-C<sub>4</sub> alkoxy carbonyl; and  $R^3$  is hydrogen or hydroxy, and the hydrochloride salt of said compound.

4,683,312

### IMIDAZOLIUM HYPOGLYCEMIC AGENTS

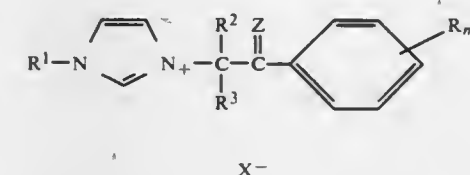
Samuel J. Dominianni, and Terence T. Yen, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind. Division of Ser. No. 670,776, Nov. 13, 1984, Pat. No. 4,609,670. This application May 27, 1986, Ser. No. 866,664

Int. Cl.<sup>4</sup> C07D 233/60

U.S. Cl. 548—341

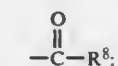
4 Claims

1. A compound of the formula

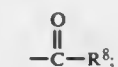


wherein:

$R^1$  is C<sub>1</sub>-C<sub>4</sub> alkyl;  
 $R^2$  and  $R^3$  independently are hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl;  
each  $R^4$  independently is —OR<sup>5</sup>, —NR<sup>6</sup>R<sup>7</sup>, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy or C<sub>1</sub>-C<sub>4</sub> alkylthio;  
 $R^5$  is hydrogen or



$R^6$  is hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl or



$R^7$  is hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl;  
each  $R^8$  independently is C<sub>1</sub>-C<sub>4</sub> alkyl or phenyl;  
Z is oxygen or sulfur;  
X is a therapeutically acceptable anion; and  
m is 1 or 2;

with the proviso that when  $R^1$  is methyl,  $R^2$  and  $R^3$  are hydrogen, Z is oxygen, and X is bromine,  $R^4$  is other than 4-methoxy and 4-methyl.

4,683,313

### 2-ALKYL(OR PHENYL)THIO-6-N ALKYL ERGOLINES AND 4-DIALKYLAMINOTETRAHYDROBENZ[c,d]INDOLES

Bennett C. Laguzza; Cynthia L. Nichols, and Nicholas J. Bach, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

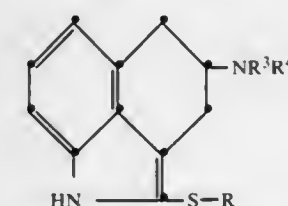
Filed Jun. 24, 1985, Ser. No. 747,753

Int. Cl.<sup>4</sup> C07D 209/90; A61K 31/48

U.S. Cl. 548—437

2 Claims

1. A compound of the formula:



wherein R is C<sub>1</sub>-3 alkyl or phenyl and  $R^3$  and  $R^4$  are individually methyl, ethyl or n-propyl; and pharmaceutically-acceptable, acid-addition salts thereof.

4,683,314

**3-O-BENZYL-2,4,6-TRIDEOXY-6-iodo- $\alpha$ -D-erythro-hexopyranide useful for preparing inhibitors of 3-hydroxy-3-methylglutaryl coenzyme A reductase**

John D. Prugh, Chalfont, Pa., assignor to Merck &amp; Co., Inc., Rahway, N.J.

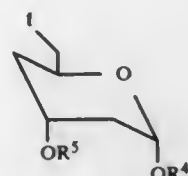
Division of Ser. No. 731,693, May 8, 1985, abandoned, which is a division of Ser. No. 568,977, Jan. 6, 1984, Pat. No. 4,540,796, which is a division of Ser. No. 373,605, May 3, 1982, Pat. No. 4,440,927, which is a continuation-in-part of Ser. No. 275,521, Jan. 19, 1981, abandoned. This application Apr. 28, 1986, Ser. No. 858,899

Int. Cl.<sup>4</sup> C07D 309/06

U.S. Cl. 549—417

2 Claims

I. The compound

wherein R<sup>4</sup> is C<sub>1-3</sub> alkyl and R<sup>5</sup> is benzyl, or 4-methoxybenzyl.

4,683,315

**REDUCTIVE COUPLING OF LINEAR CARBON-CONTAINING LIGANDS VIA TRANSITION METAL COMPLEXES**

Stephen J. Lippard, and Patricia A. Blanconi, both of Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 1, 1985, Ser. No. 761,399

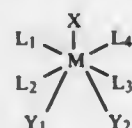
Int. Cl.<sup>4</sup> C07F 9/00

U.S. Cl. 556—12

9 Claims

I. A process for the formation of an isolable C<sub>2</sub> containing compound comprising the steps:

(a) reacting an early transition metal seven coordinate complex of the formula:



wherein;

M is an early transition metal selected from the group consisting of vanadium, niobium, tantalum, chromium, molybdenum, tungsten, manganese, technetium, and rhenium;

Y<sub>1</sub> and Y<sub>2</sub> are each independently selected from the group of linear carbon-containing ligands consisting of C≡O, CNR, NCR, —C≡CR, CN, C=S, CO<sub>2</sub> and CS<sub>2</sub>, wherein R is hydrogen, an alkyl group, or an aryl group, with the exception that Y<sub>1</sub> and Y<sub>2</sub> are not both CNR;L<sub>1</sub>, L<sub>2</sub>, L<sub>3</sub>, and L<sub>4</sub>, are each independently selected from ligands that are 2-electron donors;

X is halogen or pseudohalogen;

with a second metal complex of the formula:



wherein:

M' is a Lewis Acid selected from the group consisting of Ti, Zr, Hg, Al, Zn, Mg, and Na;

L<sub>1</sub>' and L<sub>2</sub>' are ligands selected from the group consisting of cyclic hydrocarbons which ensure a cis orientation of Y<sub>1</sub> and Y<sub>2</sub> groups upon reaction with Formula I above; in the presence of a sufficient quantity of a reducing agentselected to effect the formation of a complex wherein Y<sub>1</sub> and Y<sub>2</sub> are bound to both M and M'; and(b) reacting the species formed in step (a) with a sufficient quantity of a Lewis Acid such that an isolable species is formed, said species containing a new C<sub>2</sub> bond between the Y<sub>1</sub> and Y<sub>2</sub> carbon atoms bound to M.

4,683,316

**METHOD OF PREPARATION OF DITHIOCARBAMATE COMPLEXES OF MOLYBDENUM (VI)**

Gopal H. Singh, Houston, Tex., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jan. 2, 1986, Ser. No. 815,604

Int. Cl.<sup>4</sup> C07F 11/00

U.S. Cl. 556—38

13 Claims

I. A method for preparing a dihydrocarbyl substituted dithiocarbamate of molybdenum (VI) comprising the steps of:

(a) combining a salt of a dihydrocarbyl substituted dithiocarbamate, each of said dihydrocarbyl substitutions being the same or a different hydrocarbon radical selected from the group consisting of C<sub>1</sub>—C<sub>18</sub> straight and branched chain aliphatic radicals, C<sub>5</sub>—C<sub>8</sub> cycloalkyl radicals, alkyl substituted cycloalkyl radicals having from 1 to 3 carbon atoms in the alkyl group and from 5 to 7 carbon atoms in the cycloalkyl group, aryl and alkyl aryl radicals having from 1 to 4 carbon atoms in the alkyl portion thereof and 6 carbon atoms in the aryl portion thereof or both of said dihydrocarbyl substitutions may be a single cyclo or cycloalkyl radical having from about 5 to about 10 carbon atoms, said salt being selected from the group consisting of alkali metal salts, ammonium salts and substituted ammonium salts, wherein one or more of the hydrogen atoms of the ammonium ion is replaced with a hydrocarbon radical, selected from the same group as previously recited, an alkali metal molybdate and an organic acid in an inert atmosphere and at a temperature within the range from about —10° C. to about +25° C., the amount of organic acid present being sufficient to provide a pH within the range from about 5.0 to about 8.0; and

(b) recovering a dihydrocarbyl substituted dithiocarbamate of molybdenum (VI).

4,683,317

**PHOTOPOLYMERIZABLE ORGANIC COMPOSITIONS AND DIARYLIODONIUM SALTS USED THEREIN**

James V. Crivello, Clifton Park, and Julia L. Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 497,357, May 23, 1983, Pat. No. 4,529,490.

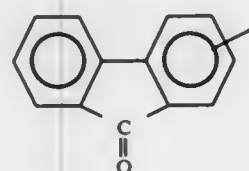
This application Apr. 8, 1985, Ser. No. 721,244

Int. Cl.<sup>4</sup> C07F 9/66, 9/00, 5/02

U.S. Cl. 556—64

5 Claims

I. Arylketone containing iodonium salts of the formula

where R is a C<sub>(6-13)</sub> monovalent aromatic hydrocarbon radical or halo substituted C<sub>(6-13)</sub> monovalent aromatic hydrocarbon radical and R<sup>1</sup> is a monovalent aryl ketone group which is attached to iodine to form a carbon-iodine linkage selected from the class consisting ofand X<sup>-</sup> is a counter ion selected from the class consisting of

tosylate, tetrafluoroborate, hexafluorophosphate, hexafluoroarsenate, and hexafluoroantimonate.

4,683,318

**HYDROPHOBIC, CRYSTALLINE, MICROPOROUS SILICEOUS MATERIALS OF REGULAR GEOMETRY**

Kenneth S. Defferes, Princeton, N.J., and Aaron A. Rosenblatt, New York, N.Y., assignors to The Scapas Technology Company, Inc., New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,460

Int. Cl.<sup>4</sup> C07F 5/06

U.S. Cl. 556—173

19 Claims

I. A hydrophobic microporous crystalline tectosilicate material of regular geometry comprising aluminum-free sites in a siliceous lattice that are characterized by the presence of about 1-4 associated moieties of the formula —SiOR wherein R is a substituent that is a weaker point electric source than aluminum.

4,683,319

**THERMAL STABILIZER FOR ORGANOPOLYSILOXANE OILS**

Makoto Yoshitake, and Keiichi Kishimoto, both of Tokyo, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1986, Ser. No. 917,328

Claims priority, application Japan, Nov. 7, 1985, 60-249743

Int. Cl.<sup>4</sup> C07F 7/10

U.S. Cl. 556—425

14 Claims

I. A composition comprising the reaction product of: (A) an organopolysiloxane which possesses at least 10 siloxane units and has the average unit formula



wherein R is a monovalent hydrocarbon group and a is 1.4 to 2.3 with (B) from 0.01 to 10 parts by weight of an aromatic aminophenol per 100 parts of said organopolysiloxane (A), in the presence of (C) from 0.001 to 1.0 parts by weight of a quaternary phosphonium hydroxide per 100 parts of said organopolysiloxane (A).

4,683,320

**NOVEL ORGANOPOLYSILOXANE, METHOD FOR THE PREPARATION THEREOF AND COMPOSITION CONTAINING THE SAME**

Yoshinori Hida, and Shohel Kozakai, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1986, Ser. No. 878,002

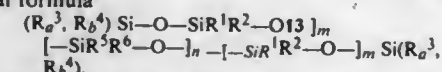
Claims priority, application Japan, Jun. 26, 1985, 60-139743

Int. Cl.<sup>4</sup> C07F 7/08

U.S. Cl. 556—453

7 Claims

I. An organopolysiloxane represented by the general structural formula

in which R<sup>1</sup> is a vinyl group, R<sup>2</sup> is a methyl group, R<sup>3</sup> and R<sup>4</sup> are each a monovalent hydrocarbon group, R<sup>5</sup> and R<sup>6</sup> are each monovalent hydrocarbon groups free from aliphatic unsaturation, a+b are each zero or a positive integer not exceeding 3 with the proviso that a+b is 3, m is a positive integer of at least 3 and n is a positive integer of at least 6, the —SiR<sup>1</sup>R<sup>2</sup>—O— units included within the square brackets including m units being connected together in an uninterrupted sequence and bonded directly to the terminal triorganosiloxy unit (R<sub>0</sub><sup>3</sup>, R<sub>0</sub><sup>4</sup>)SiO—.

4,683,321

**PREPARATION OF DIALKYLALCOXYSILANES AND RELATED COMPOUNDS**

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 27, 1986, Ser. No. 923,184

Int. Cl.<sup>4</sup> C07F 7/18

U.S. Cl. 556—478

5 Claims

I. A process for preparing a dialkylalcoxysilane, R<sup>1</sup>R<sup>2</sup>Si(OR<sup>3</sup>)<sub>2</sub>, said process comprising reacting an alkali metal aluminum tetraalkyl, MAIR<sup>4</sup>, with a silicon-containing reactant selected from the class consisting of:(i) tetraalkyl silicates, Si(OR<sup>3</sup>)<sub>4</sub>; and(ii) alkyltrialcoxysilanes, R<sup>2</sup>Si(OR<sup>3</sup>)<sub>3</sub>,wherein R<sup>1</sup> is an alkyl radical of 2-18 carbons, R<sup>2</sup> is an alkyl radical of 1-18 carbons, R<sup>3</sup> is an alkyl radical of 1-4 carbon atoms, and M is an alkali metal selected from lithium, sodium, and potassium.

4,683,322

**PROCESS FOR THE PRODUCTION OF METHOMYL OXIME**

Zohar Oren, Beer Sheva, Israel, assignor to Makhteshim Chemical Works Ltd., Beer Sheva, Israel

Filed Dec. 4, 1985, Ser. No. 805,424

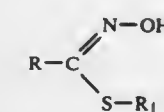
Claims priority, application Israel, Dec. 5, 1984, 73749

Int. Cl.<sup>4</sup> C07C 119/18

U.S. Cl. 558—3

8 Claims

I. A process for the production of alkyl thiolhydroxamates of the formula:

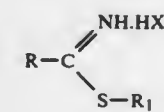


wherein

R is lower alkyl or lower methoxyalkyl;

R<sub>1</sub> is lower alkyl or cyanoalkyl, which comprises preparing a reaction mixture of:

(a) an anhydrous hydroxylamine salt selected from the group consisting of hydroxylamine hydrochloride, hydroxylamine hydrobromide, hydroxylamine sulfate, and hydroxylamine acid sulfate;

wherein R and R<sub>1</sub> are as defined; and HX is an inorganic acid selected from the group consisting of hydrogen chloride, hydrogen bromide, and hydrogen sulfate;

(c) a solvent selected from the group consisting of acetonitrile, isobutyronitrile, hydrocarbon solvents, and chlorinated hydrocarbon solvents, to give a reaction mixture of pH 0; adding thereto an ammonium, alkali or alkaline earth metal carbonate or bicarbonate and maintaining the mixture at a temperature between 25° and 50° C., mixing the reactants at an initial pH of no greater than zero and maintaining the reaction until the reaction is complete while keeping the pH below 2 to the end of the reaction, and recovering the alkyl thiolhydroxamate which is formed.

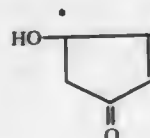


4,683,323  
**METHOD FOR INVERSION OF OPTICALLY ACTIVE 4-HYDROXY-2-CYCLOPENTENONES**  
 Masayoshi Minai, Moriyama, and Yoji Ueda, Izumi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 25, 1985, Ser. No. 758,801  
 Claims priority, application Japan, Jul. 31, 1984, 59-162739; Aug. 3, 1984, 59-164018; Sep. 25, 1984, 59-199995; Sep. 29, 1984, 59-204315

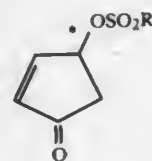
The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.  
 Int. Cl.<sup>4</sup> C07C 143/68

U.S. Cl. 558—52  
 1. A method for inversion of an optically active 4-hydroxy-2-cyclopentenone which comprises hydrolyzing under neutral or acid conditions a sulfonic acid ester of the raw material optically active 4-hydroxy-2-cyclopentenone having the following formula



wherein the mark \* shows asymmetric carbon atom representing (R)- or (S)-configuration, to obtain an optically active 4-hydroxy-2-cyclopentenone having a configuration as an antipode of the raw material above.

29.

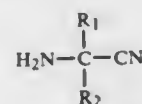


where R is a lower alkyl group, a trifluoromethyl group, a phenyl group, or a substituted phenyl group, which compound is a sulfonic acid ester of the optically active 4-hydroxy-2-cyclopentenone.

4,683,324  
**PROCESS FOR THE RESOLUTION OF CERTAIN RACEMIC AMINO NITRILES**  
 William H. Gastrock, Hightstown, and Peter J. Wepplo, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 25, 1982, Ser. No. 381,828  
 Int. Cl.<sup>4</sup> C07C 121/42

U.S. Cl. 558—354  
 1. A process for the concomitant resolution-racemization-resolution of racemic amino nitriles of formula



wherein R<sub>1</sub> is C<sub>1</sub>–C<sub>4</sub> alkyl; R<sub>2</sub> is C<sub>1</sub>–C<sub>4</sub> alkyl or C<sub>3</sub>–C<sub>6</sub> cycloalkyl provided that when R<sub>1</sub> and R<sub>2</sub> are selected from C<sub>1</sub>–C<sub>4</sub> alkyl, they cannot be the same, comprising: react molar amount of the above racemic aminonitrile with from 0.5 to 1.2 molar amount of resolved (+) or (–)-tartaric acid in the presence of a solvent of methanol, ethanol 2-propanol or a mixture of methanol and methylene chloride, at a temperature range of from +5° C. to +50° C., for a period of time from one hour to forty hours or until essentially most of the racemic aminonitrile

is converted to the optically active tartrate salt of the desired isomer.

4,683,325  
**LEUKOTRIENE ANTAGONISTS**  
 Richard Frenette; Joshua Rokach, both of Laval, Canada; Masatoshi Kakushima, Hiroshi, Japan, and Robert N. Young, Senneville, Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Continuation-in-part of Ser. No. 573,169, Jan. 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 546,013, Oct. 27, 1983, abandoned. This application Oct. 17, 1984, Ser. No. 661,560  
 Int. Cl.<sup>4</sup> C07C 149/40

U.S. Cl. 560—10  
 1. Methyl 5-(3-(4-acetyl-3-hydroxy-2-n-propylphenoxy)-propoxy)-1-indanone-2-acetate.

4,683,326  
**SOLVENT-FREE CRYSTALLIZATION OF PENTAERYTHRITOL TETRAKIS-[3-(3,5-DI-TERT-BUTYL-4-HYDROXY-PHENYL)PROPIONATE] AND THE NOVEL ALPHA-CRYSTALLINE FORM THEREOF**

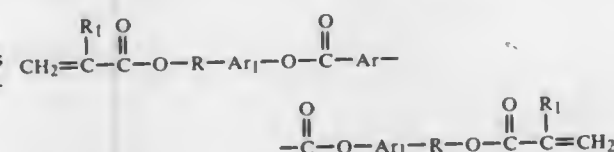
Ivan Orban, and Werner Fussenegger, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 10, 1986, Ser. No. 884,254  
 Claims priority, application Switzerland, Jul. 19, 1985, 3146185

Int. Cl.<sup>4</sup> C07C 69/76  
 U.S. Cl. 560—75  
 1. A process for the complete, solvent-free crystallization of pentaerythritol tetrakis-[3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate], which comprises seeding a melt of this compound in an extruder, a kneader or an internal mixer with at least 0.1 to 5% by weight, based on said melt, of the β-, δ- or λ-crystal modification of said compound, at a temperature in the range from 70° to 130° C.

4,683,327  
**ANISOTROPIC HEAT-CURABLE ACRYLIC TERMINATED MONOMERS**  
 Robert W. Stackman, Racine, Wis., assignor to Celanese Corporation, New York, N.Y.

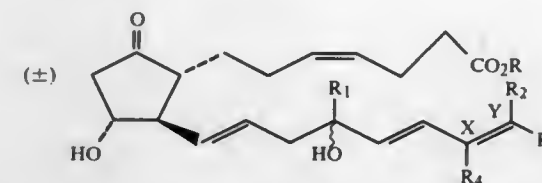
Filed Jun. 24, 1985, Ser. No. 748,293  
 Int. Cl.<sup>4</sup> C07C 69/82, 69/773  
 U.S. Cl. 560—86  
 1. Heat-curable acrylic-terminated monomer capable of forming an anisotropic melt phase of the formula:



wherein Ar is a divalent radical comprising at least one aromatic ring, Ar<sub>1</sub> is a divalent radical selected from the group, consisting of phenylene, naphthalene, biphenylene and mixtures thereof, R is selected from the group consisting of an alkylene group having from one to four carbon atoms and an oxyalkylene group having from one to four carbon atoms, and R<sub>1</sub> is selected from the group consisting of hydrogen and methyl, wherein hydrogen atoms present on the aromatic rings in said divalent radicals Ar and Ar<sub>1</sub> may be replaced by substitution selected from the group consisting of an alkyl group having one to four carbon atoms, an alkoxy group having one to four carbon atoms, halogen, phenyl, and mixtures thereof.

4,683,328  
**TETRAENYL PROSTAGLANDINS**  
 Paul W. Collins, Deerfield, and Alan F. Gasielki, Vernon Hills, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.  
 Filed Nov. 25, 1985, Ser. No. 801,370  
 Int. Cl.<sup>4</sup> C07C 177/00

U.S. Cl. 560—118  
 1. A compound of the formula



wherein R represents hydrogen or lower alkyl having 1 to 6 carbon atoms; R<sub>1</sub> represents hydrogen, vinyl, or lower alkyl having 1 to 4 carbon atoms and the wavy line represents R or S stereochemistry; R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are hydrogen or lower alkyl having 1 to 4 carbon atoms or R<sub>2</sub> and R<sub>3</sub> together with carbon Y form a cycloalkenyl having 4 to 6 carbon atoms or R<sub>3</sub> and R<sub>4</sub> together with carbons X and Y form a cycloalkenyl having 4 to 6 carbons.

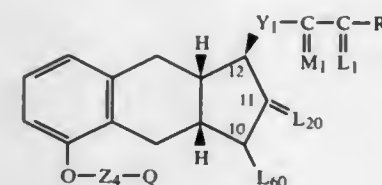
4,683,329  
**BENEFICIAL USE OF WATER IN CATALYTIC CONVERSION OF FORMAMIDES TO ISOCYANATES**  
 Velliyur N. M. Rao, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Apr. 16, 1986, Ser. No. 852,707  
 Int. Cl.<sup>4</sup> C07C 71/00

U.S. Cl. 560—338  
 1. An improved process for preparing isocyanates of the formula R—NCO, wherein R is C<sub>1</sub>–C<sub>3</sub> alkyl, by reacting a corresponding formamide of the formula R—NHCHO with oxygen or an oxygen-containing gas at a temperature from about 400° C. to about 800° C., in the presence of a silver catalyst, wherein the improvement comprises feeding water and formamide in vapor form to provide a reaction feed mixture having a mole ratio of water to formamide from about 0.1 to about 10.0.

4,683,330  
**INTERPHENYLENE CARBACYCLIN DERIVATIVES**  
 Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.  
 Continuation-in-part of Ser. No. 587,337, Mar. 8, 1984, abandoned. This application Jan. 11, 1985, Ser. No. 690,804  
 Int. Cl.<sup>4</sup> C07C 177/00

U.S. Cl. 560—51  
 1. A compound of the formula:



wherein Q is  
 (1) —COOR<sub>1</sub>, wherein R<sub>1</sub> is  
 (a) hydrogen;  
 (b) (C<sub>1</sub>–C<sub>12</sub>) alkyl;  
 (c) (C<sub>3</sub>–C<sub>10</sub>) cycloalkyl;  
 (d) (C<sub>7</sub>–C<sub>13</sub>) aralkyl;  
 (e) phenyl, optionally substituted with one, 2 or 3 chloro or (C<sub>1</sub>–C<sub>3</sub>) alkyl;  
 (f) phenyl substituted in the para position by

(i) —NHCOR<sub>25</sub>,  
 (ii) —COR<sub>26</sub>,  
 (iii)



or  
 (iv) —CH=N—NHCONH<sub>2</sub> wherein R<sub>25</sub> is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH<sub>2</sub>; R<sub>26</sub> is methyl, phenyl, —NH<sub>2</sub>, or methoxy; R<sub>54</sub> is phenyl or acetamidophenyl; inclusive; or  
 (g) a pharmacologically acceptable cation;  
 (2) —CH<sub>2</sub>OH;  
 (3) —COL<sub>4</sub>, wherein L<sub>4</sub> is  
 (a) amino of the formula —NR<sub>51</sub>R<sub>52</sub> wherein R<sub>51</sub> and R<sub>52</sub> are

(i) hydrogen,  
 (ii) (C<sub>1</sub>–C<sub>12</sub>) alkyl,  
 (iii) (C<sub>3</sub>–C<sub>10</sub>) cycloalkyl,  
 (iv) (C<sub>7</sub>–C<sub>12</sub>) aralkyl,  
 (v) phenyl, optionally substituted with one 2 or 3 chloro, (C<sub>1</sub>–C<sub>3</sub>) alkyl, hydroxy, carboxy, (C<sub>2</sub>–C<sub>5</sub>) alkoxy, carbonyl, or nitro,  
 (vi) (C<sub>2</sub>–C<sub>5</sub>) cyanoalkyl,  
 (vii) (C<sub>2</sub>–C<sub>5</sub>) carboxyalkyl,  
 (viii) (C<sub>2</sub>–C<sub>5</sub>) carbamoylalkyl,  
 (ix) (C<sub>3</sub>–C<sub>6</sub>) acetylalkyl,  
 (x) (C<sub>7</sub>–C<sub>11</sub>) benzoalkyl, optionally substituted by one, 2 or 3 chloro, (C<sub>1</sub>–C<sub>3</sub>) alkyl, hydroxy, (C<sub>1</sub>–C<sub>3</sub>) alkoxy, carboxy, (C<sub>2</sub>–C<sub>5</sub>) alkoxy carbonyl, or nitro,  
 (xi) pyridyl, optionally substituted by one, 2 or 3 chloro, (C<sub>1</sub>–C<sub>3</sub>) alkyl, or (C<sub>1</sub>–C<sub>3</sub>) alkoxy,  
 (xii) (C<sub>6</sub>–C<sub>9</sub>) pyridylalkyl optionally substituted by one, 2 or 3 chloro, (C<sub>1</sub>–C<sub>3</sub>) alkyl, hydroxy, or (C<sub>1</sub>–C<sub>3</sub>) alkoxy,  
 (xiii) (C<sub>1</sub>–C<sub>4</sub>) hydroxyalkyl,  
 (xiv) (C<sub>1</sub>–C<sub>4</sub>) dihydroxyalkyl,  
 (xv) (C<sub>1</sub>–C<sub>4</sub>) trihydroxyalkyl, with the proviso that not more than one of R<sub>51</sub> and R<sub>52</sub> is other than hydrogen or alkyl;

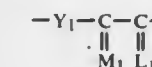
(b) cycloamino selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino, hexamethylenimino, pyrrolino, or 3,4-didehydropiperidinyl optionally substituted by one or 2 (C<sub>1</sub>–C<sub>12</sub>) alkyl of one to 12 carbon atoms, inclusive;  
 (c) carbonylamino of the formula —NR<sub>53</sub>COR<sub>51</sub> wherein R<sub>53</sub> is hydrogen or (C<sub>1</sub>–C<sub>4</sub>) alkyl and R<sub>51</sub> is other than hydrogen, but otherwise defined as above;  
 (d) sulfonylamino of the formula —NR<sub>53</sub>SO<sub>2</sub>R<sub>51</sub>, wherein R<sub>51</sub> and R<sub>53</sub> are defined in (c);  
 (4) —CH<sub>2</sub>NL<sub>2</sub>L<sub>3</sub> wherein L<sub>2</sub> and L<sub>3</sub> are hydrogen or (C<sub>1</sub>–C<sub>4</sub>) alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when X<sub>1</sub> is —CH<sub>2</sub>NL<sub>2</sub>L<sub>3</sub>;  
 (5) —CN;

wherein Z<sub>4</sub> is —CH<sub>2</sub>—, —CH<sub>2</sub>CH<sub>2</sub>—, —CF<sub>2</sub>—, or —CH<sub>2</sub>CF<sub>2</sub>—;

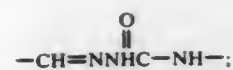
wherein L<sub>20</sub> is α-OH,β-H; α-H,β-OH, H,H; α-CH<sub>3</sub>, β-H; α-CH<sub>2</sub>OH,β-H; =O; or =CH<sub>2</sub>; wherein L<sub>60</sub> is hydrogen or L<sub>20</sub> and L<sub>60</sub> taken together form a double bond between positions 10 and 11;

wherein Y<sub>1</sub> is —CH<sub>2</sub>CH<sub>2</sub>—, —SCH<sub>2</sub>—, —C≡C—, trans —CH=CH—, or cis —CH=CH—;

wherein



taken together is

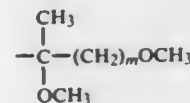


wherein  $M_1$  is  $\alpha\text{-H}:\beta\text{-H}$ ;  $=\text{O}$ ;  $\alpha\text{-OH}:\beta\text{-R}_5$ ; or  $\alpha\text{-R}_5:\beta\text{-OH}$ ; wherein  $R_5$  is hydrogen or methyl; wherein  $L_1$  is

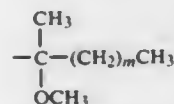
- (1)  $\alpha\text{-R}_3:\beta\text{-R}_4$ ,  $\alpha\text{-R}_4:\beta\text{-R}_3$ , or mixtures thereof wherein  $R_3$  and  $R_4$  are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of  $R_3$  and  $R_4$  is fluoro only when the other is hydrogen or fluoro;  
 (2) or when  $M_1$  is  $\alpha\text{-H}:\beta\text{-H}$   $L_1$  is  $\alpha\text{-OH}:\beta\text{-R}_3$ ,  $\alpha\text{-R}_3:\beta\text{-OH}$ ; or a mixture of  $\alpha\text{-OH}:\beta\text{-R}_3$  and  $\alpha\text{-R}_3:\beta\text{-OH}$  wherein  $R_3$  is hydrogen, methyl, vinyl, or ethynyl;  
 wherein  $R_7$  is  $-(\text{CH}_2)_m\text{OCH}_3$ , wherein  $m$  is an integer from 2 to 5, inclusive and said group is straight or branched; or wherein



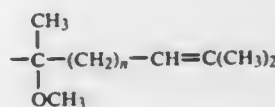
taken together is  
 (1)



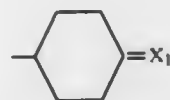
wherein  $m$  is an integer of from 2 to 5 inclusive;  
 (2)



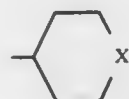
wherein  $m$  is an integer of from 2 to 5 inclusive;  
 (3)



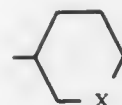
wherein  $n$  is an integer of from 1 to 4 inclusive; or  
 (4)



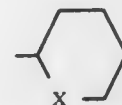
wherein  $X_1$  is  $=\text{O}$ ;  $\text{F}$ ;  $\text{F}$ ;  $\alpha\text{-H}:\beta\text{-OH}$  and  $\alpha\text{-OH}:\beta\text{-H}$ ;  
 (5)



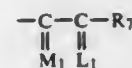
wherein  $X$  is  $-\text{O}-$ ,  $-\text{S}-$ , or  $-\text{NH}-$ ;  
 (6)



wherein  $X$  is as defined above;  
 (7)



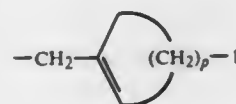
wherein  $X$  is as defined above;  
 (8) phenyl optionally substituted with one, 2 or 3 chloro, fluoro, trifluoromethyl,  $\text{C}_1\text{-C}_3$  alkyl, or  $\text{C}_1\text{-C}_3$  alkoxy with the proviso that not more than two substituents are other than alkyl;  
 wherein



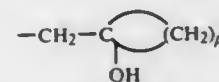
taken together is  
 (1)



wherein  $p$  is an integer of from 3 to 7 inclusive;  
 (2)



wherein  $p$  is as defined above;  
 (3)



wherein  $p$  is as defined above; and the  
 (4) benzyl optionally substituted on the aromatic ring with one, 2 or 3 chloro, fluoro, trifluoromethyl,  $\text{C}_1\text{-C}_3$  alkyl, or  $\text{C}_1\text{-C}_3$  alkoxy with the proviso that not more than two substituents are other than alkyl; individual optical enantiomers and salts thereof.

4,683,331

#### OMEGA-(2,4-DIHALOBIPHENYL) OXO ALKANOIC ACIDS

Miroslav Kuchar; Bohumila Brunova; Jaroslava Grimova, and Eva Maturova, all of Prague, Czechoslovakia, assignors to Spofa spojene podniky pro zdravotnickou, Prague, Czechoslovakia

Filed Jul. 29, 1985, Ser. No. 760,338

Claims priority, application Czechoslovakia, Aug. 31, 1984, 6586-84

Int. Cl.<sup>4</sup> C07C 59/86

U.S. Cl. 562-459

4 Claims

1. Omega-(2',4'-dihalobiphenyl)oxo alkanic acids of the formula

4,683,333

#### PROCESS FOR PREPARING SUBSTITUTED BIS-ETHERS

Thomas R. Britt, Denham Springs, and Willie C. Burton, Baton Rouge, all of La., assignors to The Dow Chemical Company, Midland, Mich.

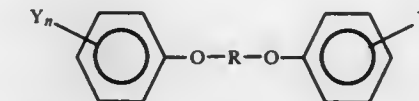
Filed Nov. 22, 1985, Ser. No. 800,885

Int. Cl.<sup>4</sup> C07C 85/24, 85/00

U.S. Cl. 564-414

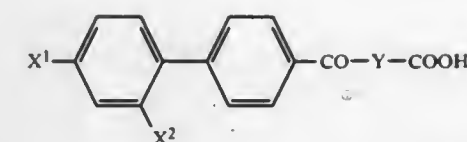
23 Claims

1. An aqueous process for preparing a water insoluble substituted bis-ether of the formula



wherein  $R$  is a divalent alkyl radical having from about 2 to about 40 carbon atoms, a divalent cycloalkyl radical having from about 3 to about 8 carbon atoms, a divalent bridged ring aliphatic radical having from about 5 to about 10 carbon atoms, a divalent aromatic radical, a divalent alkylaryl radical having from about 7 to about 30 carbon atoms or a divalent fused ring aromatic compound having from about 10 to about 14 carbon atoms;  $Y$  is a monovalent radical selected from the group consisting of an amino radical, a halogen radical, a hydroxy radical, an alkyl radical of 1 to 30 carbon atoms, an aryl radical of 6 to 14 carbon atoms, a cycloalkyl radical having from 3 to 8 carbon atoms, an alkylaryl radical having from 7 to 30 carbon atoms, a substituted alkylaryl radical, a substituted aryl radical or a substituted cycloalkyl radical; and  $n$  is an integer of from about 1 to about 5 inclusive, which process comprises:

- (a) refluxing an admixture comprising (1) an organic dihalo compound, (2) an aqueous solution of a phenol which is substituted with at least one halogen-reactive moiety, and (3) an aqueous base solution, for a period of time sufficient to form an intermediate compound;  
 (b) hydrolyzing said intermediate compound with a mineral acid; and  
 (c) neutralizing said hydrolyzed compound with a base to provide the substituted bis-ether.



wherein  $X^1$  and  $X^2$  are each selected from the group consisting of a fluorine atom and a chlorine atom and  $Y$  is a bivalent hydrocarbon chain selected from the group consisting of  $-\text{CH}_2-\text{CH}=\text{CH}_2$  and  $(\text{CH}_2)_3$ .

4,683,332

#### PARA-NITRODIPHENYLAMINE SYNTHESIS

Budd H. Sturm, Hartsville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

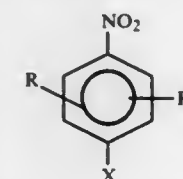
Filed May 20, 1985, Ser. No. 735,513

Int. Cl.<sup>4</sup> C07C 85/02

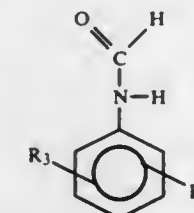
U.S. Cl. 564-414

11 Claims

1. A process wherein (1) a para-halonitrobenzene conforming to the following structural formula:



wherein  $R$  and  $R_1$  are selected from the group consisting of hydrogen radicals and alkyl radicals of 1 to 9 carbon atoms and wherein  $X$  is a halogen selected from the group consisting of chlorine and bromine; is reacted with (2) a formanilide of the following general structural formula:



wherein  $R_2$  and  $R_3$  are selected from the group consisting of hydrogen radicals, alkyl radicals of 1 to 9 carbon atoms and alkoxy radicals of 1 to 9 carbon atoms and cycloalkyl radicals of 5 to 6 carbon atoms; in the presence of (3) a neutralizing agent, selected from the group consisting of alkali metal salts, oxides of alkali metal salts and alkali metal hydroxides; (4) at a temperature of  $120^\circ\text{--}250^\circ\text{C}$ ; (5) at a pressure from atmospheric to about 300 kPa; (6) with an excess of formanilide; wherein the improvement is characterized in that a catalyst is added to the formanilide/p-halonitrobenzene reaction selected from the group consisting of (a) zinc (II) salts, (b) zinc (II) oxides, (c) zinc (II) sulfides and (d) organometallic zinc (II) compounds.

4,683,334

#### MODIFIED 8-RING ZEOLITES AS CATALYSTS FOR CONVERSION OF METHANOL AND AMMONIA TO DIMETHYLAMINE

Horacio E. Bergna, Wilmington, Del.; David R. Corbin, West Chester, Pa., and George Sonnichsen, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 30, 1985, Ser. No. 729,161

Int. Cl.<sup>4</sup> C07C 85/02, 85/06

U.S. Cl. 564-474

26 Claims

1. A process for producing dimethylamine, comprising reacting methanol and/or dimethylether and ammonia, in amounts sufficient to provide a carbon/nitrogen (C/N) ratio from about 0.2 to about 1.5, and at a temperature from about  $250^\circ\text{C}$ . to about  $450^\circ\text{C}$ ., in the presence of a catalytic amount of a modified acidic zeolite selected from the group consisting of chabazite, erionite, ZK-5, and rho, the zeolite having been modified by treatment with one or more compounds containing at least one element selected from the group consisting of silicon, aluminum, phosphorus, and boron, to deposit thereon at least 0.05 weight percent of the element.



4,683,335

**CATALYTIC PROCESS FOR THE PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES WITH TUNGSTOPHOSPHORIC ACID-OR MOLYBDOPHOSPHORIC ACID-ON-TITANIA CATALYSTS**

John F. Knifton, and Neal J. Grice, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 18, 1986, Ser. No. 909,042

Int. Cl.<sup>4</sup> C07C 85/06

U.S. Cl. 564—480

18 Claims

1. In a method wherein monoethanolamine is reacted with ethylenediamine in a reaction zone in the presence of a phosphorus-containing catalyst to provide an essentially noncyclic product comprising polyethylenepolyamines, the improvement for conducting said process on a continuous basis which comprises:

- using, as a catalyst, titania pellets having deposited thereon a minor amount of a tungstophosphoric acid or a molybdophosphoric acid or a mixture thereof;
- continuously contacting a mixture of ethylenediamine and monoethanolamine in a molar ratio of about 1 to 5 moles of ethylenediamine per mole of monoethanolamine with said pelleted catalyst at a temperature of about 250° to about 400° C. and a pressure of about 500 to about 3000 psig. to obtain an essentially noncyclic reaction product.

4,683,336

**PREPARATION OF AMINES**

Clarence W. Blackhurst, 2801 Snouffer Rd., Worthington, Ohio 43085

Filed Dec. 13, 1985, Ser. No. 808,693

Int. Cl.<sup>4</sup> C07C 85/06

U.S. Cl. 564—480

24 Claims

1. A process for producing amines which comprises reacting an aliphatic alcohol or an aliphatic aldehyde with an aminating agent selected from the group of ammonia, primary amine, and secondary amine in the liquid phase in the presence of a catalytic amount of an unsupported catalyst comprising copper carbonate and a carbonate of a metal selected from the group of nickel, cobalt, and mixtures thereof.

4,683,337

**PROCESS FOR THE RECOVERY OF ETHYLENE AMINES FROM AN AQUEOUS SOLUTION**

Frederik J. Budde, Hengelo, Netherlands, assignor to Akzo nv, Arnhem, Netherlands

Filed Nov. 21, 1983, Ser. No. 553,971

Claims priority, application Netherlands, Nov. 23, 1983, 8204546

Int. Cl.<sup>4</sup> C07G 85/26

U.S. Cl. 564—498

5 Claims

1. A process for the recovery of ethylene amines from an aqueous solution thereof by extracting the solution with a water-immiscible, aliphatic, 4 to 10 carbon atoms-containing alcohol and purifying the resulting amine-containing extract liquid, characterized in that the extract liquid is purified by the absorption therein of carbon dioxide with conversion of the amines into carbamates, which are dissolved in a limited amount of water such that the concentration on the basis of amine is at least twice the concentration in the original aqueous solution, after which the ethylene amines are recovered from the resulting carbamate solution by decarbonation and dehydration in a manner known in itself.

4,683,338

**PROCESS FOR THE PREPARATION OF BIS-PHOSPHINEOXIDE COMPOUNDS**

Richard L. Wife, Johannes J. M. Snel, and Aart B. Van Oort, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 13, 1985, Ser. No. 797,549

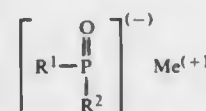
Claims priority, application United Kingdom, Nov. 22, 1984, 8429537

Int. Cl.<sup>4</sup> C07F 9/53

U.S. Cl. 568—12

10 Claims

1. A process for the preparation of phenylene-bis-phosphineoxide compounds which comprises reacting in the presence of a polar aprotic solvent difluorobenzene compound with a compound of the general formula



wherein Me is an alkali metal and R<sup>1</sup> and R<sup>2</sup> each independently represents an alkyl-, aryl-, alkaryl- or aralkyl group, or R<sup>1</sup> and R<sup>2</sup> together form an alkylene group.

4,683,339

**2,2-BIS-(2-PERFLUOROALKYLETHYLTHIO)ACETALDEHYDES AND PROCESS FOR PRODUCTION THEREOF**

Brigitte Bertaina; Aimé Cambon, both of Nice, and André Lantz, Vernaison, all of France, assignors to Atochem, France

Filed Nov. 26, 1985, Ser. No. 801,791

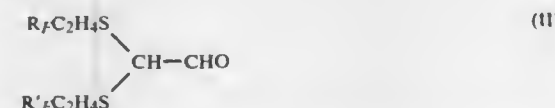
Claims priority, application France, Nov. 28, 1984, 84 18106

Int. Cl.<sup>4</sup> C07C 149/16

U.S. Cl. 568—41

4 Claims

1. 2,2-bis-(2-Perfluoroalkylethylthio)acetaldehydes having the formula:



wherein R<sub>f</sub> and R'<sub>f</sub> are the same or different and are a straight or branched perfluorinated chain, C<sub>n</sub>F<sub>2n+1</sub>, n being from one to 20.

4,683,340

**BIS(BENZILYLOXY) COMPOUNDS**

Patricia M. Lindley, Springfield, Va.; Bruce A. Reinhardt, New Carlisle, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

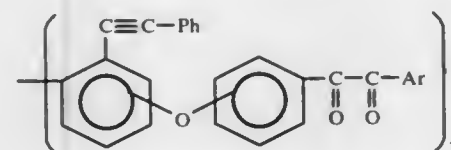
Filed Oct. 8, 1986, Ser. No. 916,964

Int. Cl.<sup>4</sup> C07C 49/794

U.S. Cl. 568—331

4 Claims

1. A bis(benzilyloxy) compound of the general formula:



wherein Ph is —C<sub>6</sub>H<sub>5</sub> and Ar is Ph, —C<sub>6</sub>H<sub>4</sub>Br, —C<sub>6</sub>H<sub>4</sub>CH<sub>3</sub> or —C<sub>6</sub>H<sub>4</sub>C<sub>2</sub>H<sub>5</sub>.

4,683,341

**OPTICAL RESOLUTION OF OXYCYCLOPENTENONE**

Kunio Ishii, Hasuda, and Tohru Shibata, Himeji, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Dec. 12, 1985, Ser. No. 808,593

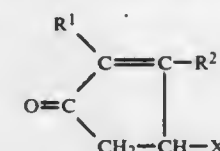
Claims priority, application Japan, Dec. 19, 1984, 59-266294

Int. Cl.<sup>4</sup> C07C 45/79

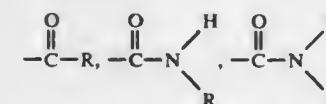
U.S. Cl. 568—366

10 Claims

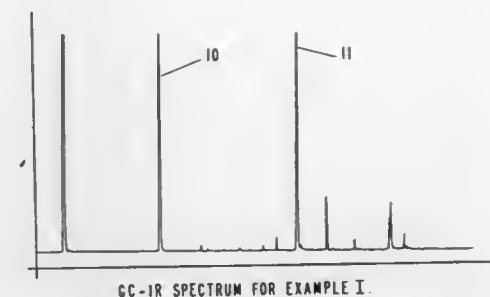
1. A method for chromatographically separating a mixture of optically active enantiomers having the formula



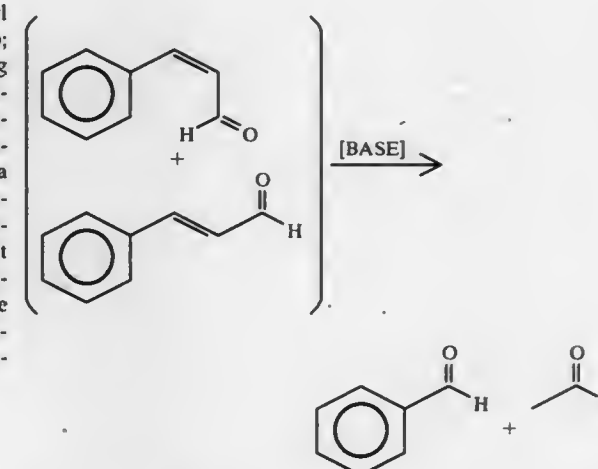
in which R<sup>1</sup> is hydrogen, alkyl having 1 to 10 carbons or alkyl having 1 to 10 carbon atoms and containing an aromatic group; R<sup>2</sup> is hydrogen, alkyl having 1 to 10 carbon atoms, alkyl having 1 to 10 carbon atoms and containing an aromatic group, unsaturated aliphatic group having 1 to 10 carbon atoms or unsaturated aliphatic group having 1 to 10 carbon atoms and containing an aromatic group; and X is OH or OR<sup>3</sup>, wherein R<sup>3</sup> is a protective group for protecting a hydroxyl group, which comprises the steps of: under chromatographic separation conditions, passing said mixture with an eluant therefor into contact with a resolving agent comprising an optically active polysaccharide or a derivative thereof in which at least part of the hydrogen atoms on the hydroxyl groups of the polysaccharide are replaced by a member selected from the group consisting of



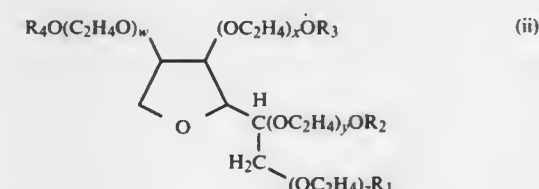
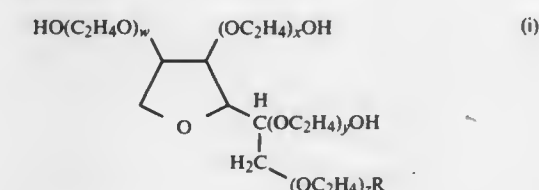
and R, wherein R is an aliphatic group having 1 to 3 carbon atoms, an alicyclic group having 3 to 8 carbon atoms, an aromatic group having 4 to 20 carbon atoms, or a heteroaromatic group having 4 to 20 carbon atoms.



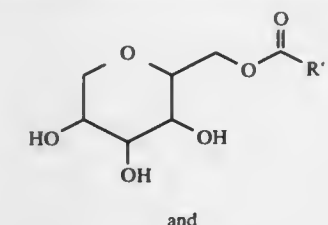
GC-IR SPECTRUM FOR EXAMPLE I.



and simultaneously or subsequently steam distilling the reaction product from the reaction mass, the reaction being carried out in the presence of a nonionic sorbitan derivative emulsifier selected from the group consisting of compositions defined according to the structures:



mixtures of materials having the structures: (iii)



and

4,683,342

**PROCESS FOR PREPARING NATURAL BENZALDEHYDE AND ACETALDEHYDE, NATURAL BENZALDEHYDE AND ACETALDEHYDE COMPOSITIONS, PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC UTILITIES THEREFOR**

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven, and Arthur L. Liberman, Highlands, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

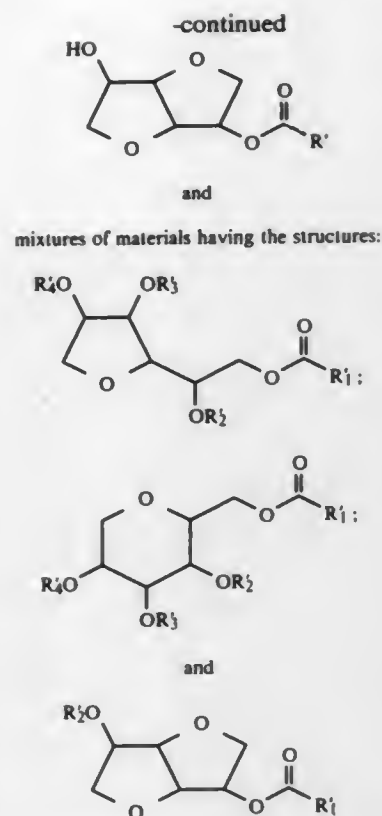
Continuation-in-part of Ser. No. 780,298, Sep. 26, 1985, Pat. No. 4,617,419. This application Aug. 13, 1986, Ser. No. 896,174

Int. Cl.<sup>4</sup> C07C 45/72

U.S. Cl. 568—464

4 Claims

1. A process for preparing a composition of matter containing a substantial quantity of natural benzaldehyde and/or acetaldehyde comprising the step of carrying out a retro-aldol reaction on naturally occurring cinnamaldehyde in the presence of base, a natural or food grade nonionic emulsifier and an inert solvent selected from the group consisting of water and mixtures of water and C<sub>1</sub>-C<sub>5</sub> alkanols and in the absence of any other reagents according to the reaction:



wherein R represents a fatty acid moiety selected from the group consisting of laurate, palmitate, stearate, oleate and tallate; wherein R' represents a fatty acid moiety selected from the group consisting of laurate, palmitate, stearate, oleate and tallate; wherein one, two, three or four of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> represents the same or different laurate, palmitate, stearate, oleate or tallate and the other of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> represents hydrogen; and wherein one, two, three or four of R<sub>1</sub>', R<sub>2</sub>', R<sub>3</sub>' and R<sub>4</sub>' represents the same or different laurate, palmitate, stearate, oleate or tallate; and wherein W + X + Y + Z is in the range of from 4 up to 80, and wherein the reaction is carried out at from about 0.2 up to about 10 atmospheres; at a temperature of from about 40° C. up to about 150° C. and for a period of time of from about 5 hours up to about 80 hours.

4,683,343

**ETHER-CONTAINING MIXTURES IN FLEXIBLE PVC**  
Jean A. Hanin, Rixensart, and Pierre E. Verrier, Brussels, both of Belgium, assignors to Exxon Research & Engineering Co., Florham Park, N.J.  
Division of Ser. No. 803,085, Nov. 27, 1985, Pat. No. 4,656,215.  
This application Dec. 5, 1986, Ser. No. 938,408  
Claims priority, application United Kingdom, Nov. 30, 1984, 8430224

Int. Cl.<sup>4</sup> C07C 43/30

U.S. Cl. 568—594

7 Claims

1. An ether rich hydroformylation-coproduct mixture comprising ether, ether-alcohol and acetal components which is obtained by hydrogenation and subsequent distillation of the crude product derived from the catalytic hydroformylation of a C<sub>6</sub>-C<sub>12</sub> olefinic feedstock with synthesis gas to yield a bottoms product, followed by catalytic steam cracking of such bottoms product at 260°-380° C. using as catalyst an active metal oxide or pseudo metal oxide.

4,683,344  
**PROCESS FOR THE PREPARATION OF AN ORGANOMAGNESIUM COMPOUND**  
Robert B. Hodek, Gibsonia, and Jerome A. Seiner, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.  
Continuation-in-part of Ser. No. 575,089, Jan. 30, 1984, Pat. No. 4,508,646. This application Jan. 11, 1985, Ser. No. 690,443  
Int. Cl.<sup>4</sup> C07C 39/00, 39/02, 39/04

U.S. Cl. 568—716

7 Claims

(iv) 1. A process for the preparation of a pulverulent organomagnesium compound comprising bringing together into intimate admixture a particulate hydroxyl functional material with an organomagnesium-containing material at a temperature below the melting point of the hydroxyl functional material but at a temperature sufficient to convert at least a portion of the hydroxyl functional material to said pulverulent organomagnesium compound.

4,683,345  
**PREPARATION AND USE OF SUBSTITUTED BISPHENOLS**  
Guy Lejeune, Neuilly-Sur-Seine, France, assignor to Colette Nouvel, France  
Filed Apr. 16, 1986, Ser. No. 852,409  
Claims priority, application France, Apr. 16, 1985, 85 05681  
Int. Cl.<sup>4</sup> C07C 39/16

U.S. Cl. 568—726

17 Claims

1. In the process of preparation of a bisphenol by condensing a phenol, carrying a halogen substituent and alkyl groups, with an aldehyde in a solvent for the phenol in the presence of sulfuric acid, the improvement which comprises the proportion of acid with respect to the phenol being 21 to 171 g H<sub>2</sub>SO<sub>4</sub> per mole of phenol such that, after the condensation and absorption by the acid of the water eliminated, the acid contains less than 50% of water by weight, and the reaction takes place at a temperature in the range from 40° to 65° C.

4,683,346  
**SELECTIVE PREPARATION OF MONOHALOHYDROQUINONES**  
Serge Ratton, Villefontaine, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France  
Filed Dec. 19, 1985, Ser. No. 810,753  
Claims priority, application France, Dec. 19, 1984, 84 19748  
Int. Cl.<sup>4</sup> C07C 39/10

U.S. Cl. 568—765

11 Claims

1. A process for the essentially selective nascent chlorination of hydroquinone to monochlorohydroquinone, comprising reacting hydroquinone with an aqueous solution of hydrochloric acid and hydrogen peroxide, in the presence of an ether solvent for, and inert to, said hydroquinone.

4,683,347  
**GLYCERINE PURIFICATION PROCESS**  
Zaida Diaz, Houston, and James H. Miller, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.  
Filed Jun. 23, 1986, Ser. No. 877,051  
Int. Cl.<sup>4</sup> C07C 29/86, 31/22

U.S. Cl. 568—869

13 Claims

1. A process for reducing the level of acetals and/or ketals in glycerine which contains acetals and/or ketals, which process comprises:  
(a) extracting said glycerine in an extraction zone with CO<sub>2</sub> at conditions above or near the critical point of CO<sub>2</sub> to obtain (1) an extract comprising CO<sub>2</sub>, acetals and/or ketals and a minor amount of glycerine, and (2) glycerine having reduced acetals and/or ketals content, and  
(b) separating said extract from said glycerine having reduced acetals and/or ketals content.

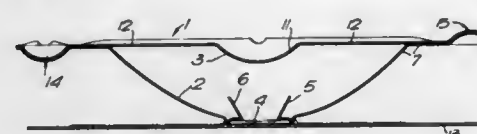
## ELECTRICAL

4,683,348  
**SOLAR CELL ARRAYS**  
Alastair N. Pidgeon, Turin, Italy, and Arthur L. Webb, Guildford, England, assignors to The Marconi Company Limited, England  
Filed Apr. 23, 1986, Ser. No. 855,513  
Claims priority, application United Kingdom, Apr. 26, 1985, 8510706

U.S. Cl. 136—246

Int. Cl.<sup>4</sup> H01L 25/02

6 Claims



1. A rigid, self-supporting construction for a solar cell array, comprising:  
(a) a first unitary member composed of carbon fiber composite material, said first member having a plurality of paraboloid-shaped portions spaced apart of, and integrally interconnected with, one another, said paraboloid-shaped portions having reflecting surfaces located in the path of incident light and serving as primary reflectors to reflect the incident light;  
(b) a second unitary member composed of carbon fiber composite material and rigidly secured to the first unitary member, said second member having a plurality of hyperboloid-shaped portions spaced apart of, and integrally interconnected with, one another, said hyperboloid-shaped portions being respectively positioned within the paraboloid-shaped portions and having reflecting surfaces located in the path of the light reflected from the primary reflectors and serving as secondary reflectors to redirect the light impinging thereon;  
(c) a generally planar, heat radiator member composed of carbon-carbon material, said radiator member being rigidly secured to the first and second unitary members to form a rigid, self-supporting assembly therewith, said radiator member supporting a plurality of solar cells respectively positioned within the paraboloid-shaped portions in the path of the light redirected by the secondary reflectors to generate electrical energy, said radiator member having a high thermal conductivity for conveying unwanted heat away from the solar cells; and  
(d) a plurality of light catcher cones each mounted between the members for rigidifying the assembly and surrounding respective solar cells to permit off-pointing tolerance.

4,683,349  
**ELASTIC ELECTRIC CABLE**  
Norichika Takebe, 11-go, 5-ban, Taiheji 2-chome, Kashiwara-shi, Osaka, Japan  
Filed Sep. 25, 1985, Ser. No. 779,962  
Claims priority, application Japan, Nov. 29, 1984, 59-252484; Jan. 21, 1985, 60-7126[U]

U.S. Cl. 174—69

Int. Cl.<sup>4</sup> H01B 7/06

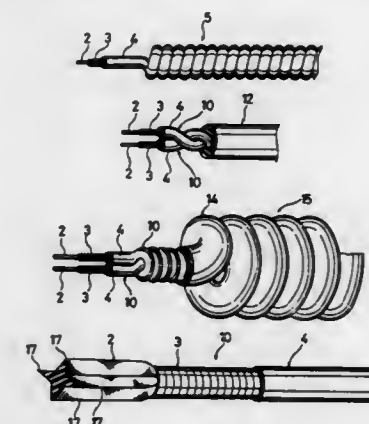
57 Claims

1. An elastic electric cable comprising an elastic and deformable linear core member, wherein said core member is provided with longitudinally protrusive ribs at the periphery thereof, said ribs in cross section being generally triangular, trapezoidal or arcuate in shape, a conductor spirally wound around said core member, and an insulator made of an elastic and deformable material covering the outer surface of said conductor.  
6. An elastic electric cable comprising an elastic and deformable linear core member wherein said core member is provided with longitudinally protrusive ribs at the periphery thereof, said ribs in cross section being generally triangular, trapezoidal or arcuate in shape, a conductor spirally wound around said core member, and an insulator made of an elastic and deformable material covering the outer surface of said wound conductor.

tor, the entire body thereof being wound at close pitches like a coiled spring.

13. An elastic electric cable comprising an elastic and deformable linear core member wherein said core member is provided with longitudinally protrusive ribs at the periphery thereof, said ribs in cross section being generally triangular, trapezoidal or arcuate in shape, a conductor spirally wound around said core member, an insulator made of elastic and deformable material covering the outer surface of said spirally wound conductor, an outer conductor for noise prevention spirally wound around said insulator, and a sheath made of an elastic and deformable material covering said outer conductor.

33. An elastic electric cable comprising core cables each composed of an elastic and deformable linear core member wherein said core member is provided with longitudinally protrusive ribs at the periphery thereof, said ribs in cross section being generally triangular, trapezoidal or arcuate in shape,



a conductor spirally wound around said core member, and an insulator made of an elastic and deformable material covering said wound conductor, in which a plurality of said core cables are twisted together and a sheath made of an elastic, and deformable material is provided covering the outer periphery of said twisted core cables.

52. An elastic electric cable comprising elastic and deformable core cables each composed of an elastic and deformable linear core member wherein said core member is provided with longitudinally protrusive ribs at the periphery thereof, said ribs in cross section being generally triangular, trapezoidal or arcuate in shape, a conductor spirally wound around said core member, and an insulator made of an elastic and deformable material covering the outer surface of said wound conductor, in which a plurality of core cables are spirally wound and a sheath made of an elastic and deformable material is provided around said core cables, the entire body thereof being spirally wound at close pitches like a coiled spring.

4,683,350  
**BUSHING FOR BX CABLE**  
Lucien C. Ducret, 9 Tod's Driftway, Old Greenwich, Conn. 06870  
Filed Oct. 22, 1986, Ser. No. 922,061  
Int. Cl.<sup>4</sup> H01B 17/58

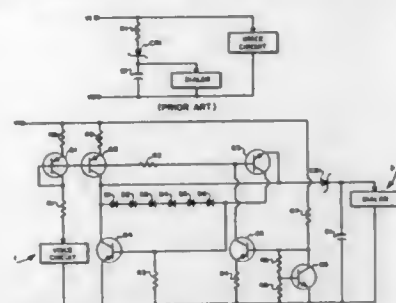
U.S. Cl. 174—83

14 Claims

1. A protective bushing for wires projecting from an armored cable end having a helical edge portion and an edge portion parallel to the cable longitudinal axis, said bushing comprising a cylindrical tubular body portion adapted to be fitted within said end of said cable between the armor and said wires, a radially outwardly projecting rim at an upper end of said body portion, and a raised flange integral with said body and rim and extending at least partially circumferentially



around the body portion, said flange having a lower surface adapted to rest against said helical edge portion of the armored



cable end when said body portion is fitted within said cable end.

#### 4,683,351 IMPEDANCE MAINTENANCE CIRCUIT FOR TELEPHONE INTERFACE

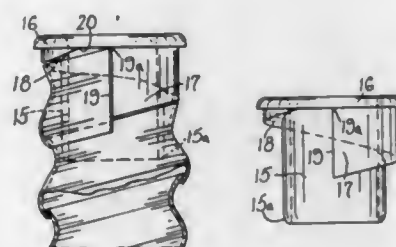
Robert G. Thomson, Tempe, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Oct. 4, 1985, Ser. No. 784,065

Int. Cl.<sup>4</sup> H04M 1/00, 19/00

U.S. Cl. 379—398

15 Claims



11. In an interface circuit for customer premises telecommunications equipment, the interface circuit for coupling to a telephone central office through first and second input terminals and including a bypass element coupled across the input terminals for maintaining a minimum current flow sufficient to preserve the connection of the interface circuit to the central office, a nonsaturating supply of current for pendant portions of the interface circuit, the supply coupled across the input terminals and to the bypass element and comprising:

- a source transistor having a first terminal coupled to the first input terminal, a second terminal coupled to the bypass element, and a third terminal coupled to the pendant portions of the interface circuit for supplying current to those portions;
- a current sink coupled between the third terminal of the source transistor and an input terminal for selectively enhancing the current drawn on the source transistor, a voltage offset element, and
- a normally nonconducting sensing transistor having an emitter coupled to the collector of the source transistor and a base coupled through the voltage offset element to the base of the source transistor and a collector coupled to the current sink, whereby a circuit loop is formed and includes the base-collector junction of the source transistor, the emitter-base junction of the switching transistor, and the voltage offset element so that in the event that the base-collector junction of the source transistor should approach a forward-biased condition, the sensing transistor is caused to conduct current for driving the current sink and enhancing the current drain on the source transistor and accordingly preclude the saturation of the source transistor.

4,683,352

#### CHANGEOVER SWITCH

Takashi Yano, Yokohama, and Yasuo Yoneyama, Kawasaki, both of Japan, assignors to Fujisoku Electric Co., Ltd., Kawasaki, Japan

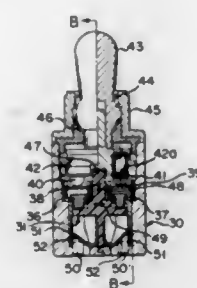
Filed Jul. 10, 1986, Ser. No. 884,183

Claims priority, application Japan, Jul. 17, 1985, 60-109269[U]

Int. Cl.<sup>4</sup> H01H 9/00, 21/04, 1/58

U.S. Cl. 200—6 R

3 Claims



1. A changeover switch comprising:  
a casing body;

first switch means including first and second fixed contacts located inside the casing body, a first common contact located between the first and second fixed contacts, and a first movable contact strip means attached to the first common contact for alternatively touching the first and second fixed contacts;

second switch means including a third and fourth fixed contacts located inside the casing body, a second common contact located between the third and fourth fixed contacts, and a second movable contact strip means attached to the second common contact for alternatively touching the third and fourth fixed contacts;

operating means for actuating the first and second movable contact strip means concurrently in order to connect the first and third fixed contacts to the first and second common contacts, respectively, or connect the second and fourth fixed contacts to the first and second common contacts, respectively;

a partition wall provided between the first and second switch means in the casing body, to divide the switch means; and

first and second connecting means located inside the partition wall and cross-connecting the first and fourth fixed contacts and the second and third fixed contacts, respectively.

4,683,353

#### ROTARY SWITCH FOR INDUCTIVELY DRIVEN RAIL GUN SYSTEMS

Jiing-Liang Wu, Murrysville Boro; David W. Scherbarth, Wilkinsburg, and David Marschik, Wilkins Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 4, 1986, Ser. No. 848,369

Int. Cl.<sup>4</sup> H01H 9/30, 19/56, 33/04, 33/06

U.S. Cl. 200—8 R

23 Claims

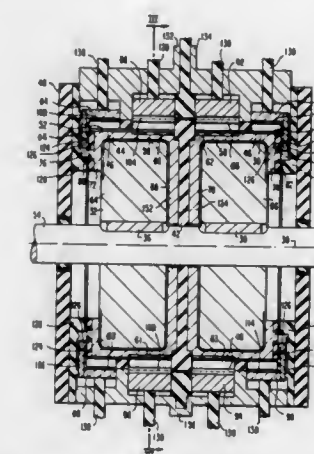
1. A switch for switching direct current comprising:

a rotor having a generally cylindrical conductive element; said conductive element having first and second portions, wherein said first portion includes a continuously conductive external surface;

a pair of insulating members fixed at angularly spaced locations on said second portion such that sections of said conductive element and said insulating members alternate along a generally cylindrical surface of said second portion;

a first pair of angularly spaced retractable brush members

extending radially inward toward and axially along the conductive external surface of the first portion of the conductive element, for making sliding electrical contact with said first portion of the conductive element;  
a second pair of angularly spaced retractable brush members extending radially inward toward and axially along the generally cylindrical surface of the second portion of the conductive element;  
means for electrically connecting a first one of said first pair of brush members and a first one of said second pair of brush members to an external circuit;  
means for electrically connecting a second one of said first pair of brush members to a second one of said second pair of brush members;  
a switch housing encircling said rotor;  
means for rotating the rotor with respect to said housing;



means for moving each of said brush members from a first position, wherein the brush members do not make electrical contact with said conductive element, to a second position, wherein the brush members make electrical contact with said conductive element; and  
said second pair of brush members and said conductive element being so dimensioned and positioned such that with said rotor in a first position, applied current flows from said first one of said second pair of brush members through said conductive element to said second one of said second pair of brush members, and with said rotor rotated to a second position, said conductive element no longer makes contact with both of said second pair of brush members, thereby interrupting the flow of current between the brush members of said second pair of brush members.

4,683,354

#### APPARATUS FOR SUPPORTING AND ALIGNING EQUIPMENT

Samuel J. Phillips, Canoga Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 28, 1985, Ser. No. 750,331

Int. Cl.<sup>4</sup> H01H 3/16

U.S. Cl. 200—61.41

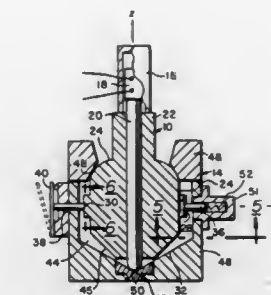
4 Claims

1. Means for supporting and aligning equipment in a three axes cartesian coordinate system comprising:

a stator, supported upon its top end and having a downwardly biased extendible centering pintle positioned for axial movement along a substantially vertical z axis, an indexing-pintle-receiving detent groove on the outer side surface thereof and substantially parallel to but offset from said z axis, and a spherically-zonal-shaped supporting-surface symmetrical about said first axis proximal to said supported top end;

said stator having a pair of substantially horizontal perpendicular axes, x and y, defining an orthogonal set of axes with said z axis, said x axis intersecting substantially the center of said indexing-pintle-receiving detent groove;

a rotor, forming a cavity surrounding said stator, said cavity having an inner surface supported by but free to slide on said spherically-zonal-shaped supporting-surface to support said rotor, a centering-pintle-receiving detent in the bottom surface of said cavity for engaging said centering pintle to align said rotor with said z axis, a cammed guiding surface on the bottom surface of said cavity adjacent said centering-pintle-receiving detent for guiding said



centering pintle into said centering-pintle-receiving detent, and an inwardly-biased indexing pintle positioned for sliding movement relative to said rotor, on an axis perpendicular to the axis defined by said centering-pintle-receiving detent, to engage said indexing-pintle-receiving detent groove on said stator to hold the alignment of said indexing pintle with said x axis and said rotor about said z axis.

4,683,355

#### POSITION INSENSITIVE SHOCK SENSOR

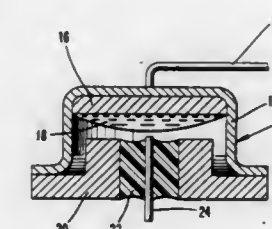
Sheldon S. Bitko, East Brunswick, N.J., assignor to Fifth Dimension Inc., Trenton, N.J.

Filed Dec. 9, 1986, Ser. No. 939,725

Int. Cl.<sup>4</sup> H01H 1/08, 29/00, 35/14

U.S. Cl. 200—61.47

27 Claims



1. A shock sensor for sensing shock directed in a given direction, comprising:

a housing containing a volume of an electrically conductive liquid and having an interior surface that is not wettable thereby;

a rigid insert arranged within the housing, said insert presenting a support surface wetted by said electrically conductive liquid;

a first contact terminal in electrical communication with said insert;

a second contact terminal electrically insulated from said insert and arranged within the housing adjacent the volume of electrically conductive liquid supported by said insert;

said volume of electrically conductive liquid and the area of said wetted support surface being such that said electrically conductive liquid, while wetted to said support surface, moves into electrical contact with said second contact terminal in response to shocks and is thereafter restored.

4,683,356

**TAUT WIRE FENCE SYSTEM AND SENSOR THEREFOR**  
Arie Stoler, Holon, Israel, assignor to Israel Aircraft Industries Ltd., Israel

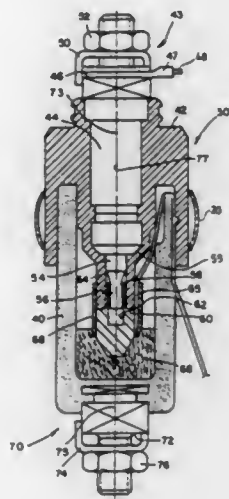
Continuation of Ser. No. 658,883, Oct. 9, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 882,431

Claims priority, application Israel, Oct. 10, 1983, 69945

Int. Cl.<sup>4</sup> A01K 3/00; G08B 13/00; H01H 3/02

U.S. Cl. 200—61.93

13 Claims



1. A sensor for a taut wire fence comprising a plurality of generally parallel taut wires, which sensor comprises:

a first terminal at one longitudinal end of the sensor comprising a first clamp connector for allowing rigid attachment thereto of a first taut wire, and a second terminal at the opposite longitudinal end of the sensor comprising a second clamp connector for allowing rigid attachment thereto of a second taut wire, each of said first and second taut wire attachment terminals being rigidly attached to a respective first and second sensor housing portion, said sensor housing portions lying on respective longitudinal axes which are collinear with each other and with said longitudinal sensor ends in a rest position of said first and second taut wires, said first sensor housing portion being mounted onto said second housing portion so as to enable relative motion therebetween by skewing between their respective longitudinal axes;

means located on the sensor between said longitudinal sensor ends for mounting it in pivotal fashion on an upright rigid support such that the sensor as a whole is pivotable substantially only in the plane defined by the taut wires attached thereto; and

first and second electrical contacts each disposed within a respective one of said sensor housing portions, at least one of said first and second electrical contacts being electrically insulated from said first and second attachment terminals, each of said respective electrical contacts being movable in response to a pivoting movement of said sensor imposed by a predetermined dislocation from said rest position of either of said first or second taut wires acting through a respective one of the first and second attachment terminals, the disposition of said contacts within said respective sensor housing portions being such that a predetermined relative motion between said first and second attachment terminals produces an electrical connection between said first and second electrical contacts.

4,683,357

**SWITCH-OPERATING MECHANISM WITH IMPROVED CHARGING ARRANGEMENT**

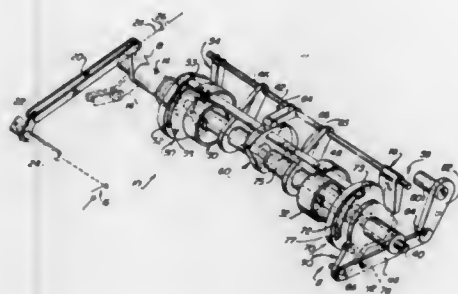
John C. Opfer, Chicago, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Dec. 19, 1985, Ser. No. 810,796

Int. Cl.<sup>4</sup> H01H 3/30

U.S. Cl. 200—153 SC

10 Claims



1. An operating mechanism for a switch comprising: an operating member movable in switch-opening and switch-closing directions;
- a first selectively releasable latch for preventing movement of said operating member in said switch-closing direction;
- a control member movable in first and second opposed directions between first and second positions;
- a closing spring which acts between said operating member and said control member so that switch-closing energy is stored in said closing spring by movement of said control member in said first direction from said first position to said second position while said first latch prevents switch-closing movement of said operating member;
- a second selectively releasable latch for preventing movement of said control member in the second direction whenever said control member has moved to the second position to store switch-closing energy in said closing spring;
- a charging member movable in said first and second directions and including means for moving said control member in said first direction from said first position to said second position when said charging member is moved in said first direction;
- an opening spring which acts between said control member and said charging member so that switch-opening energy is stored in said opening spring by movement of said charging member in said second direction while said second latch prevents movement of said control member in said second direction;
- a third latch for preventing movement of said charging member in said first direction after said opening spring is charged with switch-opening energy; and
- means for moving said operating member in the switch-opening direction in response to movement of said control member from said second position to said first position, whereby movement of said charging member in said first direction followed by movement of said charging member in said second direction sequentially charges said closing and opening springs with switch-closing and switch-opening energy respectively, said operating member moving in the switch-closing direction in response to release of said first latch, subsequent release of said second latch allowing said operating member to be moved in the switch-opening direction.

4,683,358

**CONTACT ARRANGEMENT IN A RELAY FOR HIGH BREAKING CAPACITY**

Michael Dittmann, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

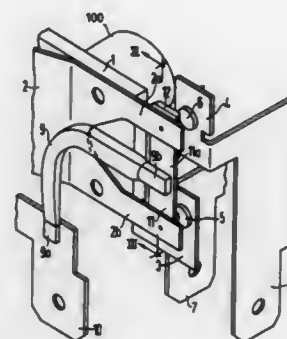
Filed Feb. 26, 1986, Ser. No. 833,226

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 8506345[U]

Int. Cl.<sup>4</sup> H01H 1/20

U.S. Cl. 200—243

9 Claims



1. A contact arrangement in a relay for high breaking current capacity, comprising: a movable one-piece contact spring split in fork-like fashion into two integral fork ends at its free end; each of said fork ends being opposite a fixed, stationary cooperating contact element at at least one side; said two fork ends being connected to one another via a contact strip of material having relatively good electrical conductivity compared to the contact spring; said contact strip having contact regions positioned near its opposite ends adjacent the fixed contact elements for electrical contact therewith and said contact strip extending perpendicular to a longitudinal extend of the fork ends of said contact spring and lying free and away from portions of the contact spring in a region between said fork end; and a flexible current carrying conductor connected at one end to said contact strip.

4,683,359

**ILLUMINATED SWITCH ASSEMBLY WITH COMBINED LIGHT AND LIGHT SHIELD**

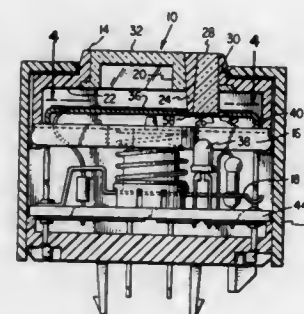
Guy A. Wojtanek, Franklin Park, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 13, 1986, Ser. No. 839,239

Int. Cl.<sup>4</sup> H01H 9/18

U.S. Cl. 200—314

2 Claims



1. An illuminated switch assembly comprising: a switch;
- a switch actuator operative upon movement by an operator to activate said switch with a display panel having a gen-

erally planar display surface, the display surface having a first region of graphic indicia adapted to be illuminated by a first source from one side thereof away from the operator to display the function controlled by the switch and a second region adapted to be illuminated by a second source from said one side away from the operator to indicate actuation of said switch, said actuator being formed with a wall separating said first and second regions and extending away from the display surface in a direction substantially transverse thereto;

means defining a first support surface underlying said display panel in close proximity to said display surface, said first support surface being formed with an opening to allow said wall to extend therethrough;

an electroluminescent panel mounted on said first support surface underlying said first region but not said second region of said display surface and operative as said first source of illumination, said electroluminescent panel being formed as a sandwich comprising plural layers with a layer having areas of electroluminescent phosphor and electrical conductors thereon and disposed between supporting transparent layers;

means defining a second support surface underlying said first support surface;

a lamp mounted on said second support surface and disposed to underly the opening of said first support surface and operative as said second source of illumination; and, shield means operative to prevent said lamp from illuminating said first region and including a coating of opaque material on the layer of said electroluminescent panel adjacent said first support surface and adjacent said opening, said opaque material extending along said layer a sufficient distance such that light from said lamp cannot leak through the coated layer to said first region of graphic indicia.

4,683,360

**MEMBRANE SWITCH COMBINED WITH ELECTROLUMINESCENT LAMP PANEL**

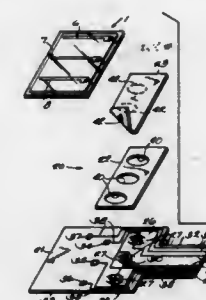
Thomas L. Maser, Mequon, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed May 9, 1986, Ser. No. 861,485

Int. Cl.<sup>4</sup> H01H 9/16

U.S. Cl. 200—314

5 Claims



1. A membrane switch-electroluminescent lamp panel assembly comprising, in combination:

- (1) a membrane switch comprising a first circuit layer and a second circuit layer spaced from one another, a conductive circuit including at least one contact on a surface of the first circuit layer and a conductive circuit including at least one contact on a surface of the second circuit layer, the circuit layers being arranged with their surface carrying the conductive circuits facing one another, conductive tracks leading from the conductive circuit on at least one of said circuit layers to the end of a tail portion extending from such circuit layer, said conductive circuits forming a



membrane switch with at least one switch cell comprising spaced contacts;

- (2) an electroluminescent lamp panel including spaced transparent and base electrodes with dielectric and phosphorescent layers therebetween surrounded by an envelope of insulating plastic, a conductive lead from each transparent electrode of the lamp panel arranged along a surface of the envelope and a conductive lead from the base electrode of the lamp panel arranged along a surface of the envelope; and wherein
- (3) the electroluminescent lamp panel is attached to the first circuit layer or the second circuit layer with each conductive lead of the electroluminescent lamp panel electrically connected to a conductive pad on the circuit layer, and a conductive track on such circuit layer leading from each conductive pad to a tail portion for connection to electrical circuitry.

4,683,361

# BRAZING APPARATUS HAVING A DUAL FUNCTION HEATING AND EDDY CURRENT PROBE COIL

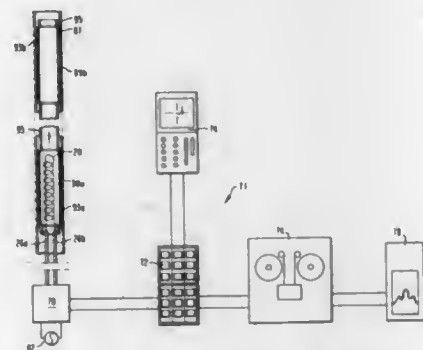
John M. Driggers, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 4, 1985, Ser. No. 720,106

Int. Cl.<sup>4</sup> H05B 6/06

U.S. Cl. 219—10.43

28 Claims



1. A process for using a heater assembly as an eddy current probe with an elongated, electrically conductive conduit in order to position the heater assembly adjacent to a selected section of the conduit prior to the heating thereof, wherein said heater assembly includes an electrical resistance heating element, comprising the steps of:

- (a) conducting an alternating current having a frequency of between about 10 to 10,000 kHz through the electrical resistance heating element in order to induce eddy currents in the conduit;
- (b) moving the heater assembly along the longitudinal axis of the conduit while monitoring changes in the impedance of the electrical resistance heating element in order to properly position the heating element with respect to said conduit, and
- (c) conducting a heat-producing current through said electrical heating element in order to generate and apply radiant heat onto said selected section.

4,683,362

# REFLECTIVE APPARATUS FOR MICROWAVE COOKING

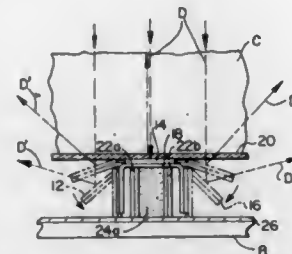
Roger A. Yangas, 14000 Citation Dr., Orland Park, Ill. 60642  
Continuation-in-part of Ser. No. 652,897, Sep. 21, 1984, Pat. No. 4,539,454. This application Aug. 14, 1985, Ser. No. 765,374

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.<sup>4</sup> H05B 6/64

U.S. Cl. 219—10.55 F

8 Claims



1. A reflective cell in combination with an oven for improving uniformity in the temperature of a food product heated in a radiant energy heating cavity of said oven, comprising:

- A. an oven having a radiant energy heating cavity;
- B. temperature sensor means responsive to heat generated within said cavity, said temperature sensor means including a bimetallic element, said bimetallic element having a U-shaped configuration including a pair of spaced, opposing arms, said arms being generally parallel in unheated condition of said bimetallic element, said arms being spreadable when said bimetallic element is heated and retractable when said bimetallic element is cooled;
- C. movable reflection means for reflecting radiant energy within said cavity, said movable reflection means also being located in said cavity, said reflection means including a pair of reflective members engaging said respective arms and movable therewith; and
- D. said reflection means being movable with variation in the response of said sensor means to said heat, in order to vary the direction of said reflecting radiant energy relative to said food product and to vary concentration of said reflecting radiant energy incident on said product for promoting said temperature uniformity therein.

4,683,363

# MICROWAVE APPARATUS FOR PROCESSING SEMICONDUCTOR

Peter D. Scovell, Essex, England, assignor to ITT Industries Inc., New York, N.Y.

Continuation of Ser. No. 661,144, Nov. 15, 1984, abandoned, which is a division of Ser. No. 413,327, Aug. 31, 1982, Pat. No. 4,490,183. This application Jun. 18, 1986, Ser. No. 876,306

Claims priority, application United Kingdom, Sep. 17, 1981, 8128127

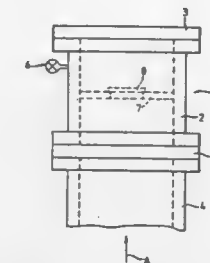
Int. Cl.<sup>4</sup> H05B 6/80

U.S. Cl. 219—10.55 A

9 Claims

1. A semiconductor processing apparatus comprising: a sealable chamber including a length of microwave waveguide and window means for the passage of microwaves into the chamber in the direction of the axis of the waveguide; means for controlling the ambient atmosphere within the chamber, said controlling means maintaining said ambient atmosphere at elevated pressures;

semiconductor wafer support means mounted in the chamber and supporting a semiconductor wafer; and



means for supplying pulses of microwave energy through said window means into said chamber to pulse heat said semiconductor wafer placed on said support means.

4,683,364

# ELECTRICAL DISCHARGE SHAPE FORMING AND SURFACE CONDITIONING DEVICE

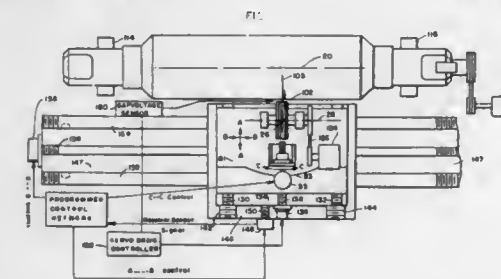
Alex L. Anderson, Rockford, Ill., assignor to Micro Surface Technology, Inc., Rockford, Ill.

Filed Oct. 7, 1985, Ser. No. 785,145

Int. Cl.<sup>4</sup> B23H 1/04, 7/26

U.S. Cl. 219—69 R

8 Claims



1. Improved apparatus for electric discharge machining the surface of an electrically conductive generally cylindrical workpiece wherein said workpiece is mounted for rotation about a longitudinal axis for cooperation with an electrode that moves over the surface and including means for directing a dielectric fluid flow in the gap between the electrode and workpiece, said electrode providing an electric discharge therefrom to the roll form surface to alter the surface condition into a desired form, said apparatus comprising, in combination:

- a cylindrical electrode having a rotational axis;
- means for mounting the electrode for rotation about the rotational axis, said means for mounting also including means for aligning the rotational axis generally parallel to the workpiece longitudinal axis, so as to maintain the cylindrical electrode surface generally parallel to an increment of the workpiece surface;
- gap means for defining a gap between the electrode and the workpiece surface, said gap being located on a line generally perpendicular to the axes and connecting the axes;
- means for providing electric current for discharge from the cylindrical electrode;
- means for rotating the cylindrical electrode about its axis;
- means for moving the cylindrical electrode transversely along the longitudinal axis;
- said gap means including sensor means for detecting the magnitude of the gap, and means for adjusting the magnitude of said gap, said means for adjusting including platform means for supporting the electrode and means for moving the platform means in response to the sensor means toward or away from the surface; and
- means for supporting the cylindrical workpiece, said means for supporting including a workpiece support station

affixed to a workpiece platform, said station including first and second roller bearing members, each member mounted on a bracket, said brackets being pivotally mounted to accommodate the workpiece.

4,683,365

# LASER BEAM TRANSPORT SYSTEM

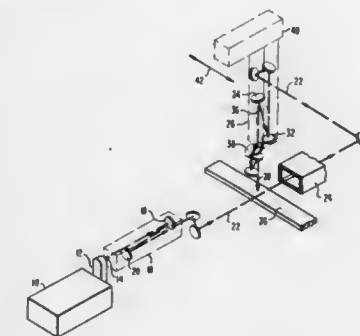
William H. Kasner, Penn Hills Township, Allegheny County; Martin H. Cooper, Churchill Boro, both of Pa.; Clark E. Swenson, Orchard Park, N.Y.; Albert P. Ciez, Monroeville, and Katherine M. Andrews, Shadyside, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 26, 1986, Ser. No. 844,422

Int. Cl.<sup>4</sup> B23K 26/00

U.S. Cl. 219—121 LC

4 Claims



1. A laser beam transport system for laser welding at a relatively remote welding station comprising: a laser generator at one location relatively remote to said welding station producing a laser beam of a given diameter significantly under 0.13 meters; means for expanding said beam closely adjacent said one location to about at least 0.13 meters diameter; means for directing the expanded beam to a second location relatively closely adjacent said welding station; means for reducing said expanded beam to a reduced diameter selected for the welding process and for directing said reduced diameter beam to said station; and means for moving said beam reducing means and the reduced beam linearly along the length of said work station which has a high range in excess of 15 meters in length, whereby the reduced beam diameter is sufficiently constant to provide a uniform weld along the entire length of said work station.

4,683,366

# ALL ELECTROSTATIC ELECTRON OPTICAL SUB-SYSTEM FOR VARIABLE ELECTRON BEAM SPOT SHAPING AND METHOD OF OPERATION

Kenneth J. Harte, Carlisle, and Guenther O. Langner, Westford, both of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 28, 1985, Ser. No. 749,789

Int. Cl.<sup>4</sup> B23K 15/00

U.S. Cl. 219—121 ER

14 Claims

1. An all electrostatic charged particle beam variable spot-shaping lens and deflector assembly to be mounted within an elongated evacuated housing along the optical axis of the undeflected charged particle beam path of a charged particle beam produced by a charged particle gun mounted at one end of the elongated housing;

said electrostatic charged particle beam spot shaping lens and deflector assembly including first and second spot shaping apertured plate members spaced apart a predetermined axial distance along the optical axis of the assembly and having spot shaping apertures formed therein, first and second electrostatic spot shaping lens sub-assemblies

mounted between the first and second spot shaping apertured plate members along the optical axis of the assembly housing and spaced apart a predetermined distance with relation to each other and the apertured plate members, and first and second spot shaping electrostatic deflector means mounted along the optical axis of the assembly with the first spot-shaping deflector means interposed between the first and second spot shaping electrostatic lenses for imaging the aperture of the first spot shaping apertured plate member onto the second spot shaping apertured

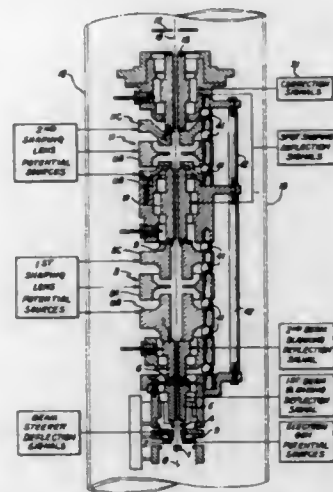


plate member to thereby produce a partially truncated image of the first spot shaping aperture for application to a target surface, and said second spot-shaping electrostatic deflector means being mounted immediately following the second spot-shaping apertured plate member in the direction of the charged particle beam path for restoring the partially truncated charged particle beam image of the first spot shaping aperture back to the optical axis of the undeflected beam to thereby avoid the need to correct the beam spot position at the target plane as the charged particle beam shape is varied.

4,683,367

# METHOD AND DEVICE FOR CONTROLLING THE EROSION OF THE ELECTRODES OF A PLASMA TORCH

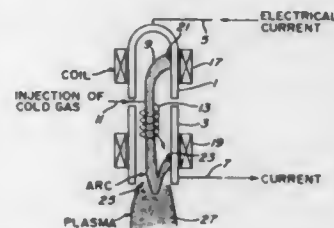
Michel G. Drouet, St-Brono, Canada, assignor to Hydro-Quebec, Quebec, Canada

Continuation of Ser. No. 751,573, Jul. 3, 1985, abandoned. This application Apr. 18, 1986, Ser. No. 854,677

Claims priority, application Canada, Jun. 7, 1985, 483451 Int. Cl.<sup>4</sup> B23K 15/00, 9/00

U.S. Cl. 219—121 PY

8 Claims



1. Method for controlling the erosion of the electrodes of a plasma torch, in which an electric arc is produced when the electrodes are connected to an electrical supply, gases are introduced in said electrodes tangentially relative to said arc, an axial magnetic field generated by a system of field coils causing the rotation of the extremities of the arc along a circular trajectory inside the electrodes, which comprises providing

at least two field coils for each electrode, continuously modulating the value of the current in at least one of the coils so as to axially modify the position of the minimum of the sum of the two fields produced by the two coils, positioning said field coils so as to produce said minimum on the surface of the electrode, allowing the extremity of said arc to run along the surface of the electrode where the value of the magnetic field presents said minimum, thereby causing a unidirectional displacement of the circular trajectory of the extremity of the arc.

4,683,368

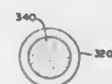
# WELD ROD

K. Bhagwan Das, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 743,175, Jun. 10, 1985, which is a continuation-in-part of Ser. No. 473,718, Mar. 8, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 854,458 Int. Cl.<sup>4</sup> B23K 35/22

U.S. Cl. 219—146.1

10 Claims



1. A consumable weld rod suitable for use in arc welding fiber reinforced metal matrix composites to form welds having fiber reinforcement, consisting essentially of:

- a sheath of matrix metal having a bore;
- a core filling the bore and comprising a mixture of a powdered matrix metal that is identical to or compatible with the metal of the sheath and reinforcing fibers having an aspect ratio of between about 20:1 to 200:1.

4,683,369

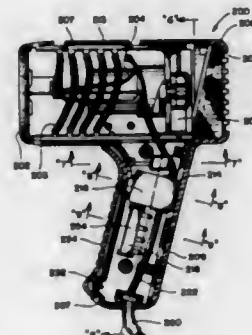
# HAND HELD ELECTRIC HAIR DRYER

Roger A. Rieckman, Elmhurst; William R. Hemrich, Glen Ellyn; Donald N. Jursich, Chicago, all of Ill., and George C. Crowley, Pinehurst, N.C., assignors to John Zink Company, Tulsa, Okla.

Filed Feb. 5, 1986, Ser. No. 826,178 Int. Cl.<sup>4</sup> H05B 1/00

U.S. Cl. 219—364

17 Claims



1. A portable electric hair dryer comprising a housing of electrically insulating material having air inlet and outlet openings, a motor driven fan mounted within said housing for drawing air into said housing through said inlet opening and

for exhausting said air through said outlet opening, a resistance heater mounted in said housing and located in the stream of air circulated into and out of said housing by said fan, a two conductor electrical power cord connected at one end to said housing to supply electricity to said motor and said heater and having a plug connector at the other end, a normally open double pole switch mounted on said housing and connected to said power cord and said motor and said heater to control the flow of power to said motor and said heater, said double pole switch being completely sealed against the entrance of water if the hair dryer is immersed in water, said power cord having a water impermeable sheath extending from said plug connector to the entrance of said power cord into said switch whereby all of the electrically energized parts of said hair dryer are sealed against contact with water in the event of the hair dryer being immersed in water when said power cord is connected to a source of electrical power.

4,683,370

# HOT AIR GUN WITH AIR DIRECTING HOUSING

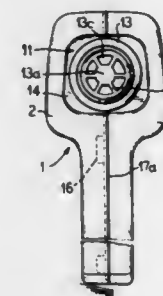
Walter J. Petersen, Eden Prairie, and John M. Svendsen, New Hope, both of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Aug. 8, 1984, Ser. No. 639,663

Int. Cl.<sup>4</sup> H05B 3/00; F24H 3/04; A45D 20/10

U.S. Cl. 219—370

26 Claims



1. A hand-held hot air gun comprising:

- a housing having an air inlet means for admitting fresh air into said housing;
- a motor supported in a motor mount in said housing, said motor having an impeller for drawing air into said housing through said inlet means;
- a shroud in said housing surrounding said impeller for receiving air drawn in by said impeller and having an air inlet and an air outlet;
- a heater unit in said housing having a first end forming an inlet communicating with the outlet of said shroud for receiving and heating air therefrom and a second end defining an air outlet from which heated air is discharged out of said housing; and

air directing means including a plurality of brackets integrally formed on an interior of said housing including front brackets supporting and retaining said first end of said heating unit, in spaced relation to the interior surface of said housing, and rear brackets supporting and retaining said motor mount located a predetermined distance away from said front brackets on the side of said front brackets opposite said heater unit with said shroud being press fit between said heating unit and said motor mount in sealed relation therewith, said plurality of brackets defining a plurality of air passages in said housing in cooperation with respective exterior surfaces of said shroud and heater unit communicating said housing air inlet means with said shroud air inlet, at least one of said air passages being adjacent said exterior surface of said heater unit for pre-heating air flowing through said at least one of said air passages.

4,683,371

# DUAL STRIPE OPTICAL DATA CARD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

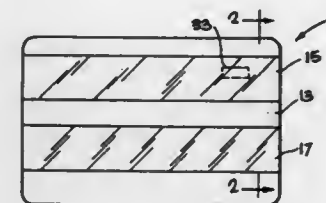
Continuation-in-part of Ser. No. 673,573, Nov. 21, 1984, Pat. No. 4,542,288, which is a continuation-in-part of Ser. No. 566,966, Dec. 29, 1983, Pat. No. 4,500,777, which is a continuation-in-part of Ser. No. 492,691, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 763,027

The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.

Int. Cl.<sup>4</sup> G06K 19/00

U.S. Cl. 235—487

4 Claims



1. An optical data card comprising, a card substrate having opposed sides and a length equal to or exceeding a width, a first strip of erasable optical recording material affixed to said card substrate, said first strip being in-situ laser recordable and being substantially blank, and a second strip of optical data storage material affixed to said card substrate, said second strip having pre-recorded programs or data thereon.

4,683,372

# IC CARD SYSTEM

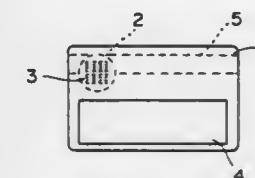
Hiromichi Matsumoto, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 25, 1985, Ser. No. 705,184

Claims priority, application Japan, Feb. 25, 1984, 59-33845 Int. Cl.<sup>4</sup> G06K 15/00

U.S. Cl. 235—492

2 Claims



1. An integrated circuit card system comprising:

- a card comprising:
  - an integrated circuit supported on said card and comprising a data memory area divided into a plurality of memory regions, each of said regions corresponding to a respective type of data terminal which is capable of accessing it, and processing means for enabling a particular memory region to be accessed by a data terminal when received identification data from said data terminal indicates that said data terminal has access to said particular memory region, said processing means denying said data terminal access to other memory regions; and
  - means for connecting said integrated circuit with said data terminal; and
- a data terminal comprising:
  - a card input means for receiving said card and transmit-

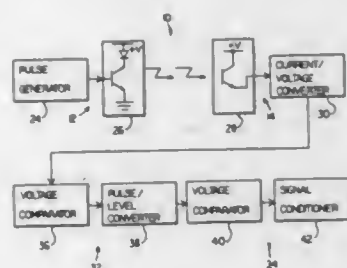
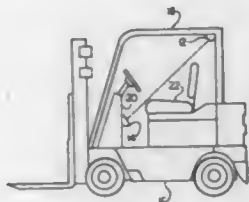


ting data to and receiving data from said integrated circuit, and, means for providing said terminal identification data to said integrated circuit.

4,683,373

## OPTICAL SEAT SWITCH

David J. Tapman, Mentor, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio  
Continuation of Ser. No. 773,142, Sep. 5, 1985, abandoned. This application Oct. 23, 1986, Ser. No. 921,892  
Int. Cl.<sup>4</sup> H01J 40/14; B60K 28/04  
U.S. Cl. 250—221 8 Claims



1. Apparatus for producing a control signal in response to the presence and absence of an occupant in the seat of a vehicle, comprising:
  - emitting means for directing a source of coded radiant energy across said vehicle seat;
  - detecting means for receiving radiant energy, including a portion of said coded radiant energy in response to said seat being vacant, and producing an electrical signal in response to said received radiant energy;
  - discriminating means for distinguishing said electrical signal produced in response to said detecting means receiving said coded radiant energy, from electrical signals produced in response to said detecting means receiving spurious uncoded radiant energy; and
  - circuit means for producing said control signal only in response to said detecting means receiving said coded radiant energy.

4,683,374

## METHOD AND MEANS FOR MULTIPLEXING OPTICAL SENSORS

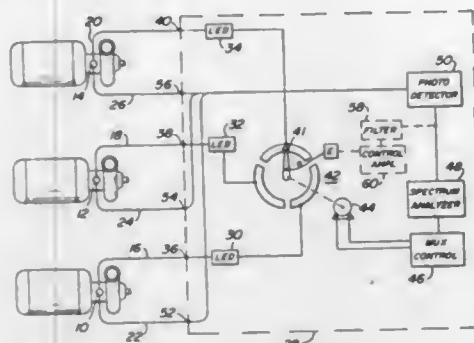
Edward L. Weiss, Milford Township, Pike County, Pa., assignor to General Signal Corporation, Stamford, Conn.  
Filed Aug. 7, 1985, Ser. No. 763,156  
Int. Cl.<sup>4</sup> G02F 1/00, 2/00

U.S. Cl. 250—227

3 Claims

1. A method for multiplexing the signals of several optical sensors of the type which utilize a single light input optical fiber for each sensor to send light to said sensors from a central monitoring station and a single signal output optical fiber for each sensor to communicate the light output of the sensors back to a single receiver in said monitoring station, which comprises the step of:
  - sequentially introducing a predetermined amount of light

flux into selected ones of said light input optical fibers to activate the associated sensors to produce signal outputs



indicative of the magnitude of the quantities being measured for communication to said receiver.

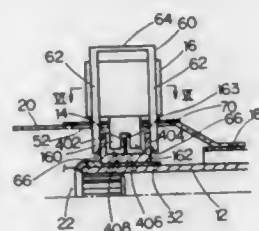
4,683,375

## APPARATUS FOR DETECTING A STEERING ANGLE AND A STEERING ANGULAR VELOCITY

Shigeru Hoshino, and Hiroshi Miyata, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha  
Continuation of Ser. No. 574,353, Jan. 27, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 883,438  
Claims priority, application Japan, Jan. 29, 1983, 58-11959[U]  
Int. Cl.<sup>4</sup> G01D 5/34

U.S. Cl. 250—231 SE

10 Claims



6. An apparatus for detecting a steering angle and an angular velocity of a rotating member, comprising:
  - a holder member circumferentially secured onto an outer peripheral portion of the rotating member, the holder member including a first radial projection and a second radial projection with a first interval defined therebetween;
  - a disc mounted on and rotatable with the holder member, the disc having a plurality of holes therein located at equal radial distances from the center of the disc, the disc being centrally located between the first and second radial projections of the holder member, whereby a lower half interval is defined between the first radial projection and the disc and an upper half interval is defined between the second radial projection and the disc;
  - a tube for rotatably mounting the rotating member therein, wherein the tube does not rotate with the rotating member;
  - a lower tube secured to a lower end of the tube;
  - a sensor detachably mounted and slidable on the lower tube and having a first extending portion housing a luminescent means and a second extending portion housing a light receiving means axially aligned through the disc, the first and second extending portions being inserted respectively into the lower and upper half intervals, and
  - a jig detachably mounted on said sensor, the jig having a first contacting leg and a second contacting leg, the first and second contacting legs extending to the holder member,

the first contacting leg being in contact with the first radial projection of said holder member, the second contacting leg being in contact with the second radial projection of said holder member, whereby the first and second contacting legs of said jig adjust and maintain clearances between the first and second radial projections of said holder member, the first and second extending portions of the sensor and the disc, and said disc is prevented from coming in contact with said first or second extending portions.

4,683,376

## OPPOSING FIELD SPECTROMETER FOR ELECTRON BEAM MENSURATION TECHNOLOGY

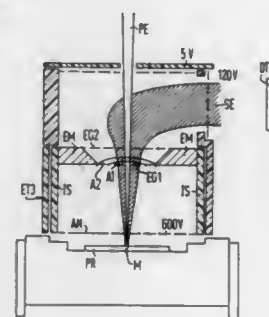
Hans-Peter Feuerbaum, Munich, Fed. Rep. of Germany, assignor to ICT Integrated Circuit Testing Gesellschaft, fuer Halbleiterprüftechnik mbH, Fed. Rep. of Germany  
Filed Sep. 9, 1985, Ser. No. 773,863

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1984, 3434231

Int. Cl.<sup>4</sup> G01N 23/00

U.S. Cl. 250—309

11 Claims



1. An electrostatic opposing field spectrometer having a primary beam for generating secondary particles when focused on a specimen, comprising:
  - an extraction electrode and
  - an opposing field electrode arrangement wherein said opposing field electrode arrangement includes at least one essentially planar opposing field electrode, and wherein said opposing field electrode arrangement, so as to accommodate the angular distribution of secondary particles, includes
    - an outer electrode part arranged at the edge of said at least one essentially planar opposing field electrode, said outer electrode part has an inside wall at the edge of said at least one essentially planar opposing field electrode wherein said inside wall is closer to the primary beam at a portion toward said extraction electrode and spaced farther from the primary beam at a portion away from said extraction electrode.

4,683,377

## SUBTRACTION PROCESSING METHOD AND APPARATUS FOR RADIATION IMAGES

Kazuhiro Hishinuma, and Akihiro Ohga, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan  
Filed Jul. 5, 1983, Ser. No. 511,026

Claims priority, application Japan, Jul. 5, 1982, 57-116457

Int. Cl.<sup>4</sup> G03C 5/16

U.S. Cl. 250—327.2

8 Claims

1. A subtraction processing method for radiation images including the steps of recording two or more radiation images on separate stimuable phosphor sheets, at least a part of image information being different among said radiation images, scanning the respective stimuable phosphor sheets with stimulating rays to sequentially release the radiation energy stored in the stimuable phosphor sheets as light emission, photoelectrically detecting the emitted light by a light detecting means to

obtain digital image signals of the respective radiation images, and extracting an image of a specific structure contained in at least one of said radiation images by conducting a subtraction processing among said digital image signals, the subtraction processing method for radiation images comprising:

- (i) when each radiation image to be subtraction processed is recorded on each stimuable phosphor sheet, simultaneously recording a marker having such a shape as provides a reference point or a reference line to said stimuable phosphor sheet in a position fixed with respect to said radiation image,



- (ii) scanning said stimuable phosphor sheet carrying said radiation image stored therein with stimulating rays, and detecting the spatial coordinate of said reference point or said reference line of said marker detected from the light emitted from said stimuable phosphor sheet,
- (iii) moving said stimuable phosphor sheet with respect to scanning lines of stimulating rays based on said detected spatial coordinate and adjusting the position of said spatial coordinate to a spatial coordinate predetermined with respect to said scanning lines of stimulating rays, and thereafter,
- (iv) reading out said radiation image.

4,683,378

## APPARATUS FOR ION BEAM WORK

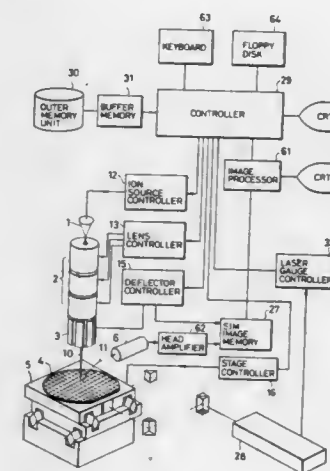
Akira Shimase, Yokohama; Hiroshi Yamaguchi, Fujisawa; Satoshi Haraichi, and Tateoki Miyauchi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Jul. 15, 1985, Ser. No. 754,930

Claims priority, application Japan, Jul. 13, 1984, 59-144478

Int. Cl.<sup>4</sup> H01J 37/304, 37/302

U.S. Cl. 250—492.2

8 Claims



1. An ion beam work apparatus comprising: ion beam radiation means for focusing and radiating an ion beam extracted from an ion beam source on a target placed on a moving mechanism, and scanning two-dimensionally the ion beam radiation position; secondary particle detection means for detecting secondary

particles generated from a surface of said target by radiation of said ion beam, and forming a secondary particle image from the detection signals;

display means for superposing a display of said secondary particle image near a processing area formed by said secondary particles with a different image having position information not obtained from said secondary particle image and indicating a wiring layer of said target near the processing area, said different image including at least one of an optical microscope image and an image derived from an optical microscope image;

first means for detecting a relative deviation of reference points for each of said secondary particle image and said different image, and for moving at least one of said images with respect to the other of said images so that the relative deviation is minimized;

second means for setting the processing area of said target based on the position information of said different image as adjusted by said first means; and

third means for processing a portion of the wiring layer of said target by radiating the ion beam from said ion beam radiation means on the processing area set by the second means;

4,683,379

**LAMP FOR EMISSION OF RADIATION IN UV AND VISIBLE LIGHT RANGES OF THE SPECTRUM**  
Friedrich Wolff, Störklingasse 38, CH-4125 Riehen/Basel, Switzerland

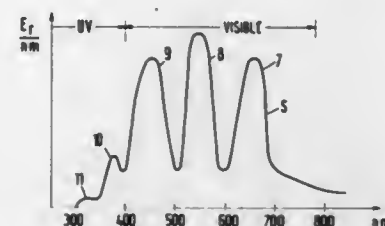
Filed Aug. 29, 1985, Ser. No. 770,723

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431692

Int. Cl.<sup>4</sup> G21G 4/00

U.S. Cl. 250-493.1

15 Claims



1. A lamp, comprising an envelope; a gas in said envelope discharge means and for effecting a discharge; and a mixture of substances in said envelope for emitting radiation in response to a discharge, said mixture including a first substance which emits radiation having energy maxima in the red, blue and green bands of the visible range, a second substance which emits radiation having an energy maximum in the long-wave portion of the UVA band, and a third substance which emits radiation in a part of the UV range extending from the short-wave portion of the UVA band down to approximately 300 nm in the long-wave portion of the UVB band, the third substance's radiation having an energy maximum in the short-wave portion of the UVA band the energy maximum of radiation in the long-wave portion of the UVA band lying between 370 and 390 nm and being less pronounced than the energy maxima in the red, blue and green bands of the visible range, and the energy maximum of radiation in the short-wave portion of the UVA band being substantially less pronounced than the energy maximum in the long-wave portion of the UVA band.

4,683,380  
**APPARATUS AND METHOD FOR DETECTING A PERFORATION ON A WEB**

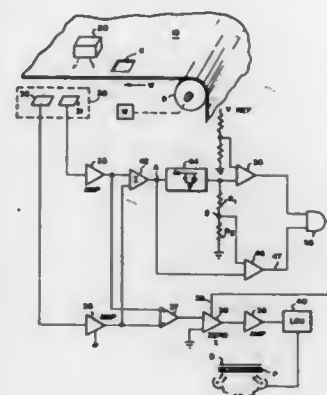
James P. Shpikowski, and Phillip W. Pearce, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 6, 1985, Ser. No. 795,563

Int. Cl.<sup>4</sup> G01N 21/86

U.S. Cl. 250-548

8 Claims



1. An electrophotographic reproduction apparatus comprising:

a photoconductive member movable along a path;

means for moving the member along the path;

means for performing an operation upon said apparatus in accordance with a timed sequence;

the member including an indicium for use in timing said sequence;

photoelectric sensing means for locating the indicium;

the sensing means including first and second photosensitive means and light generating means adapted to project a different amount of light onto the photosensitive means in accordance with the relative positioning of the indicium vis-a-vis the photosensitive means, the photosensitive means each providing a signal related to the amount of light falling thereon, the sensing means also including

(a) means for comparing the signals from the photosensitive means and when they are simultaneously equal, generating a third signal for performing said operation, and

(b) means for adding together the signals from the photosensitive means and for comparing a fourth signal representing the sum of said signals with a threshold signal and for inhibiting the transmission of the third signal when the fourth signal is less than the threshold signal.

4,683,381

**CONTROLLED-ACCESS APPARATUS FOR THE AGRICULTURAL FOOD INDUSTRIES**

Gilbert E. Dufoug, Paris, France, assignor to Ets. Bonnet, Sur Saone, France

Filed Oct. 4, 1984, Ser. No. 657,523

Claims priority, application France, Oct. 14, 1983, 83 16387

Int. Cl.<sup>4</sup> H01H 47/00

U.S. Cl. 307-125

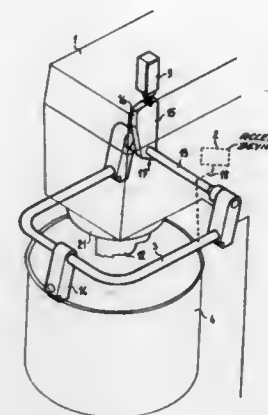
10 Claims

1. A controlled-access apparatus for an agricultural food apparatus having a vessel with an opening and a tool-holder, comprising:

means provided within a space located between the tool-holder and an edge of the opening of the vessel of said apparatus, for detecting a characteristic of an object located in the vicinity of the detecting means, and producing a signal indicative thereof; and

protection means for selectively acting on the food apparatus allowing agricultural food products or ingredients, utensils and instruments located in the vicinity of the

detecting means and which produce impedance variations lower than predetermined limits to be located in the vicinity of said apparatus without acting on the operation of the apparatus, and shutting off the apparatus when objects



which produce impedance variations higher than said predefined limits are detected in the vicinity of the detecting means, said predefined limits chosen so that a member of a human body will shut off said apparatus.

4,683,382

**POWER-SAVING VOLTAGE SUPPLY**

Takayasu Sakurai, Tokyo, and Tetsuya Iizuka, Funabashi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

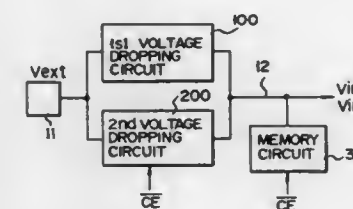
Filed Nov. 1, 1984, Ser. No. 667,417

Claims priority, application Japan, Feb. 22, 1984, 59-32068

Int. Cl.<sup>4</sup> H03K 3/01, 5/153; H01L 9/02; G06G 7/10

U.S. Cl. 307-296 R

17 Claims



1. A semiconductor device comprising:

an external power supply terminal to which an external power supply voltage is supplied;

an internal power supply line;

first voltage dropping means, connected between said external power supply terminal and said internal power supply line, operative in at least a standby interval, for generating a first voltage having a smaller value than that of the external power supply voltage to supply the first voltage to said internal power supply line; and

second voltage dropping means, connected between said external power supply terminal and said internal power supply line, operative in an interval other than the standby interval for generating a second voltage having a smaller value than that of the external power supply voltage to supply the second voltage to said internal power supply line.

4,683,383

**DRIVER CIRCUIT FOR A THREE-STATE GATE ARRAY USING LOW DRIVING CURRENT**

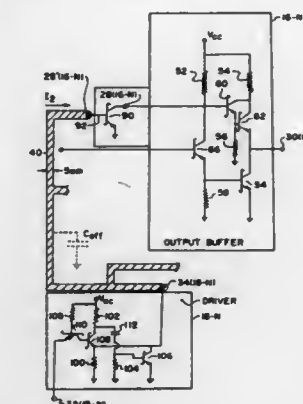
Hsienchin W. Wang, Milpitas, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Jul. 19, 1984, Ser. No. 632,236

Int. Cl.<sup>4</sup> H03K 19/086, 17/26, 17/60

U.S. Cl. 307-473

20 Claims



1. A driver circuit for simultaneously setting a plurality of output buffers of a three state gate array into and out of a floating third state, said driving circuit comprising:

a. a plurality of buffer driver transistors, one for each output buffer, with each buffer driver transistor having a primary current path coupled to a third state control input of a respective output buffer, and each buffer driver transistor further having a control electrode;

b. a first resistor;

c. a common driver transistor having a primary current path coupled to ground through said first resistor;

d. conductor means for connecting the junction of said common driver transistor primary current path and said first resistor to the control electrode of each of said buffer driver transistors;

e. clamp means for discharging said conductor means to ground upon turn-off of said common driver transistor, said clamp means including a clamp transistor having a primary current path coupled between said conductor means and ground and having a control electrode; said clamp means further comprising differentiator means, coupled to said common driver transistor, and to said control electrode of said clamp transistor, for detecting and responding to the leading edge of a signal at a node coupling said differentiator means to said common driver transistor, indicative of said turn-off of said common driver transistor, to momentarily turn ON said clamp transistor and thereby rapidly clamp said conductor means to ground.

4,683,384

**INTEGRATED CIRCUIT HAVING INPUT AND OUTPUT DRIVERS CASCADED BETWEEN I/O PADS AND INTERNAL CIRCUITRY**

Manabu Shibata, and Akira Urugami, both of Takasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1986, Ser. No. 895,216

Claims priority, application Japan, Aug. 9, 1985, 60-174133

Int. Cl.<sup>4</sup> H03K 17/693, 19/094

U.S. Cl. 307-475

14 Claims

1. An integrated circuit comprising:

(1) a substrate having one main surface;

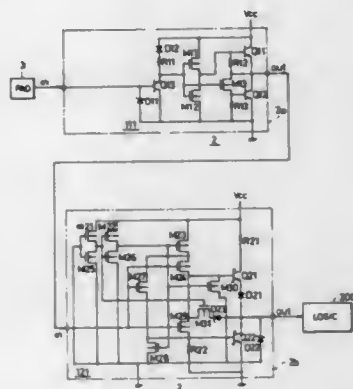
(2) a plurality of external connection pads formed on said main surface;

(3) a plurality of input circuits and a plurality of output circuits formed on said main surface in such a manner as to



form pairs that each correspond respectively to one of a plurality of said external connection pads; and

(4) an internal circuit disposed on said main surface in such a manner as to receive at input terminals thereof the output signals of a plurality of said input circuits and to generate at output terminals thereof the output signals that drive the inputs of a plurality of said output circuits, wherein each of said input circuits includes an input and an output and elements which can be connected to provide a predetermined signal transmission path between the input and the output to provide a predetermined signal transmission function for said input circuit, wherein each of said output circuits includes an input and an output and elements which can be connected to provide a predetermined signal transmission path between the input and output to provide a predetermined signal transmission



function for said output circuit, and wherein the predetermined signal transmission path between the input and output of said input circuit formed so as to correspond to at least one of said external connection pads and at least part of the predetermined signal transmission path between the input and output of said output circuit formed so as to correspond to said one external connection pad are connected in series between said one external connection pad and one of the input terminals of said internal circuit so that the output signal of said output circuit responds to the input signal applied to said one external connection pad in a signal transmission relation determined by the predetermined signal transmission function of said input circuit and the predetermined signal transmission function of said output circuit, and is applied to said internal circuit.

4,683,385

## PULSE NUMBER DETECTION CIRCUIT

Takashi Kaneko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 2, 1985, Ser. No. 688,370

Claims priority, application Japan, Jan. 4, 1984, 59-162

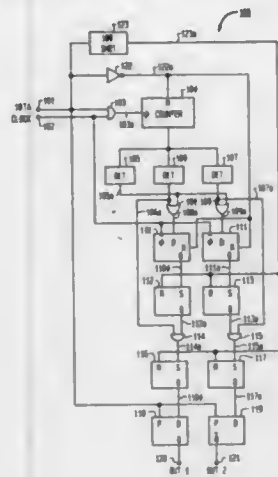
Int. Cl.<sup>4</sup> H03K 5/22; G01R 19/145

U.S. Cl. 307—518

6 Claims

1. A circuit comprising a first input terminal receiving an input data signal, a second input terminal receiving clock pulses, gate means coupled to said first and second input terminals for transmitting said clock pulses during a period of one logic level of said input data signal, a counter coupled to said gate means for counting the pulses transmitted by said gate means, said counter changing a count value in synchronism with one of a rising and a falling edge of each pulse supplied thereto and generating an output signal representative of its count value, a first detector coupled to said counter and generating a first signal only during a period of time when said counter takes a starting value, a second detector coupled to said counter and generating a second signal only during a period of time when said counter takes a count value of A that

is a positive integer other than said starting value, first signal-producing means coupled to said second input terminal and to said first and second detectors for producing a third signal in response to the other of the rising and the falling edge of one of said clock pulses during a period of time when at least one of said first and second signals is generated, a first output



terminal, and first output means coupled to said first output terminal, said second detector and said first signal-producing means for producing a first output signal at said first output terminal when both of said second and third signals are generated, whereby said first output signal represents that said period of said one logic level of said input data signal is longer than a period of time equal to  $A \cdot \frac{1}{2}$  cycles of said clock pulses.

4,683,386

## ELECTRONIC ATTENUATION VALUE CONTROL CIRCUIT IN WHICH SWITCHING NOISE IS SUPPRESSED

Toshio Kamikawara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

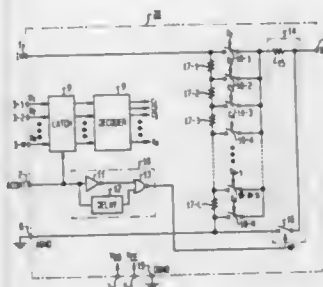
Filed Jul. 26, 1984, Ser. No. 634,693

Claims priority, application Japan, Jul. 26, 1983, 58-136102

Int. Cl.<sup>4</sup> H03K 17/16, 17/693; H03H 7/24

U.S. Cl. 307—549

10 Claims



1. A circuit comprising an input terminal supplied with an input signal, a reference terminal supplied with a reference potential, a plurality of resistors connected in series between said input terminal and said reference terminal, a plurality of first electronic switches each having one end connected to a different one of the connection points among said resistors, the other ends of said first electronic switches being connected in common, a control circuit for making one of said first electronic switches conductive, an output terminal, means for coupling the common connection point of said first electronic switches to said output terminal, a second electronic switch coupled between said output terminal and said reference terminal,

nal, and means for controlling said second electronic switch to turn said second electronic switch on when one of said first electronic switches is changed from the conductive state to the non-conductive state while another of said first electronic switches is, in turn, changed from the nonconductive state to the conductive state.

4,683,387

## QUADRATURE SWITCH APPARATUS FOR MULTI-MODE PHASE SHIFT DRIVERS

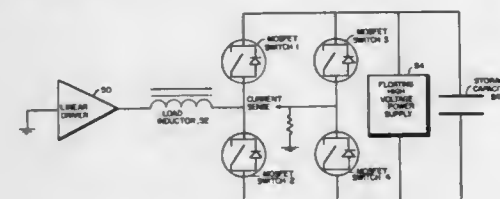
Franklin B. Jones, Baltimore; Walter E. Milberger, Severna Park, and Charles S. Kerfoot, Pasadena, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 3, 1985, Ser. No. 804,194

Int. Cl.<sup>4</sup> H03K 17/687, 19/16; H01J 29/70

U.S. Cl. 307—571

4 Claims



1. A quadrature switch apparatus for multi-mode phase shift drivers comprising in combination:

- an impedance means,
- a linear driver means operatively connected to one end of said impedance means, said linear driver means applying a linear drive signal to said impedance means,
- a switch means operatively connected to the other end of said impedance means, said switch means to provide high speed bi-directional high voltage random mode switching, said switch means including a switchable ground reference, said switch means comprises a first and second MOSFET switch means in series and a third and fourth MOSFET switch means in series, said first and second MOSFET switch means is in parallel with said third and fourth MOSFET switch means, a first junction between said first and second switch means operatively connected to said impedance means, a second junction between said third and fourth MOSFET switch means operatively connected to ground, a third junction between said first and third MOSFET switch means operatively connected to one side of said high voltage power supply means, a fourth junction between said second and fourth MOSFET means operatively connected to the other side of said high voltage power supply means, and,
- a high voltage power supply means operatively connected to said switch means, said high voltage power supply means being floating with respect to said ground reference, said high voltage power supply means being switchably connected to said impedance means to provide a bi-directional high voltage reset signal to said impedance means.

4,683,388

## COMPOUND INDUCTION ELECTRIC ROTATING MACHINE

Dominc De Cesare, 223 Center St., Elizabeth, N.J. 07202  
Continuation-in-part of Ser. No. 209,646, Nov. 24, 1980, Pat. No. 4,441,043, and a continuation-in-part of Ser. No. 438,905, Nov. 1, 1982, Pat. No. 4,581,554. This application Apr. 2, 1984, Ser. No. 595,729

Int. Cl.<sup>4</sup> H02K 37/00

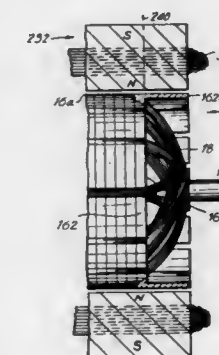
U.S. Cl. 310—46

11 Claims

- 1. A dynamoelectric machine comprising:
  - a frame;
  - a rotatable shaft supported by said frame;
  - a cylindrical rotor mounted coaxially on said shaft defining

two axial end surfaces each substantially in a plane normal to said shaft and a cylindrical circumferential surface coaxial with said shaft between said axial end surfaces, said rotor being provided with a plurality of rotor coil winding grooves which are generally parallel to said shaft and substantially uniformly spaced from each other about said circumferential surface to define a predetermined number of magnetic poles;

a distributed armature winding having axial portions parallel to said shaft and received within said rotor grooves and radial portions in the region of said end surfaces and extending between substantially diametrically opposite grooves with respect to said shaft; said winding radial portions at each axial end surface of said rotor creating a build-up of overlapping windings which is minimum at said circumferential surface and gradually increases to a



maximum in the region of said shaft, said build-up generally defining a conical convex surface; magnetic field producing means mounted on said frame in proximity to said rotor cylindrical circumferential surface and extending axially beyond at least one of said rotor axial end surfaces; and

a plurality of rotor extensions projecting axially at said at least one of said rotor axial end surfaces to thereby position said rotor extensions and said portion of said magnetic field producing means in proximity and in magnetic coupling relationship to one another and said extensions at least partially axially overlapping said build-up of winding radial portions, whereby magnetic fields coupled into said rotor extensions by said magnetic field producing means is induced into said cylindrical rotor and to both said axial and radial portions of said distributed armature.

4,683,389

## OIL SCAVENGE SYSTEM

John Readman, and Timothy J. Bland, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 23, 1985, Ser. No. 812,188

Int. Cl.<sup>4</sup> H02K 7/08; F01M 1/12

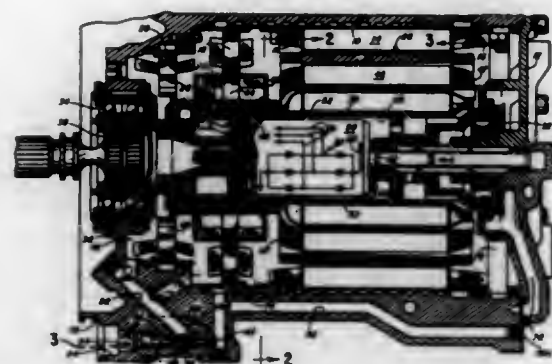
U.S. Cl. 310—62

16 Claims

1. In a generator which includes a housing having a plurality of isolated compartments into which oil may leak from the coolant flow passages of the generator, an oil scavenge system comprising:

- a plurality of fluid jet pumps mounted internally of the housing integral therewith;
- passageway means formed by flow passages in the housing communicating each isolated compartment with one of the fluid jet pumps whereby oil leaking into a compart-

ment can be withdrawn therefrom by the respective fluid jet pump; and



conduit means formed by flow passages in the housing for delivering fluid under pressure to the jet pumps for operating the pumps.

4,683,390

# TERMINAL STRUCTURE FOR AN AUTOMOTIVE AC GENERATOR

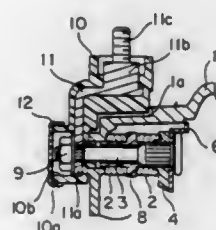
Hideo Imori, and Katsumi Adachi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 9, 1986, Ser. No. 849,872

Claims priority, application Japan, Apr. 10, 1985, 60-54520[U]

Int. Cl.<sup>4</sup> H01R 3/00

U.S. Cl. 310-71

6 Claims



1. A terminal structure for an automotive AC generator having a housing rotatably supporting a rotary shaft of the generator and a rectifier accommodated in the housing, said terminal structure comprising an output terminal assembly including an axial output terminal member connected to the rectifier and disposed axially within the housing, said axial output terminal member having one end extending through and projecting outwardly from an outer surface of the housing substantially parallel to the axis of the generator shaft, and a radial output terminal member connected with said one end of said axial output terminal member, said radial output terminal member extending radially adjacent the outer surface of the housing and having a terminal end extending substantially perpendicularly to the axis of the generator shaft for connection with an external wiring member, and anti-rotation means cooperating with the generator housing for preventing rotation of said radial output terminal member relative to the housing whereby said radial output terminal member is held substantially perpendicularly to the axis of the generator shaft.

## 4,683,391 MAGNETICALLY FLOATING ACTUATOR HAVING ANGULAR POSITIONING FUNCTION

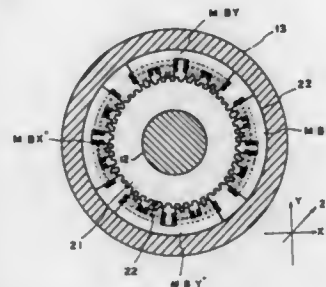
Toshiro Higuchi, Yokohama, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1986, Ser. No. 840,813

Claims priority, application Japan, Mar. 22, 1985, 60-56024  
Int. Cl.<sup>4</sup> F16C 39/06

U.S. Cl. 310-90.5

9 Claims



1. A magnetically floating actuator having an angular positioning function, comprising:  
a rotor having surface teeth spaced circumferentially at a predetermined pitch;  
a stator comprising a core member having poles arranged in a plurality of pole groups, said groups being arranged in diametrically opposite pairs of groups and said stator including at least two circumferentially spaced pairs of said pole groups;  
each pole group including a plurality of poles formed with spaced teeth juxtaposed to said rotor teeth to form a stepping motor; and  
a plurality of winding means on each said pole group, said winding means comprising a first winding means having at least one coil arranged on each pole group so as to control said pole group as a magnetic flotation means for said rotor and a second winding means comprising coils wound on said poles so as to constitute angular position means for said rotor as the rotor of said stepping motor about its axis of rotation.

## 4,683,392 EDDY CURRENT COUPLING HAVING STEPPED ROTOR AND COIL SUPPORT

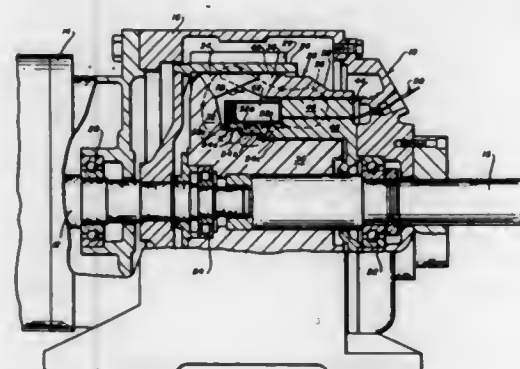
Daniel J. MacDonald, Brookfield, and Thomas H. Jones, Wauwatosa, both of Wis., assignors to MagneTek, Inc., Encino, Calif.

Filed Apr. 26, 1982, Ser. No. 371,900

Int. Cl.<sup>4</sup> H02K 49/02

U.S. Cl. 310-105

2 Claims



1. An eddy current coupling comprising:  
rotatable input and output shafts;

a generally tubular inductor member mounted on one of said input and output shafts for rotation therewith;  
a magnetic rotor member having a collar mounted on the other of said input and output shafts for rotation therewith, said rotor member being located within said inductor member and having a plurality of peripheral, arcuately spaced poles separated from said inductor member by a circumferential air gap;  
a field coil generating an encircling magnetic flux causing torque transmission between said inductor and rotor members and said input and output shafts; and  
a flux carrying support for said field coil, said support positioning said field coil radially inwardly from said rotor member and between said poles and collar, said support having a first portion for affixing said support in said coupling, said support having a second portion extending along said collar for supporting said coil at the end of said second portion, said collar and second portion having a stepped configuration increasing the thickness of said coil support in a step-wise manner in a direction away from said coil and toward said first portion of said support whereby a plurality of flux carrying air gaps are interposed between said collar and second portion.

## 4,683,393 REINFORCED ROTOR ASSEMBLY AND METHOD OF MAKING SAME

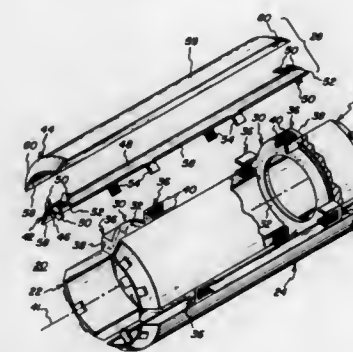
Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 23, 1986, Ser. No. 866,527

Int. Cl.<sup>4</sup> H02K 15/02, 21/16

U.S. Cl. 310-156

11 Claims



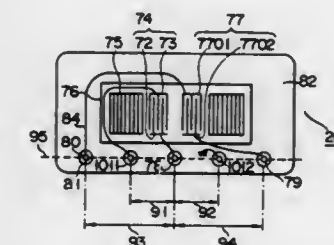
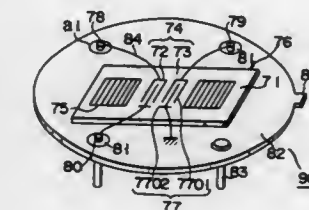
1. A rotor assembly comprising:  
at least one stiffening ring including at least two radially outwardly extending tangs;  
at least two flux ring segments of magnetic flux conducting material, each of said flux ring segments disposed about the outer circumference of said stiffening ring with at least one tang separating each adjacent pair of said flux ring segments;  
a magnetic body mounted on each of said flux ring segments, each of said magnetic bodies including an arcuate outer surface, said magnetic body outer surfaces forming a substantially cylindrical rotor surface generally coaxial with said stiffening ring;  
mounting means for providing an axis of rotation for said rotor assembly; and  
a matrix disposed between said stiffening ring, said flux ring segments and said mounting means for maintaining the relative positions therebetween.

4,683,394  
ACOUSTIC SURFACE WAVE RESONATOR DEVICE  
Masayoshi Koshino, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Continuation of Ser. No. 678,756, Dec. 5, 1984, abandoned. This application Jun. 10, 1986, Ser. No. 872,638  
Claims priority, application Japan, Dec. 15, 1983, 58-235061; Mar. 6, 1984, 59-41255; Mar. 6, 1984, 59-41256; Aug. 23, 1984, 59-174125

Int. Cl.<sup>4</sup> H01L 41/08

U.S. Cl. 310-313 R

26 Claims



1. An assembly for an acoustic surface wave resonator device and a printed circuit board, said assembly comprising:  
(a) an acoustic surface wave resonator element having a piezoelectric substrate, first and second interdigital electrodes formed on one major surface of said piezoelectric substrate, said first interdigital electrode including first and second interleaving comb-shaped electrodes separated at a predetermined distance from each other on said major surface of said piezoelectric substrate, said second interdigital electrode including third and fourth interleaving comb-shaped electrodes separated at a predetermined distance from each other on said major surface of said piezoelectric substrate, and a pair of acoustic surface wave reflectors formed on said major surface of said piezoelectric substrate so as to sandwich said first and second interdigital electrodes;  
(b) a base for mounting said acoustic surface wave resonator element thereon;  
(c) first, second, and third lead terminals arranged on said base at positions substantially corresponding to three adjacent corners of a regular n-sided polygon, said first lead terminal being disposed between said second and third lead terminals;  
(d) a first connection member for connecting said first lead terminal to said first interleaving comb-shaped electrode;  
(e) a second connection member for connecting said second lead terminal to said third interleaving comb-shaped electrode;  
(f) a third connection member for connecting said third lead terminal to said fourth interleaving comb-shaped electrode, and  
(g) reference potential applying means coupled to said second interleaving comb-shaped electrode to apply a reference potential thereto; and  
a printed circuit board having first, second, and third openings arranged in correspondence with said first, second, and third lead terminals of said acoustic surface



wave resonator device so as to respectively receive said first, second, and third lead terminals, first and second signal line patterns being respectively provided in said first and second openings, and a grounding line pattern being provided in said third opening;

said first, second, and third lead terminals of said acoustic surface wave resonator device being respectively inserted in said first, second, and third openings of said printed circuit board with a first orientational relationship with respect to said printed circuit board when used in an in-phase oscillator application, said first, second, and third lead terminals being inserted in said openings with a second orientational relationship with respect to said printed circuit board which is different from said first orientational relationship when used in an out-of-phase oscillator application, the difference between the first and second orientational relationships being provided by rotating said first to third lead terminals by an angle  $2\pi/\eta$  of with respect to said printed circuit board.

4,683,395

## SURFACE ACOUSTIC WAVE DEVICE

Syulchi Mitsutsuka, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

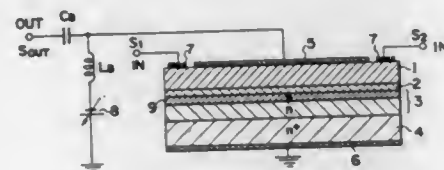
Filed Sep. 8, 1986, Ser. No. 905,368

Claims priority, application Japan, Sep. 13, 1985, 60-202845

Int. Cl.<sup>4</sup> H01L 41/08

U.S. Cl. 310—313 R

3 Claims



1. A surface acoustic wave device comprising:
  - a low-resistance semiconductive substrate in a first conductivity;
  - a semiconductive layer in the first conductivity provided on said substrate;
  - a semiconductive layer in a second conductivity provided on said first conductivity semiconductive substrate;
  - an insulative layer provided on said second conductivity semiconductive layer;
  - a piezoelectric layer provided on said insulative layer;
  - a gate electrode provided on said piezoelectric layer;
  - two comb-shaped electrodes provided on opposite sides of said gate electrode; and
  - a bias voltage source connected to said gate electrode, said second conductivity semiconductive layer having an impurity concentration and a thickness which allow a depletion layer to expand throughout it when a bias voltage supplied from said bias voltage source is zero.

4,683,396

## COMPOSITE ULTRASONIC TRANSDUCERS AND METHODS FOR MAKING SAME

Hiroshi Takeuchi, Matsudo; Chitose Nakaya, Nishitama, and Kageyoshi Katakura, Meguro, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,928

Claims priority, application Japan, Oct. 17, 1983, 58-192415; Nov. 2, 1983, 58-204837

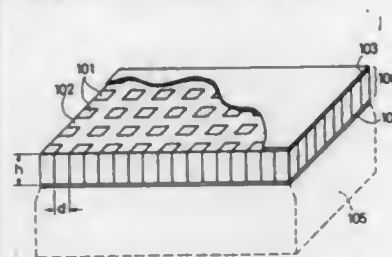
Int. Cl.<sup>4</sup> H01L 41/08

U.S. Cl. 310—358

19 Claims

1. A composite ultrasonic transducer comprising a plurality of ceramic piezoelectric poles having a height, arranged in a plate-like polymer matrix having opposing surfaces, wherein

said piezoelectric poles are arranged such that their height direction is perpendicular to said opposing surfaces, the volume ratio of said piezoelectric poles to that of the entire com-



posite is in the range of 0.15 to 0.75, and the height of each of said piezoelectric poles is larger than a spacing between every adjacent piezoelectric pole.

4,683,397

## COMPACT INCANDESCENT COILED COIL FILAMENT

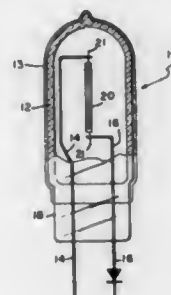
Pierce Johnson, Jr., Topsfield, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Apr. 14, 1986, Ser. No. 852,010

Int. Cl.<sup>4</sup> H01J 1/16, 19/10; H01K 1/14

U.S. Cl. 313—344

14 Claims



1. An incandescent lamp comprising:
  - a hermetically sealed light transmissive envelope;
  - means for structurally and electrically mounting a filament within said envelope; and
  - a refractory metal coiled coil filament electrically coupled to and supported by said means for mounting wherein the primary winding diameter  $D_1$  and the secondary winding diameter  $D_2$  of said filament are:

$$D_1 = d(A + 2)$$

and

$$D_2 = D_1(B + 2)$$

wherein:  
 $d$  = the filament wire diameter  
 $1.40 \leq A \leq 4.00$

$B \geq A$   
 such that said filament exhibits an increase in compactness and retains or exhibits an increase in structural rigidity.

13. A method of making a coiled coil filament that exhibits an increase in compactness and retains or exhibits an increase in structural rigidity for an incandescent lamp rated at a particular wattage, voltage and efficacy, said method comprising the steps of:

providing a strand of fibrous filament wire having a predetermined length  $L$  and diameter  $d$  for a desired wattage, voltage and efficacy;  
 winding said filament wire around a primary mandrel having a diameter  $M_1$  determined by  $M_1 = A(d)$ , to produce a primary coil, wherein  $1.40 \leq A \leq 4.00$ ; and

winding said primary coil around a secondary mandrel having a secondary mandrel diameter  $M_2$  determined by  $M_2 = B(M_1 + 2d)$ , to produce a coiled coil configuration, where  $B \geq A$ .

4,683,398

## PROJECTION TELEVISION DISPLAY TUBE AND DEVICE HAVING INTERFERENCE FILTER

Leendert Vriens, Eindhoven, Netherlands; John A. Clark, Carshalton, United Kingdom, and Johannes H. M. Spruit, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

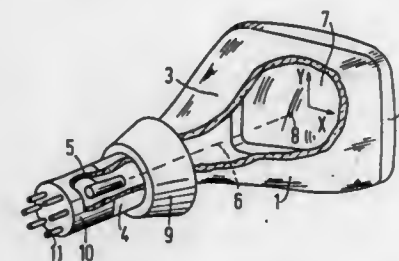
Filed Nov. 4, 1985, Ser. No. 794,862

Claims priority, application United Kingdom, May 29, 1985, 8513558

Int. Cl.<sup>4</sup> H01J 29/89

U.S. Cl. 313—474

17 Claims



1. A projection television display tube comprising in an evacuated envelope a display screen on the inside of a display window in the wall of the envelope, said display screen comprising a layer of a luminescent material and a multilayer interference filter between said luminescent material layer and the display window, the filter comprising a number of layers alternately having a high refractive index and a low refractive index, characterized in that the inside of the display window is substantially convex having an angle of curvature  $\phi$ , wherein  $\phi$  is the angle between the axis normal to the center of the display screen and a line normal to the part of the display screen farthest remote from the center, and wherein  $\phi$  is between  $5^\circ$  and  $25^\circ$ , and further characterized in that the filter is composed of at least 6 layers each having an optical thickness  $nd$ , wherein  $n$  is the refractive index of the material of the layer, and  $d$  is the thickness of the layer, said optical thickness being between  $0.2 \lambda_f$  and  $0.3 \lambda_f$ , wherein  $\lambda_f$  is equal to  $p \times \lambda$ , where  $\lambda$  is the desired central wavelength which is selected from the spectrum transmitted by the luminescent material and  $p$  is a number between 1.18 and 1.32.

4,683,399

## SILICON VACUUM ELECTRON DEVICES

Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 29, 1981, Ser. No. 278,528

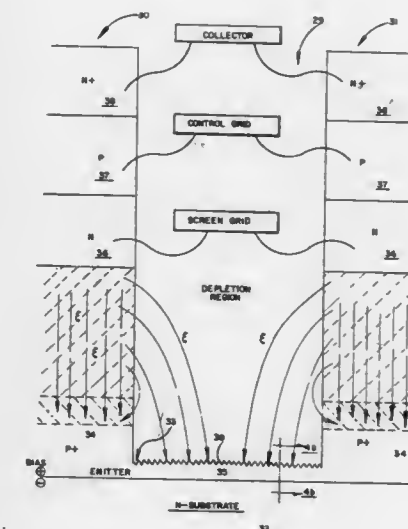
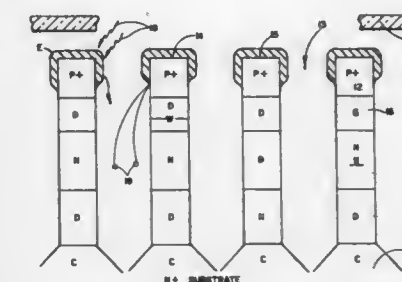
Int. Cl.<sup>4</sup> H01L 29/90; H01J 40/16

U.S. Cl. 313—537

102 Claims

1. A vacuum electron device comprising:
  - a hermetically sealed container enclosing a vacuum;
  - a semiconductor device in said container comprising a semiconductor body including an electron emissive source portion for emitting electrons into the vacuum and a collector portion for collecting electrons emitted from said electron emissive source portion and transported through the vacuum;
  - means for providing a high internal electric field in said semiconductor body such that electrons in said emissive

source are excited to energies greater than the electron affinity of said semiconductor body; and



means for establishing a potential between said electron emissive source portion and said collector portion deriving an electrical output from said electron device.

4,683,400

## TRAVELLING WAVE TUBE AND HELIX FOR SUCH TRAVELLING WAVE TUBE

Michael Seal, Amsterdam, Netherlands, assignor to D. Drukker & Zn. N.V., Amsterdam, Netherlands

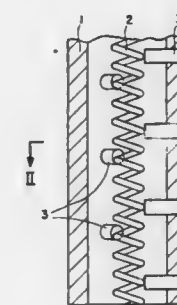
Filed Oct. 25, 1985, Ser. No. 791,313

Claims priority, application Netherlands, Oct. 31, 1984, 8403311

Int. Cl.<sup>4</sup> H01J 25/34

U.S. Cl. 315—3.5

3 Claims



1. Travelling wave tube comprising a tube, and a helix mounted in said tube, said helix being made of diamond and

being coated at least partially with an electrically conductive material.

4,683,401

## MICROWAVE TUBE OUTPUT SECTION

Yukio Okazaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

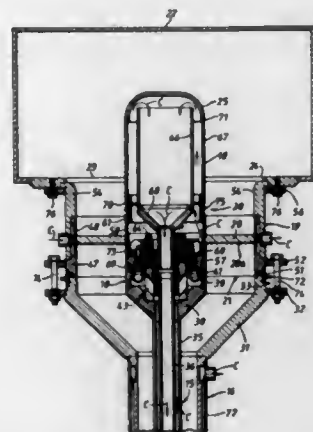
Filed Sep. 26, 1985, Ser. No. 780,308

Claims priority, application Japan, Sep. 28, 1984, 59-203554; Sep. 28, 1984, 59-146776[U]

Int. Cl.<sup>4</sup> H01J 7/46

U.S. Cl. 315—39

9 Claims



1. A microwave tube output section in a microwave tube having an output cavity which can maintain a vacuum inside, comprising:

a coaxial line section having an internal conductor and an external conductor coupled to said output cavity; and a dielectric air-tight ring which is attached so as to be vacuum-tight between an outer wall of the internal conductor and an inner wall of the external conductor of the coaxial line section;

wherein the internal conductor is cylindrical, and is divided into two parts at a position on the output cavity side of the dielectric air-tight ring in the coaxial line, each of said two parts including thin weld rings attached to respective inner walls of the two parts of the divided internal conductor, these thin weld rings being welded together so as to be air-tight; and

wherein the external conductor is divided into two parts at a position on the output cavity side of the dielectric ring in the coaxial line, each of said two parts of the external conductor including thin weld rings attached to outer walls of the two parts of the divided external conductor, said thin weld rings of the external conductor parts being welded together so as to be air-tight, and the two parts of the respective conductors each mutually electrically contacting.

4,683,402

## ADAPTORS FOR FLUORESCENT LAMPS

Truman Aubrey, 1472 Beaudry Blvd., Glendale, Calif. 91208

Filed Apr. 25, 1985, Ser. No. 727,300

Int. Cl.<sup>4</sup> H01J 17/34, 7/44

U.S. Cl. 315—56

9 Claims

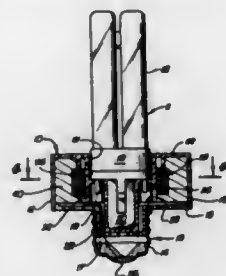
1. An adaptor which facilitates the installation into a light fixture designed for conventional incandescent light bulbs of a fluorescent lamp having an elongated bulb portion, a base and depending from the base a starter portion and a pair of pin electrodes on opposite sides of the starter portion comprising:

a. housing having a centrally disposed passageway which passes through the housing;

b. mounting means depending from the underside of the housing for mounting the adaptor to a light fixture for

conventional incandescent light bulbs, said mounting means having a receiving chamber therein which is in alignment with the centrally disposed passageway through the housing;

c. ballast means disposed within the housing having a central passageway therethrough which is coaxial with the centrally disposed passageway through the housing;



d. a socket defined in part by said centrally disposed passageway through the housing and a receiving chamber of the mounting means which allows the starter portion of the fluorescent lamp to extend into the receiving mounting means.

4,683,403

## DIMMER PASSING DEVICE FOR HEADLAMP OF VEHICLE

Tadashi Iwamoto; Toshiki Ikeda; Kazuo Yukitomo, all of Hiroshima; Masaichi Hattori, Aichi; Kaneyasu Arakawa, Aichi; Koichi Kihira, Aichi, and Akira Hanaki, Aichi, all of Japan, assignors to Mazda Motor Corporation, Aichi, Japan

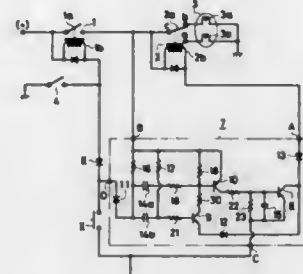
Filed Jul. 17, 1986, Ser. No. 886,404

Claims priority, application Japan, Jul. 24, 1985, 60-113500[U]

Int. Cl.<sup>4</sup> B60Q 1/02

U.S. Cl. 315—83

4 Claims



1. A dimmer passing device for a headlamp of a vehicle comprising:

a light switch operable selectively to an on and off state;

a momentary control switch operable selectively to an on and off state;

a light relay operative when driven for energizing one of a low beam portion and a high beam portion of said headlamp;

first circuit means connecting said light relay to said light switch for activating said light relay in response to the on state of said light switch;

second circuit means connecting said light relay to said momentary control switch for activating said light relay in response to the on state of said momentary control switch;

latch circuit means including an internal switching element operative to alternately turn on and off said internal switching element in response to the on state of said momentary control switch;

a dimmer relay operative to a first position for causing said

light relay to energize said low beam portion and operative to a second position for causing said light relay to energize said high beam portion; and

third circuit means for operating said dimmer relay to said second position at times when said internal switching element is in the on state, and for operating said light relay to energize said low beam portion at times when said dimmer relay is operated to said first position and said internal switching element is in the off state.

4,683,404

## STARTING CIRCUIT AND APPARATUS FOR HIGH PRESSURE SODIUM LAMPS

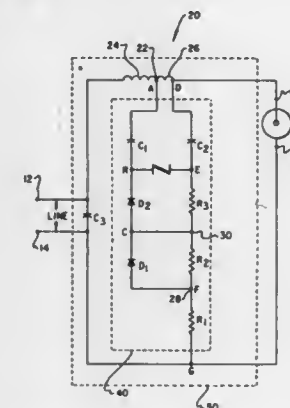
William H. Hitchcock, Vicksburg, Miss., assignor to Cooper Industries, Houston, Tex.

Filed Sep. 29, 1986, Ser. No. 912,037

Int. Cl.<sup>4</sup> H05B 37/00

U.S. Cl. 315—289

4 Claims



1. A circuit for incorporation into a starting apparatus for a high pressure sodium discharge lamp, said circuit comprising a six-node (A, B, C, D, E, F, G) electrical network including a first capacitor having a known capacitance C1 connected between network nodes (A) and (B); a second capacitor having a known capacitance C2 connected between network nodes (D) and (E); a first, second, and third resistors having known resistances R1, R2, R3 connected between network nodes (E) and (C), (C) and (F), and (F) and (G), respectively; first and second diodes D1, D2 connected between network nodes (B) and (C), and (C) and (F), respectively; and a bilateral symmetrical voltage sensitive switch connected between network nodes (B) and (E).

4,683,405

## PARABOLIC VOLTAGE GENERATING APPARATUS FOR TELEVISION

Walter Truskalo, Titusville, and Thomas F. Nolan, Wrightstown, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 27, 1986, Ser. No. 879,304

Int. Cl.<sup>4</sup> H01J 29/56

U.S. Cl. 315—371

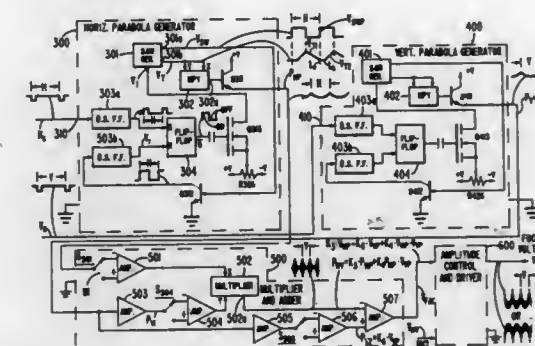
11 Claims

1. A video apparatus responsive to a periodic synchronizing signal at a frequency that is related to a deflection frequency for generating a parabolic first signal synchronized to said synchronizing signal, comprising:

means responsive to said synchronizing signal for generating a sawtooth waveform having, during a given period of said sawtooth waveform, an upramping portion, a downramping portion and a substantially flat portion;

means responsive to said synchronizing signal and coupled to said sawtooth waveform generating means for varying the length of said flat portion when a change occurs in the length of the period of said synchronizing signal without affecting the length of each of said downramping and upramping portions such that the length of said given

period of said sawtooth waveform is determined in accordance with the length of the period of said synchronizing signal and such that said sawtooth waveform becomes synchronized to said synchronizing signal; and



means responsive to said sawtooth waveform for generating from said upramping and downramping portions corresponding portions of said parabolic first signal.

4,683,406

## JOINT ASSEMBLY MOVABLE LIKE A HUMAN ARM

Hiroki Ikeda, and Nobuaki Takanashi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

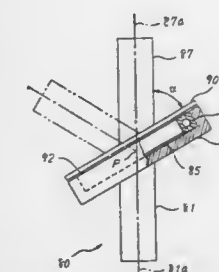
Filed Jun. 7, 1985, Ser. No. 742,711

Claims priority, application Japan, Jun. 8, 1984, 59-117747; Oct. 5, 1984, 59-151070[U]; Oct. 11, 1984, 59-212878; Oct. 11, 1984, 59-212879; Oct. 11, 1984, 59-212880; Oct. 12, 1984, 59-213874

Int. Cl.<sup>4</sup> G05B 19/42

U.S. Cl. 318—568

11 Claims



1. A joint assembly for joining a reference end to a free end to move said free end relative to said reference end, said joint assembly comprising:

a first axle member having a first axis, a first axis end rotatably supported on said reference end, and a second axis end, defining an axis end plane oblique to said first axis at a predetermined angle;

a second axle member having a second axis concurrent with said first axis, a third axis end rotatably guided along said axis end plane, and a fourth axis end adjacent to said free end; and

coupling means for coupling said fourth axis end to said reference end and said free end to move said free end in cooperation with said first and said second axle members.



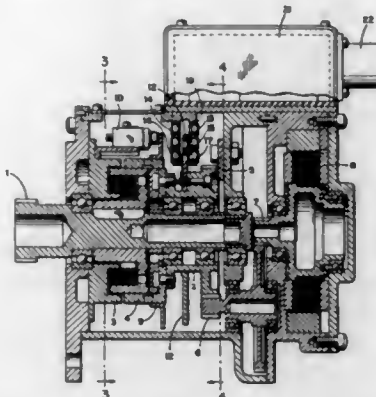
# 4,683,407 AUTHORITY LIMITER

Valentin G. Barba, Princeton Junction, N.J., and Eugene E. Shube, Elmont, N.Y., assignors to Plessey Incorporated, New York, N.Y.

Filed Apr. 2, 1985, Ser. No. 719,150  
Int. Cl.<sup>4</sup> G05B 17/00; B64C 3/18

U.S. Cl. 318—689

6 Claims



1. In combination with an autopilot transfer device, an authority limiter comprising:

- an input shaft which is normally free to rotate in either direction;
- a motor gear output shaft;
- an electromagnetic clutch used to couple the input shaft to the motor gear output shaft;
- a torque motor geared to said output shaft;
- An obtruding disc attached to the motor gear output shaft, said obtruding disc having at least three arcuate cut-out portions therethrough respectively indicative of a null angular position of said output shaft and at least two predetermined degrees of permissible angular deviation in either direction from said null position by said output shaft;
- at least three stationary opto sensors activated by the presence or absence of said cut-out portions of said obtruding disc and producing outputs respectively representative of the direction of angular deviation by said output shaft from said null position and of any angular deviation exceeding either of said two predetermined degrees of angular deviation; and
- an electronic circuit means for controllably applying at least two scheduled currents, dependent upon the outputs of said opto sensors, to said torque motor to generate two corresponding scheduled opposing torques in either opposing direction on said output shaft when the angular deviation thereof exceeds a corresponding predetermined degree of angular deviation.

4,683,408

## STEPPING MOTOR CONTROL APPARATUS

Akira Inoue, Shinichi Nomura, and Osamu Hanami, all of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed Oct. 4, 1985, Ser. No. 784,179  
Claims priority, application Japan, Dec. 25, 1984, 59-279313  
Int. Cl.<sup>4</sup> H02P 8/00

U.S. Cl. 318—696

14 Claims

1. A stepping motor control apparatus for controlling the stepwise rotation of a rotor of a stepping motor, comprising: driving means for applying different drive currents to a stepping motor to selectively effect regular step rotation of the stepping motor rotor at a fixed angular interval and a variable step rotation of the rotor from a temporary hold position to a desired final hold position through a variable angular transfer distance which is shorter than the fixed angular interval; means for providing transfer data of the variable step rotation includ-

ing data representative of the temporary hold position, and data defining the angular transfer distance and the final hold position; and control means responsive to the transfer data for producing an accelerating drive current effective to accelerate the movement of the rotor from the temporary hold position through a part of the angular transfer distance, a decelerating



drive current effective to decelerate the movement of the rotor to the final hold position through another part of the angular transfer distance, and a holding drive current effective to hold the rotor at the final hold position so as to enable the driving means to sequentially apply the accelerating, decelerating and holding drive currents to the rotor.

4,683,409

## STABILIZING ARRANGEMENT FOR A STEPPING MOTOR

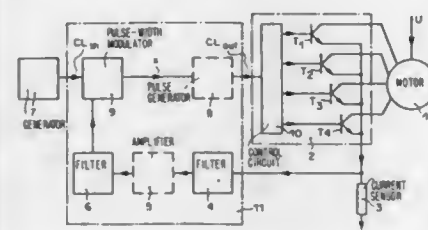
Pierre Boillat, Meyriez, Switzerland, assignor to Sodeco-Saida AG, Murten, Switzerland

Continuation-in-part of Ser. No. 706,501, Feb. 28, 1985. This application Apr. 21, 1986, Ser. No. 854,337  
Claims priority, application Switzerland, Feb. 24, 1986, 00727/86

Int. Cl.<sup>4</sup> H02P 8/00

U.S. Cl. 318—696

11 Claims



1. A stabilizing arrangement for a stepping motor comprising:

- a pulse-width modulator for modulating control pulses of said stepping motor, said pulse-width modulator receiving an error correction signal as one input and the output of a cycle generator as the other input, said error correction signal being generated by a current sensor by way of a low pass filter and a high pass filter,
- said pulse-width modulator comprising a controllable saw-tooth generator and a comparator connected to the output of the saw-tooth generator for comparing the saw-tooth signal produced by the saw-tooth generator with the error-correction signal,
- said saw-tooth generator comprising a capacitor, a controllable switch, connected in parallel to said capacitor, a controllable current source connected in series to said capacitor, and a control device, the input of the control device being connected to said capacitor and the output of said control device being connected to a control input of the controllable current source by way of a diode, a control input of said controllable switch being connected to an input of the controllable saw-tooth generator.

4,683,410.

## METHOD FOR DETECTING STEP LOSSES IN STEPPING-MOTOR-DRIVEN ADJUSTING DEVICES

Rudolf Kressler, Frankfurt am Main, and Siegfried Oehler, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

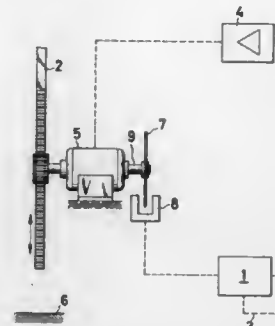
Filed Jun. 24, 1985, Ser. No. 748,315

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423420

Int. Cl.<sup>4</sup> H02P 8/00

U.S. Cl. 318—696

2 Claims



1. A method of detecting step losses caused by ineffective driving pulse commands in a stepping motor driven actuating device movable through incremental steps, said motor having a shaft and a rotor rigidly attached to said shaft said rotor having a plurality of segments providing alternate light and dark fields, said method comprising:

- determining a desired position of the actuating device;
- generating a plurality of drive pulse sequences, each said sequence of drive pulses operative to move said actuating device a single step;
- sensing said alternate light and dark fields at a single position adjacent said rotor in response to operation of the stepping motor;
- generating a light pulse sequence of binary bits in response to sensing of the light and dark fields during rotation of said rotor, each light pulse of said light pulse sequence having a duration corresponding to each said drive pulse sequence;
- comparing each bit of said light pulse sequence of binary bits to said plurality of driving pulse sequences during the stepping of the motor to detect said step losses of the actuating device from said desired position.

4,683,411

## SYNCHRONOUS MOTOR PROTECTION

James W. Hamilton, Jr., Mebane, and Edward A. Long, Chapel Hill, both of N.C., assignors to General Electric Company, Charlottesville, Va.

Continuation of Ser. No. 652,983, Sep. 21, 1984, Pat. No. 4,641,074. This application Sep. 2, 1986, Ser. No. 902,940  
Int. Cl.<sup>4</sup> H02P 5/40

U.S. Cl. 318—706

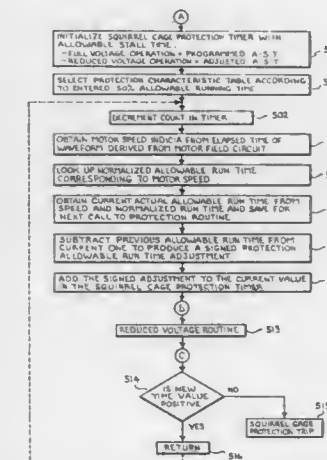
33 Claims

1. In a digital control system for protecting a plurality of synchronous motors having squirrel cage windings, during full or reduced voltage start-up, the combination comprising:

- (a) means for storing digital data representative of a plurality of thermal limit characteristic curves corresponding to a plurality of synchronous motors each having a different starting torque, said curves having an independent function representative of instantaneous motor speed and a dependent function representative of maximum allowable motor excitation time, the thermal limit characteristic curves each covering a speed range of from substantially zero speed to substantially synchronous speed;
- (b) programmable means for manual entry of data represen-

tative of at least two set points for any motor being controlled by the digital control system, each set point having a value representative of the maximum allowable motor excitation time of said controlled motor at a predetermined motor speed;

- (c) motor speed signal means for deriving a motor speed signal indicative of actual motor speed from AC energization applied to any motor being controlled by the control system;
- (d) digital processing means responsive to the digital data, the set points and the motor speed signal for sequentially deriving the maximum allowable excitation time for any controlled motor to attain any instantaneous motor speed during acceleration and for providing an output signal indicative of the actual accrued excitation time exceeding the maximum allowable excitation time said motor being



controlled by the control system, said digital processing means comprising:

- selection means responsive to at least one of the set points for selecting the tabular representation of one of the plurality of thermal characteristic curves having the closest fit to the value of the at least one of the set points; and
- indexing means responsive to the value of the motor speed signal to derive a representation of the maximum allowable motor excitation time applicable to the actual motor speed from the selected one of the tabular representations of said curves; and
- (e) output means for reducing motor excitation responsive to the output signal so as to prevent thermal damage to the squirrel cage windings in a motor being controlled by the control system.

4,683,412

## CURRENT SOURCE INVERTER MOTOR DRIVE ADAPTED FOR FULL CURRENT REGENERATIVE MODE OPERATION

Edward J. Bialek, Buffalo, N.Y., and Leslie B. Anticich, Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 21, 1985, Ser. No. 800,253

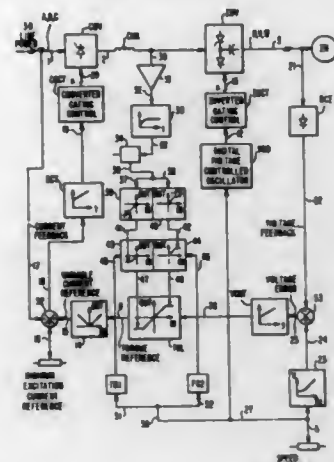
Int. Cl.<sup>4</sup> H02P 3/18

U.S. Cl. 318—798

4 Claims

1. In a current source inverter (CSI) motor drive control system including: an AC/DC converter and an inverter coupled thereto through a DC link for supplying excitation to an induction motor; means operative at constant volts-per-hertz for deriving a voltage error in relation to the motor voltage and a speed reference signal; and a PI controller means responsive to said voltage error for generating a torque representative signal;

ence signal; and said converter being controlled in relation to a current reference signal to vary the DC link current in accordance with said current reference signal; the combination of:  
means for deriving a signal representative of the DC voltage of said DC link in sign and magnitude;



means responsive to the magnitude of said DC voltage representative signal for generating in response to said torque representative signal a torque reference signal in accordance with the sign of said DC voltage representative signal; and  
absolute value function generator means responsive to said torque reference signal for generating said current reference signal.

4,683,413

### REDUCING POWER CONSUMPTION AND MONITORING SYNCHRONOUS RUNNING OF THREE-PHASE ELECTRIC MOTORS

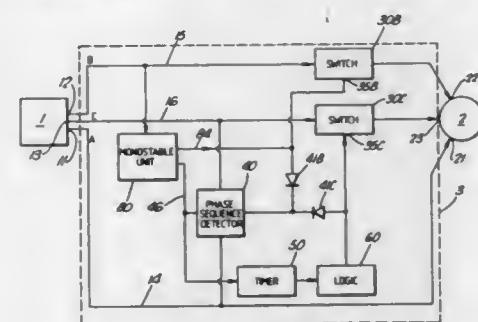
Anton M. Bax, Farnhampton, England, assignor to Smiths Industries Public Limited Company, London, England  
Filed Oct. 3, 1985, Ser. No. 783,400

Claims priority, application United Kingdom, Oct. 3, 1984, 8424989

Int. Cl.<sup>4</sup> H02P 5/28

U.S. Cl. 318—779

10 Claims



5. A motor control system comprising: three phase supply lines; first and second switching means; means connecting said first and second switching means respectively in a first and second of the supply lines; control means; means connecting said control means to said first and second switching means, said control means causing both said switching means to be initially closed such that power is supplied to said motor on all said lines, said control means causing said first switching means to be opened when said motor has reached a predetermined speed so that power supply to said motor on said first line is

thereby interrupted, said control means subsequently periodically closing said first switching means to enable power supply to the motor on the first line for short intervals, and periodically opening said second switching means to prevent power supply to the motor on the second line for short intervals thereby to cause hunting of the motor only when the motor is running in synchronism with the supply; means for detecting hunting of the motor; means for indicating synchronous running of the motor in response to detected hunting of the motor; phase detector means; means connecting said phase detector means to receive signals from the first and second lines; said phase detector means being responsive to the phase relationship between signals on the first and second supply lines, said phase detector means being operable to open both the first and second switching means thereby to prevent supply of power to said motor when an undesired phase relationship occurs between said signals.

4,683,414

### BATTERY ECONOMISING CIRCUIT

Paul A. Moore, Hove, England, assignor to U.S. Philips Corporation, New York, N.Y.

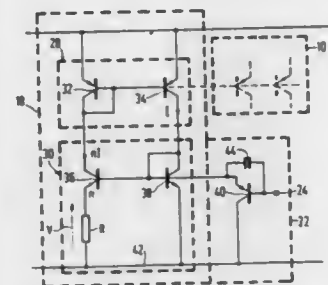
Filed Jul. 22, 1985, Ser. No. 757,234

Claims priority, application United Kingdom, Aug. 22, 1984, 8421315

Int. Cl.<sup>4</sup> H01M 10/44; G05F 3/26

U.S. Cl. 320—13

8 Claims



1. A current reference circuit for switching a current of an operating circuit comprising:

first and second opposing current mirror circuits, connected together and between first and second power supply terminals, said first and second mirror circuits having a total loop gain of substantially unity, said connected current mirrors having first and second stable current states; said first state corresponding to substantially zero current level passing between said first and said second mirror circuits; and

a control circuit connected to switch said current mirrors between said first and second stable states comprising means for momentarily diverting current around one of said mirror circuits whereby said first state is assumed, and for injecting current into an input of said one mirror circuit whereby said second non-zero current state is assumed.

4,683,415

### LINE FREQUENCY SWITCHING POWER SUPPLY

Matt J. Zimmerman, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 15, 1986, Ser. No. 906,872

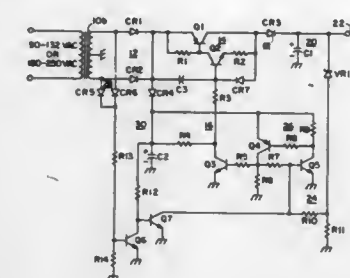
Int. Cl.<sup>4</sup> G05F 1/46

U.S. Cl. 323—282

2 Claims

1. A power supply, comprising:  
a rectifier circuit coupled to a secondary winding of a transformer adapted to receive a cyclic line voltage, said rectifier circuit producing a pulsating D.C. voltage;  
a pass element coupled to said rectifier circuit;  
a filter coupled to said pass element to provide a filtered

D.C. output voltage in response to the output of said pass element;  
means for sensing when said output voltage reaches a predetermined value;



latch means coupled to said sensing means and responsive thereto to switch said pass element off; and  
means for detecting when said line voltage crosses a zero point in its cycle and resetting said latch means and enabling said pass element.

4,683,416

### VOLTAGE REGULATOR

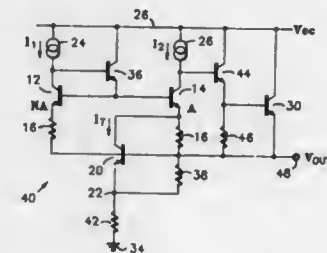
Byron G. Bynum, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 6, 1986, Ser. No. 915,483

Int. Cl.<sup>4</sup> G05F 3/16

U.S. Cl. 323—314

17 Claims



1. A regulated voltage supply, comprising:  
first and second transistors arranged with the bases thereof coupled together to conduct respective currents there-through;

first and second resistors coupled to said first and second transistors respectively with the current flowing through said first transistor also flowing through said first resistor and a portion of the current flowing through said second transistor also flowing through said second resistor;  
a third transistor having its collector-emitter conduction path coupled between the emitter of said second transistor and a circuit node;

feedback circuit means coupled between the collector of said second transistor and the base of said third transistor which is responsive to the voltage level at the collector of said second transistor for providing feedback to said third transistor to set the collector current therethrough wherein said first and second transistors are operated at different current densities thereby producing a difference voltage therebetween having a predetermined temperature coefficient (TC) and magnitude, said third transistor conducting the remainder portion of the current from said second transistor and said current flowing through said third transistor having a predetermined magnitude and said temperature coefficient; and  
means for developing a voltage at said circuit node that is a function of the current sourced to said circuit node, said voltage having a controlled magnitude and TC which is proportional to absolute temperature.

4,683,417

### METHOD AND APPARATUS FOR RAPIDLY TESTING CAPACITORS AND DIELECTRIC MATERIALS

Michel De Burgat, Rennes; André Le Traon, Cesson Sevigne; Jean-Claude Pilet, and Ammar Sharaiha, both of Rennes, all of France, assignors to Université de Rennes I, Rennes, France

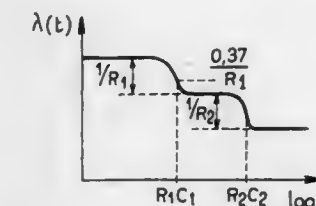
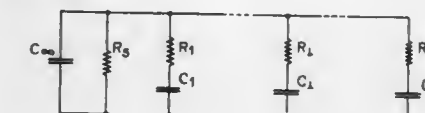
Filed May 10, 1985, Ser. No. 733,149

Claims priority, application France, May 10, 1984, 84 07196

Int. Cl.<sup>4</sup> G01R 27/26, 11/52

U.S. Cl. 324—60 C

37 Claims



1. A method of testing capacitors and dielectric materials, wherein the method comprises the following steps:

- inserting the item to be tested in series with a reference impedance in a measuring chain;
- applying repetitive stimulating voltage pulses to the measuring chain;
- zeroing the voltage at the terminals of the reference impedance during each inactive half-cycle of the stimulating pulses;
- sampling the response obtained at the terminals of the reference impedance for each stimulating pulse at time instants which are progressively shifted relative to the beginning of the stimulating pulses; and
- analyzing the samples to deduce parameters of the element under test in accordance with a Foster model comprising a plurality of main parallel connected branches, each of which is constituted by a resistance and a capacitance connected in series, together with two auxiliary branches which are likewise connected in parallel and are respectively constituted by a pure capacitance and by a pure resistance wherein the value of said resistances and capacitances of the Foster model represent said parameters.

4,683,418

### MOISTURE MEASURING METHOD AND APPARATUS

Edward D. Wagner, and Richard R. Trautwein, both of Rogue River, Oreg., assignors to Wagner Electronic Products, Inc., Rogue River, Oreg.

Filed Aug. 6, 1984, Ser. No. 638,020

Int. Cl.<sup>4</sup> G01R 27/26

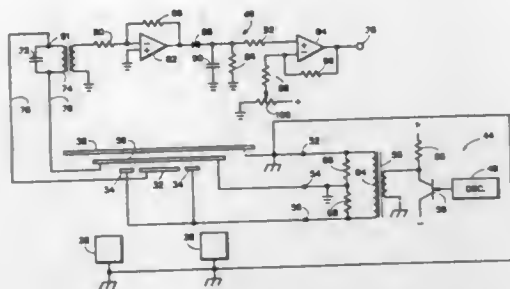
U.S. Cl. 324—61 P

11 Claims

2. The method of measuring the moisture content of material comprising:  
passing a first radio frequency signal through said material for reception by a receiving plate;  
transmitting a second radio frequency signal in out-of-phase relation to said first radio frequency signal with respect to a common reference, said second signal being transmitted from a source adjacent said receiving plate without passing through said material, said first and second radio frequency signals inducing a potential in said receiving plate, the induction of said first radio frequency signal



varying in accordance with the moisture contained in said material; and



measuring the potential of said receiving plate to determine the extent of said moisture.

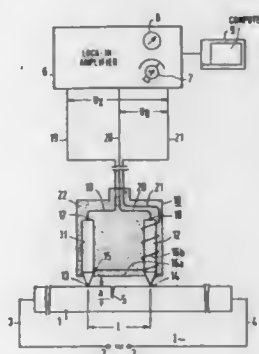
4,683,419

# METHOD AND APPARATUS FOR DETECTING FAULTS IN A STRUCTURE BY MEASURING VOLTAGE DROP BETWEEN SURFACE POINTS THEREOF

Rolf Neuemann, Bergisch-Gladbach, and Manfred Fortmann, Overath, both of Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch-Gladbach, Fed. Rep. of Germany  
Filed Sep. 20, 1985, Ser. No. 778,548

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434801; Jan. 18, 1985, 3501614  
Int. Cl.<sup>4</sup> G01R 27/14, 27/26; G01N 27/82  
U.S. Cl. 324-64

24 Claims



1. Method for monitoring structures by measuring electrical quantities, which comprises subjecting an electrically conducting component to an ac current with a predetermined frequency in a given direction generating a magnetic flux in a given direction, measuring a voltage drop across two measurement points mutually spaced apart by a given distance at individual partial regions of the component by means of two measuring lines contacting the component, a segment of one of said measuring lines extending parallel to said component, in closely spaced relation thereto, from the region of one of said measurement points to the region of the other one of said measurement points, wherein said two measuring lines, including said segment of said one of said measuring lines extending between said two measurement points, and the component disposed between said two measurement points form a first conductor loop with an inductively effective area between said segment and said component being as small as possible measuring an induction voltage from the change of the magnetic flux as close as possible to said two measuring points by means of a second conductor loop being substantially parallel to the given direction of the current and perpendicular to the given direction of the magnetic flux; feeding the voltage drop and the induction voltage to an electronic evaluation circuit, and deriving the local resistance of the component at the measure-

ment points from the voltage drop and the induction voltage with the evaluation circuit.

4,683,420

# ACOUSTO-OPTIC SYSTEM FOR TESTING HIGH SPEED CIRCUITS

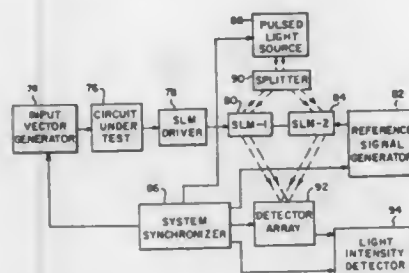
Anastasios P. Goutzoulis, Forest Hills Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 10, 1985, Ser. No. 753,506

Int. Cl.<sup>4</sup> G01R 31/26, 17/02, 19/10

U.S. Cl. 324-73 R

20 Claims



1. An optical system for testing high speed logic devices, said system comprising:  
means for driving the device under test with a set of input vectors;  
first means for producing a pulsed light signal;  
a first spatial light modulator;  
first means for loading a predetermined number of time sequenced binary values of an output signal from the device under test into said spatial light modulator;  
means for detecting the spatial light intensity of a modulated light signal produced when said pulsed light signal passes through said spatial light modulator;  
means for analyzing the detected light signal intensities; and  
means for synchronizing the operation of said driving, producing, detecting, and analyzing means, said synchronizing causing the light signal to be pulsed on after said predetermined number of binary values of the input vector driven output signals have been loaded into the spatial light modulator.

4,683,421

# DRIFT COMPENSATION TECHNIQUE FOR A MAGNETO-OPTIC CURRENT SENSOR

Robert C. Miller, Penn Hills Township, Allegheny County, and Jaris A. Asars, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 29, 1985, Ser. No. 717,989

Int. Cl.<sup>4</sup> G01R 31/00, 33/00; G01J 1/32; G02F 1/31

U.S. Cl. 324-96

4 Claims

4. In a magneto-optic current measuring system including a magneto-optic current sensor of a material composition exhibiting different Verdet Constants (V) at different wavelengths, and functioning as a Faraday rotator by receiving a polarized light input and generating a light output, the rotation of which is indicative of the current flow in an adjacent electrical conductor, and converter means for converting said light output to electrical signals:

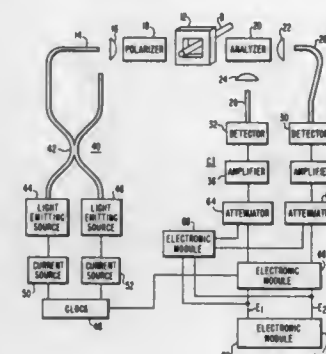
the improvement for providing drift compensation for said system, said improvement comprising:

an input circuit means including:

- (a) a first light source for emitting light at a first wavelength and a second light source for emitting light at a second wavelength;
- (b) a light activating control means for alternately activating said first and second light sources; and
- (c) an optical coupler means for introducing the light output

from said alternately activated first and second light sources to said magneto-optic current sensor;  
an output circuit means including:

- (a) means responsive to electrical signals representing the light output of said first and second light sources transmitted through said magneto-optic current sensor for generating first and second output signals indicative of the intensity of the light output at said first and second wavelengths, respectively; and
- (b) means for responding to the first and second output



signals by computing the magnitude of the first output signal multiplied by  $V_2$  minus the second output signal multiplied by  $V_1$ , where  $V_1$  and  $V_2$  are the Verdet constants of the material composition of the magneto-optic current sensor at said first and second wavelengths respectively; and

means for adjusting the gain of at least one of said input circuit means and output circuit means to maintain the magnitude of the first output signal multiplied by  $V_2$  minus the second output signal multiplied by  $V_1$  essentially constant.

4,683,422

# LOW VOLTAGE CONTINUITY TESTER

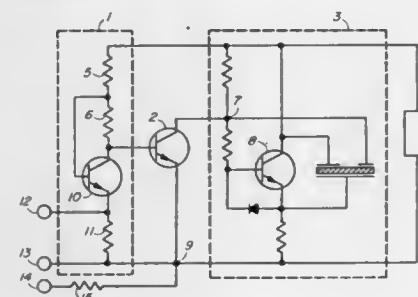
David R. Goodson, 28267 Tahoe Ct., Hayward, Calif. 94545

Filed Sep. 20, 1985, Ser. No. 778,145

Int. Cl.<sup>4</sup> G01R 31/08

U.S. Cl. 324-133

9 Claims



1. A continuity tester for tracing circuit paths by applying test voltages below any conduction threshold of the circuits under test and by sensing a continuity induced current, comprising:

- (A) indicator means (3) actuated in response to the presence of continuity;
- (B) switching means (2), controlling said indicator means, having a threshold with temperature dependency for defining continuity presence;
- (C) voltage divider means (1), defining said test voltages below any conduction threshold and providing tempera-

ture compensation for said switching means, said voltage divider means comprising:

(AA) third resistor, in parallel with a pair of probing terminals being applied to the circuit paths being traced, receiving a biasing current;

(BB) active buffer means (10), controlling the switching means and supplying said biasing current to said third resistor and said pair of probing terminals, said active buffer including a junction with temperature sensitivity capable of supplying temperature compensation for said switching means;

(CC) first and second resistor means (5 and 6), supplying biasing currents to both the active buffer means and the switching means;

wherein continuity is sensed by a change in the current of the buffer means to an extent sufficient to cross the threshold of the switching means and trigger the indicator means.

4,683,423

# LEADLESS CHIP TEST SOCKET

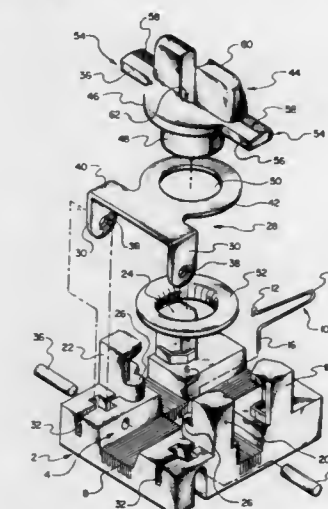
William D. Morton, Santa Clara, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Oct. 30, 1985, Ser. No. 792,805

Int. Cl.<sup>4</sup> G01R 31/26; H01R 9/09

U.S. Cl. 324-158 F

22 Claims



1. A test socket for a leadless chip carrier assembly, the assembly including a leadless chip and a carrier housing the chip, the carrier being adapted to hold a leadless chip in a cavity with the chip's contact pads exposed for probing, comprising (for a reference orientation with the chip contact pads facing downward):

a base member adapted to receive a chip carrier assembly with the exposed chip contact pads facing downward towards the base,

a plurality of spring biased contact members extending upward from within the base member to establish electrical contact with respective contact pads of a chip in the carrier,

a plurality of spaced projecting members extending upward from the base member to a level above the chip carrier assembly, each projecting member including a generally downward facing bearing surface,

a pivot member pivotally retained on the base member for pivoting between an open position permitting the loading of a chip carrier assembly into the base member, and a closed position over the chip carrier assembly, and

a rotatable clamp carried by and rotatable with respect to the pivot member, the clamp having an upper bearing member which fits between the projecting member bear-

ing surfaces and the pivot member, the bearing member engaging the bearing surfaces of the projecting members and progressively forcing the pivot member more fully closed when the pivot member is at an initially closed position and the clamp is rotated, and the clamp further having a lower clamping member bearing against the chip carrier assembly and progressively urging it down to a positive engagement between the chip contact pads and the spring biased contact members when the clamp is rotated.

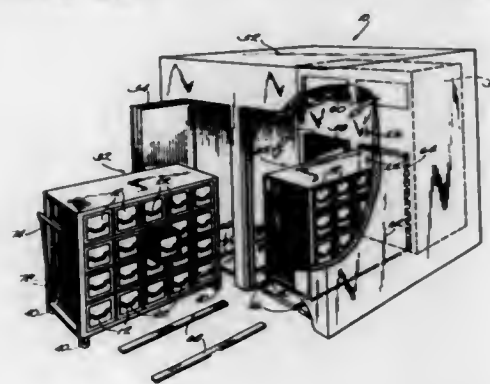
4,683,424

**APPARATUS FOR USE IN TESTING CIRCUIT BOARDS**  
Robert A. Cutright; Mark W. Briggs, both of Holland, and George J. Bouwman, Hamilton, all of Mich., assignors to Wehr Corporation, Milwaukee, Wis.

Filed Nov. 7, 1984, Ser. No. 669,117  
Int. Cl.<sup>4</sup> G01R 31/28; H05K 7/14

U.S. Cl. 324-158 F

40 Claims



1. An apparatus for testing circuit boards, said apparatus comprising
  - a plurality of hand manipulable circuit board baskets adapted to contain a plurality of generally planar circuit boards, each of said baskets including
  - frame means defining a structure of generally open construction, said frame means including a box-like structure having opposite first and second sides, opposite third and fourth sides, and opposite first and second ends, said opposite ends and said first side being closed by walls to prevent air flow therethrough, and said second, third and fourth sides being open to permit air flow therethrough, the circuit boards being supported in perpendicular relation to said third and fourth sides,
  - a plurality of first electrical connectors supported by said frame means and being adapted to engage electrical connectors on the circuit boards,
  - a second electrical connector supported by said frame means and being electrically connected with each of said first electrical connectors, and
  - means for supporting the circuit boards in parallel spaced relationship within said frame means with the electrical connectors on the circuit boards being plugged into said first electrical connectors, whereby in conjunction with said open construction of said frame means air can flow freely through said baskets and over the circuit boards supported therein,
  - a test chamber for enclosing said baskets and including electrical connector means electrically connected with said second electrical connectors on said baskets, and
  - wall means within said test chamber, said baskets being supported within said test chamber with said second side of one of said baskets being closed by said wall means and with said second side of each of the other baskets being closed by said first side of an adjacent basket, whereby said baskets and said wall means define a plurality of air

plenums directing air flow through said baskets and over the circuit boards supported therein.

4,683,425

**INTEGRATED CIRCUIT TEST CLIP**  
Jean F. Tossutto, Velizy, and Hervé Bricaud, Plaisir, both of France, assignors to Socapex, Suresnes, France

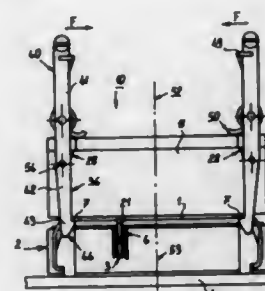
Filed Oct. 28, 1985, Ser. No. 792,199

Claims priority, application France, Oct. 30, 1984, 84 16596

Int. Cl.<sup>4</sup> G01R 31/02

U.S. Cl. 324-158 F

25 Claims



1. An integrated circuit-testing combination of a printed circuit and a test clip, comprising an insulating body having a predetermined number of test clip contacts constructed for establishing electrical connection with inputs-outputs of integrated circuits in a vertical direction, at least two levers oppositely disposed with respect to said insulating body and connected together by at least one cross-piece, each lever having a lower part which ends in at least one hook for hooking onto means for carrying at least one of said integrated circuits, each lever comprising an articulation for permitting rotation with respect to an axis parallel to said cross-pieces and mounted in a manner for pivoting on said body whereby each of said at least one hook can be moved for hooking onto said means for carrying at least one of said integrated circuit, a printed circuit fixed onto said insulating body and having plural conductive circuit paths, each one in electrical contact with a respective one of said predetermined number of test clip contacts, and a connecting cable having plural conductors, each for establishing electrical contact into a respective one of said predetermined number of contacts.

4,683,426

**PROCESS AND APPARATUS FOR MEASURING DIFFERENCES IN THE CONCENTRATIONS OF PARAMAGNETIC COMPONENTS OF GASES**

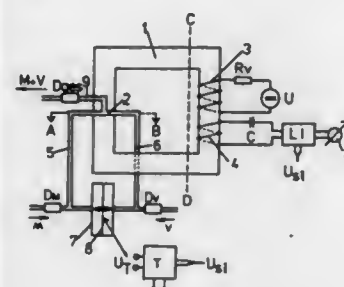
Heinz P. Hummel, Königstein-Johanniswald, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 10, 1984, Ser. No. 659,269

Int. Cl.<sup>4</sup> G01R 33/12

U.S. Cl. 324-204

6 Claims



1. A method of measuring a difference in concentration of

paramagnetic components between an unknown gas and a standard gas comprising:

- periodically alternating entry of two gases into an air gap of a magnetic circuit by delivering the two gases into the air gap alternately from opposite directions;
- moving a boundary zone between the two gases back and forth periodically in the air gap perpendicularly to the lines of force;
- alternately causing part of the two gases to escape from the air gap region by letting the respective one or other of the two gases flow in behind the respective escaping gas; and
- detecting periodic changes, caused by the gases, in magnetic flux in the magnetic circuit.

4,683,427

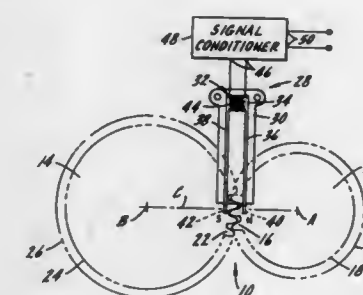
**MAGNETIC GEAR TOOTH SEPARATION DETECTOR**  
Metia M. Durum, Elmhurst, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 11, 1985, Ser. No. 786,889

Int. Cl.<sup>4</sup> G01B 7/14; G01N 27/72; G01R 33/00

U.S. Cl. 324-207

6 Claims



1. Gear transmission apparatus comprising a drive gear defining drive gear teeth extending from a root circle thereof, a driven gear defining driven gear teeth extending from a root circle thereof, said drive and driven gear teeth moving into meshing contact at an initial contact point and out of meshing contact at a final contact point as said gears rotate, and means sensing a change in magnetic flux density across said teeth for detecting a break in said meshing contact between said initial and final contact points.

4,683,428

**METHOD OF AND A DEVICE FOR IDENTIFYING THE POSITION OF THE ROTOR OF A STEPPING MOTOR**  
Henri Gête, Les Hauts-Geneveys, Switzerland, assignor to Asulab S.A., Blenne, Switzerland

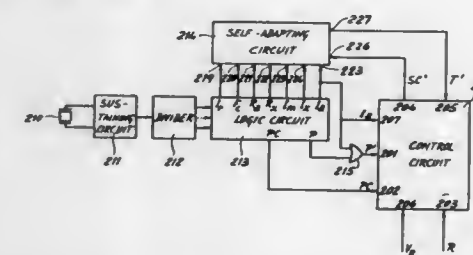
Filed Jul. 17, 1985, Ser. No. 755,753

Claims priority, application Switzerland, Jul. 27, 1984, 03648/84

Int. Cl.<sup>4</sup> G01B 7/14; H02P 8/00; G04F 5/00; G06F 1/04

U.S. Cl. 324-208

4 Claims



4. A device for determining the angular position of the rotor of a stepping motor comprising a magnetized rotor having a

pair of diametrically opposite poles liable to lie in two rest positions, a stator forming a magnetic circuit having saturable narrow portions and a coil coupled magnetically to the stator for setting up therein a magnetic field, said device comprising:

- means for generating an electric control pulse;
- means for applying said pulse to the coil of the motor;
- means for measuring a control current, generated in the coil by said pulse, at the end of a control time interval counted from the beginning of said pulse;
- memory means for storing said control time interval;
- means for comparing the control current with a first reference current and for generating a signal representative of the sign of the comparison, said sign indicating the angular position of the rotor, characterized in that it further comprises:

- means for generating a first electric pulse;
- means for applying said first pulse to the coil of the motor;
- means for measuring a first current in the coil, generated by said first pulse;
- means for determining a first time interval corresponding to the time needed by the first current to reach a second reference current;
- means for generating a second electric pulse having the same amplitude as the first but of opposite polarity;
- means for measuring a second current in the coil, generated by said second pulse;
- means for determining a second time interval corresponding to the time needed by the second current to reach the second reference current;
- means for adding the second time interval to the first; and
- means for calculating the mean value of said two time intervals and for transferring said mean value into said memory means, said value being the control time interval.

4,683,429

**ELECTRICAL CIRCUIT WHICH IS LINEARLY RESPONSIVE TO CHANGES IN MAGNETIC FIELD INTENSITY**

Radivoje Popovic, Zug, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

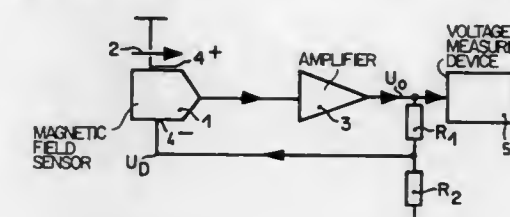
Filed Aug. 20, 1984, Ser. No. 642,407

Claims priority, application Switzerland, Aug. 26, 1983, 4664/83

Int. Cl.<sup>4</sup> G01N 27/72; G01R 33/02; H03K 17/90, 19/18

U.S. Cl. 324-225

8 Claims



1. A circuit for measuring the intensity of a magnetic field, said circuit comprising:
  - (a) a magnetic field sensing device for sensing said magnetic field intensity, said magnetic field sensing device being adapted to produce an electrical output signal ( $U_{in}$ ), said electrical output signal ( $U_{in}$ ) being dependent on an electrical input signal ( $U_D$ ) received at an electrical control input and said magnetic field intensity, the electrical output signal ( $U_{in}$ ) of said magnetic field sensing device having a sensitivity ( $K_H$ ) to said magnetic field intensity and a sensitivity ( $K_E$ ) to said electrical input signal ( $U_D$ );
  - (b) an amplifier, said amplifier being adapted to receive said electrical output signal of said magnetic sensing device ( $U_{in}$ ) and amplify said electrical output signal of said magnetic sensing device ( $U_{in}$ ) by an amplification factor ( $K_V$ ) to produce an amplified output signal ( $U_O$ );
  - (c) a potentiometer, said potentiometer being adapted to



receive said amplified output signal ( $U_O$ ) and damp said amplifier output signal ( $U_O$ ) by a damping factor ( $K_D$ ) to produce said electrical input signal ( $U_D$ ) wherein  $U_D = U_O K_D$  and

- (d) feedback means for connecting said potentiometer to said electrical control input of said magnetic field sensing device, so that said magnetic field sensing device can receive said input signal ( $U_D$ ) from said potentiometer, said magnetic field sensing device, said amplifier and said potentiometer being adapted so that the product of
- (i) the sensitivity ( $K_E$ ) of said magnetic field sensing device to said electrical input signal ( $U_D$ );
- (ii) the amplification factor ( $K_V$ ) of said amplifier; and
- (iii) the damping factor ( $K_D$ ) of said potentiometer, is much greater than unity, so that said amplifier output signal ( $U_O$ ) is substantially linearly related to said magnetic field intensity.

4,683,430

# EDDY CURRENT FLAW DETECTOR METHOD AND APPARATUS HAVING A ROTATABLE HIGH PERMEABILITY FLUX CONCENTRATOR ENCIRCLING A WORKPIECE

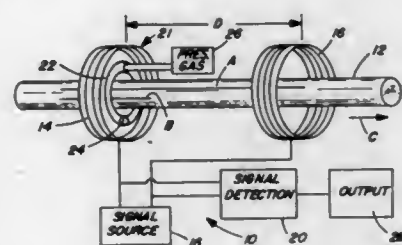
Richard M. Harris, North Royalton, and Richard F. Abramczyk, Brunswick, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Jun. 27, 1984, Ser. No. 625,033

Int. Cl.<sup>4</sup> G01N 27/82; G01R 33/12

U.S. Cl. 324-241

5 Claims



1. Eddy current test apparatus for detecting flaws in a workpiece comprising:

- two differentially wound conductive coils coaxial with each other and spaced along a workpiece path of travel for detecting the presence of flaws in said workpiece as said workpiece passes through said coils;
- excitation circuitry coupled to said coils for exciting said coils with an electrical signal to induce eddy currents at spaced locations beneath said coils;
- detection circuitry for monitoring eddy currents in the workpiece at the spaced locations beneath said coils and for correlating changes in said eddy currents with flaw locations in the workpiece; and
- field altering means mounted in close proximity to one of said detection coils to distort a magnetic field at changing locations along a workpiece surface of interest, said field altering means including an enclosed annular track that encircles the workpiece path near the workpiece surface of interest, a ball having a high magnetic permeability positioned within the enclosed annular track, and a source of pressurized fluid coupled to an interior of the enclosed annular track to drive said ball about said workpiece path.

## 4,683,431 MAGNETIC RESONANCE IMAGING OF HIGH VELOCITY FLOWS

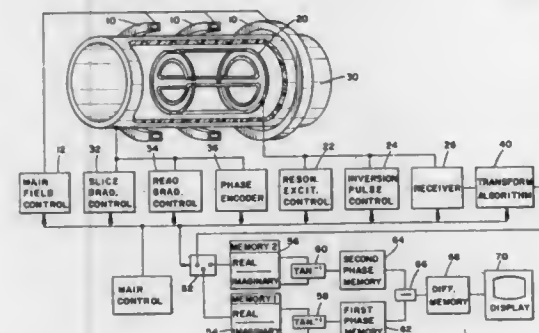
Pradip M. Pattany, Willoughby, Ohio, and Graham L. Naylor, Oxon, United Kingdom, assignors to Picker International, Inc., Highland Hts., Ohio

Filed Aug. 16, 1985, Ser. No. 766,757

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324-306

22 Claims



19. A magnetic resonance apparatus for examining moving substances, the apparatus comprising:

- a main magnetic field control means for generating a generally uniform magnetic field through an image region;
- at least one coil for transmitting and receiving radio frequency signals, the coil being disposed adjacent the image region;
- a resonance excitation control means for selectively causing the coil to transmit a resonance excitation pulse;
- an inversion pulse control means for selectively causing the coil to transmit a spin inversion pulse;
- a receiving means for receiving a radio frequency resonance signal received by from the coil;
- a gradient coil means for selectively causing magnetic field gradients across the main magnetic field;
- a slice selection gradient means for selectively causing the gradient coil means to generate gradients for selecting a slice through the image region to be imaged;
- a read gradient control means for selectively causing the gradient coil means to generate a read gradient across the slice;
- a phase encoder means for selectively causing the gradient coil means to phase encode resonating nuclei in the selected slice;
- a transform means for selectively transforming the resonance signal from the receiving means into an image representation which has real and imaginary values corresponding to each of a plurality of pixels;
- a first memory means for storing real and imaginary portions of a first image representation which is produced when the slice selection gradient control means and the read gradient control means apply slice selection and read gradients in such a manner that an effective first moment in time in the selected slice is substantially zero;
- a second memory means for storing real and imaginary portions of a second image representation which is produced when at least one of the slice selection gradient control means and the read gradient control means flow encodes resonating nuclei in the selected slice by shifting at least one of the respective slice selection and read gradients;
- a phase determining means for determining a phase map whose intensity values vary with phase shift, the phase determining means being operatively connected with the first and second memory means for determining at least first and second phase maps from the first and second images;
- a first and second phase map memory means for storing the

first and second phase maps, the phase map memory means being operatively connected with the velocity determining means; and

a difference means for subtractively combining the first and second phase maps to correct for any stationary artifacts the difference means being operatively connected with the first and second phase map memory means.

4,683,432

## NUCLEAR MAGNETIC RESONANCE METHODS AND APPARATUS

Ian R. Young, Sunbury-on-Thames, England, assignor to Picker International, Inc., Wembley, England

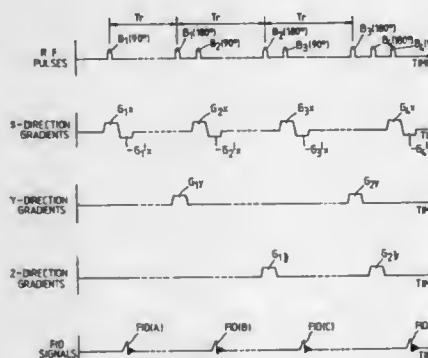
Filed Sep. 18, 1986, Ser. No. 908,576

Claims priority, application United Kingdom, Sep. 25, 1985, 8523673

Int. Cl.<sup>4</sup> G01R 33/20

U.S. Cl. 324-309

5 Claims



4,683,435

## CIRCUIT FOR COMPENSATING NON-LINEARITIES IN ELECTROLYTE CONDUCTIVITY MEASUREMENT SYSTEM

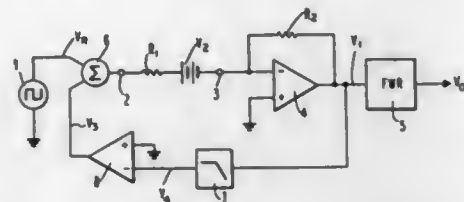
Frederick K. Blades, Boulder, Colo., assignor to Anatel Instrument Corporation, Boulder, Colo.

Filed Jan. 9, 1985, Ser. No. 689,871

Int. Cl.<sup>4</sup> G01N 27/06

U.S. Cl. 324-442

4 Claims



1. A circuit for measuring the resistance of an electrolyte cell comprising a pair of electrodes, said cell being juxtaposed to a source of high-frequency noise, comprising:
  - oscillator means, for supplying a relatively low-frequency AC excitation signal  $V_R$ , connected to one of said electrodes;
  - first filter means, connected to the other of said electrodes, for receiving and filtering a major component of said noise from an AC output signal from said cell, said filter introducing a nonlinearity into said AC output signal;
  - current-to-voltage converter means connected to said filter means, for generating an output signal  $V_1$ , having an AC component proportional to the resistance of the cell and to the excitation signal  $V_R$ , and a DC component  $V_2$ ;
  - a feedback loop comprising an integrator for generating a DC compensation signal equal to the DC component  $V_2$  of  $V_1$ , said integrator introducing an AC nonlinearity into said output signal, wherein said first filter means and said integrator are chosen such that said AC nonlinearities are equal and opposite in sign; and
  - means for summing said DC compensation signal with said AC input signal  $V_R$ .

4,683,436

## SURFACE POTENTIAL ELECTROMETER AND IMAGE FORMING APPARATUS USING THE SAME

Koji Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

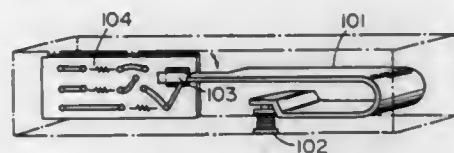
Continuation of Ser. No. 418,024, Sep. 14, 1982, abandoned, which is a continuation of Ser. No. 141,885, Apr. 21, 1980, Pat. No. 4,367,948. This application Mar. 21, 1985, Ser. No. 714,574

Claims priority, application Japan, Apr. 24, 1979, 54-51141; Apr. 28, 1979, 54-52632; Apr. 28, 1979, 54-52633; May 8, 1979, 54-56536; Jun. 25, 1979, 54-79860; Jul. 10, 1979, 54-87118

Int. Cl.<sup>4</sup> G01R 29/12

U.S. Cl. 324-458

9 Claims



1. A surface potential electrometer, comprising:
  - a measuring electrode arranged to be shielded from an external electric field produced by a test element except by way of an aperture through which in use said electrode can be exposed to a said electric field;
  - a chopper arranged to be vibrated so as to intersect cyclically the lines of electric force extending from the test element to the measuring electrode through the aperture;
  - an amplifier circuit for converting an AC signal outputted

from said measuring electrode into a low impedance signal; and

a printed circuit board on which said measuring electrode and said amplifier circuit are provided;

wherein said measuring electrode on said printed circuit board is a planar element disposed in a fixed position with respect to vibratory movement of said chopper.

4,683,437

## FREQUENCY SUBTRACTOR

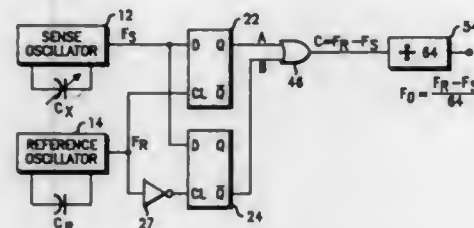
Rupin J. Javeri, Elk Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1986, Ser. No. 871,228

Int. Cl.<sup>4</sup> H03D 13/00

U.S. Cl. 328-133

11 Claims



11. A subtractor for developing an output signal that is representative of the frequency difference between a first signal and a second signal that has leading and trailing edges, comprising:
  - first means for sampling the first signal upon the occurrence of each leading edge of the second signal so as to develop a first binary signal whose state depends on the sampled state of the first signal;
  - second means for sampling the first signal upon the occurrence of each trailing edge of the second signal so as to develop a second binary signal whose state depends on the sampled state of the first signal; and
  - means for logically ORing the first and second binary signals to develop the output signal.

4,683,438

## CIRCUIT FOR CONNECTING A LOAD TO THE HIGH SIDE OF A DC POWER SUPPLY

Alfred Hauenstein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

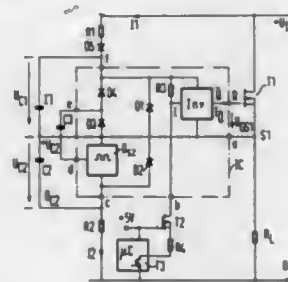
Filed May 9, 1986, Ser. No. 861,488

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516936

Int. Cl.<sup>4</sup> G05F 1/56

U.S. Cl. 323-288

10 Claims



1. A circuit for connecting a load to a high side of a DC power supply, comprising:
  - an n-channel MOSFET between said high side and said load;

- a first RC network containing a first capacitor, said first RC network being in parallel with the drain-source path of the MOSFET;
- a second RC network containing a second capacitor, said second RC network being in parallel with the load and connected such that the first and second capacitors are connected together;
- an inverter with an input connected to that plate of the first capacitor which is unconnected to the second capacitor and with an output connected to the gate of the MOSFET; and
- means for trickle-charging said first capacitor.

resultant symmetrically pulse width modulated digital output signal from said combining means; and

switching amplifier means coupled to said modulating means to amplify said pulse width modulated output signals.

4,683,440

## HIGH-FREQUENCY AMPLIFIER DEVICE

Yoshihiko Yoshikawa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

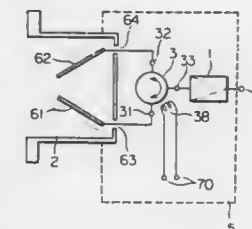
Filed Feb. 27, 1986, Ser. No. 833,159

Claims priority, application Japan, Feb. 28, 1985, 58-39079

Int. Cl.<sup>4</sup> H03F 3/60

U.S. Cl. 330-51

3 Claims



1. A high-frequency amplifier device comprising a high-frequency amplifier portion, a high-frequency input portion which is formed of a waveguide and which can transmit polarized signals orthogonal to each other, two detector portions which are inserted in said waveguide of said input portion and which independently detect the polarized wave signals orthogonal to each other, respectively, an irreversible circuit to which the polarized wave signals detected by said detector portions are individually input and which selectively and switchingly delivers one of the polarized wave signals to said high-frequency amplifier portion and returns the other polarized wave signal to the input portion, and switching control means to switch and control transmitting directions of said irreversible circuit in response to a control signal externally applied, whereby the two orthogonal polarized wave signals can be switched and amplified.

4,683,441

## APPARATUS FOR ESTABLISHING THE DIFFERENCES BETWEEN MULTIPLE PAIRS OF ANALOG INPUT SIGNALS

Thomas K. Naylor, Belmont, Mass., assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 19, 1985, Ser. No. 799,621

Int. Cl.<sup>4</sup> H03F 3/45

U.S. Cl. 330-69

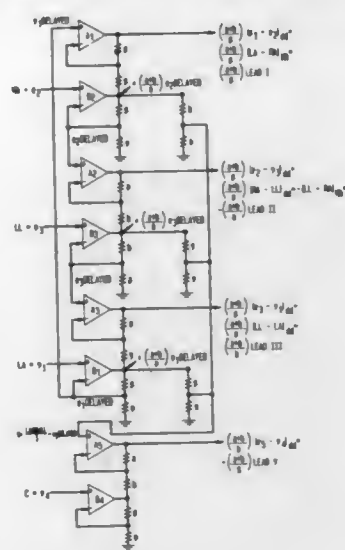
19 Claims

1. A signal control circuit including a digital power amplifier, said power amplifier comprising:
  - a source of digital signals representative of successive values of a predetermined signal train;
  - a digital symmetrical pulse width modulating means for producing a succession of symmetrically pulse width modulated output signals;
  - connecting means coupling said source of digital signals to said modulating means to control said modulating means in accordance with the digital signals from said source;
  - said digital symmetrical pulse width modulating means including:
    - latch means connected to said source of digital signals for holding at the output thereof each of said successive values of digital signals from said source;
    - a first and a second controllable delay shift register having an input connection, an output connection, and control input connections;
    - first coupling means connected between said output of said latch means and said control input connections of said first shift register to apply said successive values directly to said control input connections;
    - second coupling means connected between said output of said latch means and said control input connections of said second shift register to apply said successive values inversely to said control input connections of said second shift register;
    - digital input signal means connected to apply digital input signals to said input connections of said first and second shift register;
    - combining means connected to said output connection means of said first and second shift registers to provide a

11. Apparatus for establishing the differences between multiple time-coincident pairs of analog input signals with a minimum number of active devices comprising:
  - a bank of differential amplifier circuits limited in number to the number of pairs of signals for which the differences between pairs is sought, each of said differential amplifier circuits having at least one high impedance input terminal and a low impedance output;
  - means within each of said differential amplifier circuits for generating a delayed version of an input signal thereto; and
  - means for applying said delayed version of an input signal from each differential amplifier circuit to the high impedance input terminal of another differential amplifier circuit, whereby each differential amplifier circuit is sup-



plied with one properly delayed input signal from another differential amplifier circuit where it is subtracted from



the delayed version of the input signal applied directly to this differential amplifier circuit.

4,683,442

#### OPERATIONAL AMPLIFIER CIRCUIT UTILIZING RESISTORS TRIMMED BY METAL MIGRATION

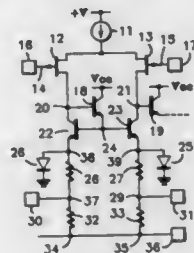
Robert L. Vyne, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 662,109, Oct. 18, 1984, Pat. No. 4,606,781. This application Apr. 28, 1986, Ser. No. 856,258

Int. Cl.<sup>4</sup> H03F 3/45

U.S. Cl. 330-261

9 Claims



9. A circuit formed in a semiconductor substrate, comprising: transistor means having base, emitter and collector terminals, and having a base-emitter conduction path, said emitter coupled to a first supply voltage conductor; diode means coupled in parallel with said base-emitter conductor path; and a first RTMM resistor coupled between said diode means and said supply voltage conductor.

4,683,443

#### MONOLITHIC LOW NOISE AMPLIFIER WITH LIMITING

James P. Young, Cedar Rapids; Robert J. Weber, Marion, both of Iowa, and G. Robert Kaelin, Thousand Oaks, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1986, Ser. No. 822,579

Int. Cl.<sup>4</sup> H03F 1/52, 3/16

U.S. Cl. 330-277

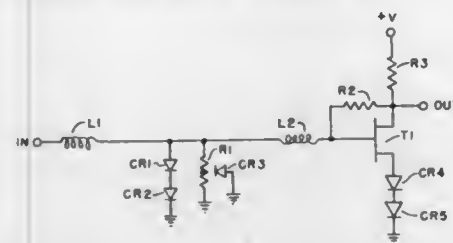
4 Claims

2. A low noise amplifier comprising: a positive voltage source; a transistor which receives an input signal over its gate

terminal, is connected to the positive voltage source with its drain terminal, and has a source terminal connected with a common electrical ground;

a biasing circuit which electrically connects the transistor to the positive voltage source and the common electrical ground, said biasing circuit providing a forward bias to the transistor;

a means for limiting high input voltages from entering the transistor, said limiting means being electrically connected with the biasing circuit and the transistor; and



first and second inductor coils, being connected in series with each other and conducting input signals into the gate terminal of the transistor, said first and second inductor coils being connected to the common electrical ground by the biasing circuit and limiting means, said first and second inductor coils together with impedance in the limiting means and biasing circuit simulating a shunt capacitor which connects the transistor's gate terminal with the common electrical ground, said first and second conductor coils thereby providing input impedance matching between the low noise amplifier and the input signals.

4,683,444

#### GENERATOR CIRCUIT FOR GENERATING TWO SINUSOIDAL SIGNALS WITH A PHASE DIFFERENCE OF 90 DEGREES

Otmar Kappeler, Neuenburg, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

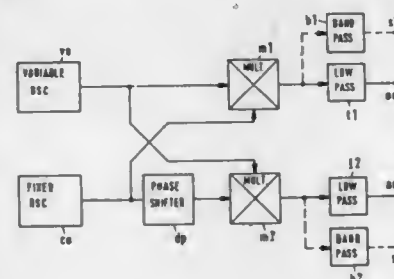
Filed Dec. 13, 1985, Ser. No. 810,610

Claims priority, application European Pat. Off., Dec. 14, 1984, 84 11 5450.3

Int. Cl.<sup>4</sup> H03B 21/02; H03L 7/18

U.S. Cl. 331-25

5 Claims



1. A generator circuit for generating first and second jointly frequency-variable sinusoidal signals which are phase shifted by 90° in relation to one another, comprising:

a first analog multiplier;

a 90° phase shifter;

a main oscillator;

a fixed frequency divider coupled to said main oscillator, and a third low-pass filter whose cutoff (limit) frequency lies below the output signal frequency of said fixed frequency divider, said third low-pass filter coupled to the output of said fixed frequency divider and to the input of

said 90° phase shifter and to a first input of said analog multiplier;

a second analog multiplier having a first input connected to the output of said 90° phase shifter;

a variable frequency divider coupled to said main oscillator, and whose number of divisions is determined by digital data and having its output coupled to a second input of said first multiplier and to a second input of said second multiplier;

a first low-pass filter coupled to the output of said first multiplier, the output of said first low-pass filter providing said first sinusoidal signal;

a second low-pass filter coupled to the output of said second multiplier, the output of said second low-pass filter providing said second sinusoidal signal; and wherein

the upper cutoff frequencies of said first and second low-pass filters lie between the sum and the difference of the frequencies of the signals provided by said fixed frequency divider and of said variable frequency divider.

4,683,445

#### SYNCHRONIZATION METHOD FOR DERIVING A REFERENCE SIGNAL FROM A PILOT FREQUENCY

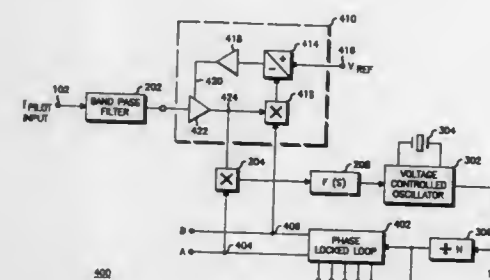
Paul M. Erickson, Hanover Park, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Apr. 30, 1986, Ser. No. 858,323

Int. Cl.<sup>4</sup> H03L 7/00

U.S. Cl. 331-25

24 Claims



1. Synchronization apparatus for deriving a stable reference signal from a selected pilot frequency which is embedded among other signal information inputted thereto, the apparatus forming a loop comprising in combination:

controlled oscillator means for generating an output signal whose frequency is a harmonic of the desired reference signal and proportional to a control signal applied thereto; programmable means for multiplying the frequency of said output signal by a given preset factor to generate an injection signal therefrom; and

linear means for comparing the phase difference between the selected pilot frequency and said injection signal, thereby producing a control signal at baseband to rapidly phase-lock the controlled oscillator means to the selected pilot frequency in accordance with said given preset factor of said programmable means.

4,683,446

#### PRF COHERENT, PULSED OSCILLATOR APPARATUS

Thomas W. McDonald, San Juan Capistrano, Calif., assignor to Cartwright Engineering, Inc., Anaheim, Calif.

Filed Jun. 12, 1985, Ser. No. 743,799

Int. Cl.<sup>4</sup> H03K 7/08

U.S. Cl. 331-47

15 Claims

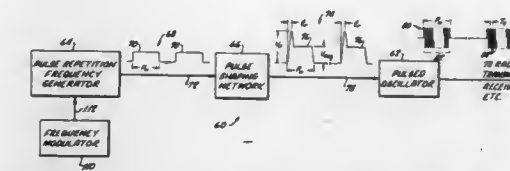
1. Phase-locked, pulsed oscillator apparatus which comprises:

(a) a pulse repetition frequency (PRF) generator having pulse output signals of a frequency,  $f_1$ , with an associated period,  $T_1$ , equal to  $1/f_1$ ;

(b) a pulsed oscillator having a free running frequency,  $f_{FR}$ ,

which is approximately equal to N times the PRF generator output signal frequency,  $f_1$ , wherein N is an integer; and

(c) pulse shaping means connected for receiving the PRF generator output signals and for shaping thereof into reshaped pulses having a sharp rise time,  $t_r$ , selected to impart significant harmonic power to the reshaped pulses



near the free running frequency of the pulsed oscillator, said pulse shaping means being connected to the pulsed oscillator and providing said reshaped pulses thereto for causing triggering on of the pulsed oscillator,

whereby the pulsed oscillator is caused to have pulse-to-pulse consistency such that each oscillator output pulse bears the same phase relationship to the reshaped pulses as does any other of said oscillator output pulses.

4,683,447

#### VARACTOR TUNING CIRCUIT FOR DIELECTRIC RESONATOR STABILIZED OSCILLATOR

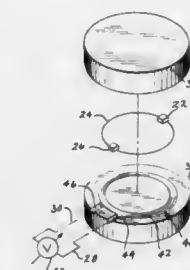
Ashok K. Talwar, Westlake Village; William E. Poole, Jr., Newbury Park, and Richard B. Steinkolk, Sherman Oaks, all of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 1, 1986, Ser. No. 936,228

Int. Cl.<sup>4</sup> H03J 3/18

U.S. Cl. 331-177 V

4 Claims



1. A tuning varactor circuit for a dielectric resonator stabilized oscillator, comprising a varactor diode electrically connected in an electrically conductive loop with an RF bypass capacitor and having a pair of terminals for applying bias voltage across said diode, and first and second dielectric resonator substrates facing each other along the plane of said loop, with said loop therebetween.

4,683,448

#### HIGH SENSITIVITY INTERFERENTIAL ELECTRO-OPTICAL MODULATOR

Christian Duchet, Marcoussis, and René Martin, Massy, both of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Jan. 9, 1985, Ser. No. 689,902

Claims priority, application France, Jan. 18, 1984, 84 00734

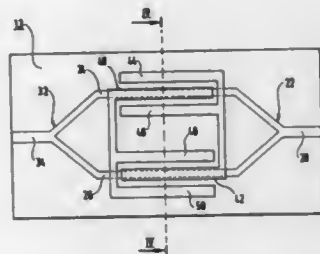
Int. Cl.<sup>4</sup> H01S 1/00; G02B 5/14

U.S. Cl. 332-7.51

5 Claims

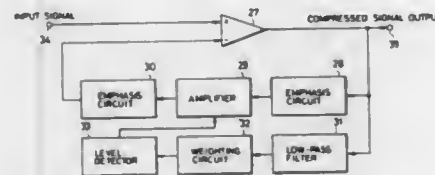
1. High sensitivity, interferential electro-optical modulator including a modulator input and output comprising: a Mach-Zehnder integrated type interferometer (13), said interferometer comprising:

a platelet (18) having a face and being of transparent crystal-line material whose optical index varies by electro-optical effect under the action of an electrical field; integrated input and output optical guides, said guides being formed in said face of said platelet through permanent localized increases in the optical index resulting from doping of the material, said guides being monomode both as to their width and thickness and format; said input guide (20) receiving from said modulator input and conducting a light with space coherence; an optical input junction in Y form integrated with said input guide and separating the light from the input guide into two beams of same intensity; two interferometer arms (24, 26) integrated with said input junction and being of similar length conducting the two beams thus separated, said two arms extending parallel to each other in a longitudinal direction; an optical junction in Y form (21) integrated with said interferometer arms to recombine the two beams from the two arms; said output guide (34) integrated with said output junction and receiving the light thus recombined and transmitting it on output (9) from the modulator, the length of said output guide being such that it only transmits its fundamental mode;



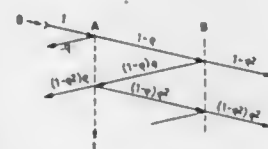
said modulator further containing electrodes formed on said face of the platelet, associated with the two interferometer arms and means for applying an electrical modulation signal to the material of said two arms (24, 26) to create two electrical fields varying the optical length of said two arms in opposite directions thus modulating the intensity of the light transmitted by the output guide (34), said electrodes extending along said longitudinal direction over practically the whole length of the arms to increase the sensitivity of the modulator, one of the electrodes associated with each of said arms being an overlapping electrode which overlaps each said arm so that the electrical field applied to each said arm is practically perpendicular to said face of the platelet, the other electrodes being lateral electrodes formed at a lateral distance from said arms; the improvement wherein said modulator contains six said electrodes, each arm being associated with three electrodes which are: an overlapping electrode fitted between two lateral electrodes, said modulation signal being applied between firstly said overlapping electrode and secondly said two lateral electrodes so that the electric field applied to each arm is made practically uniform over the whole of its width to still further increase sensitivity of the modulator.

**4,683,449**  
**NOISE REDUCTION COMPRESSION SYSTEM**  
**CONTROLLED BY COMPRESSED OUTPUT**  
**COMPONENTS WHICH ARE IN-BAND**  
 Shigeru Kato, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan  
 Filed May 2, 1985, Ser. No. 729,781  
 Claims priority, application Japan, May 2, 1984, 59-89091; May 2, 1984, 59-89092  
 Int. Cl.<sup>4</sup> H04B 1/64; H03G 7/00  
 U.S. Cl. 333—14 2 Claims



1. A compression circuit for a noise reduction system coupled to a bandwidth-limited transmission system having a transmission band defined by bandwidth limitations, said circuit receiving and compressing an input signal to provide a compressed output signal to said transmission system, said circuit comprising subtraction means for subtracting a feedback signal from said input signal to obtain said compressed output signal, a controllable gain amplifier for processing said compressed output signal in accordance with a control signal to obtain said feedback signal, a low-pass filter having a pass band substantially the same as said transmission band of said transmission system, said filter receiving said compressed output signal and providing a filter output; and level detector means responsive to said filter output for providing said control signal to said controllable gain amplifier, whereby the gain of said amplifier is controlled in accordance only with components of said compressed output signal within the bandwidth of said transmission system.

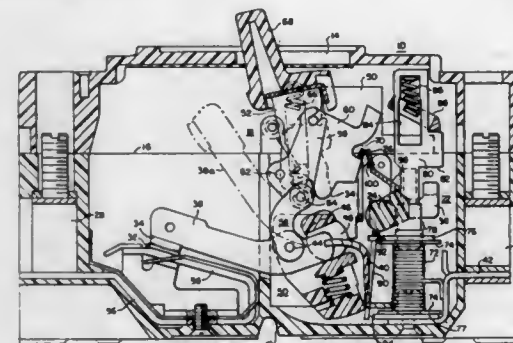
**4,683,450**  
**LINE WITH DISTRIBUTED LOW-PASS FILTER**  
**SECTION WHEREIN SPURIOUS SIGNALS ARE**  
**ATTENUATED**  
 Jean-Joseph Max, Neuchatel, and Arvind Shah, Cormondreche, both of Switzerland, assignors to Feller AG, Horgen, Switzerland  
 Filed Jun. 29, 1983, Ser. No. 509,217  
 Claims priority, application Switzerland, Jul. 1, 1982, 4021/82  
 Int. Cl.<sup>4</sup> H01P 1/201  
 U.S. Cl. 333—202 11 Claims



1. An electrical transmission line comprising an elongated main conductor of low resistivity and including first and second line sections, each section including a segment of the main conductor and each section having a predetermined characteristic impedance; and a distributed low-pass filter comprising a third line section connected in series between the first and second line sections.

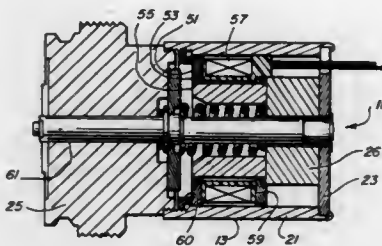
tions, the third line section including a main conductor segment interconnecting the main conductor segments of the first and second line sections, the third line section having a characteristic impedance substantially different from the characteristic impedance of either one of the first and second line sections so that high frequency spurious signals occurring on the transmission line are repetitively reflected back and forth within the third line section, and the third line section having a layer of non-magnetic conductive material, having a resistivity many times higher than the resistivity of the main conductor segment of the third line section, encompassing the main conductor segment of the third line section, affording substantial losses for such high frequency spurious signals so that such signals are highly attenuated as they are reflected within the third line section.

**4,683,451**  
**CIRCUIT BREAKER WITH TRIP DELAY MAGNETIC CIRCUIT**  
 Kurt A. Grunert, Beaver Boro, and Alfred E. Maier, Chippewa, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Filed Mar. 14, 1986, Ser. No. 839,484  
 Int. Cl.<sup>4</sup> H01H 9/00  
 U.S. Cl. 335—174 2 Claims



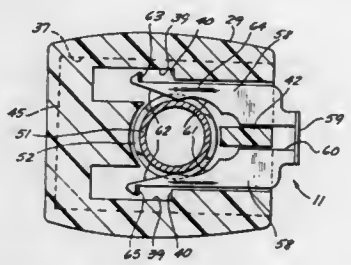
1. A circuit breaker comprising: a pair of separable contacts including a movable contact; a movable contact arm carrying the movable contact and movable between open and closed positions of the contacts; an operating mechanism for actuating the contact arm and comprising a pivotally supported releasable member; latching means for latching the releasable member and including a latch lever movable between latched and unlatched positions of the releasable member; trip means including a trip bar for releasably holding the latch lever in the latched position; trip delay means for avoiding premature unlatching of the trip bar and including first electromagnetic means including a first armature and second electromagnetic means including a second armature and a solenoid coil; the first armature being movable preliminary to operation of the second armature in response to an overcurrent below a predetermined overcurrent condition; and the second electromagnetic means also including a magnetic frame having opposite end portions each disposed at opposite ends of the coil and including the second armature pivotally mounted on one end portion and movable into and out of contact with the other end portion in response to a magnetic force, so as to enhance the electromagnetic force acting on the second armature.

**4,683,452**  
**BI-STABLE ELECTROMAGNETIC ACTUATOR**  
 Lester P. Henley, Stickney, Ill., assignor to Regdon Solenoid, Inc., Brookfield, Ill.  
 Filed Jun. 30, 1986, Ser. No. 879,894  
 Int. Cl.<sup>4</sup> H01F 7/08  
 U.S. Cl. 335—234 6 Claims



1. A bi-stable electromagnetic actuator comprising: a housing; an armature disposed in said housing and being moveable between first and second predetermined positions; a retractable linkage member disposed in said housing in sliding engagement with said armature, said linkage member including a portion which projects out of said housing to allow manual advancement of said linkage between said first and second locations and a stop which the armature engages to move said linkage from said first to said second position; magnetic means for retaining said armature in said first stable position; coil means for reducing the net flux through said armature; advancing means for advancing said armature from said first to said second stable positions when said coil means reduces the net flux through said armature; and a biasing member secured to said linkage, said biasing member disposed within the magnetic field of said magnetic means to bias said linkage and maintain said linkage in abutting relation with said armature.

**4,683,453**  
**SOLENOID ACTUATOR WITH FASTENER**  
 David J. Vollmer, Ironia, and James E. Greame, Long Valley, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.  
 Filed Nov. 25, 1985, Ser. No. 801,466  
 Int. Cl.<sup>4</sup> H01F 7/08  
 U.S. Cl. 335—255 11 Claims



1. A solenoid actuator comprising: a coil of electrically conductive wire wound about an axis, an enclosure for the coil, receptacle means carried by the enclosure for accommodating a mounting member of a device to be controlled by the solenoid actuator, a slideway carried by the enclosure extending transverse to the coil axis, a fastener movable within the slideway between a latched position in which it can engage the mounting member, to secure the enclosed coil to the device to be controlled, and an unlatched position in which it is disengaged from the mounting member, to permit separation of the enclosed coil from the device to be controlled, and



means for preventing separation of the fastener and the enclosure when the fastener is in its unlatched position.

4,683,454

### SOLENOID ACTUATOR WITH ELECTRICAL CONNECTION MODULES

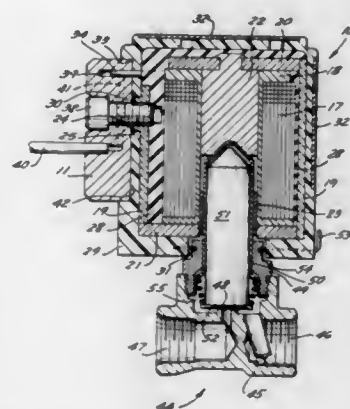
David J. Vollmer, Ironia, and James E. Greame, Long Valley, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Oct. 31, 1985, Ser. No. 793,208

Int. Cl.<sup>4</sup> H01F 15/10, 27/04

U.S. Cl. 335-299

14 Claims



1. A solenoid actuator comprising: a coil of electrically conductive wire, a yoke of magnetic material surrounding the coil, a non-electrically and non-magnetically conductive material encapsulating the coil and yoke, a pair of terminals connected to the ends of the coil and projecting outwardly beyond an exterior surface of the encapsulation, an electrical connection module having means for receiving the coil terminals, means for connecting the module to a source of electric power, and means within the module for electrically connecting the coil terminals to the electric power connecting means, and means for fastening the module to the encapsulated coil and yoke, the fastening means including attachment means carried by the yoke, and a fastener cooperable with the attachment means for securing the module to the yoke, the encapsulating material having an opening for permitting access to the attachment means.

4,683,455

### SHIFTING TIMING INDICATING SYSTEM FOR A VEHICLE

Yoshinobu Kido, and Toshihiro Yamada, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Jul. 1, 1985, Ser. No. 750,511

Claims priority, application Japan, Jul. 4, 1984, 59-138577

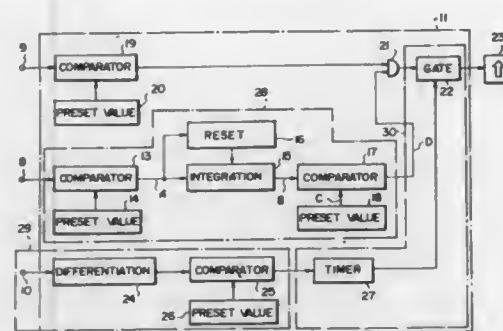
Int. Cl.<sup>4</sup> B60Q 1/00; G08B 9/04

U.S. Cl. 340-52 R

11 Claims

1. A shifting timing indicating system for a vehicle comprising a control means having an engine rpm detecting means for detecting the engine rpm and a rpm determination means which receives the output of the engine rpm detecting means and determines whether the engine rpm exceeds a preset value, the control means outputting a shift-up signal when the engine rpm exceeds the preset value, and a shift-up indicating means which receives the shift-up signal from the control means and makes a shift-up indication to direct the operator of the vehicle to shift up, wherein the improvement comprises an engine load detecting means for detecting the engine load; an acceleration detecting means responsive to said engine load detecting means to detect the rate of increase in engine load and restrict-

ing means responsive to said acceleration detecting means to inhibit the shift-up indicating means from making the shift-up



indication when the rate of increase in engine load is greater than a predetermined positive value.

4,683,456

### METHODS AND APPARATUS FOR ANALOG TO DIGITAL CONVERSION

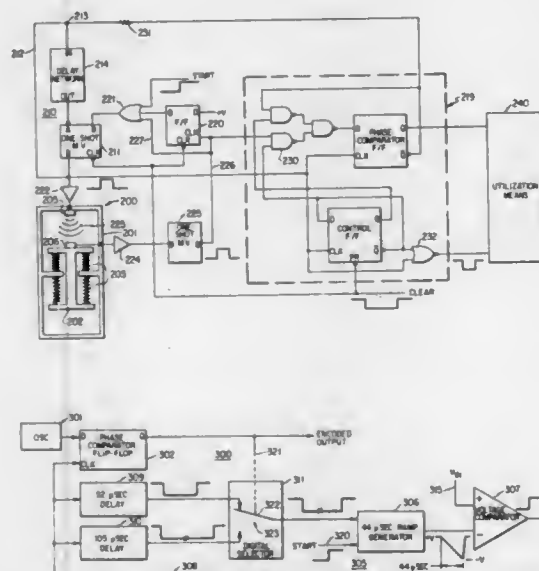
Robert G. Nelson, Dallas, Tex., assignor to Timeback Systems, Inc., Dallas, Tex.

Filed Dec. 28, 1983, Ser. No. 566,314

Int. Cl.<sup>4</sup> A03K 13/20; G01P 15/08

U.S. Cl. 340-347 AD

49 Claims



10. A system for digitizing a representation of an analog condition comprising:

- (a) two means for generating time spaced digital pulse signals and whose frequencies are harmonically related one to the other, each said means comprising an oscillator;
- (b) means responsive to a representation of said analog condition to effect a relative phase shift between said digital pulse signals;
- (c) means for measuring said relative phase shift; both said digital pulse signals appearing at said measuring means having a constant frequency;
- (d) means responsive to the measure of said relative phase shift to return said signals toward an in-phase relationship;
- (e) means for producing a digital function representation of said measure of relative phase shift; and
- (f) means for utilizing said digital function.

4,683,457

### ANALOG TO DIGITAL CONVERTER

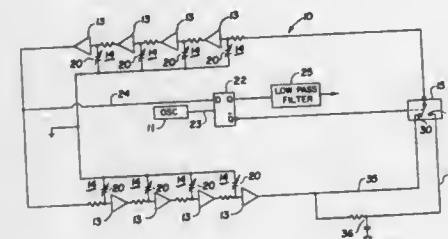
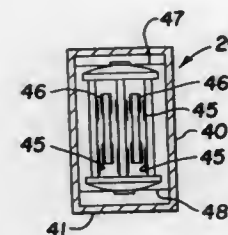
Robert G. Nelson, Dallas, and James D. Awtrey, Garland, both of Tex., assignors to Royalty Funding Ltd., Houston, Tex.

Continuation-in-part of Ser. No. 566,314, Dec. 28, 1983. This application Apr. 29, 1986, Ser. No. 857,028

Int. Cl.<sup>4</sup> A03K 13/20; G01P 15/08

U.S. Cl. 340-347 AD

13 Claims



1. An analog to digital converter comprising: a source having an output of fixed frequency time spaced pulses, means, including an oscillator comprised of a plurality of digital gates connected serially in a loop, and having an output of time-spaced pulses whose frequency is harmonically related to the output frequency of said source, an impedance in said loop responsive to an analog condition to change the phase of said time-spaced pulses from said means, a comparator, means for applying the outputs of said source and said means to said comparator, means responsive to said comparator to correct said time-spaced pulses from said means to an in-phase state relative to the time spaced pulses from said source, and means for producing digital signals whose value is proportional to the correction made to said time-spaced pulses from said means.

4,683,458

### CURRENT-STEERING DIGITAL-TO-ANALOG CONVERTER FOR PROVIDING BI-DIRECTIONAL CURRENTS THROUGH A LOAD

Robert Hallgren, 142 Cornell Quarters, Ithaca, N.Y. 14850

Filed Jul. 31, 1986, Ser. No. 891,129

Int. Cl.<sup>4</sup> H03M 1/80

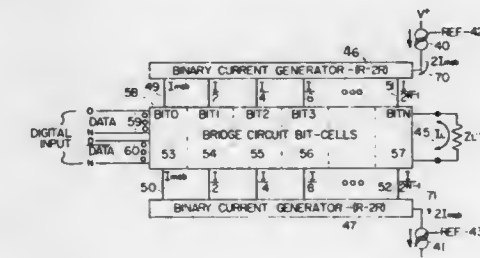
U.S. Cl. 340-347 DA

11 Claims

1. A digital-to-analog converter for converting a digital input signal comprising a binary encoded number having a plurality of data bits, the signal appearing at a digital signal input and its complement appearing at a complementary signal input, to a bidirectional analog current output representation of the digital input signal, the analog current output being adapted to supply current to a floating load at a first and second current output means, the digital-to-analog converter comprising:

- (a) a plurality of bit-cell circuits, one for each data bit in the digital input signal, each bit-cell circuit comprising:

- (1) a first current input;
- (2) a second current input;
- (3) a data bit input and a complementary data-bit input, the complementary data-bit input being the logical inverse of the data-bit input;
- (4) first and second current output means for supplying current to a load;
- (5) a bridge circuit comprising four controllable devices arranged in two pairs, each device having an input, an output, and control input means for activating the current flowing from the input to the output in response to a predetermined logical value at the control input;
- (6) the inputs of the first pair of controllable devices being connected to the first current input;
- (7) the outputs of the second pair of controllable devices being connected to the second current input;
- (8) the output of one of the first pair of controllable devices and the input of one of the second pair of controllable devices being connected to each other and to the first current output means;
- (9) the output of the other of the first pair of controllable devices and the input of the other of the second pair of controllable devices being connected to each other and to the second current output means;
- (10) the control inputs of the two controllable devices whose input or output is connected to the first current output means being connected to the data-bit input;
- (11) the control inputs of the other two controllable devices being connected to the complementary data-bit input;



combination being then connected to the first current load output means of the digital-to-analog converter;

(f) the second current output means of each of the bit-cell circuits being connected together in parallel, and the combination being then connected to the second current load output means of the digital-to-analog converter.

4,683,459

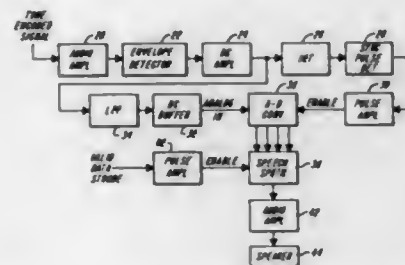
## ALARM SYSTEM TEST ANNUNCIATOR

James B. Edson, Concord, Mass., assignor to ADT, Inc., Parsippany, N.J.

Filed May 28, 1985, Ser. No. 738,576  
Int. Cl.<sup>4</sup> G08B 29/00, 1/08

U.S. Cl. 340—514

7 Claims



1. For use in a wireless alarm system having one or more transmitters each providing a coded transmitted signal representing status and alarm conditions, and a receiver for receiving each of the transmitted signals, test apparatus comprising: first means operative in response to a signal from the receiver which is representative of signal strength to provide a first signal;

second means for providing a digital signal representative of the first signal;

speech synthesizer means;

means for providing the digital signal to the synthesizer means to cause the provision of an audio output signal representing a digit corresponding to the signal strength represented by the digital signal, said means for providing the digital signal being responsive to said coded transmitted signal; and

output means operative in response to the audio output signal to provide verbal annunciation of the digit represented by the audio output signal.

4,683,460

## INTRUSION ALARM SYSTEM WITH AUTOMATIC EXIT CONTROL AND MISSET INDICATOR

Norihiko Nakatsugawa, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 22, 1985, Ser. No. 736,949

Claims priority, application Japan, May 25, 1984, 59-105961  
Int. Cl.<sup>4</sup> G08B 13/08

U.S. Cl. 340—545

6 Claims

1. An intrusion alarm system comprising:

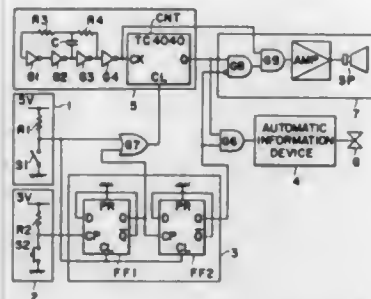
a mode selection circuit which selects a "Present" mode which represents the presence of a resident in a house, building, room or the like and an "Absent" mode which represents the absence of the resident from the house, building, room or the like, said mode selection circuit being set by the resident;

a door open/closed detection circuit which detects a door's being in an open state or a closed state;

a sequential circuit which operates while said mode selection circuit is set in the "Absent" mode and stores signals representative of the door being opened and then closed according to said door open/closed detection circuit, said sequential circuit detecting that the door was opened for a second time after the mode selection circuit is set in the

"absent" mode, and producing an output signal upon the detection of the second door opening;

a miset alarm device which generates an alarm if an opening of the door is not detected by said door open/closed detection circuit within a predetermined time after said mode selection circuit is placed in the "Absent" mode;



a timer circuit which starts counting upon said second door opening detected by said sequential circuit and produces an output signal upon expiration of a predetermined time as counted from the second door opening; and

an automatic information device which informs a security center of the detection of a trespasser when the output signal of the sequential circuit and the output signal of the timer circuit are both present.

4,683,461

## INDUCTIVE MAGNETIC FIELD GENERATOR

John J. Torre, Monroe, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 17, 1985, Ser. No. 776,921

Int. Cl.<sup>4</sup> G08B 13/24

U.S. Cl. 340—551

19 Claims



1. A power-line-activated inductive magnetic field generator having an on-duty cycle portion considerably less than 50% for deriving an AC magnetic field having a predetermined frequency comprising: a transformerless AC-power-line-to-DC converter, a series resonant circuit including coil means, and switch means activated during the on-duty cycle portions and deactivated during off-duty cycle portions, the switch means being activated at a selected frequency during the on-duty cycle portions and being connected to the resonant circuit as well as to the converter to cause resonant current to flow in the series circuit at the predetermined frequency during each on-duty cycle portion to thereby cause the coil means to derive the AC inductive magnetic field.

4,683,462

## DEVICE FOR PROTECTING AUDIO EQUIPMENT IN VEHICLE AGAINST THEFT

Kazuma Takeda, and Tsutomu Igarashi, both of Iwaki, Japan, assignors to Alpine Electronics Inc., Japan

Filed Nov. 7, 1984, Ser. No. 669,103

Claims priority, application Japan, Nov. 8, 1983, 58-209471  
Int. Cl.<sup>4</sup> G08B 13/14; G06F 7/04; H04B 11/16

U.S. Cl. 340—571

11 Claims

1. In an audio equipment adapted to be installed in a vehicle and having an audio section for providing an audio sound

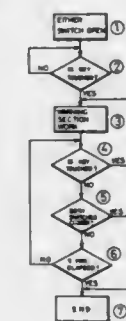
output, the improvement of said audio equipment being provided integrally with its own anti-theft device comprising:

an entry section including a plurality of keys for entering a selected number;

a storage section for storing a code number;

a power section for connecting said audio equipment including said anti-theft device to a battery when said audio equipment is installed in a vehicle;

control means connected to said entry section, storage section, and power section, which becomes operative upon connecting said power section to the battery of a vehicle, for receiving a number entered on said entry section and comparing said entered number to said code number stored in said storage section, and for providing a signal



indicating if said entered number and said stored code number match; and

a muting circuit for muting the audio section from providing an audio sound output or for releasing the audio section from a muted condition to an operative condition depending upon whether said signal is provided by said control means;

further including a second power section for receiving an operative voltage supplied to said anti-theft device when a power switch in the vehicle is switched on, said control means including a detector for detecting if said second power section is not provided with the operative voltage and if a key of said entry section is depressed, and a warning section connected to said control means which provides a warning signal if both said conditions are detected.

4,683,463

## GAS AND FIRE ALARM AND CONTROL SYSTEM FOR SEMICONDUCTOR FACTORIES OR THE LIKE

Shoichi Kimura, Tokyo, Japan, assignor to Nohmi Bosai Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 581,972, Feb. 21, 1984, abandoned.

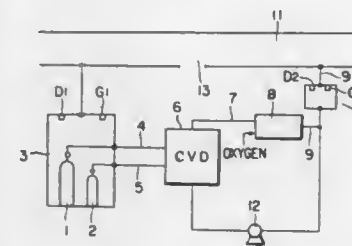
This application Oct. 3, 1986, Ser. No. 914,529

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> G08B 17/10

U.S. Cl. 340—629

3 Claims



1. An alarm and control system for semiconductor factories or the like having an exhaust system wherein treatment gases including silane gas are used in the manufacturing process of semiconductors, comprising: gas detecting means to detect the leakage of said treatment gases including silane gas, and fire

detecting means to detect products of combustion of said treatment gases, which include silane gas, provided at locations where said treatment gases, including silane gas, are used; said fire detecting means consisting of an ionization-type smoke detector; said gas detecting means, provided at the locations where said treatment gases are used, utilize a metal oxide semiconductor containing platinum black as a detecting element for detecting the leakage of said treatment gases, including silane gas, and any said metal oxide semiconductor used as said detecting element, which contains said platinum black, is aged in an atmosphere of silane gas; said gas detecting means and said fire detecting means having circuitry means which, upon a change in the output stage of either of said metal oxide semiconductor or said fire detecting means, causes an alarm signal to issue; and means responsive to said alarm signal connected to control a protection device such as a fire extinguishing device as well as said manufacturing process of semiconductors or the like.

4,683,464

## SAFETY MONITOR MEANS AND METHOD

Chew-Chen Lin, Houston; Winthrop K. Brown; Frank L. Lankford, Jr., both of Bellaire; Katherine L. Greenhill, Houston, and Ronald L. Campsey, Alief, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 509,106, Jun. 30, 1983, abandoned.

This application Jan. 23, 1986, Ser. No. 821,711

Int. Cl.<sup>4</sup> G08B 13/26, 21/00

U.S. Cl. 340—685

12 Claims

1. An automatic safety monitor for use with apparatus having a conductive member, said apparatus changes the attitude and/or altitude of the conductive member during operation of the apparatus, comprising:

antenna means mounted on the conductive member for sensing an electric field and providing an AC signal representative of the strength of the electric field,

means for averaging the peaks of the AC signal over several cycles to provide an average peak signal,

means connected to the averaging means for providing a reference signal derived from either the average peak signal prior to a change in the member's attitude and/or altitude or while the apparatus is changing the member's attitude and/or altitude, and

alarm means connected to said averaging means and to the reference signal means for providing an alarm to the operator of apparatus so that the operator may prevent further changing of the conductive member's attitude and/or altitude, said alarm means provides said alarm in accordance with the average peak signal and the reference signal when the electric field strength is substantially greater than a safe value.

9. A method for safely changing the attitude and/or altitude of a conductive member in the vicinity of a power line comprising the steps of:

providing an AC signal when the conductive member is in the presence of an electric field which is representative of the strength of the electric field,

averaging the peak of an AC signal when it occurs to provide an average peak signal,

providing a reference signal derived from the average signal prior to a change in the member's attitude and/or altitude or while the apparatus is changing the member's attitude and/or altitude, and

moving the conductive member until either it arrives at a desired attitude and/or altitude for the conductive member or an average peak signal is provided which in cooperation with the reference signal indicates that the conductive member has entered an electric field whose strength is greater than a safe value.



4,683,465

## DATA DISPLAY TERMINAL USING A FLAT DISPLAY PANEL

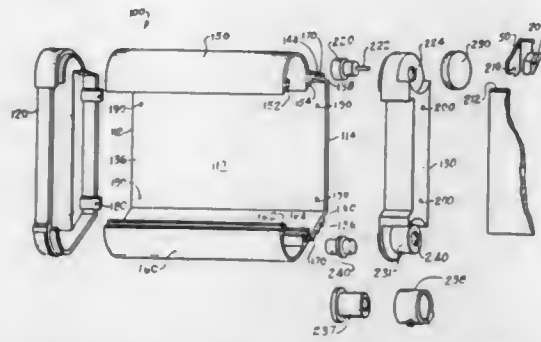
Ralph J. Lake, Jr., Somerville, N.J.; Timothy R. Stern, Southfield, Mich.; George A. Sudol, Mine Hill, and Vladimir Selepouchin, Cedar Grove, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1984, Ser. No. 683,579

Int. Cl.<sup>4</sup> G09G 3/00

U.S. Cl. 340-700

16 Claims



1. A data display terminal comprising a generally thin, flat display panel assembly; a base to which said display panel assembly is pivotally coupled; and means for coupling together said display panel assembly and said base, said coupling means including a hollow tubular member connected to said display panel assembly, a torsion spring disposed within said hollow tubular member, a frictional sleeve enclosing said hollow tubular member, and a split tubular bracket enclosing said sleeve and said hollow tubular member, said split tubular bracket being connected to said base; said display panel assembly including a central frame portion and left and right end brackets secured thereto and flat display panel seated on said central frame portion.

4,683,466

## MULTIPLE COLOR GENERATION ON A DISPLAY

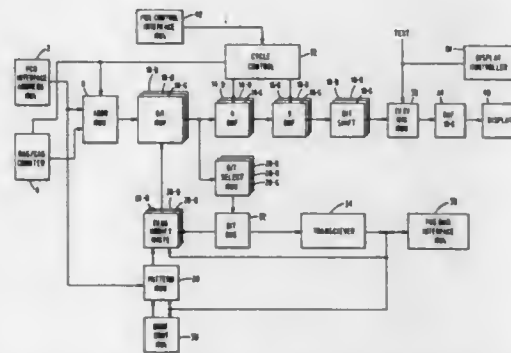
Thomas O. Holtey, Newton, Mass.; Kenneth E. Bruce, Nashua, N.H., and Gary J. Goss, Acton, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 14, 1984, Ser. No. 681,539

Int. Cl.<sup>4</sup> G09G 1/16, 1/28

U.S. Cl. 340-703

7 Claims



1. A color display graphics system for displaying a color image, said color image being made up of a plurality of pixels, said system including apparatus for painting areas of said color image with a plurality of colors and a plurality of shades of colors, said apparatus comprising: a plurality of bit map memory means for storing bits, combined with a plurality of processing means for providing two difference signals by comparing the detection signal from the reference photodetector to the detection signal of one of the two directional photodetectors, thereby providing one difference signal, and comparing

nation of said bits in corresponding locations of said plurality of bit map memory means determining one of said plurality of colors of a corresponding one of said pixels; read only memory means coupled to said plurality of bit map memory means for storing a plurality of bit patterns for each of said plurality of colors, a first of said plurality of bit patterns being representative of a plurality of solid colors and a second plurality of said plurality of bit patterns being representative of predetermined shades of said each of said plurality of colors; a plurality of bit select means coupled to said plurality of bit map memory means, each of said plurality of bit select means selecting a corresponding bit from each of said plurality of bit map memory means; and a plurality of gate means coupled to said plurality of bit select means and to said read only memory means and responsive to plurality of bits from a selected one of said plurality of bit patterns and said corresponding bit from each of said plurality of bit map memory means for performing a logical operation and to write the result representing color bit signals back in said corresponding locations of said plurality of bit map memory means for displaying said color image.

4,683,467

## IMAGE REGISTRATION SYSTEM

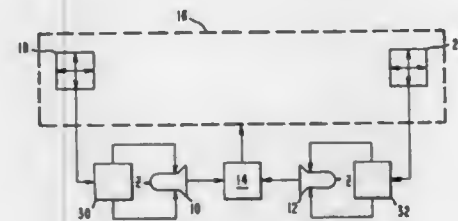
Malcolm Macaulay, Fullerton, and William F. Singleton, Balboa Island, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 1, 1983, Ser. No. 556,882

Int. Cl.<sup>4</sup> G02B 27/02

U.S. Cl. 340-705

19 Claims



10. An image registration system for registering a plurality of images projected onto a common screen, comprising: a plurality of projection means for projecting the plurality of separate images onto the common screen, each image having a registration pattern disposed in a fixed orientation within the image, and each projection means having respective cathode ray tubes with beam centering/deflection coils; a plurality of photodetector sensors, each of which is associated with a respective one of the plurality of projection means, each photodetector sensor comprising three photodetectors arranged in a right angle relationship with the photodetector at the vertex of the right angle being the reference photodetector, the other two photodetectors being directional photodetectors, each photodetector providing detection signals in response to the detection of registration pattern illumination; the plurality of photodetector sensors collocated with the screen and having predetermined spatial relationships with each other such that when the registration patterns are in register with the associated sensors, then the images are in register with each other; a plurality of processing means, each of which is associated with a respective one of the plurality of sensors, for providing two difference signals by comparing the detection signal from the reference photodetector to the detection signal of one of the two directional photodetectors, thereby providing one difference signal, and comparing

the detection signal of the reference photodetector to the detection signal of the other of the two directional photodetectors, thereby providing a second difference signal; and

- a plurality of repositioning means, each of which is associated with a respective one of the plurality of processing means, for controlling the current of the beam centering/deflection coils of the cathode ray tube in response to the difference signals, thereby positioning the image of the CRT.

4,683,468

## METHOD FOR MANIPULATION OF GRAPHIC SUB-OBJECTS IN AN INTERACTIVE DRAW GRAPHIC SYSTEM

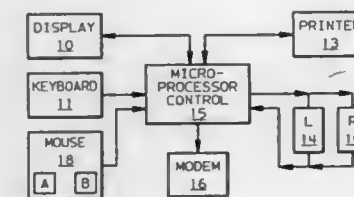
Carol S. Himelstein, and John S. Wang, both of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,762

Int. Cl.<sup>4</sup> G09G 1/16

U.S. Cl. 340-709

11 Claims



1. A method for editing a sub-object of a graphic object displayed in an interactive draw graphic system in which said object has at least one vertex and a pair of selectable line segment sub-objects which define said vertex, said method including the steps of: (a) assigning to said vertex an attribute which permits said vertex to 'break' during a sub-object editing action; (b) selecting said line segment sub-object at a different point along the length of said line segment depending upon the modification desired on said sub-object, and (c) moving said sub-object selected in step b) to obtain said desired modification.

4,683,469

## DISPLAY TERMINAL HAVING MULTIPLE CHARACTER DISPLAY FORMATS

Jeff Elsmore, Tempe; Kenneth W. Stoorza, and Timothy A. Walker, both of Phoenix, all of Ariz., assignors to ITT Corporation, New York, N.Y.

Filed Mar. 14, 1985, Ser. No. 711,912

Int. Cl.<sup>4</sup> G09G 1/06

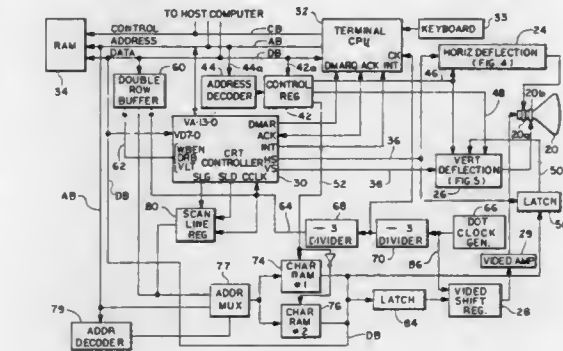
U.S. Cl. 340-723

35 Claims

1. An apparatus for displaying rows of characters, in a plurality of different display formats, said display formats being characterized by display frames that include different respective numbers of characters and different respective numbers of character rows, comprising: (a) a CRT display; (b) CRT control means for controlling the timing of the display, said control means including means for generating horizontal and vertical sync signals and means for storing a set of display parameters including at least: (i) the number of character rows in each display frame, (ii) the number of characters in each character row, and (iii) the number of horizontal scan lines in each character row; (c) memory means for storing data indicative of the characters to be displayed within the display frame and for storing

ing one set of said display parameters for each of said display formats;

- (d) a digital computer connected to the memory means and the CRT control means for loading the CRT control means with a selected one of said sets of display parameters, and for generating a plurality of sets of display format control signals, each set of display parameters and display format control signals being associated with a respective one of said display formats;
- (e) a horizontal deflection circuit responsive to the display format control signals and to the horizontal sync signal for driving the electron beam of the display at one of at least first and second horizontal rates;



of video signals during a sequence of horizontal scan line operations, said means including, addressing means for updating said panel on a scan line basis, said addressing means generating a write sequence applied to a first scan line whereby all display cells in said scan line are written, said write sequence comprising a full write signal applied in coincidence with a sustain signal during the normal sustain alternation, said addressing means generating a selective erase sequence to selectively erase the cells in said first scan line in accordance with the contents of said data stream, said selective erase sequence comprising an erase signal positioned near the leading edge of a sustain signal alternation, and a second full select scan line for priming said first scan line during said selective erase sequences, the duration of said write and erase sequences defining the update time of said plasma display device, said full line write sequence applied to all cells in said first and second scan lines combined with said selective erase sequence in said first scan line eliminating the conventional plasma display non-select state of said plasma display device and the time associated therewith whereby the combined time for sustain, write, and selective erase sequences is substantially reduced to correspond to the data rate of said data stream of video signals.

4,683,471

## DATA BUS PILOT TONE

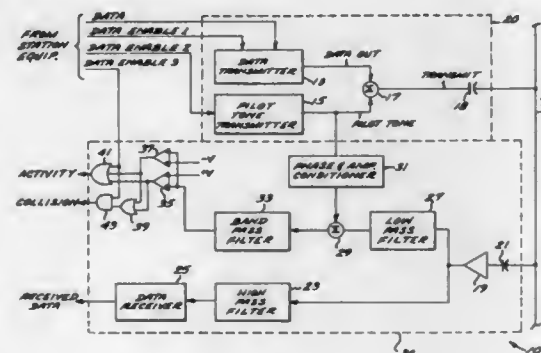
Gary W. Blackstone, Mission Viejo, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 30, 1985, Ser. No. 696,662

Int. Cl. H04Q 3/00; H04J 1/02; H04N 3/02

U.S. Cl. 340-825.5

6 Claims



1. A transceiver for a local area network system having a communications medium comprising:
  - a. transmitter means for providing a communications signal for transmission on the communications medium, said communications signal including a transmit data component and a transmit reference component;
  - b. means for receiving signals on the communications medium and for separating a received signal into a received data component and a received reference component; and
  - c. comparison and logic means responsive to said transmit reference component and to said received reference component for providing an output indicative of whether a transmission collision has occurred, said comparison and logic means including:
    - i. means for comparing said transmit reference component with said received reference component and for providing an output indicative of whether said received reference component is based on said transmit reference component, said comparing means including:
      - (a) conditioning means responsive to said transmit reference component for providing a conditioned refer-

ence signal adapted to be substantially similar to a received reference component which is based on said transmit reference component, and

- (b) means for subtracting said conditioned reference signal from said received reference component to provide said comparing means output; and
- ii. logic means responsive to the output of said comparing means for providing said output indicative of whether a transmission collision has occurred.

4,683,472

## SIGNAL READING SYSTEM SUCH AS FOR REMOTE READING OF METERS

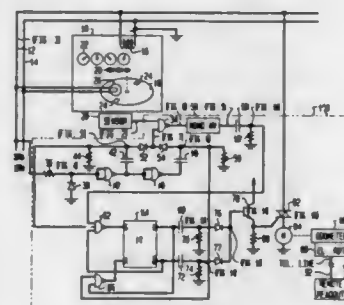
Thomas E. Beling, Saxonville, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Filed Aug. 5, 1982, Ser. No. 405,689

Int. Cl. G08C 13/00

U.S. Cl. 340-870.02

19 Claims



1. A system for detection and readout of energy flow in a power line carrying an alternating voltage and current, comprising:
  - a watt-hour meter including a sensor for sensing energy in the line and a rotating member with a portion passing a predetermined position during rotation, sensing means for sensing the portion and producing signals having signal lengths,
  - a mechanical register for accumulating mechanical motions applied thereto and indicating a value representative of the accumulated motions,
  - amplifier means for responding to the signals and converting the signals to mechanical motions,
  - said amplifier means being coupled to said sensing means so that said amplifier means is arranged to convert the signal sensed by said sensing means to mechanical motions, and coupled to said mechanical register for supplying said mechanical motions to the register so as to cause said register to accumulate the motions of said amplifier means and indicate a value representative of the signals, said amplifier means including:
    - pulse forming means responsive to said sensing means for producing pulses, and
    - converter means responsive to pulses time displaced from each other by a time greater than the signal lengths, said converter means being coupled to the pulse forming means to receive the pulses,
    - said amplifier means including coupling means for coupling said amplifier means to the line, said pulse forming means being connected to said coupling means for producing the pulses from the power in the line in synchronism with a component of power in the line.

4,683,473

## RADAR TRANSIT TIME SIMULATOR DEVICE

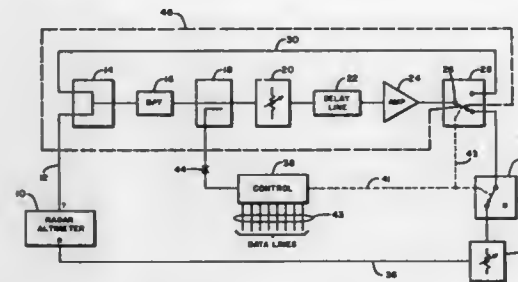
James R. Haugland, Hennepin, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 10, 1986, Ser. No. 817,642

Int. Cl. G01S 7/40

U.S. Cl. 342-172

11 Claims



1. Apparatus for simulating the transit time of a radar signal, the radar being of the type having transmitter output means for periodically generating and transmitting a burst of rf energy and receiver input means for later receiving a return of rf energy from a target, comprising:
  - (a) recirculating delay line means including a fixed delay element, two terminal input means coupled to the input of said fixed delay element and a single-pole, double-throw electronic switching means having said single pole coupled to the output of said fixed delay element;
  - (b) means coupling one terminal of said single-pole, double-throw electronic switching means to a first terminal of said two terminal input means;
  - (c) means for coupling the other terminal of said single-pole, double-throw electronic switching means to said receiver input means;
  - (d) means for coupling the transmitter output of said radar altimeter to the second terminal of said two terminal input means; and
  - (e) electronic control means operatively coupled to said single-pole, double-throw electronic switching means for allowing said rf pulse to recirculate through said fixed delay element a predetermined number of times before being routed to the receiver input of said radar equipment wherein said electronic control means comprises counting means, means for coupling said counting means to said recirculating delay line means for counting the number of traversals of said rf pulse through said recirculating delay line means, means for detecting when a count reaches a predetermined value, and means responsive to said detecting means for altering the state of said single-pole, double-throw and single-pole, single-throw electronic switching means.

4,683,474

## SURVIVABLE GROUND BASE SENSOR

George W. Randig, Harvard, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 26, 1985, Ser. No. 705,827

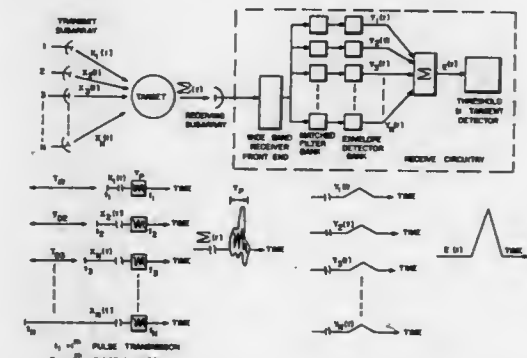
Int. Cl. H01Q 3/22, 1/04

U.S. Cl. 342-368

9 Claims

1. A survivable ground base sensor apparatus comprising in combination:
  - a plurality of radiating elements encased in a first hardened enclosure means, each of said plurality of radiating elements cooperating to form a steerable subarray means, a predetermined number of said subarray means are arranged in a predetermined geometric configuration to form a phased-array radar system, each subarray means being spaced at least ten nautical miles from each other,

said first hardened enclosure means being located above ground, and a plurality of electronics means each encased in a second hardened enclosure means, said plurality of second hardened enclosure means being located below ground, each of said plurality of electronic means operatively connected to its corresponding subarray means, each subarray means transmits a single pulse at a different frequency in time sequence that adds coherently to form a beam with a predetermined azimuth and range, the time of transmission is adjusted so that all of the n pulses arrive at a target



in time coincidence, when a target is at this range and azimuth, n time coincident pulses are reflected back to each subarray means, each subarray means utilizing a receiver that contains n separate channels tuned to the n frequencies that are transmitted by each of said subarrays means, n is defined as a positive integer greater than one, each of said subarray means comprises a self-contained, small phased array radar means, said electronic means receiving other signal returns and performing non-coherently time-delay processing of all the target return signals to perform target detection.

4,683,475

## FOLDING DISH REFLECTOR

Robert A. Luly, 449 S. Sierra Way, San Bernardino, Calif. 92406

Continuation of Ser. No. 279,734, Jul. 2, 1981, Pat. No.

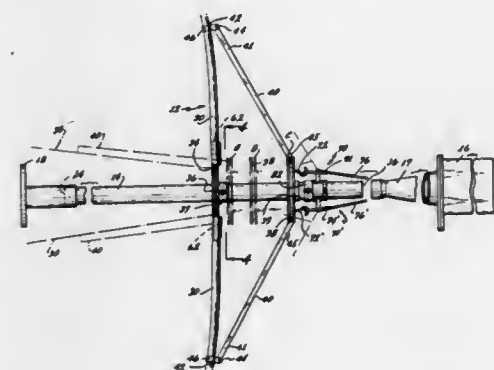
4,527,166, which is a continuation-in-part of Ser. No. 247,922, Mar. 26, 1981, Pat. No. 4,608,571. This application Sep. 4, 1985, Ser. No. 750,847

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl. H01Q 15/20

U.S. Cl. 343-915

4 Claims



1. A foldable reflector comprising:
  - a central support;
  - a plurality of resiliently flexible normally straight radial spokes of tapering cross section, the cross-sectional taper



of each spoke being such that said spoke is stressable to a desired reflector curvature, said spokes being mounted at their thicker ends to said central support for pivotal movement between an axial folded position and a radial deployed position;  
means for simultaneously urging each of said radial spokes to said radially deployed position;  
means for stressing said radial spokes to said desired reflector curvature in said deployed position, said spokes reverting to said normal straight state in said folded position; and elastic sheet means of reflecting material deployable by said spokes such that said sheet means conform to the curvature of said stressed spokes to define a dish reflecting surface.

4,683,476

# DRAWING MACHINE HAVING AUTOMATICALLY REPLACED WRITING MEMBERS AND APPARATUS THEREFOR

Alphonse Ferrari, Vincennes; Michel Roche, Courtry, and Jean-Claude Dard, Villemomble, all of France, assignors to Benson S.A., Creteil, France

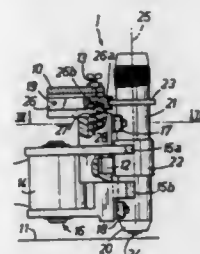
Filed Jun. 13, 1985, Ser. No. 744,353

Claims priority, application France, Jun. 22, 1984, 84 09829; Oct. 29, 1984, 84 16500

Int. Cl.<sup>4</sup> G01D 9/00, 9/28, 15/16

U.S. Cl. 346—29

27 Claims



1. A marking head for a plotting machine, comprising:  
a support;  
a writing member having side walls and a marking tip at one end thereof;  
means for mounting said writing member for longitudinal movement on said support between a work position wherein the writing tip is operative for producing a mark on a writing medium placed opposite said support and a rest position further away from the writing medium, including;  
means on said support for engaging the side wall of said writing member when the same is urged toward said support, in a direction transverse to said longitudinal direction while allowing movement of said writing member relative to the support between said work and said rest positions; and  
holding means on said support and said writing member for producing a magnetic force for urging said side wall toward said support in said transverse direction and sufficient for holding said writing member at least in said rest position,  
said mounting means arranged to allow said writing member to be pulled away from said support in a direction generally opposite to said transverse direction in at least one position, and  
selectively controlled driving means for moving said writing member in the longitudinal direction from said rest to said work positions thereof.

4,683,477

# INK JET PRINT HEAD

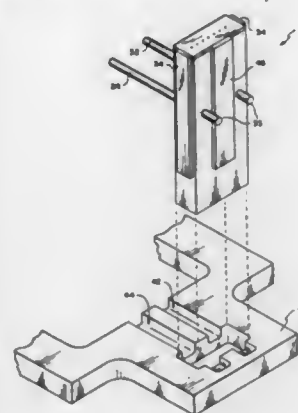
Hilarion Braun, Xenia, and Fletcher Bray, Fairfield, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1986, Ser. No. 901,669

Int. Cl.<sup>4</sup> G01D 15/18

U.S. Cl. 346—75

5 Claims



1. An ink jet print head of the type having an elongated rectangular print head body defining an ink reservoir having an opening at one end of said elongated body, an orifice plate having a plurality of orifices fixed over said opening in said ink reservoir, for expelling ink from said orifices to form a plurality of ink jets, means for supplying ink under pressure to said reservoir, piezoelectric transducer means mounted on the exterior of said elongated body and extending in a longitudinal direction, for inducing longitudinal vibrations in said body to stimulate said ink jets, and mounting means for mechanically supporting said ink jet print head, said mounting means contacting said print head body at a nodal plane intermediate the ends of said print head body, characterized by: said means for supplying ink comprising rigid tube means connected to said print head body at said nodal plane and said mounting means comprising means for supporting said print head body by said rigid tube means.

4,683,478

# PRINTER WITH DETACHABLY MOUNTABLE INK RIBBON CASSETTE

Masayuki Suzuki, Fujisawa; Shoji Nishiwaki, Machida; Toshitaka Hayashima, Yamato; Kazuo Uezu, Hadano; Hidejiro Maehara, Yokohama, and Masanori Momose, Hiratsuka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

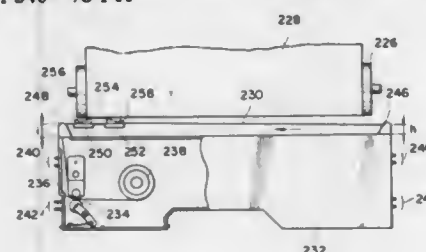
Division of Ser. No. 631,603, Jul. 17, 1984. This application Nov. 29, 1985, Ser. No. 803,503

Claims priority, application Japan, Jul. 23, 1983, 58-134861; Jul. 23, 1983, 58-134862; Jul. 29, 1983, 58-138942; Oct. 19, 1983, 58-195496

Int. Cl.<sup>4</sup> G01J 15/10

U.S. Cl. 346—76 PH

23 Claims



1. A printing system comprising:  
a platen for placing thereon a recording medium;  
supporting means for supporting a part of a printing ribbon

extending between a pair of first and second positions which are fixed with respect to said platen, such that said part of the ribbon is inclined with respect to said platen and said part of printing ribbon between said pair of first and second positions is gradually separated farther away from said platen in a first direction; and  
a carriage supported to be movable along said platen in a reciprocating manner, said carriage having mounted thereon a printing device which effects printing on said recording medium using said printing ribbon while said carriage moves in said first direction and which does not effect printing while said carriage moves in a second direction which is opposite to said first direction.

4,683,479

# THERMAL PRINTER

Keiichi Horiya, Numazu; Kazuhide Takahama, Shizuoka, and Yutaka Usami, Mishima, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

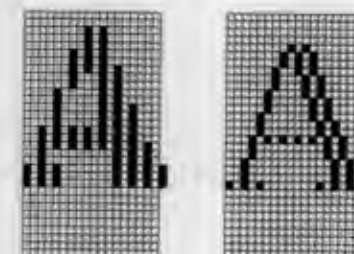
Filed Mar. 6, 1986, Ser. No. 837,074

Claims priority, application Japan, Mar. 12, 1985, 60-48641

Int. Cl.<sup>4</sup> G01D 15/10; B41J 3/10

U.S. Cl. 346—76 PH

6 Claims



1. A thermal printer comprising:  
a thermal head having a plurality of heating elements arranged at a preset pitch D1 in a line;  
memory means including a first memory area in which a plurality of high speed printing character data each column of which is composed of n-bit data are stored and a second memory area in which a plurality of high resolution printing character data each column of which is composed of m-bit data (m>n) are stored; and  
printing control means for reading out the m-bit data of each column designated by an input character code data from said second memory area in accordance with a high resolution printing mode designation data, for selectively energizing the heating elements of said thermal head to execute a high resolution printing in accordance with said m-bit data read out, and also for reading out the n-bit data of each column designated by an input character code data from said first memory area in accordance with a high speed printing mode designation data, for converting said n-bit data into N-bit data (N>n) corresponding to the n-bit data, for selectively energizing the heating elements of said thermal head to execute a high speed printing at an average pitch D2 (D2 is larger than D1 and different from the integer multiple of D1) between adjacent dots in accordance with said N-bit data.

4,683,480

# X-Y PLOTTER DRIVE ROLLER ARRANGEMENT

Masami Sakamoto, Ryoichi Nagumo, and Tamio Ishihara, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1985, Ser. No. 752,854

Claims priority, application Japan, Jul. 6, 1984, 59-139058

Int. Cl.<sup>4</sup> G01D 15/16; B65H 17/38; B41J 11/00

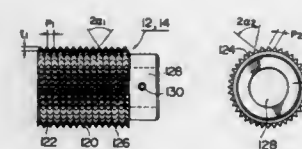
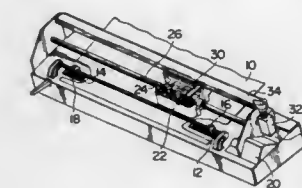
U.S. Cl. 346—134

7 Claims

1. An X-Y plotter comprising:

a recording paper;

at least one recording element for recording on said recording paper;  
first drive means for moving said recording element in a direction X;  
at least one set of a drive roller means and a pinch roller means disposed for clamping said recording paper therebetween; and  
second drive means for rotating said drive roller means to said recording paper in a direction Y which is orthogonal to the moving direction of said recording element;



said drive roller means having a plurality of projections for engaging and piercing said recording paper to insure exact feeding of said recording paper without slippage thereof, said plurality of projections being formed by a plurality of V-grooves cut in an outer surface of said drive roller means both in the axial direction of said drive roller means and in the circumferential direction substantially orthogonal to said axial direction, each of said projections having the shape of a substantially quadrangular pyramid with a sharp point for enabling piercing of the recording paper.

4,683,481

# THERMAL INK JET COMMON-SLOTTED INK FEED PRINTER

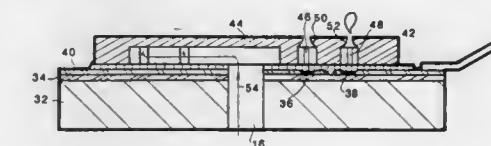
Samuel A. Johnson, Eagle, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 806,294, Dec. 6, 1985, abandoned. This application Dec. 4, 1986, Ser. No. 939,285

Int. Cl.<sup>4</sup> G01D 15/18; H05B 3/00

U.S. Cl. 346—140 R

6 Claims



1. A thermal ink jet print head assembly including:  
(a) a substrate member having an elongated slot therein for receiving ink from a common reservoir, said substrate mounted on a header for providing a supply of ink and further having an ink feed slot which is aligned with said elongated slot on said substrate for providing ink flow to said elongated slot,  
(b) a plurality of resistive heater elements spaced around the periphery of said slot at predetermined distances therefrom and connected to a corresponding plurality of conductors atop the surface of said substrate member, and  
(c) a barrier layer and orifice plate member mounted atop said conductors and including a corresponding plurality of ink jet reservoirs for receiving ink from said elongated

slot, said reservoirs aligned with said resistive heater elements and with a plurality of exit orifices for receiving thermal energy from said heater elements and ejecting ink onto a selected print medium, said reservoirs all being at predetermined ink flow path distances from said elongated slot, whereby the liquid pressure flow loss between said reservoirs and said slot is equalized.

4,683,482

# ION GENERATING DEVICE AND METHOD OF MANUFACTURING SAME

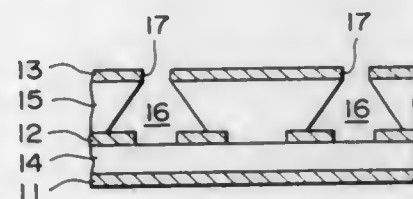
Yutaka Inaba, Kawasaki, and Yujiro Ando, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 711,178, Mar. 13, 1985, abandoned.

This application Nov. 12, 1986, Ser. No. 930,047

Claims priority, application Japan, Mar. 19, 1984, 59-51035  
Int. Cl.<sup>4</sup> G01D 15/06

U.S. Cl. 346-159

6 Claims



1. An ion generating device, comprising:
  - a plurality of first electrodes extending in a first direction;
  - a plurality of second electrodes extending in a second direction which is different from the first direction, to constitute a matrix;
  - a third electrode so disposed that said second electrodes lie between said first electrodes and the third electrode, said third electrode having apertures corresponding to the matrix;
  - a first dielectric member disposed between said first electrodes and said second electrodes; and
  - a second dielectric member disposed between said second electrodes and third electrode, said second dielectric member having a plurality of apertures corresponding to the matrix, which apertures each have a cross-sectional area generally decreasing toward said third electrode.

4,683,483

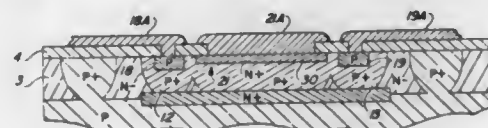
# SUBSURFACE ZENER DIODE AND METHOD OF MAKING

Stephen R. Burnham, and William J. Lillis, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.  
Filed May 5, 1986, Ser. No. 859,454

Int. Cl.<sup>4</sup> H01L 29/90

U.S. Cl. 357-13

8 Claims



1. A subsurface zener diode including:
  - (a) a P type substrate;
  - (b) a lightly doped N type region on the P type substrate;
  - (c) means for electrically isolating the N type region from any other lightly doped N type region on the P type substrate;
  - (d) a heavily doped first P type region disposed in the lightly doped N type region and having a relatively heavily

doped inner portion and a relatively lightly doped laterally outdiffused peripheral portion;

- (e) a second P type region disposed in the lightly doped N type region and having a lightly doped peripheral portion, at least a part of which overlaps a portion of the lightly doped laterally outdiffused peripheral portion of the first P type region;

- (f) a heavily doped N type region disposed partly in the first P type region and having a peripheral portion including a first peripheral portion, the first peripheral portion being centrally located entirely in the lightly doped laterally outdiffused peripheral portion of the first P type region and the lightly doped peripheral portion of the second P type region,

whereby no peripheral portion of the heavily doped N<sup>+</sup> region is disposed in P type semiconductor material that is more heavily doped than P type semiconductor material adjacent to a subsurface portion of the PN junction between the heavily doped N<sup>+</sup> region and the first P type region.

4,683,484

# LATERAL CONFINEMENT OF CHARGE CARRIERS IN A MULTIPLE QUANTUM WELL STRUCTURE

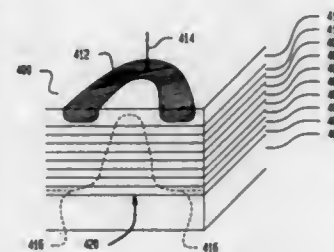
Gustav E. Derkits, Jr., Boro of New Providence, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 23, 1985, Ser. No. 768,673

Int. Cl.<sup>4</sup> H01L 29/48, 29/205, 29/78, 29/06

U.S. Cl. 357-16

9 Claims



1. A semiconductor device comprising:
  - a semiconductor body of first conductivity type having at least one relatively narrow bandgap layer and two relatively wide bandgap layers, said relatively narrow bandgap layer being sandwiched between and contiguous with said relatively wide bandgap layers and defining a quantum well; and
  - a ring-like zone of a second conductivity type formed within said semiconductor body and spaced apart from said narrow bandgap layer for generating an electric field barrier within said narrow bandgap layer, said electric field barrier defining a region of said narrow bandgap layer in which charge carriers are laterally confined.

4,683,485

# TECHNIQUE FOR INCREASING GATE-DRAIN BREAKDOWN VOLTAGE OF ION-IMPLANTED JFET

Gregory A. Schrantz, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 27, 1985, Ser. No. 813,718

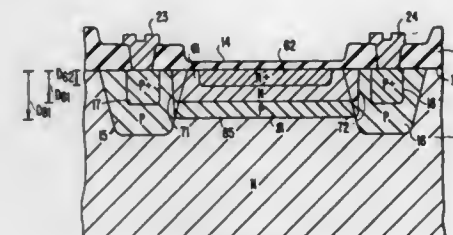
Int. Cl.<sup>4</sup> H01L 29/80

U.S. Cl. 357-22

6 Claims

1. A semiconductor device comprising:
  - a semiconductor substrate of a first conductivity type;
  - a first semiconductor region of a second conductivity type, opposite said first conductivity type, formed in a first surface portion of said substrate;
  - a second semiconductor region of said second conductivity type, formed in a second surface portion of said substrate, spaced apart from said first surface portion by a third surface portion therebetween; and
  - a third semiconductor region of said first conductivity type

formed in said third surface portion of said substrate and being contiguous with said first and second regions so as to define therewith respective first and second PN junctions, and wherein a first portion of said third semiconductor region is spaced apart from said first and second PN junctions by a second portion of said third semiconductor region contiguous with and extending a separation distance away from said first and second PN junctions to said first portion of said third semiconductor region, said first portion of said third semiconductor region having a first impurity concentration, and wherein said said second portion of said third semiconductor region has a second



1. A heterojunction bipolar transistor having a main surface and comprising active regions which include at least one heterojunction, the active regions having top and bottom surfaces extending in the same direction as the main surface and side surfaces extending between the top and bottom surfaces, a base region lead-out portion which is formed spaced from a side surface of said active regions and extending to said main surface, with an insulating region filling the space between the side surface of the active regions and the base region lead-out portion, and a collector region lead-out portion which is formed spaced from another side surface of said active regions and extending to said main surface, with another insulating region filling the space between said another side surface of the active regions and the collector region lead-out portion, wherein the insulating region and the another insulating region are regions in self-alignment with an emitter electrode on the main surface of the bipolar transistor.

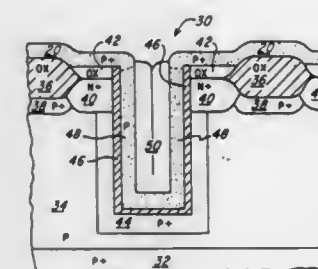
4,683,486  
DRAM CELL AND ARRAY  
Pallab K. Chatterjee, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 24, 1984, Ser. No. 654,285

Int. Cl.<sup>4</sup> H01L 29/78, 29/04, 29/06, 27/02

U.S. Cl. 357-23.6

11 Claims



1. A device comprising:
  - a substrate having a trench;
  - an insulating layer formed on the walls of said trench;
  - a semiconductive layer formed on said insulating layer, said semiconductive layer having a transistor formed in said trench, said transistor having a source, a drain and a channel, said drain serving as a node for storing charge; and
  - a gate formed in said substrate adjacent to said insulating layer, said gate controlling current in said channel.

4,683,487

# HETEROJUNCTION BIPOLAR TRANSISTOR

Kiichi Ueyanagi, Kokubunji; Susumu Takahashi, Nishitama; Toshiyuki Usagawa, Kokubunji; Yasunari Umemoto, Hachioji, and Toshihisa Tsukada, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

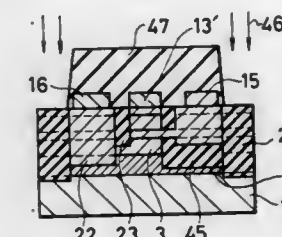
Filed Nov. 6, 1985, Ser. No. 795,465

Claims priority, application Japan, Nov. 9, 1984, 59-234908

Int. Cl.<sup>4</sup> H01L 29/72

U.S. Cl. 357-34

19 Claims



1. A heterojunction bipolar transistor having a main surface and comprising active regions which include at least one heterojunction, the active regions having top and bottom surfaces extending in the same direction as the main surface and side surfaces extending between the top and bottom surfaces, a base region lead-out portion which is formed spaced from a side surface of said active regions and extending to said main surface, with an insulating region filling the space between the side surface of the active regions and the base region lead-out portion, and a collector region lead-out portion which is formed spaced from another side surface of said active regions and extending to said main surface, with another insulating region filling the space between said another side surface of the active regions and the collector region lead-out portion, wherein the insulating region and the another insulating region are regions in self-alignment with an emitter electrode on the main surface of the bipolar transistor.

4,683,488

# LATCH-UP RESISTANT CMOS STRUCTURE FOR VLSI INCLUDING RETROGRADED WELLS

William W. Y. Lee, Fullerton, and Kuang-Yeh Chang, Fountain Valley, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

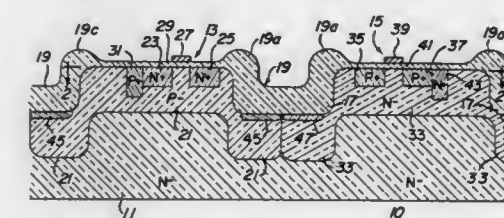
Continuation of Ser. No. 594,589, Mar. 29, 1984, abandoned.

This application Feb. 28, 1986, Ser. No. 835,447

Int. Cl.<sup>4</sup> H01L 27/02

U.S. Cl. 357-42

7 Claims

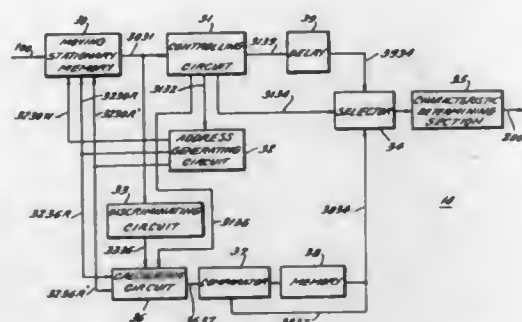


1. A complementary metal oxide semiconductor (CMOS) structure comprising:
  - a semiconductor substrate;
  - a trench region formed in said substrate;
  - a first retrograde well region of a first conductivity type formed in said substrate and having (a) an upper portion adjacent said trench region and (b) a lower portion beneath said trench region, said upper and lower portions merging together and having substantially the same depth;
  - a second retrograde well region of a second conductivity





video signal to supply a delayed input video signal for said quantizer; and means coupled to said storing means for determining a quantization characteristic in response to said moving-station-



ary information signal stored in said storing means to produce a quantization control signal; said quantization control signal being applied to said quantizer to control said quantizer.

#### 4,683,495 CIRCUIT ARRANGEMENT FOR DISTINGUISHING BETWEEN THE TWO FIELDS IN A TELEVISION SIGNAL

Thorsten Brock, Buchholz, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

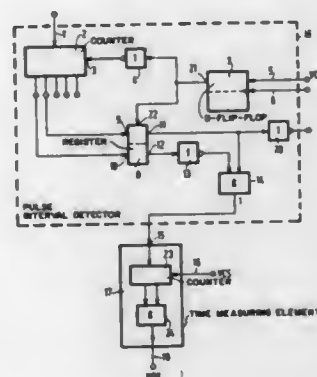
Filed Nov. 22, 1985, Ser. No. 800,890

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1984, 3443925

Int. Cl.<sup>4</sup> H04N 5/04

U.S. Cl. 358-148

8 Claims



1. A circuit arrangement for distinguishing between two fields in a television signal, comprising a detector adapted to assume a first or a second signal state in dependence on the time position of synchronizing pulses contained in the television signal, and a time measuring element connected to the detector for producing a field identification signal in dependence on the duration of one of the signal states, characterized in that the detector is formed as a pulse interval detector for measuring the intervals between the trailing edge of each of said synchronizing pulses and the leading edge of subsequent synchronizing pulses, said detector assuming its first signal state, for pulse intervals located between first and second limit values and its second signal state for pulse intervals located outside these limit values.

#### 4,683,496 SYSTEM FOR AND METHOD OF ENHANCING IMAGES USING MULTIBAND INFORMATION

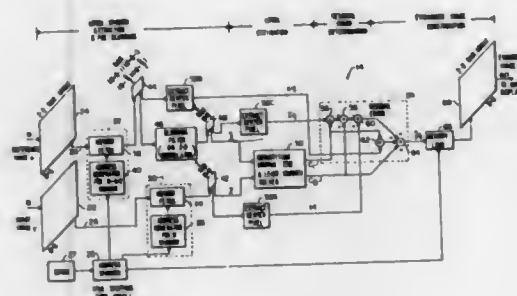
Victor T. Tom, Bedford, Mass., assignor to The Analytic Sciences Corporation, Reading, Mass.

Filed Aug. 23, 1985, Ser. No. 768,957

Int. Cl.<sup>4</sup> H04N 5/14; G06K 9/40

U.S. Cl. 358-166

19 Claims



1. A system for enhancing a first pictorial representation of an image within a first frequency band so as to provide an enhanced pictorial representation of said image using information contained within at least a second pictorial representation of said image within a second frequency band, wherein said second pictorial representation of said image has a better resolution than said first pictorial representation of said image, said system comprising:

means for generating a first plurality of signals as a function of a first set of pictorial segments of said first pictorial representation, wherein each of said first pictorial segments comprises at least one component part;

means for generating a second plurality of signals as a function of a second set of pictorial segments of said second pictorial representation, said second set of pictorial segments spatially corresponding with respect to said image to said first set of pictorial segments;

means, responsive to said first and second plurality of signals, for generating a third plurality of signals as a function of respective correlation information associated with and between each of said pictorial segments of said first set of pictorial segments and the corresponding pictorial segment of said second set of pictorial segments;

means, responsive to said first and third plurality of signals, for generating a fourth plurality of signals as a function of a pictorial component part of each pictorial segment of a third set of pictorial segments representative of said enhanced pictorial representation, wherein the pictorial segments of said third set spatially correspond with respect to said image to the pictorial segments of said first set, and each of said pictorial component parts of each of said pictorial segments of said first pictorial representation is modified as a function of the respective correlation information associated with that pictorial segment so as to provide each corresponding pictorial component part of said enhanced pictorial representation; and

means for combining said fourth plurality of signals so as to produce said enhanced pictorial representation.

#### 4,683,497 TELEVISION RECEIVER FOR FLICKER-FREE REPRODUCTION OF AN INTERLACED VIDEO SIGNAL

Soenke Mehrgardt, March-Neuershausen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

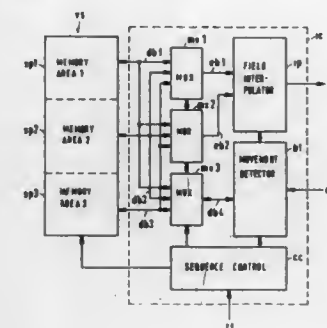
Filed Nov. 4, 1985, Ser. No. 794,518

Claims priority, application European Pat. Off., Nov. 8, 1984, 84113457.0

Int. Cl.<sup>4</sup> H04N 5/208

U.S. Cl. 358-166

3 Claims



1. A television receiver whereby an interlaced video signal containing fields is reproduced flicker-free, said receiver comprising:

a digital movement detector receiving digital video signals;

a digital field interpolator having an output which provides said digital flicker-free video signal;

a single frame memory which is divided into first, second and third memory areas;

first, second and third bidirectional data buses each respectively associated with said first, second and third memory areas and used for word-section/word-block transfer in a unidirectional mode;

first, second and third multiplexers each connected to all of said first, second and third memory areas by said first, second and third bidirectional data buses, respectively;

a first unidirectional data bus coupling the output of said first multiplexer to a first input of said field interpolator;

a second unidirectional data bus coupling the output of said second multiplexer to a second input of said field interpolator;

a fourth bidirectional data bus coupling said third multiplexer to said movement detector and used for word-section/word-block transfer in a unidirectional mode;

a sequence control circuit for controlling said movement detector, said first, second and third multiplexers, said field interpolator and said memory; said sequence control circuit controlling the storing of data words into said first, second and third memory areas at a horizontal frequency rate and controlling the reading of stored data words from said first, second and third memory areas at twice the horizontal frequency rate;

said sequence control circuit operating such that the first and second word blocks of an nth line, the first and second word blocks of line n+1, and the first and second word blocks of line n+2 are written in direct succession into said first, second, third, first, second and third memory areas respectively where n=1, 4, N/2 and N=the number of frame lines or the number of frame lines only containing picture information;

said sequence control circuit further operating such that each data word of a line of a second field is divided into two sections and the first word section of an mth line, the second word section of said mth line, the first and second word sections of line m+1, the first and second word sections of line m+2 are written in direct succession into

said second, third, first, second, third and first memory areas, respectively;

said sequence control circuit further operating such that during the second half of the duration of a triple sequence of successive lines, data words of the respective triple sequence which are delayed by one frame period are read from said frame memory and compared with the data words of the triple sequence in said movement detector, and that during the first half of the duration of the next triple sequence, said data words, together with movement information are written into those of said first, second and third memory areas which contain the data word delayed by one frame period, and wherein said first and second word blocks of each data word are read out together with the corresponding word sections of each data word of the respective triple sequence.

#### 4,683,498 COMPATIBLE WIDE-SCREEN TELEVISION SYSTEM CAMERA

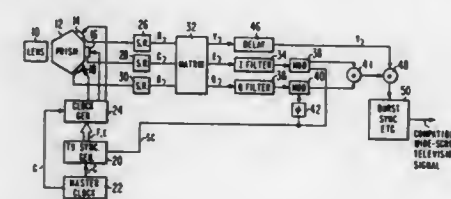
Robert J. Topper, Hatboro, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 21, 1986, Ser. No. 853,855

Int. Cl.<sup>4</sup> H04N 3/14

U.S. Cl. 358-209

17 Claims



1. Apparatus for generating a compatible wide-screen television signal comprising:

a solid-state imager including an array of photosensitive picture elements (pixels) arranged in rows and columns for developing an image-representative charge pattern in response to incident radiation, wherein the pixel distribution in a center portion of each row of said array is constant and a pixel distribution in the left and right edge portions of each row of said array is different from said pixel distribution in said center portion; and wherein said center portion of each said row includes a greater number of pixels than said edge portions.

#### 4,683,499 METHOD FOR GENERATING A PIXEL SYNCHRONIZING SIGNAL IN A PICTURE INPUT SCANNING APPARATUS AND A REPRODUCTION RECORD SCANNING APPARATUS THEREFOR

Akira Kuwabara, Shiga, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 31, 1985, Ser. No. 816,169

Claims priority, application Japan, Jan. 11, 1985, 60-2056

Int. Cl.<sup>4</sup> H04N 1/36

U.S. Cl. 358-264

6 Claims

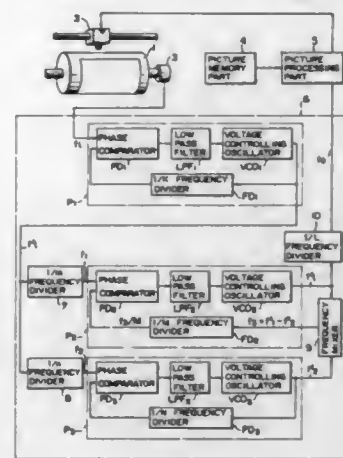
1. A pixel synchronizing signal generating method in a picture input scanning apparatus and a reproduction record scanning apparatus characterized by comprising steps of:

dividing frequency of a reference signal according to main scanning speed of the picture scanning apparatus into a plurality of slightly different frequencies from one another by a plurality of frequency dividers;

converting pairs of said plurality of frequencies by at least a pair of phase synchronizing loop circuits coupled with heterodyne frequencies of mutual output frequencies;



dividing appropriately frequencies of output signals of phase synchronizing loop circuits of which feeding back signals



are said heterodyne frequencies among said phase synchronizing loop circuits to make them output frequencies.

4,683,500

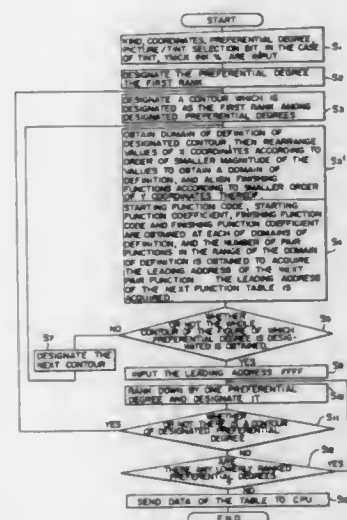
**METHOD FOR REPRODUCING PICTURE IMAGE**  
Hideaki Kitamura, Osaka; Syogo Fujiki, and Mitsubishi Yamada, both of Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Oct. 25, 1985, Ser. No. 791,331

Claims priority, application Japan, Dec. 25, 1984, 59-272003  
Int. Cl.<sup>4</sup> H04N 1/387

U.S. Cl. 358—280

3 Claims



1. A method for reproducing picture images in which a plurality of original pictures scanned appropriately by more than two picture scanning input means are recorded on a recording surface of a picture scanning recording machine according to a predetermined layout, comprising the steps of: inputting data regarding configurations and dispositions of more than one closed contour in accordance with said predetermined layout on said recording surface of the picture scanning recording machine and data regarding pictures to be recorded inside said closed contours by a data inputting means; converting said input data regarding said configurations and said dispositions of said closed contours into closed contour data which are rearranged in order of having been

recorded on the recording surface of said picture scanning recording machine; storing these data together with data regarding pictures to be recorded in the insides of said closed contours by memory means; reading said two kinds of recorded data out of said data memory means according to the order of their having been recorded on the recording surface of said picture scanning recording machine; and recording a picture signal or a tint screen which is output from said picture scanning input means in accordance with these data in the inside of more than one closed contour; wherein in the case where said closed contours are represented by a function, data are input to said picture scanning recording machine in accordance with the order required by the function, and said input data are converted into closed contour data in the order of their having been recorded on the recording surface of said picture scanning recording machine.

4,683,501

**APPARATUS FOR READING AND REPRODUCING GRAPHIC INFORMATION**

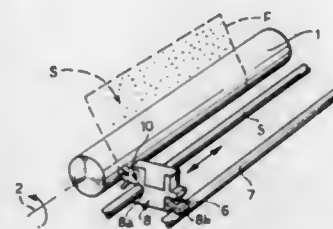
Ugo Carena, Ivrea; Giuseppe Coli, Pavon Canavese, and Giuseppe Fogaroli, Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Oct. 3, 1985, Ser. No. 783,352

Claims priority, application Italy, Oct. 3, 1984, 67982 A/84  
Int. Cl.<sup>4</sup> H04N 1/024

U.S. Cl. 358—293

7 Claims



1. An apparatus for reading and reproducing graphic information comprising a cylindrical platen for supporting a sheet, advancing means for controlling the rotation of said platen in successive steps to effect a progressive longitudinal advancement of said sheet, a reciprocating carriage parallel to the axis of said platen to effect at each rotational step of said platen a transverse scanning movement with respect to said sheet, a dot matrix printing head mounted on said carriage for printing on said sheet a plurality of matrix dots arranged in a printing column parallel to said advancement, a dot sensing head including a plurality of photoelectric sensors for reading on said sheet a plurality of elemental areas arranged in a reading column corresponding to said printing column and each able to generate an electric signal indicative of the luminosity of the image in the elemental area being sensed, said sensors being arranged in a predetermined plane parallel to said reading column and said axis, at least a pair of light sources mounted within said housing for generating light beams intersecting on said reading column, an optical system mounted closely adjacent to said sources to form an image of the reading column in said predetermined plane, and housing means for mounting inside said sensors, said light sources and said optical system, said housing means being mounted on said carriage so that said light sources can direct the light beams toward a reading column adjacent and parallel to the printing column faced by said printing head.

4,683,502

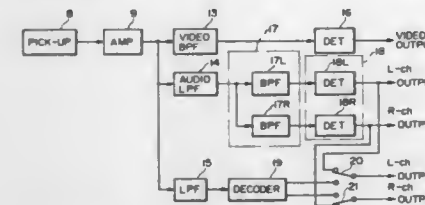
**VIDEO DISC TYPE RECORDING AND REPRODUCING SYSTEM WITH INTERFERENCE REDUCTION FILTER**  
Ryoji Higashi, and Satoru Nomura, both of Yamanashi, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan  
Filed Aug. 30, 1983, Ser. No. 527,721

Claims priority, application Japan, Aug. 30, 1982, 57-149100; Mar. 18, 1983, 58-45780; Jul. 30, 1983, 58-119400[U]

Int. Cl.<sup>4</sup> H04N 5/85, 5/92

U.S. Cl. 358—342

8 Claims



1. A video disc type recording and reproducing system, comprising:

recording means, said recording means including: a first frequency modulator for modulating a video signal; a second frequency modulator for modulating at least an audio signal; a digital encoder connected in parallel with said second frequency modulator for digitally encoding said audio signal; filter means connected to an output of said first frequency modulator for removing a frequency component of the frequency-modulated video signal which covers a frequency component of the frequency-modulated audio signal from said second frequency modulator, said filter means comprising a high pass filter for passing only components having frequency higher than the lower secondary sideband of the modulated video signal; an adder circuit connected to an output of said filter means and to outputs of said second frequency modulator and digital encoder; a limiter connected to an output of said adder circuit; and an electrical/optical modulator connected to said limiter;

reproducing means, said reproducing means including: an information pick-up; an amplifier coupled to said pick-up; a video detector means for detecting the video signal component in the output of said amplifier to provide a video output signal; an audio detector means for detecting the audio signal component in the output of said amplifier to provide a first audio output signal; and a decoder means for decoding the digitally encoded audio signal component in the output of said amplifier to provide a second audio output signal.

4,683,503

**INFORMATION SIGNAL REPRODUCING APPARATUS HAVING MEANS FOR DISCRIMINATING A TRACK PITCH AND SELECTING THE REPRODUCTION MODE SPEED**

Hiroyuki Takimoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,201

Claims priority, application Japan, Dec. 28, 1983, 58-245336  
Int. Cl.<sup>4</sup> G11B 15/14, 5/52, 15/52

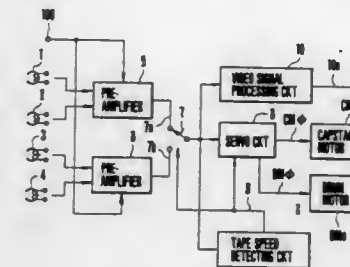
U.S. Cl. 360—64

20 Claims

1. An information signal reproducing apparatus for reproducing information signals from a recording medium in which a large number of recording tracks, each having one of four kinds of pilot signals with different frequencies recorded successively on each track together with said information signals, are formed with either a first track pitch or a second track pitch, comprising:

(a) a first head having a head width which corresponds to said first track pitch;

(b) a second head having a head width which corresponds to said second track pitch;  
(c) switching means for producing either of a signal reproduced by said first head from said recording medium and a signal reproduced by said second head from said recording medium, thus producing a reproduction signal;  
(d) four detecting means for respectively detecting said four kinds of pilot signals included in said reproduction signal to produce four detecting signals;



4,683,504

**APPARATUS FOR RECORDING AND READING BINARY INFORMATION ON A MAGNETIC DISC**

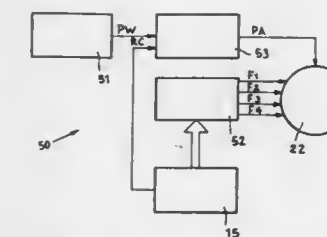
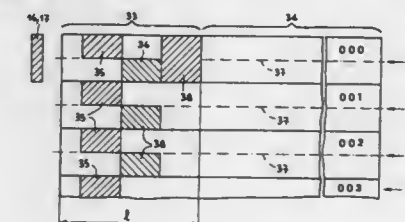
Giuseppe Cantello, S. Giusto C.S.E., and Severino Conari, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jan. 7, 1986, Ser. No. 816,796

Claims priority, application Italy, Feb. 21, 1985, 67177 A/85  
Int. Cl.<sup>4</sup> G11B 5/55

U.S. Cl. 360—78

7 Claims



1. A magnetic disc comprising a plurality of concentric recording tracks, each consisting of a useful zone for recording binary information and a function zone within a predetermined sector of the disc, and means identifying a reference circumfer-

ential position on the disc, each function zone including first and second information blocks which are both circumferentially and radially displaced relative to each other and can be sensed at times (ST1, ST2) fixed relative to a time (IM) corresponding to the reference circumferential position for providing servo control information to a control unit which controls the position of a magnetic head relative to a selected track, wherein the first and second information blocks occupy part only of the angular extent of the function zones and, within the spare part of the function zones of one only of the tracks of the disc has a third information block recorded therein to identify that track as a reference track.

2. Apparatus for recording and reading binary information on a magnetic disc having a plurality of concentric recording tracks, comprising means for rotating the magnetic disc, at least one magnetic head for recording and reading information on the recording tracks, a stepping motor adapted to translate the magnetic head radially with respect to the disc to position it on a selected recording track, and a voltage source for supplying the stepping motor, a voltage boosting circuit interposed between the voltage source and the stepping motor, and means for providing an enabling signal (RC) such as to activate the voltage boosting circuit at the beginning of each shifting of the magnetic head towards a selected recording track and keep the voltage boosting circuit activated until such time as the magnetic head has reached the selected track, wherein the voltage source generates a d.c. voltage (PW) of constant value, and the voltage boosting circuit comprises an inductance coil, a diode and a capacitor connected in series between the d.c. voltage and earth, a switch being connected between the inductance coil and earth and a voltage (PA) of actual supply for the stepping motor being generated at an intermediated point between the diode and the capacitor.

4,683,505

# ALTERNATELY CENTERED DISK PACK ASSEMBLY AND METHOD

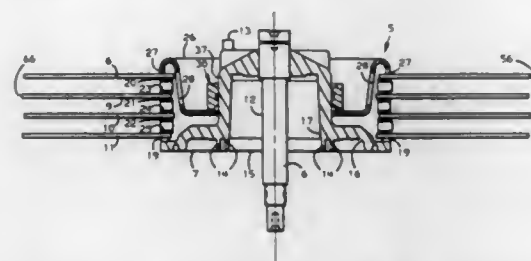
Laurence J. Schmidt; Randall L. Severson, both of Rochester; Lyle R. Tufty, Elgin, and Steven H. Voss, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,433

Int. Cl.<sup>4</sup> G11B 5/012, 23/03

U.S. Cl. 360—98

12 Claims



1. A disk pack assembly for use in a disk drive wherein the disk pack assembly is rotated within the disk drive apparatus, the disk pack assembly comprising:

spindle hub means rotatably coupled to the disk drive apparatus for providing a spindle about which the disk pack assembly is rotated;

first disk means coupled to the spindle hub means for storing information and having an outer diameter substantially equal to a desired diameter; and

second disk means coupled to the spindle hub means a desired distance from the first disk means along the spindle hub means for storing information and having an outer diameter substantially equal to the desired diameter; wherein opposite edges of adjacent disk means are diametrically offset about the spindle hub means so that said oppo-

site edges are at a distance from the axis of the spindle hub means substantially equal to the desired diameter.

4,683,506

# DISC DRIVE ARRANGEMENT FOR A HARD DISC CARTRIDGE WITH A READ/WRITE HEAD RETRACT MECHANISM

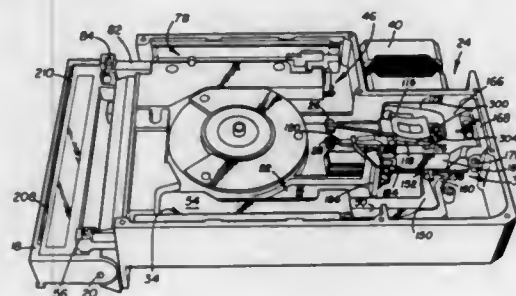
George Toldi, Santa Clara; Anil Nigam, Cupertino; Ronald Crain, and Dominic Mercurio, both of San Jose, all of Calif., assignors to Syquest Technology, Fremont, Calif.

Filed Aug. 4, 1983, Ser. No. 520,256

Int. Cl.<sup>4</sup> G11B 5/54, 21/22, 5/012, 5/016

U.S. Cl. 360—105

8 Claims



1. A disc drive arrangement for accessing information from and recording information into a disc retained in a cartridge, which cartridge is insertable into the disc drive, comprising:

a housing;

a door;

means for mounting the door to the housing;

at least one head;

a carriage for mounting and transporting said head;

means for movably mounting said carriage to said housing;

and

linkage means for operatively connecting said door to said carriage for urging said carriage and head away from the cartridge when said door is open;

said linkage means including a linkage arrangement which is operatively connected to the door and an arm means for selectively engaging said carriage;

said linkage arrangement includes a link means which means rearwardly as said door is opened for engaging said arm means;

said arm means having a cammed surface;

means for mounting said arm means with the cammed surface engageable with said link means so that as said link means is urged against said cammed surface of said arm means as said door is opened, said arm means in urged rearwardly along the line of travel of said link means in a more accelerated manner than the movement of said link means and said arm means simultaneously urges said carriage rearwardly away from said cartridge and thereby precluding contact between said head and the cartridge.

4,683,507

# FIXED/ADJUSTABLE HEAD MOUNT

Clyde D. Roberts, Tulsa, Okla., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Filed Jun. 17, 1985, Ser. No. 745,090

Int. Cl.<sup>4</sup> G11B 5/56, 21/24

U.S. Cl. 360—109

2 Claims

1. A device for a magnetic tape comprising:

a deck having two spaced apart support surfaces in a plane, and having a threaded opening in each support surface;

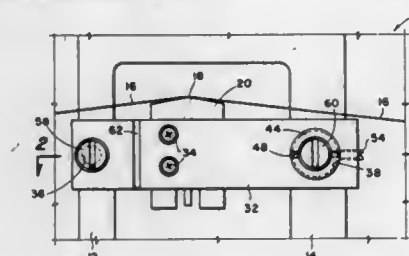
a skew plate having a rearward surface and having spaced apart first and second openings therein in alignment with said support surfaces threaded openings, the second opening being threaded, the skew plate having a slot thereacross adjacent said first opening to permit flexing of said

skew plate, the slot being in a plane perpendicular to the plane through said skew plate openings;

a read/write head affixed to said skew plate rearward surface between said slot and said second opening and having a longitudinal read/write surface thereacross engageable by a magnetic tape, the longitudinal read/write surface extending generally perpendicular to said skew plate rearward surface;

a first screw received in said first opening in said skew plate and in said threaded opening of one of said deck support surfaces;

a cup screw received in said skew plate threaded opening, the cup screw having a recess therein and an unthreaded opening therethrough;



a second screw received in said cup screw and the other of said deck support surface threaded openings, the second screw having a head therein engaging said cup screw within said recess therein;

and a spring washer positioned between said skew plate rearward surface and said deck support surface and receiving said second screw to bias said skew plate away from said deck support surface, whereby the azimuth angle between said read/write surface and the plane of said deck surface is adjustable by means of the said two distinct threaded adjustments the action of and said spring washer.

4,683,508

# MAGNETO-RESISTIVE HEAD WITH REDUCED THERMAL NOISE

Frederick J. Jeffers, Escondido, and John L. Simonds, San Diego, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1985, Ser. No. 693,957

Int. Cl.<sup>4</sup> G11B 5/127, 5/33

U.S. Cl. 360—113

6 Claims



1. A sensor for use in a magneto-resistive head comprising:  
a. means supporting an elongated film of magneto-resistive material, said elongated film connected to a pair of electrical leads, one lead located on each side of said film, and said elongated film having a first region adjacent to a magnetic recording medium and a second region having one or more generally crosswise slots therein for prevent-

ing current flow within said magneto-resistive film in the second region, and  
b. thermally conductive means on said magneto-resistive film exclusively in the region thereof having said slots.

4,683,509

# HIGH EFFICIENCY MAGNETIC ERASE HEAD

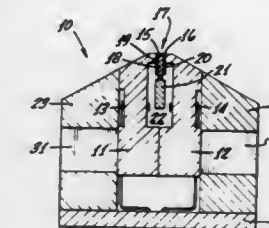
Bruce L. Steele, Rancho California, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Jun. 15, 1984, Ser. No. 621,230

Int. Cl.<sup>4</sup> G11B 5/23, 5/325

U.S. Cl. 360—119

7 Claims



1. A magnetic transducer capable of diverting magnetic flux flowing therein toward an adjacent magnetic media comprising:

first and second pole pieces made of ferrite material and respectively having end faces spaced apart to define a gap therebetween above which said magnetic media may be located;

a first conductive gap material positioned in said gap between said end faces such that an alternating magnetic flux flow between said faces will induce a first eddy current in said first conductive gap material and thereby inhibit said alternating magnetic flux from flowing through said first conductive gap material;

a conductive bar insulated electrically from said first conductive gap material and positioned below said gap such that a portion of said alternating magnetic flux flowing below said gap, through said conductive bar, will induce a second eddy current therein and thereby inhibit said portion of said alternating magnetic flux from flowing below said gap; said first conductive gap material and said conductive bar thus diverting magnetic flux to flow above said gap; and

a gap spacer made of ferrite material positioned in said gap between said end faces, wherein said conductive bar is bonded to said gap spacer.

4,683,510

# LOCK MECHANISM FOR TAPE PROTECTIVE CLOSURE FOR MAGNETIC TAPE CASSETTE

Niroshi Meguro, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1985, Ser. No. 711,521

Claims priority, application Japan, Apr. 10, 1984, 59-71462

Int. Cl.<sup>4</sup> G11B 23/087, 15/32

U.S. Cl. 360—132

20 Claims

1. A magnetic tape cassette comprising:

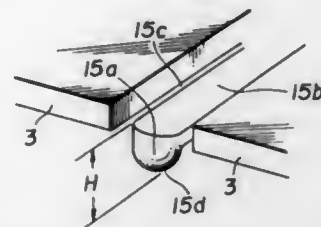
a cassette casing having a mouth through which a magnetic tape is accessible, said mouth including a first opening in a front end face of said casing and a second opening in a lower section of the casing adjacent said front end face;

a pivotal lid pivotable between a closed position covering said first opening of said mouth and an open position exposing said first opening of said mouth;

a sliding shutter member slidable with respect to a lower section of said cassette casing between a first position in which it covers said second opening and a second position in which it exposes said second opening; said shutter member including first and second means for engagingly



receiving a locking head of a locking lever at first and second positions of said shutter; and  
a resilient locking lever integrally formed with said cassette casing and having a resiliently deformable lever and a locking head engageable with said shutter member, said locking lever normally holding said shutter member in



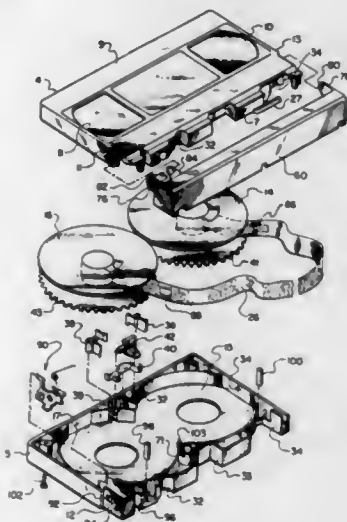
said first position while said cassette is not in use, and allowing said shutter member to move to said second position when said cassette is inserted into an associated recording and reproducing apparatus, and holding said shutter member at said second position while said cassette is used.

4,683,511

#### HEAD AND GUIDE CLEANING DEVICE FOR VIDEO TAPE RECORDER

Stephen Kara, 2609 Sopra St., Thousand Oaks, Calif. 91360  
Continuation-in-part of Ser. No. 325,923, Nov. 30, 1981, Pat. No. 4,462,056. This application Oct. 28, 1983, Ser. No. 546,506  
Int. Cl.<sup>4</sup> G11B 23/02, 5/025, 5/008, 15/00  
U.S. Cl. 360—132

8 Claims



1. In a cleaning device for a video tape recorder of the type adapted to move a video tape between two reels along a predetermined path in moving contact with a plurality of operating heads and tape guides, the cleaning device having a cassette housing adapted to be inserted into the recorder in the manner of a video tape cassette, the cassette housing having a front wall with at least one indentation for receiving a tape contacting member of the video tape recorder, which is movable from a position in the indentation to a position out of the indentation, a pair of tape reels rotatably supported within the housing, a cleaning tape carried on the reels and adapted to be advanced by the video tape recorder along the recorder tape path from one reel to the other reel in moving contact with the operating heads and tape guides when the cassette housing is inserted

into the recorder and the recorder operated, wherein the improvement comprises:

blocking means fixed to the front wall of the cassette housing extending into one of the indentation for blocking the movement of the movable tape contacting member from within the indentation to without the indentation.

4,683,512

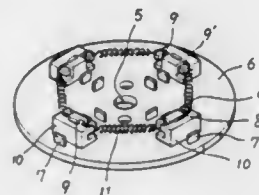
#### DEVICE FOR VARIABLY ADJUSTING A MOMENT OF INERTIA OF A DRUM OF A VIDEOCASSETTE RECORDER

Soo K. Kim, Kyungki, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea  
Filed Jul. 8, 1986, Ser. No. 883,267  
Claims priority, application Rep. of Korea, Jul. 8, 1985, 4873/1985

Int. Cl.<sup>4</sup> G11B 00/00

U.S. Cl. 360—137

1 Claim



1. A device for variably adjusting a moment of inertia of a drum of a videocassette recorder, said drum including upper and thereof to a motor, the device comprising:

- a disc-shaped plate fixedly mounted to a rotor of said motor and provided at the center portion thereof with a hole for receiving said rotating shaft;
- a plurality of protrusions radially arranged at concentric circles on said plate, said circles being spaced at different radial distances from the center of said rotating shaft, respectively;
- a plurality of inertial masses separably coupled to selected protrusions of said plate, respectively; and
- a plurality of springs each connecting adjacent inertial masses, whereby a moment of inertia of the drum can be variably adjusted depending upon the selective coupling of said inertial masses to selected protrusions of said plate.

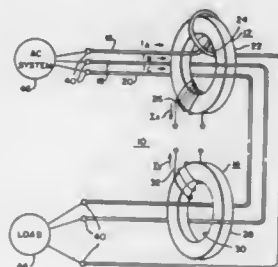
4,683,513

#### DUAL CURRENT TRANSFORMER CURRENT SENSING METHOD AND SENSOR

Robert C. Miller, Salem Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Apr. 7, 1986, Ser. No. 848,541  
Int. Cl.<sup>4</sup> H02H 3/26

U.S. Cl. 361—76

10 Claims



1. In a three phase ac system definable by positive, negative and zero sequence currents providing power to an electrical load via a current carrying conductor for each phase where

current in the conductors is sensed using current transducers, each current transducer comprising a core having a window therethrough for receiving one or more of the current carrying conductors and having a winding disposed thereon for producing an electrical output signal, a method of producing the electrical output signal indicative of the sum of the three phase current and phase imbalance of the load, comprising the steps of:

- providing a first current transducer;
- providing a second transducer wherein the number of turns in the winding thereof is substantially equal to  $\sqrt{3}$  times the number of turns in the winding of the first current transducer;
- passing the conductor of said one of phases twice through the window of the first current transducer;
- passing the conductors of the other two of the phases through the window of the first current transducer such that the current flow therein is in the same direction with respect to one another but opposite in direction to the current flow of the conductor passing twice through the window of the first current transducer;
- passing the conductors of the two phases that each pass once through the first current transducer through the window of the second current transducer such that the direction of the current flow in one of the phases is opposite to the direction of current flow of the other phase;
- squaring the output of the winding of the first current transducer;
- squaring the output of the winding of the second current transducer; and
- summing together the squared outputs of the first and second current transducers whereby the summed outputs have a dc term substantially proportional to the average value of the sum of the squares of the current flowing in the conductors and an ac term substantially proportional to phase imbalance and being substantially at twice the frequency of the current and substantially proportional to the product of the positive and negative sequence currents.

4,683,514

#### SURGE VOLTAGE PROTECTIVE CIRCUIT ARRANGEMENTS

Kenneth G. Cook, Middlesex, England, assignor to The M-O Valve Company Limited, England

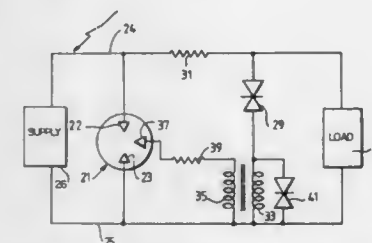
Filed Oct. 1, 1985, Ser. No. 782,434

Claims priority, application United Kingdom, Oct. 3, 1984, 8424907; Apr. 19, 1985, 8510051

Int. Cl.<sup>4</sup> H02H 9/04

U.S. Cl. 361—91

2 Claims



1. An electrical circuit arrangement for protecting a load connected across an electrical supply against surge voltages, comprising:

- (a) a resistance connected in one of a pair of supply lines which run from an electrical supply to a load, said resistance having a supply side and a load side;
- (b) a first voltage arrester including a gas-filled enclosure in which two main electrodes and a trigger electrode are housed, said main electrodes being spaced apart to form a discharge gap having a predetermined breakdown voltage, one of the main electrodes being connected to the supply side of the resistance in said one supply line, and

the other of the main electrodes being connected to the other of the supply lines;

- (c) a second excess voltage semiconductor arrester having a breakdown voltage lower than said predetermined breakdown voltage, said second arrester being connected between the load side of the resistance in said one supply line and said other supply line;
- (d) firing means operative in response to breakdown of the second arrester, for applying a voltage between the trigger electrode and one of the main electrodes of the first arrester to thereby reduce the predetermined breakdown voltage;
- said firing means including a step-up transformer having a first winding connected in series with the second arrester, and a second winding in series with the trigger electrode; and
- (e) a third arrester being connected in parallel with the first winding.

4,683,515

#### MODULAR PTC THERMISTOR OVERLOAD PROTECTION SYSTEM

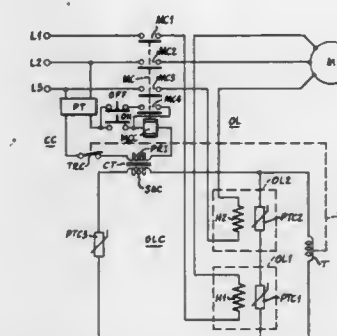
Bruce C. Beihoff, Avie Judes, both of Glendale, and Michael S. Baran, Milwaukee, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 20, 1985, Ser. No. 800,174

Int. Cl.<sup>4</sup> H02H 7/08

U.S. Cl. 361—106

14 Claims



enough power to cause motor energization if said control means is operated to apply power under overload conditions.

4,683,516

**EXTENDED LIFE CAPACITOR AND METHOD**

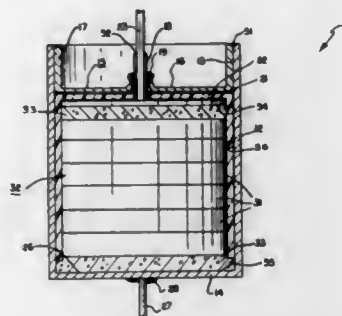
John R. Miller, Shaker Heights, Ohio, assignor to Kennecott Corporation, Cleveland, Ohio

Filed Aug. 8, 1986, Ser. No. 894,673

Int. Cl.<sup>4</sup> H01G 4/38, 9/00

U.S. Cl. 361—328

28 Claims



1. An extended life capacitor comprising, in combination: an enclosing body having an interior surface formed from a material highly resistance to corrosion by the electrolyte of the capacitor; a plurality of double layer capacitor cells inside said enclosing body and having first and second electron-conducting end members; said plurality of capacitor cells including a high surface area carbon material impregnated with an electrolyte; means providing electrical connection external to said body, mutually insulated, to said first and second end members of said plurality of capacitor cells as anode and cathode; means to inhibit the loss of electrolyte from the interior to the exterior of said capacitor body; and said inhibiting means including an hermetically sealed body and high purity components.

4,683,517

**INTEGRATED LIGHTING PANELBOARD AND WIRING GUTTER ASSEMBLY**

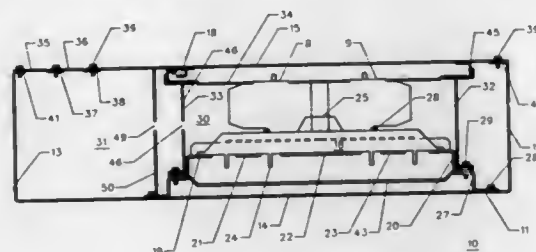
Thomas A. Yazvac, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,248

Int. Cl.<sup>4</sup> H02B 1/04

U.S. Cl. 361—358

8 Claims



1. An integrated electrical panelboard and wiring gutter assembly comprising: a rectangular enclosure including a bottom plate supporting a pair of first and second opposing sidewalls, said first and second sidewalls each terminating in an angled rim on a surface opposite said bottom plate; a rectangular door flange and door on said enclosure defining a first interior within said enclosure; circuit breaker support means carrying a plurality of circuit

breakers within said first interior and attached to said bottom plate; and a first rectangular trim plate having a first planar edge and an opposing offset edge, both said first planar edge and said first offset edge including a pair of first apertures, said first rectangular trim plate being fastened to said first angled rim on said first planar edge and to said door flange on said first offset edge, said first rectangular trim plate thereby defining a second interior within said enclosure coextensive with said first interior for housing electrical power distribution cables.

4,683,518

**IGNITION FOR OIL BURNER**

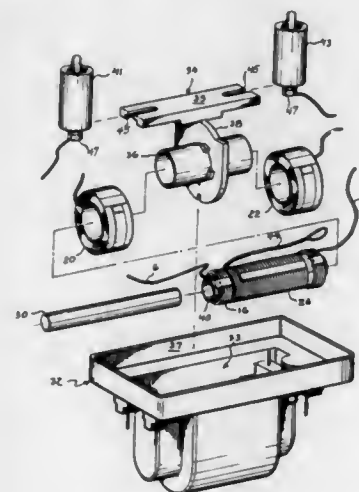
Adam A. Gwozdz, Chicopee, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Nov. 17, 1986, Ser. No. 931,207

Int. Cl.<sup>4</sup> F23Q 3/00

U.S. Cl. 361—263

6 Claims



1. Oil burner igniter having a transformer with a primary winding and secondary winding connected to electrodes for providing an ignition spark, a feedback coil is inductively coupled to the primary coil and a transistor is connected in circuit with an input energy source and the primary coil, the improvement comprising said primary winding and feedback coil being continuously wound and disposed about the circumference of a ferromagnetic core, a secondary winding disposed about the circumference of the primary winding and feedback coil in inductively coupled radial relationship, said primary winding, feedback coil and secondary coil all being disposed in axially coextensive relation about said core.

4,683,519

**CONNECTION STRUCTURE**

Osamu Murakami, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1985, Ser. No. 790,960

Claims priority, application Japan, Oct. 30, 1984, 59-226748

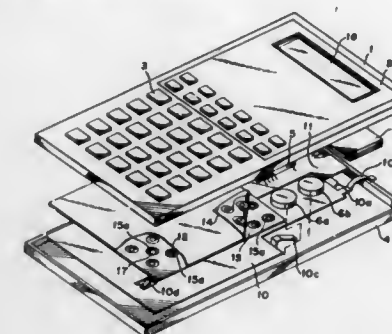
Int. Cl.<sup>4</sup> H05K 9/00

U.S. Cl. 361—424

13 Claims

9. A connection structure for electrically and mechanically connecting electronic components comprising: an insulating sheet having first and second opposed surfaces and having a plurality of holes; a first flexible printed circuit board formed of an insulating material having first and second opposed surfaces with said first surface being disposed adjacent and facing said first surface of said insulating sheet and being provided with an electric circuit including a plurality of contacts

disposed at positions facing respective said holes in said insulating sheet; a second flexible printed circuit board formed of insulating material and having first and second opposed surfaces, with said first surface of said second printed circuit board being provided with an electric circuit containing a plurality of contacts disposed opposite said holes and being disposed so that it is adjacent and facing said second surface of said insulating sheet;



- pressing means including a first pressing portion for pressing respective said contacts of said first printed circuit board against corresponding said contacts of said second printed circuit board via respective said holes formed in said insulating sheet, and a second pressing portion for pressing respective said contacts of said second printed circuit board against corresponding said contacts of the first printed circuit board via respective said holes in said insulating sheet.

4,683,520

**MECHANICAL SHOCK MOUNT SYSTEM FOR ELECTRICAL APPARATUS**

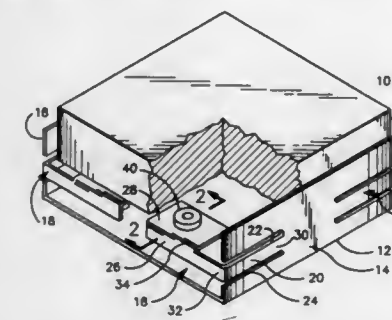
Leonardus J. Grassens, and Peter J. Janssen, both of Colorado Springs, Colo., assignors to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Filed Jul. 14, 1986, Ser. No. 885,351

Int. Cl.<sup>4</sup> H02B 1/02; H05K 7/02

U.S. Cl. 361—427

4 Claims



1. A shock mount for mounting an electrical apparatus to a chassis comprising: a resilient buffer mounted to said apparatus for compressive shock absorption along a first line; and an L-shaped arm having a first arm portion and a second arm portion, said first arm portion extending along a second line normal to said first line, said first arm portion having support means supporting said resilient buffer at one end thereof, said second arm portion extending along a third line normal to said first and second lines, one end of said second arm portion being joined to the end of said first arm portion opposite the end supporting said resilient buffer and the other end of said second arm portion joined to and integral with said chassis, said L-

shaped, are being so sized as to support bending and torsional loads to absorb mechanical shock.

4,683,521

**UNDER HOOD AND LUGGAGE COMPARTMENT LAMP ASSEMBLY**

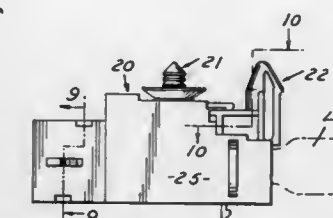
Nicholas A. Poleschuk, Farmington, and LeRoy A. Poleschuk, Warren, both of Mich., assignors to Beta Manufacturing Corp., Warren, Mich.

Filed Mar. 7, 1986, Ser. No. 837,300

Int. Cl.<sup>4</sup> F21V 21/00, 23/04

U.S. Cl. 362—80

20 Claims



1. An under hood and luggage compartment lamp assembly which is adapted to be positioned on a hood or luggage compartment of a vehicle comprising a plastic body having at one end, a first set of spaced terminals the outer end of which extend parallel for connection to a plug of a wiring harness and at the other end a second set of spaced terminals the outer end of which are shaped for receiving a wedge based lamp, a mercury switch in said body having a spherical contact and a button contact, the inner end of one of the first set of terminals being bent and resiliently engaging the spherical contact of said mercury switch and the inner end of one of the second set of terminals being bent to engage the button contact of the mercury switch, the inner end of the other of the first set of terminals directly engaging the inner end of the other of the second set of terminals the body being provided with projections and recesses for locating the terminals and mercury switch such that they can be dropped in place during assembly, a cover closing said body.

4,683,522

**SUN VISOR FOR VEHICLES**

Lothar Viertel, Berus/Uberherrn, and Klaus-Peter Kaiser, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

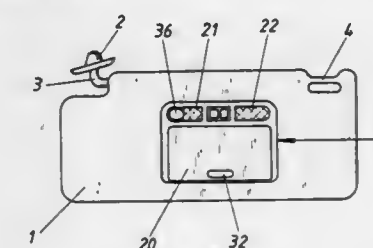
Filed Jul. 3, 1985, Ser. No. 752,385

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427952

Int. Cl.<sup>4</sup> F21V 33/00

U.S. Cl. 362—135

6 Claims



1. A sun visor for a vehicle, comprising: a flat sun-visor body with two opposite main surfaces; a recess in one of the surfaces; a housing in the recess, a



mirror in the housing; an illuminating device in the housing at the mirror;  
the housing comprising a trough-shaped bottom part attached to the visor body, a top part detachably connected to the bottom part; a light source in the bottom part; the top part is an insert; the mirror being included in the top part; a cover over the mirror, the cover displaceable over the mirror selectively to cover the mirror and to be off the mirror to expose the mirror; an illumination window for permitting light from the light source to shine through; and  
a spring attached to the cover for normally urging the cover into the open condition uncovering the mirror; releasable closure means for holding the cover closed against the bias of the spring; the closure comprising an opening in the bottom part and comprising a spring-loaded pin extending from the cover into the opening in the bottom part, the pin being shaped such that pushing upon the pin against the spring loading releases the cover to move open under the bias of the spring for the cover.

4,683,523

## DEEP SUBMERSIBLE LIGHT ASSEMBLY

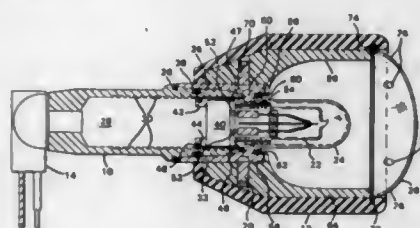
Mark S. Olsson, 4968 Diane Pl.; William H. Hagey, 3653 Jennifer St., both of San Diego, Calif. 92117, and Brock J. Rosenthal, 230 Fourth St., Del Mar, Calif. 92014

Filed Jun. 13, 1986, Ser. No. 874,271

Int. Cl.<sup>4</sup> F21V 29/00

U.S. Cl. 362-267

10 Claims



1. A submersible light assembly, comprising:  
a hollow body having at least one opening;  
a lamp socket;  
means for holding the lamp socket in a predetermined position within the body;  
a lamp having contacts removably inserted in the socket and a bulb extending through the opening and having a base connectable with the socket;  
a transparent cylindrical envelope enclosing a portion of the lamp and having a closed forward end and an open rearward end with a radially outwardly projecting shoulder, the shoulder having a flat rearward face extending perpendicular to a longitudinal axis of the envelope, a cylindrical outer surface extending forward from the rearward face, and a radially tapered outer surface forward of the cylindrical surface and decreasing in diameter moving in a forward direction; and  
means for holding the rearward end of the transparent envelope to the body including means connected to the body for defining a cylindrical cavity adjacent the opening, the rearward face of the transparent envelope being abutted against a rearward wall of the cavity, an O-ring radially seated in the cavity surrounding the cylindrical outer surface of the shoulder of the transparent envelope, and means for engaging the tapered outer surface of the shoulder and pressing the O-ring and the rearward face of the shoulder against the rearward wall of the cavity.

4,683,524

## ILLUMINATION APPARATUS

Masakatsu Ohta, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

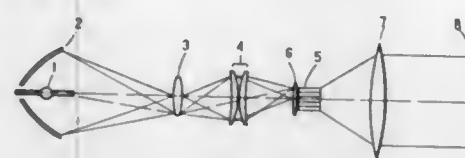
Continuation of Ser. No. 720,610, Apr. 8, 1985, abandoned. This application Oct. 16, 1986, Ser. No. 919,377

Claims priority, application Japan, Apr. 13, 1984, 59-75388

Int. Cl.<sup>4</sup> F21V 7/04; G03B 27/02

U.S. Cl. 362-268

8 Claims



1. An illumination apparatus, comprising:  
a light source;  
an elliptical mirror for forming an image of said light source;  
an imaging system for re-imaging the image formed by said elliptical mirror, while causing a curvature of field;  
a multi-beam generating system for producing, from a light beam emitted from said light source, a number of discrete light beams, said multi-beam generating system having an input surface disposed in a predetermined relation to the image of said light source formed by said imaging system; and  
a collimating system for collimating each of the discrete light beams emerging from said multi-beam generating system.

4,683,525

## LAMP HAVING SEGMENTED REFLECTOR

David M. Camm, Vancouver, Canada, assignor to Fuson Systems Corporation, Rockville, Md.

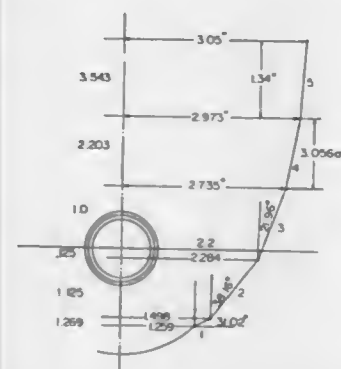
Continuation of Ser. No. 707,159, Mar. 1, 1985, abandoned. This application Nov. 5, 1986, Ser. No. 928,649

Claims priority, application Japan, Mar. 1, 1984, 59-39719

Int. Cl.<sup>4</sup> F21V 7/00

U.S. Cl. 362-346

14 Claims



1. A lamp for providing both substantially uniform light flux and small average local divergence over the extent of a target of variable transparency to be illuminated, comprising  
a light source for emitting radiation, and  
a reflector in which said light source is disposed, said reflector having an axis and being comprised of a plurality of annular reflecting segments which are symmetrical with respect to said axis and which are arranged with respect to said source and the area of a target of variable transparency to be illuminated so that the points on said target receive radiation which is reflected from a plurality of different segments with points on the target which are

closer to the periphery thereof receiving radiation which is reflected from a greater number of segments than points which are closer to the center of the target in such manner that due to the increase in target area in the direction from the target center to periphery the radiation incident across the entire target area is substantially uniform, and whereby the radiation incident on the variable transparency target is averaged over the reflecting segments and the average local divergence of such radiation is minimized.

4,683,526

## ASYMMETRIC LAMP

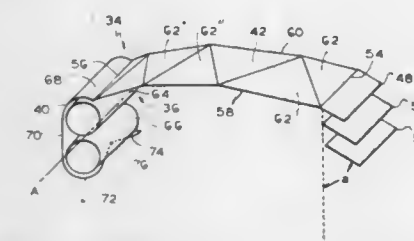
Jens C. Krogsrud, Oslo, Norway, and Kai O. Sorensen, Lyngby, Denmark, assignors to Jac Jacobsen A/S, Norway

Continuation of Ser. No. 795,638, Nov. 6, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 931,945

Int. Cl.<sup>4</sup> F21V 7/00

U.S. Cl. 362-346

20 Claims



1. A lamp, comprising:  
a head, a faceted top reflector; a rear reflector; and a socket means for receiving a light source, the socket means being rearwardly mounted in the head, said light source defining a vertical plane generally parallel to said rear reflector, said light source also defining a horizontal line in said plane, said rear reflector being located generally rearward of said light source, said top reflector being located generally above said light source;  
said faceted top reflector having a generally parabolic longitudinal cross-sectional shape, said top reflector including a plurality of triangular facets, adjacent facets defining lines that are nonparallel to said horizontal line defined by the light source, said top reflector having a front edge, a rear edge, and first and second side edges;  
said rear reflector having an upper portion and a lower portion, said upper portion being located rearward of said rear edge of said top reflector, said lower portion generally conforming to the contours of said light source and extending forward of said vertical plane, said lower portion including a notch.

4,683,527

## AC/DC OR DC/AC CONVERTER SYSTEM WITH OUTBOARD COMMUTATION INDUCTORS

John Rosa, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 13, 1986, Ser. No. 896,027

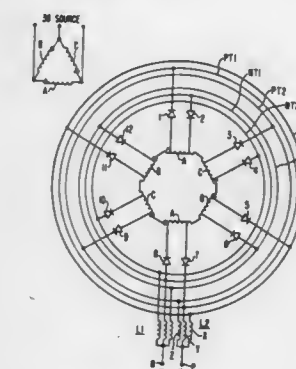
Int. Cl.<sup>4</sup> H02M 7/70

U.S. Cl. 363-5

6 Claims

1. In an AC/DC converter system interconnecting AC phase lines with two direct current (DC) terminals defining opposite poles for such converter, the converter system including 12 rectifying devices equally distributed about twelve successive phase voltages oriented vectorially in a star-fashion and at 30 degrees to one another;  
one set of 6 of said rectifying devices being associated with one DC terminal, a second set of 6 of said rectifying devices being associated with the other DC terminal;  
said rectifying devices becoming operatively conducting between said DC terminals in cyclic sequential order so that two commutating devices are commutating one an-

other from one phase voltage to the next phase voltage at 60 degrees phase shift; the combination of:  
in each of said two sets of rectifying devices three pairs of rectifying devices are arranged in a staggered fashion so that one rectifying device of a pair is next in said sequential order of conduction relative to another rectifying device of another pair;  
while being associated with a rectifying device ranking third in said sequential order and belonging to the third pair of such set;  
a group of three inductors being provided for each of said sets of rectifying devices, each such group being connected between the associated pole and the respective pairs of rectifying devices;



two inductors of a group being operatively associated with the two commutating rectifying devices in said sequential order;  
the other inductor of said group being associated with the third rectifying device which is in sequential order relative to said two commutating rectifying devices;  
such two inductors of a group being effective to reduce the rate of change of the commutating currents in both of said two commutating rectifying devices so as to extend the duration of the attending commutation and reduce the harmonics of the currents drawn from said phase lines, and said pair of inductors being effective via said other inductor of said group to prevent interference by said third rectifying device upon the commutation of said commutating devices.

4,683,528

## PULSE POSITION MODULATED REGULATION FOR POWER SUPPLIES

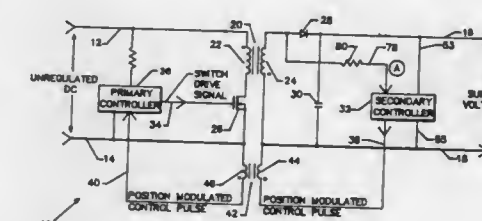
Dane R. Snow, Santa Clara, and David Bingham, San Jose, both of Calif., assignors to Intersil, Inc., Cupertino, Calif.

Filed Jul. 22, 1985, Ser. No. 757,808

Int. Cl.<sup>4</sup> H02M 3/335; 363 21, 25, 26, 97, 131, 134

U.S. Cl. 363-21

2 Claims



1. A power supply for providing a regulated supply voltage, said power supply comprising:  
a transformer with a primary winding and a secondary winding;  
a switching device connected to said primary winding for

controlling the duty cycle of the power delivered to said primary winding;

- a primary controller coupled to said switching device for driving said switching device;
  - a secondary controller coupled to said secondary winding for generating a position modulated control pulse, the timing of said control pulse being generated in accordance with any error between the supply voltage and its regulated value, said secondary controller including amplifier means for amplifying the difference between said error and a reference signal to provide a current source control signal, sawtooth generator means for generating a periodic sawtooth waveform in which the slope of the sawtooth waveform is proportional to said error and comparison means for comparing the sawtooth signal to said reference signal and providing an output signal when the sawtooth signal exceeds said reference signal, said sawtooth generator means including a storage capacitor, means for cyclically discharging the capacitor and variable current source means responsive to said current source control signal for providing current to said storage capacitor to charge said storage capacitor at a rate in accordance with the magnitude of the current source control signal; and
  - a pulse transformer for coupling said position modulated control pulse from said secondary controller to said primary controller;
- whereby feedback information is transmitted from the power supply output to the power supply input across the isolation boundary of said transformer.

4,683,529

#### SWITCHING POWER SUPPLY WITH AUTOMATIC POWER FACTOR CORRECTION

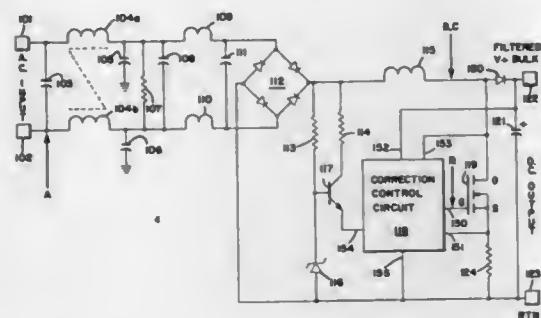
James D. Bucher, II, St. Paul, Minn., assignor to Zytec Corporation, Eden Prairie, Minn.

Filed Nov. 12, 1986, Ser. No. 929,603

Int. Cl.<sup>4</sup> H02M 7/217, 1/12

U.S. Cl. 363-44

11 Claims



1. An off-line switching power supply with automatic power factor correction, comprising:
  - input connection means for connecting to a power source and for receiving input current;
  - first rectifier means connected to said input connection means for rectifying said input current and for producing rectified input current;
  - inductor means for charging and discharging said rectified input current;
  - switching means connected to said inductor means and to said first rectifier means for placing said inductor means in a first position so that said rectified input current from said first rectifier means is charged in said inductor means and for placing said inductor means in a second position so that said charged rectified input current is discharged from said inductor means;
  - second rectifier means connected to said inductor means for receiving said discharged rectified input current and for

producing rectified inductor current when said inductor means is placed in said second position by said switching means;

capacitor means connected to said second rectifier means for receiving said rectified inductor current, for charging the voltage produced when said inductor means is placed in said second position by said switching means and for discharging regulated direct current and voltage;

output connection means connected to said capacitor means for driving a load with said discharged regulated direct current and voltage;

control means connected to said switching means for alternately placing said inductor means in said first and said second positions, which comprises:

on-time amplifier means connected to said capacitor means for generating an on-time error signal in response to said voltage across said voltage capacitor;

off-time amplifier means connected to said voltage storage means for generating an off-time error signal in response to said voltage across said voltage storage means;

reset detect means connected to said second rectifier means for generating a reset signal when said rectified inductor current through said second rectifier means is approximately zero;

clock circuit means for producing a high frequency clock signal to control said switching means having an on-time interval corresponding to the amount of time said switching means places said inductor means in said first position and having an off-time interval corresponding to the amount of time said switching means places said inductor means in said second position;

the length of said on-time interval controlled by the magnitude of said on-time error signal; and

the length of said off-time interval controlled by said reset signal and said off-time signal so that said reset signal operates to terminate said off-time interval and said off-time error signal operates to extend the off-time interval beyond the termination point set by said reset signal.

4,683,530

#### SERIAL INFORMATION TRANSFER PROTOCOL

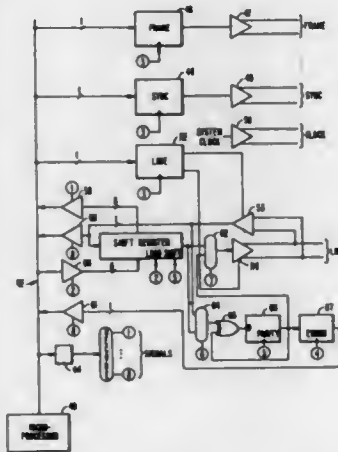
Jesse T. Quatse, Corte Madera, Calif., assignor to Telemecanique Electrique, Nanterre Cedex, France

Filed Apr. 10, 1984, Ser. No. 598,644

Int. Cl.<sup>4</sup> G06F 13/42

U.S. Cl. 364-200

14 Claims



1. In an information processing system an apparatus for transferring information between a central processing unit (CPU) and at least one peripheral module, the apparatus comprising:

line means coupled to said CPU and to said at least one peripheral module for providing serial transmission of address signals and serial bidirectional transmission of data signals;

means coupled to said at least one peripheral module for generating a frame signal, said frame signal having a first transition for initiating an address transmission phase and a second transition for terminating a data transmission phase;

means coupled to said at least one peripheral module for generating a clock signal for defining a synchronous transmission rate during the data transmission phase and the address transmission phase;

means coupled to said at least one peripheral module for generating a sync signal for terminating the address transmission phase and for delimiting data fields transmitted during the data transmission phase; and

means coupled to said line means and to said sync signal generating means and responsive to a first transition of said sync signal for generating on said line means an acknowledgement (ack) signal having a first transition verifying correct receipt of signals transmitted on said line means;

said sync signal generating means being further operative to cause a second transition of said sync signal in response to the first transition of said ack signal and said ack signal generating means being further operative to cause a second transition of said ack signal in response to the second transition of said sync signal.

4,683,531

#### POLLING METHOD FOR DATA PROCESSING SYSTEM

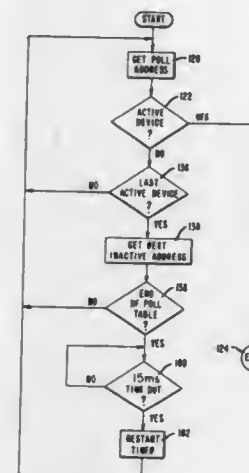
Russell K. Kelch, Seneca, Ill.; Don C. Finrock, Cambridge; Donald J. Girard, Cambridge; Daniel B. Seever, Cambridge; Barry D. Briggs, New Concord, and Gene R. Mathes, Zanesville, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 2, 1984, Ser. No. 627,253

Int. Cl.<sup>4</sup> G06F 13/22

U.S. Cl. 364-200

5 Claims



1. A method for polling during a processing operation a plurality of active and inactive remote processing units interconnected in a communication network with a master processing unit having a memory comprising the steps of:

- (a) sequentially transmitting a status message from the master processing unit to each of the remote processing units prior to the start of the processing operation;
- (b) transmitting a response message to the master processing unit from a remote processing unit that is active in response to receiving the status message;
- (c) establishing in the memory a table of first and second bytes of binary signals in accordance with the response

received to the status message in which each first byte of binary signals represents an active remote processing unit that has transmitted a response message to the master processing unit and each second byte of binary signals represents an inactive remote processing unit in the communication network that has not transmitted a response message to the master processing unit;

(d) sequentially transmitting a polling message to each active remote processing unit in the order listed in the table;

(e) at the conclusion of transmitting a polling message to the last active remote processing unit listed in the table, transmitting a polling message to the first inactive remote processing unit listed in the table;

(f) after transmitting a polling message to the first inactive remote processing unit, repeating step (d);

(g) at the conclusion of transmitting a polling message to the last active remote processing unit listed in the table, transmitting a polling message to the next inactive remote processing unit listed in the table;

(h) repeating steps (d), (e), (f) and (g) until all of the active and inactive remote processing units listed in the table have been polled;

(i) generating first and second time-out periods by the master processing unit at the start of transmitting a polling word to an inactive processing unit;

(j) storing a third byte of binary signals in the poll table representing the inactive device polled if the inactive device does not respond within the first time-out period; and

(k) changing the third byte of binary signals representing the inactive processing unit polled to said first byte of binary signals upon receiving a response message from the inactive processing unit polled to the transmission of the polling word within said second time-out period.

4,683,532

#### REAL-TIME SOFTWARE MONITOR AND WRITE PROTECT CONTROLLER

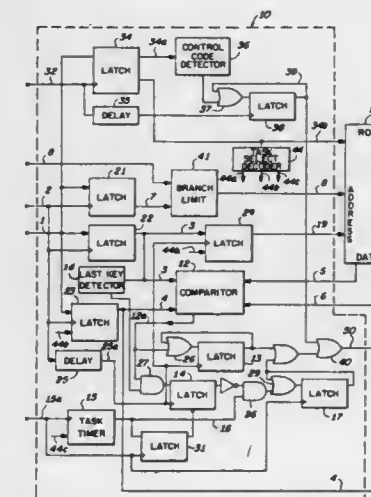
Larry J. Yount, Scottsdale; Nicholas J. Wilt, Phoenix; Bryan H. Hill, Phoenix, and Donald A. Peterson, Jr., Phoenix, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 3, 1984, Ser. No. 677,275

Int. Cl.<sup>4</sup> G06F 11/30

U.S. Cl. 364-200

4 Claims



1. Real-time software monitor and write protect apparatus comprising:

means for providing a sequence of memory addresses in response to input of a sequence of data keys, said data keys



occurring at selected times during execution of a program in a central processor, means for sequentially accepting said memory addresses and providing in response thereto a plurality of sequential legitimate codes, means for sequentially comparing said legitimate codes with selected portions of said data keys to provide therefrom a signal indicating the validity of said keys, and means for providing software isolation by specifying areas of memory that may not be altered in response to said sequence of data keys.

4,683,533

# STORAGE CONTROL SYSTEM USING PLURAL BUFFER ADDRESS ARRAYS

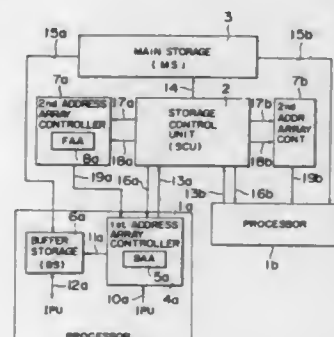
Kenichi Shiozaki, Odawara, and Kanji Kubo, Hadano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,771

Claims priority, application Japan, Oct. 27, 1983, 58-202004  
Int. Cl.<sup>4</sup> G06F 13/00; G11C 29/00

U.S. Cl. 364—200

2 Claims



1. A storage control apparatus for a data processing system including a shared storage and a plurality of processors which share said shared storage, at least one of said plurality of processors having a buffer storage for retaining a copy of a part of data stored in said shared storage, said storage control apparatus associated with said at least one processor having the buffer storage, comprising:

- a first buffer address array for storing addresses of data stored in said buffer storage and responsive to an access request from said one processor for indicating whether or not a data item exists in said buffer storage;
- a second buffer address array for storing the same addresses as those stored in said first buffer address array; and
- control means connected to said first and second buffer arrays for updating the content of said second buffer address array and the content of said first buffer address array in response to a first signal indicating a block transfer of data from said shared storage to the buffer storage of said one processor and a second signal indicating a store operation of another processor, said control means including a first address array controller connected to said buffer storage and said first buffer address array for controlling the update of said first buffer address array, and a second address array controller connected to said first address array controller for searching said second buffer address array in response to receipt of said second signal in the form of a store address check request associated with a store operation conducted by said other processor on said shared storage to cancel the store operation address from said second buffer address array and to send a cancellation request to said first address array controller to cancel the store operation address registered in said first buffer address array when the address for said store operation is found in said second buffer address array, said second address array controller including means for replacing an address stored in said second buffer address array with

another address in response to said first signal in the form of a replace indication for a block transfer request generated by said one processor and for sending a replace indication to said first address array controller to effect replacement of the same address therein; wherein said first buffer address array includes means for accepting an access request which has been generated in said one processor on condition that no block transfer to the one processor is in progress and that the content of said first buffer address array associated with any block transfer by said control means has been updated; and wherein said second address array controller further includes a request stack operating in accordance with a first-in first-out algorithm and connected to said second buffer address array for stacking said store address check request, said replace indication, and said cancellation request generated within said second address array controller in the order of reception thereof and for issuing a refer, cancel or replace indication to said second buffer address array in response to a request issued therefrom; and a cancel/replace stack operating in accordance with the first-in first-out algorithm and connected to said first address array controller for stacking cancellation requests and replace indications in the order of reception thereof and for sending said stacked requests and indications to said first address array controller; whereby said second address array controller, when a store address check request is issued from said request stack, stacks a cancellation request in said cancel/replace stack in association with an indication made by said second buffer address array for the presence of an address associated with said store address search and further stacks a cancellation request in said request stack, and when a replace request is issued from said request stack, stacks a replace indication in said cancel/replace stack.

4,683,534

# METHOD AND APPARATUS FOR INTERFACING BUSES OF DIFFERENT SIZES

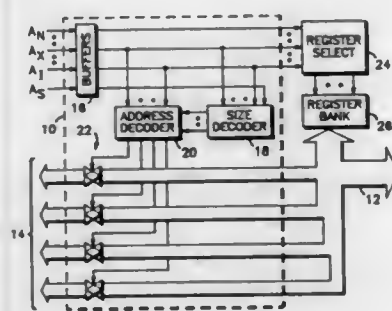
Donald L. Tietjen, and Michael W. Cruess, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 17, 1985, Ser. No. 745,477

Int. Cl.<sup>4</sup> G06F 3/00

U.S. Cl. 364—200

4 Claims



1. In a data processing system comprising first and second buses, wherein the second bus is a  $2^x$  sub-multiple of the first bus,  $x$  being a predetermined positive integer, a circuit for interfacing the first bus to the second bus, comprising:
- a size decoder for receiving as a size control signal the  $(x-1)$  least significant bits of a control address and a decoder control signal, the size decoder providing a size select signal indicative of the number  $y$  of consecutive least significant bits of the size control signal which are equal to logic one (1);
  - an address decoder for receiving the  $x$  least significant bits of the control address and the size select signal, the address decoder providing  $2^2$  enable signals indicative of the en-

coding of the  $(x-y)$  most significant bits of the  $x$  control address bits; and  $2^x$  sets of buffers, each set coupling a selected portion of the first bus to a respective portion of the second bus in response to a respective one of the enable signals.

4,683,535

# THIN FILM MAGNETOMETER

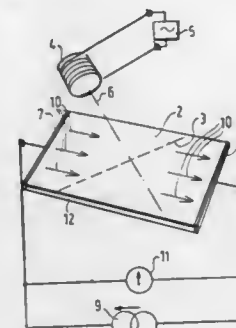
René M. de Ridder, Hengelo, and Johannes H. J. Fluitman, Enschede, both of Netherlands, assignors to Stichting Centrum Voor Micro Electronika Twente, Enschede, Netherlands

Filed Apr. 2, 1985, Ser. No. 719,067

Int. Cl.<sup>4</sup> G01R 33/02

U.S. Cl. 324—249

11 Claims



1. A magnetometer comprising the combination of a thin film of ferromagnetic material having an axis of anisotropy lying within the film, means for passing unidirectional electric current along a path lying within said film, means for periodically magnetizing said ferromagnetic material in relatively opposite directions with an alternating magnetic field extending within the film and of sufficient strength to saturate at least a part of the ferromagnetic material through which the current passes, and means for detecting a change in electrical property of that part of the film which is saturated and affected by the presence of an extraneous magnetic field having a component lying within the ferromagnetic material perpendicular to said opposite directions.

4,683,536

# PRODUCT SALES DATA PROCESSING SYSTEM FOR ON-LINE CONNECTION TO HOST CPU

Mikio Yamamoto, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

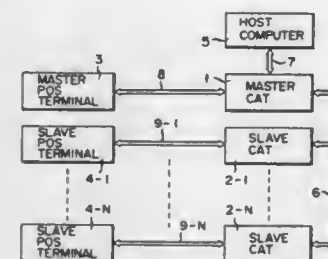
Filed Jul. 29, 1985, Ser. No. 760,294

Claims priority, application Japan, Aug. 8, 1984, 59-166249

Int. Cl.<sup>4</sup> G06F 15/30

U.S. Cl. 364—408

2 Claims



1. A product sales data processing system, comprising: a plurality of point of sales (POS) terminals including a master POS terminal and a number of slaves POS terminals for registering sales data of products by transferring

said sales data to an external host computer for registration;

- a plurality of slave credit authorization terminals (CATs), each including first card reading means for reading a credit card number from a credit card set at a reading position, a first working memory area, first data input means for inputting sales data of products and a personal identification number into said first working memory area, a slave POS interface arranged for connection to a respective one of said slave POS terminals, a slave CAT interface, and first data transfer control means for controlling data transfer to said slave POS and said slave CAT interfaces; and
  - a master credit authorization terminal including second card reading means for reading the credit card number from the credit card set at a reading position, a second working memory area, second data input means for inputting sales data of products and a personal identification number, a master POS interface arranged for connection to said master POS terminal, a master CAT interface arranged for connection to the CAT interfaces of said plurality of slave credit authorization terminals, inline circuit means for connecting said master CAT interface to each of said slave CAT interfaces, a host interface arranged for connection to said external host computer, online circuit means for connecting said host interface to said host computer, and second data transfer control means for controlling data transfer to said master POS, master CAT and host interfaces,
- wherein each of said first data transfer control means of said plurality of slave credit authorization terminals produces authorization data on the basis of the sales data from either said respective slave POS terminal or said first data input means, the card data from said first card reading means and the personal identification number from said first data input means, and then supplies said authorization data to said master credit authorization terminal, the second data transfer control means of said master credit authorization terminal sequentially transferring the authorization data from said plurality of slave credit authorization terminals to the external host computer through said host interface.

4,683,537

# ANTI-SKID BRAKE CONTROL SYSTEM FOR AUTOMOTIVE BRAKE SYSTEM WITH QUICK TAKE-UP FEATURE

Toshiro Matsuda, Sagami, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

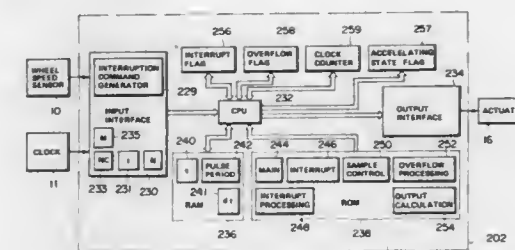
Filed Oct. 29, 1984, Ser. No. 666,055

Claims priority, application Japan, Nov. 9, 1983, 58-208959

Int. Cl.<sup>4</sup> B60T 8/32

U.S. Cl. 364—426

17 Claims



1. An anti-skid brake control system for an automotive brake system comprising:
- a hydraulic brake system including a wheel cylinder for applying braking pressure to a vehicle wheel, and a pressure control valve associated with said wheel cylinder for adjusting fluid pressure in said wheel cylinder, said pressure control valve being operative to increase fluid pres-





ing conditions of a plurality of rotary machines comprising a rotational frequency setting unit for setting rotational frequencies of respective rotary machines, an alarm level setting unit for setting alarm vibration level values of corresponding rotary machines, a nonvolatile memory for storing set values provided by said rotational frequency setting unit and said alarm level setting unit, a vibration sensor receiving oscillation signals generated by the rotary machines to detect vibrations thereof, signal processing means operated under program control for determining vibration amplitude values corresponding to the vibrations of respective rotary machines, a control processor supplying the set values provided by said rotational frequency setting unit and said alarm level setting unit to said processing means, said processing means including means for comparing the alarm vibration level values set for the respective rotary machines and for generating an output each time one of the vibration amplitude values is greater than one of the alarm vibration level values of the corresponding rotary machine, said control processor including means responsive to the output generated by said processing means for generating alarm and indicating signals corresponding to the output from said processing means, and output means receiving the alarm and indicating signals from said control processor and indicating vibrating conditions of said rotary machines.

4,683,543

## TIME-BASED INTERPOLATION CONTROL OF A ROBOT

Kazushige Hirasawa, Kawanishi; Yasuhiro Shimizu, Nara, and Takemasa Matsumura, Minoo, all of Japan, assignors to Matsushita Electrical Industrial Co. Ltd., Osaka, Japan

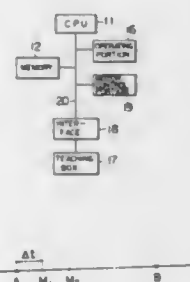
Filed Jul. 11, 1984, Ser. No. 629,623

Claims priority, application Japan, Jul. 14, 1983, 58-128607

Int. Cl.<sup>4</sup> G05B 19/41

U.S. Cl. 364—513

4 Claims



1. A method of interpolatively controlling the movement of an arm portion of a robot along a locus between predetermined first and second spatial positions, said arm being movable at predetermined velocities, comprising

(1) teaching steps including

- inputting and storing in a teaching data storing memory the values of coordinates defining said first and second spatial positions;
- inputting and storing in said teaching data storing memory the predetermined velocity of said arm at said first spatial position;
- determining from the coordinates stored in said memory in step (1)(a) the distance to be traversed by said arm between said first and second spatial positions, said distance being stored in said memory; and
- determining from the predetermined velocity stored in step (1)(b) and the distance stored in step (1)(c) the traversal time required for said arm to move from said

- first spatial position to said second spatial position, said traversal time being stored in said memory; and
- playing back steps for calculating in a locus calculating processing unit interpolated distances through which the arm portion of said robot is to be moved based on the teaching data stored in said memory in step (1), said playback steps including
  - dividing the traversal time obtained in step (1)(d) by a predetermined unit time to obtain a plurality of time-separated interpolation points, said time-separated interpolation points corresponding to distance-separated points along said locus having a unit distance therebetween; and
  - calculating sequentially incremental coordinate values for each of said distance-separated points from the stored coordinate values obtained in step (1)(a); and
  - moving the arm portion of said robot in accordance with the incremental coordinate values calculated in step (2)(b).

4,683,544

## METHOD OF TEACHING AN OPERATION PROGRAM TO A LINE ROBOT WHEREIN A MASTER ROBOT POSITIONED AT A LOCATION REMOTE FROM SAID LINE ROBOT IS FIRST TAUGHT THE PROGRAM

Kazuo Hariki, Toyama, Japan, assignor to Kabushiki Kaisha Fujikoshi, Toyama, Japan

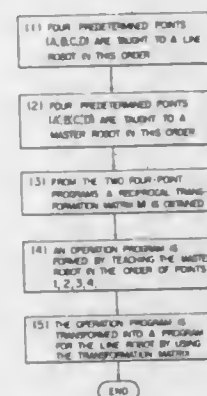
Filed Oct. 2, 1984, Ser. No. 657,381

Claims priority, application Japan, Nov. 16, 1983, 58-214085

Int. Cl.<sup>4</sup> G05B 13/00

U.S. Cl. 364—513

1 Claim



1. An off-line teaching method for industrial robots including at least a line robot placed in an operating line for processing a line work arranged therein, said method comprising the steps of:

- preparing, in addition to the line robot and the line work, a master disposed in a location remote from the operating line and a model work similar to the line work positioned adjacent said master robot;
- selecting a first four reference points on said model work and a second corresponding four reference points on said line work, said first and second four reference points being located in different planes;
- teaching said master robot said first four reference points at said location remote from the operating line;
- teaching said line robot said second four reference points in the same order as said teaching of the first four reference points to the master robot;
- obtaining a transformation matrix from the first four reference points taught to said master robot and the second four reference points taught to said line robot, said transformation matrix being obtained by solving a system of twelve linear equation with twelve unknowns, said linear equations being established by the first four reference

points taught to said master robot and the second four reference points taught to said line robot; teaching said master robot an operation program by using said model work in said location remote from said operating line; and transforming the operation program taught to said master robot into an operation program for said line robot by using said transformation matrix to thereby teach the operation program to said line robot.

4,683,545

## SPEED DETERMINING PROCESS AND A DEVICE FOR IMPLEMENTING SAME

Jean-Pierre Fauvet, Rueil Malmaison, and Jacques Parisel, Maisons Laiffite, both of France, assignors to La Telemecanique Electrique, France

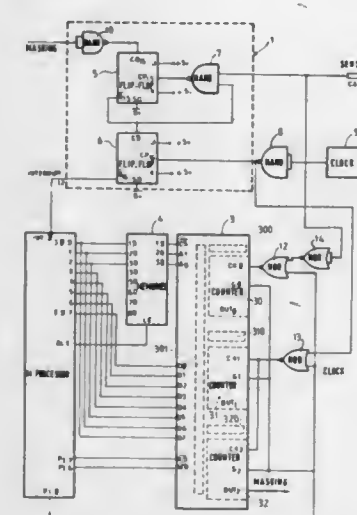
Filed Aug. 20, 1984, Ser. No. 642,326

Claims priority, application France, Aug. 30, 1983, 83 13869

Int. Cl.<sup>4</sup> G01P 3/48, 3/54, 3/56; G01R 23/02

U.S. Cl. 364—565

4 Claims



1. Device for determining the speed of a member carrying a sensor producing first pulses whose frequency is proportional to the speed, said device comprising:

- a time measuring clock which produces second pulses;
- a microprocessor having at least an interruption input, an address/data BUS and an input/output port;
- a programmable counting circuit connected to said address/data BUS and including a first counter for downcounting a first preselected value at the timing of the pulses generated by said sensor, a second counter for downcounting a second preselected value at the timing of said time measuring clock and a third counter for downcounting in a downcounting step a third preselected value at the timing of said time measurement clock, said third counter having a masking output which produces a masking signal during said downcounting step;
- means for applying on said interruption input interruption signals in synchronism and generated in accordance with said first and second pulses;
- means for periodically masking said interruption signals following a predetermined wave front of the clock signal succeeding to the emission of said masking signal,
- said microprocessor having means for reading and for storing in a memory of the contents of said first and second counters through at least a read out register during an interruption which follows the end of said masking signal, means for reloading of said first, second and third counters respectively to said first, second and third preselected values after said reading, means for calculating the speed by determining the quotient of

the contents of said first and said second counters stored in said memory

4,683,546

## FLOATING POINT CONDITION CODE GENERATION

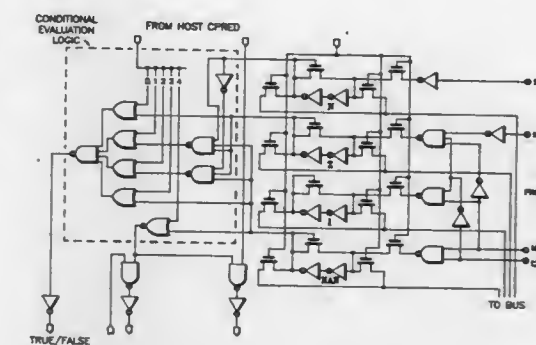
Joel F. Boney, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 787,025, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 567,830, Jan. 3, 1984, abandoned. This application Oct. 14, 1986, Ser. No. 918,682

Int. Cl.<sup>4</sup> G06F 7/48

U.S. Cl. 364—748

20 Claims



1. A method comprising the steps of: performing an arithmetic operation on two floating point operands to produce a floating point result; generating a first set of condition codes comprising: Zero (Z) if the result is a floating point zero; Negative (N) if the result is negative; Not a Number (NaN) if the result is not a floating point number; and Infinity (I) if the result is a floating point number; logically combining the first set of condition codes to produce a second set of condition codes comprising: Equal (EQ) if the result is equal to zero; Greater Than (GT) if the result is greater than zero; Less Than (LT) if the result is less than zero; and Unordered (UN) if the result is not a floating point number.

4,683,547

## SPECIAL ACCUMULATE INSTRUCTION FOR MULTIPLE FLOATING POINT ARITHMETIC UNITS WHICH USE A PUTAWAY BUS TO ENHANCE PERFORMANCE

Richard D. DeGroot, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1984, Ser. No. 664,739

Int. Cl.<sup>4</sup> G06F 7/38

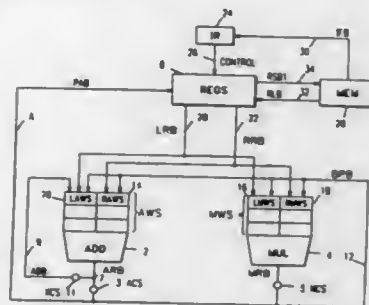
U.S. Cl. 364—748

9 Claims

4. In an arithmetic unit for performing vector and matrix related arithmetic operations for producing two arithmetic results per cycle of operation, one of which is the result of an accumulate type operation, the combination: an adder having first and second inputs and an output, including a first switch connected to said output, with said first switch being on when an add type operation is being completed, with said first switch being off at all other times; a multiplier having first and second inputs and an output, including a second switch connected to said output, with said second switch being on when a multiply type operation is being completed, with said second switch being off at all other times; an accumulator bypass bus connected to said first input of said adder, including a third switch connected to said

accumulator bypass bus and connected to said output of said adder, with said third switch being on when an accumulate type operation is being completed, with said third switch being off at all other times, and with said second and third switches being permitted to be concurrently on such that two arithmetic results may be concurrently produced, one of which is the result of an accumulate type operation;

a putaway bus connected to said first and second switches for receiving the results of an adder type or multiplier type operation, dependent upon whether or not said first or second switch is on;



a bypass bus connected to said first and second switches and to the first and second inputs of each of said adder and multiplier for receiving the results of an adder type or multiplier type operation, dependent upon whether or not said first or second switch is on; and

a register file having an input connected to said putaway bus for receiving the results of an adder type or multiplier type operation dependent upon whether or not said first or second switch is on, with said register file having a first output connected to the respective first inputs of said adder and multiplier, and said register file having a second output connected to the respective second inputs of said adder and multiplier.

4,683,548

#### BINARY MOS RIPPLE-CARRY PARALLEL ADDER/SUBTRACTOR AND ADDER/SUBTRACTOR STAGE SUITABLE THEREFOR

Daniel Mlynec, Wolfgangten, France, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 311,377, Oct. 14, 1981, abandoned.

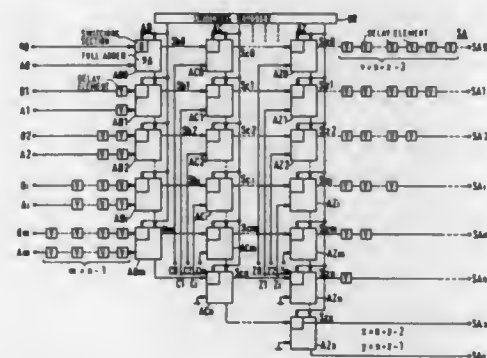
This application Sep. 24, 1985, Ser. No. 780,226

Claims priority, application European Pat. Off., Nov. 3, 1980, 80106726.5

Int. Cl. G06F 7/50

U.S. Cl. 364-786

19 Claims



1. A parallel adder/subtractor employing enhancement-mode insulated-gate field-effect transistors for combining a

plurality of numbers each represented by a plurality of parallel bits, comprising:

a plurality of binary ripple-carry parallel adders/subtractors, each operating on a pair of digital words coupled thereto, each of said adders/subtractors forming partial sum outputs, each of said plurality of adders/subtractors including a plurality of adder/subtractor stages the partial sum outputs from each stage coupled to the succeeding stage, each said stage being responsive to a different bit of an associated one of said pairs of digital words;

each of said stages comprises a full adder, said full adder having a first input receiving a bit of a first one of said pair of digital words and having a second input; and switching section means having a first input receiving a bit of the second one of said pair of digital words and having an output coupled to said full adder second input, said switching section means being selectively operable to invert or not invert said bit of the second one of said pair of digital words in response to switching signals;

an input delay means for coupling said two numbers to said first one of said adder/subtractors such that each bit of a first of said two numbers and each bit of a second of said numbers is delayed by one predetermined time period greater than the preceding lower order bit of said first number and the preceding lower order bit of said second number, respectively;

a plurality of sum output terminals; and an output delay means for coupling the outputs of a last one of said plurality of adder/subtractors to said plurality of sum output terminals such that each output bit of said last adder/subtractor is delayed by one predetermined time period greater than the succeeding higher order output bit.

4,683,549

#### SEQUENCE CONTROL METHOD AND APPARATUS

Masaaki Takaki, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo and Hitachi Control Systems, Inc., Ibaraki, both of Japan

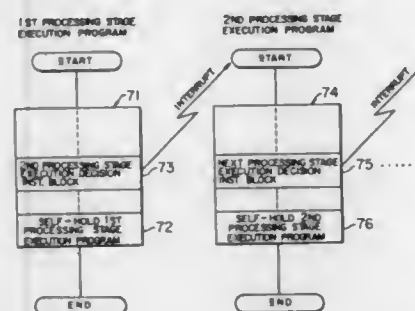
Filed May 7, 1984, Ser. No. 607,652

Claims priority, application Japan, May 7, 1983, 58-79895

Int. Cl. G06F 9/00, 15/00

U.S. Cl. 364-900

14 Claims



1. A sequence control apparatus comprising: means for storing a plurality of divisional programs divided from a sequence program for sequence-controlling a system under control, each of said divisional programs corresponding to a respective one of a plurality of processing stage units of a sequence process for the system; means for storing a main program including a plurality of instruction blocks, each instruction block corresponding to a respective one of the divisional programs and including a decision step of whether the corresponding divisional program is to be executed or not in accordance with information read from the system under control; an address table containing information indicating the correspondence between said divisional program and their top addresses;

a first processor connected to said main program storing means and including a program counter for cyclically executing said main program while updating the content of the program counter and reading out the information from the system under control, and for interrupting the execution of said main program to produce a control signal including identification information for identifying the divisional program corresponding to the instruction block being executed when it is determined during the execution of the corresponding instruction block that said divisional program is to be executed; and

a second processor connected to said address table and said first processor and responsive to said control signal for retrieving from said address table the top address of the divisional program for the instruction block in which said control signal was produced, based on the identification information of said control signal, and for setting the retrieved top address into said program counter of said first processor.

4,683,550

#### PERSONAL COMPUTER INSTRUMENTATION SYSTEM INCLUDING CARRIER BOARD HAVING BUS-ORIENTED PLUG-IN INSTRUMENTATION MODULES

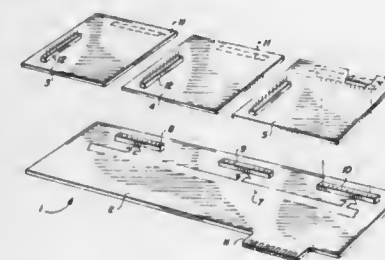
James A. Jindrick; Shashikant M. Patil; Margaret S. Morrison, and Littleton D. Page, all of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Jul. 30, 1984, Ser. No. 634,999

Int. Cl. G06F 9/02

U.S. Cl. 364-900

36 Claims



1. An instrumentation system, for connection to a connector of a digital bus of a host computer, comprising in combination: (a) a carrier module having a host computer digital bus connector for mating with said digital bus connector; (b) an instrumentation bus disposed on said carrier module, said instrumentation bus including a digital portion and a segmented analog portion; (c) a plurality of instrument module connectors electrically connected to said instrumentation bus, said digital portion of said instrumentation bus including a plurality of conductors each coupled to a corresponding terminal conductor of a respective one of said instrument module connectors, each segment of said segmented analog portion of said instrumentation bus including an analog bus segment connector connected to a respective input terminal conductor of one of said instrument module connectors and a respective output terminal conductor of another one of said instrument module connectors; (d) interface circuit means coupled to said host computer digital bus connector and to said digital portion of said instrumentation bus for reconfiguring and/or reformatting digital data received from one of said digital bus of said host computer on said digital portion of said instrumentation bus and outputting the reconfigured and/or reformatted digital data to the other of said digital bus of said host computer and said digital portion of said instrumentation bus; and (e) a plurality of instrument module means, each plugged into a respective one of said instrument module connectors.

tors, for receiving an analog signal from a conductor of one segment of said segmented analog bus portion, and transmitting a modified version of that analog signal to another conductor of another segment of said segmented analog portion, each instrument means including means for operating on its received analog signal to produce the modified version.

4,683,551

#### RAM CLOCK SWITCHING CIRCUITRY FOR A LASER BEAM PRINTER

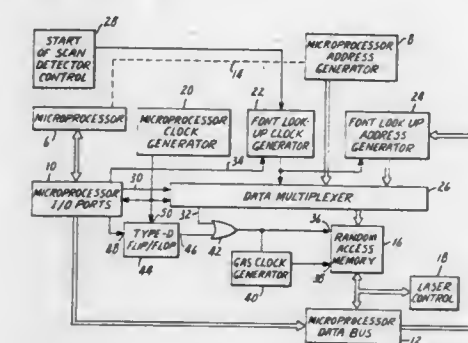
David J. Schoon, North Branch, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1984, Ser. No. 594,211

Int. Cl. G06F 13/00

U.S. Cl. 364-900

2 Claims



1. An improved microprocessor controlled laser printer that includes a microprocessor; memory for storage of microprocessor information plus memory for storage of font information for laser output control; a microprocessor clock generator having an output providing clock signals for use in accessing the microprocessor information; and a font look-up clock generator having an output providing clock signals for use in accessing the font information; wherein the improvement includes a single random access memory (RAM) providing the memory for storage of the microprocessor information plus the font information; the microprocessor having a first output at which control signals are provided and a second output at which lockout request signals are provided; and a clock switching circuitry for said RAM having a switch means connected to the output of the microprocessor and font look-up clock generators and to said first output of the microprocessor, said switching means having an output at which the clock signals of the microprocessor and font look-up clock generators are alternately provided in response to said control signals from said first output of the microprocessor and said clock switching circuitry further including a lockout switch portion having one input connected to said output of said switch means and a second input connected to said second output of the microprocessor for receiving lockout request signals, said lockout switch portion having an output connected to said RAM, said lockout switch portion producing a lockout signal in response to a lockout request signal which prevents passage to said output of said lockout switch portion of clock signals presented at said output of said switch means, said lockout switch portion having a third input connected to the output of the microprocessor clock generator for receiving clock signals for timing operation of the lockout switch portion for the initiation and termination of a lockout signal relative to the start and end of a lockout request signal.

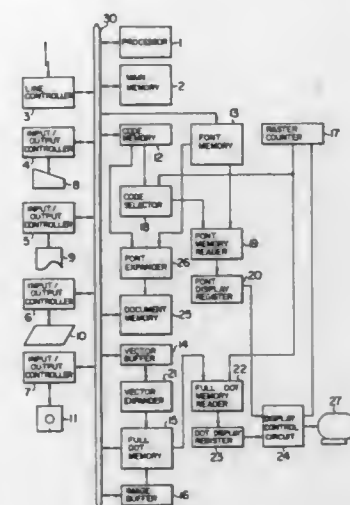


4,683,552

**SYSTEM FOR ON-LINE AND OFF-LINE DISPLAY**  
Hiroaki Kambayashi, and Yasuyuki Okada, both of Sagami-hara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Apr. 25, 1984, Ser. No. 603,825  
Claims priority, application Japan, Apr. 27, 1983, 58-72861  
Int. Cl.<sup>4</sup> G06F 3/023

U.S. Cl. 364—900

2 Claims



2. A display system operated in an on-line mode when connected with a host computer and in an off-line mode when disconnected from said host computer for displaying character data having a first display data form under control of processing means in a display device for on-line mode operation and for displaying character data having a second display data form under control of said processing means on said display device for off-line operation mode, wherein said first and second display data forms are different from each other, comprising:

- first storage means for storing character codes;
- second storage means for storing dot patterns for each of said character codes;
- first means coupled to said first storage means and said second storage means for reading out in the on-line mode from said second storage means dot pattern data corresponding to the character codes read out from said first storage means;
- second means coupled to said first means and said display device for converting said dot pattern data read out from said second storage means during said on-line mode into video signals so that said dot pattern data is displayed on said display device in said first display data form;
- third storage means coupled to said first storage means for storing character codes read out from said first storage means under control of said processing means;
- fourth storage means for storing dot patterns in said second display data form;
- data transforming means coupled to said second storage means, said third storage means, and said fourth storage means for reading out in the off-line mode from said second storage means dot patterns on a character-by-character basis corresponding to the character codes stored in said third storage means, for converting said dot patterns to said second display data form, and for storing the same in said fourth storage means in the second display data form; and
- third means coupled to said fourth storage means and said second means so that said dot patterns are displayed on said display device in said second display data form during said off-line mode of operation;
- said processing means operation to control said first storage means so that the storing of character codes in said third

storage means by said processing means and the dot pattern displaying operation by said first means and said second means are carried out simultaneously with each other for the same character code stored in said first storage means during said in-line mode of operation.

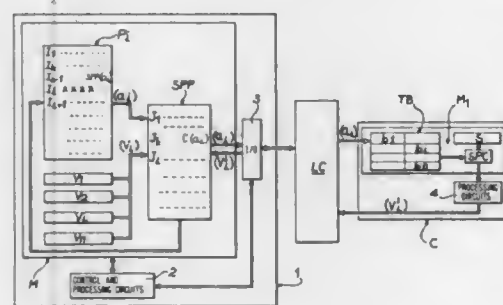
4,683,553

# METHOD AND DEVICE FOR PROTECTING SOFTWARE DELIVERED TO A USER BY A SUPPLIER

Jean Mollier, Bougival, France, assignor to CII Honeywell Bull (Societe Anonyme), Paris, France  
Continuation of Ser. No. 698,261, Feb. 5, 1985, abandoned, which is a continuation of Ser. No. 476,494, Mar. 18, 1983, abandoned. This application Feb. 5, 1986, Ser. No. 828,080  
Claims priority, application France, Mar. 18, 1982, 82 04612  
Int. Cl.<sup>4</sup> H04L 9/00

U.S. Cl. 380—4

8 Claims



1. A system for protecting software programs ( $P_1 \dots P_n$ ) adapted to be executed on a data processing machine (1) of a user of the software programs, said machine having at least one memory (M), control and processing circuits (2), and an input/output device (3), the system comprising:

- a card (C), specific to the user, possessing at least one memory (M1) and processing circuits (4), and
- a card reader (LC) coupled with the input/output device (3) of the machine (1) and with the card (C) to enable data transfer therebetween; the memory (M) of the machine (1) containing at least one program ( $P_i$ ) delivered by a supplier of the software programs, the one program including an identification parameter ( $a_i$ ) which identifies the one program and having a scrambled portion which renders the one program non-executable on the machine, containing a main validation key code ( $V_i$ ), specific to the one program, issued by the supplier, and containing a master program (SPP); the memory (M1) of the card (C) containing at least one secret code (S) specific to the user and known only to the supplier, and identification arguments which identify the programs, at least one of said identification arguments ( $b_i$ ) identifying said one program, the card having means responsive to the identification parameter ( $a_i$ ) contained in the one program ( $P_i$ ) for addressing said identification argument ( $b_i$ ), and the processing circuits (4) of the card having means for computing a supplementary validation key code ( $V'_i$ ) from the secret code (S) and the addressed identification argument ( $b_i$ ) of the program ( $P_i$ ) and for transferring the supplementary validation key code to the machine; and wherein the master program (SPP) is formed to combine the supplementary validation key code ( $V'_i$ ) and the main validation key code ( $V_i$ ) for unscrambling the scrambled portion of the program ( $P_i$ ) and rendering the program executable.

4,683,554

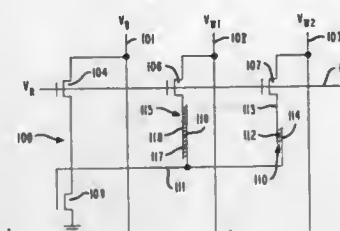
**DIRECT WRITE NONVOLATILE MEMORY CELLS**  
George C. Lockwood, Dayton; James A. Topich, Centerville; Raymond A. Turi, Miamisburg, and George H. Maggard, Xenia, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 13, 1985, Ser. No. 775,980

Int. Cl.<sup>4</sup> G11C 11/40

U.S. Cl. 365—185

9 Claims



1. A floating gate type nonvolatile memory cell formed in a semiconductor substrate, comprising:

- a floating gate electrode having four defined regions over the semiconductor substrate;
- a first conductively doped region in the substrate, situated beneath the first region of the floating gate electrode and separated therefrom by a first dielectric material layer to form thereby a coupling of first capacitance;
- a second conductively doped region in the substrate, situated beneath the second region of the floating gate electrode and separated therefrom by a second dielectric material layer to form a coupling of second capacitance, materially less than the first capacitance, and defined a region of charge transfer through the second dielectric material layer;
- third and fourth conductively doped regions in the substrate which are electrically isolated from the first and second conductively doped regions, defining therebetween a channel situated beneath the third region of the floating gate electrode and separate therefrom by a third dielectric material layer, to form a field effect transistor responsive to the charge resident on the floating gate electrode;
- access means for selectively connecting the third conductively doped region in the substrate to a bit line, selectively connecting the first conductively doped region in the substrate to a first write line, and selectively connecting the second conductively doped region in the substrate to a second write line; and
- means for selectively applying potentials of first relative polarity between the first and second write lines suitable to cause a transfer of charge in one direction through the second dielectric material layer, or of a second relative polarity between the first and second write lines to cause a transfer of charge in the opposite direction through the second dielectric material layer.

4,683,555

**SERIAL ACCESSED SEMICONDUCTOR MEMORY WITH RECONFIGUREABLE SHIFT REGISTERS**  
Raymond Pinkham, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 22, 1985, Ser. No. 693,498

Int. Cl.<sup>4</sup> G11C 13/00

U.S. Cl. 365—215

11 Claims

- 1. A semiconductor memory for storing pixel information for a video display, comprising:
- a first memory array having a plurality of memory elements arranged in rows and columns and associated with a predetermined pixel locations in the display;
- a second memory array having a plurality of memory elements arranged in rows and columns and associated with

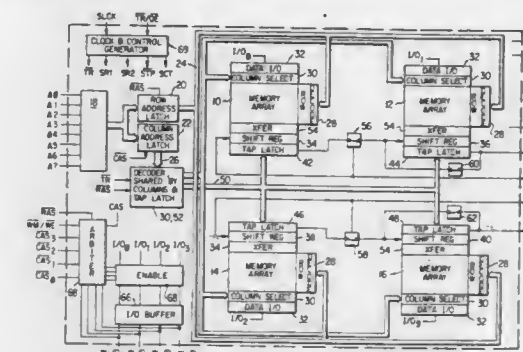
predetermined pixel locations on the display said first and second memory arrays being identical;

row decode means for receiving a row address and selecting one of the rows of memory elements in both said first and second memory arrays;

first serial access means for storing data from the selected memory elements of said first memory array in a serial format;

said second serial access means for storing data from selected memory elements of said second memory array in a serial format;

said first and second serial access means having a separate



serial input and a separate serial output and controlled from an external source to serially shift data therethrough;

transfer means for transferring data from the selected memory elements at said first and second array to the respective one of said first and second serial access means or from said serial access means to the selected memory elements in said first and second array; and

means for configuring said first and second access means to each circulate data from the serial output to serial input thereof or to cascade said first and second serial access means with the serial output of said first serial access means connected to the serial input of said second serial access means.

4,683,556

**METHOD FOR IDENTIFYING ARRIVAL TIMES OF WAVEFORMS ON ACOUSTIC BOREHOLE WELL LOGS**  
Mark E. Willis, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 27, 1985, Ser. No. 706,531

Int. Cl.<sup>4</sup> G01V 1/00

U.S. Cl. 367—27

6 Claims

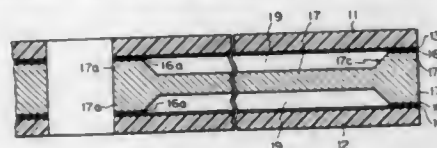
1. A method for identifying the arrival times of waveforms on an acoustic borehole well log obtained by running a borehole logging tool having at least one acoustic transmitter and at least one acoustic receiver through a borehole and activating said transmitter at a plurality of spaced-apart depth points within the borehole so that an acoustic trace is obtained of the transmission of acoustic energy from the transmitter to the receiver through the earth formations surrounding the borehole at each of said plurality of depth points, comprising the steps of:

- (a) selecting a plurality of at least three successive depth point acoustic traces from a single transmitter-receiver pair;
- (b) measuring the arrival time of the acoustic wave on the center trace of said plurality of traces from visual observation;
- (c) placing a first window about the arrival time of the acoustic signal along the trace of the center trace of said selected plurality of successive traces;
- (d) positioning said first window across each of the remain-





and respectively adhered onto said annular spacers so as to respectively face the main surfaces of said reinforcement disk in such a manner that the center bores of said reinforcement disk and said disk-shaped substrates are aligned to each other, at least one of said disk-shaped substrates carrying an information bearing layer on the



inner surface thereof, in which said reinforcement disk having the outer cylindrical surface thereof exposed to the outside in the radial direction, which is characterized in that the inner surface of each of said annular spacers is so inclined as to form an obtuse angle together with the main surface of said reinforcement disk.

4,683,563

## DATA COMMUNICATION NETWORK

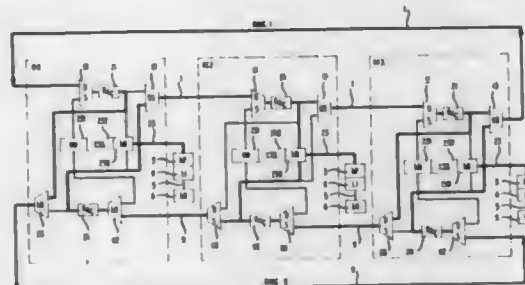
David M. Rouse, Columbus; Richard E. Wallace, Newark, and Charles M. Zelms, Worthington, all of Ohio, assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 11, 1984, Ser. No. 660,015

Int. Cl.<sup>4</sup> H04J 1/16

U.S. Cl. 370-16

25 Claims



1. A method for maintaining a data communication network having ring transmission paths interconnected by nodes each coupled with a node processor and data systems comprising the steps of

isolating failing segments of the data communication network by enabling ones of the nodes to loop connect ones of the ring transmission paths together, and communicating with ones of the nodes located in said isolated failed segments from the part of the data communication network which has not failed by transferring data messages between ones of said loop connected ring paths.

4,683,564

## MATRIX SWITCH SYSTEM

Gladstone F. Young, Redding; Richard F. Green, Oxford, both of Conn.; S. David Miller, Buffalo, N.Y., and Thomas J. Quinlan, III, Norwalk, Conn., assignors to Data Switch Corporation, Shelton, Conn.

Filed Nov. 22, 1982, Ser. No. 443,193

Int. Cl.<sup>4</sup> H04Q 11/04

U.S. Cl. 370-63

29 Claims

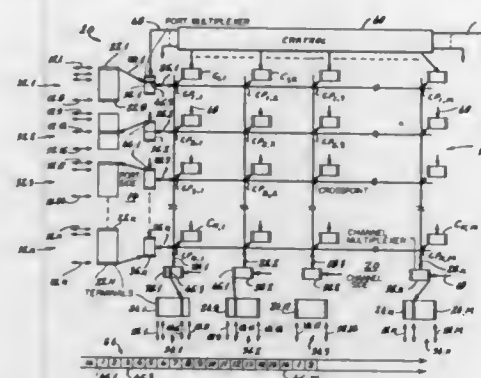
1. A matrix switch system for coupling a plurality of signals on incoming lines to outgoing lines and with lines associated with a matrix being located on a port side and on a channel side of the matrix, comprising:

matrix means for coupling signals on matrix incoming lines to matrix outgoing lines, said matrix means having a plurality of crosspoints where matrix lines leading to one side

are selectively coupled to matrix lines leading to another side;

a plurality of port multiplexer means coupled to multiplex respective groups of port lines with respectively different matrix lines leading to one side of crosspoints of the matrix means;

a plurality of channel multiplexer means coupled to multiplex respective groups of channel lines with respectively different matrix lines leading to other sides of crosspoints of the matrix means;



means for controlling said port and channel multiplexer means and said matrix means to enable bidirectional communication between a port line and a channel line through a matrix crosspoint; said controlling means including:

means for generating a recurring timing signal having time slices; and

means responsive to the timing signal for coupling during a common time slice a line that is a source of signals on one side of the matrix means to a plurality of lines located on another side of the matrix means.

4,683,565

## PHASE CONTROLLED FREQUENCY DIVISION MULTIPLEXED COMMUNICATIONS SYSTEM

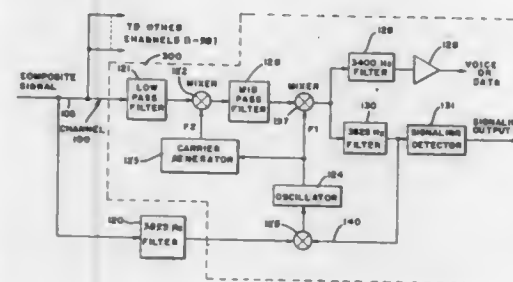
Joseph Hanulec, Shoreham, N.Y., assignor to ISC Cardion Electronics, Inc., Woodbury, N.Y.

Filed Mar. 15, 1985, Ser. No. 712,051

Int. Cl.<sup>4</sup> H04J 1/00

U.S. Cl. 370-69.1

12 Claims



1. A frequency division multiplexed, transmission system providing a predictable input to output phase characteristic for signals transmitted over a communications link between a transmitter and a receiver,

(a) said transmitter including means for transmitting a composite signal including:

(i) a first portion including at least one frequency translated multi-component signal including an information signal component and an out of band signalling tone component, and

- (ii) a second portion comprising an out of band signalling tone,
- (b) said receiver including:
  - (i) a phase controlled oscillator,
  - (ii) means responsive to said phase controlled oscillator and to said transmitted composite signal for frequency retranslating said multi-component signal to produce a received information signal and a received out of band signalling tone, and
  - (iii) phase comparison means responsive to said received out of band signalling tone and to said out of band signalling tone of said second portion of said transmitted signal for controlling said phase controlled oscillator.

4,683,567

## ASYNCHRONOUS SIGNALING SYSTEM FOR DIGITAL COMMUNICATION CHANNEL

Michael J. Green, and James B. McKay, both of Coquitlam, Canada, assignors to British Columbia Telephone Company, Burnaby, Canada

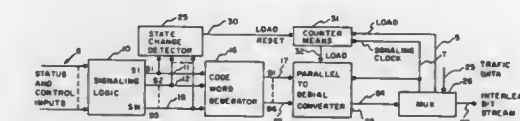
Filed Jul. 30, 1985, Ser. No. 760,717

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.<sup>4</sup> H04J 3/12

U.S. Cl. 370-110.1

11 Claims



4,683,566

## DIGITAL RADIO COMMUNICATION SYSTEM

Susumu Sasaki, Fujisawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

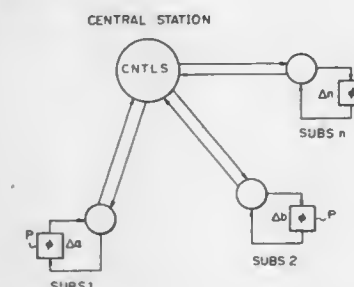
Filed Oct. 31, 1985, Ser. No. 793,242

Claims priority, application Japan, Nov. 2, 1984, 59-232081

Int. Cl.<sup>4</sup> H04J 3/06; H04L 7/00

U.S. Cl. 370-100

3 Claims



1. A digital radio communication system in the form of a multipoints to point time division multiplex network, comprising:

- a central station including one working transmitter and receiver and one standby transmitter and receiver both said working and standby transmitter and receiver include radio line terminating equipment, a first phase shifting means, connected to said radio line terminating equipment and said transmitter, for adjusting a phase of a transmission signal, a second phase shifting means, connected to said first phase shifting means, for adjusting a phase of a sampling clock signal, and a sampling unit connected to said receiver, said second phase shifter and said radio line terminating equipment to receive a reception signal, having a width from said receiver, whereby a signal propagation delay time of said working transmitter and receiver is adjusted by said first phase shifting means to be equal to that of said standby transmitter and receiver by adjusting the phase of the transmission signal and a phase of the sampling clock signal is adjusted between said second phase shifting means of both receivers to be at the central position of the bit width of the reception signal; and
- a plurality of substations, each operatively connected to the corresponding central station using a time-divided digital radio signal, and each having at least clock phase shifting means for adjusting a phase of a transmission signal transmitted by the corresponding substation.

1. Apparatus for performing asynchronous signaling in a digital communications system including transmitter and receiver equipment for multiplexing and demultiplexing digital signaling information signals and digital traffic information signals, each of said signaling information signals defining a different one of a plurality of signaling states S1-SM, said apparatus comprising:

means for storing a plurality of M unique N-bit primary digital code words Sm1 each defining a different one of the signal states S1-SM and each having N-1 additional ordered permutations of the order of the N-bits thereof, said additional ordered permutations being designated as secondary code words;

first means responsive to a particular status/control input signal for causing said storing means to serially produce an output signal comprising serial bits B1-BN of one of the primary and secondary code words for a particular signaling state Ss at a signaling clock rate;

means for multiplexing the serially produced bits from said storing means with traffic information bits at signaling time slots in a bit stream, said signaling time slots occurring at the signaling clock rate;

means for transmitting the multiplexed bit stream to receiver equipment;

means for extracting a signaling clock signal from the multiplexed bit stream in the receiver equipment;

means for demultiplexing the multiplexed bit stream in the receiver equipment for producing a stream of serial signaling bits; and

means for producing during each signaling bit interval a first indication that the transmitted signaling state is a prescribed signaling state Sp when there is a match between the most recently received N signaling bits of the serial signaling bit stream and one of the N-bit primary and secondary code words associated with the prescribed signaling state Sp; and producing a second indication when there is not a match between the most recently received N signaling bits of the serial signaling bit stream and any of the primary and secondary code words.

4,683,568

# METHOD OF MONITORING COMPUTER ELEMENTS, PARTICULARLY MICROPROCESSORS

Manfred Urban, Auenwald, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
PCT No. PCT/DE84/00232, § 371 Date Jul. 11, 1985, § 102(e)  
Date Jul. 11, 1985, PCT Pub. No. WO85/02475, PCT Pub. Date Jun. 6, 1985

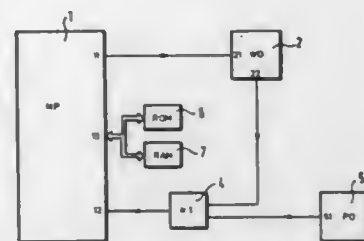
PCT Filed Nov. 2, 1984, Ser. No. 760,734

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343227

Int. Cl.<sup>4</sup> G06F 11/00

U.S. Cl. 371-12

4 Claims



1. Method for monitoring computer elements (1), particularly microprocessors, having  
a reset input (12),  
a volatile or erasable memory (7),  
a non-volatile or non-erasable memory (6),  
input/output port means (13) connecting said memories to the computer element (1),  
a monitoring device (2) for the computer element (1) which device causes a resetting of the computer element (1), comprising the steps of  
detecting a reset signal on said reset input (12),  
performing a comparison (62) between a comparison pattern stored in said non-erasable memory (6) and a pattern present in said erasable memory (7); and  
performing, selectively, one of a complete re-initialization (65) of said microprocessor and a shorter program sequence (64) in dependence upon whether said comparison indicates that the pattern in said volatile or erasable memory is random.

4,683,569

# DIAGNOSTIC CIRCUIT UTILIZING BIDIRECTIONAL TEST DATA COMPARISONS

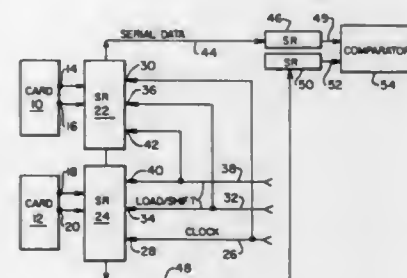
Albert M. Rubin, West Milford, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 21, 1985, Ser. No. 789,528

Int. Cl.<sup>4</sup> G01R 31/28; G06F 11/00

U.S. Cl. 371-25

4 Claims



4. A method for diagnosing circuit test points comprising the steps:

- reading digital test signals from the test points;
- storing the read signals;
- serially reading the digital signals from storage;

comparing the levels of the signals to predetermined levels indicative of error-free circuit operation;  
wherein any bit of the serially read out signal corresponds to a respective test point location and wherein a difference between any bit of the serially read out signal and its predetermined level is indicative of an error at a test point location corresponding to the position of the bit in a serial data stream read from storage; together with the stop of bidirectionally shifting the contents from storage;  
comparing the digital signals resulting from the bidirectional shift; and  
detecting, as a result of such comparison, faulty operation of a determinable bit of a stored read signal.

4,683,570

# SELF-CHECKING DIGITAL FAULT DETECTOR FOR MODULAR REDUNDANT REAL TIME CLOCK

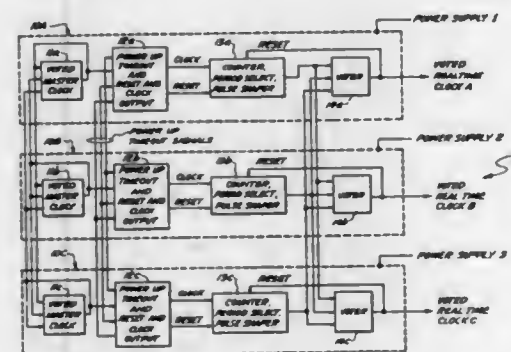
James F. Bedard, Schenectady, N.Y., and Vilay C. Jaswa, San Jose, Calif., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,852

Int. Cl.<sup>4</sup> G06F 11/18

U.S. Cl. 371-36

7 Claims



1. A self-checking fault detector for a modular redundant clock of the type that includes a plurality of clock circuits, each producing a clock signal, the detector comprising a majority voter circuit for receiving the clock signals and for producing a voted majority output signal; comparison means for comparing each of the clock signals with the voted majority output signal and for providing a plurality of corresponding comparison signals, one for each clock signal, representative of the results of the comparisons; and means responsive to the plurality of comparison signals for providing a first failure signal indicating a failure of a clock circuit and for providing a second failure signal indicating a failure of the majority voter circuit; wherein the comparison means comprises a plurality of comparison circuit elements, each receiving a different one of the clock signals and the voted majority output, and each providing a separate comparison signal representing the results of the comparison between its received clock signal and the voted majority output signal, said comparison signal having a first state when the clock signal and the voted majority output signal agree, and a second state when the clock signal and the voted majority output signal disagree; and wherein the failure signal providing means comprises a first circuit for providing the first failure signal upon any of the plurality of comparison signals being in the second state, and comprises a second circuit for providing the second failure signal only upon all of the comparison signals being in the second state.

4,683,571

# DIGITAL SIGNAL DECODING SYSTEM

Tooru Yamagishi, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

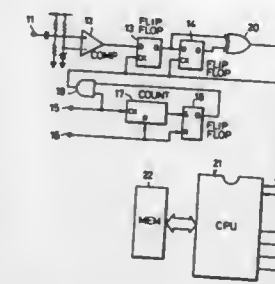
Filed May 29, 1985, Ser. No. 739,016

Claims priority, application Japan, May 30, 1984, 59-110238; Jun. 18, 1984, 59-124810

Int. Cl.<sup>4</sup> G06F 11/10

U.S. Cl. 371-37

13 Claims



1. A digital signal decoding system comprising:  
input terminal means for receiving a digital signal comprising a plurality of code words through a transmission path, said digital signal being encoded so that each code word is constituted by adding a Hamming correction code to information bits and being modulated according to a self clock modulation system;  
demodulating means for obtaining a demodulated signal by demodulating the digital signal from said input terminal means;

first means for generating a demodulated data and a clock signal from the output demodulated signal of said demodulating means, said demodulated data comprising a predetermined number of demodulated code words;

error possibility data generating means for generating error possibility data from said demodulated data and said clock signal which are supplied by said first means, said error possibility data comprising a plurality of error possibility data words in correspondence with said predetermined number of demodulated code words and assuming a first logic value at a bit position corresponding to a bit of said demodulated data whereat an error does not exist and assuming a second logic value at a bit position corresponding to a bit of said demodulated data whereat the possibility that an error exists is high;

second means for sequentially correcting error in said predetermined number of demodulated code words and said plurality of error possibility data words, and decoding corrected demodulated code words and corrected error possibility data words to produce a decoded data; and  
first memory means coupled to said second means for pre-storing a first table containing a priority of a decoding sequence, said priority of the decoding sequence being the priority with which said predetermined number of demodulated code words are to be corrected and decoded by said second means and being determined by values of a demodulated data word and an error possibility data word,

said second means obtaining the priority of the decoding sequence of each demodulated code word from said first table based on each demodulated code word and each corresponding error possibility data word and performing correction and decoding with respect to said predetermined number of demodulated code words and the corresponding error possibility data words in a sequence depending on the priority of the decoding sequences of each demodulated code word, so as to correct error in one or a plurality of bits of each demodulated code word and each corresponding error possibility data word.

4,683,572

# DECODING DEVICE FOR CODE SYMBOLS PROTECTED BY REED-SOLOMON CODE

Constant P. M. J. Baggen; Leonardus M. H. E. Driessen; Rudy W. J. Pollen, and Lodewijk B. Vries, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

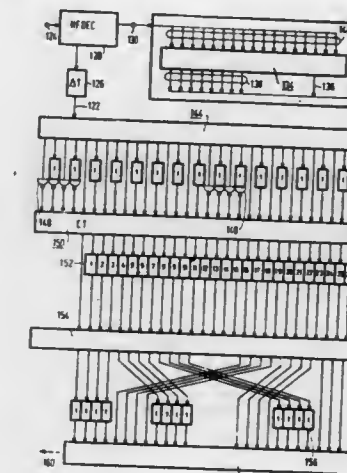
Filed Sep. 24, 1984, Ser. No. 653,255

Claims priority, application Netherlands, Feb. 29, 1984, 8400630

Int. Cl.<sup>4</sup> G06F 11/10

U.S. Cl. 371-37

13 Claims



1. A decoding device for a stream of successive code symbols which are protected against symbol errors by a pair of a first and a second cross-interleaved Reed-Solomon codes, the respective symbols of any particular multi-symbol code word of the second code all belonging to different multi-symbol code words of the first code, comprising:

a first input for receiving code symbols of the first code, each associated with a reliability information code in the form of at least one reliability bit;

storage means connected to said first input for storing data symbols of code words of the first code as received, data symbols of code words of the second code, and said reliability information code, said data symbols of the first code if corrected for an error therein by means of the first code, being stored after such correction, until at least all symbols of the relevant code word of the second code are stored together in said storage means,

a first strategy-determining device connected to said first input for receiving, for each code word of the first code, the reliability information code of the symbols contained in the first code word, generating an aggregate reliability information signal for this code word, and generating a strategy indicating signal, said strategy indicating signal identifying a predetermined fixed number of erase symbols in said first code word and also a maximum number of error symbols above said fixed number of erase symbols that is accepted as being correctable, and further, generating a risk indication code (FHCO);

first arithmetic means for receiving all symbols of any code word of the first code and generating therefrom associated first syndrome symbols for such code word;

second arithmetic means connected to said first strategy-determining device for receiving said strategy-indicating signal, connected to said first arithmetic means for receiving said first syndrome symbols, connected to said storage means for accessing selected code symbols and said associated reliability information code for correcting said code symbol by means of an error value calculated therefor, and returning such corrected code symbols to said storage means, and for generating word-wise signalization infor-



mation (UEP, ERUF, NCE, NSFL) signalling a measure of decoding success;  
flag processing means including flag hardening element connected to said second arithmetic means for receiving such word-wise signalization information, and to said first strategy-determining device for receiving said risk-indicating code, and generating therefrom for each code symbol of the first code word, a secondary flag information (O, F3, F2, F1) having a value range of at least three discrete values; and indicating a secondary reliability; and further processing means connected to said storage means for receiving code symbols associated with a code word of the second code and associated secondary flag information, for generating therefrom second syndrome symbols, error locator information, and error value information calculated therefor, and supplying data symbols of a code word of the second code after error processing on a user output.

4,683,573

## TEMPERATURE STABILIZATION OF INJECTION LASERS

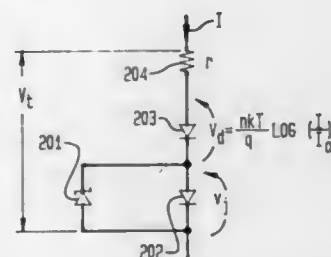
Andres Albanese, Morristown, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.  
PCT No. PCT/US85/01814, § 371 Date Sep. 24, 1985, § 102(e)  
Date Sep. 24, 1985, PCT Pub. No. WO87/01875, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 24, 1985, Ser. No. 784,878

Int. Cl.<sup>4</sup> H01S 3/04

U.S. Cl. 372—34

5 Claims



1. Circuitry for stabilizing the ambient temperature of an injection laser, the injection laser having a two-terminal equivalent circuit comprising: a parallel combination of an ideal laser diode and a zener diode, in series with a bias diode and a resistor, the circuitry comprising  
means, in electrical energy transfer relation with the injection laser, for generating a compensation voltage matching a sum of the voltages developed across the resistor and the bias diode of the laser,  
means for continuously monitoring a voltage across the two terminals of the injection laser to produce a monitored voltage indicative of the ambient temperature of the laser diode,  
means for deriving from said compensation voltage and said monitored voltage a derived voltage corresponding to a voltage developed across the laser diode of the laser, and  
means for adjusting the ambient temperature of the injection laser to stabilize the laser wavelength in response to said derived voltage.

4,683,574  
SEMICONDUCTOR LASER DIODE WITH BURIED HETERO-STRUCTURE

Jochen Heinen, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

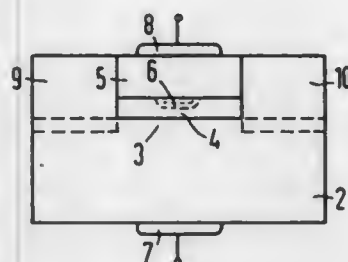
Filed Sep. 12, 1985, Ser. No. 775,399

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435307

Int. Cl.<sup>4</sup> H01S 3/10

U.S. Cl. 372—44

16 Claims



1. A laser diode comprising:  
a semiconductor substrate,  
a plurality of strip shaped heterogenous layers sequentially arranged vertically on said substrate, said heterogenous layers between them providing a strip shaped laser active zone,  
additional doped semiconductor structures having a lower refractive index than said heterogenous layers lying laterally adjacent to said strip shaped heterogenous layers,  
a zone adjacent to said additional structures laterally of said homogenous layers, said zone having a conductivity type different from that of said additional structures, and of the conductivity of the lowermost of said heterogenous layers, thereby providing a blocking p-n junction at the side of said heterogenous layers at the boundary between said lowermost layer and said additional structures,  
said zone having its dopant confined to the direction of the boundary surface between the adjacent zone and the adjoining additional structures, said dopant being diffused only from the boundary surface between said adjacent zone and said additional structure and not diffused from said additional structures.

4,683,575

## GAS FILL SYSTEM FOR A LASER TUBE

Lee R. Carlson, Pleasanton; Denes A. Hegedus, Redwood City; Steven M. Jarrett, Los Altos; Michael F. Miller, Mountain View; Martin E. Riley, Grass Valley, and David L. Wright, Rough and Ready, all of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

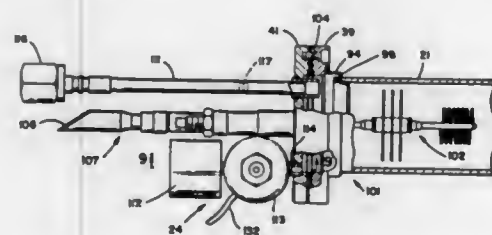
Division of Ser. No. 649,206, Sep. 10, 1984, Pat. No. 4,649,547.

This application Sep. 11, 1986, Ser. No. 906,121

Int. Cl.<sup>4</sup> H01S 3/22

U.S. Cl. 372—59

3 Claims



1. A gas fill system for the plasma tube of a gas laser, comprising:

a gas reservoir containing gas under much greater pressure than that in the plasma tube;  
gas conducting means between the reservoir and the plasma tube, forming an inlet chamber and an outlet chamber, a first conduit from the reservoir to the inlet chamber, a second conduit from the outlet chamber to the plasma tube, and a gas metering chamber between the inlet chamber and outlet chamber; and  
valve means including first and second valves for normally closing the metering chamber from both the inlet and outlet chambers and for selectively opening the first valve to open the metering chamber to the inlet chamber, to admit reservoir gas pressure into the metering chamber, then for closing the first valve to isolate the metered volume of gas and then opening the second valve to open the metering chamber to the plasma tube to admit the metered gas to the plasma tube.

4,683,576

## OPTICAL PUMPING LASER SYSTEM

Akira Nagashima, Ibaragi, and Osamu Sukegawa, Tokyo, both of Japan, assignors to Japan Atomic Energy Research Institute and NEC Corporation, both of Tokyo, Japan

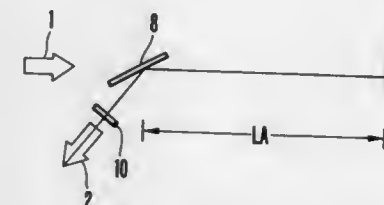
Filed Oct. 17, 1985, Ser. No. 788,720

Claims priority, application Japan, Oct. 19, 1984, 59-219873

Int. Cl.<sup>4</sup> H01S 3/08

U.S. Cl. 372—98

6 Claims



1. An optical pumping laser system comprising:  
an optical element functioning as a Brewster plate with respect to a pumping beam and functioning as a reflection mirror with respect to an oscillation laser beam;  
a total reflection mirror spaced apart from said optical element and located on an axis of the pumping beam with the optical element disposed between the total reflection mirror and a pumping beam source; and  
a partially reflecting mirror for outputting the oscillation laser beam, the partially reflecting mirrors being disposed off the axis of the pumping beam and arranged relative to said optical element and to said total reflection mirror to constitute a laser cavity for the oscillation laser beam with said optical element functioning as a tilted reflector

4,683,577

## METHOD AND APPARATUS FOR REGULATING ARC DISCHARGE FURNACE

Karlheinz Bretthauer, and Hans-Dietrich Obenaus, both of Clausthal-Zellerfeld, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 3, 1986, Ser. No. 847,921

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512189

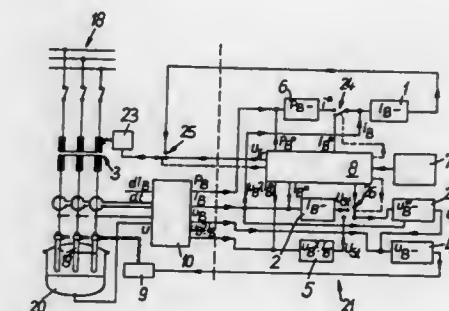
Int. Cl.<sup>4</sup> H05B 7/148

U.S. Cl. 373—105

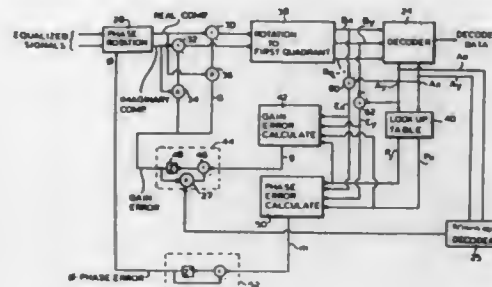
17 Claims

9. Apparatus for regulating an arc discharge furnace, which furnace has a lining, a plurality of electrodes disposed above a bath of conductive material, adjustable transformer means connected for applying to each electrode a voltage which causes an arc current proportional to the applied transformer voltage to flow between the electrode and the bath, voltage varying means for varying the voltage applied by the transformer to each electrode, and electrode height adjusting means

for varying the vertical spacing between each electrode and the bath, said apparatus comprising:  
signal generator means providing representations of desired values for a maximum of two of the following parameters: the voltage of the arc current produced by at least one electrode; the arc current produced by the at least one electrode; the power of the arc produced by the at least one electrode; a parameter which is proportional to the wear caused to the furnace lining by the arc produced by the at least one electrode; and the furnace voltage acting as a correcting variable for the voltage applied to the one electrode by the transformer;  
measuring means connected for measuring the actual current and voltage of the arc produced by the at least one electrode for and for producing representations of actual values for the arc voltage, arc current, arc power, and the parameter proportional to wear for the at least one electrode; and



when said ideal vector corresponds to an extreme point of said signal constellation;  
 adjustment means responsive to said adjustment signal for modifying said instantaneous gain error signal to generate a final gain error signal; and  
 means for modifying said received vector in accordance with said final gain error signal and wherein said instantane-



aneous gain error signal is given by gain error signal  $g = E_x P_x - E_y P_y$ , where  $E_x$  and  $E_y$  are the real and imaginary components of the error vector;  
 $P_x = \cos s$ ;  
 $P_y = \sin s$ ;  
 $s$  being an instantaneous phase angle of the ideal vector.

4,683,579

# METHOD AND APPARATUS FOR MEASURING BLOOD CONSTITUENT COUNTS

Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405

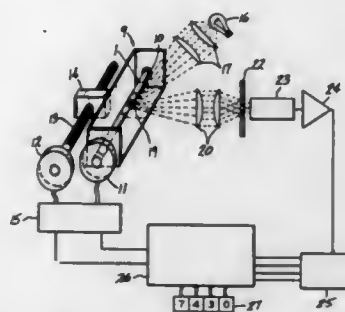
Filed Dec. 27, 1985, Ser. No. 813,978

The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.

Int. Cl. G01N 15/02, 21/00

U.S. Cl. 377-11

9 Claims



1. An optical scanning apparatus for measuring blood cell counts in a centrifuged sample of anticoagulated whole blood contained in a transparent tube wherein the blood cell types are separated into different layers in the tube, said apparatus comprising:

- means for supporting the tube;
- a source of near infra-red region-light operable to illuminate the blood cell layers in the tube;
- photosensor means focused on the illuminated blood cell layers in the tube and operable to scan the cell layers to detect differing light scattering properties of the different cell types in the layers of cells;
- means for causing relative movement between the tube and said photosensor means for enabling said photosensor means to scan the layers of blood cells at all different locations circumferentially of the tube;
- converter means operably connected to said photosensor

means for converting analog signals from said photosensor means to digital form; and

- computer means operably connected to said converter means for receiving and storing digital signals from said converter means, said computer means further being operable to utilize the signals received to calculate the average axial dimension of each layer of cells scanned to determine from previously inputted data the true cell counts for each layer of cells scanned.

4,683,580

# CCD OUTPUT SIGNAL PROCESSING CIRCUIT FOR USE IN AN IMAGE PICK-UP DEVICE

Yoshiyuki Matsunaga, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

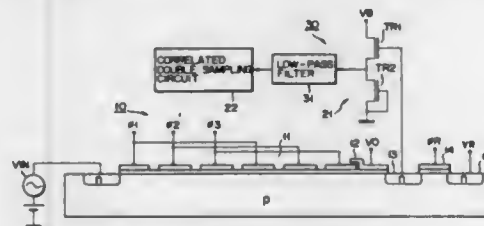
Filed Aug. 7, 1985, Ser. No. 763,225

Claims priority, application Japan, Aug. 20, 1984, 59-172746

Int. Cl. H03H 17/06; G11C 19/28, 27/02

U.S. Cl. 377-60

10 Claims



1. A CCD output signal generating circuit comprising:
  - a CCD type charge transfer device for transferring and outputting signal charges in response to a drive signal of a frequency  $f_c$ ;
  - an output circuit for generating an output signal corresponding to output signal charges from said CCD type charge transfer device;
  - a low-pass filter circuit, having a cut-off frequency limited to a range of  $2f_c$  to  $6f_c$ , which is connected to said output circuit and eliminates a high frequency component over the cut-off frequency of an output signal from said output circuit; and
  - a correlated double sampling circuit, connected to said low-pass filter circuit, for sampling and holding an output signal from said low-pass filter circuit.

4,683,581

# APPARATUS FOR X-RAY PHOTOGRAPHY OF THE AREA OF THE DENTITION AND OF THE JAWS

Erkki Tammissalo; Heikki Kanerva, both of Turku; Jaakko Aarnio, Helsinki; Markku Wederborn, Espoo, and Kai Laner, Helsinki, all of Finland, assignors to Orion-Yhtymä, Nilsiankatu, Finland

Filed Jan. 31, 1985, Ser. No. 696,776

Claims priority, application Finland, Feb. 1, 1984, 840412

The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.

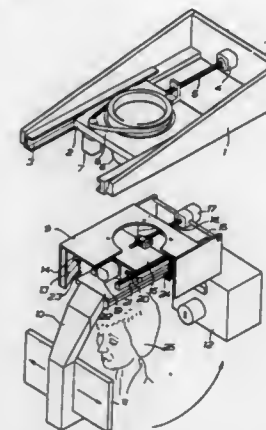
Int. Cl. A61B 6/14

U.S. Cl. 378-38

9 Claims

1. An apparatus for X-ray photography of the area of dentition and the jaws, said apparatus comprising
  - a stationary frame part; a bearing supported in the frame part and movable in relation thereto;
  - a support arm mounted for rotational movement in relation to said bearing;
  - a source of X-ray radiation provided at one end of the support arm;
  - means for supporting and moving an X-ray film provided at the other end of the support arm;
  - first means for rotating the support arm; second means for

transferring the axis of rotation of the support arm along a predetermined path during the rotation;  
 the movements of the support arm and the film being synchronized so that, during the movement, an image of the dental arch of a patient, is obtained on the film;  
 bracket means for mounting the support arm in relation to the bearing part;



guide means on said bracket means, said guide means extending in the longitudinal direction of the support arm;  
 third means provided on said bracket means for transferring of the support arm in relation to its axis of rotation, together with the X-ray source and the X-ray film in a direction parallel to said longitudinal direction.

4,683,582

# PORTABLE ROENTGENOGRAPHIC CEPHALOSTAT

John L. Spolyar, 2769 Homewood Dr., Troy, Mich. 48098

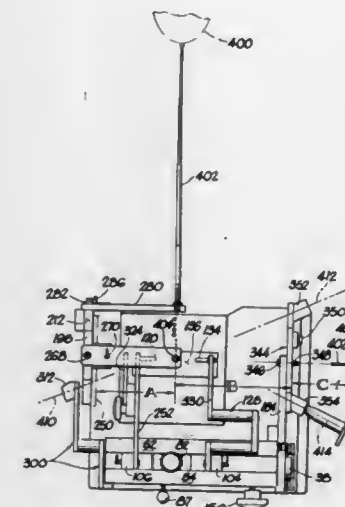
Continuation of Ser. No. 506,005, Jun. 20, 1983. This application Jul. 22, 1985, Ser. No. 757,451

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl. G03B 42/02

U.S. Cl. 378-174

16 Claims



1. A portable cephalostat, comprising portable body means, first means defining a non-resilient fixed reference plane of elevation carried by said body means and against which the back of a patient's head is to be directly located, second means for locating first unexposed film at a preselected elevation below the back of the patient's head and said fixed reference plane of elevation, third means for locating second unexposed

film to one side of the patient's head when the back of said patient's head is located against said fixed reference plane of elevation, fourth means for locating third unexposed film at generally the top of the patient's head when the back of said patient's head is located against said fixed reference plane of elevation, and fifth means for guidingly positioning said patient's head along said fixed reference plane of elevation as to have the mid-sagittal plane of said patient's head situated at a preselected distance from said second unexposed film and for determining the elevation above the plane of said first film of the axis of said patient's auditory canals when the mid-sagittal plane of the patient's head is at said preselected distance, wherein said second means comprises reference surface means carried by said body means, wherein said third means comprises support means carried by said body means, wherein said support means is effective to support said second unexposed film in a generally vertical position generally parallel to said mid-sagittal plane, wherein said fifth means comprises first and second arm-like containing means, said first arm-like containing means being effective to be disposed at a first side of the patient's head, said second arm-like containing means being effective to be disposed at a second side of the patient's head opposite to said first side, first ear canal locating means carried by said first arm-like containing means and extending generally toward said second arm-like containing means, second ear canal locating means carried by said second arm-like containing means and extending generally toward said first arm-like containing means, said first and second arm-like containing means being adjustable through an arcuate path of movement simultaneously toward and away from said fixed reference plane of elevation as to enable said first and second ear canal locating means to be at an appropriate elevation with respect to said fixed reference plane of elevation as to enable the respective reception of said first and second ear canal locating means by the auditory canals of the patient's head, wherein said arcuate path of movement is about an axis of rotation, wherein said axis of rotation is parallel to said fixed reference plane of elevation, and said first and second arm-like containing means also being simultaneously movable toward and away from each other as to thereby respectively generally contain and release said patient's head.

4,683,583

# METHOD AND APPARATUS FOR CONTROLLING TELEPHONE LINE ACCESS

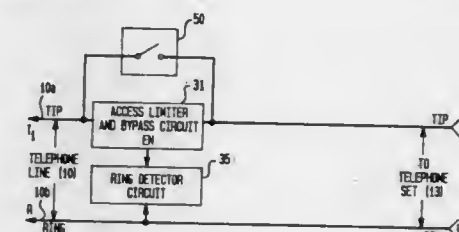
Michael G. Kossor, 317 W. First Ave., Roselle, N.J. 07203

Filed Apr. 1, 1985, Ser. No. 718,565

Int. Cl. H04M 1/66

U.S. Cl. 379-200

9 Claims



1. A security unit to protect a telephone line from unauthorized outgoing calls from a telephone unit including a base telephone, said security unit comprising in combination:
  - means comprising an access limiter and bypass circuit interposed in series circuit relation between said base telephone and said telephone line;
  - means comprising a ring detector circuit constructed to be connected in circuit relation between said telephone line and said access limiter and bypass circuit for detecting incoming telephone call ring signals; and



access enabling means connected in circuit relation with said ring detector circuit and said access limiter and bypass circuit, constructed when said telephone unit is off-hook to block said access limiter and bypass circuit to normal telephone communication including outgoing telephone calls and dial information between said base telephone unit and said telephone line in response to a first condition, and to unblock said access limiter and bypass circuit to said normal telephone communication including outgoing telephone calls and dial information between said base telephone and said telephone line in response to a second condition, wherein said means comprises said ring detector circuit and is responsive to the incoming telephone signals whether or not said access limiter and bypass circuit is unblocked to outgoing calls.

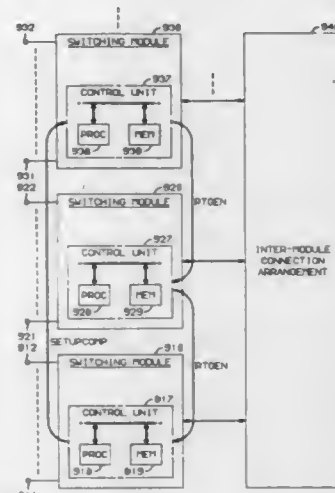
4,683,584

**DIRECTORY NUMBER TRANSLATION IN A DISTRIBUTED CONTROL SWITCHING SYSTEM**  
Shih-Jeb Chang, Naperville; Richard T. Emery, Montgomery, and Shafik J. Hakim, Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 7, 1985, Ser. No. 699,463  
Int. Cl.<sup>4</sup> H04Q 3/47

U.S. Cl. 379-269

21 Claims



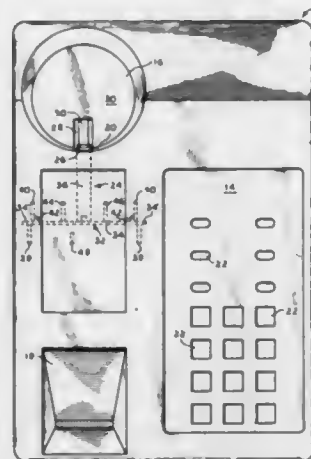
1. In a distributed call processing system for use in a switching system having a plurality of ports defined by an associated plurality of directory numbers, said call processing system comprising a plurality of control units each associated with a subset of said plurality of ports and each storing translation data defining, for each of a subset of said plurality of directory numbers, the one of said plurality of ports defined by said each of said subset of directory numbers, a call processing method comprising a first one of said control units receiving a given directory number for a call from one of said ports associated with said first control unit, said first control unit accessing its translation data and determining that a given one of said plurality of ports is defined by said given directory number, said first control unit determining that said given port is associated with a second one of said control units, said first control unit transmitting to said second control unit a message defining said given port and said second control unit effecting the transmission of an alerting signal to said given port.

4,683,585

**TELEPHONE HOOKING POST AND ASSEMBLY**  
James R. Watkins, Jr., and Ken T. Huang, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.  
Continuation of Ser. No. 603,812, Apr. 25, 1984, abandoned.  
This application Apr. 28, 1986, Ser. No. 858,081  
Int. Cl.<sup>4</sup> H04M 1/08

U.S. Cl. 379-426

17 Claims



1. An arrangement for releasably retaining a telephone apparatus in a standby condition comprising:  
a handset including an earpiece having a front face with a lip surface portion projecting to an edge;  
a base having a shelf portion for receiving said lip surface portion;  
a hooking post member having a hooking post portion protruding through and beyond said shelf portion and being movable towards and away from said shelf portion, and a spring means portion for resiliently restraining movement of said hooking post member towards said shelf portion, said hooking post portion being integral with said spring means portion; and  
switch hook means separate from said hooking post member and having an outer surface portion arranged to engage said earpiece front face; whereby,  
when said earpiece is brought into engagement with said base upon said shelf portion, said telephone apparatus is releasably retained in a standby condition with said said hooking post portion resiliently urged by said spring means portion into contact with said earpiece lip surface for releasably retaining said earpiece in engagement with said base and with said earpiece front face engaging said switch hook means for actuating said switch hook means.

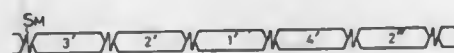
4,683,586

**SCRAMBLING SYSTEM FOR AN AUDIO FREQUENCY SIGNAL**

Akira Sakamoto; Takeshi Fukami, both of Tokyo; Takehiro Sugita, Chigasaki, and Masakatsu Toyoshima, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan  
Filed Dec. 29, 1983, Ser. No. 566,899  
Claims priority, application Japan, Jan. 11, 1983, 58-2481  
Int. Cl.<sup>4</sup> H04L 9/00

U.S. Cl. 380-48

3 Claims



1. Apparatus for scrambling and unscrambling an audio frequency analog signal which is digitized and divided into blocks, each block consisting of a plurality of adjoining multi-

ple-bit segments arranged in an original order; said apparatus comprising:

encoding means for providing at an end of each of said segments a redundant signal portion from an adjacent end of one of said adjoining segments, thereby to form enlarged segments, rearranging and uniformly timebase-compressing by a selected amount said enlarged segments to form rearranged segments of the same duration as the original segments, and inserting a marker signal in place of each of said redundant signal portions to form an encoded signal on a predetermined time base for transmission to a decoding means, during which transmission the rearranged segments of said encoded signal may be randomly timebase-compressed or timebase-expanded relative to said predetermined time base; and  
said decoding means receiving said encoded signal for detecting successive ones of said marker signals in said received encoded signal, for measuring the respective separations between successive ones of said marker signals as detected, and for uniformly timebase-expanding said segments by the reciprocal of said selected amount used in said encoding means for said uniformly timebase-compressing and restoring the segments to said original order of said segments prior to the encoding thereof, said segments, as restored to the original order by said decoding means, each having a respective length proportional to the respective one of said separations measured between the preceding and succeeding marker signals in said decoding means, said decoding means comprising first memory means having a plurality of addresses for storing data representing respective segments of the received encoded signal corresponding to one of said blocks;  
second memory means for storing data representing the addresses in said first memory means at which said segments of said one of said blocks are stored;  
third memory means for storing data representing a duration of time for each of said segments stored in said first memory means; and  
means for reading out from said first memory means the data stored at said addresses in an order determined by data from said second memory means and during a time determined by data from said third memory means.

4,683,587

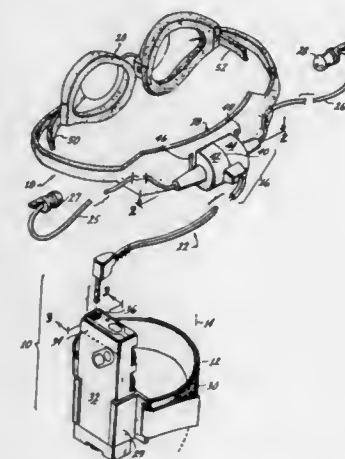
**SUBMERSIBLE PERSONAL STEREO**

Michael D. Silverman, 16410 Calahan St., Sepulveda, Calif. 91343

Filed Jun. 11, 1985, Ser. No. 743,385  
Int. Cl.<sup>4</sup> H04R 5/00

U.S. Cl. 381-25

12 Claims



1. Portable waterproof stereo sound headphone system for use with a source of electronic signals having means for attach-

ment to the user, comprising at least two transducers for converting electrical signals to sound signals,  
a transducer housing having a pair of separate sound chambers, said transducers being mounted in said chambers, waterproof electrical signal transmission means for connecting the transducers to said signal source,  
means for attaching the housing to the user,  
left and right air transmission lines for transmitting sound, each of said lines including a section of tubing connected at one end to respective one of said chambers and sealed in air tight relation to said housing so that said chambers and associated tubing represents an air tight volume containing a column of air extending end-to-end to said tubing, a pair of earplugs each having a hole therein and attached to the other end of the respective tubing section so that sound passes through said tubing section and earplug to the ear of the wearer,  
said tubing and earplugs having an inside diameter large enough to pass sound with fidelity, but small enough to impede entrance of water by a combination of capillary action in relation to the surface tension and contact angle of water, together with compression resistance of the sealed column of air contained within each of said sealed tubing and chamber volumes.

4,683,588

**FACE MASK WITH VOICE MODIFYING CAPABILITY**  
Mel Goldberg, c/o Topstone Industries, Inc., 2 Augusta Dr., Danbury, Conn. 06810

Filed Oct. 17, 1985, Ser. No. 788,349  
Int. Cl.<sup>4</sup> H03G 3/00

U.S. Cl. 381-61

7 Claims



1. A face mask comprising:  
(a) a face covering disguise section having a mouth area in the form of a forwardly projecting protrusion, said protrusion having a retention rim, integrally molded with said disguise section;  
(b) a speaker proximally secured within said protrusion;  
(c) a microphone proximally secured to said mouth area;  
(d) voice signal modification means electrically connected between said microphone and said speaker and also located within said protrusion, said retention rim serving to firmly abut against said voice signal modification means to hold the same in place yet being resilient enough to allow for repeated and easy removal and replacement of said voice signal modification means within said protrusion;  
(e) electrical power means for electrically connecting and driving said microphone, said voice signal modification means and said speaker; and  
(f) said voice signal modification means being modularly connected to said speaker and being capable of easy dis-

connection from and replacement by a second voice signal modification means.

4,683,589

## ELECTRONIC AUDIO SYSTEM

Donald T. Scholz, Wayland, and Augustine Antoine, Dorchester, both of Mass., assignors to Scholz Research & Development, Waltham, Mass.

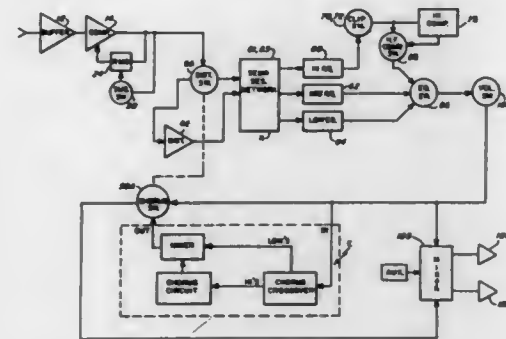
Continuation of Ser. No. 566,189, Dec. 28, 1983, abandoned.

This application Nov. 27, 1985, Ser. No. 802,694

Int. Cl.<sup>4</sup> H03G 3/00

U.S. Cl. 381-61

17 Claims



1. An electronic audio signal system for processing signals in the audio frequency range and comprising, input circuit means for receiving the audio signal, filter means comprising separate high EQ, mid EQ and low EQ filter circuits, said input circuit means coupling to said filter means, EQ switch means coupled from the output of said low, mid and high EQ filter circuits for selectively establishing multiple frequency response waveforms, and output circuit means coupled from said EQ switch means, said input circuit means comprising a compressor, a sustain control switch means and a detector means comprising an RMS detector, and a feedback loop between the input and the output of the compressor including in the feedback loop said RMS detector and said sustain control switch means.

4,683,590

## INVERSE CONTROL SYSTEM

Masato Miyoshi, Tokorozawa; Yntaka Kaneda, Tanashi, and Juro Ohga, Kamakura, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

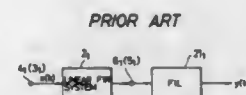
Filed Mar. 14, 1986, Ser. No. 839,677

Claims priority, application Japan, Mar. 18, 1985, 60-53886; Feb. 17, 1986, 61-32659

Int. Cl.<sup>4</sup> H04B 15/00; G10K 11/16; G11B 3/00

U.S. Cl. 381-71

25 Claims



2. An inverse control system for an m-input n-output (m being 1 or greater integer, n being an integer greater than m) linear finite impulse response (FIR) system defining m-n signal transmission channels between m input points and n output points, with n receiving elements being disposed at the respec-

tive n output points for receiving signals provided to said linear FIR system, wherein

said inverse control system is disposed between said n receiving elements and n input terminals of adder means for effecting an inverse control such as to provide desired impulse responses between the output side of said adder means and said m input points;

said inverse control system comprises n FIR filters disposed between said n receiving elements and the n input terminals of said adder means, respectively;

a j-th (j=1, 2, ..., n) one of said n FIR filters connected to a j-th one of said output points through an associated one of said receiving elements having a number  $L_j$  of taps which satisfies the relationships represented by

$$\sum_{s=1}^n L_s \geq \sum_{t=1}^m (w_{ij} + L_j - 1) \quad (1a)$$

$$w_{ij} + L_j - 1 \geq P_i \quad (1b)$$

for all  $i=1, 2, \dots, m$  and  $j=1, 2, \dots, n$  where  $w_{ij}$  is the number of discrete signals representing the impulse response  $g_{ij}(k)$  of said signal transmission channel between an i-th one of said m input points and the j-th output point of said linear FIR system and  $P_i$  is the number of discrete signals representing said desired impulse response  $r_i(k)$  between said i-th input point and output side of said adder means; and

said j-th FIR filter having filter coefficients  $h_j(k)$  satisfying a relationship

$$r_i(k) = \sum_{j=1}^n g_{ij}(k) * h_j(k) \quad (2)$$

for all  $i=1, 2, \dots, m$   
where \* represents a discrete convolution.

4,683,591

## PROPORTIONAL POWER DEMAND AUDIO AMPLIFIER CONTROL

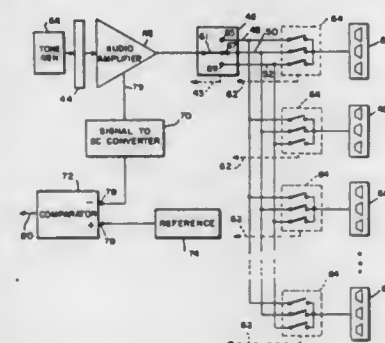
Brian D. Dawson, and James R. Leacock, both of Lincoln, Nebr., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Apr. 29, 1985, Ser. No. 728,408

Int. Cl.<sup>4</sup> H03F 21/00

U.S. Cl. 381-85

6 Claims



1. A proportional audio power demand system comprising a plurality of speaker banks, each speaker bank having at least one speaker, at least one audio channel, a plurality of amplifiers, amplifier coupling means for selectively coupling each amplifier to the channel, speaker bank coupling means for selectively coupling each speaker bank to the channel, control means for controlling the amplifier coupling means and the

speaker bank coupling means to cause at least one amplifier and one speaker bank to be coupled to the channel, means for sensing the power output of the amplifier, means for coupling the sensing means to the control means and to the amplifier, means for coupling the amplifier coupling means to the control means, and means for coupling the speaker bank coupling means to the control means, the control means including means

for causing the speaker bank coupling means to sequentially couple one or more speaker banks to the channel and for determining, after each speaker bank has been coupled, whether to couple an additional amplifier to the channel based upon the sensed audio power, and for causing said amplifier coupling means to couple said additional amplifier if so determined.



# DESIGNS

JULY 28, 1987

291,020

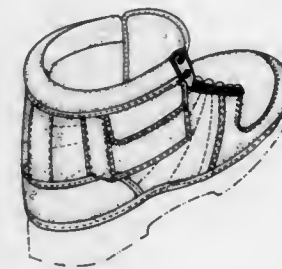
## POCKETED BOOT UPPER

Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.

Filed Mar. 30, 1984, Ser. No. 595,520

Term of patent 14 years

U.S. Cl. D2—272



291,022

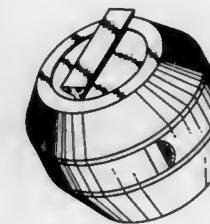
## DISPOSABLE SHOE SHINE KIT

Richard D. Erickson, 362 N. Shady View, Des Moines, Iowa 50317

Filed Dec. 10, 1984, Ser. No. 679,994

Term of patent 14 years

U.S. Cl. D3—30.5



291,023

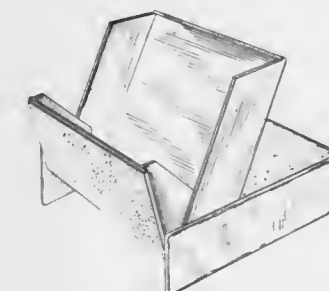
## STORAGE CASE FOR FLAT ARTICLES

Craig D. Drake, and Craig W. Crist, both of Muscatine, Iowa, assignors to Ring King Visibles, Inc., Muscatine, Iowa

Filed Aug. 3, 1984, Ser. No. 637,559

Term of patent 14 years

U.S. Cl. D3—35



291,021

## POCKETED SHOE

Adelino Caldeira, Taunton, Mass., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.

Filed Jun. 4, 1984, Ser. No. 617,226

Term of patent 14 years

U.S. Cl. D2—309



291,024

## CASE FOR A MAGNETIC TAPE CASSETTE OR THE LIKE

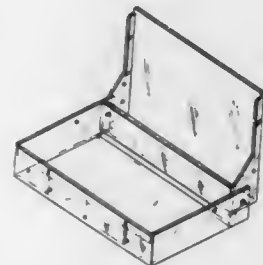
Katsutoshi Kikuchi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 678,153

Claims priority, application Japan, Jul. 2, 1984, 59-27234

Term of patent 14 years

U.S. Cl. D3—35



291,026

## ARMREST ENCLOSURE FOR AN AUTOMOBILE TELEPHONE

Samuel W. Bird, Jr., 338 Sugar Hill Rd., Falls Village, Conn. 06031

Filed Jan. 7, 1985, Ser. No. 689,578

Term of patent 14 years

U.S. Cl. D3—40



291,025

## CONTAINER FOR MAGNETIC TAPE MAGAZINES

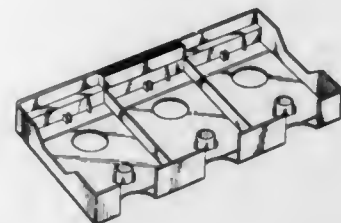
Nobuaki Matsutsuka, Mito, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 10, 1984, Ser. No. 680,055

Claims priority, application Japan, Jun. 14, 1984, 59-88356

Term of patent 14 years

U.S. Cl. D3—35



291,027

## CASE FOR A WORD PROCESSOR

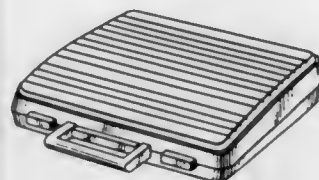
Junji Hirooka, Higashimurayama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 683,215

Claims priority, application Japan, Jul. 2, 1984, 59-27239

Term of patent 14 years

U.S. Cl. D3—76



291,028

## FOUNTAIN BRUSH

Franco Clivio, Zürich, Switzerland, and Dieter Raffler, Neu-Ulm, Fed. Rep. of Germany, assignors to Gardena Kress &amp; Kastner GmbH &amp; Co. KG

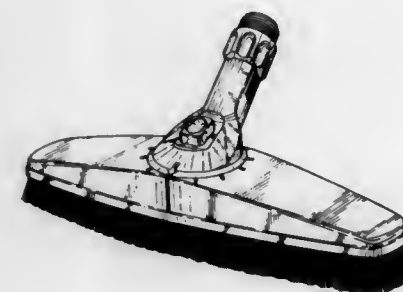
Filed Dec. 17, 1984, Ser. No. 682,065

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, GRAIII14638403

The portion of the term of this patent subsequent to Jul. 21, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D4—115



291,030

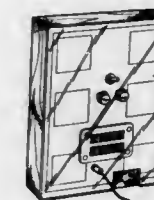
## ILLUMINATED PICTURE FRAME

George Butterfield, Rte. 2, P.O. Box 180, New Caney, Tex. 77357

Filed Aug. 23, 1984, Ser. No. 643,484

Term of patent 14 years

U.S. Cl. D6—308



291,031

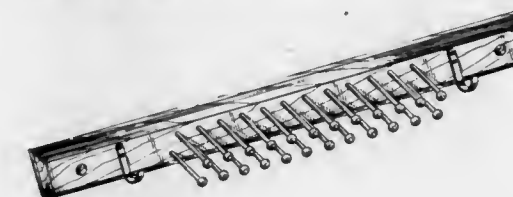
## COMBINED TIE AND BELT RACK

William A. Luongo, 38 Main St., Malden, Mass. 02148

Filed Nov. 1, 1985, Ser. No. 803,865

Term of patent 14 years

U.S. Cl. D6—323



291,032

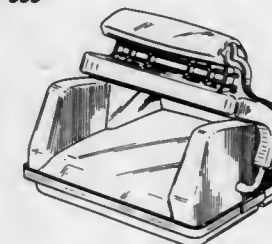
## CHILD'S BOOSTER SEAT

Bruce M. Sauter, and Orville E. Snyder, both of Columbus, Ind., assignors to Cosco, Inc., Columbus, Ind.

Filed Mar. 14, 1985, Ser. No. 712,005

Term of patent 14 years

U.S. Cl. D6—333



291,029

## BRUSH

Grant D. Purvis, 47 Totara Road, Miramar; Raymond F. Grout, 6 Margaret Street, Levin, and Grant Harrison, 12A Park Avenue, Waikanae, all of New Zealand

Filed Apr. 25, 1985, Ser. No. 727,383

Term of patent 14 years

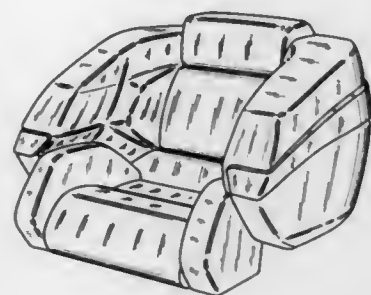
U.S. Cl. D4—118





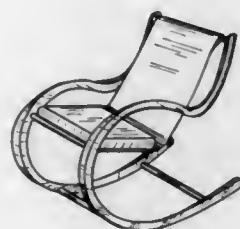
291,033  
CHAIRMichael E. McLeod, 28645 S. Pointe Dr., Grosse Ile, Mich.  
48138Filed Apr. 24, 1985, Ser. No. 726,675  
Term of patent 14 years

U.S. Cl. D6—334

291,034  
ROCKING CHAIRDavid W. Burns, P.O. Box 2465, Shelby, N.C. 28151  
Filed Feb. 22, 1985, Ser. No. 704,479

Term of patent 14 years

U.S. Cl. D6—348

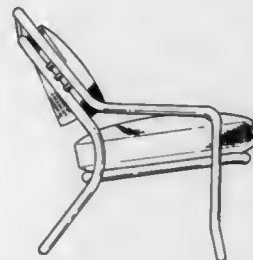
291,035  
CHAIR

Babette L. Strousse, Manhattan Beach, and Stephen H. Kamiński, Burbank, both of Calif., assignors to Samsonite Corporation, Denver, Colo.

Filed Sep. 11, 1984, Ser. No. 649,787

Term of patent 14 years

U.S. Cl. D6—380

291,036  
COMBINED ILLUMINABLE DISPLAY SHELF AND CLOTHES RACK

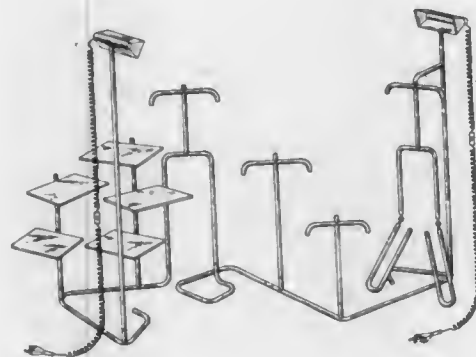
Tobia Scarpa, and Afra Bianchi Scarpa, both of Tervignano, Italy, assignors to Centro Studi E Servizi Moda Di Paolo Bertagnin E C. S.A.S., Villorba, Italy

Filed Aug. 8, 1984, Ser. No. 638,890

Claims priority, application Italy, Feb. 9, 1984, 20788/84[U]

Term of patent 14 years

U.S. Cl. D6—399

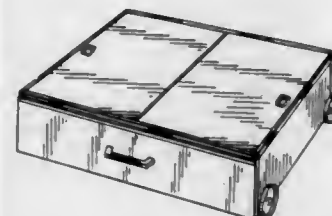
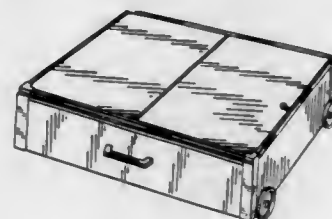
291,037  
STORAGE CABINET

Milton E. Handier, Northbrook; Richard Syivan, Glenview; Herbert Baisch, Palatine, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Continuation-in-part of Ser. No. 741,749, Jun. 10, 1985, abandoned. This application Mar. 4, 1986, Ser. No. 841,698

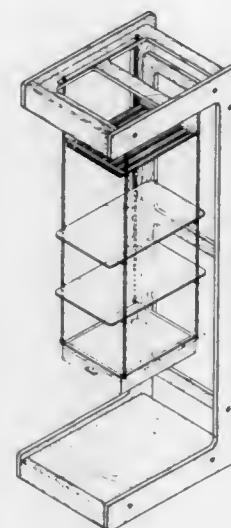
Term of patent 14 years

U.S. Cl. D6—432

291,038  
SHELF UNITJames E. Hice, 7858 Lumber Jack, Houston, Tex. 77040  
Filed Apr. 15, 1985, Ser. No. 723,363

Term of patent 14 years

U.S. Cl. D6—479

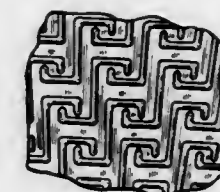
291,040  
BEVERAGE CUP

Robert C. Dart, Okemos, Mich., assignor to Dart Container Corporation, Mason, Mich.

Filed Feb. 11, 1985, Ser. No. 700,528

Term of patent 14 years

U.S. Cl. D7—6

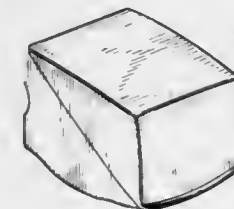
291,039  
CLEANING WAND CADDY

David J. Bokmiller, San Antonio, Tex., assignor to Sani-Fresh International, Inc., San Antonio, Tex.

Filed Sep. 20, 1984, Ser. No. 652,870

Term of patent 14 years

U.S. Cl. D6—551



291,041

## COVERED VEGETABLE DISH

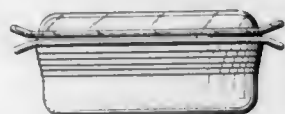
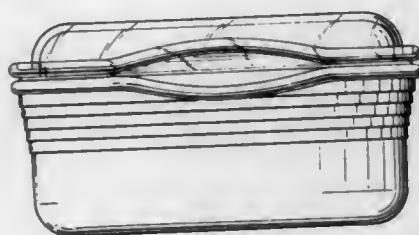
Kenneth Grange, Acrise Cottage, 53 Christchurch Hill, London, England

Filed Feb. 21, 1984, Ser. No. 581,674

Claims priority, application United Kingdom, Aug. 19, 1983, 1014744

Term of patent 14 years

U.S. Cl. D7-18



291,042

## COMPARTMENTED DISH

William K. Fahey, Longwood, Fla., and Augusto A. Picozza, Johnston, R.I., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Dec. 26, 1984, Ser. No. 686,321

Term of patent 14 years

U.S. Cl. D7-27



291,043

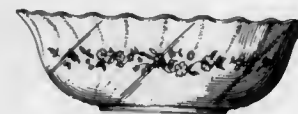
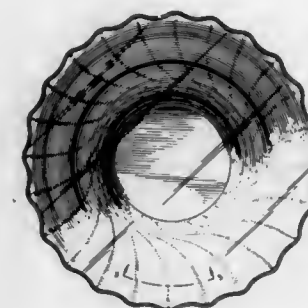
## MULTI-PURPOSE BOWL OR SIMILAR ARTICLE

Jean-Jacques Durand, LaBute, 62510 Arques, France

Filed Feb. 22, 1985, Ser. No. 704,559

Term of patent 14 years

U.S. Cl. D7-28



291,045

## SPOON OR SIMILAR ARTICLE

Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.

Filed Jun. 18, 1984, Ser. No. 621,803

Term of patent 14 years

U.S. Cl. D7-137



291,044

## BEVERAGE CAN HOLDER

Gienn R. Canning, 815 Tamarack Ave., Carlsbad, Calif. 92008

Filed Mar. 26, 1985, Ser. No. 716,119

Term of patent 14 years

U.S. Cl. D7-70

291,046

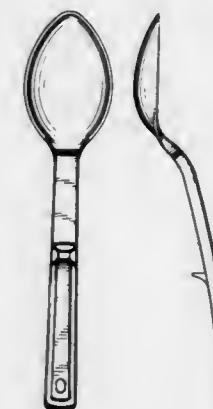
## SPOON

Stanley A. Johnson, Brookfield, Wis., assignor to The Vollrath Company, Sheboygan, Wis.

Filed Mar. 18, 1985, Ser. No. 712,790

Term of patent 14 years

U.S. Cl. D7-137



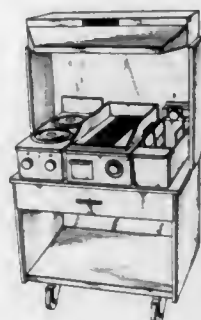


291,047

**COMPACT PORTABLE KITCHEN**Phillip M. Pappas, 2318 Bluebonnet Blvd., Houston, Tex. 77030  
Filed Nov. 21, 1985, Ser. No. 805,993

Term of patent 14 years

U.S. Cl. D7—334



291,048

**MICROWAVE OVEN**

Masayoshi Knbo; Kensuke Mizuma; Masuo Ichihara, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

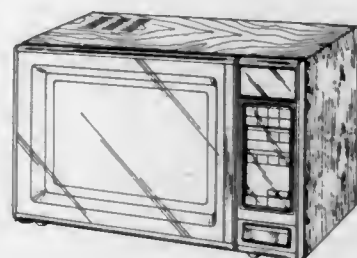
Filed Oct. 16, 1984, Ser. No. 663,247

Claims priority, application Japan, Apr. 16, 1984, 59-15254

The portion of the term of this patent subsequent to Jul. 14, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—351



291,049

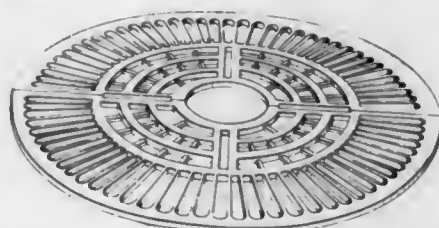
**TREE DRAIN GRATE OR SIMILAR ARTICLE**

Robert E. Haggard, Snohomish, Wash., assignor to Merry Haggard, Snohomish, Wash.

Division of Ser. No. 575,420, Jan. 30, 1984. This application Apr. 23, 1986, Ser. No. 857,568

Term of patent 14 years

U.S. Cl. D8—1



291,050

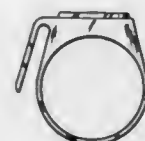
**ECOLOGY TAB CAN OPENING RING**

Thomas S. McIntire, 70-B W. Franklin St., Centerville, Ohio 45459

Filed Sep. 24, 1984, Ser. No. 653,994

Term of patent 14 years

U.S. Cl. D8—18



291,051

**PLASTIC BUCKET LID REMOVAL TOOL**

John DiFede, 24878 Tioga Rd., Hayward, Calif. 94544

Filed Aug. 13, 1984, Ser. No. 639,850

Term of patent 14 years

U.S. Cl. D8—40



291,052

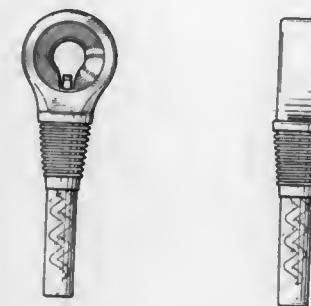
**COMBINATION BOTTLE OPENER AND RESEALER**

Garry E. Henshaw, 6616 St. Estaban, Tujunga, Calif. 91042

Filed Jan. 14, 1985, Ser. No. 691,413

Term of patent 14 years

U.S. Cl. D8—40



291,053

**KNOB**

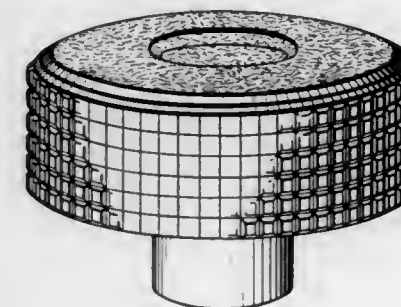
Giorgio Decursa, Milan, Italy, assignor to Elessa S.p.A., Milan, Italy

Filed Jan. 30, 1984, Ser. No. 575,145

Claims priority, application Italy, Apr. 8, 1983, 22588/83[U]

Term of patent 14 years

U.S. Cl. D8—310



291,054

**HINGE**

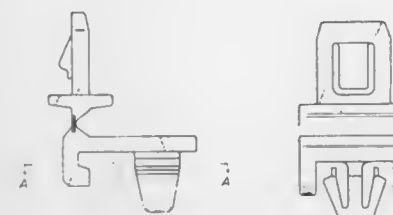
Katsumi Niwa, 874-2, Nakagiri, Mitake-cho, Kani-gun, Gifu-ken, Japan

Filed Feb. 15, 1985, Ser. No. 702,310

Claims priority, application Japan, Sep. 19, 1984, 59-38939

Term of patent 14 years

U.S. Cl. D8—325



291,055

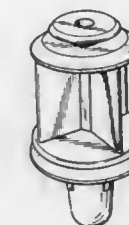
**PANEL FASTENER OR SIMILAR ARTICLE**

Kunihiro Fukuhara, and Masayuki Naruse, both of Yokohama, Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Feb. 10, 1986, Ser. No. 827,560

Term of patent 14 years

U.S. Cl. D8—354



291,056

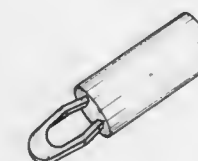
**CIRCUIT BOARD SUPPORT**

Royce W. Hill, Flippin, Ark., assignor to Micro Plastics, Inc., Flippin, Ark.

Filed May 24, 1985, Ser. No. 737,513

Term of patent 14 years

U.S. Cl. D8—354



291,057

**PANEL FASTENER OR SIMILAR ARTICLE**

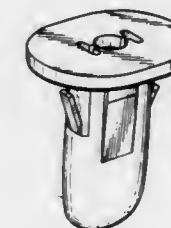
Toshiyuki Shiraishi, Hiroshima, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Aug. 26, 1985, Ser. No. 769,848

Claims priority, application Japan, Mar. 2, 1985, 60-8258

Term of patent 14 years

U.S. Cl. D8—354



291,058

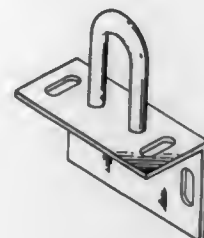
**TIE FOR A BOAT GUNWALE**

George C. Sorensen, P.O. Box 46754, Seattle, Wash. 98146

Filed Sep. 17, 1984, Ser. No. 651,697

Term of patent 14 years

U.S. Cl. D8—356



291,061

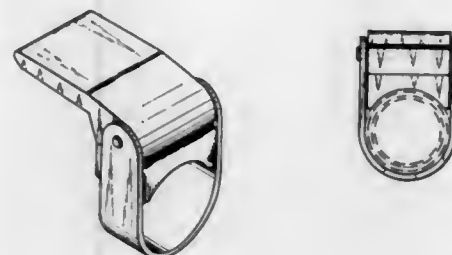
**TUBULAR LEG CLAMP**

Koma Nakatani, Tokyo, Japan, assignor to Velbon International Corp., Torrance, Calif.

Filed Oct. 4, 1984, Ser. No. 657,510

Term of patent 14 years

U.S. Cl. D8—396



291,059

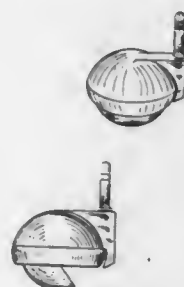
**CASTER ASSEMBLY**

Dale Mickelson, 829 Zurich Dr., Lake Arrowhead, Calif. 92317

Filed Apr. 12, 1984, Ser. No. 599,672

Term of patent 14 years

U.S. Cl. D8—375



291,062

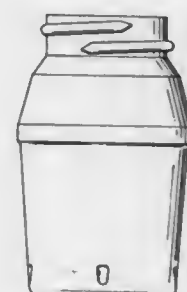
**PACKAGING CONTAINER**

Donald N. MacLaughlin, Midland, Mich., assignor to Vercon, Inc., Dallas, Tex.

Filed Feb. 25, 1985, Ser. No. 705,250

Term of patent 14 years

U.S. Cl. D9—390



291,060

**PACKAGING CONTAINER**

Donald N. MacLaughlin, Midland, Mich., assignor to Vercon, Inc., Dallas, Tex.

Filed Feb. 25, 1985, Ser. No. 705,253

Term of patent 14 years

U.S. Cl. D9—389



291,063

**LUBRICANT CONTAINER**

Anthony P. Prince, Waukegan; Richard P. Kolb, Gages Lake, both of Ill., and Myron T. Stevens, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 30, 1984, Ser. No. 645,699

Term of patent 14 years

U.S. Cl. D9—401



291,064

**PACKAGING CONTAINER FOR A TELEPHONE**

Barry Haber, Westport, Conn., and Charles Walkley, East Brunswick, N.J., assignors to Conair Corporation, Edison, N.J.

Filed May 27, 1986, Ser. No. 867,398

Term of patent 14 years

U.S. Cl. D9—415



291,066

**PACKAGING CONTAINER**

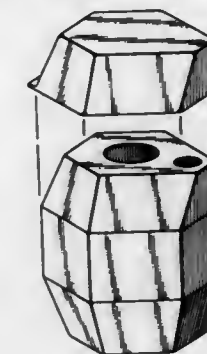
Jean-Luc Antoine, 12, rue de Petit Ban, 88000 Vittel, France

Filed Sep. 13, 1984, Ser. No. 650,048

Claims priority, application France, Mar. 22, 1984, 104

Term of patent 14 years

U.S. Cl. D9—418



291,067

**DISPENSING BOX FOR COTTONWOOL-TIPPED STICKS OR THE LIKE**

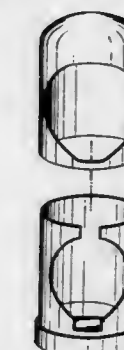
Henri Minost, Neuilly S/Seine, France, assignor to Beghin-Say, S.A., Thumeries, France

Filed Oct. 1, 1984, Ser. No. 656,678

Claims priority, application France, Mar. 29, 1984, 84 1433

Term of patent 14 years

U.S. Cl. D9—418



291,068

**SPORTS TIMER**

Charles Jones, Hope; James L. Murphy, and Kenneth Burks, both of Little Rock, Ark., assignors to Sports Timer, Inc., North Little Rock, Ark.

Filed Jan. 8, 1985, Ser. No. 689,775

Term of patent 14 years

U.S. Cl. D10—30



291,065

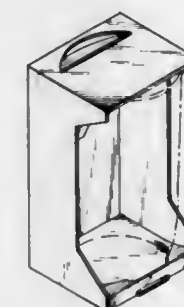
**PACKAGING CONTAINER OR SIMILAR ARTICLE**

Richard E. Pugh, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Jul. 12, 1984, Ser. No. 630,183

Term of patent 14 years

U.S. Cl. D9—418





291,069  
TIMER

Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.

Filed Mar. 11, 1985, Ser. No. 710,401  
Term of patent 14 years

U.S. Cl. D10—40



291,070  
CRIBBAGE BOARD

David E. Watson, 15 Ives St., Beverly, Mass. 01915  
Filed Apr. 8, 1985, Ser. No. 720,918

Term of patent 14 years

U.S. Cl. D10—46.1



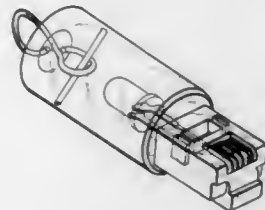
291,071

TELEPHONE LINE POLARITY TESTER

Randy J. Breil, 5352 Belle Ave., Cypress, Calif. 90630  
Filed Mar. 28, 1985, Ser. No. 717,434

Term of patent 14 years

U.S. Cl. D10—78

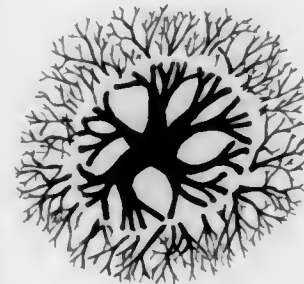


291,072  
TREE SCULPTURE

Loney J. Hebert, Jr., P.O. Box 224, Opelousas, La. 70571  
Filed Sep. 4, 1984, Ser. No. 646,506

Term of patent 14 years

U.S. Cl. D11—118



291,073

TIRE FOR A VEHICLE WHEEL

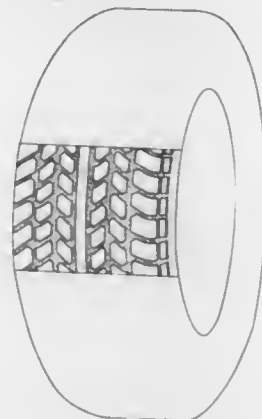
Romano Guermandi, Milan, Italy, assignor to Societa' Pneumatici Pirelli, Italy

Filed Aug. 27, 1984, Ser. No. 644,682

Claims priority, application Italy, Feb. 29, 1984, 21046/84[U]

Term of patent 14 years

U.S. Cl. D12—146

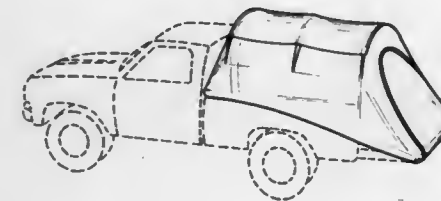


291,074  
TRUCK TENT

Ronald R. Ravana, 1929 Montecito Dr., Glendale, Calif. 91208  
Filed Oct. 11, 1985, Ser. No. 786,753

Term of patent 14 years

U.S. Cl. D12—156



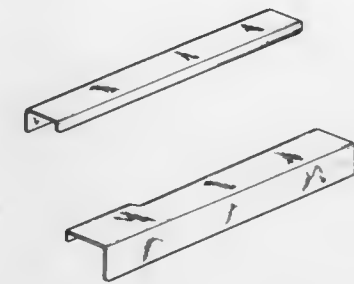
291,077

PAIR OF AUTOMOTIVE STEP PLATES

Leroy O. Parno, 5747 E. Admiral Pl., Tulsa, Okla. 74115  
Filed Oct. 24, 1983, Ser. No. 544,849

Term of patent 14 years

U.S. Cl. D12—203



291,078

MICROPHONE OR SIMILAR ARTICLE

William J. Scheid, Coral Springs, and Craig F. Siddoway, Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 4, 1985, Ser. No. 697,817

Term of patent 14 years

U.S. Cl. D14—12



291,075

FRONT BUMPER FOR AN AUTOMOBILE

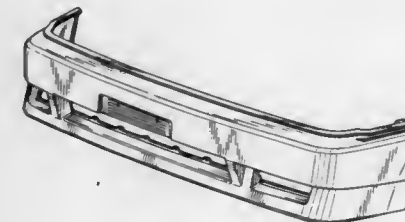
Seiichiro Kitahashi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 10, 1985, Ser. No. 807,476

Claims priority, application Japan, Jul. 3, 1985, 60-28468

Term of patent 14 years

U.S. Cl. D12—169



291,076

AIR SPOILER FOR A VEHICLE

Tsutomu Kawaguchi, and Yuji Ito, both of Toyota, Japan, assignors to Toyoda Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 31, 1985, Ser. No. 760,970

Term of patent 14 years

U.S. Cl. D12—181



291,079

CAR SPEAKER

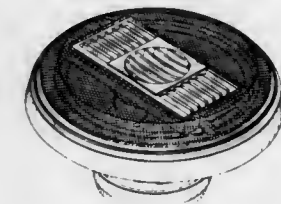
Tetsuo Ohtsuji, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 16, 1984, Ser. No. 641,155

Claims priority, application Japan, Feb. 21, 1984, 59-6280

Term of patent 14 years

U.S. Cl. D14—30



291,080  
LOUDSPEAKER

Noboru Keitoku, and Akira Katsuno, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan  
Filed Nov. 16, 1984, Ser. No. 672,437  
Claims priority, application Japan, Jun. 12, 1984, 59-24001  
Term of patent 14 years

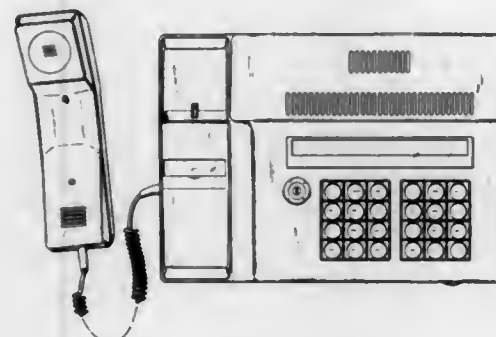
U.S. Cl. D14—30



291,082  
TELEPHONE SET

Karl Büchin, Berlin, Fed. Rep. of Germany, assignor to Krone GmbH, Berlin, Fed. Rep. of Germany  
Filed Jul. 30, 1985, Ser. No. 760,584  
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1985, 95 MR 5423 NZ  
Term of patent 14 years

U.S. Cl. D14—53

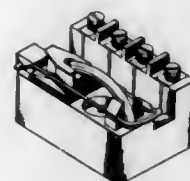


291,081  
TELEPHONE NETWORK INTERFACE DEVICE

N. Peter Mickelson, Gorham, and John J. Napiorkowski, Cape Elizabeth, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 13, 1986, Ser. No. 818,144  
Term of patent 14 years

U.S. Cl. D14—52

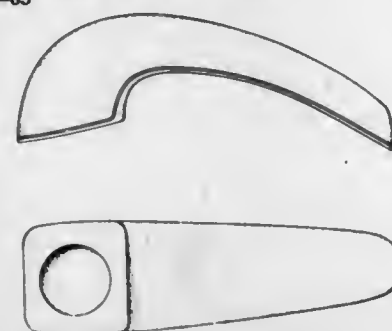


291,083  
TELEPHONE HANDSET

Charles B. Davidson, Croton-on-Hudson, N.Y., assignor to AT&T Technologies, Inc. American Telephone & Telegraph Co., Murray Hill, N.J.

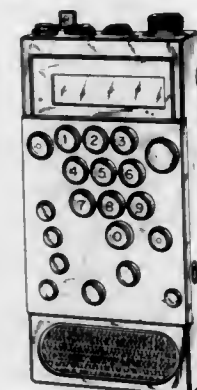
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Term of patent 14 years

U.S. Cl. D14—63



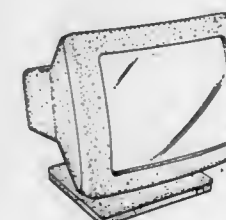
291,084  
RADIO RECEIVER OR THE LIKE  
Syuhei Taniguchi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan  
Filed Sep. 14, 1984, Ser. No. 650,492  
Claims priority, application Japan, Apr. 3, 1984, 59-13077  
Term of patent 14 years

U.S. Cl. D14—68



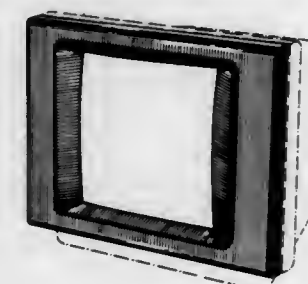
291,085  
MONITOR  
Michael J. Nuttall, Palo Alto; Diab E. Freige, Los Altos, and Leroy B. Keely, Portola Valley, all of Calif., assignors to Convergent Technologies, Inc., San Jose, Calif.  
Filed May 9, 1984, Ser. No. 608,602  
Term of patent 14 years

U.S. Cl. D14—113



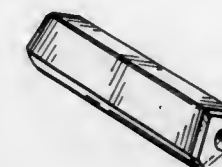
291,086  
MONITOR BEZEL  
John Price, Peabody, Mass., assignor to Xyvision, Inc., Woburn, Mass.  
Filed May 18, 1984, Ser. No. 612,047  
Term of patent 14 years

U.S. Cl. D14—115



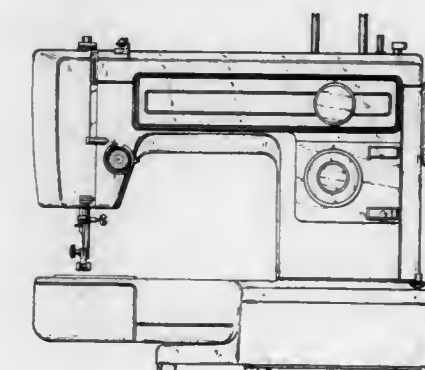
291,087  
WEDGE FOR A DRILL SHANK OF A PERCUSSION DRILLING MACHINE  
Pekka Salmi, Tampere, and Timo Muuttonen, Nokia, both of Finland, assignors to OY Tampella AB, Tampere, Finland  
Filed Dec. 18, 1984, Ser. No. 683,259  
Claims priority, application Finland, Jul. 3, 1984, 670/84  
Term of patent 14 years

U.S. Cl. D15—21



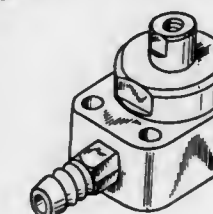
291,088  
SEWING MACHINE  
Susumu Hanyu, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan  
Filed Mar. 5, 1984, Ser. No. 586,095  
The portion of the term of this patent subsequent to Jun. 9, 2001, has been disclaimed.  
Term of patent 14 years

U.S. Cl. D15—69



291,089  
RAM FOR INDUSTRIAL ROBOTS OR THE LIKE  
Ynji Ise, Tokyo, Japan, assignor to Myotoku Ltd., Tokyo, Japan  
Filed Nov. 8, 1984, Ser. No. 669,291  
Term of patent 14 years

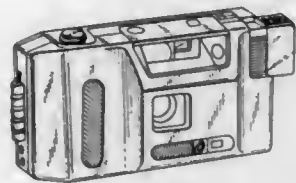
U.S. Cl. D15—199



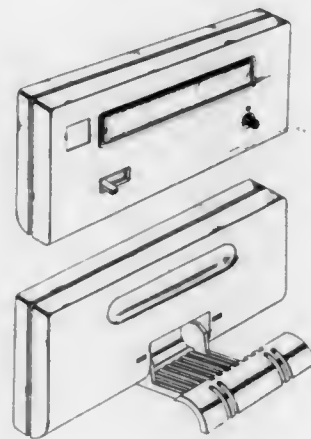


291,090  
CAMERA

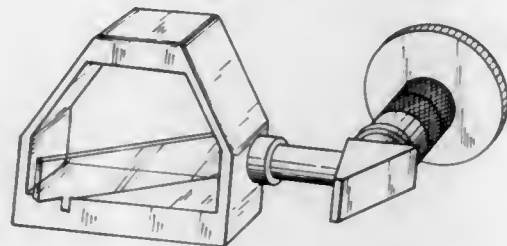
Nobuhiro Ago, and Takayuki Tsuboi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 22, 1985, Ser. No. 725,550  
Claims priority, application Japan, Nov. 28, 1984, 59-48869  
Term of patent 14 years  
U.S. Cl. D16—6

291,093  
DISPLAY FOR ELECTRONIC TYPEWRITER OR  
SIMILAR ARTICLE

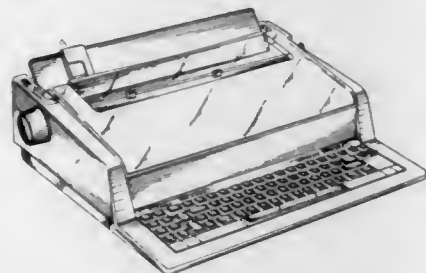
James P. Wang, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Apr. 19, 1984, Ser. No. 602,106  
Term of patent 14 years  
U.S. Cl. D18—12

291,091  
COMBINED BEAM SPLITTER AND OPTICAL COUPLER  
FOR CONNECTING A LIGHT SOURCE TO A  
TELEVISION CAMERA DURING SURGICAL  
PROCEDURES

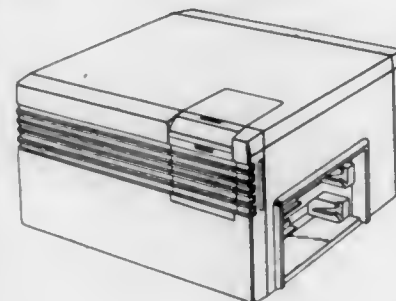
Richard E. Feinbloom, New York, and Lung T. Yee, Brooklyn, both of N.Y., assignors to Designs for Vision, Inc., Ronkonkoma, N.Y.  
Filed Feb. 6, 1984, Ser. No. 577,202  
Term of patent 14 years  
U.S. Cl. D16—130

291,092  
TYPEWRITER

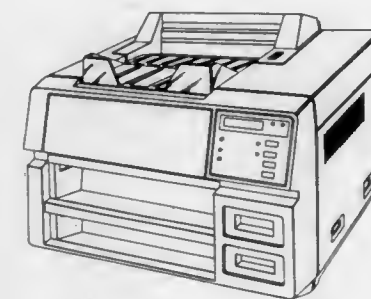
Christoph Egli, Huddinge, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden  
Filed May 3, 1985, Ser. No. 730,339  
Claims priority, application Sweden, Nov. 5, 1984, 84-2945  
Term of patent 14 years  
U.S. Cl. D18—1

291,094  
LASER PRINTER

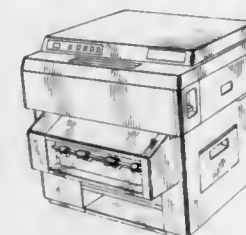
Kenichi Nakade, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan  
Filed Sep. 20, 1985, Ser. No. 778,333  
Claims priority, application Japan, Mar. 22, 1985, 60-11341  
Term of patent 14 years  
U.S. Cl. D18—13

291,095  
LASER PRINTER

Kiyotaka Morozumi; Masanori Hashimoto, both of Kanagawa, and Masahiro Minagawa, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan  
Filed Sep. 20, 1985, Ser. No. 778,335  
Claims priority, application Japan, Mar. 22, 1985, 60-11343  
Term of patent 14 years  
U.S. Cl. D18—13

291,096  
LASER BEAM PRINTER

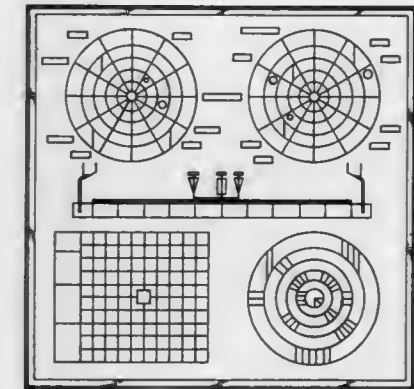
Takashi Yomo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Nov. 8, 1985, Ser. No. 804,740  
Claims priority, application Japan, May 11, 1985, 60-19486  
Term of patent 14 years  
U.S. Cl. D18—13

291,097  
DISPLAY PANEL FOR SHELVING

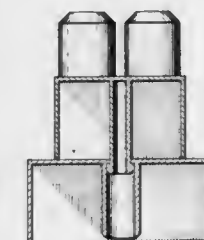
Gary L. Dalbey, Ankeny, and Ronald L. Huston, Altoona, both of Iowa, assignors to Hulsizer's, Inc., Ankeny, Iowa  
Filed Oct. 17, 1984, Ser. No. 661,604  
Term of patent 14 years  
U.S. Cl. D20—44

291,098  
DART FOOTBALL GAMEBOARD

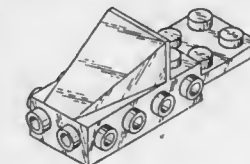
Timothy M. O'Connor, 1017 Hall Ave., West St. Paul, Minn. 55118  
Filed Feb. 11, 1985, Ser. No. 700,659  
Term of patent 14 years  
U.S. Cl. D21—6

291,099  
TOY CONSTRUCTION PIECE

Vic Bertrand, 89 Woodlawn, Dollard des Ormeaux (Quebec), Canada H9A 1Z3, assignor to The Ritvik Group Inc., Dorval, Canada  
Filed Dec. 2, 1985, Ser. No. 803,478  
Term of patent 14 years  
U.S. Cl. D21—108

291,100  
TOY BUILDING BLOCK

Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland  
Filed Dec. 4, 1985, Ser. No. 805,192  
Term of patent 14 years  
U.S. Cl. D21—108



291,101

## TOY CONSTRUCTION PIECE

Jens N. Knudsen, and Daniel A. Krentz, both of Billund, Denmark, assignors to Interlego A.G., Baar, Switzerland  
Filed Dec. 4, 1985, Ser. No. 805,194  
Term of patent 14 years

U.S. Cl. D21—108



291,103

## TOY PONY

Elizabeth Knight, Milton, Mass., assignor to Hasbro Industries, Inc., Pawtucket, R.I.  
Continuation of Ser. No. 549,905, Nov. 7, 1983, and Ser. No. 549,907, Nov. 7, 1983. This application Jun. 14, 1986, Ser. No. 875,231

Term of patent 14 years

U.S. Cl. D21—165



291,102

## DOLL CARRIER

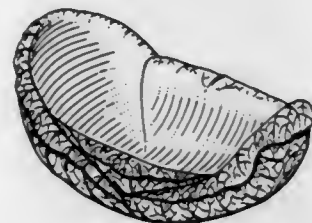
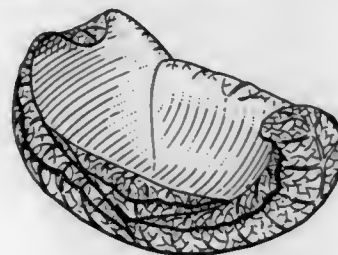
Brigitte C. Marshall, 660 Briar Hill Ave., Apt. 502, Toronto, Ontario, Canada M6B 4B7

Filed May 6, 1985, Ser. No. 731,162

Claims priority, application Canada, Dec. 3, 1984, 03-12-84-9

Term of patent 14 years

U.S. Cl. D21—121



291,104

## GIRL CLOWN RAG DOLL

Betty L. Koester, R.R. 1, Box 232, Poseyville, Ind. 47633, and Janet F. Adler, R.R. 2, Box 219, Haubstadt, Ind. 47639

Filed Feb. 15, 1985, Ser. No. 702,178

Term of patent 14 years

U.S. Cl. D21—173



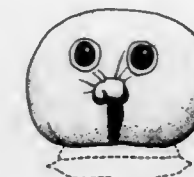
291,105

## DOLL HEAD

Katherine M. Ehrenfried, R.R. #1, Box 191, Beecher, Ill. 60401  
Filed Feb. 11, 1985, Ser. No. 700,822

Term of patent 14 years

U.S. Cl. D21—190



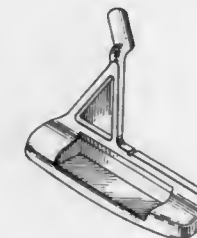
291,106

## GOLF CLUB HEAD

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204  
Filed Sep. 24, 1984, Ser. No. 653,534

Term of patent 14 years

U.S. Cl. D21—219



291,107

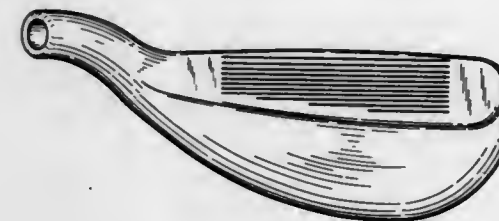
## GOLF CLUB HEAD

Robert A. Mendralla, Wheeling, and Carl E. Scheie, Libertyville, both of Ill., assignors to Wilson Sporting Goods Co., River Grove, Ill.

Filed Jan. 4, 1985, Ser. No. 688,647

Term of patent 14 years

U.S. Cl. D21—220



291,108

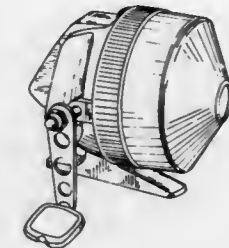
## FISHING REEL

Richard J. Robbins, Derby, Kans., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 30, 1984, Ser. No. 635,447

Term of patent 14 years

U.S. Cl. D22—141



291,109

## FISHING REEL

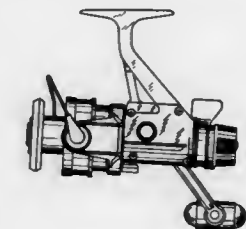
Seiji Myojo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Oct. 17, 1984, Ser. No. 661,960

Claims priority, application Japan, Apr. 24, 1984, 59-16685

Term of patent 14 years

U.S. Cl. D22—141



291,110

## FISHING REEL

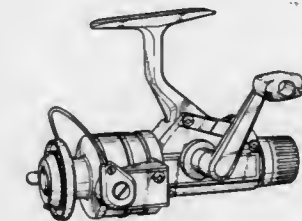
Takeshi Shohoji, and Masakazu Sakamoto, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Dec. 4, 1984, Ser. No. 678,184

Claims priority, application Japan, Jun. 18, 1984, 59-25212

Term of patent 14 years

U.S. Cl. D22—141





291,111

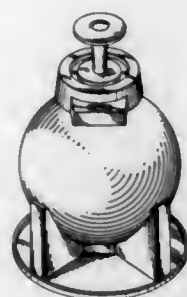
## TANK FOR PRESSURE FEEDING OF PAINT OR OTHER LIQUIDS

Richard A. Linn, Minneapolis, Minn., assignor to Padco, Inc., Minneapolis, Minn.

Filed Feb. 8, 1985, Ser. No. 699,733

Term of patent 14 years

U.S. Cl. D23—2



291,112

## COMBINED PRESSURE REDUCER AND FERTILIZER DISPENSER

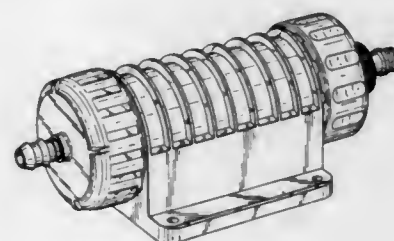
Clivio: Franco, Zürich, Switzerland, and Dieter Raffler, Neu-Ulm, Fed. Rep. of Germany, assignors to Gardena Kress &amp; Kastner GmbH, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,410

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, GRAIII730/8403

Term of patent 14 years

U.S. Cl. D23—3



291,113

## SPRAY GUN

Horst Bauer, Frankenthal, Fed. Rep. of Germany, assignor to Carl Platz GmbH, Frankenthal, Fed. Rep. of Germany

Filed Jan. 17, 1985, Ser. No. 692,783

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 1055

Term of patent 14 years

U.S. Cl. D23—17



291,114

## COMBINED BATHTUB FAUCET AND HAND SHOWER

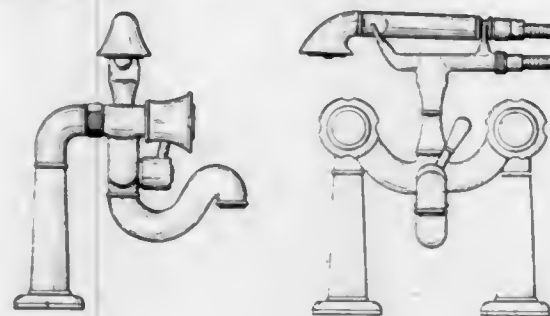
Nazzareno Plesco, Milan, Italy, assignor to F.I.R. Rubinetteria S.p.A., Italy

Filed May 7, 1985, Ser. No. 731,242

Claims priority, application Italy, Nov. 7, 1984, 23700/84[U]

Term of patent 14 years

U.S. Cl. D23—25



291,115

## SPOUT

Jean-Claude Deleploue, 23 Rue de Clapeyron, 75008, Paris, France

Filed Dec. 20, 1984, Ser. No. 686,026

Claims priority, application France, Jan. 29, 1984, 84 2925

Term of patent 14 years

U.S. Cl. D23—32



291,116

## SPOUT

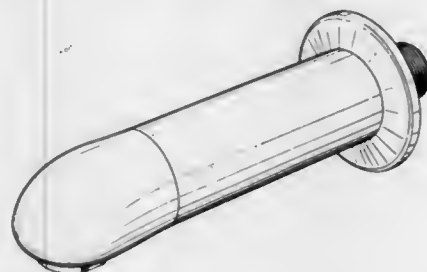
Andreas Haug, Altensteig, and Thomas Schönherr, Egenhausen, both of Fed. Rep. of Germany, assignors to Hans Grohe GmbH &amp; Co KG, Fed. Rep. of Germany

Filed Sep. 4, 1985, Ser. No. 772,355

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1985, MR 1158 0B

Term of patent 14 years

U.S. Cl. D23—32



291,117

## FAUCET SPOUT

Thomas J. Ryan, San Diego, Calif., assignor to Masco Building Products Corp., Taylor, Mich.

Filed Oct. 17, 1985, Ser. No. 788,345

Term of patent 14 years

U.S. Cl. D23—32



291,118

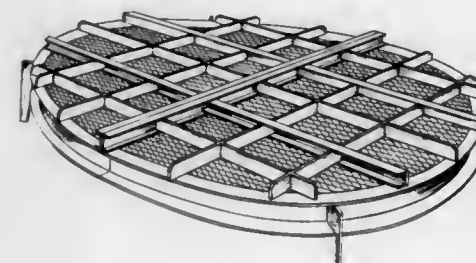
## COVER FOR A LADLE OR THE LIKE

Thomas M. Miller, North Olmsted, and Raymond J. Schraff, Cleveland, both of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Filed Oct. 2, 1984, Ser. No. 656,829

Term of patent 14 years

U.S. Cl. D23—82



291,119

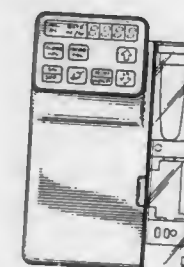
## ENTERIC PUMP

Bruce R. Campbell, San Diego, Calif., assignor to IVAC Corporation, San Diego, Calif.

Filed Jun. 8, 1984, Ser. No. 618,884

Term of patent 14 years

U.S. Cl. D24—8



291,120

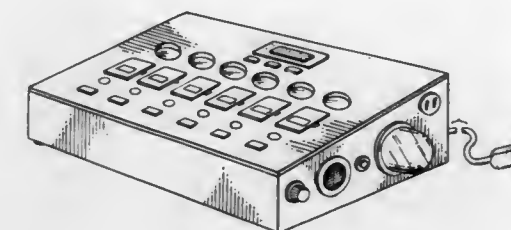
## TIMED MEDICATION DISPENSER

Donna Schuster, 443 Roberts, Reno, Nev. 89450

Filed Jan. 14, 1985, Ser. No. 691,184

Term of patent 14 years

U.S. Cl. D24—8



291,121

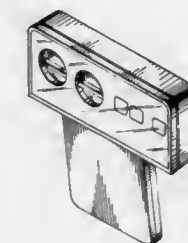
## INTERFACING CASSETTE FOR USE WITH A DEFIBRILLATOR OR THE LIKE

Paul W. Jones, Issaquah, and Casey M. Bardue, Seattle, both of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Jan. 8, 1985, Ser. No. 689,745

Term of patent 14 years

U.S. Cl. D24—17



291,122

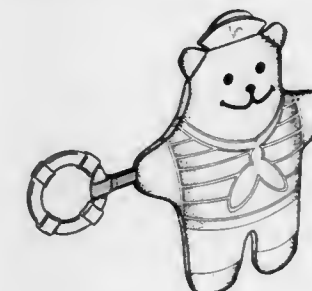
## TEETHING TOY

Lawrence B. Grubb, Monkton, Md., and Lois E. Kelly, Brooklyn, N.Y., assignors to Johnson &amp; Johnson Baby Products Company, New Brunswick, N.J.

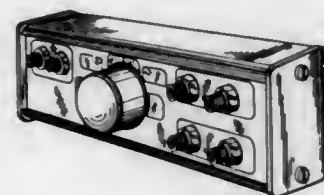
Filed Jul. 16, 1984, Ser. No. 631,274

Term of patent 14 years

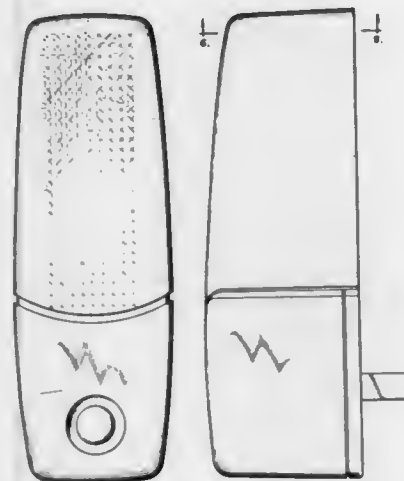
U.S. Cl. D24—45



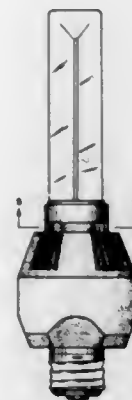
291,123  
**CONTROL PANEL FOR A CONTROL VALVE FOR USE  
 WITH A TOURNIQUET SYSTEM**  
 William L. McCune, Denver, Colo., assignor to Aspen Laborato-  
 ries, Inc., Englewood, Colo.  
 Filed Aug. 23, 1983, Ser. No. 525,756  
 Term of patent 14 years  
 U.S. Cl. D24—21



291,125  
**NIGHT-LIGHT**  
 Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corpora-  
 tion, Aurora, Ill.  
 Filed Apr. 18, 1985, Ser. No. 724,537  
 Term of patent 14 years  
 U.S. Cl. D26—26



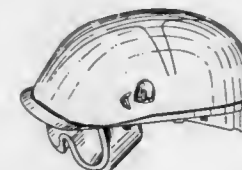
291,124  
**FLUORESCENT LAMP OR THE LIKE**  
 Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly,  
 both of Mass., assignors to GTE Products Corporation, Dan-  
 vers, Mass.  
 Filed Apr. 12, 1985, Ser. No. 722,963  
 Term of patent 14 years  
 U.S. Cl. D26—3



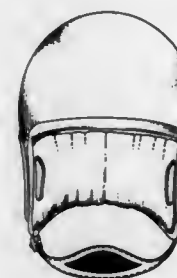
291,126  
**COMBINED CIGARETTE SNUFFER AND HOLDER**  
 Ingrid E. Gaptjern, 242 Farrwood Dr., Bradford, Mass. 01830  
 Filed Dec. 3, 1985, Ser. No. 804,298  
 Term of patent 14 years  
 U.S. Cl. D27—2



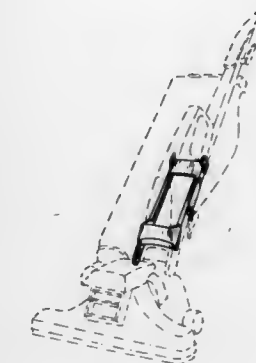
291,127  
**PROTECTIVE HELMET WITH RETRACTABLE  
 GOGGLES**  
 Bengt Bohjort, Enkoping, Sweden, assignor to Miniman Security  
 AB, Enkoping, Sweden  
 Filed Aug. 30, 1984, Ser. No. 645,757  
 Claims priority, application Sweden, Mar. 6, 1984, 84-0765  
 Term of patent 14 years  
 U.S. Cl. D29—15



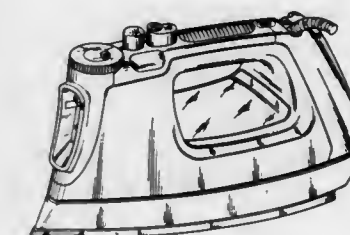
291,128  
**JOCKEY HELMET**  
 Barbara S. Grandsart, 347 Helois, Metairie, La. 70005  
 Filed Mar. 15, 1985, Ser. No. 712,139  
 Term of patent 14 years  
 U.S. Cl. D29—15



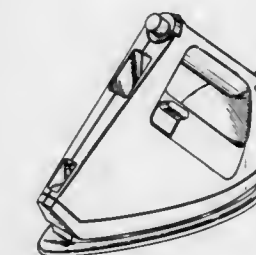
291,129  
**VACUUM CLEANER BRACKET**  
 John R. Lackner, North Ridgeville, and William E. Bartasevich,  
 Jr., Kent, both of Ohio, assignors to The Scott & Fetzer  
 Company, Westlake, Ohio  
 Filed May 9, 1985, Ser. No. 732,433  
 Term of patent 14 years  
 U.S. Cl. D32—31



291,130  
**ELECTRIC IRON**  
 Serge Brun, Lyons, France, assignor to Calor S.A., Lyons,  
 France  
 Filed Jun. 11, 1985, Ser. No. 743,653  
 Claims priority, application France, Dec. 19, 1984, 84 5720  
 Term of patent 14 years  
 U.S. Cl. D32—70



291,131  
**PRESSING IRON**  
 Michael N. Komar, Manchester, England, assignor to TI Russell  
 Hobbs Limited, Stoke-on-Trent, England  
 Filed Mar. 4, 1985, Ser. No. 707,541  
 Claims priority, application United Kingdom, Oct. 16, 1984,  
 1022713  
 Term of patent 14 years  
 U.S. Cl. D32—70





291,132

## STAND FOR A PRESSING IRON

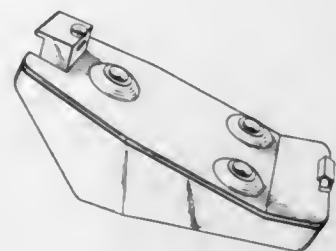
Michael N. Komar, Manchester, England, assignor to TI Russell Hobbs Limited, Stoke-on-Trent, England

Filed Mar. 4, 1985, Ser. No. 707,540

Claims priority, application United Kingdom, Oct. 16, 1984, 1022714

Term of patent 14 years

U.S. Cl. D32—73



291,133

## LEAF AND CUTTINGS GATHERER

Paul Disanza, 18 Homestead Pl., Bergenfield, N.J. 07621

Filed May 2, 1984, Ser. No. 606,142

Term of patent 14 years

U.S. Cl. D34—1



291,134

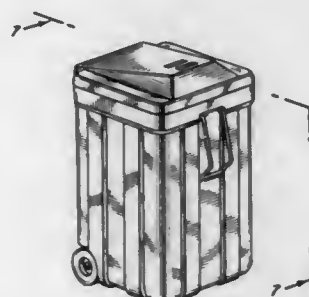
## REFUSE CONTAINER

Robert A. DeMars, 7932 Maestro St., Canoga Park, Calif. 91304

Filed Aug. 8, 1985, Ser. No. 763,629

Term of patent 14 years

U.S. Cl. D34—5



291,135

## REFUSE CONTAINER

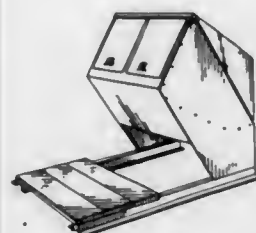
Dennis Neufeldt, Coaldale, Canada, assignor to Neufeldt Industries Limited, Lethbridge, Canada

Filed Jul. 6, 1984, Ser. No. 628,489

Claims priority, application Canada, Jan. 11, 1984, 11-01-84-3

Term of patent 14 years

U.S. Cl. D34—8



291,136

## TRANSPORTING DEVICE

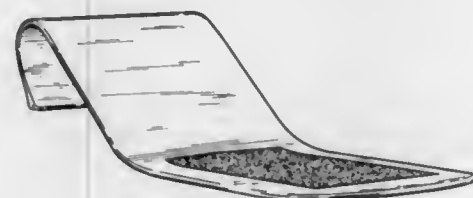
Krister Andersson, Skolgatan 12, S-82400 Hudiksvall, Sweden

Filed Oct. 19, 1984, Ser. No. 662,901

Claims priority, application Sweden, May 29, 1984, 84-1652

Term of patent 14 years

U.S. Cl. D34—28



291,137

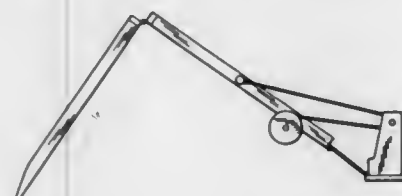
## FOLDING RAMP

Fred C. Malara, 20 Preston St., Middletown, N.Y. 10940

Filed Nov. 12, 1985, Ser. No. 804,733

Term of patent 14 years

U.S. Cl. D34—32



291,138

## BRACKET FOR USE IN A TROLLEY MEMBER

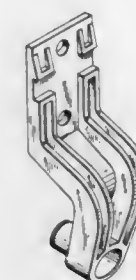
Ingemar Arneteg, Vretstorp, Sweden, assignor to Stellana Plast AB, Laxa, Sweden

Filed Sep. 18, 1984, Ser. No. 652,149

Claims priority, application Sweden, Mar. 23, 1984, 84-0983

Term of patent 14 years

U.S. Cl. D34—35



291,139

## CASH BOX

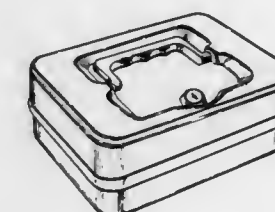
Clive W. Warwicker, Cookley, Nr. Kidderminster, England, assignor to Helix Limited, West Midlands, England

Filed Sep. 7, 1984, Ser. No. 648,462

Claims priority, application United Kingdom, Mar. 10, 1984, 1018422

Term of patent 14 years

U.S. Cl. D99—28



# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF JULY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. E. Staley Manufacturing Company: See—  
Malik, Arshad H.; and Urfer, Allen D., 4,683,074, Cl. 252-136.000.
- A. H. Robins Company, Incorporated: See—  
Poser, Richard G., 4,683,242, Cl. 514-539.000.
- Aarnio, Jaakko: See—  
Tammisalo, Erkki; Kanerva, Heikki; Aarnio, Jaakko; Wederhorn, Markku; and Laner, Kai, 4,683,581, Cl. 378-38.000.
- Abbey, Kirk J., to Glidden Company, The. Process for preparing a cationic amine-stabilized latex thermosetting electrocoat composition, method of cathodic electrocoating and resultant product. 4,683,173, Cl. 428-425.800.
- Abbey, Kirk J.: See—  
Lin, Ju-Chui; Abbey, Kirk J.; Craun, Gary P.; and Robinson, Peter V., 4,683,271, Cl. 525-403.000.
- Abe, Kazuki: See—  
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.
- Abrahamsson, Lars: See—  
Kagstrom, Per-Olof; and Abrahamsson, Lars, 4,682,990, Cl. 55-80.000.
- Abramczyk, Richard F.: See—  
Harris, Richard M.; and Abramczyk, Richard F., 4,683,430, Cl. 324-241.000.
- Acco Babcock Inc.: See—  
Baumgarten, John M., 4,682,760, Cl. 254-199.000.
- Achelpohl, Fritz, to Windmoller & Holscher. Apparatus for cutting stacks of flat workpieces. 4,682,524, Cl. 83-151.000.
- Achtzig, Klaus-Peter; Herfort, Herrman; and Hegner, Gunther, to KRONE GmbH. Multipolar plug. 4,682,838, Cl. 439-598.000.
- Acker, Jesse L.: See—  
Messerol, Peter M.; and Acker, Jesse L., 4,683,120, Cl. 422-72.000.
- Ackley, Charles E., Jr.: See—  
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,682,683, Cl. 198-380.000.
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- Acorn Engineering Company: See—  
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Celanese Corporation: See—  
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Chaix, Jean E.: See—  
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Lee, William W. Y.; and Chang, Kuang-Yeh, 4,683,488, Cl. 357-42.000.

Chang, Shien F. Grinding mill. 4,682,738, Cl. 241-56.000.

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Cheng, Chin S., to Wilson Foods Corporation. Process for prepacking fresh meat. 4,683,139, Cl. 426-265.000.

Chisari, Frank: See—  
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Sugimori, Shigeru; Goto, Yasuyuki; and Ogawa, Tetsuya, 4,683,078, Cl. 252-299.610.

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Cho, Hidetsura; Aisaka, Kazuo; Sato, Fumio; and Ishihara, Takafumi, to Suntory Limited. 2,6-Dimethyl-3N,5-disubstituted-4-(substituted phenyl)3,4-dihydropyrimidine compounds and a method for treating disorders of cardiocirculatory system. 4,683,234, Cl. 514-256.000.

Chovich, Milija M. Projectile. 4,682,546, Cl. 102-529.000.

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Christenson, Roger M.: See—  
Palermo, Anthony C.; Christenson, Roger M.; and Mazza, Glenn L., 4,683,266, Cl. 525-123.000.

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Cirolor Incorporated: See—  
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Mitsutsuka, Syuichi, 4,683,395, Cl. 310-313.00R.

Clark Equipment Company: See—  
Tamas, Attila J., 4,682,751, Cl. 248-503.000.

Clark, John A.: See—  
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Bramblett, Earl C.; and Clem, Warren E., 4,682,539, Cl. 100-265.000.

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Brandes, John H.; King, Eddie W.; and Summerville, Don S., 4,682,709, Cl. 221-2.000.

Credle, William S., Jr., 4,682,937, Cl. 417-393.000.

Cochran, Gary L.: See—  
Klee, Maurice; Peterson, Robert T.; Cochran, Gary L.; Dawson, James E.; and Anderson, Robert M., 4,682,666, Cl. 180-89.130.

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Droller, Richard; and Farrington, Richard I., 4,682,968, Cl. 446-268.000.

Dubois, Craig; and Fontaine, Brian, 4,682,970, Cl. 446-309.000.

Coleman Company, Inc., The: See—  
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Collis, Raymond D.: See—  
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Colorcon, Inc.: See—  
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Comau S.p.A.: See—  
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Connor, Lee: See—  
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Cook, Richard C. Cryptographic process and enciphered product. 4,682,954, Cl. 380-154.000.

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Cooper, Graham H. B.; and Williams, John A., to Supergas Ltd. Manifolding systems for gas containers. 4,682,627, Cl. 137-572.000.

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Cowen, Steven J., to United States of America, Navy. Hermetic high pressure fiber optic bulkhead penetrator. 4,682,846, Cl. 350-96.180.

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- Dawson, James E.: See—  
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- Deacon, Kim: See—  
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- DeLoach, Anthony, to Water Equipment Services, Inc. Loose fill media cleaning apparatus. 4,682,613, Cl. 134-58.00R.
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- Fohr, Robert D.; and Tieze, Jeffrey E. Underseat tackle container, 4,682,813, Cl. 297-192.000.
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- Fong, Dodd W.: See—  
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- Fontaine, Brian: See—  
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- Ford Meter Box Company, Inc., The: See—  
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- Ford Motor Company: See—  
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- Simko, Aladar O., 4,682,575, Cl. 123-90.440.
- Forsman, Ailyn J., to Honeywell Inc. Training device, 4,682,952, Cl. 434-12.000.
- Forsythe Cosmetic Group, Ltd.: See—  
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- Fortmann, Manfred: See—  
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- Foster, Thomas V.; Jones, Stanley P.; and Alderson, David L., to Emhart Industries, Inc. Parison formation in the manufacture of hollow articles of glassware, 4,682,996, Cl. 65-25.100.

- Foster Wheeler Energy Corporation: See—  
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- Foulke, Richard F.; and Lord, Steven M., to Proconics International, Inc. Wafer transfer apparatus, 4,682,928, Cl. 414-416.000.
- Framatome: See—  
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- Framatome & Cie.: See—  
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- Frankel, Milton B.; and Wilson, Edgar R., to Rockwell International Corporation. Polyazido esters, 4,683,085, Cl. 260-349.000.
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- Franz, Michael R. Apparatus and method for recording monophasic action potentials from an in vivo heart, 4,682,603, Cl. 128-642.000.
- Freber, Elmer C., to Marquette Tool & Die Company. Adjustable head restraint for vehicular seats, 4,682,817, Cl. 297-408.000.
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- Freelain, Kenneth W. Water pipe, 4,682,610, Cl. 131-173.000.
- Frenette, Richard; Rokach, Joshua; Kakushima, Masatoshi; and Young, Robert N., to Merck Frosst Canada, Inc. Leukotriene antagonists, 4,683,325, Cl. 560-10.000.
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- Freudenmann, Kurt; and Wiese, Heiner, to ITW Ateco. One-piece clip-shaped holder for elongated articles, 4,682,748, Cl. 248-73.000.
- Fried, Krupp Gesellschaft mit beschränkter Haftung: See—  
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- Fried, Morton. Temperature offset control system, 4,682,648, Cl. 165-12.000.
- Friedrichsfeld GmbH Keramik-und Kunststoffwerke: See—  
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- Fromel, Gustav; and Steinke, Alexander, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor fuel assembly, 4,683,115, Cl. 376-439.000.
- FSI Corporation: See—  
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- Silvernail, James M.; and Schneider, Dallas J., 4,682,614, Cl. 134-99.000.
- Fuchs, Alfred E., to Potters Industries, Inc. Microbicidal coated beads, 4,682,992, Cl. 55-279.000.
- Fuchs, Hugo; Brand, Uwe; and Buchaeckert, Helmut, to BASF Aktiengesellschaft. Obtaining caprolactam by cleaving oligomers of caprolactam, 4,683,305, Cl. 540-533.000.
- Fuji Photo Film Co., Ltd.: See—  
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- Idota, Yoshio; and Yagihara, Morio, 4,683,189, Cl. 430-248.000.
- Ihama, Mikio; Tani, Tadaaki; and Ohnishi, Hiroshi, 4,683,193, Cl. 430-570.000.
- Nishiyama, Shingo, 4,683,192, Cl. 430-567.000.
- Yamada, Sadao; Takayama, Takeshi; Seshimoto, Osamu; and Yamaguchi, Akira, 4,683,048, Cl. 204-416.000.
- Fujibayashi, Kazuo: See—  
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- Fujicar Manu. Co. Ltd.: See—  
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- Fujii, Haruo; Inaba, Yutaka; and Ando, Yujiro, to Canon Kabushiki Kaisha. Multicolor image recording method and device utilizing a single image transfer to the recording material, 4,682,880, Cl. 355-4.000.
- Fujikawa, Tetsuzo; Hirata, Makizo; and Tamba, Shinichi, to Kawasaki Jukogyo Kabushiki Kaisha. Valve gear for use in a four cycle engine, 4,682,573, Cl. 123-90.200.
- Fujiki, Syogo: See—  
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- Fujisoku Electric Co., Ltd.: See—  
Yano, Takashi; and Yoneyama, Yasuo, 4,683,352, Cl. 200-6.00R.
- Fujita, Kunihiko; and Tanaka, Hideaki, to Mitsubishi Belting Ltd. V-belt for high load power transmission, 4,682,973, Cl. 474-263.000.
- Fujiu Limited: See—  
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- Fujiwara, Katsuyoshi; Miwa, Yoshihisa; and Yoshiura, Shoichiro, to Sharp Kabushiki Kaisha. Electrophotographic copying apparatus with a selecting means of magnification changing elements, 4,682,877, Cl. 355-3.00R.
- Fukami, Takeshi: See—  
Sakamoto, Akira; Fukami, Takeshi; Sugita, Takehiro; and Toyoshima, Masakatsu, 4,683,586, Cl. 380-48.000.
- Fukumoto, Shigeaki, to Sharp Kabushiki Kaisha. Exhaust system for a cooking apparatus, 4,682,580, Cl. 126-299.00D.
- Fukunaga, Takahiro: See—  
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- Fukutome Meat Packers, Ltd.: See—  
Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, 4,682,385, Cl. 17-45.000.
- Fuller Company: See—  
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- Fuller, David C.: See—  
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- Furukawa, Akihiro; and Ohki, Junichi, to NEC Corporation. Inter-frame predictive coding apparatus for video signal, 4,683,494, Cl. 358-136.000.
- Furuya, Akira: See—  
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- Fusion Systems Corporation: See—  
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- Fussenecker, Werner: See—  
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- G. D. Searle & Co.: See—  
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- Miyano, Masateru; and Deason, James R., 4,683,241, Cl. 514-512.000.
- Gabuzda, Paul G., to Burroughs Corporation (now Unisys Corporation). Segmented heat sink device, 4,682,651, Cl. 165-80.300.
- Gach, Peter P., to Sunbeam Plastics Corporation. Tamper indicating closure, 4,682,702, Cl. 215-232.000.
- Gaertner, Adolf W.: See—  
Wiedenhoff, Wolfgang; Gaertner, Adolf W.; Vogt, Gert; and Wiegner, Claus, 4,682,632, Cl. 138-178.000.
- Gaget, Pierre, to Charbonnages de France. Centrifugal drier drum for wet granular material, 4,682,423, Cl. 34-58.000.
- Gaida, Wolfram: See—  
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- Gallati, Harald, to Hoffmann-La Roche Inc. Detection method for occult blood, 4,683,197, Cl. 435-7.000.
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Tse, Samuel W.; and Galloway, Deane E., 4,683,170, Cl. 428-349.000.
- Gallusser, David O.: See—  
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- Gamma Biologicals, Inc.: See—  
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- Gandini, Mario: See—  
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- Ganguli, Keshab L.: See—  
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- Garbrecht, William L.: See—  
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- Garcia-Mallol, Juan A.; and Alliston, Michael G., to Foster Wheeler Energy Corporation. Fluidized bed steam generator and method of generating steam including a separate recycle bed, 4,682,567, Cl. 122-4.00D.
- Gardikes, John J.: See—  
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- Garrett Corporation, The: See—  
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- Maynard, Frederick C., 4,682,469, Cl. 60-39.060.
- Gasielki, Alan F.: See—  
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- Gasner, Earl L.: See—  
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- Gastrock, William H.; and Wepplo, Peter J., to American Cyanamid Company. Process for the resolution of certain racemic amino nitriles, 4,683,324, Cl. 558-354.000.
- Gaudin, Carl J. Self sealing sewer cover assembly, 4,682,907, Cl. 404-25.000.
- Gaudreau, Laurent R.: See—  
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- Gauthier, Gilbert, to Moulinsages Henri Lacroix. Device for making a new type of yarn, 4,682,478, Cl. 66-81.000.
- Gauthier, Michel: See—  
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- Gebr. Hapich GmbH: See—  
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- Geiser, Joseph. Protective ear covering, 4,682,374, Cl. 2-209.000.
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General Electric Company: See—  
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Bedard, James F.; and Jaswa, Vilay C., 4,683,570, Cl. 371-36.000.

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Stokes, Vijay K., 4,683,393, Cl. 310-156.000.

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Georg Knoblauch, Firma: See—  
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Georgiev, Vassil S.; and Mullen, George B., to Pennwalt Corporation. Spiro[isoxazolidine-3,2'-tricyclo[3.3.1.1<sup>2,7</sup>] decanes], 4,683,311, Cl. 548-240.000.

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Kussel, Willy; and Bohle, Werner, 4,682,678, Cl. 192-56.00F.

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Kelch, Russell K.; Finrock, Don C.; Girard, Donald J.; Seevers, Daniel B.; Briggs, Barry D.; and Mathes, Gene R., 4,683,531, Cl. 364-200.000.

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Armandillo, Errico; Salvetti, Gianemilio; and Giuliani, Giampiero, 4,682,893, Cl. 356-356.000.

Giuliano, James T., to Zotos International, Inc. Novel process and article for preparing artificial nails. 4,682,612, Cl. 132-73.000.

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Glaser, Ronald M.: See—  
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Glass, Michael; Hoholick, Joseph; and Orlandi, Daniel A., to Warner-Lambert Company. Low moisture, sugarless, center-filled chewing gum. 4,683,138, Cl. 426-5.000.

Glassman, Alexander H., to Research Foundation for Mental Hygiene, Inc. Method of preventing withdrawal symptoms associated with the cessation or reduction of tobacco smoking. 4,683,231, Cl. 514-220.000.

Glidden Company, The: See—  
Abbey, Kirk J., 4,683,173, Cl. 428-425.800.

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Lin, Ju-Chui; Abbey, Kirk J.; Craun, Gary P.; and Robinson, Peter V., 4,683,271, Cl. 525-403.000.

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Glowacki, Robert D.: See—  
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Go, Youki: See—  
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Goddard, Errol D., to Union Carbide Corporation. Foamable compositions and processes for use thereof. 4,683,004, Cl. 106-170.000.

Goebel, Konrad; and Schiffrers, Ulrich, to Kraftwerk Union Aktiengesellschaft. Clean-gas continuous-flow intermediate storage or accumulator plant. 4,682,620, Cl. 137-110.000.

Goel, Anil B., to Ashland Oil, Inc. Removal of small amounts of water from moisture containing carboxylic acids, alcohols, or phenols by contacting with a tetrasubstituted bicyclic amide acetal. 4,683,077, Cl. 252-194.000.

Goel, Anil B., to Ashland Oil, Inc. Organophosphite accelerators for epoxide curing. 4,683,281, Cl. 528-89.000.

Goel, Anil B., to Ashland Oil, Inc. Novel boron trifluoride-poly (alkylene oxide) amine catalysts for curing epoxy resins. 4,683,282, Cl. 528-91.000.

Goel, Anil B., to Ashland Oil, Inc. Latent accelerators for epoxide curing. 4,683,283, Cl. 528-93.000.

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Goepfert, Serge P. P.; Renault, Serge A. M.; Roger, Françoise M. M.; Themont, Jean-Pierre; and Vachet, André J., to Corning Glass Works. Transparent laminated polarizing glasses. 4,683,153, Cl. 428-1.000.

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Goldstein, Amnon; and Cooper, John F. Dry process electrostatic developer comprising a generally round magnetic carrier and a flake-type carrier. 4,683,187, Cl. 430-106.600.

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Goodall, Brian L.: See—  
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Chawla, Surendra K., 4,682,892, Cl. 356-353.000.

Portalupi, Steven J.; and Riggs, Robert S., 4,683,020, Cl. 156-403.000.

Stalter, Joseph F., deceased; and Feller, Gilbert M., 4,683,021, Cl. 156-415.000.

Sturm, Budd H., 4,683,332, Cl. 564-414.000.

Goss, Gary J.: See—  
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Gotchel, Joel P.; Norton, Henry J.; Neuschwander, Rudolf; and Stango, Daniel J., to Scott Paper Company. Dry formed-web embossing apparatus. 4,682,942, Cl. 425-103.000.

Goto, Sumio; Ishibashi, Jiro; and Nemoto, Masakazu, to Tokyo Juki Industrial Co., Ltd. Method and apparatus for performing sewing operations utilizing sewing machine having means to adjust terminal stitch pitch and sew consecutive patterns. 4,682,554, Cl. 112-262.100.

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Gotoh, Hiroshi: See—  
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Goudriaan, Johan C.; and Van der Burgt, Maarten J., to Shell Oil Company. Reactor for non-isothermic reactions for the preparation of hydrocarbons. 4,683,121, Cl. 422-197.000.

Gould, Herbert L. Apparatus for the self-examination of the human eye. 4,682,867, Cl. 351-223.000.

Gounder, Raj N., to RCA Corporation. Spacecraft structure. 4,682,744, Cl. 244-158.00R.

Goutzoulis, Anastasios P., to Westinghouse Electric Corp. Acousto-optic system for testing high speed circuits. 4,683,420, Cl. 324-73.00R.

Gowland, Frederick W.: See—  
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Graco Inc.: See—  
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Gradl, Reinhard: See—  
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Grams, Christiane: See—  
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Gray, Warren E., to Northrop Corporation. Mechanically lockable fastener assembly. 4,682,520, Cl. 81-471.000.

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Green, Michael J.; and McKay, James B., to British Columbia Telephone Company. Asynchronous signaling system for digital communication channel. 4,683,567, Cl. 370-110.100.

Green, Richard F.: See—  
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Greenfield, Moses A.: See—  
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Greenhill, Katherine L.: See—  
Lin, Chew-Chen; Brown, Winthrop K.; Lankford, Frank L., Jr.; Greenhill, Katherine L.; and Campsey, Ronald L., 4,683,464, Cl. 340-685.000.

Greer, J. Rex. Auxiliary air conditioning, heating and engine warming system for trucks. 4,682,649, Cl. 165-43.000.

Gregory, Richard B.: See—  
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Grethe, Klaus; and Steven, Hubert, to L. & C. Steinmuller GmbH. Method and apparatus for scrubbing flue gas with flowable absorbing material pursuant to the air flow atomization principle. 4,682,991, Cl. 55-84.000.

Grice, Neal J.: See—  
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Grimova, Jaroslava: See—  
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Hall, Marvin Z. Deadbolt lock. 4,682,482, Cl. 70-129.000.

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Wienck, Dennis A.; and Mints, Danny K., 4,682,506, Cl. 73-863.540.

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Onizuka, Masakazu; Tatani, Atsushi; Hamada, Takayoshi; and Omoto, Setsuo, 4,683,210, Cl. 436-50.000.

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Porowski, Jan S.; O'Donnell, William J.; Badlani, Manu L.; and Hampton, Edward J., 4,683,014, Cl. 148-131.000.

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Handler, Milton E.; Sylvan, Richard; and Peterson, Michael, to Hirsh Company. Tool holder. 4,682,698, Cl. 211-70.600.

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Hanulec, Joseph, to ISC Cardion Electronics, Inc. Phase controlled frequency division multiplexed communications system. 4,683,565, Cl. 370-69.100.



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chi, Tateoki, 4,683,378, Cl. 250-492.000.
- Harbridge, John B., to Beecham Group, p.l.c. Deadcat reaction for  
making 9-deoxy-9-isocyanato clavulanates. 4,683,300, Cl.  
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- Hardy, James E.: See—  
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; and  
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Main, Brian G., 4,683,232, Cl. 514-228.000.
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at a location remote from said line robot is first taught the program.  
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- Harmer, Alan L., to Stanley Electric Co., Ltd. Refractometer for  
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- Harris, Bob. Bowlers' hand-drying bag. 4,682,422, Cl. 34-9.000.
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- Harris, Richard M.; and Abramczyk, Richard F., to Republic Steel  
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oshi; and Ohigashi, Tsugio, 4,682,768, Cl. 271-3.100.
- Haruta, Masahiro: See—  
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Miroslav; and Hasal, Pavel, 4,683,062, Cl. 210-617.000.
- Hasenbalg, Ralph D. Automated keyboard testing. 4,682,695, Cl.  
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- Hashimoto Denki Co., Ltd.: See—  
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- Hashimoto, Shinichi: See—  
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- Hasselbach, Petra: See—  
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ray tube. 4,682,962, Cl. 445-5.000.
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Sadao; and Murakami, Hajime, 4,682,881, Cl. 355-10.000.
- Hattori, Masachichi: See—  
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- Hattori, Tadashi: See—  
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- Hawkins, Gene: See—  
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Snowball, Malcolm R.; and Hayes, Cecil, 4,682,537, Cl. 99-282.000.
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to Systemate B.V. Poultry breast filleting system. 4,682,386, Cl.  
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- Health Research, Incorporated: See—  
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functional maleimide thermosetting composition. 4,683,276, Cl.  
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Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller,  
Michael F.; Riley, Martin E.; and Wright, David L., 4,683,575,  
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- Hegner, Gunther: See—  
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for setting-up basket style article carriers. 4,682,975, Cl. 493-123.000.
- Heil-Quaker Corporation: See—  
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- Heimbach, Glenn A. Method and tool for removing the nut which  
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- Heinen, Jochen, to Siemens Aktiengesellschaft. Semiconductor laser  
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Hell, Uwe, 4,682,562, Cl. 118-500.000.
- Hell, Uwe, to Hell GmbH & Co. Holding device for metal sections  
which are to be coated in two colors. 4,682,562, Cl. 118-500.000.
- Helm, John L.; and Leonard, John S., to Proto-Power Corporation. Gas  
circulator for a nuclear reactor and a method for use thereof.  
4,683,111, Cl. 376-391.000.
- Heltman, Carolyn R. Protective eye patch. 4,682,371, Cl. 2-15.000.
- Heltzel, James. Safety system for disabling a firearm. 4,682,435, Cl.  
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- Hemmes, Paul: See—  
Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp,  
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- Hemrich, William R.: See—  
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Hengstenberger, Gary M.; and Montavon, John I. Safety harness.  
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- Henkel Kommanditgesellschaft auf Aktien: See—  
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- Moeller, Hinrich; and Wallat, Siegfried, 4,683,244, Cl. 514-568.000.
- Henley, Lester P., to Regdon Solenoid, Inc. Bi-stable electromagnetic  
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- Henry Valve Company: See—  
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A., 4,683,057, Cl. 210-232.000.
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with rotary valve. 4,682,572, Cl. 123-80.0BB.
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machine. 4,682,552, Cl. 112-121.120.
- Herfort, Herrman: See—  
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- Herro, Harvey M.: See—  
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- Herzig, Frank: See—  
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- Herzog-Hart Corporation: See—  
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- Hewlett-Packard Company: See—  
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Novel organopolysiloxane, method for the preparation thereof and  
composition containing the same. 4,683,320, Cl. 556-453.000.
- Hideyuki, Ishibashi: See—  
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- Higashi, Robert E.; James, Steven D.; Johnson, Robert G.; and Satren,  
Ernest A., to Honeywell Inc. Microscopic size, thermal conductivity  
type, air or gas absolute pressure sensor. 4,682,503, Cl. 73-755.000.
- Higashi, Robert E.: See—  
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tion. Video disc type recording and reproducing system with inter-  
ference reduction filter. 4,683,502, Cl. 358-342.000.
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- Higuchi, Toshiro, to Nippon Seiko Kabushiki Kaisha. Magnetically  
floating actuator having angular positioning function. 4,683,391, Cl.  
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- Hijikigawa, Masaya: See—  
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- Hildner, Knut, to Friedrichsfeld GmbH Keramik-und Kunststoffwerke.  
Connecting arrangement with a threaded sleeve. 4,682,797, Cl.  
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Yount, Larry J.; Wilt, Nicholas J.; Hill, Bryan H.; and Peterson,  
Donald A., Jr., 4,683,532, Cl. 364-200.000.
- Hill, Stephen A. Faucet system. 4,682,628, Cl. 137-624.110.
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interactive draw graphic system. 4,683,468, Cl. 340-709.000.
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contact section. 4,683,150, Cl. 427-239.000.
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control of a robot. 4,683,543, Cl. 364-513.000.
- Hirata, Makizo: See—  
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4,682,573, Cl. 123-90.200.
- Hirohashi, Setsuo; Shimozato, Yukio; and Watanabe, Masahiko, to  
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cancer antigen and method for producing same. 4,683,200, Cl.  
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- Hirsh Company: See—  
Handler, Milton E.; Sylvan, Richard; and Peterson, Michael,  
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- Hishinuma, Kazuhiro; and Ohga, Akihiro, to Fuji Photo Film Co., Ltd.  
Subtraction processing method and apparatus for radiation images.  
4,683,377, Cl. 250-327.200.
- Hitachi Control Systems, Inc.: See—  
Takaki, Masaoki, 4,683,549, Cl. 364-900.000.
- Hitachi Engineering Co., Ltd.: See—  
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Ozawa, Michihiro, 4,683,113, Cl. 376-419.000.
- Hitachi, Ltd.: See—  
Ebata, Sakae; and Ohshima, Nobuaki, 4,682,754, Cl. 248-639.000.
- Itoh, Yoshitoshi; Mizuno, Katsuhiko; and Noguchi, Atomi,  
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- Kambayashi, Hiroaki; and Okada, Yasuyuki, 4,683,552, Cl.  
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- Mochida, Takaaki; Yamashita, Junichi; Yoshioka, Toshiro; and  
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- Sakamoto, Masami; Nagumo, Ryoichi; and Ishihara, Tamio,  
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- Shibata, Manabu; and Uragami, Akira, 4,683,384, Cl. 307-475.000.
- Shimase, Akira; Yamaguchi, Hiroshi; Haraichi, Satoshi; and Miyau-  
chi, Tateoki, 4,683,378, Cl. 250-492.000.
- Shiozaki, Kenichi; and Kubo, Kanji, 4,683,533, Cl. 364-200.000.
- Takaki, Masaoki, 4,683,549, Cl. 364-900.000.
- Takeuchi, Hiroshi; Nakaya, Chitose; and Katakura, Kageyoshi,  
4,683,396, Cl. 310-358.000.
- Teranishi, Katsuya; Ozima, Kazuhira; Saito, Cyuichi; and Ogawa,  
Hiroyasu, 4,682,681, Cl. 198-333.000.
- Ueyanagi, Kiichi; Takahashi, Susumu; Usagawa, Toshiyuki;  
Umemoto, Yasunari; and Tsukada, Toshihisa, 4,683,487, Cl.  
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- Yamamoto, Etsuji; Kohno, Hideki; Kuroda, Masao; Matsui,  
Shigeru; and Shiono, Hidemi, 4,683,433, Cl. 324-309.000.
- Hitachi Medical Corporation: See—  
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- Hitchcock, William H., to Cooper Industries. Starting circuit and  
apparatus for high pressure sodium lamps. 4,683,404, Cl. 315-289.000.
- Hitec Co., Ltd.: See—  
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Chiyoji; and Nakamura, Minoru, 4,682,385, Cl. 17-45.000.
- Ho, Shih-Ming; and Radford, Kenneth C., to Westinghouse Electric  
Corp. Burnable absorber-containing nuclear fuel pellets and forma-  
tion of the same. 4,683,114, Cl. 376-419.000.
- Hobbs, Monte O.: See—  
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man, Marilyn L.; and Houghten, Richard A., 4,683,221, Cl.  
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- Hodek, Robert B.; and Seiner, Jerome A., to PPG Industries, Inc.  
Process for the preparation of an organomagnesium compound.  
4,683,344, Cl. 568-716.000.
- Hodogaya Chemical Co., Ltd.: See—  
Suzuki, Nobuo; Okamura, Kikuko; Sugiyama, Genpei; and Suzuka,  
Susumu, 4,683,188, Cl. 430-110.000.
- Hoehst Aktiengesellschaft: See—  
Bader, Rolf; Last, Hartmut; Mayer, Manfred; Rittner, Siegfried; and  
Wetzel, Edgar, 4,683,034, Cl. 203-43.000.
- Kaulich, Franz, 4,683,164, Cl. 428-287.000.
- Kolkman, Friedrich; Ressel, Herbert; Gradl, Reinhard; and  
Schimmel, Gunther, 4,683,127, Cl. 423-321.00R.
- Krakay, Tibor; Poggi, Tatjana; and Schubert, Ernst, 4,683,286, Cl.  
525-329.100.
- Kressler, Rudolf; and Oehler, Siegfried, 4,683,410, Cl. 318-696.000.
- Hoefke, Wolfgang: See—  
Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann,  
Ingrid; Gaida, Wolfram; and Hoefke, Wolfgang, 4,683,238, Cl.  
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- Hoerenz, Peter G.; and Mueller, Gerhard, to Carl-Zeiss-Stiftung. Illu-  
minance dosage device. 4,682,595, Cl. 128-303.100.
- Hoffman, Harry S., Jr.: See—  
Crisimagna, Tony N.; Hoffman, Harry S., Jr.; and Knecht, Wil-  
liam R., 4,683,470, Cl. 340-771.000.
- Hoffman, Kent C., to Murray Electronics Associates Limited. Liquid  
crystal matrix for extended range high resolution temperature map-  
ping. 4,682,605, Cl. 128-736.000.
- Hoffmann-La Roche Inc.: See—  
Gallati, Harald, 4,683,197, Cl. 435-7.000.
- Hogshead, Rodney C., III; and Van Dune, Giles, Jr. Fastener for  
plastic film sheeting. 4,682,642, Cl. 160-392.000.
- Hohl, Hans-Walter: See—  
Gunter, Andreas; Malone, James R.; Lenthe, Manfred; and Hohl,  
Hans-Walter, 4,683,308, Cl. 544-211.000.
- Hoholick, Joseph: See—  
Glass, Michael; Hoholick, Joseph; and Orlandi, Daniel A.,  
4,683,138, Cl. 426-5.000.
- Holdridge, David W., to Swedlow, Inc. Contoured transparency pro-  
viding reduced optical distortion and method for making it. 4,682,856,  
Cl. 350-319.000.
- Holdt, Bernd-Dieter; Menke, Ronald; Praus, Gerd; and Hasselbach,  
Petra, to Henkel Kommanditgesellschaft auf Aktien. Two-com-  
ponent cleaner and disinfectant tablet. 4,683,072, Cl. 252-102.000.
- Hollaway, Gerald C., Jr., to Dayco Products, Inc. Polymeric composi-  
tion and method of producing same. 4,683,270, Cl. 525-347.000.
- Hollon, Blake D.: See—  
Hollon, Edmund D.; and Hollon, Blake D., 4,682,910, Cl.  
404-94.000.
- Hollon, Edmund D.; and Hollon, Blake D. Marking system. 4,682,910,  
Cl. 404-94.000.



- Holmes, Dorothy F.: See—  
Coggins, Leroy; Murphy, Brian R.; Holmes, Dorothy F.; Anguish, Lynne J.; and Gillespie, James H., 4,683,137, Cl. 424-89.000.
- Holmgren, Klas. Floor construction suitable for installation in rooms containing switchgear, computers, and like electrical apparatus, and a method for producing such a floor construction. 4,682,453, Cl. 52-126.200.
- Holopainen, Weikko R. Ground piercing attachment for tractors. 4,682,659, Cl. 175-19.000.
- Holtey, Thomas O.; Bruce, Kenneth E.; and Goss, Gary J., to Honeywell Information Systems Inc. Multiple color generation on a display. 4,683,466, Cl. 340-703.000.
- Holy, Stephen M., to Arvidson, Joseph; Wells, Sharon K.; and Skoza, Thomas E. Collapsible, re-combinative martial-arts weapon. 4,682,774, Cl. 273-84.00R.
- Hommen, Winfried; Stauble, Georg; and Wieser, Tiberius, to Knorr-Bremse AG. Electrically controlled brake for vehicles, especially rail vehicles. 4,682,823, Cl. 303-22.00R.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Higuchi, Kazuo; Sugama, Takayuki; Okuhara, Hisakazu; and Sasaki, Kiichi, 4,682,789, Cl. 280-801.000.
- Nakajima, Toyoheti; and Mieno, Toshiyuki, 4,683,049, Cl. 204-428.000.
- Okubo, Kiyokazu, 4,682,516, Cl. 74-701.000.
- Yamada, Hiroyasu; Shiraiishi, Motoatsu; Tazuo, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,682,685, Cl. 198-621.000.
- Honda, Keiji: See—  
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- Honda, Tatsutoku; Endo, Michiyuki; Wakamatsu, Saburo; and Kudo, Yoshio, to Director-General of Agency of Industrial Science and Technology; and Showa Denko Kabushiki Kaisha. Laser-light absorber and method for absorbing laser light. 4,682,855, Cl. 330-276.00R.
- Honegger, Werner, to Ferag AG. Apparatus for unwinding flexible flat products, especially printed products, arriving continuously, especially in imbricated formation. 4,682,741, Cl. 242-55.000.
- Honeywell Inc.: See—  
Atherton, Jay W.; Castor, Raymond A.; Christie, Leonard F.; and Engerman, Robert C., 4,683,439, Cl. 330-10.000.
- Bohrer, Philip J.; Higashi, Robert E.; and Johnson, Robert G., 4,683,159, Cl. 428-138.000.
- Forsman, Allyn J., 4,682,952, Cl. 434-12.000.
- Haugland, James R., 4,683,473, Cl. 342-172.000.
- Higashi, Robert E.; James, Steven D.; Johnson, Robert G.; and Satren, Ernest A., 4,682,503, Cl. 73-755.000.
- Janssen, John E., 4,682,898, Cl. 374-179.000.
- Yount, Larry J.; Wilt, Nicholas J.; Hill, Bryan H.; and Peterson, Donald A., Jr., 4,683,532, Cl. 364-200.000.
- Honeywell Information Systems Inc.: See—  
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- Hong, You H.: See—  
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- Honig, Helmut: See—  
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- Hopkins, Thomas M., II: See—  
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- Horikawa, Tooru: See—  
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- Horiya, Keiichi; Takahama, Kazuhide; and Usami, Yutaka, to Tokyo Electric Co., Ltd. Thermal printer. 4,683,479, Cl. 346-76.0PH.
- Horn, Glenn T.: See—  
Mullis, Kary B.; Erlich, Henry A.; Arnheim, Norman; Horn, Glenn T.; Saiki, Randall K.; and Scharf, Stephen J., 4,683,195, Cl. 435-6.000.
- Horowitz, Carl; Ryan, John M.; Sanduja, Mohan L.; Sugathan, Kenneth K.; and Thottathil, Paulose P., to Forsythe Cosmetic Group, Ltd. Titanium dioxide dispersions and processes for their production. 4,683,007, Cl. 106-308.00M.
- Hosaka, Akio, to Nissan Motor Co., Ltd. Power train control method for slip prevention. 4,682,667, Cl. 180-197.000.
- Hoshino, Shigeru; and Miyata, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Apparatus for detecting a steering angle and a steering angular velocity. 4,683,375, Cl. 250-231.0SE.
- Hosoya, Jun, to Canon Kabushiki Kaisha. Projection lens. 4,682,861, Cl. 350-432.000.
- Hossner, Klaus: See—  
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- Houghten, Richard: See—  
Zimmerman, Theodore S.; Ruggeri, Zaverio M.; and Houghten, Richard, 4,683,291, Cl. 530-324.000.
- Houghten, Richard A.: See—  
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- House, Marshall K., to Cascade Corporation. Lift truck clamp for handling stacked loads of different sizes. 4,682,931, Cl. 414-623.000.
- Huang, Ken T.: See—  
Watkins, James R., Jr.; and Huang, Ken T., 4,683,585, Cl. 379-426.000.
- Huang, Wann-Sheng; and Hight, Margaret A., to Texaco Inc. Producing hydrocarbons through successively perforated intervals of a horizontal well between two vertical wells. 4,682,652, Cl. 166-263.000.
- Huard, Jean-Francois, to Tunzini Nessi Entreprises d'Equipements. Coupling device for tubes, tubular elbows and end plates of thermoelectric devices. 4,682,472, Cl. 62-3.000.
- Hubble, Terence H., to P & H Enterprises Limited (Musical Products). Protective cover for window sills. 4,682,451, Cl. 52-97.000.
- Hughes Aircraft Company: See—  
Blackstone, Gary W., 4,683,471, Cl. 340-825.500.
- Lee, William W. Y.; and Chang, Kuang-Yeh, 4,683,488, Cl. 357-42.000.
- Macaulay, Malcolm; and Singleton, William F., 4,683,467, Cl. 340-705.000.
- Stadnick, Steven J.; and Rogers, Howard H., 4,683,178, Cl. 429-101.000.
- Welner, Jerome M., 4,682,888, Cl. 356-73.000.
- Hughes, Philip M.; and McHugh, Michael W. Drilling apparatus. 4,682,661, Cl. 175-215.000.
- Hulek, Anton, to Voest-Alpine. Continuous casting mold for selectively casting strands of different widths and thicknesses and a method for operating the continuous casting mold. 4,682,646, Cl. 164-481.000.
- Hummel, Heinz P., to Leybold-Heraeus GmbH. Process and apparatus for measuring differences in the concentrations of paramagnetic components of gases. 4,683,426, Cl. 324-204.000.
- Humphries, John; and Morrison, Neil S., to United Kingdom Atomic Energy Authority. Cold trap apparatus. 4,683,056, Cl. 210-186.000.
- Huni, Jean-Paul R.: See—  
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- Hunkele, Paul W.: See—  
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- Hunt, Barry E.; Herro, Harvey M.; Lee, Kyu-Hwa; and Mindick, Morris, to Nalco Chemical Company. Method for in situ corrosion detection using electrochemically active compounds. 4,683,035, Cl. 204-1.00T.
- Hunter, Robert F. Animal trap. 4,682,440, Cl. 43-61.000.
- Hurnik, Helmut: See—  
Lindner, Christian; Brudermanns, Karola; Waniczek, Helmut; Uerdinger, Walter; and Hurnik, Helmut, 4,683,267, Cl. 525-133.000.
- Hurst, James: See—  
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- Hurten, Oskar; Vogt, Hans; and Stutenkemper, Paul, to Ford Motor Company. Motor vehicle body side wall. 4,682,812, Cl. 296-195.000.
- Hurumoto, Kunihiko: See—  
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- Hurwitz, James D. Internal lid for a liquid container. 4,682,705, Cl. 220-93.000.
- Husky Injection Molding Systems Ltd.: See—  
Schad, Robert D., 4,682,945, Cl. 425-549.000.
- Huss, Heinrich. Car body. 4,682,809, Cl. 296-31.00P.
- Hydro-Quebec: See—  
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- Drouet, Michel G., 4,683,367, Cl. 219-121.0PY.
- Hynes, Martin D., to Eli Lilly and Company. Analgesic method. 4,683,235, Cl. 514-282.000.
- Ichikoh Engineering, Ltd.: See—  
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- ICI Americas Inc.: See—  
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- ICT Integrated Circuit Testing Gesellschaft, fuer Halbleiterprueftechnik mbH: See—  
Feuerbaum, Hans-Peter, 4,683,376, Cl. 250-309.000.
- Ide, Fumito: See—  
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- Idota, Yoshio; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Toners for silver halide diffusion transfer image with sulfo or carboxyl groups. 4,683,189, Cl. 430-248.000.
- Ienaga, Kazuharu; Nakamura, Ko; and Ishii, Akira, to Nippon Zoki Pharmaceutical Co., Ltd. Pharmaceutical composition containing an imidazolidinetrione derivative or pharmaceutically acceptable salt thereof. 4,683,240, Cl. 514-390.000.
- Igarashi, Tsutomu: See—  
Takeda, Kazuma; and Igarashi, Tsutomu, 4,683,462, Cl. 340-571.000.
- Ihama, Mikio; Tani, Tadaaki; and Ohnishi, Hiroshi, to Fuji Photo Film Co., Ltd. Process for producing silver halide photographic emulsion. 4,683,193, Cl. 430-570.000.
- Iida, Koujiro; Yoshioka, Yasuo; Ogawa, Hiroshi; Haruno, Kiyoshi; and Ohigashi, Tsugio, to Matsushita Electric Industrial Co., Ltd. Bill receiving/dispensing apparatus. 4,682,768, Cl. 271-3.100.
- Iijima, Kenzaburo; and Hayashi, Yoshinori, to Nippon Gakki Seizo Kabushiki Kaisha. Method for producing a shadow mask for a color cathode ray tube. 4,683,013, Cl. 148-102.000.
- Iijima, Takashi: See—  
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- Iizuka, Tetsuya: See—  
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- Ikeda, Hiroki; and Takanashi, Nobuaki, to NEC Corporation. Joint assembly movable like a human arm. 4,683,406, Cl. 318-568.000.
- Ikeda, Toshiaki: See—  
Iwamoto, Tadashi; Ikeda, Toshiaki; Yukitomo, Kazuo; Hattori, Masachi; Arakawa, Kaneyasu; Kihira, Koichi; and Hanaki, Akira, 4,683,403, Cl. 315-83.000.
- Ikeda, Yoshiaki: See—  
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- Imai, Chihoro: See—  
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- Immunetech, Inc.: See—  
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- Imori, Hideo; and Adachi, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Terminal structure for an automotive AC generator. 4,683,390, Cl. 310-71.000.
- Imperial Chemical Industries Limited: See—  
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- Imperial Chemical Industries PLC: See—  
Brown, David; Dowell, Robert I.; Hargreaves, Rodney B.; and Main, Brian G., 4,683,232, Cl. 514-228.000.
- Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,683,310, Cl. 546-321.000.
- Kirkland, Karin M.; and Mant, Derrick M., 4,683,228, Cl. 514-211.000.
- Inaba, Yasuhisa: See—  
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- Inaba, Yutaka; and Ando, Yujiro, to Canon Kabushiki Kaisha. Ion generating device and method of manufacturing same. 4,683,482, Cl. 346-159.000.
- Inaba, Yutaka: See—  
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- Industrial Metal Products Corporation: See—  
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- Ing. C. Olivetti & C., S.p.A.: See—  
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- Carena, Ugo; Coli, Giuseppe; and Fogaroli, Giuseppe, 4,683,501, Cl. 358-293.000.
- Ingram, Douglas E.: See—  
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- Inoue, Akio; and Tanabe, Tsuneaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Acrylonitrile polymer film and process for preparing same. 4,683,261, Cl. 524-566.000.
- Inoue, Akira; Nomura, Shinichi; and Hanami, Osamu, to Seiko Seiki Kabushiki Kaisha. Stepping motor control apparatus. 4,683,408, Cl. 318-696.000.
- Inoue, Kiyoshi; and Nose, Yoshiharu, to Nippon Oil Co., Ltd. Method for producing alkaline earth metal borate dispersions. 4,683,126, Cl. 423-280.000.
- Inoue, Koi; Go, Youki; and Naeki, Yoshihiro, to Daiwa Seiko Inc. Fishingline guide for fishing rod. 4,682,439, Cl. 43-24.000.
- Inoue, Shunichi: See—  
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- Inoue, Tokuta: See—  
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- Institut Textile de France: See—  
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- Intamin Corporation: See—  
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- Intel Corporation: See—  
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- Interatom GmbH: See—  
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- International Business Machines Corporation: See—  
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- DeGroot, Richard D., 4,683,547, Cl. 364-748.000.
- Himelstein, Carol S.; and Wang, John S., 4,683,468, Cl. 340-709.000.
- Itoh, Masaharu; Yokemura, Taketoshi; and Yanagisawa, Hiroshi, 4,682,869, Cl. 358-260.000.
- Schmidt, Laurence J.; Severson, Randall L.; Tufty, Lyle R.; and Voss, Steven H., 4,683,505, Cl. 360-98.000.
- International Flavors & Fragrances Inc.: See—  
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- Internationale Octrooi Maatschappij "Octropa" BV: See—  
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- Interplastic Corporation: See—  
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- Intersil, Inc.: See—  
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- Intevp, S.A.: See—  
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- Inuzuka, Hideo: See—  
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- Irving, Arillian. Clothes drying apparatus. 4,682,424, Cl. 34-151.000.
- Irwin Company, The: See—  
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- ISC Cardion Electronics, Inc.: See—  
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- Iscar Ltd.: See—  
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- Ishibashi, Jiro: See—  
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- Ishihama, Toshio: See—  
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- Ishihara Sangyo Kaisha Ltd.: See—  
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- Ishihara, Takafumi: See—  
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- Ishihara, Tamio: See—  
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- Ishii, Akira: See—  
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- Ishii, Yoshihiro: See—  
Tokuno, Masateru; Sawada, Tetsuya; and Ishii, Yoshihiro, 4,682,743, Cl. 242-58.600.
- Ishikawa, Hidehiko; Matsuura, Kazuo; and Misaki, Hideo, to Toyo Jozo Kabushiki Kaisha. Novel maltose dehydrogenase, process for its production, and analytical method using the same. 4,683,198, Cl. 435-22.000.
- Ishikawa, Kenji: See—  
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- Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp, Adam, to Miles Laboratories, Inc. Viability test device. 4,683,209, Cl. 436-14.000.
- Isonaga, Tomichi: See—  
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- Israel Aircraft Industries Ltd.: See—  
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- ITV/CLM Impianti Tecnici Industriali SpA: See—  
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- Ito, Hiroshi: See—  
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- Ito, Ryoze: See—  
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- Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, to Mitsui Toatsu Chemicals, Incorporated. Agent for absorbing and releasing water vapor. 4,683,258, Cl. 524-434.000.
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- Itoh, Masaharu; Yokemura, Taketoshi; and Yanagisawa, Hiroshi, to International Business Machines Corporation. Image processing system and method. 4,682,869, Cl. 358-260.000.
- Itoh, Yoshitoshio; Mizuno, Katsuhiko; and Noguchi, Atomi, to Hitachi, Ltd. Apparatus for transmitting optical image. 4,682,845, Cl. 350-96.180.
- ITT Corporation: See—  
Elsmore, Jeff; Stoorza, Kenneth W.; and Walker, Timothy A., 4,683,469, Cl. 340-723.000.
- White, John S.; Vaughan, A. Dahlgren; and Akers, Francis I., 4,682,850, Cl. 350-96.230.
- ITT Industries, Inc.: See—  
Mlynec, Daniel, 4,683,548, Cl. 364-786.000.
- Scovell, Peter D., 4,683,363, Cl. 219-10.55A.
- ITW Ateco: See—  
Freudenmann, Kurt; and Wiese, Heiner, 4,682,748, Cl. 248-73.000.
- Iwai, Shingo: See—  
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- Iwamoto, Tadashi; Ikeda, Toshiaki; Yukitomo, Kazuo; Hattori, Masachi; Arakawa, Kaneyasu; Kihira, Koichi; and Hanaki, Akira, to Mazda Motor Corporation. Dimmer passing device for headlamp of vehicle. 4,683,403, Cl. 315-83.000.
- Iwasaki, Yukio: See—  
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- J. I. Case Company: See—  
Klee, Maurice; Peterson, Robert T.; Cochran, Gary L.; Dawson, James E.; and Anderson, Robert M., 4,682,666, Cl. 180-89.130.
- Jac Jacobsen A/S: See—  
Krogsrud, Jens C.; and Sorensen, Kai O., 4,683,526, Cl. 362-346.000.



- Jahnke, Serge, to Framatome & Cie. Wiring installation above the cover of a nuclear reactor vessel for connection of electric devices. 4,683,106, Cl. 376-259.000.
- James, Steven D.: See—  
Higashi, Robert E.; James, Steven D.; Johnson, Robert G.; and Satren, Ernest A., 4,682,503, Cl. 73-755.000.
- Janke, Donald E., to Whirlpool Corporation. Temperature responsive baffle control circuit for a refrigerator. 4,682,474, Cl. 62-187.000.
- Jansen-Herfeld, Roettger, to Richard Jansen GmbH. Hydraulic saw frame with external sealing means. 4,682,525, Cl. 83-751.000.
- Janssen, John E., to Honeywell Inc. Method and apparatus for measuring a varying parameter. 4,682,898, Cl. 374-179.000.
- Janssen, Peter J.: See—  
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- Japan Atomic Energy Research Institute: See—  
Nagashima, Akira; and Sukegawa, Osamu, 4,683,576, Cl. 372-98.000.
- Japan Synthetic Rubber Co., Ltd.: See—  
Ukachi, Takashi; Bessho, Keiichi; Kumano, Atsushi; Matsumura, Yoshio; and Ansel, Robert E., 4,683,280, Cl. 528-71.000.
- Jaqua, Vance W.: See—  
Feight, Robert A.; Jaqua, Vance W.; and Trom, Joseph, Jr., 4,682,779, Cl. 277-34.300.
- Jarrett, Steven M.: See—  
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., 4,683,575, Cl. 372-59.000.
- Jarry, Philippe; Haji, Mohamed L.; Guittard, Pierre; Guillemet, Bernard; and Piaget, Claude, to U.S. Philips Corporation. Vitreous semiconductor supporting structure and device realized with such a structure. 4,683,163, Cl. 428-209.000.
- Jaswa, Vilay C.: See—  
Bedard, James F.; and Jaswa, Vilay C., 4,683,570, Cl. 371-36.000.
- Javeri, Rupin J., to Motorola, Inc. Frequency subtractor. 4,683,437, Cl. 328-133.000.
- Jean, San B. Massage-functional pedal structure. 4,682,771, Cl. 272-73.000.
- Jeffers, Frederick J.; and Simonds, John L., to Eastman Kodak Company. Magneto-resistive head with reduced thermal noise. 4,683,508, Cl. 360-113.000.
- Jentry, Danny R. Quick attach and release base. 4,682,561, Cl. 114-363.000.
- Jett, Thomas M., Jr. Ammunition round. 4,682,545, Cl. 102-430.000.
- Jeuch, Pierre: See—  
Hartmann, Joel; and Jeuch, Pierre, 4,682,403, Cl. 29-571.000.
- Jewett, Walter L.: See—  
Ernst, M. Eric; and Jewett, Walter L., 4,682,719, Cl. 224-310.000.
- Jindrick, James A.; Patil, Shashikant M.; Morrison, Margaret S.; and Page, Littleton D., to Burr-Brown Corporation. Personal computer instrumentation system including carrier board having bus-oriented plug-in instrumentation modules. 4,683,550, Cl. 364-900.000.
- Jochem, Cornelis M. G.: See—  
Broer, Dirk J.; Zwiers, Renso J. M.; and Jochem, Cornelis M. G., 4,682,853, Cl. 350-128.000.
- John D. Hollingsworth on Wheels, Inc.: See—  
Pinto, Akiva, 4,682,388, Cl. 19-105.000.
- John Davis & Son (Derby) Limited: See—  
Moore, Robert H.; and Morgan, Paul, 4,682,847, Cl. 350-96.200.
- John Zink Company: See—  
Rieckman, Roger A.; Hemrich, William R.; Jursich, Donald N.; and Crowley, George C., 4,683,369, Cl. 219-364.000.
- Johnson, Alan R.; and Yawberg, Richard C., to Owens-Corning Fiberglass Corporation. Methods of making glass wool blowing insulation. 4,682,523, Cl. 83-19.000.
- Johnson, Donald K.: See—  
Green, Kenneth E.; Johnson, Donald K.; and Woodruff, Roger W., 4,682,568, Cl. 122-235.000.
- Johnson, Douglas W. Adjustable breast bridge for use in multiple-plane interstitial breast implants. 4,682,593, Cl. 128-303.000.
- Johnson, Gerald T., Sr. Swather with swinging hitch. 4,682,462, Cl. 56-228.000.
- Johnson Matthey & Company, Limited: See—  
Selman, Gordon L.; and Midgley, Richard J., 4,683,119, Cl. 420-444.000.
- Johnson, Pierce, Jr., to GTE Products Corporation. Compact incandescent coiled coil filament. 4,683,397, Cl. 313-344.000.
- Johnson, Robert G.: See—  
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- Higashi, Robert E.; James, Steven D.; Johnson, Robert G.; and Satren, Ernest A., 4,682,503, Cl. 73-755.000.
- Johnson, Samuel A., to Hewlett-Packard Company. Thermal ink jet common-slotted ink feed printhead. 4,683,481, Cl. 346-140.000.
- Jona, Mario, to Campagnolo S.p.A. Toe clip for bicycle pedals. 4,682,514, Cl. 74-594.600.
- Jones, Franklin B.; Milberger, Walter E.; and Kerfoot, Charles S., to United States of America, Air Force. Quadrature switch apparatus for multi mode phase shift drivers. 4,683,387, Cl. 307-571.000.
- Jones, Norman S., to Pneupac Limited. Resuscitator/ventilator. 4,682,591, Cl. 128-204.250.
- Jones, Stanley P.: See—  
Foster, Thomas V.; Jones, Stanley P.; and Alderson, David L., 4,682,996, Cl. 65-25.100.
- Jones, Thomas H.: See—  
MacDonald, Daniel J.; and Jones, Thomas H., 4,683,392, Cl. 310-105.000.
- Jordan, Chalmer; Connor, Lee; and Lybarger, Robert, to Saegertown Manufacturing Corporation. Spike forming method. 4,682,381, Cl. 10-63.000.
- Joseph Galkin Corporation: See—  
Block, Charles, 4,682,556, Cl. 112-265.100.
- Josey, Alden D., to Du Pont de Nemours, E. I., and Company. Process for the nucleophilic substitution of unactivated aromatic and heteroaromatic substrates. 4,683,091, Cl. 260-543.00R.
- Jovell, Robert J.: See—  
de Macario, Everly C.; Jovell, Robert J.; and Macario, Alberto J. L., 4,682,890, Cl. 356-244.000.
- de Macario, Everly C.; Jovell, Robert J.; and Macario, Alberto J. L., 4,682,891, Cl. 356-244.000.
- Joy Manufacturing Company: See—  
Shelton, William S., 4,682,757, Cl. 251-77.000.
- Joy, Stanley E. Hand-held apparatus and method for loosening, aerating and fertilizing soil plant roots. 4,682,550, Cl. 111-7.100.
- Judes, Avie: See—  
Beihoff, Bruce C.; Judes, Avie; and Baran, Michael S., 4,683,515, Cl. 361-106.000.
- Judge, Edward E., Jr.: See—  
Judge, Norman R.; Judge, Edward E., Jr.; and Reiser, Arthur G., 4,682,444, Cl. 51-154.000.
- Judge, Norman R.; Judge, Edward E., Jr.; and Reiser, Arthur G., to Industrial Metal Products Corporation. Microfinishing apparatus and method. 4,682,444, Cl. 51-154.000.
- Jungkind, Roland, to adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG. Cross-country ski binding. 4,682,785, Cl. 280-615.000.
- Jursich, Donald N.: See—  
Rieckman, Roger A.; Hemrich, William R.; Jursich, Donald N.; and Crowley, George C., 4,683,369, Cl. 219-364.000.
- Kabushiki Kaisha Fujikoshi: See—  
Hariki, Kazuo, 4,683,544, Cl. 364-513.000.
- Kabushiki Kaisha Kaneda Kikai Seisakusho: See—  
Watanabe, Takemi; and Shiba, Noriyuki, 4,683,022, Cl. 156-505.000.
- Kabushiki Kaisha Tamura Seisakusho: See—  
Masuda, Tsugunori; and Muto, Shoji, 4,682,563, Cl. 118-503.000.
- Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: See—  
Katsuno, Mitsuaki; Gyoda, Toshio; Tanaka, Hideki; Hurumoto, Kunihiro; Yoshitsugu, Noritada; and Matsui, Kenji, 4,682,790, Cl. 280-801.000.
- Kabushiki Kaisha Toshiba: See—  
Koshino, Masayoshi, 4,683,394, Cl. 310-313.00R.
- Matsunaga, Yoshiyuki, 4,683,580, Cl. 377-60.000.
- Murakami, Reiji; Hashimoto, Shinichi; Shimono, Mamoru; and Ide, Fumito, 4,682,769, Cl. 271-10.000.
- Nakatsugawa, Norihiko, 4,683,460, Cl. 340-545.000.
- Okazaki, Yukio, 4,683,401, Cl. 315-39.000.
- Sakurai, Takayasu; and Iizuka, Tetsuya, 4,683,382, Cl. 307-296.00R.
- Sasaki, Hiroshi, 4,682,497, Cl. 73-602.000.
- Kaelin, G. Robert: See—  
Young, James P.; Weber, Robert J.; and Kaelin, G. Robert, 4,683,443, Cl. 330-277.000.
- Kaeseler, Werner. Method for reconditioning spot welding electrodes. 4,682,487, Cl. 72-354.000.
- Kaesler, Ralph W.: See—  
Rose, Gerard R.; Kaesler, Ralph W.; and Fong, Dodd W., 4,683,066, Cl. 210-734.000.
- Kagan, Neil. Balancing figure toy building blocks. 4,682,966, Cl. 446-101.000.
- Kageyama, Ryoichi: See—  
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,682,685, Cl. 198-621.000.
- Kagstrom, Per-Olof; and Abrahamsson, Lars, to Granges Aluminium Aktiebolag. Method and apparatus for cleaning watery ventilating air containing liquids which have been gasified during cooling or lubrication of converting machines, particularly rolling mills. 4,682,990, Cl. 55-80.000.
- Kahn, Manfred: See—  
Rice, Roy W.; Kahn, Manfred; and Shadwell, Damian E., 4,683,161, Cl. 428-178.000.
- Kaiser, Klaus-Peter: See—  
Viertel, Lothar; and Kaiser, Klaus-Peter, 4,683,522, Cl. 362-135.000.
- Kakii, Toshiaki; Matsuno, Koichiro; Kawada, Osamu; Ito, Ryojo; and Nakamura, Eiji, to Nippon Telegraph & Telephone Corporation; and Nippon Kogaku K.K. Method and apparatus for simultaneously observing a transparent object from two directions. 4,682,864, Cl. 350-511.000.
- Kakiuchi, Shinichi; Saito, Tasuku; and Tomita, Seisuke, to Bridgestone Corporation. Rubber compositions for solid golf balls. 4,683,257, Cl. 524-432.000.
- Kakushima, Masatoshi: See—  
Frenette, Richard; Rokach, Joshua; Kakushima, Masatoshi; and Young, Robert N., 4,683,325, Cl. 560-10.000.
- Kambayashi, Hiroaki; and Okada, Yasuyuki, to Hitachi, Ltd. System for on-line and off-line display. 4,683,552, Cl. 364-900.000.
- Kamikawara, Toshio, to NEC Corporation. Electronic attenuation value control circuit in which switching noise is suppressed. 4,683,386, Cl. 307-549.000.

- Kamio, Hideo: See—  
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.
- Kammann, Karl P., Jr.; and Troxel, Kathleen A., to Ferro Corporation. Aqueous corrosion inhibitor compositions of a half-amide and a dicarboxylic acid amine salt. 4,683,081, Cl. 252-392.000.
- Kanbe, Junichiro; Okada, Shinjiro; Takahashi, Tohru; and Ando, Yujiro, to Canon Kabushiki Kaisha. Liquid crystal device having reduced-pressure region in communication with ferroelectric liquid crystal. 4,682,858, Cl. 350-334.000.
- Kaneda, Naoya: See—  
Toyama, Masamichi; Kaneda, Naoya; and Fujibayashi, Kazuo, 4,682,886, Cl. 356-1.000.
- Kaneda, Yutaka: See—  
Miyoshi, Masato; Kaneda, Yutaka; and Ohga, Juro, 4,683,590, Cl. 381-71.000.
- Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—  
Maeda, Hirofumi; and Akamatsu, Naruhiko, 4,682,989, Cl. 55-23.000.
- Kanehara, Kenji: See—  
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,682,496, Cl. 73-204.000.
- Kanehira, Kenichi: See—  
Kume, Hisao; Nishihara, Tokihiro; Shirasaka, Hiroharu; Kanehira, Kenichi; and Saita, Koji, 4,682,965, Cl. 445-37.000.
- Kaneko, Takashi, to NEC Corporation. Pulse number detection circuit. 4,683,385, Cl. 307-518.000.
- Kaneko, Toshio: See—  
Mirua, Kono; Takimoto, Hiroshi; Kaneko, Toshio; Ohta, Tokuya; Kobayashi, Masatsune; and Eida, Tsuyoshi, 4,683,002, Cl. 106-20.000.
- Kanerva, Heikki: See—  
Tammisalo, Erkki; Kanerva, Heikki; Aarnio, Jaakko; Wederhorn, Markku; and Laner, Kai, 4,683,581, Cl. 378-38.000.
- Kang, Kwon J. Process for manufacturing an herb tea from the leaves of Ginkgo, Persimmon and Pine. 4,683,140, Cl. 426-597.000.
- Kanno, Yoshiaki; and Nishimura, Yukinobu, to Mitsubishi Denki Kabushiki Kaisha. Fuel control system for internal combustion engine. 4,683,539, Cl. 364-431.050.
- Kano, Takenori: See—  
Sumiya, Koji; Kano, Takenori; Kubo, Seitoku; and Watanabe, Kazuaki, 4,682,534, Cl. 92-130.00R.
- Kao, Ching-Ho. Multi-purpose building block. 4,682,967, Cl. 446-113.000.
- Kappeler, Otmär, to Deutsche ITT Industries GmbH. Generator circuit for generating two sinusoidal signals with a phase difference of 90 degrees. 4,683,444, Cl. 331-25.000.
- Kara, Stephen. Head and guide cleaning device for video tape recorder. 4,683,511, Cl. 360-132.000.
- Karasawa, Akira: See—  
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.
- Kargetta, David J.: See—  
Thomas, Bradley S.; and Kargetta, David J., 4,682,806, Cl. 294-88.000.
- Karner, Gary M., to Atlantic Richfield Company. Control system for inclined impact-type surface seismic source. 4,683,558, Cl. 367-189.000.
- Kasada, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Carburetion type burning apparatus. 4,682,946, Cl. 431-14.000.
- Kasai, Masaaki; and Ishikawa, Kenji, to Terumo Kabushiki Kaisha. Stopper for medical container. 4,682,703, Cl. 215-247.000.
- Kasai, Masaji: See—  
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.
- Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, to Fukutome Meat Packers, Ltd.; and Hitec Co., Ltd. Method and apparatus for automatically suspending sausages from a bar. 4,682,385, Cl. 17-45.000.
- Kase, Hiroshi: See—  
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.
- Kashiwa, Michiaki: See—  
Kurosu, Noriaki; Ohmae, Masanori; and Kashiwa, Michiaki, 4,683,540, Cl. 364-468.000.
- Kashu, Seiichi: See—  
Hayashi, Chikara; and Kashu, Seiichi, 4,683,118, Cl. 419-23.000.
- Kasner, William H.; Cooper, Martin H.; Swenson, Clark E.; Ciez, Albert P.; and Andrews, Katherine M., to Westinghouse Electric Corp. Laser beam transport system. 4,683,365, Cl. 219-121.0LC.
- Katakura, Kageyoshi: See—  
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- Kataoka, Hiroshi. Device for taking out sheet rolls and mounting sheet roll cores. 4,682,929, Cl. 414-589.000.
- Kato, Kenji; Inoue, Tokuta; Nakanishi, Kiyoshi; and Matsushita, Soichi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for reducing NOx in internal combustion engine. 4,682,577, Cl. 123-492.000.
- Kato, Masayuki; Taguchi, Yoshio; Imai, Chihiro; and Makishima, Tokuo, deceased (by Makishima, Nobuko, legal representative), to Toa Nenryo Kogyo Kabushiki Kaisha. Methylstyrene maleimide copolymer. 4,683,275, Cl. 526-262.000.
- Kato, Shigeru, to Pioneer Electronic Corporation. Noise reduction compression system controlled by compressed output components which are in-band. 4,683,449, Cl. 333-14.000.
- Katoh, Itsuro, to Sharp Kabushiki Kaisha. Electrophotographic copier. 4,682,879, Cl. 355-3.000.
- Katsumata, Ryoichi; Ozaki, Akio; Oka, Tetsuo; and Furuya, Akira, to Kyowa Hakko Kogyo Co., Ltd. Method for transforming microorganisms. 4,683,205, Cl. 435-172.300.
- Katsuno, Mitsuaki; Gyoda, Toshio; Tanaka, Hideki; Hurumoto, Kunihiro; Yoshitsugu, Noritada; and Matsui, Kenji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho; and Toyota Jidosha Kabushiki Kaisha. Webbing retaining structure. 4,682,790, Cl. 280-801.000.
- Katsuragawa Denki Kabushiki Kaisha: See—  
Takizawa, Tatsuji; Noda, Nobutaka; and Takigawa, Hideaki, 4,682,878, Cl. 355-3.0FU.
- Katz, Gary P. Tamper-proof container. 4,682,701, Cl. 215-230.000.
- Kaufman, Vernon R.; and Geringer, Miles S., to Tecumseh Products Company. Exhaust gas recirculation system for crankcase scavenged two cycle engine. 4,682,571, Cl. 123-73.00A.
- Kaulich, Franz, to Hoechst Aktiengesellschaft. Nonwoven for manufacturing flameproof roofing sheets. 4,683,164, Cl. 428-287.000.
- Kawabata, Takashi: See—  
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- Kawada, Haruki: See—  
Saito, Kenji; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nishimura, Yukuo; and Nakagiri, Takashi, 4,682,897, Cl. 374-45.000.
- Kawada, Osamu: See—  
Kakii, Toshiaki; Matsuno, Koichiro; Kawada, Osamu; Ito, Ryojo; and Nakamura, Eiji, 4,682,864, Cl. 350-511.000.
- Kawamoto, Isao: See—  
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.
- Kawasaki Jukogyo Kabushiki Kaisha: See—  
Fujikawa, Tetsuzo; Hirata, Makizo; and Tamba, Shinichi, 4,682,573, Cl. 123-90.200.
- Kazooka, Kenichi; Okazaki, Hiroshi; and Inaba, Yasuhisa, to Aisin Seiki Kabushiki Kaisha. Flexible mounting. 4,682,763, Cl. 267-89.000.
- Kea, Sandra; Walker, Charles E.; and Kline, Eric, to Nebraska Department of Economic Development. Sugar esters and an improved anhydrous method of manufacture. 4,683,299, Cl. 536-119.000.
- Kelch, Russell K.; Finckel, Don C.; Girard, Donald J.; Seever, Daniel B.; Briggs, Barry D.; and Mathes, Gene R., to NCR Corporation. Polling method for data processing system. 4,683,531, Cl. 364-200.000.
- Keller, Ron F., to GTE Government Systems Corporation. Method of extracting insulated wires from a shielded cable. 4,682,413, Cl. 29-825.000.
- Kelley Company Inc.: See—  
Bennett, Mark A., 4,682,382, Cl. 14-71.300.
- Kemp, Charles W., to Canadian Corporate Management Co., Ltd. Load sensing systems for conveyor weigh scales. 4,682,664, Cl. 177-16.000.
- Kenjo, Hideyuki: See—  
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- Kennecott Corporation: See—  
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- Kerfoot, Charles S.: See—  
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- Kerr, J. Russell: See—  
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- Kerr, Jack R.; Dunsmore, Gerald L.; and Shelton, Thomas V. Self-locking nut device and method. 4,682,924, Cl. 411-329.000.
- Kessler, Milton. Carrier with indicia mounting means. 4,682,692, Cl. 206-459.000.
- Kessler, Ronald N.; and Ullman, Myron E., to Boardman Molded Products, Inc. Floating cap seal. 4,682,704, Cl. 215-329.000.
- Keystone International, Inc.: See—  
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- Kido, Yoshinobu; and Yamada, Toshihiro, to Mazda Motor Corporation. Shifting timing indicating system for a vehicle. 4,683,455, Cl. 340-52.00R.
- Kihira, Koichi: See—  
Iwamoto, Tadashi; Ikeda, Toshiaki; Yukitomo, Kazuo; Hattori, Masaichi; Arakawa, Kaneyasu; Kihira, Koichi; and Hanaki, Akira, 4,683,403, Cl. 315-83.000.
- Kim, Choung U., to Bristol-Myers Company. Carbenem antibiotics. 4,683,301, Cl. 340-350.000.
- Kim, Soo K., to Gold Star Co., Ltd. Device for variably adjusting a moment of inertia of a drum of a videocassette recorder. 4,683,512, Cl. 360-137.000.
- Kimberly-Clark Corporation: See—  
Floyd, David T.; Shanklin, Garry L.; Lynch, Gordon E.; and Meitner, Gary H., 4,683,001, Cl. 106-3.000.



Kimura, Shoichi, to Nohmi Bosai Kogyo Co., Ltd. Gas and fire alarm and control system for semiconductor factories or the like. 4,683,463, Cl. 340-629.000.

Kindlmann, Peter J.; and Lewis, Brian G., to Olin Corporation. Control system for electromagnetic casting of metals. 4,682,645, Cl. 164-453.000.

King, Eddie W.: See—  
Brandes, John H.; King, Eddie W.; and Summerville, Don S., 4,682,709, Cl. 221-2.000.

King, Halm C., Jr.; and King, Nancy. Utility insulated cross-arm. 4,682,747, Cl. 248-68.100.

King Instrument Corporation: See—  
Woodley, George M.; and Bakes, William S., 4,682,742, Cl. 242-56.00R.

King, Nancy: See—  
King, Halm C., Jr.; and King, Nancy, 4,682,747, Cl. 248-68.100.

King-Seely Thermos Co.: See—  
Nelson, Kenneth L., 4,682,475, Cl. 62-354.000.

Kinoshita, Tomohiro; Tanabe, Seichi; and Sakakawa, Eishiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Power generation system in fuel cell. 4,683,177, Cl. 429-26.000.

Kinsman, Donald V.: See—  
Luken, Clement H., Jr.; and Kinsman, Donald V., 4,682,947, Cl. 431-288.000.

Kioritz Corporation: See—  
Nagashima, Akira, 4,682,830, Cl. 439-224.000.

Kipling, Graham V., to Diesel Equipment Limited. Modulator valve. 4,682,621, Cl. 137-116.300.

Kirkland, Karin M.; and Mant, Derrick M., to ICI Americas Inc.; and Imperial Chemical Industries PLC. Guanidinopyrazolylamides, guanidimimidazolylamides, compositions containing them, and method of using them to inhibit gastric acid secretion. 4,683,228, Cl. 514-211.000.

Kishimoto, Keiichi: See—  
Yoshitake, Makoto; and Kishimoto, Keiichi, 4,683,319, Cl. 556-425.000.

Kitamura, Hideaki; Fujiki, Syogo; and Yamada, Mitsuhiro, to Dainippon Screen Mfg. Co., Ltd. Method for reproducing picture image. 4,683,500, Cl. 358-280.000.

Kitamura, Nobuo: See—  
Shimada, Satoshi; Kitamura, Nobuo; Shikakura, Kunio; and Maeda, Namio, 4,683,491, Cl. 358-56.000.

Kiyohara, Shyuichi: See—  
Ohmura, Hiroshi; Tsunekawa, Tokuchi; Kiyohara, Shyuichi; and Kawabata, Takashi, 4,682,873, Cl. 354-478.000.

Klann, Horst. Device for pushing wheel flange hubs and splined flange hubs of motor vehicles out of a shaft bearing. 4,682,395, Cl. 29-261.000.

Klee, Maurice; Peterson, Robert T.; Cochran, Gary L.; Dawson, James E.; and Anderson, Robert M., to J. I. Case Company. Operator compartment assembly. 4,682,666, Cl. 180-89.130.

Kline, Eric: See—  
Kea, Sandra; Walker, Charles E.; and Kline, Eric, 4,683,299, Cl. 536-119.000.

Klompburg, Mario V., to Rolscen Company. Sliding window construction. 4,682,455, Cl. 52-207.000.

Knapp, Fum F., Jr.; Butler, Thomas A.; and Brihaye, Claude, to United States of America, Energy. Osmium-191/iridium-191m radionuclide. 4,683,123, Cl. 423-2.000.

Knecht, William R.: See—  
Crisimagna, Tony N.; Hoffman, Harry S., Jr.; and Knecht, William R., 4,683,470, Cl. 340-771.000.

Knifton, John F.; and Grice, Neal J., to Texaco Inc. Catalytic process for the preparation of linear polyethylenepolyamines with tungstophosphoric acid or molybdophosphoric acid-on-titania catalysts. 4,683,335, Cl. 564-480.000.

Knorowski, Victor J.; Hean, Charles R.; and Placek, Ronald J., to General Electric Company. Wheel anti-rotation means. 4,682,934, Cl. 416-198.00A.

Knorr-Bremse AG: See—  
Hommen, Winfried; Stauble, Georg; and Wieser, Tiberius, 4,682,823, Cl. 303-22.00R.

Knuepfer, Wolfgang: See—  
Haas, Werner; Knuepfer, Wolfgang; and Pfeiler, Manfred, 4,682,600, Cl. 128-328.000.

Kobayashi, Masashi, to Maruman Golf Co., Ltd. Device for measuring a stiffness of a golf-club shaft. 4,682,504, Cl. 73-854.000.

Kobayashi, Masatsune: See—  
Mirua, Konoe; Takimoto, Hiroshi; Kaneko, Toshio; Ohta, Tokaya; Kobayashi, Masatsune; and Eida, Tsuyoshi, 4,683,002, Cl. 106-20.000.

Kobayashi, Sadao: See—  
Ito, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.

Kobayashi, Seishichi: See—  
Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,683,263, Cl. 525-57.000.

Kobayashi, Tomio: See—  
Yamauchi, Kazushi; Ogata, Muneyuki; Kobayashi, Tomio; Kubota, Makoto; and Kumura, Tatsuo, 4,683,012, Cl. 148-301.000.

Kobayashi, Yuki: See—  
Togino, Takayoshi; Kobayashi, Yuki; and Yonekubo, Ken, 4,682,859, Cl. 350-414.000.

Kocanowski, Stephen: See—  
Vaillancourt, Vincent L.; and Kocanowski, Stephen, 4,682,607, Cl. 128-772.000.

Koenig & Bauer Aktiengesellschaft: See—  
Wieland, Erich G., 4,682,542, Cl. 101-148.000.

Koga, Naoki: See—  
Ueno, Shinji; and Koga, Naoki, 4,683,130, Cl. 423-579.000.

Kohama, Tokio: See—  
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,682,496, Cl. 73-204.000.

Kohl, Arthur L., to Rockwell International Corporation. Gasification of black liquor. 4,682,985, Cl. 48-197.00R.

Kohno, Hideki: See—  
Yamamoto, Eisuiji; Kohno, Hideki; Kuroda, Masao; Matsui, Shigeru; and Shiono, Hidemi, 4,683,433, Cl. 324-309.000.

Kohzato, Yasuo: See—  
Sugiura, Susumu; and Kohzato, Yasuo, 4,683,492, Cl. 358-80.000.

Kojima, Teiryu; Matsuda, Heichiro; and Tokizane, Masaru, to Toray Industries, Inc. False-twist textured yarn of polyamide. 4,682,465, Cl. 57-247.000.

Koleske, Joseph V.; and Domeier, Linda A., to Union Carbide Corporation. Compositions containing a reactive monomer derived from a lactone. 4,683,287, Cl. 528-357.000.

Kolkman, Friedrich; Ressel, Herbert; Gradl, Reinhard; and Schimmel, Gunther, to Hoechst Aktiengesellschaft. Process for making wet-process phosphoric acid. 4,683,127, Cl. 423-321.00R.

Kollmorgen Technologies Corporation: See—  
Morrissey, Denis M.; Takach, Peter E.; and Zebelsky, Rudolph J., 4,683,036, Cl. 204-15.000.

Komatsubara, Shoji; Hatabe, Yukio; Horikawa, Tooru; Murasawa, Sadao; and Murakami, Hajime, to Dainippon Screen Mfg. Co., Ltd.; and Ishihara Sangyo Kaisha Ltd. Apparatus for producing an electrophotographic print. 4,682,881, Cl. 355-10.000.

Konishi, Masataka: See—  
Tsunakawa, Mitsuki; Konishi, Masataka; and Miyaki, Takao, 4,683,230, Cl. 314-214.000.

Konomura, Yutaka, to Olympus Optical Co., Ltd. Basket forceps assembly for endoscope. 4,682,599, Cl. 128-328.000.

Konovalov, Viktor A.: See—  
Bezborodov, Vladimir S.; Konovalov, Viktor A.; Ptashnikov, Jury L.; Astafiev, Vladimir M.; and Petrovich, Alexandr E., 4,683,079, Cl. 252-299.670.

Koroscil, Anthony; Smithy, Walter A.; and Delgado, Paul A., to American Cyanamid Company; and Del Manufacturing. Chemiluminescent light container. 4,682,544, Cl. 102-336.000.

Kortenbach & Rauh Kommanditgesellschaft: See—  
Schultes, Tilmann, 4,682,616, Cl. 135-38.000.

Schultes, Tilmann; and Stiller, Klaus, 4,682,617, Cl. 135-38.000.

Kosan Crisplant A/S: See—  
Hartlepp, Karl H., 4,682,682, Cl. 198-368.000.

Koshino, Masayoshi, to Kabushiki Kaisha Toshiba. Acoustic surface wave resonator device. 4,683,394, Cl. 310-313.00R.

Kossor, Michael G. Method and apparatus for controlling telephone line access. 4,683,583, Cl. 379-200.000.

Kothmann, Kody R. Method of inserting intramedullary coupled pin. 4,682,590, Cl. 128-92.0YZ.

Kowalchuk, William M., to Moore Business Forms, Inc. Hospital arm band. 4,682,431, Cl. 40-21.00C.

Kowata, Nobuo; and Sasano, Naoshige, to Showa Electric Wire & Cable Co. Ltd. Optical fiber junction and method of making same. 4,682,849, Cl. 350-96.220.

Kozakai, Shohei: See—  
Hida, Yoshinori; and Kozakai, Shohei, 4,683,320, Cl. 556-453.000.

Kraftwerk Union Aktiengesellschaft: See—  
Fromel, Gustav; and Steinke, Alexander, 4,683,115, Cl. 376-439.000.

Goebel, Konrad; and Schiffrs, Ulrich, 4,682,620, Cl. 137-110.000.

Krakkay, Tibor; Poggi, Tatjana; and Schubert, Ernst, to Hoechst Aktiengesellschaft. Polyacrylonitriles with a low K value, a process for their preparation and their suitable use. 4,683,286, Cl. 525-329.100.

Kramer, Roman A.: See—  
Hand, George E.; and Kramer, Roman A., 4,683,097, Cl. 264-268.000.

Krane, Leonard. Apparatus and method for learning about the relationships and personalities of a group of two or more persons. 4,682,956, Cl. 434-237.000.

Kraus, Werner: See—  
Baro, Gunter; Kraus, Werner; and Stindt, Wilfried, 4,683,107, Cl. 376-260.000.

Krause, Richard J.; Gugala, Zbigniew H.; and Shah, Madhukant A., to Henry Valve Company. Refillable filter-drier assembly. 4,683,057, Cl. 210-232.000.

Kreiskorte, Ing. H., to Thyssen Industrie AG. Surface testing apparatus. 4,682,498, Cl. 73-618.000.

Kress, Hans-Jurgen; Lindner, Christian; Morbitzer, Leo; Peters, Horst; Ott, Karl-Heinz; and Schoeps, Jochen, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions consisting of polycarbonates, graft polymers and copolymers. 4,683,265, Cl. 525-67.000.

Kressler, Rudolf; and Oehler, Siegfried, to Hoechst Aktiengesellschaft. Method for detecting step losses in stepping-motor-driven adjusting devices. 4,683,410, Cl. 318-696.000.

Kreuter, Peter. Electromagnetically-actuated positioning system. 4,682,574, Cl. 123-90.110.

Kreuzer, Helmut; and Meier, Klaus-Peter, to Robert Bosch GmbH. Process of making a dynamo electric machine. 4,682,410, Cl. 29-596.000.

Krogsrud, Jens C.; and Sorensen, Kai O., to Jac Jacobsen A/S. Asymmetric lamp. 4,683,526, Cl. 362-346.000.

KRONE GmbH: See—  
Achtung, Klaus-Peter; Herfort, Herrman; and Hegner, Gunther, 4,682,838, Cl. 439-598.000.

Krovak, Premysl; Behunek, Vladimir; Vojtisek, Vladimir; Salvat, Miroslav; and Hasal, Pavel, to Ceskoslovenska akademie ved. Method of circulation of a liquid phase through a solid phase particularly for biocatalytical reactions and a device for realization thereof. 4,683,062, Cl. 210-617.000.

Kubo, Kanji: See—  
Shiozaki, Kenichi; and Kubo, Kanji, 4,683,533, Cl. 364-200.000.

Kubo, Seitoku: See—  
Sumiya, Koji; Kano, Takenori; Kubo, Seitoku; and Watanabe, Kazuaki, 4,682,534, Cl. 92-130.00R.

Kubota, Makoto: See—  
Yamauchi, Kazushi; Ogata, Muneyuki; Kobayashi, Tomio; Kubota, Makoto; and Kumura, Tatsuo, 4,683,012, Cl. 148-301.000.

Kucera, Clare H., to Dowell Schlumberger Incorporated. Fracturing of subterranean formations. 4,683,068, Cl. 252-8.551.

Kuchar, Miroslav; Brunova, Bohumila; Grimova, Jaroslava; and Maturova, Eva, to Spofa spojene podniky pro zdravotnickou. Omega-(2,4-dihalo(biphenyl)) oxo alkanic acids. 4,683,331, Cl. 562-459.000.

Kuck, Varl-Heinz: See—  
Salzburg, Herbert; Hajek, Manfred; Hanssler, Gerd; and Kuck, Varl-Heinz, 4,683,233, Cl. 514-253.000.

Kudo, Yoshio: See—  
Honda, Tatsutoku; Endo, Michiyuki; Wakamatsu, Saburo; and Kudo, Yoshio, 4,682,855, Cl. 350-276.00R.

Kuga, Kazuhiko; Washita, Hiroshi; and Watanabe, Hiroyuki, to Asahi Glass Company, Ltd. Laminated and method for its preparation. 4,683,171, Cl. 428-354.000.

Kukolja, Stjepan; and Wright, Walter E., to Eli Lilly and Company. Antibiotic derivatives of 7β-[2-(thiazol-4-yl)acetamide]-3-chloro-3-cephem-4-carboxylic acids and compositions and method of use thereof. 4,683,227, Cl. 514-202.000.

Kumano, Atsushi: See—  
Ukachi, Takashi; Bessho, Keiichi; Kumano, Atsushi; Matsumura, Yoshio; and Ansel, Robert E., 4,683,280, Cl. 528-71.000.

Kumazawa, Takahiro; Nakamura, Yoshihiro; and Yamaguchi, Yoshimitsu, to Nippondenso Co., Ltd. Method and device for removing defective products. 4,682,694, Cl. 209-559.000.

Kume, Hisao; Nishihara, Tokihiro; Shirasaka, Hiroharu; Kanehira, Kenichi; and Saita, Koji, to Sony Corporation. Method for manufacturing an electron beam selection electrode. 4,682,965, Cl. 445-37.000.

Kumura, Tatsuo: See—  
Yamauchi, Kazushi; Ogata, Muneyuki; Kobayashi, Tomio; Kubota, Makoto; and Kumura, Tatsuo, 4,683,012, Cl. 148-301.000.

Kunkle, John P.; and McClune, Donald W., to AMP Incorporated. Surface mount socket for dual in-line package. 4,682,829, Cl. 439-83.000.

Kurama, Kenichiro; and Shibata, Michiyasu, to Mazda Motor Corporation; and Nippon Kokan Kabushiki Kaisha. Rod chucking device for a perforator for perforating a pig iron discharge opening in a blast furnace. 4,682,780, Cl. 279-79.000.

Kuriyama, Hiroaki: See—  
Ueda, Kouzou; Nagumo, Daisuke; Shuto, Hirotetsu; and Kuriyama, Hiroaki, 4,682,686, Cl. 198-844.000.

Kuroda, Masao: See—  
Yamamoto, Eisuiji; Kohno, Hideki; Kuroda, Masao; Matsui, Shigeru; and Shiono, Hidemi, 4,683,433, Cl. 324-309.000.

Kurome, Yoshio: See—  
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Kurosaki Refractories Co., Ltd.: See—  
Hamaguchi, Setsunori; and Hanaoka, Sumio, 4,683,151, Cl. 427-397.800.

Kurosaki, Tadamasu: See—  
Nakatani, Keiichi; Ohnishi, Shohzo; and Kurosaki, Tadamasu, 4,683,249, Cl. 521-129.000.

Kurosu, Noriaki; Ohmae, Masanori; and Kashiwa, Michiaki, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for ordering a working operation in an assembly line. 4,683,540, Cl. 364-468.000.

Kuschall, Rainer, to Paratec AG. Wheel chair. 4,682,783, Cl. 280-242.0WC.

Kussel, Willy; and Bohle, Werner, to Gewerkschaft Eisenhutte Westfalen. Gearing units for use with mining equipment. 4,682,678, Cl. 192-56.00F.

Kutsumura, Shoji; and Isonaga, Touchi, to Nippon Steel Corp.; and Fujicar Manu. Co. Ltd. Hot coke receiving device. 4,683,031, Cl. 202-227.000.

Kuwabara, Akira, to Dainippon Screen Mfg. Co., Ltd. Method for generating a pixel synchronizing signal in a picture input scanning apparatus and a reproduction record scanning apparatus and apparatus therefor. 4,683,499, Cl. 358-264.000.

Kyocera Kabushiki Kaisha: See—  
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Kyokuto Kaihatsu Kogyo Co., Ltd.: See—  
Ueda, Kouzou; Nagumo, Daisuke; Shuto, Hirotetsu; and Kuriyama, Hiroaki, 4,682,686, Cl. 198-844.000.

Kyowa Hakkō Kogyo Co., Ltd.: See—  
Katsumata, Ryoichi; Ozaki, Akio; Oka, Tetsuo; and Furuya, Akira, 4,683,205, Cl. 435-172.300.

Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi;

Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.

Kyowa Medex Co., Ltd.: See—  
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Kysor Industrial Corporation: See—  
Elmer, Arthur E. H., 4,682,679, Cl. 192-58.00C.

L B & M Associates, Inc.: See—  
Doerfel, Stephen; Pokorny, Anthony G.; and Rubin, Howard H., 4,682,953, Cl. 434-16.000.

L & C Steinmuller GmbH: See—  
Grethe, Klaus; and Steven, Hubert, 4,682,991, Cl. 55-84.000.

La Telemecanique Electrique: See—  
Fauvet, Jean-Pierre; and Parisel, Jacques, 4,683,545, Cl. 364-565.000.

Laguzza, Bennett C.; Nichols, Cynthia L.; and Bach, Nicholas J., to Eli Lilly and Company. 2-alkyl(or phenyl)thio-6-N alkyl ergolines and 4-dialkylaminotetrahydrobenz[c,d]indoles. 4,683,313, Cl. 548-437.000.

Laing, Birger: See—  
Laing, Karsten; Laing, Doerte; and Laing, Birger, 4,682,581, Cl. 126-362.000.

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Laing, Karsten; Laing, Doerte; and Laing, Birger. Secondary circulation system. 4,682,581, Cl. 126-362.000.

Lake, Ralph J., Jr.; Stern, Timothy R.; Sudol, George A.; and Seleppouchin, Vladimir, to Burroughs Corporation. Data display terminal using a flat display panel. 4,683,465, Cl. 340-700.000.

Laupont, Robert D., Jr.; and Hopkins, Thomas M., II, to Dow Chemical Company, The. Process for the removal of H<sub>2</sub>S from geothermal steam and the conversion to sulfur using ferric chelate and cationic polymer. 4,683,076, Cl. 252-191.000.

Lancerotto, Fabio: See—  
Meroni, Roberto; Lant, Danny; Lancerotto, Fabio; and Gerin, Umberto, 4,682,466, Cl. 57-274.000.

Landolt, George R.: See—  
Degnan, Thomas F., Jr.; and Landolt, George R., 4,683,052, Cl. 208-111.000.

Landstingens Inkopscentral Lic, Ekonomisk Forening: See—  
Feldt, Mats, 4,682,376, Cl. 5-60.000.

Lane, Gary S.: See—  
Brown, James R.; Lane, Gary S.; and Larson, Wallace H., 4,682,530, Cl. 89-1.550.

Laner, Kai: See—  
Tammisalo, Erkki; Kanerva, Heikki; Aarnio, Jaakko; Wederhorn, Markku; and Laner, Kai, 4,683,581, Cl. 378-38.000.

Langenwaller, Michael; Moehrmann, Karl H.; Prussas, Herbert; and Spater, Lothar, to Siemens Aktiengesellschaft. Common housing for two semi-conductor bodies. 4,683,489, Cl. 357-81.000.

Langer, Heimo J.: See—  
Dunnivant, William R.; Fechter, Robert B.; Gardikes, John J.; and Langer, Heimo J., 4,683,252, Cl. 523-143.000.

Langner, Guenther O.: See—  
Harte, Kenneth J.; and Langner, Guenther O., 4,683,366, Cl. 219-121.00R.

Langpape, Reinhart; Dorrscheidt, Wolfgang; Roze, Jean-Philippe; and Steinleitner, Gunther, to Brown, Boveri & Cie AG. Electrochemical storage cell. 4,683,179, Cl. 429-104.000.

Langston, Herbert: See—  
Mitchell, William; and Langston, Herbert, 4,682,776, Cl. 273-189.00A.

Lankford, Frank L., Jr.: See—  
Lin, Chew-Chen; Brown, Winthrop K.; Lankford, Frank L., Jr.; Greenhill, Katherine L.; and Campsey, Ronald L., 4,683,464, Cl. 340-685.000.

Lant, Danny: See—  
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Lantz, Andre: See—  
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Larad Equipment Corporation: See—  
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Larson, Wallace H.: See—  
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Laser Magnetic Storage International Company: See—  
Grassens, Leonardus J.; and Janssen, Peter J., 4,683,520, Cl. 361-427.000.

Laska, Eugene M.: See—  
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,683,243, Cl. 514-557.000.

Last, Hartmut: See—  
Bader, Rolf; Last, Hartmut; Mayer, Manfred; Rittner, Siegfried; and Wetzel, Edgar, 4,683,034, Cl. 203-43.000.

LaValley Industrial Plastics, Inc.: See—  
LaValley, Richard W., 4,683,059, Cl. 210-404.000.

LaValley, Richard W., to LaValley Industrial Plastics, Inc. Vacuum breaker valve-discharge elbow assembly for rotary drum filters. 4,683,059, Cl. 210-404.000.

Leacock, James R.: See—  
Dawson, Brian D.; and Leacock, James R., 4,683,591, Cl. 381-85.000.



- Lee, Daeyong: See—  
Luborsky, Fred; and Lee, Daeyong, 4,682,486, Cl. 72-148.000.
- Lee, Julia L.: See—  
Crivello, James V.; and Lee, Julia L., 4,683,317, Cl. 556-64.000.
- Lee, Kyu-Hwa: See—  
Hunt, Barry E.; Herro, Harvey M.; Lee, Kyu-Hwa; and Mindick, Morris, 4,683,035, Cl. 204-1.00T.
- Lee, Wai-Nang P.: See—  
Fymat, Alain L.; Lee, Wai-Nang P.; and Greenfield, Moses A., 4,682,604, Cl. 128-659.000.
- Lee, Wei-Kuo; and Wong, Hin-Wan, to Exxon Research and Engineering. Process for separating catalytic coal gasification chars. 4,682,986, Cl. 48-210.000.
- Lee, William Y. Y.; and Chang, Kuang-Yeh, to Hughes Aircraft Company. Latch-up resistant CMOS structure for VLSI including retrograded wells. 4,683,488, Cl. 357-42.000.
- Leege, James W.; Stacey, Robert E.; and Uttke, Russell H. C., to Rexnord Inc. Pintle chain including self-retaining pin. 4,682,687, Cl. 198-452.000.
- Legendre, Yves: See—  
Barthelemy, Herve; and Legendre, Yves, 4,682,660, Cl. 175-96.000.
- Leggett & Platt, Incorporated: See—  
Pool, Jerry S., 4,682,708, Cl. 220-460.000.
- Wells, Thomas J.; and Serafini, Angelo, 4,682,394, Cl. 29-173.000.
- LeGrand, Donald G.; and Olaszewski, William V., to General Electric Company. Method for making safety or impact resistant laminates. 4,683,172, Cl. 428-412.000.
- Leigh, Thomas, to Imperial Chemical Industries Limited. Cyclopropane carboxylic acid derivatives. 4,683,089, Cl. 260-501.160.
- Leining, Lyndon R., to Geo. A. Hormel & Co. Apparatus and method for stripping casing from sausages. 4,682,387, Cl. 17-49.000.
- Lejeune, Guy, to Nouvel, Colette. Preparation and use of substituted bisphenols. 4,683,345, Cl. 568-726.000.
- Lekavich, Carl W. Fence system with one-piece posts. 4,682,762, Cl. 256-63.000.
- Lema, Peter: See—  
Figiel, Janusz; Tremper, Donald; and Lema, Peter, 4,683,017, Cl. 156-73.100.
- Lenders, Jean-Pierre: See—  
Anton, Octavian; Crichton, Robert; and Lenders, Jean-Pierre, 4,683,203, Cl. 435-94.000.
- Lenthe, Manfred: See—  
Gunther, Andreas; Malone, James R.; Lenthe, Manfred; and Hohl, Hans-Walter, 4,683,308, Cl. 544-211.000.
- Leonard, John S.: See—  
Baudro, Thomas O.; and Leonard, John S., 4,683,110, Cl. 376-261.000.
- Helm, John L.; and Leonard, John S., 4,683,111, Cl. 376-391.000.
- Leonov, Mark, to Intel Corporation. Centering/positioning apparatus for wafer and vacuum chuck. 4,682,396, Cl. 29-271.000.
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- Martin, Jack R., to General Electric Company. Bowed turbine blade. 4,682,935, Cl. 416-223.00A.
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Nagumo, Daisuke: See—  
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Nakamura, Yoshihiro: See—  
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Moran, James J.; and Boyes, Russell S., 4,683,152, Cl. 427-428.000.

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Naylor, Thomas K., to Siemens Aktiengesellschaft. Apparatus for establishing the differences between multiple pairs of analog input signals. 4,683,441, Cl. 330-69.000.

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NEC Corporation: See—  
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Kurosu, Noriaki; Ohmae, Masanori; and Kashiwa, Michiaki, 4,683,540, Cl. 364-468.000.

Ohmura, Hiroshi; Tsunekawa, Tokuchi; Kiyohara, Shyuichi; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Photometric device for camera. 4,682,873, Cl. 354-478.000.

Ohnishi, Hiroshi: See—  
Ihama, Mikio; Tani, Tadaaki; and Ohnishi, Hiroshi, 4,683,193, Cl. 430-570.000.

Ohnishi, Shohzo: See—  
Nakatani, Keiichi; Ohnishi, Shohzo; and Kurosaki, Tadamasu, 4,683,249, Cl. 521-129.000.

Ohsaka, Yoshosuke; Amimoto, Yoshio; and Negishi, Yoshio, to Daikin Industries Ltd. Novel fluorine-containing polyaminoamide and preparation thereof from fluorooxetane and polyamine. 4,683,289, Cl. 528-402.000.

Ohsaki, Ryouhei: See—  
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Ohshima, Iwao: See—  
Orii, Koichi; Nishida, Masashi; Yagi, Junsuke; and Ohshima, Iwao, 4,683,128, Cl. 423-338.000.

Ohshima, Ken: See—  
Takeuchi, Toyooki; Ohshima, Ken; Kenjo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,683,560, Cl. 369-45.000.

Ohshima, Nobuaki: See—  
Ebata, Sakae; and Ohshima, Nobuaki, 4,682,754, Cl. 248-639.000.

Ohta, Masakatsu, to Canon Kabushiki Kaisha. Illumination apparatus. 4,683,524, Cl. 362-268.000.

Ohta, Tokuya: See—  
Mirua, Kono; Takimoto, Hiroshi; Kaneko, Toshio; Ohta, Tokuya; Kobayashi, Masatsune; and Eida, Tsuyoshi, 4,683,002, Cl. 106-20.000.

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Oka, Takao: See—  
Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, 4,682,385, Cl. 17-45.000.

Oka, Tetsuo: See—  
Katsumata, Ryoichi; Ozaki, Akio; Oka, Tetsuo; and Furuya, Akira, 4,683,205, Cl. 435-172.300.

Okabe, Kazuo: See—  
Hagiwara, Satoru; Satoh, Kimio; and Okabe, Kazuo, 4,683,093, Cl. 264-22.000.

Okabe, Masao: See—  
Sugio, Akitoshi; Okabe, Masao; and Amagai, Akikazu, 4,683,255, Cl. 524-151.000.

Okachi, Ryo: See—  
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.

Okada, Mitsuhiro; and Ito, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Hydraulic fluid pressure control device for a continuously variable automobile transmission providing a quick speed change ratio increase. 4,682,519, Cl. 74-868.000.

Okada, Shinjiro: See—  
Kanbe, Junichiro; Okada, Shinjiro; Takahashi, Tohru; and Ando, Yujiro, 4,682,858, Cl. 350-334.000.

Okada, Yasuyuki: See—  
Kambayashi, Hiroaki; and Okada, Yasuyuki, 4,683,552, Cl. 364-900.000.

Okamura, Kikuko: See—  
Suzuki, Nobuo; Okamura, Kikuko; Sugiyama, Genpei; and Suzuka, Susumu, 4,683,188, Cl. 430-110.000.

Okano, Mikio: See—  
Aoyama, Norihito; Muke, Akira; Okano, Mikio; and Tatano, Toshio, 4,683,208, Cl. 436-12.000.

Okashiro, Tetuo: See—  
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Okazaki, Hiroshi: See—  
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Okazaki, Yukio, to Kabushiki Kaisha Toshiba. Microwave tube output section. 4,683,401, Cl. 315-39.000.

Oki Electric Industry Co., Ltd.: See—  
Yoshimura, Masato; and Ohsaki, Ryouhei, 4,682,904, Cl. 400-616.000.

Okkerse, Cornelis E. G. Trousers-press. 4,682,429, Cl. 38-36.000.

Okubo, Kiyokazu, to Honda Giken Kogyo Kabushiki Kaisha. Vehicular transmission with additional low speed. 4,682,516, Cl. 74-701.000.

Okuhara, Hisakazu: See—  
Higuchi, Kazuo; Sugama, Takayuki; Okuhara, Hisakazu; and Sasaki, Kiichi, 4,682,789, Cl. 280-801.000.

Oleck, Stephen M.: See—  
Angevine, Philip J.; and Oleck, Stephen M., 4,683,214, Cl. 502-66.000.

Olin Corporation: See—  
Butt, Sheldon H., 4,682,414, Cl. 29-840.000.

Kindimann, Peter J.; and Lewis, Brian G., 4,682,645, Cl. 164-453.000.

Olschewski, Armin, to SKF GmbH, Schweinfurt. Cover plate for universal joint assembly. 4,682,972, Cl. 464-130.000.

Olsson, Mark S.; Hagey, William H.; and Rosenthal, Brock J. Deep submersible light assembly. 4,683,523, Cl. 362-267.000.

Olszewski, William V.: See—  
LeGrand, Donald G.; and Olszewski, William V., 4,683,172, Cl. 428-412.000.

Olympus Optical Co., Ltd.: See—  
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Matsuo, Kazumasa, 4,682,586, Cl. 128-6.000.

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Togino, Takayoshi; Kobayashi, Yuki; and Yonekubo, Ken, 4,682,859, Cl. 350-414.000.

Yusa, Atsushi, 4,683,125, Cl. 423-219.000.

Omoto, Setsuo: See—  
Onizuka, Masakazu; Tanani, Atsushi; Hamada, Takayoshi; and Omoto, Setsuo, 4,683,210, Cl. 436-50.000.

Omron Tateisi Electronics Co.: See—  
Matsumoto, Hiromichi, 4,683,372, Cl. 235-492.000.

Onizuka, Masakazu; Tanani, Atsushi; Hamada, Takayoshi; and Omoto, Setsuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for measuring concentrations of CaCO<sub>3</sub> and CaSO<sub>3</sub> in a slurry. 4,683,210, Cl. 436-50.000.

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Ono, Katsuhiro, to NGK Insulators, Ltd. Ceramic center for machine tools. 4,682,445, Cl. 51-236.000.

Ono, Kyushichi, to Asahi Breweries Ltd. Method and apparatus for preventing clogging of powdery granules in light powdery granule treating system. 4,682,737, Cl. 241-34.000.

Ono, Yoichi, to Seiko Epson Kabushiki Kaisha. Method of manufacturing MIM elements in liquid crystal displays. 4,683,183, Cl. 430-20.000.

Onoda, Hiroshi; and Mizuno, Kenji, to Brother Kogyo Kabushiki Kaisha. Writing plotting apparatus with keyboard. 4,682,902, Cl. 400-18.000.

Ooguro, Yukito, to Sanyo Mikawa Body Corp. Van body used with container car, freight car and truck. 4,682,811, Cl. 296-181.000.

Opfer, John C., to S&C Electric Company. Switch-operating mechanism with improved charging arrangement. 4,683,357, Cl. 200-153.05C.

Opitz, Hans-Georg: See—  
Stadler, Peter; Lockhoff, Oswald; Opitz, Hans-Georg; and Schaller, Klaus, 4,683,222, Cl. 514-42.000.

Orban, Ivan; and Fussenegger, Werner, to Ciba-Geigy Corporation. Solvent-free crystallization of pentaerythritol tetrakis-(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate) and the novel alpha-crystalline form thereof. 4,683,326, Cl. 560-75.000.

Oren, Zohar, to Makhteshim Chemical Works Ltd. Process for the production of methoxym oxime. 4,683,322, Cl. 558-3.000.



- Orii, Koichi; Nishida, Masashi; Yagi, Junsuke; and Ohshima, Iwao, to Nitto Chemical Industry Co., Ltd.; and Mitsubishi Rayon Co., Ltd. Process for manufacturing high purity silica. 4,683,128, Cl. 423-338.000.
- Orillo, Stephen, Jr.: See—  
Wilder, John F.; Orillo, Stephen, Jr.; and Nakano, Gregory S., 4,682,631, Cl. 138-94.000.
- Orion-Yhtymä: See—  
Tammisalo, Erkki; Kanerva, Heikki; Aarnio, Jaakko; Wederhorn, Markku; and Laner, Kai, 4,683,581, Cl. 378-38.000.
- Orlandi, Daniel A.: See—  
Glass, Michael; Hoholick, Joseph; and Orlandi, Daniel A., 4,683,138, Cl. 426-5.000.
- Orner, Angelika: See—  
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- Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, to Minolta Camera Kabushiki Kaisha. Electrophotosensitive member having alternating amorphous semiconductor layers. 4,683,184, Cl. 430-57.000.
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- Osborn, Paul V., to Mobil Oil Corporation. Lightweight tarpaulin. 4,682,447, Cl. 52-3.000.
- Oshima, Ryoichi: See—  
Yanami, Tetsuji; Murai, Yoshiyuki; and Oshima, Ryoichi, 4,683,297, Cl. 536-18.600.
- Ota, Yoshifumi: See—  
Nakamura, Kyuzo; Ota, Yoshifumi; and Asaka, Tsutomu, 4,683,176, Cl. 428-692.000.
- Otis Engineering Corporation: See—  
Waters, Fleming A., 4,682,656, Cl. 166-372.000.
- Ott, Karl-Heinz: See—  
Kress, Hans-Jürgen; Lindner, Christian; Morbitzer, Leo; Peters, Horst; Ott, Karl-Heinz; and Schoeps, Jochen, 4,683,265, Cl. 525-67.000.
- Ottosensor Corporation: See—  
Prohaska, Otto, 4,682,602, Cl. 128-635.000.
- Ouchi, Takahiro: See—  
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.
- Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., to Internationale Octrooi Maatschappij "Octropa" BV. Nickel/alumina/silicate catalyst, its preparation and use. 4,683,088, Cl. 260-409.000.
- Oudenhoven, Martin S.; and Ruskey, Frank. Method and apparatus for controlling the temperature and flow rate of a fluid. 4,682,728, Cl. 236-12.120.
- Outboard Marine Corporation: See—  
Hall, Charles B.; and Mondek, Martin J., 4,682,759, Cl. 251-210.000.
- Lieb, M. Jeremy; and Collis, Raymond D., 4,682,560, Cl. 114-343.000.
- Owens-Corning Fiberglas Corporation: See—  
Brannon, Robert C.; Sage, Donald B., Jr.; and Miller, David G., 4,683,234, Cl. 523-303.000.
- Johnson, Alan R.; and Yawberg, Richard C., 4,682,523, Cl. 83-19.000.
- Oyler, John F.; Brand, Jerry D.; and Zavada, Richard, to Dravo Corporation. Circular solvent extractor. 4,683,029, Cl. 196-14.520.
- Ozaki, Akio: See—  
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- Ozawa, Masaaki: See—  
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- Ozawa, Michihiro: See—  
Mochida, Takaaki; Yamashita, Junichi; Yoshioka, Toshiro; and Ozawa, Michihiro, 4,683,113, Cl. 376-419.000.
- Ozima, Kazuhira: See—  
Teranishi, Katsuya; Ozima, Kazuhira; Saito, Cuyichi; and Ogawa, Hiroyasu, 4,682,681, Cl. 198-333.000.
- P & H Enterprises Limited (Musical Products): See—  
Hubble, Terence H., 4,682,451, Cl. 52-97.000.
- Paar, Willibald; and Honig, Helmut, to Vianova Kunstharz, A.G. Pigment grinding vehicles for use in water-dilutable paints. 4,683,285, Cl. 528-113.000.
- Pace, Incorporated: See—  
Barkley, Vincent, 4,682,766, Cl. 269-71.000.
- Page, Littleton D.: See—  
Jindrick, James A.; Patil, Shashikant M.; Morrison, Margaret S.; and Page, Littleton D., 4,683,550, Cl. 364-900.000.
- Pagliari, Michael J. Peg drops. 4,682,527, Cl. 84-305.000.
- Palau, Joseph; and Bassi, Dario. Lifting beam for shed forming device in a weaving loom. 4,682,634, Cl. 139-85.000.
- Palermo, Anthony C.; Christenson, Roger M.; and Mazza, Glenn L., to Ashland Oil, Inc. Compositions thickened through urethane reaction. 4,683,266, Cl. 525-123.000.
- Palinczar, Victor. Waterproof sunscreen compositions. 4,683,134, Cl. 424-59.000.
- Palladino, Michael, to Sloan-Kettering Institute for Cancer Research. Interleukin-2 dependent cytotoxic T-cell clones. 4,683,199, Cl. 435-68.000.
- Palm, Bernhard, to Milwaukee Electric Tool Corporation. Keyless impacting chuck. 4,682,918, Cl. 408-241.00R.
- Palmer, William B.; and Fink, Henry, to TRW Inc. Releasable coupling assembly. 4,682,804, Cl. 294-82.260.
- Paper Converting Machine Company: See—  
Buxton, Gerald W., 4,682,977, Cl. 493-358.000.
- Paradyne Corporation: See—  
Betts, William L.; and Zuranski, Edward S., 4,683,578, Cl. 375-98.000.
- Paratec AG: See—  
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- Parisel, Jacques: See—  
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- Parli, C. John: See—  
Whitten, Kathleen R.; Garbrecht, William L.; Marzoni, Gifford P.; and Parli, C. John, 4,683,236, Cl. 514-288.000.
- Parrish, Stanley G. Buckle and body restraint system for a vehicle. 4,682,390, Cl. 24-632.000.
- Parrow, R. Alan; and DiAntonio, Francis W. Fuel line adaptor. 4,682,796, Cl. 285-39.000.
- Parsons, Nathan. Cervical-dilation meter. 4,682,609, Cl. 128-775.000.
- Patil, Shashikant M.: See—  
Jindrick, James A.; Patil, Shashikant M.; Morrison, Margaret S.; and Page, Littleton D., 4,683,550, Cl. 364-900.000.
- Pattany, Pradip M.; and Nayler, Graham L., to Picker International, Inc. Magnetic resonance imaging of high velocity flows. 4,683,431, Cl. 324-306.000.
- Pawlek, Rudolf: See—  
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- Pawling, Daniel F.: See—  
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- Payre, Didier; Crozat, Georges; and Spinner, Bernard, to Societe Nationale Elf Aquitaine. Three-phase heat pump. 4,682,476, Cl. 62-480.000.
- Pearce, Phillip W.: See—  
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- Pecht, Israel; and Mazurek, Nachman, to Yeda Research and Development Co., Ltd. DSCG binding protein and process for preparing same. 4,683,135, Cl. 424-85.000.
- Pelava, John W.: See—  
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- Peletan, Rene: See—  
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- Peng, Chen H. Refuse disposing method and the apparatus thereof. 4,682,548, Cl. 110-222.000.
- Pennwalt Corporation: See—  
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- Georgiev, Vassil S.; and Mullen, George B., 4,683,311, Cl. 548-240.000.
- Pereira, Joseph J.; Taylor, Malcolm E.; and Sawaf, Bernard, to Clairol Incorporated. Dual compartment container. 4,682,689, Cl. 206-222.000.
- Perkin-Elmer Corporation, The: See—  
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- Perkins, Clarence: See—  
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- Pernick, Bruce M. Seamless knit composite garment blank and method. 4,682,479, Cl. 66-176.000.
- Peste, Hansgeorg: See—  
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- Peters, Horst: See—  
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- Peters, Rudolf: See—  
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- Petersen, W. Christian, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,683,000, Cl. 71-92.000.
- Petersen, Walter J.; and Svendsen, John M., to Wagner Spray Tech Corporation. Hot air gun with air directing housing. 4,683,370, Cl. 219-370.000.
- Peterson, Carlton G. Power train for heavy lift helicopters. 4,682,512, Cl. 74-410.000.
- Peterson, Charlie A.: See—  
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- Peterson, Donald A., Jr.: See—  
Yount, Larry J.; Wilt, Nicholas J.; Hill, Bryan H.; and Peterson, Donald A., Jr., 4,683,532, Cl. 364-200.000.
- Peterson, Lars-Eric; and Soderlind, Jan. Protective apron. 4,682,372, Cl. 2-51.000.
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- Peterson, Robert T.: See—  
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- Petro Canada Inc.: See—  
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- Petrovich, Alexandr E.: See—  
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- Peyre, Henri, to Ste Look, French Societe Anonyme. Safety ski binding. 4,682,786, Cl. 280-628.000.
- Pfaendler, Hans R. Reduction process for the preparation of 4-unsubstituted azetidin-2-ones. 4,683,303, Cl. 540-362.000.
- Pfeffer, George B., to ADC Telecommunications, Inc. Insertion tool. 4,682,412, Cl. 29-750.000.
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- Cobb, Raymond L., 4,683,033, Cl. 203-38.000.
- Craig, William S., 4,683,293, Cl. 530-359.000.
- Phillips, Samuel J., to Litton Systems, Inc. Apparatus for supporting and aligning equipment. 4,683,354, Cl. 200-61.410.
- Photon Devices, Ltd.: See—  
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- Piaget, Claude: See—  
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- Picker International, Inc.: See—  
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- Young, Ian R., 4,683,432, Cl. 324-309.000.
- Pidgeon, Alastair N.; and Webb, Arthur L., to Marconi Company Limited. The solar cell arrays. 4,683,348, Cl. 136-246.000.
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- Piezo Electric Products, Inc.: See—  
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- Pilet, Jean-Claude: See—  
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- Pinkham, Raymond, to Texas Instruments Incorporated. Serial accessed semiconductor memory with reconfigurable shift registers. 4,683,555, Cl. 365-215.000.
- Pinto, Akiva, to John D. Hollingsworth on Wheels, Inc. Textile flock feed control system and method. 4,682,388, Cl. 19-105.000.
- Pion, Jacques: See—  
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- Pioneer Electronic Corporation: See—  
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- Kato, Shigeru, 4,683,449, Cl. 333-14.000.
- Matsui, Fumio; and Murata, Yasushi, 4,683,562, Cl. 369-284.000.
- Piper, Douglas E.; and Black, Michael D., to 501 Woven Electronics Corporation. Bus bar bridged pc board for transitional termination of multiple cables and method. 4,682,828, Cl. 439-92.000.
- Pirelli Coordinamento Pneumatici S.p.A.: See—  
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- Pischzik, Bruno, to Mannesmann Aktiengesellschaft. Holding fixture for a pipe-line. 4,682,752, Cl. 248-550.000.
- Pitkajarvi, Kari, to Valmet Oy. Method and apparatus in a paper machine for regulating pressure in the space between a headbox lip beam and breast roll. 4,683,027, Cl. 162-199.000.
- Pitney Bowes Inc.: See—  
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- Pittet, Alan O.; Muralidhara, Ranya; and Liberman, Arthur L., to International Flavors & Fragrances Inc. Process for preparing natural benzaldehyde and acetaldehyde, natural benzaldehyde and acetaldehyde compositions, products produced thereby and organoleptic utilities therefor. 4,683,342, Cl. 568-464.000.
- Pittsburgh Tube Company: See—  
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- Pivot Manufacturing Company: See—  
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- Pizzorno, Augusto, to Pirelli Coordinamento Pneumatici S.p.A. Double-molded vulcanizing press. 4,682,940, Cl. 425-34.00R.
- Placek, Ronald J.: See—  
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- Plasti-Line, Inc.: See—  
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- Plessey Incorporated: See—  
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- Plummer, James D.: See—  
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- Pneumedic Corp.: See—  
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- Curlee, James D., 4,682,588, Cl. 128-78.000.
- Pneupac Limited: See—  
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- Poggi, Tatjana: See—  
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- Pohlner, Erwin: See—  
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- Porowski, Jan S.; O'Donnell, William J.; Badlani, Manu L.; and Hampton, Edward J., to O'Donnell & Associates, Inc. Mechanical stress improvement process. 4,683,014, Cl. 148-131.000.
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- Pose, Wolfgang. Dental care instrument. 4,682,584, Cl. 128-1.300.
- Poser, Richard G., to A. H. Robins Company, Incorporated. Transdermal treatment for pain and inflammation with 2-amino-3-arylbenzenecetic acids, salts and esters. 4,683,242, Cl. 514-539.000.
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- PPG Industries, Inc.: See—  
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Kakiuchi, Shinichi; Saito, Tasuku; and Tomita, Seisuke, 4,683,257, Cl. 524-432.000.  
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Sakamoto, Masami; Nagumo, Ryoichi; and Ishihara, Tamio, to Hitachi, Ltd. X-Y plotter drive roller arrangement. 4,683,480, Cl. 346-134.000.  
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Sakka, Sumio: See—  
Miyake, Yoshifumi; and Sakka, Sumio, 4,683,253, Cl. 523-442.000.  
Sakurai, Shigeru: See—  
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Salmon, Michael E.; and Hunkele, Paul W. Go-cart. 4,682,668, Cl. 180-209.000.  
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Salzburg, Herbert; Hajek, Manfred; Hanssler, Gerd; and Kuck, Varl-Heinz, to Bayer Aktiengesellschaft. Salts of 2-keto-2H, 3H-1,2-benzothiazole 1,1-dioxide as microbicides. 4,683,233, Cl. 514-253.000.  
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Sanduja, Mohan L.: See—  
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Sanity Marine Products: See—  
Arrow, Martin, 4,682,438, Cl. 43-21.200.  
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Nakahama, Ryoji, 4,682,961, Cl. 440-61.000.  
Santostasi, Paul A.: See—  
Dutt, Herbert V.; Foldesi, Istvan; and Santostasi, Paul A., 4,683,016, Cl. 156-69.000.  
Sanyo-Kokusaku Pulp Co., Ltd.: See—  
Urata, Keiji; and Kurome, Yoshio, 4,683,264, Cl. 525-65.000.  
Sanyo Mikawa Body Corp.: See—  
Ooguro, Yukito, 4,682,811, Cl. 296-181.000.  
Sasagawa, Masaru: See—  
Yamada, Hiroyasu; Shirashi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,682,685, Cl. 198-621.000.  
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Sasaki, Hiroshi, to Kabushiki Kaisha Toshiba. Ultrasonic imaging apparatus. 4,682,497, Cl. 73-602.000.  
Sasaki, Kiichi: See—  
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Sasaki, Susumu, to Fujitsu Limited. Digital radio communication system. 4,683,566, Cl. 370-100.000.  
Sasano, Naoshige: See—  
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Satoh, Kimio: See—  
Hagiwara, Satoru; Satoh, Kimio; and Okabe, Kazuo, 4,683,093, Cl. 264-22.000.  
Satren, Ernest A.: See—  
Higashi, Robert E.; James, Steven D.; Johnson, Robert G.; and Satren, Ernest A., 4,682,503, Cl. 73-755.000.  
Sauer, Heinz, to Rasmussen GmbH. Hose coupling. 4,682,798, Cl. 285-174.000.  
Savenije, Franciscus G., to Auping b.v. Body support, such as a mattress. 4,682,378, Cl. 5-239.000.  
Sawada, Tetsuya: See—  
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Sawaf, Bernard: See—  
Pereira, Joseph J.; Taylor, Malcolm E.; and Sawaf, Bernard, 4,682,689, Cl. 206-222.000.  
Schacht, Hans: See—  
Bosch, Franz-Ulrich; Muller, Willi; Schacht, Hans; and Straubel, Max, 4,683,055, Cl. 210-120.000.  
Schad, Robert D., to Husky Injection Molding Systems Ltd. Thermal insulating and expansion assembly for injection molding machine. 4,682,945, Cl. 425-549.000.  
Schaller, Klaus: See—  
Stadler, Peter; Lockhoff, Oswald; Opitz, Hans-Georg; and Schaller, Klaus, 4,683,222, Cl. 514-42.000.  
Scharf, Stephen J.: See—  
Mullis, Kary B.; Erlich, Henry A.; Arnheim, Norman; Horn, Glenn T.; Saiki, Randall K.; and Scharf, Stephen J., 4,683,195, Cl. 435-6.000.  
Scharpenberg, Rainer, to Brown Boveri Reaktor GmbH. Equipment for the inspection of fuel rods of nuclear reactors. 4,683,104, Cl. 376-251.000.  
Scharpey, Wilhelm; and Pawlek, Rudolf, to Swiss Aluminium Ltd. Reduction pot for the production of aluminum. 4,683,046, Cl. 204-243.00R.  
Scherbarth, David W.: See—  
Wu, Jiing-Liang; Scherbarth, David W.; and Marschik, David, 4,683,353, Cl. 200-8.00R.  
Scherer, Jerome. Tool for removal of debris from pipe containing gas under pressure. 4,682,623, Cl. 137-317.000.  
Schering Corporation: See—  
McCombie, Stuart W., 4,683,226, Cl. 514-192.000.  
Schier, J. Alan: See—  
Steiner, Urs; Hurst, James; and Schier, J. Alan, 4,682,508, Cl. 73-866.500.  
Schiffers, Ulrich: See—  
Goebel, Konrad; and Schiffers, Ulrich, 4,682,620, Cl. 137-110.000.  
Schimmel, Gunther: See—  
Kolkman, Friedrich; Ressel, Herbert; Gradl, Reinhard; and Schimmel, Gunther, 4,683,127, Cl. 423-321.00R.  
Schlage Lock Company: See—  
Smallegan, Jon M., 4,682,802, Cl. 292-337.000.  
Schmidt, Alfred. Apparatus for limiting back pressure in an exhaust-type engine suppressor. 4,682,674, Cl. 188-273.000.  
Schmidt, Gerhard, to Flour City Architectural Metals, Division of E.G. Smith Construction Products, Inc. Infrared radiant heater. 4,682,578, Cl. 126-91.00R.  
Schmidt, Laurence J.; Severson, Randall L.; Tufty, Lyle R.; and Voss, Steven H., to International Business Machines Corporation. Alternately centered disk pack assembly and method. 4,683,505, Cl. 360-98.000.  
Schmidt, Richard; Stern, Howard; Mauro, Alex; and Ross, Joseph, to Robotic Vision Systems, Inc. Calibration of three-dimensional space. 4,682,894, Cl. 356-375.000.  
Schneegg, Julius, to Burlington Industries, Inc. Warp-knit, weft-inserted fabric with substrate and method and apparatus to produce same. 4,682,480, Cl. 66-192.000.  
Schneider, Dallas J.: See—  
Silvernail, James M.; and Schneider, Dallas J., 4,682,614, Cl. 134-99.000.  
Schnitzer, Emanuel; and Williams, Leonard E., Jr., to Cameron Iron Works, Inc. Gas driven anchor and launching system therefor. 4,682,559, Cl. 114-295.000.  
Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann, Ingrid; Gaida, Wolfgang; and Hoefke, Wolfgang, to Boehringer Ingelheim KG. 2,3,4,9-tetrahydro beta carboline derivatives, useful as antihypertensive agents. 4,683,238, Cl. 514-292.000.  
Schoeps, Jochen: See—  
Kress, Hans-Jurgen; Lindner, Christian; Morbitzer, Leo; Peters, Horst; Ott, Karl-Heinz; and Schoeps, Jochen, 4,683,265, Cl. 525-67.000.  
Scholz, Donald T.; and Antoine, Augustine, to Scholz Research & Development. Electronic audio system. 4,683,589, Cl. 381-61.000.  
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Schomblond, Jacques, to Cartier Industrie. Injection molds for the manufacture of composite bodies. 4,682,943, Cl. 425-130.000.  
Schoon, David J., to Minnesota Mining and Manufacturing Company. Ram clock switching circuitry for a laser beam printer. 4,683,551, Cl. 364-900.000.  
Schorling, Stefan H. G.: See—  
Andersson, Lars G. R.; and Schorling, Stefan H. G., 4,682,899, Cl. 384-41.000.  
Schrantz, Gregory A., to Harris Corporation. Technique for increasing gate-drain breakdown voltage of ion-implanted JFET. 4,683,485, Cl. 357-22.000.  
Schubert, Ernst: See—  
Krakkay, Tibor; Poggi, Tatjana; and Schubert, Ernst, 4,683,286, Cl. 525-329.100.  
Schubert, Keith E.: See—  
Pollak, Philip, Jr.; and Schubert, Keith E., 4,682,541, Cl. 101-91.000.  
Schukei, Glen E., to Combustion Engineering, Inc. High pressure nozzle dam. 4,682,630, Cl. 138-89.000.  
Schultes, Tilman, to Kortenbach & Rauh Kommanditgesellschaft. Umbrella with a mechanism for locking and releasing a slider. 4,682,616, Cl. 135-38.000.

Schultes, Tilman; and Stiller, Klaus, to Kortenbach & Rauh Kommanditgesellschaft. Shortenable umbrella having a telescopic stick. 4,682,617, Cl. 135-38.000.  
Schumacher, David D.: See—  
Burkman, Don C.; Schumacher, David D.; and Peterson, Charlie A., 4,682,615, Cl. 134-102.000.  
Schumacher, Percy W.: See—  
Daly, Jeffery E.; and Schumacher, Percy W., 4,682,663, Cl. 175-329.000.  
Schwarzenberg, Norbert: See—  
Halberschmidt, Friedrich; Reinhold, Heinz-Josef; Schwarzenberg, Norbert; Rademacher, Herbert; Blank, Kurt; Audi, Josef; and Vanaschen, Luc, 4,682,997, Cl. 65-106.000.  
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Schwarzkopf GmbH, Firma: See—  
Schwarzkopf, Anton, 4,682,547, Cl. 104-53.000.  
Scobie, William B.; and Wagberg, Michael L., to Keystone International, Inc. Disk/stem connection apparatus for butterfly valve. 4,682,758, Cl. 251-84.000.  
Scopas Technology Company, Inc.: See—  
Defieves, Kenneth S.; and Rosenblatt, Aaron A., 4,683,318, Cl. 556-173.000.  
Scott, Charles D., to United States of America, Energy. Method and apparatus for continuous annular electrochromatography. 4,683,042, Cl. 204-180.100.  
Scott & Fetzer Company, The: See—  
Prah, Joseph M., 4,682,384, Cl. 15-344.000.  
Scott, Lawrence M.; and Rexroat, Gary D., to Ampex Corporation. Magnetic iron oxide pigment and recording media. 4,683,167, Cl. 428-328.000.  
Scott Paper Company: See—  
Goichel, Joel P.; Norton, Henry J.; Neuenschwander, Rudolf; and Stango, Daniel J., 4,682,942, Cl. 425-103.000.  
Scott, Stephen E.: See—  
McNeel, William O.; Montieth, Royel F.; and Scott, Stephen E., 4,682,831, Cl. 439-294.000.  
Scovell, Peter D., to ITT Industries Inc. Microwave apparatus for processing semiconductor. 4,683,363, Cl. 219-10.55A.  
Scripps Clinic and Research Foundation: See—  
Carson, Dennis A., 4,683,295, Cl. 530-391.000.  
Milich, David; and Chisari, Frank, 4,683,136, Cl. 424-89.000.  
Weigle, William O.; Hobbs, Monte O.; Morgan, Edward L.; Thoman, Marilyn L.; and Houghten, Richard A., 4,683,221, Cl. 514-14.000.  
Zimmerman, Theodore S.; Ruggeri, Zaverio M.; and Houghten, Richard, 4,683,291, Cl. 530-324.000.  
Seal, Michael, to D. Drukker & Zn N.V. Travelling wave tube and helix for such travelling wave tube. 4,683,400, Cl. 315-3.500.  
Securitron-Magnalock Corp.: See—  
Cook, Robert C.; and Toeg, Sasson, 4,682,801, Cl. 292-251.500.  
Seever, Daniel B.: See—  
Kelch, Russell K.; Finrock, Don C.; Girard, Donald J.; Seever, Daniel B.; Briggs, Barry D.; and Mathes, Gene R., 4,683,531, Cl. 364-200.000.  
Seiko Epson Kabushiki Kaisha: See—  
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Seiko Seiki Kabushiki Kaisha: See—  
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Seiner, Jerome A.: See—  
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Seitetsu Kagaku Co., Ltd.: See—  
Nakamura, Morio; Obayashi, Shigeji; Yamamoto, Takushi; Nakaniishi, Toshikazu; Tanaka, Hitoshi; and Sakamoto, Yuji, 4,683,274, Cl. 526-216.000.  
Seko, Maomi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for electrolysis of sodium chloride. 4,683,040, Cl. 204-98.000.  
Seko, Maomi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for electrolysis of sodium chloride. 4,683,041, Cl. 204-98.000.  
Selepouchin, Vladimir: See—  
Lake, Ralph J., Jr.; Stern, Timothy R.; Sudol, George A.; and Selepouchin, Vladimir, 4,683,465, Cl. 340-700.000.  
Selman, Gordon L.; and Midgley, Richard J., to Johnson Matthey & Company, Limited. Platinum group metal-containing alloy. 4,683,119, Cl. 420-444.000.  
Serafini, Angelo: See—  
Wells, Thomas J.; and Serafini, Angelo, 4,682,394, Cl. 29-173.000.  
Seshimoto, Osamu: See—  
Yamada, Sadao; Takayama, Takeshi; Seshimoto, Osamu; and Yamaguchi, Akira, 4,683,048, Cl. 204-416.000.  
Sevelinge, Gerard, to Framatome. Device for projecting solid particles for a vacuum centrifugal grinder. 4,682,739, Cl. 241-275.000.  
Severson, Randall L.: See—  
Schmidt, Laurence J.; Severson, Randall L.; Tufty, Lyle R.; and Voss, Steven H., 4,683,505, Cl. 360-98.000.  
Seymour, James O., Jr.: See—  
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SFE Technologies: See—  
Carrico, Philip H., 4,682,565, Cl. 118-719.000.  
Shadwell, Damian E.: See—  
Rice, Roy W.; Kahn, Manfred; and Shadwell, Damian E., 4,683,161, Cl. 428-178.000.

Shaff, Gerald, to Echlin, Inc. Catalytic converter for exhaust gases. 4,682,470, Cl. 60-299.000.  
Shah, Arvind: See—  
Max, Jean-Joseph; and Shah, Arvind, 4,683,450, Cl. 333-202.000.  
Shah, Madhukant A.: See—  
Krause, Richard J.; Gugala, Zbigniew H.; and Shah, Madhukant A., 4,683,057, Cl. 210-232.000.  
Shanklin, Garry L.: See—  
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Sharaiha, Ammar: See—  
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Fukumoto, Shigeaki, 4,682,580, Cl. 126-299.00D.  
Katoh, Itsuro, 4,682,879, Cl. 355-3.000.  
Miyoshi, Shuji; and Hijikigawa, Masaya, 4,682,502, Cl. 73-723.000.  
Ohashi, Kunio; Toneyawa, Tadashi; Nagata, Shoichi; and Nakamura, Masatsugu, 4,683,186, Cl. 430-84.000.  
Taniguchi, Akihiko; Fukunaga, Takahiro; and Shimizu, Eiichi, 4,682,884, Cl. 355-51.000.  
Uda, Kazutaka, 4,682,500, Cl. 73-705.000.  
Sharps, Gordon V., Jr., to Mobil Oil Corporation. Process for producing oriented polyolefin films with enhanced physical properties. 4,683,094, Cl. 264-38.000.  
Shatto, Howard L.; and Agon, Theodore L., to Shell Offshore Inc. Hydraulic stab connector. 4,682,913, Cl. 405-169.000.  
Sheikh, Morris. Method for reduction of cod in water. 4,683,065, Cl. 210-668.000.  
Shell Offshore Inc.: See—  
Shatto, Howard L.; and Agon, Theodore L., 4,682,913, Cl. 405-169.000.  
Shell Oil Company: See—  
Bilhou, Jean L.; and Goodall, Brian L., 4,683,215, Cl. 502-107.000.  
Diaz, Zaida; and Miller, James H., 4,683,347, Cl. 568-869.000.  
Goudriaan, Johan C.; and Van der Burgt, Maarten J., 4,683,121, Cl. 422-197.000.  
Slaugh, Lynn H., 4,683,218, Cl. 502-302.000.  
van Dongen, Johannes C. M.; and Mackiaho, Leo B., 4,682,421, Cl. 33-302.000.  
Wife, Richard L.; Snel, Johannes J. M.; and Van Oort, Aart B., 4,683,338, Cl. 568-12.000.  
Shelton, Thomas V.: See—  
Kerr, Jack R.; Dunsmore, Gerald L.; and Shelton, Thomas V., 4,682,924, Cl. 411-329.000.  
Shelton, William S., to Joy Manufacturing Company. Secondary back-seat for gate valve. 4,682,757, Cl. 251-77.000.  
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Sherwood, Philip W.: See—  
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Sheu, Muh-Chuan. Adjustable bookrack. 4,682,696, Cl. 211-43.000.  
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Shibata, Chiyoji: See—  
Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, 4,682,385, Cl. 17-45.000.  
Shibata, Manabu; and Uragami, Akira, to Hitachi, Ltd. Integrated circuit having input and output drivers cascaded between I/O pads and internal circuitry. 4,683,384, Cl. 307-475.000.  
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Shields, Thomas A., to USM Corporation. Tack strip. 4,682,925, Cl. 411-461.000.  
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Shikoku Kaken Kogyo Kabushiki Kaisha: See—  
Motoki, Hideo, 4,683,019, Cl. 156-293.000.  
Shimada, Satoshi; Kitamura, Nobuo; Shikakura, Kunio; and Maeda, Namio, to Sony Corporation. Display system comprising a plurality of display cells arranged in an X-Y matrix and a plurality of horizontal-extending blinds disposed adjacent the upper edges of the display cells in the rows of the matrix. 4,683,491, Cl. 358-56.000.  
Shimase, Akira; Yamaguchi, Hiroshi; Haraichi, Satoshi; and Miyauchi, Tateoki, to Hitachi, Ltd. Apparatus for ion beam work. 4,683,378, Cl. 250-492.200.  
Shimizu, Eiichi: See—  
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Shimono, Mamoru: See—  
Murakami, Reiji; Hashimoto, Shinichi; Shimono, Mamoru; and Ide, Fumito, 4,682,769, Cl. 271-10.000.



- Shimosato, Yukio: See—  
Hirohashi, Setsuo; Shimosato, Yukio; and Watanabe, Masahiko, 4,683,200, Cl. 435-68.000.
- Shin-Etsu Chemical Co., Ltd.: See—  
Hida, Yoshinori; and Kozakai, Shohet, 4,683,320, Cl. 556-453.000.
- Shindler, Geoffrey A., executor: See—  
Waller, Martin; Farrell, Geoffrey; Mills, Kenneth W., deceased; Mason, Margaret, executor; and Shindler, Geoffrey A., executor, 4,683,028, Cl. 162-275.000.
- Shiono, Hidemi: See—  
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- Shiozaki, Kenichi; and Kubo, Kanji, to Hitachi, Ltd. Storage control system using plural buffer address arrays, 4,683,533, Cl. 364-200.000.
- Shipkowski, James P.; and Pearce, Phillip W., to Eastman Kodak Company. Apparatus and method for detecting a perforation on a web, 4,683,380, Cl. 250-548.000.
- Shiraga, Jun: See—  
Suzuki, Ryojo; Shiraga, Jun; Iwai, Shingo; and Okashiro, Tetuo, 4,682,936, Cl. 417-366.000.
- Shirahata, Kunikatsu: See—  
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- Shiraishi, Motoatsu: See—  
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- Shirasaka, Hiroharu: See—  
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- Showa Denko Kabushiki Kaisha: See—  
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- Showa Electric Wire & Cable Co. Ltd.: See—  
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- Shriver, Frank L., to Adolph Coors Company. Bottle drying apparatus, 4,683,009, Cl. 134-30.000.
- Shube, Eugene E.: See—  
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- Shuto, Hirotetsu: See—  
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- Shuto, Katsuichi: See—  
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- Siepa Holding S.A.: See—  
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- Siegel, Carole E.: See—  
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- Silvernail, James M.; and Schneider, Dallas J., to FSI Corporation. Wafer processing machine, 4,682,614, Cl. 134-99.000.
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- Simko, Aladar O., to Ford Motor Company. Low friction high speed rocker arm, 4,682,575, Cl. 123-90.440.
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- Simmons, Ronald G. Adapters for golf shoes, 4,682,425, Cl. 36-44.000.
- Simonds, John L.: See—  
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- Sizemore, Charles P.: See—  
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- Sizemore, Winston C.: See—  
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- SKF GmbH, Schweinfurt: See—  
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- Spencer, Richard O. Open office landscape system, 4,682,457, Cl. 52-239.000.
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- Stalter, Joseph F., deceased (by Stalter, Bernadette M., executrix); and Feller, Gilbert M., to Goodyear Tire & Rubber Company, The. Tire building drum, 4,683,021, Cl. 156-415.000.
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- Sugimori, Shigeru; Goto, Yasuyuki; and Ogawa, Tetsuya, to Chisso Corporation. Dihaloeno-aromatic compound. 4,683,078, Cl. 252-299.610.
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- Riordan, R. Michael, 4,682,938, Cl. 418-1.000.
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- Suzuki, Ryoichi; Taka, Hideo; and Tamura, Shuichi, to Canon Kabushiki Kaisha. Signal processing apparatus for a semiconductor position sensing device. 4,682,872, Cl. 354-403.000.
- Suzuki, Ryozo; Shiraga, Jun; Iwai, Shingo; and Okashiro, Tetuo, to Mitsubishi Denki Kabushiki Kaisha. Fuel supplying pump. 4,682,936, Cl. 417-366.000.
- Suzuki, Tadashi, to Canon Kabushiki Kaisha. Image forming system having external signal generating means. 4,682,875, Cl. 355-3.00R.
- Suzuki, Tatsuo, to Terumo Corporation. Puncture needle assembly. 4,682,980, Cl. 604-122.000.
- Suzuki, Tatsuo; and Matsumoto, Atsushi, to Terumo Kabushiki Kaisha. Medical device. 4,682,981, Cl. 604-158.000.
- Suzuki, Toshio, to Toray Silicone Co., Ltd. Alkenyl organopolysiloxane and curable composition therefrom. 4,683,278, Cl. 528-32.000.
- Suzuki, Yasuo; and Ando, Yasunori, to Nissin Electric Co., Ltd. Film forming process. 4,683,149, Cl. 427-38.000.
- Suzuki, Yoichi: See—  
Yuto, Masao; and Suzuki, Yoichi, 4,683,166, Cl. 428-314.800.
- Svendsen, John M.: See—  
Petersen, Walter J.; and Svendsen, John M., 4,683,370, Cl. 219-370.000.
- Swedlow, Inc.: See—  
Holdridge, David W., 4,682,856, Cl. 350-319.000.
- Swenson, Clark E.: See—  
Kasner, William H.; Cooper, Martin H.; Swenson, Clark E.; Ciez, Albert P.; and Andrews, Katherine M., 4,683,365, Cl. 219-121.0LC.
- Swift, Graham: See—  
Beckley, Ronald S.; Randow, Rodney L.; and Swift, Graham, 4,683,100, Cl. 260-513.00R.
- Swiss Aluminium Ltd.: See—  
Scharpey, Wilhelm; and Pawlek, Rudolf, 4,683,046, Cl. 204-243.00R.
- Sylvan, Richard: See—  
Handler, Milton E.; Sylvan, Richard; and Peterson, Michael, 4,682,698, Cl. 211-70.600.
- Syquest Technology: See—  
Toldi, George; Nigam, Anil; Crain, Ronald; and Mercurio, Dominic, 4,683,306, Cl. 360-105.000.
- Systemate B.V.: See—  
Hazenbroek, Jacobus E.; Verrijp, Bastiaan; and Wallbridge, William L., 4,682,386, Cl. 17-46.000.
- Szluk, Nicholas J.: See—  
Miller, Gayle W.; Szluk, Nicholas J.; Maheras, George; and Metz, Werner A., Jr., 4,682,404, Cl. 29-571.000.
- Tadashi, Hirata; Yoshirou, Satou; and Yoshimitsu, Tsutsui, to Amada Company, Limited. Multiple processing machine. 4,682,401, Cl. 29-568.000.
- Taft, Jeffrey D.; and Seymour, James O., Jr., to Westinghouse Electric Corp. Compact optical apparatus for tracking a path of movement of a tool along a line of travel on a workpiece. 4,683,493, Cl. 358-101.000.
- Tagliavini, Antonio. Electronic device for curative stimulation of the body. 4,682,601, Cl. 128-422.000.
- Taguchi, Yoshio: See—  
Kato, Masayuki; Taguchi, Yoshio; Imai, Chihiro; and Makishima, Tokuo, deceased, 4,683,275, Cl. 526-262.000.
- Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, to Toyo Seikan Kaisha Ltd. Metal vessel having circumferential side seam and adhesive primer for use in production thereof. 4,683,263, Cl. 525-57.000.
- Taisei Road Construction Co., Ltd.: See—  
Mihara, Tohru, 4,682,909, Cl. 404-90.000.
- Tajima, Akira: See—  
Tanaka, Kazuo; and Tajima, Akira, 4,682,860, Cl. 350-423.000.
- Taka, Hideo: See—  
Suzuki, Ryoichi; Taka, Hideo; and Tamura, Shuichi, 4,682,872, Cl. 354-403.000.
- Takach, Peter E.: See—  
Morrissey, Denis M.; Takach, Peter E.; and Zebelsky, Rudolph J., 4,683,036, Cl. 204-15.000.

- Takada, Mitsuru; Itoh, Hiroshi; Hiramatsu, Shigeki; and Tamura, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling hydraulically-operated power transmitting system including continuously variable transmission. 4,682,518, Cl. 74-867.000.
- Takagi, Atsushi: See—  
Tokuda, Wahei; and Takagi, Atsushi, 4,682,882, Cl. 355-14.00D.
- Takahama, Kazuhide: See—  
Horiya, Keiichi; Takahama, Kazuhide; and Usami, Yutaka, 4,683,479, Cl. 346-76.0PH.
- Takahashi, Susumu: See—  
Ueyanagi, Kiichi; Takahashi, Susumu; Usagawa, Toshiyuki; Umemoto, Yasunari; and Tsukada, Toshihisa, 4,683,487, Cl. 357-34.000.
- Takahashi, Tohru: See—  
Kanbe, Junichiro; Okada, Shinjiro; Takahashi, Tohru; and Ando, Yujiro, 4,682,858, Cl. 350-334.000.
- Takaki, Masaoki, to Hitachi, Ltd.; and Hitachi Control Systems, Inc. Sequence control method and apparatus. 4,683,549, Cl. 364-900.000.
- Takamagari, Munenori: See—  
Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, 4,682,385, Cl. 17-45.000.
- Takamiya, Kikuzo; and Hideyuki, Ishibashi, to Bridgestone Cycle Co., Ltd. Adjustable handlebar for bicycle. 4,682,509, Cl. 74-551.400.
- Takanashi, Nobuaki: See—  
Ikeda, Hiroki; and Takanashi, Nobuaki, 4,683,406, Cl. 318-568.000.
- Takayama, Takeshi: See—  
Yamada, Sadao; Takayama, Takeshi; Seshimoto, Osamu; and Yamaguchi, Akira, 4,683,048, Cl. 204-416.000.
- Takebayashi, Koji, to Matsushita Electronics Corporation. Method for making field oxide region with self-aligned channel stop implantation. 4,682,408, Cl. 29-576.00W.
- Takebe, Norichika. Elastic electric cable. 4,683,349, Cl. 174-69.000.
- Takeda Chemical Industries, Ltd.: See—  
Tanaka, Motoaki; Ogawa, Yasuaki; Miyagawa, Tsutomu; and Watanabe, Toshio, 4,683,288, Cl. 528-361.000.
- Takeda, Kazuma; and Igarashi, Tsutomu, to Alpine Electronics Inc. Device for protecting audio equipment in vehicle against theft. 4,683,462, Cl. 340-571.000.
- Takeda, Shigeki; and Maekawa, Sachio, to Hashimoto Denki Co., Ltd. Apparatus for cutting veneer pieces into equal sections. 4,682,639, Cl. 144-2.00R.
- Takeuchi, Hiroshi; Nakaya, Chitose; and Katakura, Kageyoshi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Composite ultrasonic transducers and methods for making same. 4,683,396, Cl. 310-358.000.
- Takeuchi, Toyosaki; Ohshima, Ken; Kenjiyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, to Olympus Optical Company, Ltd. Microprocessor controlled focussing servo acquisition. 4,683,560, Cl. 369-45.000.
- Takigawa, Hideaki: See—  
Takizawa, Tatsuji; Noda, Nobutaka; and Takigawa, Hideaki, 4,682,878, Cl. 355-3.0FU.
- Takimoto, Hiroshi: See—  
Mirua, Konoe; Takimoto, Hiroshi; Kaneko, Toshio; Ohta, Tokuya; Kobayashi, Masatsune; and Eida, Tsuyoshi, 4,683,002, Cl. 106-20.000.
- Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Information signal reproducing apparatus having means for discriminating a track pitch and selecting the reproduction mode speed. 4,683,503, Cl. 360-64.000.
- Takizawa, Tatsuji; Noda, Nobutaka; and Takigawa, Hideaki, to Katsuragawa Denki Kabushiki Kaisha. Fixing devices for electrophotographic apparatus. 4,682,878, Cl. 355-3.0FU.
- Talwar, Ashok K.; Poole, William E., Jr.; and Steinkolk, Richard B., to Eaton Corporation. Varactor tuning circuit for dielectric resonator stabilized oscillator. 4,683,447, Cl. 331-177.00V.
- Tamas, Attila J., to Clark Equipment Company. Battery mounting device. 4,682,751, Cl. 248-503.000.
- Tamba, Shinichi: See—  
Fujikawa, Tetsuzo; Hirata, Makizo; and Tamba, Shinichi, 4,682,573, Cl. 123-90.200.
- Tammisalo, Erkki; Kanerva, Heikki; Aarnio, Jaakko; Wederhorn, Markku; and Laner, Kai, to Orion-Yhtymä. Apparatus for X-ray photography of the area of the dentition and of the jaws. 4,683,581, Cl. 378-38.000.
- Tamura, Shuichi: See—  
Suzuki, Ryoichi; Taka, Hideo; and Tamura, Shuichi, 4,682,872, Cl. 354-403.000.
- Tamura, Tadashi: See—  
Takada, Mitsuru; Itoh, Hiroshi; Hiramatsu, Shigeki; and Tamura, Tadashi, 4,682,518, Cl. 74-867.000.
- Tan, Peng. Liquid crystal hot spot detection with infinitesimal temperature control. 4,682,857, Cl. 350-331.00T.
- Tanabe, Seiichi: See—  
Kinoshita, Tomohiro; Tanabe, Seiichi; and Sasakawa, Eishiro, 4,683,177, Cl. 429-26.000.
- Tanabe, Tsuneaki: See—  
Inoue, Akio; and Tanabe, Tsuneaki, 4,683,261, Cl. 524-566.000.
- Tanaka, Hideaki: See—  
Fujita, Kunihiko; and Tanaka, Hideaki, 4,682,973, Cl. 474-263.000.
- Tanaka, Hideki: See—  
Katsuno, Mitsuaki; Gyoda, Toshio; Tanaka, Hideki; Hurumoto, Kunihiko; Yoshitsugu, Noritada; and Matsui, Kenji, 4,682,790, Cl. 280-801.000.
- Tanaka, Hitoshi: See—  
Nakamura, Morio; Obayashi, Shigeji; Yamamoto, Takushi; Nakaniishi, Toshikazu; Tanaka, Hitoshi; and Sakamoto, Yuji, 4,683,274, Cl. 526-216.000.
- Tanaka, Kazuo; and Tajima, Akira, to Canon Kabushiki Kaisha. Ultra-small size zoom lens. 4,682,860, Cl. 350-423.000.
- Tanaka, Motoaki; Ogawa, Yasuaki; Miyagawa, Tsutomu; and Watanabe, Toshio, to Waco Pure Chemical Ind. Inc.; and Takeda Chemical Industries, Ltd. Polymer and its production. 4,683,288, Cl. 528-361.000.
- Tanaka, Tomio: See—  
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.
- Tandem Computers Incorporated: See—  
Ferchau, Joerg U.; and Trujillo, Victor D., 4,682,833, Cl. 439-377.000.
- Wang, Hsienchin W., 4,683,383, Cl. 307-473.000.
- Tandy, Mark P.: See—  
Eastman, Robert J.; and Tandy, Mark P., 4,682,540, Cl. 101-32.000.
- Tani, Tadaaki: See—  
Ihama, Mikio; Tani, Tadaaki; and Ohnishi, Hiroshi, 4,683,193, Cl. 430-570.000.
- Taniguchi, Akihiko; Fukunaga, Takahiro; and Shimizu, Eiichi, to Sharp Kabushiki Kaisha. Mechanism for adjusting the starting position of sliding table of an electrophotographic copying machine. 4,682,884, Cl. 355-51.000.
- Taniguti, Ryosuke, to Mitsubishi Denki Kabushiki Kaisha. Vibration monitoring apparatus. 4,683,542, Cl. 364-508.000.
- Tatani, Atsushi: See—  
Onizuka, Masakazu; Tatani, Atsushi; Hamada, Takayoshi; and Omoto, Setsuo, 4,683,210, Cl. 436-50.000.
- Onizuka, Masakazu; Tatani, Atsushi; and Hamada, Takayoshi, 4,683,211, Cl. 436-50.000.
- Tatano, Toshio: See—  
Aoyama, Norihito; Mijike, Akira; Okano, Mikio; and Tatano, Toshio, 4,683,208, Cl. 436-12.000.
- Taylor, Frank S.; and Bourdon, Claude, to Monitronik Ltee. Self-supporting element for mosaic display panel. 4,682,432, Cl. 40-573.000.
- Taylor, Gary N.: See—  
Miller, David A.; Moran, Joseph M.; and Taylor, Gary N., 4,683,024, Cl. 156-643.000.
- Taylor, Keith H.: See—  
Morissette, Pierre; Stewart, Alexander W.; and Taylor, Keith H., 4,682,505, Cl. 73-862.340.
- Taylor, Malcolm E.: See—  
Pereira, Joseph J.; Taylor, Malcolm E.; and Sawaf, Bernard, 4,682,689, Cl. 206-222.000.
- Tazou, Ken: See—  
Yamada, Hiroyasu; Shiraiishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,682,685, Cl. 198-621.000.
- Technicon Instruments Corporation: See—  
Uffenheimer, Kenneth F., 4,683,212, Cl. 436-52.000.
- Tecumseh Products Company: See—  
Kaufman, Vernon R.; and Geringer, Miles S., 4,682,571, Cl. 123-73.00A.
- Teets, Bradley, to Iscar Ltd. Center height gage for cut-off tools. 4,682,420, Cl. 33-626.000.
- Teijin Limited: See—  
Yasuoka, Toshio, 4,683,158, Cl. 428-95.000.
- Tektronix, Inc.: See—  
Zimmerman, Matt J., 4,683,415, Cl. 323-282.000.
- Telemecanique Electrique: See—  
Quatse, Jesse T., 4,683,530, Cl. 364-200.000.
- Telex Computer Products, Inc.: See—  
Roberts, Clyde D., 4,683,507, Cl. 360-109.000.
- Tenenbaum, Martin, to Dakten Products Corp. Cooling system monitor. 4,682,493, Cl. 73-118.100.
- Tenneco Canada Inc. (ERCO division): See—  
Twardowski, Zbigniew; and McGilvery, James D., 4,683,039, Cl. 204-95.000.
- Teranishi, Katsuya; Ozima, Kazuhira; Saito, Cyuichi; and Ogawa, Hiroyasu, to Hitachi, Ltd. Escalator. 4,682,681, Cl. 198-333.000.
- Terrell, Michael S., to Duke Power Company. Material sampling apparatus. 4,682,507, Cl. 73-863.570.
- Terumo Corporation: See—  
Suzuki, Tatsuo, 4,682,980, Cl. 604-122.000.
- Terumo Kabushiki Kaisha: See—  
Kasai, Masaaki; and Ishikawa, Kenji, 4,682,703, Cl. 215-247.000.
- Suzuki, Tatsuo; and Matsumoto, Atsushi, 4,682,981, Cl. 604-158.000.
- Tetra Pak International AB: See—  
Lothman, Stig A., 4,682,684, Cl. 198-461.000.
- Tewes, Heinz: See—  
Becker, Wolfgang; and Tewes, Heinz, 4,683,032, Cl. 202-248.000.
- Texaco Inc.: See—  
Cuscirida, Michael; and Speranza, George P., 4,683,272, Cl. 525-404.000.
- Huang, Wann-Sheng; and Hight, Margaret A., 4,682,652, Cl. 166-263.000.
- Knifton, John F.; and Grice, Neal J., 4,683,335, Cl. 564-480.000.
- Lin, Chew-Chen; Brown, Winthrop K.; Lankford, Frank L., Jr.; Greenhill, Katherine L.; and Campsey, Ronald L., 4,683,464, Cl. 340-685.000.



- Texas A&M University: See—  
Costello, David, 4,682,895, Cl. 356-402.000.
- Texas Instruments Incorporated: See—  
Chatterjee, Pallab K., 4,683,486, Cl. 357-23.600.  
Pinkham, Raymond, 4,683,555, Cl. 365-215.000.  
Weber, Richard M., 4,682,669, Cl. 181-114.000.
- Texpa Arbtier Maschinenbau GmbH: See—  
Bierbaum, Joe; Henze, Siegfried; Mussig, Karl; and Ziegler, Hans, 4,682,555, Cl. 112-262.100.
- Tezuka, Junichi: See—  
Murata, Yasuto; Tezuka, Junichi; and Yamamoto, Kenji, 4,683,045, Cl. 204-206.000.
- Thackston, Ronald L.: See—  
Williams, A. Graves, III; and Thackston, Ronald L., 4,682,917, Cl. 408-212.000.
- Themont, Jean-Pierre: See—  
Goepfert, Serge P. P.; Renault, Serge A. M.; Roger, Françoise M. M.; Themont, Jean-Pierre; and Vachet, André J., 4,683,153, Cl. 428-1.000.
- Thoman, Marilyn L.: See—  
Weigle, William O.; Hobbs, Monte O.; Morgan, Edward L.; Thoman, Marilyn L.; and Houghten, Richard A., 4,683,221, Cl. 514-14.000.
- Thomas, Andrew S. W., to Lockheed Corporation. Control force generator, 4,682,746, Cl. 244-207.000.
- Thomas & Betts Corporation: See—  
Noorily, Peter; and Slachetka, Joseph P., 4,682,836, Cl. 439-426.000.
- Thomas, Bradley S.; and Kargetta, David J., to General Electric Company. Quadrupole gripper, 4,682,806, Cl. 294-88.000.
- Thomas, Mammen; and Weinberg, Matthew, to Advanced Micro Devices, Inc. Fast bipolar transistor for integrated circuit structure and method for forming same, 4,682,409, Cl. 29-591.000.
- Thomas, Stephen M.; and Nitowski, Ronald, to Siemon Company, The. Eight conductor modular plug, 4,682,837, Cl. 439-344.000.
- Thompson, Dale G.: See—  
Melton, Carl W.; Thompson, Dale G.; Vassamillet, Larry F.; and Wickersham, Charles E., 4,683,043, Cl. 204-192.150.
- Thomson, Robert G., to GTE Communication Systems Corporation. Impedance maintenance circuit for telephone interface, 4,683,351, Cl. 379-398.000.
- Thorsgard, Knute E. Method and device for achieving reversible male sterilization, 4,682,592, Cl. 128-303.00R.
- Thottathil, Paulose P.: See—  
Horowitz, Carl; Ryan, John M.; Sanduja, Mohan L.; Sugathan, Kenneth K.; and Thottathil, Paulose P., 4,683,007, Cl. 106-308.00M.
- Thysen Industrie AG: See—  
Kreiskorte, Ing. H., 4,682,498, Cl. 73-618.000.
- Tietjen, Donald L.; and Cruess, Michael W., to Motorola, Inc. Method and apparatus for interfacing buses of different sizes, 4,683,534, Cl. 364-200.000.
- Tieze, Jeffrey E.: See—  
Fohr, Robert D.; and Tieze, Jeffrey E., 4,682,813, Cl. 297-192.000.
- Tiffany, James J., to Newell Co. Display product and package combination, 4,682,690, Cl. 206-305.000.
- Timeback Systems, Inc.: See—  
Nelson, Robert G., 4,683,456, Cl. 340-347.0AD.
- Toa Nenryo Kogyo Kabushiki Kaisha: See—  
Kato, Masayuki; Taguchi, Yoshio; Imai, Chihiro; and Makishima, Tokuo, deceased, 4,683,275, Cl. 526-262.000.
- Todd, Christian A.; and Hart, William D., to Storage Technology Corporation. Fluid filter system with replaceable filter element, 4,682,993, Cl. 55-314.000.
- Toeg, Sasson: See—  
Cook, Robert C.; and Toeg, Sasson, 4,682,801, Cl. 292-251.500.
- Togino, Takayosi; Kobayashi, Yuki; and Yonekubo, Ken, to Olympus Optical Co., Ltd. Objective lens for microscope, 4,682,859, Cl. 350-414.000.
- Tokizane, Masaru: See—  
Kojima, Teiryō; Matsuda, Heiichi; and Tokizane, Masaru, 4,682,465, Cl. 57-247.000.
- Tokuda, Wahei; and Takagi, Atushi, to Canon Kabushiki Kaisha. Image recording apparatus, 4,682,882, Cl. 355-14.00D.
- Tokuno, Masateru; Sawada, Tetsuya; and Ishii, Yoshihiro, to Rengo Co., Ltd. Apparatus for automatically mounting a web roll on a mill roll stand, 4,682,743, Cl. 242-58.600.
- Tokyo Electric Co., Ltd.: See—  
Horiya, Keiichi; Takahama, Kazuhide; and Usami, Yutaka, 4,683,479, Cl. 346-76.0PH.
- Yamamoto, Mikio, 4,683,536, Cl. 364-408.000.
- Tokyo Juki Industrial Co., Ltd.: See—  
Goto, Sumio; Ishibashi, Jiro; and Nemoto, Masakazu, 4,682,554, Cl. 112-262.100.
- Toldi, George; Nigam, Anil; Crain, Ronald; and Mercurio, Dominic, to Syquest Technology. Disc drive arrangement for a hard disc cartridge with a read/write head retract mechanism, 4,683,506, Cl. 360-105.000.
- Tolonen, Eric; Tubbe, Clifford J.; Giesbrecht, George G.; and Wiens, John A., to Uniroyal Goodrich Tire Company, The. Early progressive junction extrusion process and system, 4,683,095, Cl. 264-171.000.
- Tom, Victor T., to Analytic Sciences Corporation, The. System for and method of enhancing images using multiband information, 4,683,496, Cl. 358-166.000.
- Toman, George M., to Meistergram, Inc. Multi-emblem clamping device, 4,682,551, Cl. 112-103.000.
- Tomes, Herbert, Jr. Wire identifying sleeve applicator, 4,682,411, Cl. 29-745.000.
- Tomida, Yoshinori: See—  
Saito, Kenji; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nishimura, Yukuo; and Nakagiri, Takashi, 4,682,897, Cl. 374-45.000.
- Tomita, Seisuke: See—  
Kakiuchi, Shinichi; Saito, Tasuku; and Tomita, Seisuke, 4,683,257, Cl. 524-432.000.
- Tonegawa, Tadashi: See—  
Ohashi, Kunio; Tonegawa, Tadashi; Nagata, Shoichi; and Nakamura, Masatsugu, 4,683,186, Cl. 430-84.000.
- Topich, James A.: See—  
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- Topper, Robert J., to RCA Corporation. Compatible wide-screen television system camera, 4,683,498, Cl. 358-209.000.
- Toray Industries, Inc.: See—  
Hagiwara, Satoru; Satoh, Kimio; and Okabe, Kazuo, 4,683,093, Cl. 264-22.000.
- Kojima, Teiryō; Matsuda, Heiichi; and Tokizane, Masaru, 4,682,465, Cl. 57-247.000.
- Toray Silicone Co., Ltd.: See—  
Mikami, Ryuzo, 4,683,250, Cl. 522-33.000.  
Mikami, Ryuzo, 4,683,251, Cl. 522-46.000.  
Suzuki, Toshio, 4,683,278, Cl. 528-32.000.
- Yoshitake, Makoto; and Kishimoto, Keiichi, 4,683,319, Cl. 556-425.000.
- Torigoe, Makoto, to Canon Kabushiki Kaisha. Illumination apparatus, 4,682,885, Cl. 355-67.000.
- Toro Company, The: See—  
Walto, Joseph J., 4,682,732, Cl. 239-123.000.
- Torre, John J., to Allied Corporation. Inductive magnetic field generator, 4,683,461, Cl. 340-551.000.
- Toshiba Ceramics Co., Ltd.: See—  
Watanabe, Kuniaki; and Suzuki, Hideo, 4,682,718, Cl. 222-591.000.
- Tossuto, Jean F.; and Bricaud, Hervé, to Socapex. Integrated circuit test clip, 4,683,425, Cl. 324-158.00F.
- Tote-Cart Company: See—  
Mills, Frank, 4,682,782, Cl. 280-33.99B.
- Toyama, Masamichi; Kaneda, Naoya; and Fujibayashi, Kazuo, to Canon Kabushiki Kaisha. Distance measuring device, 4,682,886, Cl. 356-1.000.
- Toyo Jozo Kabushiki Kaisha: See—  
Ishikawa, Hidehiko; Matsuura, Kazuo; and Misaki, Hideo, 4,683,198, Cl. 435-22.000.
- Toyo Seikan Kaisha Ltd.: See—  
Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,683,263, Cl. 525-57.000.
- Toyoshima, Masakatsu: See—  
Sakamoto, Akira; Fukami, Takeshi; Sugita, Takehiro; and Toyoshima, Masakatsu, 4,683,586, Cl. 380-48.000.
- Toyota Jidosha Kabushiki Kaisha: See—  
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Kato, Kenji; Inoue, Tokuta; Nakanishi, Kiyoshi; and Matsushita, Soichi, 4,682,577, Cl. 123-492.000.
- Katsuno, Mitsuaki; Gyoda, Toshio; Tanaka, Hideki; Hurumoto, Kunihiko; Yoshitsugu, Noritada; and Matsui, Kenji, 4,682,790, Cl. 280-801.000.
- Kurosu, Noriaki; Ohmae, Masanori; and Kashiwa, Michiaki, 4,683,540, Cl. 364-468.000.
- Murata, Kiyohito, 4,682,676, Cl. 192-21.500.
- Okada, Mitsuhiro; and Ito, Hiroshi, 4,682,519, Cl. 74-868.000.
- Sumiya, Koji; Kano, Takenori; Kubo, Seitoku; and Watanabe, Kazuaki, 4,682,534, Cl. 92-130.00R.
- Takada, Mitsuru; Itoh, Hiroshi; Hiramatsu, Shigeki; and Tamura, Tadashi, 4,682,518, Cl. 74-867.000.
- Tracy, C. Edwin: See—  
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- Trautwein, Richard R.: See—  
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- Tremper, Donald: See—  
Figiel, Janusz; Tremper, Donald; and Lems, Peter, 4,683,017, Cl. 156-73.100.
- Trent Jetfloor Limited: See—  
Sparrow, Ian H., 4,682,458, Cl. 52-309.800.
- Tri Plas, Inc.: See—  
DeVore, Frank C.; and Argudo, Marcos A., 4,682,706, Cl. 220-276.000.
- Trivedi, Bharat K., to Warner-Lambert Company. Ng-Benzopyrano- and benzothioopyrano adenosines and methods of use, 4,683,223, Cl. 514-46.000.
- Trom, Joseph, Jr.: See—  
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- Troxel, Kathleen A.: See—  
Kammann, Karl P., Jr.; and Troxel, Kathleen A., 4,683,081, Cl. 252-392.000.
- Trujillo, Victor D.: See—  
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- Ukachi, Takashi; Bessho, Keiichi; Kumano, Atsushi; Matsumura, Yoshio; and Ansel, Robert E., to DeSoto, Inc.; and Japan Synthetic Rubber Co., Ltd. Radiation curable composition, 4,683,280, Cl. 528-71.000.
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- Koleske, Joseph V.; and Domeier, Linda A., 4,683,287, Cl. 528-357.000.
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- United Kingdom Atomic Energy Authority: See—  
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- Randig, George W., 4,683,474, Cl. 342-368.000.
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- Bierhoff, Martinus P. M.; and Lonij, Hubertus M. M., 4,683,561, Cl. 369-45.000.
- Brock, Thorsten, 4,683,495, Cl. 358-148.000.
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- Clasen, Rolf, 4,682,995, Cl. 65-18.100.
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- Upmeyer, Hartmut; and Peters, Rudolf, to Windmoller & Holscher. Flattening and take-off apparatus for providing a plastic film web from a blown tubular film, 4,682,941, Cl. 425-72.00R.
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- Urata, Keiji; and Kurome, Yoshio, to Sanyo-Kokusaku Pulp Co., Ltd. Hardenable coating composition for polypropylene resins, 4,683,264, Cl. 525-65.000.
- Urban, Manfred, to Robert Bosch GmbH. Method of monitoring computer elements, particularly microprocessors, 4,683,568, Cl. 371-12.000.
- Urfer, Allen D.: See—  
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- Usami, Yutaka: See—  
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- USM Corporation: See—  
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- Shields, Thomas A., 4,682,925, Cl. 411-461.000.
- Uttke, Russell H. C.: See—  
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- Vaillancourt, Marilyn L. Convertible pierced-earlobe earring, 4,682,477, Cl. 63-12.000.
- Vaillancourt, Vincent L.; and Kocanowski, Stephen, to VLV Associates. Wire guide, 4,682,607, Cl. 128-772.000.
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- Vancura, Vladimir. Drill adapter, 4,682,662, Cl. 175-320.000.
- Van der Burgt, Maarten J.: See—  
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- Van DerLinden, Roy E.: See—  
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- van Dongen, Johannes C. M.; and Maekiaho, Leo B., to Shell Oil Company. Method for determining the azimuth of a borehole, 4,682,421, Cl. 33-302.000.
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- Van Geenen, Albert A.; and Bongers, Jozef J. M., to Stamicarbon B.V. Process for preparing an acyl-lactam compound, 4,683,304, Cl. 540-529.000.
- Vanhille, Andre A. F. L., to Sobemi N.V. Method of forming a cylindrical sleeve, 4,682,485, Cl. 72-133.000.
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- Vartanian, Albert V.: See—  
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- Vas-Cath of Canada Limited: See—  
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- Vassamillet, Larry F.: See—  
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- Vassort, Guy: See—  
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- Velencei, John. Internal combustion engine (JV-1), 4,682,570, Cl. 123-73.0PP.
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Waller, Martin; Farrell, Geoffrey; Mills, Kenneth W., deceased; Mason, Margaret, executor; and Shindler, Geoffrey A., executor, 4,683,028, Cl. 162-275.000.
- Verrier, Pierre E.: See—  
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- Verrijp, Bastiaan: See—  
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- Vianova Kunstharz, A.G.: See—  
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- Victor Company of Japan, Ltd.: See—  
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- Victor Stanley, Inc.: See—  
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- Vipont Laboratories, Inc.: See—  
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- Vitamins, Inc.: See—  
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- Vitro Tec Fideicomiso: See—  
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- VLV Associates: See—  
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- Vogt, Hans: See—  
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- Vojtisek, Vladimir: See—  
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- Vollmer, David J.; and Greame, James E., to Automatic Switch Company. Solenoid actuator with electrical connection modules, 4,683,454, Cl. 335-299.000.
- Voss, Steven H.: See—  
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- W. M. Still & Sons Limited: See—  
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- W. Schlafhorst & Co.: See—  
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- Waco Pure Chemical Ind. Inc.: See—  
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- Wada, Yoshiomi. Educational toy, 4,682,955, Cl. 434-191.000.
- Wagberg, Michael L.: See—  
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- Wagers, Kevin J., to Dow Chemical Company. The. Method of forming flexible fastener elements and securing them to a traveling web, 4,683,015, Cl. 156-66.000.
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- Wagner Electronic Products, Inc.: See—  
Wagner, Edward D.; and Trautwein, Richard R., 4,683,418, Cl. 324-61.00P.
- Wagner Spray Tech Corporation: See—  
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- Wagner, William R., to Rockwell International Corporation. Turbo-compressor downhole steam-generating system, 4,682,471, Cl. 60-649.000.
- Wagner, William R., to Rockwell International Corporation. Labyrinthine turbine-rotor-blade tip seal, 4,682,933, Cl. 415-172.00A.
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- Walker, Bryan J., to 501 Granulite Limited. Building materials, 4,683,006, Cl. 106-288.00R.
- Walker, Charles E.: See—  
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- Walker, Thomas. Temperature compensated Bourdon tube gauge, 4,682,501, Cl. 73-708.000.
- Walker, Timothy A.: See—  
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- Wallace, Richard E.: See—  
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- Wallat, Siegfried: See—  
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- Wallbridge, William L.: See—  
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- Waller, Martin; Farrell, Geoffrey; Mills, Kenneth W., deceased; by Mason, Margaret, executor; and by Shindler, Geoffrey A., executor, to Vernon and Company (Pulp Products) Limited. Moulding, 4,683,028, Cl. 162-275.000.
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- Walto, Joseph J., to Toro Company, The. Sprinkler with improved riser seal, 4,682,732, Cl. 239-123.000.
- Walz, Gerard F. Multi-part mailer form assembly, 4,682,793, Cl. 282-11.50A.
- Wang, Hsienchin W., to Tandem Computers Incorporated. Driver circuit for a three-state gate array using low driving current, 4,683,383, Cl. 307-473.000.
- Wang, John S.: See—  
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- Glass, Michael; Hobolick, Joseph; and Orlandi, Daniel A., 4,683,138, Cl. 426-5.000.
- Trivedi, Bharat K., 4,683,223, Cl. 514-46.000.
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- Warrin, George E., to Dentsply Research & Development Corp. Tool holder for ultrasonic endodontic apparatus, 4,682,949, Cl. 433-81.000.
- Washington, Leo. Stick and hoop toy, 4,682,971, Cl. 446-450.000.
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- Watanabe, Tadashi; and Inoue, Shunichi, to Bridgestone Corporation. System for manufacture of high-lug tires, 4,682,641, Cl. 157-13.000.
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- Watanabe, Toshio: See—  
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- Hager, Robert E., 4,683,105, Cl. 376-259.000.
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- Williams, Warren R., Jr.: See—  
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- Wilt, Nicholas J.: See—  
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- Wiltshire, Bruce: See—  
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- Witak, Donald T.; and Glaser, Ronald M., to Ohio State University Research Foundation. The Anti-cancer agents and processes for their preparation, 4,683,087, Cl. 260-396.00R.
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- Wohler, Johann F., to General Dynamics Land Systems, Inc. Active protection system, 4,682,528, Cl. 89-1.300.
- Wojtanek, Guy A., to Eaton Corporation. Illuminated switch assembly with combined light and light shield, 4,683,359, Cl. 200-314.000.
- Wolf, James A., Jr.: See—  
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- Wolff, Friedrich. Lamp for emission of radiation in UV and visible light ranges of the spectrum, 4,683,379, Cl. 250-493.100.
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- Wood, Chester W., to Dover Corporation. Nozzle construction and method of making the same, 4,682,714, Cl. 222-153.000.
- Wood, John M. Golf swing training device, 4,682,775, Cl. 273-186.00A.
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- Woodley, George M.; and Bakes, William S., to King Instrument Corporation. Apparatus and method for loading tape into a cassette, 4,682,742, Cl. 242-56.00R.
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- Woznicki, Edward J.: See—  
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- Wright, Walter E.: See—  
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- Yalpani, Manssur, to British Columbia Research Council. Process for the preparation of aminated polysaccharide derivatives, 4,683,298, Cl. 536-45.000.
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- Yamamoto, Kenji: See—  
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- Yamamoto, Mikio, to Tokyo Electric Co., Ltd. Product sales data processing system for on-line connection to host CPU, 4,683,536, Cl. 364-408.000.
- Yamamoto, Takashi: See—  
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- Yamaura, Junichi: See—  
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- Yanagisawa, Hiroshi: See—  
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- Yangas, Roger A. Reflective apparatus for microwave cooking, 4,683,362, Cl. 219-10.55F.
- Yano, Takashi; and Yoneyama, Yasuo, to Fujisoku Electric Co., Ltd. Changeover switch, 4,683,352, Cl. 200-6.00R.
- Yao, Raymond C.: See—  
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- Yasuoka, Toshio, to Teijin Limited. Carpet having bottom portions of pile covered with carbon black containing resin, 4,683,158, Cl. 428-95.000.
- Yawberg, Richard C.: See—  
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- Yazvac, Thomas A., to General Electric Company. Integrated lighting panelboard and wiring gutter assembly, 4,683,517, Cl. 361-358.000.
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- Yeh, Ching-Hsuan. Tumbler plate cylinder lock, 4,682,484, Cl. 70-364.00R.
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- Yokemura, Taketoshi: See—  
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- Yoneyama, Yasuo: See—  
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- Yoshimitsu, Tsutsui: See—  
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- Yoshimura, Masato; and Ohaki, Ryouhei, to Oki Electric Industry Co., Ltd. Paper feed mechanism for printer, 4,682,904, Cl. 400-616.000.
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- Yoshioka, Toshiro: See—  
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- Yoshitake, Makoto; and Kishimoto, Keiichi, to Toray Silicone Co., Ltd. Thermal stabilizer for organopolysiloxane oils, 4,683,319, Cl. 556-425.000.
- Yoshitsugu, Noritada: See—  
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- Yoshiura, Shoichiro: See—  
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- Younes, Usama E., to Atlantic Richfield Company. Composition comprising a matrix resin, a flame retarding synergist, and an alternating copolymer of brominated styrene and N-brominated phenyl maleimide, 4,683,084, Cl. 252-609.000.
- Young, Brad J. Portable low profile mechanical scales, 4,682,665, Cl. 177-139.000.
- Young, Donald C., to Union Oil Company of California. Methods for enhancing the productivity of plants, 4,682,999, Cl. 71-28.000.
- Young, Gladstone F.; Green, Richard F.; Miller, S. David; and Quinlan, Thomas J., III, to Data Switch Corporation. Matrix switch system, 4,683,564, Cl. 370-63.000.
- Young, Gordon W. Teleconferencing and teaching method and apparatus, 4,682,957, Cl. 434-307.000.
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- Young, James P.; Weber, Robert J.; and Kaelin, G. Robert, to United States of America, Air Force. Monolithic low noise amplifier with limiting, 4,683,443, Cl. 330-277.000.
- Young, Robert N.: See—  
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- Young, Ronald F.: See—  
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- Yount, Larry J.; Wilt, Nicholas J.; Hill, Bryan H.; and Peterson, Donald A., Jr., to Honeywell Inc. Real-time software monitor and write protect controller, 4,683,532, Cl. 364-200.000.
- YuHan Corporation Co., Ltd.: See—  
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- Yukitomo, Kazuo: See—  
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- Yusa, Atsushi, to Olympus Optical Co., Ltd. Method for purifying an industrial raw material gas and a purifier for use in said method and a method of manufacturing said purifier, 4,683,125, Cl. 423-219.000.
- Yuto, Masao; and Suzuki, Yoichi, to Sumitomo Electric Industries, Ltd. Foamed plastic insulated wire and method for producing same, 4,683,166, Cl. 428-314.800.
- Zahlaus, Alfred, to Alfa-Laval Cheese Systems Limited. Processing of curd, 4,682,538, Cl. 99-453.000.
- Zarka, Michel, to Contact Securite - Societe d'Exploitation. Wheeled stretcher in which the plane on which the patient lies is adaptable in height, 4,682,810, Cl. 296-20.000.
- Zavada, Richard: See—  
Oyler, John F.; Brand, Jerry D.; and Zavada, Richard, 4,683,029, Cl. 196-14.520.
- Zeblicky, Rudolph J.: See—  
Morrissey, Denis M.; Takach, Peter E.; and Zeblicky, Rudolph J., 4,683,036, Cl. 204-15.000.
- Zelms, Charles M.: See—  
Rouse, David M.; Wallace, Richard E.; and Zelms, Charles M., 4,683,563, Cl. 370-16.000.
- Ziegler, Hans: See—  
Bierbaum, Joe; Henze, Siegfried; Mussig, Karl; and Ziegler, Hans, 4,682,555, Cl. 112-262.100.
- Zierenberg, Bernd; and Gupta, Arun R., to Boehringer Ingelheim KG. Divisible pharmaceutical tablet with delayed active ingredient release, 4,683,131, Cl. 424-467.000.
- Zimmerman, Matt J., to Tektronix, Inc. Line frequency switching power supply, 4,683,415, Cl. 323-282.000.
- Zimmerman, Theodore S.; Ruggeri, Zaverio M.; and Houghten, Richard, to Scripps Clinic and Research Foundation. Platelet binding inhibitors, 4,683,291, Cl. 530-324.000.
- Zimmermann, Eberhard; and Stroetmann, Michael. Resorptive sheet material for closing and healing wounds and method of making the same, 4,683,142, Cl. 427-2.000.
- Zipp, Adam: See—  
Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp, Adam, 4,683,209, Cl. 436-14.000.
- Zolton, Gregory P., II: See—  
Harth, George H., III; Zolton, Gregory P., II; and Copen, Robert L., 4,682,397, Cl. 29-407.000.
- Zotos International, Inc.: See—  
Giuliano, James T., 4,682,612, Cl. 132-73.000.
- Zsida, Attila, to Grams, Christiane. Solar energy collector and sun motor utilizing same, 4,682,582, Cl. 126-440.000.
- Zuranski, Edward S.: See—  
Betts, William L.; and Zuranski, Edward S., 4,683,578, Cl. 375-98.000.
- Zwick, David J., to Coleman Company, Inc. The Canvas retaining assembly for camping trailer, 4,682,618, Cl. 135-89.000.
- Zwiers, Renso J. M.: See—  
Broer, Dirk J.; Zwiers, Renso J. M.; and Jochem, Cornelis M. G., 4,682,853, Cl. 350-128.000.
- Zytec Corporation: See—  
Bucher, James D., II, 4,683,529, Cl. 363-44.000.
- 501 Granulite Limited: See—  
Walker, Bryan J., 4,683,006, Cl. 106-288.00R.
- 501 Hoya Corporation: See—  
Shimizu, Yasumoto; and Matsudaira, Takeo, 4,683,044, Cl. 204-192.260.
- 501 Woven Electronics Corporation: See—  
Piper, Douglas E.; and Black, Michael D., 4,682,828, Cl. 439-92.000.



## LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF JULY, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Afonso, Adriano; and Hon, Frank, to Schering Corporation. AZA penem compounds. Re. 32,465, Cl. 514-210.000.
- Aine, Harry E. Thin film recording and method of making. Re. 32,464, Cl. 428-622.000.
- Ainsworth, Clifford L.: See—  
Westlake, John H.; Leach, Clifford H.; and Ainsworth, Clifford L., Re. 32,463, Cl. 175-48.000.
- Hon, Frank: See—  
Afonso, Adriano; and Hon, Frank, Re. 32,465, Cl. 514-210.000.
- Leach, Clifford H.: See—  
Westlake, John H.; Leach, Clifford H.; and Ainsworth, Clifford L., Re. 32,463, Cl. 175-48.000.
- Mita Industrial Co Ltd.: See—  
Miyakawa, Nobuhiro, Re. 32,466, Cl. 503-208.000.
- Miyakawa, Nobuhiro, to Mita Industrial Co Ltd. Heat-sensitive color-forming recording material and process for preparation thereof. Re. 32,466, Cl. 503-208.000.
- Norton Christensen, Inc.: See—  
Westlake, John H.; Leach, Clifford H.; and Ainsworth, Clifford L., Re. 32,463, Cl. 175-48.000.
- Schering Corporation: See—  
Afonso, Adriano; and Hon, Frank, Re. 32,465, Cl. 514-210.000.
- Westlake, John H.; Leach, Clifford H.; and Ainsworth, Clifford L., to Norton Christensen, Inc. Method of and apparatus for telemetering information from a point in a well borehole to the earth's surface. Re. 32,463, Cl. 175-48.000.

## LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

- Alfa Chemicals Italiana S.p.A.: See—  
Cannata, Vincenzo; and Tamerlani, Giancarlo, B1 4,423,244, Cl. 562-466.000.
- BASF Wyandotte Corporation: See—  
Kaneko, Thomas M., B1 4,351,753, Cl. 252-357.000.
- Cannata, Vincenzo; and Tamerlani, Giancarlo, to Alfa Chemicals Italiana S.p.A. Process for the preparation of the d-2-(6-methoxy-2-naphthyl)-propionic acid. B1 4,423,244, 7-28-87, Cl. 562-466.000.
- Kaneko, Thomas M., to BASF Wyandotte Corporation. Liquified normally solid polyoxyalkylene block copolymers. B1 4,351,753, 7-28-87, Cl. 252-357.000.
- Tamerlani, Giancarlo: See—  
Cannata, Vincenzo; and Tamerlani, Giancarlo, B1 4,423,244, Cl. 562-466.000.

## LIST OF DESIGN PATENTEES

- Adler, Janet F.: See—  
Koester, Betty L.; and Adler, Janet F., 291,104, Cl. D21-173.000.
- Ago, Nobuhiro; and Tsuboi, Takayuki, to Canon Kabushiki Kaisha. Camera. 291,090, 7-28-87, Cl. D16-6.000.
- American Telephone & Telegraph Co., AT&T Technologies, Inc.: See—  
Davidson, Charles B., 291,083, Cl. D14-63.000.
- Anchor Hocking Corporation: See—  
Pugh, Richard E., 291,065, Cl. D9-418.000.
- Andersson, Krister. Transporting device. 291,136, 7-28-87, Cl. D34-28.000.
- Antoine, Jean-Luc. Packaging container. 291,066, 7-28-87, Cl. D9-418.000.
- Antonious, Anthony J. Golf club head. 291,106, 7-28-87, Cl. D21-219.000.
- Arneteg, Ingemar, to Stellana Plast AB. Bracket for use in a trolley member. 291,138, 7-28-87, Cl. D34-35.000.
- Aspen Laboratories, Inc.: See—  
McCune, William L., 291,123, Cl. D24-21.000.
- Baisch, Herbert: See—  
Handler, Milton E.; Sylvan, Richard; Baisch, Herbert; and Peterson, Michael, 291,037, Cl. D6-432.000.
- Bardue, Casey M.: See—  
Jones, Paul W.; and Bardue, Casey M., 291,121, Cl. D24-17.000.
- Bartasevich, William E., Jr.: See—  
Lackner, John R.; and Bartasevich, William E., Jr., 291,129, Cl. D32-31.000.
- Bauer, Horst, to Carl Platz GmbH. Spray gun. 291,113, 7-28-87, Cl. D23-17.000.
- Beghin-Say, S.A.: See—  
Minost, Henri, 291,067, Cl. D9-418.000.
- Bertrand, Vic, to Ritvik Group Inc., The. Toy construction piece. 291,099, 7-28-87, Cl. D21-108.000.
- Bianchi Scarpa, Afra: See—  
Scarpa, Tobia; and Bianchi Scarpa, Afra, 291,036, Cl. D6-399.000.
- Bird, Samuel W., Jr. Armrest enclosure for an automobile telephone. 291,026, 7-28-87, Cl. D3-40.000.
- Blaisdell, Ronald G.; and Hough, Harold L., to GTE Products Corporation. Fluorescent lamp. 291,124, 7-28-87, Cl. D26-3.000.
- Bohjort, Bengt, to Miniman Security AB. Protective helmet with retractable goggles. 291,127, 7-28-87, Cl. D29-15.000.
- Bokmiller, David J., to Sani-Fresh International, Inc. Cleaning wand caddy. 291,039, 7-28-87, Cl. D6-551.000.
- Breil, Randy J. Telephone line polarity tester. 291,071, 7-28-87, Cl. D10-78.000.
- Brun, Serge, to Calor S.A. Electric iron. 291,130, 7-28-87, Cl. D32-70.000.
- Brunswick Corporation: See—  
Robbins, Richard J., 291,108, Cl. D22-141.000.
- Buchin, Karl, to Krone GmbH. Telephone set. 291,082, 7-28-87, Cl. D14-53.000.
- Burks, Kenneth: See—  
Jones, Charles; Murphy, James L.; and Burks, Kenneth, 291,068, Cl. D10-30.000.
- Burns, David W. Rocking chair. 291,034, 7-28-87, Cl. D6-348.000.
- Butterfield, George. Illuminated picture frame. 291,030, 7-28-87, Cl. D6-308.000.
- Caldeira, Adelino, to Kangaroos U.S.A., Inc. Pocketed shoe. 291,021, 7-28-87, Cl. D2-309.000.
- Calor S.A.: See—  
Brun, Serge, 291,130, Cl. D32-70.000.
- Campbell, Bruce R., to IVAC Corporation. Enteric pump. 291,119, 7-28-87, Cl. D24-8.000.
- Canning, Glenn R. Beverage can holder. 291,044, 7-28-87, Cl. D7-70.000.
- Canon Kabushiki Kaisha: See—  
Ago, Nobuhiro; and Tsuboi, Takayuki, 291,090, Cl. D16-6.000.
- Hirooka, Junji, 291,027, Cl. D3-76.000.
- Yomo, Takashi, 291,096, Cl. D18-13.000.

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- Carl Platz GmbH: See—  
Bauer, Horst, 291,113, Cl. D23-17.000.
- Centro Studi E Servizi Moda Di Paolo Bertagnin E C. S.A.S.: See—  
Scarpa, Tobia; and Bianchi Scarpa, Afra, 291,036, Cl. D6-399.000.
- Clivio, Franco; and Raffler, Dieter, to Gardena Kress & Kastner GmbH & Co. KG. Fountain brush. 291,028, 7-28-87, Cl. D4-115.000.
- Clivio, Franco; and Raffler, Dieter, to Gardena Kress & Kastner GmbH. Combined pressure reducer and fertilizer dispenser. 291,112, 7-28-87, Cl. D23-3.000.
- Conair Corporation: See—  
Haber, Barry; and Walkley, Charles, 291,064, Cl. D9-415.000.
- Convergent Technologies, Inc.: See—  
Nuttall, Michael J.; Freige, Diab E.; and Keely, Leroy B., 291,085, Cl. D14-113.000.
- Cosco, Inc.: See—  
Sauter, Bruce M.; and Snyder, Orville E., 291,032, Cl. D6-333.000.
- Crist, Craig W.: See—  
Drake, Craig D.; and Crist, Craig W., 291,023, Cl. D3-35.000.
- Dalbey, Gary L.; and Huston, Ronald L., to Hulsizer's, Inc. Display panel for shelving. 291,097, 7-28-87, Cl. D20-44.000.
- Dart Container Corporation: See—  
Dart, Robert C., 291,040, Cl. D7-6.000.
- Dart Industries Inc.: See—  
Fahey, William K.; and Picozza, Augusto A., 291,042, Cl. D7-27.000.
- Dart, Robert C., to Dart Container Corporation. Beverage cup. 291,040, 7-28-87, Cl. D7-6.000.
- Davidson, Charles B., to American Telephone & Telegraph Co., AT&T Technologies, Inc. Telephone handset. 291,083, 7-28-87, Cl. D14-63.000.
- Decursu, Giorgio, to Eles S.p.A. Knob. 291,053, 7-28-87, Cl. D8-310.000.
- Delepine, Jean-Claude. Spout. 291,115, 7-28-87, Cl. D23-32.000.
- DeMars, Robert A. Refuse container. 291,134, 7-28-87, Cl. D34-5.000.
- Designs for Vision, Inc.: See—  
Feinbloom, Richard E.; and Yee, Lung T., 291,091, Cl. D16-130.000.
- DiFede, John. Plastic bucket lid removal tool. 291,051, 7-28-87, Cl. D8-40.000.
- Disanza, Paul. Leaf and cuttings gatherer. 291,133, 7-28-87, Cl. D34-1.000.
- Drake, Craig D.; and Crist, Craig W., to Ring King Visibles, Inc. Storage case for flat articles. 291,023, 7-28-87, Cl. D3-35.000.
- Durand, Jean-Jacques. Multi-purpose bowl or similar article. 291,043, 7-28-87, Cl. D7-28.000.
- Egli, Christoph, to Telefonaktiebolaget LM Ericsson. Typewriter. 291,092, 7-28-87, Cl. D18-1.000.
- Ehrenfried, Katherine M. Doll head. 291,105, 7-28-87, Cl. D21-190.000.
- Elesa S.p.A.: See—  
Decursu, Giorgio, 291,053, Cl. D8-310.000.
- Eltech Systems Corporation: See—  
Miller, Thomas M.; and Schraff, Raymond J., 291,118, Cl. D23-82.000.
- Erickson, Richard D. Disposable shoe shine kit. 291,022, 7-28-87, Cl. D3-30.500.
- F.I.R. Rubinetterie S.p.A.: See—  
Piesco, Nazzareno, 291,114, Cl. D23-25.000.
- Fahey, William K.; and Picozza, Augusto A., to Dart Industries Inc. Compartmented dish. 291,042, 7-28-87, Cl. D7-27.000.
- Feinbloom, Richard E.; and Yee, Lung T., to Designs for Vision, Inc. Combined beam splitter and optical coupler for connecting a light source to a television camera during surgical procedures. 291,091, 7-28-87, Cl. D16-130.000.
- Fenne, Kenneth R., to Pittway Corporation. Timer. 291,069, 7-28-87, Cl. D10-40.000.
- Fenne, Kenneth R., to Pittway Corporation. Night-light. 291,125, 7-28-87, Cl. D26-26.000.
- Freige, Diab E.: See—  
Nuttall, Michael J.; Freige, Diab E.; and Keely, Leroy B., 291,085, Cl. D14-113.000.
- Fukuhara, Kunihiro; and Naruse, Masayuki, to Nifco Inc. Panel fastener or similar article. 291,055, 7-28-87, Cl. D8-354.000.
- Gamm, Robert J., to Kangaroos U.S.A., Inc. Pocketed boot upper. 291,020, 7-28-87, Cl. D2-272.000.
- Gaptjern, Ingrid E. Combined cigarette snuffer and holder. 291,126, 7-28-87, Cl. D27-2.000.
- Gardena Kress & Kastner GmbH: See—  
Clivio, Franco; and Raffler, Dieter, 291,112, Cl. D23-3.000.
- Gardena Kress & Kastner GmbH & Co. KG: See—  
Clivio, Franco; and Raffler, Dieter, 291,028, Cl. D4-115.000.
- Grandsart, Barbara S. Jockey helmet. 291,128, 7-28-87, Cl. D29-15.000.
- Grange, Kenneth. Covered vegetable dish. 291,041, 7-28-87, Cl. D7-18.000.
- Grout, Raymond F.: See—  
Purvis, Grant D.; Grout, Raymond F.; and Harrison, Grant, 291,029, Cl. D4-118.000.
- Grubb, Lawrence B.; and Kelly, Lois E., to Johnson & Johnson Baby Products Company. Teething toy. 291,122, 7-28-87, Cl. D24-45.000.
- GTE Products Corporation: See—  
Blaisdell, Ronald G.; and Hough, Harold L., 291,124, Cl. D26-3.000.
- Mickelson, N. Peter; and Napiorkowski, John J., 291,081, Cl. D14-52.000.
- Guermendi, Romano, to Societa' Pneumatici Pirelli. Tire for a vehicle wheel. 291,073, 7-28-87, Cl. D12-146.000.
- Haber, Barry; and Walkley, Charles, to Conair Corporation. Packaging container for a telephone. 291,064, 7-28-87, Cl. D9-415.000.
- Haggard, Merry: See—  
Haggard, Robert E., 291,049, Cl. D8-1.000.
- Haggard, Robert E., to Haggard, Merry. Tree drain grate or similar article. 291,049, 7-28-87, Cl. D8-1.000.
- Handler, Milton E.; Sylvan, Richard; Baisch, Herbert; and Peterson, Michael, to Hirsh Company. Storage cabinet. 291,037, 7-28-87, Cl. D6-432.000.
- Hans Grohe GmbH & Co KG: See—  
Haug, Andreas; and Schonherr, Thomas, 291,116, Cl. D23-32.000.
- Hanyu, Susumu, to Janome Sewing Machine Co. Ltd. Sewing machine. 291,088, 7-28-87, Cl. D15-69.000.
- Harada, Toshio: See—  
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 291,048, Cl. D7-351.000.
- Harrison, Grant: See—  
Purvis, Grant D.; Grout, Raymond F.; and Harrison, Grant, 291,029, Cl. D4-118.000.
- Hasbro Industries, Inc.: See—  
Knight, Elizabeth, 291,103, Cl. D21-165.000.
- Hashimoto, Masanori: See—  
Morozumi, Kiyotaka; Hashimoto, Masanori; and Minagawa, Masahiro, 291,095, Cl. D18-13.000.
- Haug, Andreas; and Schonherr, Thomas, to Hans Grohe GmbH & Co KG. Spout. 291,116, 7-28-87, Cl. D23-32.000.
- Hebert, Loney J., Jr. Tree sculpture. 291,072, 7-28-87, Cl. D11-118.000.
- Helix Limited: See—  
Warwicker, Clive W., 291,139, Cl. D99-28.000.
- Henshaw, Garry E. Combination bottle opener and resealer. 291,052, 7-28-87, Cl. D8-40.000.
- Hice, James E. Shelf unit. 291,038, 7-28-87, Cl. D6-479.000.
- Hill, Royce W., to Micro Plastics, Inc. Circuit board support. 291,056, 7-28-87, Cl. D8-354.000.
- Hirooka, Junji, to Canon Kabushiki Kaisha. Case for a word processor. 291,027, 7-28-87, Cl. D3-76.000.
- Hirsh Company: See—  
Handler, Milton E.; Sylvan, Richard; Baisch, Herbert; and Peterson, Michael, 291,037, Cl. D6-432.000.
- Hough, Harold L.: See—  
Blaisdell, Ronald G.; and Hough, Harold L., 291,124, Cl. D26-3.000.
- Hulsizer's, Inc.: See—  
Dalbey, Gary L.; and Huston, Ronald L., 291,097, Cl. D20-44.000.
- Huston, Ronald L.: See—  
Dalbey, Gary L.; and Huston, Ronald L., 291,097, Cl. D20-44.000.
- Ichihara, Masuo: See—  
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 291,048, Cl. D7-351.000.
- Interlego A.G.: See—  
Knudsen, Jens N., 291,100, Cl. D21-108.000.
- Knudsen, Jens N.; and Krentz, Daniel A., 291,101, Cl. D21-108.000.
- International Business Machines Corporation: See—  
Wang, James P., 291,093, Cl. D18-12.000.
- Ise, Yoji, to Myotoku Ltd. Ram for industrial robots or the like. 291,089, 7-28-87, Cl. D15-199.000.
- Ito, Yuji: See—  
Kawaguchi, Tsutomu; and Ito, Yuji, 291,076, Cl. D12-181.000.
- IVAC Corporation: See—  
Campbell, Bruce R., 291,119, Cl. D24-8.000.
- Janome Sewing Machine Co. Ltd.: See—  
Hanyu, Susumu, 291,088, Cl. D15-69.000.
- Johnson & Johnson Baby Products Company: See—  
Grubb, Lawrence B.; and Kelly, Lois E., 291,122, Cl. D24-45.000.
- Johnson, Stanley A., to Vollrath Company, The. Spoon. 291,046, 7-28-87, Cl. D7-137.000.
- Jones, Charles; Murphy, James L.; and Burks, Kenneth, to Sports Timer, Inc. Sports timer. 291,068, 7-28-87, Cl. D10-30.000.
- Jones, Paul W.; and Bardue, Casey M., to Physio-Control Corporation. Interfacing cassette for use with a defibrillator or the like. 291,121, 7-28-87, Cl. D24-17.000.
- Kaminski, Stephen H.: See—  
Strousse, Babette L.; and Kaminski, Stephen H., 291,035, Cl. D6-380.000.
- Kangaroos U.S.A., Inc.: See—  
Caldeira, Adelino, 291,021, Cl. D2-309.000.
- Gamm, Robert J., 291,020, Cl. D2-272.000.
- Katsuno, Akira: See—  
Keitoku, Noboru; and Katsuno, Akira, 291,080, Cl. D14-30.000.
- Kawaguchi, Tsutomu; and Ito, Yuji, to Toyoda Jidosha Kabushiki Kaisha. Air spoiler for a vehicle. 291,076, 7-28-87, Cl. D12-181.000.
- Keely, Leroy B.: See—  
Nuttall, Michael J.; Freige, Diab E.; and Keely, Leroy B., 291,085, Cl. D14-113.000.
- Keitoku, Noboru; and Katsuno, Akira, to Pioneer Electronic Corporation. Loudspeaker. 291,080, 7-28-87, Cl. D14-30.000.
- Kelly, Lois E.: See—  
Grubb, Lawrence B.; and Kelly, Lois E., 291,122, Cl. D24-45.000.
- Kikuchi, Katsutoshi, to Sony Corporation. Case for a magnetic tape cassette or the like. 291,024, 7-28-87, Cl. D3-35.000.
- Kitahashi, Seiichiro, to Toyota Jidosha Kabushiki Kaisha. Front bumper for an automobile. 291,075, 7-28-87, Cl. D12-169.000.
- Knight, Elizabeth, to Hasbro Industries, Inc. Design for a toy pony. 291,103, 7-28-87, Cl. D21-165.000.
- Knudsen, Jens N., to Interlego A.G. Toy building block. 291,100, 7-28-87, Cl. D21-108.000.

Knudsen, Jens N.; and Krentz, Daniel A., to Interlego A.G. Toy construction piece. 291,101, 7-28-87, Cl. D21-108.000.  
 Koester, Betty L.; and Adler, Janet F. Girl clown rag doll. 291,104, 7-28-87, Cl. D21-173.000.  
 Kolb, Richard P.: See—  
 Prince, Anthony P.; Kolb, Richard P.; and Stevens, Myron T., 291,063, Cl. D9-401.000.  
 Komar, Michael N., to TI Russell Hobbs Limited. Pressing iron. 291,131, 7-28-87, Cl. D32-70.000.  
 Komar, Michael N., to TI Russell Hobbs Limited. Stand for a pressing iron. 291,132, 7-28-87, Cl. D32-73.000.  
 Krentz, Daniel A.: See—  
 Knudsen, Jens N.; and Krentz, Daniel A., 291,101, Cl. D21-108.000.  
 Krone GmbH: See—  
 Buchin, Karl, 291,082, Cl. D14-53.000.  
 Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 291,048, 7-28-87, Cl. D7-351.000.  
 Lackner, John R.; and Bartsevich, William E., Jr., to Scott & Fetzer Company, The. Vacuum cleaner bracket. 291,129, 7-28-87, Cl. D32-31.000.  
 Linn, Richard A., to Padco, Inc. Tank for pressure feeding of paint or other liquids. 291,111, 7-28-87, Cl. D23-2.000.  
 Luongo, William A. Combined tie and belt rack. 291,031, 7-28-87, Cl. D6-323.000.  
 MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 291,060, 7-28-87, Cl. D9-389.000.  
 MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 291,062, 7-28-87, Cl. D9-390.000.  
 Malara, Fred C. Folding ramp. 291,137, 7-28-87, Cl. D34-32.000.  
 Marshall, Brigitte C. Doll carrier. 291,102, 7-28-87, Cl. D21-121.000.  
 Masco Building Products Corp.: See—  
 Ryan, Thomas J., 291,117, Cl. D23-32.000.  
 Matsushita Electric Industrial Co., Ltd.: See—  
 Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 291,048, Cl. D7-351.000.  
 Matsutaka, Nobuaki, to Victor Company of Japan, Limited. Container for magnetic tape magazines. 291,025, 7-28-87, Cl. D3-35.000.  
 McCune, William L., to Aspen Laboratories, Inc. Control panel for a control valve for use with a tourniquet system. 291,123, 7-28-87, Cl. D24-21.000.  
 McIntire, Thomas S. Ecology tab can opening ring. 291,050, 7-28-87, Cl. D8-18.000.  
 McLeod, Michael E. Chair. 291,033, 7-28-87, Cl. D6-334.000.  
 Mendralla, Robert A.; and Scheie, Carl E., to Wilson Sporting Goods Co. Golf club head. 291,107, 7-28-87, Cl. D21-220.000.  
 Mickelson, Dale. Caster assembly. 291,059, 7-28-87, Cl. D8-375.000.  
 Mickelson, N. Peter; and Napiorkowski, John J., to GTE Products Corporation. Telephone network interface device. 291,081, 7-28-87, Cl. D14-52.000.  
 Micro Plastics, Inc.: See—  
 Hill, Royce W., 291,056, Cl. D8-354.000.  
 Miller, Thomas M.; and Schraff, Raymond J., to Eltech Systems Corporation. Cover for a ladle or the like. 291,118, 7-28-87, Cl. D23-82.000.  
 Minagawa, Masahiro: See—  
 Morozumi, Kiyotaka; Hashimoto, Masanori; and Minagawa, Masahiro, 291,095, Cl. D18-13.000.  
 Miniman Security AB: See—  
 Bohjort, Bengt, 291,127, Cl. D29-15.000.  
 Minost, Henri, to Beghin-Say, S.A. Dispensing box for cottonwool-tipped sticks or the like. 291,067, 7-28-87, Cl. D9-418.000.  
 Mizuma, Kensuke: See—  
 Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 291,048, Cl. D7-351.000.  
 Morozumi, Kiyotaka; Hashimoto, Masanori; and Minagawa, Masahiro, to Ricoh Company, Ltd. Laser printer. 291,095, 7-28-87, Cl. D18-13.000.  
 Motorola, Inc.: See—  
 Scheid, William J.; and Siddoway, Craig F., 291,078, Cl. D14-12.000.  
 Murphy, James L.: See—  
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 Muutonen, Timo: See—  
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 Myojo, Seiji, to Shimano Industrial Company Limited. Fishing reel. 291,109, 7-28-87, Cl. D22-141.000.  
 Myotoku Ltd.: See—  
 Ise, Yoji, 291,089, Cl. D15-199.000.  
 Nakade, Kenichi, to Ricoh Company, Ltd. Laser printer. 291,094, 7-28-87, Cl. D18-13.000.  
 Nakatani, Koma, to Velbon International Corp. Tubular leg clamp. 291,061, 7-28-87, Cl. D8-396.000.  
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 Mickelson, N. Peter; and Napiorkowski, John J., 291,081, Cl. D14-52.000.  
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 Neufeldt Industries Limited: See—  
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 Oneida Ltd.: See—  
 Richmond, Colin B., II, 291,045, Cl. D7-137.000.  
 Outboard Marine Corporation: See—  
 Prince, Anthony P.; Kolb, Richard P.; and Stevens, Myron T., 291,063, Cl. D9-401.000.  
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 Linn, Richard A., 291,111, Cl. D23-2.000.  
 Pappas, Phillip M. Compact portable kitchen. 291,047, 7-28-87, Cl. D7-334.000.  
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 Piesco, Nazzareno, to F.I.R. Rubinetterie S.p.A. Combined bathtub faucet and hand shower. 291,114, 7-28-87, Cl. D23-25.000.  
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 Pittway Corporation: See—  
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 Prince, Anthony P.; Kolb, Richard P.; and Stevens, Myron T., to Outboard Marine Corporation. Lubricant container. 291,063, 7-28-87, Cl. D9-401.000.  
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 Clivio, Franco; and Raffler, Dieter, 291,112, Cl. D23-3.000.  
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 Drake, Craig D.; and Crist, Craig W., 291,023, Cl. D3-35.000.  
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 Ryobi Ltd.: See—  
 Shohoji, Takeshi; and Sakamoto, Masakazu, 291,110, Cl. D22-141.000.  
 Sakamoto, Masakazu: See—  
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 Sauter, Bruce M.; and Snyder, Orville E., 291,032, Cl. D6-333.000.  
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 Yee, Lung T.: See—  
 Feinbloom, Richard E.; and Yee, Lung T., 291,091, Cl. D16-130.000.  
 Yomo, Takashi, to Canon Kabushiki Kaisha. Laser beam printer. 291,096, 7-28-87, Cl. D18-13.000.



# CLASSIFICATION OF PATENTS

ISSUED JULY 28, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

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15	4,682,371	36	4,682,429	25.1		4,682,996		265		CLASS 100		422		4,682,599		392		4,682,642	
51	4,682,372	CLASS 40		106		4,682,997		CLASS 66		CLASS 101		635		4,682,600		CLASS 162			
175	4,682,373	5	4,682,430	164		4,682,998		81		4,682,540		642		4,682,601		199		4,683,027	
209	4,682,374	21 C	4,682,431	176				176		4,682,541		659		4,682,602		275		4,683,028	
CLASS 5		573	4,682,432	192		4,682,480		CLASS 70		CLASS 102		736		4,682,603		CLASS 164			
13	4,682,375	615	4,682,433	CLASS 42				14		4,682,542		754		4,682,604		34		4,682,643	
60	4,682,376	51	4,682,434	51		4,682,434		129		4,682,543		772		4,682,605		359		4,682,644	
86	4,682,377	70.01	4,682,435	CLASS 43		4,682,435		312		4,682,544		774		4,682,606		453		4,682,645	
239	4,682,378	CLASS 44		1		4,682,436		364 R		4,682,545		775		4,682,607		481		4,682,646	
500	4,682,379	19	4,682,437	19		4,682,437		CLASS 71		CLASS 104		173		4,682,610		CLASS 165			
CLASS 6		21.2	4,682,438	24		4,682,438		28		4,682,547		256		4,682,611		11.1		4,682,647	
9	4,682,380	61	4,682,440	CLASS 48		4,682,439		92		CLASS 106		73		4,682,612		12		4,682,648	
137	4,682,382	CLASS 49		197 R		4,682,441		CLASS 72		CLASS 110		102		4,682,613		43		4,682,649	
CLASS 08		210	4,682,442	56		4,682,442		3		4,683,001		27		4,682,614		80.3		4,682,651	
468	4,682,383	CLASS 10	4,682,443	CLASS 44		4,682,443		20		4,683,002		30		4,682,615		173		4,682,650	
63	4,682,381	56	4,682,444	CLASS 48		4,682,444		86		4,683,003		58 R		4,683,008		CLASS 166			
CLASS 14		197 R	4,682,445	387		4,682,445		170		4,683,004		99		4,682,613		263		4,682,652	
71.3	4,682,382	210	4,682,446	460		4,682,446		273 R		4,683,005		102		4,682,614		303		4,682,653	
CLASS 15		462	4,682,447	CLASS 73		4,682,447		308 M		4,683,006		102		4,682,615		308		4,682,654	
105.5	4,682,383	466	4,682,448	12		4,682,490		CLASS 110		CLASS 110		38		4,682,616		369		4,682,655	
344	4,682,384	CLASS 51		37		4,682,491		CLASS 111		CLASS 111		89		4,682,617		372		4,682,656	
CLASS 17		154	4,682,444	49.2		4,682,492		7.1		4,682,550		246		4,682,618		385		4,682,657	
45	4,682,385	147	4,682,494	118.1		4,682,493		CLASS 112		CLASS 112		89		4,682,619		73		4,682,658	
46	4,682,386	168	4,682,495	147		4,682,494		103		4,682,551		246		4,682,620		CLASS 174			
49	4,682,387	204	4,682,496	168		4,682,495		121.12		4,682,552		68.1		4,682,621		83		4,683,349	
CLASS 19		602	4,682,497	176		4,682,498		262.1		4,682,553		110		4,682,622		19		4,683,350	
105	4,682,388	701	4,682,498	204		4,682,499		265.1		4,682,554		116.3		4,682,623		48		4,682,659	
CLASS 24		705	4,682,500	618		4,682,500		39		4,682,555		154		4,682,624		96		Re. 32,463	
599	4,682,389	708	4,682,501	701		4,682,501		222		4,682,556		317		4,682,625		215		4,682,660	
632	4,682,390	723	4,682,502	705		4,682,502		222		4,682,557		318		4,682,626		320		4,682,661	
CLASS 29		755	4,682,503	708		4,682,503		295		4,682,558		538		4,682,627		329		4,682,662	
33 M	4,682,391	854	4,682,504	723		4,682,504		343		4,682,559		551		4,682,628		16		4,682,663	
34 B	4,682,392	862.34	4,682,505	755		4,682,505		363		4,682,560		572		4,682,629		139		4,682,664	
130	4,682,393	863.54	4,682,506	854		4,682,506		CLASS 74		CLASS 74		624.11		4,682,630		CLASS 180			
173	4,682,394	866.5	4,682,507	97		4,682,507		410		4,682,561		625.4		4,682,631		89.13		4,682,666	
261	4,682,395	866.5	4,682,508	118		4,682,508		551.4		4,682,562		625.4		4,682,632		197		4,682,667	
271	4,682,396	866.5	4,682,509	126.2		4,682,509		594.6		4,682,563		625.4		4,682,633		209		4,682,668	
407	4,682,397	207	4,682,510	200		4,682,510		665 N		4,682,564		625.4		4,682,634		CLASS 181			
426.4	4,682,398	221	4,682,511	207		4,682,511		681		4,682,565		625.4		4,682,635		114		4,682,669	
CLASS 29		239	4,682,512	239		4,682,512		687		4,682,566		625.4		4,682,636		287		4,682,670	
564.7	4,682,399	321	4,682,513	261		4,682,513		687		4,682,567		625.4		4,682,637		3		4,682,671	
568	4,682,400	229	4,682,514	271		4,682,514		687		4,682,568		625.4		4,682,638		CLASS 184			
571	4,682,401	239	4,682,515	277		4,682,515		687		4,682,569		625.4		4,682,639		106		4,682,672	
CLASS 30		247	4,682,516	281		4,682,516		687		4,682,570		625.4		4,682,640		126		4,682,673	
572	4,682,402	281	4,682,517	287		4,682,517		687		4,682,571		625.4		4,682,641		CLASS 188			
576 B	4,682,403	298	4,682,518	298		4,682,518		687		4,682,572		625.4		4,682,642		273		4,682,674	
576 W	4,682,404	298	4,682,519	298		4,682,519		687		4,682,573		625.4		4,682,643		299		4,682,675	
591	4,682,405	298	4,682,520	298		4,682,520		687		4,682,574		625.4		4,682,644		CLASS 192			
596	4,682,406	298	4,682,521	298		4,682,521		687		4,682,575		625.4		4,682,645		21.5		4,682,676	
745	4,682,407	298	4,682,522	298		4,682,522		687		4,682,576		625.4		4,682,646		41 A		4,682,677	
750	4,682,408	298	4,682,523	298		4,682,523		687		4,682,577		625.4		4,682,647		56 F		4,682,678	
825	4,682,409	298	4,682,524	298		4,682,524		687		4,682,578		625.4		4,682,648		58 C		4,682,679	
840	4,682,410	298	4,682,525	298		4,682,525		687		4,682,579		625.4		4,682,649		98		4,682,680	
846	4,682,411	298	4,682,526	298		4,682,526		687		4,682,580		625.4		4,682,650		CLASS 196			
CLASS 30		298	4,682,527	298		4,682,527		687		4,682,581		625.4		4,682,651		14.52		4,683,029	
228	4,682,416	298	4,682,528	298		4,682,528		687		4,682,582		625.4		4,682,652		CLASS 198			
294	4,682,417	298	4,682,529	298		4,682,529		687		4,682,583		625.4		4,682,653		333		4,682,681	
CLASS 33		298	4,682,530	298		4,682,530		687		4,682,584		625.4		4,682,654		368		4,682,682	
1 M	4,682,418	298	4,682,531	298		4,682,531		687		4,682,585		625.4		4,682,655		380		4,682,683	
302	4,682,421	298	4,682,532	298		4,682,532		687		4,682,586		625.4		4,682,656		461		4,682,684	
613	4,682,419	298	4,682,533	298		4,682,533		687		4,682,587		625.4		4,682,657		621		4,682,685	
626	4,682,420	298	4,682,534	298		4,682,534		687		4,682,588		625.4		4,682,658		844		4,682,686	
CLASS 34		298	4,682,535	298		4,682,535		687		4,682,589		625.4		4,682,659		852		4,682,687	
9	4,682,422	298	4,682,536	298		4,682,536		687		4,682,590		625.4		4,682,660		CLASS 200			
58	4,682,423	298	4,682,537	298		4,682,537		687		4,682,591		625.4		4,682,661		6 R		4,683,352	
151	4,682,424	298	4,682,538	298		4,682,538		687		4,682,592		625.4		4,682,662		8 R		4,683,353	
CLASS 36		298	4,682,539	298		4,682,539		687		4,682,593		625.4		4,682,663		61.41		4,683,354	
44	4,682,425	298	4,682,540	298		4,682,540		687		4,682,594		625.4		4,682,664		61.47		4,683,355	
30	4,682,426	298	4,682,541	298		4,682,541		687		4,682,595		625.4		4,682,665		61.93		4,683,356	
CLASS 37		298	4,682,542	298		4,682,542		687		4,682,596		625.4		4,682,666		CLASS 203			
91	4,682,427	298	4,682,543	298		4,682,543		687		4,682,597		625.4		4,682,667		6 R		4,683,357	
104	4,682,428	298	4,682,544	298		4,682,544		687		4,682,598		625.4		4,682,668		8 R		4,683,358	

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243	4,683,358	591	4,682,717		408	4,682,817		
314	4,683,359		4,682,718		452	4,682,818		
	4,683,360							
6	4,683,030	310	4,682,719	CLASS 261	10	4,682,819	1	4,682,886
		311	4,682,720		47	4,682,844	39	4,682,887
227	4,683,031	67	4,682,721	CLASS 262	177 V	4,682,845	73	4,682,888
248	4,683,032					4,682,846	135	4,682,889
						4,682,847	244	4,682,890
38	4,683,033	39	4,682,723	CLASS 263	37 P	4,682,820	353	4,682,891
43	4,683,034	41	4,682,722	CLASS 264	37 R	4,682,821	356	4,682,892
		50	4,682,724			4,682,822	375	4,682,893
		119	4,682,725	CLASS 265	20	4,682,823	402	4,682,894
1 T	4,683,035	146	4,683,101	CLASS 266	22 R	4,682,824		4,682,895
15	4,683,036	22	4,683,092	CLASS 267	92	4,682,824		
64 R	4,683,037	38	4,683,094	CLASS 268	125	4,683,381	13	4,683,483
93	4,683,038	171	4,683,095	CLASS 269	296 R	4,683,382	16	4,683,484
95	4,683,039	249	4,683,096		473	4,683,383	22	4,683,485
98	4,683,040	268	4,683,097	CLASS 270	475	4,683,384	23.6	4,683,486
	4,683,041	302	4,683,098	CLASS 271	518	4,683,385	34	4,683,487
	4,683,042	511	4,683,099	CLASS 272	549	4,683,386	42	4,683,488
180.1	4,683,043			CLASS 273	571	4,683,387	81	4,683,489
192.15	4,683,044	89	4,682,763	CLASS 274			30	4,683,490
192.26	4,683,045	3	4,682,764	CLASS 275	46	4,683,388	54	4,683,491
206	4,683,046	41	4,682,765	CLASS 276	62	4,683,389	56	4,683,492
243 M	4,683,047	71	4,682,766	CLASS 277	71	4,683,390	80	4,683,493
416	4,683,048	105	4,682,767	CLASS 278	105	4,683,391	101	4,683,494
428	4,683,049	119	4,682,768	CLASS 279	105.5	4,683,392	136	4,683,495
		123	4,682,769	CLASS 280	131 R	4,683,393	148	4,683,496
1.5	4,682,688	263.39	4,682,733	CLASS 281	156	4,683,394	166	4,683,497
222	4,682,689	315	4,682,734	CLASS 282	313 R	4,683,395	209	4,683,498
223	4,682,513	690	4,682,735	CLASS 283	358	4,683,396	260	4,683,499
305	4,682,690	736	4,682,736	CLASS 284	42	4,682,825	264	4,683,500
373	4,682,691			CLASS 285	42.5	4,682,826	283	4,683,501
439	4,682,692	34	4,682,737	CLASS 286	870.02	4,682,827	342	4,683,502
583	4,682,693	56	4,682,738	CLASS 287	172	4,683,473		4,683,503
		275	4,682,739	CLASS 288	368	4,683,474	64	4,683,504
		282.1	4,682,740	CLASS 289	915	4,683,475	98	4,683,505
110	4,683,050	55	4,682,741	CLASS 290	29	4,683,476	105	4,683,506
111	4,683,051	56 R	4,682,742	CLASS 291	75	4,683,477	109	4,683,507
	4,683,052	58.6	4,682,743	CLASS 292	76 PH	4,683,478	113	4,683,508
559	4,682,694	158 R	4,682,744	CLASS 293	134	4,683,479	119	4,683,509
571	4,682,695	161	4,682,745	CLASS 294	140 R	4,683,480	132	4,683,510
		207	4,682,746	CLASS 295	159	4,683,481	137	4,683,511
36	4,683,053	68.1	4,682,747	CLASS 296	106	4,683,482	263	4,683,512
91	4,683,054	73	4,682,748	CLASS 297	263	4,682,841	328	4,683,516
120	4,683,055	284	4,682,749	CLASS 298	37	4,682,842	358	4,683,517
186	4,683,056	703	4,682,750	CLASS 299	96.15	4,682,843	424	4,683,519
232	4,683,057	503	4,682,751	CLASS 300	96.18	4,682,844	427	4,683,520
359	4,683,058	550	4,682,752	CLASS 301	96.20	4,682,845		
404	4,683,059	562	4,682,753	CLASS 302	96.21	4,682,846	80	4,683,521
448	4,683,060	639	4,682,754	CLASS 303	96.22	4,682,847	135	4,683,522
512.1	4,683,061			CLASS 304	96.23	4,682,848	267	4,683,523
605	4,683,062	615	4,682,786	CLASS 305	96.24	4,682,849	268	4,683,524
617	4,683,063	628	4,682,787	CLASS 306	96.34	4,682,850	346	4,683,525
634	4,683,064	775	4,682,788	CLASS 307	105	4,682,851		4,683,526
668	4,683,065	801	4,682,789	CLASS 308	128	4,682,852		
734	4,683,066	806	4,682,790	CLASS 309	255	4,682,853		
767	4,683,067	45	4,682,791	CLASS 310	276 R	4,682,854		
		309	4,683,374	CLASS 311	319	4,682,855		
43	4,682,696	327.2	4,683,375	CLASS 312	331 T	4,682,856		
45	4,682,697	492.2	4,683,376	CLASS 313	334	4,682,857		
70.6	4,682,698	493.1	4,683,377	CLASS 314	414	4,682,858		
71	4,682,699	548	4,683,378	CLASS 315	423	4,682,859		
			4,683,380	CLASS 316	432	4,682,860		
216	4,682,700	11.5 A	4,682,793	CLASS 317	463	4,682,861		
230	4,682,701	82	4,682,794	CLASS 318	464	4,682,862		
232	4,682,702	4	4,682,755	CLASS 319	465	4,682,863		
247	4,682,703	63.5	4,682,756	CLASS 320	466	4,682,864		
329	4,682,704	77	4,682,757	CLASS 321	467	4,682,865		
		84	4,682,758	CLASS 322	468	4,682,866		
		210	4,682,759	CLASS 323	469	4,682,867		
10.43	4,683,361	39	4,682,796	CLASS 324	470	4,682,868		
10.55 A	4,683,362	40	4,682,797	CLASS 325	471	4,682,869		
10.55 F	4,683,363	174	4,682,798	CLASS 326	472	4,682,870		
69 R	4,683,364	169.15	4,682,799	CLASS 327	473	4,682,871		
121 ER	4,683,365	247	4,682,800	CLASS 328	474	4,682,872		
121 LC	4,683,366	251.5	4,682,801	CLASS 329	475	4,682,873		
121 PY	4,683,367	337	4,682,802	CLASS 330	476	4,682,874		
146.1	4,683,368			CLASS 331	477	4,682,875		
364	4,683,369	25	4,682,803	CLASS 332	478	4,682,876		
370	4,683,370	82.26	4,682,804	CLASS 333	479	4,682,877		
		86.4	4,682,805	CLASS 334	480	4,682,878		
93	4,682,705	88	4,682,806	CLASS 335	481	4,682,879		
276	4,682,706	161	4,682,807	CLASS 336	482	4,682,880		
307	4,682,707			CLASS 337	483	4,682,881		
460	4,682,708			CLASS 338	484	4,682,882		
				CLASS 339	485	4,682,883		
				CLASS 340	486	4,682,884		
2	4,682,709	1 S	4,682,808	CLASS 341	487	4,682,885		
		20	4,682,810	CLASS 342	488	4,682,886		
63	4,682,710	31 P	4,682,809	CLASS 343	489	4,682,887		
75	4,682,711	181	4,682,811	CLASS 344	490	4,682,888		
137	4,682,712	195	4,682,812	CLASS 345	491	4,682,889		
153	4,682,713			CLASS 346	492	4,682,890		
	4,682,714			CLASS 347	493	4,682,891		
175	4,682,715			CLASS 348	494	4,682,892		

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57	4,683,557	616	4,682,904	4,683,137	173	4,682,951	CLASS 503	480	4,683,290
189	4,683,558	CLASS 403	409	4,683,132	CLASS 434	208	Re.32,466	CLASS 530	
		327	4,682,905	CLASS 425	12	4,682,952	CLASS 514	324	4,683,291
44	4,683,559	409.1	4,682,906	34 R	16	4,682,953	7	328	4,683,292
45	4,683,560	CLASS 404	103	4,682,940	191	4,682,954	14	359	4,683,293
284	4,683,561	25	4,682,907	72 R	237	4,682,955	14	371	4,683,294
	4,683,562	84	4,682,908	130	307	4,682,956	42	391	4,683,295
CLASS 370		90	4,682,909	549	335	4,682,957	46	CLASS 536	
16	4,683,563	94	4,682,910	4,682,945	CLASS 435	120	4,683,223	CLASS 536	
63	4,683,564	CLASS 405	5	4,683,138	6	4,683,194	120	4,683,224	18.6
69.1	4,683,565	53	4,682,911	4,683,139	7	4,683,195	128	4,683,225	45
100	4,683,566	154	4,682,912	4,683,140	22	4,683,196	192	4,683,226	119
110.1	4,683,567	169	4,682,913	4,683,141	68	4,683,197	202	4,683,227	CLASS 539
CLASS 371		283	4,682,914	4,683,142	7	4,683,198	210	Re.32,465	558
12	4,683,568	639	4,683,141	4,683,143	22	4,683,199	211	4,683,228	CLASS 539
25	4,683,569	CLASS 406	5	4,683,144	68	4,683,199	213	4,683,229	CLASS 540
36	4,683,570	31	4,682,915	4,683,145	75	4,683,200	220	4,683,231	348
37	4,683,571	CLASS 407	2	4,683,146	91	4,683,201	228	4,683,232	4,683,300
	4,683,572	113	4,682,916	4,683,147	94	4,683,202	235	4,683,233	4,683,301
CLASS 372		34	4,682,917	4,683,148	128	4,683,203	256	4,683,234	350
34	4,683,573	35	4,682,918	4,683,149	172.3	4,683,204	282	4,683,235	362
44	4,683,574	212	4,682,919	4,683,150	253	4,683,205	288	4,683,236	329
59	4,683,575	241 R	4,682,920	4,683,151	311	4,683,206	292	4,683,237	533
98	4,683,576	CLASS 409	239	4,683,152	50	4,683,207	299	4,683,238	CLASS 544
CLASS 373		179	4,682,921	4,683,153	12	4,683,208	390	4,683,239	33
105	4,683,577	231	4,682,922	4,683,154	14	4,683,209	512	4,683,240	4,683,306
CLASS 374		299	4,682,923	4,683,155	50	4,683,210	539	4,683,241	198
45	4,682,897	CLASS 410	1	4,683,156	52	4,683,211	557	4,683,242	211
179	4,682,898	30	4,682,924	4,683,157	501	4,683,212	568	4,683,243	4,683,308
CLASS 375		90	4,682,925	4,683,158	CLASS 439	4,683,213	652	4,683,244	353
98	4,683,578	CLASS 411	65	4,683,159	83	4,682,829	CLASS 521	4,683,245	321
CLASS 376		329	4,682,926	4,683,160	92	4,682,828	54	4,683,246	240
209	4,683,102	461	4,682,925	4,683,161	224	4,682,830	91	4,683,247	341
	4,683,103	CLASS 414	138	4,683,162	294	4,682,831	96	4,683,248	437
251	4,683,104	11	4,682,926	4,683,163	344	4,682,832	129	4,683,249	CLASS 549
259	4,683,105	217	4,682,927	4,683,164	377	4,682,833	CLASS 522		417
	4,683,106	416	4,682,928	4,683,165	395	4,682,834	33	4,683,250	CLASS 556
260	4,683,107	589	4,682,929	4,683,166	426	4,682,835	46	4,683,251	12
	4,683,108	CLASS 417	314.8	4,683,167	589	4,682,836	143	4,683,252	4,683,315
261	4,683,109	623	4,682,930	4,683,168	598	4,682,837	412	4,683,253	38
	4,683,110	744 A	4,682,931	4,683,169	874	4,682,838	442	4,683,254	173
391	4,683,111	CLASS 415	337	4,683,170	CLASS 440	4,682,839	503	4,683,254	425
402	4,683,112	172 A	4,682,932	4,683,171	53	4,682,959	CLASS 524		478
419	4,683,113	CLASS 416	412	4,683,172	61	4,682,960	151	4,683,255	CLASS 558
439	4,683,114	198 A	4,682,934	4,683,173	5	4,682,961	285	4,683,256	3
447	4,683,116	223 A	4,682,935	4,683,174	28	4,682,962	432	4,683,257	52
449	4,683,117	CLASS 417	677	4,683,175	37	4,682,965	434	4,683,258	354
11	4,683,579	366	4,682,936	4,683,176	101	4,682,966	447	4,683,259	CLASS 560
60	4,683,580	393	4,682,937	4,683,177	268	4,682,967	512	4,683,260	10
CLASS 377		CLASS 418	26	4,683,178	279	4,682,968	566	4,683,261	51
38	4,683,581	1	4,682,938	4,683,179	450	4,682,970	608	4,683,262	86
174	4,683,582	178	4,682,939	4,683,180	CLASS 446	4,682,971	CLASS 525	4,683,263	118
CLASS 379		CLASS 419	192	4,683,181	130	4,682,972	57	4,683,264	338
200	4,683,583	23	4,683,118	4,683,182	263	4,682,973	65	4,683,265	CLASS 562
269	4,683,584	CLASS 420	20	4,683,183	55	4,682,974	67	4,683,266	459
398	4,683,585	444	4,683,119	4,683,184	123	4,682,975	123	4,683,267	BI 4,623,244
426		CLASS 422	57	4,683,185	206	4,682,976	137	4,683,268	CLASS 564
4	4,683,553	72	4,683,120	4,683,186	358	4,682,977	238	4,683,269	414
134	4,683,586	197	4,683,121	4,683,187	CLASS 430	4,682,978	329.1	4,683,270	476
CLASS 381		227	4,683,122	4,683,188	403	4,682,979	404	4,683,271	480
25	4,683,587	2	4,683,123	4,683,189	CLASS 464	4,682,972	CLASS 526	4,683,272	498
61	4,683,588	6	4,683,124	4,683,190	CLASS 474	4,682,973	216	4,683,274	CLASS 568
71	4,683,589	219	4,683,125	4,683,191	263	4,682,973	262	4,683,275	12
85	4,683,590	280	4,683,126	4,683,192	55	4,682,974	21	4,683,276	41
	4,683,591	321 R	4,683,127	4,683,193	123	4,682,975	32	4,683,277	331
CLASS 384		338	4,683,128	4,683,194	206	4,682,976	67	4,683,278	366
41	4,682,899	351	4,683,129	4,682,946	358	4,682,977	71	4,683,279	464
105	4,682,900	579	4,683,130	4,682,947	CLASS 431	4,682,978	89	4,683,280	716
539	4,682,901	CLASS 424	58	4,682,948	66	4,683,214	91	4,683,281	765
18	4,682,902	49	4,683,133	4,683,199	107	4,683,215	93	4,683,282	869
121	4,682,903	59	4,683,134	4,683,200	159	4,683,216	113	4,683,283	CLASS 604
	4,682,905	85	4,683,135	4,683,201	214	4,683,217	357	4,683,284	43
		89	4,683,136	4,683,202	302	4,683,218	361	4,683,285	48
		81		4,682,950	404	4,683,219	402	4,683,286	122
		90			CLASS 433	4,683,220	406	4,683,287	158
					66	4,683,221	113	4,683,288	4,682,980
					107	4,683,222	357	4,683,289	4,682,981
					159	4,683,223	357	4,683,290	
					214	4,683,224	361	4,683,291	
					302	4,683,225	402	4,683,292	
					404	4,683,226	406	4,683,293	
					CLASS 434	4,683,227	406	4,683,294	
					66	4,683,228	406	4,683,295	
					107	4,683,229	406		
					159	4,683,230	406		
					214	4,683,231	406		
					302	4,683,232	406		
					404	4,683,233	406		
					CLASS 435	4,683,234	406		
					66	4,683,235	406		
					107	4,683,236	406		
					159	4,683,237	406		
					214	4,683,238	406		
					302	4,683,239	406		
					404	4,683,240	406		
					CLASS 436	4,683,241	406		
					66	4,683,242	406		
					107	4,683,243	406		
					159	4,683,244	406		
					214	4,683,245	406		
					302	4,683,246	406		
					404	4,683,247	406		
					CLASS 437	4,683,248	406		
					66	4,683,249	406		
					107	4,683,250	406		
					159	4,683,251	406		
					214	4,683,252	406		
					302	4,683,253	406		
					404	4,683,254	406		
					CLASS 438	4,683,255	406		
					66	4,683,256	406		
					107	4,683,257	406		
					159	4,683,258	406		
					214	4,683,259	406		
					302	4,683,260	406		
					404	4,683,261	406		
					CLASS 439	4,683,262	406		
					66	4,683,263	406		
					107	4,683,264	406		
					159	4,683,265	406		
					214	4,683,266	406		
					302	4,683,267	406		
					404	4,683,268	406		
					CLASS 440	4,683,269	406		
					66	4,683,270	406		
					107	4,683,271	406		
					159	4,683,272	406		
					214	4,683,273	406		
					302	4,683,274	406		
					404	4,683,275	406		
					CLASS 441	4,683,276	406		
					66	4,683,277	406		
					107	4,683,278	406		
					159	4,683,279	406		
					214	4,683,280	406		
					302	4,683,281	406		
					404	4,683,282	406		
					CLASS 442	4,683,283	406		
					66	4,683,284	406		
					107	4,683,285	406		
					159	4,683,286	406		



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D3— 30.5 291,022	27 291,042	390 291,062	53 291,082	21 291,123
35 291,023	28 291,043	401 291,063	63 291,083	45 291,122
291,024	70 291,044	415 291,064	68 291,084	3 291,124
291,025	137 291,045	418 291,065	113 291,085	26 291,125
40 291,026	291,046	291,066	115 291,086	2 291,126
76 291,027	334 291,047	291,067	21 291,087	15 291,127
D4— 115 291,028	351 291,048	291,068	69 291,088	291,128
118 291,029	1 291,049	40 291,069	199 291,089	31 291,129
D6— 308 291,030	18 291,050	46.1 291,070	6 291,090	70 291,130
323 291,031	40 291,051	78 291,071	130 291,091	291,131
333 291,032	291,052	118 291,072	1 291,092	73 291,132
334 291,033	310 291,053	146 291,073	12 291,093	1 291,133
348 291,034	325 291,054	156 291,074	13 291,094	5 291,134
380 291,035	354 291,055	169 291,075	291,095	8 291,135
399 291,036	291,056	181 291,076	291,096	28 291,136
432 291,037	291,057	203 291,077	291,097	32 291,137
479 291,038	356 291,058	12 291,078	6 291,098	35 291,138
551 291,039	375 291,059	30 291,079	108 291,099	28 291,139
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04 : 4,682,407	4,682,801	4,683,509	4,682,705	4,683,057	4,683,101
4,682,446	4,682,802	4,683,511	4,682,772	4,683,066	4,683,246
4,682,469	4,682,804	4,683,523	4,682,773	4,683,074	4,683,387
4,682,512	4,682,827	4,683,528	4,682,825	4,683,241	4,682,448
4,682,550	4,682,833	4,683,530	4,682,844	4,683,328	4,682,515
4,682,625	4,682,842	4,683,541	4,682,861	4,683,357	4,682,552
4,682,777	4,682,846	4,683,575	4,682,889	4,683,359	4,682,568
4,683,351	4,682,856	4,683,587	4,682,893	4,683,362	4,682,609
4,683,416	4,682,857	4,682,857	4,682,896	4,683,364	4,682,659
4,683,442	4,682,888	4,682,900	4,682,898	4,683,369	4,682,740
4,683,469	4,682,900	4,682,901	4,682,912	4,683,389	4,682,742
4,683,483	4,682,916	4,682,912	4,682,912	4,683,427	4,682,755
4,683,532	4,682,927	4,682,933	4,682,912	4,683,437	4,682,796
4,683,550	4,682,933	4,682,956	4,682,993	4,683,445	4,682,925
4,682,389	4,682,956	4,682,969	4,683,009	4,683,452	4,682,928
4,682,396	4,682,985	4,682,985	4,683,124	4,683,454	4,682,935
4,682,405	4,682,985	4,683,133	4,682,848	4,682,443	4,682,976
4,682,409	4,682,999	4,683,154	4,682,860	4,682,624	4,682,988
4,682,413	4,683,023	4,683,435	4,682,884	4,682,700	4,682,994
4,682,422	4,683,050	4,683,435	4,682,971	4,682,702	4,683,080
4,682,441	4,683,085	4,683,520	4,683,016	4,683,063	4,683,082
4,682,450	4,683,086	4,682,371	4,683,485	4,683,081	4,683,092
4,682,457	4,683,129	4,682,477	4,683,578	4,683,169	4,683,122
4,682,471	4,683,136	4,682,541	4,682,392	4,683,180	4,683,247
4,682,473	4,683,167	4,682,630	4,682,654	4,683,201	4,683,315
4,682,482	4,683,178	4,682,645	4,682,709	4,683,204	4,683,366
4,682,508	4,683,194	4,682,689	4,682,746	4,683,206	4,683,397
4,682,520	4,683,195	4,682,713	4,682,937	4,683,207	4,683,441
4,682,521	4,683,196	4,682,765	4,683,067	4,683,209	4,683,459
4,682,522	4,683,196	4,682,781	4,682,631	4,683,222	4,683,466
4,682,526	4,683,202	4,682,803	4,682,926	4,683,227	4,683,472
4,682,532	4,683,221	4,682,805	4,682,926	4,683,235	4,683,474
4,682,533	4,683,224	4,682,837	4,683,054	4,683,236	4,683,496
4,682,557	4,683,225	4,682,950	4,683,481	4,683,237	4,683,518
4,682,564	4,683,291	4,682,968	4,683,312	4,683,312	4,683,589
4,682,581	4,683,292	4,682,970	4,683,313	4,683,313	4,682,444
4,682,594	4,683,293	4,682,970	4,683,345	4,682,455	4,682,459
4,682,604	4,683,295	4,683,096	4,682,551	4,682,666	4,682,470
4,682,637	4,683,354	4,683,110	4,682,560	4,682,787	4,682,474
4,682,651	4,683,371	4,683,302	4,682,622	4,683,443	4,682,528
4,682,670	4,683,383	4,683,350	4,682,690	4,682,492	4,682,575
4,682,695	4,683,399	4,683,517	4,682,698	4,682,947	4,682,597
4,682,706	4,683,402	4,683,564	4,682,726	4,682,657	4,682,602
4,682,731	4,683,422	4,683,579	4,682,759	4,682,715	4,682,668
4,682,734	4,683,423	4,683,588	4,682,774	4,682,907	4,682,668
4,682,762	4,683,446	4,682,406	4,682,782	4,683,268	4,682,672
4,682,773	4,683,447	4,683,000	4,682,851	4,683,321	4,682,675
4,682,775	4,683,467	4,683,091	4,682,868	4,683,333	4,682,711
4,682,779	4,683,471	4,683,228	4,682,911	4,683,058	4,682,719
4,682,784	4,683,475	4,683,269	4,682,938	4,682,501	4,682,751
4,682,793	4,683,488	4,683,329	4,682,958	4,682,513	4,682,760
4,682,794	4,683,506	4,683,334	4,683,017	4,682,605	4,683,015
	4,683,508	4,682,610	4,683,035	4,682,701	4,683,065

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,683,095	4,682,699	4,682,890	4,682,939	4,683,014	4,682,924
4,683,223	4,682,744	4,682,891	4,682,964	4,683,029	4,682,979
4,683,290	4,682,808	4,682,894	4,683,008	4,683,052	4,683,076
4,683,251	4,682,836	4,682,934	4,683,011	4,683,084	4,683,152
4,683,277	4,682,951	4,682,949	4,683,020	4,683,090	4,683,218
4,683,300	4,682,982	4,682,963	4,683,021	4,683,100	4,683,272
4,683,424	4,682,986	4,683,007	4,683,043	4,683,103	4,683,276
4,683,321	4,682,992	4,683,036	4,683,077	4,683,105	4,683,316
4,683,382	4,683,004	4,683,075	4,683,087	4,683,108	4,683,335
4,683,352	4,683,024	4,683,094	4,683,143	4,683,109	4,683,347
4,682,387	4,683,025	4,683,148	4,683,173	4,683,114	4,683,456
4,682,412	4,683,051	4,683,168	4,683,252	4,683,116	4,683,457
4,682,475	4,683,070	4,683,172	4,683,254	4,683,117	4,683,464
4,682,503	4,683,120	4,683,187	4,683,260	4,683,157	4,683,468
4,682,546	4,683,134	4,683,199	4,683,281	4,683,175	4,683,486
4,682,583	4,683,138	4,683,212	4,683,273	4,683,229	4,683,534
4,682,614	4,683,160	4,683,217	4,683,281	4,683,239	4,683,546
4,682,615	4,683,214	4,683,243	4,683,282	4,683,256	4,683,555
4,682,727	4,683,216	4,683,296	4,683,283	4,683,266	4,683,556
4,682,732	4,683,301	4,683,301	4,683,284	4,683,279	4,683,557
4,682,735	4,683,311	4,683,311	4,683,309	4,683,314	4,683,558
4,682,852	4,683,318	4,683,317	4,683,332	4,683,344	4,683,585
4,682,863	4,683,324	4,683,380	4,683,336	4,683,353	4,682,693
4,682,898	4,683,342	4,683,393	4,683,373	4,683,361	4,682,729
4,682,952	4,683,355	4,683,412	4,683,430	4,683,365	4,682,957
4,682,960	4,683,388	4,683,438	4,683,431	4,683,374	4,682,807
4,683,097	4,683,405	4,683,461	4,683,477	4,683,420	4,682,835
4,683,132	4,683,407	4,683,470	4,683,516	4,683,421	4,682,894
4,683,159	4,683,453	4,683,547	4,683,531	4,683,451	4,682,939
4,683,191	4,683,454	4,683,565	4,683,554	4,683,490	4,682,766
4,683,262	4,683,465	4,683,570	4,683,563	4,683,493	4,682,850
4,683,370	4,683,484	4,682,379	4,682,454	4,683,498	4,682,954
4,683,473	4,683,569	4,682,388	4,682,506	4,683,513	4,682,966
4,683,505	4,683,573	4,682,436	4,682,619	4,683,527	4,683,161
4,683,529	4,683,583	4,682,480	4,682,953	4,683,527	4,683,161
4,682,720	4,682,373	4,682,507	4,682,033	4,683,527	4,683,161
4,683,404	4,682,375	4,682,708	4,683,068	4,682,440	4,683,340
4,682,393	4,682,377	4,682,821	4,683,139	4,682,828	4,682,531
4,682,394	4,682,398	4,682,829	4,683,139	4,683,165	4,683,059
4,682,572	4,682,438	4,683,137	4,683,290	4,682,430	4,683,368
4,682,623	4,682,447	4,683,411	4,683,507	4,682,579	4,683,439
4,682,761	4,682,449	4,682,462	4,682,736	4,683,042	4,682,517
4,682,795	4,682,479	4,682,530	4,682,931	4,683,123	4,682,569
4,682,817	4,682,486	4,682,592	4,683,415	4,682,415	4,682,665
4,682,887	4,682,488	4,682,384	4,683,418	4,682,424	4,683,287
4,682,987	4,682,493	4,682,397	4,682,374	4,682,442	4,682,382
4,683,270	4,682,527	4,682,418	4,682,381	4,682,452	4,682,419
4,682,417	4,682,556	4,682,434	4,682,391	4,682,455	4,682,571
4,682,750	4,682,565	4,682,461	4,682,399	4,682,499	4,682,687
4,683,299	4,682,582	4,682,490	4,682,400	4,682,559	4,682,776
4,683,591	4,682,595	4,682,523	4,682,456	4,682,590	4,682,813
4,682,800	4,682,606	4,682,640	4,682,467	4,682,649	4,682,825
4,683,098	4,682,648	4,682,671	4,682,481	4,682,652	4,682,918
4,683,162	4,682,721	4,682,692	4,682,587	4,682,656	4,682,977
Re.32,465	4,682,738	4,682,704	4,682,588	4,682,663	4,683,001
4,682,383	4,682,767	4,682,710	4,682,618	4,682,664	4,683,170
4,682,420	4,682,818	4,682,714	4,682,653	4,682,669	4,683,213
4,682,468	4,682,832	4,682,820	4,682,840	4,682,745	4,683,327
4,682,511	4,682,839	4,682,862	4,682,919	4,682,757	4,683,360
4,682,567	4,682,865	4,682,866	4,682,921	4,682,758	4,683,392
4,682,570	4,682,867	4,682,892	4,682,942	4,682,831	4,683,515
4,682,607	4,682,870	4,682,917	4,682,948	4,682,895	4,682,910
4,682,697	4,682,874	4,682,920	4,682,974	4,682,913	4,682,984

## DESIGN PATENTS

05 : 291,056	08 : 291,134	18 : 291,032	25 : 291,021	29 : 291,111	40 : 291,129
291,068	291,123	291,104	291,031	291,020	291,077
06 : 291,035	09 : 291,026	291,022	291,070	32 : 291,120	48 : 291,030
291,044	291,064	291,073	291,086	34 : 291,133	291,038
291,051	12 : 291,042	291,097	291,103	36 : 291,045	291,039
291,052	291,078	20 : 291,108	291,124	291,083	291,047
291,059	291,037	21 : 291,093	291,126	291,091	51 : 291,034
291,071	291,063	22 : 291,072	291,033	291,137	53 : 291,049
291,074	291,069	23 : 291,128	291,040	39 : 291,030	291,058
291,085	291,105	24 : 291,081	291,060	291,065	291,121
291,117	291,107	291,106	291,062	291,118	291,046
291,119	291,125	291,122	291,098		

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